

CERTIFICATE OF TYPE APPROVAL FOR 15 PPM BILGE ALARM

issued under the authority of the Government of the

GRAND-DUCHY OF LUXEMBOURG

by GERMANISCHER LLOYD

THIS IS TO CERTIFY

that the 15 ppm Bilge Alarm, comprising the equipment listed below, has been examined and tested in accordance with the requirements of the Specifications contained in part 2 of the annex to the Guidelines and Specifications contained in IMO resolution MEPC.107(49). This Certificate is valid only for 15 ppm Bilge Alarm referred to below.

| | | |
|--|---|------------------------|
| 15 ppm Bilge Alarm supplied by | <u>Rivertrace Engineering LTD (RTE)</u> | |
| Under type and model designation and incorporating | <u>Smart Cell - Bilge</u> | |
| *15 ppm Bilge Alarm analysing unit manufactured by | <u>RTE</u> | |
| to specification/assembly drawing No. | <u>Smart Cell Assembly</u> | date <u>2004-07-14</u> |
| | <u>Dwg. No.: 109072</u> | date _____ |
| * Electronic section of 15 ppm Bilge Alarm manufactured by | <u>RTE</u> | |
| to specification/assembly drawing No. | <u>Smart Bilge Assembly</u> | date <u>2004-07-14</u> |
| | <u>Dwg. No.: 109069</u> | date _____ |
| * Sample feed pump manufactured by | <u>N.A.</u> | |
| to specification/assembly drawing No. | _____ | date _____ |
| | _____ | date _____ |
| * Sample conditioning unit manufactured by | <u>N.A.</u> | |
| to specification/assembly drawing No. | _____ | date _____ |
| | _____ | date _____ |

The 15 ppm Bilge Alarm is acceptable for use in accordance with regulation 14(7).

Test date and results attached in the appendix.

A copy of this Certificate should be carried aboard a vessel fitted with this equipment at all times.

Issued at
Hamburg the 2009-11-17



Germanischer Lloyd

Hanspeter Raschle
i.V. Hanspeter Raschle

Markus
i.A. Hagen Markus

* Delete as appropriate

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 RTE

Test location RTE, Unit P, Kingsfield Business Centre, Philanthropic Road, Redhill, RH1 4DP, England

Organisation conducting the test Germanischer Lloyd, Hamburg, Mr Hagen Markus

Method of sample analysis ISO 9377-2:2000

Test rig according to drawing _____

Samples analysed by Tei-Testing Services - Analytical Laboratory, Mr Mathew Mac Gregor

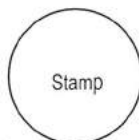
Environmental testing of the electronic section of the 15 ppm Bilge Alarm has been carried out in accordance with part 3 of the annex to the guidelines and specifications contained in IMO Resolution MEPC.107(49). The equipment functioned satisfactorily on completion of each test specified on the environmental test protocol.

Test were carried out at *Intertek Testing Services, Guilford, U.K.*, Test report No.: *04014866*, issued at _____ on _____.

Remarks:

None

The 15 ppm Bilge Alarm serial No. _____ complies with the tested type.



Place, Date

Signature of Company

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 °C | | 24 °C | |
| Re-zero | YES / NO * | | YES / NO * | | YES / NO * | |
| Recalibrate | YES / NO * | | YES / NO * | | YES / NO * | |
| Response Time | --- sec | | 3.7 sec | | --- sec | |

Contaminant(s) and Colour Test

Non-oil particulate matter

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

| | | 15 ppm Bilge Alarm [ppm] | |
|---------------------------------------|---------|--------------------------|-----|
| Clean water and 10 ppm Test Fluid "B" | | 9.4 | 9.9 |
| Very salt water | | 7.1 | -- |
| Iron Oxide | 10 ppm | -- | 8.5 |
| Iron Oxide | 50 ppm | -- | 8.5 |
| Iron Oxide | 100 ppm | -- | 8.5 |

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

* Delete as appropriate

Shut-Off Test

| | Measured | Grab sample | |
|---|-------------|-------------|-----|
| 15 ppm Bilge Alarm before shut-off | <u>14.0</u> | <u>17.5</u> | ppm |
| 15 ppm Bilge Alarm reading after start-up (minimum dry period 8 hours) | <u>15.3</u> | <u>19.5</u> | ppm |

Damage to meter as follows:

None**Utilities Supply Variation Test**

| | |
|----------------------------------|---------------------------------|
| 100 % Voltage | <u>12.1 ppm</u> |
| 110 % voltage effects | <u>11.9 ppm</u> |
| 90 % voltage effects | <u>11.8 ppm</u> |
| 110 % air pressure effects | <u>n.a.</u> |
| 90 % air pressure effects | <u>n.a.</u> |
| 110 % hydraulic pressure effects | <u>see results of flow test</u> |
| 90 % hydraulic pressure effects | <u>dto.</u> |

Other CommentsNone**Calibration and Zero Drift Test**

| | | |
|-------------------|--------------|-----|
| Calibration drift | <u>-1.18</u> | ppm |
| Zero drift | <u>0.0</u> | ppm |

Hamburg the *17*day of *November 2009***Germanischer Lloyd**

Hanspeter Raschle *Hagen Markus*

i.V. Hanspeter Raschle

i.A. Hagen Markus