

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: STREETWORKS

Report Number: P1380327

Luminaire Tested: **VAL-T-SB3A-730-U-T2-HSS**

Issue Date: 02/18/2026

This test was performed under the Supervised Manufacturer's Testing Program. The results of this test have not been  
influenced by sources from within Cooper Lighting Solutions or from external interests.

**Test Information**

Test Method: LM-79-08  
Report Number: P1380327  
Test Lab: INNOVATION CENTER(G3)  
Issue Date: 02/18/2026  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: STREETWORKS  
Catalog Number: VAL-T-SB3A-730-U-T2-HSS  
Description: GALLEON II WALL SLIM HIGH DENSITY LED ARRAYS 3SQUARE 85W 70CRI  
3000K FIXTURE w/ TYPE II DISTRIBUTION OPTIC AND HOUSE SIDE SHIELD  
Light Source: (78) 3000K CCT, 70 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER  
Luminaire Equipment:

| <u>Sample No.</u> | <u>Condition</u> | <u>Description</u> |
|-------------------|------------------|--------------------|
| a                 | good             | reflector          |
| b                 | good             | lens               |
| c                 | good             | housing            |
| d                 | good             | cord               |

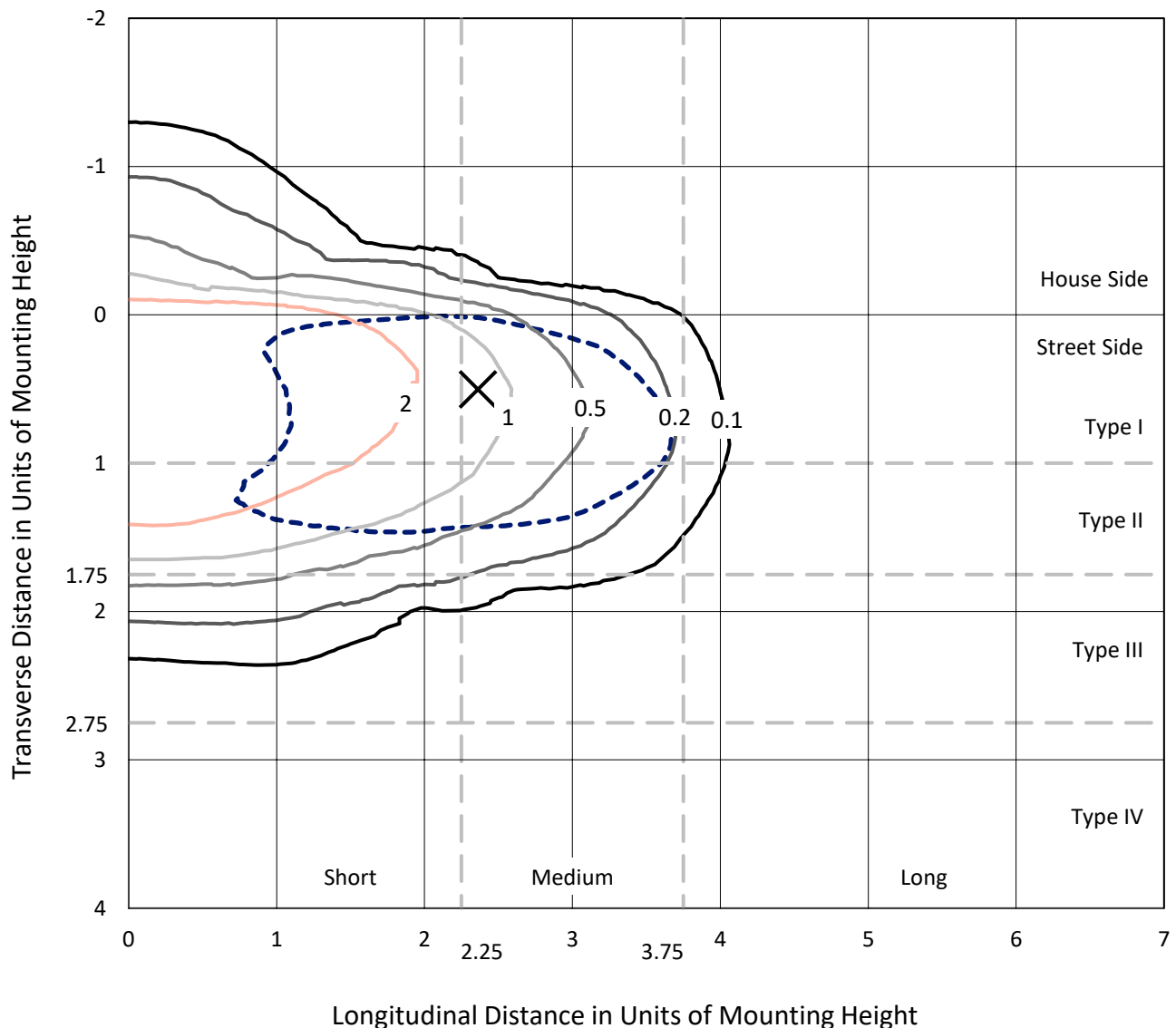
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 9717.1 lumens  
Efficiency: N/A  
Efficacy: 114.3 lumens/watt  
Luminous Opening: Rectangular (W 1.5' x L: 0.5' x H: 0')  
IES Classification: Type II - Medium  
BUG Rating: B1 - U0 - G2  
  
Input Watts (W): 85  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.98  
Total Harmonic Distortion (THDi): 11.0%  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT

REPORT NUMBER: P1380327  
 CATALOG NUMBER: VAL-T-SB3A-730-U-T2-HSS

## Iso-Footcandle Lines of Horizontal Illumination

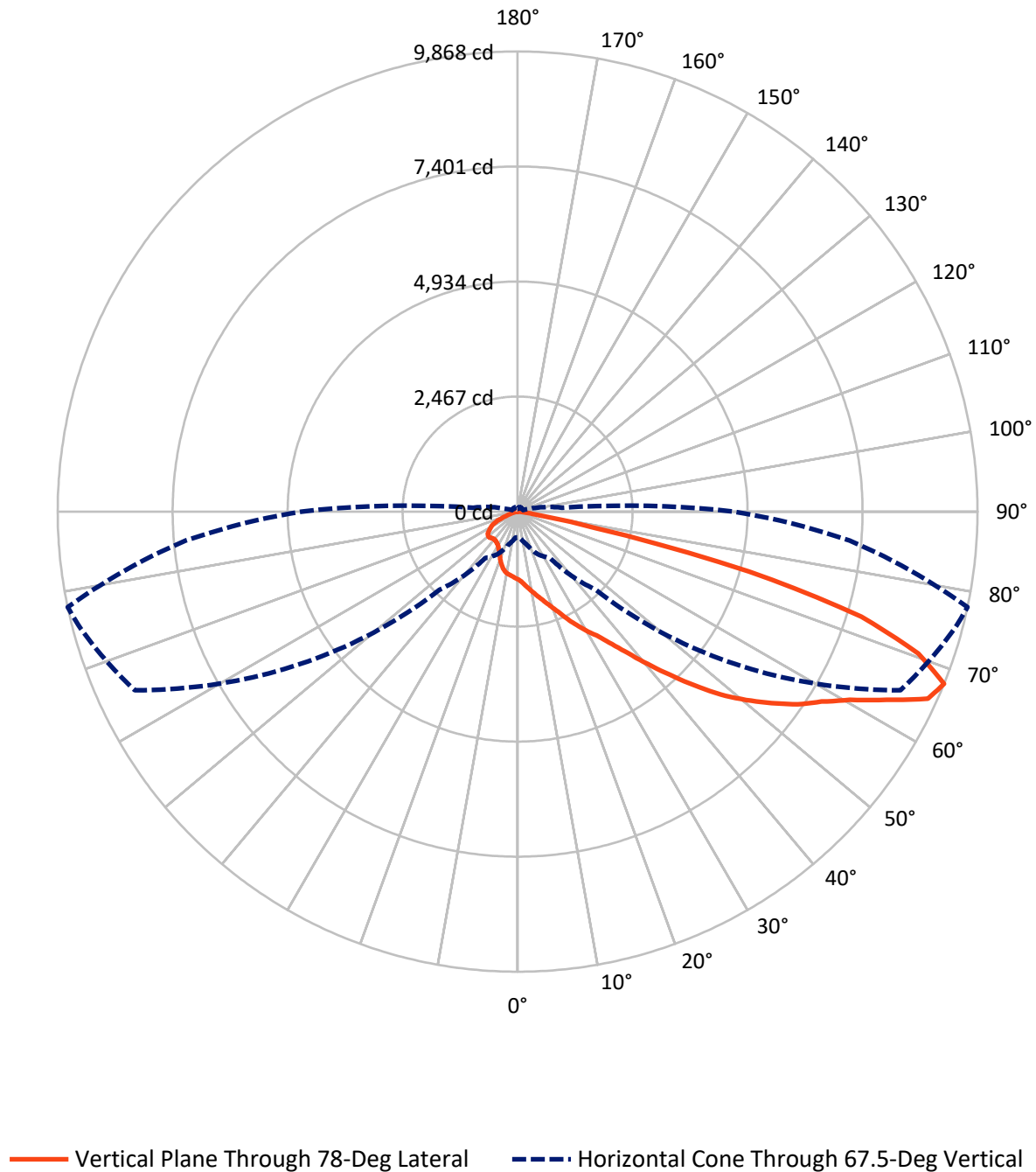
× Max cd  
 - - - 1/2 Max cd



Based on 20 foot mounting height. Maximum calculated value = 4.9 fc  
 Type II - Medium - N/A

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CATALOG NUMBER: VAL-T-SB3A-730-U-T2-HSS

## Luminous Intensity Polar Plot



REPORT NUMBER: P1380327

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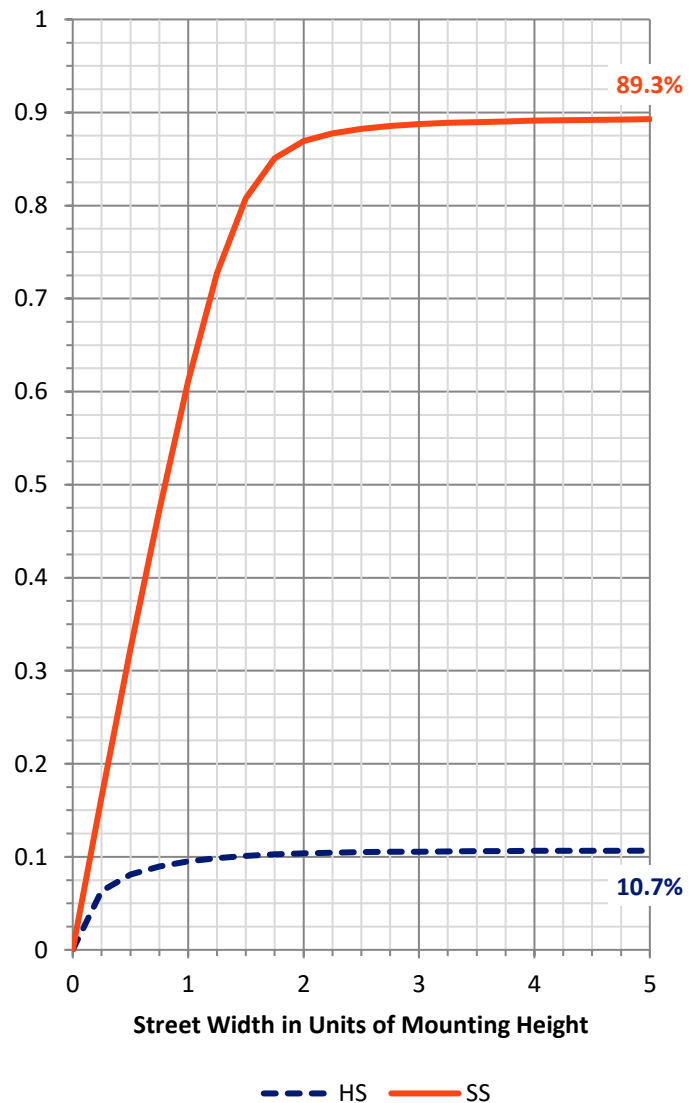
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 1042.7   | 0.0    | 1042.7 |
|                    | % Fixture | 10.7     | 0.0    | 10.7   |
| <b>Street Side</b> | Lumens    | 8674.4   | 0.0    | 8674.4 |
|                    | % Fixture | 89.3     | 0.0    | 89.3   |
| <b>Total</b>       | Lumens    | 9717.1   | 0.0    | 9717.1 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 131.1  | 1.3       |
| 10°-20°   | 356.8  | 3.7       |
| 20°-30°   | 587.1  | 6.0       |
| 30°-40°   | 1025.4 | 10.6      |
| 40°-50°   | 1744.6 | 18.0      |
| 50°-60°   | 2516.2 | 25.9      |
| 60°-70°   | 2428.7 | 25.0      |
| 70°-80°   | 892.1  | 9.2       |
| 80°-90°   | 35.2   | 0.4       |
| 90°-100°  | 0.0    | 0.0       |
| 100°-110° | 0.0    | 0.0       |
| 110°-120° | 0.0    | 0.0       |
| 120°-130° | 0.0    | 0.0       |
| 130°-140° | 0.0    | 0.0       |
| 140°-150° | 0.0    | 0.0       |
| 150°-160° | 0.0    | 0.0       |
| 160°-170° | 0.0    | 0.0       |
| 170°-180° | 0.0    | 0.0       |
| 0°-90°    | 9717.1 | 100.0     |
| 0°-180°   | 9717.1 | 100.0     |

**Coefficient of Utilization**



REPORT NUMBER: P1380327

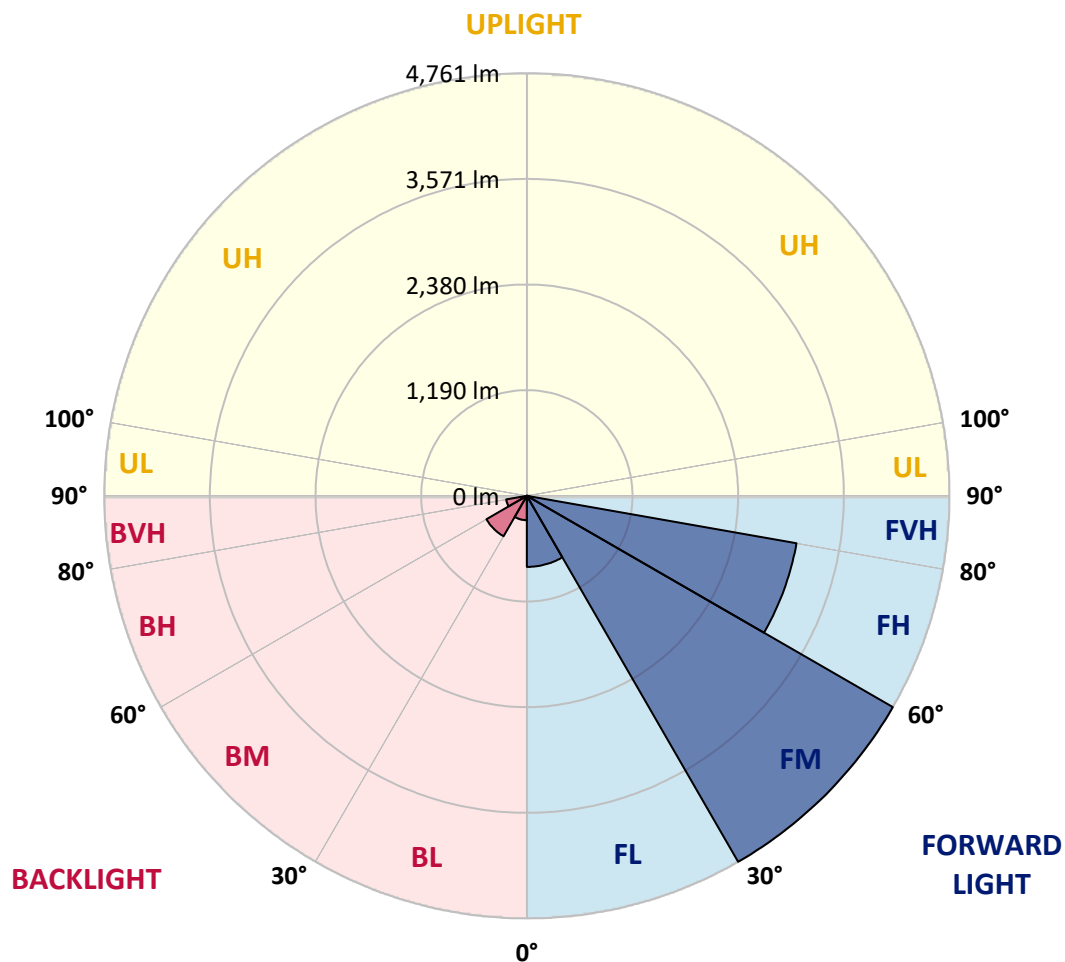
CATALOG NUMBER: VAL-T-SB3A-730-U-T2-HSS

**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 800.7  | 8.2       |                         |      |         |
| FM   | (30°-60°)   | 4760.7 | 49.0      |                         |      |         |
| FH   | (60°-80°)   | 3084.4 | 31.7      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 28.6   | 0.3       |                         |      | G1/100  |
| BL   | (0°-30°)    | 274.3  | 2.8       | B1/500                  |      |         |
| BM   | (30°-60°)   | 525.5  | 5.4       | B1/1000                 |      |         |
| BH   | (60°-80°)   | 236.4  | 2.4       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 6.6    | 0.1       |                         |      | G0/10   |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B1-U0-G2**

Type II Medium



REPORT NUMBER: P1380327

CATALOG NUMBER: VAL-T-SB3A-730-U-T2-HSS

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 75°    | 78°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1454.4 | 1454.4 | 1454.4 | 1454.4 | 1454.4 | 1454.4 | 1454.4 | 1454.4 | 1454.4 | 1454.4 | 1454.4 |
| 2.5°  | 1609.7 | 1607.0 | 1612.4 | 1601.5 | 1604.2 | 1590.6 | 1560.7 | 1541.6 | 1517.1 | 1500.7 | 1481.7 |
| 5°    | 1726.8 | 1729.5 | 1724.1 | 1726.8 | 1718.6 | 1699.6 | 1683.2 | 1634.2 | 1593.3 | 1577.0 | 1536.1 |
| 7.5°  | 1764.9 | 1770.4 | 1770.4 | 1784.0 | 1792.2 | 1800.3 | 1786.7 | 1735.0 | 1680.5 | 1658.7 | 1590.6 |
| 10°   | 1764.9 | 1764.9 | 1784.0 | 1803.1 | 1841.2 | 1868.4 | 1865.7 | 1846.6 | 1778.5 | 1745.9 | 1669.6 |
| 12.5° | 1715.9 | 1713.2 | 1737.7 | 1792.2 | 1843.9 | 1906.6 | 1952.9 | 1936.5 | 1873.9 | 1849.4 | 1737.7 |
| 15°   | 1579.7 | 1582.4 | 1628.7 | 1710.5 | 1814.0 | 1920.2 | 1999.2 | 2034.6 | 1991.0 | 1952.9 | 1841.2 |
| 17.5° | 1400.0 | 1410.9 | 1465.3 | 1579.7 | 1735.0 | 1906.6 | 2056.4 | 2140.8 | 2113.6 | 2078.2 | 1942.0 |
| 20°   | 1334.6 | 1337.3 | 1367.3 | 1449.0 | 1626.0 | 1854.8 | 2072.7 | 2255.2 | 2277.0 | 2219.8 | 2050.9 |
| 22.5° | 1435.4 | 1446.3 | 1435.4 | 1440.8 | 1552.5 | 1792.2 | 2089.0 | 2356.0 | 2435.0 | 2380.5 | 2181.7 |
| 25°   | 1620.6 | 1609.7 | 1579.7 | 1555.2 | 1574.3 | 1745.9 | 2097.2 | 2484.0 | 2633.8 | 2587.5 | 2353.2 |
| 27.5° | 1830.3 | 1805.8 | 1781.3 | 1724.1 | 1685.9 | 1773.1 | 2124.5 | 2560.2 | 2819.0 | 2783.6 | 2508.5 |
| 30°   | 2154.4 | 2149.0 | 2075.4 | 1944.7 | 1849.4 | 1879.3 | 2168.0 | 2639.2 | 3031.4 | 2987.9 | 2666.5 |
| 32.5° | 2535.7 | 2522.1 | 2426.8 | 2249.7 | 2080.9 | 2029.1 | 2255.2 | 2715.5 | 3268.4 | 3192.1 | 2870.7 |
| 35°   | 2917.0 | 2914.3 | 2857.1 | 2598.4 | 2369.6 | 2233.4 | 2410.4 | 2832.6 | 3543.5 | 3489.0 | 3091.4 |
| 37.5° | 3222.1 | 3241.2 | 3276.6 | 2930.7 | 2710.0 | 2503.0 | 2617.4 | 3020.5 | 3889.4 | 3851.3 | 3369.2 |
| 40°   | 3475.4 | 3508.1 | 3554.4 | 3262.9 | 3026.0 | 2827.2 | 2898.0 | 3328.3 | 4306.1 | 4300.7 | 3701.5 |
| 42.5° | 3693.3 | 3745.0 | 3706.9 | 3540.8 | 3322.9 | 3156.7 | 3205.7 | 3682.4 | 4758.2 | 4782.7 | 4082.8 |
| 45°   | 3949.3 | 3982.0 | 3984.7 | 3810.4 | 3608.8 | 3494.5 | 3576.2 | 4085.5 | 5281.2 | 5311.1 | 4488.6 |
| 47.5° | 4229.8 | 4218.9 | 4238.0 | 4110.0 | 3927.5 | 3824.0 | 3971.1 | 4513.1 | 5757.8 | 5864.0 | 4902.6 |
| 50°   | 4453.2 | 4491.3 | 4521.3 | 4450.5 | 4281.6 | 4191.7 | 4360.6 | 4954.3 | 6229.0 | 6351.6 | 5294.8 |
| 52.5° | 4477.7 | 4499.5 | 4652.0 | 4720.1 | 4711.9 | 4567.6 | 4763.7 | 5365.6 | 6632.1 | 6822.8 | 5613.5 |
| 55°   | 4123.6 | 4276.1 | 4526.7 | 4761.0 | 5068.7 | 5093.2 | 5147.7 | 5757.8 | 6986.2 | 7296.7 | 5885.8 |
| 57.5° | 3388.2 | 3502.6 | 3941.1 | 4499.5 | 5090.5 | 5599.8 | 5812.3 | 6182.7 | 7348.4 | 7688.9 | 6201.8 |
| 60°   | 2306.9 | 2260.6 | 2772.7 | 3851.3 | 4763.7 | 5798.7 | 6705.6 | 6923.5 | 7735.2 | 8192.8 | 6542.2 |
| 62.5° | 1252.9 | 1285.6 | 1601.5 | 2481.3 | 3805.0 | 5515.4 | 7471.0 | 8228.2 | 8432.4 | 8887.3 | 6937.2 |
| 65°   | 803.5  | 833.4  | 1029.5 | 1413.6 | 2228.0 | 4306.1 | 7323.9 | 9344.9 | 9328.5 | 9671.7 | 7250.4 |
| 67.5° | 550.2  | 563.8  | 721.8  | 1002.3 | 1217.5 | 2372.3 | 5695.2 | 9064.3 | 9704.4 | 9867.8 | 7146.9 |
| 70°   | 370.4  | 384.0  | 512.0  | 740.8  | 874.3  | 1040.4 | 3393.7 | 7479.2 | 9018.0 | 9121.5 | 6324.3 |
| 72.5° | 234.2  | 247.9  | 310.5  | 495.7  | 659.1  | 588.3  | 1557.9 | 5215.8 | 7503.7 | 7713.4 | 5409.2 |
| 75°   | 133.5  | 141.6  | 193.4  | 343.2  | 416.7  | 386.8  | 419.4  | 3265.7 | 5038.8 | 5128.7 | 3600.7 |
| 77.5° | 68.1   | 73.5   | 122.6  | 220.6  | 266.9  | 215.2  | 223.3  | 1421.8 | 1759.5 | 1694.1 | 988.7  |
| 80°   | 32.7   | 38.1   | 76.3   | 133.5  | 174.3  | 122.6  | 130.7  | 321.4  | 422.2  | 359.5  | 231.5  |
| 82.5° | 16.3   | 16.3   | 49.0   | 54.5   | 95.3   | 73.5   | 57.2   | 111.7  | 158.0  | 160.7  | 106.2  |
| 85°   | 10.9   | 8.2    | 13.6   | 19.1   | 21.8   | 30.0   | 32.7   | 46.3   | 51.7   | 54.5   | 40.9   |
| 87.5° | 0.0    | 0.0    | 2.7    | 2.7    | 5.4    | 8.2    | 13.6   | 19.1   | 19.1   | 21.8   | 19.1   |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

REPORT NUMBER: P1380327

CATALOG NUMBER: VAL-T-SB3A-730-U-T2-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1454.4 | 1454.4 | 1454.4 | 1454.4 | 1454.4 | 1454.4 | 1454.4 | 1454.4 | 1454.4 | 1454.4 | 1454.4 |
| 2.5°  | 1470.8 | 1462.6 | 1410.9 | 1367.3 | 1329.1 | 1301.9 | 1266.5 | 1258.3 | 1236.5 | 1222.9 | 1225.6 |
| 5°    | 1495.3 | 1457.2 | 1361.8 | 1280.1 | 1190.2 | 1100.4 | 1021.4 | 994.1  | 939.7  | 920.6  | 926.0  |
| 7.5°  | 1525.2 | 1478.9 | 1323.7 | 1163.0 | 1007.8 | 893.4  | 781.7  | 713.6  | 659.1  | 637.3  | 634.6  |
| 10°   | 1582.4 | 1503.5 | 1277.4 | 1045.9 | 830.7  | 675.5  | 577.4  | 539.3  | 520.2  | 514.8  | 514.8  |
| 12.5° | 1642.4 | 1530.7 | 1214.8 | 904.3  | 656.4  | 536.6  | 498.4  | 487.5  | 482.1  | 479.4  | 479.4  |
| 15°   | 1702.3 | 1549.8 | 1124.9 | 732.7  | 533.8  | 484.8  | 468.5  | 463.0  | 454.9  | 452.1  | 457.6  |
| 17.5° | 1786.7 | 1563.4 | 1021.4 | 599.2  | 479.4  | 454.9  | 438.5  | 433.1  | 424.9  | 422.2  | 424.9  |
| 20°   | 1860.3 | 1585.2 | 901.5  | 512.0  | 446.7  | 427.6  | 405.8  | 394.9  | 392.2  | 389.5  | 389.5  |
| 22.5° | 1947.4 | 1609.7 | 762.6  | 463.0  | 419.4  | 392.2  | 367.7  | 359.5  | 354.1  | 354.1  | 354.1  |
| 25°   | 2070.0 | 1628.7 | 651.0  | 441.2  | 389.5  | 356.8  | 332.3  | 324.1  | 321.4  | 318.7  | 321.4  |
| 27.5° | 2173.5 | 1628.7 | 577.4  | 427.6  | 365.0  | 326.8  | 305.0  | 299.6  | 294.2  | 288.7  | 291.4  |
| 30°   | 2271.5 | 1593.3 | 522.9  | 416.7  | 348.6  | 302.3  | 286.0  | 275.1  | 269.6  | 261.5  | 261.5  |
| 32.5° | 2383.2 | 1560.7 | 501.2  | 405.8  | 332.3  | 283.3  | 266.9  | 258.7  | 253.3  | 245.1  | 245.1  |
| 35°   | 2503.0 | 1503.5 | 498.4  | 397.7  | 315.9  | 269.6  | 253.3  | 247.9  | 239.7  | 234.2  | 234.2  |
| 37.5° | 2671.9 | 1468.1 | 493.0  | 386.8  | 302.3  | 256.0  | 239.7  | 237.0  | 231.5  | 226.1  | 228.8  |
| 40°   | 2898.0 | 1465.3 | 482.1  | 378.6  | 291.4  | 242.4  | 228.8  | 223.3  | 223.3  | 217.9  | 217.9  |
| 42.5° | 3115.9 | 1476.2 | 482.1  | 362.2  | 280.5  | 228.8  | 217.9  | 215.2  | 209.7  | 201.6  | 201.6  |
| 45°   | 3382.8 | 1517.1 | 487.5  | 345.9  | 269.6  | 220.6  | 209.7  | 204.3  | 198.8  | 193.4  | 193.4  |
| 47.5° | 3630.6 | 1568.8 | 493.0  | 329.6  | 258.7  | 212.4  | 204.3  | 201.6  | 193.4  | 187.9  | 190.7  |
| 50°   | 3840.4 | 1631.5 | 479.4  | 313.2  | 242.4  | 209.7  | 198.8  | 196.1  | 185.2  | 182.5  | 185.2  |
| 52.5° | 4028.3 | 1669.6 | 438.5  | 296.9  | 226.1  | 204.3  | 193.4  | 190.7  | 179.8  | 177.0  | 174.3  |
| 55°   | 4172.6 | 1683.2 | 392.2  | 272.4  | 212.4  | 196.1  | 185.2  | 179.8  | 171.6  | 166.1  | 163.4  |
| 57.5° | 4314.3 | 1628.7 | 332.3  | 239.7  | 196.1  | 182.5  | 174.3  | 168.9  | 158.0  | 147.1  | 144.4  |
| 60°   | 4477.7 | 1560.7 | 277.8  | 198.8  | 177.0  | 168.9  | 160.7  | 155.2  | 141.6  | 122.6  | 122.6  |
| 62.5° | 4668.4 | 1528.0 | 220.6  | 163.4  | 155.2  | 147.1  | 147.1  | 141.6  | 119.8  | 100.8  | 98.1   |
| 65°   | 4810.0 | 1331.9 | 168.9  | 136.2  | 133.5  | 125.3  | 128.0  | 125.3  | 100.8  | 76.3   | 73.5   |
| 67.5° | 4641.1 | 953.3  | 130.7  | 114.4  | 111.7  | 100.8  | 108.9  | 106.2  | 87.2   | 65.4   | 59.9   |
| 70°   | 3962.9 | 621.0  | 106.2  | 95.3   | 89.9   | 76.3   | 89.9   | 92.6   | 73.5   | 51.7   | 49.0   |
| 72.5° | 3371.9 | 397.7  | 84.4   | 76.3   | 62.6   | 54.5   | 70.8   | 79.0   | 59.9   | 40.9   | 38.1   |
| 75°   | 2334.2 | 250.6  | 62.6   | 57.2   | 43.6   | 38.1   | 57.2   | 62.6   | 49.0   | 27.2   | 27.2   |
| 77.5° | 770.8  | 125.3  | 46.3   | 38.1   | 30.0   | 27.2   | 43.6   | 46.3   | 32.7   | 19.1   | 16.3   |
| 80°   | 147.1  | 59.9   | 32.7   | 24.5   | 21.8   | 16.3   | 27.2   | 24.5   | 13.6   | 10.9   | 10.9   |
| 82.5° | 70.8   | 35.4   | 24.5   | 19.1   | 10.9   | 10.9   | 8.2    | 10.9   | 10.9   | 8.2    | 8.2    |
| 85°   | 32.7   | 21.8   | 16.3   | 10.9   | 8.2    | 5.4    | 5.4    | 8.2    | 8.2    | 8.2    | 5.4    |
| 87.5° | 19.1   | 16.3   | 10.9   | 8.2    | 5.4    | 5.4    | 5.4    | 5.4    | 5.4    | 5.4    | 2.7    |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |



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

Report Prepared for

Cooper Lighting Solutions

McGraw-Edison

Report Number: SP1-2407-184-4

Test Date: 10/10/2024

Luminaire Tested: GSS-SB1A-730-U-5WQ

Data in this report applies to families of products including GSS-SB1A-730-U-5WQ

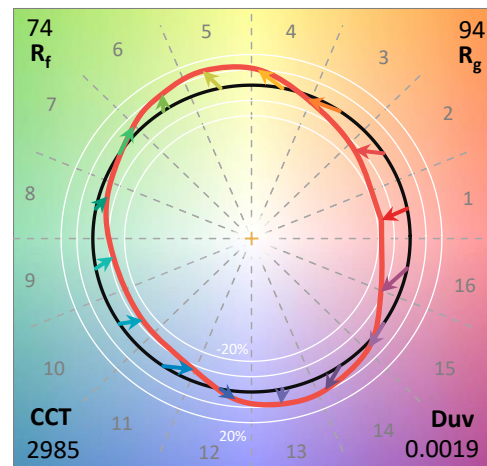
### Test Information

Test Method: LM-79-2019  
 Report Number: SP1-2407-184-4  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry:  $4\pi$   
 Issue Date: 10/15/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: McGraw-Edison  
 Catalog Number: **GSS-SB1A-730-U-5WQ**  
 Description: GALLEON II SITE SLIM 1SQ 350MA 5WQ HIGH DENSITY LIGHTSQUARE WITH 70 CRI  
 3000K CCT 26 LEDS

### Spectral Parameters

CCT (K): 2985  
 CIE  $u'$ : 0.2504  
 CIE  $v'$ : 0.5243  
 Duv: 0.0019  
 CIE x: 0.4408  
 CIE y: 0.4101  
 CIE z: 0.1491  
 Peak Wavelength (nm): 595  
 Dominant Wavelength (nm): 582  
 Purity: 55.41818  
 R<sub>f</sub>: 73.8  
 R<sub>g</sub>: 94.4

CRI (Ra): 70.8  
 R1: 66.3  
 R2: 80.6  
 R3: 94.5  
 R4: 68.2  
 R5: 66.5  
 R6: 74.7  
 R7: 76.2  
 R8: 39.6  
 R9: -43.2  
 R10: 57.6  
 R11: 64.8  
 R12: 53.5  
 R13: 68.7  
 R14: 97.0  
 R15: 56.4



### Test Conditions

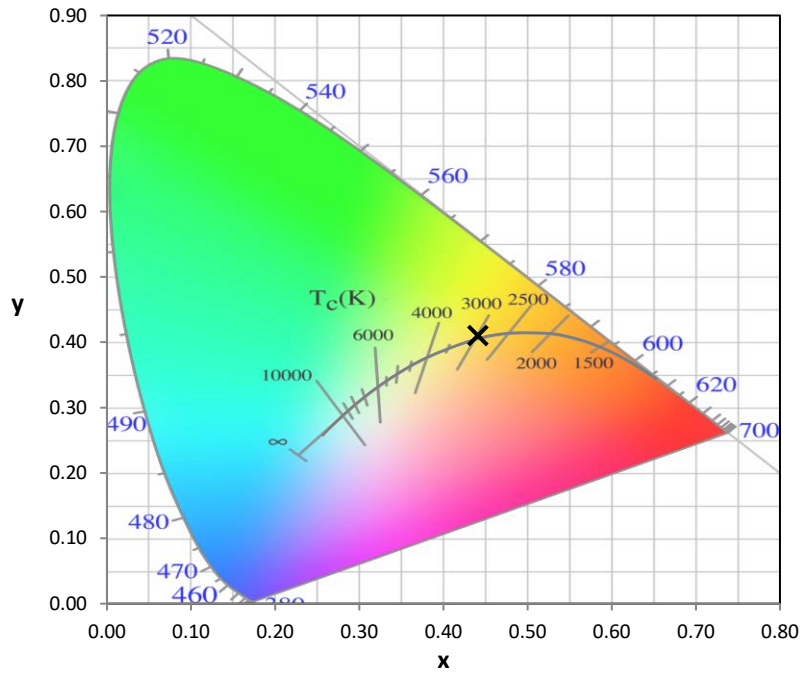
Stabilization Time: 36M  
 Operation Time: 1H 36M  
 Sphere Temperature (°C): 25.2

REPORT NUMBER: SP1-2407-184-4

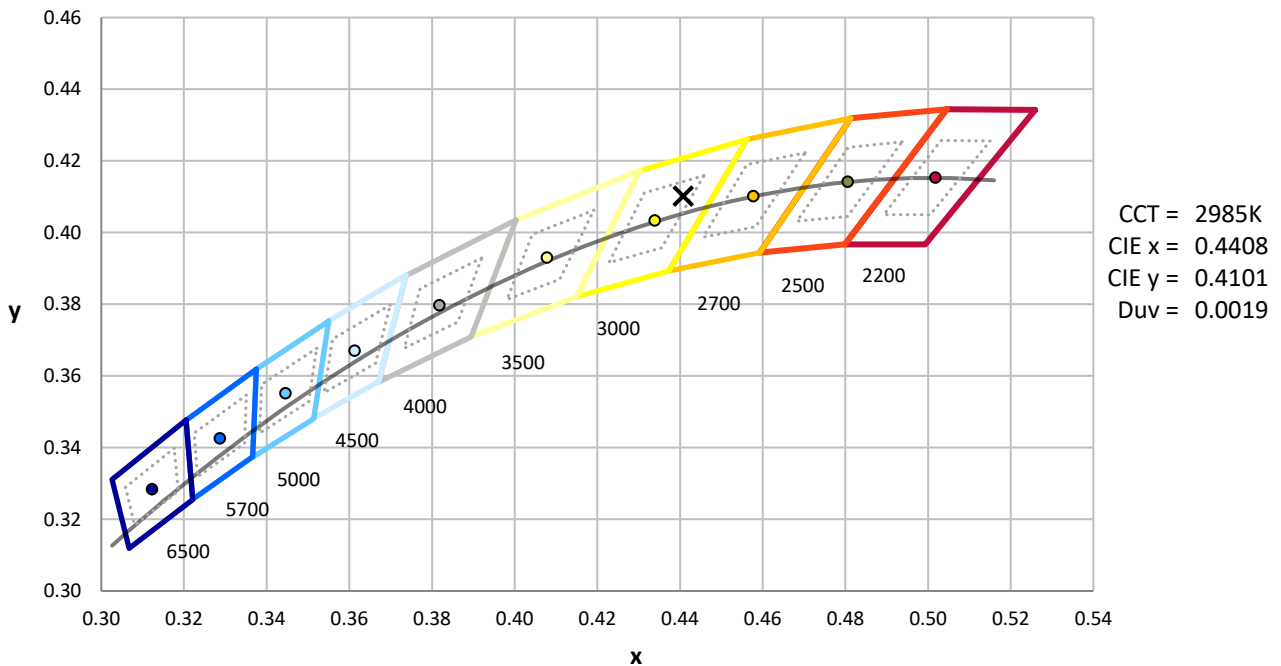
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 6/18/2024        | 12/18/2024           |
| Power Meter                    | INXT2011004           | 2/8/2024         | 2/8/2025             |
| AC Power Source                | IN0063                | 10/24/2023       | 10/24/2024           |
| DC Power Source                | IN0208                | 10/24/2023       | 10/24/2024           |
| Sphere Thermometer             | IN0085                | 10/24/2023       | 10/24/2024           |
| Room Thermometer               | IN0046                | 10/24/2023       | 10/24/2024           |

REPORT NUMBER: SP1-2407-184-4

**CIE 1931 Chromaticity Diagram**



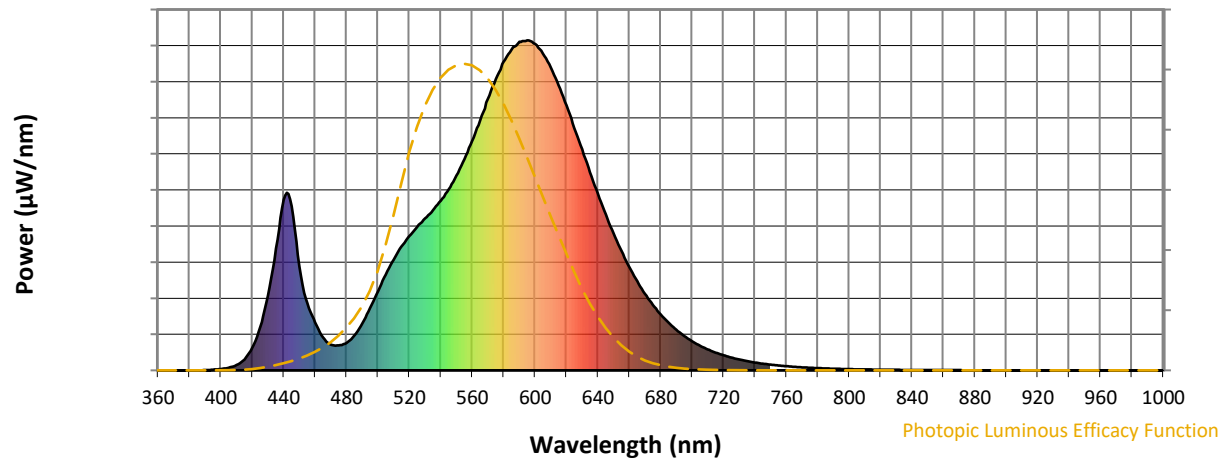
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 3000K 4-step quadrangle

REPORT NUMBER: SP1-2407-184-4

### Photopic Flux vs. Wavelength

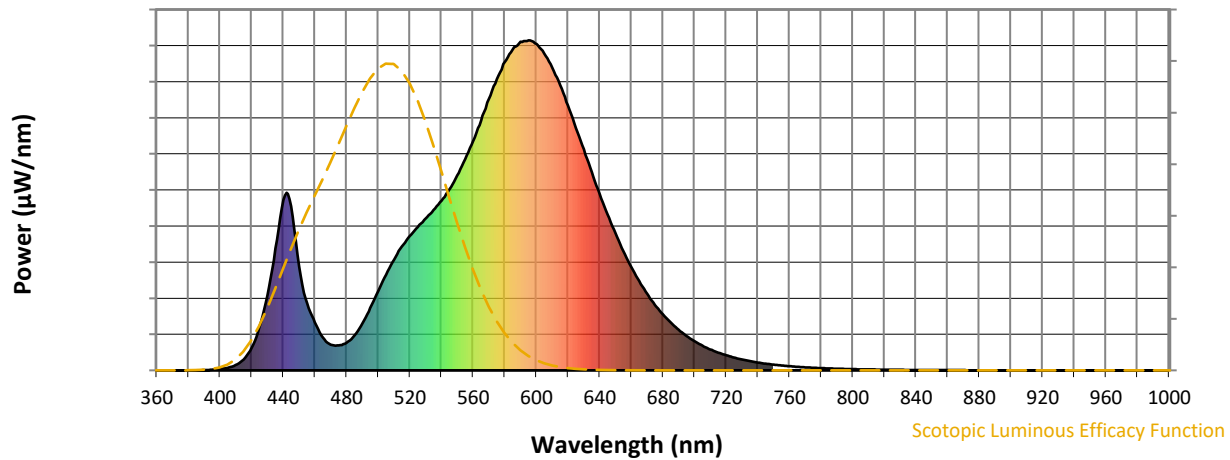


### Photopic Lumens: NR

| $\lambda$<br>(nm) | Power<br>$\text{W}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) |
|-------------------|-------------------------------|--------------------------------|-------------------|-------------------------------|--------------------------------|-------------------|-------------------------------|--------------------------------|-------------------|-------------------------------|--------------------------------|-------------------|-------------------------------|--------------------------------|
| 360               | 0                             | NR                             | 490               | 142                           | NR                             | 620               | 803                           | NR                             | 750               | 17                            | NR                             | 880               | 0                             | NR                             |
| 365               | 0                             | NR                             | 495               | 189                           | NR                             | 625               | 734                           | NR                             | 755               | 15                            | NR                             | 885               | 0                             | NR                             |
| 370               | 0                             | NR                             | 500               | 240                           | NR                             | 630               | 670                           | NR                             | 760               | 13                            | NR                             | 890               | 0                             | NR                             |
| 375               | 0                             | NR                             | 505               | 290                           | NR                             | 635               | 600                           | NR                             | 765               | 11                            | NR                             | 895               | 0                             | NR                             |
| 380               | 0                             | NR                             | 510               | 335                           | NR                             | 640               | 535                           | NR                             | 770               | 9                             | NR                             | 900               | 0                             | NR                             |
| 385               | 0                             | NR                             | 515               | 375                           | NR                             | 645               | 473                           | NR                             | 775               | 8                             | NR                             | 905               | 0                             | NR                             |
| 390               | 1                             | NR                             | 520               | 408                           | NR                             | 650               | 415                           | NR                             | 780               | 7                             | NR                             | 910               | 0                             | NR                             |
| 395               | 2                             | NR                             | 525               | 434                           | NR                             | 655               | 362                           | NR                             | 785               | 6                             | NR                             | 915               | 0                             | NR                             |
| 400               | 4                             | NR                             | 530               | 461                           | NR                             | 660               | 313                           | NR                             | 790               | 5                             | NR                             | 920               | 0                             | NR                             |
| 405               | 8                             | NR                             | 535               | 486                           | NR                             | 665               | 271                           | NR                             | 795               | 4                             | NR                             | 925               | 0                             | NR                             |
| 410               | 16                            | NR                             | 540               | 514                           | NR                             | 670               | 231                           | NR                             | 800               | 4                             | NR                             | 930               | 0                             | NR                             |
| 415               | 33                            | NR                             | 545               | 549                           | NR                             | 675               | 198                           | NR                             | 805               | 3                             | NR                             | 935               | 0                             | NR                             |
| 420               | 69                            | NR                             | 550               | 591                           | NR                             | 680               | 169                           | NR                             | 810               | 3                             | NR                             | 940               | 0                             | NR                             |
| 425               | 131                           | NR                             | 555               | 640                           | NR                             | 685               | 144                           | NR                             | 815               | 2                             | NR                             | 945               | 0                             | NR                             |
| 430               | 227                           | NR                             | 560               | 695                           | NR                             | 690               | 123                           | NR                             | 820               | 2                             | NR                             | 950               | 0                             | NR                             |
| 435               | 369                           | NR                             | 565               | 757                           | NR                             | 695               | 104                           | NR                             | 825               | 2                             | NR                             | 955               | 0                             | NR                             |
| 440               | 517                           | NR                             | 570               | 822                           | NR                             | 700               | 88                            | NR                             | 830               | 2                             | NR                             | 960               | 0                             | NR                             |
| 445               | 498                           | NR                             | 575               | 882                           | NR                             | 705               | 75                            | NR                             | 835               | 1                             | NR                             | 965               | 0                             | NR                             |
| 450               | 315                           | NR                             | 580               | 935                           | NR                             | 710               | 63                            | NR                             | 840               | 1                             | NR                             | 970               | 0                             | NR                             |
| 455               | 204                           | NR                             | 585               | 972                           | NR                             | 715               | 54                            | NR                             | 845               | 1                             | NR                             | 975               | 0                             | NR                             |
| 460               | 145                           | NR                             | 590               | 996                           | NR                             | 720               | 46                            | NR                             | 850               | 1                             | NR                             | 980               | 0                             | NR                             |
| 465               | 100                           | NR                             | 595               | 1000                          | NR                             | 725               | 39                            | NR                             | 855               | 1                             | NR                             | 985               | 0                             | NR                             |
| 470               | 78                            | NR                             | 600               | 989                           | NR                             | 730               | 33                            | NR                             | 860               | 1                             | NR                             | 990               | 0                             | NR                             |
| 475               | 76                            | NR                             | 605               | 960                           | NR                             | 735               | 28                            | NR                             | 865               | 1                             | NR                             | 995               | 0                             | NR                             |
| 480               | 83                            | NR                             | 610               | 918                           | NR                             | 740               | 24                            | NR                             | 870               | 1                             | NR                             | 1000              | 0                             | NR                             |
| 485               | 105                           | NR                             | 615               | 864                           | NR                             | 745               | 20                            | NR                             | 875               | 1                             | NR                             |                   |                               |                                |

REPORT NUMBER: SP1-2407-184-4

### Scotopic Flux vs. Wavelength



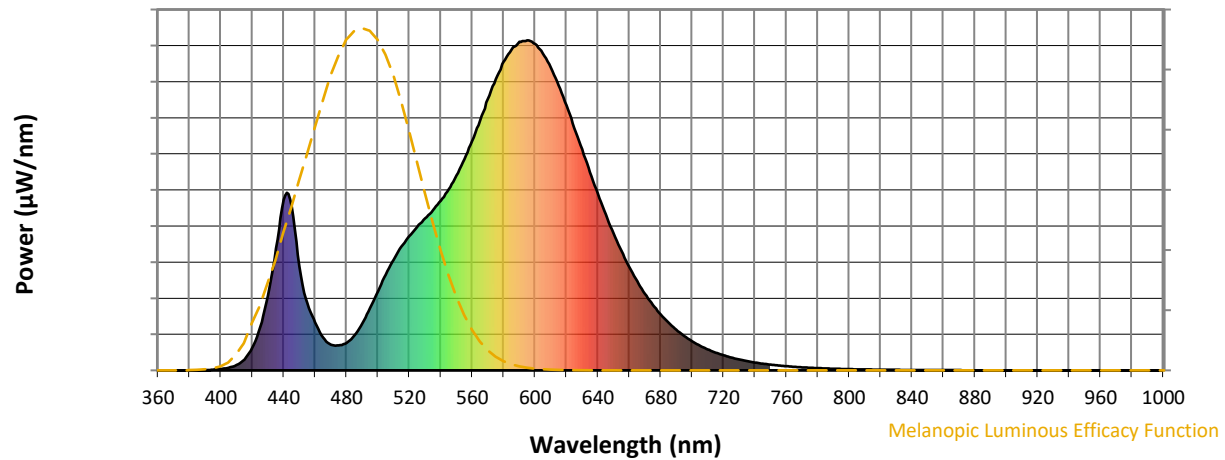
Scotopic Lumens: NR

S/P: 1.19

| $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) |
|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|
| 360               | 0                                    | NR                             | 490               | 142                                  | NR                             | 620               | 803                                  | NR                             | 750               | 17                                   | NR                             | 880               | 0                                    | NR                             |
| 365               | 0                                    | NR                             | 495               | 189                                  | NR                             | 625               | 734                                  | NR                             | 755               | 15                                   | NR                             | 885               | 0                                    | NR                             |
| 370               | 0                                    | NR                             | 500               | 240                                  | NR                             | 630               | 670                                  | NR                             | 760               | 13                                   | NR                             | 890               | 0                                    | NR                             |
| 375               | 0                                    | NR                             | 505               | 290                                  | NR                             | 635               | 600                                  | NR                             | 765               | 11                                   | NR                             | 895               | 0                                    | NR                             |
| 380               | 0                                    | NR                             | 510               | 335                                  | NR                             | 640               | 535                                  | NR                             | 770               | 9                                    | NR                             | 900               | 0                                    | NR                             |
| 385               | 0                                    | NR                             | 515               | 375                                  | NR                             | 645               | 473                                  | NR                             | 775               | 8                                    | NR                             | 905               | 0                                    | NR                             |
| 390               | 1                                    | NR                             | 520               | 408                                  | NR                             | 650               | 415                                  | NR                             | 780               | 7                                    | NR                             | 910               | 0                                    | NR                             |
| 395               | 2                                    | NR                             | 525               | 434                                  | NR                             | 655               | 362                                  | NR                             | 785               | 6                                    | NR                             | 915               | 0                                    | NR                             |
| 400               | 4                                    | NR                             | 530               | 461                                  | NR                             | 660               | 313                                  | NR                             | 790               | 5                                    | NR                             | 920               | 0                                    | NR                             |
| 405               | 8                                    | NR                             | 535               | 486                                  | NR                             | 665               | 271                                  | NR                             | 795               | 4                                    | NR                             | 925               | 0                                    | NR                             |
| 410               | 16                                   | NR                             | 540               | 514                                  | NR                             | 670               | 231                                  | NR                             | 800               | 4                                    | NR                             | 930               | 0                                    | NR                             |
| 415               | 33                                   | NR                             | 545               | 549                                  | NR                             | 675               | 198                                  | NR                             | 805               | 3                                    | NR                             | 935               | 0                                    | NR                             |
| 420               | 69                                   | NR                             | 550               | 591                                  | NR                             | 680               | 169                                  | NR                             | 810               | 3                                    | NR                             | 940               | 0                                    | NR                             |
| 425               | 131                                  | NR                             | 555               | 640                                  | NR                             | 685               | 144                                  | NR                             | 815               | 2                                    | NR                             | 945               | 0                                    | NR                             |
| 430               | 227                                  | NR                             | 560               | 695                                  | NR                             | 690               | 123                                  | NR                             | 820               | 2                                    | NR                             | 950               | 0                                    | NR                             |
| 435               | 369                                  | NR                             | 565               | 757                                  | NR                             | 695               | 104                                  | NR                             | 825               | 2                                    | NR                             | 955               | 0                                    | NR                             |
| 440               | 517                                  | NR                             | 570               | 822                                  | NR                             | 700               | 88                                   | NR                             | 830               | 2                                    | NR                             | 960               | 0                                    | NR                             |
| 445               | 498                                  | NR                             | 575               | 882                                  | NR                             | 705               | 75                                   | NR                             | 835               | 1                                    | NR                             | 965               | 0                                    | NR                             |
| 450               | 315                                  | NR                             | 580               | 935                                  | NR                             | 710               | 63                                   | NR                             | 840               | 1                                    | NR                             | 970               | 0                                    | NR                             |
| 455               | 204                                  | NR                             | 585               | 972                                  | NR                             | 715               | 54                                   | NR                             | 845               | 1                                    | NR                             | 975               | 0                                    | NR                             |
| 460               | 145                                  | NR                             | 590               | 996                                  | NR                             | 720               | 46                                   | NR                             | 850               | 1                                    | NR                             | 980               | 0                                    | NR                             |
| 465               | 100                                  | NR                             | 595               | 1000                                 | NR                             | 725               | 39                                   | NR                             | 855               | 1                                    | NR                             | 985               | 0                                    | NR                             |
| 470               | 78                                   | NR                             | 600               | 989                                  | NR                             | 730               | 33                                   | NR                             | 860               | 1                                    | NR                             | 990               | 0                                    | NR                             |
| 475               | 76                                   | NR                             | 605               | 960                                  | NR                             | 735               | 28                                   | NR                             | 865               | 1                                    | NR                             | 995               | 0                                    | NR                             |
| 480               | 83                                   | NR                             | 610               | 918                                  | NR                             | 740               | 24                                   | NR                             | 870               | 1                                    | NR                             | 1000              | 0                                    | NR                             |
| 485               | 105                                  | NR                             | 615               | 864                                  | NR                             | 745               | 20                                   | NR                             | 875               | 1                                    | NR                             |                   |                                      |                                |

REPORT NUMBER: SP1-2407-184-4

### Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 2.13

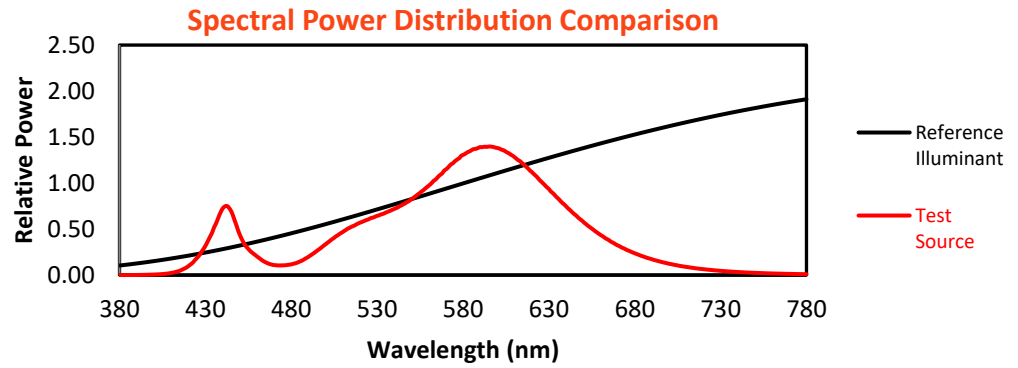
| λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) |
|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|
| 360       | 0                           | NR               | 490       | 142                         | NR               | 620       | 803                         | NR               | 750       | 17                          | NR               | 880       | 0                           | NR               |
| 365       | 0                           | NR               | 495       | 189                         | NR               | 625       | 734                         | NR               | 755       | 15                          | NR               | 885       | 0                           | NR               |
| 370       | 0                           | NR               | 500       | 240                         | NR               | 630       | 670                         | NR               | 760       | 13                          | NR               | 890       | 0                           | NR               |
| 375       | 0                           | NR               | 505       | 290                         | NR               | 635       | 600                         | NR               | 765       | 11                          | NR               | 895       | 0                           | NR               |
| 380       | 0                           | NR               | 510       | 335                         | NR               | 640       | 535                         | NR               | 770       | 9                           | NR               | 900       | 0                           | NR               |
| 385       | 0                           | NR               | 515       | 375                         | NR               | 645       | 473                         | NR               | 775       | 8                           | NR               | 905       | 0                           | NR               |
| 390       | 1                           | NR               | 520       | 408                         | NR               | 650       | 415                         | NR               | 780       | 7                           | NR               | 910       | 0                           | NR               |
| 395       | 2                           | NR               | 525       | 434                         | NR               | 655       | 362                         | NR               | 785       | 6                           | NR               | 915       | 0                           | NR               |
| 400       | 4                           | NR               | 530       | 461                         | NR               | 660       | 313                         | NR               | 790       | 5                           | NR               | 920       | 0                           | NR               |
| 405       | 8                           | NR               | 535       | 486                         | NR               | 665       | 271                         | NR               | 795       | 4                           | NR               | 925       | 0                           | NR               |
| 410       | 16                          | NR               | 540       | 514                         | NR               | 670       | 231                         | NR               | 800       | 4                           | NR               | 930       | 0                           | NR               |
| 415       | 33                          | NR               | 545       | 549                         | NR               | 675       | 198                         | NR               | 805       | 3                           | NR               | 935       | 0                           | NR               |
| 420       | 69                          | NR               | 550       | 591                         | NR               | 680       | 169                         | NR               | 810       | 3                           | NR               | 940       | 0                           | NR               |
| 425       | 131                         | NR               | 555       | 640                         | NR               | 685       | 144                         | NR               | 815       | 2                           | NR               | 945       | 0                           | NR               |
| 430       | 227                         | NR               | 560       | 695                         | NR               | 690       | 123                         | NR               | 820       | 2                           | NR               | 950       | 0                           | NR               |
| 435       | 369                         | NR               | 565       | 757                         | NR               | 695       | 104                         | NR               | 825       | 2                           | NR               | 955       | 0                           | NR               |
| 440       | 517                         | NR               | 570       | 822                         | NR               | 700       | 88                          | NR               | 830       | 2                           | NR               | 960       | 0                           | NR               |
| 445       | 498                         | NR               | 575       | 882                         | NR               | 705       | 75                          | NR               | 835       | 1                           | NR               | 965       | 0                           | NR               |
| 450       | 315                         | NR               | 580       | 935                         | NR               | 710       | 63                          | NR               | 840       | 1                           | NR               | 970       | 0                           | NR               |
| 455       | 204                         | NR               | 585       | 972                         | NR               | 715       | 54                          | NR               | 845       | 1                           | NR               | 975       | 0                           | NR               |
| 460       | 145                         | NR               | 590       | 996                         | NR               | 720       | 46                          | NR               | 850       | 1                           | NR               | 980       | 0                           | NR               |
| 465       | 100                         | NR               | 595       | 1000                        | NR               | 725       | 39                          | NR               | 855       | 1                           | NR               | 985       | 0                           | NR               |
| 470       | 78                          | NR               | 600       | 989                         | NR               | 730       | 33                          | NR               | 860       | 1                           | NR               | 990       | 0                           | NR               |
| 475       | 76                          | NR               | 605       | 960                         | NR               | 735       | 28                          | NR               | 865       | 1                           | NR               | 995       | 0                           | NR               |
| 480       | 83                          | NR               | 610       | 918                         | NR               | 740       | 24                          | NR               | 870       | 1                           | NR               | 1000      | 0                           | NR               |
| 485       | 105                         | NR               | 615       | 864                         | NR               | 745       | 20                          | NR               | 875       | 1                           | NR               |           |                             |                  |

REPORT NUMBER: SP1-2407-184-4

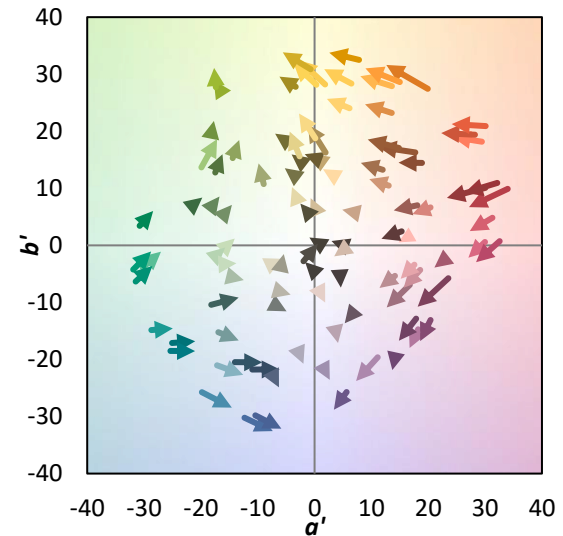
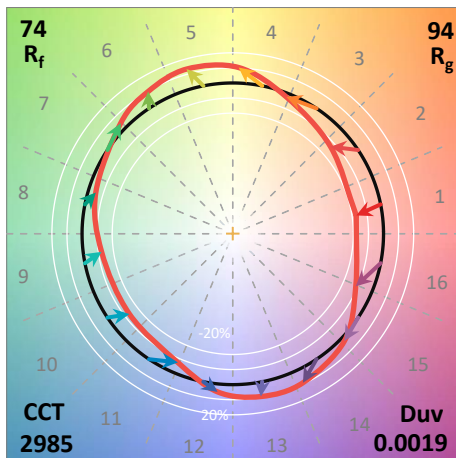
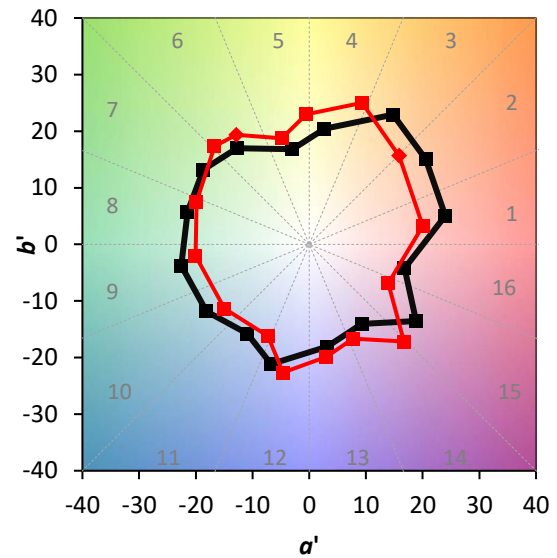
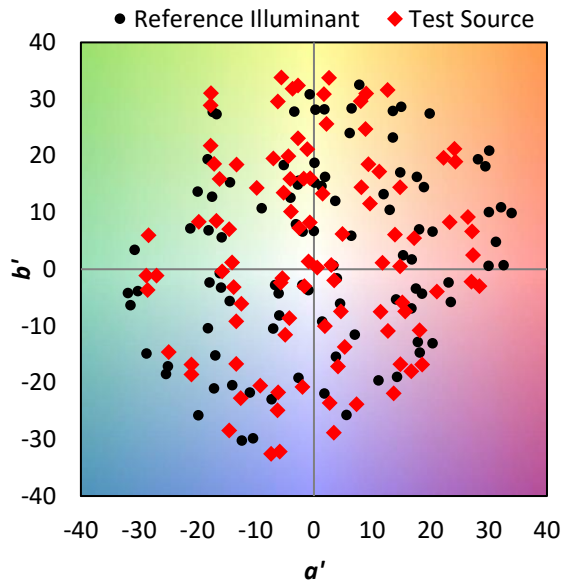
TM-30-18

### Summary

$R_f = 73.8$   
 $R_g = 94.4$   
 $CIE\ R_a = 70.8$   
 $R_g = -43.2$



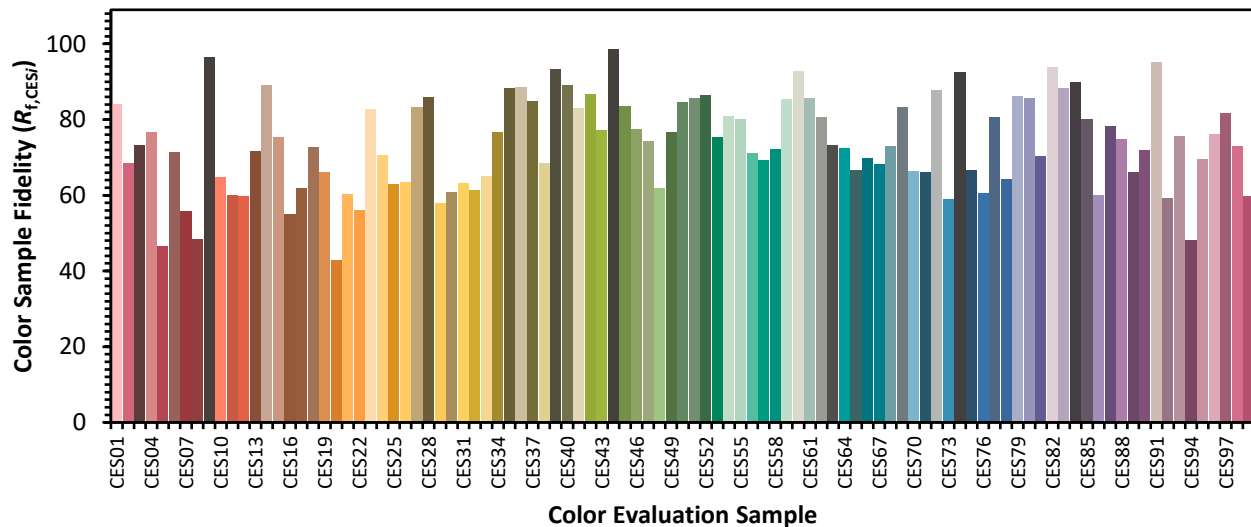
### Color Vector Graphics



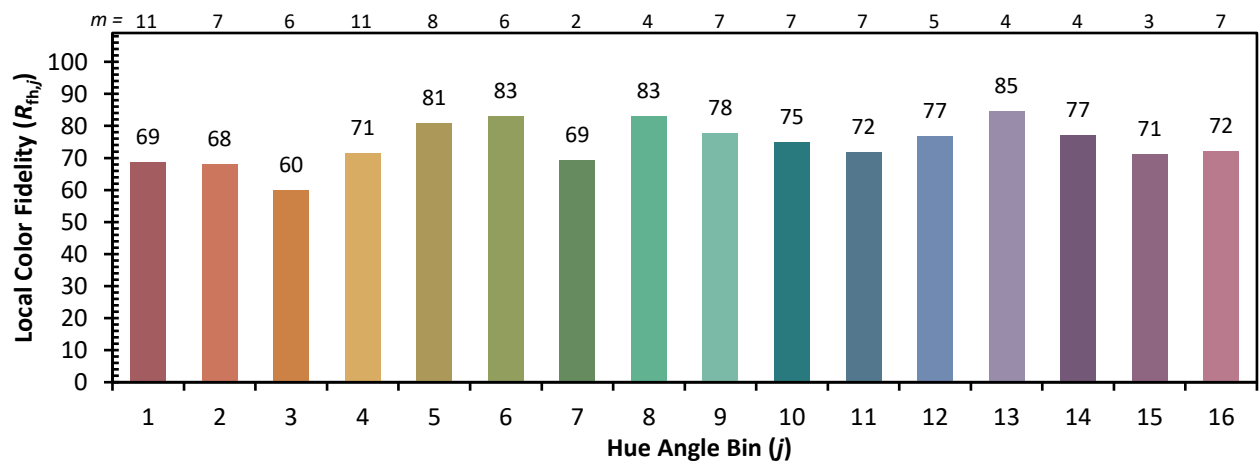
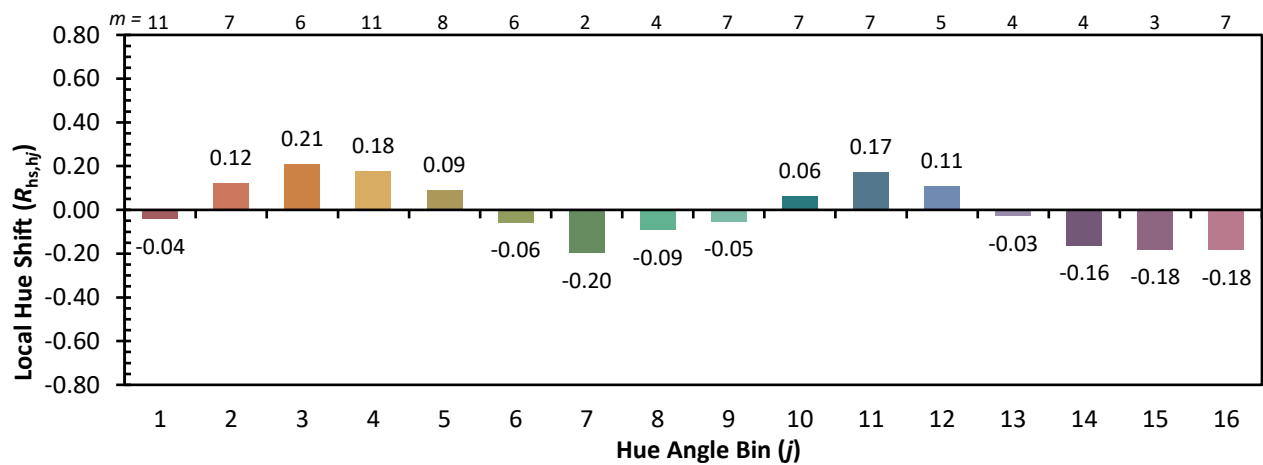
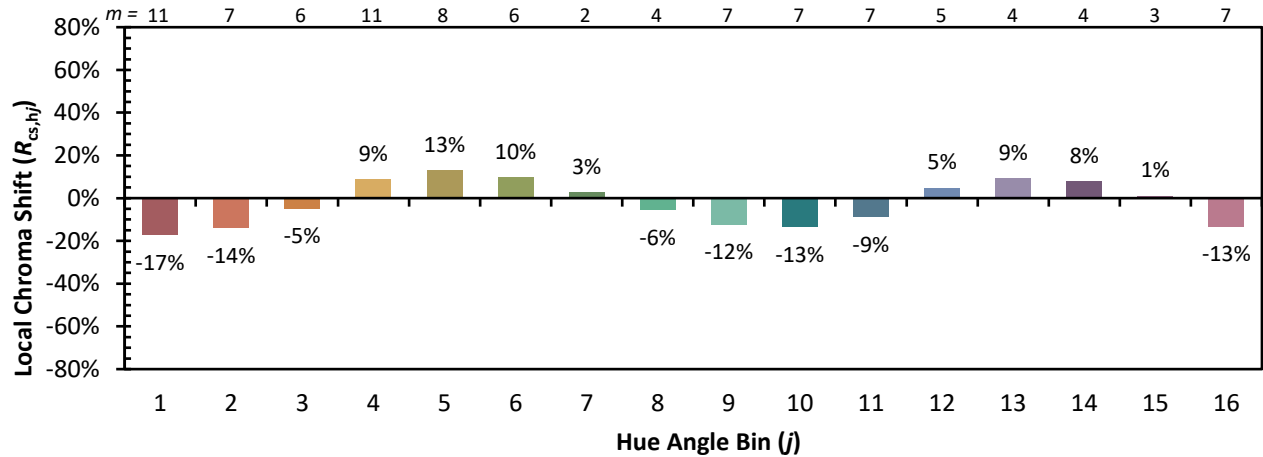


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

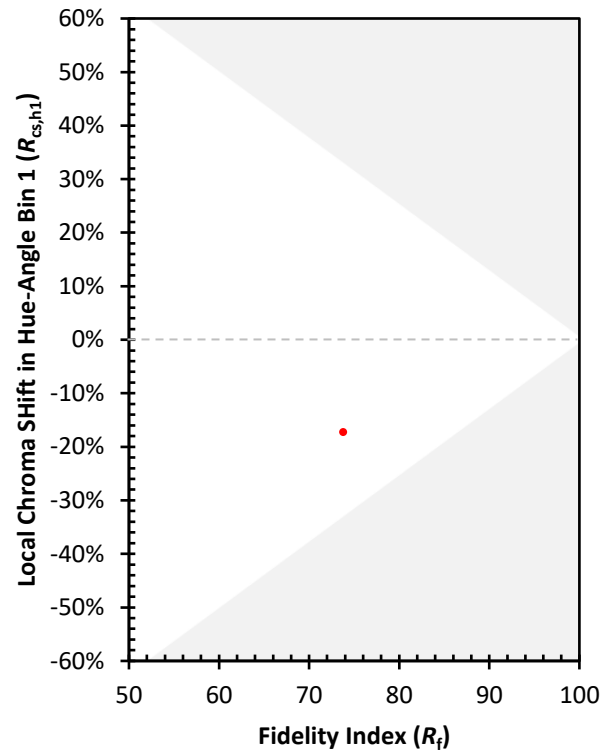
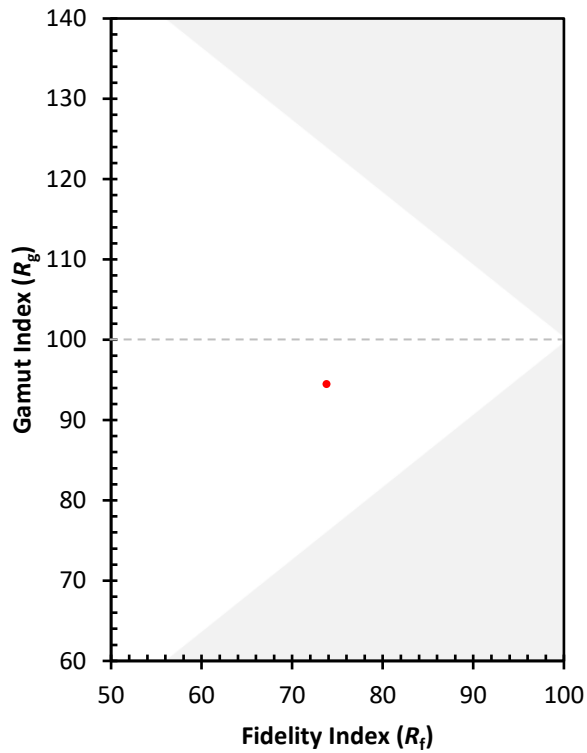
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 63 | CES51 = 86 | CES76 = 61 |
| CES02 = 62 | CES27 = 83 | CES52 = 86 | CES77 = 81 |
| CES03 = 31 | CES28 = 86 | CES53 = 75 | CES78 = 64 |
| CES04 = 71 | CES29 = 58 | CES54 = 81 | CES79 = 86 |
| CES05 = 49 | CES30 = 61 | CES55 = 80 | CES80 = 86 |
| CES06 = 51 | CES31 = 63 | CES56 = 71 | CES81 = 70 |
| CES07 = 41 | CES32 = 61 | CES57 = 69 | CES82 = 94 |
| CES08 = 40 | CES33 = 65 | CES58 = 72 | CES83 = 88 |
| CES09 = 29 | CES34 = 77 | CES59 = 85 | CES84 = 90 |
| CES10 = 76 | CES35 = 88 | CES60 = 93 | CES85 = 80 |
| CES11 = 59 | CES36 = 89 | CES61 = 86 | CES86 = 60 |
| CES12 = 65 | CES37 = 85 | CES62 = 81 | CES87 = 78 |
| CES13 = 43 | CES38 = 69 | CES63 = 73 | CES88 = 75 |
| CES14 = 74 | CES39 = 93 | CES64 = 72 | CES89 = 66 |
| CES15 = 71 | CES40 = 89 | CES65 = 67 | CES90 = 72 |
| CES16 = 47 | CES41 = 83 | CES66 = 70 | CES91 = 95 |
| CES17 = 50 | CES42 = 87 | CES67 = 68 | CES92 = 59 |
| CES18 = 56 | CES43 = 77 | CES68 = 73 | CES93 = 76 |
| CES19 = 73 | CES44 = 99 | CES69 = 83 | CES94 = 48 |
| CES20 = 66 | CES45 = 83 | CES70 = 66 | CES95 = 70 |
| CES21 = 87 | CES46 = 77 | CES71 = 66 | CES96 = 76 |
| CES22 = 79 | CES47 = 74 | CES72 = 88 | CES97 = 82 |
| CES23 = 92 | CES48 = 62 | CES73 = 59 | CES98 = 73 |
| CES24 = 91 | CES49 = 77 | CES74 = 93 | CES99 = 60 |
| CES25 = 73 | CES50 = 85 | CES75 = 67 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)