

INTERMODAL MATERIÉL
AND
NAUTICAL/NUCLEAR ANALYSIS
IMANNA
LABORATORY INC.

CERTIFICATION TEST REPORT

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CERTIFICATION TEST REPORT
21-21871-11
NAVIGATION LIGHT TESTING
ON
M/N: 72116B WHITE STERN LIGHT
FOR
SHIN YUH CHERNG IND. CO., LTD

CUSTOMER:

Shin Yuh Cherng
No. 13, Gongye 5th Rd.
AnNan Dist. Tainan, 709
Taiwan

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Testing conducted in accordance with ISO 17025.

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|--|---------------------------------|
| MANUFACTURER OF TEST ARTICLE: SHIN YUH CHERNG IND. CO., LTD | REPORT NO.: 21-21871-11 |
| REPORT DATE: October 1, 2021 | IMANNA JOB NO.: 21-21871 |
| ACTIVITY DATE: 09/09/2021-10/01/2021 | CUSTOMER P.O. NO.: Email |
| TECHNICIAN: J. Costa | CONTRACT: N/A |
| | PAGES IN REPORT: 11 |

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.

Robert L. White

SUBSCRIBED and sworn to before me this 1st day of October, 2021

COREY HARRIS
MY COMMISSION # HH 057866
EXPIRES: November 6, 2024
Bonded Thru Notary Public Underwriters

Corey Harris

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 samples of a 2NM White Stern Light were received from Shin Yuh Cherng for testing. The light is designed to be mounted above the sheer line.



Figure 1: View of Test Article

2. PART NUMBER

72116B, 72116W

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 ABYC A-16:2016.

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, without additions or deletions. The procedure contains the detailed steps necessary to determine the compliance of the test specimen to the ABYC A-16:2016 and COLREG requirements.

5. TESTING SEQUENCE

- Receiving Inspection
- Functional Operation
- Chromaticity Test
- Luminous Intensity Tests
- Cut-off Angle Verification
- Weathertightness 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 light samples were received for test. The lights appeared to in good condition and ready for testing. Testing will be conducted on the black model. By similarity of design and engineering commonality, the navigation light certification test efforts performed on the 72116B will incorporate the 72116W.

6.2 FUNCTIONAL OPERATION

The light was mounted on a panel simulating a boat deck surface then operated and tested using a DC electrical power supply set at 12.84 VDC.

6.3 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.

6.4 LUMINOUS INTENSITY TESTS

The luminous intensity of the light was measured to be above the 2-mile limit of 4.3 candela in the critical areas.

6.5 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 4.3 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 ABYC requirements.

6.6 WEATHERTIGHTNESS TEST

Since the light will be installed above the sheer line, it was subjected to the Weathertightness Test. This test consisted of a continuous water spray using nozzles over the entire top and all exposed sides of the structure for 15 minutes at a rate of at

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least two inches (50mm) per hour, at an operating pressure of five psi (0.352 kilograms per square centimeter).

No water intrusion was present after the 15-minute duration and indicates the light meets the requirements of the weathertightness test.

7.0 RESULTS

The data from these tests show that the sample meets the functional requirements of the standards listed above for sail and power-driven vessels under 12 meters in length.

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.

The data from these tests show that the sample meets the functional requirements of the standards listed above for sail and power-driven vessels under 12 meters in length.

In order to be fully certified the light must also meet the label information requirements set forth by the USCG in 33 CFR 183.810 that state in part that a light must:

- (1) Bear a permanent and indelible label that is visible without removing or disassembling the light and states the following:
 - (i) "USCG Approval 33 CFR 183.810."
 - (ii) "Meets ABYC A-16."
 - (iii) "Tested by Imanna Lab., Inc." if tested by Imanna or other appropriate lab if not
 - (iv) Name of manufacturer.
 - (v) Number of model.
 - (vi) Visibility of the light in nautical miles.
 - (vii) Date on which the light was type-tested.
 - (viii) Identification and specifications of the bulb used in the compliance test.

If a light is too small to attach the required label –

- (1) Place the information from the label in or on the package that contains the light: and
- (2) Mark the light "USCG" followed by the certified range of visibility in nautical miles. Once installed, this mark must be visible without removing the light.

APPENDIX SUPPORTING DATA

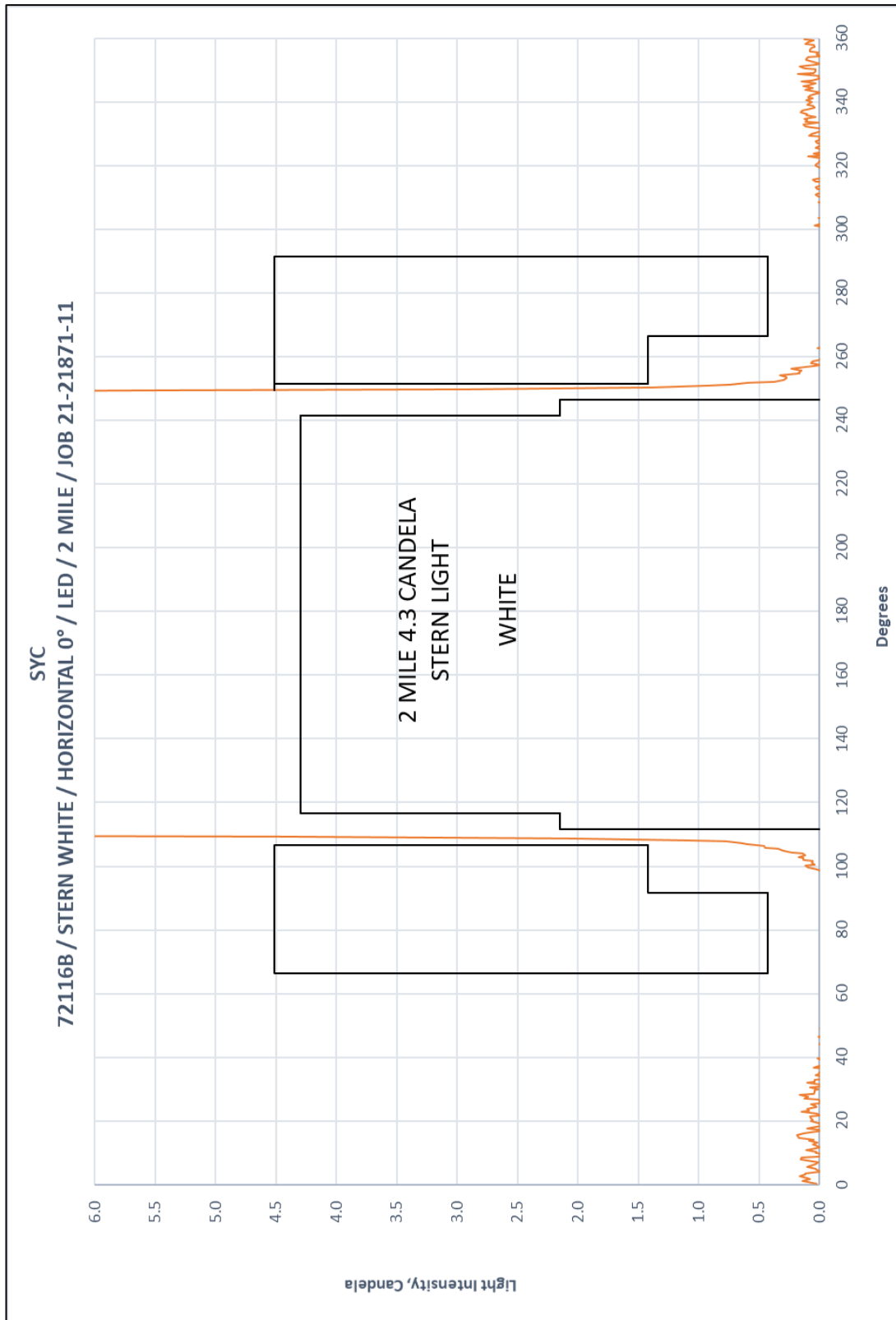


Figure 2: Horizontal Cut-Off 0°

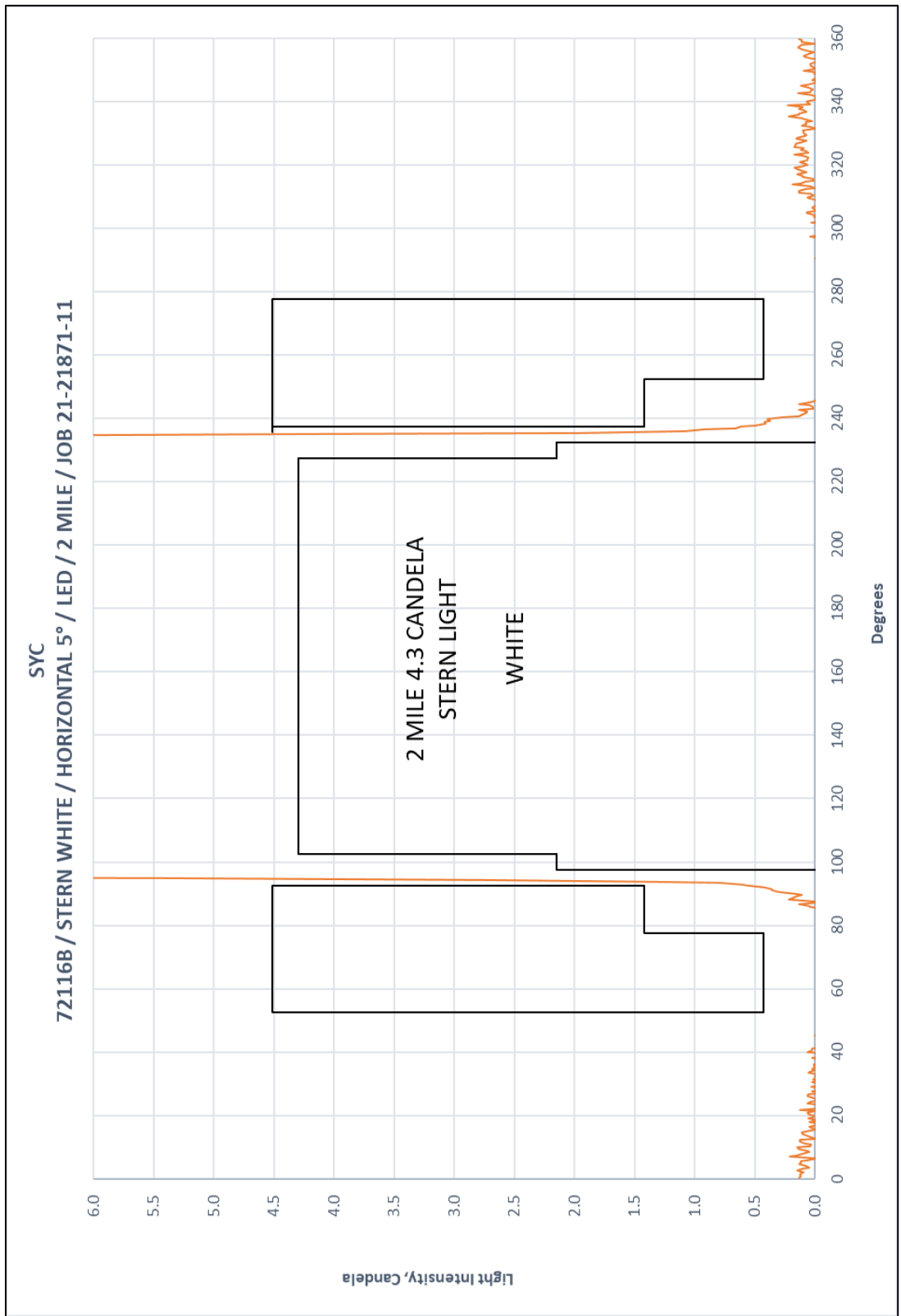


Figure 3: Horizontal Cut-Off 5°

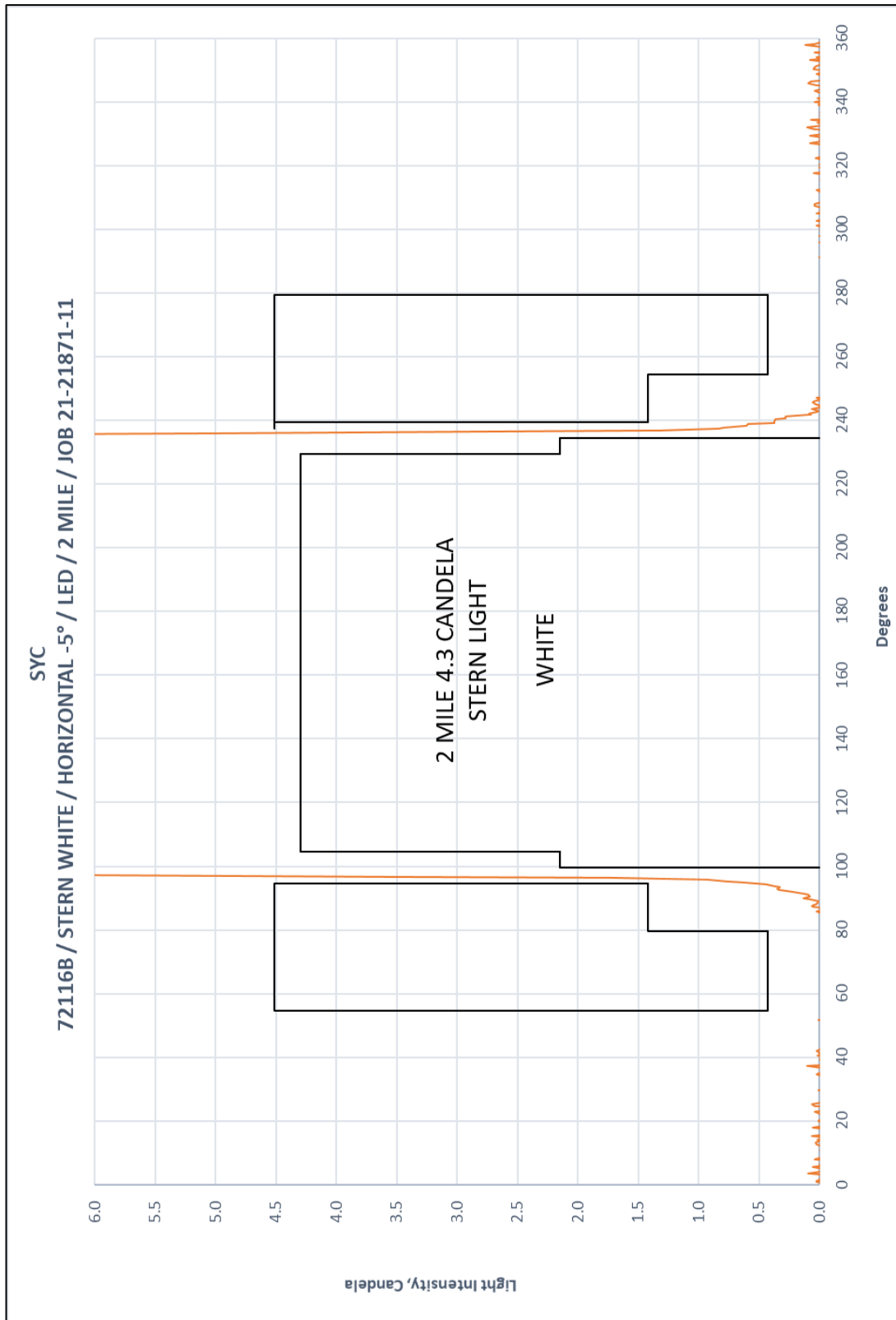


Figure 4: Horizontal Cut-Off -5°

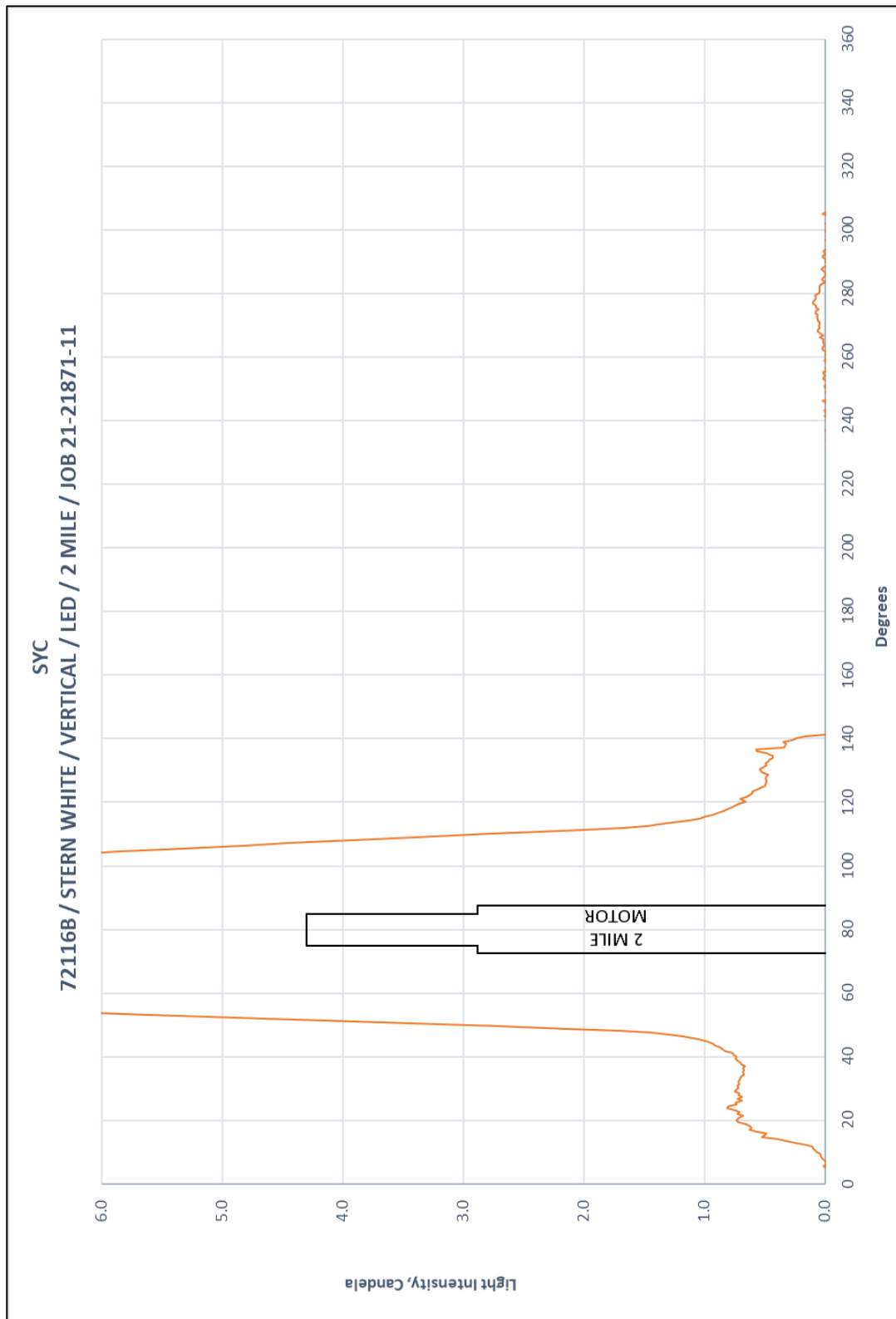


Figure 3: Vertical Cut-Off

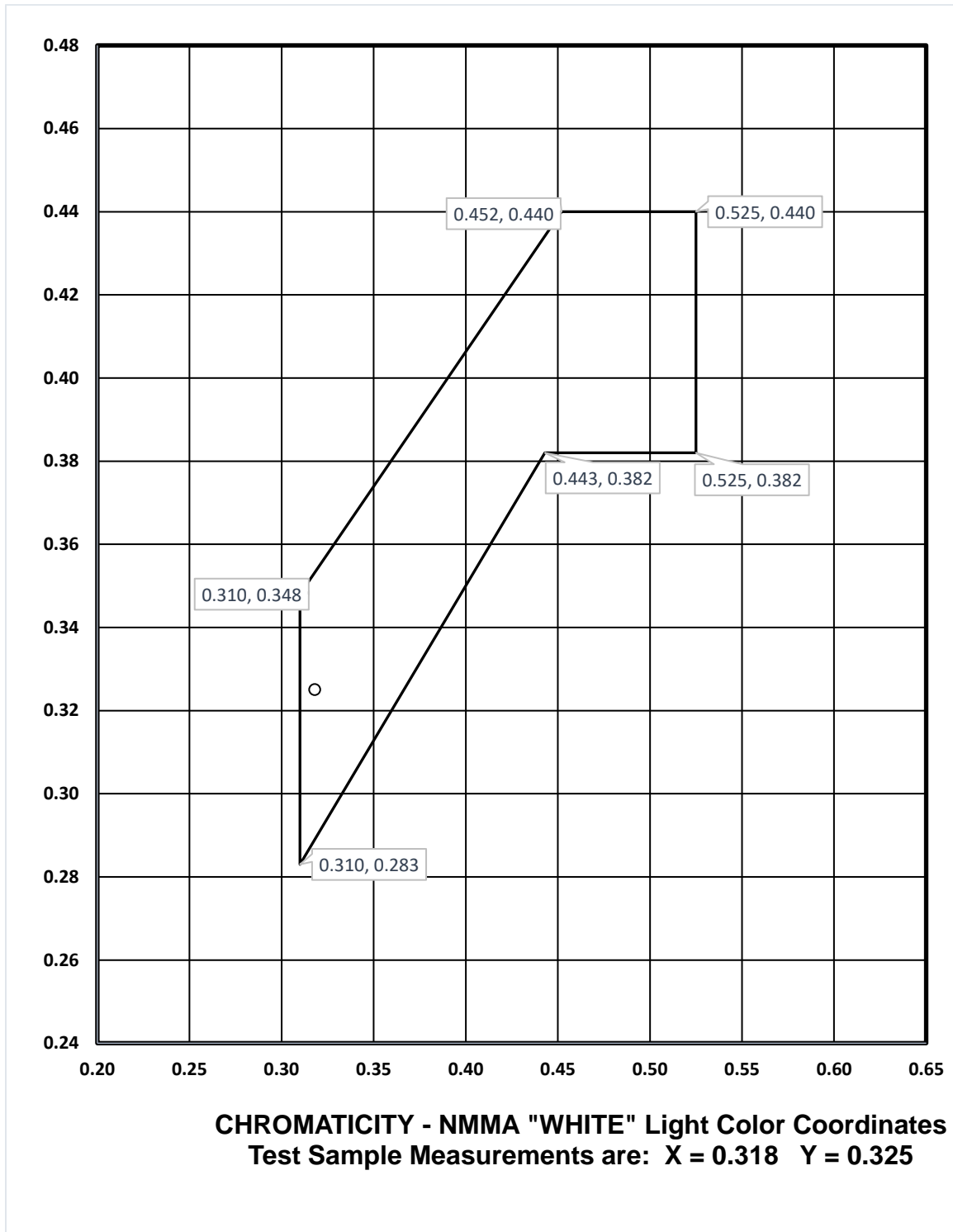


Figure 4: Chromaticity Plot / White / Stern Light

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|--|
| 1. Date |
| 9/9/2021 |
| 2. Test Article I.D. Number(s) |
| 21-21871-11 (Only black tested) |
| 3. Description of Test Article |
|  |
| 4. Receiving Condition |
| No Damage |
| 5. Model Number(s) |
| 72116B, 72116W |
| 6. Serial Number |
| |
| 7. Capacity or Rating |
| 12V, White Stern Light |
| 8. Notes |
| Received by Juan Costa |

IMANNA Receiving Inspection