

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: P830669

Luminaire Tested: **OHBL-60SE-A-UNV-L740-CD**

Issue Date: 5/3/2024



**Test Information**

Test Method: LM-79-08  
Report Number: P830669  
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-60SE-A-UNV-L740-CD  
Description: 60000 LUMEN OHBL SE LED LUMINAIRE WITH 70CRI, 4000K LEDS AND AISLE LENS  
Light Source: -  
Ballast/Driver: -

**Summary**

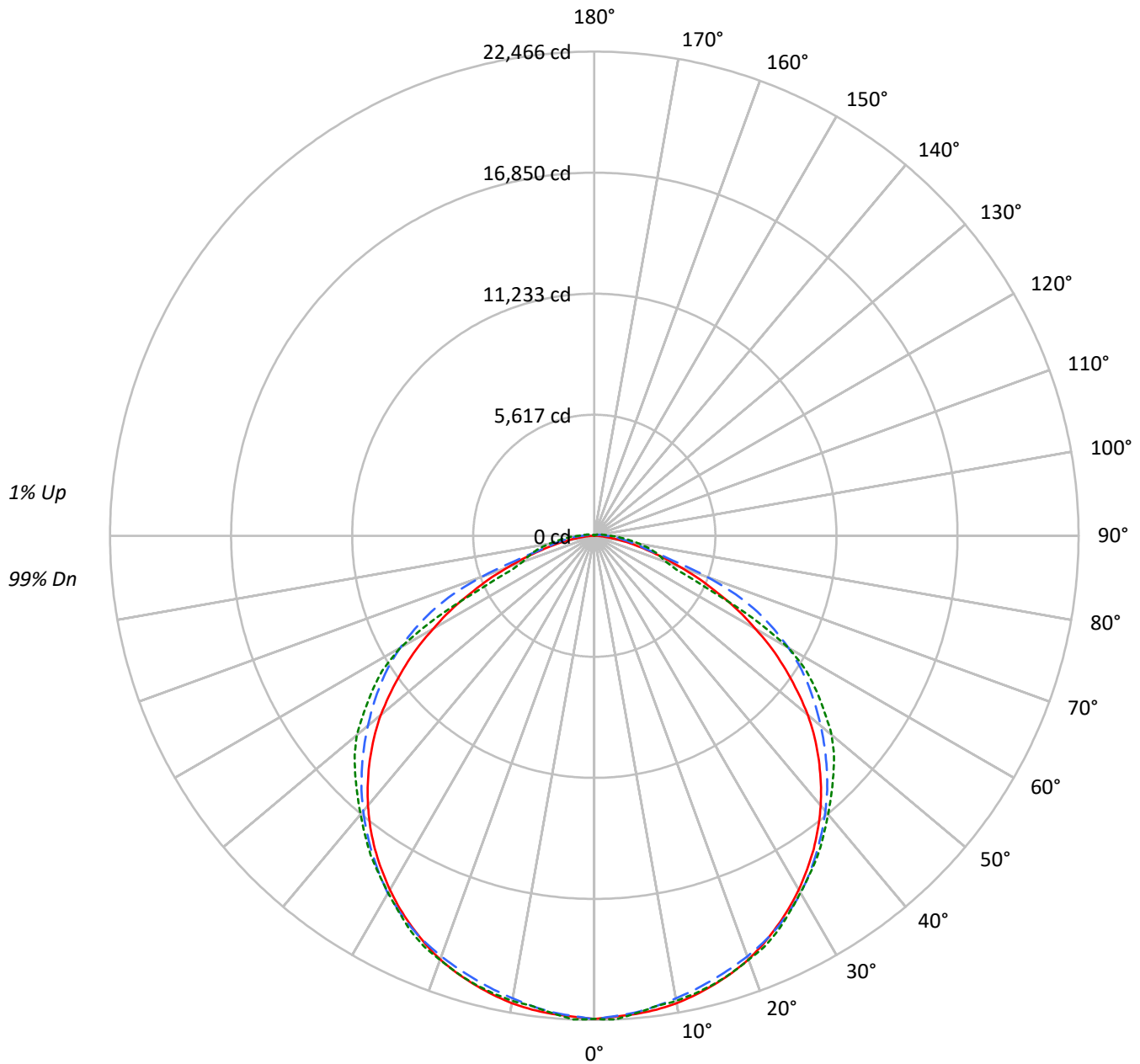
Lumens per Lamp: N/A  
Luminaire Lumens: 63370.0 lumens  
Efficiency: N/A  
Efficacy: 175.1 lumens/watt  
Spacing Criteria (0/90/45): 1.26 / 1.27 / 1.39  
Luminous Opening: Rectangular w/ Sides (W: 1.67' x L: 3.78' x H: 0.17')  
CIE Type: Direct

Input Watts (W): 362  
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: P830669

CATALOG NUMBER: OHBL-60SE-A-UNV-L740-CD

### Luminous Intensity Polar Plot





TEST NUMBER: P830669

CATALOG NUMBER: OHBL-60SE-A-UNV-L740-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   | 119 | 119 | 119 | 119 |  | 116 | 116 | 116 | 116 |  | 110 | 110 | 110 |  | 106 | 106 | 106 |  | 101 | 101 | 101 |
| 1   | 109 | 104 | 100 | 96  |  | 106 | 102 | 98  | 95  |  | 97  | 94  | 91  |  | 93  | 91  | 88  |  | 90  | 87  | 86  |
| 2   | 99  | 91  | 84  | 79  |  | 96  | 89  | 83  | 78  |  | 85  | 80  | 76  |  | 82  | 78  | 74  |  | 79  | 75  | 72  |
| 3   | 91  | 80  | 72  | 66  |  | 88  | 79  | 71  | 65  |  | 75  | 69  | 64  |  | 72  | 67  | 63  |  | 70  | 65  | 61  |
| 4   | 83  | 71  | 62  | 56  |  | 81  | 70  | 62  | 55  |  | 67  | 60  | 54  |  | 65  | 59  | 54  |  | 62  | 57  | 53  |
| 5   | 76  | 64  | 55  | 48  |  | 74  | 62  | 54  | 48  |  | 60  | 53  | 47  |  | 58  | 52  | 46  |  | 56  | 50  | 46  |
| 6   | 70  | 57  | 48  | 42  |  | 68  | 56  | 48  | 42  |  | 54  | 47  | 41  |  | 52  | 46  | 41  |  | 51  | 45  | 40  |
| 7   | 65  | 52  | 43  | 37  |  | 63  | 51  | 43  | 37  |  | 49  | 42  | 36  |  | 48  | 41  | 36  |  | 46  | 40  | 36  |
| 8   | 61  | 47  | 39  | 33  |  | 59  | 46  | 38  | 33  |  | 45  | 38  | 33  |  | 44  | 37  | 32  |  | 42  | 36  | 32  |
| 9   | 57  | 43  | 35  | 30  |  | 55  | 43  | 35  | 29  |  | 41  | 34  | 29  |  | 40  | 34  | 29  |  | 39  | 33  | 29  |
| 10  | 53  | 40  | 32  | 27  |  | 52  | 39  | 32  | 27  |  | 38  | 31  | 27  |  | 37  | 31  | 26  |  | 36  | 30  | 26  |

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

|     | 0°    | 45°   | 90°   |
|-----|-------|-------|-------|
| 0°  | 38294 | 38294 | 38294 |
| 5°  | 38043 | 37720 | 37793 |
| 10° | 37904 | 37132 | 37349 |
| 15° | 37664 | 36688 | 37075 |
| 20° | 37423 | 36402 | 36722 |
| 25° | 36971 | 36113 | 36371 |
| 30° | 36480 | 35668 | 35656 |
| 35° | 35893 | 34972 | 35249 |
| 40° | 35130 | 34252 | 34702 |
| 45° | 34072 | 33421 | 34439 |
| 50° | 32638 | 32476 | 34127 |
| 55° | 30360 | 31543 | 32808 |
| 60° | 27377 | 30187 | 30280 |
| 65° | 23485 | 27697 | 19148 |
| 70° | 18917 | 21577 | 13842 |
| 75° | 14182 | 12771 | 13989 |
| 80° | 9872  | 10569 | 13265 |
| 85° | 5619  | 9597  | 12272 |



TEST NUMBER: P830669

CATALOG NUMBER: OHBL-60SE-A-UNV-L740-CD

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 2114.0  | 3.3       |
| 10°-20°   | 6062.0  | 9.6       |
| 20°-30°   | 9258.7  | 14.6      |
| 30°-40°   | 11233.9 | 17.7      |
| 40°-50°   | 11774.2 | 18.6      |
| 50°-60°   | 10669.2 | 16.8      |
| 60°-70°   | 7153.3  | 11.3      |
| 70°-80°   | 3212.1  | 5.1       |
| 80°-90°   | 1165.7  | 1.8       |
| 90°-100°  | 350.9   | 0.6       |
| 100°-110° | 165.6   | 0.3       |
| 110°-120° | 83.0    | 0.1       |
| 120°-130° | 45.8    | 0.1       |
| 130°-140° | 31.5    | 0.0       |
| 140°-150° | 21.2    | 0.0       |
| 150°-160° | 15.7    | 0.0       |
| 160°-170° | 10.1    | 0.0       |
| 170°-180° | 3.2     | 0.0       |
| 0°-30°    | 17434.7 | 27.5      |
| 0°-40°    | 28668.7 | 45.2      |
| 0°-60°    | 51112.1 | 80.7      |
| 0°-90°    | 62643.2 | 98.9      |
| 90°-120°  | 599.4   | 0.9       |
| 90°-150°  | 697.8   | 1.1       |
| 90°-180°  | 727.0   | 1.1       |
| 0°-180°   | 63370.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°    | 22.5° | 45°   | 67.5° | 90°   | Flux  |
|------|-------|-------|-------|-------|-------|-------|
| 0°   | 22420 | 22420 | 22420 | 22420 | 22420 |       |
| 5°   | 22274 | 22352 | 22197 | 22265 | 22236 | ###   |
| 15°  | 21552 | 21467 | 21315 | 21503 | 21529 | 6085  |
| 25°  | 20021 | 19934 | 20073 | 20258 | 20200 | 9229  |
| 35°  | 17746 | 17788 | 17969 | 18161 | 18089 | 11092 |
| 45°  | 14728 | 14967 | 15246 | 15635 | 15684 | 11345 |
| 55°  | 10837 | 11359 | 12134 | 12620 | 12591 | 9674  |
| 65°  | 6360  | 7356  | 8351  | 7048  | 5754  | 6337  |
| 75°  | 2503  | 3631  | 2671  | 2733  | 2911  | 2735  |
| 85°  | 431   | 827   | 1060  | 1280  | 1342  | 526   |
| 90°  | 3     | 276   | 548   | 687   | 720   | 26    |
| 95°  | 3     | 172   | 376   | 457   | 470   | 4     |
| 105° | 13    | 75    | 185   | 224   | 233   | 15    |
| 115° | 26    | 39    | 94    | 120   | 126   | 24    |
| 125° | 23    | 26    | 58    | 68    | 71    | 23    |
| 135° | 29    | 32    | 36    | 52    | 55    | 23    |
| 145° | 29    | 32    | 32    | 36    | 39    | 19    |
| 155° | 32    | 36    | 36    | 36    | 32    | 15    |
| 165° | 36    | 36    | 36    | 36    | 36    | 10    |
| 175° | 36    | 36    | 32    | 29    | 29    | 3     |
| 180° | 32    | 32    | 32    | 32    | 32    |       |



TEST NUMBER: P830669

CATALOG NUMBER: OHBL-60SE-A-UNV-L740-CD

**CANDELA DISTRIBUTION (FULL):**

|        | 0°      | 22.5°   | 45°     | 67.5°   | 90°     |
|--------|---------|---------|---------|---------|---------|
| 0°     | 22420.4 | 22420.4 | 22420.4 | 22420.4 | 22420.4 |
| 2.5°   | 22329.6 | 22423.6 | 22306.9 | 22433.3 | 22465.7 |
| 5°     | 22274.5 | 22352.3 | 22196.7 | 22264.8 | 22235.6 |
| 7.5°   | 22174.0 | 22199.9 | 22015.1 | 22070.2 | 22011.9 |
| 10°    | 22024.9 | 22011.9 | 21794.7 | 21901.7 | 21914.6 |
| 12.5°  | 21804.4 | 21765.5 | 21571.0 | 21733.1 | 21736.3 |
| 15°    | 21551.6 | 21467.3 | 21314.9 | 21502.9 | 21528.9 |
| 17.5°  | 21259.8 | 21149.6 | 21049.1 | 21292.2 | 21253.3 |
| 20°    | 20919.4 | 20789.7 | 20770.3 | 21036.1 | 20938.9 |
| 22.5°  | 20498.0 | 20397.5 | 20442.9 | 20695.7 | 20634.1 |
| 25°    | 20021.4 | 19933.9 | 20073.3 | 20258.1 | 20199.7 |
| 27.5°  | 19518.9 | 19467.1 | 19625.9 | 19768.6 | 19655.1 |
| 30°    | 18967.8 | 18938.7 | 19149.4 | 19266.1 | 19123.4 |
| 32.5°  | 18368.1 | 18377.8 | 18578.8 | 18737.7 | 18604.7 |
| 35°    | 17745.7 | 17787.8 | 17969.4 | 18160.6 | 18089.3 |
| 37.5°  | 17061.6 | 17155.7 | 17337.2 | 17554.4 | 17479.8 |
| 40°    | 16338.7 | 16474.9 | 16675.9 | 16938.5 | 16870.4 |
| 42.5°  | 15557.4 | 15729.3 | 15988.6 | 16280.4 | 16273.9 |
| 45°    | 14727.5 | 14967.4 | 15246.2 | 15635.3 | 15683.9 |
| 47.5°  | 13865.2 | 14134.3 | 14487.6 | 15006.3 | 15080.9 |
| 50°    | 12928.3 | 13265.5 | 13706.4 | 14328.8 | 14374.2 |
| 52.5°  | 11884.5 | 12344.8 | 12928.3 | 13524.8 | 13469.7 |
| 55°    | 10837.4 | 11359.3 | 12134.1 | 12620.4 | 12591.2 |
| 57.5°  | 9793.5  | 10380.3 | 11320.4 | 11667.3 | 11664.0 |
| 60°    | 8626.5  | 9368.8  | 10396.5 | 10659.1 | 10399.7 |
| 62.5°  | 7546.9  | 8344.4  | 9411.0  | 9219.7  | 8331.5  |
| 65°    | 6360.4  | 7355.7  | 8350.9  | 7047.7  | 5754.2  |
| 67.5°  | 5306.8  | 6344.2  | 7093.1  | 4827.1  | 4133.3  |
| 70°    | 4246.8  | 5391.1  | 5530.5  | 3582.2  | 3533.6  |
| 72.5°  | 3306.6  | 4525.6  | 3815.6  | 3066.8  | 3222.4  |
| 75°    | 2502.7  | 3630.8  | 2671.3  | 2732.8  | 2911.1  |
| 77.5°  | 1825.1  | 2788.0  | 2078.0  | 2395.7  | 2541.6  |
| 80°    | 1254.6  | 1974.3  | 1695.5  | 2013.2  | 2113.7  |
| 82.5°  | 787.8   | 1303.2  | 1358.3  | 1620.9  | 1724.6  |
| 85°    | 431.2   | 826.7   | 1060.1  | 1280.5  | 1342.1  |
| 87.5°  | 178.3   | 499.2   | 810.5   | 988.8   | 1040.6  |
| 90°    | 3.2     | 275.6   | 547.9   | 687.3   | 719.7   |
| 92.5°  | 3.2     | 210.7   | 447.4   | 554.3   | 577.0   |
| 95°    | 3.2     | 171.8   | 376.0   | 457.1   | 470.1   |
| 97.5°  | 6.5     | 136.2   | 314.5   | 379.3   | 392.3   |
| 100°   | 9.7     | 113.5   | 262.6   | 317.7   | 327.4   |
| 102.5° | 13.0    | 90.8    | 220.4   | 265.8   | 275.6   |
| 105°   | 13.0    | 74.6    | 184.8   | 223.7   | 233.4   |



TEST NUMBER: P830669

CATALOG NUMBER: OHBL-60SE-A-UNV-L740-CD

**CANDELA DISTRIBUTION (continued):**

|        | 0°   | 22.5° | 45°   | 67.5° | 90°   |
|--------|------|-------|-------|-------|-------|
| 112.5° | 22.7 | 45.4  | 110.2 | 139.4 | 145.9 |
| 115°   | 25.9 | 38.9  | 94.0  | 119.9 | 126.4 |
| 117.5° | 25.9 | 32.4  | 81.0  | 100.5 | 107.0 |
| 120°   | 25.9 | 29.2  | 71.3  | 87.5  | 90.8  |
| 122.5° | 25.9 | 25.9  | 61.6  | 77.8  | 81.0  |
| 125°   | 22.7 | 25.9  | 58.4  | 68.1  | 71.3  |
| 127.5° | 25.9 | 25.9  | 51.9  | 61.6  | 64.8  |
| 130°   | 25.9 | 29.2  | 45.4  | 58.4  | 58.4  |
| 132.5° | 29.2 | 32.4  | 42.1  | 55.1  | 55.1  |
| 135°   | 29.2 | 32.4  | 35.7  | 51.9  | 55.1  |
| 137.5° | 32.4 | 32.4  | 32.4  | 48.6  | 51.9  |
| 140°   | 32.4 | 32.4  | 29.2  | 42.1  | 45.4  |
| 142.5° | 29.2 | 32.4  | 29.2  | 38.9  | 42.1  |
| 145°   | 29.2 | 32.4  | 32.4  | 35.7  | 38.9  |
| 147.5° | 32.4 | 32.4  | 32.4  | 32.4  | 35.7  |
| 150°   | 32.4 | 32.4  | 32.4  | 32.4  | 32.4  |
| 152.5° | 32.4 | 32.4  | 32.4  | 32.4  | 32.4  |
| 155°   | 32.4 | 35.7  | 35.7  | 35.7  | 32.4  |
| 157.5° | 32.4 | 35.7  | 35.7  | 35.7  | 35.7  |
| 160°   | 32.4 | 35.7  | 35.7  | 35.7  | 35.7  |
| 162.5° | 35.7 | 35.7  | 35.7  | 35.7  | 35.7  |
| 165°   | 35.7 | 35.7  | 35.7  | 35.7  | 35.7  |
| 167.5° | 35.7 | 38.9  | 35.7  | 35.7  | 35.7  |
| 170°   | 35.7 | 35.7  | 35.7  | 32.4  | 32.4  |
| 172.5° | 35.7 | 35.7  | 35.7  | 32.4  | 32.4  |
| 175°   | 35.7 | 35.7  | 32.4  | 29.2  | 29.2  |
| 177.5° | 38.9 | 35.7  | 32.4  | 29.2  | 25.9  |
| 180°   | 32.4 | 32.4  | 32.4  | 32.4  | 32.4  |



Report Generated By 670246072 / DESKTOP-50001EG





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







|        |      |      |       |       |       |
|--------|------|------|-------|-------|-------|
| 107.5° | 16.2 | 61.6 | 158.8 | 191.3 | 197.8 |
| 110°   | 19.5 | 51.9 | 132.9 | 162.1 | 168.6 |



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

Report Prepared for

Cooper Lighting Solutions

METALUX

Report Number: SP1-2307-100-3

Test Date: 08/03/2023

Luminaire Tested: OHB-15SE-N-UNV-L740-CD

Data in this report applies to families of products including OHB-15SE-N-UNV-L740-CD.

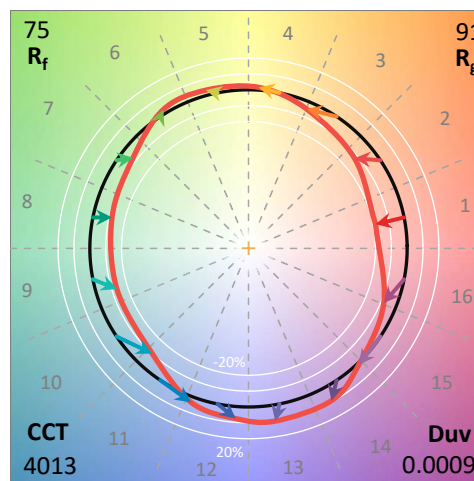
### Test Information

Test Method: LM-79-2019  
 Report Number: SP1-2307-100-3  
 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-L740-CD**  
 Description: 15000 LUMEN OHB SE LED LUMINAIRE WITH 70CRI, 4000K LEDS AND NARROW LENS

LENS

### Spectral Parameters

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 4013   | CRI (Ra): | 71.9 |      |       |
| CIE u':                   | 0.2243 | R1:       | 67.7 | R9:  | -37.4 |
| CIE v':                   | 0.5023 | R2:       | 81.2 | R10: | 55.0  |
| Duv:                      | 0.0009 | R3:       | 90.6 | R11: | 61.2  |
| CIE x:                    | 0.3803 | R4:       | 67.3 | R12: | 42.7  |
| CIE y:                    | 0.3785 | R5:       | 67.5 | R13: | 70.6  |
| CIE z:                    | 0.2412 | R6:       | 72.5 | R14: | 94.8  |
| Peak Wavelength (nm):     | 454    | R7:       | 80.1 |      |       |
| Dominant Wavelength (nm): | 578    | R8:       | 48.1 |      |       |
| Purity:                   | 27.9   |           |      |      |       |
| Rf:                       | 74.7   |           |      |      |       |
| Rg:                       | 90.6   |           |      |      |       |



### Test Conditions

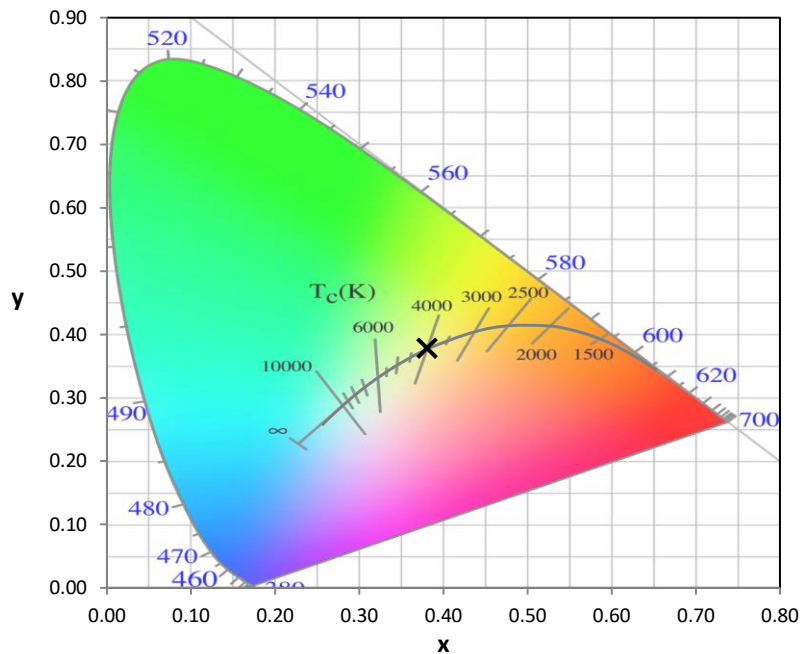
Stabilization Time: 24M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.7/58%  
 Sphere Temperature (°C): 25.2

REPORT NUMBER: SP1-2307-100-3

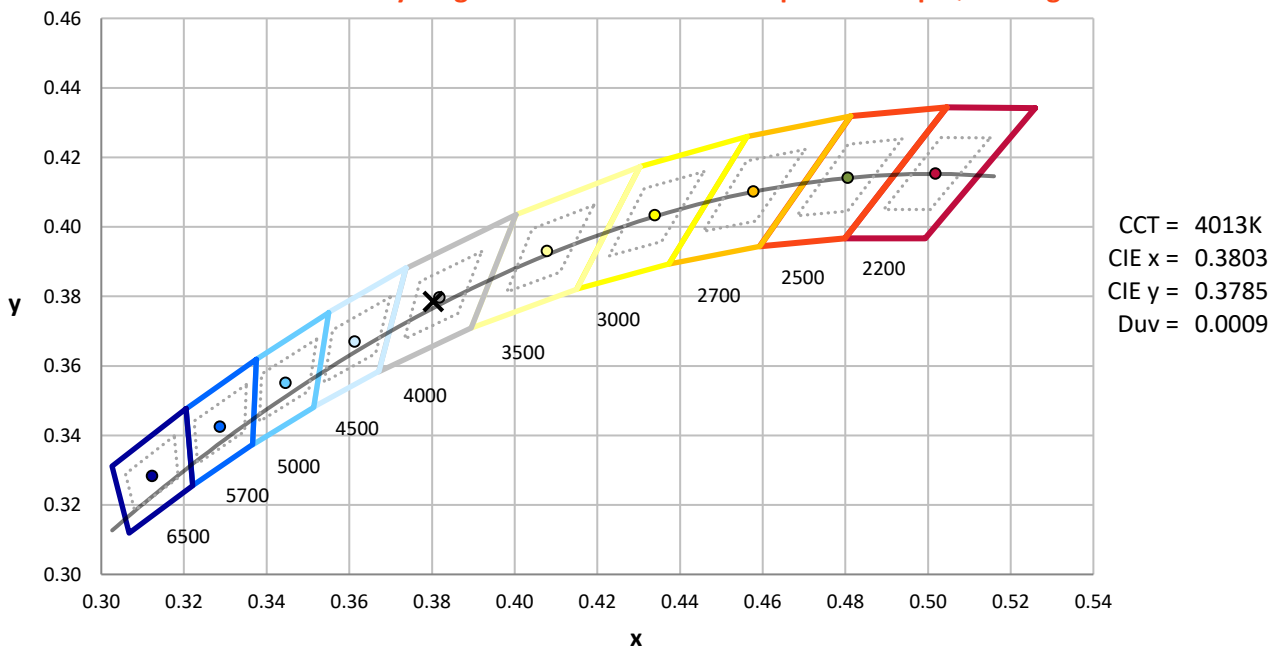
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| 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: SP1-2307-100-3

CIE 1931 Chromaticity Diagram



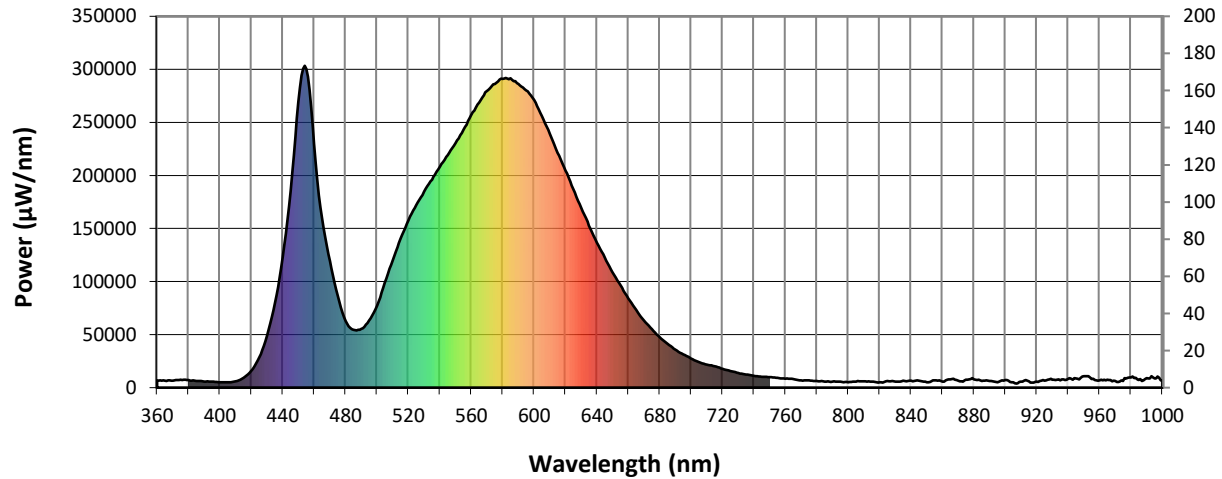
CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies inside the ANSI 4000K 4-step quadrangle

REPORT NUMBER: SP1-2307-100-3

**Photopic Flux vs. Wavelength**

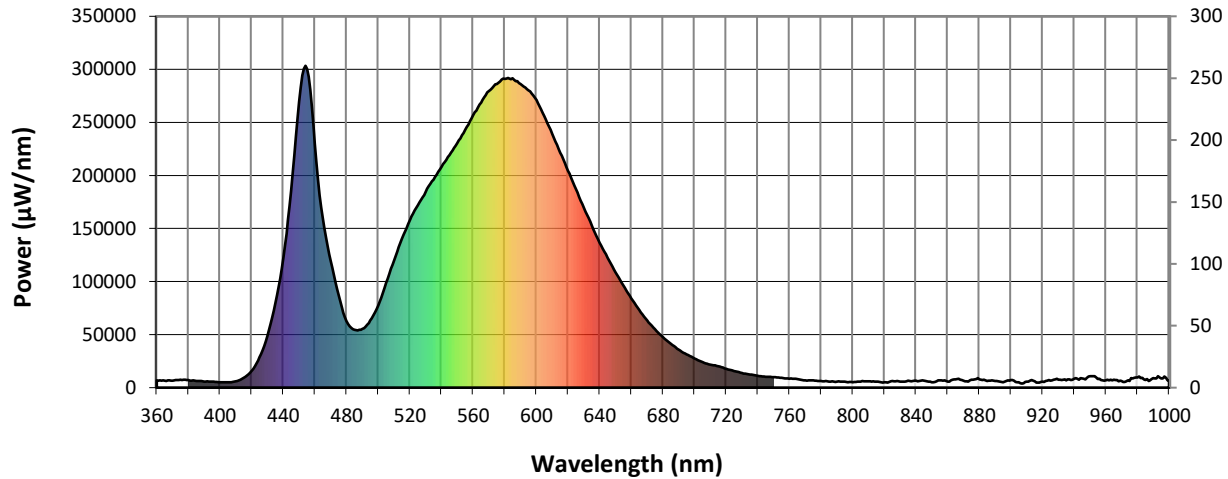


#####

| 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       | 6930             | NR               | 490       | 55345            | NR               | 620       | 204359           | NR               | 750       | 9973             | NR               | 880       | 7740             | NR               |
| 365       | 6548             | NR               | 495       | 63140            | NR               | 625       | 187136           | NR               | 755       | 9262             | NR               | 885       | 6139             | NR               |
| 370       | 6520             | NR               | 500       | 77260            | NR               | 630       | 169554           | NR               | 760       | 8423             | NR               | 890       | 6392             | NR               |
| 375       | 7463             | NR               | 505       | 98785            | NR               | 635       | 152565           | NR               | 765       | 8205             | NR               | 895       | 5061             | NR               |
| 380       | 7033             | NR               | 510       | 119863           | NR               | 640       | 136700           | NR               | 770       | 6817             | NR               | 900       | 7326             | NR               |
| 385       | 6403             | NR               | 515       | 140055           | NR               | 645       | 122449           | NR               | 775       | 6792             | NR               | 905       | 5039             | NR               |
| 390       | 5734             | NR               | 520       | 157790           | NR               | 650       | 108580           | NR               | 780       | 6216             | NR               | 910       | 5717             | NR               |
| 395       | 5717             | NR               | 525       | 171938           | NR               | 655       | 96370            | NR               | 785       | 5732             | NR               | 915       | 5977             | NR               |
| 400       | 4977             | NR               | 530       | 184920           | NR               | 660       | 84194            | NR               | 790       | 5647             | NR               | 920       | 5766             | NR               |
| 405       | 5006             | NR               | 535       | 196020           | NR               | 665       | 73166            | NR               | 795       | 5584             | NR               | 925       | 6611             | NR               |
| 410       | 5959             | NR               | 540       | 208194           | NR               | 670       | 63358            | NR               | 800       | 5174             | NR               | 930       | 7338             | NR               |
| 415       | 9179             | NR               | 545       | 219324           | NR               | 675       | 55149            | NR               | 805       | 5757             | NR               | 935       | 6930             | NR               |
| 420       | 15787            | NR               | 550       | 230377           | NR               | 680       | 47533            | NR               | 810       | 6012             | NR               | 940       | 8242             | NR               |
| 425       | 28518            | NR               | 555       | 242973           | NR               | 685       | 41350            | NR               | 815       | 5577             | NR               | 945       | 8766             | NR               |
| 430       | 48907            | NR               | 560       | 256802           | NR               | 690       | 35841            | NR               | 820       | 5086             | NR               | 950       | 10931            | NR               |
| 435       | 79961            | NR               | 565       | 268752           | NR               | 695       | 31197            | NR               | 825       | 6404             | NR               | 955       | 8190             | NR               |
| 440       | 122565           | NR               | 570       | 279406           | NR               | 700       | 27528            | NR               | 830       | 5767             | NR               | 960       | 6809             | NR               |
| 445       | 185397           | NR               | 575       | 286045           | NR               | 705       | 24001            | NR               | 835       | 6610             | NR               | 965       | 7570             | NR               |
| 450       | 269609           | NR               | 580       | 291082           | NR               | 710       | 21755            | NR               | 840       | 6428             | NR               | 970       | 6365             | NR               |
| 455       | 300483           | NR               | 585       | 291620           | NR               | 715       | 20058            | NR               | 845       | 6469             | NR               | 975       | 6203             | NR               |
| 460       | 229777           | NR               | 590       | 286117           | NR               | 720       | 17690            | NR               | 850       | 5020             | NR               | 980       | 9515             | NR               |
| 465       | 159722           | NR               | 595       | 280083           | NR               | 725       | 15738            | NR               | 855       | 6786             | NR               | 985       | 7323             | NR               |
| 470       | 119038           | NR               | 600       | 270967           | NR               | 730       | 13744            | NR               | 860       | 5776             | NR               | 990       | 9023             | NR               |
| 475       | 86663            | NR               | 605       | 255964           | NR               | 735       | 12435            | NR               | 865       | 7909             | NR               | 995       | 8813             | NR               |
| 480       | 62772            | NR               | 610       | 239107           | NR               | 740       | 11118            | NR               | 870       | 6451             | NR               | 1000      | 6436             | NR               |
| 485       | 54561            | NR               | 615       | 221194           | NR               | 745       | 10318            | NR               | 875       | 7611             | NR               |           |                  |                  |

REPORT NUMBER: SP1-2307-100-3

Scotopic Flux vs. Wavelength



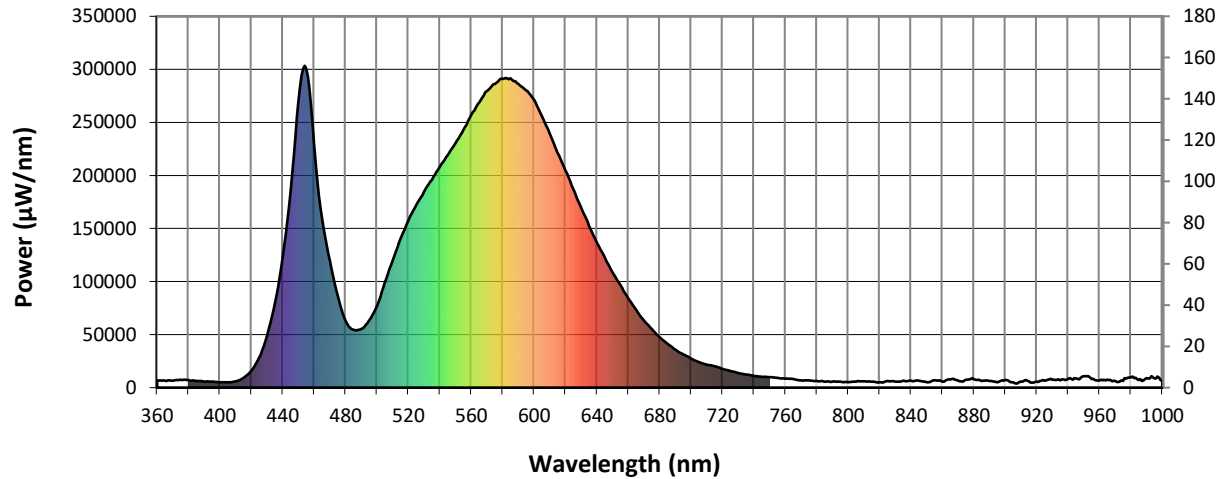
Scotopic Lumens: 24452.5

S/P: 1.56

| 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       | 6930             | NR               | 490       | 55345            | NR               | 620       | 204359           | NR               | 750       | 9973             | NR               | 880       | 7740             | NR               |
| 365       | 6548             | NR               | 495       | 63140            | NR               | 625       | 187136           | NR               | 755       | 9262             | NR               | 885       | 6139             | NR               |
| 370       | 6520             | NR               | 500       | 77260            | NR               | 630       | 169554           | NR               | 760       | 8423             | NR               | 890       | 6392             | NR               |
| 375       | 7463             | NR               | 505       | 98785            | NR               | 635       | 152565           | NR               | 765       | 8205             | NR               | 895       | 5061             | NR               |
| 380       | 7033             | NR               | 510       | 119863           | NR               | 640       | 136700           | NR               | 770       | 6817             | NR               | 900       | 7326             | NR               |
| 385       | 6403             | NR               | 515       | 140055           | NR               | 645       | 122449           | NR               | 775       | 6792             | NR               | 905       | 5039             | NR               |
| 390       | 5734             | NR               | 520       | 157790           | NR               | 650       | 108580           | NR               | 780       | 6216             | NR               | 910       | 5717             | NR               |
| 395       | 5717             | NR               | 525       | 171938           | NR               | 655       | 96370            | NR               | 785       | 5732             | NR               | 915       | 5977             | NR               |
| 400       | 4977             | NR               | 530       | 184920           | NR               | 660       | 84194            | NR               | 790       | 5647             | NR               | 920       | 5766             | NR               |
| 405       | 5006             | NR               | 535       | 196020           | NR               | 665       | 73166            | NR               | 795       | 5584             | NR               | 925       | 6611             | NR               |
| 410       | 5959             | NR               | 540       | 208194           | NR               | 670       | 63358            | NR               | 800       | 5174             | NR               | 930       | 7338             | NR               |
| 415       | 9179             | NR               | 545       | 219324           | NR               | 675       | 55149            | NR               | 805       | 5757             | NR               | 935       | 6930             | NR               |
| 420       | 15787            | NR               | 550       | 230377           | NR               | 680       | 47533            | NR               | 810       | 6012             | NR               | 940       | 8242             | NR               |
| 425       | 28518            | NR               | 555       | 242973           | NR               | 685       | 41350            | NR               | 815       | 5577             | NR               | 945       | 8766             | NR               |
| 430       | 48907            | NR               | 560       | 256802           | NR               | 690       | 35841            | NR               | 820       | 5086             | NR               | 950       | 10931            | NR               |
| 435       | 79961            | NR               | 565       | 268752           | NR               | 695       | 31197            | NR               | 825       | 6404             | NR               | 955       | 8190             | NR               |
| 440       | 122565           | NR               | 570       | 279406           | NR               | 700       | 27528            | NR               | 830       | 5767             | NR               | 960       | 6809             | NR               |
| 445       | 185397           | NR               | 575       | 286045           | NR               | 705       | 24001            | NR               | 835       | 6610             | NR               | 965       | 7570             | NR               |
| 450       | 269609           | NR               | 580       | 291082           | NR               | 710       | 21755            | NR               | 840       | 6428             | NR               | 970       | 6365             | NR               |
| 455       | 300483           | NR               | 585       | 291620           | NR               | 715       | 20058            | NR               | 845       | 6469             | NR               | 975       | 6203             | NR               |
| 460       | 229777           | NR               | 590       | 286117           | NR               | 720       | 17690            | NR               | 850       | 5020             | NR               | 980       | 9515             | NR               |
| 465       | 159722           | NR               | 595       | 280083           | NR               | 725       | 15738            | NR               | 855       | 6786             | NR               | 985       | 7323             | NR               |
| 470       | 119038           | NR               | 600       | 270967           | NR               | 730       | 13744            | NR               | 860       | 5776             | NR               | 990       | 9023             | NR               |
| 475       | 86663            | NR               | 605       | 255964           | NR               | 735       | 12435            | NR               | 865       | 7909             | NR               | 995       | 8813             | NR               |
| 480       | 62772            | NR               | 610       | 239107           | NR               | 740       | 11118            | NR               | 870       | 6451             | NR               | 1000      | 6436             | NR               |
| 485       | 54561            | NR               | 615       | 221194           | NR               | 745       | 10318            | NR               | 875       | 7611             | NR               |           |                  |                  |

REPORT NUMBER: SP1-2307-100-3

**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 9678.5**

**M/P: 0.62**

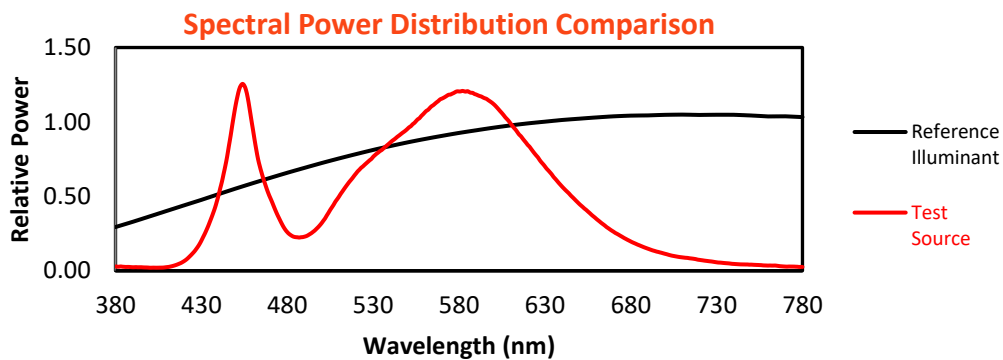
| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 6930             | NR               | 490       | 55345            | NR               | 620       | 204359           | NR               | 750       | 9973             | NR               | 880       | 7740             | NR               |
| 365       | 6548             | NR               | 495       | 63140            | NR               | 625       | 187136           | NR               | 755       | 9262             | NR               | 885       | 6139             | NR               |
| 370       | 6520             | NR               | 500       | 77260            | NR               | 630       | 169554           | NR               | 760       | 8423             | NR               | 890       | 6392             | NR               |
| 375       | 7463             | NR               | 505       | 98785            | NR               | 635       | 152565           | NR               | 765       | 8205             | NR               | 895       | 5061             | NR               |
| 380       | 7033             | NR               | 510       | 119863           | NR               | 640       | 136700           | NR               | 770       | 6817             | NR               | 900       | 7326             | NR               |
| 385       | 6403             | NR               | 515       | 140055           | NR               | 645       | 122449           | NR               | 775       | 6792             | NR               | 905       | 5039             | NR               |
| 390       | 5734             | NR               | 520       | 157790           | NR               | 650       | 108580           | NR               | 780       | 6216             | NR               | 910       | 5717             | NR               |
| 395       | 5717             | NR               | 525       | 171938           | NR               | 655       | 96370            | NR               | 785       | 5732             | NR               | 915       | 5977             | NR               |
| 400       | 4977             | NR               | 530       | 184920           | NR               | 660       | 84194            | NR               | 790       | 5647             | NR               | 920       | 5766             | NR               |
| 405       | 5006             | NR               | 535       | 196020           | NR               | 665       | 73166            | NR               | 795       | 5584             | NR               | 925       | 6611             | NR               |
| 410       | 5959             | NR               | 540       | 208194           | NR               | 670       | 63358            | NR               | 800       | 5174             | NR               | 930       | 7338             | NR               |
| 415       | 9179             | NR               | 545       | 219324           | NR               | 675       | 55149            | NR               | 805       | 5757             | NR               | 935       | 6930             | NR               |
| 420       | 15787            | NR               | 550       | 230377           | NR               | 680       | 47533            | NR               | 810       | 6012             | NR               | 940       | 8242             | NR               |
| 425       | 28518            | NR               | 555       | 242973           | NR               | 685       | 41350            | NR               | 815       | 5577             | NR               | 945       | 8766             | NR               |
| 430       | 48907            | NR               | 560       | 256802           | NR               | 690       | 35841            | NR               | 820       | 5086             | NR               | 950       | 10931            | NR               |
| 435       | 79961            | NR               | 565       | 268752           | NR               | 695       | 31197            | NR               | 825       | 6404             | NR               | 955       | 8190             | NR               |
| 440       | 122565           | NR               | 570       | 279406           | NR               | 700       | 27528            | NR               | 830       | 5767             | NR               | 960       | 6809             | NR               |
| 445       | 185397           | NR               | 575       | 286045           | NR               | 705       | 24001            | NR               | 835       | 6610             | NR               | 965       | 7570             | NR               |
| 450       | 269609           | NR               | 580       | 291082           | NR               | 710       | 21755            | NR               | 840       | 6428             | NR               | 970       | 6365             | NR               |
| 455       | 300483           | NR               | 585       | 291620           | NR               | 715       | 20058            | NR               | 845       | 6469             | NR               | 975       | 6203             | NR               |
| 460       | 229777           | NR               | 590       | 286117           | NR               | 720       | 17690            | NR               | 850       | 5020             | NR               | 980       | 9515             | NR               |
| 465       | 159722           | NR               | 595       | 280083           | NR               | 725       | 15738            | NR               | 855       | 6786             | NR               | 985       | 7323             | NR               |
| 470       | 119038           | NR               | 600       | 270967           | NR               | 730       | 13744            | NR               | 860       | 5776             | NR               | 990       | 9023             | NR               |
| 475       | 86663            | NR               | 605       | 255964           | NR               | 735       | 12435            | NR               | 865       | 7909             | NR               | 995       | 8813             | NR               |
| 480       | 62772            | NR               | 610       | 239107           | NR               | 740       | 11118            | NR               | 870       | 6451             | NR               | 1000      | 6436             | NR               |
| 485       | 54561            | NR               | 615       | 221194           | NR               | 745       | 10318            | NR               | 875       | 7611             | NR               |           |                  |                  |

REPORT NUMBER: SP1-2307-100-3

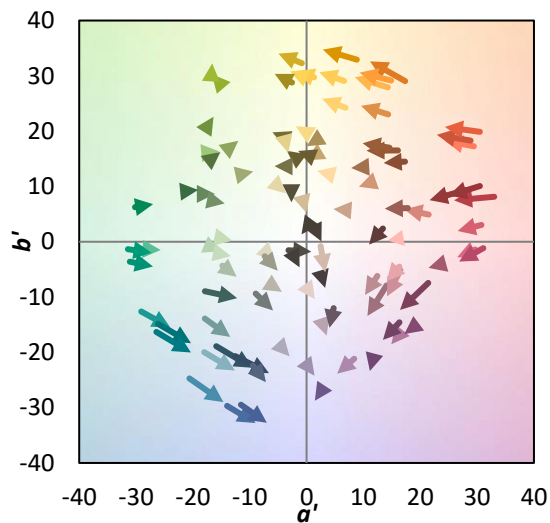
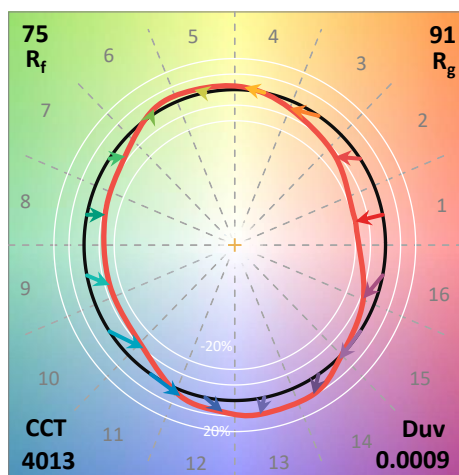
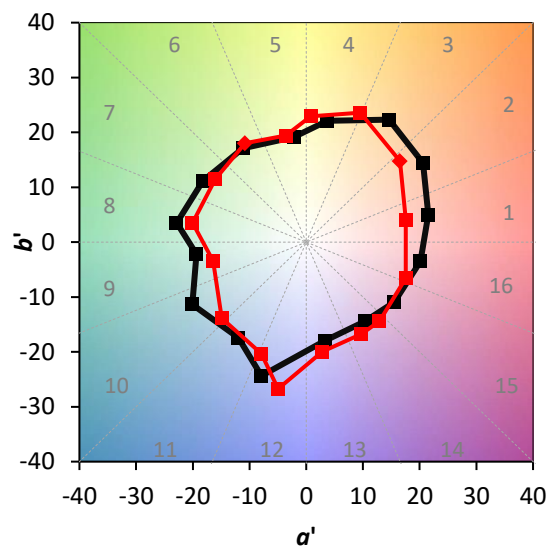
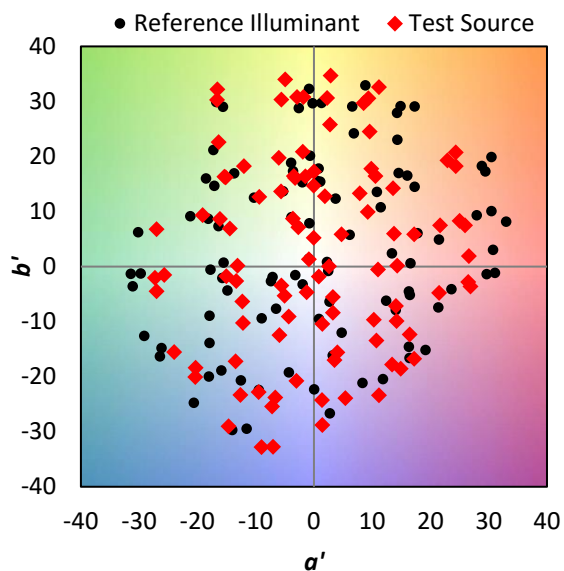
TM-30-18

### Summary

$R_f = 74.7$   
 $R_g = 90.6$   
 CIE  $R_a = 71.9$   
 $R_g = -37.4$



### Color Vector Graphics

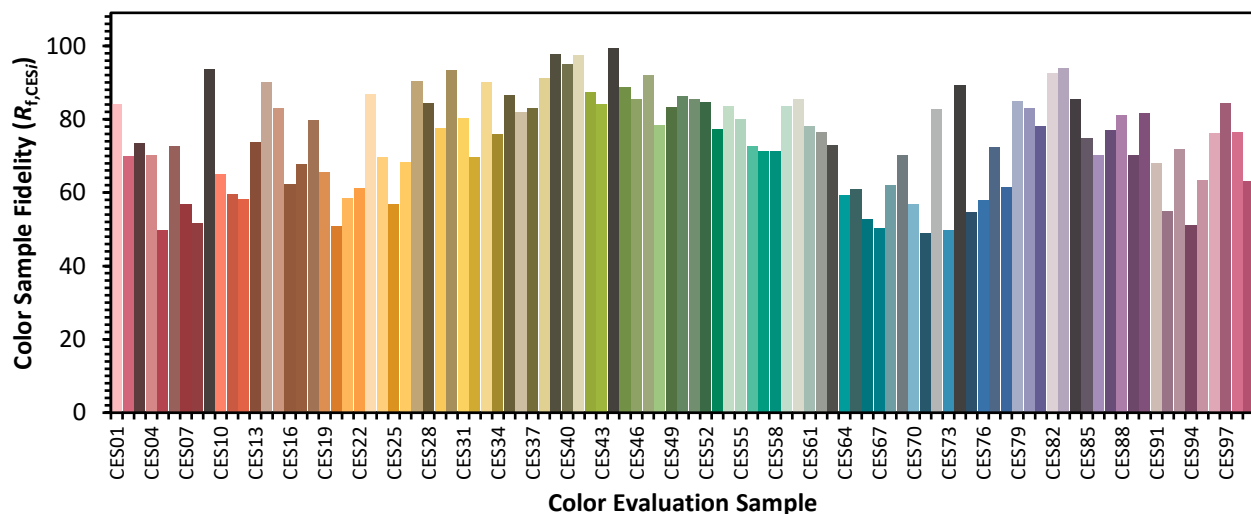


REPORT NUMBER: SP1-2307-100-3

TM-30-18

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

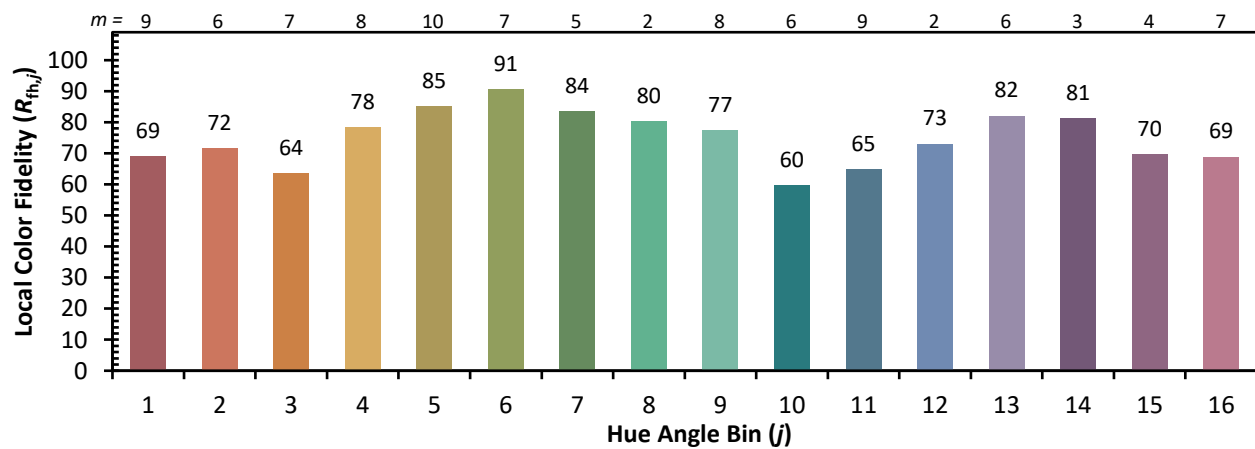
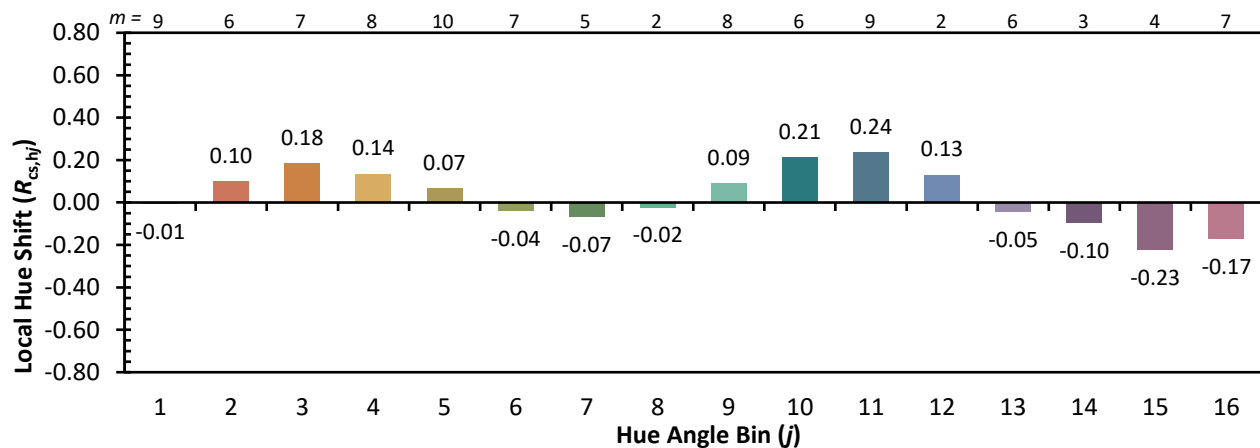
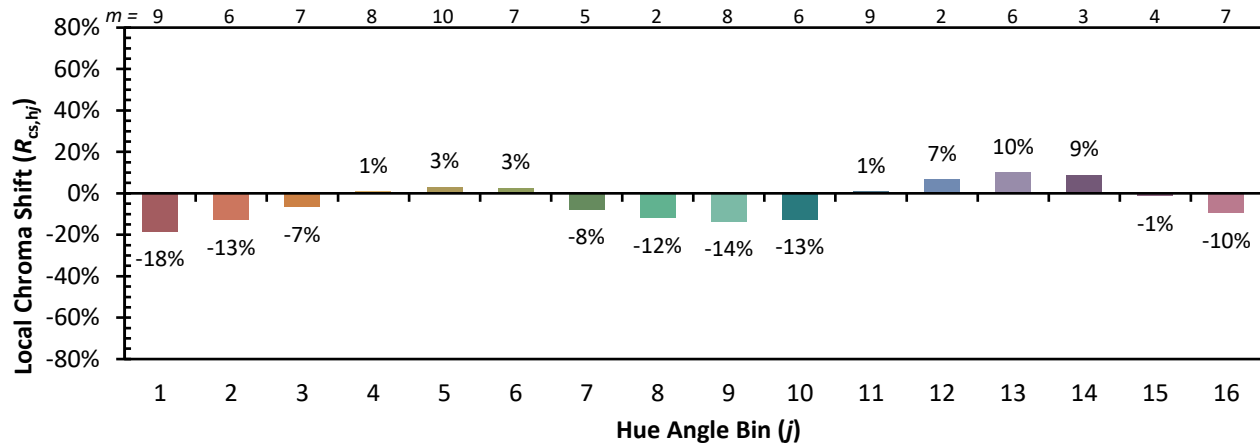
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 68 | CES51 = 85 | CES76 = 58 |
| CES02 = 61 | CES27 = 90 | CES52 = 85 | CES77 = 72 |
| CES03 = 30 | CES28 = 84 | CES53 = 77 | CES78 = 61 |
| CES04 = 70 | CES29 = 77 | CES54 = 83 | CES79 = 85 |
| CES05 = 47 | CES30 = 93 | CES55 = 80 | CES80 = 83 |
| CES06 = 50 | CES31 = 80 | CES56 = 73 | CES81 = 78 |
| CES07 = 39 | CES32 = 70 | CES57 = 71 | CES82 = 93 |
| CES08 = 39 | CES33 = 90 | CES58 = 71 | CES83 = 94 |
| CES09 = 29 | CES34 = 76 | CES59 = 84 | CES84 = 85 |
| CES10 = 74 | CES35 = 87 | CES60 = 85 | CES85 = 75 |
| CES11 = 57 | CES36 = 82 | CES61 = 78 | CES86 = 70 |
| CES12 = 63 | CES37 = 83 | CES62 = 76 | CES87 = 77 |
| CES13 = 42 | CES38 = 91 | CES63 = 73 | CES88 = 81 |
| CES14 = 74 | CES39 = 98 | CES64 = 59 | CES89 = 70 |
| CES15 = 71 | CES40 = 95 | CES65 = 61 | CES90 = 82 |
| CES16 = 46 | CES41 = 97 | CES66 = 53 | CES91 = 68 |
| CES17 = 49 | CES42 = 87 | CES67 = 50 | CES92 = 55 |
| CES18 = 56 | CES43 = 84 | CES68 = 62 | CES93 = 72 |
| CES19 = 72 | CES44 = 99 | CES69 = 70 | CES94 = 51 |
| CES20 = 64 | CES45 = 89 | CES70 = 57 | CES95 = 63 |
| CES21 = 86 | CES46 = 86 | CES71 = 49 | CES96 = 76 |
| CES22 = 78 | CES47 = 92 | CES72 = 83 | CES97 = 84 |
| CES23 = 92 | CES48 = 78 | CES73 = 50 | CES98 = 76 |
| CES24 = 91 | CES49 = 83 | CES74 = 89 | CES99 = 63 |
| CES25 = 72 | CES50 = 86 | CES75 = 55 |            |



REPORT NUMBER: SP1-2307-100-3

**TM-30-18**

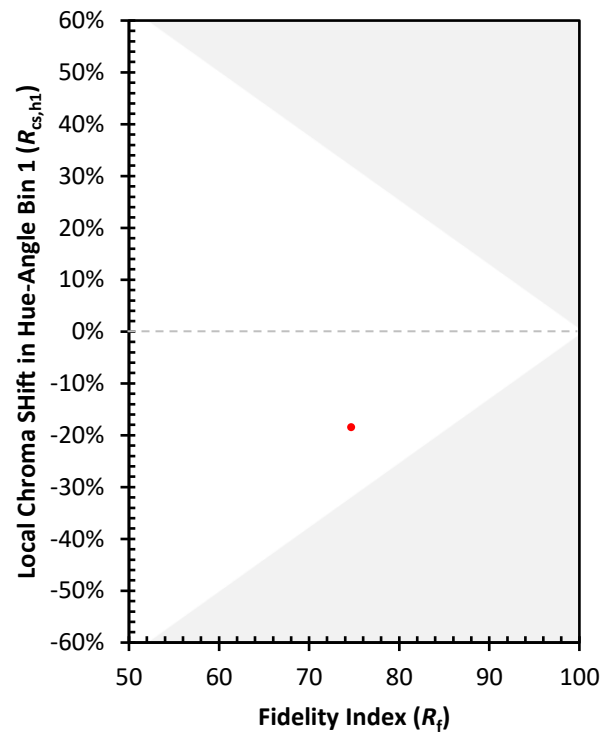
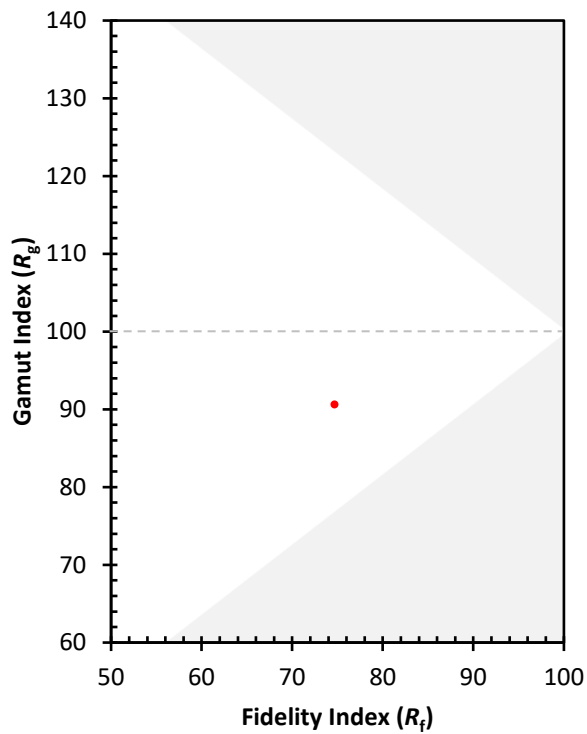
**Color Rendition by Hue-Angle Bin**



REPORT NUMBER: SP1-2307-100-3

**TM-30-18**

**Measure Comparisons**



(END OF REPORT)