



Lloyd's
Register

Type Approval Certificate Extension

This is to certify that Certificate No. 09/00010(E3) for the undernoted products is extended and renumbered as shown.

This certificate is issued to:

PRODUCER	Hyde Marine 2000 McClaren Woods Drive Coraopolis, Pennsylvania, 15108 United States of America (USA)
PLACE OF PRODUCTION	Calgon Carbon 2000 McClaren Woods Drive Coraopolis Pennsylvania, 15108 United States of America (USA)
DESCRIPTION	Ballast water treatment system using filtration and UV-C light
TYPE	Hyde GUARDIAN®, Types HG 60 to HG 6000 (Incorporating alternative filter housings SF50, SF70 and SF90 and alternative filter designs of Filtrex ACB, Hydac RF10, Filtersafe/Balastsafe, Amiad/Omega))
APPLICATION	For treatment of ship's ballast water
STANDARD	LR Rules for Classification of Ships, Part 5, ch25 and Rules for the Manufacture, Testing and Certification of Materials.
HAZARDOUS AREA CERTIFICATION	Ex II 2 G Ex c d e ia ib px T4 Gb
Certificate No.	09/00010(E4)
Issue Date	13 April 2016
Expiry Date	12 April 2019
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Sahan Abeysekara
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Lloyd's Register EMEA

LR031.1.2013.12

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RATINGS

Model	Flow rate (m ³ /hr)	Filter unit	UV unit
HG 60	60	3" x 8	080620
HG 100	100	4" x 3	160620
HG 150	150	4" x 4	160620
HG 200	200	4" x 5	160635
HG 250	250	4" x 6	160635
HG 300	300	4" x 6	160835
HG 350	350	4" x 8	161235
HG 400	400	4" x 8	161235
HG 450	450	4" x 10	161235
HG 500	500	4" x 12	201235
HG 600	600	6" x 8	201235
HG 700	700	6" x 10	201835
HG 800	800	6" x 12	201835
HG 900	900	6" x 12	201835
HG 1000	1000	6" x 14	201835
HG 1250	1250	6" x 16	201850
HG 1350	1350	6" x 18	201850
HG 1400	1400	6" x 20	201850
HG 1500	1500	6" x 20	201850
HG 1600	1600	6" x 24	201835 x 2
HG 2000	2000	6" x 28	201835 x 2
HG 2500	2500	6" x 32	201850 x 2
HG 3000	3000	6" x 42	201850 x 2
HG 4000	4000	6" x 56	201850 x 3
HG 5000	5000	6" x 64	201850 x 4
HG 6000	6000	6" x 80	201850 x 4

Filters:


Filtration grade (µm): 55

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Alternative filter housing arrangements:

Model	Flow rate (m ³ /hr)	Filter unit	UV unit
HG 1350	1350	SF50 x 3	201850
HG 1400	1400	SF50 x 4	201850
HG 1500	1500	SF50 x 4	201850
HG 1500	1500	SF70 x 3	201850
HG 1600	1600	SF50 x 4	201835 x 2
HG 1600	1600	SF70 x 3	201835 x 2
HG 2000	2000	SF50 x 5	201835 x 2
HG 2000	2000	SF70 x 4	201835 x 2
HG 2000	2000	SF90 x 3	201835 x 2
HG 2500	2500	SF50 x 6	201850 x 2
HG 2500	2500	SF70 x 4	201850 x 2
HG 2500	2500	SF90 x 3	201850 x 2
HG 3000	3000	SF50 x 7	201850 x 2
HG 3000	3000	SF70 x 5	201850 x 2
HG 3000	3000	SF90 x 4	201850 x 2
HG 4000	4000	SF50 x 9	201850 x 3
HG 4000	4000	SF70 x 7	201850 x 3
HG 4000	4000	SF90 x 5	201850 x 3
HG 5000	5000	SF50 x 11	201850 x 4
HG 5000	5000	SF70 x 8	201850 x 4
HG 5000	5000	SF90 x 6	201850 x 4
HG 6000	6000	SF50 x 13	201850 x 5
HG 6000	6000	SF70 x 10	201850 x 5
HG 6000	6000	SF90 x 8	201850 x 5

Filters:

Filtration grade (µm): 55

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Alternative filter design arrangements:

Filtrex ACB

Model	Flow rate (m ³ /hr)	Filter unit	UV unit
HG 60	60	ACB-906-100	080420/080620
HG 100	100	ACB-910-150	160620
HG 150	150	ACB-915-150	160620
HG 250	250	ACB-935-200	160635
HG 300	300	ACB-945-200	160835
HG 350	350	ACB-955-250	161235
HG 450	450	ACB-955-250	161235
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 ³ /hr)	Filter unit	UV unit
HG 60	60	RF10-10	080420/080620
HG 100	100	RF10-10	160620
HG 150	150	RF10-20	160620
HG 250	250	RF10-20	160635
HG 300	300	RF10-25	160835
HG 350	350	RF10-25	161235
HG 450	450	RF10-25	161235
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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**Filtersafe
Ballastsafe**

Model	Flow rate (m ³ /hr)	Filter unit	UV unit
HG 60	60	BS-031-4	080420/080620
HG 100	100	BS-061H/V-06	160620
HG 150	150	BS-061H/V-06	160620
HG 250	250	BS-101H/V-10	160635
HG 300	300	BS-151H/V-10	160835
HG 350	350	BS-151H/V-12	161235
HG 450	450	BS-201H/V-12	161235
HG 500	500	BS-201H/V-14	201235
HG 600	600	BS-201H/V-T-14	201235
HG 700	700	BS-300H/V-14	201835
HG 800	800	BS-300H/V-14	201835
HG 900	900	BS-300H/V-T-14	201835
HG 1000	1000	BS-400H/V-14	201835
HG 1250	1250	BS-400H/V-16	201850
HG 1500	1500	BS-603H/V-16	201850
HG 1600	1600	BS-603H/V-16	201835 x 2
HG 2000	2000	BS-804H/V-18	201835 x 2
HG 2500	2500	BS-1004H/V-20	201850 x 2
HG 3000	3000	BS-1204H/V-24	201850 x 2
HG 4000	4000	2 x BS-804H/V-18	201850 x 3
HG 5000	5000	2 x BS-1004H/V-24	201850 x 4
HG 6000	6000	2 x BS-1204H/V-24	201850 x 4

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Filters:
Filtration grade (µm): 40

**Amiad
Omega**

Model	Flow rate (m ³ /hr)	Filter unit	UV unit
HG 60	60	SAF4500	080420/080620
HG 100	100	SAF4500	160620
HG 150	150	SAF6000	160620
HG 250	250	Omega I	160635
HG 300	300	Omega I	160835
HG 350	350	Omega I	161235
HG 450	450	Omega I E	161235
HG 500	500	Omega I E	201235
HG 600	600	Omega II	201235
HG 700	700	Omega II	201835
HG 800	800	Omega II	201835
HG 900	900	Omega II E	201835
HG 1000	1000	Omega III	201835
HG 1250	1250	Omega III	201850
HG 1500	1500	Omega III	201850
HG 1600	1600	Omega III E	201835 x 2
HG 2000	2000	Omega III E	201835 x 2
HG 2500	2500	Omega IV E	201850 x 2
HG 3000	3000	Omega IV E	201850 x 2
HG 4000	4000	2 x Omega III E	201850 x 3
HG 5000	5000	2 x Omega IV E	201850 x 4
HG 6000	6000	3 x Omega IV E	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.

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Installation survey and commissioning is to be conducted for each installation on-board ship in accordance with IMO Res. 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(E4) and its supplementary Type Approval Terms and Conditions form part of this Certificate.

All other details remain as the previous Certificate No. 09/00010(E3) to which this extension should be attached.

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