

EC-TYPE EXAMINATION CERTIFICATE (MODULE B)

Application of: Directive 2014/90/EU of 23 July 2014 on marine equipment (MED). This Certificate is issued by DNV GL SE based on the notification of the Federal Maritime and Hydrographic Agency of Germany.

This is to certify:

That the Oil-content meters

with type designation(s)
SMART CELL - BILGE

Issued to

Rivertrace Limited
London, United Kingdom

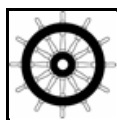
is found to comply with the requirements in the following Regulations/Standards:
Regulation **(EU) 2019/1397,**
item No. MED/2.3. Marpol 73/78 as amended, Annex I Regulation 14, IMO Res. MEPC.107(49), IMO MEPC.1/Circ. 643

Further details of the equipment and conditions for certification are given overleaf.

This Certificate is valid until **2025-01-06.**

Issued at **Hamburg** on **2020-01-07**

DNV GL local station:
Southampton



for **DNV GL SE**

Approval Engineer:
Hagen Markus

Notified Body
No.: **0098**

Gerhard Aulbert
Head of Notified Body

The mark of conformity may only be affixed to the above type approved equipment and a Manufacturer's Declaration of Conformity issued when the production-surveillance module (D, E or F) of Annex B of the MED is fully complied with and controlled by a written inspection agreement with a Notified Body. The product liability rests with the manufacturer or his representative in accordance with Directive 2014/90/EU. This certificate is valid for equipment, which is conform to the approved type. The manufacturer shall inform DNV GL SE of any changes to the approved equipment. This certificate remains valid unless suspended, withdrawn, recalled or cancelled. Should the specified regulations or standards be amended during the validity of this certificate, the product is to be re-approved before being placed on board a vessel to which the amended regulations or standards apply.



Product description

The SMART Cell - Bilge Oil Monitor is split into two logical modules.

Module 1

SMART - Display / CONTROL MODULE contains the membrane keypad, LCD display and the Smart Bilge Control PCB.

Module 2

SMART – MEASURING CELL contains the optoelectronics and mechanics used in the calculation of the sample oil content. Measuring principle by the Smart Cell Detector Array Technology, developed by Rivertrace Limited. The SMART CELL analyses all three oil types (HFO, Diesel and Emulsions) simultaneously without the need for re-calibration.

The 15ppm Bilge Alarm is designed and tested to meet the requirements of IMO Resolution MEPC.107(49).

Application/Limitation

The SMART CELL - BILGE Alarm by Rivertrace Limited are intended for installation on-board ships for monitoring the oil content of bilge water. The unit monitors the effluent from an approved Bilge Water Separator and sends an alarm signal that facilitates the activation of discharge control devices that divert bilge water from overboard to bilge tank(s) when the oil content exceeds 15ppm.

A copy of the Instruction Manual "SMART BILGE" shall always be delivered with the content meter and available on-board vessel.

The equipment is not permitted to be installed in spaces subject to explosion hazards.

The following shall be verified during installation:

- The alarm is always activated whenever clean water is used for cleaning or zeroing purposes
- Any alarm will activate the automatic stopping device preventing overboard discharge and lead to recirculation.
- The overall response time (including the response time of the alarm) between the effluent discharge exceeding 5 ppm oil and the operation of the automatic stopping device preventing overboard discharge is not more than 20 seconds.

Type Examination documentation

General documents

Dwg. No.	Rev.	Date	Title
109080	AF	2019-10-02	Instruction Manual "SMART BILGE"
109275	H	2018-07-13	SMART CELL – BILGE Calibration Procedure

Analysing unit / Electronic section

Dwg. No.	Rev.	Date	Title
109072 S1	G	2016-05-05	SMART CELL (Bilge) Assembly
109072 S2	G	2016-05-05	SMART CELL (Bilge) Assembly – Parts List
109069 S1	E	2014-01-16	SMART BILGE Module Assembly 115/230VAC
109069 S2	E	2014-01-16	SMART BILGE Module Assembly 115/230VAC (LID)
109069 S3	E	2014-01-16	SMART BILGE Module Assembly 115/230VAC – Parts List


Job Id: **344.1-009955-1**
 Certificate No: **MEDB0000629**

Tests carried out

Test standard	IMO Resolution MEPC.107(49)
Test location	Rivertrace Limited, Unit P, Kingsfield Business Centre, Philanthropic Road, Redhill, RH1 4DP, England
Test specimen	
15 ppm Bilge Alarm (Oil Content Monitor) Model SMART CELL-BILGE	
Analysing unit	Smart Cell Assembly - Dwg.No.:109072, 2004-07-14
Electronic section	Smart Bilge Assembly - Dwg.No.: 109069, 2004-07-14
Witnessing of tests	Hagen Markus, Germanischer Lloyd, Hamburg
Samples taken by	Mr Mathew Mac Gregor, TEI-Testing Services-Plumbing Laboratory
Sample analysing	
Samples analysed by	Testing Engineers International, Inc. Testing Services-Plumbing Laboratory 4121 South 500 West, Salt Lake City, UT 84123-1399, USA;
Test report	Smart Bilge TEI Summation Certificate TS-P00372
Environmental testing	
Testing laboratory	Intertek Testing Services, Guilford, U.K.
Test report	No. 04014866, September 2004

Marking of product

For traceability to this EC Type-Examination, each unit to be marked with;

Scope	Example
Manufacturer name	Rivertrace Limited
Separator type	SMART CELL - BILGE
MED Mark of conformity Wheel mark / notified body / Year built	 0098 /2019
Serial number	xxxxxxxxxxxxxxxxxxxxxx

This certificate replaces previous MED Module B certificate 11 478-14HH.

APPENDIX

Test Data and Results of Tests conducted on a 15 ppm Bilge Alarm in accordance with Part 2 of the Annex to the Guidelines and Specifications contained in IMO Resolution MEPC.107(49)

15 ppm Bilge Alarm submitted by	Rivertrace Limited
Test location	Rivertrace Limited, Unit P, Kingsfield Business Centre, Philanthropic Road, Redhill, RH1 4DP, England
Organisation conducting the test	Rivertrace Limited
Organisation witnessed the test	Germanischer Lloyd, Hamburg, Mr Hagen Markus
Method of sample analysis	ISO 9377-2:2000
Test rig according to drawing	Smart Cell – Bilge Calibration procedure, 109275 rev. H, 2018-07-13
Samples analysed by	Tei-Testing Services - Analytical Laboratory, Mr Mathew Mac Gregor Test report: TEI Summation Certificate TS-P00372
Environmental testing of the electronic section of the 15 ppm Bilge Alarm has been carried out in accordance with part 3 of the annex to the guidelines and specifications contained in IMO Resolution MEPC.107(49). The equipment functioned satisfactorily on completion of each test specified on the environmental test protocol.	
Test were carried out at Intertek Testing Services, Guilford, U.K., Test report No.: 04014866, issued September 2004.	

Calibration Test and Response Time

	Test Fluid					
	A		B		C	
	Measured	Grab sample	Measured	Grab sample	Measured	Grab sample
0 ppm	0	0	0	0	0	0
15 ppm	16.2	19.5	14.8	16.9	16.4	18.8
Full scale [ppm]	29.5	28.6	29.2	34.0	28.3	32.1
Water Temperature	26.5 °C		27.2 °C		24.0 °C	
Re-zero	No		No		No	
Recalibrate	No		No		No	
Response Time	1.5 sec		1.7sec		1.5 sec	

Contaminant(s) and Colour Test

Non-oil particulate matter

Meter reading shift with ppm non-oil particulate contaminants and with very salt water.

Test condition	Expected Reading	Oil Content Meter Reading
Clean water and 10 ppm Test Fluid "B"	10	9.9
Very salt water (6% common salt with clean water)	10	7.1
Fluid B and Iron Oxide in a concentration of	10 ppm	10
	50 ppm	10
	100 ppm	10

Sample Pressure of Flow Test

15 ppm Bilge Alarm reading shift at normal	12.9	ppm
15 ppm Bilge Alarm reading shift at 50 % of normal	13.2	ppm
15 ppm Bilge Alarm reading shift at 200 % of normal	12.9	ppm
Deviations from this test should be stated if necessary: None		

Shut-Off Test

	Measured	Grab sample	
15 ppm Bilge Alarm before shut-off	14.0	17.5	ppm
15 ppm Bilge Alarm reading after start-up (minimum dry period 8 hours)	15.3	19.5	ppm
Damage to meter as follows: None			

Utilities Supply Variation Test

110 %	voltage effects	There was no change in the Oil Content Meter Reading when the voltage was varied.
90 %	voltage effects	There was no change in the Oil Content Meter Reading when the voltage was varied.
110 %	air pressure effects	Not applicable
90 %	air pressure effects	
110 %	hydraulic pressure effects	
90 %	hydraulic pressure effects	

Other Comments

None

Calibration and Zero Drift Test

Calibration drift	-1.18	ppm
Zero drift	0.0	ppm

End of certificate