

Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269



Scaled data based on original data using  
LM-79-08 Approved Method: Electrical and Photometric Measurements of Solid-State  
Lighting Products

Test Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

Brand: METALUX

Report Number: P830339

Luminaire Tested: **OHBL-36HE-MFL-UNV-L930-CD**

Issue Date: 5/3/2024



**Test Information**

Test Method: LM-79-08  
Report Number: P830339  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2106-285-1)  
Test Lab: INNOVATION CENTER  
Issue Date: 5/3/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: METALUX  
Catalog Number: OHBL-36HE-MFL-UNV-L930-CD  
Description: 36000 LUMEN OHBL HE LED LUMINAIRE WITH 90CRI, 3000K LEDS AND MEDIUM FROSTED LENS  
Light Source: -  
Ballast/Driver: -

**Summary**

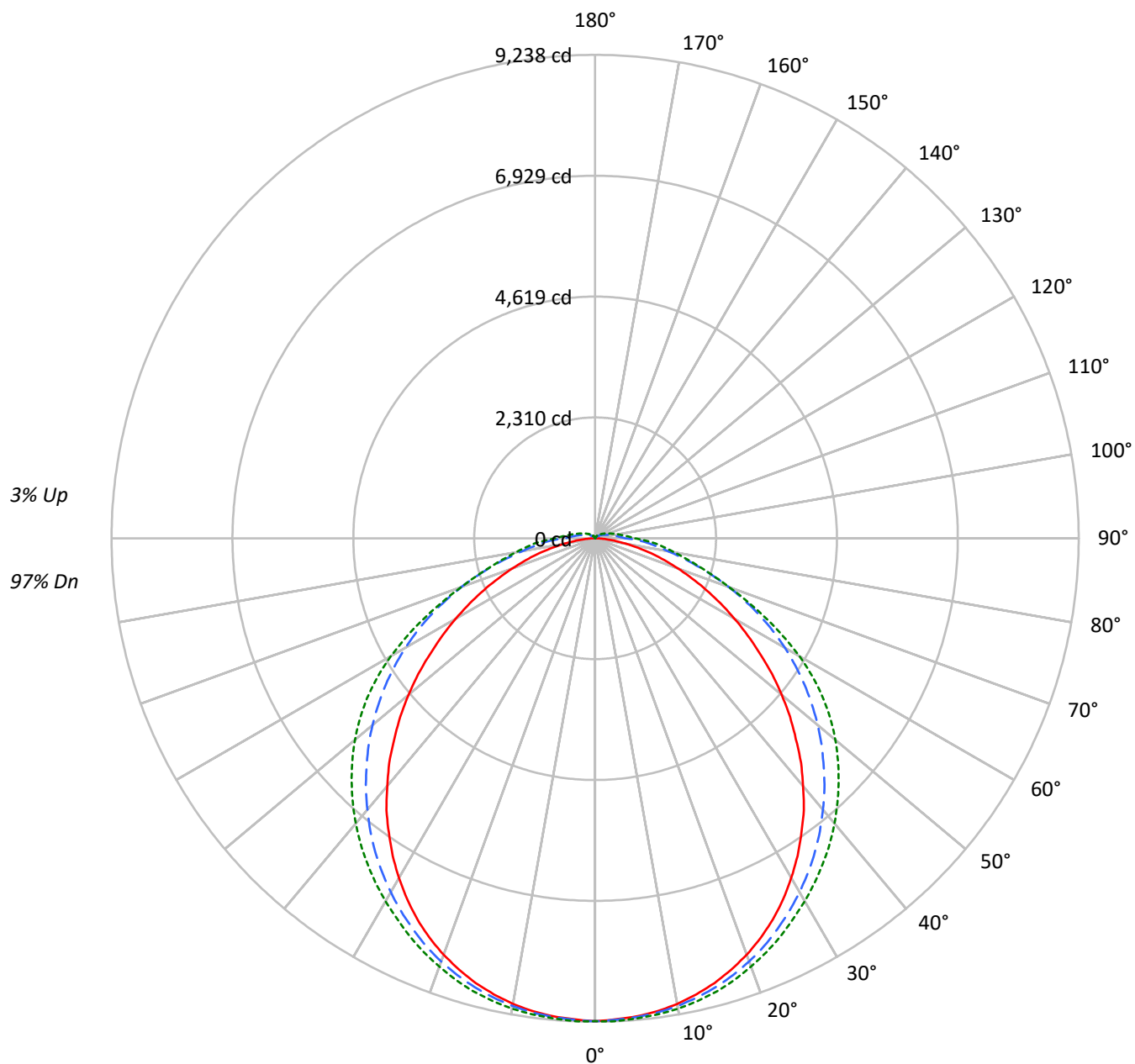
Lumens per Lamp: N/A  
Luminaire Lumens: 27620.0 lumens  
Efficiency: N/A  
Efficacy: 130.3 lumens/watt  
Spacing Criteria (0/90/45): 1.21 / 1.29 / 1.38  
Luminous Opening: Rectangular w/ Sides (W: 1.8' x L: 3.78' x H: 0.17')  
CIE Type: Direct

Input Watts (W): 212  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 25 FT

TEST NUMBER: P830339

CATALOG NUMBER: OHBL-36HE-MFL-UNV-L930-CD

### Luminous Intensity Polar Plot





TEST NUMBER: P830339

CATALOG NUMBER: OHBL-36HE-MFL-UNV-L930-CD

**COEFFICIENT OF UTILIZATION - ZONAL CAVITY METHOD:**

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |    |    |    |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|----|
| RF  | 20  |     |     |     | 20  |     |     |     | 20  |     |     |     | 20  |     |    |    | 20 |
| RC  | 80  |     |     |     | 70  |     |     |     | 50  |     |     |     | 30  |     |    |    | 10 |
| RW  | 70  | 50  | 30  | 10  | 70  | 50  | 30  | 10  | 50  | 30  | 10  | 50  | 30  | 10  | 50 | 30 | 10 |
| RCR |     |     |     |     |     |     |     |     |     |     |     |     |     |     |    |    |    |
| 0   | 118 | 118 | 118 | 118 | 115 | 115 | 115 | 115 | 109 | 109 | 109 | 104 | 104 | 104 | 99 | 99 | 99 |
| 1   | 107 | 102 | 98  | 94  | 104 | 100 | 96  | 92  | 95  | 91  | 88  | 90  | 88  | 85  | 86 | 84 | 82 |
| 2   | 98  | 89  | 82  | 76  | 95  | 87  | 80  | 75  | 83  | 77  | 73  | 79  | 74  | 71  | 75 | 72 | 68 |
| 3   | 89  | 78  | 70  | 63  | 86  | 76  | 69  | 62  | 73  | 66  | 61  | 70  | 64  | 59  | 67 | 62 | 58 |
| 4   | 81  | 69  | 60  | 53  | 79  | 68  | 59  | 53  | 65  | 57  | 52  | 62  | 56  | 51  | 59 | 54 | 50 |
| 5   | 75  | 62  | 53  | 46  | 72  | 60  | 52  | 46  | 58  | 50  | 45  | 56  | 49  | 44  | 53 | 48 | 43 |
| 6   | 69  | 56  | 47  | 40  | 67  | 54  | 46  | 40  | 52  | 45  | 39  | 50  | 44  | 39  | 48 | 43 | 38 |
| 7   | 64  | 50  | 42  | 35  | 62  | 49  | 41  | 35  | 48  | 40  | 35  | 46  | 39  | 34  | 44 | 38 | 34 |
| 8   | 60  | 46  | 37  | 31  | 58  | 45  | 37  | 31  | 43  | 36  | 31  | 42  | 35  | 31  | 41 | 35 | 30 |
| 9   | 56  | 42  | 34  | 28  | 54  | 41  | 34  | 28  | 40  | 33  | 28  | 39  | 32  | 28  | 37 | 32 | 27 |
| 10  | 52  | 39  | 31  | 26  | 51  | 38  | 31  | 26  | 37  | 30  | 25  | 36  | 29  | 25  | 35 | 29 | 25 |

**AVERAGE LUMINANCE (cd/sqm):**

|     | 0°    | 45°   | 90°   |
|-----|-------|-------|-------|
| 0°  | 14595 | 14595 | 14595 |
| 5°  | 14502 | 14457 | 14501 |
| 10° | 14400 | 14329 | 14425 |
| 15° | 14239 | 14177 | 14325 |
| 20° | 14026 | 13990 | 14179 |
| 25° | 13740 | 13757 | 14032 |
| 30° | 13346 | 13505 | 13883 |
| 35° | 12868 | 13237 | 13755 |
| 40° | 12294 | 12926 | 13629 |
| 45° | 11616 | 12589 | 13468 |
| 50° | 10876 | 12248 | 13272 |
| 55° | 9966  | 11831 | 12942 |
| 60° | 9033  | 11339 | 12282 |
| 65° | 8015  | 10711 | 11198 |
| 70° | 6912  | 9911  | 10024 |
| 75° | 5795  | 8986  | 9231  |
| 80° | 4394  | 8317  | 9157  |
| 85° | 2780  | 8645  | 10233 |



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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 874.5   | 3.2       |
| 10°-20°   | 2508.7  | 9.1       |
| 20°-30°   | 3794.0  | 13.7      |
| 30°-40°   | 4554.8  | 16.5      |
| 40°-50°   | 4704.3  | 17.0      |
| 50°-60°   | 4232.4  | 15.3      |
| 60°-70°   | 3188.2  | 11.5      |
| 70°-80°   | 1925.2  | 7.0       |
| 80°-90°   | 941.6   | 3.4       |
| 90°-100°  | 396.3   | 1.4       |
| 100°-110° | 226.2   | 0.8       |
| 110°-120° | 132.8   | 0.5       |
| 120°-130° | 75.1    | 0.3       |
| 130°-140° | 39.5    | 0.1       |
| 140°-150° | 19.2    | 0.1       |
| 150°-160° | 7.1     | 0.0       |
| 160°-170° | 0.0     | 0.0       |
| 170°-180° | 0.0     | 0.0       |
| <hr/>     |         |           |
| 0°-30°    | 7177.2  | 26.0      |
| 0°-40°    | 11732.0 | 42.5      |
| 0°-60°    | 20668.7 | 74.8      |
| 0°-90°    | 26723.6 | 96.8      |
| 90°-120°  | 755.4   | 2.7       |
| 90°-150°  | 889.2   | 3.2       |
| 90°-180°  | 896.0   | 3.2       |
| 0°-180°   | 27620.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 9229 | 9229  | 9229 | 9229  | 9229 |      |
| 5°   | 9170 | 9195  | 9184 | 9220  | 9208 | 871  |
| 15°  | 8800 | 8842  | 8883 | 8958  | 8967 | 2481 |
| 25°  | 8036 | 8124  | 8239 | 8368  | 8388 | 3696 |
| 35°  | 6871 | 7031  | 7320 | 7542  | 7587 | 4295 |
| 45°  | 5423 | 5696  | 6173 | 6509  | 6579 | 4187 |
| 55°  | 3842 | 4239  | 4883 | 5251  | 5314 | 3445 |
| 65°  | 2344 | 2823  | 3456 | 3627  | 3587 | 2329 |
| 75°  | 1104 | 1586  | 2001 | 2053  | 2033 | 1178 |
| 85°  | 230  | 608   | 1003 | 1141  | 1161 | 266  |
| 90°  | 0    | 237   | 574  | 723   | 752  | 15   |
| 95°  | 11   | 160   | 429  | 547   | 567  | 10   |
| 105° | 16   | 93    | 248  | 325   | 339  | 16   |
| 115° | 18   | 52    | 154  | 206   | 215  | 18   |
| 125° | 18   | 25    | 93   | 133   | 140  | 16   |
| 135° | 16   | 20    | 47   | 81    | 90   | 12   |
| 145° | 23   | 20    | 23   | 41    | 47   | 13   |
| 155° | 23   | 25    | 23   | 20    | 23   | 7    |
| 165° | 0    | 0     | 0    | 0     | 0    | 0    |
| 175° | 0    | 0     | 0    | 0     | 0    | 0    |
| 180° | 0    | 0     | 0    | 0     | 0    |      |



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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 9228.7 | 9228.7 | 9228.7 | 9228.7 | 9228.7 |
| 2.5°   | 9201.6 | 9224.2 | 9210.7 | 9240.0 | 9237.8 |
| 5°     | 9170.0 | 9194.8 | 9183.5 | 9219.7 | 9208.4 |
| 7.5°   | 9115.8 | 9142.9 | 9140.6 | 9181.3 | 9176.8 |
| 10°    | 9036.7 | 9066.1 | 9075.1 | 9129.3 | 9129.3 |
| 12.5°  | 8928.3 | 8966.7 | 8989.3 | 9054.8 | 9057.1 |
| 15°    | 8799.6 | 8842.5 | 8883.2 | 8957.7 | 8966.7 |
| 17.5°  | 8643.7 | 8697.9 | 8754.4 | 8840.2 | 8851.5 |
| 20°    | 8467.6 | 8528.5 | 8605.3 | 8695.7 | 8709.2 |
| 22.5°  | 8264.3 | 8336.6 | 8435.9 | 8542.1 | 8557.9 |
| 25°    | 8036.2 | 8124.3 | 8239.4 | 8368.2 | 8388.5 |
| 27.5°  | 7776.4 | 7878.1 | 8033.9 | 8178.5 | 8196.5 |
| 30°    | 7494.1 | 7613.8 | 7808.0 | 7979.7 | 8009.1 |
| 32.5°  | 7196.0 | 7333.7 | 7573.2 | 7765.1 | 7805.8 |
| 35°    | 6870.7 | 7031.1 | 7320.2 | 7541.5 | 7586.7 |
| 37.5°  | 6550.0 | 6726.2 | 7053.7 | 7306.6 | 7360.8 |
| 40°    | 6175.1 | 6394.2 | 6769.1 | 7049.2 | 7114.7 |
| 42.5°  | 5822.7 | 6059.9 | 6484.5 | 6789.4 | 6852.7 |
| 45°    | 5422.9 | 5696.2 | 6172.8 | 6509.3 | 6579.4 |
| 47.5°  | 5048.0 | 5343.9 | 5872.4 | 6220.2 | 6292.5 |
| 50°    | 4652.8 | 4978.0 | 5551.7 | 5915.3 | 5989.9 |
| 52.5°  | 4257.5 | 4607.6 | 5219.7 | 5596.9 | 5666.9 |
| 55°    | 3841.9 | 4239.4 | 4883.1 | 5251.3 | 5314.5 |
| 57.5°  | 3455.7 | 3875.8 | 4537.6 | 4887.7 | 4926.0 |
| 60°    | 3074.0 | 3509.9 | 4185.2 | 4492.4 | 4505.9 |
| 62.5°  | 2701.3 | 3159.8 | 3823.8 | 4067.8 | 4049.7 |
| 65°    | 2344.4 | 2823.3 | 3455.7 | 3627.3 | 3586.7 |
| 67.5°  | 2001.1 | 2495.8 | 3078.5 | 3189.2 | 3135.0 |
| 70°    | 1675.9 | 2177.3 | 2712.6 | 2769.1 | 2719.4 |
| 72.5°  | 1389.1 | 1874.7 | 2342.2 | 2389.6 | 2353.5 |
| 75°    | 1104.5 | 1585.6 | 2001.1 | 2053.1 | 2032.8 |
| 77.5°  | 837.9  | 1305.5 | 1687.2 | 1754.9 | 1759.5 |
| 80°    | 603.1  | 1050.3 | 1413.9 | 1520.1 | 1533.6 |
| 82.5°  | 397.5  | 815.4  | 1185.8 | 1321.3 | 1341.6 |
| 85°    | 230.4  | 607.6  | 1002.8 | 1140.6 | 1160.9 |
| 87.5°  | 99.4   | 438.2  | 806.3  | 930.6  | 955.4  |
| 90°    | 0.0    | 237.2  | 573.7  | 722.8  | 752.1  |
| 92.5°  | 6.8    | 196.5  | 492.4  | 627.9  | 652.7  |
| 95°    | 11.3   | 160.4  | 429.1  | 546.6  | 566.9  |
| 97.5°  | 13.6   | 135.5  | 372.7  | 476.6  | 496.9  |
| 100°   | 13.6   | 117.4  | 323.0  | 417.8  | 435.9  |
| 102.5° | 13.6   | 103.9  | 282.3  | 365.9  | 381.7  |
| 105°   | 15.8   | 92.6   | 248.4  | 325.2  | 338.8  |



TEST NUMBER: P830339

CATALOG NUMBER: OHBL-36HE-MFL-UNV-L930-CD

**CANDELA DISTRIBUTION (continued):**

|        | 0°   | 22.5° | 45°   | 67.5° | 90°   |
|--------|------|-------|-------|-------|-------|
| 112.5° | 18.1 | 61.0  | 171.7 | 230.4 | 239.4 |
| 115°   | 18.1 | 51.9  | 153.6 | 205.5 | 214.6 |
| 117.5° | 20.3 | 45.2  | 135.5 | 185.2 | 192.0 |
| 120°   | 20.3 | 38.4  | 119.7 | 164.9 | 173.9 |
| 122.5° | 20.3 | 31.6  | 106.2 | 149.1 | 155.8 |
| 125°   | 18.1 | 24.8  | 92.6  | 133.3 | 140.0 |
| 127.5° | 15.8 | 20.3  | 79.1  | 119.7 | 126.5 |
| 130°   | 15.8 | 18.1  | 67.8  | 106.2 | 112.9 |
| 132.5° | 15.8 | 20.3  | 56.5  | 92.6  | 101.6 |
| 135°   | 15.8 | 20.3  | 47.4  | 81.3  | 90.3  |
| 137.5° | 15.8 | 20.3  | 38.4  | 70.0  | 79.1  |
| 140°   | 18.1 | 20.3  | 31.6  | 58.7  | 67.8  |
| 142.5° | 20.3 | 20.3  | 24.8  | 49.7  | 56.5  |
| 145°   | 22.6 | 20.3  | 22.6  | 40.7  | 47.4  |
| 147.5° | 22.6 | 22.6  | 22.6  | 31.6  | 38.4  |
| 150°   | 22.6 | 24.8  | 22.6  | 24.8  | 31.6  |
| 152.5° | 22.6 | 24.8  | 22.6  | 20.3  | 24.8  |
| 155°   | 22.6 | 24.8  | 22.6  | 20.3  | 22.6  |
| 157.5° | 0.0  | 0.0   | 0.0   | 0.0   | 0.0   |
| 160°   | 0.0  | 0.0   | 0.0   | 0.0   | 0.0   |
| 162.5° | 0.0  | 0.0   | 0.0   | 0.0   | 0.0   |
| 165°   | 0.0  | 0.0   | 0.0   | 0.0   | 0.0   |
| 167.5° | 0.0  | 0.0   | 0.0   | 0.0   | 0.0   |
| 170°   | 0.0  | 0.0   | 0.0   | 0.0   | 0.0   |
| 172.5° | 0.0  | 0.0   | 0.0   | 0.0   | 0.0   |
| 175°   | 0.0  | 0.0   | 0.0   | 0.0   | 0.0   |
| 177.5° | 0.0  | 0.0   | 0.0   | 0.0   | 0.0   |
| 180°   | 0.0  | 0.0   | 0.0   | 0.0   | 0.0   |



Report Generated By 670246072 / DESKTOP-50001EG





— 0°-180°    - - 45°-225°    - - - 90°-270°







|        |      |      |       |       |       |
|--------|------|------|-------|-------|-------|
| 107.5° | 15.8 | 81.3 | 219.1 | 289.1 | 300.4 |
| 110°   | 15.8 | 72.3 | 194.2 | 257.5 | 268.8 |



LM-79-2019: Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Report Prepared for

Cooper Lighting Solutions

METALUX

Report Number: SP1-2304-001-2

Test Date: 05/31/2023

Luminaire Tested: OHB-15SE-N-UNV-L930

Data in this report applies to families of products including OHB-15SE-N-UNV-L930.

### Test Information

Test Method: LM-79-2019  
 Report Number: SP1-2304-001-2  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry:  $4\pi$   
 Issue Date: 05/31/2023  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: METALUX  
 Catalog Number: **OHB-15SE-N-UNV-L930**  
 Description: 15SE OHB WITH APT LEDS, NARROW LENS, 90CRI 3000K

### Spectral Parameters

|                           |         |           |      |      |      |
|---------------------------|---------|-----------|------|------|------|
| CCT (K):                  | 3051    | CRI (Ra): | 92.2 |      |      |
| CIE u':                   | 0.2497  | R1:       | 92.8 | R9:  | 60.2 |
| CIE v':                   | 0.5166  | R2:       | 95.6 | R10: | 88.6 |
| Duv:                      | -0.0027 | R3:       | 96.4 | R11: | 92.7 |
| CIE x:                    | 0.4295  | R4:       | 92.2 | R12: | 82.3 |
| CIE y:                    | 0.3950  | R5:       | 92.5 | R13: | 93.6 |
| CIE z:                    | 0.1755  | R6:       | 94.0 | R14: | 97.4 |
| Peak Wavelength (nm):     | 621     | R7:       | 91.7 |      |      |
| Dominant Wavelength (nm): | 583     | R8:       | 82.4 |      |      |
| Purity:                   | 47.8    |           |      |      |      |
| Rf:                       | 90.7    |           |      |      |      |
| Rg:                       | 101.5   |           |      |      |      |



### Test Conditions

Stabilization Time: 22M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.2/44%  
 Sphere Temperature (°C): 25.3

REPORT NUMBER: SP1-2304-001-2

| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | 76INCH SPHERE IN0058  | 2/9/2023         | 8/9/2023             |
| Power Meter                    | XITRON 2801 IN0071    | 11/29/2022       | 11/29/2023           |
| AC Power Source                | CHROMA 61603 IN0063   | 11/28/2022       | 11/28/2023           |
| DC Power Source                | AGILENT E3634A IN0208 | 11/28/2022       | 11/28/2023           |
| Sphere Thermometer             | ONSET IN0085          | 11/28/2022       | 11/28/2023           |
| Room Thermometer               | ONSET IN0046          | 11/28/2022       | 11/28/2023           |

REPORT NUMBER: SP1-2304-001-2

CIE 1931 Chromaticity Diagram



CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies inside the ANSI 3000K 4-step quadrangle

REPORT NUMBER: SP1-2304-001-2

**Photopic Flux vs. Wavelength**



#####

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 5142             | NR               | 490       | 62439            | NR               | 620       | 231386           | NR               | 750       | 21976            | NR               | 880       | 7157             | NR               |
| 365       | 4540             | NR               | 495       | 73651            | NR               | 625       | 230941           | NR               | 755       | 19435            | NR               | 885       | 7445             | NR               |
| 370       | 4803             | NR               | 500       | 84837            | NR               | 630       | 226625           | NR               | 760       | 17457            | NR               | 890       | 5651             | NR               |
| 375       | 5429             | NR               | 505       | 96138            | NR               | 635       | 221573           | NR               | 765       | 15928            | NR               | 895       | 5663             | NR               |
| 380       | 5059             | NR               | 510       | 104675           | NR               | 640       | 214183           | NR               | 770       | 13612            | NR               | 900       | 4391             | NR               |
| 385       | 5164             | NR               | 515       | 112374           | NR               | 645       | 206197           | NR               | 775       | 12383            | NR               | 905       | 4718             | NR               |
| 390       | 4787             | NR               | 520       | 120074           | NR               | 650       | 195149           | NR               | 780       | 11099            | NR               | 910       | 4205             | NR               |
| 395       | 4429             | NR               | 525       | 125393           | NR               | 655       | 184048           | NR               | 785       | 9818             | NR               | 915       | 4466             | NR               |
| 400       | 3966             | NR               | 530       | 131080           | NR               | 660       | 171890           | NR               | 790       | 8853             | NR               | 920       | 4608             | NR               |
| 405       | 4026             | NR               | 535       | 137166           | NR               | 665       | 158117           | NR               | 795       | 8815             | NR               | 925       | 6506             | NR               |
| 410       | 4947             | NR               | 540       | 141770           | NR               | 670       | 144601           | NR               | 800       | 7747             | NR               | 930       | 6091             | NR               |
| 415       | 6735             | NR               | 545       | 146789           | NR               | 675       | 131155           | NR               | 805       | 7317             | NR               | 935       | 6242             | NR               |
| 420       | 10542            | NR               | 550       | 151664           | NR               | 680       | 119765           | NR               | 810       | 7417             | NR               | 940       | 5908             | NR               |
| 425       | 16995            | NR               | 555       | 157152           | NR               | 685       | 106544           | NR               | 815       | 7400             | NR               | 945       | 4377             | NR               |
| 430       | 27239            | NR               | 560       | 162379           | NR               | 690       | 94952            | NR               | 820       | 6832             | NR               | 950       | 6170             | NR               |
| 435       | 43016            | NR               | 565       | 167867           | NR               | 695       | 83928            | NR               | 825       | 6514             | NR               | 955       | 6143             | NR               |
| 440       | 69527            | NR               | 570       | 174214           | NR               | 700       | 74959            | NR               | 830       | 6419             | NR               | 960       | 5227             | NR               |
| 445       | 113795           | NR               | 575       | 179459           | NR               | 705       | 66186            | NR               | 835       | 6702             | NR               | 965       | 4363             | NR               |
| 450       | 137556           | NR               | 580       | 186493           | NR               | 710       | 58632            | NR               | 840       | 6224             | NR               | 970       | 9654             | NR               |
| 455       | 112457           | NR               | 585       | 194218           | NR               | 715       | 52023            | NR               | 845       | 5410             | NR               | 975       | 7378             | NR               |
| 460       | 88709            | NR               | 590       | 201759           | NR               | 720       | 46022            | NR               | 850       | 5183             | NR               | 980       | 8170             | NR               |
| 465       | 74548            | NR               | 595       | 208902           | NR               | 725       | 40235            | NR               | 855       | 6469             | NR               | 985       | 7350             | NR               |
| 470       | 58681            | NR               | 600       | 217002           | NR               | 730       | 35330            | NR               | 860       | 7161             | NR               | 990       | 8712             | NR               |
| 475       | 50369            | NR               | 605       | 222691           | NR               | 735       | 31141            | NR               | 865       | 5351             | NR               | 995       | 7670             | NR               |
| 480       | 50005            | NR               | 610       | 226497           | NR               | 740       | 27444            | NR               | 870       | 5943             | NR               | 1000      | 8916             | NR               |
| 485       | 54326            | NR               | 615       | 229506           | NR               | 745       | 24768            | NR               | 875       | 6650             | NR               |           |                  |                  |

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Scotopic Flux vs. Wavelength



Scotopic Lumens: 16819.9

S/P: 1.43

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 5142             | NR               | 490       | 62439            | NR               | 620       | 231386           | NR               | 750       | 21976            | NR               | 880       | 7157             | NR               |
| 365       | 4540             | NR               | 495       | 73651            | NR               | 625       | 230941           | NR               | 755       | 19435            | NR               | 885       | 7445             | NR               |
| 370       | 4803             | NR               | 500       | 84837            | NR               | 630       | 226625           | NR               | 760       | 17457            | NR               | 890       | 5651             | NR               |
| 375       | 5429             | NR               | 505       | 96138            | NR               | 635       | 221573           | NR               | 765       | 15928            | NR               | 895       | 5663             | NR               |
| 380       | 5059             | NR               | 510       | 104675           | NR               | 640       | 214183           | NR               | 770       | 13612            | NR               | 900       | 4391             | NR               |
| 385       | 5164             | NR               | 515       | 112374           | NR               | 645       | 206197           | NR               | 775       | 12383            | NR               | 905       | 4718             | NR               |
| 390       | 4787             | NR               | 520       | 120074           | NR               | 650       | 195149           | NR               | 780       | 11099            | NR               | 910       | 4205             | NR               |
| 395       | 4429             | NR               | 525       | 125393           | NR               | 655       | 184048           | NR               | 785       | 9818             | NR               | 915       | 4466             | NR               |
| 400       | 3966             | NR               | 530       | 131080           | NR               | 660       | 171890           | NR               | 790       | 8853             | NR               | 920       | 4608             | NR               |
| 405       | 4026             | NR               | 535       | 137166           | NR               | 665       | 158117           | NR               | 795       | 8815             | NR               | 925       | 6506             | NR               |
| 410       | 4947             | NR               | 540       | 141770           | NR               | 670       | 144601           | NR               | 800       | 7747             | NR               | 930       | 6091             | NR               |
| 415       | 6735             | NR               | 545       | 146789           | NR               | 675       | 131155           | NR               | 805       | 7317             | NR               | 935       | 6242             | NR               |
| 420       | 10542            | NR               | 550       | 151664           | NR               | 680       | 119765           | NR               | 810       | 7417             | NR               | 940       | 5908             | NR               |
| 425       | 16995            | NR               | 555       | 157152           | NR               | 685       | 106544           | NR               | 815       | 7400             | NR               | 945       | 4377             | NR               |
| 430       | 27239            | NR               | 560       | 162379           | NR               | 690       | 94952            | NR               | 820       | 6832             | NR               | 950       | 6170             | NR               |
| 435       | 43016            | NR               | 565       | 167867           | NR               | 695       | 83928            | NR               | 825       | 6514             | NR               | 955       | 6143             | NR               |
| 440       | 69527            | NR               | 570       | 174214           | NR               | 700       | 74959            | NR               | 830       | 6419             | NR               | 960       | 5227             | NR               |
| 445       | 113795           | NR               | 575       | 179459           | NR               | 705       | 66186            | NR               | 835       | 6702             | NR               | 965       | 4363             | NR               |
| 450       | 137556           | NR               | 580       | 186493           | NR               | 710       | 58632            | NR               | 840       | 6224             | NR               | 970       | 9654             | NR               |
| 455       | 112457           | NR               | 585       | 194218           | NR               | 715       | 52023            | NR               | 845       | 5410             | NR               | 975       | 7378             | NR               |
| 460       | 88709            | NR               | 590       | 201759           | NR               | 720       | 46022            | NR               | 850       | 5183             | NR               | 980       | 8170             | NR               |
| 465       | 74548            | NR               | 595       | 208902           | NR               | 725       | 40235            | NR               | 855       | 6469             | NR               | 985       | 7350             | NR               |
| 470       | 58681            | NR               | 600       | 217002           | NR               | 730       | 35330            | NR               | 860       | 7161             | NR               | 990       | 8712             | NR               |
| 475       | 50369            | NR               | 605       | 222691           | NR               | 735       | 31141            | NR               | 865       | 5351             | NR               | 995       | 7670             | NR               |
| 480       | 50005            | NR               | 610       | 226497           | NR               | 740       | 27444            | NR               | 870       | 5943             | NR               | 1000      | 8916             | NR               |
| 485       | 54326            | NR               | 615       | 229506           | NR               | 745       | 24768            | NR               | 875       | 6650             | NR               |           |                  |                  |

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**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 6505.3 M/P: 0.55**

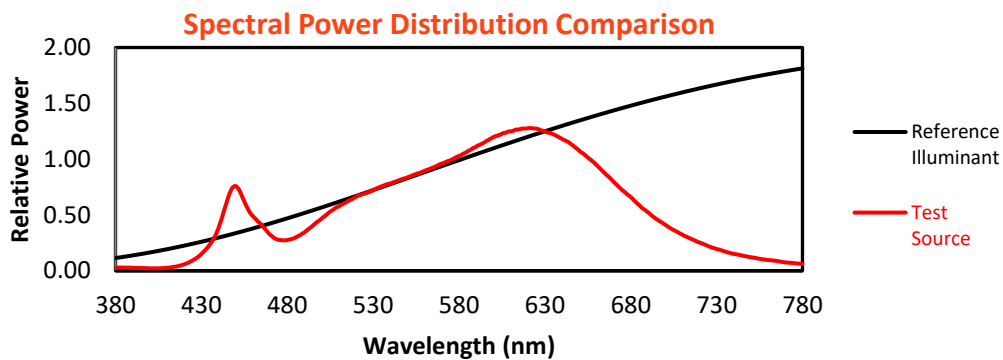
| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 5142             | NR               | 490       | 62439            | NR               | 620       | 231386           | NR               | 750       | 21976            | NR               | 880       | 7157             | NR               |
| 365       | 4540             | NR               | 495       | 73651            | NR               | 625       | 230941           | NR               | 755       | 19435            | NR               | 885       | 7445             | NR               |
| 370       | 4803             | NR               | 500       | 84837            | NR               | 630       | 226625           | NR               | 760       | 17457            | NR               | 890       | 5651             | NR               |
| 375       | 5429             | NR               | 505       | 96138            | NR               | 635       | 221573           | NR               | 765       | 15928            | NR               | 895       | 5663             | NR               |
| 380       | 5059             | NR               | 510       | 104675           | NR               | 640       | 214183           | NR               | 770       | 13612            | NR               | 900       | 4391             | NR               |
| 385       | 5164             | NR               | 515       | 112374           | NR               | 645       | 206197           | NR               | 775       | 12383            | NR               | 905       | 4718             | NR               |
| 390       | 4787             | NR               | 520       | 120074           | NR               | 650       | 195149           | NR               | 780       | 11099            | NR               | 910       | 4205             | NR               |
| 395       | 4429             | NR               | 525       | 125393           | NR               | 655       | 184048           | NR               | 785       | 9818             | NR               | 915       | 4466             | NR               |
| 400       | 3966             | NR               | 530       | 131080           | NR               | 660       | 171890           | NR               | 790       | 8853             | NR               | 920       | 4608             | NR               |
| 405       | 4026             | NR               | 535       | 137166           | NR               | 665       | 158117           | NR               | 795       | 8815             | NR               | 925       | 6506             | NR               |
| 410       | 4947             | NR               | 540       | 141770           | NR               | 670       | 144601           | NR               | 800       | 7747             | NR               | 930       | 6091             | NR               |
| 415       | 6735             | NR               | 545       | 146789           | NR               | 675       | 131155           | NR               | 805       | 7317             | NR               | 935       | 6242             | NR               |
| 420       | 10542            | NR               | 550       | 151664           | NR               | 680       | 119765           | NR               | 810       | 7417             | NR               | 940       | 5908             | NR               |
| 425       | 16995            | NR               | 555       | 157152           | NR               | 685       | 106544           | NR               | 815       | 7400             | NR               | 945       | 4377             | NR               |
| 430       | 27239            | NR               | 560       | 162379           | NR               | 690       | 94952            | NR               | 820       | 6832             | NR               | 950       | 6170             | NR               |
| 435       | 43016            | NR               | 565       | 167867           | NR               | 695       | 83928            | NR               | 825       | 6514             | NR               | 955       | 6143             | NR               |
| 440       | 69527            | NR               | 570       | 174214           | NR               | 700       | 74959            | NR               | 830       | 6419             | NR               | 960       | 5227             | NR               |
| 445       | 113795           | NR               | 575       | 179459           | NR               | 705       | 66186            | NR               | 835       | 6702             | NR               | 965       | 4363             | NR               |
| 450       | 137556           | NR               | 580       | 186493           | NR               | 710       | 58632            | NR               | 840       | 6224             | NR               | 970       | 9654             | NR               |
| 455       | 112457           | NR               | 585       | 194218           | NR               | 715       | 52023            | NR               | 845       | 5410             | NR               | 975       | 7378             | NR               |
| 460       | 88709            | NR               | 590       | 201759           | NR               | 720       | 46022            | NR               | 850       | 5183             | NR               | 980       | 8170             | NR               |
| 465       | 74548            | NR               | 595       | 208902           | NR               | 725       | 40235            | NR               | 855       | 6469             | NR               | 985       | 7350             | NR               |
| 470       | 58681            | NR               | 600       | 217002           | NR               | 730       | 35330            | NR               | 860       | 7161             | NR               | 990       | 8712             | NR               |
| 475       | 50369            | NR               | 605       | 222691           | NR               | 735       | 31141            | NR               | 865       | 5351             | NR               | 995       | 7670             | NR               |
| 480       | 50005            | NR               | 610       | 226497           | NR               | 740       | 27444            | NR               | 870       | 5943             | NR               | 1000      | 8916             | NR               |
| 485       | 54326            | NR               | 615       | 229506           | NR               | 745       | 24768            | NR               | 875       | 6650             | NR               |           |                  |                  |

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### Summary

$R_f = 90.7$   
 $R_g = 101.5$   
 CIE  $R_a = 92.2$   
 $R_9 = 60.2$



### Color Vector Graphics



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**Individual Sample Fidelity Index ( $R_{f,i}$ )**

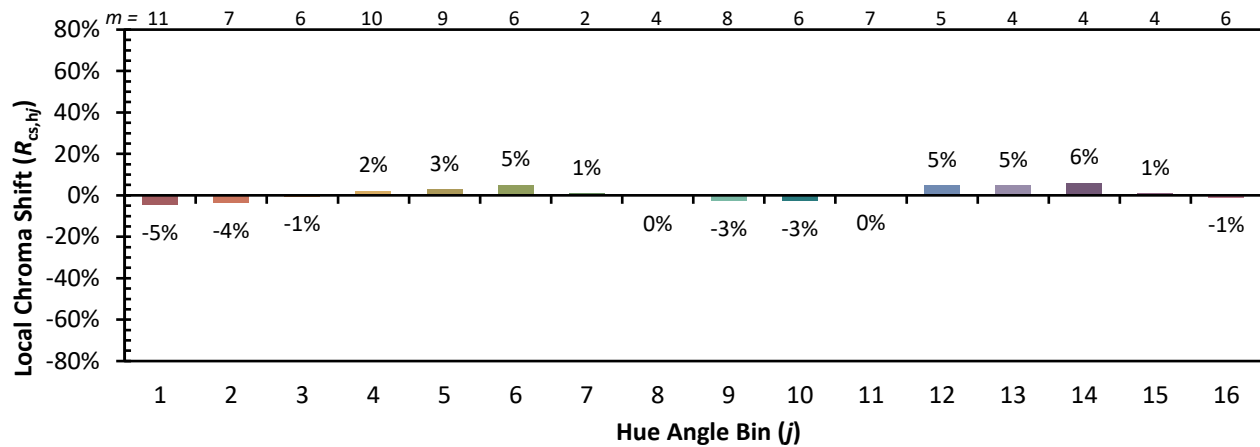
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 87 | CES51 = 97 | CES76 = 83 |
| CES02 = 63 | CES27 = 96 | CES52 = 95 | CES77 = 89 |
| CES03 = 32 | CES28 = 94 | CES53 = 92 | CES78 = 82 |
| CES04 = 70 | CES29 = 87 | CES54 = 97 | CES79 = 94 |
| CES05 = 51 | CES30 = 95 | CES55 = 96 | CES80 = 92 |
| CES06 = 51 | CES31 = 88 | CES56 = 93 | CES81 = 86 |
| CES07 = 43 | CES32 = 83 | CES57 = 93 | CES82 = 96 |
| CES08 = 42 | CES33 = 90 | CES58 = 94 | CES83 = 95 |
| CES09 = 29 | CES34 = 89 | CES59 = 97 | CES84 = 95 |
| CES10 = 76 | CES35 = 94 | CES60 = 96 | CES85 = 85 |
| CES11 = 59 | CES36 = 90 | CES61 = 94 | CES86 = 85 |
| CES12 = 65 | CES37 = 92 | CES62 = 95 | CES87 = 90 |
| CES13 = 44 | CES38 = 99 | CES63 = 92 | CES88 = 95 |
| CES14 = 74 | CES39 = 98 | CES64 = 91 | CES89 = 85 |
| CES15 = 72 | CES40 = 95 | CES65 = 89 | CES90 = 95 |
| CES16 = 48 | CES41 = 96 | CES66 = 89 | CES91 = 83 |
| CES17 = 50 | CES42 = 91 | CES67 = 88 | CES92 = 82 |
| CES18 = 57 | CES43 = 87 | CES68 = 88 | CES93 = 89 |
| CES19 = 72 | CES44 = 99 | CES69 = 90 | CES94 = 80 |
| CES20 = 67 | CES45 = 92 | CES70 = 85 | CES95 = 85 |
| CES21 = 86 | CES46 = 92 | CES71 = 84 | CES96 = 91 |
| CES22 = 79 | CES47 = 91 | CES72 = 94 | CES97 = 93 |
| CES23 = 92 | CES48 = 93 | CES73 = 80 | CES98 = 93 |
| CES24 = 91 | CES49 = 90 | CES74 = 94 | CES99 = 91 |
| CES25 = 72 | CES50 = 96 | CES75 = 84 |            |



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**Color Rendition by Hue-Angle Bin**



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**Measure Comparisons**



(END OF REPORT)