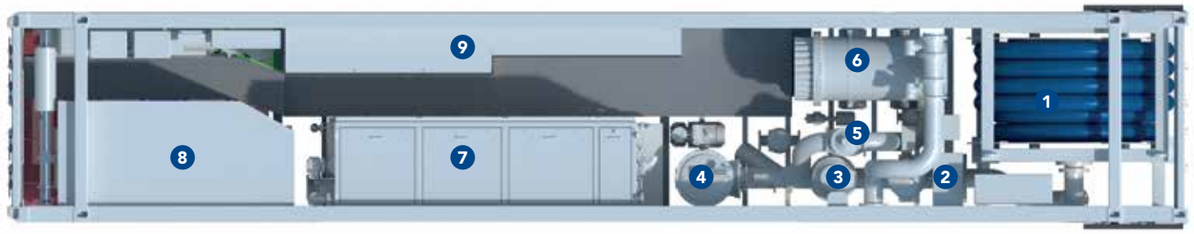
INVASAVE 300
OUTLINE SPECIFICATION



GENERAL

Basic functions	Receive and treat ballast water of vessels in ports
Description	Mobile ballast water discharge technology
Classification	Bureau Veritas, Regulation D-2 of the BWM Covention CSC type approval Statutory type approval pending

GENERAL

LxWxH	45' x 8' x 9,6' high cube container

CAPACITIES

Capacity	10-300 m³/hr
Power consumption	70-140 kW
Design pressure	10 bar

TREATMENT SYSTEM

1	Hose reel	8" / 40 m
2	Priming arrangement	18 Nm³/h
3	Booster pump	300 m³/h
4	First stage treatment	Fine filtration
5	Flow control	Automated control valve
6	Second stage treatment	LP UV system
7	Secondary filter	Fine filtration + separator
8	Generator	US / EPA Tier 3 / EU Stage 3A 160 kWe

CONTROL EQUIPMENT

9 17" TFT color graphic screen
Complete automated operation
Remote monitoring
Designed to operate in parallel with other InvaSave systems

CONTACT

Please contact us at **green@damen.com**
to discuss the solution that suits you best.

FOR MORE INFORMATION

please visit
www.damenballastwatertreatment.com

PORT SOLUTIONS

DAMEN GREEN SOLUTIONS

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BALLAST WATER TREATMENT

PORT SOLUTIONS

BALLAST WATER TREATMENT PORT SOLUTIONS

INVASAVE – MOBILE BALLAST WATER DISCHARGE TECHNOLOGY

Most ship owners are expected to comply with new ballast water regulations by installing onboard Ballast Water Treatment Systems. Damen has also considered alternatives for those owners that may not want to retrofit a treatment system, perhaps because their ships operate on non-exempted fixed routes or their ships are so old as to make any investment in such a system prohibitively expensive. Alternatives are also required for ports that need to provide backup in the case of emergencies when ships' onboard treatment systems fail.

ALTENATIVE FOR ON BOARD TREATMENT

For these reasons, Damen has developed a unique mobile discharge technology – InvaSave – which enables port based treatment of ballast water. With InvaSave technology, ballast water only needs treating at the point of discharge, in contrast to most fixed onboard installations that also need to treat at intake.

SELF SUFFICIENT MOBILE CONTAINER

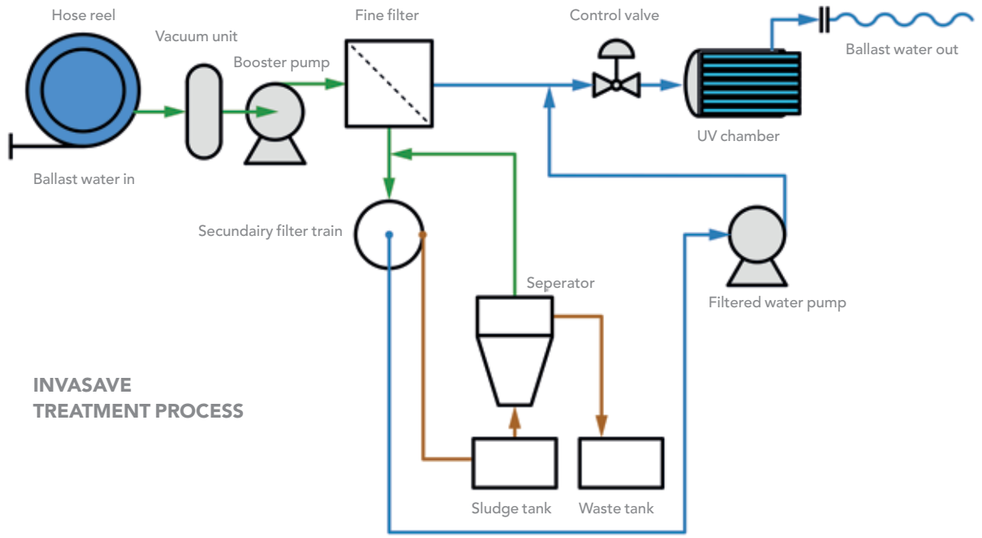
Damen can deliver the technology in a self-sufficient mobile container, which can be put on board a barge or moved around the port on a trailer, a pontoon or other types of vessel. Each Damen InvaSave container unit handles 300 m³/h – and it's easy to scale up if required, using multiple InvaSave container units. For those situations where mobility is not required, InvaSave can also be utilised to create a land based reception facility.

TYPE APPROVAL AND PATENT

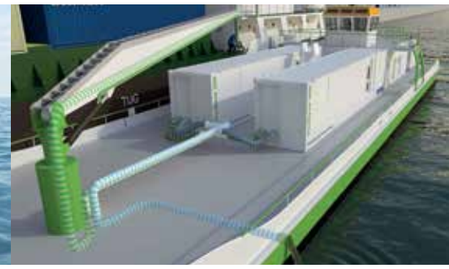
The InvaSave system was successfully tested in various representative challenging water qualities. The official land based testing was completed at the MEA test institute in the Netherlands in 2015 and final shipboard testing will be finalised shortly. IMO type approval by the Dutch flagstate is expected to be obtained in 2016 and a patent is pending. In a forthcoming phase USCG type approval shall be obtained.

WORLD FIRST AND PIONEERING TECHNOLOGY

The unique InvaSave technology is based on continuous fine filtration combined with Ultra Violet treatment. Sludge and sediment is dewatered and compacted in a secondary treatment so it can be further processed safely ashore. Treated water meets the ballast water performance standard specified in Regulation D-2 of the IMO Ballast Water Management Convention as an absolute minimum. InvaSave is the only technology on the market today to treat ballast water at discharge in only one step.



INVASAVE TREATMENT PROCESS



DAMEN

INVASAVE ADVANTAGES

- Unique technology for treatment of ballast water at discharge
- Enables contingency measures in ports in case on board treatment systems fail
- Total cost of treatment favorable vs on board retrofitted treatment for certain trades and ship types
- Self-sufficient system, independent of external power supply and pumping capacity
- Treatment in one step, no need for buffering
- Container sized, scalable and ready for multi-modal transport, truck or barge
- Suitable for all water types, temperatures and waters with low UV transmittance
- Safe and sustainable chemical free technology
- A reliable solution for both ports and operators
- A business opportunity for service providers in ports and at terminals