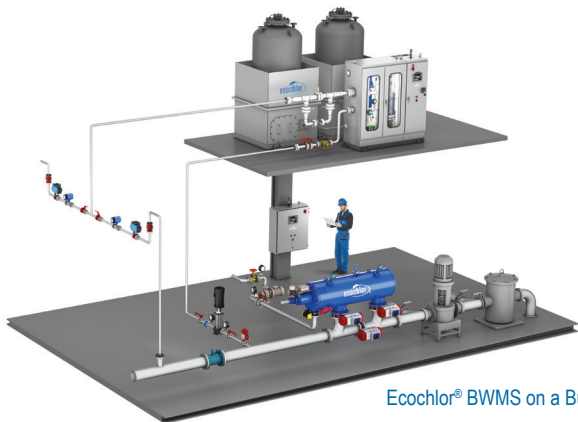




Ballast Water Management System



Ecochlor® BWMS Specifications Sheet



Ecochlor® BWMS on a Bulk Carrier

Company Information

Company Name:	Ecochlor, Inc.
Founded:	2001
Headquarters:	USA
International Sales:	Cyprus, Greece, Germany, Hong Kong, Japan, Republic of Korea, United Kingdom
Agent Offices:	China, Cyprus, Greece, India, Norway, Turkey, United Arab Emirates
Website:	www.ecochlor.com
Treatment Technology:	Filtration + Chlorine Dioxide (ClO ₂) Chemical Injection

Certificates & Type Approvals

IMO Type Approval

BWMS Code: August 2020

IMO G9 Active Substance

Approval Date: 6 Oct 2010

USCG Type Approval

Certificate Date: 10 August 2017

Class Type Approvals

ABS, BV, LR, KR, DNV GL

Flag State Type Approvals

IMO Cyprus Type Approval, IMO Hellenic Type Approval, IMO Norwegian Type Approval

IMO & USCG Type Approval Limitations

Flow Rates (TRC): 500 - 16,200 m³/hour

ClO₂ Dose: 4.25 mg/L

US Flag Hazardous Approved: Yes

Minimum Hold Time: 24 hours, plus confirmation of MADC

Maximum Allowable Discharge Concentration: Less than 0.2 mg/L ClO₂, confirmed using an in-tank sample

Temperature: Not applicable

Electrolyte Feed Temp./Salinity: Not applicable

Salinity: Not applicable

TRO: No TRO Sensors

Discharge Standards: No neutralization or retreatment at discharge

Ecochlor Components

ClO₂ Generator

Option for Series 75, 100, 150, 200, 250, 300



Ecochlor BWMS Generator, Chemical Storage Tankers and Treatment System Control Panel

Precursor Chemical Storage Tanks

Two self-contained chemical storage tanks. The first is a vented carbon steel tank lined with Halar (ECTFE). The second is a vented 316L stainless steel tank.

Main and Aft Peak Tank Filtration System

Filtersafe E-series 40 micron filters (standard screen material provided: 904L SST)

Motive Water Booster Pump

Vertical, multi-stage centrifugal pump sized to supply motive water that ranges from 1.3 - 45.4 m³/hour

System Control Panels

Treatment System Control Panel (CP-1) is mounted on the same skid as the ClO₂ Generator, Auxiliary Control Panels (CP-2 and CP-4 as required) are located local to the ballast, Remote Panel (CP-3) is installed in the Ballast/ Cargo Control Room or Deck Office for monitoring system operation.

Piping/Components

Piping for one chemical storage tank is Alloy 20. The second storage tank has 316L SST piping. Chlorine dioxide piping is Glass Reinforced Epoxy (GRE). Teflon-lined Steel Pipe and other materials acceptable for use pending discussion and approval from Ecochlor.



Ecochlor System Details

Maximum Flow Rate Capacity of an Ecochlor® BWMS

One (1) BWMS can treat a ballast flow rate of up to 16,200 m³/hr with an option for up to three (3) ClO₂ injection points

Power Consumption

Power is required for the operation of the filter(s), filter cleaning suction pump, generator, control panel and motive water booster pump. Specific power requirements must be calculated on an individual system basis. However, an overall summary of expected power requirement is listed below:

Power consumption for flow rates from 500 - 3,000 m³/hr.:

Typical < 7 kW

Maximum of < 30 kW

Power consumption for flow rates from 3,000 - 10,000+ m³/hr.:

Typical < 14 kW

Maximum < 50 kW

Maximum power requirements will only occur when the filter is in continuous cleaning mode for turbid water

Weight

Dry weight of an Ecochlor generator and chemical storage tanks range from 4,700 to 8,400 kg. Chemical tank size is determined by total annual ballast volume to be treated.

Footprint

Actual footprint will be determined based on the selected EcoOne™ Hybrid BWMS Model. The range of possible footprints for the major Ecochlor BWMS components is below:

Treatment System (Generator + Precursor Chemical Storage Tanks)

Ranges from 11.3 - 18.4 m²

One Filter

Horizontal orientation: Ranges from 1.4 - 7.3 m³

Vertical orientation: Ranges from 0.5 - 5.0 m³

Motive Water Source

Sea water or fresh water

Ballast Operation Data Storage

The minimum amount of data storage is two years

Installation

BWMS Standard Delivery Time Frame

Short delivery times; contact your local sales representative to discuss specific details

BWMS System Delivery Method

Ecochlor System delivery terms are EXW or FCA (Incoterms® 2020) each place of manufacture, as follows:

- **Generator, Control Panels and Other Components:** Currently manufactured in the United States
- **Filter Assemblies:** Currently manufactured in Haifa, Israel or Hong Kong
- **Tank Assemblies and Other Components:** Currently manufactured in Shanghai, China
- **Project-specific additional components:** Location of manufacture

Training, Service & Chemical Resupply

Training Selections

Shipboard training options, Client-site training (including portable HMI Simulator), Computer-based training program, Ecochlor Training Center in the United States

Chemical Resupply Schedule

Typically, two times a year depending on ballasting operations of the vessel

Chemical Resupply Locations*

Ecochlor has a significant number of chemical storage hubs and resupply locations strategically positioned around the globe. We have further plans to develop more locations that align with the needs of our client-base. Chemical Resupply locations followed by an asterisk (*) are under development.

Chemical Resupply Hubs: Emirate of Dubai, Houston, Rotterdam, Singapore
Chemical Resupply Locations: Australia, Brazil, Belgium, Canada, Croatia, Denmark, Emirate of Sharjah, Estonia, Finland, France, Germany, Greece, Italy, Latvia, Lithuania, Malaysia (Mainland), Panama*, Poland, Republic of Korea, Saudi Arabia, Slovenia, South Africa*, Spain, Sweden, United Kingdom

Spare Parts Support Network Location

Netherlands, Singapore, United States

Ecochlor Global Service Engineer Locations

China, Netherlands, Poland, Russia, Singapore, Sweden, United Kingdom, United States

Authorized Service Vendor Locations

Australia, Brazil, China, Emirate of Dubai, Greece, Netherlands, Republic of Korea, Saudi Arabia, Singapore, Turkey, United Kingdom

Standard Warranty Two (2) years

International Service Support

Ecochlor Service Engineers are strategically located across three major time zones to ensure quicker response time to vessel crews located anywhere in the world. Contact ecochlorservice@ecochlor.com for service support or chemops@ecochlor.com to reach the chemical resupply support team.