

Section

ECS Approvals

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APPROVALS

Approvals Summary

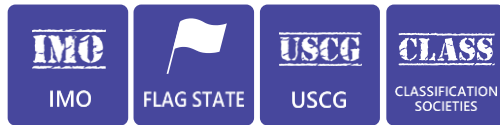
IMO & USCG Approvals

- USCG TA Revision Status
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- Documentation

Flag State Approvals

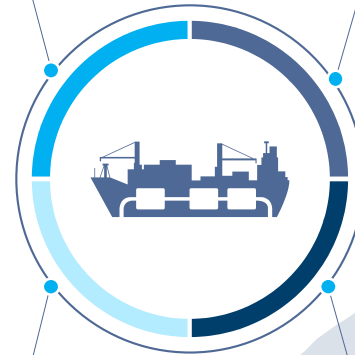
Class Approvals

Approvals Summary



IMO

- Basic Approval (2006)
World's First Approval
- Final Approval (2008)



Flag State

- Korean Government (2008)
- Liberian Government (2011)
- Cyprus Government (2014)
- Japanese Government (2016)
- Danish Government (2017)
- Greek Government (2017)
- Panama Government (2017)

USCG

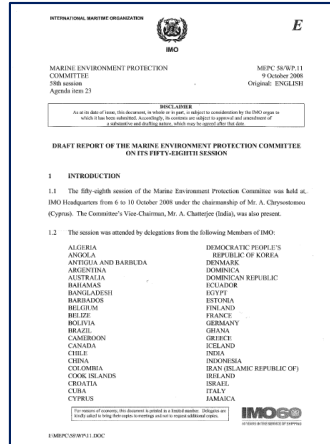
- Alternate Management System(AMS) Approved (2013)
- Type Approved by 5th June 2018
- Revision tests completed by 30th June 2018.
- Revised USCG TA by 1st quarter 2019

Classification Societies

1. APPROVED

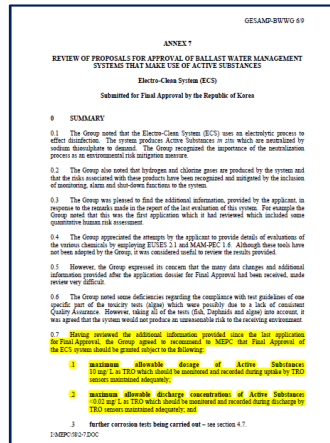
- KR Type Approval (2008)
- ABS Type Approval (2011)
- BV Type Approval (2013)
- RS Type Approval (2013)
- RINA Type Approval (2013)
- LR Type Approval (2015)
- DNV&GL Plan Approval (2016)
- CCS Type Approval (2016)

IMO – USCG Approvals (Documentation)



IMO

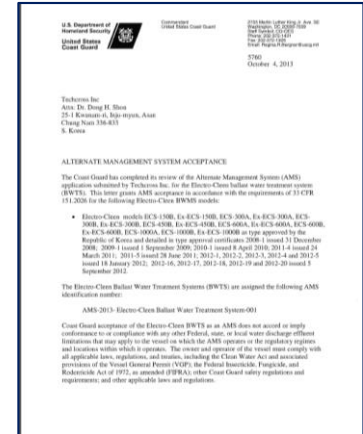
- Basic Approval (2006)
- World's First Approval



- Final Approval (2008)

USCG

- Alternate Management System(AMS) Approved (2013) ECU & Ex-ECU



USCG TA Revision Status

USCG

USCG

Process	Schedule		
	Date	Status	
USCG Type Approval	05 06 2018	Approved ⁽¹⁾	
Land-based Tests for revision (Hold time: 120 Hours → 48 Hours) (De-rate 50% → 70% in freshwater) (TRO: 9mg/L → 7.5mg/L)	By June, 2018	Land-Based Test	Status
		Sea Water 1 st -2 nd	Completed
		Brackish Water 1 st -2 nd	Completed
		Fresh Water 1 th -2 nd	Completed
		Sea Water 3 rd	Completed
		Brackish Water 3 rd	Completed
		Fresh Water 3 rd	Completed
Test result evaluation by IL and review Test Report to USCG	By Aug. 2018	Completed ⁽²⁾	
Test Report Submission	By Oct. 2018	Completed and submitted by 23/10/2018 ⁽³⁾	
Revised USCG Type Approval Certification Issuance	Within 1st quarter 2019	Pending	

Related documents



USCG TA Initial 5.6.2018
(1) Dropbox link



Notification of test
successful completion
(2) Dropbox link



USCG TA Status 13.2.2019
(3) Dropbox link

USCG Approval (restrictions brief & revision)

1. Capacity derated 50% in freshwater

1.1 Capacity derated 50% occurs only in case of ballasting in fresh water and only below 1 PSU.

1.2 However Techcross has already taken all the required additional tests that have been **successfully completed** by IL(KR).

The USCG TA will be renewed with **30% only in fresh water ballasting**.

(Doc) KR's official letter confirming the completion of the tests and official application submitted to USCG (on next page)

2. Salinity (not applicable)

2.1 Kindly note that Techcross ECS has been approved to operate on all salinities, seawater, brackish and fresh water.

3. Ambient Temperature: 0-45°C

3.1 Ambient Temperature refers to temperatures in E/R and P/R and has nothing to do with water temperatures.

3.2 These were the testing conditions of ECS during USCG TA.

4. Hold Time: 120 Hours.

4.1 Kindly note that initial USCG TA has been approved as set up for holding time of 120 hours.

4.2 Techcross has already taken all the required additional tests that have **been successfully completed** by IL(KR). The USCG TA will be renewed with **48 hours** of holding time.

(Doc) KR's official letter confirming the completion of the tests and official application submitted to USCG (on next page)

5. Electrolyte Feed Salinity: 1.5 (PSU)

5.1 Kindly note that ECS shall be installed and operated in accordance with the Techcross OMSM, Rev. 0.1, dated April 21, 2018.

As per OMSM, operation with no mixing application can be done in salinities over 1 PSU. Mixing is applied only in fresh water ballasting operation below 1 PSU and the feed salinity should be 1.5 PSU for ECU.

5.2 Techcross R & D is on the way to reduce it and the development will be reflected as a way of certificate renewal going forward, we will keep you updated on this issue

6. Total Residual Oxidant (TRO): 9 mg/L

6.1 Kindly note that 9mg/l was the targeted TRO for initial USCG TA.

6.2 Techcross has already taken all the required additional tests that have been successfully completed by IL(KR). The USCG TA will be renewed with **7,5 mg/l**.

(Doc) KR's official letter confirming the completion of the tests and official application submitted to USCG (on next page)

KR's official letter confirming the completion of all the tests USCG Applications Submission

162.060/7/0

Amendment

Limitation	Description
Capacity	Derated 50 % in fresh water (50% of TRC)
Hold Time	120 hours
TRO	9.0 mg/L

Limitation	Description
Capacity	Derated 30 % in fresh water (70% of TRC)
Hold Time	48 hours
TRO	7.5 mg/L

Test results of
successful completion
KR Official Letter



Marine Safety Center
BWMS Type Approval Status



Under Review

Application Received	Manufacturer (Country)	Model	Independent Laboratory	System Type	Capacity	Certificate Issued* (Amended)
16 Mar 2018	Alfa Laval (Sweden)	PureBallast 3	DNV GL	Filtration + Ultraviolet	150 – 3,000 m³/h	23 Dec 2016 (21 Dec 2017)
22 Mar 2018	Optimarin (Norway)	OBS/OBS Ex	DNV GL	Filtration + Ultraviolet	167 – 3,000 m³/h	02 Dec 2016 (03 Nov 2017)
30 Aug 2018	NK BMS Co., Ltd. (Republic of Korea)	NK-O3 BlueBallast II	Lloyd's Register	Ozone	200 – 8,000 m³/h	Pending
27 Sep 2018	NK BMS Co., Ltd. (Republic of Korea)	NK-O3 BlueBallast II Plus	Lloyd's Register	Ozone	200 – 8,000 m³/h	Pending
18 Oct 2018	DESMI Ocean Guard A/S (Denmark)	CompactClean	Lloyd's Register	Filtration + Ultraviolet	135 – 3,000 m³/h	Pending
19 Oct 2018	Wärtsilä Water Systems, Ltd. (UK)	Aquarius UV	DNV GL	Filtration + Ultraviolet	50 – 1,000 m³/h	Pending
19 Oct 2018	Cathelco Ltd. (UK)	Evolution	Lloyd's Register	Filtration + Ultraviolet	34 – 1,500 m³/h	Pending
23 Oct 2018	Techcross, Inc. (Republic of Korea)	Electro-Cleen	Korean Register	Electrolysis	150 – 12,000 m³/h	05 Jun 2018 (Pending)
27 Nov 2018	Semb-Eco Pte, Ltd. (Singapore)	LUV U1	Lloyd's Register	Filtration + Ultraviolet	500 m³/h	Pending
12 Dec 2018	Wärtsilä Water Systems, Ltd. (UK)	Aquarius EC	DNV GL	Filtration + Electrolysis	250 – 4,000 m³/h	30 Aug 2018 (Pending)
23 Jan 2019	Miura Co., Ltd. (Japan)	HK-S(E)	NSF International	Filtration + UV	200 – 900 m³/h	Pending

USCG TA Status 13.2.2019
[Dropbox link](#)

KOREAN REGISTER OF SHIPPING Head office
36, Myeongji ocean city 9-ro, Gangseo-gu, Busan, Republic of Korea
Tel +82 70-8799-8240 Fax +82 70-8799-8269 <http://www.krs.co.kr>
Staff in charge : Shon Myung-Baek (+82-070-87998258, mbshon@krs.co.kr)



Doc No. : MET4200-303-2018 Date : 2018.06.29
To : Techcross INC.
Attn : Mr. Jeon, Hyeon geon
Subject : Notifying-Completion of additional testing for amendment of USCG type approval
Job Id. :

- We greatly appreciate your continuous cooperation to this Society.
- With regard to the amendment of USCG type approval certificate of Electro-Cleen™ System (Cert. No: 162.060/7/0) in accordance with 46 CFR 162.060-16, we hereby confirm that all of the additional land-based tests satisfying with guidance of USCG (Doc. No.: E1-1801293 (Attachment 1) and E1-1701792 (Attachment 2)) have been successfully completed as of 28th June, 2018 under the supervision of this Society.
- We will send the test results to USCG and your company in due course upon completion of our review process. We believe that the description on the original type approval certificate issued by USCG could be amended as below subject to USCG's acceptance:

162.060/7/0		Amendment	
Limitation	Description	Limitation	Description
Capacity	Derated 50 % in fresh water (50% of TRC)	Capacity	Derated 30 % in fresh water (70% of TRC)
Hold Time	120 hours	Hold Time	48 hours
TRO	9.0 mg/L	TRO	7.5 mg/L

- The End -

Notification of test
successful completion
[Dropbox link](#)

18 Oct 2018	DESMI Ocean Guard A/S (Denmark)	CompactClean	Lloyd's Register	Filtration + Ultraviolet	135 – 3,000 m³/h	Pending
19 Oct 2018	Wärtsilä Water Systems, Ltd. (UK)	Aquarius UV	DNV GL	Filtration + Ultraviolet	50 – 1,000 m³/h	Pending
19 Oct 2018	Cathelco Ltd. (UK)	Evolution	Lloyd's Register	Filtration + Ultraviolet	34 – 1,500 m³/h	Pending
23 Oct 2018	Techcross, Inc. (Republic of Korea)	Electro-Cleen	Korean Register	Electrolysis	150 – 12,000 m³/h	05 Jun 2018 (Pending)
27 Nov 2018	Semb-Eco Pte, Ltd. (Singapore)	LUV U1	Lloyd's Register	Filtration + Ultraviolet	500 m³/h	Pending
12 Dec 2018	Wärtsilä Water Systems, Ltd. (UK)	Aquarius EC	DNV GL	Filtration + Electrolysis	250 – 4,000 m³/h	30 Aug 2018 (Pending)
23 Jan 2019	Miura Co., Ltd. (Japan)	HK-S(E)	NSF International	Filtration + UV	200 – 900 m³/h	Pending

USCG TA Status 13.2.2019
Detailed confirmation

Flag State Approvals (Documentation)



<p>Korean Government</p>	<p>Japanese Government</p>	<p>Liberian Government</p>	<p>Cyprus Government</p>
<p>Greek Government</p>	<p>Danish Government</p>	<p>Panama Government</p>	<p>Australian Government</p>

The logo features a large white 'T' inside a blue circle, followed by the words 'HANK YOU' in a white, italicized, sans-serif font.

Pera Marine P.C.

5, Akti Miaouli Str.
Piraeus 185 35 Greece

Tel : +30 210 4124532

 www.peramarine.gr

 info@peramarine.gr



Tasos Carydopoulos

B.S Marketing Mgmt.
Sales Manager

Mobile : +30 6932 246533

carydopoulos@peramarine.gr