

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: P830067

Luminaire Tested: **OHBL-24HE-NL-UNV-L730-CD**

Issue Date: 5/3/2024



**Test Information**

Test Method: LM-79-08  
Report Number: P830067  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (P472951)  
Test Lab: INNOVATION CENTER  
Issue Date: 5/3/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: METALUX  
Catalog Number: OHBL-24HE-NL-UNV-L730-CD  
Description: 24000 LUMEN OHBL HE LED LUMINAIRE WITH 70CRI, 3000K LEDS AND NO LENS  
Light Source: -  
Ballast/Driver: -

**Summary**

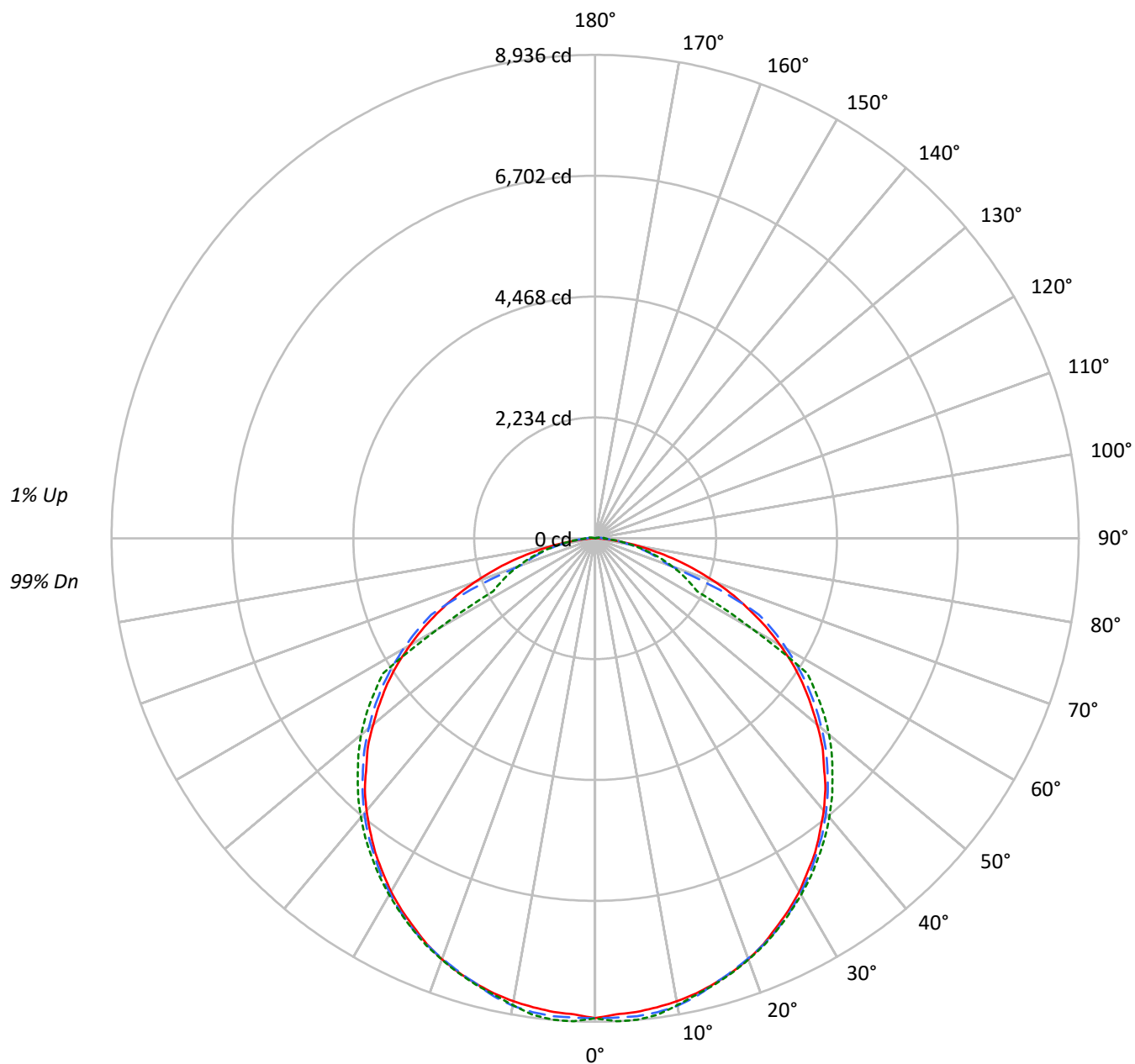
Lumens per Lamp: N/A  
Luminaire Lumens: 24906.0 lumens  
Efficiency: N/A  
Efficacy: 187.3 lumens/watt  
Spacing Criteria (0/90/45): 1.26 / 1.28 / 1.39  
Luminous Opening: Rectangular (W 1.8' x L: 3.78' x H: 0')  
CIE Type: Direct

Input Watts (W): 133  
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: P830067

CATALOG NUMBER: OHBL-24HE-NL-UNV-L730-CD

### Luminous Intensity Polar Plot





TEST NUMBER: P830067

CATALOG NUMBER: OHBL-24HE-NL-UNV-L730-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  | 50 | 30 | 10 |
| RCR |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |    |    |    |
| 0   | 119 | 119 | 119 | 119 | 116 | 116 | 116 | 116 | 111 | 111 | 111 | 106 | 106 | 106 | 102 | 102 | 102 |    |    | 99 |
| 1   | 109 | 105 | 100 | 97  | 106 | 102 | 99  | 95  | 98  | 95  | 92  | 94  | 91  | 89  | 90  | 88  | 86  |    |    | 84 |
| 2   | 99  | 92  | 85  | 79  | 97  | 90  | 84  | 78  | 86  | 81  | 76  | 83  | 78  | 75  | 80  | 76  | 73  |    |    | 71 |
| 3   | 91  | 81  | 73  | 66  | 88  | 79  | 72  | 66  | 76  | 70  | 64  | 73  | 68  | 63  | 70  | 66  | 62  |    |    | 60 |
| 4   | 83  | 71  | 63  | 56  | 81  | 70  | 62  | 56  | 67  | 60  | 55  | 65  | 59  | 54  | 63  | 58  | 53  |    |    | 51 |
| 5   | 76  | 64  | 55  | 48  | 74  | 63  | 54  | 48  | 60  | 53  | 47  | 58  | 52  | 47  | 57  | 51  | 46  |    |    | 44 |
| 6   | 71  | 57  | 49  | 42  | 69  | 56  | 48  | 42  | 55  | 47  | 42  | 53  | 46  | 41  | 51  | 45  | 41  |    |    | 39 |
| 7   | 65  | 52  | 43  | 37  | 64  | 51  | 43  | 37  | 50  | 42  | 37  | 48  | 41  | 36  | 47  | 41  | 36  |    |    | 34 |
| 8   | 61  | 47  | 39  | 33  | 59  | 47  | 39  | 33  | 45  | 38  | 33  | 44  | 37  | 33  | 43  | 37  | 32  |    |    | 30 |
| 9   | 57  | 43  | 35  | 30  | 55  | 43  | 35  | 30  | 42  | 35  | 30  | 41  | 34  | 29  | 40  | 34  | 29  |    |    | 27 |
| 10  | 53  | 40  | 32  | 27  | 52  | 40  | 32  | 27  | 39  | 32  | 27  | 38  | 31  | 27  | 37  | 31  | 26  |    |    | 25 |

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

|     | 0°    | 45°   | 90°   |
|-----|-------|-------|-------|
| 0°  | 14029 | 14029 | 14029 |
| 5°  | 13952 | 14078 | 14184 |
| 10° | 13956 | 14088 | 14070 |
| 15° | 13953 | 13951 | 13981 |
| 20° | 13934 | 13913 | 13947 |
| 25° | 13839 | 13909 | 13920 |
| 30° | 13775 | 13846 | 13900 |
| 35° | 13685 | 13761 | 13890 |
| 40° | 13567 | 13696 | 13898 |
| 45° | 13372 | 13574 | 13869 |
| 50° | 13170 | 13438 | 13882 |
| 55° | 12918 | 13253 | 13730 |
| 60° | 12485 | 12929 | 10689 |
| 65° | 11813 | 12500 | 7194  |
| 70° | 10926 | 6636  | 6982  |
| 75° | 9530  | 6306  | 6667  |
| 80° | 7329  | 5784  | 6110  |
| 85° | 3700  | 5846  | 5986  |



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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 842.8   | 3.4       |
| 10°-20°   | 2413.1  | 9.7       |
| 20°-30°   | 3671.7  | 14.7      |
| 30°-40°   | 4464.3  | 17.9      |
| 40°-50°   | 4694.0  | 18.8      |
| 50°-60°   | 4286.1  | 17.2      |
| 60°-70°   | 2747.6  | 11.0      |
| 70°-80°   | 1297.9  | 5.2       |
| 80°-90°   | 359.9   | 1.4       |
| 90°-100°  | 95.3    | 0.4       |
| 100°-110° | 26.1    | 0.1       |
| 110°-120° | 7.2     | 0.0       |
| 120°-130° | 0.0     | 0.0       |
| 130°-140° | 0.0     | 0.0       |
| 140°-150° | 0.0     | 0.0       |
| 150°-160° | 0.0     | 0.0       |
| 160°-170° | 0.0     | 0.0       |
| 170°-180° | 0.0     | 0.0       |
| 0°-30°    | 6927.5  | 27.8      |
| 0°-40°    | 11391.8 | 45.7      |
| 0°-60°    | 20371.9 | 81.8      |
| 0°-90°    | 24777.4 | 99.5      |
| 90°-120°  | 128.6   | 0.5       |
| 90°-150°  | 128.6   | 0.5       |
| 90°-180°  | 129.0   | 0.5       |
| 0°-180°   | 24906.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 8871 | 8871  | 8871 | 8871  | 8871 |      |
| 5°   | 8788 | 8823  | 8868 | 8916  | 8935 | 836  |
| 15°  | 8522 | 8586  | 8521 | 8533  | 8539 | 2406 |
| 25°  | 7931 | 7943  | 7971 | 7984  | 7977 | 3659 |
| 35°  | 7089 | 7047  | 7128 | 7215  | 7194 | 4430 |
| 45°  | 5979 | 5968  | 6069 | 6212  | 6201 | 4621 |
| 55°  | 4685 | 4649  | 4807 | 4967  | 4980 | 4178 |
| 65°  | 3157 | 3157  | 3340 | 1916  | 1922 | 3130 |
| 75°  | 1560 | 1589  | 1032 | 1086  | 1091 | 1644 |
| 85°  | 204  | 258   | 322  | 349   | 330  | 301  |
| 90°  | 0    | 87    | 143  | 170   | 167  | 9    |
| 95°  | 5    | 45    | 103  | 139   | 139  | 3    |
| 105° | 8    | 17    | 25   | 25    | 23   | 8    |
| 115° | 8    | 11    | 16   | 11    | 2    | 5    |
| 125° | 0    | 0     | 0    | 0     | 0    | 0    |
| 135° | 0    | 0     | 0    | 0     | 0    | 0    |
| 145° | 0    | 0     | 0    | 0     | 0    | 0    |
| 155° | 0    | 0     | 0    | 0     | 0    | 0    |
| 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°     | 8870.9 | 8870.9 | 8870.9 | 8870.9 | 8870.9 |
| 2.5°   | 8808.6 | 8838.2 | 8870.9 | 8912.9 | 8936.1 |
| 5°     | 8788.3 | 8822.6 | 8867.7 | 8916.0 | 8934.7 |
| 7.5°   | 8744.8 | 8792.9 | 8836.6 | 8870.9 | 8881.8 |
| 10°    | 8690.3 | 8747.9 | 8772.8 | 8769.7 | 8761.9 |
| 12.5°  | 8617.1 | 8677.9 | 8670.2 | 8634.2 | 8640.5 |
| 15°    | 8522.2 | 8585.9 | 8520.7 | 8533.0 | 8539.3 |
| 17.5°  | 8410.1 | 8472.4 | 8396.1 | 8421.0 | 8422.6 |
| 20°    | 8279.4 | 8326.1 | 8266.9 | 8287.2 | 8287.2 |
| 22.5°  | 8122.2 | 8154.8 | 8129.9 | 8144.0 | 8147.1 |
| 25°    | 7930.7 | 7943.1 | 7971.1 | 7983.6 | 7977.3 |
| 27.5°  | 7747.1 | 7731.5 | 7786.0 | 7815.5 | 7799.9 |
| 30°    | 7543.1 | 7518.2 | 7582.0 | 7630.3 | 7611.7 |
| 32.5°  | 7309.6 | 7294.1 | 7367.3 | 7424.8 | 7413.9 |
| 35°    | 7088.6 | 7046.6 | 7127.5 | 7214.7 | 7194.4 |
| 37.5°  | 6827.1 | 6802.2 | 6894.0 | 6985.9 | 6975.0 |
| 40°    | 6571.8 | 6529.8 | 6634.1 | 6743.0 | 6732.1 |
| 42.5°  | 6297.9 | 6248.0 | 6361.7 | 6492.5 | 6480.0 |
| 45°    | 5978.7 | 5967.8 | 6069.0 | 6212.2 | 6201.3 |
| 47.5°  | 5695.6 | 5641.0 | 5782.6 | 5921.2 | 5933.7 |
| 50°    | 5352.9 | 5332.8 | 5462.0 | 5630.1 | 5642.5 |
| 52.5°  | 5018.4 | 5004.4 | 5139.7 | 5309.4 | 5331.2 |
| 55°    | 4685.2 | 4649.4 | 4806.6 | 4967.0 | 4979.5 |
| 57.5°  | 4328.9 | 4291.5 | 4451.8 | 4626.2 | 4652.6 |
| 60°    | 3947.4 | 3911.6 | 4087.5 | 4249.5 | 3379.3 |
| 62.5°  | 3566.0 | 3541.2 | 3724.9 | 2638.4 | 2126.4 |
| 65°    | 3156.7 | 3156.7 | 3340.3 | 1916.1 | 1922.4 |
| 67.5°  | 2773.9 | 2749.0 | 2490.6 | 1721.5 | 1721.5 |
| 70°    | 2362.9 | 2372.3 | 1435.1 | 1508.4 | 1509.9 |
| 72.5°  | 1950.4 | 1984.7 | 1239.1 | 1298.1 | 1301.2 |
| 75°    | 1559.6 | 1589.3 | 1032.0 | 1086.5 | 1091.1 |
| 77.5°  | 1145.7 | 881.0  | 829.6  | 871.8  | 873.3  |
| 80°    | 804.7  | 555.7  | 635.1  | 675.5  | 670.9  |
| 82.5°  | 470.0  | 389.1  | 465.4  | 495.1  | 493.4  |
| 85°    | 203.9  | 258.4  | 322.2  | 348.7  | 329.9  |
| 87.5°  | 65.3   | 160.3  | 200.7  | 216.4  | 214.7  |
| 90°    | 0.0    | 87.2   | 143.2  | 169.6  | 166.6  |
| 92.5°  | 0.0    | 68.4   | 124.6  | 155.7  | 157.2  |
| 95°    | 4.6    | 45.2   | 102.8  | 138.6  | 138.6  |
| 97.5°  | 3.1    | 32.6   | 73.2   | 108.9  | 112.1  |
| 100°   | 3.1    | 26.4   | 48.3   | 77.8   | 79.4   |
| 102.5° | 7.7    | 21.8   | 29.5   | 49.8   | 51.4   |
| 105°   | 7.7    | 17.1   | 24.9   | 24.9   | 23.4   |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°  | 22.5° | 45°  | 67.5° | 90° |
|--------|-----|-------|------|-------|-----|
| 112.5° | 9.4 | 12.5  | 17.1 | 12.5  | 1.5 |
| 115°   | 7.7 | 10.9  | 15.5 | 10.9  | 1.5 |
| 117.5° | 0.0 | 0.0   | 0.0  | 0.0   | 0.0 |
| 120°   | 0.0 | 0.0   | 0.0  | 0.0   | 0.0 |
| 122.5° | 0.0 | 0.0   | 0.0  | 0.0   | 0.0 |
| 125°   | 0.0 | 0.0   | 0.0  | 0.0   | 0.0 |
| 127.5° | 0.0 | 0.0   | 0.0  | 0.0   | 0.0 |
| 130°   | 0.0 | 0.0   | 0.0  | 0.0   | 0.0 |
| 132.5° | 0.0 | 0.0   | 0.0  | 0.0   | 0.0 |
| 135°   | 0.0 | 0.0   | 0.0  | 0.0   | 0.0 |
| 137.5° | 0.0 | 0.0   | 0.0  | 0.0   | 0.0 |
| 140°   | 0.0 | 0.0   | 0.0  | 0.0   | 0.0 |
| 142.5° | 0.0 | 0.0   | 0.0  | 0.0   | 0.0 |
| 145°   | 0.0 | 0.0   | 0.0  | 0.0   | 0.0 |
| 147.5° | 0.0 | 0.0   | 0.0  | 0.0   | 0.0 |
| 150°   | 0.0 | 0.0   | 0.0  | 0.0   | 0.0 |
| 152.5° | 0.0 | 0.0   | 0.0  | 0.0   | 0.0 |
| 155°   | 0.0 | 0.0   | 0.0  | 0.0   | 0.0 |
| 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° | 7.7 | 15.5 | 21.8 | 14.0 | 4.6 |
| 110°   | 9.4 | 14.0 | 18.6 | 12.5 | 1.5 |



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

Report Prepared for

Cooper Lighting Solutions

METALUX

Report Number: SP1-2307-100-1

Test Date: 07/27/2023

Luminaire Tested: OHB-15SE-N-UNV-L730-CD

Data in this report applies to families of products including OHB-15SE-N-UNV-L730-CD.

### Test Information

Test Method: LM-79-2019  
 Report Number: SP1-2307-100-1  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry: 4π  
 Issue Date: 08/04/2023  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: METALUX  
 Catalog Number: **OHB-15SE-N-UNV-L730-CD**  
 Description: 15000 LUMEN OHB SE LED LUMINAIRE WITH 70CRI, 3000K LEDS AND NARROW LENS

LENS

### Spectral Parameters

|                           |         |           |      |      |       |
|---------------------------|---------|-----------|------|------|-------|
| CCT (K):                  | 3069    | CRI (Ra): | 71.3 |      |       |
| CIE u':                   | 0.2485  | R1:       | 67.4 | R9:  | -35.7 |
| CIE v':                   | 0.5185  | R2:       | 83.0 | R10: | 60.6  |
| Duv:                      | -0.0010 | R3:       | 94.0 | R11: | 58.9  |
| CIE x:                    | 0.4306  | R4:       | 65.2 | R12: | 49.5  |
| CIE y:                    | 0.3993  | R5:       | 66.6 | R13: | 70.5  |
| CIE z:                    | 0.1702  | R6:       | 76.0 | R14: | 97.0  |
| Peak Wavelength (nm):     | 596     | R7:       | 76.4 |      |       |
| Dominant Wavelength (nm): | 582     | R8:       | 41.9 |      |       |
| Purity:                   | 49.5    |           |      |      |       |
| Rf:                       | 74.9    |           |      |      |       |
| Rg:                       | 92.7    |           |      |      |       |



### Test Conditions

Stabilization Time: 23M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.7/57%  
 Sphere Temperature (°C): 25.2

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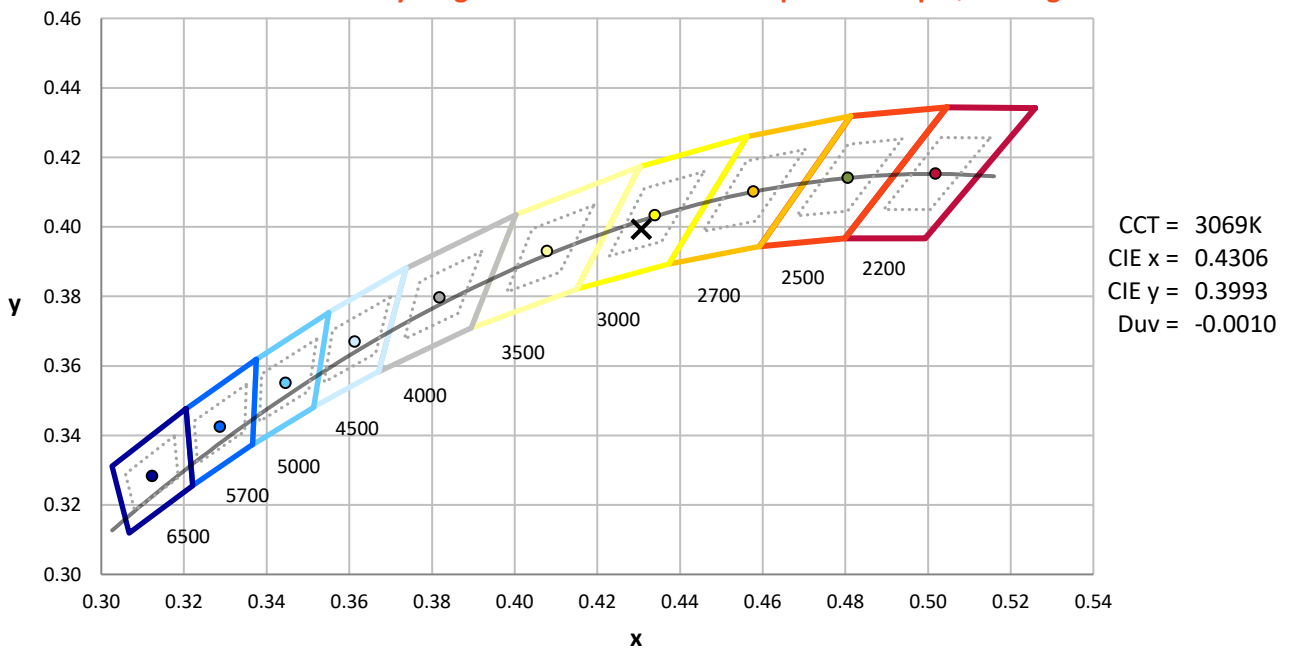
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| 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: SP1-2307-100-1

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

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**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       | 6099             | NR               | 490       | 40168            | NR               | 620       | 253019           | NR               | 750       | 11053            | NR               | 880       | 4764             | NR               |
| 365       | 5425             | NR               | 495       | 46535            | NR               | 625       | 234501           | NR               | 755       | 10436            | NR               | 885       | 4069             | NR               |
| 370       | 5467             | NR               | 500       | 57902            | NR               | 630       | 214134           | NR               | 760       | 9340             | NR               | 890       | 5470             | NR               |
| 375       | 5866             | NR               | 505       | 75040            | NR               | 635       | 194074           | NR               | 765       | 9223             | NR               | 895       | 5625             | NR               |
| 380       | 5693             | NR               | 510       | 92426            | NR               | 640       | 175837           | NR               | 770       | 7875             | NR               | 900       | 5662             | NR               |
| 385       | 5528             | NR               | 515       | 109218           | NR               | 645       | 158182           | NR               | 775       | 6995             | NR               | 905       | 4976             | NR               |
| 390       | 5323             | NR               | 520       | 124301           | NR               | 650       | 139770           | NR               | 780       | 6291             | NR               | 910       | 3243             | NR               |
| 395       | 4691             | NR               | 525       | 136616           | NR               | 655       | 124825           | NR               | 785       | 5894             | NR               | 915       | 4005             | NR               |
| 400       | 4292             | NR               | 530       | 148525           | NR               | 660       | 109765           | NR               | 790       | 5176             | NR               | 920       | 4854             | NR               |
| 405       | 4106             | NR               | 535       | 158686           | NR               | 665       | 95251            | NR               | 795       | 5191             | NR               | 925       | 3999             | NR               |
| 410       | 4555             | NR               | 540       | 170513           | NR               | 670       | 82640            | NR               | 800       | 4961             | NR               | 930       | 4856             | NR               |
| 415       | 6579             | NR               | 545       | 182793           | NR               | 675       | 71832            | NR               | 805       | 5762             | NR               | 935       | 5652             | NR               |
| 420       | 11281            | NR               | 550       | 196628           | NR               | 680       | 62184            | NR               | 810       | 5247             | NR               | 940       | 7244             | NR               |
| 425       | 19782            | NR               | 555       | 213600           | NR               | 685       | 53604            | NR               | 815       | 5570             | NR               | 945       | 6266             | NR               |
| 430       | 32934            | NR               | 560       | 232241           | NR               | 690       | 46370            | NR               | 820       | 5470             | NR               | 950       | 6258             | NR               |
| 435       | 52004            | NR               | 565       | 250545           | NR               | 695       | 40048            | NR               | 825       | 5780             | NR               | 955       | 6166             | NR               |
| 440       | 77987            | NR               | 570       | 269608           | NR               | 700       | 35148            | NR               | 830       | 4151             | NR               | 960       | 4813             | NR               |
| 445       | 117241           | NR               | 575       | 286007           | NR               | 705       | 30717            | NR               | 835       | 5899             | NR               | 965       | 6539             | NR               |
| 450       | 171397           | NR               | 580       | 300402           | NR               | 710       | 27137            | NR               | 840       | 5774             | NR               | 970       | 2930             | NR               |
| 455       | 188676           | NR               | 585       | 310093           | NR               | 715       | 24655            | NR               | 845       | 4055             | NR               | 975       | 3170             | NR               |
| 460       | 142860           | NR               | 590       | 313605           | NR               | 720       | 21845            | NR               | 850       | 4767             | NR               | 980       | 3959             | NR               |
| 465       | 100906           | NR               | 595       | 314960           | NR               | 725       | 19116            | NR               | 855       | 4780             | NR               | 985       | 6920             | NR               |
| 470       | 78130            | NR               | 600       | 311387           | NR               | 730       | 16889            | NR               | 860       | 5148             | NR               | 990       | 2710             | NR               |
| 475       | 57660            | NR               | 605       | 301618           | NR               | 735       | 14825            | NR               | 865       | 6865             | NR               | 995       | 5566             | NR               |
| 480       | 43089            | NR               | 610       | 288042           | NR               | 740       | 13154            | NR               | 870       | 5392             | NR               | 1000      | 0                | NR               |
| 485       | 38569            | NR               | 615       | 270953           | NR               | 745       | 11725            | NR               | 875       | 6166             | NR               |           |                  |                  |

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Scotopic Flux vs. Wavelength



Scotopic Lumens: 18956.8

S/P: 1.25

| 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       | 6099             | NR               | 490       | 40168            | NR               | 620       | 253019           | NR               | 750       | 11053            | NR               | 880       | 4764             | NR               |
| 365       | 5425             | NR               | 495       | 46535            | NR               | 625       | 234501           | NR               | 755       | 10436            | NR               | 885       | 4069             | NR               |
| 370       | 5467             | NR               | 500       | 57902            | NR               | 630       | 214134           | NR               | 760       | 9340             | NR               | 890       | 5470             | NR               |
| 375       | 5866             | NR               | 505       | 75040            | NR               | 635       | 194074           | NR               | 765       | 9223             | NR               | 895       | 5625             | NR               |
| 380       | 5693             | NR               | 510       | 92426            | NR               | 640       | 175837           | NR               | 770       | 7875             | NR               | 900       | 5662             | NR               |
| 385       | 5528             | NR               | 515       | 109218           | NR               | 645       | 158182           | NR               | 775       | 6995             | NR               | 905       | 4976             | NR               |
| 390       | 5323             | NR               | 520       | 124301           | NR               | 650       | 139770           | NR               | 780       | 6291             | NR               | 910       | 3243             | NR               |
| 395       | 4691             | NR               | 525       | 136616           | NR               | 655       | 124825           | NR               | 785       | 5894             | NR               | 915       | 4005             | NR               |
| 400       | 4292             | NR               | 530       | 148525           | NR               | 660       | 109765           | NR               | 790       | 5176             | NR               | 920       | 4854             | NR               |
| 405       | 4106             | NR               | 535       | 158686           | NR               | 665       | 95251            | NR               | 795       | 5191             | NR               | 925       | 3999             | NR               |
| 410       | 4555             | NR               | 540       | 170513           | NR               | 670       | 82640            | NR               | 800       | 4961             | NR               | 930       | 4856             | NR               |
| 415       | 6579             | NR               | 545       | 182793           | NR               | 675       | 71832            | NR               | 805       | 5762             | NR               | 935       | 5652             | NR               |
| 420       | 11281            | NR               | 550       | 196628           | NR               | 680       | 62184            | NR               | 810       | 5247             | NR               | 940       | 7244             | NR               |
| 425       | 19782            | NR               | 555       | 213600           | NR               | 685       | 53604            | NR               | 815       | 5570             | NR               | 945       | 6266             | NR               |
| 430       | 32934            | NR               | 560       | 232241           | NR               | 690       | 46370            | NR               | 820       | 5470             | NR               | 950       | 6258             | NR               |
| 435       | 52004            | NR               | 565       | 250545           | NR               | 695       | 40048            | NR               | 825       | 5780             | NR               | 955       | 6166             | NR               |
| 440       | 77987            | NR               | 570       | 269608           | NR               | 700       | 35148            | NR               | 830       | 4151             | NR               | 960       | 4813             | NR               |
| 445       | 117241           | NR               | 575       | 286007           | NR               | 705       | 30717            | NR               | 835       | 5899             | NR               | 965       | 6539             | NR               |
| 450       | 171397           | NR               | 580       | 300402           | NR               | 710       | 27137            | NR               | 840       | 5774             | NR               | 970       | 2930             | NR               |
| 455       | 188676           | NR               | 585       | 310093           | NR               | 715       | 24655            | NR               | 845       | 4055             | NR               | 975       | 3170             | NR               |
| 460       | 142860           | NR               | 590       | 313605           | NR               | 720       | 21845            | NR               | 850       | 4767             | NR               | 980       | 3959             | NR               |
| 465       | 100906           | NR               | 595       | 314960           | NR               | 725       | 19116            | NR               | 855       | 4780             | NR               | 985       | 6920             | NR               |
| 470       | 78130            | NR               | 600       | 311387           | NR               | 730       | 16889            | NR               | 860       | 5148             | NR               | 990       | 2710             | NR               |
| 475       | 57660            | NR               | 605       | 301618           | NR               | 735       | 14825            | NR               | 865       | 6865             | NR               | 995       | 5566             | NR               |
| 480       | 43089            | NR               | 610       | 288042           | NR               | 740       | 13154            | NR               | 870       | 5392             | NR               | 1000      | 0                | NR               |
| 485       | 38569            | NR               | 615       | 270953           | NR               | 745       | 11725            | NR               | 875       | 6166             | NR               |           |                  |                  |

REPORT NUMBER: SP1-2307-100-1

**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 7042.8**

**M/P: 0.47**

| 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       | 6099             | NR               | 490       | 40168            | NR               | 620       | 253019           | NR               | 750       | 11053            | NR               | 880       | 4764             | NR               |
| 365       | 5425             | NR               | 495       | 46535            | NR               | 625       | 234501           | NR               | 755       | 10436            | NR               | 885       | 4069             | NR               |
| 370       | 5467             | NR               | 500       | 57902            | NR               | 630       | 214134           | NR               | 760       | 9340             | NR               | 890       | 5470             | NR               |
| 375       | 5866             | NR               | 505       | 75040            | NR               | 635       | 194074           | NR               | 765       | 9223             | NR               | 895       | 5625             | NR               |
| 380       | 5693             | NR               | 510       | 92426            | NR               | 640       | 175837           | NR               | 770       | 7875             | NR               | 900       | 5662             | NR               |
| 385       | 5528             | NR               | 515       | 109218           | NR               | 645       | 158182           | NR               | 775       | 6995             | NR               | 905       | 4976             | NR               |
| 390       | 5323             | NR               | 520       | 124301           | NR               | 650       | 139770           | NR               | 780       | 6291             | NR               | 910       | 3243             | NR               |
| 395       | 4691             | NR               | 525       | 136616           | NR               | 655       | 124825           | NR               | 785       | 5894             | NR               | 915       | 4005             | NR               |
| 400       | 4292             | NR               | 530       | 148525           | NR               | 660       | 109765           | NR               | 790       | 5176             | NR               | 920       | 4854             | NR               |
| 405       | 4106             | NR               | 535       | 158686           | NR               | 665       | 95251            | NR               | 795       | 5191             | NR               | 925       | 3999             | NR               |
| 410       | 4555             | NR               | 540       | 170513           | NR               | 670       | 82640            | NR               | 800       | 4961             | NR               | 930       | 4856             | NR               |
| 415       | 6579             | NR               | 545       | 182793           | NR               | 675       | 71832            | NR               | 805       | 5762             | NR               | 935       | 5652             | NR               |
| 420       | 11281            | NR               | 550       | 196628           | NR               | 680       | 62184            | NR               | 810       | 5247             | NR               | 940       | 7244             | NR               |
| 425       | 19782            | NR               | 555       | 213600           | NR               | 685       | 53604            | NR               | 815       | 5570             | NR               | 945       | 6266             | NR               |
| 430       | 32934            | NR               | 560       | 232241           | NR               | 690       | 46370            | NR               | 820       | 5470             | NR               | 950       | 6258             | NR               |
| 435       | 52004            | NR               | 565       | 250545           | NR               | 695       | 40048            | NR               | 825       | 5780             | NR               | 955       | 6166             | NR               |
| 440       | 77987            | NR               | 570       | 269608           | NR               | 700       | 35148            | NR               | 830       | 4151             | NR               | 960       | 4813             | NR               |
| 445       | 117241           | NR               | 575       | 286007           | NR               | 705       | 30717            | NR               | 835       | 5899             | NR               | 965       | 6539             | NR               |
| 450       | 171397           | NR               | 580       | 300402           | NR               | 710       | 27137            | NR               | 840       | 5774             | NR               | 970       | 2930             | NR               |
| 455       | 188676           | NR               | 585       | 310093           | NR               | 715       | 24655            | NR               | 845       | 4055             | NR               | 975       | 3170             | NR               |
| 460       | 142860           | NR               | 590       | 313605           | NR               | 720       | 21845            | NR               | 850       | 4767             | NR               | 980       | 3959             | NR               |
| 465       | 100906           | NR               | 595       | 314960           | NR               | 725       | 19116            | NR               | 855       | 4780             | NR               | 985       | 6920             | NR               |
| 470       | 78130            | NR               | 600       | 311387           | NR               | 730       | 16889            | NR               | 860       | 5148             | NR               | 990       | 2710             | NR               |
| 475       | 57660            | NR               | 605       | 301618           | NR               | 735       | 14825            | NR               | 865       | 6865             | NR               | 995       | 5566             | NR               |
| 480       | 43089            | NR               | 610       | 288042           | NR               | 740       | 13154            | NR               | 870       | 5392             | NR               | 1000      | 0                | NR               |
| 485       | 38569            | NR               | 615       | 270953           | NR               | 745       | 11725            | NR               | 875       | 6166             | NR               |           |                  |                  |

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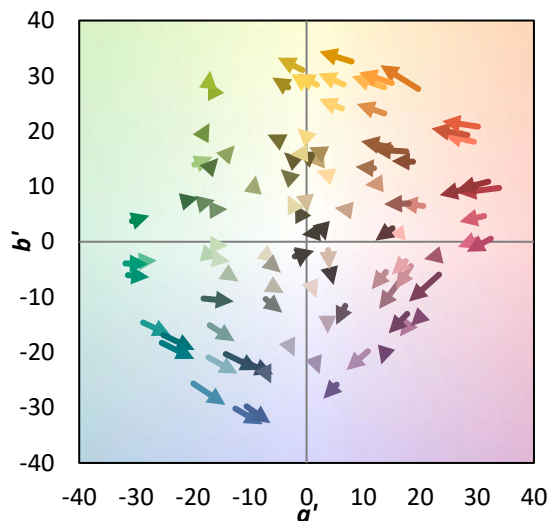
**TM-30-18**

**Summary**

$R_f = 74.9$   
 $R_g = 92.7$   
 CIE  $R_a = 71.3$   
 $R_g = -35.7$



**Color Vector Graphics**



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 67 | CES51 = 85 | CES76 = 60 |
| CES02 = 62 | CES27 = 90 | CES52 = 83 | CES77 = 76 |
| CES03 = 31 | CES28 = 85 | CES53 = 77 | CES78 = 64 |
| CES04 = 71 | CES29 = 73 | CES54 = 85 | CES79 = 86 |
| CES05 = 49 | CES30 = 90 | CES55 = 82 | CES80 = 85 |
| CES06 = 51 | CES31 = 76 | CES56 = 74 | CES81 = 72 |
| CES07 = 41 | CES32 = 67 | CES57 = 73 | CES82 = 93 |
| CES08 = 40 | CES33 = 84 | CES58 = 73 | CES83 = 92 |
| CES09 = 29 | CES34 = 77 | CES59 = 83 | CES84 = 87 |
| CES10 = 76 | CES35 = 88 | CES60 = 88 | CES85 = 74 |
| CES11 = 59 | CES36 = 89 | CES61 = 79 | CES86 = 64 |
| CES12 = 65 | CES37 = 85 | CES62 = 85 | CES87 = 77 |
| CES13 = 43 | CES38 = 98 | CES63 = 76 | CES88 = 80 |
| CES14 = 74 | CES39 = 98 | CES64 = 62 | CES89 = 67 |
| CES15 = 71 | CES40 = 94 | CES65 = 64 | CES90 = 81 |
| CES16 = 47 | CES41 = 97 | CES66 = 57 | CES91 = 76 |
| CES17 = 50 | CES42 = 88 | CES67 = 55 | CES92 = 55 |
| CES18 = 56 | CES43 = 80 | CES68 = 64 | CES93 = 72 |
| CES19 = 73 | CES44 = 99 | CES69 = 73 | CES94 = 49 |
| CES20 = 66 | CES45 = 86 | CES70 = 60 | CES95 = 66 |
| CES21 = 87 | CES46 = 83 | CES71 = 56 | CES96 = 76 |
| CES22 = 79 | CES47 = 91 | CES72 = 84 | CES97 = 81 |
| CES23 = 92 | CES48 = 76 | CES73 = 53 | CES98 = 76 |
| CES24 = 91 | CES49 = 80 | CES74 = 93 | CES99 = 64 |
| CES25 = 73 | CES50 = 85 | CES75 = 61 |            |



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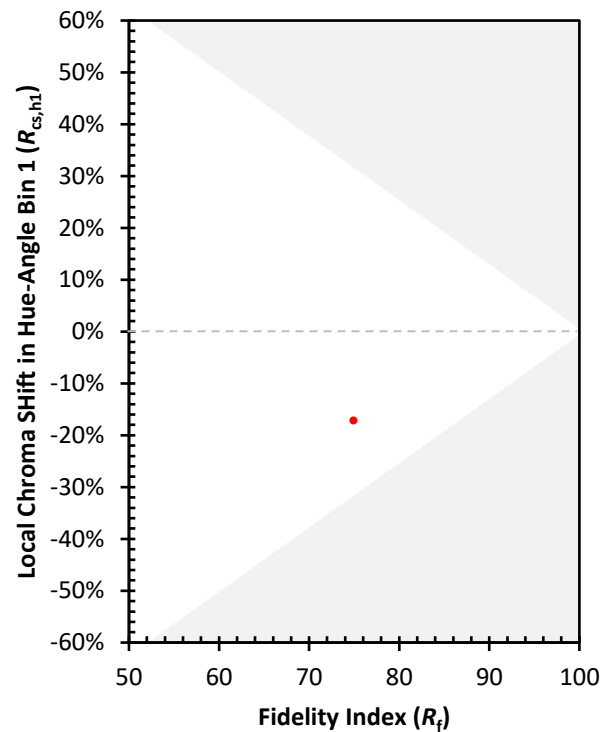
Color Rendition by Hue-Angle Bin



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**Measure Comparisons**



(END OF REPORT)