Honeywell
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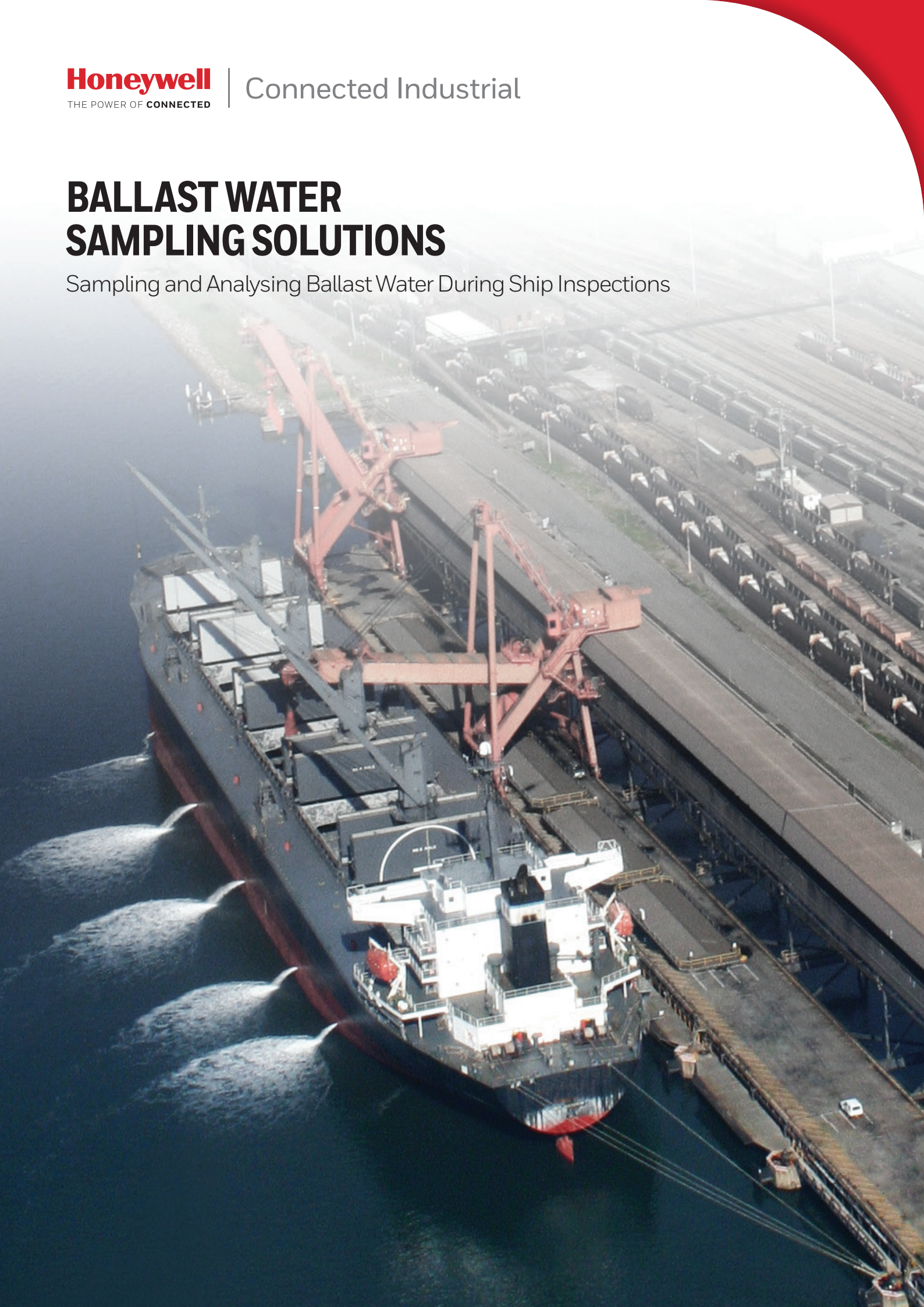
BALLAST WATER SAMPLING SOLUTIONS

Sampling and Analysing Ballast Water During Ship Inspections



The Ballast water convention is not only about water treatment – it is also a lot about sampling and verifying. When it comes to sampling the ballast water, IMO guidelines recognize two ways: “in-line” sampling and “in-tank” sampling.

The challenges faced by the authorities in charge of verifying the compliance are quite serious:

- *Some ballast water systems produce gaseous by-products, like hydrogen and chlorine*
- *Some leave in the water “active ingredients”, which must be neutralized before discharge*
- *A proficient biological laboratory may not be at convenient distance*
- *Lack of qualified personal for biology analysis*
- *Opening hatches in the ballast tanks can be a long and tedious work*
- *Ensuring a representative sampling is difficult or impossible.*

In-line Sampling

In-line sampling is well defined (“isokinetic samplers”) and is the recommended method to verify the compliance with D2 standard. “In-line” sampling usually means filtering a very large volume of water to verify precisely the density of alive or viable micro-organisms.

In-tank Sampling

In-tank sampling is not the recommended way when verifying compliance with D2 standard during type tests approvals; it is however the only practical way to perform “indicative analysis” on a ship and make sure of the innocuity of the ballast water before discharge. It is also the most convenient way to take samples from the bottom of the tank (sediments).

Why Check the Ballast Water When Arriving to Port ?

Buying, installing and operating a type approved ballast water treatment system does not solve all issues:

Several factors may impel the efficiency of the treatment system. Temperature, salinity, turbidity - operational records may be corrupted or lost.

Even properly treated ballast water is subject to “regrowth”, the multiplication of the surviving micro-organisms, which may lead to non-compliance with D2 standard.

Honeywell Tanksystem is a global leader in gauging and sampling solutions used in hydrocarbons, oil, fine chemicals and water. Our products are installed and used day and night on more than 7000 ships and barges around the planet.

We applied our know-how and our quality system to the new challenges brought by the ballast water convention, to bring practical and safe solutions for in-tank ballast water sampling.

The Deck valve

Made of stainless steel with high Molybdenum content and PFTE seals: Approved and certified for marine application, and designed to last at least longer than the ship on which they are installed. The deck valve is the perfect solution to ensure easy sampling operations and prevent against water contamination and release of gases.

Other ways to access the ballast water without discharging usually involve opening deck screw holes or opening manholes. The deck valve provides obvious advantages over those methods in terms of speed, safety and practicality.

Deck Valves, Samplers and Bottles are corrosion-resistant, and can be operated in hazardous areas (ATEX II 1 G c IIB T6). They are approved by all major classification societies.

The deck valve can accommodate instruments like samplers and UTImeter (Ullage, Temperature, Interface). It may also be used to lower an aspiration pipe connected to a pump, in order to pump and filter large amounts of water.

Guidelines for Ballast Water Sampling (G2)

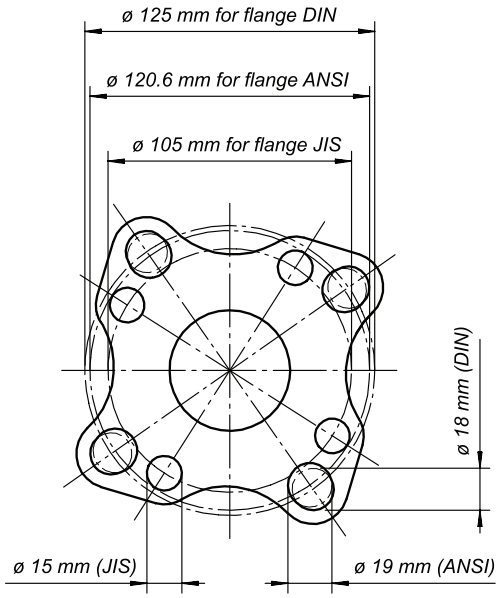
6.3 Prior to testing for compliance with the D-2 standard, it is recommended that, as a first step, an indicative analysis of ballast water discharge may be undertaken to establish whether a ship is potentially compliant or non-compliant. Such a test could help the Party identify immediate mitigation measures, within their existing powers, to avoid any additional impact from a possible non-compliant ballast water discharge from the ship.

HERMetic quick connector with DUJ multistandard flange Ref. TS 10081

HERMetic security cover connector with DUJ multistandard flange Ref. TS 10082

HERMetic quick connector with DUJ multistandard flange, 2" and 1" quick connectors. Ref TS 10083

HERMetic deck valve A-4-2-1 SS Ref. TS 98172



DUJ multistandard flange fits following standards: DIN PN 10 DN 50; DIN PN 16 DN 50; DIN PN 25 DN 50; DIN PN 40 DN 50; JIS 5K 50; JIS 10K 50; ANSI 150 lbs. 2 inch

Features		Benefits
Valve body raised above the deck		Prevents water ingress and contamination when opening.
Mounting: DUJ multistandard flange or JIS 5K-80A		Extremely quick and easy installation on new and existing ships, keeping the "hot works" to the minimum.
or	2" HERMetic quick connector	Reliable, easy-to-open connector allowing to connect close gauging sampler. particularly appreciated by the users when compared to rusty carbon steel threads.
	2" HERMetic quick connector with 1" adaptor	Same as above plus possibility to adapt 1" equipment.
	2" HERMetic quick connector with security cover	Double lock security cover prevents inadvertent opening.
	4" Valve with 2" and 1"connectors	Allows access to a wide range of equipments including hoses, plankton nets, 2 liters samplers.
1" Adaptor		Support all portable HERMetic equipment with HERMetic 1Inch quick connector (UTI, pressure gauge, oxygen sensor...)
Cover cable		A stainless steel cable connects the lid to the body, against fall or loss during operations.
Optional: Special handle for padlock (not supplied)		Add an additional layer of security by preventing unauthorized the opening of the valve (2" valves only).

The Sampler

The Hermetic sampler GTX is designed for the maximum security of operations while keeping the operations simple and quick.

HERMetic Sampler GTX Chem

Graduated Tape Visible by the Window

Features	Benefits
2" quick disconnect hermetic valve	The sampler is installed in a matter of seconds
Closed gauging	Designed to prevent the release of gases present in the tank
Graduated tape	To control precisely the height of the sampling point
Down tap	Very simple manipulation to pour quickly the necessary amount of water from the bottle
Top opening	Allows to get the bottle from the top if necessary
materials 316L stainless steel, PTFE, PVDF	Totally immune to the corrosion of chemicals, sea water and treated water
Tape length 35m /115 ft.	Allows reliable sampling of bottom part in most ballast tanks
Pump (optional)	In case of zero release of gas is required, the sampler can be pressurized quickly with a manual pump before the opening of the valve

Bottles

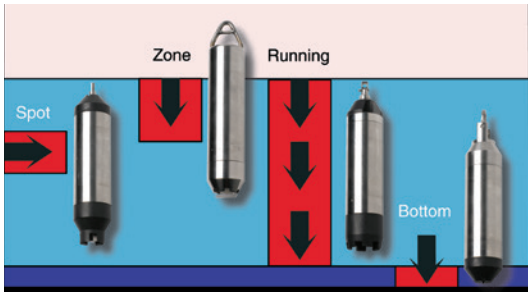
The four bottles types have been designed to fulfill the difficult requirements of Ballast water gauging : some inspections are based on getting a representative sample of the water column (running bottle); Other inspections or scientific sampling activities require to collect exclusively the top surface of the water (zone bottle), or the bottom of the tank (bottom bottle), or a sample taken at a precise height (spot bottle).

Standard bottles carry 430ml of liquid, and are used in tanks without sounding pipes or with vertical sounding pipes.

Reduced bottles carry only 130ml, which is usually is adequate for the needs of testing devices. Reduced bottles can pass both-ways in 2" sounding pipes with bending angles up to 10°.

Features	Benefits
Two types of length and volume	Bottles types fit for straight or bended sounding pipes.
Slick design	The bottles shapes have been specifically designed to prevent blocking in the pipes or at the bottom of the tank.
Material: Stainless steel and FKM	Totally immune to the corrosion of chemicals, sea water and treated water.
Running bottle	the running bottle takes a representative sample of the whole water column while being lowered and pulled. The diameter of the water incoming hole can be selected, so that the bottle will not be completely filled by return: this ensures that water from all parts of the tank have been sampled equally. The running bottle is the best choice for a quick assessment of the compliance with D-2 standard.
Zone bottle	The zone bottle is open at its top and takes liquid from the surface when lowered with precaution. It can be used to verify the concentration of organisms or salinity or residual chemicals at the surface of the ballast water.
Bottom bottle	The bottom bottle has a small valve which will let water in only when touching the bottom. It can be used to verify the concentration of organisms or salinity or residual chemicals at the bottom of the ballast tank or in sediments.
Spot bottle	The spot bottle has a small valve which is open by the operator at the desired height by "kicking" the handle rapidly. It can be used to verify the concentration of organisms, salinity or residual chemicals at any level, measured precisely on the tape.

Demonstrators of the four types (real bottles do not have side openings)



Sampling bottles synopsis

Selecting the water intake hole on the running bottle

Sampling Bottle (Zone type)

Why Closed Gauging

According to the condition of the ballast tank and the Water treatment method selected, water in ballast tanks may be covered by layers of gas like hydrogen, chlorine, or other active substances. Opening the ballast tank to the open air may present a risk to the personal operating. If the sound pipe openings are blocked or inexistent, the level inside the sound pipe may rise quickly when opening the tank and a cloud of vapor be spit around the working personal. Using Closed gauging valves and instruments helps prevent these potential issues, as they do in the hydrocarbon (oil) gauging and sampling industry.

Categories of Invaders as Defined by the IMO Ballast Water Convention

Name	Size	D2 standard	How to detect them
Bacteria	<10 µm	Less than 3 CFU (Colony forming units) per milliliter of water	Bacteria can only be identified by growing them ("colonies") in Petri boxes or equivalent. Small sample but several hours or even days are necessary.
Phyto-plankton	> 10 µm, < 50 µm	Less than 10 viable organisms per milliliter of water	Phytoplankton or Algae uses chlorophyll like other plants. In dead organisms the chlorophyll degrades rapidly. A small sample can be tested in a matter of minutes using fluoroscopy.
Zoo-plankton	>50 µm	Less than 10 viable organisms per cubic meter of water	A large quantity of water (typ. > 1/2 m3) must be filtered and the living or viable microorganisms identified from the dead/non-viable. Needs several minutes of pumping, laboratory tools and qualified personal. Some organisms may have been killed during pumping or transportation making the detection less accurate & reliable.
Phyto-plankton	<10 µm	Not covered	A future evolution of the Ballast Water Convention will probably include those, similar to the bigger ones.

Ordering Guide

Product	Ordering code	Recommended number
Deck valve C2-SS-BL: 2" DUJ multistandard flange, standard lid	TS 10081	One per ballast tank
Deck valve C2-SS-SEC: 2" DUJ multistandard flange, dopuble lock security cover	TS 10082	
Deck valve C2-SS-W: 2" DUJ multistandard flange, with 1" connection	TS 10083	
Deck valve C2-SS-W: 2" JIS 5K-80A flange, with 1" connection	TS 98121	
Deck Valve A-4-2-1: 4" flange with either 1", 2", or 4" connections	TS 98172	
Handle with locking device (2" valve)	Optional	
HERMetic Sampler GTX Chem 35m	TS 98113	Two per ship, or one per inspector
Standard running bottle 430 ml	TS 20138	Two sets per ship or one set per inspector
Standard zone bottle 430 ml	TS 10380	
Standard bottom bottle 430 ml	TS 20124	
Standard spot bottle 430 ml	TS 20137	
Reduced running bottle 130 ml	TS 20184	Two sets per ship or one set per inspector
Reduced zone bottle 130 ml	TS 20183	
Reduced bottom bottle 130 ml	TS 20185	
Reduced spot bottle 130 ml	TS 20186	

Service and support

Honeywell Tanksystem offers unmatched support and a range of services to help ship owners and operators optimize their equipment usage and run their operations smoothly, while complying with all pertinent regulations. Since 1983,Honeywell has maintained complete traceability of all its ship installations and interventions. This allows immediate identification of the equipment type, configuration and related parts to address user needs in minimal time.

The combination of Honeywell's global network of experienced technicians, remote parts warehouses and certified service stations further ensures a speedy response.

For more information

To learn more about Honeywell's Sampling and Valves for Ballast Water Solutions, visit www.tanksystem.com or contact your Honeywell account manager.

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