



DHI SOLUTION

DHI BALLAST WATER CENTRE

Testing and assessment for type approval

TYPE APPROVAL ACCORDING TO INTERNATIONAL MARITIME ORGANIZATION OR UNITED STATES COAST GUARD STANDARDS

Our Ballast Water Centre offers biological performance evaluation of ballast water management systems (BWMS) according to International Maritime Organization (IMO) and United States Coast Guard (USCG) standards.

Our team is the largest in the world, with land-based test facilities in Denmark and Singapore. Our two test facilities provide excellent opportunities for verification of biological performance in fresh, brackish and high saline waters.

THE FLEXIBILITY TO MEET YOUR NEEDS

Our Ballast Water Centre offers a broad range of testing and consultancy services such as:

- Pilot testing of components or BWMS to provide biological performance data that can be used by the manufacturer to adjust the BWMS or define performance claims prior to testing for type approval
- Type approval testing at land-based test facility
- Operation and maintenance testing
- Shipboard tests
- Human and environmental risk assessment
- Whole effluent toxicity (WET) tests
- Consultancy assistance related to basic and final approval applications
- Performance testing of filters and other components
- Scale-up modelling using Computational Fluid Dynamics (CFD)



ABOUT OUR TEST FACILITY IN DENMARK

Our test facility in Denmark (Hundested) includes seven steel cylindrical tanks: one 765 m³ source tank and six retention tanks, each with a volume of 256 m³. The design of the test facility permits parallel testing of more ballast water management systems and enables us to offer flexible solutions. We can provide flow rates from 200 to 600 m³/h.

SUMMARY

CLIENT

Manufacturers of ballast water management systems or components

CHALLENGE

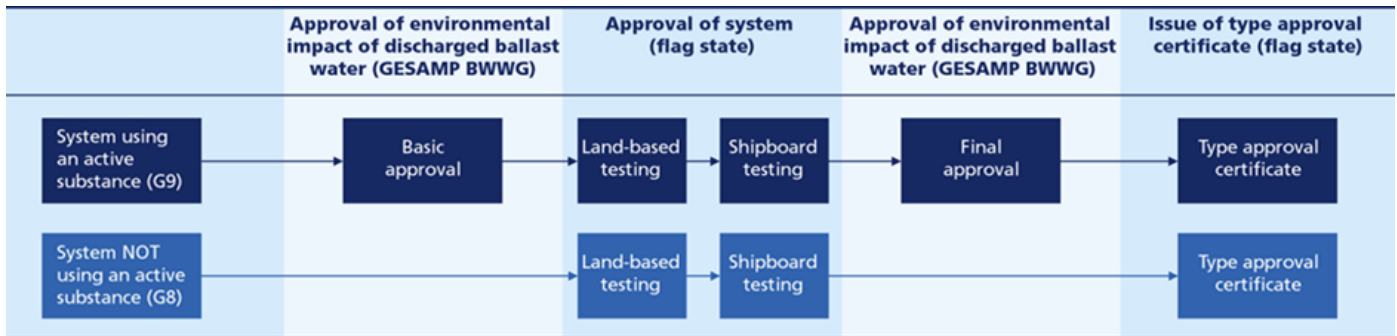
- Meeting the discharge standards defined by the International Maritime Organization (IMO) and the United States Coast Guard (USCG)
- Verifying biological performance in fresh, brackish and high saline waters
- Ensuring efficient and high-quality performance evaluation that meets time schedules for product development, approval and marketing

SOLUTION

- Biological performance evaluation of ballast water management systems based on several years of experience
- Strict procedures for QA/QC subjected to external audit

VALUE

- Detailed understanding of type approval testing according to USCG and IMO standards
- All services from proof-of-concept to type approval
- High degree of flexibility and short time from contract to initiation of testing



Process leading to IMO type approval (Lloyd's Register 2010)

We analyse samples from land-based test cycles in our environmental laboratory. The laboratory is inspected and audited as required to maintain its authorisation to perform studies in accordance with ISO 17025 and the OECD Principles of Good Laboratory Practice (GLP).



ABOUT OUR TEST FACILITY IN SINGAPORE

Our test facility in Singapore mimics real ballast tanks found on ships in order to minimise the potential gap between land-based and shipboard testing. As the only test facility in a tropical climate, we can conduct test year-round under highly challenging conditions. Our facility consists of a 550 m³ source tank and two retention tanks, each with a volume of 250 m³. We can provide flow rates from 200 to 500 m³/h. The environmental laboratory is accredited as per ISO 17025 standards.



DHI BALLAST WATER CENTRE CLIENTS

- AlfaWall, Sweden (land-based and shipboard tests)
- AMIAD Water Systems, Israel (filter tests)
- Auramarine Ltd, Finland (shipboard test)
- BAWAC Pte Ltd, Singapore (land-based test)
- BAWAT A/S, Denmark (land-based test)
- BIO-UV, France (land-based and shipboard tests)
- BlueSeas, Singapore (land-based test)
- Boll Filter Nordic, Denmark (filter tests)
- DESMI Ocean Guard A/S, Denmark (land-based and shipboard tests)
- Dow-Pinnacle, United States (land-based test)
- HYDAC Process Technology GmbH, Germany (filter tests)
- Hyde Marine, United States (filter tests)
- KALF Engineering, Singapore (land-based test)
- KSB Aktiengesellschaft, Germany (land-based and shipboard tests)
- Nanothree, Singapore (land-based test)
- Qingdao Headway Technology Co., Ltd, China (land-based and shipboard tests)
- Sembawang-Ecospec, Singapore (land-based test)
- TechCross, Korea (land-based and shipboard tests)
- Trojan Technologies, Canada (land-based and shipboard tests)
- Wärtsilä Water Systems Ltd, United Kingdom (land-based and shipboard tests)

COMPREHENSIVE SERVICES TO MEET YOUR SPECIFIC NEEDS AND CHALLENGES

We have extensive experience with pilot tests, land-based tests and shipboard tests, which we have obtained through years of testing for a large number of diverse clients.

In addition, we are recognised by the United States Coast Guard as a sub-lab under the Independent Laboratory headed by DNV GL.

Contact: info@dhigroup.com

For more information visit: www.dhigroup.com and www.ballastwater.dhigroup.com