

OMNIPURE™ Marine Sewage Treatment System



OMNIPURE™ RUGGED, DEPENDABLE AND PURPOSE-BUILT FOR THE DEMANDING OFFSHORE INDUSTRIAL SECTOR.

OMNIPURE™ is the only marine sewage system that oxidizes sewage in an electrochemical cell as well as generates sodium hypochlorite for the disinfection of the sewage streams. It offers effective electrolytic treatment of both black and gray water through a patented and certified process. OMNIPURE systems range in treatment capacities from 781 to 15,842 gal/day, while utilizing small installation floor space. OMNIPURE units are specifically manufactured for marine and offshore installations requiring permanent or long-term operation for sewage treatment. The rugged design of the OMNIPURE offshore line of units is well suited for the rigors of industrial platform installations. Minimal maintenance, small equipment footprint and the light weight packages, make the OMNIPURE a long-term solution for wastewater treatment on a variety of offshore and marine installations, including those deeper water, weight-sensitive applications.

OMNIPURE™ TREATMENT PROCESS

The processing function of every OMNIPURE unit is the same – regardless of size. The automatic treatment process for generating oxidant on-demand is simple and proven effective. Operation is 24/7, with continuous collection and treatment of the accumulated black and gray water.

- Raw sewage is collected via gravity into the system's V-1 influent collection tank.
- The OMNIPURE unit oxidizes and disinfects raw sewage by means of an electrochemical reaction in the unit's bookcell.
- After the slurry of sewage and seawater has been electrolyzed in the bookcell, the stream is routed into the OMNIPURE unit V-2 residence tank.
- The V-2 tank is sized to provide the required retention

time to assure that any remaining bacteria will be exposed to the produced hypochlorite and killed.

- After retention in the V-2 tank, the effluent overflows from the top of the V-2 tank to the sea, via gravity. If this discharge point is below a vessel's waterline, the V-2 tank discharge is routed to an on-board centrifugal overboard discharge pump for discharge to the sea.

OMNIPURE™ BENEFITS AND CERTIFICATIONS

Benefits:

- Effective electrolytic wastewater treatment
- Treats both black and gray water
- Patented, certified process
- Compact and lightweight with short retention periods
- Low maintenance
- No dangerous chemical additives
- No odors
- No screens or growth media to clean
- No filters
- No sludge
- No dilution required
- No microorganisms to maintain
- No additional tanks required
- 26-plus years of field installation experience

Equipment Certifications:

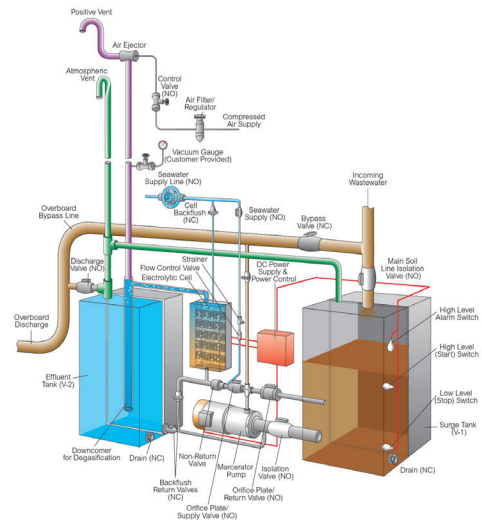
- International Maritime Organization (IMO) Resolution MEPC.2 33 CFR 59
- United States Coast Guard (USCG) Type Test Certified
- Certified for use in Hazardous Areas per NEC 501-1 of NFPA 70 (CL.1, C/D, Div.2)
- China Classification Society No. NYT02610001
- Russian Maritime Register of Shipping No. 97.143.009
- Certified by Nationally Recognized Testing Laboratory (NRTL)
- UL508A
- UL73
- NFPA 70, UL1604 and NFPA 496
- UL698A
- CSA 22.2 14-95
- Applicable sections of Article 500 of the National Electric Code (NEC)

OMNIPURE™ Marine Sewage Treatment System



STANDARD OMNIPURE UNITS

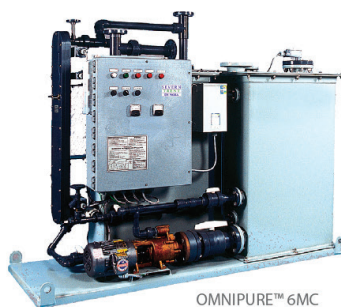
The OMNIPURE™ 6MC, 8MC and 12MC units offer desirable attributes common to drilling platforms and smaller ocean going vessels. The compact size and light weight allow for easy movement through existing passageways and hatches and installation into tight spaces. Available standard options include: Overboard Pump, Briner Unit, Dechlorination Unit, Vent Blower and Z-Purge Kit.



Standard OMNIPURE™ Design Specifications		6MC	8MC	12MC
Personnel Complement (Maximum) ¹	Black Water Only	25	60	120
	Black & Gray Water	12	25	50
Treatment Ratings (Maximum) ²	Treatment Volume: l/day (gal/day)	2,960 (781)	6,800 (1,796)	13,600 (3,593)
Dimensions & Weights	Length: mm (inches)	1,600 (63)	2,210 (87)	2,311 (91)
	Width: mm (inches)	711 (28)	711 (28)	711 (28)
	Height: mm (inches)	1,727 (68)	1,727 (68)	1,778 (70)
	Dry Weight: kg (pounds)	654 (1,441)	895 (1,973)	991 (2,185)
	Operating Weight: kg (pounds)	994 (2,191)	1,633 (3,600)	2,043 (4,505)
	V-1 Volume: liters (gallons)	227 (60)	568 (150)	643 (170)
	V-2 Volume: liters (gallons)	114 (30)	284 (75)	454 (120)
Utility Requirements	Power (KVA)**	5.5	5.5	8.8
	Seawater: l/min (g/min)	1.9 (0.5)	5.7 (1.5)	9.5 (2.5)

¹ Personnel complement provided for reference only. System sizing to be based on daily hydraulic loadings as determined by actual field data where available. 2100% peak capacity. DNWT recommends that actual operational capacities not exceed 90% of maximum capacity. Units should be sized based on daily hydraulic loading, not number of persons.

**All electrical ratings assume normal operating conditions at normal seawater salinity levels. All information is subject to change at the discretion of De Nora Water Technologies.



OMNIPURE™ Marine Sewage Treatment System



HIGH CAPACITY OMNIPURE TREATMENT UNITS

The OMNIPURE™ 12MX and 15MX units offer increased treatment capacities for larger offshore installation demands. All OMNIPURE units are designed for easy disassembly into component parts to allow for easy movement through existing passageways and hatches and installation into tight spaces.

Available standard options include: Overboard Pump, Briner Unit, Dechlorination Unit, Vent Blower and Z-Purge Kit.

High Capacity OMNIPURE™ Design Specifications		12MX	15MX
Personnel Complement (Maximum) ¹	Black Water Only	250	500
	Black & Gray Water	110	225
Treatment Ratings (Maximum) ²	Treatment Volume: l/day (gal/day)	28,390 (7,500)	56,000 (14,794)
Dimensions & Weights	Length: mm (inches)	2,616 (103)	3,607 (142)
	Width: mm (inches)	1,219 (48)	1,372 (54)
	Height: mm (inches)	2,870 (113)	3,048 (120)
	Dry Weight: kg (pounds)	1,452 (3,200)	2,994 (6,600)
	Operating Weight: kg (pounds)	3,987 (8,792)	7,994 (17,624)
	V-1 Volume: liters (gallons)	1,476 (390)	2,945 (778)
	V-2 Volume: liters (gallons)	1,170 (309)	2,271 (600)
Utility Requirements	Power (KVA)**	21	24
	Seawater: l/min (g/min)	28.39 (7.5)	47.32 (12.5)

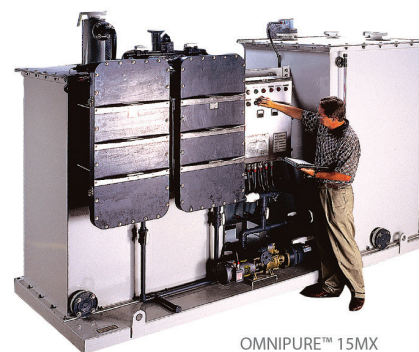
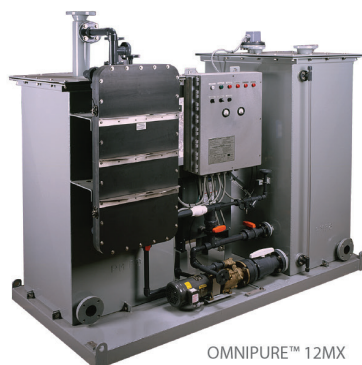
¹ Personnel complement provided for reference only. System sizing to be based on daily hydraulic loadings as determined by actual field data where available.

² 100% peak capacity. DNWT recommends that actual operational capacities not exceed 90% of maximum capacity. Units should be sized based on daily hydraulic loading, not number of persons.

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†Denotes overall height including unit sprayhead device.

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OMNIPURE™ Marine Sewage Treatment System



WE UNDERSTAND OFFSHORE SEWAGE TREATMENT

Automated Maintenance OMNIPURE Units

The OMNIPURE™ 12MXMP and 15MXMP units offer the same treatment capacities as the high capacity MX series units but include enhanced automated maintenance features. The OMNIPURE 18MXMP is only offered with the automated maintenance features, it is not available as an MX series unit. For applications requiring larger unit sizes, operators

find it beneficial to install systems requiring less frequent manual maintenance. The MXMP models offer the benefit of longer, continuous on-line operation between required manual maintenance duties.

These enhanced features include:

- Automated V-2 blowdown
- Automated cell flow reversal
- Enhanced bookcell electrolyzer design permits higher throughput flow velocity through the treatment cell, enhancing the scouring effect of the flow

Automated Maintenance OMNIPURE® Design Specifications		12MXMP	15MXMP	18MXMP
Personnel Complement (Maximum) ¹	Black Water Only	250	500	525
	Black & Gray Water	110	225	240
Treatment Ratings (Maximum) ²	Treatment Volume: l/day (gal/day)	28,390 (7,500)	56,000 (14,794)	60,000 (15,842)
Dimensions & Weights	Length: mm (inches)	2,616 (103)	3,607 (142)	3,657 (144)
	Width: mm (inches)	1,219 (48)	1,372 (54)	1,372 (54)
	Height: mm (inches)	2,870 (113)	3,073 (121)	3,225 (127)
	Dry Weight: kg (pounds)	1,500 (3,300)	3,045 (6,700)	3,340 (7,363)
	Operating Weight: kg (pounds)	4,033 (8,895)	7,994 (17,624)	8,040 (18,386)
	V-1 Volume: liters (gallons)	1,476 (390)	2,945 (778)	3,236 (855)
	V-2 Volume: liters (gallons)	1,170 (309)	2,271 (600)	2,498 (660)
Utility Requirements	Power (KVA)**	21	24	24
	Seawater: l/min (g/min)	28.39 (7.5)	47.32 (12.5)	51.10 (13.5)

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[†]Denotes overall height including unit sprayhead device.

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OMNIPURE™ 12MC



OMNIPURE™ 12MXMP



OMNIPURE™ 15MXMP

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PROCESS MODULE OMNIPURE UNITS

Process modules are available in the same treatment capacities as complete OMNIPURE units to take advantage of existing influent and effluent tanks or tanks manufactured in place as well as very tight installation locations.*

Process modules are constructed of the same high quality industry standard components as are all other OMNIPURE systems but without tanks mounted on the equipment's base frame. Due to specific equipment configuration criteria, process modules are sold as made-to-order packages requiring De Nora Water Technologies engineering and design services. Each package design takes into account the customer's particular installation space, prefabricated or existing tanks and any equipment interfaces.

*Process module equipment arrangements may vary based on actual installation configuration.

Available Factory Standard Options

OMNIPURE units can be supplied with a variety of standard factory-installed options. Each unit is designed to be easily fitted with any combination of options offered.

Overboard Pump

- Required when the unit's overboard discharge point is below a vessel's water line or additional unit discharge pressure is desired
- 316 SS centrifugal pump is supplied mounted to the unit (12MC requires off-skid mounting) and pre-wired into the unit's main control panel

Brine Add System

- Required for operating in brackish (or fresh) waters where salinity is below 1.5 percent
- Provides user with an off-skid salt tank and briner prime/ purge panel

- System automatically injects brine solution (saltwater) into the OMNIPURE unit as required to sustain the electrolytic process
- Essential in maintaining a properly functioning unit in brackish waters

Z-Purge (Pressurization) System

- A UL listed Z-Purging system can be fitted to the main control panel for installations in a Hazardous, Class 1, Groups C/D, Division 2 location
- Allows for safe operation of the unit in the classified area with minor cost impact to the unit

Dechlorination System

- Uses a mixture of food grade sodium sulfite and seawater to effectively remove the chlorine produced by the electrolytic process, before the effluent is discharged to sea
- Required when the effluent discharge cannot contain chlorine or the effluent discharge point is into sensitive waters
- Provides user with an off-skid mixing tank and dechlorination control panel
- Automatically injects sodium sulfite into the effluent discharge line

Blower

- May be included for those applications where no compressed air is available for the required powered V-2 vent, or when dilution of the vent gases is required
- An air ejector is supplied normally as standard equipment on all OMNIPURE units for removal of gases to a safe location (when air is not available, this electric blower is required)
- Associated blower circuit and motor starter are included in the unit's main control panel



OMNIPURE™ 15MXP

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