

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: P829681

Luminaire Tested: **OHBL-100SE-MCL-UNV-L940-CD**

Issue Date: 5/3/2024



**Test Information**

Test Method: LM-79-08  
Report Number: P829681  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2103-200-1)  
Test Lab: INNOVATION CENTER  
Issue Date: 5/3/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: METALUX  
Catalog Number: OHBL-100SE-MCL-UNV-L940-CD  
Description: 100000 LUMEN OHBL SE LED LUMINAIRE WITH 90CRI, 4000K LEDS AND MEDIUM CLEAR LENS  
Light Source: -  
Ballast/Driver: -

**Summary**

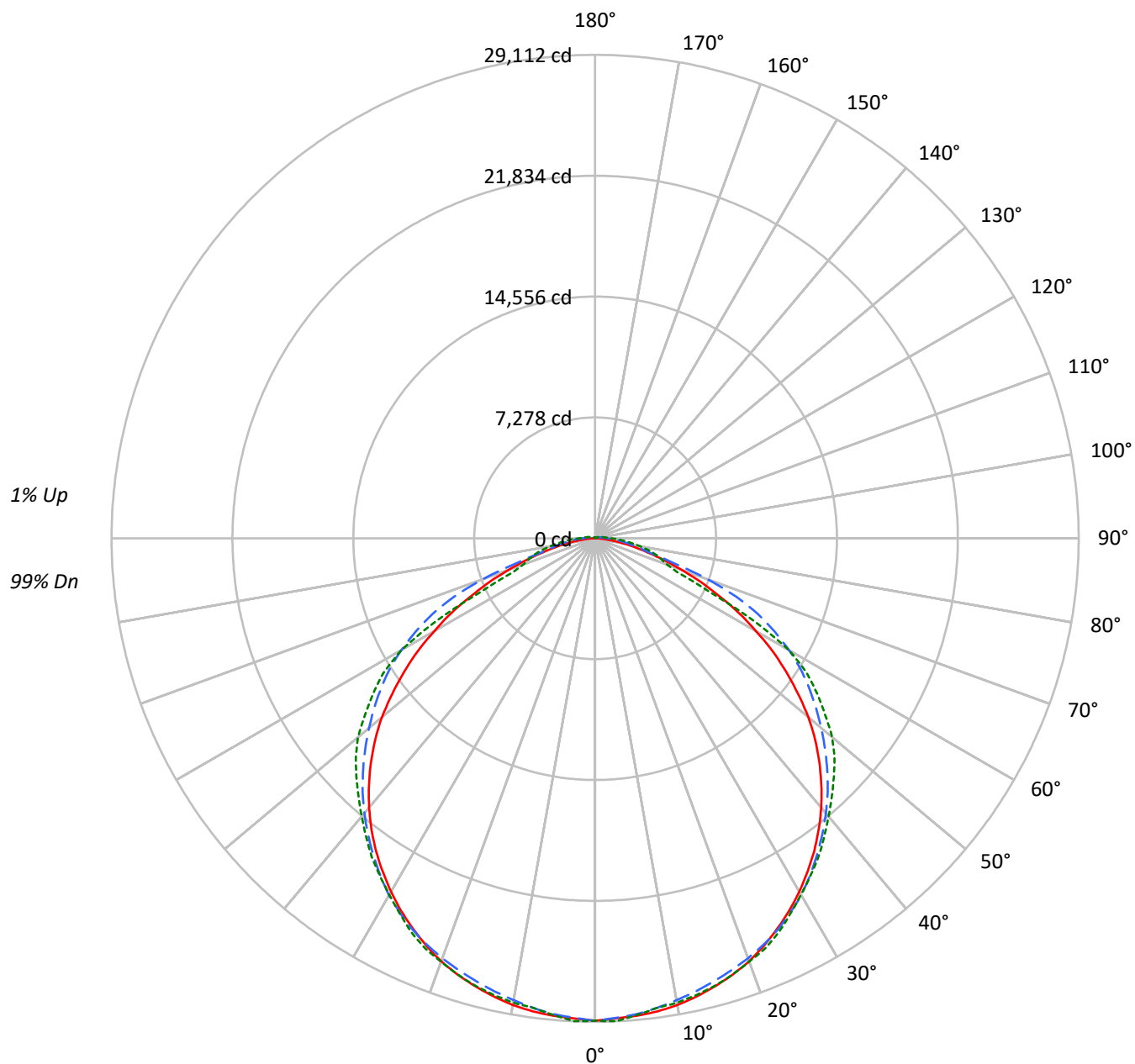
Lumens per Lamp: N/A  
Luminaire Lumens: 82116.0 lumens  
Efficiency: N/A  
Efficacy: 139.2 lumens/watt  
Spacing Criteria (0/90/45): 1.26 / 1.27 / 1.39  
Luminous Opening: Rectangular w/ Sides (W: 1.8' x L: 3.78' x H: 0.17')  
CIE Type: Direct

Input Watts (W): 590.1  
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: P829681

CATALOG NUMBER: OHBL-100SE-MCL-UNV-L940-CD

### Luminous Intensity Polar Plot





TEST NUMBER: P829681

CATALOG NUMBER: OHBL-100SE-MCL-UNV-L940-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 | 110 | 110 | 110 | 106 | 106 | 106 | 101 | 101 | 101 |    |    | 99 |
| 1   | 109 | 104 | 100 | 96  | 106 | 102 | 98  | 95  | 97  | 94  | 91  | 93  | 91  | 88  | 90  | 87  | 86  |    |    | 83 |
| 2   | 99  | 91  | 84  | 79  | 96  | 89  | 83  | 78  | 85  | 80  | 76  | 82  | 78  | 74  | 79  | 75  | 72  |    |    | 70 |
| 3   | 91  | 80  | 72  | 66  | 88  | 79  | 71  | 65  | 75  | 69  | 64  | 72  | 67  | 63  | 70  | 65  | 61  |    |    | 59 |
| 4   | 83  | 71  | 62  | 56  | 81  | 70  | 62  | 55  | 67  | 60  | 54  | 65  | 59  | 54  | 62  | 57  | 53  |    |    | 51 |
| 5   | 76  | 64  | 55  | 48  | 74  | 62  | 54  | 48  | 60  | 53  | 47  | 58  | 52  | 46  | 56  | 50  | 46  |    |    | 44 |
| 6   | 70  | 57  | 48  | 42  | 68  | 56  | 48  | 42  | 54  | 47  | 41  | 52  | 46  | 41  | 51  | 45  | 40  |    |    | 38 |
| 7   | 65  | 52  | 43  | 37  | 63  | 51  | 43  | 37  | 49  | 42  | 36  | 48  | 41  | 36  | 46  | 40  | 36  |    |    | 34 |
| 8   | 61  | 47  | 39  | 33  | 59  | 46  | 38  | 33  | 45  | 38  | 33  | 44  | 37  | 32  | 42  | 36  | 32  |    |    | 30 |
| 9   | 57  | 43  | 35  | 30  | 55  | 43  | 35  | 29  | 41  | 34  | 29  | 40  | 34  | 29  | 39  | 33  | 29  |    |    | 27 |
| 10  | 53  | 40  | 32  | 27  | 52  | 39  | 32  | 27  | 38  | 31  | 27  | 37  | 31  | 26  | 36  | 30  | 26  |    |    | 24 |

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

|     | 0°    | 45°   | 90°   |
|-----|-------|-------|-------|
| 0°  | 45946 | 45946 | 45946 |
| 5°  | 45646 | 45279 | 45374 |
| 10° | 45478 | 44593 | 44870 |
| 15° | 45190 | 44080 | 44570 |
| 20° | 44901 | 43757 | 44175 |
| 25° | 44360 | 43431 | 43784 |
| 30° | 43770 | 42919 | 42956 |
| 35° | 43066 | 42105 | 42499 |
| 40° | 42150 | 41264 | 41877 |
| 45° | 40880 | 40291 | 41602 |
| 50° | 39160 | 39184 | 41272 |
| 55° | 36427 | 38095 | 39732 |
| 60° | 32848 | 36500 | 36732 |
| 65° | 28178 | 33542 | 23279 |
| 70° | 22696 | 26184 | 16878 |
| 75° | 17016 | 15544 | 17130 |
| 80° | 11844 | 12924 | 16354 |
| 85° | 6741  | 11842 | 15330 |



TEST NUMBER: P829681

CATALOG NUMBER: OHBL-100SE-MCL-UNV-L940-CD

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 2739.4  | 3.3       |
| 10°-20°   | 7855.3  | 9.6       |
| 20°-30°   | 11997.5 | 14.6      |
| 30°-40°   | 14557.1 | 17.7      |
| 40°-50°   | 15257.3 | 18.6      |
| 50°-60°   | 13825.4 | 16.8      |
| 60°-70°   | 9269.4  | 11.3      |
| 70°-80°   | 4162.4  | 5.1       |
| 80°-90°   | 1510.5  | 1.8       |
| 90°-100°  | 454.7   | 0.6       |
| 100°-110° | 214.5   | 0.3       |
| 110°-120° | 107.5   | 0.1       |
| 120°-130° | 59.3    | 0.1       |
| 130°-140° | 40.8    | 0.0       |
| 140°-150° | 27.4    | 0.0       |
| 150°-160° | 20.4    | 0.0       |
| 160°-170° | 13.1    | 0.0       |
| 170°-180° | 4.2     | 0.0       |
| 0°-30°    | 22592.2 | 27.5      |
| 0°-40°    | 37149.4 | 45.2      |
| 0°-60°    | 66232.0 | 80.7      |
| 0°-90°    | 81174.2 | 98.9      |
| 90°-120°  | 776.7   | 0.9       |
| 90°-150°  | 904.2   | 1.1       |
| 90°-180°  | 942.0   | 1.1       |
| 0°-180°   | 82116.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°    | 22.5° | 45°   | 67.5° | 90°   | Flux  |
|------|-------|-------|-------|-------|-------|-------|
| 0°   | 29053 | 29053 | 29053 | 29053 | 29053 |       |
| 5°   | 28864 | 28964 | 28763 | 28851 | 28813 | ###   |
| 15°  | 27927 | 27818 | 27620 | 27864 | 27898 | 7885  |
| 25°  | 25944 | 25831 | 26011 | 26251 | 26175 | 11959 |
| 35°  | 22995 | 23050 | 23285 | 23533 | 23440 | 14373 |
| 45°  | 19084 | 19395 | 19756 | 20260 | 20324 | 14701 |
| 55°  | 14043 | 14720 | 15724 | 16354 | 16316 | 12535 |
| 65°  | 8242  | 9532  | 10821 | 9132  | 7456  | 8212  |
| 75°  | 3243  | 4705  | 3462  | 3541  | 3772  | 3544  |
| 85°  | 559   | 1071  | 1374  | 1659  | 1739  | 682   |
| 90°  | 4     | 357   | 710   | 891   | 933   | 33    |
| 95°  | 4     | 223   | 487   | 592   | 609   | 6     |
| 105° | 17    | 97    | 239   | 290   | 302   | 19    |
| 115° | 34    | 50    | 122   | 155   | 164   | 31    |
| 125° | 29    | 34    | 76    | 88    | 92    | 29    |
| 135° | 38    | 42    | 46    | 67    | 71    | 30    |
| 145° | 38    | 42    | 42    | 46    | 50    | 25    |
| 155° | 42    | 46    | 46    | 46    | 42    | 19    |
| 165° | 46    | 46    | 46    | 46    | 46    | 13    |
| 175° | 46    | 46    | 42    | 38    | 38    | 4     |
| 180° | 42    | 42    | 42    | 42    | 42    |       |



TEST NUMBER: P829681

CATALOG NUMBER: OHBL-100SE-MCL-UNV-L940-CD

**CANDELA DISTRIBUTION (FULL):**

|        | 0°      | 22.5°   | 45°     | 67.5°   | 90°     |
|--------|---------|---------|---------|---------|---------|
| 0°     | 29052.7 | 29052.7 | 29052.7 | 29052.7 | 29052.7 |
| 2.5°   | 28935.1 | 29056.9 | 28905.7 | 29069.5 | 29111.5 |
| 5°     | 28863.7 | 28964.5 | 28762.9 | 28851.1 | 28813.3 |
| 7.5°   | 28733.4 | 28767.1 | 28527.6 | 28599.0 | 28523.4 |
| 10°    | 28540.2 | 28523.4 | 28242.0 | 28380.6 | 28397.4 |
| 12.5°  | 28254.6 | 28204.1 | 27952.1 | 28162.1 | 28166.3 |
| 15°    | 27926.9 | 27817.7 | 27620.2 | 27863.9 | 27897.5 |
| 17.5°  | 27548.8 | 27406.0 | 27275.8 | 27590.8 | 27540.4 |
| 20°    | 27107.7 | 26939.7 | 26914.5 | 27259.0 | 27132.9 |
| 22.5°  | 26561.6 | 26431.4 | 26490.2 | 26817.9 | 26738.1 |
| 25°    | 25944.1 | 25830.7 | 26011.3 | 26250.8 | 26175.2 |
| 27.5°  | 25293.0 | 25225.8 | 25431.6 | 25616.5 | 25469.4 |
| 30°    | 24578.9 | 24541.1 | 24814.1 | 24965.3 | 24780.5 |
| 32.5°  | 23801.7 | 23814.3 | 24074.8 | 24280.6 | 24108.4 |
| 35°    | 22995.2 | 23049.8 | 23285.0 | 23532.9 | 23440.4 |
| 37.5°  | 22108.8 | 22230.6 | 22465.9 | 22747.3 | 22650.7 |
| 40°    | 21172.0 | 21348.4 | 21608.9 | 21949.2 | 21860.9 |
| 42.5°  | 20159.6 | 20382.3 | 20718.3 | 21096.4 | 21088.0 |
| 45°    | 19084.2 | 19395.1 | 19756.3 | 20260.4 | 20323.5 |
| 47.5°  | 17966.8 | 18315.5 | 18773.4 | 19445.5 | 19542.1 |
| 50°    | 16752.8 | 17189.7 | 17761.0 | 18567.5 | 18626.3 |
| 52.5°  | 15400.1 | 15996.6 | 16752.8 | 17525.7 | 17454.3 |
| 55°    | 14043.3 | 14719.6 | 15723.6 | 16353.7 | 16315.9 |
| 57.5°  | 12690.6 | 13451.0 | 14669.2 | 15118.7 | 15114.5 |
| 60°    | 11178.3 | 12140.3 | 13472.0 | 13812.2 | 13476.2 |
| 62.5°  | 9779.5  | 10812.9 | 12194.9 | 11947.1 | 10796.0 |
| 65°    | 8242.0  | 9531.6  | 10821.3 | 9132.5  | 7456.4  |
| 67.5°  | 6876.7  | 8221.0  | 9191.3  | 6255.0  | 5356.0  |
| 70°    | 5503.0  | 6985.9  | 7166.6  | 4641.9  | 4578.9  |
| 72.5°  | 4284.8  | 5864.3  | 4944.3  | 3974.0  | 4175.6  |
| 75°    | 3243.0  | 4704.9  | 3461.5  | 3541.3  | 3772.3  |
| 77.5°  | 2365.0  | 3612.7  | 2692.7  | 3104.4  | 3293.4  |
| 80°    | 1625.7  | 2558.3  | 2197.0  | 2608.7  | 2738.9  |
| 82.5°  | 1020.8  | 1688.7  | 1760.1  | 2100.4  | 2234.8  |
| 85°    | 558.7   | 1071.2  | 1373.7  | 1659.3  | 1739.1  |
| 87.5°  | 231.0   | 646.9   | 1050.2  | 1281.2  | 1348.5  |
| 90°    | 4.2     | 357.1   | 709.9   | 890.6   | 932.6   |
| 92.5°  | 4.2     | 273.1   | 579.7   | 718.3   | 747.7   |
| 95°    | 4.2     | 222.6   | 487.3   | 592.3   | 609.1   |
| 97.5°  | 8.4     | 176.4   | 407.5   | 491.5   | 508.3   |
| 100°   | 12.6    | 147.0   | 340.3   | 411.7   | 424.3   |
| 102.5° | 16.8    | 117.6   | 285.7   | 344.5   | 357.1   |
| 105°   | 16.8    | 96.6    | 239.4   | 289.9   | 302.5   |



TEST NUMBER: P829681

CATALOG NUMBER: OHBL-100SE-MCL-UNV-L940-CD

**CANDELA DISTRIBUTION (continued):**

|        | 0°   | 22.5° | 45°   | 67.5° | 90°   |
|--------|------|-------|-------|-------|-------|
| 112.5° | 29.4 | 58.8  | 142.8 | 180.6 | 189.0 |
| 115°   | 33.6 | 50.4  | 121.8 | 155.4 | 163.8 |
| 117.5° | 33.6 | 42.0  | 105.0 | 130.2 | 138.6 |
| 120°   | 33.6 | 37.8  | 92.4  | 113.4 | 117.6 |
| 122.5° | 33.6 | 33.6  | 79.8  | 100.8 | 105.0 |
| 125°   | 29.4 | 33.6  | 75.6  | 88.2  | 92.4  |
| 127.5° | 33.6 | 33.6  | 67.2  | 79.8  | 84.0  |
| 130°   | 33.6 | 37.8  | 58.8  | 75.6  | 75.6  |
| 132.5° | 37.8 | 42.0  | 54.6  | 71.4  | 71.4  |
| 135°   | 37.8 | 42.0  | 46.2  | 67.2  | 71.4  |
| 137.5° | 42.0 | 42.0  | 42.0  | 63.0  | 67.2  |
| 140°   | 42.0 | 42.0  | 37.8  | 54.6  | 58.8  |
| 142.5° | 37.8 | 42.0  | 37.8  | 50.4  | 54.6  |
| 145°   | 37.8 | 42.0  | 42.0  | 46.2  | 50.4  |
| 147.5° | 42.0 | 42.0  | 42.0  | 42.0  | 46.2  |
| 150°   | 42.0 | 42.0  | 42.0  | 42.0  | 42.0  |
| 152.5° | 42.0 | 42.0  | 42.0  | 42.0  | 42.0  |
| 155°   | 42.0 | 46.2  | 46.2  | 46.2  | 42.0  |
| 157.5° | 42.0 | 46.2  | 46.2  | 46.2  | 46.2  |
| 160°   | 42.0 | 46.2  | 46.2  | 46.2  | 46.2  |
| 162.5° | 46.2 | 46.2  | 46.2  | 46.2  | 46.2  |
| 165°   | 46.2 | 46.2  | 46.2  | 46.2  | 46.2  |
| 167.5° | 46.2 | 50.4  | 46.2  | 46.2  | 46.2  |
| 170°   | 46.2 | 46.2  | 46.2  | 42.0  | 42.0  |
| 172.5° | 46.2 | 46.2  | 46.2  | 42.0  | 42.0  |
| 175°   | 46.2 | 46.2  | 42.0  | 37.8  | 37.8  |
| 177.5° | 50.4 | 46.2  | 42.0  | 37.8  | 33.6  |
| 180°   | 42.0 | 42.0  | 42.0  | 42.0  | 42.0  |



Report Generated By 670246072 / DESKTOP-50001EG







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







|        |      |      |       |       |       |
|--------|------|------|-------|-------|-------|
| 107.5° | 21.0 | 79.8 | 205.8 | 247.8 | 256.2 |
| 110°   | 25.2 | 67.2 | 172.2 | 210.0 | 218.4 |



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

Report Prepared for

Cooper Lighting Solutions

METALUX

Report Number: SP1-2307-100-8

Test Date: 08/01/2023

Luminaire Tested: OHB-15SE-N-UNV-L940-CD

Data in this report applies to families of products including OHB-15SE-N-UNV-L940-CD.

### Test Information

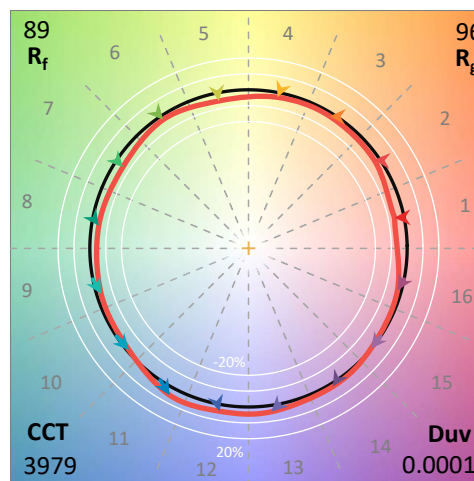
Test Method: LM-79-2019  
 Report Number: SP1-2307-100-8  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry:  $4\pi$   
 Issue Date: 08/04/2023  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: METALUX  
 Catalog Number: **OHB-15SE-N-UNV-L940-CD**  
 Description: 15000 LUMEN OHB SE LED LUMINAIRE WITH 90CRI, 4000K LEDS AND NARROW LENS

LENS

### Spectral Parameters

CCT (K): 3979  
 CIE u': 0.2254  
 CIE v': 0.5020  
 Duv: 0.0001  
 CIE x: 0.3813  
 CIE y: 0.3773  
 CIE z: 0.2414  
 Peak Wavelength (nm): 455  
 Dominant Wavelength (nm): 579  
 Purity: 27.8  
 Rf: 88.6  
 Rg: 96.2

CRI (Ra): 91.5  
 R1: 91.7  
 R2: 96.4  
 R3: 97.6  
 R4: 89.2  
 R5: 90.3  
 R6: 93.0  
 R7: 91.6  
 R8: 81.9  
 R9: 57.0  
 R10: 89.6  
 R11: 89.1  
 R12: 69.6  
 R13: 93.4  
 R14: 98.9



### Test Conditions

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

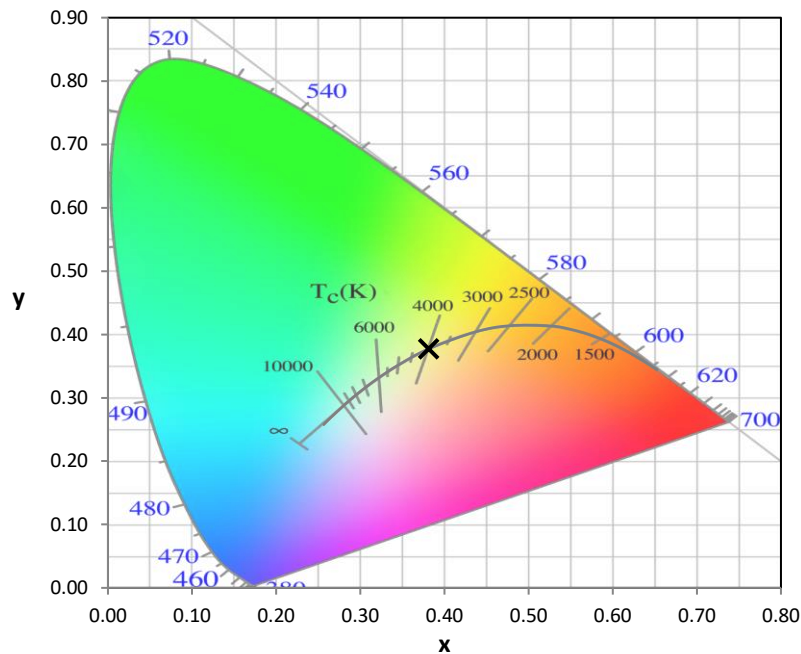


REPORT NUMBER: SP1-2307-100-8

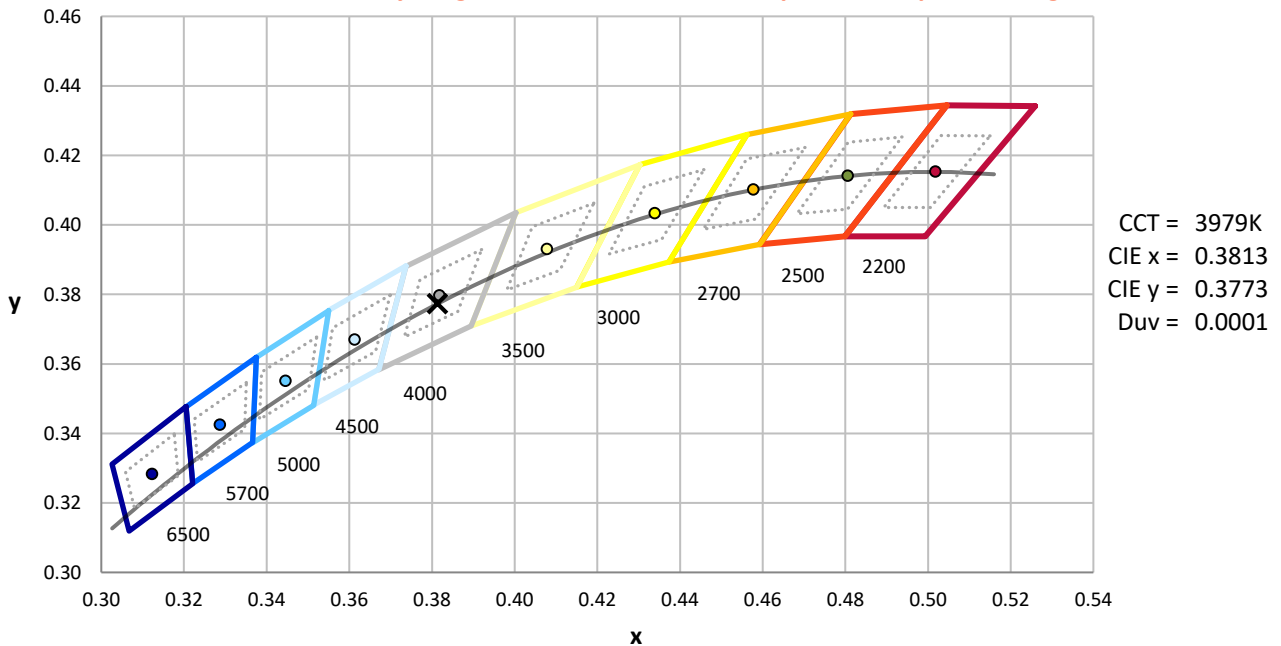
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| 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: SP1-2307-100-8

CIE 1931 Chromaticity Diagram



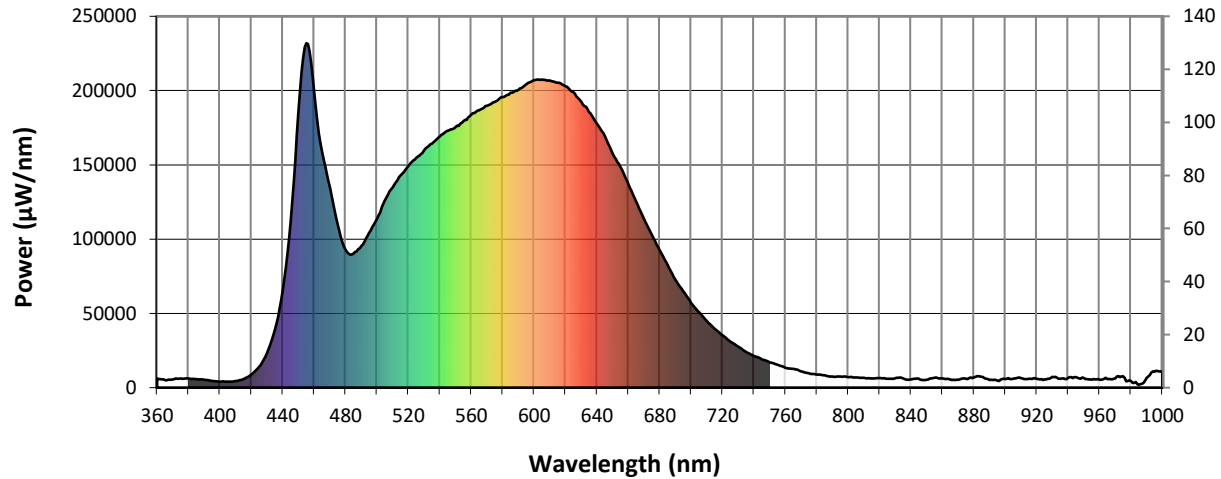
CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies inside the ANSI 4000K 4-step quadrangle

REPORT NUMBER: SP1-2307-100-8

**Photopic Flux vs. Wavelength**

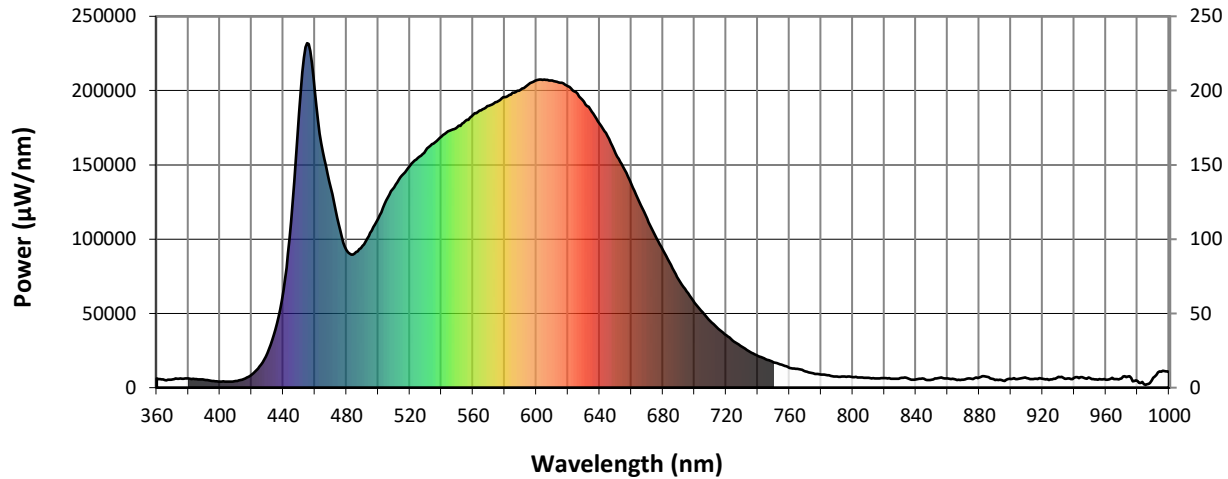


#####

| 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       | 6299             | NR               | 490       | 95290            | NR               | 620       | 202945           | NR               | 750       | 17048            | NR               | 880       | 6802             | NR               |
| 365       | 5178             | NR               | 495       | 104168           | NR               | 625       | 198934           | NR               | 755       | 15396            | NR               | 885       | 7389             | NR               |
| 370       | 5490             | NR               | 500       | 113725           | NR               | 630       | 192455           | NR               | 760       | 13359            | NR               | 890       | 5235             | NR               |
| 375       | 6104             | NR               | 505       | 126034           | NR               | 635       | 185651           | NR               | 765       | 12573            | NR               | 895       | 4778             | NR               |
| 380       | 6149             | NR               | 510       | 134848           | NR               | 640       | 177659           | NR               | 770       | 10940            | NR               | 900       | 5847             | NR               |
| 385       | 5688             | NR               | 515       | 142720           | NR               | 645       | 169230           | NR               | 775       | 9589             | NR               | 905       | 5969             | NR               |
| 390       | 5262             | NR               | 520       | 149276           | NR               | 650       | 157607           | NR               | 780       | 8802             | NR               | 910       | 6399             | NR               |
| 395       | 4581             | NR               | 525       | 154675           | NR               | 655       | 148474           | NR               | 785       | 8257             | NR               | 915       | 5912             | NR               |
| 400       | 4118             | NR               | 530       | 159852           | NR               | 660       | 137175           | NR               | 790       | 7397             | NR               | 920       | 6048             | NR               |
| 405       | 4084             | NR               | 535       | 164319           | NR               | 665       | 125124           | NR               | 795       | 7591             | NR               | 925       | 5552             | NR               |
| 410       | 4438             | NR               | 540       | 169099           | NR               | 670       | 113759           | NR               | 800       | 7116             | NR               | 930       | 7244             | NR               |
| 415       | 5782             | NR               | 545       | 173030           | NR               | 675       | 102656           | NR               | 805       | 6905             | NR               | 935       | 6076             | NR               |
| 420       | 8737             | NR               | 550       | 175415           | NR               | 680       | 92651            | NR               | 810       | 6711             | NR               | 940       | 6581             | NR               |
| 425       | 14203            | NR               | 555       | 179385           | NR               | 685       | 82728            | NR               | 815       | 6202             | NR               | 945       | 7094             | NR               |
| 430       | 23287            | NR               | 560       | 183651           | NR               | 690       | 72755            | NR               | 820       | 6421             | NR               | 950       | 6374             | NR               |
| 435       | 39198            | NR               | 565       | 186704           | NR               | 695       | 64864            | NR               | 825       | 6067             | NR               | 955       | 5408             | NR               |
| 440       | 65090            | NR               | 570       | 189735           | NR               | 700       | 57132            | NR               | 830       | 6507             | NR               | 960       | 5406             | NR               |
| 445       | 111800           | NR               | 575       | 192391           | NR               | 705       | 50899            | NR               | 835       | 6304             | NR               | 965       | 5676             | NR               |
| 450       | 185327           | NR               | 580       | 195587           | NR               | 710       | 44715            | NR               | 840       | 5605             | NR               | 970       | 6132             | NR               |
| 455       | 231910           | NR               | 585       | 198690           | NR               | 715       | 39661            | NR               | 845       | 5975             | NR               | 975       | 7732             | NR               |
| 460       | 199850           | NR               | 590       | 200528           | NR               | 720       | 35220            | NR               | 850       | 5252             | NR               | 980       | 4497             | NR               |
| 465       | 159032           | NR               | 595       | 204245           | NR               | 725       | 31033            | NR               | 855       | 6570             | NR               | 985       | 1796             | NR               |
| 470       | 134681           | NR               | 600       | 206961           | NR               | 730       | 27573            | NR               | 860       | 6167             | NR               | 990       | 6719             | NR               |
| 475       | 109873           | NR               | 605       | 207509           | NR               | 735       | 24077            | NR               | 865       | 5558             | NR               | 995       | 10730            | NR               |
| 480       | 92595            | NR               | 610       | 206751           | NR               | 740       | 21375            | NR               | 870       | 5280             | NR               | 1000      | 10317            | NR               |
| 485       | 90323            | NR               | 615       | 205233           | NR               | 745       | 19152            | NR               | 875       | 5889             | NR               |           |                  |                  |

REPORT NUMBER: SP1-2307-100-8

Scotopic Flux vs. Wavelength



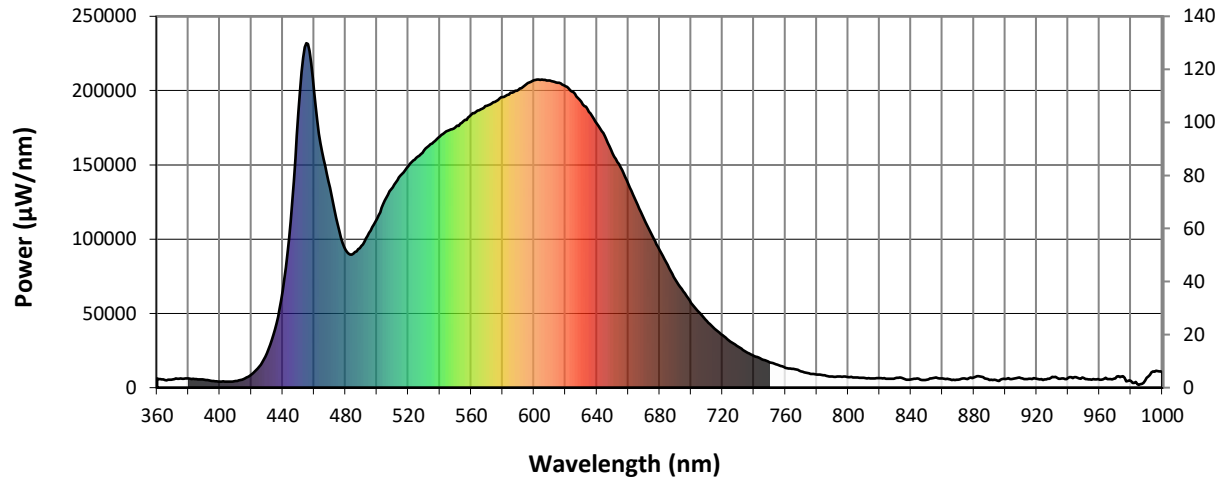
Scotopic Lumens: 22729.8

S/P: 1.79

| 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       | 6299             | NR               | 490       | 95290            | NR               | 620       | 202945           | NR               | 750       | 17048            | NR               | 880       | 6802             | NR               |
| 365       | 5178             | NR               | 495       | 104168           | NR               | 625       | 198934           | NR               | 755       | 15396            | NR               | 885       | 7389             | NR               |
| 370       | 5490             | NR               | 500       | 113725           | NR               | 630       | 192455           | NR               | 760       | 13359            | NR               | 890       | 5235             | NR               |
| 375       | 6104             | NR               | 505       | 126034           | NR               | 635       | 185651           | NR               | 765       | 12573            | NR               | 895       | 4778             | NR               |
| 380       | 6149             | NR               | 510       | 134848           | NR               | 640       | 177659           | NR               | 770       | 10940            | NR               | 900       | 5847             | NR               |
| 385       | 5688             | NR               | 515       | 142720           | NR               | 645       | 169230           | NR               | 775       | 9589             | NR               | 905       | 5969             | NR               |
| 390       | 5262             | NR               | 520       | 149276           | NR               | 650       | 157607           | NR               | 780       | 8802             | NR               | 910       | 6399             | NR               |
| 395       | 4581             | NR               | 525       | 154675           | NR               | 655       | 148474           | NR               | 785       | 8257             | NR               | 915       | 5912             | NR               |
| 400       | 4118             | NR               | 530       | 159852           | NR               | 660       | 137175           | NR               | 790       | 7397             | NR               | 920       | 6048             | NR               |
| 405       | 4084             | NR               | 535       | 164319           | NR               | 665       | 125124           | NR               | 795       | 7591             | NR               | 925       | 5552             | NR               |
| 410       | 4438             | NR               | 540       | 169099           | NR               | 670       | 113759           | NR               | 800       | 7116             | NR               | 930       | 7244             | NR               |
| 415       | 5782             | NR               | 545       | 173030           | NR               | 675       | 102656           | NR               | 805       | 6905             | NR               | 935       | 6076             | NR               |
| 420       | 8737             | NR               | 550       | 175415           | NR               | 680       | 92651            | NR               | 810       | 6711             | NR               | 940       | 6581             | NR               |
| 425       | 14203            | NR               | 555       | 179385           | NR               | 685       | 82728            | NR               | 815       | 6202             | NR               | 945       | 7094             | NR               |
| 430       | 23287            | NR               | 560       | 183651           | NR               | 690       | 72755            | NR               | 820       | 6421             | NR               | 950       | 6374             | NR               |
| 435       | 39198            | NR               | 565       | 186704           | NR               | 695       | 64864            | NR               | 825       | 6067             | NR               | 955       | 5408             | NR               |
| 440       | 65090            | NR               | 570       | 189735           | NR               | 700       | 57132            | NR               | 830       | 6507             | NR               | 960       | 5406             | NR               |
| 445       | 111800           | NR               | 575       | 192391           | NR               | 705       | 50899            | NR               | 835       | 6304             | NR               | 965       | 5676             | NR               |
| 450       | 185327           | NR               | 580       | 195587           | NR               | 710       | 44715            | NR               | 840       | 5605             | NR               | 970       | 6132             | NR               |
| 455       | 231910           | NR               | 585       | 198690           | NR               | 715       | 39661            | NR               | 845       | 5975             | NR               | 975       | 7732             | NR               |
| 460       | 199850           | NR               | 590       | 200528           | NR               | 720       | 35220            | NR               | 850       | 5252             | NR               | 980       | 4497             | NR               |
| 465       | 159032           | NR               | 595       | 204245           | NR               | 725       | 31033            | NR               | 855       | 6570             | NR               | 985       | 1796             | NR               |
| 470       | 134681           | NR               | 600       | 206961           | NR               | 730       | 27573            | NR               | 860       | 6167             | NR               | 990       | 6719             | NR               |
| 475       | 109873           | NR               | 605       | 207509           | NR               | 735       | 24077            | NR               | 865       | 5558             | NR               | 995       | 10730            | NR               |
| 480       | 92595            | NR               | 610       | 206751           | NR               | 740       | 21375            | NR               | 870       | 5280             | NR               | 1000      | 10317            | NR               |
| 485       | 90323            | NR               | 615       | 205233           | NR               | 745       | 19152            | NR               | 875       | 5889             | NR               |           |                  |                  |

REPORT NUMBER: SP1-2307-100-8

**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 9423.4**

**M/P: 0.74**

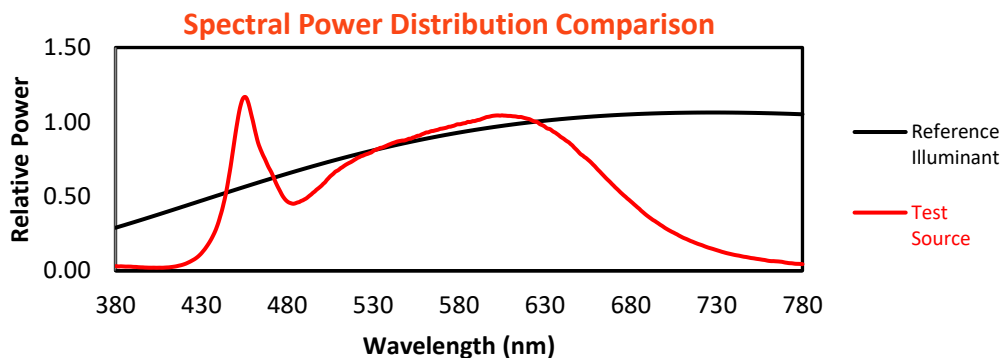
| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 6299             | NR               | 490       | 95290            | NR               | 620       | 202945           | NR               | 750       | 17048            | NR               | 880       | 6802             | NR               |
| 365       | 5178             | NR               | 495       | 104168           | NR               | 625       | 198934           | NR               | 755       | 15396            | NR               | 885       | 7389             | NR               |
| 370       | 5490             | NR               | 500       | 113725           | NR               | 630       | 192455           | NR               | 760       | 13359            | NR               | 890       | 5235             | NR               |
| 375       | 6104             | NR               | 505       | 126034           | NR               | 635       | 185651           | NR               | 765       | 12573            | NR               | 895       | 4778             | NR               |
| 380       | 6149             | NR               | 510       | 134848           | NR               | 640       | 177659           | NR               | 770       | 10940            | NR               | 900       | 5847             | NR               |
| 385       | 5688             | NR               | 515       | 142720           | NR               | 645       | 169230           | NR               | 775       | 9589             | NR               | 905       | 5969             | NR               |
| 390       | 5262             | NR               | 520       | 149276           | NR               | 650       | 157607           | NR               | 780       | 8802             | NR               | 910       | 6399             | NR               |
| 395       | 4581             | NR               | 525       | 154675           | NR               | 655       | 148474           | NR               | 785       | 8257             | NR               | 915       | 5912             | NR               |
| 400       | 4118             | NR               | 530       | 159852           | NR               | 660       | 137175           | NR               | 790       | 7397             | NR               | 920       | 6048             | NR               |
| 405       | 4084             | NR               | 535       | 164319           | NR               | 665       | 125124           | NR               | 795       | 7591             | NR               | 925       | 5552             | NR               |
| 410       | 4438             | NR               | 540       | 169099           | NR               | 670       | 113759           | NR               | 800       | 7116             | NR               | 930       | 7244             | NR               |
| 415       | 5782             | NR               | 545       | 173030           | NR               | 675       | 102656           | NR               | 805       | 6905             | NR               | 935       | 6076             | NR               |
| 420       | 8737             | NR               | 550       | 175415           | NR               | 680       | 92651            | NR               | 810       | 6711             | NR               | 940       | 6581             | NR               |
| 425       | 14203            | NR               | 555       | 179385           | NR               | 685       | 82728            | NR               | 815       | 6202             | NR               | 945       | 7094             | NR               |
| 430       | 23287            | NR               | 560       | 183651           | NR               | 690       | 72755            | NR               | 820       | 6421             | NR               | 950       | 6374             | NR               |
| 435       | 39198            | NR               | 565       | 186704           | NR               | 695       | 64864            | NR               | 825       | 6067             | NR               | 955       | 5408             | NR               |
| 440       | 65090            | NR               | 570       | 189735           | NR               | 700       | 57132            | NR               | 830       | 6507             | NR               | 960       | 5406             | NR               |
| 445       | 111800           | NR               | 575       | 192391           | NR               | 705       | 50899            | NR               | 835       | 6304             | NR               | 965       | 5676             | NR               |
| 450       | 185327           | NR               | 580       | 195587           | NR               | 710       | 44715            | NR               | 840       | 5605             | NR               | 970       | 6132             | NR               |
| 455       | 231910           | NR               | 585       | 198690           | NR               | 715       | 39661            | NR               | 845       | 5975             | NR               | 975       | 7732             | NR               |
| 460       | 199850           | NR               | 590       | 200528           | NR               | 720       | 35220            | NR               | 850       | 5252             | NR               | 980       | 4497             | NR               |
| 465       | 159032           | NR               | 595       | 204245           | NR               | 725       | 31033            | NR               | 855       | 6570             | NR               | 985       | 1796             | NR               |
| 470       | 134681           | NR               | 600       | 206961           | NR               | 730       | 27573            | NR               | 860       | 6167             | NR               | 990       | 6719             | NR               |
| 475       | 109873           | NR               | 605       | 207509           | NR               | 735       | 24077            | NR               | 865       | 5558             | NR               | 995       | 10730            | NR               |
| 480       | 92595            | NR               | 610       | 206751           | NR               | 740       | 21375            | NR               | 870       | 5280             | NR               | 1000      | 10317            | NR               |
| 485       | 90323            | NR               | 615       | 205233           | NR               | 745       | 19152            | NR               | 875       | 5889             | NR               |           |                  |                  |

REPORT NUMBER: SP1-2307-100-8

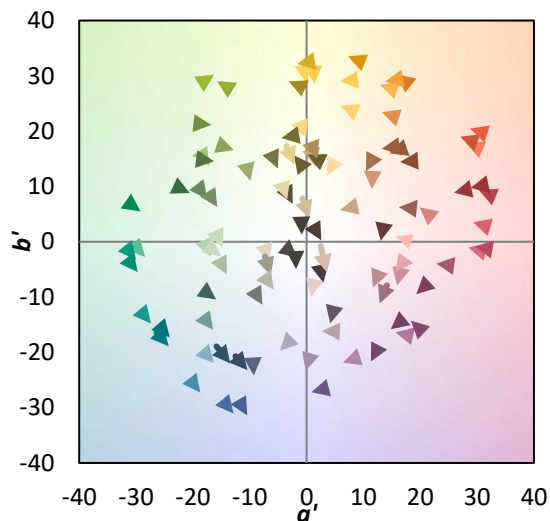
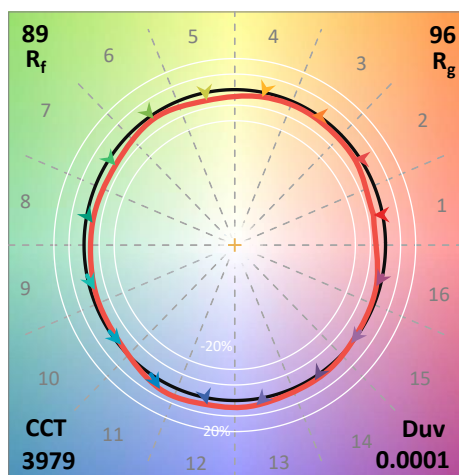
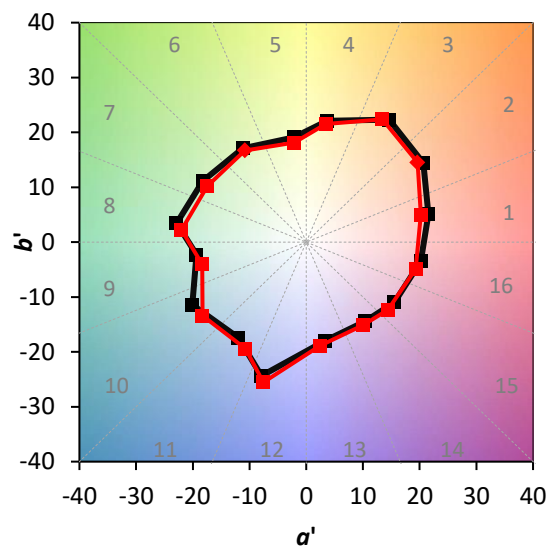
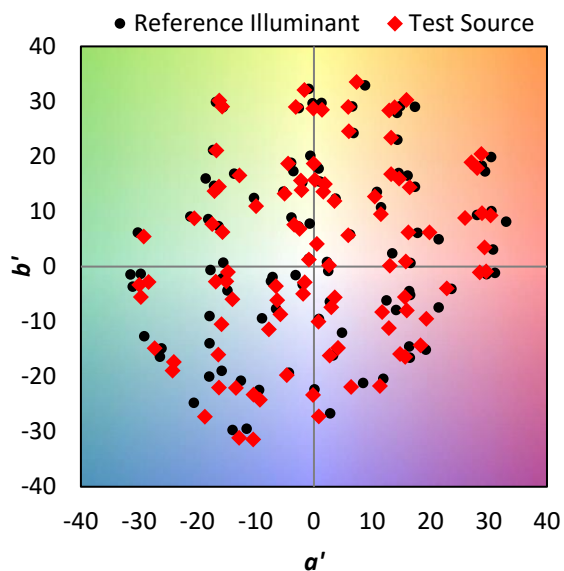
**TM-30-18**

**Summary**

$R_f = 88.6$   
 $R_g = 96.2$   
 $CIE R_a = 91.5$   
 $R_9 = 57.0$



**Color Vector Graphics**

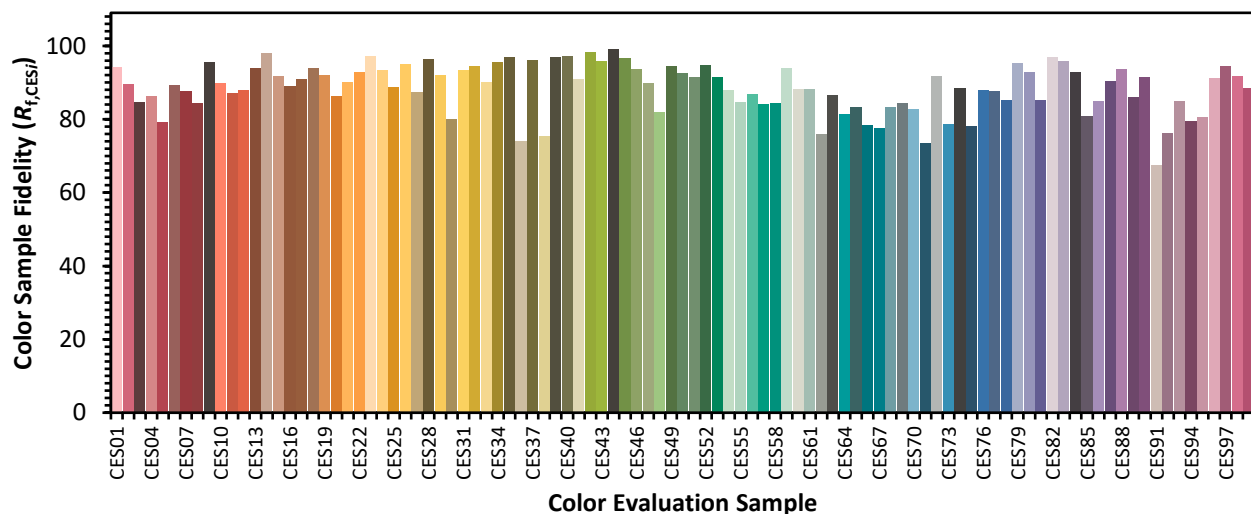


REPORT NUMBER: SP1-2307-100-8

**TM-30-18**

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

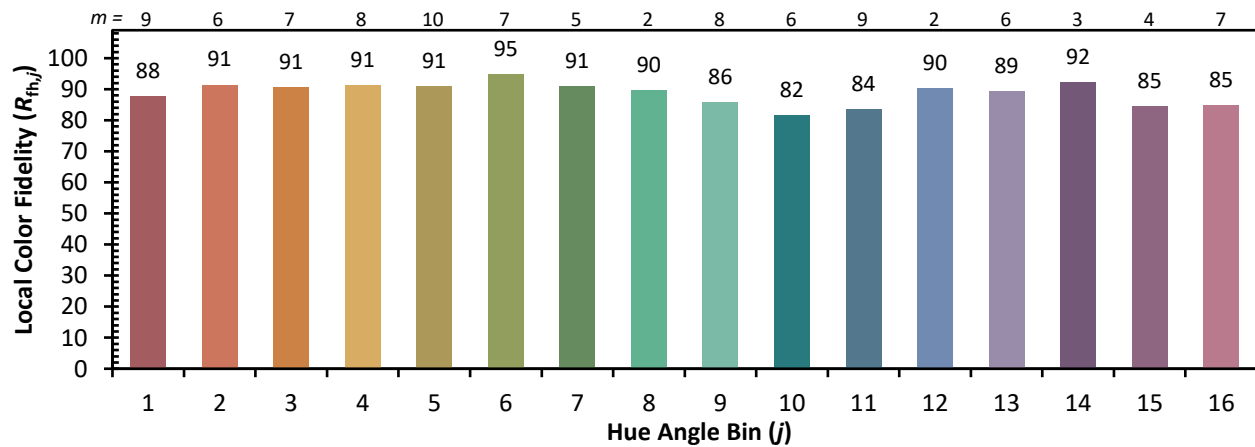
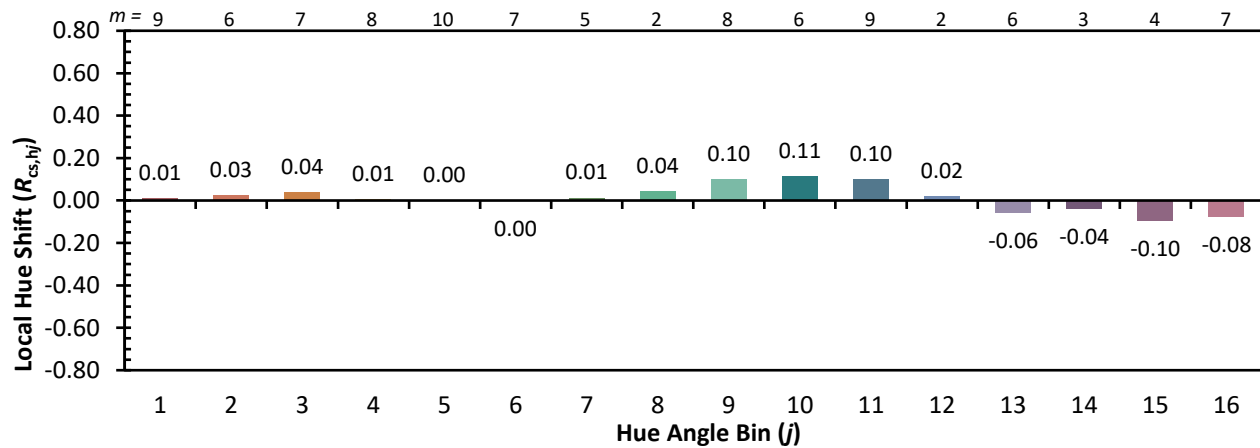
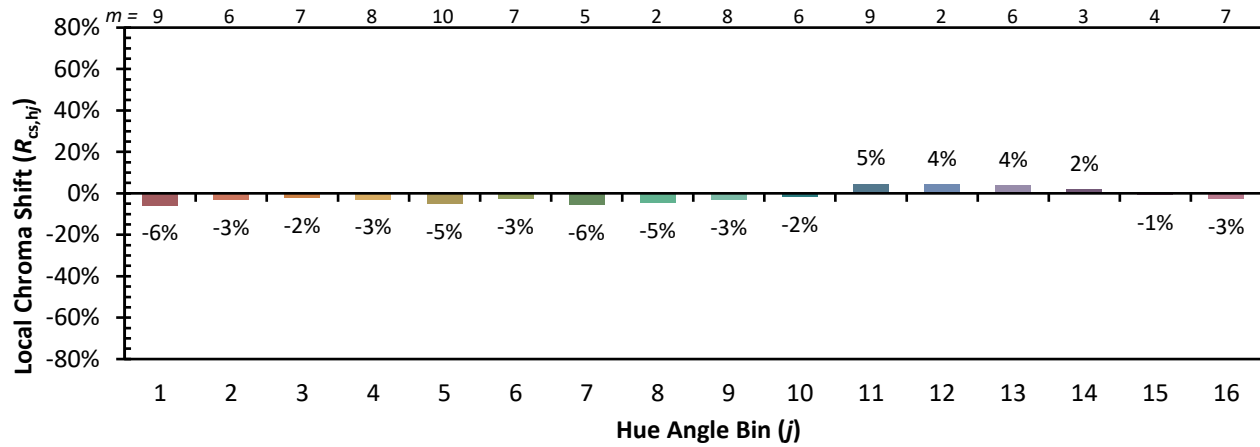
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 95 | CES51 = 92 | CES76 = 88 |
| CES02 = 62 | CES27 = 87 | CES52 = 95 | CES77 = 88 |
| CES03 = 31 | CES28 = 96 | CES53 = 92 | CES78 = 85 |
| CES04 = 69 | CES29 = 92 | CES54 = 88 | CES79 = 95 |
| CES05 = 49 | CES30 = 80 | CES55 = 85 | CES80 = 93 |
| CES06 = 50 | CES31 = 93 | CES56 = 87 | CES81 = 85 |
| CES07 = 42 | CES32 = 94 | CES57 = 84 | CES82 = 97 |
| CES08 = 41 | CES33 = 90 | CES58 = 84 | CES83 = 96 |
| CES09 = 29 | CES34 = 96 | CES59 = 94 | CES84 = 93 |
| CES10 = 74 | CES35 = 97 | CES60 = 88 | CES85 = 81 |
| CES11 = 57 | CES36 = 74 | CES61 = 88 | CES86 = 85 |
| CES12 = 63 | CES37 = 96 | CES62 = 76 | CES87 = 90 |
| CES13 = 43 | CES38 = 75 | CES63 = 86 | CES88 = 94 |
| CES14 = 74 | CES39 = 97 | CES64 = 81 | CES89 = 86 |
| CES15 = 71 | CES40 = 97 | CES65 = 83 | CES90 = 91 |
| CES16 = 47 | CES41 = 91 | CES66 = 78 | CES91 = 67 |
| CES17 = 49 | CES42 = 98 | CES67 = 78 | CES92 = 76 |
| CES18 = 56 | CES43 = 96 | CES68 = 83 | CES93 = 85 |
| CES19 = 71 | CES44 = 99 | CES69 = 84 | CES94 = 79 |
| CES20 = 66 | CES45 = 97 | CES70 = 83 | CES95 = 81 |
| CES21 = 85 | CES46 = 94 | CES71 = 74 | CES96 = 91 |
| CES22 = 78 | CES47 = 90 | CES72 = 92 | CES97 = 94 |
| CES23 = 91 | CES48 = 82 | CES73 = 79 | CES98 = 92 |
| CES24 = 90 | CES49 = 94 | CES74 = 89 | CES99 = 89 |
| CES25 = 71 | CES50 = 93 | CES75 = 78 |            |



REPORT NUMBER: SP1-2307-100-8

**TM-30-18**

Color Rendition by Hue-Angle Bin

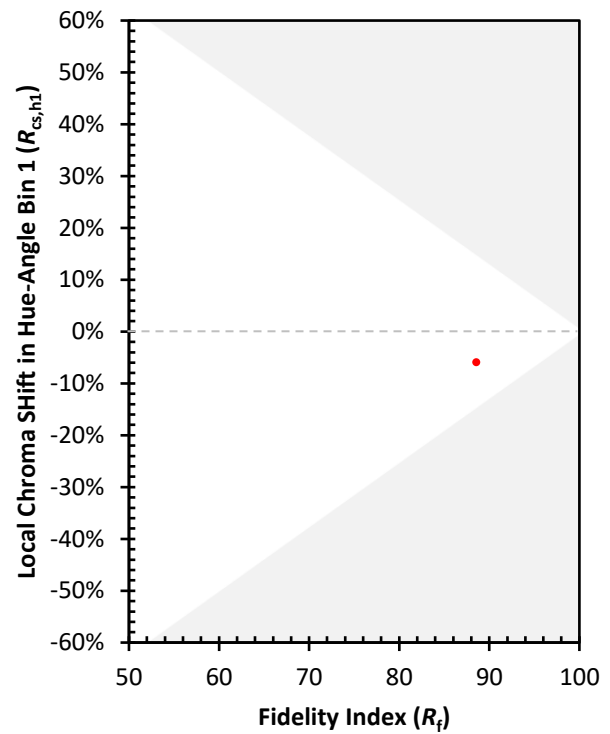
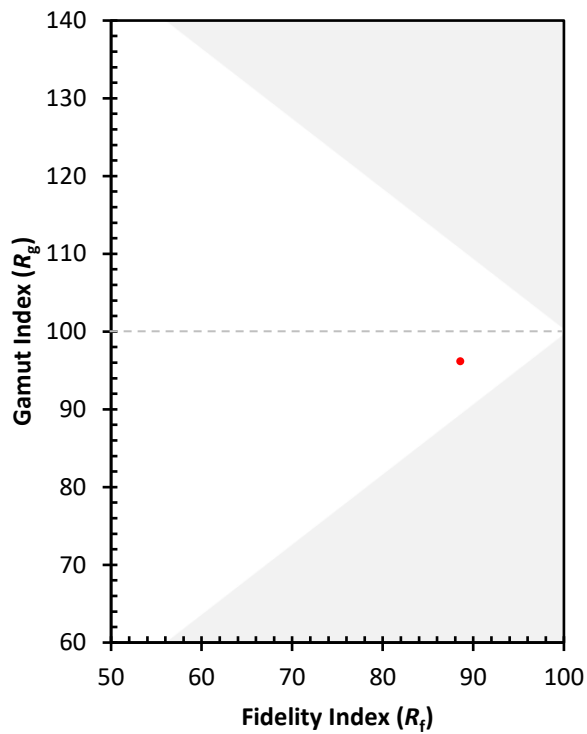




REPORT NUMBER: SP1-2307-100-8

**TM-30-18**

**Measure Comparisons**



(END OF REPORT)