# ILLUMADYNE, INC

# TEST REPORT

**SCOPE OF WORK**
LED Performance Testing

**MODEL NUMBER**
4CB-HE-44-W-3500-[OPTIONS]

**PROJECT NUMBER**
G104427113

**REPORT NUMBER**
104427113CRT-003

**ISSUE DATE**
8/26/2020

**REVISED DATE**
None

**TEST DATES**
August 25, 2020 through August 26, 2020

**DOCUMENT CONTROL NUMBER**
RTTDS-R-AMER-Test-3407


**PAGES**
8

**REPORT NUMBER**
104427113CRT-003

**MODEL NUMBER(s)**
4CB-HE-44-W-3500-[OPTIONS]

**REPORT RENDERED TO:**
ILLUMADYNE, INC
3840 HOPKINS STREET
PENSACOLA, FL 32505

## STATEMENT OF LIMITATION

NVLAP Lab Code 100402-0. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government.

## AUTHORIZATION

The testing performed was authorized by signed quote number Qu-01101681-0.

## TEST STANDARDS

IESNA LM-79 - 2008: Electrical and Photometric Measurements of Solid State Lighting

| In Charge of Testing: | Reviewer: |
|---|---|
| Melanie Brittain | Jeff Davis |
| Senior Associate Engineer | Technical Lead |
| Lighting Division | Lighting Division |

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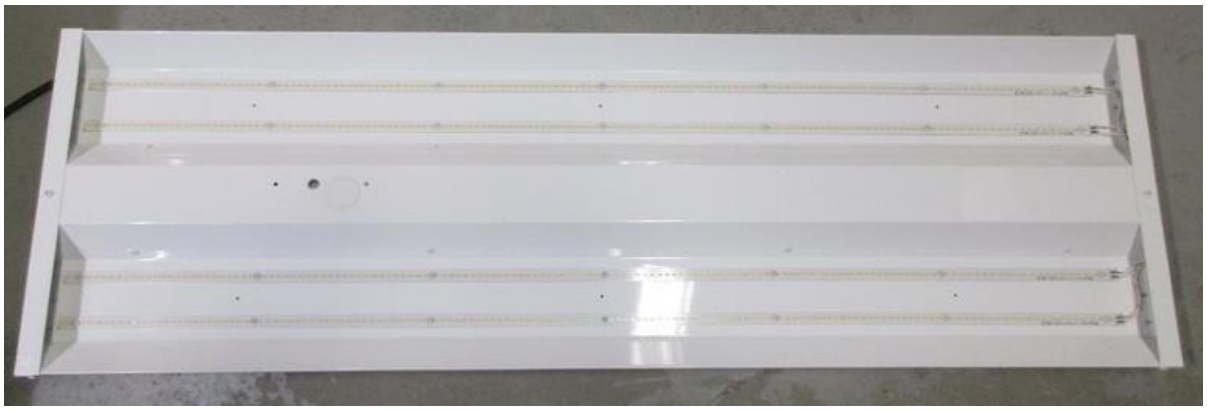
**SAMPLE INFORMATION** **REPORT NO. 104427113CRT-003**

ITEMS RECEIVED

| Item No. | Control No. | Model No. | Description | Type | Received |
|---|---|---|---|---|---|
| 1 | CRT2008241426-001A | 4CB-HE-44-W-3500-[OPTIONS] | High Bay | Production | 8/24/2020 |

*options do not impact performance

SAMPLE PHOTOS - TESTED CONFIGURATIONS



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**SUMMARY** **REPORT NO. 104427113CRT-003**

PRODUCT INFORMATION AND SUMMARY OF DATA

| | |
|---|---|
| Product Model No.: | 4CB-HE-44-W-3500-[OPTIONS] |
| Product Description: | High Bay |
| LED Model No.: | Seoul Semiconductor 3528 Series |
| Driver Model No.: | SS-80V-42B |
| Light Source: | LED |

| Criteria | Results |
|---|---|
| Light Output (lumens) | 15882.1 |
| Input Power (W) @ 120 (Vac) | 95.34 |
| Lumen Efficacy (lm/W) | 166.6 |
| Input Power Factor () @ 120 (Vac) | 0.997 |

TEST METHODS

**SEASONING IN SAMPLE ORIENTATION - LED PRODUCTS**

No seasoning was performed in accordance with IESNA LM-79.

**TYPE C GONIOPHOTOMETER DISTRIBUTION TESTING**

A Type C Mirror Goniophotometer system was used to measure the luminous intensity (candela) at each angle of distribution for the EUT. Electrical measurements of the unit were measured using a power analyzer. Each EUT was operated at the rated input voltage of the system in its designated orientation. The ambient temperature was measured at a position near the EUT at equal height and stabilization procedures to LM-79 were followed.

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## TYPE C GONIOPHOTOMETER DISTRIBUTION TESTING

**REPORT NO. 104427113CRT-003**

PHOTOMETRIC AND ELECTRICAL MEASUREMENTS (25°C +/- 1°C)

| Base Orientation | Input Voltage (Vac) | Input Current (mA) | Input Power (W) | Input Power Factor () |
|---|---|---|---|---|
| Up | 120.08 | 796.4 | 95.34 | 0.997 |
| | 277.00 | 351.7 | 92.69 | 0.951 |

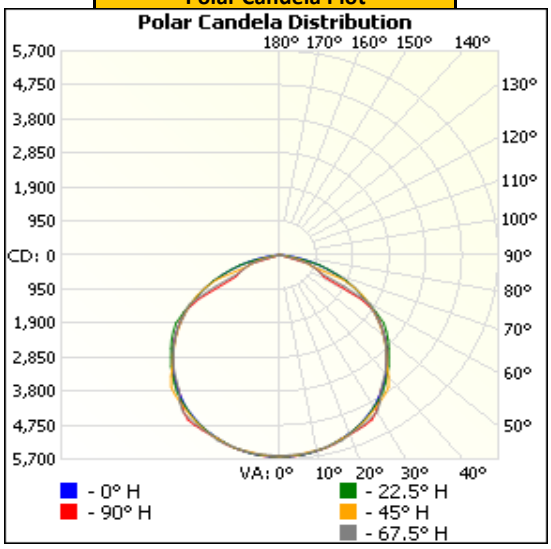
| Light Output (lm) | Lumen Efficacy (lm/W) |
|---|---|
| 15882.1 | 166.6 |

INTENSITY SUMMARY - CANDELA

| Angle | 0 | 22.5 | 45 | 67.5 | 90 |
|---|---|---|---|---|---|
| 0 | 5617 | 5617 | 5617 | 5617 | 5617 |
| 5 | 5609 | 5607 | 5594 | 5584 | 5619 |
| 10 | 5552 | 5542 | 5537 | 5534 | 5546 |
| 15 | 5441 | 5438 | 5448 | 5456 | 5466 |
| 20 | 5301 | 5306 | 5321 | 5319 | 5331 |
| 25 | 5115 | 5127 | 5143 | 5208 | 5241 |
| 30 | 4906 | 4903 | 4951 | 5056 | 5037 |
| 35 | 4625 | 4673 | 4763 | 4599 | 4605 |
| 40 | 4312 | 4355 | 4410 | 4278 | 4320 |
| 45 | 3946 | 4013 | 3937 | 3927 | 3945 |
| 50 | 3563 | 3687 | 3540 | 3550 | 3568 |
| 55 | 3112 | 3304 | 3111 | 3139 | 3156 |
| 60 | 2642 | 2676 | 2662 | 2707 | 2431 |
| 65 | 2146 | 2134 | 2150 | 1163 | 1179 |
| 70 | 1578 | 1594 | 872 | 902 | 913 |
| 75 | 1049 | 1072 | 610 | 399 | 164 |
| 80 | 566 | 319 | 86 | 94 | 93 |
| 85 | 174 | 37 | 38 | 37 | 35 |
| 90 | 0 | 0 | 0 | 0 | 0 |
| 95 | 0 | 0 | 0 | 0 | 0 |
| 100 | 0 | 0 | 0 | 0 | 0 |
| 105 | 0 | 0 | 0 | 0 | 0 |
| 110 | 0 | 0 | 0 | 0 | 0 |
| 115 | 0 | 0 | 0 | 0 | 0 |
| 120 | 0 | 0 | 0 | 0 | 0 |
| 125 | 0 | 0 | 0 | 0 | 0 |
| 130 | 0 | 0 | 0 | 0 | 0 |
| 135 | 0 | 0 | 0 | 0 | 0 |
| 140 | 0 | 0 | 0 | 0 | 0 |
| 145 | 0 | 0 | 0 | 0 | 0 |
| 150 | 0 | 0 | 0 | 0 | 0 |
| 155 | 0 | 0 | 0 | 0 | 0 |
| 160 | 0 | 0 | 0 | 0 | 0 |
| 165 | 0 | 0 | 0 | 0 | 0 |
| 170 | 0 | 0 | 0 | 0 | 0 |
| 175 | 0 | 0 | 0 | 0 | 0 |
| 180 | 0 | 0 | 0 | 0 | 0 |

*Entire luminous intensity matrix found in .IES file*

**Polar Candela Plot**



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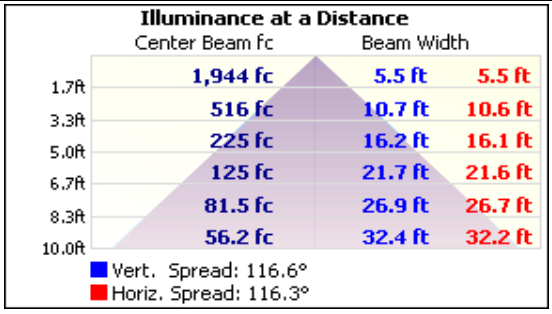
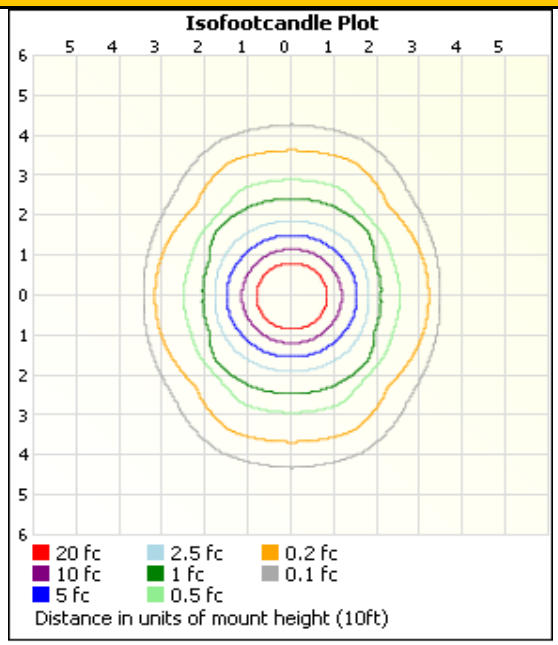
ILLUMINANCE SUMMARY

**Mounting Height: 10ft**

**Illuminance - Cone Of Light**




**Isoillumination Plot**




ZONAL LUMENS

**Zonal Lumen Summary**

| Zone | Lumens | Luminaire |
|---|---|---|
| 0-30 | 4,453.5 | 28.0% |
| 0-40 | 7,375.0 | 46.4% |
| 0-60 | 13,253.1 | 83.4% |
| 60-90 | 2,629.0 | 16.6% |
| 70-100 | 811.8 | 5.1% |
| 90-120 | 0.0 | 0.0% |
| 0-90 | 15,882.1 | 100.0% |
| 90-180 | 0.0 | 0.0% |
| 0-180 | 15,882.1 | 100.0% |

| Zone | Lumens | Total | Zone | Lumens | Total |
|---|---|---|---|---|---|
| 0-10 | 532.5 | 3.4% | 90-100 | 0.0 | 0.0% |
| 10-20 | 1539.3 | 9.7% | 100-110 | 0.0 | 0.0% |
| 20-30 | 2381.7 | 15.0% | 110-120 | 0.0 | 0.0% |
| 30-40 | 2921.5 | 18.4% | 120-130 | 0.0 | 0.0% |
| 40-50 | 3059.0 | 19.3% | 130-140 | 0.0 | 0.0% |
| 50-60 | 2819.0 | 17.7% | 140-150 | 0.0 | 0.0% |
| 60-70 | 1817.2 | 11.4% | 150-160 | 0.0 | 0.0% |
| 70-80 | 727.7 | 4.6% | 160-170 | 0.0 | 0.0% |
| 80-90 | 84.1 | 0.5% | 170-180 | 0.0 | 0.0% |

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| Output Electricals (Out of Driver) - if applicable | | | |
|---|---|---|---|
| **Input Voltage (Vac)** | **Output Voltage (Vdc)** | **Output Current (mA)** | **Output Power (W)** |
| 120.04 | 37.71 | 2213.0 | 83.45 |
| 277.00 | 37.70 | 2212.0 | 83.39 |

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**EQUIPMENT LIST**

**REPORT NO. 104427113CRT-003**

| # | Equipment | Model No | Control No. | Last Cal | Cal Due |
|---|---|---|---|---|---|
| 1 | LSI High Speed Mirror Goniometer | 6440 | --- | 8/21/2020 | 9/21/2020 |
| 2 | Elgar AC Power Supply | CW1251 | --- | VBU | VBU |
| 3 | Yokogawa Power Analyzer | WT210 | E464 | 5/11/2020 | 5/11/2021 |
| 4 | Traceable Hygrothermometer | 4800 | L203 | 2/17/2020 | 2/17/2021 |
| 5 | M-D Building Products Digital Level | Smart Tool | 307-L112 | 5/14/2020 | 5/14/2021 |
| 6 | NIST Luminous Intensity Standard Source | NBS10322 | N1427 | 2/11/2019 | 2/11/2021 |
| 7 | NIST Luminous Intensity Standard Source | NBS10332 | N1435 | 2/11/2019 | 2/11/2021 |
| 8 | NIST Luminous Intensity Standard Source | NBS10265 | N1437 | 2/11/2019 | 2/11/2021 |
| 9 | NIST Luminous Flux Standard Source | NBS10428 | N1424 | 1/3/2019 | 1/3/2021 |
| 10 | Sorenson DC Power Supply | XG 150-10 | --- | VBU | VBU |
| 11 | Omega Thermometer | DPi8-C24 | M263 | 2/27/2020 | 2/27/2021 |
| 12 | Multi Channel Spectroradiometer | OL 770 | O230 | 7/21/2020 | 7/21/2021 |

Note: Standard sources listed above are traceable to NIST: National Institute of Standards and Technology

**REVISION HISTORY**

| # | Revision Date | Updated By | Reviewed By | Description of Change |
|---|---|---|---|---|
| --- | None | --- | --- | --- |
| --- | --- | --- | --- | --- |
| --- | --- | --- | --- | --- |