



CERTIFICATION TEST REPORT

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CERTIFICATION TEST REPORT
21-21909-1
UL 1104 NAVIGATION LIGHT TESTING
ON
75 SERIES LIGHTS
FOR
GLAMOX AQUA SIGNAL CORPORATION

CUSTOMER:

Glamox Aqua Signal Corporation
22370 Merchants Way Suite 170
Katy, Texas 77449

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AT-2826

Testing conducted in accordance with ISO 17025.

MANUFACTURER OF TEST ARTICLE: Glamox Aqua Signal Corporation

REPORT NO.: 21-21909-1

IMANNA JOB NO.: 21-21909

REPORT DATE: February 4, 2022

CUSTOMER P.O. NO.: 2013920

ACTIVITY DATE: 11/19/2021-2/4/2022

CONTRACT: None

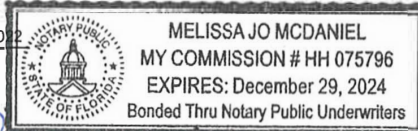
TECHNICIAN: J. Costa, M. White

PAGES IN REPORT: 15

STATE OF FLORIDA

ROBERT L. WHITE, who physically appeared, 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.

SUBSCRIBED and sworn to before me this 4th day of February, 2022



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

Robert L. White

PROJ. MANAGER

1. TEST ARTICLE

Two representative sample of a 6NM masthead light was received from Glamox for testing. The lights are part of the 75 series of lights which use the same LEDs and cut-off housing as the previously tested 61S series. The light is designed to be mounted above the sheer line.

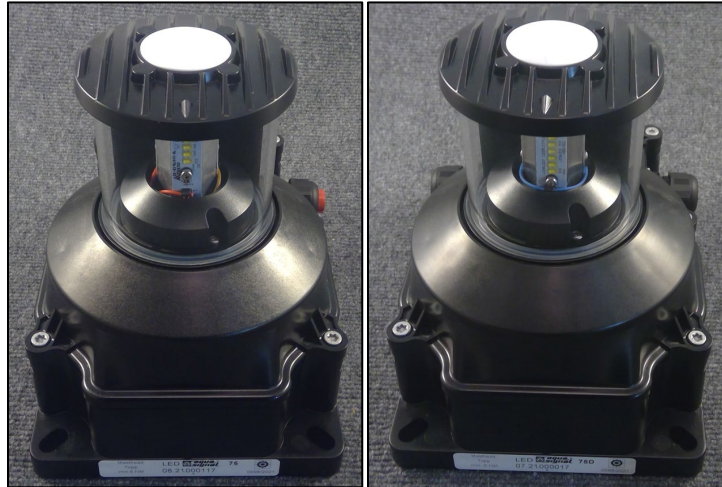


Figure 1: View of Test Article

2. PART NUMBER

3681005000, 3676006000

3. REQUIREMENTS

The requirements for this effort are to test the light in accordance with the USCG COLREG 1972 (IMO) standards and verify conformance with the navigation light regulations of UL 1104. The results are to then be compared to the results of the 61S series equivalent to determine similarity of design for family certification.

4. PROCEDURES

The procedure used in performing this test details the requirements and procedures specified in IMANNA Procedure "P-LIT-Navigation Light Procedure", Revision 1.2, dated June 16, 2020, with alterations to include the UL 1104 preconditioning. The procedure contains the detailed steps necessary to determine the compliance of the test specimen to the UL 1104 and COLREG requirements.

5. TESTING SEQUENCE

- Receiving Inspection
- Functional Operation
- Vibration Test

- Cold Shock Test
- Luminous Intensity and Cut-Off Verification
- Chromaticity Test

6. RESULTS

The results of the tests performed are presented below by their order within the test sequence. These results reflect the data collected from the light in the as received configuration from the manufacturer.

6.1 PRETEST INSPECTION

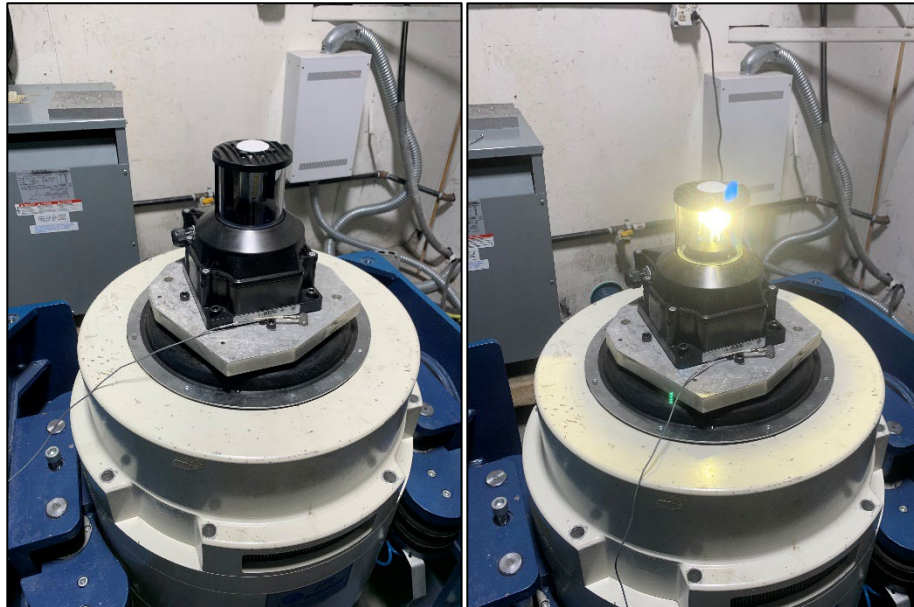
Two 75 series light samples were received for test. The lights appeared to in good condition and ready for testing.

6.2 FUNCTIONAL OPERATION

The lights were mounted on a panel simulating a boat deck surface then operated and tested using 115 VAC.

6.3 VIBRATION TEST

The light was bolted to a vibration table and subjected to 2 hour vibrations in the X, Y, and Z directions at a peak-to-peak amplitude of 0.015 ± 0.001 inches at a uniform rate of 10 to 60 to 10 Hz every 4 minutes. During the test, the light was operational and showed no signs of deterioration as a result of the vibrations.



Figures 2-3: Light during Vibration Testing

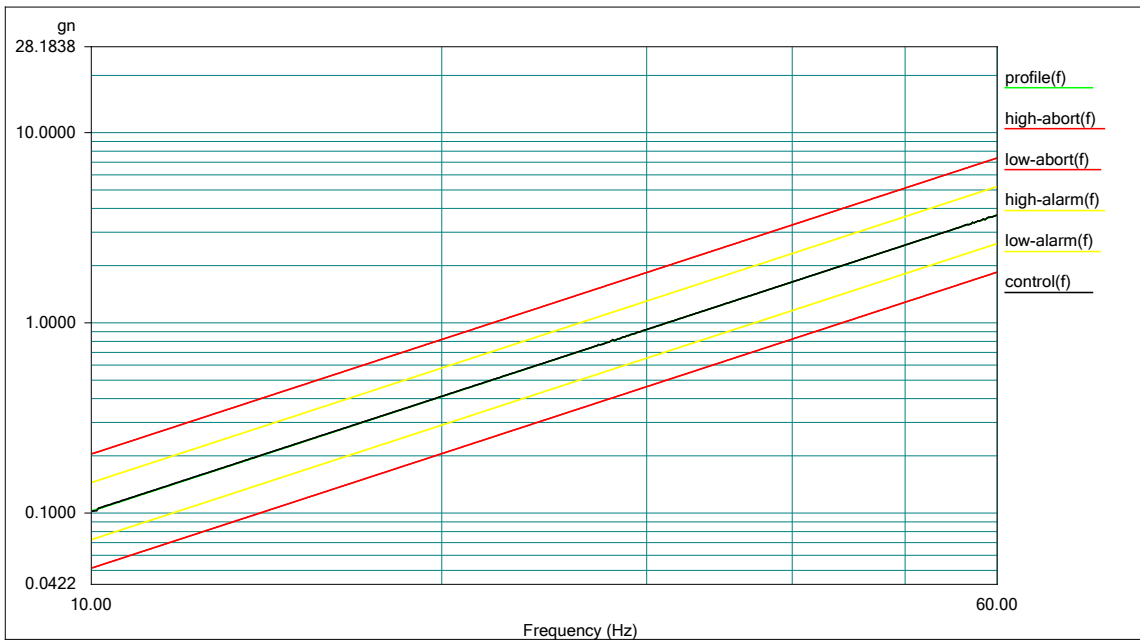


Figure 4: X-Axis Vibration Profile

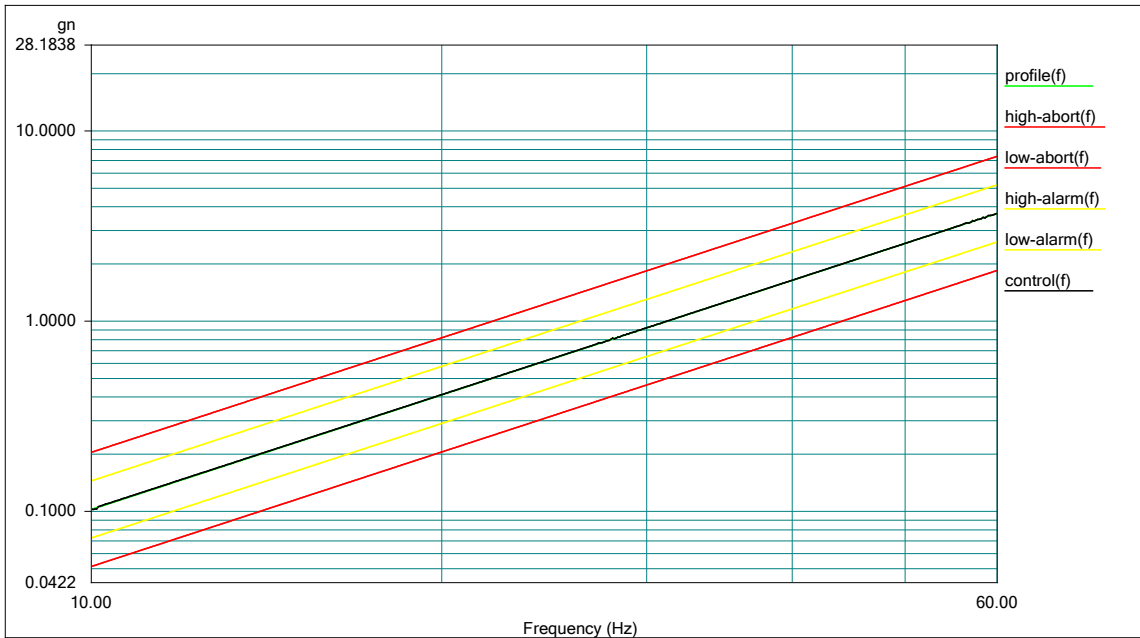


Figure 5: Y-Axis Vibration Profile

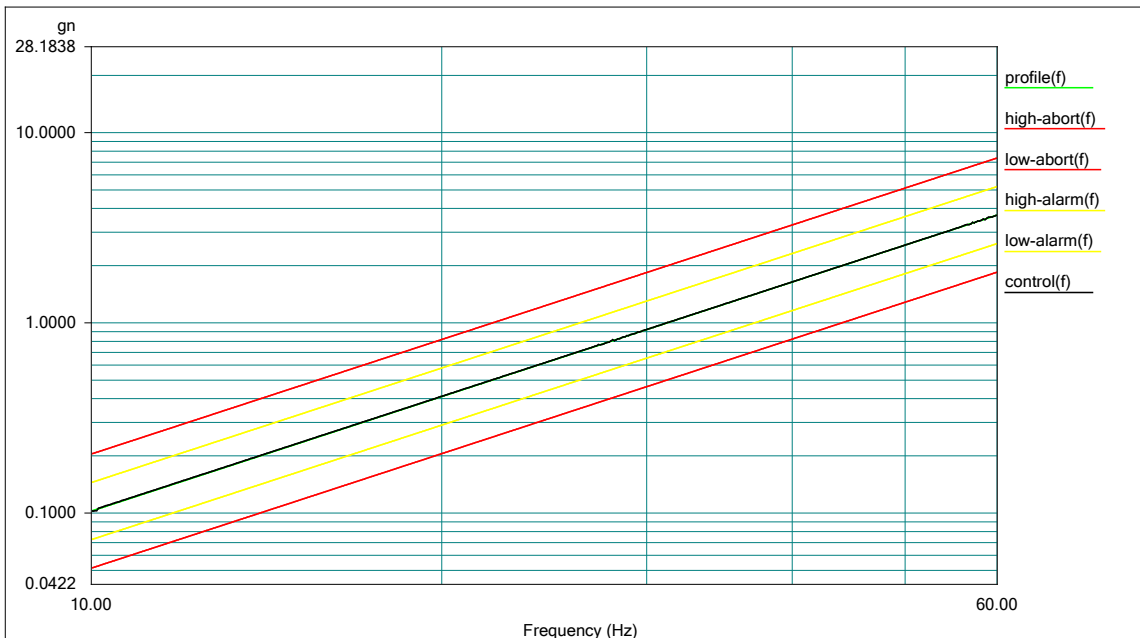
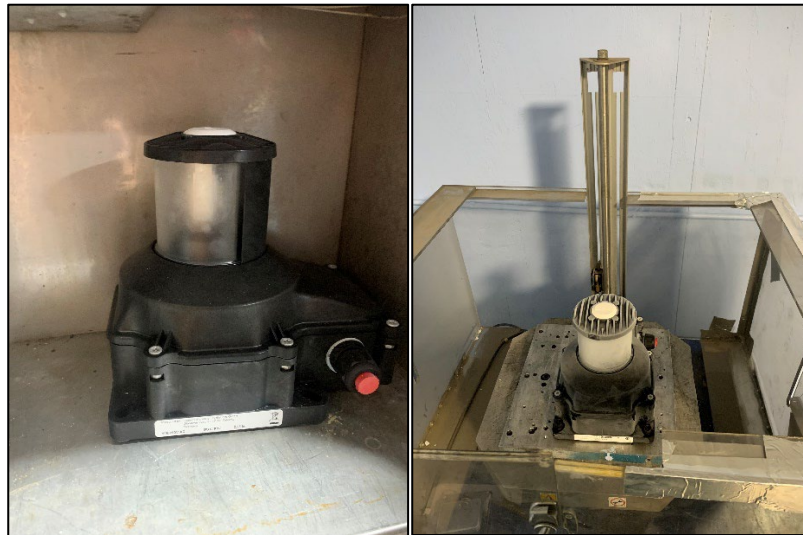


Figure 6: Z-Axis Vibration Profile

6.4 COLD SHOCK TEST

Following the vibration testing, the light was stored in a temperature chamber at -30°C for 72 hours, then immediately removed, mounted on the vibration table, and subjected to 25 shock impacts of 10 g (98m/s²) with each impacting lasting 20 milliseconds. The light operated as intended following the 25 shock impacts and showed no signs of cracking or damage.



Figures 7-8: Light in Cold Chamber Prior to Cold Shock and Light on Shock Test Machine

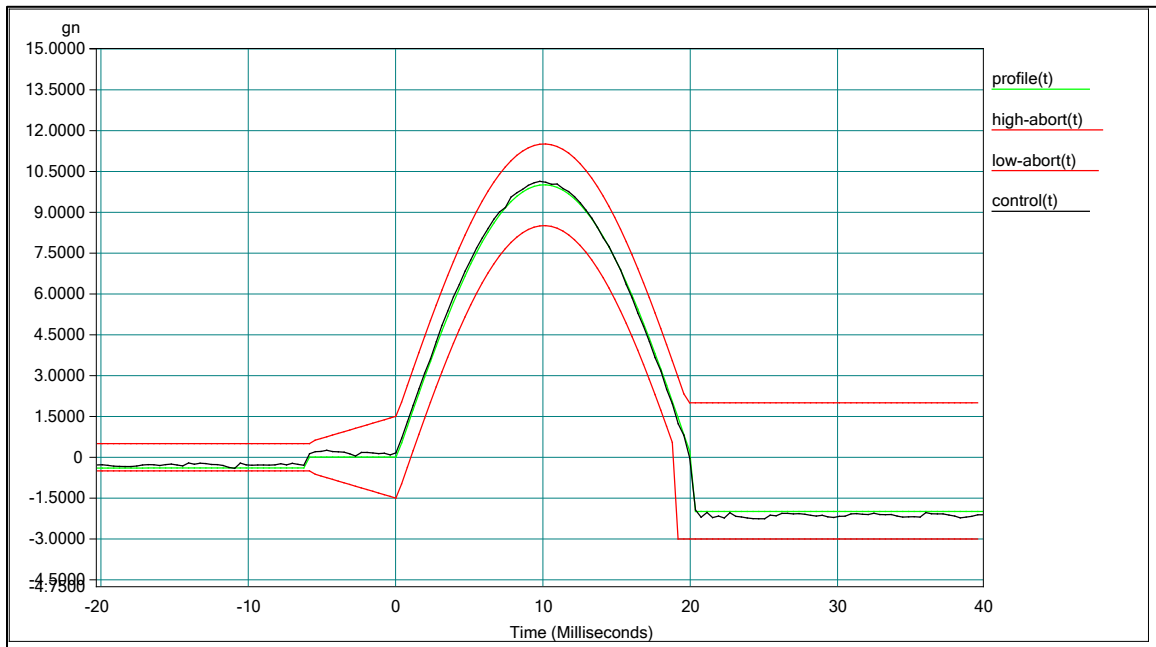


Figure 8: Shock Test Profile

6.5 CHROMATICITY TEST

The chromaticity of the light emissions from the light lens was measured and found to be within the “White” range as specified by the standard. The chromaticity chart is included in the appendix.

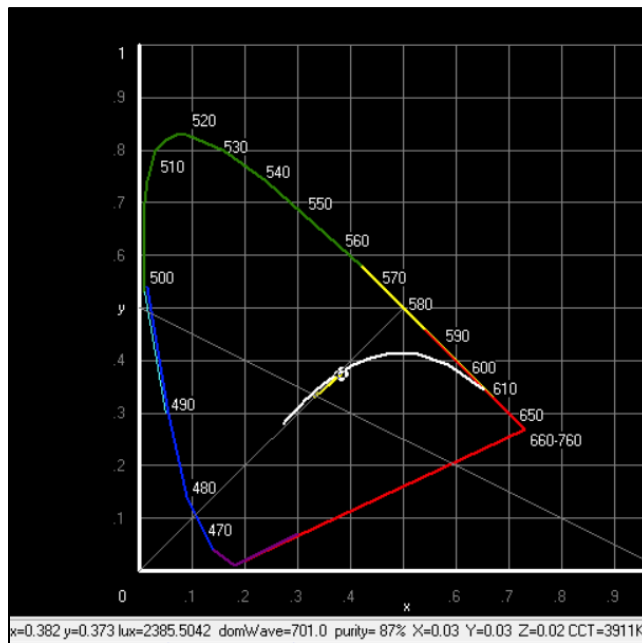


Figure 9: CIE Color Chart Measurement of Light

6.6 LUMINOUS INTENSITY TESTS

The luminous intensity of the light was measured to be above the 6-mile limit of 94 candela in the critical areas.

6.7 CUT-OFF ANGLE VERIFICATION

The light intensity that was measured was graphed and included in the appendix. The graph also includes the minimum required cut-off angle of 94 candela.

The data measured from the light sample shows that the light emits sufficient light in the required zones and prevents light from entering the “keep out” zones according to the USCG requirements outlined in the COLREGS. This indicates that the light meets the photometric requirements of the standard under the USCG and UL requirements.

7.0 RESULTS

The data from these tests show that the S75 and S75D navigation lights meet the Vibration, Thermal Shock and Photometric requirements of UL 1104, UL Standard for Safety for Marine Navigation Lights.

Based on similarity of design and engineering commonality the S75 and S75D series of navigation lights can be incorporated under the IMANNA test reports 19-21346-XX.

8.0 COMMENTS AND OBSERVATIONS

The results presented herein apply only to the test specimen 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 and/or verified at the time of the test using internationally recognized methods to validate the accuracy and repeatability of the values recorded or collected during the tests. Equipment details are available upon request.

APPENDIX SUPPORTING DATA

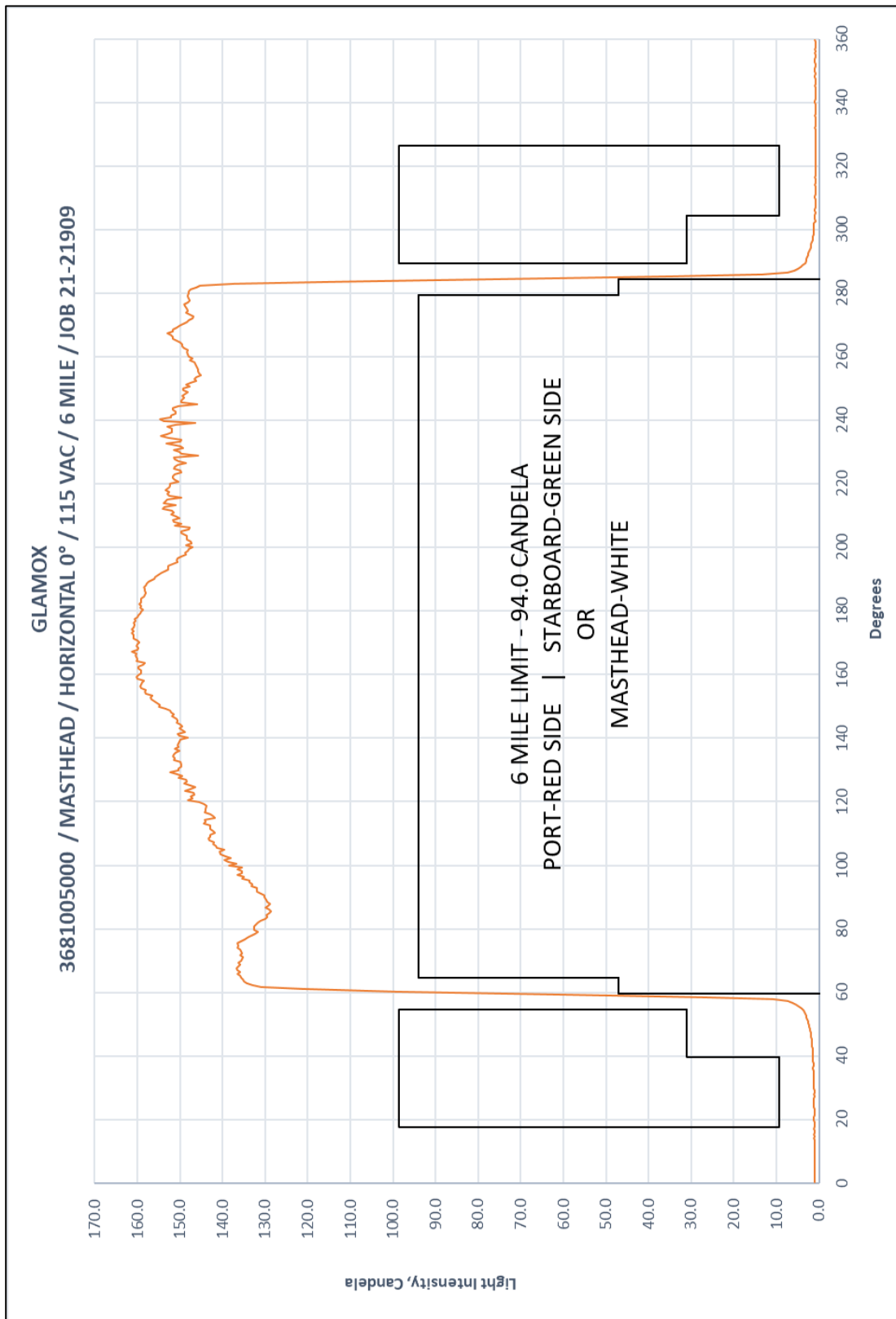


Figure 10: Horizontal Cut-Off 0°

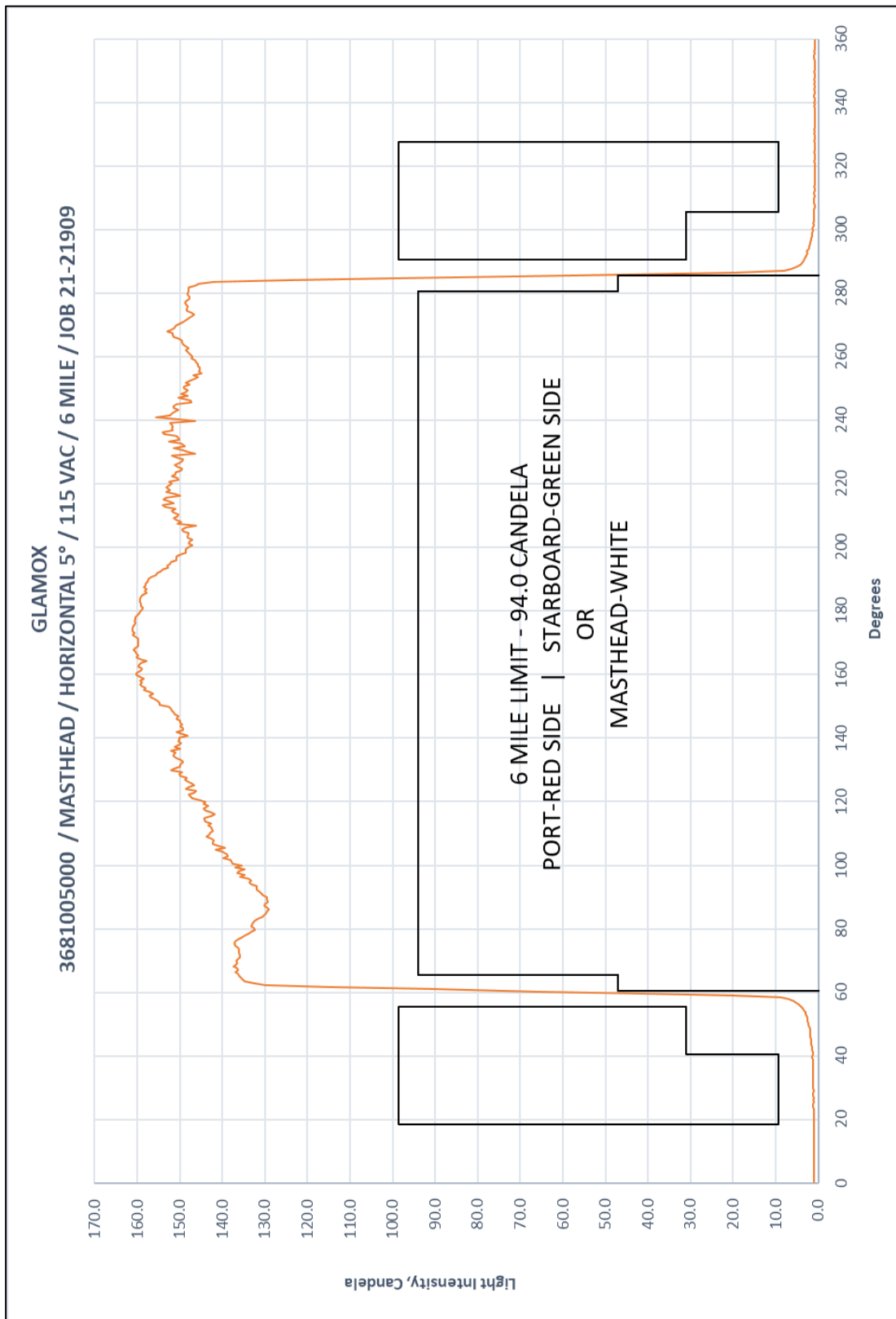


Figure 11: Horizontal Cut-Off 5°

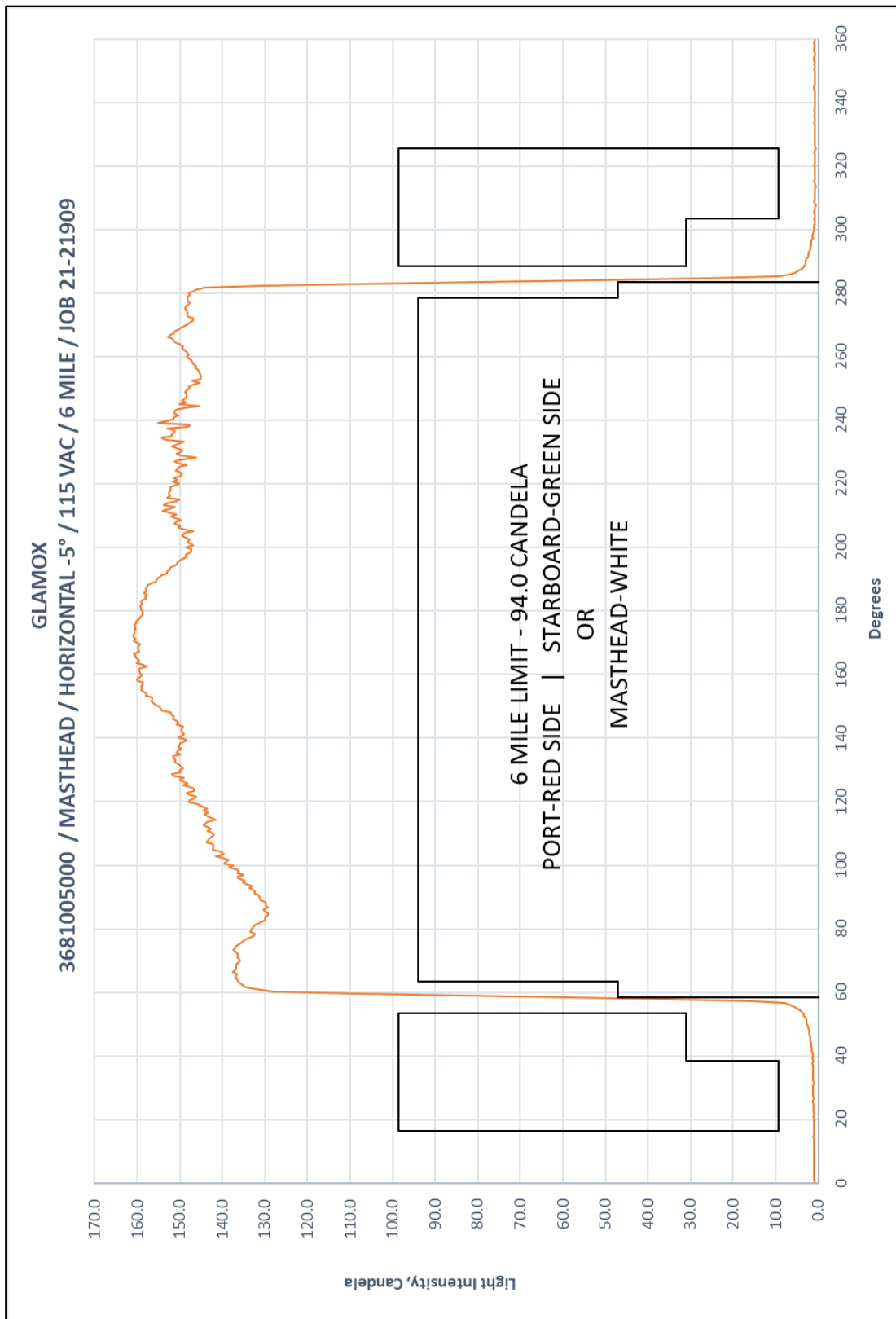


Figure 12: Horizontal Cut-Off -5°

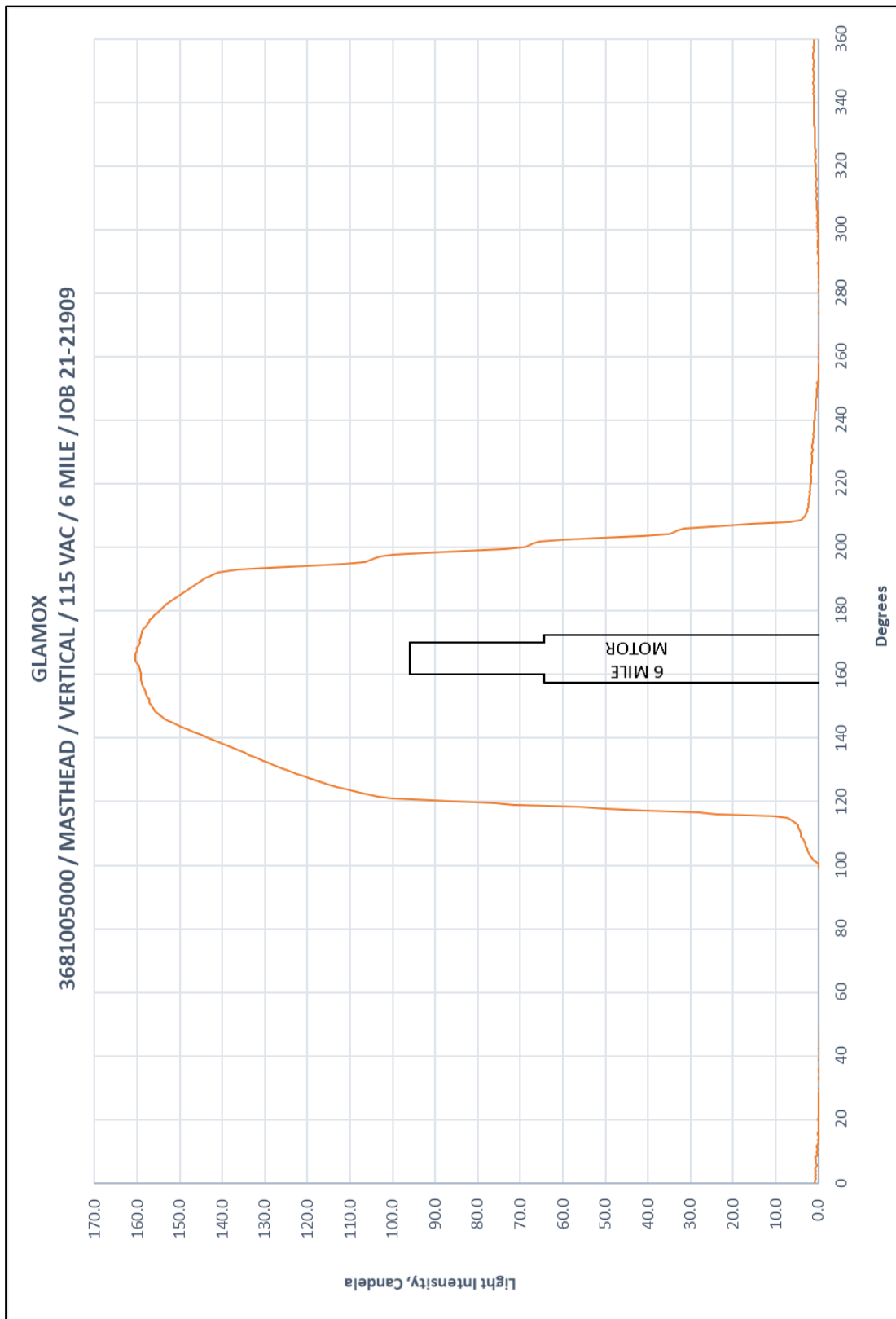


Figure 13: Vertical Cut-Off

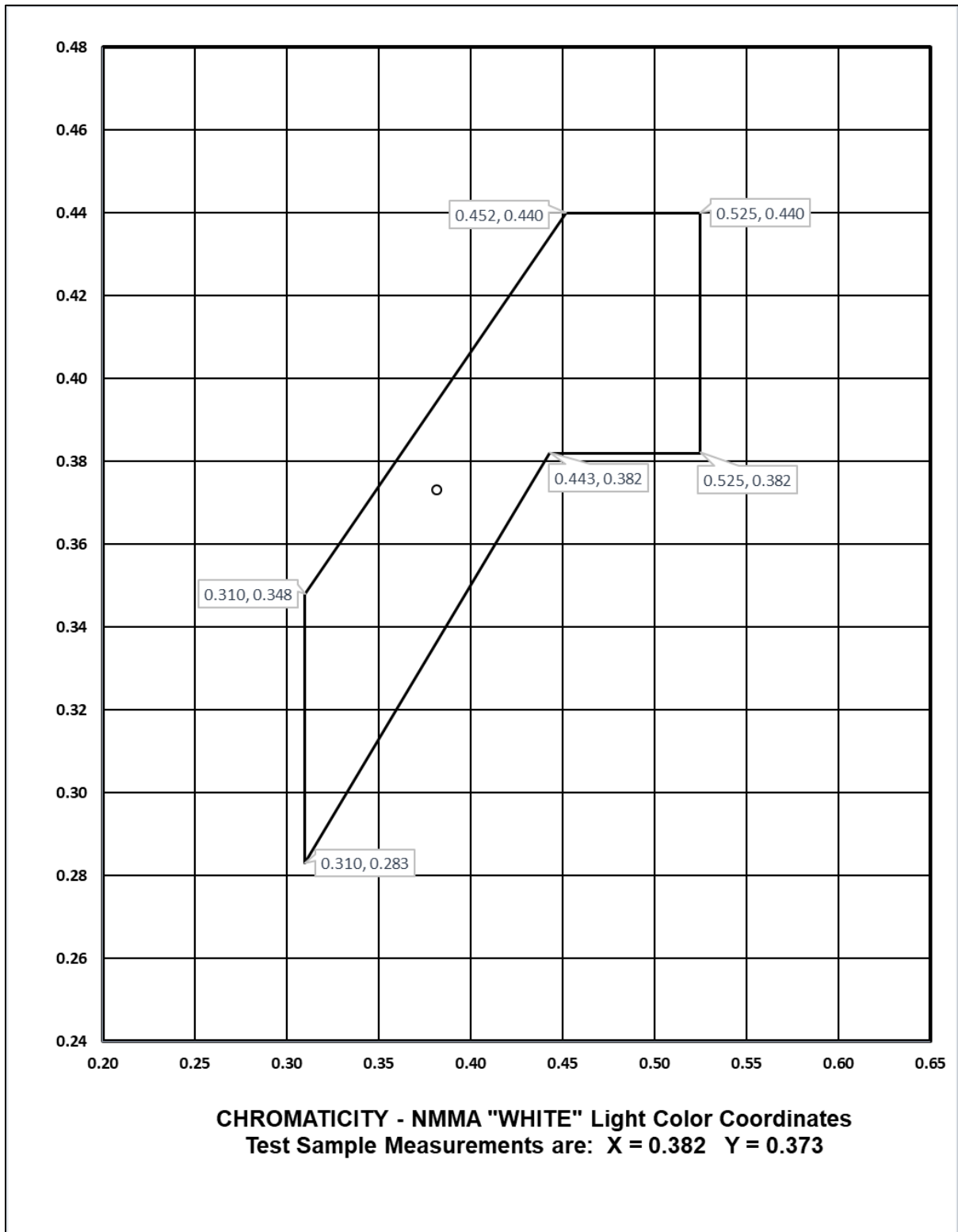


Figure 14: Chromaticity Plot / White / Masthead

1. Date			
11/19/2021			
2. Test Article I.D. Number(s)			
21-21909-1, 21-21909-2			
3. Description of Test Article			
			
4. Receiving Condition			
No damage, appear sound and ready for testing			
5. Model Number(s)			
S75, S75D			
6. Serial Number			
None			
7. Capacity or Rating			
115 VAC			
8. Received By			
Name	Juan Costa	Date/Time	11/19/2021

IMANNA Receiving Inspection



PROJECT INSTRUMENT LOG

Project: 21-21909

Gage ID	Description	Manufacturer	Model	Range	Accuracy	Measurement Uncertainty	Last Cal Next Cal
ILI-00001	Temperature Data Logger	Omega	RDXL6SD-USB	-200 to 1768°C	0.1° below 1000°C or °F, 1° above 1000°C or °F	0.2° C	10/19/21 10/19/22
ILI-00023	System Controller - Vibration	Dactron	LAS 200			Multiple	11/20/20 11/20/22
ILI-00040	Flexoptometer	UDTi	S480			Multiple	3/17/21 3/17/23
ILI-00041	Sensor - Illuminance	UDTi	3211	1 x 10 ⁻² to 5 x 105 lux		Multiple	3/17/21 3/17/23
ILI-00042	Spectrometer	StellarNet	BLACK-Comet CXR-SR-50	220-1100 nm		Multiple	9/9/21 9/9/22
ILI-00103	Measuring Tape	Starrett	KTX1-26ME	26 ft	1/16"	0.062 in	3/12/20 3/12/22
ILI-00171	Environmental Chamber - Temperature	Tenney	Tenney Jr	-75°C to +200°C			
ILI-00184	Accelerometer	Bruel & Kjaer	42A14			Multiple	10/1/20 10/1/22
ILI-00185	Thermocouple Probe - K	Omega	Omega Type K Thermocouple	-200° to 1250°C (- 328° to 2282°F)		± 0.01°C	12/9/21 12/9/22
ILI-00204	Thermocouple Wire - K	Omega	Omega Type K Thermocouple Wire			± 0.01°C	12/9/21 12/9/22

Note: Unless expressly requested by customer, simple acceptance will be utilized as the decision rule where measurement uncertainty is not factored in to the compliance statement. Calibration certificates are available upon request for calibrated equipment.