



Certificate No. 02-002839/024844

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:

OCEANGUARD BWMS
(model range HMT-50 to HMT-4000)
(model range HMT-50-Ex to HMT-4000-Ex)
Treatment rated capacity (TRC): 65-5200 m³/h

MANUFACTURER:

**HEADWAY TECHNOLOGY GROUP
(QINGDAO) CO.LTD.**
No.32 KEYUAN JING 6th ROAD, LAOSHAN AREA
QINGDAO 266100
P.R.CHINA

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 approved of ballast water management systems

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

APPROVAL IS VALID UNTIL: **2023-12-12**

Place and date: Split, 2019-12-12

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 electrocatalysis at ballast water uptake and neutralization at ballast water discharge.

The electrocatalysis unit (EUT unit) shall be operated within the TRC of the BWMS while a lower flow rate shall be applied if the water has a salinity below 1PSU.

Model	TRC with brackish and marine water (m3/ h)	TRC with fresh water (<1PSU) (m3/ h)	EUT unit	Filter HMT-F	Filter S-ZF
HMT-50	65	50	HMT-50E	HMT- 100F	S-ZF1-V/H
HMT-100	130	100	HMT-100E	HMT-100F	S-ZF1-V/H
HMT-200	260	200	HMT-200E	HMT-200F	S-ZF2-V/H
HMT-300	390	300	HMT-300E	HMT-300F	S-ZF3-V/H
HMT-450	585	450	HMT-450E	HMT-500 F	S-ZF4-V/H
HMT-600	780	600	HMT-600E	HMT-600F	S-ZF5-V/H
HMT-800	1040	800	HMT-800E	HMT-800F	S-ZF6-V/H
HMT-1000	1300	1000	HMT-1000E	HMT-1000F	S-ZF7-V/H
HMT-1200	1560	1200	HMT-1200E	HMT-1500F	S-ZF8-V/H
HMT-1500	1950	1500	HMT-1500E	HMT-1500F	S-Z F9-V/H
HMT-2000	2600	2000	HMT-2000E	HMT-2000F	S-ZF10-V/H
HMT-2500	3250	2500	HMT-2500E	HMT-3000F	S-ZFII-V/H
HMT-3000	3900	3000	HMT-3000E	HMT-3000F	S-ZF12-V/H
HMT-4000	5200	4000	HMT-4000E	HMT-4000F	S-ZF13-V/H

APPLICATION / LIMITATIONS:

If the BWMS is fitted with a brine injection unit, salinity of the ballast water is not a limiting condition for the BWMS.

Without a brine injection unit, the BWMS has a limitation to treat water with a salinity above 0,85 PSU.

Temperature of the ballast water is not a limiting condition for the BWMS.

Minimum holding time between uptake and discharge of 24 hours is required for brackish and marine water.

Minimum holding time of 120 hours is required for fresh water with salinity below 1 PSU.

During ballast water uptake target TRO shall be 2,0 mg/l.

TRO concentration at ballast water discharge shall be $\leq 0,1$ mg/l.

Maximum working pressure: 10 bar for HMT-100 F to HMT-300F filters

6 bar for other HMT-F filters and for S-ZF filters

TYPE APPROVAL DOCUMENTATION:

Type	Description	Drawing no.	Rev.
Piping and instrumentation diagram (P&ID)	Flow diagram of OceanGuard BWMS	HMT-PID-HMT-F / HMT-PID-S-ZF	A1.3
Ex-proof piping and instrumentation diagram (P&ID)	Flow diagram of Ex-proof OceanGuard BWMS	HMT-PID-Ex-HMT-F / HMT-PID-Ex-S-ZF	A1.3
Assembly drawing	Assembly drawing of OceanGuard BWMS: HMT-F/ S-ZF-V / S-ZF-H / Brine/Sea Water Injection	HMT-BWMS-AS-HMT-F / HMT-BWMS-AS-S-ZF-V / HMT-BWMS-AS-S-ZF-H / HMT-BWMS-BSIAS	A1.0
Ex-proof assembly drawing	Assembly drawing of Ex-proof OceanGuard BWMS: HMT-F / S-ZF-V / S-ZF-H / Brine/Sea Water Injection	HMT-BWMS-AS-HMT-F-EX / HMT-BWMS-AS-S-ZF-V-EX / HMT-BWMS-AS-S-ZF-H-EX / HMT-BWMS-BSIAS	A1.0
Electrical wiring diagram	Electric drawing of OceanGuard BWMS	HMT-BWMS-EL02	A2.5
Cable connect drawing	Cable connection drawing of EUT for BWMS	HMT-BWM-EUT-SPC-00	A.01-2016
Equipment list	Bill of Materials for OceanGuard BWMS	OG-BWMS-BOM01	A1.3
Ex-proof equipment list	Bill of Materials for Ex-proof OceanGuard BWMS	OG-BWMS-BOM02	A1.3

HAZARDOUS AREA:

Filters, EUT unit, monitoring unit, valves and flowmeters with Ex certificates can be installed in hazardous area zone 1, gas group IIC and temperature class T4.

Electrical supply and control systems are to be located in safe zone.

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 in Norwegian Maritime Authority type approval certificate No. TAP 00001M7.

BWMS is type approved with the following safety related instruments:

- flow meter installed after EUT unit
- temperature sensor mounted in EUT unit
- pressure switch mounted in EUT unit and arranged with independent shutdown functionality.