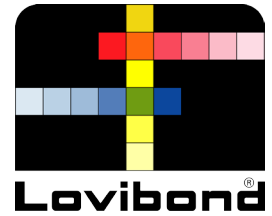


# Lovibond® Water Analysis

Tintometer® Group



## Ballast Water Test Kit

**Perfect systems for the control and optimisation of water quality**

### **Photosynthetic Activity**

- D1 & D2 Compliance
- Fluorescence Technology
- Go – NoGo Screen
- Handheld Fluorometer (IP67)
- Results in seconds
- Early Warning Fail Alert
- No Consumables
- Battery Operated
- Self calibration

### **Chlorine**

- Electrolysis/electrochlorination systems
- Residual and discharge level verification
- IP68 Waterproof
- Long life, tablet reagents

### **Salinity**

- Refractometer Measurement
- Ballast Exchange Reporting
- Log Results for D1 Compliance
- Quick and Simple Test

[www.lovibondwater.com](http://www.lovibondwater.com)

## Ballast Water Compliance to D1 and D2

The arrival of invasive species in coastal waters via ballast water discharge can have a serious impact on local biodiversity, with invading species out-competing local flora and fauna. The spiny water flea (*Bythotrephes cederstroemi*), and the round goby (*Neogobius melanostomus*) are examples of ballast water introductions into the US Great Lakes. The damage caused by zebra mussels in North America is thought to have totalled at least \$100 million since its introduction in 1987.

The BWM Convention, 2004, was adopted by IMO member states to define standards for ballast water treatment/discharge in order to lower the impact of invasive contamination. The challenge ahead is how to demonstrate compliance to both D1 (ballast water exchange) and D2 (ballast water treatment) regulations.

## FM 500 Fluorometer

For many years, oceanographers have used fluorescence devices for studying phytoplankton and photosynthetic efficiency. Ballast water treatment directly affects planktonic activity, so screening with the simple to use, handheld FM 500 Fluorometer, set to maximum sensitivity, is an ideal on-board way of determining the effectiveness of the ballast water treatment system. A rapid indication of exceeding the D2 compliance standard (live organisms, 10-50µm) is achieved in seconds.

The FM 500 handheld Fluorometer is compact, rugged and lightweight. The instrument is factory calibrated and can be used straight from the box, enabling simple one-button operation. Estimates of total chlorophyll and yield (Fv/Fm) are displayed simultaneously with a risk level indication of grossly exceeding the D2 standard (High, Medium, or Low).

A self-check standard is supplied in the test kit, together with sampling cuvettes.

## MD 100 Chlorine Analyser (0-6 mg/l as Cl<sub>2</sub>)

Post filtration, many ballast water treatment systems employ electrolysis or electrochlorination as a means of chlorine generation for the disinfection process. Residual chlorine levels, typically being 2mg/l, would be neutralised with sulphite or bisulphite prior to discharge.

The MD 100 chlorine analyser can be used to check both residual and discharge levels of chlorine (or chlorine dioxide), to help verify effective system operation and performance.



## Salinity

Ballast Water Compliance to D1 can be proven with simple salinity checks. Ocean salinity varies across the globe, so testing and recording the change in salinity at each exchange will demonstrate and verify the exchange has actually taken place.

The salinity refractometer is an optical device that detects the change in refractive index of different sea water salinities. Result expressed as ppt NaCl.



## Technical Data FM 500 Fluorometer

Linear Range	0-100 µg/l typical
Sensitivity	1 µg/l
Temperature	5-40°C
Case	IP 67 standard
Power Supply	4 AAA batteries
Light Source	LED
Detector	Photodiode
weight	0.4 kg
Size	189 x 89 x 44.5 mm

## Technical Data MD 100 Chlorine

Optics	LEDs, interference filter (IF) and photo sensor
Wavelength Accuracy	± 1 nm
Photometric Accuracy	3% FS (T=20 °C - 25 °C)
Photometric Resolution	0.01 A
Power Supply	4 AAA batteries capacity approx. 17 hours or 5000 tests
Display	Backlit LCD (on keypress)
Storage	Internal ring memory for 16 data sets
Dimensions	155 x 75 x 35 mm
Weight	Approx 260 g
CE Conformity	

## Technical Data Salinity Refractometer

Range	0-100 ppt NaCl
Resolution	0.01ppt NaCl
Temperature	Temperature Compensation
Weight	0.25 kg
Size	250 x 35 mm OD

## The Tintometer® Group

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## Ordering Information

P/N	Description
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56K023201	Ballast Water Test Kit
56M001601	FM 500 Fluorometer
56M001701	FM 500 Secondary Standard
56M001801	FM 500 Cuvettes (pk 100)
276000	MD 100 Chlorine (0-6mg/l)
197629	MD 100 Glass Cells (pk 5)
56M000405	Salinity Refractometer