Scienco InTank **FITT®** Ballast Water Treatment System

Our InTank FITT® ballast water treatment solution is designed for **small and infrequent** de-ballasting vessels. With one of the smallest footprints in the market **0,5 m²** and very low power requirement **(< 4 kW**) the InTank FITT® solution meets two important criteria in water ballast treatment system selection for smaller vessel types.

FITT® also supports the operational profile perfectly as ballast water treatment is not performed whilst pumping in (or out). Treatment is performed inside the tank via a simple chemical dosing method and is triggered at the courtesy, readiness of vessel (crew) **just before** D-2 compliant discharge requirement.

Based on the proven InTank® WBTS method our FITT® unit offers the flexibility to treat **a specific tank**, a **group of tanks or All Tanks** subject to vessel requirements such as for transit to another environmental (biological) risk area. Obviously, this flexibility simplifies greatly the water ballast treatment puzzle to meet D-2 discharge standard. **Only treat what is discharged**.

Features:

- Simple bulk chemical treatment
- Filterless
- Small footprint (0.5 m^2) incl. hold tank
- Low power consumption (< 4 kW)
- Automatic treatment of All selected tanks
- Fully Type Approved (BWM code)

Application / Vessel Type / Specifications:

- Effective in all water qualities
- No design limitations
- Treats up to 12 tanks without restrictions
- Yachts, Supply vessels, AHT, Dredgers
- Offshore: Cargo barges, Semi-submersibles

Operational Benefits:

- ✓ Simple installation and integration
- ✓ Flexible in treatment start
- ✓ Low OPEX, Capex
- ✓ Fully automatic treatment
- ✓ Select and treat any tank
- ✓ PLC controlled auto switching between tanks
- ✓ Compliance assurance before discharge

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One of the smallest footprint in the market (0,5 m²) :

The system is ideally suited for the smallest engine rooms of platform supply vessels, anchor handlers, hopper dredgers & Super Yachts. Typically, vessels with infrequent ballast operations and or a low necessity to perform treatment of the ballastwater may also benefit from the FITT® solution e.g. semi-subs & barges

Filterless:

The single greatest operational — and packaging — advantage of InTank FITT® is that it has No filter, making it the easiest product on the market to install, maintain and operate. For simple maintenance and consistent compliance, FITT® is the way to go.

Fully automated treatment of All tanks:

FITT® is a fully automated product and includes tank switching. The system will treat and neutralize up to 12 pre-programmed or manually selected ballast tanks with our active substance bulk liquid sodium hypochlorite.

Assured Compliance:

Treating and neutralizing inside the tank allows FITT® to complete treatment just before discharge overboard. FITT® is adaptive to the water quality in each tank assuring biological compliance and taking out the guesswork for your vessel. Neutralization is also completed and registered in the tank safeguarding the local marine environment from unwanted discharge.

Solving your WBTS Puzzle: Time, Timing, Power (kW), Space & Operations :

FITT® offers vessels maximum flexibility in Time and Timinig to start water ballast treatment whilst retaining all compliance and operational benefits of the larger InTank® solution. Eliminating many disadvantages of most inline treatment systems such as: filters (space), peak power demand (kW) and forced treatment at uptake alongside. FITT also accommodates for specific water quality, long hold periods and related regrowth concerns whilst reducing complexity and install costs.

InVoyage™ + InControl™ = InTank®

SCIENCO InTank FITT- an AllTank solution for ALL types of vessels.

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Scienco® InTank™ – Ballast Water Treatment

Brief Description of system and method

The Scienco® inTank™ BWTS utilizes liquid sodium hypochlorite (NaOCl) solution as the active substance to achieve the IMO Regulation D-2 ballast water discharge standard. NaOCl as active substance can be generated onboard via an electrochemical generator or applied as ready liquid bulk solution, or both. The system is effective in all water qualities: fresh-, brackish- and saltwater. The system has received both IMO- and USCG type approvals certificates with DNV-GL as Independent Laboratory and is in full compliance with the 2016 Guidelines and the BWMS code.

Key Characteristics of Scienco® inTank™ ballast water treatment solution:

Active substance	: Sodium hypochlorite (NaOCl)
Applied method	: InTank dosing via recirculation & active monitoring of TRO
Applied metric	: Target concentration time dosing (CT-value)
Set Value	: CT-value = 120 (5 mg/ltr x 24 hours Hold time)
Pre-Filtration	: None

Treatment Sequence

- Ballast water uptake : None
- At Sea InVoyage : Treatment of all tanks (dosing, mixing & neutralisation)
- Ballast water discharge : None

Operational limitations

- Salinity : Not applicable
- Water Temperature : Not applicable
- Hold Time : > 24 Hrs.
- Min. avg. TRO (mg/L) : 2 - 5 mg/ltr (varies with hold time)
- EC feed limitations : Temperature 0 - 35°C & > 22 mS/cm

System design limitations

- Ballast water salinity and temperature are not limiting conditions for the Scienco inTank BWTS
- Target concentration time (CT) must be ≥ 120 mg-h/L , measured TRO as CL_2
- System is approved with initial dose setting at 1,25 x target average TRO concentration
- Maximum allowable initial dose is set at 8 mg/L
- TRO concentration at InTank before discharge shall be ≤ 0.1 mg/

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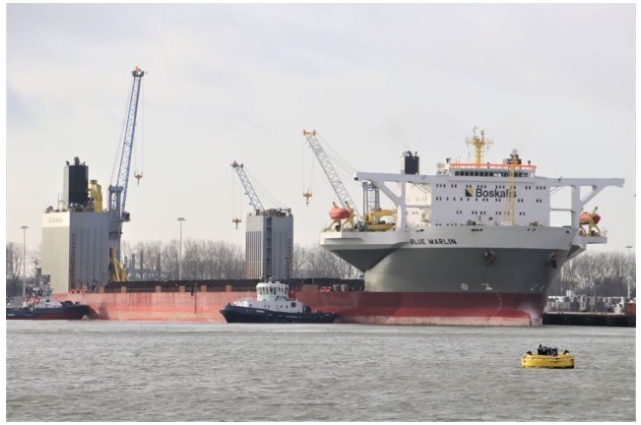
EXAMPLES OF TYPICAL INSTALLATIONS

Heavy lift assets & semi-submersible heavy lift vessels:



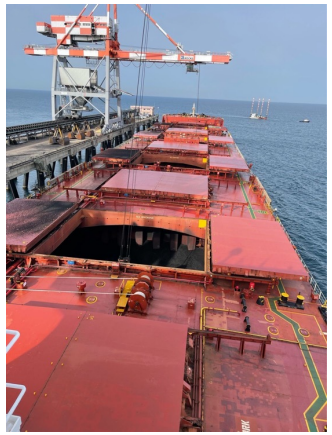
Number of water ballast tanks	: 65 to 95
Dynamic Water ballast volumes in place	: 120.000 m3
No of ballast pumps (+ Compressed air)	: 4 to 6
Flow rate (per pump)	: Avg. 2000 m3/hour
Transit Water Ballast Volumes	: avg. 26.000 m3

Why InTank ..?

1. Filterless and tank per tank selection
2. No Treatment during in-place flood- and deballast ops.
3. Transit water ballast volume (in full) only
4. Flexibility to treat all tanks and NOT to treat
5. No changes to critical in place operational

EXAMPLES OF TYPICAL INSTALLATIONS

High ballast dependent vessels (VLCC, LNG's, Capes, Newcastle maxes, VlOC):



Number of water ballast tanks	: 14
Water ballast volumes in place	: 60.000 m3 – 90.000m3
No of ballast pumps	: 2
Flow rate (per pump)	: Avg. 3000 m3/hour
Transit Water Ballast Volumes	: As above + HWballast

Why InTank ..?

1. Filterless without treatment InPort (time criticality)
2. Footprint of only 8 m2 complete hardware
3. Limited available power with full InPort service load
4. Includes treatment of cargo hold in HWB condition
5. Voyages exceed 5 days, scale down system & capex

EXAMPLES OF TYPICAL INSTALLATIONS

Drill- & Jack-up rigs as well as semi sub offshore assets:

Number of water ballast tanks	: 18 to 20
Water ballast volumes in place	: 6.000 m3
No of ballast pumps	: 2
Flow rate (per pump)	: Avg. 500 m3/hour
Transit Water Ballast Volumes	: 3.000 m3

Why InTank ..?

1. Infrequent requirement to treat WB & long InTank hold
2. Preferred timing of treatment just before discharge
3. Ability to select specific tanks for WB treatment & discharge
4. Simplicity of install, footprint hardware i.c.t. InLine solutions
5. Bulk chemical version is cost effective option

EXAMPLES OF TYPICAL INSTALLATIONS

Sea going Heavy lift barges (not self propelled) :

Number of water ballast tanks	: 35 to 56
Water ballast volumes in place	: 40.000 m3
No of ballast pumps	: 2
Flow rate (per pump)	: Avg. 2.000 m3/hour
Transit Water Ballast Volumes	: 10.000 m3

Why InTank ..?

1. BC version enables treatment alongside without restrictions
2. Preferred timing of treatment just before voyage (tow)
3. Ability to select specific tanks for WB treatment & discharge in accordance with load plan
4. External ballast water treatment solution found costly (project) and difficult to re-locate

AllTanks™

Another FITT® for purpose PRODUCT

Platform supply, TSHD, Barges, Superyachts, Anchor Handlers:

Typically, these assets have minimal wb volume, very low frequency and for refit purposes little space and spare kW available.

Number of water ballast tanks	: 2 to 12
Water ballast volumes in place	: up to 2.000 m3
No of ballast pumps	: 2.
Flow rate (per pump)	: Avg. 120 m3/hour

Why InTank FITT®?

1. It **FITT®'s** with skid size = 65 x 80 x 105 cm. (all incl.) & <5 kW
2. Plug & Play simple install on basis of bulk chemical dosing
3. Fully automated tank switching and program (incl. reporting)
4. Ability to select specific water ballast tanks
5. To prevent regrowth issues due to long hold periods