



U. S. Department of Homeland Security
United States Coast Guard
Certificate of Approval

Coast Guard Approval Number: 162.050/9064/0

Expires: 01 March 2023

OIL POLLUTION PREVENTION EQUIPMENT

The following device has been tested in accordance IMO Resolution MEPC.107(49)

ARJAY ENGINEERING, LIMITED
2851 Brighton Road
Oakville Ontario L6H 6C9 CANADA

HydroSense 2410; 15 ppm Bilge Alarm

This is to certify that the equipment listed has been examined and tested in accordance with the requirements contained in Annex 13 to IMO Resolution MEPC.107(49).

Equipment is manufactured by Arjay Engineering, Limited to specification/assembly drawing nos. 20020025 dated 22/5/2003, 20020021 dated 21/5/2003, and 20020019 dated 18/4/2002. The unit is manufactured to meet Zone 2 (Division 2) specifications.

A copy of this Certificate should be carried aboard a vessel fitted with this equipment at all times. IMO Certificates of Type Approval do not expire and are valid for equipment manufactured at any time during the period of validity of this Certificate. Test data and results are attached in the appendix.

This certificate documents compliance with 46 CFR 162.050.

*** End ***

THIS IS TO CERTIFY THAT the above named manufacturer has submitted to the undersigned satisfactory evidence that the item specified herein complies with the applicable laws and regulations as outlined on the reverse side of this Certificate, and approval is hereby given. This approval shall be in effect until the expiration date hereon unless sooner canceled or suspended by proper authority.

GIVEN UNDER MY HAND THIS 01st DAY OF
MARCH 2018, AT WASHINGTON D.C.



C. J. ROBUCK
Chief, Engineering Division
BY DIRECTION OF THE COMMANDANT

TERMS: The approval of the item described on the face of the Certificate has been based upon the submittal of satisfactory evidence that the item complies with the applicable provisions of the navigation and shipping laws and the applicable regulations in Title 33 and/or Title 46 of the Code of Federal Regulations. The approval is subject to any conditions noted on this Certificate and in the applicable laws and regulations governing the use of the item on vessels subject to Coast Guard inspection or on other vessels and boats.

Consideration will be given to an extension of this approval provided application is made 3 months prior to the expiration date of this Certificate.

The approval holder is responsible for making sure that the required inspections or tests of materials or devices covered by this approval are carried out during production as prescribed in the applicable regulations.

The approval of the item covered by this certificate is valid only so long as the item is manufactured in conformance with the details of the approved drawings, specifications, or other data referred to. No modification in the approved design, construction, or materials is to be adopted until the modification has been presented for consideration by the Commandant and confirmation received that the proposed alteration is acceptable.

NOTICE: Where a manufacturer of safety-at-sea equipment is offering for sale to the maritime industry, directly or indirectly, equipment represented to be approved, which fails to conform with either the design details or material specifications, or both, as approved by the Coast Guard, immediate action may be taken to invoke the various penalties and sanctions provided by law including prosecution under 46 U.S.C. 3318, which provides:

"A person that knowingly manufactures, sells, offers for sale, or possesses with intent to sell, any equipment subject to this part (*Part B. of Subtitle II of Title 46 U.S.C.*) and the equipment is so defective as to be insufficient to accomplish the purpose for which it is intended, shall be fined not more than \$10,000, imprisoned for not more than 5 years or both."

APPENDIX

United States Coast Guard Certificate of Approval

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TEST DATA AND RESULTS OF TESTS CONDUCTED ON A 15 PPM BILGE ALARM IN ACCORDANCE WITH THE GUIDELINES AND SPECIFICATIONS CONTAINED IN IMO RESOLUTION MEPC.107(49)

15 ppm Bilge Alarm submitted by:

TEi-Testing Services, LLC - Plumbing Laboratory

Test location:

TEi-Testing Services, LLC - Plumbing Laboratory

3455 South 500 West

Salt Lake City, UT 84115-4234

USA

Method of sample analysis:

ISO 9377-2-2000(E)

Samples analyzed by:

Director, Tei-Testing Services-Analytical Laboratory

Environmental testing of the electrical and electronic sections of the 15 ppm Bilge Alarm has been carried out in accordance with 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.

Calibration Test and Response Time Test

	"A"		"B"		"C"	
	Measured	Grab	Measured	Grab	Measured	Grab
0 ppm	0.0	< 0.5	0.0	< 0.5	0.0	< 0.5
15 ppm	14.3	14.1	15.0	14.8	14.9	15.2
Full Scale	30.0	29.3	27.0	27.2	30.0	30.3
Water Temperature	22.0°C		24.0°C		24.0°C	
Re-zero	No		No		No	
Recalibrate	No		No		No	
Response Time (seconds)	1.2		1.2		1.9	

Contamination and Color Test

	Oil Content Meter Reading
Clean Water and Test Fluid "B" at 10 ppm	10.0 ppm
Very Salt Water and Test Fluid "B" at 10 ppm	9.9 ppm
Iron Oxide at 10 ppm	10.6 ppm
Iron Oxide at 50 ppm	11.0 ppm
Iron Oxide at 100 ppm	11.0 ppm

Sample Pressure or Flow Test

15 ppm Bilge Alarm reading shift at 50% of normal	0 ppm
15 ppm Bilge Alarm reading shift at 200% of normal	0 ppm
Deviations:	No deviations to the test method were made.

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ALARM IN ACCORDANCE WITH THE GUIDELINES AND SPECIFICATIONS CONTAINED
IN IMO RESOLUTION MEPC.107(49)**

Shut Off Test

15 ppm Bilge Alarm reading before shut off	14.6 ppm
15 ppm Bilge Alarm reading after shut off	15.0 ppm
Damage to 15 ppm Bilge Alarm:	No damage was caused by this test to the 15 ppm Bilge Alarm.

Utilities Supply Variation Test

110% Voltage Effects	There was no change in the Bilge Alarm reading.
90% Voltage Effects	There was no change in the Bilge Alarm reading.
110% Air Pressure Effects	Not Applicable
90% Air Pressure Effects	Not Applicable
110% Hydraulic Pressure Effects	Not Applicable
90% Hydraulic Pressure Effects	Not Applicable

Calibration and Zero Drift Test

Calibration Drift	1.0 ppm
Zero Drift	0.0 ppm

Diagram of test rig attached.
Diagram of sampling arrangement attached.

*** END ***