
ALFA
LAVAL

PureBallast

Ballast Water Treatment Solution

Anders Lindmark

Vice President, Head of PureBallast

Contents

IMO status

- By September 8th 2017 (EIF) every vessel subject to the convention and as agreed in the assembly resolution need to:
  - Ships with keel laying after the EIF will need to equip their vessel with a ballast water treatment system [BWTS] at the time of delivery
  - Existing vessels that already have an installed BWTS will have to use that or conduct a Ballast Water Exchange [BWE] up to the vessels' next IOPP certification renewal survey were they have to use the BWTS
  - Existing vessel that are not fitted with a BWTS will need to conduct BWE up to the vessels' next IOPP certification renewal survey after September 8, 2019 were they are required to install a BWTS

USCG requirements and status

- “A vessel discharging ballast to waters of the United States after its original compliance date [next drydock] must either ensure the discharged water meets the BWDS [use a USCG TA system] or use an AMS”
- Vessel that have been granted an extended compliance date could still conduct a ballast water exchange up to the extended compliance date
- “Now that a type approved BWMS is available, any owner/operator requesting an extension must provide the Coast Guard with an explicit statement supported by documentary evidence”
- USCG will from now require vessel owner to fill out a justification why they can’t fit any of the type approved systems

➢ **Existing vessels without approved extensions need to install BWTS at next scheduled dry dock**

Contents

U. S. Department of Homeland Security
United States Coast Guard
Certificate of Approval

Coast Guard Approval Number: 162.060/2/0 Expires: 23 December 2021

BALLAST WATER MANAGEMENT SYSTEM
Filtration/Ultraviolet

Alfa Laval Tumba AB
Hans Stahles vag 7
147 80
Tumba SWEDEN

Alfa Laval PureBallast 3

Capacities: 150 - 3000 m3/h,
Only PureBallast 3 models that use the Idefix and Obelix reactors are approved.

This is to certify that the above listed BWMS with the listed treatment capacities has been satisfactorily examined and tested by Independent Lab DNV GL in accordance with the requirements contained in 46 CFR 162.060. The system shall be installed and operated in accordance with the below listed Operation, Maintenance, and Safety Manual applicable to the particular model.

PureBallast 3.0: Alfa Laval OMS Manual No. 9028553 02, Rev. 0, Dated 2016
PureBallast 3.0 Ex: Alfa Laval OMS Manual No. 9028554 02, Rev. 0, Dated 2016
PureBallast 3.1: Alfa Laval OMS Manual No. 9028378 02, Rev. 0, Dated 2016
PureBallast 3.1 Ex: Alfa Laval OMS Manual No. 9028493 02, Rev. 0, Dated 2016
PureBallast 3.1 Compact: Alfa Laval OMS Manual No. 9028495 02, Rev. 0, Dated 2016

Operational Limitations:
See Appendix

The PureBallast 3.0 Ex and 3.1 Ex models meet the requirements of 46 CFR 111.105 and may be installed in hazardous locations on a U.S. flag vessel. The electrical supply and control systems must remain outside of hazardous locations.

The BWMS must be marked in accordance with 46 CFR 162.060-22.

A copy of this Type Approval Certificate shall be carried on board a vessel fitted with the ballast water management system at all times.

Certification Testing

x 2

Under both MPN and USCG CMFDA/FDA methods

USCG Testing Time

Verification factors	Typical Time Required
Electrical Tests Voltage variation	1 to 2 months
Frequency variation	1 to 2 months
Vibration Tests	1 to 2 months
Inclination tests	1 to 2 months
Temperature tests	1 to 2 months
Humidity	1 to 2 months
Electrical, Mechanical and Environmental test	6 months
IP Ratings and Safety assessment	2 months
Ship Board Biological efficacy test	9 to 18 months
Land based test	6 months

A full USCG testing time-line typically take 2-3 years.
There are several manufactures that submitted their LOI to USCG already 2013/14, but they still haven't managed to pass the requirements for a type approval certificate

Contents

Alfa Laval PureBallast

- Pioneer in BWTS
- Development started 2004
- UV/filtration system, 32 – 6,000 m3/h
- 1,400 + systems sold, of them 400 + for retrofit installations
- IMO & USCG Approved!

PureBallast – Large capacity systems

- Single system sizes up to 3000 m3/h / Ex
- No use of chemicals or active substances
- Independence of temperature and salinity
- Easy installation and operation
- No requirements for monitoring or reporting of TRO

PureBallast 2000 and 3000 m3/h systems sold to KOTC, Torm, Teekay, Saipem…

Peak Power and Energy

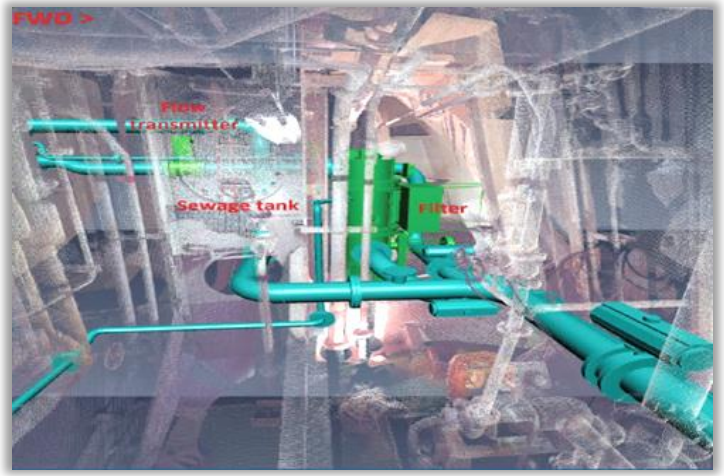
UV Technology vs. Electro Chlorination for a 3000 m3/h

Requirement	PureBallast	Electro Chlorination	Note
Power			
Min. Power required	156 kW	48 kW	~ @ 20 °C and 30 PSU or UVT 75%
Low temp penalty		+110 kW	For operation at 10 °C
Low salt penalty		+42 kW	At 10 PSU
Low temp penalty		+175 kW	When below 10 °C. (Heat steam could be used)
Low UVT penalty	+ 144 kW		When below UVT 60%
Max. Power required	**300 kW**	**375 kW**	
Energy	**300 – 156 kWh**	**375 - 50 kWh**	EC require min. power for de-ballast

Peak power requirements for UV and EC are very similar

Retrofit experience

- No customer is the same
- No ship is the same
- No project is the same

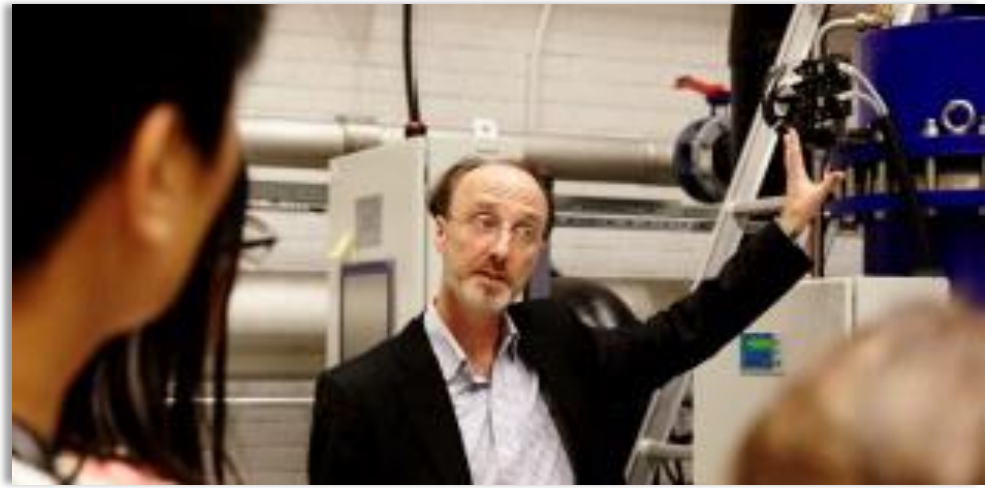


Key experiences of retrofit installations

- Unclear responsibility for the project between involved companies
- Lack of project management
  - Misunderstandings, delayed delivery, wrong delivery and additional costs
- Late changes in scope of supply
- Only checking floor area lead to lack of maintenance height
- Not checking pump performance lead to insufficient back-flushing of filter
- Lack of BWMS knowledge lead to wrong installation and insufficient functionality

Project Management = Minimized technical complications

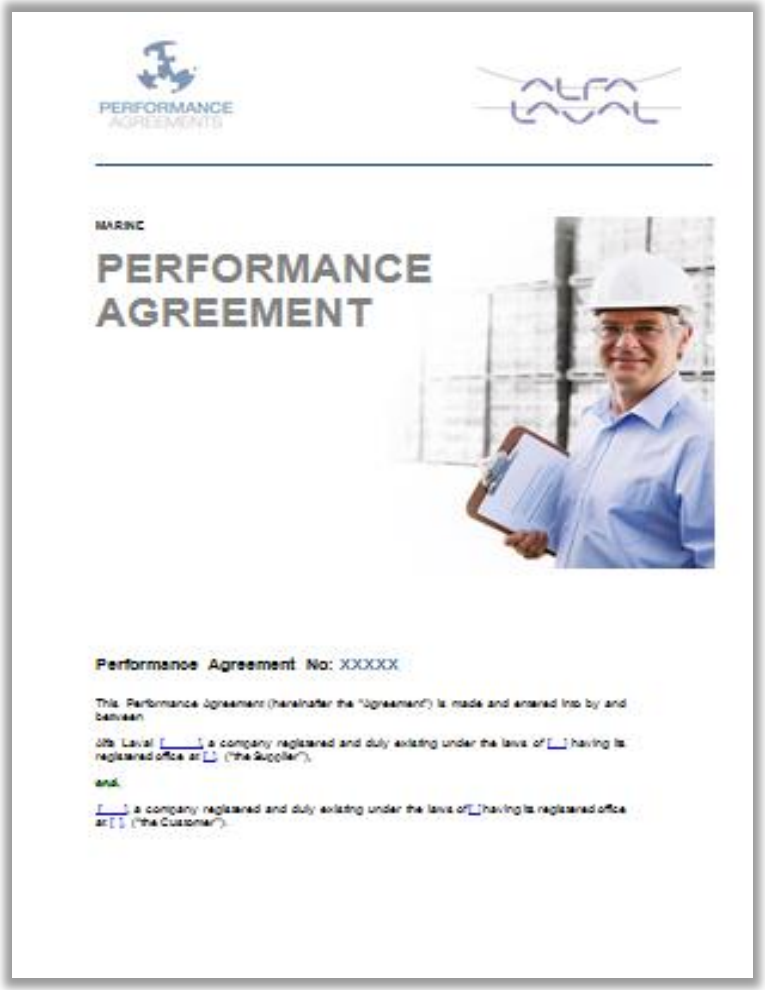
- **Invest time in the beginning to set up the project**
  - Establish project organization including representatives from involved parties
    - Agree on responsibilities
  - Education of customer, engineering company and installation company
  - Take enough time to execute the project
- **Involvement of supplier**
  - Education
  - Verification of engineering
  - Installation support



Typical questions

- Clarification of regulations
- US Coast Guard regulation and AMS validity
- Clarification of misinformation
- Installation possibilities
- Differences between technologies

We offer more than a product


PERFORMANCE AGREEMENTS

ALFA LAVAL

MARINE

PERFORMANCE AGREEMENT

Performance Agreement No: XXXXX

This Performance Agreement (hereinafter the "Agreement") is made and entered into by and between

Alfa Laval [____], a company registered and duly existing under the laws of [__] having its registered office at [__] ("the Supplier"),

and,

[____] a company registered and duly existing under the laws of [__] having its registered office at [ ] ("the Customer").

Global availability through the Alfa Laval Marine Service network

Summary

- PureBallast is USCG Type Approved and IMO certified system with market leading performance
- Project management is key for success
- Global service availability
- Flexible system, for easy customization and installation
- Strong solution also for flow up to 6,000 m3/h
- Solid company with long term commitment

Questions?