



Lloyd's  
Register

## Type Approval Certificate Extension

This is to certify that Certificate No. 09/ 00010(E5) for the undernoted products is extended and renumbered as shown.

This certificate is issued to:

<b>PRODUCER</b>	Hyde Marine 2000 McClaren Woods Drive Coraopolis, Pennsylvania, 15108 United States of America (USA)
<b>PLACE OF PRODUCTION</b>	Calgon Carbon 2000 McClaren Woods Drive Coraopolis Pennsylvania, 15108 United States of America (USA)
<b>DESCRIPTION</b>	Ballast water treatment system using filtration and UV-C light
<b>TYPE</b>	Hyde GUARDIAN®, Types HG 60 to HG 6000 (Incorporating filters of Filtrix ACB and Hydac RF10)
<b>APPLICATION</b>	For treatment of ship's ballast water
<b>STANDARD</b>	LR Rules for Classification of Ships, Part 5, ch25 , LR type approval system procedure TA 14
<b>HAZARDOUS AREA CERTIFICATION</b>	Ex II 2 G Ex c d e ia ib px T4 Gb
<b>RATINGS</b>	
<b>Certificate No.</b>	09/ 00010(E6)
<b>Issue Date</b>	12 April 2019
<b>Expiry Date</b>	20 October 2020
<b>Sheet</b>	1 of 5



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**Filtrex ACB**

Model	Flow rate (m <sup>3</sup> /hr)	Filter unit	UV unit
HG 602	60	ACB-906-100	080420 or 0806
HG 100	100	ACB-910-150	160620
HG 150	150	ACB-915-150	160620
HG 250	250	ACB-935-200	160635 or 1608
HG 300	300	ACB-945-200	160835
HG 350	350	ACB-955-250	161235 or 2012
HG 450	450	ACB-955-250	161235 or 2012
HG 500	500	ACB-955-250	201235
HG 600	600	ACB-985-300	201235
HG 700	700	ACB-985-300	201835
HG 800	800	ACB-999-350	201835
HG 900	900	ACB-999-350	201835
HG 1000	1000	ACB-999-350	201835
HG 1250	1250	ACB-9100-400	201850
HG 1500	1500	2 x ACB-985-300	201850
HG 1600	1600	2 x ACB-999-350	201835 x 2
HG 2000	2000	2 x ACB-999-350	201835 x 2
HG 2500	2500	2 x ACB-9100-400	201850 x 2
HG 3000	3000	3 x ACB-999-350	201850 x 2
HG 4000	4000	4 x ACB-999-350	201850 x 3
HG 5000	5000	5 x ACB-999-350	201850 x 4
HG 6000	6000	6 x ACB-999-350	201850 x 4

**Filters:**

Filtration grade (µm): 30

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**Hydac RF10**

Model	Flow rate (m <sup>3</sup> /hr)	Filter unit	UV unit
HG 60	60	RF10-10	080420 or 080620
HG 100	100	RF10-10	160620
HG 150	150	RF10-20	160620
HG 250	250	RF10-20	160635 or 160835
HG 300	300	RF10-25	160835
HG 350	350	RF10-25	161235 or 201235
HG 450	450	RF10-25	161235 or 201235
HG 500	500	RF10-25	201235
HG 600	600	RF10-30	201235
HG 700	700	RF10-30	201835
HG 800	800	RF10-35	201835
HG 900	900	RF10-35	201835
HG 1000	1000	RF10-35	201835
HG 1250	1250	RF10-40	201850
HG 1500	1500	RF10-40	201850
HG 1600	1600	RF10-50	201835 x 2
HG 2000	2000	RF10-50	201835 x 2
HG 2500	2500	RF10-60	201850 x 2
HG 3000	3000	RF10-60	201850 x 2
HG 4000	4000	2 x RF10-50	201850 x 3
HG 5000	5000	2 x RF10-60	201850 x 4
HG 6000	6000	2 x RF10-60	201850 x 4

**Filters:**  
Filtration grade (µm): 40

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**UV-C Light Source (Medium Pressure):**

Size of chamber (inch): 8, 16 & 20  
Number of lamps: 4, 6, 8, 12 & 18  
Lamp power (kW): 2, 3.5 & 5

Max. water pressure (bar): 10  
Max. water temperature (°C): 80

**OTHER CONDITIONS**

The intended installation location of the Hyde GUARDIAN® BWTS models onboard ship is to be suitable and in compliance with the requirements for such location. Its connection into the ship's system, including the electrical system, is to be shown on the ship's plans to be submitted for approval.


In addition, proposed installation of equipment in explosive gas atmospheres is to be of a type providing protection meeting the specific hazardous area requirements.

Components of Hyde GUARDIAN® BWTS outside the scope of supply from Hyde Marine, Pennsylvania, 15108 (USA) are to be of type complying with Lloyd's Register Rules for Ships Part 5 and part 6 and submitted for approval prior to installation.

The maximum treated rated capacity (TRC) of each Hyde GUARDIAN® BWTS models are not to be exceeded. In the use of parallel UV reactors, flow is to be arranging as such not to exceed the TRC of the unit concern.

Installation survey and commissioning is to be conducted for each installation on-board ship in accordance with IMO Res.

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MEPC.174(58) Section 8 and Lloyd's Register specific survey requirements.

*"This Certificate is not valid for equipment, the design, ratings or operating parameters of which have been varied from the specimen tested. The manufacturer should notify Lloyd's Register EMEA of any modification or changes to the equipment in order to obtain a valid certificate."*

*The attached Design Appraisal Document No. 09/ 00010(E6) and its supplementary Type Approval Terms and Conditions form part of this Certificate*

All other details remain as the previous Certificate No. 09/ 00010(E5) to which this extension should be attached.

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**DESIGN APPRAISAL DOCUMENT**

Date 12 April 2019	Quote this reference on all future communications UKITSO/ENG/TA/SA/WP35637276
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**LLOYD'S REGISTER TYPE APPROVAL SYSTEM, 2002.**

**Issued to: HYDE MARINE**

**for: HYDE GUARDIAN® BALLAST WATER TREATMENT SYSTEM  
TYPE APPROVAL CERTIFICATE No. 09/00010(E5)**

The undernoted documents have been reviewed for compliance with the requirements of the Lloyd's Register Type Approval System, 2002 and this Design Appraisal Document forms part of the Certificate.

**APPROVAL DOCUMENTATION**

Request form	02-Dec-2013
Hyde Marine drawing no. E5868-00, rev. J	undated
Hyde Marine drawing no. E5868.1, rev. A	undated
Hyde Marine drawing no. E5868.3, rev. A	undated
Hyde Guardian Ballast Water Treatment System, Operation and Maintenance Manual, CGS Manual Iss. 1	undated
Hyde Guardian Filter Service and Maintenance Manual	undated
Hyde marine In Line UV System Operations and Maintenance Manual, Version 2.0	July 2008
Hyde Guardian Electrical Components by Location	undated
Hyde Marine email	08 Apr 2009
Hyde Marine letter	07 Apr 2009
Hyde Marine letter, re additional filter housings	23-Dec-2010
Hyde Marine letter , re filter scaling	23-Dec-2010
Hyde GUARDIAN Ballast Water Treatment System	undated
LR Design Appraisal Document no. BDSO 182595, Issue 1	22-Mar-2011
Drawings and documents as listed on above LR Design Appraisal Document	
Hyde Marine drawings HG-300S Gen II Control Cabinet Fab Rev A	Mar 2013
Hyde Marine drawings HG-300S Gen II Power Cabinet Fab Rev A	Mar 2013
Hyde Marine drawings HG-300S Gen II Elect System Fab Rev A	Mar 2013
Software Quality Plan QP270 Rev 1	Undated
Scheduled drawing list of ATEX critical components Rev 6	Feb 2011
Hyde Marine email, Filter maintenance manual	17 March 2014
Hyde Marine email, Filter test results	19 August 2013
Hyde Guardian Implementation matrix	Undated
Hyde Guardian component comparison	Undated
Reactor assembly drawings No G300514, G300539	Oct 2012
System General Arrangement No G900391 rev A	March 2013
UV vessel general arrangement No G300585 rev A	March 2013
UV vessel components No G300583 rev A	March 2013

**TEST REPORTS**

Environmental acceptability evaluation of the Hyde Guardian Ballast water Treatment System as part of the Type Approval Process, Version 2	13 Feb 2009
Royal Netherlands institute for Sea Research (NIOZ) final report of the land-based	

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**DESIGN APPRAISAL DOCUMENT**

Date 12 April 2019	Quote this reference on all future communications UKITSO/ENG/TA/SA/WP35637276
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testing of the Hyde-Guardian® system	January 2009
University of Maryland Center for Environmental Sciences report of shipboard trials of the Hyde 'Guardian' system in Caribbean Sea and Western Pacific Ocean	January 2009
Lou Baxter & Associates report	06 Mar 2009
Lou Baxter & Associates report	30 Mar 2009
Summary of the test results for the shipboard and land based trials of the Hyde GUARDIAN® Ballast Water Treatment System	27 Apr 2009
Inspection and Surveillance of production facilities, Con No NYK 1400059	21 March 2014
EC Type Examination certificate no. DNV 11 ATEX 04992X	09-Dec-2011
Test reports as listed on above referenced EC Type Examination certificate	
Compact NSX, rated 100A/160A/250A/400A/630A 3 and 4 pole circuit breakers LR TA CERTIFICATE 09/00032(E1)	08 Aug 2012
ISO 9001:2008 Management System Standard certificate no 87859-2010-AQ-USA-ANAB	05-Nov-2013
Report submitted to Maritime and Coastguard Agency (MCA)	28 March 2014
Comparative filter performance test report, DHI	Feb 2014
CFD analysis of reactor UV8B (080420) and HG 1500	March 2014
Vibration, Environmental, Power fluctuation and Tilt test report	Sept 2011
FMEA report, Gold, rev 02	Oct 2015
Filtration and UV disinfection, with two mechanical filter options, Filtrex ACB 945 and Hydac AutoFilt RF 10-25A, Final report	22 Sept 2016

**Supplementary Type Approval Terms and Conditions**

*Type Approval certifies that a representative sample of the product(s) referred to herein has/have been found to meet the applicable design criteria for the use specified herein. It does not mean or imply approval for any other use, nor approval of any product(s) designed or manufactured otherwise than in strict conformity with the said representative sample.*

*Type Approval is based on the understanding that the manufacturer's recommendations and instructions and any relevant requirements of the Rules and Regulations are complied with.*

*Type Approval does not eliminate the need for normal inspection and survey procedures required by the Rules and Regulations.*

*Lloyd's Register EMEA reserves the right to cancel or withdraw this Type Approval Certificate in accordance with the Lloyd's Register Type Approval System Procedure.*

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