

# OceanGuard™

## Ballast Water Management System (BWMS)



Enwa represents the OceanGuard™ Ballast Water Management System (BWMS). OceanGuard™ Ballast Water Management System is researched and developed by Headway Technology Co., Ltd.

### Treatment Process of OceanGuard® BWMS

#### Step 1 - Filtration

50 microns precision filtration; Automatic backflush and filtration at the same time.

#### Step 2 - Advanced Electro-catalysis Oxidation Process (AEOP)

Electro-Catalysis in the EUT Unit produces ( $\bullet$ OH) radicals with perfect sterilization performance; the final products of reaction are CO<sub>2</sub>, H<sub>2</sub>O, and traces of inorganic salt without any hazardous residuals - zero -pollution emissions.

### Advantages of OceanGuard™ BWMS

#### High sterilization efficiency,

Complied to Highest Requirement IMO D-2 Regulation, California Requirement and USCG Standard.

#### Single way treatment

Single way treatment, suitable for all kinds of ballast water drainage system

#### Small size, skid installation

Small footprint and compact design makes the installation easy and flexible.

#### Low power consumption

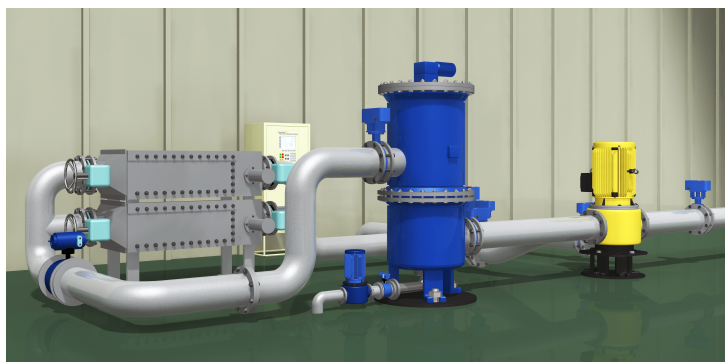
Low operation costs. Energy consumption is only appr. 17kwh for the treatment of 1000m<sup>3</sup> of ballast water.

## AEOP Technology of EUT Unit

To kill microbes, bacteria, viruses, etc.

By destroying the cell membrane of the microbe using ( $\bullet$  OH) made from water molecules under electron excitation of the special semiconductor materials.

Hydroxyl radical ( $\bullet$  OH) is one of the most active substances with very strong oxidizability, extremely fast reaction rate and strong negative charge affinities.



The final products of reaction are CO<sub>2</sub>, H<sub>2</sub>O and traces of inorganic salt, zero-pollution emissions.

The generating and existing time of hydroxyl radicals is less than 10<sup>-12</sup> s, and the reaction rate with organics is over 109 L/(mol.s), guaranteeing the high efficiency and effectiveness of OceanGuard BWMS.

Model	Capacity Range (m³/h)	Power (kw)	Dimension (mm)
HMT-50E	10~85	0.8	386*411*1041
HMT-100E	10~150	1.5	386*555*1041
HMT-200E	10~250	3	386*555*1376
HMT-300E	50~350	4.5	386*555*1701
HMT-450E	50~500	6.8	416*601*1821
HMT-600E	50~700	9	465*631*1957
HMT-800E	50~900	13	465*781*1957
HMT-1000E	50~1100	17	565*676*2123
HMT-1200E	100~1400	21	565*786*2123
HMT-1500E	100~1700	25	625*786*2123
HMT-2000E	100~2200	34	625*926*2208
HMT-2500E	100~2700	42	655*1054*2212
HMT-3000E	100~3500	52	655*1054*2222

## Approvals:

IMO Basic Approval, MEPC 60, March, 2010  
 IMO Final Approval, MEPC 61, October, 2010  
 CCS Type Approval, March, 2011,  
 DNV GL Type Approval, January, 2020,  
 California report, 2011  
 AMS (USCG), April 2013

BV Type Approval, November 2013  
 Rina Type Approval, May 2013  
 NK Type Approval, January 2014  
 LR, July 2014  
 USCG Type Approval - land based testing, June 2015  
 USCG Type Approval, May 2020

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