



CERTIFICATE NUMBER

10-HS490473-PDA

DATE

17 May 2010

ABS TECHNICAL OFFICE

Houston SED - Ship Equipment

CERTIFICATE OF DESIGN ASSESSMENT

This is to Certify that a representative of this Bureau did, at the request of
HYDE MARINE, INC. - WESTLAKE

assess design plans and data for the below listed product. This assessment is a representation by the Bureau as to the degree of compliance the design exhibits with applicable sections of the Rules. This assessment does not waive unit certification or classification procedures required by ABS Rules for products to be installed in ABS classed vessels or facilities. This certificate, by itself, does not reflect that the product is Type Approved. The scope and limitations of this assessment are detailed on the pages attached to this certificate. It will remain valid as noted below or until the Rules or specifications used in the assessment are revised (whichever occurs first).

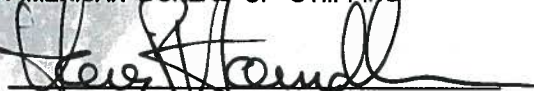
PRODUCT: Ballast Water Treatment

MODEL: GUARDIAN Type HG60 to HG6000

ABS RULE: 2010 Steel Vessels Rules 1-1-4/7.7

OTHER STANDARD: IMO Res. MEPC.174(58)- Guide Lines for approval of ballast water management systems (G8).
ISO 1183, ISO 1133, DIN EN ISO 179, DIN EN ISO 527, DIN ISO 2039-1, DIN ESO 868, DIN 53736, DIN 52612, VDE 0303-21, DIN IEC 93, DIN IEC 167, DIN IEC 112, DIN 4102, DIN 53495, DIN 8078.
; MCA Type Approval, April 2009.;

AMERICAN BUREAU OF SHIPPING



Hans P. Haendler

Engineering Type Approval Co-ordinator

NOTE: This certificate evidences compliance with one or more of the Rules, Guides, standards or other criteria of ABS or a statutory, industrial or manufacturer's standards. It is issued solely for the use of ABS, its committees, its clients or other authorized entities. Any significant changes to the aforementioned product without approval from ABS will result in this certificate becoming null and void. This certificate is governed by the terms and conditions as contained in ABS Rules 1-1-A3/5.9 Terms and Conditions of the Request for Product Type Approval and Agreement (2010).

HYDE MARINE, INC.

28045 RAINNY PARKWAY
WESTLAKE
OH 44145
United States
Telephone: 440-871-8000
Fax: 440-871-8104

Product: **Ballast Water Treatment**

Model: **GUARDIAN Type HG60 to HG6000**

Intended Service:

Marine Vessels-Treatment of Ship's Ballast Water

Description:

Hyde Marine Ballast Water Treatment System is based on Solids Separation and UV Irradiation. The Hyde Marine System utilizes existing Ballast Pumps and Piping.

Ratings:

Flow Rate(M³/hr): 60 to 6000
(See attachment for specific details)
Filtration grade (µm): 55
Filter unit diameter (inch): 3, 4, 6

UV-C light source

Size of Chamber (inch): 8, 16, & 20
Number of lamps: 6, 8, 12, Or 18
Lamp power (kW): 2, 3.5 or 5

Enclosure

Power Panel : IP66
Control Panel - Type 1, 12, 4

Maximum water pressure (bar): 10
Maximum water temperature (°C): 80

Service Restrictions:

Unit Certification is not required for this product.

1. The Hyde GUARDIAN Ballast Water Treatment System Skid-Unit is not to be installed in Hazardous Areas or in the near vicinity of Hot Surfaces and Equipment Containing Flammable Liquids or Substances (See item 4 below)
2. Detailed Ship's Installation Arrangement Plans are to be submitted for approval. The plans are to clearly indicate and/or include information such as the following (but not be limited to):
 - a. Location of the Hyde GUARDIAN ballast water treatment skid-unit
 - b. Connection details into ship's ballast piping arrangements.
 - c. Types and operating controls for system isolation valves.
 - d. location of local fire extinguishing systems, if any.
3. Please note that depending on the exact location of the installed Skid-Unit within a Category A Machinery Space, Local Firefighting Arrangements and/or Metallic Enclosure Covering the Plastic Filter Assembly (including associated Plastic Molded Pipes and Components) may be required at the discretion of the Bureau.
4. Inlet, Outlet and Drain Pipes connected to the Skid-Mounted Unit are to be made of Steel or Equivalent Material. However, Fiber Reinforced Pipe (FRP) of approved Type and suitable design, which have passed at least the Fire Endurance Test, Level 3 (L3) could be considered for these purposes.
5. For all ABS Classed Vessels and MODUs, the Flag Administration's Mandatory Requirements for Plastic Pipes and Components are to be satisfied.
6. The installation of Hyde GUARDIAN Ballast Water Treatment System is to have the approval of the vessel's Flag Administration

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ADMINISTRATION.

If the manufacturer or purchaser requests an ABS Certification for compliance with a specification or standard, the specification or standard, including inspection standards and tolerances, must be clearly defined.

Comments:

- 1) The booster pump is to have motor overload protection set to at least 100% of the motor rated current and not more than 125% of the motor rated current.
- 2) The disconnecting device may be in the same enclosure with the controller, in which case it is to be externally operable. If the disconnecting device is not within sight of both the motor and the controller, or if it is more than 15 m (50 ft) from either, it is to be arranged for locking in the open position as per 4-8-4/9.3.2 of the SV Rules.
- 3) The disconnect device is to be provided with an indication of whether it is open or closed as per 4-8-4/9.3.3 if the SV Rules.

The scope of Type Approval is to comply with "MSC.1/Circ.1221 dated 11 December 2006 - Validity of Type Approval Certification for Marine Products"

Notes / Drawings / Documentation:

This Product Design Assessment (PDA) is valid for products intended for use on ABS classed vessels, MODUs or facilities which are in existence or under contract for construction on the date of the ABS Rules used to evaluate the Product. Use in a non-classed vessel, MODU or Facility is to be to the satisfaction of the manufacturer and purchaser.

Documentation and Reports:

- 1) Hyde Marine In-Line UV System O&M Manual.
- 2) Hyde Guardian BWTS Operation & Maintenance Manual-CGS Man-Issue-1.
- 3) Hyde Guardian Filter Service and Maintenance Manual.
- 4) Hyde Guardian Electrical Components by Location.
- 5) Hyde Marine drawing no E5868-00-RevJ.
- 6) Hyde Marine drawing no E5868-1-RevA.
- 7) Hyde Marine drawing no E5868-3-RevA.
- 8) Royal Netherlands- NIOZ - final report of the land based testing Hyde BWTS.
- 9) Summary of test results for shipboard and land based trials of Hyde BWTS.
- 10) University of Maryland Center for Enviro Sciences Report in the Caribbean and West Pacific.
- 11) Environmental acceptability evaluation of Hyde BWTS as part of Type Approval Process-Ver3.

Term of Validity:

This product/model is covered under Product Design Assessment (PDA) Certificate # 10-HS490473-PDA, dated 17/May/2010. This PDA Certificate expires 16/May/2015. It will remain valid for 5 years from date of issue or until the Rules or specifications used in the assessment are revised (whichever occurs first). It is valid for all vessels contracted on or before the date of the Rules used in this evaluation.

STANDARDS**ABS Rules:**

2010 Steel Vessels Rules 1-1-4/7.7

National:

NA

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International:

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Government Authority:

NA

EUMED:

NA

Others:

MCA Type Approval, April 2009.