

## Advantages

- Robust design, proven in continuous shipboard use
- Easy, automatic operation
- Low power consumption
- Minimum maintenance
- Safe. No chemicals to transport, store, or handle
- Compact design
- Low pressure drop allows use of existing ballast pumps
- EX-proof standard option

## Proven Performance

- Hyde **GUARDIAN™** Systems installed and operating reliably since 2000
- Extensive independent testing to confirm system efficiency
- Tested in extreme high sediment conditions
- **IMO Type Approval pending**

## Total Solution

- Capacities to meet any requirement
- Flexible modular design for easy installation in crowded machinery space on existing ships
- Skid-mounted systems for new construction
- Suitable for all ship types
- Ship checks, installation support, spare parts and service available worldwide

# Hyde **GUARDIAN™** Ballast Water Treatment System



*Hyde **GUARDIAN™** skid-mounted ballast water treatment system selected for the Royal Navy Aircraft Carrier (CVF) Program.*

## Cost-Effective Control of Aquatic Invasive Species

Hyde Marine has worked with ballast water management solutions since 1969 and is a leader in developing effective treatment systems to control sediment and fight the spread of aquatic invasive species in ship's ballast water.

Hyde pioneered the use of mechanical separation and UV disinfection as a ballast water management solution. The Hyde **GUARDIAN™** system is a totally chemical-free process, based on a patented auto-backflushing disk filter and powerful medium pressure UV treatment. The system has successfully undergone testing according to the IMO D2 performance standard.

The Hyde **GUARDIAN™** design is well suited for all sizes and types of commercial and military vessels. Hyde has delivered systems for cruise ships, a parcel tanker, and a container ship, as well as naval vessels.

The Hyde **GUARDIAN™** is the most practical, reliable and cost-effective solution available to meet international ballast water management requirements.



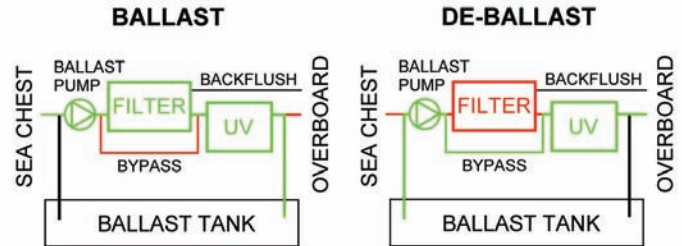
HONEST SOLUTIONS. HONEST EQUIPMENT.

# Hyde GUARDIAN™ Ballast Water Treatment System



"Coral Princess" with Hyde GUARDIAN™ BWT system is first in line for acceptance into USCG STEP program.

## Flow Diagrams



## Hyde GUARDIAN™ Process

During ballasting, water is processed through the filter to remove any particles or organisms larger than 50 microns in size. It then passes through the UV treatment and to the ship's ballast system. Backflushing water is returned overboard at the ballasting site.

During deballasting, the filter is bypassed and the ballast water receives a second dose of UV before being discharged overboard.

## Filter System

The unique depth filter design performs efficiently even under extremely high sediment loading conditions. The

automatic backflushing process keeps the filters clean and maintains high ballast water flow rates.

## UV System

The Hyde Marine UV system uses high output, medium pressure lamps oriented perpendicular to the fluid flow which results in high performance and compact size for easy installation. An automatic, quartz sleeve cleaning mechanism ensures consistent, reliable UV dosage.

The treatment chamber is made of heavy-duty, 316L stainless steel for a long, trouble free service life.

## Supervisory Control

A single control panel operates the entire Hyde GUARDIAN™ system (filter, UV, valves and booster pump, if required). All operations and indications can be viewed via the LCD panel and recorded on the built-in data logger.

The system can easily be integrated into the ships control system to allow for operation and monitoring in the control room.



Hyde's modular design, shown aboard the "Mercury", allows great flexibility to install in existing machinery spaces.

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