

**Latest Information of Approval of Ballast Water Management System (BWMS Code MEPC300(72))**

No	Ballast Water Management System					Approval Information		
						Approval of Active Substances G9 (MEPC169(57)) Approval given by IMO		Approval of BWMS / BWMS Code (MEPC300(72)) Approval given by the Administration
	BWMS Manufacture	BWMS Name	Country	Process	Capacity of Approved BWMS	Basic Approval	Final Approval	
1	DESMI Ocean Guard A/S	CompactClean CC	Denmark	Filter + UV	35 – 3,000m <sup>3</sup> /h	N.A.	N.A.	Approved (Denmark)
2	BAWAT A/S	BAWAT BWMS Mk2	Denmark	heat (pasteurization)	50 – 5,000m <sup>3</sup> /h	N.A.	N.A.	Approved (Denmark)
3	Team Tec Ocean saver	Oceansaver BWTS MKIIB	Norway	Filtration + electrolytic chlorination	200 – 7,200m <sup>3</sup> /h	Approved	Approved	Approved (Norway)
4	Calgon Carbon UV Technologies LLC, d/b/a Hyade Marine	Hyde GUARDIAN-US (model range HG60U to HG3000U)	USA	Filtration + UV	60 – 3,000m <sup>3</sup> /h	N.A.	N.A.	Approved (Norway)
5	MIURA CO., LTD.	Miura BWMS HK	Japan	Filtration + UV	160 – 6,000m <sup>3</sup> /h	N.A.	N.A.	Approved (Japan)
6	Shanghai Electric Cyeco Environmental Technology Co., Ltd.	Cyeco™	China	Filtration + UV	200 – 6,000 m <sup>3</sup> /h	N.A.	N.A.	Approved (China(CCS))
7	Alfa Laval Tumba AB	PureBallast 3.2/ PureBallast 3.2 Compact flex	Sweden	Filtration + UV	85 – 3,000 m <sup>3</sup> /h	N.A.	N.A.	Approved (Vietnam(VR))
8	De Nora Marine Technologies, LLC	BALPURE®	USA	Filtration + electrolytic chlorination	400 – 8,570 m <sup>3</sup> /h	Approved	Approved	Approved (United Kingdom)
9	Thao Linh Development Maritime Technology Co., Ltd.	TLC-BWM	Vietnam	Filtration + UV	50 – 500 m <sup>3</sup> /h	N.A.	N.A.	Approved (Vietnam(VR))
10	Scienco/FAST, a subsidiary of BioMicrobics, Inc.	inTank BWTS	USA	Electrolytic chlorination + Sodium hypochlorite	up to 200,000 m <sup>3</sup> in 36 to 168 hours	Approved	Approved	Approved (Norway)
11	oneTank, LLC	oneTank	USA	Sodium hypochlorite	up to 4,000 m <sup>3</sup> / ballast water tank	Approved	Approved	Approved (Norway)

**Latest Information of Approval of Ballast Water Management System (G8 MEPC279(70))**

No	Ballast Water Management System					Approval Information		
						Approval of Active Substances G9 (MEPC169(57)) Approval given by IMO		Approval of BWMS / G8 (MEPC279(70)) Approval given by the Administration
	BWMS Manufacture	BWMS Name	Country	Process	Capacity of Approved BWMS	Basic Approval	Final Approval	
1	Alfa Laval Tumba AB	PureBallast 3.2/ PureBallast 3.2 Compact flex	Sweden	Filtration + UV	85 – 3,000m <sup>3</sup> /h	N.A.	N.A.	Approved (Norway)
2	Envirocleanse LLC	Envirocleanse in Tank Electrochlorination (EC) BWTS	USA	electrolytic chlorination	up to 200,000 m <sup>3</sup> in 36 to 168 hours	Approved	Approved	Approved (Norway)
3	Hyundai Heavy Industries Co., Ltd.	HiBallast™ BWMS	Korea	Filtration + electrolytic chlorination	75 – 10,000m <sup>3</sup> /h	Approved	Approved	Approved (Norway)
4	SunRui Marine Environment Engineering Co.,Ltd.	BalClor® BWMS	China	Filtration + electrolytic chlorination	170 – 8500 m <sup>3</sup> /h	Approved	Approved	Approved (Norway)
5	Qingdao Headway Technology Co., Ltd	OceanGuard® BWMS	China	Filtration + electrolytic chlorination	65 – 5200 m <sup>3</sup> /h	Approved	Approved	Approved (Norway)
6	ERMA FIRST	ERMA FIRST BWMS FIT	Greece	Filtration + electrolytic chlorination	75 – 3,000m <sup>3</sup> /h	Approved	Approved	Approved (Greece)
7	COSCO (Weihai) Shipbuilding Marine Technology Co., Ltd.	Blue Ocean Shield BWMS	China	Filtration + UV	100 – 3,200m <sup>3</sup> /h	N.A.	N.A.	Approved (Norway)
8	Panasia Co., Ltd	GloEn-Patrol 2.0	Korea	Filtration + UV	50 – 6,000m <sup>3</sup> /h	N.A.	N.A.	Approved (Norway)

**Latest Information of Approval of Ballast Water Management System (G8 MEPC174(58))**

No	Ballast Water Management System					Approval Information		
						Approval of Active Substances G9 (MEPC169(57)) Approval given by IMO		Approval of BWMS G8 (MEPC174(58)) Approval given by the Administration
	BWMS Manufacture	BWMS Name	Country	Process	Capacity of Approved BWMS	Basic Approval	Final Approval	
1	Alfa-Laval AB	PureBallast	Sweden	Filtration + UV/TiO2	250 – 3,000m <sup>3</sup> /h	Approved	Approved	Approved (Norway)
2	Ocean Saver AS	OceanSaver BWTS Mark I	Norway	Filtration + Deoxygenation + Cavitation+ Electrodialytic Disinfection	40 – 10,000m <sup>3</sup> /h	Approved	Approved	Approved (Norway)
3	Ocean Saver AS	OceanSaver BWTS Mark II	Norway	Filtration + Electrodialytic Disinfection	200–4600m <sup>3</sup> /h	Approved	Approved	Approved (Norway)
4	Optimarin AS	Optimarin Ballast System	Norway	Filtration + UV	21 – 5,400m <sup>3</sup> /h	N.A.	N.A.	Approved (Norway)
5	Hamann AG / Degussa GmbH (withdrawn from the market)	SEDNA BWMS	Germany	Filtration + Peracetic acid	50 – 1,000m <sup>3</sup> /h	Approved	Approved	Approved (Germany)
6	Mitsui Engineering & Shipbuilding Co.,LTD.	FineBallast OZ	Japan	Cavitation(by high shear) + Ozonation	75 – 300m <sup>3</sup> /h	Approved	Approved	Approved (Japan)
7	Mitsui Engineering & Shipbuilding Co.,LTD.	FineBallast MF	Japan	Membrane filter	50 – 900m <sup>3</sup> /h	N.A.	N.A.	Approved (Japan)
8	Hitachi Plant Technologies, Ltd.	ClearBallast	Janan	Filtration + pre- coagulant (enhanced flocculation)	200 – 2,400m <sup>3</sup> /h	Approved	Approved	Approved (Japan)

9	JFE Engineering Corporation	JFE BallastAce	Japan	Filtration + Chlorination + Cavitation	17.5 – 4,500m <sup>3</sup> /h	Approved	Approved	Approved (Japan)
10	TEHCROSS INC	Electro-Clean System	Korea	Electrolysis/Electrochlorination	300m <sup>3</sup> /h –	Approved	Approved	Approved (Korea)
11	RWO	CleanBallast	Germany	Filtration + Electrolysis/Electrochlorination	150 – 2,500m <sup>3</sup> /h	Approved	Approved	Approved (Germany)
12	NEI Treatment Systems, LLC	Mitsubishi VOS System	USA	Deoxygenation + Cavitation	300 – 6,800m <sup>3</sup> /h	N.A.	N.A.	Approved (Liberia)
13	NK CO., LTD.	NK-O3 Blue Ballast System	Korea	Ozonation	125x2 – 4,000x2m <sup>3</sup> /h	Approved	Approved	Approved (Korea)
14	Ecochlor, INC.	Ecochlor BWT System	USA	Filtration + CLO2	250 – 16,000m <sup>3</sup> /h	Approved	Approved	Approved (Germany)
15	Resource Ballast Technologies (Pty.) Ltd.	Resource Ballast Water Treatment System	South Africa	Filtration + Cavitation + Ozonation + Electrolysis/Electrochlorination	100 – 4,000m <sup>3</sup> /h	Approved	Approved	Approved (South Africa)
16	PANASIA CO., LTD.	GloEn-Patrol	Korea	Filtration + UV	150 – 6,000m <sup>3</sup> /h	Approved	Approved	Approved (Korea)
17	Hamworthy Greenship B.V.	Greenship Sedinox Ballast Water Management System	Netherlands	hydrocyclone + electrolytic chlorination		Approved	Approved	<i>Not yet</i>
18	COSCO Shipbuilding Industrial Company	Blue Ocean Shield	China	UV treatment + Filter system	100 – 3,500m <sup>3</sup> /h	Approved	N.A.	Approved (China(CCS))
19	Hyundai Heavy Industries Co. Ltd.	EcoBallast	Korea	UV treatment + Filter system	600 – 1,000m <sup>3</sup> /h	Approved	Approved	Approved (Korea)

20	GEA Westfalia Separator Group GmbH	Ballast Master ultraV	Germany	UV radiation + Ultrasonic oscillation	under investigation	Approved	N.A.	Approved (Germany)
21	Evoqua Water Technologies LLC	SeaCURE BWMS SC-1500/1	Germany	Filter + Electrolysis	300 – 4,000m <sup>3</sup> /h	Approved	Approved	Approved (Germany)
22	MAHLE Industrial Filtration	Ocean Protection System	Germany	Filter + UV Treatment	250m <sup>3</sup> /h	N.A.	N.A.	Approved (Germany)
23	Hyde Marine Inc.	Hyde GUARDIAN	U.S.A	Filter + UV Treatment	60 – 6,000m <sup>3</sup> /h	N.A.	N.A.	Approved (UK)
24	SunRui Marine Environment Engineering Company	BalClor BWMS	China	Filter + Electrolysis	100 – 7,000m <sup>3</sup> /h	Approved	Approved	Approved (China(CCS))
25	DESMI Ocean Guard A/S	DESMI Ocean Guard Ballast Water Treatment System (discontinued item)	Denmark	Filter + UV+Ozone	75 – 3,000m <sup>3</sup> /h	Approved	Approved	Approved (Denmark)
26	SAMKUN CENTURY Co., Ltd.	ARA PLASMA BWTS	Korea	Filter + UV + Plasma	150 – 2,600m <sup>3</sup> /h	Approved	Approved	Approved (Korea)
27	Hyundai Heavy Industries Co. Ltd.	HiBallast	Korea	Filtration + Electrolysis/Electrochlorination	75 – 2,000m <sup>3</sup> /h	Approved	Approved	Approved (Korea)
28	Kwang San Co. Ltd.	En-Ballast System	Korea	Filter + Electrolysis		Approved	<i>Not yet</i>	<i>Not yet</i>
29	Qingdao Headway Technology Co., Ltd.	OceanGuard BWTS	China	Filter + Electro catalysis	50 – 9,350m <sup>3</sup> /h	Approved	Approved	Approved (Norway)
30	Wuxi Brightsky Electronic CO., Ltd.	BSKY BWMS	China	Filter + Ultrasonic + UV	100 – 6,000m <sup>3</sup> /h	N.A.	N.A.	Approved (China(CCS))

31	Severn Trent DeNora	BalPure BWMS	USA	Filter + Electrolysis	up to 500m <sup>3</sup> /h	Approved	Approved	Approved (Germany)
32	Samsung Heavy Industries Co., Ltd.	Purimar System	Korea	Filter + Electrolysis	250 – 6,500m <sup>3</sup> /h	Approved	Approved	Approved (Korea)
33	AQUA Eng. Co., Ltd.	AquaStar BWMS	Korea	Pipe unit + Electrolysis	200 – 5,000m <sup>3</sup> /h	Approved	Approved	Approved (Korea)
34	Kuraray Co., Ltd.	MICROFADE	Japan	Filter + Calcium hypochlorite	125 – 4,000m <sup>3</sup> /h	Approved	Approved	Approved (Japan)
35	JFE Engineering Corporation	JFE BallastAce (NEO-CHLOR MARINE)	Japan	Filtration + Chemical Injection	17.5 – 4,500m <sup>3</sup> /h	Approved	Approved	Approved (Japan)
36	NIPPON YUKA KOGYO CO., LTD.	SKY-SYSTEM (ex. BWMS with Peraclean Ocean(SKY-System))	Japan	Chemical Injection	25 – 34,000m <sup>3</sup> /h	Approved	Approved	Approved (Japan)
37	ERMA FIRST	ERMA FIRST BWMS	Greece	Filtration + hydrocyclone + electrolytic chlorination	50 – 3,000m <sup>3</sup> /h	Approved	Approved	Approved (Greece)
38	Envirotech and Consultancy Pte. Ltd.	BlueSeas BWMS	Singapore	Filter + Electrolysis		Approved	<i>Not yet</i>	<i>Not yet</i>
39	Envirotech and Consultancy Pte. Ltd.	BlueWorld BWMS	Singapore	Filtration + Chemical Injection		Approved	<i>Not yet</i>	<i>Not yet</i>
40	GEA Westfalia Separator Group GmbH	Ballast Master ecoP	Germany	Filtration + Chemical Injection		Approved	<i>Not yet</i>	<i>Not yet</i>

41	Samsung Heavy Industries Co., Ltd.	SHI BWMS (Neo-Purimar)	Korea	Filteration + Chemical Injection		Approved	Approved	<i>Not yet</i>
42	Daliam Marine University	DMU OH BWMS	China	Filteration + Sodium subsulfite		Approved	<i>Not yet</i>	<i>Not yet</i>
43	Hanla IMS Co., Ltd.	EcoGuardian System	Korea	Filteration + Electrolysis	130 – 6000m <sup>3</sup> /h	Approved	Approved	Approved (Korea)
44	STX Metal Co., Ltd.	Smart Ballast BWMS	Korea	Electrolysis		Approved	Approved	<i>Not yet</i>
45	Jiujiang Precision Measuring Technology Research Institute	OceanDoctor	China	Filter + Photocatalytic	50–5,000m <sup>3</sup> /h	Approved	Approved	Approved (China(CCS))
46	HWASEUNG R&A Co. Ltd.	HS-BALLAST	Korea	Electrolysis		Approved	<i>Not yet</i>	<i>Not yet</i>
47	PANASIA Co., Ltd.	GloEn-Saver	Korea	Filter+Electrochlorination		Approved	<i>Not yet</i>	<i>Not yet</i>
48	Korea Top Marine (KT Marine) Co., Ltd.	MARINOMATE (ex. KTM-BWMS)	Korea	Plankill pipe+electrolyzer		Approved	Approved	<i>Not yet</i>
49	Wärtsilä Water Systems Ltd	AQUARIUS EC BWMS	Netherlands	Filter+Electrochlorination		Approved	Approved	<i>Not yet</i>
50	Shanghai Cyeco Environmental Technology Co., Ltd.	Cyeco Ballast Water Management System	China	Filter + UV	250 & 300m <sup>3</sup> /h	N.A.	N.A.	Approved (China(CCS))
51	Knutsen Ballatvann AS	KBAL Ballast Water Management System	Norway	UV	200 & 600m <sup>3</sup> /h	N.A.	N.A.	Approved (Norway)

52	AURAMARINE LTD.	CrystalBallast Ballast Water Management System	Finland	Filter + UV	21 – 1,500m <sup>3</sup> /h	N.A.	N.A.	Approved (Norway)
53	Van Oord B.V.	Van Oord Ballast Water Management System	Netherlands	Chlorine(Drinking water only)	450m <sup>3</sup> /h	Approved	Approved	Approved (Netherlands)
54	Redox Maritime Technologies AS	REDOX AS Ballast Water Management System	Norway	Filter + Ozone + UV		Approved	<i>Not yet</i>	<i>Not yet</i>
55	SUNBO INDUSTRIES Co. Ltd., DSEC Co. Ltd.	Blue Zone BWMS DNS 250	Korea	Ozone	250 – 6,000m <sup>3</sup> /h	Approved	Approved	Approved (Korea)
56	Wärtsilä Water Systems Ltd	Wärtsilä AQUARIUS UV ballast water management system	Netherlands	Filter+UV	50 – 1,000m <sup>3</sup> /h	N.A.	N.A.	Approved (Netherlands)
57	BIO-UV SAS	BIO-SEA	France	Filter+UV	75 – 2,000m <sup>3</sup> /h	N.A.	N.A.	Approved (France(BV))
58	MMC Green Technology AS	MMC BWMS	Norway	Filter+UV	150 & 300m <sup>3</sup> /h	N.A.	N.A.	Approved (Norway)
59	Jiangsu Nanji Machinery Co., Ltd.	NiBallast BWMS	China	Filter+ Micromembrane + Deoxygenation	200 – 1,500m <sup>3</sup> /h	N.A.	N.A.	Approved (China(CCS))
60	Elite Marine Ballast Water Treatment System Corp.	Seascope Ballast Water Management System	China	Filter+UV	200 – 4,000m <sup>3</sup> /h	N.A.	N.A.	Approved (China(CCS))
61	Shanghai Hengyuan Marine Equipment Co., Ltd	HY-BWMS	China	Filter+UV	200 m <sup>3</sup> /h	N.A.	N.A.	Approved (China(CCS))
62	Shanghai Jiazhou Environmental Mechanical & Electrical	BALWAT Ballast Water Management System	China	Under investigation	200 m <sup>3</sup> /h	N.A.	N.A.	Approved (China(CCS))



63	Azienda Chimica Genovese (ACG)	ECOLCELL BTs Ballast Water Management System	Italy	Filter + Electrochlorination		Approved	<i>Not yet</i>	<i>Not yet</i>
64	Panasonic Environmental Systems & Engineering Co., Ltd.	ATPS-BLUE sys (ATPS)	Japan	Electrochlorination	12 – 7200 m <sup>3</sup> /h	Approved	Approved	Approved (Japan)
65	Ecomarine Technology Research Association	ECOMARINE EC BWTS	Japan	Filter + Electrochlorination		Approved	Approved	<i>Not yet</i>
66	KURITA WATER INDUSTRIES LTD.	KURITA BWMS (KA)	Japan	Chemical Injection	50 – 10,500 m <sup>3</sup> /h	Approved	Approved	Approved (Japan)
67	Evonik Industries AG	Evonik Ballast Water Treatment System with PERACLEAN Ocean	Germany	Filter + Electrochlorination		Approved	Approved	<i>Not yet</i>
68	MIURA Co., Ltd.	Miura BWMS	Japan	Filter + UV	200 – 6000 m <sup>3</sup> /h	N.A.	N.A.	Approved (Japan)
69	SUMITOMO ELECTRIC INDUSTRIES, LTD. (withdrawn from the market)	ECOMARINE UV BWTS	Japan	Filter + UV	100 – 1000 m <sup>3</sup> /h	N.A.	N.A.	Approved (Japan)
70	KALF Engineering Pte. Ltd.	ElysisGuard	Singapore	Filter + Electrochlorination		Approved	<i>Not yet</i>	<i>Not yet</i>
71	Trojan Technologies	Trojan Marinex BWT Ballast Water Management System	Canada	Filter + UV	150, 250, 500 m <sup>3</sup> /h	N.A.	N.A.	Approved (Norway)
72	Cathelco LTD	Cathelco Ballast Water Management System – A2	U.K.	Filter + UV	200 m <sup>3</sup> /h	N.A.	N.A.	Approved (Germany)
73	Bawat A/S	Bawat BWMS	Denmark	Heat treatment + Oxygen stripping	N.A.	N.A.	N.A.	Approved (Denmark)
74	NK CO., LTD.,	NK-CI Blue Ballast System	Korea	Chemical Injection		Approved	Approved	<i>Not yet</i>

75	TEHCROSS INC	ECS-HYCHLOR™ SYSTEM	Korea	Filter + Electrochlorination		Approved	Approved	<i>Not yet</i>
76	TEHCROSS INC	ECS-HYCHEM™ SYSTEM	Korea	Filter + Chemical Injection		Approved	Approved	<i>Not yet</i>
77	TEHCROSS INC	ECS-HYBRID™ SYSTEM	Korea	Filter + Chemical Injection + Electrochlorination		Approved	Approved	<i>Not yet</i>
78	KADALNEER TECHNOLOGIES PTE.LTD.	VARUNA	Singapore	Filter + Electrochlorination		Approved	<i>Not yet</i>	<i>Not yet</i>
79	Yixing PACT environmental Technology Co., Ltd.	PACT marine™ Ballast Water Management System	China	Filter + UV	300m³/h	N.A.	N.A.	Approved (China(CCS))
80	Coldharbour Marine Ltd.	Coldharbour GLDTM Ballast Water Management System, incorporating types SeaGuardian™ IGG500 to IGG6000	U.K.	Deoxygenation	Max. 6,000m³/h	N.A.	N.A.	Approved (UK)
81	DESMI Ocean Guard A/S	Ray Clean™ BWTS (End of sale)	Denmark	Filter + UV	75 – 3,000m³/h	N.A.	N.A.	Approved (Denmark)
82	Ahead Ocean Technology (Dalian) Co., Ltd.	AHEAD-BWMS	China	Filter + UV	200 – 1500m³/h	N.A.	N.A.	Approved (China(CCS))
83	Jiangsu Nanji Machinery Co., Ltd.	NiBallast Ballast Water Management System	China	Filter + membrane separation + de-oxygenation	200 – 4000m³/h	N.A.	N.A.	Approved (China(CCS))
84	Zhejiang Yingpeng Marine Equipment Manufacturer Co. Ltd.	YP-BWMS ballast water management system	China	Filter + UV	300 – 1200m³/h	N.A.	N.A.	Approved (China(CCS))
85	BIO-UV SAS	BIO-SEA® Ballast Water Treatment System	France	Filter + UV	30 – 87m³/h	N.A.	N.A.	Approved (France)
86	Shanghai LEE's FUDA Electromechanical Technology Co. Ltd	LeesGreen	China	Filter + UV	250 – 1500m³/h	N.A.	N.A.	Approved (China(CCS))

87	Yixing PACT environmental Technology Co., Ltd.	PACT Marine™ Ballast Water Management System	China	Filter + UV	200 – 4000m³/h	N.A.	N.A.	Approved (China(CCS))
88	Sembcorp Marine Reparis & Upgrades Pte. Ltd.	Semb-Eco LUV 500 & Semb-Eco LUV 1500	Singapore	Filter + UV	500m³/h 1500m³/h	N.A.	N.A.	Approved (Singapore(LR))
89	Sembcorp Marine Reparis & Upgrades Pte. Ltd.	Semb-Eco LUV 250 Semb-Eco LUV 750 Semb-Eco LUV 1000	Singapore	Filter + UV	250m³/h 750m³/h 1000m³/h	N.A.	N.A.	Approved (Singapore(LR))
90	University of Strathclyde	ClearBal BWMS	Denmark	Chemical Injection + hydrocyclone + Filtration		Approved	<i>Not yet</i>	<i>Not yet</i>
91	Damen Green Solutions B.V.	Damen InvaSave 300	Netherlands	Filter + UV	300m³/h	N.A.	N.A.	Approved (Netherlands)
92	Kashiwa Co., Ltd. and Kuraray Co., Ltd	MICROFADE II BWMS	Netherlands	Filter + Calcium hypochlorite		Approved	<i>Not yet</i>	<i>Not yet</i>
93	Envirocleanse, LLC	Envirocleanse inTank™ BWTS	Norway	Hypochlorous acid+ Hypobromous acid		Approved	<i>Not yet</i>	<i>Not yet</i>
94	Alfa-Laval AB	PureBallast 3.2	Sweden	Filtration + UV	32 – 3,000m³/h	N.A.	N.A.	Approved (Norway)
95	ERMA FIRST	ERMA FIRST BWMS FIT	Greece	Filtration + electrolytic chlorination	75 – 3,000m³/h	Approved	Approved	Approved (Greece)
96	Ecochlor, Inc.	Ecochlor® Ballast Water Management System	USA	Filtration + Chemical disinfection	75 – 16,200m³/h	Approved	Approved	Approved (Norway)