

INTERMODAL MATERIÉL
AND
NAUTICAL/NUCLEAR ANALYSIS
IMANNA
LABORATORY INC.

CERTIFICATION TEST REPORT

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CERTIFICATION TEST REPORT
17763-1
IGNITION PROTECTION TESTS
OF
UNDERWATER LIGHTS
FOR
OCEAN LED USA

CUSTOMER:

Ocean LED USA LLC
2015 SW 20th Street, Suite 210
Fort Lauderdale
FL 33315

MANUFACTURER
OF TEST ARTICLE: Ocean LED

REPORT NO.: 17763-1

IMANNA JOB NO.: 17763

CUSTOMER P.O. NO.: Verbal

DATE: June 27, 2007

CONTRACT: N/A

PAGES IN REPORT: 13

STATE OF FLORIDA

ROBERT L. WHITE, being duly sworn, deposes and says: The information contained in this report is the result of complete and carefully conducted tests and is to the best of his knowledge true and correct in all respects.

Robert L. White

SUBSCRIBED and sworn to before me this 27th day of June, 2007

Marydel Kramer



Imanna shall have no liability for damages of any kind to person or property, including special or consequential damages resulting from Imanna's providing the service covered by the report.

IMANNA LABORATORY, Inc.

TEST BY

Alan Bell
PROJ. MANAGER

1. TEST ARTICLE

Representative samples of Ocean LED LLC Underwater Lights were received for test. The lights could be placed in a compartment where an explosive mixture of gasoline and air could exist.

The units tested are representative of a family/series of units, 12 - 24 volt versions, with identical electrical components, that bear different model numbers based on the voltage requirement, case and installation configuration, LED colors and number of LEDs, etc. The models/series lights, which fall within the electrical design characteristics of the unit tested and therefore are considered part of this test, are as follows.

2. PART NUMBERS

3000 Series Lights	2000 Series Lights	1000 Series Lights	500 Series
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3. REQUIREMENTS

The light is to be tested to the ignition protection requirements of the NMMA, the USCG, ISO 8846 and SAE J1171 to determine compliance of the item to the Ignition Protection requirements for electrical components as stated in the ISO Standard ISO 8846 as well as the Electrical System Standard, Title 33 CFR, Part 183, Subpart I, Section 183.410, SAE J1171 and the NMMA Certification Handbook.

4. PROCEDURE

The procedures used to accomplish the Ignition Protection tests are ISO 8846, SAE J1171, and the USCG recommended procedures entitled "USCG Electrical System Standard Test Procedure", dated January 1978. These procedures are acceptable to the European Community and the United States Coast Guard respectively for establishing conformance to the ignition protection requirements.

Upon receipt, the test specimen was inspected for damage and any obvious signs of noncompliance with the requirements of the ISO Standard, the SAE Standard and the USCG requirements.

The light was subjected to an Explosive Atmosphere Exposure Test, and a High Temperature Operation Test per the ISO 8846, the USCG and SAE J1171 requirements. Because the light is designed to operate while in the water under a boat the High Temperature Test was conducted with the light sitting in a water bath. The light with the greatest number of LEDs

was subjected to all of the tests as the “worse case” example of the lights. Additional High Temperature tests were conducted on a cross section of samples.

5. RESULTS

The results of the test performed indicate that the received light meets the Ignition Protection Test requirements of ISO 8846, the USCG, stated in Title 33 CFR 183.410 and the SAE J1171 Standard.

The tested light sample was cycled on-off-on 50 times while in an explosive atmosphere without igniting the atmosphere and at no time during the High Temperature Test was a temperature in excess of the limits of the standards detected on any exterior surface of the light.

6. OBSERVATIONS AND COMMENTS

The results presented herein apply only to the test specimens as prepared and as tested. All equipment used in the performance of these tests was calibrated to standards traceable to the N.I.S.T.

Received / Representative Light Samples



3010 FM



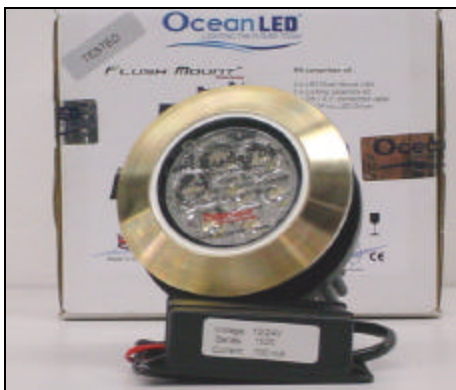
3010 TH



2010 FM



2010 TH



1520 FM



1520 TH



1010 TH



X520

INSTRUMENTATION EQUIPMENT SHEET

Date: June 26, 2007 **Job No.:** 17763 **Customer:** Ocean LED USA LLC
Technician: Connell **Test Area:** Explosion Test Cell
Test Item Description: underwater light

INSTRUMENT	MFG	MODEL	RANGE	ACCURACY	CAL DATE	CAL DUE
Hydrocarbon Analyzer	Summit Industries	703D2	0 to 10% Propane In Air	±0.1%	Each Use	Each Use
Temperature Indicator / Controller	Omega Eng'ring	i-Series	Multi	±0.03%	10-10-06	10-10-07
Digital Multimeter	Fluke	12 S/N: 81240025	Multi	±0.2%	1-20-07	1-20-08

Instrumentation Information Verified by: *Alan Bell*

APPENDIX

SUPPORTING DATA

DATA FORM NO. 1

TEST PROCEDURE USCG and ISO and SAE

RECEIVING INSPECTION(Page 2 of 3)

12. Name of Component and/or System:

No. 1 : underwater lights

No. 2 : _____

No. 3 : _____

No. 4 : _____

No. 5 : _____

13. Explanations of Additional Data:

NONE

14. Receiving Inspection Results:

Appears sound and ready to test.

15. Nonconformance Items Noted But Not Tested by this Procedure:

NONE

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DATA FORM NO.1
TEST PROCEDURE USCG and ISO and SAE
RECEIVING INSPECTION(Page 3 of 3)

Component or System : underwater lights

12(a). Manufacturer: Ocean LED

12(b). Date of Manufacture: Unknown

12(c). Part No.: 3010 FM

12(d). Serial No.: N/A

12(e). Capacity or Rating: 12-24 VDC

12(f). Shipping or Transport damage: NONE

12(g). Quality of Workmanship: GOOD

12(h). Conformity to Manufacturer's Documentation: Unknown

12(i). Dents, Cracks, or Abrasions: NONE

12(j). Loose or Missing Screws, Clamps, Nuts, etc.: NONE

12(k). Other Defects: NONE

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DATA FORM NO. 3
TEST PROCEDURE USCG and ISO and SAE
TEST DATA

PART A

1. Test Article I.D. No.: 17763-1
2. Is Component certified as ignition proof by an independent testing laboratory? NO

Requirement: A component certified by an approved testing lab as having passed an accepted industry test may be considered as having met the requirements of this procedure.

3. Is component obviously unacceptable? NO

Requirement: Components obviously unacceptable shall be rejected with no test.

PART I - HIGH TEMPERATURE OPERATING TEST

4. Component Specifications:

Voltage:	<u>12 VDC</u>
Amperage:	<u>not specified</u>
RPM:	<u>N/A</u>
Duty Factor:	<u>continuous</u>
Other:	<u>12 VDC nominal system voltage</u>

Requirement: Component shall be operated for this test at its normal rated condition.

5. Ambient Temperature during test: 60°C

Requirement: Ambient temperature surrounding the test specimen shall be 60°C throughout the test period.

6. Highest temperature indicated on any surface: 93°C*

Requirement: If the highest component surface temperature exceeds 200°C, the component shall be required to undergo additional testing.

7. Percentage of Propane in Air surrounding component: 4.8%

Requirement: 4.75% +/- 0.5%

DATA FORM NO. 3
TEST PROCEDURE USCG and ISO and SAE
TEST DATA

8. Are all readings within acceptable limits? YES
9. Did the explosive atmosphere ignite during component operation? NO
10. Was the mixture verified to be explosive? YES
11. Is the component acceptable according to the requirements of PART I? YES * highest temperature recorded on sample with greatest number of LEDs

PART II - WATER SUBMERGENCE TEST

12. What is the depth of the component beneath the surface of the water? N/A
Requirement: 14" minimum
13. What is the temperature of the water at the start of the test period? N/A
Requirement: 50°C +/- 2°C
14. Are bubbles observed coming from component? N/A
15. If component was disassembled after submergence, was water found inside component? N/A
16. Is the component acceptable according to PART II? not conducted under this effort

PART III - INDUCED IGNITION TEST

17. Test specimen I.D. No.: 17763-1
18. Percent of Propane in air: N/A
Requirement: 4.75% +/- 0.5%
19. Did explosive atmosphere surrounding component ignite during any of the internal atmosphere explosions? N/A
20. Is component acceptable according to PART III? N/A
21. Remarks:
lights contain no spark producing components

PART IV - EXPLOSIVE ATMOSPHERE EXPOSURE TEST

22. Test Specimen ID Number: _____ 17763-1 _____

23. Component Specifications:

Voltage: _____ 12 VDC _____
Amperage: _____ not specified _____
RPM: _____ N/A _____
Duty Factor: _____ continuous _____
Other: _____ 12-24 VDC nominal system voltage _____

Requirement: Component shall be operated for this test at its normal rated conditions and duty cycle.

24. Ambient Temperature during test: _____ 60°C _____

Requirement: Ambient temperature surrounding the test specimen shall be 60°C throughout the test period.

25. Percentage of Propane in Air surrounding component: _____ 4.8% _____

Requirement: 4.75% +/- 0.5%

26. Did the Explosive atmosphere ignite during 50 component cycles of operation? _____ NO _____

Requirement: The explosive atmosphere surrounding the component shall not ignite when the component is cycled 50 times.

27. Was the atmosphere verified to be explosive? _____ YES _____

28. Is the component acceptable according to the requirements of Part IV? _____ YES _____

29. Remarks: _____

