Ballard Power Systems Europe A/S
Majsmarken 1
9500 Hobro
Denmark

Revision history		
Rev.	**Date.**	**Description**
001	11/08/2023	First Issue
002	01/05/2025	Updated and ABS certificate added

Document Title:	**BLPH Project - Type Approval Certificates**
Document Number:	K559-2254-CWIWP4202202-K12-001
Revision:	Rev001
Sequence Number:	001
File Name:	K559-2254-CWIWP4202202-K12-001Rev001
Purchaser Job:	K559-2254
Purchase Order:	CWIWP4202202
Code:	K12
Requsition Number:	n/a
Customer:	CrossWind C.V., Rotterdam, The Netherlands

TYPE APPROVAL CERTIFICATE

Certificate No:
TAE00004GG
Revision No:
2

This is to certify:

That the Fuel Cell

with type designation(s)
FCwave

Issued to
Ballard Power Systems Europe A/S
Hobro, Nordjylland, Denmark

is found to comply with
DNV rules for classification – Ships

Application :

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

Issued at **Hamburg** on **2023-07-14**
This Certificate is valid until **2027-05-31**.
DNV local unit: **Denmark CMC**

Approval Engineer: **Sven Lellesch**

for **DNV**

Olaf Drews
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.

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

FCwave™ is a PEM fuel cell power module with rated power of 200 kW for marine applications. The system is comprised of an enclosure with an internal separate lower and upper cabinet. The system, lower and upper cabinet, each have individual serial numbers and can be replaced during the service lifetime of the product.

The fuel for the system is pressurized gaseous hydrogen. The hydrogen storage system is not part of Ballard Power Systems Europe scope and therefore not part of the type approval. Oxidant for the reaction is drawn from ambient air and compressed in the internal compressors to feed the fuel cell stacks.
From the stacks, the module will deliver up to 720V direct current to the output of the system. It acts as a load follower electrically. The system needs power from external power source such as the vessels power system to start up, but when running it self-powers the internal Balance of Plant components. The controller and safety system require 24 VDC continuously from the vessels power system to function.
The system requires external water cooling to remove excess heat from the exothermic reaction in the fuel cells. The heat transfer is done with the integrated heat exchanger. The heat can be used in shipboard systems or disposed of as the customer desires. The fuel cells used in the system are Low Temperature PEM fuel cells. Temperatures in the system are below 100°C. The Fuel cell system is built into a cabinet. The cabinet has an ingress protection of IP44. The system is designed to be installed inside a fuel cell installation room. FCwave™ follows the gas safe machinery space concept as per IGF Code.

System Data

Control System Hardware and Software Version

Software	2.X.X	Dated 01/06 2023
Firmware	4.0.4.0	Dated 24/11 2021 (Deif AS)

Safety System Hardware and Software Version

Software	1.1.0	Dated 01/06 2023
Firmware	4.4	01/27 2022 (Siemens)

Independent Safety triggered by

Hydrogen concentration measurement inside fuel cell
External E Stop
Heat Detection inside fuel cell
Smoke Detection inside fuel cell
Ventilation Air Flow inside fuel cell

Interfaces to vessel

Are to be coordinated for each installation
Fuel Cell installation Room and Room requirements
Vessel control system
24VDC safety power supply
24VDC power supply
DC input/output
H2 supply
Low temperature cooling supply
High temperature cooling supply
H2 Enclosure ventilation outlet
Process exhaust outlet
H2 Enclosure ventilation Inlet
Process air inlet
Water drain

Application/Limitation

Fuel cell of type FCwave™ is approved for application as per DNV-RU-SHIP Pt.6 Ch.2 Sec.3.

Installation room
The fuel cell space (H2 enclosure as part of the FCwave™ cabinet) is not equipped with A60 insulation and is not equipped with a fire extinguishing system as indicated in MSC.1/Circ.1647 para 3.1.2 and 3.3.1. Additional installation room requirements shall be defined in the detailed design phase for the vessel.

The installation room is regarded as non-hazardous space.
The free volume of the installation room shall not be less than 10m³.
Gas detection is recommended for the fuel cell installation room and in the ventilation exhaust.

The FCwave™ does not provide an emergency stop button. Adequate and accessible emergency stop buttons shall be provided and integrated to the FCwave™ emergency stop circuit.
Access to the installation room during operation shall be limited to trained service technicians and crew that have received Ballard fuel cell training. Unrestricted access to the installation room can be permitted when all fuel cell modules are powered off and otherwise deemed permissible.

Hydrogen supply
Supply piping to each cabinet shall be carried out as double walled piping following the IGF Code principles.
Each FCwave™ cabinet shall be provided with a shut-off valve with a closing time of less than 2 seconds.
The hydrogen mass flow to each FCwave™ must be restricted by suitable means in all operation scenarios to 4.9g/s.
The dimension (diameter and length) of the hydrogen supply piping from shut-off valve to module interface plate shall not exceed 5000 cm³ as per Integration Manual.

Ventilation
The fuel cell space (H2 enclosure as part of the FCwave™ cabinet) is designed with area classification according to IEC 60079-10:2020, at least suitable for zone 2 installation.
In all cases process air and ventilation exhaust must remain separated, combination of multiple systems exhaust of the same type only. If process and/or ventilation exhausts are combined from multiple systems, they must be equipped with separate isolation dampers, which must close if the module are not operating.
The integration to the vessel shall ensure the exhaust from FC modules (ventilation air) is led to a safe location free of any spark or ignition source.

Approval Conditions
For each delivery to DNV class the following documentation of the fuel cell power installation is to be submitted for approval:

Fuel cell power installation
- Reference to this type approval certificate
- Documents according to DNV RU-SHIP, Pt. 6 Ch. 2 Sec. 3, table 3 for Fuel cell power installation
- G060 Structural fire protection drawing
- G200 Fixed fire protection drawing
- MAN002 Integration Manual

The Type Approval covers hardware and software listed under product description.

When the type approved software is revised (affecting all future deliveries) DNV is to be informed by forwarding updated software version documentation. If the changes are judged to affect functionality for which rule requirements apply a new functional type test may be required and the certificate may have to be renewed to identify the new software version.

Product certificate
Each delivery of the application system is to be certified according to Pt.6, Ch.2, Sec. 3. The certification test is to be performed at the manufacturer of the application system before the system is shipped to the yard. After certification, the clause for application software control will be put into force

Application software control
All changes in software are to be recorded as long as the system is in use on board. Documentation of major changes are to be forwarded to DNV for evaluation and approval before implemented on board

Type Approval documentation

Tests carried out

Marking of product
The components shall be marked for traceability to the Type Approval.

Periodical assessment
For retention of the Type Approval, a periodical assessment as per DNV-CP-0338 Sec.4 shall be performed by a DNV Surveyor in order to verify that the conditions for the Type Approval are complied with.
To check the validity of this certificate, please look it up in https://approvalfinder.dnv.com.

Certificate No: LR23327644TA
Issue Date: 27/07/2023
Expiry Date: 26/07/2028

Type Approval Certificate

This is to certify that the undernoted product(s) has/have been tested with satisfactory results in accordance with the relevant requirements of the Lloyd's Register Type Approval System.

Manufacturer	**Ballard Power Systems Europe A/S**
Address	Majsmarken 1, Hobro, 9500, Denmark
Type	Fuel Cell Module
Description	FCwave™ is a PEM fuel cell power module with rated power of 200 kW for marine applications. The system is comprised of an enclosure with an internal separate lower and upper cabinet. The system, lower and upper cabinet, each have individual serial numbers and can be replaced during the service lifetime of the product. The fuel for the system is pressurized gaseous hydrogen. The hydrogen storage system is not part of Ballard Power Systems Europe scope and therefore not part of the type approval. Oxidant for the reaction is drawn from ambient air and compressed in the internal compressors to feed the fuel cell stacks. From the stacks, the module will deliver up to 720V DC to the output of the system. It acts as a load follower electrically. The system needs power from external power source such as the vessels power system to start up, but when running it self-powers the internal Balance of Plant components. The controller and safety system require 24V DC continuously from the vessels power system to function. The system requires external water cooling to remove excess heat from the exothermic reaction in the fuel cells. The heat transfer is done with the integrated heat exchanger. The heat can be used in shipboard systems or disposed of as the customer desires. The fuel cells used in the system are Low Temperature PEM fuel cells. Temperatures in the system are below 100°C. The Fuel cell system is built into a cabinet. The cabinet has an ingress protection of IP 44. The system is designed to be installed inside a fuel cell installation room.

Jin Meng

Electrical & Control - Senior Specialist to
Lloyd's Register EMEA
A member of the Lloyd's Register group

71 Fenchurch Street, London, EC3M 4BS, United Kingdom

Lloyd's Register Group Limited, its affiliates and subsidiaries and their respective officers, employees or agents are, individually and collectively, referred to in this clause as 'Lloyd's Register'. Lloyd's Register assumes no responsibility and shall not be liable to any person for any loss, damage or expense caused by reliance on the information or advice in this document or howsoever provided, unless that person has signed a contract with the relevant Lloyd's Register entity for the provision of this information or advice and in that case any responsibility or liability is exclusively on the terms and conditions set out in that contract.

Type Approval Certificate

FCwave™ follows the gas safe machinery space concept as per IGF Code.

Trade Name

FCwave™

Application

Marine, Offshore and Industrial applications for use in environmental categories ENV1, as defined in Lloyd's Register Type Approval System, Test Specification Number 7, Fuel Cell Modules, January 2023.

Specified Standard

-Manufacturer's specification
-IACS UR E10 Rev. 8 / 2021 as applicable

Ratings

-Maximum rated output power: 200kW
-Operating voltage: 350 – 720V DC
-Rated current: 2 x 300A or 1 x 550A

Other Conditions

The Fuel Cell Module is approved subject to the following conditions:

- A risk assessment specific to fuel cell power installations is to be carried out for each installation on board.The risk assessment is to evaluate risks related to the safe operation of the ship and as such is to address the safety of the fuel cell power installation itself and, where the fuel cell installation provides power for propulsion of the ship or other essential services, the dependability of the fuel cell power installation.
- The Fuel Cell Module shall only be used in accordance with the manufacturer's instructions and recommendations.
- The Fuel Cell Module shall be installed and maintained in accordance with the applicable rules, regulations, and standards for marine applications.
- The Fuel Cell Module shall be operated and monitored in accordance with the relevant safety requirements.
- The Fuel Cell Module shall be subject to periodic inspections and maintenance, in accordance with the manufacturer's recommendations and applicable rules and regulations.

Lloyd's Register Group Limited, its affiliates and subsidiaries and their respective officers, employees or agents are, individually and collectively, referred to in this clause as 'Lloyd's Register'. Lloyd's Register assumes no responsibility and shall not be liable to any person for any loss, damage or expense caused by reliance on the information or advice in this document or howsoever provided, unless that person has signed a contract with the relevant Lloyd's Register entity for the provision of this information or advice and in that case any responsibility or liability is exclusively on the terms and conditions set out in that contract.

Type Approval Certificate

Type Approval does not eliminate the need for normal inspection and survey procedures required by the Rules and Regulations.
If the specified standards are amended during the validity of this certificate, the product is to be re-approved prior to it being supplied to vessels to which the amended standards apply.

This certificate is not valid for equipment, the design, ratings or operating parameters of which have been varied from the specimen tested. The manufacturer should notify Lloyd's Register EMEA of any modification or changes to the equipment in order to obtain a valid Certificate.

The Design Appraisal Document HPC2262032/JM/PH and its supplementary Type Approval Terms and Conditions form part of this Certificate.

71 Fenchurch Street, London, EC3M 4BS, United Kingdom

Lloyd's Register Group Limited, its affiliates and subsidiaries and their respective officers, employees or agents are, individually and collectively, referred to in this clause as 'Lloyd's Register'. Lloyd's Register assumes no responsibility and shall not be liable to any person for any loss, damage or expense caused by reliance on the information or advice in this document or howsoever provided, unless that person has signed a contract with the relevant Lloyd's Register entity for the provision of this information or advice and in that case any responsibility or liability is exclusively on the terms and conditions set out in that contract.

Confirmation of Product Type Approval

Company Name: BALLARD POWER SYSTEMS EUROPE A/S

Address: MAJSMARKEN 19500 HOBRO Denmark

Product: Fuel Cell

Model(s): FCwave

Endorsements:

Certificate Type	Certificate Number	Issue Date	Expiry Date
Product Design Assessment (PDA)	24-2503176-PDA	01-JUL-2024	30-JUN-2029
Manufacturing Assessment (MA)	24-6556075	26-AUG-2024	25-AUG-2029
Product Quality Assurance (PQA)	NA	NA	NA

Tier
5 - Unit Certification Required

Intended Service
Main & Auxiliary Power Generation for Marine and Offshore Applications

Description
FCwave is a low temperature PEM fuel cell power system with rated power output of 200kW for marine applications. The system is comprised of an enclosure with an internal separate lower and upper cabinets, each has individual serial numbers and can be replaced during the service lifetime of the product, as necessary.

Ratings
Power output: 200 KW

H2 Inlet Supply Pressure: 3.5 - 6.5 barg

H2 Design Temperature of operation: 0 - 80°C

Fuel Cell Hydrogen Operating Pressure: 0.2 - 1.0 barg

H2 Flowrate to Valve Block: 4.9 g/s

Ingress Protection of Cabinet: IP44

Operating Ambient Temperature: 0 -45 degree

Service Restrictions
Unit Certification is required for this product as indicated in the 4-9-3/Table 2 and 4-9-9/15.7 of the ABS Rules for Building and Classing Marine Vessels (2024).

Copyright 2019 American Bureau of Shipping. All rights reserved.

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.

Comments

1. The Manufacturer has provided a declaration about the control of, or the lack of Asbestos in this product.

2. During final installation the attending Surveyor is to verify that redundant gas detectors able to detect H2 are installed in the appropriate locations and operate properly. Any accumulation of gas to 20% LFL should trigger gas detector alarm and accumulation to 40% LFL should trigger the ESD.

3. During final installation the attending Surveyor is to verify that the FCwave is equipped with anchor mechanisms or other suitable attachments to the base structure or the hull.

4. Upon installation, the Surveyor is to verify that the door air intakes/inlets are clear to minimize the risk of complete blockage.

5. Upon installation, the Surveyor is to verify that the Chassis is properly grounded.

6. After assembled to a complete assembly unit or subassembly unit, each production unit of equipment used in control, monitoring and safety systems is to be tested at the manufacturer’s shop in the presence of the ABS Surveyor according to 4-9-9/15.7 TABLE 2 as follows:

i) Visual inspection

ii) Performance test

iii) External Power supply failure

7. FCwave system has been assigned with a Category II system classification per 4-9-3/Table 1 of the Marine Vessels Rules. Accordingly, the following tests are to be performed and are to be witnessed by the Surveyor at the Factory in accordance with 4-9-3/Table 2 of the Marine Vessels Rules (MVR).

i) 3.6: Fault Simulation.

ii) 3.7: Factory Acceptance Tests.

8. The design applies the Hazardous Zone Classification method of IEC 60079-10. The fuel cell installation room is considered as a Non-Hazardous Zone or Zone 2 with negligible extent in accordance with IEC 60079-10-1/Table D.1, with all hydrogen fuel piping entering the space and leading to or from the non-structural fuel cell space enclosure to be provided with a double-wall containment system appropriate to the fuel used by the piping.

9. Structural fire protection shall apply to the fuel cell installation room boundaries, not the fuel cell space enclosure; fire detection and fire extinguishing system requirements shall apply to the fuel cell installation room, not within the fuel cell space enclosure as per Section 3 of Fuel Cell Power Systems Requirements.

10. For each installation, safety concepts including the hazardous zone of the fuel cell installation room and multiple installation of the fuel cell units are to be declared to the flag administration for further consideration and evaluated during the risk assessment.

Notes, Drawings and Documentation

Drawing No. 120-26421-1, FCE003-4.5 EMC test report, Revision: A, Pages: 1

Drawing No. 28859 O60X2 Stainless steel pipe Cert. no. 40144, Double Wall H2 pipe, Revision: A, Pages: 1

Drawing No. 28914 O20X2 Stainless steel pipe Cert no. 466220, Double Wall H2 pipe, Revision: A, Pages: 2

 Copyright 2019 American Bureau of Shipping. All rights reserved.

Drawing No. 4006956 Datasheet, Fire Wire, Revision: A, Pages: 1

Drawing No. 7000090 - Double Wall pipe drawing, Double Wall H2 pipe, Revision: A, Pages: 3

Drawing No. CMS001, Control and safety system description, Revision: A, Pages: 1

Drawing No. CMS003, Control systems diagrams, Revision: A, Pages: 1

Drawing No. CMS004, Power supply arrangement - Schematics, Revision: A, Pages: 1

Drawing No. CMS004-A, Power supply arrangement, Revision: A, Pages: 1

Drawing No. CMS004-B, High voltage supply arrangement , Revision: A, Pages: 1

Drawing No. CMS004-C, Sensor Single Line Diagram, Revision: A, Pages: 1

Drawing No. CMS004-E, FCWave Circuit Diagrams, Revision: A, Pages: 1

Drawing No. CMS005_SEL005, Instrument Cables and equipment list, Revision: A, Pages: 1

Drawing No. CMS006_SEL004, Electrical Datasheet, Revision: A, Pages: 1

Drawing No. CMS007_SAX001, Control Software Specification, Revision: A, Pages: 1

Drawing No. CMS008, Field Instruments periodic test plan, Revision: A, Pages: 1

Drawing No. CMS008-A, Field Instrument List, Revision: A, Pages: 1

Drawing No. CMS009, Software Quality Plan, Revision: A, Pages: 1

Drawing No. CMS010, Schematic description of input and output circuits, Revision: A, Pages: 1

Drawing No. CMS012, Control Monitoring and Safety Test Procedure, Revision: A, Pages: 1

Drawing No. CMS012-A CMS012 Test Report 4, CMS012-A CMS012 Test Report 4, Revision: -, Pages: -

Drawing No. CMS013, CAN matrix, Revision: A, Pages: 1

Drawing No. CMS014, Control System Alarm List, Revision: A, Pages: 1

Drawing No. CMS015, Safety System Documentation, Revision: A, Pages: 1

Drawing No. Correspondence, PDA Preliminary Comment Responses, Revision: 0, Pages: 26

Drawing No. Correspondence, PDA Application New PDA Fuel Cell Power System, Revision: -, Pages: -

Drawing No. FAT001, System FAT, Revision: A, Pages: 1

Drawing No. FAT002, FAT with surveyor, Revision: A, Pages: 1

Drawing No. FCE003, Test programme, Revision: A, Pages: 1

Drawing No. FCE003-2, Safety Test Programme, Revision: A, Pages: 1

Drawing No. FCE003-3, Performance Test Programme, Revision: A, Pages: 1

Drawing No. FCE003-4.1, Inclination Test Programme, Revision: A, Pages: 1

Drawing No. FCE003-4.2, Vibration Test Programme, Revision: A, Pages: 1

Drawing No. FCE003-4.3, Environmental Climate Chamber Test Programme, Revision: A, Pages: 1

Drawing No. FCE003-4.4, Power Supply Test Programme, Revision: A, Pages: 1

 Copyright 2019 American Bureau of Shipping. All rights reserved.

Drawing No. FCE003-4.5, EMC Test Programme, Revision: A, Pages: 1

Drawing No. H2E Purge Valve Datasheet, H2E Purge Valve, Revision: A, Pages: 6

Drawing No. INT001 Explosion Analysis Report 1, INT001 Explosion Analysis Report 1, Revision: -, Pages: -

Drawing No. MAN001_SEL003, Service Manual, Revision: A, Pages: 1

Drawing No. MAN002, Integration Manual, Revision: A, Pages: 1

Drawing No. N1424AY6-A1013702, FCE003-4-4 Power supply failure test report, Revision: A, Pages: 1

Drawing No. N1427ES7-A1110380, FCE003-2 2.2 Temperature Test, Revision: A, Pages: 1

Drawing No. N1427X8Y-A1121839-rev01, FCE003-2 2.5 Safety System Test, Revision: A, Pages: 1

Drawing No. N14284B8-A1125744, FCE003-3 DV29 Nameplate power performance test, Revision: A, Pages: 1

Drawing No. N14284YU-A1127125-rev01, FCE003-2 2.3 Back Pressure Test, Revision: A, Pages: 1

Drawing No. N1428BMZ-A1133039, FCE003-2 2.6 Electric Safety Test, Revision: A, Pages: 1

Drawing No. N1428NN3-A1141771, FCE003-3 DV32_33 Response time/start-stop test, Revision: A, Pages: 1

Drawing No. N1428NN4-A1141772, FCE003-2 2.1 Safety Pressure Test, Revision: A, Pages: 1

Drawing No. N1429D4U-A1156670, FCE003-4.1 Inclination test, Revision: A, Pages: 1

Drawing No. N1429EKW-A1157845, FCE003-2 2.4 Block Airways Test, Revision: A, Pages: 1

Drawing No. PRC001…005, Design criteria for pressure containing components, Revision: A, Pages: 1

Drawing No. PWR001, Arrangement Plan, Revision: A, Pages: 1

Drawing No. PWR002, PPHA FCWave, Revision: A, Pages: 1

Drawing No. PWR003, Hazardous Area classification plan, Revision: A, Pages: 1

Drawing No. PWR004, Piping diagram, Revision: A, Pages: 1

Drawing No. PWR005, P&ID, Revision: A, Pages: 1

Drawing No. PWR005, P&ID, Revision: , Pages: 1

Drawing No. PWR006, Functional description, Revision: A, Pages: 1

Drawing No. PWR007_PWR002, Safety description (Risk asessment), Revision: A, Pages: 1

Drawing No. PWR008-C, Commissioning checklist, Revision: A, Pages: 1

Drawing No. PWR008_TES001, Commissioning procedure, Revision: A, Pages: 1

Drawing No. PWR009, Safety concept, Revision: A, Pages: 1

Drawing No. Pipes 106039 1 DOC, Double Wall H2 pipe, Revision: A, Pages: 4

Drawing No. SVE001…003, Ventilation diagram, Revision: A, Pages: 1

Drawing No. Silicon Hose Datasheet, Silicone Hose, Revision: A, Pages: 3

Drawing No. Silicone Hose 7000046 - Fuel outlet manifold, Silicone Hose, Revision: A, Pages: 2

 Copyright 2019 American Bureau of Shipping. All rights reserved.

Drawing No. Silicone Hose 7000047 - Fuel inlet manifold, Silicone Hose, Revision: A, Pages: 3

Drawing No. TAC 44860/B2 BV, BV_Hy-Lok_Tube_Fittings_2022, Revision: -, Pages: -

Drawing No. Tube fittings catalogue, HY-LOK 7000778, Revision: -, Pages: -

Term of Validity
This Product Design Assessment (PDA) Certificate remains valid until 30/Jun/2029 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.

ABS Rules
Rules for Conditions of Classification, Part 1 - 2024 Marine Vessel Rules 1-1-4/7.7, 1-1-A3, 1-1-A4, Which covers the following:

Marine Vessel Rules (MVR) 2024 :4-9-3/Table 1, 4-9-3/Table 2, 4-9-9/15.7, 5C-13-7/3, 5C-13-16/1.1

Requirements for Fuel Cell Power Systems for Marine and Offshore Applications 2023

International Standards
IEC 60079-10: Classification of Area – Explosive Gas Atmosphere

IEC 62282-2-100:2020, Fuel cell technologies - Part 2-100: Fuel cell modules – Safety

IEC 62282-3-100:2019, Fuel cell technologies - Part 3-100: Stationary fuel cell power systems - Safety

EU-MED Standards
NA

National Standards
NA

Government Standards
NA

Other Standards
NA





Corporate ABS Programs
American Bureau of Shipping

 Copyright 2019 American Bureau of Shipping. All rights reserved.

Print Date and Time: 30-Aug-2024 2:49

ABS has used due diligence in the preparation of this certificate, and it represents the information on the product in the ABS Records as of the date and time the certificate is printed.

If the Rules and/or standards used in the PDA evaluation are revised or if there is a design modification (whichever occurs first), a PDA revalidation may be necessary.

The continued validity of the MA is dependent on completion of satisfactory audits as required by the ABS Rules. The validity of both PDA and MA entitles the product to receive a **Confirmation of Product Type Approval**.

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 prior to the effective date of the ABS Rules and standards applied at the time of PDA issuance. ABS makes no representations regarding Type Approval of the Product for use on vessels, MODUs or facilities built after the date of the ABS Rules used for this evaluation.

Type Approval requires Drawing Assessment, Prototype Testing and assessment of the manufacturer's quality assurance and quality control arrangements. The manufacturer is responsible to maintain compliance with all specifications applicable to the product design assessment. Unless specifically indicated in the description of the product, certification under type approval does not waive requirements for witnessed inspection or additional survey for product use on a vessel, MODU or facility intended to be ABS classed or that is presently in class with ABS.

Due to wide variety of specifications used in the products ABS has evaluated for Type Approval, it is part of our contract that; whether the standard is an ABS Rule or a non-ABS Rule, the Client has full responsibility for continued compliance with the standard.

Questions regarding the validity of ABS Rules or the need for supplemental testing or inspection of such products should, in all cases, be addressed to ABS.

Copyright 2019 American Bureau of Shipping. All rights reserved.