

Signify Classified - Internal  
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: McGRAW-EDISON

Report Number: P386776

Luminaire Tested: **GWC-SA2C-727-U-SL2-HSS**

Issue Date: 3/3/2020

### Test Information

Test Method: LM-79-08  
Report Number: P386776  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-21)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: MCGRAW-EDISON  
Catalog Number: GWC-SA2C-727-U-SL2-HSS  
Description: GALLEON WALL LUMINAIRE  
(2) 70 CRI, 2700K, 1050mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE II  
SPILL LIGHT ELIMINATOR OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

### Summary

Lumens per Lamp: N/A  
Luminaire Lumens: 10224 lumens  
Efficiency: N/A  
Efficacy: 90.5 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 0.5' x H: 0')  
IES Classification: Type III - Medium  
BUG Rating: B1 - U0 - G2

Input Watts (W): 113  
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: 28.75 FT

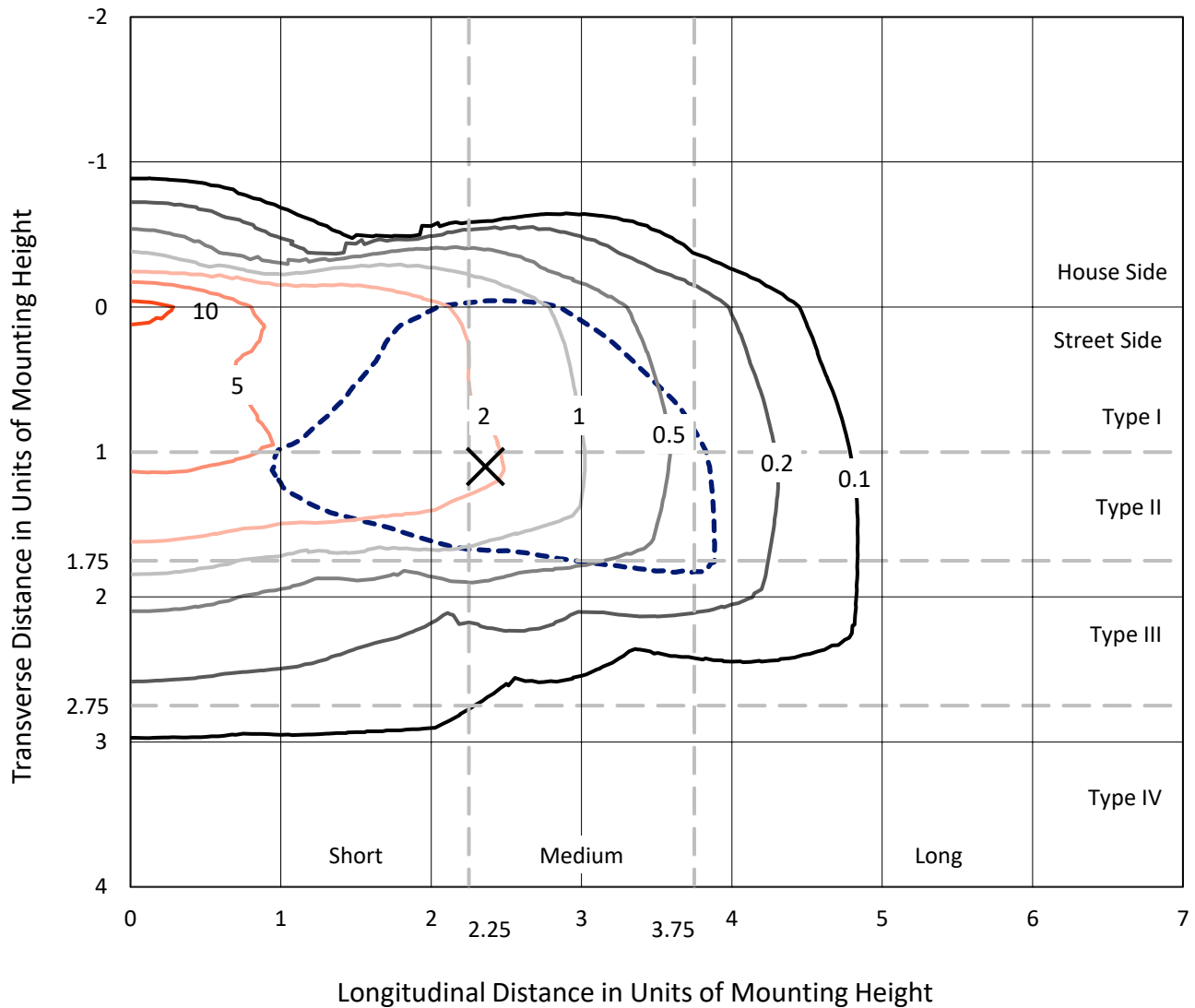


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## Iso-Footcandle Lines of Horizontal Illumination

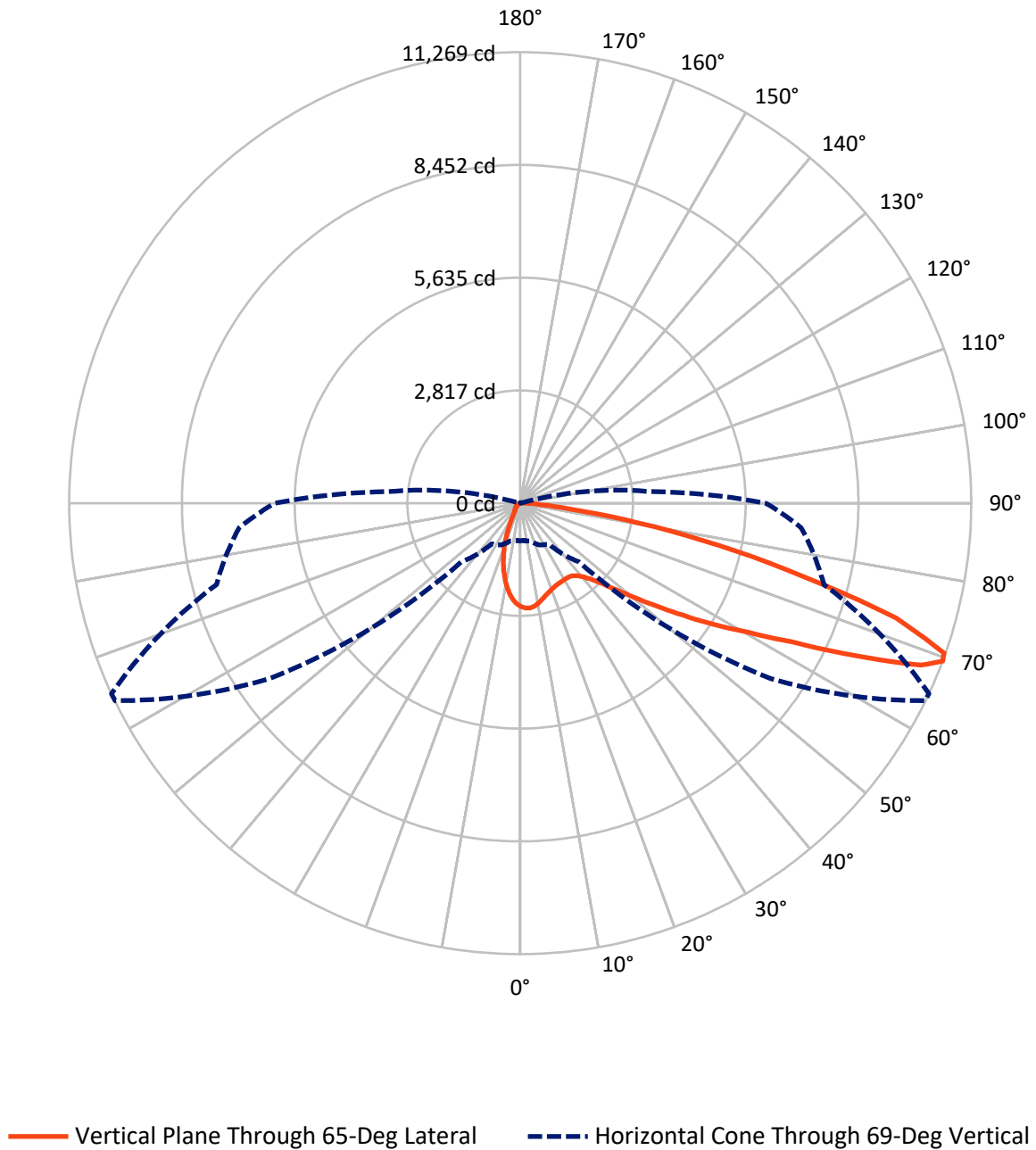
✕ Max cd  
 - - - 1/2 Max cd



Based on 15 foot mounting height. Maximum calculated value = 11.5 fc  
 Type III - Medium - N/A

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## Luminous Intensity Polar Plot



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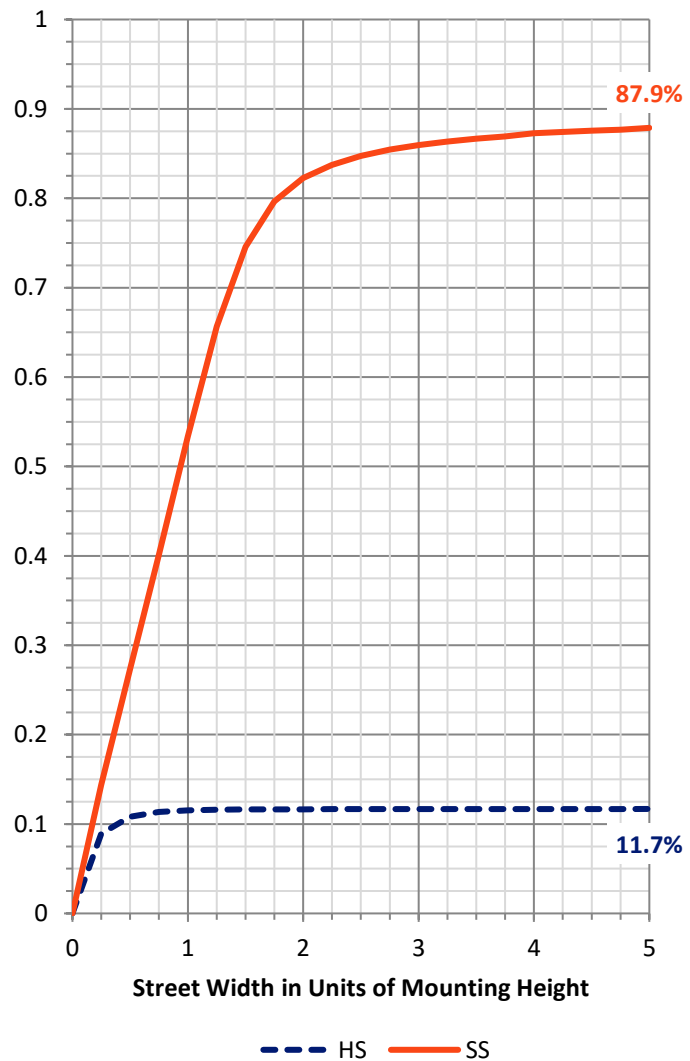
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 1205.2   | 0.0    | 1205.2  |
|                    | % Fixture | 11.8     | 0.0    | 11.8    |
| <b>Street Side</b> | Lumens    | 9018.8   | 0.0    | 9018.8  |
|                    | % Fixture | 88.2     | 0.0    | 88.2    |
| <b>Total</b>       | Lumens    | 10224.0  | 0.0    | 10224.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 216.0   | 2.1       |
| 10°-20°   | 472.9   | 4.6       |
| 20°-30°   | 655.0   | 6.4       |
| 30°-40°   | 913.3   | 8.9       |
| 40°-50°   | 1419.6  | 13.9      |
| 50°-60°   | 2279.0  | 22.3      |
| 60°-70°   | 2577.9  | 25.2      |
| 70°-80°   | 1514.0  | 14.8      |
| 80°-90°   | 176.1   | 1.7       |
| 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°    | 10224.0 | 100.0     |
| 0°-180°   | 10224.0 | 100.0     |

**Coefficient of Utilization**



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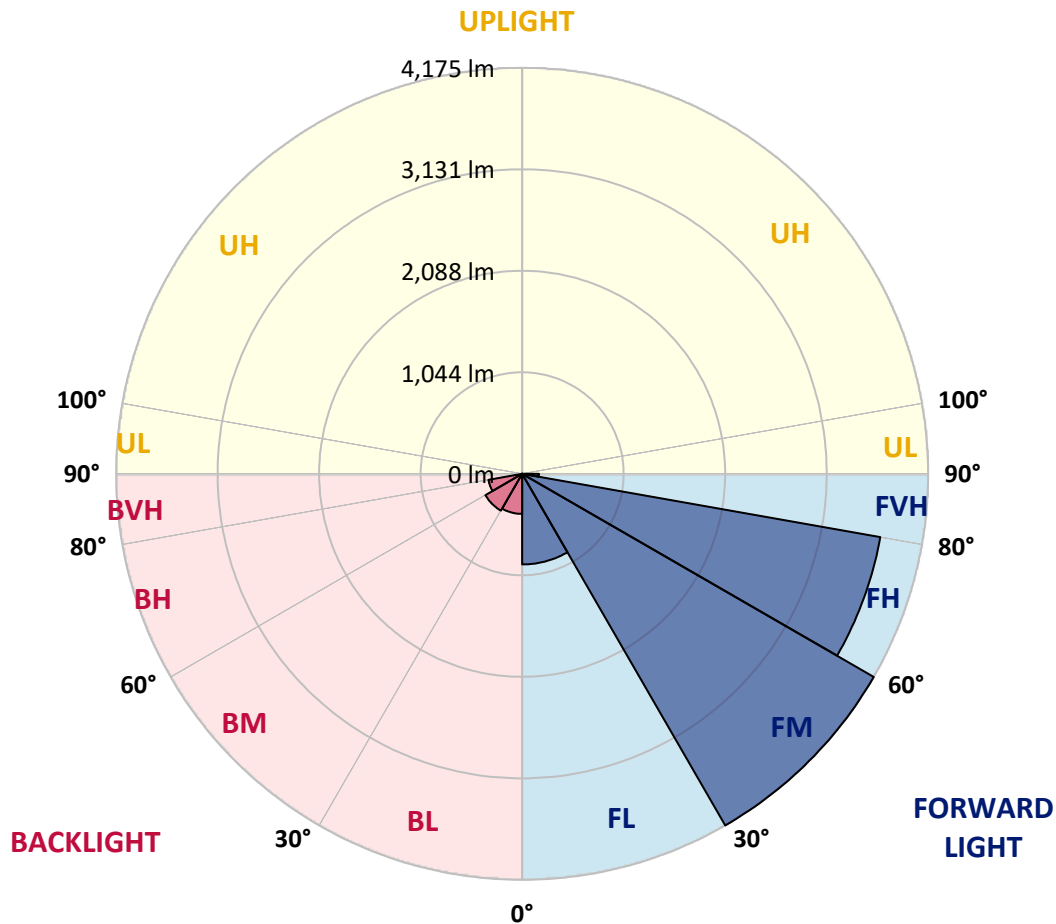
CATALOG NUMBER: GWC-SA2C-727-U-SL2-HSS

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 931.6  | 9.1       |                         |      |         |
| FM   | (30°-60°)   | 4175.2 | 40.8      |                         |      |         |
| FH   | (60°-80°)   | 3739.8 | 36.6      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 172.2  | 1.7       |                         |      | G2/225  |
| BL   | (0°-30°)    | 412.4  | 4.0       | B1/500                  |      |         |
| BM   | (30°-60°)   | 436.7  | 4.3       | B1/1000                 |      |         |
| BH   | (60°-80°)   | 352.1  | 3.4       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 4.0    | 0.0       |                         |      | 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 III Medium



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 64°     | 65°     | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|---------|---------|--------|--------|
| 0°    | 2583.6 | 2583.6 | 2583.6 | 2583.6 | 2583.6 | 2583.6 | 2583.6 | 2583.6  | 2583.6  | 2583.6 | 2583.6 |
| 2.5°  | 2606.6 | 2600.1 | 2605.3 | 2616.5 | 2622.1 | 2622.1 | 2626.5 | 2621.3  | 2623.0  | 2610.4 | 2592.3 |
| 5°    | 2443.5 | 2433.5 | 2447.8 | 2479.4 | 2518.3 | 2551.6 | 2600.9 | 2626.9  | 2629.5  | 2629.9 | 2608.7 |
| 7.5°  | 2267.8 | 2258.7 | 2279.9 | 2317.1 | 2367.3 | 2429.2 | 2515.3 | 2590.5  | 2594.9  | 2635.5 | 2620.0 |
| 10°   | 2125.0 | 2118.6 | 2143.2 | 2183.0 | 2241.9 | 2311.1 | 2416.6 | 2521.3  | 2533.9  | 2623.9 | 2618.2 |
| 12.5° | 2011.7 | 2006.5 | 2029.9 | 2075.7 | 2135.9 | 2212.4 | 2322.8 | 2444.3  | 2461.2  | 2597.5 | 2609.6 |
| 15°   | 1929.1 | 1928.2 | 1947.7 | 1991.8 | 2058.4 | 2129.8 | 2242.7 | 2372.9  | 2392.4  | 2568.9 | 2608.3 |
| 17.5° | 1885.8 | 1887.1 | 1901.4 | 1939.0 | 1996.1 | 2067.1 | 2175.2 | 2312.8  | 2334.0  | 2543.4 | 2614.8 |
| 20°   | 1881.5 | 1882.8 | 1890.6 | 1911.8 | 1958.1 | 2020.8 | 2120.3 | 2262.2  | 2284.2  | 2524.4 | 2625.2 |
| 22.5° | 1919.5 | 1918.7 | 1920.8 | 1918.7 | 1944.6 | 1992.2 | 2083.9 | 2223.2  | 2248.8  | 2511.8 | 2633.4 |
| 25°   | 1992.7 | 1991.4 | 1990.5 | 1974.5 | 1957.2 | 1982.7 | 2068.8 | 2201.2  | 2225.4  | 2502.7 | 2638.1 |
| 27.5° | 2094.3 | 2093.5 | 2092.2 | 2065.8 | 2013.9 | 1997.9 | 2070.5 | 2193.0  | 2213.3  | 2495.4 | 2637.3 |
| 30°   | 2228.0 | 2234.1 | 2232.3 | 2195.6 | 2114.7 | 2044.1 | 2088.7 | 2188.6  | 2206.4  | 2481.1 | 2628.2 |
| 32.5° | 2385.0 | 2397.2 | 2406.7 | 2367.3 | 2266.1 | 2135.9 | 2130.7 | 2193.4  | 2206.4  | 2470.3 | 2611.7 |
| 35°   | 2548.1 | 2563.7 | 2598.8 | 2584.9 | 2451.7 | 2273.9 | 2202.9 | 2222.0  | 2232.8  | 2476.3 | 2604.0 |
| 37.5° | 2708.7 | 2727.3 | 2803.4 | 2843.6 | 2694.8 | 2456.4 | 2315.4 | 2292.5  | 2298.1  | 2513.1 | 2612.6 |
| 40°   | 2895.1 | 2923.2 | 3038.7 | 3103.6 | 2985.1 | 2700.9 | 2483.7 | 2413.6  | 2415.8  | 2594.0 | 2652.8 |
| 42.5° | 3140.0 | 3169.0 | 3294.0 | 3395.7 | 3312.2 | 3009.8 | 2712.1 | 2598.8  | 2596.6  | 2745.4 | 2747.6 |
| 45°   | 3438.5 | 3468.8 | 3598.1 | 3711.0 | 3673.4 | 3375.8 | 3004.6 | 2869.2  | 2866.6  | 2984.2 | 2927.1 |
| 47.5° | 3776.8 | 3806.6 | 3922.2 | 4038.5 | 4079.2 | 3803.2 | 3377.1 | 3238.2  | 3232.1  | 3316.1 | 3204.4 |
| 50°   | 4067.1 | 4086.6 | 4193.0 | 4349.6 | 4533.0 | 4328.4 | 3840.4 | 3706.7  | 3700.2  | 3756.9 | 3611.5 |
| 52.5° | 4172.6 | 4183.9 | 4292.0 | 4511.4 | 4969.1 | 5039.6 | 4449.1 | 4276.9  | 4272.1  | 4296.8 | 4153.6 |
| 55°   | 3958.9 | 3979.3 | 4112.1 | 4437.4 | 5205.3 | 5843.4 | 5217.4 | 4982.9  | 4947.0  | 4893.8 | 4720.3 |
| 57.5° | 3376.6 | 3409.1 | 3551.8 | 3984.5 | 5095.0 | 6481.1 | 6346.6 | 5781.6  | 5728.8  | 5403.5 | 5181.1 |
| 60°   | 2530.0 | 2569.8 | 2688.3 | 3155.1 | 4506.2 | 6708.2 | 7580.4 | 6671.5  | 6552.5  | 5809.3 | 5604.6 |
| 62.5° | 1736.1 | 1756.0 | 1836.5 | 2140.6 | 3318.6 | 6336.2 | 8612.7 | 7863.4  | 7646.2  | 6250.5 | 6062.8 |
| 65°   | 1326.0 | 1332.9 | 1365.8 | 1470.5 | 1976.2 | 5146.9 | 9023.2 | 9435.9  | 9173.3  | 6778.3 | 6538.2 |
| 67.5° | 1068.6 | 1063.0 | 1108.4 | 1258.1 | 1323.4 | 3140.0 | 8544.3 | 10923.7 | 10800.9 | 7483.9 | 7016.7 |
| 69°   | 942.3  | 934.5  | 980.8  | 1154.7 | 1242.9 | 2075.7 | 7638.4 | 11261.6 | 11269.4 | 7856.4 | 7049.6 |
| 70°   | 847.9  | 853.1  | 899.0  | 1093.2 | 1215.7 | 1629.3 | 6773.1 | 11175.5 | 11236.9 | 7995.7 | 6852.3 |
| 72.5° | 566.3  | 580.1  | 672.3  | 907.6  | 1168.9 | 1233.0 | 4089.6 | 9589.9  | 9826.2  | 7682.1 | 5878.9 |
| 75°   | 319.3  | 329.7  | 439.1  | 684.4  | 1101.5 | 1174.1 | 2160.1 | 7065.2  | 7293.6  | 6424.0 | 4533.5 |
| 77.5° | 156.6  | 162.2  | 248.3  | 441.7  | 921.1  | 1118.8 | 1225.2 | 4799.1  | 5060.0  | 4193.0 | 2564.2 |
| 80°   | 66.2   | 69.2   | 124.2  | 272.6  | 658.5  | 1067.7 | 909.8  | 2953.5  | 2986.0  | 1642.7 | 683.1  |
| 82.5° | 25.5   | 26.4   | 52.3   | 170.0  | 418.3  | 832.4  | 761.0  | 1400.4  | 1366.7  | 309.3  | 155.7  |
| 85°   | 3.0    | 3.5    | 19.0   | 102.1  | 232.8  | 428.3  | 618.2  | 603.5   | 558.5   | 61.4   | 80.0   |
| 87.5° | 0.0    | 0.0    | 1.3    | 31.1   | 69.2   | 200.7  | 321.4  | 250.5   | 225.8   | 19.9   | 41.5   |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0     | 0.0     | 0.0    | 0.0    |

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CATALOG NUMBER: GWC-SA2C-727-U-SL2-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 2583.6 | 2583.6 | 2583.6 | 2583.6 | 2583.6 | 2583.6 | 2583.6 | 2583.6 | 2583.6 | 2583.6 | 2583.6 |
| 2.5°  | 2577.1 | 2572.8 | 2549.4 | 2515.7 | 2483.7 | 2443.9 | 2405.8 | 2382.9 | 2364.7 | 2352.6 | 2366.9 |
| 5°    | 2584.1 | 2565.0 | 2494.1 | 2403.2 | 2314.1 | 2213.7 | 2120.3 | 2041.1 | 2010.0 | 1975.4 | 1990.9 |
| 7.5°  | 2581.9 | 2546.0 | 2418.4 | 2256.6 | 2093.0 | 1923.9 | 1763.8 | 1640.5 | 1576.5 | 1513.7 | 1529.8 |
| 10°   | 2571.1 | 2510.5 | 2317.1 | 2077.5 | 1832.6 | 1589.5 | 1362.3 | 1189.7 | 1093.2 | 1005.8 | 1018.4 |
| 12.5° | 2547.3 | 2462.9 | 2197.7 | 1872.4 | 1544.9 | 1224.3 | 958.3  | 737.2  | 618.7  | 566.3  | 572.8  |
| 15°   | 2533.0 | 2416.6 | 2071.4 | 1664.7 | 1237.7 | 852.7  | 585.8  | 435.7  | 381.6  | 364.3  | 366.4  |
| 17.5° | 2526.1 | 2372.1 | 1940.7 | 1427.2 | 923.6  | 542.9  | 378.5  | 334.0  | 322.3  | 319.3  | 320.1  |
| 20°   | 2519.2 | 2327.1 | 1806.2 | 1192.3 | 636.4  | 365.1  | 311.1  | 298.1  | 293.8  | 289.9  | 290.7  |
| 22.5° | 2507.5 | 2283.8 | 1661.7 | 954.4  | 429.2  | 296.3  | 280.3  | 267.8  | 258.7  | 253.9  | 254.8  |
| 25°   | 2493.2 | 2238.4 | 1514.2 | 710.8  | 313.2  | 264.3  | 249.2  | 231.5  | 220.6  | 212.0  | 212.4  |
| 27.5° | 2470.3 | 2182.6 | 1361.9 | 517.4  | 263.0  | 236.6  | 216.3  | 196.8  | 178.7  | 168.7  | 168.7  |
| 30°   | 2438.3 | 2119.4 | 1192.7 | 370.3  | 235.8  | 209.4  | 184.7  | 160.5  | 141.0  | 131.9  | 131.1  |
| 32.5° | 2402.8 | 2053.7 | 1021.9 | 280.8  | 214.1  | 183.9  | 155.7  | 130.2  | 112.9  | 105.6  | 105.1  |
| 35°   | 2372.5 | 1982.7 | 851.4  | 235.3  | 192.5  | 159.2  | 128.5  | 106.9  | 93.0   | 87.0   | 86.5   |
| 37.5° | 2353.0 | 1911.8 | 685.3  | 210.3  | 173.0  | 136.3  | 107.7  | 88.3   | 78.3   | 73.5   | 73.1   |
| 40°   | 2350.0 | 1859.0 | 533.4  | 191.2  | 154.9  | 115.9  | 90.0   | 74.8   | 65.8   | 60.6   | 60.1   |
| 42.5° | 2389.4 | 1828.7 | 409.3  | 175.2  | 136.3  | 98.2   | 76.6   | 64.0   | 54.5   | 49.3   | 48.9   |
| 45°   | 2492.8 | 1838.2 | 314.9  | 160.9  | 117.7  | 83.1   | 64.9   | 53.2   | 44.6   | 40.7   | 39.8   |
| 47.5° | 2681.4 | 1904.0 | 250.5  | 146.7  | 99.9   | 70.5   | 55.4   | 44.1   | 36.8   | 32.9   | 32.4   |
| 50°   | 3017.1 | 2058.4 | 209.4  | 131.1  | 83.5   | 60.1   | 45.9   | 35.9   | 29.9   | 26.4   | 26.0   |
| 52.5° | 3462.7 | 2333.6 | 186.9  | 115.9  | 69.2   | 51.0   | 37.6   | 28.6   | 23.4   | 20.8   | 20.3   |
| 55°   | 3954.2 | 2666.7 | 172.2  | 99.5   | 56.7   | 42.4   | 29.9   | 22.5   | 18.2   | 16.0   | 15.1   |
| 57.5° | 4433.9 | 2955.2 | 158.3  | 83.5   | 47.2   | 34.6   | 23.8   | 17.7   | 14.3   | 12.1   | 11.7   |
| 60°   | 4874.8 | 3220.4 | 142.3  | 67.1   | 38.5   | 27.3   | 18.6   | 13.8   | 11.2   | 9.1    | 9.1    |
| 62.5° | 5346.8 | 3425.5 | 120.3  | 52.3   | 31.6   | 20.8   | 15.1   | 12.5   | 9.1    | 7.8    | 7.4    |
| 65°   | 5846.9 | 3577.8 | 94.3   | 40.7   | 24.7   | 15.6   | 12.5   | 13.0   | 7.4    | 5.6    | 5.2    |
| 67.5° | 6216.4 | 3547.5 | 69.7   | 32.0   | 19.0   | 12.1   | 12.1   | 13.8   | 6.5    | 4.3    | 3.9    |
| 69°   | 6135.0 | 3301.3 | 58.4   | 27.7   | 16.4   | 10.4   | 11.2   | 13.8   | 6.1    | 3.9    | 3.5    |
| 70°   | 5899.2 | 3028.8 | 51.5   | 24.7   | 14.7   | 9.5    | 10.8   | 13.4   | 5.6    | 3.9    | 3.5    |
| 72.5° | 4912.9 | 2281.2 | 40.2   | 18.6   | 11.7   | 7.8    | 9.1    | 11.7   | 5.6    | 3.9    | 3.0    |
| 75°   | 3695.5 | 1460.1 | 30.7   | 13.4   | 8.7    | 6.1    | 6.9    | 8.7    | 5.6    | 3.5    | 3.0    |
| 77.5° | 2010.8 | 526.5  | 22.1   | 9.1    | 6.1    | 4.8    | 4.8    | 6.5    | 5.2    | 2.6    | 1.7    |
| 80°   | 517.0  | 132.4  | 13.8   | 6.1    | 4.8    | 3.5    | 3.0    | 4.3    | 3.0    | 0.4    | 0.0    |
| 82.5° | 127.6  | 29.9   | 7.4    | 4.3    | 3.5    | 1.3    | 1.3    | 2.2    | 1.3    | 0.0    | 0.0    |
| 85°   | 70.1   | 14.7   | 4.8    | 3.0    | 1.7    | 0.0    | 0.0    | 0.4    | 0.0    | 0.0    | 0.0    |
| 87.5° | 35.9   | 4.3    | 1.3    | 0.9    | 0.4    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

LM-79-08: Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

INVUE

Report Number: SP1-2012-088-8-R2

Luminaire Tested: CCW-SA1B-727-U-SL4

Test Date: 01/20/2021

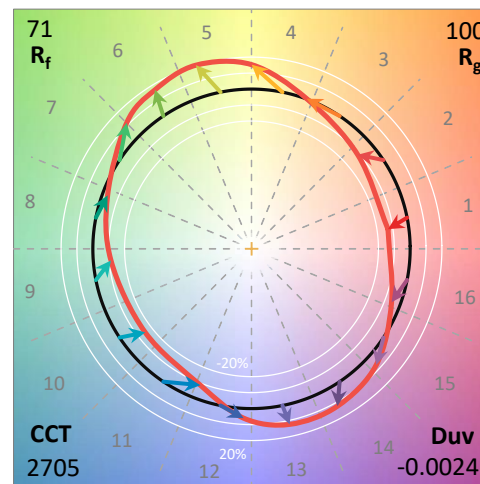
### Test Information

Test Method: LM-79-08  
 Report Number: SP1-2012-088-8-R2  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1  
 Measurement Geometry:  $4\pi$   
 Issue Date: 01/20/2021  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: INVUE  
 Catalog Number: **CCW-SA1B-727-U-SL4**  
 Description: INVUE WALL PACK

\*\*\*THIS IS A REVISION OF SP1-2012-088-8. TO UPDATE THE CATALOG INFORMATION.\*\*\*TESTED  
 IN SITU. INVUE WALL PACK LIGHT SQUARE SL4 OPTICS 1-SQUARE

### Spectral Parameters

|                           |         |           |      |      |      |
|---------------------------|---------|-----------|------|------|------|
| CCT (K):                  | 2705    | CRI (Ra): | 73.8 |      |      |
| CIE u':                   | 0.2629  | R1:       | 72.2 | R9:  | -7.6 |
| CIE v':                   | 0.5237  | R2:       | 81.9 | R10: | 56.9 |
| Duv:                      | -0.0024 | R3:       | 89.3 | R11: | 66.0 |
| CIE x:                    | 0.4552  | R4:       | 71.3 | R12: | 47.9 |
| CIE y:                    | 0.4030  | R5:       | 69.5 | R13: | 73.4 |
| CIE z:                    | 0.1418  | R6:       | 73.6 | R14: | 93.2 |
| Peak Wavelength (nm):     | 603     | R7:       | 80.1 |      |      |
| Dominant Wavelength (nm): | 585     | R8:       | 52.8 |      |      |
| Purity:                   | 57.7    |           |      |      |      |
| Rf:                       | 71.2    |           |      |      |      |
| Rg:                       | 100.1   |           |      |      |      |



### Test Conditions

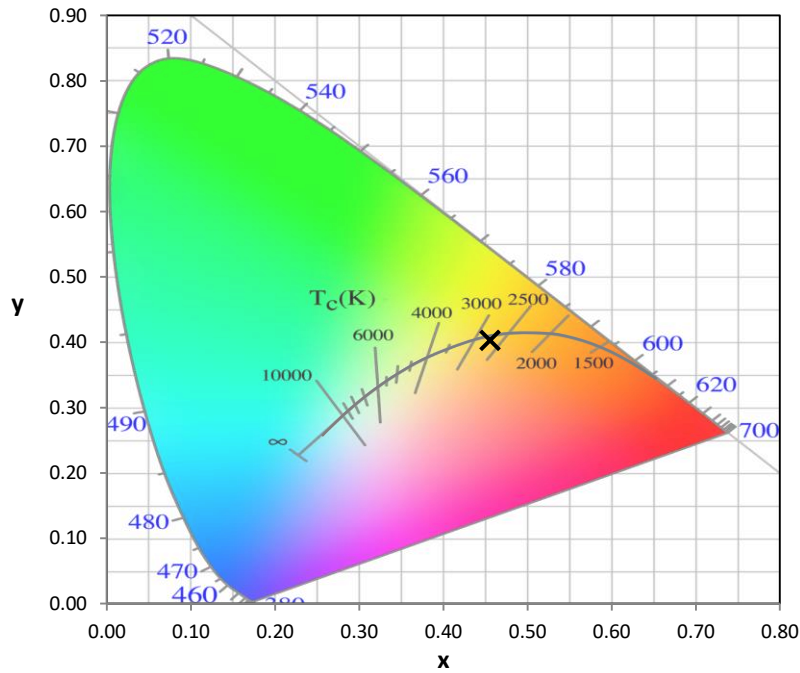
Stabilization Time: 177M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.8/34%  
 Sphere Temperature (°C): 24.7

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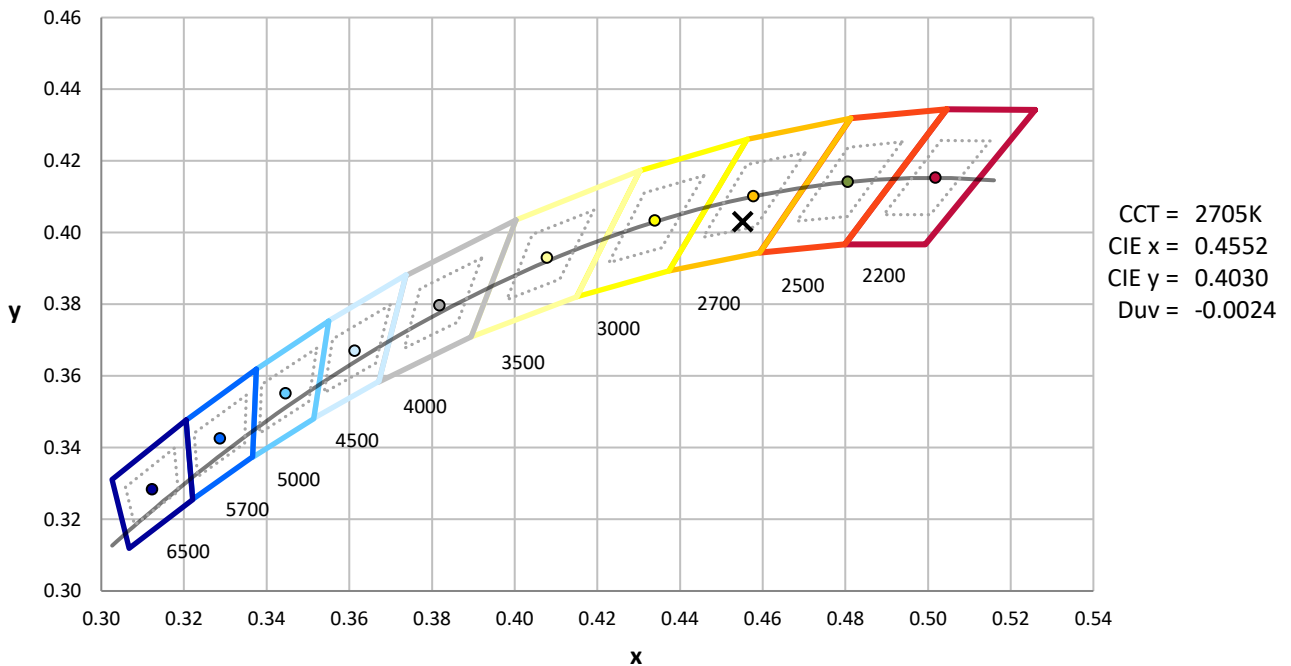
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 7/29/2020        | 1/29/2021            |
| Power Meter                    | IN0071                | 12/1/2020        | 12/1/2021            |
| AC Power Source                | IN0063                | 12/1/2020        | 12/1/2021            |
| DC Power Source                | IN0208                | 12/1/2020        | 12/1/2021            |
| Sphere Thermometer             | IN0085                | 12/1/2020        | 12/1/2021            |
| Room Thermometer               | IN0046                | 12/1/2020        | 12/1/2021            |

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**CIE 1931 Chromaticity Diagram**



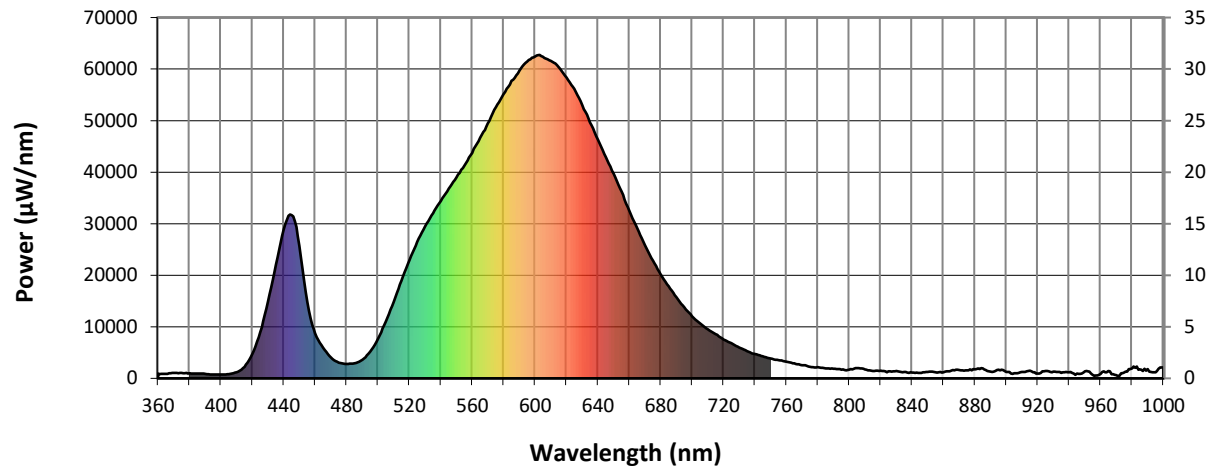
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 2700K 4-step quadrangle

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### Photopic Flux vs. Wavelength

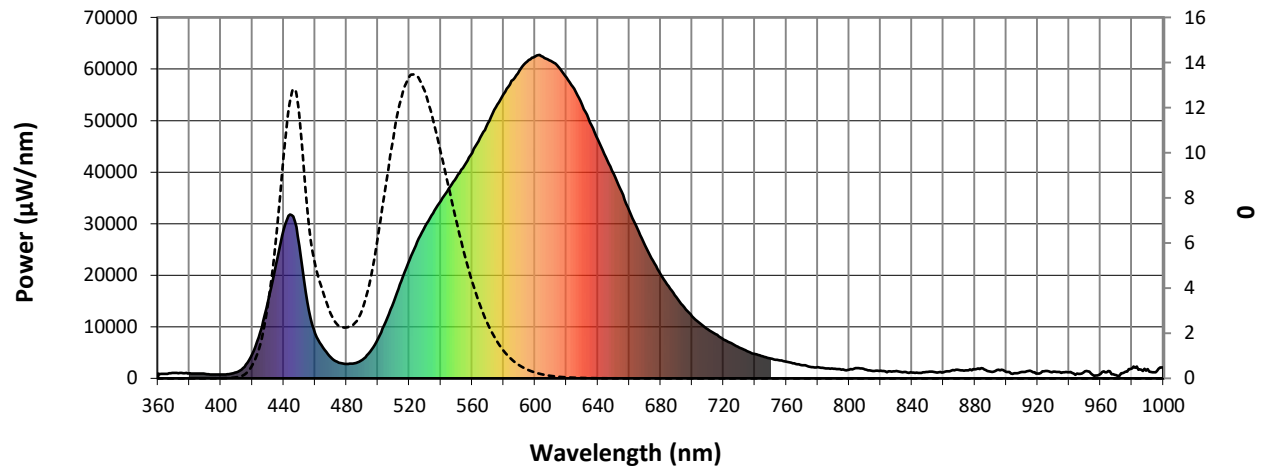


#####

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 926              | 0.0              | 490       | 3601             | 0.5              | 620       | 58340            | 15.2             | 750       | 3861             | 0.0              | 880       | 1742             | 0.0              |
| 365       | 867              | 0.0              | 495       | 5135             | 0.9              | 625       | 56180            | 12.4             | 755       | 3520             | 0.0              | 885       | 1920             | 0.0              |
| 370       | 1032             | 0.0              | 500       | 7689             | 1.7              | 630       | 53018            | 9.6              | 760       | 3223             | 0.0              | 890       | 1286             | 0.0              |
| 375       | 1034             | 0.0              | 505       | 11015            | 3.1              | 635       | 49683            | 7.5              | 765       | 2910             | 0.0              | 895       | 1660             | 0.0              |
| 380       | 979              | 0.0              | 510       | 14817            | 5.1              | 640       | 46308            | 5.5              | 770       | 2560             | 0.0              | 900       | 1274             | 0.0              |
| 385       | 938              | 0.0              | 515       | 18962            | 7.9              | 645       | 42927            | 4.1              | 775       | 2242             | 0.0              | 905       | 1020             | 0.0              |
| 390       | 893              | 0.0              | 520       | 22933            | 11.1             | 650       | 39728            | 2.9              | 780       | 2156             | 0.0              | 910       | 1258             | 0.0              |
| 395       | 757              | 0.0              | 525       | 26438            | 14.2             | 655       | 36260            | 2.1              | 785       | 1926             | 0.0              | 915       | 1481             | 0.0              |
| 400       | 728              | 0.0              | 530       | 29492            | 17.4             | 660       | 32543            | 1.4              | 790       | 1871             | 0.0              | 920       | 923              | 0.0              |
| 405       | 812              | 0.0              | 535       | 32054            | 19.9             | 665       | 29105            | 0.9              | 795       | 1697             | 0.0              | 925       | 1444             | 0.0              |
| 410       | 1197             | 0.0              | 540       | 34386            | 22.4             | 670       | 25817            | 0.6              | 800       | 1691             | 0.0              | 930       | 1315             | 0.0              |
| 415       | 2254             | 0.0              | 545       | 36784            | 24.5             | 675       | 22832            | 0.4              | 805       | 1967             | 0.0              | 935       | 1037             | 0.0              |
| 420       | 4742             | 0.0              | 550       | 39017            | 26.5             | 680       | 20201            | 0.2              | 810       | 1719             | 0.0              | 940       | 1195             | 0.0              |
| 425       | 8975             | 0.0              | 555       | 41253            | 28.2             | 685       | 17863            | 0.2              | 815       | 1436             | 0.0              | 945       | 914              | 0.0              |
| 430       | 14905            | 0.1              | 560       | 43733            | 29.7             | 690       | 15761            | 0.1              | 820       | 1465             | 0.0              | 950       | 1373             | 0.0              |
| 435       | 22096            | 0.3              | 565       | 46694            | 31.0             | 695       | 13762            | 0.1              | 825       | 1365             | 0.0              | 955       | 692              | 0.0              |
| 440       | 28868            | 0.5              | 570       | 49493            | 32.2             | 700       | 12064            | 0.0              | 830       | 1404             | 0.0              | 960       | 844              | 0.0              |
| 445       | 31683            | 0.7              | 575       | 52587            | 32.7             | 705       | 10683            | 0.0              | 835       | 1222             | 0.0              | 965       | 1427             | 0.0              |
| 450       | 25690            | 0.7              | 580       | 55129            | 32.8             | 710       | 9480             | 0.0              | 840       | 1144             | 0.0              | 970       | 654              | 0.0              |
| 455       | 14802            | 0.5              | 585       | 57737            | 32.1             | 715       | 8582             | 0.0              | 845       | 1078             | 0.0              | 975       | 1127             | 0.0              |
| 460       | 8755             | 0.4              | 590       | 59688            | 30.9             | 720       | 7530             | 0.0              | 850       | 1254             | 0.0              | 980       | 1935             | 0.0              |
| 465       | 5978             | 0.3              | 595       | 61458            | 29.1             | 725       | 6824             | 0.0              | 855       | 1203             | 0.0              | 985       | 1754             | 0.0              |
| 470       | 4047             | 0.3              | 600       | 62443            | 26.9             | 730       | 5968             | 0.0              | 860       | 1183             | 0.0              | 990       | 1822             | 0.0              |
| 475       | 3070             | 0.2              | 605       | 62403            | 24.2             | 735       | 5266             | 0.0              | 865       | 1505             | 0.0              | 995       | 1176             | 0.0              |
| 480       | 2814             | 0.3              | 610       | 61581            | 21.2             | 740       | 4712             | 0.0              | 870       | 1624             | 0.0              | 1000      | 2143             | 0.0              |
| 485       | 2926             | 0.3              | 615       | 60386            | 18.2             | 745       | 4264             | 0.0              | 875       | 1559             | 0.0              |           |                  |                  |

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### Scotopic Flux vs. Wavelength



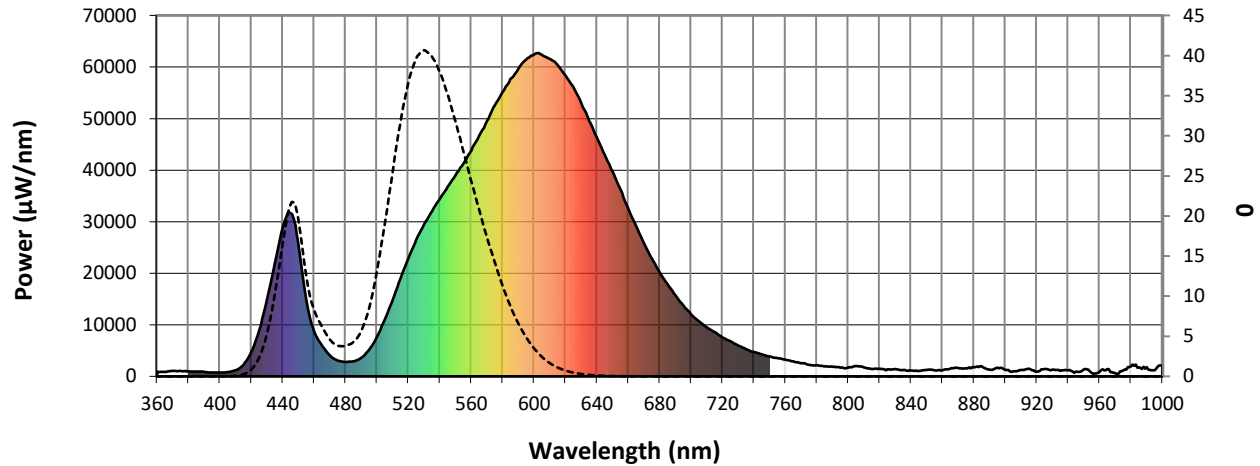
Scotopic Lumens: 1073.3

S/P: 0.36

| 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       | 926              | 0.0              | 490       | 3601             | 5.5              | 620       | 58340            | 0.7              | 750       | 3861             | 0.0              | 880       | 1742             | 0.0              |
| 365       | 867              | 0.0              | 495       | 5135             | 8.3              | 625       | 56180            | 0.5              | 755       | 3520             | 0.0              | 885       | 1920             | 0.0              |
| 370       | 1032             | 0.0              | 500       | 7689             | 12.9             | 630       | 53018            | 0.3              | 760       | 3223             | 0.0              | 890       | 1286             | 0.0              |
| 375       | 1034             | 0.0              | 505       | 11015            | 18.7             | 635       | 49683            | 0.2              | 765       | 2910             | 0.0              | 895       | 1660             | 0.0              |
| 380       | 979              | 0.0              | 510       | 14817            | 25.1             | 640       | 46308            | 0.1              | 770       | 2560             | 0.0              | 900       | 1274             | 0.0              |
| 385       | 938              | 0.0              | 515       | 18962            | 31.4             | 645       | 42927            | 0.1              | 775       | 2242             | 0.0              | 905       | 1020             | 0.0              |
| 390       | 893              | 0.0              | 520       | 22933            | 36.5             | 650       | 39728            | 0.0              | 780       | 2156             | 0.0              | 910       | 1258             | 0.0              |
| 395       | 757              | 0.0              | 525       | 26438            | 39.6             | 655       | 36260            | 0.0              | 785       | 1926             | 0.0              | 915       | 1481             | 0.0              |
| 400       | 728              | 0.0              | 530       | 29492            | 40.7             | 660       | 32543            | 0.0              | 790       | 1871             | 0.0              | 920       | 923              | 0.0              |
| 405       | 812              | 0.0              | 535       | 32054            | 39.9             | 665       | 29105            | 0.0              | 795       | 1697             | 0.0              | 925       | 1444             | 0.0              |
| 410       | 1197             | 0.1              | 540       | 34386            | 38.0             | 670       | 25817            | 0.0              | 800       | 1691             | 0.0              | 930       | 1315             | 0.0              |
| 415       | 2254             | 0.2              | 545       | 36784            | 35.3             | 675       | 22832            | 0.0              | 805       | 1967             | 0.0              | 935       | 1037             | 0.0              |
| 420       | 4742             | 0.8              | 550       | 39017            | 31.9             | 680       | 20201            | 0.0              | 810       | 1719             | 0.0              | 940       | 1195             | 0.0              |
| 425       | 8975             | 2.2              | 555       | 41253            | 28.2             | 685       | 17863            | 0.0              | 815       | 1436             | 0.0              | 945       | 914              | 0.0              |
| 430       | 14905            | 5.1              | 560       | 43733            | 24.4             | 690       | 15761            | 0.0              | 820       | 1465             | 0.0              | 950       | 1373             | 0.0              |
| 435       | 22096            | 9.9              | 565       | 46694            | 20.9             | 695       | 13762            | 0.0              | 825       | 1365             | 0.0              | 955       | 692              | 0.0              |
| 440       | 28868            | 16.1             | 570       | 49493            | 17.5             | 700       | 12064            | 0.0              | 830       | 1404             | 0.0              | 960       | 844              | 0.0              |
| 445       | 31683            | 21.2             | 575       | 52587            | 14.3             | 705       | 10683            | 0.0              | 835       | 1222             | 0.0              | 965       | 1427             | 0.0              |
| 450       | 25690            | 19.9             | 580       | 55129            | 11.4             | 710       | 9480             | 0.0              | 840       | 1144             | 0.0              | 970       | 654              | 0.0              |
| 455       | 14802            | 12.9             | 585       | 57737            | 8.8              | 715       | 8582             | 0.0              | 845       | 1078             | 0.0              | 975       | 1127             | 0.0              |
| 460       | 8755             | 8.5              | 590       | 59688            | 6.6              | 720       | 7530             | 0.0              | 850       | 1254             | 0.0              | 980       | 1935             | 0.0              |
| 465       | 5978             | 6.3              | 595       | 61458            | 4.9              | 725       | 6824             | 0.0              | 855       | 1203             | 0.0              | 985       | 1754             | 0.0              |
| 470       | 4047             | 4.7              | 600       | 62443            | 3.5              | 730       | 5968             | 0.0              | 860       | 1183             | 0.0              | 990       | 1822             | 0.0              |
| 475       | 3070             | 3.8              | 605       | 62403            | 2.5              | 735       | 5266             | 0.0              | 865       | 1505             | 0.0              | 995       | 1176             | 0.0              |
| 480       | 2814             | 3.8              | 610       | 61581            | 1.7              | 740       | 4712             | 0.0              | 870       | 1624             | 0.0              | 1000      | 2143             | 0.0              |
| 485       | 2926             | 4.2              | 615       | 60386            | 1.1              | 745       | 4264             | 0.0              | 875       | 1559             | 0.0              |           |                  |                  |

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### Melanopic Flux vs. Wavelength

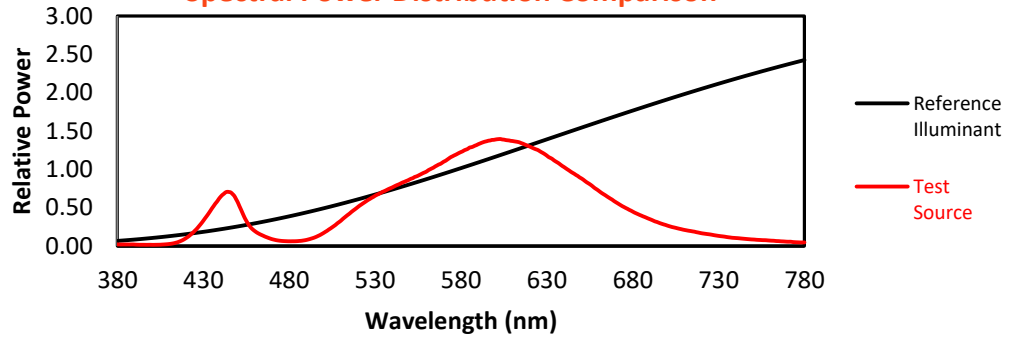

**Melanopic Lumens: 3157.6      S/P: 1.07**

| 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       | 926              | 0.0              | 490       | 3601             | 3.0              | 620       | 58340            | 0.0              | 750       | 3861             | 0.0              | 880       | 1742             | 0.0              |
| 365       | 867              | 0.0              | 495       | 5135             | 4.2              | 625       | 56180            | 0.0              | 755       | 3520             | 0.0              | 885       | 1920             | 0.0              |
| 370       | 1032             | 0.0              | 500       | 7689             | 6.2              | 630       | 53018            | 0.0              | 760       | 3223             | 0.0              | 890       | 1286             | 0.0              |
| 375       | 1034             | 0.0              | 505       | 11015            | 8.5              | 635       | 49683            | 0.0              | 765       | 2910             | 0.0              | 895       | 1660             | 0.0              |
| 380       | 979              | 0.0              | 510       | 14817            | 10.6             | 640       | 46308            | 0.0              | 770       | 2560             | 0.0              | 900       | 1274             | 0.0              |
| 385       | 938              | 0.0              | 515       | 18962            | 12.4             | 645       | 42927            | 0.0              | 775       | 2242             | 0.0              | 905       | 1020             | 0.0              |
| 390       | 893              | 0.0              | 520       | 22933            | 13.4             | 650       | 39728            | 0.0              | 780       | 2156             | 0.0              | 910       | 1258             | 0.0              |
| 395       | 757              | 0.0              | 525       | 26438            | 13.4             | 655       | 36260            | 0.0              | 785       | 1926             | 0.0              | 915       | 1481             | 0.0              |
| 400       | 728              | 0.0              | 530       | 29492            | 12.7             | 660       | 32543            | 0.0              | 790       | 1871             | 0.0              | 920       | 923              | 0.0              |
| 405       | 812              | 0.0              | 535       | 32054            | 11.5             | 665       | 29105            | 0.0              | 795       | 1697             | 0.0              | 925       | 1444             | 0.0              |
| 410       | 1197             | 0.0              | 540       | 34386            | 10.1             | 670       | 25817            | 0.0              | 800       | 1691             | 0.0              | 930       | 1315             | 0.0              |
| 415       | 2254             | 0.1              | 545       | 36784            | 8.5              | 675       | 22832            | 0.0              | 805       | 1967             | 0.0              | 935       | 1037             | 0.0              |
| 420       | 4742             | 0.5              | 550       | 39017            | 7.0              | 680       | 20201            | 0.0              | 810       | 1719             | 0.0              | 940       | 1195             | 0.0              |
| 425       | 8975             | 1.4              | 555       | 41253            | 5.6              | 685       | 17863            | 0.0              | 815       | 1436             | 0.0              | 945       | 914              | 0.0              |
| 430       | 14905            | 3.1              | 560       | 43733            | 4.3              | 690       | 15761            | 0.0              | 820       | 1465             | 0.0              | 950       | 1373             | 0.0              |
| 435       | 22096            | 5.9              | 565       | 46694            | 3.3              | 695       | 13762            | 0.0              | 825       | 1365             | 0.0              | 955       | 692              | 0.0              |
| 440       | 28868            | 9.6              | 570       | 49493            | 2.4              | 700       | 12064            | 0.0              | 830       | 1404             | 0.0              | 960       | 844              | 0.0              |
| 445       | 31683            | 12.5             | 575       | 52587            | 1.8              | 705       | 10683            | 0.0              | 835       | 1222             | 0.0              | 965       | 1427             | 0.0              |
| 450       | 25690            | 11.8             | 580       | 55129            | 1.2              | 710       | 9480             | 0.0              | 840       | 1144             | 0.0              | 970       | 654              | 0.0              |
| 455       | 14802            | 7.8              | 585       | 57737            | 0.9              | 715       | 8582             | 0.0              | 845       | 1078             | 0.0              | 975       | 1127             | 0.0              |
| 460       | 8755             | 5.2              | 590       | 59688            | 0.6              | 720       | 7530             | 0.0              | 850       | 1254             | 0.0              | 980       | 1935             | 0.0              |
| 465       | 5978             | 3.9              | 595       | 61458            | 0.4              | 725       | 6824             | 0.0              | 855       | 1203             | 0.0              | 985       | 1754             | 0.0              |
| 470       | 4047             | 2.9              | 600       | 62443            | 0.3              | 730       | 5968             | 0.0              | 860       | 1183             | 0.0              | 990       | 1822             | 0.0              |
| 475       | 3070             | 2.3              | 605       | 62403            | 0.2              | 735       | 5266             | 0.0              | 865       | 1505             | 0.0              | 995       | 1176             | 0.0              |
| 480       | 2814             | 2.3              | 610       | 61581            | 0.1              | 740       | 4712             | 0.0              | 870       | 1624             | 0.0              | 1000      | 2143             | 0.0              |
| 485       | 2926             | 2.4              | 615       | 60386            | 0.1              | 745       | 4264             | 0.0              | 875       | 1559             | 0.0              |           |                  |                  |

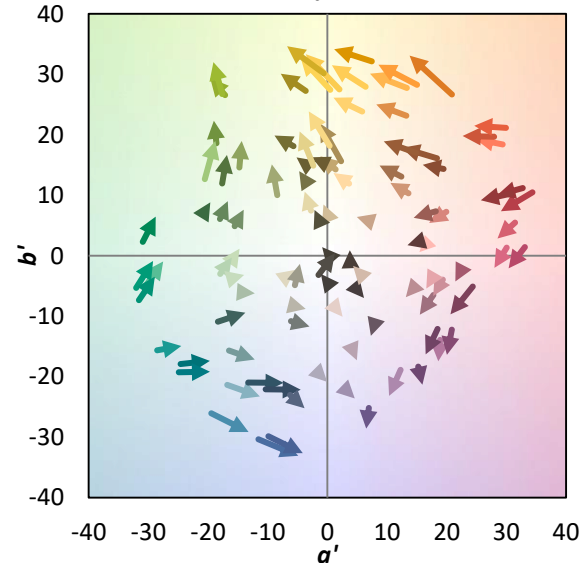
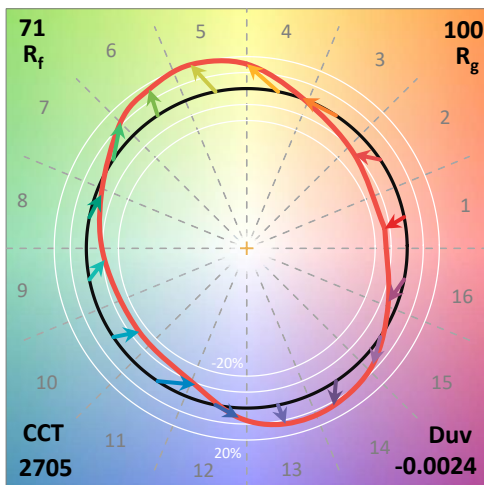
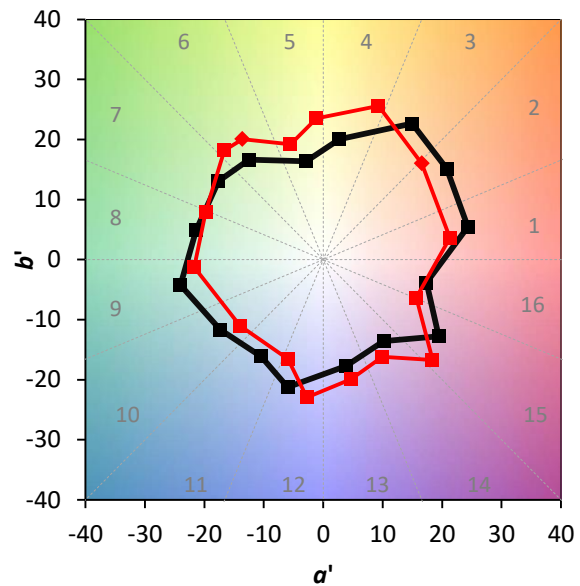
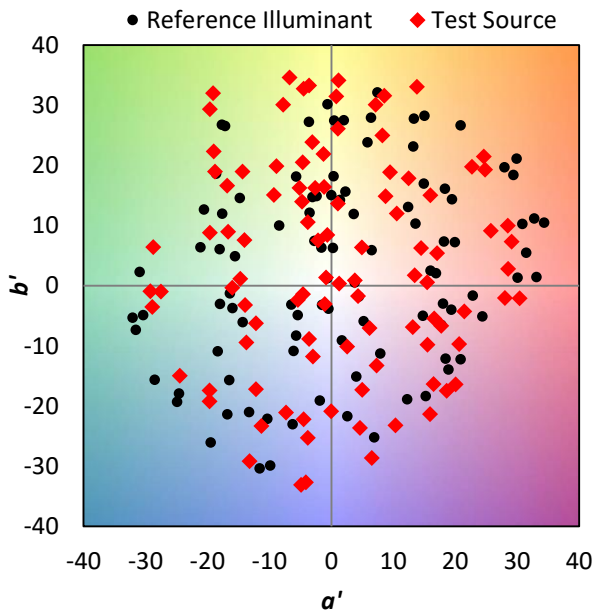
### Summary

$R_f = 71.2$   
 $R_g = 100.1$   
 CIE  $R_a = 73.8$   
 $R_g = -7.6$

### Spectral Power Distribution Comparison

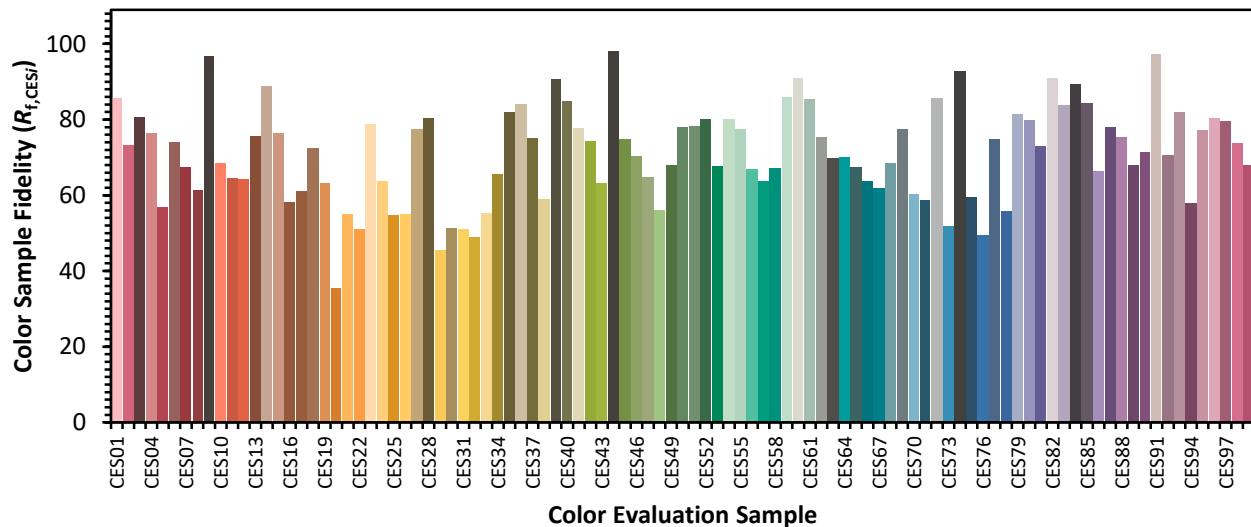


### Color Vector Graphics

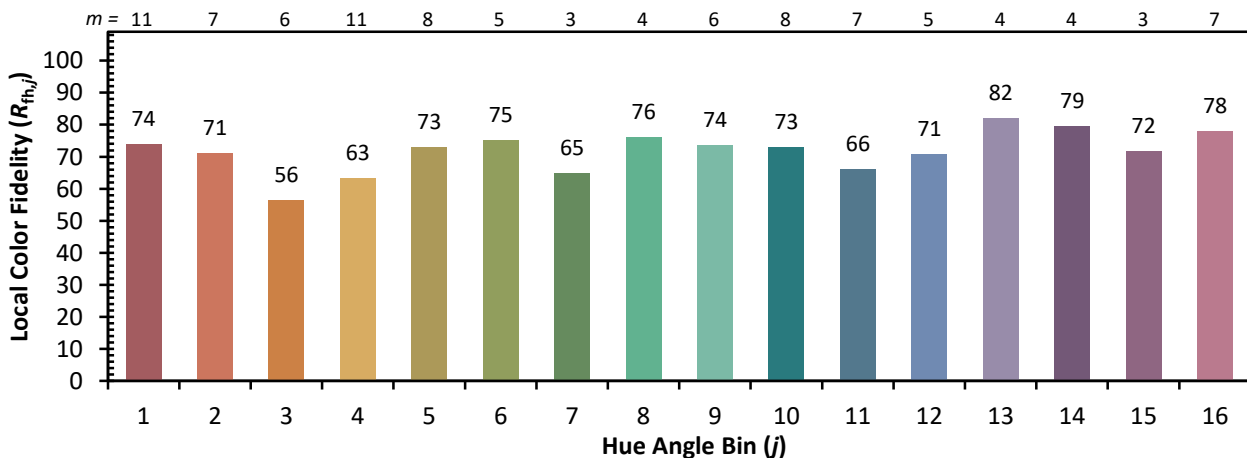
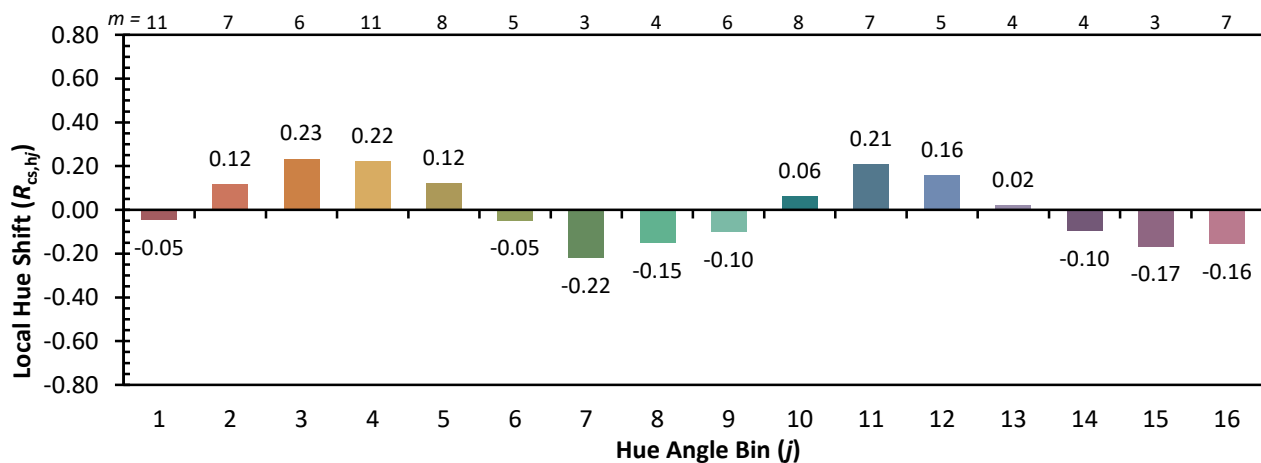
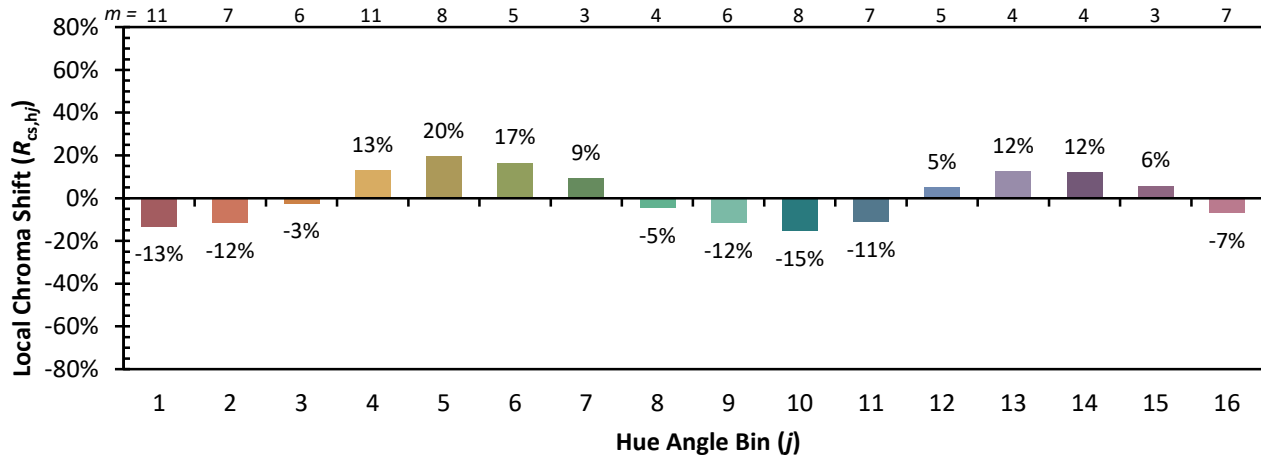


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

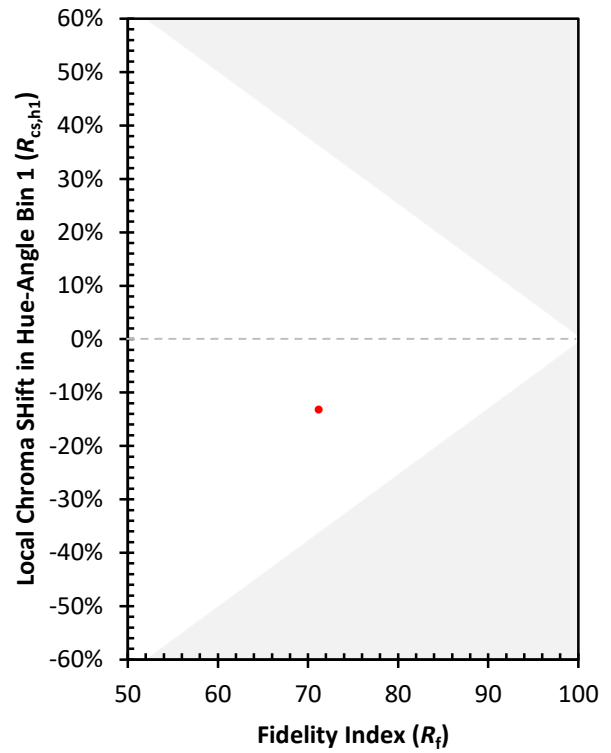
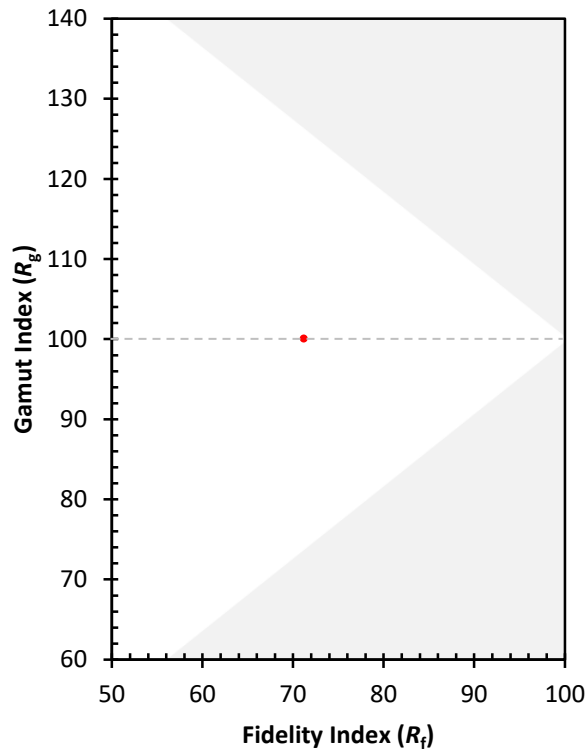
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 55 | CES51 = 78 | CES76 = 50 |
| CES02 = 63 | CES27 = 77 | CES52 = 80 | CES77 = 75 |
| CES03 = 31 | CES28 = 80 | CES53 = 68 | CES78 = 56 |
| CES04 = 71 | CES29 = 46 | CES54 = 80 | CES79 = 81 |
| CES05 = 50 | CES30 = 51 | CES55 = 78 | CES80 = 80 |
| CES06 = 52 | CES31 = 51 | CES56 = 67 | CES81 = 73 |
| CES07 = 43 | CES32 = 49 | CES57 = 64 | CES82 = 91 |
| CES08 = 41 | CES33 = 55 | CES58 = 67 | CES83 = 84 |
| CES09 = 29 | CES34 = 65 | CES59 = 86 | CES84 = 89 |
| CES10 = 77 | CES35 = 82 | CES60 = 91 | CES85 = 84 |
| CES11 = 60 | CES36 = 84 | CES61 = 85 | CES86 = 66 |
| CES12 = 66 | CES37 = 75 | CES62 = 75 | CES87 = 78 |
| CES13 = 44 | CES38 = 59 | CES63 = 70 | CES88 = 75 |
| CES14 = 74 | CES39 = 91 | CES64 = 70 | CES89 = 68 |
| CES15 = 72 | CES40 = 85 | CES65 = 67 | CES90 = 71 |
| CES16 = 48 | CES41 = 78 | CES66 = 64 | CES91 = 97 |
| CES17 = 51 | CES42 = 74 | CES67 = 62 | CES92 = 71 |
| CES18 = 57 | CES43 = 63 | CES68 = 68 | CES93 = 82 |
| CES19 = 73 | CES44 = 98 | CES69 = 77 | CES94 = 58 |
| CES20 = 67 | CES45 = 75 | CES70 = 60 | CES95 = 77 |
| CES21 = 88 | CES46 = 70 | CES71 = 59 | CES96 = 80 |
| CES22 = 80 | CES47 = 65 | CES72 = 86 | CES97 = 80 |
| CES23 = 92 | CES48 = 56 | CES73 = 52 | CES98 = 74 |
| CES24 = 91 | CES49 = 68 | CES74 = 93 | CES99 = 68 |
| CES25 = 73 | CES50 = 78 | CES75 = 59 |            |



### Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)