



Marine & Offshore

Certificate number: 60207/A2 BV

File number: .

Product code: 9086I

This certificate is not valid when presented without the full attached schedule composed of 7 sections

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TYPE APPROVAL CERTIFICATE

This certificate is issued to

Desmi Ocean Guard A/S

Nørresundby - DENMARK

for the type of product

BALLAST WATER MANAGEMENT SYSTEM

CompactClean & CompactClean EX

Requirements:

- BUREAU VERITAS Rules for the Classification of Steel Ships
- IMO Res. MEPC.300(72) - Code for Approval of Ballast Water Management Systems

This certificate is issued to attest that Bureau Veritas Marine & Offshore did undertake the relevant approval procedures for the product identified above which was found to comply with the relevant requirements mentioned above.

This certificate will expire on: 26 Feb 2025

For Bureau Veritas Marine & Offshore,

At BV FREDERICIA, on 12 Sep 2024,

Jesper JENSEN

This certificate was created electronically and is valid without signature



This certificate remains valid until the date stated above, unless cancelled or revoked, provided the conditions indicated in the subsequent page(s) are complied with and the product remains satisfactory in service. This certificate will not be valid if the applicant makes any changes or modifications to the approved product, which have not been notified to, and agreed in writing with Bureau Veritas Marine & Offshore. Should the specified regulations or standards be amended during the validity of this certificate, the product(s) is/are to be re-approved prior to it/they being placed on board vessels to which the amended regulations or standards apply. This certificate is issued within the scope of the General Conditions of Bureau Veritas Marine & Offshore available on the internet site www.veristar.com. Any Person not a party to the contract pursuant to which this document is delivered may not assert a claim against Bureau Veritas Marine & Offshore for any liability arising out of errors or omissions which may be contained in said document, or for errors of judgement, fault or negligence committed by personnel of the Society or of its Agents in establishment or issuance of this document, and in connection with any activities for which it may provide.

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BV Mod. Ad.E 530 June 2017

This certificate consists of 6 page(s)

THE SCHEDULE OF APPROVAL

1. PRODUCT DESCRIPTION

CompactClean Ballast Water Management System (BWMS)

1.1 Ballast Water Technology

- The CompactClean BWMS consists of two treatment steps in order to comply with the IMO D2 standard:

- a) Mechanical Filtration by 20 or 25 microns automatic filter, and
- b) Ultraviolet disinfection by a UV system.

- The CompactClean BWMS base unit (1 Filter + 1 UV reactor) has a TRC (Treatment Rated Capacity) automatically regulated from 20% to 100% depending on the measured UV intensity.

- The CompactClean BWMS is operated from a main panel, which starts the automated ballasting, deballasting or stripping processes. Operation (automatic or manual) is controlled through PLC and monitoring equipment (UV sensors, temperature sensor, pressure sensors, flow meter, ...).

- The Compact Clean BWMS can operate in two different modes: IMO & USCG mode

1.2 The CompactClean BWMS has the following designation:

- VxxxxxFyyyyNS00 or VxxxxxByyyyNS00 for systems to be installed in non-hazardous areas
- VxxxxxFyyyyES00 or VxxxxxByyyyES00 for systems to be installed in hazardous areas

Notes:

- Vxxxx depending on the UV unit model

- Fyyyy or Byyyy depending on the filter model (F:Filtrex - B:BOLLFILTER)

- S is the skid mounted delivery type, L is the loose component delivery type, D is the deckhouse delivery type and M is the low version of the skid mounted delivery type;

- 00 is the standard type while B0 or BC is used for BWMS installations with a booster pump and 0C or BC is used for a custom made type (in terms of selected pipe materials).

1.3 Technical characteristics of UV assembly

Maker	Desmi Ocean Guard
Design pressure	10 bar
Working temperature range	-2 / 50 °C
Mounting	Vertical
Material of Filter housing	CC333G
UV Lamp power	4 & 6kW

UV Reactor	Maximum Flow Rate (m3/h)		Nb of UV lamps	Maximum power (kW)
	IMO Mode	USCG Mode		
V10024	60	40	2	8
V15044	135	85	4	16
V15064	240	160	6	24
V20066	370	250	6	36
V20086	510	340	8	48
V25126	750	500	12	72
V30186	1200	870	18	108
V35246	1650	1180	24	144
V40366	2500	1740	36	216

1.4 Technical characteristics of Filtrex filters

Maker	Filtrex (Italy)
Filtration size	20µm screen
Backwash type	automatic
Design pressure	10 bar
Max. differential pressure	1,1 bar
Mounting	vertical
Material of Filter housing	ASTM B148 C95800
Max operating temperature	55 °C

Filter Model	Flow Rate (m3/h)	Filter Model	Flow Rate (m3/h)
ACB-903-65	8 - 35	ACB-955-250	50 - 515
ACB-904-80	10 - 55	ACB-985-300	65 - 770
ACB-906-100	15 - 87	ACB-999-350	95 - 1040
ACB-910-150	25- 135	ACB-9100-400	126 - 1500
ACB-915-150	35 - 190	ACB-9120-500	126 - 2100
ACB-935-200	35 - 255	ACB-9200-600	126 - 3000
ACB-945-200	45 - 340		

1.5 Technical characteristics of Bollfilter filters

Maker	Bollfilter
Filtration size	25 µm screen
Backwash type	automatic
Design pressure	10 bar
Max. differential pressure	1,1 bar
Mounting	vertical
Material of Filter housing	
Max operating temperature	55 °C

Filter Model	Flow Rate (m3/h)	Filter Model	Flow Rate (m3/h)
B0065	65	B1000	1000
B0125	125	B1350	1350
B0220	220	B1900	1900
B0430	430	B2600	2600
B0770	770	B3200	3200

1.5 Control and Monitoring

- Software version [1.xx.yyyy]

2. DOCUMENTS AND DRAWINGS / DOCUMENTS ET PLANS

- P&ID N° 470300 Rev. A dated 30/09/2021
- BOM N° 162240 Rev. B for installation in non-hazardous area
- BOM N° 161576 Rev. C for installation in hazardous area
- Operation, Maintenance and Safety Manual (OMSM) N° 161335 Rev. E version 3
- Arrangement Drawings N° VxxxxxFyyyyNS00 Rev. A for installation in non-hazardous area
- Arrangement Drawings N° VxxxxxFyyyyES00 Rev. A for installation in hazardous area

- Wiring diagrams N° 470540 Rev. C2 for installation in non-hazardous area
- Wiring diagrams N° 470541 Rev. C1 for installation in hazardous area
- Report N° 262.1-034941-J-3 Rev. 0 dated 14/04/2021: evaluation test report - equivalence between filter designs
- Document N° 158338 Rev. 7: Control of circuit diagrams, control programs and set parameters for BWMS controls
- aquaBoll Filter drawings dated 10/01/2023
- Drawings N° 441354 dated 18/05/2017, N° 441355 dated 18/05/2017, N° 441356 dated 17/05/2017, N° 441357 dated 17/05/2017, N° 441358 dated 04/05/2017, N° 441359 dated 14/07/2017, N° 441690 dated 11/05/2017, N° 441691 dated 18/05/2017, N° 441692 dated 17/05/2017, N° 441693 dated 17/05/2017, N° 441694 dated 30/03/2022, N° 441695 dated 20/07/2018, N° 443100 dated 17/06/2021, N° 442758 dated 11/12/2020, N° 443112 dated 17/06/2021, N° 441424 dated 11/12/2020: UV Units
- SDL Report dated 21/09/2018

No departure from the above documents shall be made without the prior consent of the Society named on this certificate. The manufacturer must inform the Society of any modification or changes to these documents and drawings.

3. TEST REPORTS

3.1 Certificate and reports verifying compliance with the Code for Approval of Ballast Water Management Systems (BWMS Code), Res. MEPC 300(72)

- N° TAP00002DR dated 15/11/2022 Rev. 3 issued by DNV issued on behalf of the Danish Environmental Protection Agency (DEPA) and Danish Maritime Authority (DMA)

3.2 Tests carried out according to the Code for Approval of Ballast Water Management Systems (BWMS Code), Res. MEPC300(72).

Land-based tests, DHI (Denmark) . All land based tests were performed with a CompactClean BWMS, Capacity of 340m³/h, consisting of one Filtrex filter with 20 µm screen and one UV Unit.

- Report N° 11821290 Rev.2 dated 20/09/2018
- Additional report for supplementary test cycles with short holding time N° 11821290 dated 22/03/2019

Land-based tests, DHI (Denmark) . All land based tests were performed with a CompactClean BWMS, Capacity of 510m³/h, consisting of one Filtrex filter ACB-955-250 with 20 µm screen (or aquaBoll 6.18.3 BWT with 25 µm screen) and one UV Unit V20086.

- Report N° 11825920 dated 02/07/2021
- Additional report for supplementary test cycles with Bollfilter N° 11821290 dated 08/10/2021

3.3 **Shipboard tests**, DHI (Denmark). All shipboard tests were performed with a CompactClean BWMS, Capacity of 1000m³/h, consisting of one Filtrex filter with 20 µm screen and one UV Unit, installed on board PROVIDANA

- Report N° 11818185 dated 28/03/2018

3.4 Environmental type tests

- N° 117-36341-1 Revision 1 dated 28/02/2019 issued by FORCE Technology
- Report N° 121-28825-1 dated 01/11/2021

4. APPLICATION / LIMITATION

4.1 Intended for Ballast Water Treatment:

- Ballast Water Uptake: Filtration / UV-disinfection
- Ballast Water Discharge: UV-disinfection
- The system can be used in the following common ambient and water conditions

Water temperature range	No limitation
Ambient temperature range	0 to +55 °C
Water salinity range	No limitation

4.2 Operating Conditions for CompactClean BWMS

	IMO Mode	USCG Mode
Treatment Rated Capacity	35~3000 m3/h	35~3000 m3/h
Minimum Operating Pressure	2 bar	2 bar
Maximum Operating Pressure	10 bar	10 bar
Minimum UV intensity	170 W/m2 @ reduced flow 800 W/m2 @ full flow	227 W/m2 @ reduced flow 880 W/m2 @ full flow
UVI limit for dimming of the UV lamp power	900 W/m2	1000 W/m2
Minimum Holding time	No limitation	No limitation

4.3 The treatment rated capacity of the BWMS is not be less than the operated flow rate of ballast pump(s). During ballast water discharge the size and number of the UV units limits the systems TRC. During ballast water intake the lower of the flowrates for respectively Filter and UV unit limits the systems TRC.

4.4 Ex-certification is not covered by this certificate. Application for use in hazardous areas to be approved in each case.

4.5 The following documentation is to submitted for approval on a ship case-by-case basis :

- On-board location of the BWTS skid-unit;
- All connection details of interface towards ship's ballast piping systems;
- Management of stripping operations;
- Layout of the system;
- All associated control, alarm and monitoring equipment;
- Wiring diagrams and the cable specifications;
- Materials list;
- Arrangement and location of Ballast Water sampling ports.

4.6. Installation of the BWMS is to be carried out in accordance with Society's Rules Pt C, Ch 1, Sec 13

5. PRODUCTION SURVEY REQUIREMENTS

5.1 The Ballast Water Management systems are to be supplied by **Desmi Ocean Guard A/S** in compliance with the type and the requirements described in this certificate. This type of product is within the category IBV of Bureau Veritas Rule Note NR320.

5.2 Production surveys requested for components:

a) Filters and pressure vessels are classified as Class 3 pressure vessels according to the Society's Rules Pt C, Ch 1, Sec 3 [table 2].

- Housings are to be hydraulically pressure tested to 1.5 times the design pressure under witnessing of a Society's surveyor;
- Work's certificate is to be provided for raw materials of shell assembly according to the Society's Rules [Class 3 vessels];
- Bureau Veritas certificate is required for final assembly of the filters according to the Society's Rules Pt C, Ch 1, Sec 3 [Class 3 vessels].

b) Electric and functional tests of Power and Control cabinets are to be performed to the surveyor satisfaction.

c) Production surveys for other components (Class III piping and manifold, sensors, pumps, electrical cables...) are to be in compliance with the **Desmi Ocean Guard A/S's** regime and Society's Rules.

d) When components (non-skid) are manufactured at supplier or subcontractor workshops, production surveys are to be carried out by the BV local surveyor in charge of the survey.

5.3 Fabrication and welding requirements to comply with the Society's Rules Pt C, Ch 1, Sec 3 [4.11 Class 3 vessels]. Welding procedures and welding consumables are to be approved by the Society.

5.4 A Bureau Veritas product certificate is required for the complete system. Factory acceptance tests records, including functional tests and electrical test are to be provided to the surveyor satisfaction.

5.5 Functional tests of the system to be carried out after onboard installation as required by the IMO resolution MEPC.300(72).

5.6 For information, **Desmi Ocean Guard A/S** has declared to Bureau Veritas the following production sites:

- **Desmi Ocean Guard A/S: P. O. Box 226, Tagholm 1, 9400 Nørresundby, DENMARK**
- **Desmi Pumping Technology (Suzhou) Co., Ltd.: 1st to 3rd Floor of No.4 Office, Building and No.5 Building, No.108 Houdai Street,SIP,Suzhou City, Jiangsu Province,P.R.China**
- **Desmi Ocean Guard A/S: Lufthavnsvej 12, 9400 Noerresundby, DENMARK**

6. MARKING OF PRODUCT

Each Ballast Water Treatment System is to be marked with:

- Manufacturer's name or trade mark
- Type designation
- Serial number
- Capacity
- Society's brand as relevant

7. OTHERS

It is **Desmi Ocean Guard A/S's** responsibility to inform shipbuilders or their sub-contractors of the proper methods of fitting, use and general maintenance of the approved equipment and the conditions of this approval.

This certificate supersedes the Type Approval Certificate No. 60207/A1 BV issued by the Society.

***** END OF CERTIFICATE *****