



Certificate No. 02-003542/025507

TYPE APPROVAL CERTIFICATE

This is to certify that this product complies with the Rules for the classification of ships, Part 1 - General requirements, Chapter 3 - Type approval of products.

TYPE AND DESCRIPTION OF PRODUCT:

OPTIMARIN BALLAST SYSTEM (OBS)

(model range 167/72BK3 to 3000/3100BK3)

(model range 167/50BK4 to 1000/1040BK4)

(model range 167/87FX2 to 3000/3000FX2)

Treatment rated capacity (TRC): 72-3000 m³/h

MANUFACTURER:

OPTIMARIN AS

Sjøveien 34
4315 SANDNES
NORWAY

THE PRODUCT MEETS FOLLOWING RULES/REGULATIONS:

CRS Rules for technical supervision of sea-going ships, Part 22 – Pollution prevention
Resolution MEPC.300(72) – Code for approval of ballast water management systems

FURTHER DETAILS OF THE PRODUCT AND CONDITIONS FOR CERTIFICATION ARE GIVEN OVERLEAF.

APPROVAL IS VALID UNTIL: **2026-04-05**

Place and date: Split, 2022-04-05

Seal

Marinko Popović, dipl.ing.

NOTE: This certificate is not valid for equipment, the design or manufacture of which has been varied or modified from the specimen tested. The manufacturer should notify Croatian Register of Shipping of any modification or changes to the product in order to obtain a valid certificate.

DETAILED PRODUCT DESCRIPTION:

Ballast water management system using filtration and UV disinfection at ballast water uptake and UV disinfection at ballast water discharge.

UV system is formed by number of UV chambers installed in parallel configuration using specific manifolds as listed below:

UV models: 167, 334, 500, 667, 834, 1000, 1167, 1334, 1500, 1667, 1834, 2000, 2167, 2334, 2500, 2667, 2834 and 3000

Manifold model	TRC (m3/ h)	Number of UV reactors	Manifold model	TRC (m3/ h)	Number of UV reactors
Type 1 DN150	167	1	Type 2 DN200	334	2
Type 1 DN200	334	2	Type 2 DN250	500	3
Type 1 DN250	500	3	Type 2 DN300	667	4
Type 1 DN300	667	4	Type 2 DN300	834	5
Type 1 DN300	834	5	Type 2 DN350	1000	6
Type 1 DN350	1000	6	Type 2 DN400	1167	7
Type 1 DN400	1167	7	Type 2 DN400	1334	8
Type 1 DN400	1334	8	Type 2 DN400	1500	9
Type 1 DN400	1500	9	Type 2 DN500	1667	10
Type 1 DN500	1667	10	Type 2 DN500	1834	11
Type 1 DN500	1834	11	Type 2 DN500	2000	12
Type 1 DN500	2000	12	Type 2 DN500	2167	13
Type 1 DN500	2167	13	Type 2 DN500	2334	14
Type 1 DN500	2334	14	Type 2 DN500	2500	15
Type 1 DN500	2500	15	Type 2 DN500	2667	16
			Type 2 DN600	2834	17
			Type 2 DN600	3000	18

Boll & Kirch aquaBoll 6.18.3 (25 µm)	Model	Flow range (m3/ h)	Boll & Kirch aquaBoll BWT (25 µm)	Model	Flow range (m3/ h)
aquaBoll 273	72BK MK3 (EX)	19-72	aquaBoll BWT DN80	50BK MK4	8-50
aquaBoll 324	94BK MK3 (EX)	19-94	aquaBoll BWT DN100	100BK MK4	15-100
aquaBoll 356	204BK MK3 (EX)	24-204	aquaBoll BWT DN150	170BK MK4	23-170
aquaBoll 419	378BK MK3 (EX)	33-378	aquaBoll BWT DN200	340BK MK4	51-340
aquaBoll 521	518BK MK3 (EX)	33-518	aquaBoll BWT DN250	515BK MK4	59-515
aquaBoll 600	614BK MK3 (EX)	34-614	aquaBoll BWT DN300	770BK MK4	88-770
aquaBoll 750	1274BK MK3 (EX)	50-1274	aquaBoll BWT DN350	1040BK MK4	109-1040
aquaBoll 900	1384BK MK3 (EX)	47-1384			
aquaBoll 1000	2040BK MK3 (EX)	47-2040			
aquaBoll 1100	3100BK MK3 (EX)	69-3100			

Filtrex ACB (20 µm)	Model	Flow range (m³/ h)
ACB-906-100	87FX MK2 (EX)	15-87
ACB-910-150	135FX MK2 (EX)	25-135
ACB-915-150	190FX MK2 (EX)	35-190
ACB-935-200	255FX MK2 (EX)	35-255
ACB-945-200	340FX MK2 (EX)	45-340
ACB-955-250	515FX MK2 (EX)	50-515
ACB-985-300	770FX MK2 (EX)	65-770
ACB-999-350	1040FX MK2 (EX)	95-1040
ACB-9100-400	1500FX MK2 (EX)	126-1500
ACB-9120-500	2100FX MK2 (EX)	126-2100
ACB-9200-600	3000FX MK2 (EX)	126-3000

APPLICATION / LIMITATIONS:

Salinity: no limitation

Temperature of ballast water: no limitation

Minimum holding time between uptake and discharge: no limitation

Minimum UV intensity (IMO Mode):

150 W/m² at reduced flow (24% TRC)

400 W/m² at full flow (TRC)

Minimum UV intensity (USCG Mode): 400 W/m² at reduced flow (24% TRC) and 1100 W/m² at full flow (TRC)

Minimum/ maximum working pressure: 1,5 bar/ 10 bar

Differential pressure triggering backflush: 0,3 bar (Filtrex)/ 0,38 bar (Boll&Kirch)

HAZARDOUS AREA/ EX-PROOF

Optimarin Ballast System Ex (OBS Ex) can be installed in hazardous area zone 1, gas group IIB and temperature class T4. Cabinets are to be installed in safe zone.

TYPE APPROVAL DOCUMENTATION:

Description	Title	Drawing no.
System drawings	Flow diagram Flow diagram Ex Flow diagram (stripping with filter) Flow diagram (stripping without filter)	300000 Rev. 6
	Wiring diagrams with UV	500000 Rev.5
Component drawings	Filter BK MK3 (Ex), BK MK4, FX MK2 (Ex) Manifold system 1 and 2 UV chambers	1xxxxx See BOM Rev.2

TYPE APPROVAL DOCUMENTATION:

Description	Title	Drawing no.
Report for land-based test	Final report SNO 6921-2015 Final report SNO7523-2020	v2.1 June 2016 August 2020
Report for shipboard test	Final report SNO 7063-2016	v2.0 June 2016
Environmental testing	Report 20226 Report 21250 Report 21356 Report 20597 Report 20984 Report 30486 Type approval certificate TAE000037U Report 30732	Rev.1 Rev.1 Rev.0 Rev.0 Rev.0 Rev.0 - Rev.0
Operation, maintenance and safety manual	OMS for BK3 (Ex) OMS for FX2 (Ex)	3xxxx-xx-xx- Rev.7

MARKING OF PRODUCT:

- Manufacturer's name or trade mark
- Type designation
- Serial number

CONDITIONS FOR CERTIFICATION:

This certificate is issued on the basis of the test reports and the documentation listed in type approval certificate issued by DNV on behalf of Norwegian Maritime Authority No. TAP0000271, Rev.1.

Operation, maintenance and safety manual for Optimarin Ballast System is to be carried onboard a vessel fitted with this ballast water management system.

BWMS is type approved with the following control and safety related instruments:

- control software version 2.1x
- flow meter installed after the filter
- flow control valve in ballast line
- temperature transmitter mounted on each UV chamber
- temperature switch with independent safety function, mounted on each UV chamber
- differential pressure switch on filter unit
- pressure transmitter installed after the filter
- UV intensity meter mounted on each UV chamber