

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: P829666

Luminaire Tested: **OHBL-100SE-A-UNV-L850-CD**

Issue Date: 5/3/2024



**Test Information**

Test Method: LM-79-08  
Report Number: P829666  
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-A-UNV-L850-CD  
Description: 100000 LUMEN OHBL SE LED LUMINAIRE WITH 80CRI, 5000K LEDS AND AISLE LENS  
Light Source: -  
Ballast/Driver: -

**Summary**

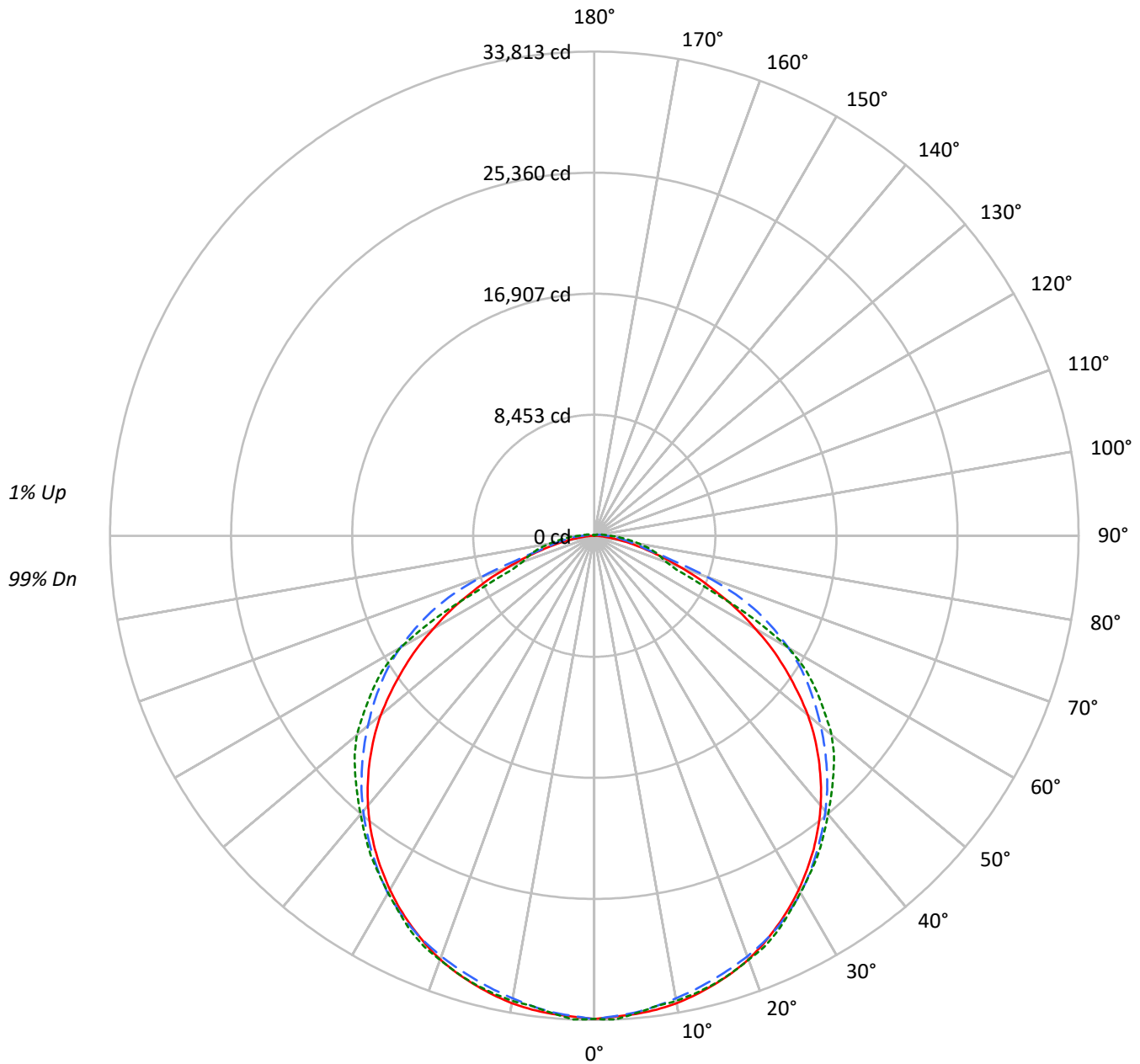
Lumens per Lamp: N/A  
Luminaire Lumens: 95377.0 lumens  
Efficiency: N/A  
Efficacy: 161.6 lumens/watt  
Spacing Criteria (0/90/45): 1.26 / 1.27 / 1.39  
Luminous Opening: Rectangular w/ Sides (W: 1.8' x L: 3.78' x H: 0.17')  
CIE Type: Direct

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: P829666

CATALOG NUMBER: OHBL-100SE-A-UNV-L850-CD

### Luminous Intensity Polar Plot





TEST NUMBER: P829666

CATALOG NUMBER: OHBL-100SE-A-UNV-L850-CD

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

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |    |    |    |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|----|
| RF  | 20  |     |     |     | 20  |     |     |     |     | 20  |     |     |     |     | 20  |     |     |    |    | 20 |
| RC  | 80  |     |     |     | 70  |     |     |     |     | 50  |     |     |     |     | 30  |     |     |    |    | 0  |
| 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°  | 53366 | 53366 | 53366 |
| 5°  | 53017 | 52591 | 52701 |
| 10° | 52823 | 51794 | 52116 |
| 15° | 52488 | 51199 | 51767 |
| 20° | 52152 | 50823 | 51309 |
| 25° | 51523 | 50445 | 50855 |
| 30° | 50839 | 49850 | 49893 |
| 35° | 50020 | 48904 | 49362 |
| 40° | 48957 | 47928 | 48640 |
| 45° | 47482 | 46798 | 48320 |
| 50° | 45484 | 45512 | 47937 |
| 55° | 42309 | 44247 | 46148 |
| 60° | 38153 | 42395 | 42664 |
| 65° | 32729 | 38958 | 27039 |
| 70° | 26362 | 30412 | 19603 |
| 75° | 19764 | 18054 | 19896 |
| 80° | 13757 | 15011 | 18995 |
| 85° | 7829  | 13755 | 17806 |



TEST NUMBER: P829666

CATALOG NUMBER: OHBL-100SE-A-UNV-L850-CD

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 3181.8  | 3.3       |
| 10°-20°   | 9123.9  | 9.6       |
| 20°-30°   | 13935.0 | 14.6      |
| 30°-40°   | 16908.0 | 17.7      |
| 40°-50°   | 17721.2 | 18.6      |
| 50°-60°   | 16058.0 | 16.8      |
| 60°-70°   | 10766.3 | 11.3      |
| 70°-80°   | 4834.5  | 5.1       |
| 80°-90°   | 1754.4  | 1.8       |
| 90°-100°  | 528.1   | 0.6       |
| 100°-110° | 249.2   | 0.3       |
| 110°-120° | 124.9   | 0.1       |
| 120°-130° | 68.9    | 0.1       |
| 130°-140° | 47.4    | 0.0       |
| 140°-150° | 31.9    | 0.0       |
| 150°-160° | 23.7    | 0.0       |
| 160°-170° | 15.2    | 0.0       |
| 170°-180° | 4.8     | 0.0       |
| <hr/>     |         |           |
| 0°-30°    | 26240.7 | 27.5      |
| 0°-40°    | 43148.7 | 45.2      |
| 0°-60°    | 76927.9 | 80.7      |
| 0°-90°    | 94283.1 | 98.9      |
| 90°-120°  | 902.1   | 0.9       |
| 90°-150°  | 1050.2  | 1.1       |
| 90°-180°  | 1094.0  | 1.1       |
| 0°-180°   | 95377.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°    | 22.5° | 45°   | 67.5° | 90°   | Flux  |
|------|-------|-------|-------|-------|-------|-------|
| 0°   | 33744 | 33744 | 33744 | 33744 | 33744 |       |
| 5°   | 33525 | 33642 | 33408 | 33510 | 33466 | ###   |
| 15°  | 32437 | 32310 | 32081 | 32364 | 32403 | 9158  |
| 25°  | 30134 | 30002 | 30212 | 30490 | 30402 | 13890 |
| 35°  | 26709 | 26772 | 27045 | 27333 | 27226 | 16694 |
| 45°  | 22166 | 22527 | 22947 | 23532 | 23606 | 17076 |
| 55°  | 16311 | 17097 | 18263 | 18995 | 18951 | 14560 |
| 65°  | 9573  | 11071 | 12569 | 10607 | 8661  | 9538  |
| 75°  | 3767  | 5465  | 4020  | 4113  | 4382  | 4116  |
| 85°  | 649   | 1244  | 1596  | 1927  | 2020  | 792   |
| 90°  | 5     | 415   | 825   | 1034  | 1083  | 39    |
| 95°  | 5     | 259   | 566   | 688   | 708   | 7     |
| 105° | 20    | 112   | 278   | 337   | 351   | 23    |
| 115° | 39    | 59    | 142   | 180   | 190   | 36    |
| 125° | 34    | 39    | 88    | 102   | 107   | 34    |
| 135° | 44    | 49    | 54    | 78    | 83    | 35    |
| 145° | 44    | 49    | 49    | 54    | 59    | 29    |
| 155° | 49    | 54    | 54    | 54    | 49    | 23    |
| 165° | 54    | 54    | 54    | 54    | 54    | 15    |
| 175° | 54    | 54    | 49    | 44    | 44    | 5     |
| 180° | 49    | 49    | 49    | 49    | 49    |       |



TEST NUMBER: P829666

CATALOG NUMBER: OHBL-100SE-A-UNV-L850-CD

**CANDELA DISTRIBUTION (FULL):**

|        | 0°      | 22.5°   | 45°     | 67.5°   | 90°     |
|--------|---------|---------|---------|---------|---------|
| 0°     | 33744.5 | 33744.5 | 33744.5 | 33744.5 | 33744.5 |
| 2.5°   | 33607.8 | 33749.3 | 33573.7 | 33764.0 | 33812.8 |
| 5°     | 33524.9 | 33642.0 | 33407.8 | 33510.3 | 33466.3 |
| 7.5°   | 33373.6 | 33412.7 | 33134.6 | 33217.5 | 33129.7 |
| 10°    | 33149.2 | 33129.7 | 32802.8 | 32963.8 | 32983.3 |
| 12.5°  | 32817.4 | 32758.9 | 32466.1 | 32710.1 | 32715.0 |
| 15°    | 32436.8 | 32310.0 | 32080.7 | 32363.7 | 32402.7 |
| 17.5°  | 31997.7 | 31831.8 | 31680.6 | 32046.5 | 31988.0 |
| 20°    | 31485.4 | 31290.2 | 31261.0 | 31661.0 | 31514.7 |
| 22.5°  | 30851.1 | 30699.8 | 30768.2 | 31148.7 | 31056.0 |
| 25°    | 30133.9 | 30002.1 | 30211.9 | 30490.0 | 30402.2 |
| 27.5°  | 29377.6 | 29299.5 | 29538.6 | 29753.3 | 29582.5 |
| 30°    | 28548.1 | 28504.2 | 28821.4 | 28997.0 | 28782.3 |
| 32.5°  | 27645.5 | 27660.1 | 27962.6 | 28201.7 | 28001.7 |
| 35°    | 26708.7 | 26772.1 | 27045.3 | 27333.2 | 27225.9 |
| 37.5°  | 25679.2 | 25820.7 | 26093.9 | 26420.8 | 26308.6 |
| 40°    | 24591.1 | 24796.0 | 25098.5 | 25493.8 | 25391.3 |
| 42.5°  | 23415.2 | 23673.8 | 24064.2 | 24503.3 | 24493.5 |
| 45°    | 22166.2 | 22527.2 | 22946.8 | 23532.3 | 23605.5 |
| 47.5°  | 20868.3 | 21273.3 | 21805.1 | 22585.8 | 22698.0 |
| 50°    | 19458.2 | 19965.6 | 20629.2 | 21566.0 | 21634.3 |
| 52.5°  | 17887.1 | 18579.9 | 19458.2 | 20356.0 | 20273.0 |
| 55°    | 16311.1 | 17096.7 | 18262.8 | 18994.7 | 18950.8 |
| 57.5°  | 14740.0 | 15623.2 | 17038.1 | 17560.2 | 17555.3 |
| 60°    | 12983.5 | 14100.9 | 15647.6 | 16042.8 | 15652.4 |
| 62.5°  | 11358.7 | 12559.0 | 14164.3 | 13876.4 | 12539.5 |
| 65°    | 9573.0  | 11070.9 | 12568.8 | 10607.4 | 8660.6  |
| 67.5°  | 7987.2  | 9548.6  | 10675.7 | 7265.1  | 6221.0  |
| 70°    | 6391.7  | 8114.1  | 8323.9  | 5391.5  | 5318.3  |
| 72.5°  | 4976.8  | 6811.3  | 5742.8  | 4615.7  | 4849.9  |
| 75°    | 3766.7  | 5464.7  | 4020.5  | 4113.2  | 4381.5  |
| 77.5°  | 2747.0  | 4196.1  | 3127.6  | 3605.7  | 3825.3  |
| 80°    | 1888.2  | 2971.4  | 2551.8  | 3030.0  | 3181.2  |
| 82.5°  | 1185.6  | 1961.4  | 2044.4  | 2439.6  | 2595.7  |
| 85°    | 648.9   | 1244.2  | 1595.5  | 1927.3  | 2020.0  |
| 87.5°  | 268.4   | 751.4   | 1219.8  | 1488.2  | 1566.2  |
| 90°    | 4.9     | 414.7   | 824.6   | 1034.4  | 1083.2  |
| 92.5°  | 4.9     | 317.1   | 673.3   | 834.3   | 868.5   |
| 95°    | 4.9     | 258.6   | 566.0   | 688.0   | 707.5   |
| 97.5°  | 9.8     | 204.9   | 473.3   | 570.9   | 590.4   |
| 100°   | 14.6    | 170.8   | 395.2   | 478.2   | 492.8   |
| 102.5° | 19.5    | 136.6   | 331.8   | 400.1   | 414.7   |
| 105°   | 19.5    | 112.2   | 278.1   | 336.7   | 351.3   |



TEST NUMBER: P829666

CATALOG NUMBER: OHBL-100SE-A-UNV-L850-CD

**CANDELA DISTRIBUTION (continued):**

|        | 0°   | 22.5° | 45°   | 67.5° | 90°   |
|--------|------|-------|-------|-------|-------|
| 112.5° | 34.2 | 68.3  | 165.9 | 209.8 | 219.6 |
| 115°   | 39.0 | 58.6  | 141.5 | 180.5 | 190.3 |
| 117.5° | 39.0 | 48.8  | 122.0 | 151.3 | 161.0 |
| 120°   | 39.0 | 43.9  | 107.3 | 131.7 | 136.6 |
| 122.5° | 39.0 | 39.0  | 92.7  | 117.1 | 122.0 |
| 125°   | 34.2 | 39.0  | 87.8  | 102.5 | 107.3 |
| 127.5° | 39.0 | 39.0  | 78.1  | 92.7  | 97.6  |
| 130°   | 39.0 | 43.9  | 68.3  | 87.8  | 87.8  |
| 132.5° | 43.9 | 48.8  | 63.4  | 82.9  | 82.9  |
| 135°   | 43.9 | 48.8  | 53.7  | 78.1  | 82.9  |
| 137.5° | 48.8 | 48.8  | 48.8  | 73.2  | 78.1  |
| 140°   | 48.8 | 48.8  | 43.9  | 63.4  | 68.3  |
| 142.5° | 43.9 | 48.8  | 43.9  | 58.6  | 63.4  |
| 145°   | 43.9 | 48.8  | 48.8  | 53.7  | 58.6  |
| 147.5° | 48.8 | 48.8  | 48.8  | 48.8  | 53.7  |
| 150°   | 48.8 | 48.8  | 48.8  | 48.8  | 48.8  |
| 152.5° | 48.8 | 48.8  | 48.8  | 48.8  | 48.8  |
| 155°   | 48.8 | 53.7  | 53.7  | 53.7  | 48.8  |
| 157.5° | 48.8 | 53.7  | 53.7  | 53.7  | 53.7  |
| 160°   | 48.8 | 53.7  | 53.7  | 53.7  | 53.7  |
| 162.5° | 53.7 | 53.7  | 53.7  | 53.7  | 53.7  |
| 165°   | 53.7 | 53.7  | 53.7  | 53.7  | 53.7  |
| 167.5° | 53.7 | 58.6  | 53.7  | 53.7  | 53.7  |
| 170°   | 53.7 | 53.7  | 53.7  | 48.8  | 48.8  |
| 172.5° | 53.7 | 53.7  | 53.7  | 48.8  | 48.8  |
| 175°   | 53.7 | 53.7  | 48.8  | 43.9  | 43.9  |
| 177.5° | 58.6 | 53.7  | 48.8  | 43.9  | 39.0  |
| 180°   | 48.8 | 48.8  | 48.8  | 48.8  | 48.8  |



Report Generated By 670246072 / DESKTOP-50001EG





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







|        |      |      |       |       |       |
|--------|------|------|-------|-------|-------|
| 107.5° | 24.4 | 92.7 | 239.1 | 287.9 | 297.6 |
| 110°   | 29.3 | 78.1 | 200.0 | 244.0 | 253.7 |



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

Report Prepared for

Cooper Lighting Solutions

METALUX

Report Number: SP1-2307-100-6

Test Date: 08/03/2023

Luminaire Tested: OHB-15SE-N-UNV-L850-CD

Data in this report applies to families of products including OHB-15SE-N-UNV-L850-CD.

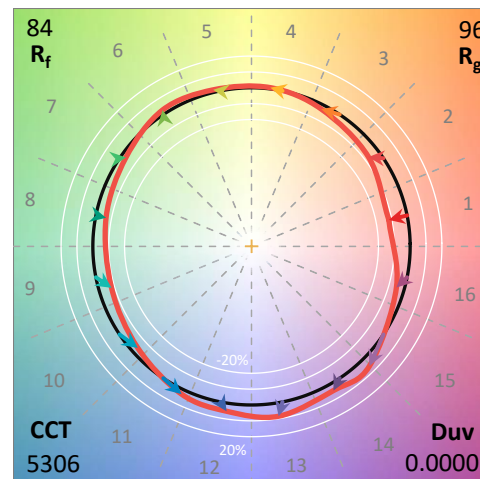
### Test Information

Test Method: LM-79-2019  
 Report Number: SP1-2307-100-6  
 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-L850-CD**  
 Description: 15000 LUMEN OHB SE LED LUMINAIRE WITH 80CRI, 5000K LEDS AND NARROW LENS

LENS

### Spectral Parameters

|                           |        |           |      |      |      |
|---------------------------|--------|-----------|------|------|------|
| CCT (K):                  | 5306   | CRI (Ra): | 84.6 |      |      |
| CIE u':                   | 0.2085 | R1:       | 83.6 | R9:  | 15.2 |
| CIE v':                   | 0.4801 | R2:       | 89.8 | R10: | 75.0 |
| Duv:                      | 0.0000 | R3:       | 93.0 | R11: | 84.1 |
| CIE x:                    | 0.3370 | R4:       | 84.5 | R12: | 63.9 |
| CIE y:                    | 0.3449 | R5:       | 84.2 | R13: | 85.4 |
| CIE z:                    | 0.3182 | R6:       | 84.7 | R14: | 96.4 |
| Peak Wavelength (nm):     | 451    | R7:       | 87.4 |      |      |
| Dominant Wavelength (nm): | 566    | R8:       | 70.0 |      |      |
| Purity:                   | 4.8    |           |      |      |      |
| Rf:                       | 84.3   |           |      |      |      |
| Rg:                       | 96.3   |           |      |      |      |



### Test Conditions

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

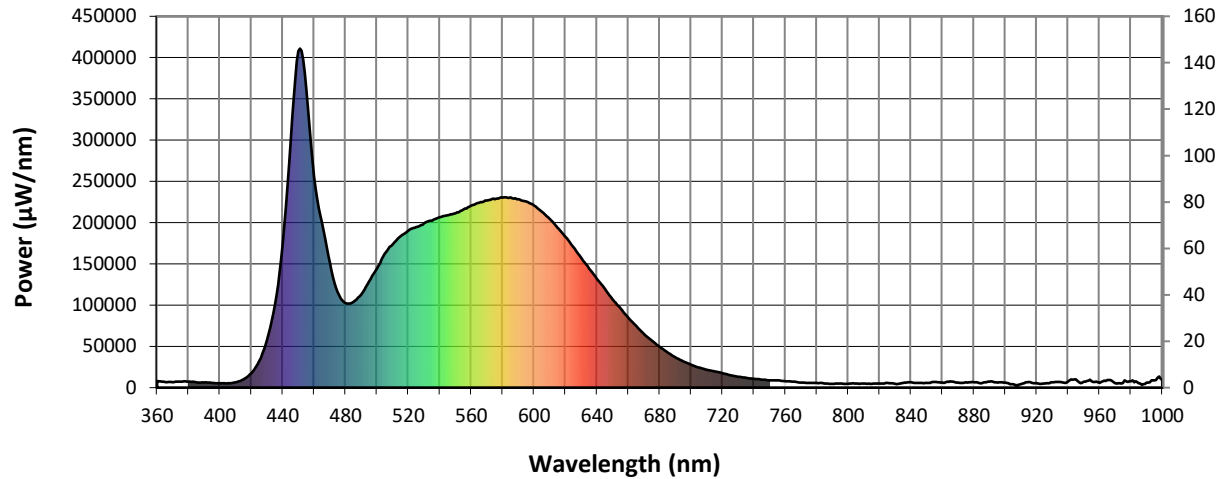
REPORT NUMBER: SP1-2307-100-6

| 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: SP1-2307-100-6

**Photopic Flux vs. Wavelength**

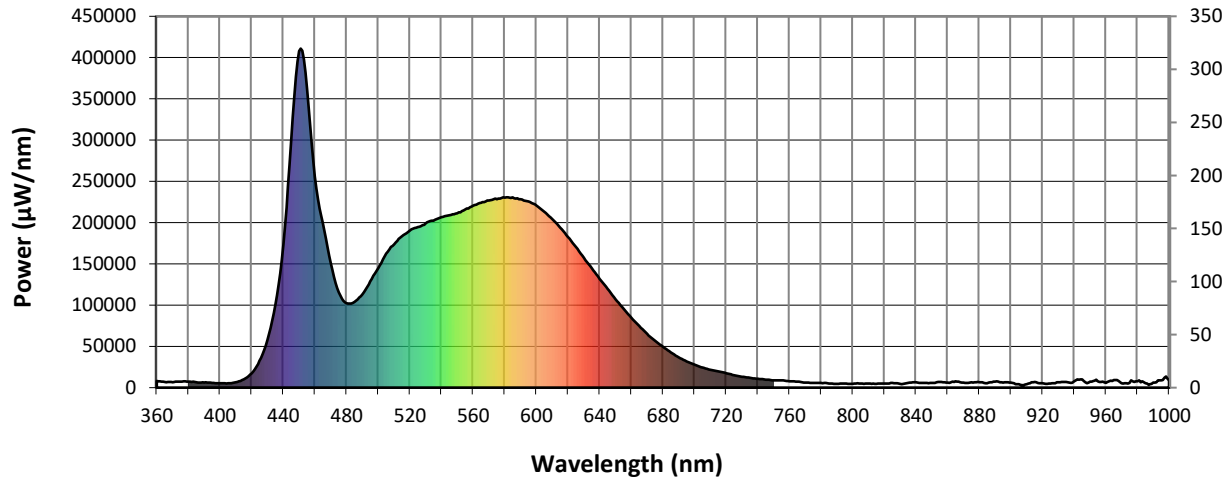


#####

| 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       | 7999             | NR               | 490       | 113267           | NR               | 620       | 182441           | NR               | 750       | 8942             | NR               | 880       | 6451             | NR               |
| 365       | 6994             | NR               | 495       | 128668           | NR               | 625       | 170736           | NR               | 755       | 8984             | NR               | 885       | 5377             | NR               |
| 370       | 6664             | NR               | 500       | 144479           | NR               | 630       | 157334           | NR               | 760       | 7704             | NR               | 890       | 7448             | NR               |
| 375       | 7229             | NR               | 505       | 162408           | NR               | 635       | 144567           | NR               | 765       | 7281             | NR               | 895       | 6272             | NR               |
| 380       | 7357             | NR               | 510       | 173534           | NR               | 640       | 131937           | NR               | 770       | 6279             | NR               | 900       | 6115             | NR               |
| 385       | 6449             | NR               | 515       | 183237           | NR               | 645       | 119591           | NR               | 775       | 5613             | NR               | 905       | 4022             | NR               |
| 390       | 6175             | NR               | 520       | 190256           | NR               | 650       | 106845           | NR               | 780       | 5679             | NR               | 910       | 4052             | NR               |
| 395       | 5794             | NR               | 525       | 194557           | NR               | 655       | 95957            | NR               | 785       | 5156             | NR               | 915       | 6717             | NR               |
| 400       | 5166             | NR               | 530       | 199159           | NR               | 660       | 84683            | NR               | 790       | 4397             | NR               | 920       | 5218             | NR               |
| 405       | 5288             | NR               | 535       | 202537           | NR               | 665       | 74636            | NR               | 795       | 5116             | NR               | 925       | 4836             | NR               |
| 410       | 6606             | NR               | 540       | 206509           | NR               | 670       | 64975            | NR               | 800       | 4766             | NR               | 930       | 6536             | NR               |
| 415       | 9924             | NR               | 545       | 209021           | NR               | 675       | 56768            | NR               | 805       | 5062             | NR               | 935       | 6910             | NR               |
| 420       | 17541            | NR               | 550       | 211454           | NR               | 680       | 49536            | NR               | 810       | 4960             | NR               | 940       | 7627             | NR               |
| 425       | 32465            | NR               | 555       | 215971           | NR               | 685       | 42760            | NR               | 815       | 4683             | NR               | 945       | 10023            | NR               |
| 430       | 57851            | NR               | 560       | 220550           | NR               | 690       | 36792            | NR               | 820       | 5057             | NR               | 950       | 7141             | NR               |
| 435       | 100826           | NR               | 565       | 224059           | NR               | 695       | 31835            | NR               | 825       | 5866             | NR               | 955       | 7688             | NR               |
| 440       | 173775           | NR               | 570       | 226749           | NR               | 700       | 27758            | NR               | 830       | 4459             | NR               | 960       | 5840             | NR               |
| 445       | 298214           | NR               | 575       | 228420           | NR               | 705       | 24370            | NR               | 835       | 5798             | NR               | 965       | 9412             | NR               |
| 450       | 407899           | NR               | 580       | 230334           | NR               | 710       | 21604            | NR               | 840       | 6573             | NR               | 970       | 5386             | NR               |
| 455       | 361294           | NR               | 585       | 230732           | NR               | 715       | 19814            | NR               | 845       | 5823             | NR               | 975       | 5739             | NR               |
| 460       | 255748           | NR               | 590       | 228424           | NR               | 720       | 17375            | NR               | 850       | 5607             | NR               | 980       | 7770             | NR               |
| 465       | 199487           | NR               | 595       | 225648           | NR               | 725       | 15167            | NR               | 855       | 6900             | NR               | 985       | 5499             | NR               |
| 470       | 150907           | NR               | 600       | 220754           | NR               | 730       | 13205            | NR               | 860       | 6212             | NR               | 990       | 6001             | NR               |
| 475       | 115645           | NR               | 605       | 213214           | NR               | 735       | 11962            | NR               | 865       | 7605             | NR               | 995       | 8876             | NR               |
| 480       | 102297           | NR               | 610       | 204308           | NR               | 740       | 10806            | NR               | 870       | 6301             | NR               | 1000      | 8861             | NR               |
| 485       | 103933           | NR               | 615       | 193788           | NR               | 745       | 9743             | NR               | 875       | 6504             | NR               |           |                  |                  |

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Scotopic Flux vs. Wavelength



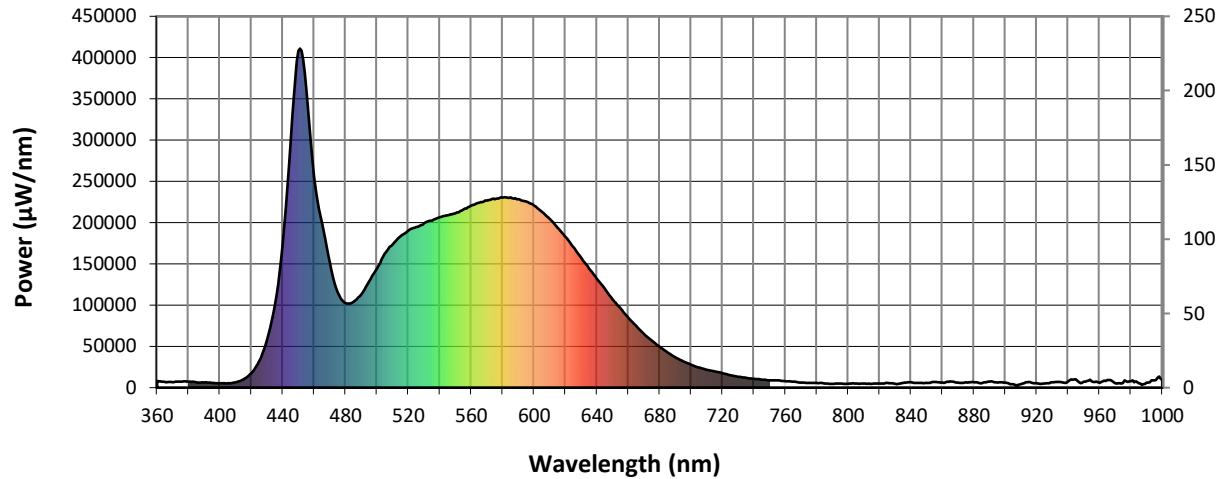
Scotopic Lumens: 29828.7

S/P: 2.04

| 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       | 7999             | NR               | 490       | 113267           | NR               | 620       | 182441           | NR               | 750       | 8942             | NR               | 880       | 6451             | NR               |
| 365       | 6994             | NR               | 495       | 128668           | NR               | 625       | 170736           | NR               | 755       | 8984             | NR               | 885       | 5377             | NR               |
| 370       | 6664             | NR               | 500       | 144479           | NR               | 630       | 157334           | NR               | 760       | 7704             | NR               | 890       | 7448             | NR               |
| 375       | 7229             | NR               | 505       | 162408           | NR               | 635       | 144567           | NR               | 765       | 7281             | NR               | 895       | 6272             | NR               |
| 380       | 7357             | NR               | 510       | 173534           | NR               | 640       | 131937           | NR               | 770       | 6279             | NR               | 900       | 6115             | NR               |
| 385       | 6449             | NR               | 515       | 183237           | NR               | 645       | 119591           | NR               | 775       | 5613             | NR               | 905       | 4022             | NR               |
| 390       | 6175             | NR               | 520       | 190256           | NR               | 650       | 106845           | NR               | 780       | 5679             | NR               | 910       | 4052             | NR               |
| 395       | 5794             | NR               | 525       | 194557           | NR               | 655       | 95957            | NR               | 785       | 5156             | NR               | 915       | 6717             | NR               |
| 400       | 5166             | NR               | 530       | 199159           | NR               | 660       | 84683            | NR               | 790       | 4397             | NR               | 920       | 5218             | NR               |
| 405       | 5288             | NR               | 535       | 202537           | NR               | 665       | 74636            | NR               | 795       | 5116             | NR               | 925       | 4836             | NR               |
| 410       | 6606             | NR               | 540       | 206509           | NR               | 670       | 64975            | NR               | 800       | 4766             | NR               | 930       | 6536             | NR               |
| 415       | 9924             | NR               | 545       | 209021           | NR               | 675       | 56768            | NR               | 805       | 5062             | NR               | 935       | 6910             | NR               |
| 420       | 17541            | NR               | 550       | 211454           | NR               | 680       | 49536            | NR               | 810       | 4960             | NR               | 940       | 7627             | NR               |
| 425       | 32465            | NR               | 555       | 215971           | NR               | 685       | 42760            | NR               | 815       | 4683             | NR               | 945       | 10023            | NR               |
| 430       | 57851            | NR               | 560       | 220550           | NR               | 690       | 36792            | NR               | 820       | 5057             | NR               | 950       | 7141             | NR               |
| 435       | 100826           | NR               | 565       | 224059           | NR               | 695       | 31835            | NR               | 825       | 5866             | NR               | 955       | 7688             | NR               |
| 440       | 173775           | NR               | 570       | 226749           | NR               | 700       | 27758            | NR               | 830       | 4459             | NR               | 960       | 5840             | NR               |
| 445       | 298214           | NR               | 575       | 228420           | NR               | 705       | 24370            | NR               | 835       | 5798             | NR               | 965       | 9412             | NR               |
| 450       | 407899           | NR               | 580       | 230334           | NR               | 710       | 21604            | NR               | 840       | 6573             | NR               | 970       | 5386             | NR               |
| 455       | 361294           | NR               | 585       | 230732           | NR               | 715       | 19814            | NR               | 845       | 5823             | NR               | 975       | 5739             | NR               |
| 460       | 255748           | NR               | 590       | 228424           | NR               | 720       | 17375            | NR               | 850       | 5607             | NR               | 980       | 7770             | NR               |
| 465       | 199487           | NR               | 595       | 225648           | NR               | 725       | 15167            | NR               | 855       | 6900             | NR               | 985       | 5499             | NR               |
| 470       | 150907           | NR               | 600       | 220754           | NR               | 730       | 13205            | NR               | 860       | 6212             | NR               | 990       | 6001             | NR               |
| 475       | 115645           | NR               | 605       | 213214           | NR               | 735       | 11962            | NR               | 865       | 7605             | NR               | 995       | 8876             | NR               |
| 480       | 102297           | NR               | 610       | 204308           | NR               | 740       | 10806            | NR               | 870       | 6301             | NR               | 1000      | 8861             | NR               |
| 485       | 103933           | NR               | 615       | 193788           | NR               | 745       | 9743             | NR               | 875       | 6504             | NR               |           |                  |                  |

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**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 12729.3 M/P: 0.87**

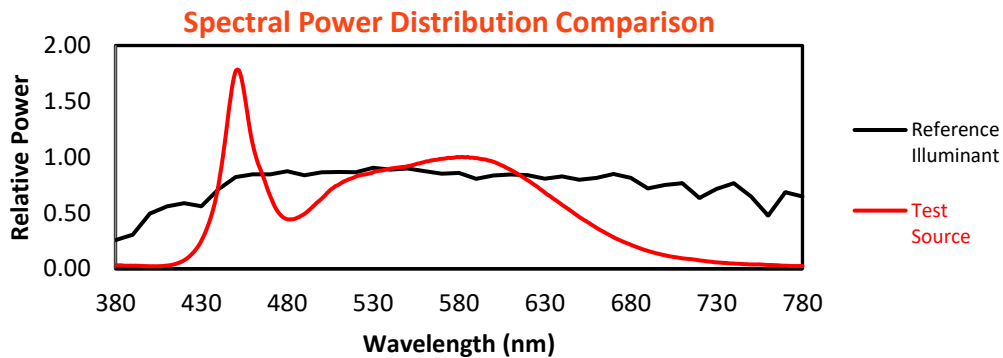
| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 7999             | NR               | 490       | 113267           | NR               | 620       | 182441           | NR               | 750       | 8942             | NR               | 880       | 6451             | NR               |
| 365       | 6994             | NR               | 495       | 128668           | NR               | 625       | 170736           | NR               | 755       | 8984             | NR               | 885       | 5377             | NR               |
| 370       | 6664             | NR               | 500       | 144479           | NR               | 630       | 157334           | NR               | 760       | 7704             | NR               | 890       | 7448             | NR               |
| 375       | 7229             | NR               | 505       | 162408           | NR               | 635       | 144567           | NR               | 765       | 7281             | NR               | 895       | 6272             | NR               |
| 380       | 7357             | NR               | 510       | 173534           | NR               | 640       | 131937           | NR               | 770       | 6279             | NR               | 900       | 6115             | NR               |
| 385       | 6449             | NR               | 515       | 183237           | NR               | 645       | 119591           | NR               | 775       | 5613             | NR               | 905       | 4022             | NR               |
| 390       | 6175             | NR               | 520       | 190256           | NR               | 650       | 106845           | NR               | 780       | 5679             | NR               | 910       | 4052             | NR               |
| 395       | 5794             | NR               | 525       | 194557           | NR               | 655       | 95957            | NR               | 785       | 5156             | NR               | 915       | 6717             | NR               |
| 400       | 5166             | NR               | 530       | 199159           | NR               | 660       | 84683            | NR               | 790       | 4397             | NR               | 920       | 5218             | NR               |
| 405       | 5288             | NR               | 535       | 202537           | NR               | 665       | 74636            | NR               | 795       | 5116             | NR               | 925       | 4836             | NR               |
| 410       | 6606             | NR               | 540       | 206509           | NR               | 670       | 64975            | NR               | 800       | 4766             | NR               | 930       | 6536             | NR               |
| 415       | 9924             | NR               | 545       | 209021           | NR               | 675       | 56768            | NR               | 805       | 5062             | NR               | 935       | 6910             | NR               |
| 420       | 17541            | NR               | 550       | 211454           | NR               | 680       | 49536            | NR               | 810       | 4960             | NR               | 940       | 7627             | NR               |
| 425       | 32465            | NR               | 555       | 215971           | NR               | 685       | 42760            | NR               | 815       | 4683             | NR               | 945       | 10023            | NR               |
| 430       | 57851            | NR               | 560       | 220550           | NR               | 690       | 36792            | NR               | 820       | 5057             | NR               | 950       | 7141             | NR               |
| 435       | 100826           | NR               | 565       | 224059           | NR               | 695       | 31835            | NR               | 825       | 5866             | NR               | 955       | 7688             | NR               |
| 440       | 173775           | NR               | 570       | 226749           | NR               | 700       | 27758            | NR               | 830       | 4459             | NR               | 960       | 5840             | NR               |
| 445       | 298214           | NR               | 575       | 228420           | NR               | 705       | 24370            | NR               | 835       | 5798             | NR               | 965       | 9412             | NR               |
| 450       | 407899           | NR               | 580       | 230334           | NR               | 710       | 21604            | NR               | 840       | 6573             | NR               | 970       | 5386             | NR               |
| 455       | 361294           | NR               | 585       | 230732           | NR               | 715       | 19814            | NR               | 845       | 5823             | NR               | 975       | 5739             | NR               |
| 460       | 255748           | NR               | 590       | 228424           | NR               | 720       | 17375            | NR               | 850       | 5607             | NR               | 980       | 7770             | NR               |
| 465       | 199487           | NR               | 595       | 225648           | NR               | 725       | 15167            | NR               | 855       | 6900             | NR               | 985       | 5499             | NR               |
| 470       | 150907           | NR               | 600       | 220754           | NR               | 730       | 13205            | NR               | 860       | 6212             | NR               | 990       | 6001             | NR               |
| 475       | 115645           | NR               | 605       | 213214           | NR               | 735       | 11962            | NR               | 865       | 7605             | NR               | 995       | 8876             | NR               |
| 480       | 102297           | NR               | 610       | 204308           | NR               | 740       | 10806            | NR               | 870       | 6301             | NR               | 1000      | 8861             | NR               |
| 485       | 103933           | NR               | 615       | 193788           | NR               | 745       | 9743             | NR               | 875       | 6504             | NR               |           |                  |                  |

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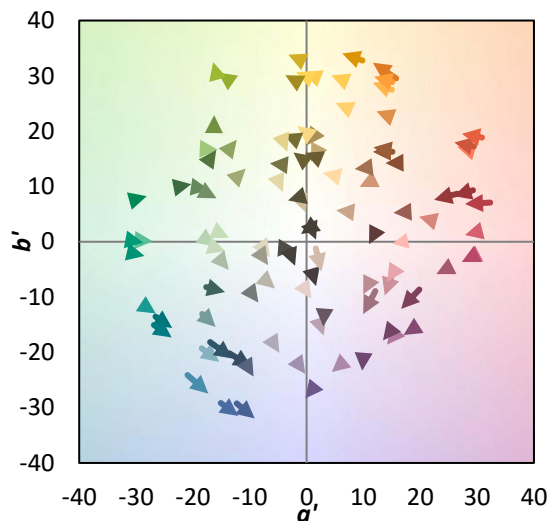
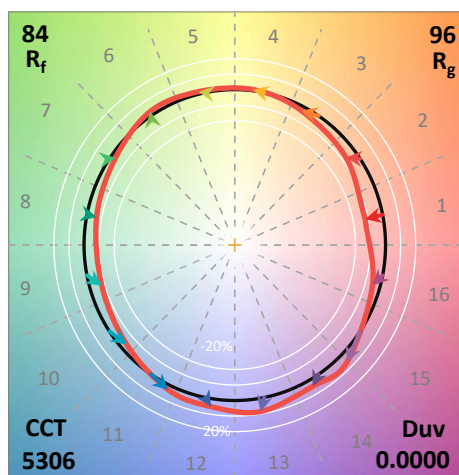
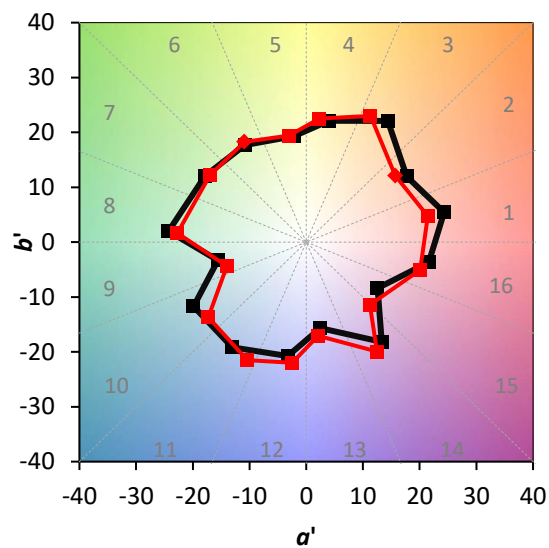
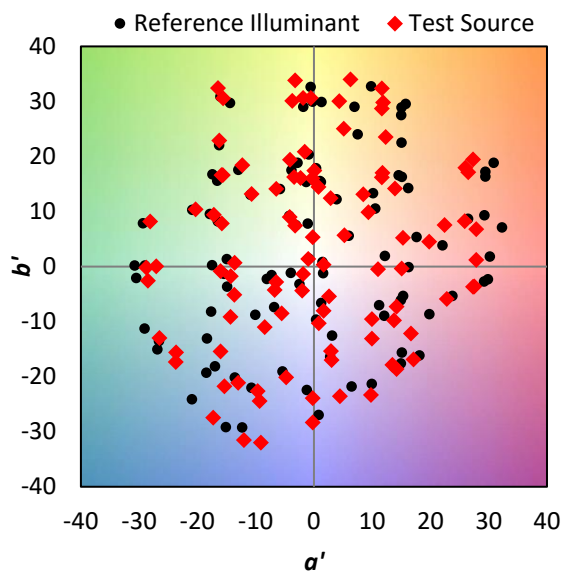
**TM-30-18**

**Summary**

$R_f = 84.3$   
 $R_g = 96.3$   
 $CIE R_a = 84.6$   
 $R_g = 15.2$



**Color Vector Graphics**

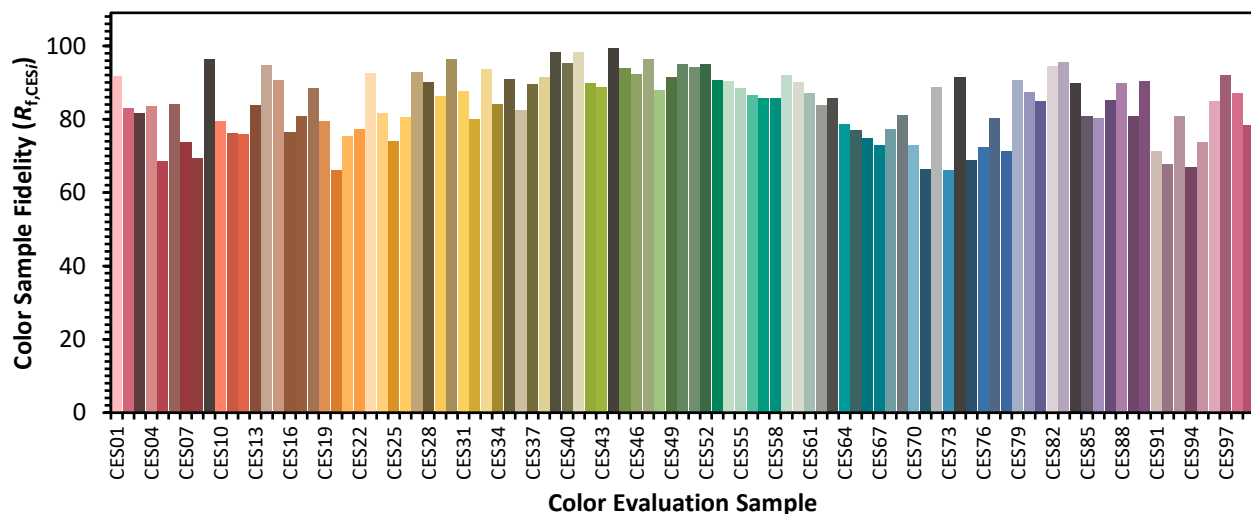


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**Individual Sample Fidelity Index ( $R_{f,i}$ )**

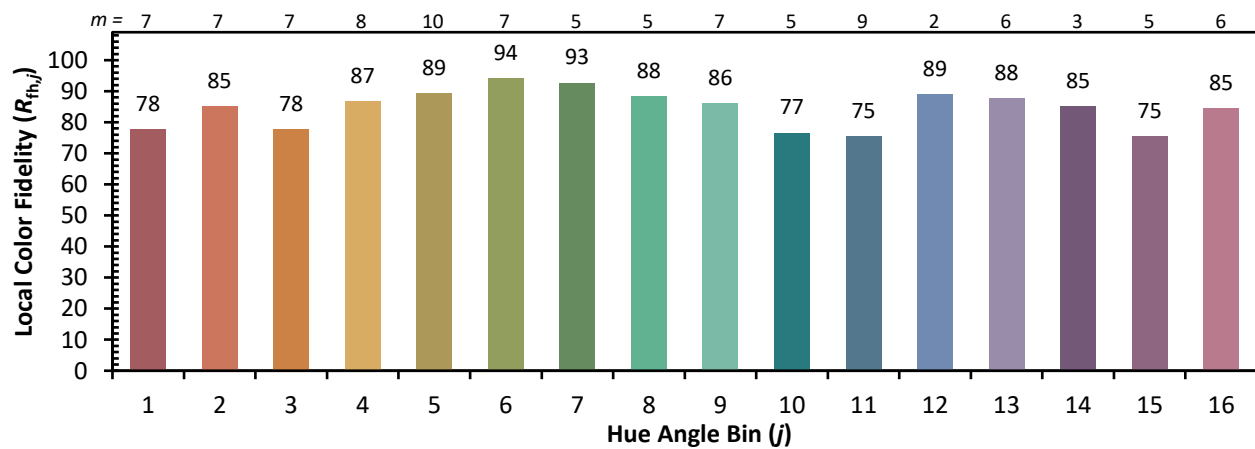
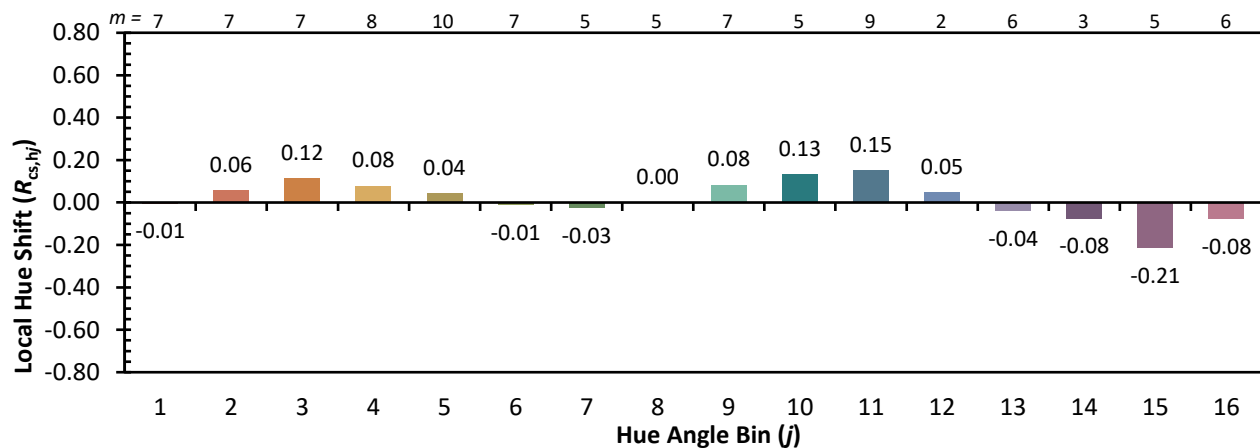
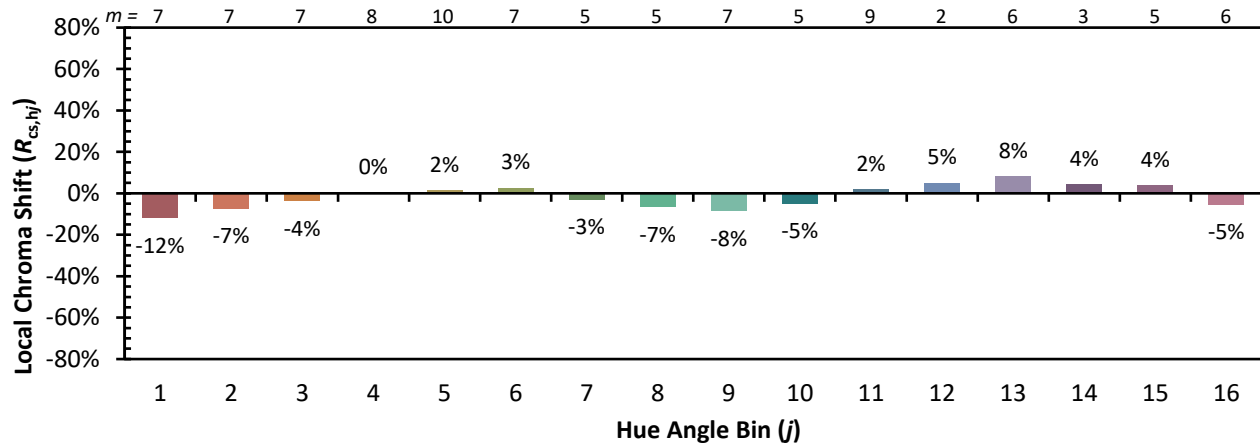
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 81 | CES51 = 94 | CES76 = 73 |
| CES02 = 60 | CES27 = 93 | CES52 = 95 | CES77 = 80 |
| CES03 = 30 | CES28 = 90 | CES53 = 91 | CES78 = 71 |
| CES04 = 69 | CES29 = 86 | CES54 = 90 | CES79 = 91 |
| CES05 = 47 | CES30 = 96 | CES55 = 88 | CES80 = 87 |
| CES06 = 50 | CES31 = 88 | CES56 = 87 | CES81 = 85 |
| CES07 = 39 | CES32 = 80 | CES57 = 86 | CES82 = 95 |
| CES08 = 39 | CES33 = 94 | CES58 = 86 | CES83 = 96 |
| CES09 = 29 | CES34 = 84 | CES59 = 92 | CES84 = 90 |
| CES10 = 73 | CES35 = 91 | CES60 = 90 | CES85 = 81 |
| CES11 = 56 | CES36 = 83 | CES61 = 87 | CES86 = 80 |
| CES12 = 62 | CES37 = 90 | CES62 = 84 | CES87 = 85 |
| CES13 = 42 | CES38 = 91 | CES63 = 86 | CES88 = 90 |
| CES14 = 74 | CES39 = 98 | CES64 = 79 | CES89 = 81 |
| CES15 = 70 | CES40 = 95 | CES65 = 77 | CES90 = 90 |
| CES16 = 46 | CES41 = 98 | CES66 = 75 | CES91 = 71 |
| CES17 = 48 | CES42 = 90 | CES67 = 73 | CES92 = 68 |
| CES18 = 55 | CES43 = 89 | CES68 = 77 | CES93 = 81 |
| CES19 = 70 | CES44 = 99 | CES69 = 81 | CES94 = 67 |
| CES20 = 64 | CES45 = 94 | CES70 = 73 | CES95 = 74 |
| CES21 = 85 | CES46 = 92 | CES71 = 66 | CES96 = 85 |
| CES22 = 77 | CES47 = 96 | CES72 = 89 | CES97 = 92 |
| CES23 = 91 | CES48 = 88 | CES73 = 66 | CES98 = 87 |
| CES24 = 90 | CES49 = 92 | CES74 = 91 | CES99 = 78 |
| CES25 = 71 | CES50 = 95 | CES75 = 69 |            |



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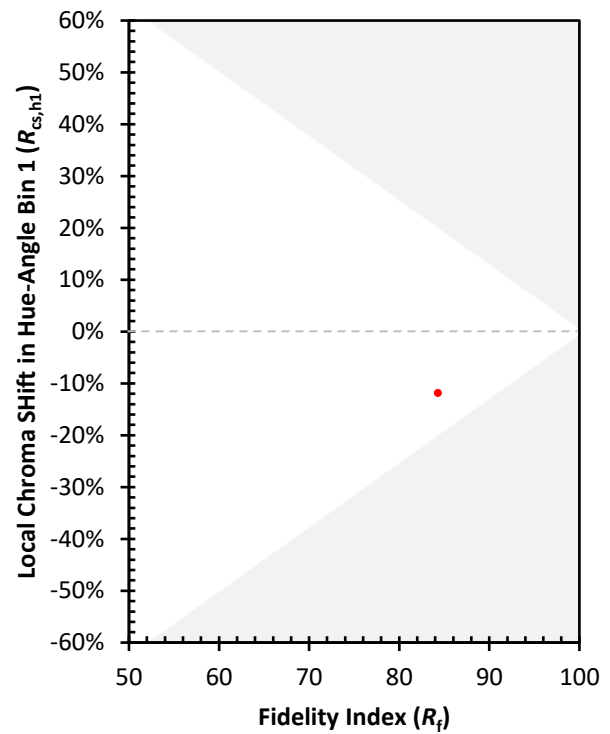
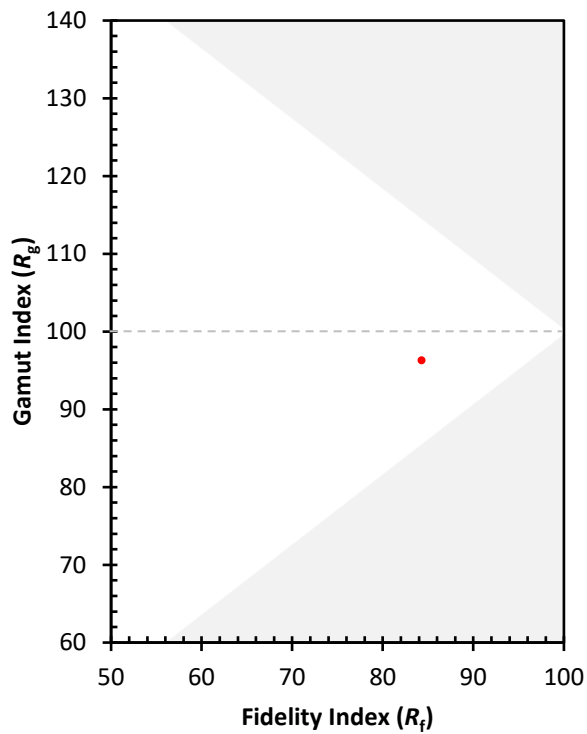
Color Rendition by Hue-Angle Bin



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**Measure Comparisons**



(END OF REPORT)