

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: P386832

Luminaire Tested: **GWC-SA2C-735-U-SL2-HSS**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P386832  
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-735-U-SL2-HSS  
Description: GALLEON WALL LUMINAIRE  
(2) 70 CRI, 3500K, 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: 11485 lumens  
Efficiency: N/A  
Efficacy: 101.6 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

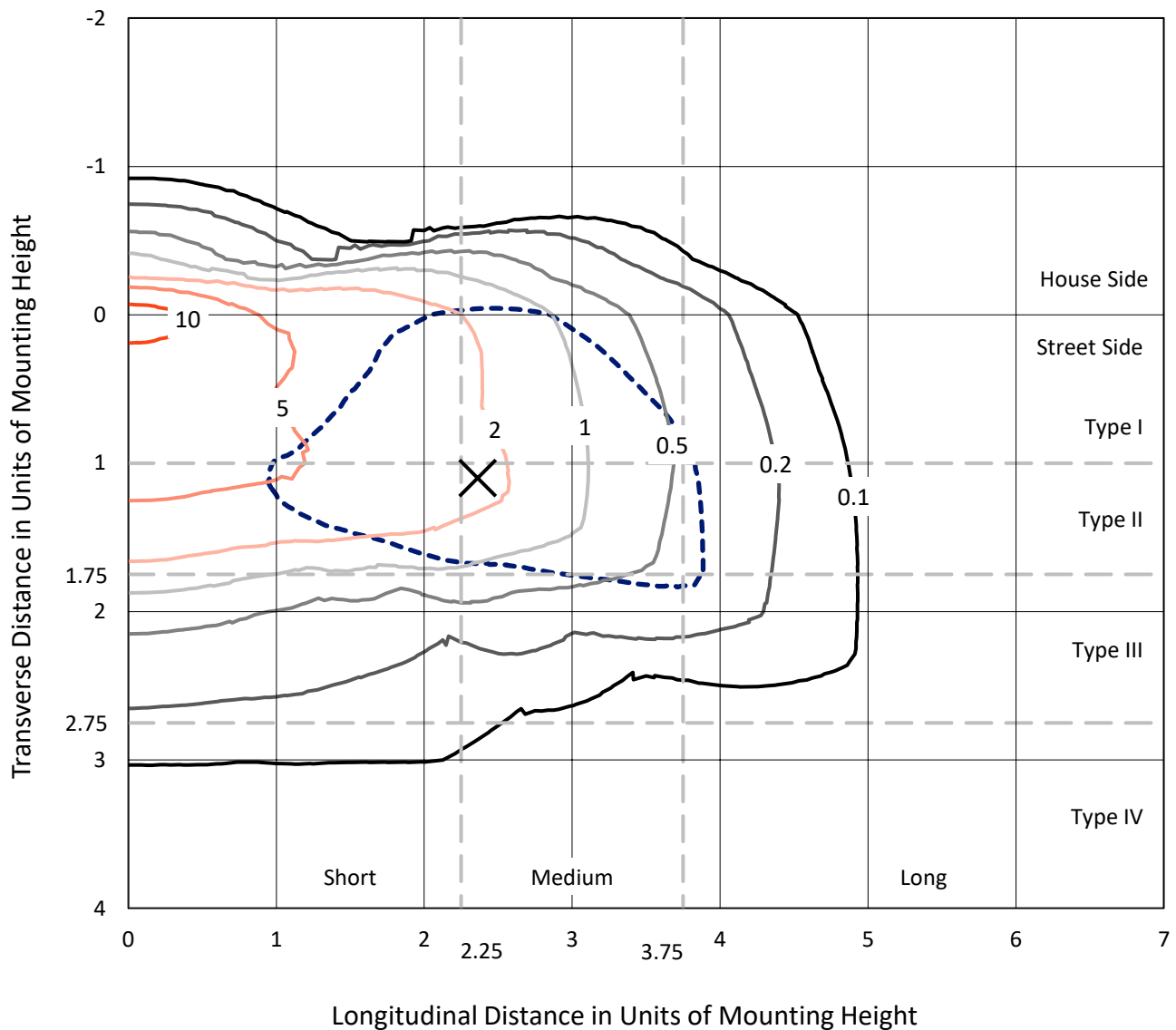


REPORT NUMBER: P386832

CATALOG NUMBER: GWC-SA2C-735-U-SL2-HSS

## Iso-Footcandle Lines of Horizontal Illumination

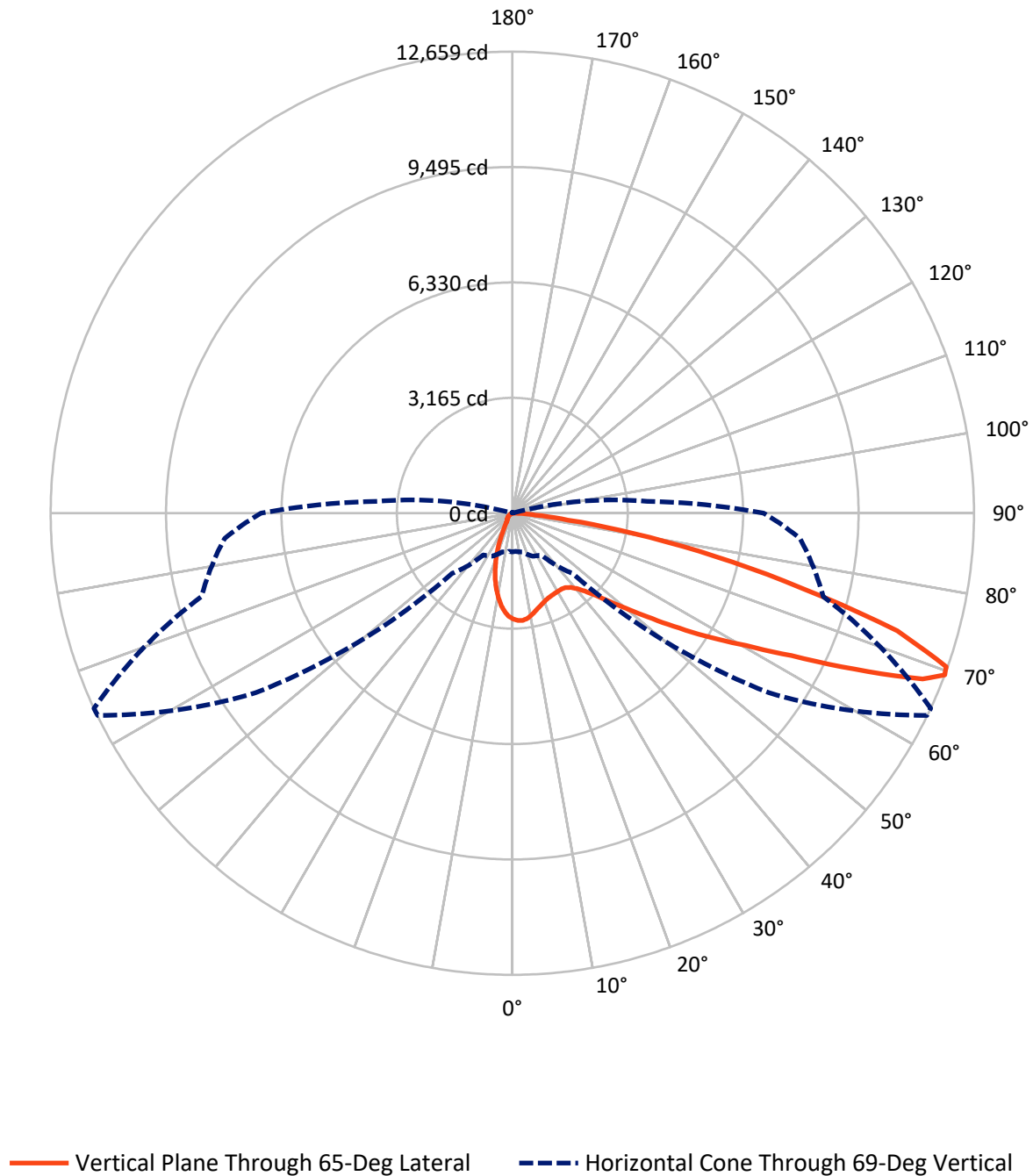
× Max cd  
 - - - 1/2 Max cd



Based on 15 foot mounting height. Maximum calculated value = 12.9 fc  
 Type III - Medium - N/A

REPORT NUMBER: P386832  
CATALOG NUMBER: GWC-SA2C-735-U-SL2-HSS

## Luminous Intensity Polar Plot



REPORT NUMBER: P386832

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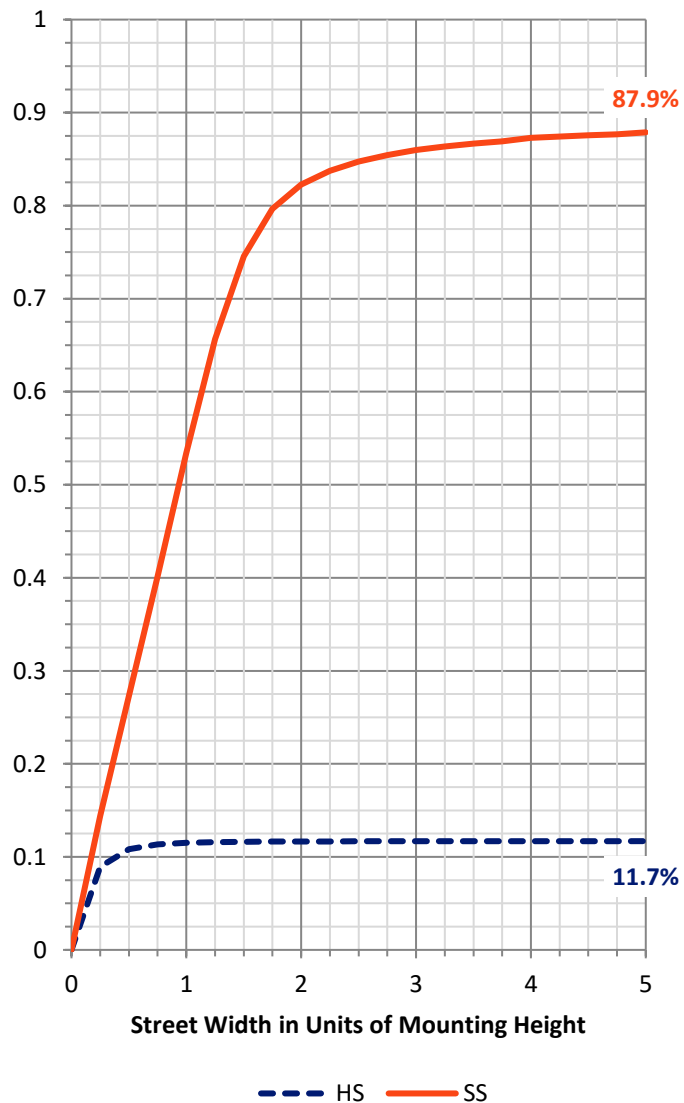
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 1353.8   | 0.0    | 1353.8  |
|                    | % Fixture | 11.8     | 0.0    | 11.8    |
| <b>Street Side</b> | Lumens    | 10131.2  | 0.0    | 10131.2 |
|                    | % Fixture | 88.2     | 0.0    | 88.2    |
| <b>Total</b>       | Lumens    | 11485.0  | 0.0    | 11485.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 242.7   | 2.1       |
| 10°-20°   | 531.3   | 4.6       |
| 20°-30°   | 735.8   | 6.4       |
| 30°-40°   | 1026.0  | 8.9       |
| 40°-50°   | 1594.7  | 13.9      |
| 50°-60°   | 2560.1  | 22.3      |
| 60°-70°   | 2895.9  | 25.2      |
| 70°-80°   | 1700.8  | 14.8      |
| 80°-90°   | 197.9   | 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°    | 11485.0 | 100.0     |
| 0°-180°   | 11485.0 | 100.0     |

**Coefficient of Utilization**



REPORT NUMBER: P386832

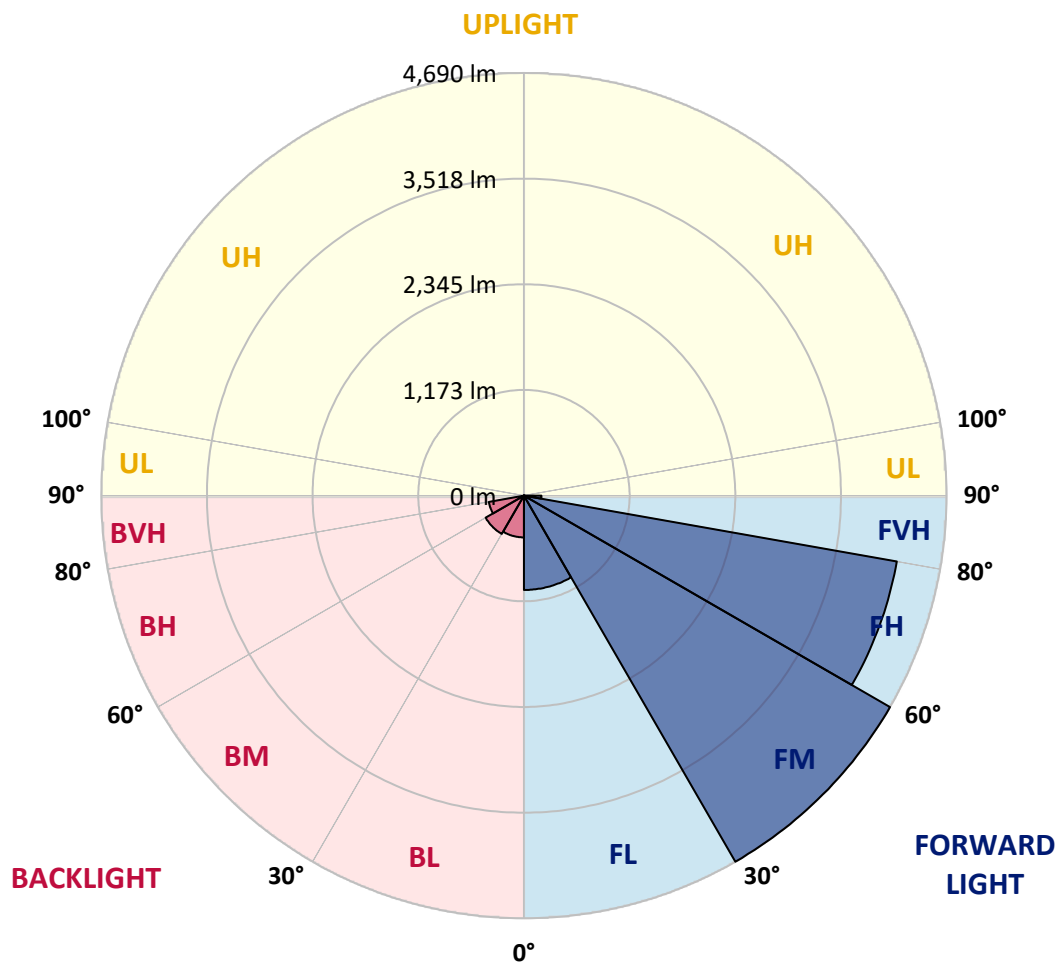
CATALOG NUMBER: GWC-SA2C-735-U-SL2-HSS

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 1046.6 | 9.1       |                         |      |         |
| FM   | (30°-60°)   | 4690.2 | 40.8      |                         |      |         |
| FH   | (60°-80°)   | 4201.1 | 36.6      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 193.4  | 1.7       |                         |      | G2/225  |
| BL   | (0°-30°)    | 463.2  | 4.0       | B1/500                  |      |         |
| BM   | (30°-60°)   | 490.6  | 4.3       | B1/1000                 |      |         |
| BH   | (60°-80°)   | 395.6  | 3.4       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 4.5    | 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



REPORT NUMBER: P386832

CATALOG NUMBER: GWC-SA2C-735-U-SL2-HSS

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°     | 64°     | 65°     | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|---------|---------|---------|--------|--------|
| 0°    | 2902.3 | 2902.3 | 2902.3 | 2902.3 | 2902.3 | 2902.3 | 2902.3  | 2902.3  | 2902.3  | 2902.3 | 2902.3 |
| 2.5°  | 2928.1 | 2920.8 | 2926.6 | 2939.2 | 2945.6 | 2945.6 | 2950.4  | 2944.5  | 2946.5  | 2932.4 | 2912.0 |
| 5°    | 2744.8 | 2733.6 | 2749.7 | 2785.2 | 2828.9 | 2866.3 | 2921.7  | 2950.9  | 2953.8  | 2954.3 | 2930.4 |
| 7.5°  | 2547.5 | 2537.3 | 2561.2 | 2603.0 | 2659.3 | 2728.8 | 2825.5  | 2910.1  | 2914.9  | 2960.6 | 2943.1 |
| 10°   | 2387.2 | 2379.9 | 2407.6 | 2452.3 | 2518.3 | 2596.1 | 2714.7  | 2832.3  | 2846.4  | 2947.4 | 2941.1 |
| 12.5° | 2259.8 | 2254.0 | 2280.2 | 2331.8 | 2399.3 | 2485.4 | 2609.3  | 2745.8  | 2764.7  | 2917.9 | 2931.5 |
| 15°   | 2167.0 | 2166.1 | 2187.8 | 2237.4 | 2312.3 | 2392.4 | 2519.4  | 2665.6  | 2687.5  | 2885.7 | 2930.0 |
| 17.5° | 2118.4 | 2119.8 | 2135.9 | 2178.2 | 2242.3 | 2322.0 | 2443.6  | 2598.1  | 2621.8  | 2857.1 | 2937.3 |
| 20°   | 2113.5 | 2115.0 | 2123.8 | 2147.5 | 2199.6 | 2270.0 | 2381.8  | 2541.2  | 2566.0  | 2835.7 | 2948.9 |
| 22.5° | 2156.3 | 2155.3 | 2157.8 | 2155.3 | 2184.5 | 2237.9 | 2341.0  | 2497.5  | 2526.1  | 2821.7 | 2958.2 |
| 25°   | 2238.5 | 2237.0 | 2236.0 | 2218.0 | 2198.6 | 2227.3 | 2324.0  | 2472.7  | 2499.9  | 2811.4 | 2963.5 |
| 27.5° | 2352.6 | 2351.7 | 2350.2 | 2320.6 | 2262.2 | 2244.3 | 2325.9  | 2463.5  | 2486.3  | 2803.2 | 2962.6 |
| 30°   | 2502.8 | 2509.6 | 2507.7 | 2466.4 | 2375.4 | 2296.3 | 2346.3  | 2458.6  | 2478.5  | 2787.1 | 2952.3 |
| 32.5° | 2679.2 | 2692.9 | 2703.5 | 2659.3 | 2545.6 | 2399.3 | 2393.5  | 2463.9  | 2478.5  | 2775.0 | 2933.9 |
| 35°   | 2862.4 | 2879.9 | 2919.3 | 2903.8 | 2754.0 | 2554.3 | 2474.6  | 2496.0  | 2508.2  | 2781.7 | 2925.1 |
| 37.5° | 3042.7 | 3063.6 | 3149.1 | 3194.4 | 3027.2 | 2759.4 | 2601.0  | 2575.3  | 2581.5  | 2823.1 | 2934.9 |
| 40°   | 3252.2 | 3283.7 | 3413.6 | 3486.5 | 3353.3 | 3034.0 | 2790.0  | 2711.3  | 2713.7  | 2913.9 | 2980.0 |
| 42.5° | 3527.2 | 3559.8 | 3700.3 | 3814.5 | 3720.7 | 3381.0 | 3046.6  | 2919.3  | 2916.9  | 3084.0 | 3086.5 |
| 45°   | 3862.6 | 3896.6 | 4041.9 | 4168.7 | 4126.5 | 3792.1 | 3375.1  | 3223.1  | 3220.1  | 3352.3 | 3288.2 |
| 47.5° | 4242.6 | 4276.1 | 4405.9 | 4536.6 | 4582.4 | 4272.3 | 3793.6  | 3637.6  | 3630.8  | 3725.1 | 3599.7 |
| 50°   | 4568.7 | 4590.6 | 4710.1 | 4886.1 | 5092.1 | 4862.2 | 4314.1  | 4163.9  | 4156.6  | 4220.2 | 4057.0 |
| 52.5° | 4687.3 | 4700.0 | 4821.4 | 5067.8 | 5582.0 | 5661.2 | 4997.9  | 4804.4  | 4799.1  | 4826.8 | 4665.9 |
| 55°   | 4447.2 | 4470.1 | 4619.3 | 4984.7 | 5847.4 | 6564.2 | 5861.0  | 5597.6  | 5557.2  | 5497.4 | 5302.6 |
| 57.5° | 3793.1 | 3829.5 | 3989.9 | 4475.9 | 5723.4 | 7280.5 | 7129.3  | 6494.7  | 6435.4  | 6069.9 | 5820.1 |
| 60°   | 2842.0 | 2886.8 | 3019.9 | 3544.2 | 5062.0 | 7535.6 | 8515.4  | 7494.3  | 7360.7  | 6525.8 | 6295.9 |
| 62.5° | 1950.3 | 1972.6 | 2063.0 | 2404.7 | 3728.0 | 7117.7 | 9674.9  | 8833.2  | 8589.3  | 7021.5 | 6810.5 |
| 65°   | 1489.5 | 1497.3 | 1534.2 | 1651.8 | 2220.0 | 5781.7 | 10136.2 | 10599.7 | 10304.8 | 7614.4 | 7344.7 |
| 67.5° | 1200.4 | 1194.1 | 1245.1 | 1413.2 | 1486.6 | 3527.2 | 9598.2  | 12271.0 | 12133.0 | 8407.0 | 7882.2 |
| 69°   | 1058.5 | 1049.7 | 1101.7 | 1297.1 | 1396.2 | 2331.8 | 8580.5  | 12650.6 | 12659.4 | 8825.4 | 7919.1 |
| 70°   | 952.5  | 958.4  | 1009.8 | 1228.1 | 1365.6 | 1830.2 | 7608.5  | 12553.9 | 12622.9 | 8981.9 | 7697.5 |
| 72.5° | 636.2  | 651.7  | 755.2  | 1019.6 | 1313.1 | 1385.0 | 4594.0  | 10772.8 | 11038.2 | 8629.6 | 6604.0 |
| 75°   | 358.7  | 370.3  | 493.3  | 768.8  | 1237.3 | 1319.0 | 2426.5  | 7936.6  | 8193.2  | 7216.3 | 5092.6 |
| 77.5° | 175.9  | 182.2  | 279.0  | 496.2  | 1034.6 | 1256.7 | 1376.3  | 5391.0  | 5684.1  | 4710.1 | 2880.5 |
| 80°   | 74.4   | 77.8   | 139.5  | 306.1  | 739.7  | 1199.4 | 1022.1  | 3317.8  | 3354.3  | 1845.3 | 767.4  |
| 82.5° | 28.7   | 29.7   | 58.8   | 191.0  | 470.0  | 935.1  | 854.8   | 1573.1  | 1535.3  | 347.5  | 174.9  |
| 85°   | 3.4    | 3.9    | 21.4   | 114.7  | 261.4  | 481.2  | 694.5   | 678.0   | 627.4   | 69.0   | 89.9   |
| 87.5° | 0.0    | 0.0    | 1.5    | 34.9   | 77.8   | 225.5  | 361.1   | 281.3   | 253.6   | 22.4   | 46.7   |
| 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: P386832

CATALOG NUMBER: GWC-SA2C-735-U-SL2-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 2902.3 | 2902.3 | 2902.3 | 2902.3 | 2902.3 | 2902.3 | 2902.3 | 2902.3 | 2902.3 | 2902.3 | 2902.3 |
| 2.5°  | 2895.0 | 2890.1 | 2863.9 | 2826.0 | 2790.0 | 2745.3 | 2702.5 | 2676.8 | 2656.4 | 2642.8 | 2658.8 |
| 5°    | 2902.7 | 2881.4 | 2801.6 | 2699.6 | 2599.5 | 2486.8 | 2381.8 | 2292.9 | 2257.8 | 2219.0 | 2236.5 |
| 7.5°  | 2900.4 | 2860.0 | 2716.6 | 2534.9 | 2351.2 | 2161.2 | 1981.4 | 1842.8 | 1770.9 | 1700.5 | 1718.4 |
| 10°   | 2888.2 | 2820.2 | 2603.0 | 2333.6 | 2058.6 | 1785.5 | 1530.4 | 1336.5 | 1228.1 | 1129.9 | 1144.0 |
| 12.5° | 2861.5 | 2766.7 | 2468.8 | 2103.3 | 1735.4 | 1375.4 | 1076.5 | 828.1  | 695.0  | 636.2  | 643.5  |
| 15°   | 2845.4 | 2714.7 | 2326.9 | 1870.1 | 1390.4 | 957.9  | 658.0  | 489.4  | 428.6  | 409.2  | 411.6  |
| 17.5° | 2837.6 | 2664.7 | 2180.1 | 1603.3 | 1037.6 | 609.9  | 425.3  | 375.2  | 362.0  | 358.7  | 359.6  |
| 20°   | 2829.8 | 2614.1 | 2029.0 | 1339.4 | 714.9  | 410.1  | 349.5  | 334.8  | 330.0  | 325.6  | 326.5  |
| 22.5° | 2816.8 | 2565.5 | 1866.7 | 1072.0 | 482.1  | 332.9  | 314.9  | 300.8  | 290.6  | 285.3  | 286.2  |
| 25°   | 2800.7 | 2514.5 | 1701.0 | 798.5  | 351.9  | 296.9  | 279.9  | 260.0  | 247.8  | 238.1  | 238.6  |
| 27.5° | 2775.0 | 2451.8 | 1529.9 | 581.2  | 295.4  | 265.8  | 243.0  | 221.1  | 200.7  | 189.6  | 189.6  |
| 30°   | 2739.0 | 2380.8 | 1339.9 | 416.0  | 264.8  | 235.2  | 207.5  | 180.3  | 158.5  | 148.2  | 147.3  |
| 32.5° | 2699.2 | 2307.0 | 1147.8 | 315.4  | 240.6  | 206.6  | 174.9  | 146.3  | 126.8  | 118.6  | 118.1  |
| 35°   | 2665.2 | 2227.3 | 956.4  | 264.3  | 216.2  | 178.9  | 144.3  | 120.1  | 104.5  | 97.7   | 97.2   |
| 37.5° | 2643.3 | 2147.5 | 769.8  | 236.2  | 194.4  | 153.1  | 121.0  | 99.1   | 87.9   | 82.6   | 82.1   |
| 40°   | 2639.9 | 2088.3 | 599.2  | 214.8  | 174.0  | 130.2  | 101.1  | 84.1   | 73.8   | 68.0   | 67.5   |
| 42.5° | 2684.0 | 2054.3 | 459.7  | 196.8  | 153.1  | 110.3  | 86.0   | 72.0   | 61.2   | 55.4   | 55.0   |
| 45°   | 2800.2 | 2065.0 | 353.8  | 180.7  | 132.2  | 93.3   | 72.9   | 59.7   | 50.1   | 45.7   | 44.7   |
| 47.5° | 3012.1 | 2138.8 | 281.3  | 164.8  | 112.3  | 79.2   | 62.2   | 49.6   | 41.3   | 36.9   | 36.4   |
| 50°   | 3389.2 | 2312.3 | 235.2  | 147.3  | 93.8   | 67.5   | 51.5   | 40.3   | 33.5   | 29.7   | 29.1   |
| 52.5° | 3889.8 | 2621.4 | 210.0  | 130.2  | 77.8   | 57.3   | 42.3   | 32.0   | 26.2   | 23.3   | 22.8   |
| 55°   | 4441.9 | 2995.6 | 193.4  | 111.8  | 63.7   | 47.6   | 33.5   | 25.3   | 20.4   | 17.9   | 17.0   |
| 57.5° | 4980.9 | 3319.7 | 177.8  | 93.8   | 53.0   | 38.9   | 26.8   | 19.9   | 16.1   | 13.6   | 13.2   |
| 60°   | 5476.0 | 3617.7 | 159.9  | 75.3   | 43.2   | 30.6   | 20.9   | 15.6   | 12.7   | 10.2   | 10.2   |
| 62.5° | 6006.3 | 3848.0 | 135.1  | 58.8   | 35.5   | 23.3   | 17.0   | 14.1   | 10.2   | 8.7    | 8.3    |
| 65°   | 6568.1 | 4019.1 | 106.0  | 45.7   | 27.7   | 17.5   | 14.1   | 14.6   | 8.3    | 6.3    | 5.8    |
| 67.5° | 6983.1 | 3985.1 | 78.3   | 36.0   | 21.4   | 13.6   | 13.6   | 15.6   | 7.3    | 4.9    | 4.4    |
| 69°   | 6891.7 | 3708.5 | 65.6   | 31.1   | 18.5   | 11.6   | 12.7   | 15.6   | 6.8    | 4.4    | 3.9    |
| 70°   | 6626.9 | 3402.4 | 57.9   | 27.7   | 16.5   | 10.7   | 12.1   | 15.0   | 6.3    | 4.4    | 3.9    |
| 72.5° | 5518.8 | 2562.6 | 45.2   | 20.9   | 13.2   | 8.7    | 10.2   | 13.2   | 6.3    | 4.4    | 3.4    |
| 75°   | 4151.3 | 1640.2 | 34.5   | 15.0   | 9.7    | 6.8    | 7.8    | 9.7    | 6.3    | 3.9    | 3.4    |
| 77.5° | 2258.9 | 591.4  | 24.8   | 10.2   | 6.8    | 5.4    | 5.4    | 7.3    | 5.8    | 2.9    | 2.0    |
| 80°   | 580.7  | 148.7  | 15.6   | 6.8    | 5.4    | 3.9    | 3.4    | 4.9    | 3.4    | 0.5    | 0.0    |
| 82.5° | 143.4  | 33.5   | 8.3    | 4.9    | 3.9    | 1.5    | 1.5    | 2.4    | 1.5    | 0.0    | 0.0    |
| 85°   | 78.7   | 16.5   | 5.4    | 3.4    | 2.0    | 0.0    | 0.0    | 0.5    | 0.0    | 0.0    | 0.0    |
| 87.5° | 40.3   | 4.9    | 1.5    | 0.9    | 0.5    | 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    |

Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

INVUE

Report Number: SP1-2104-224-2

Luminaire Tested: CCW-SA-2A-735-U-SL4

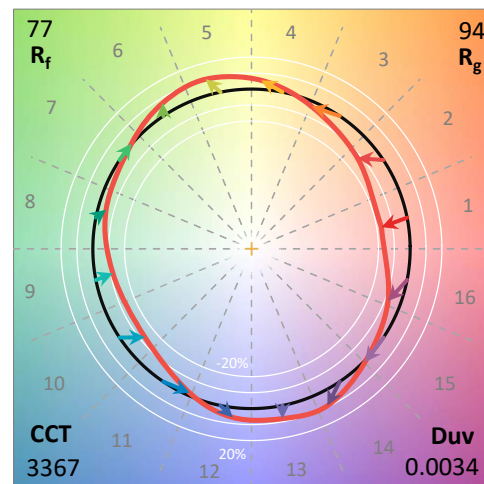
Test Date: 04/26/2021

### Test Information

Test Method: LM-79-08  
 Report Number: SP1-2104-224-2  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1  
 Measurement Geometry:  $4\pi$   
 Issue Date: 04/26/2021  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: INVUE  
 Catalog Number: **CCW-SA-2A-735-U-SL4**  
 Description: INVUE WALL PACK ClearCurve Light Square

### Spectral Parameters

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 3367   | CRI (Ra): | 73.3 |      |       |
| CIE u':                   | 0.2376 | R1:       | 69.1 | R9:  | -34.3 |
| CIE v':                   | 0.5184 | R2:       | 81.3 | R10: | 58.3  |
| Duv:                      | 0.0034 | R3:       | 93.4 | R11: | 69.1  |
| CIE x:                    | 0.4168 | R4:       | 71.8 | R12: | 54.2  |
| CIE y:                    | 0.4041 | R5:       | 69.6 | R13: | 71.1  |
| CIE z:                    | 0.1791 | R6:       | 75.4 | R14: | 96.4  |
| Peak Wavelength (nm):     | 590    | R7:       | 79.5 |      |       |
| Dominant Wavelength (nm): | 580    | R8:       | 46.4 |      |       |
| Purity:                   | 46.5   |           |      |      |       |
| Rf:                       | 77.2   |           |      |      |       |
| Rg:                       | 94.4   |           |      |      |       |



### Test Conditions

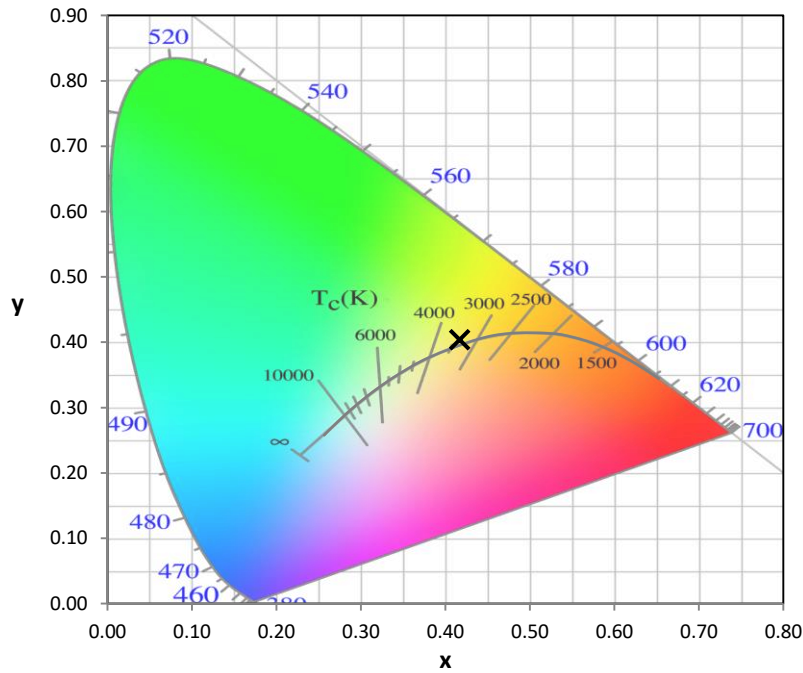
Stabilization Time: 71M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.9/38%  
 Sphere Temperature (°C): 24.2

REPORT NUMBER: SP1-2104-224-2

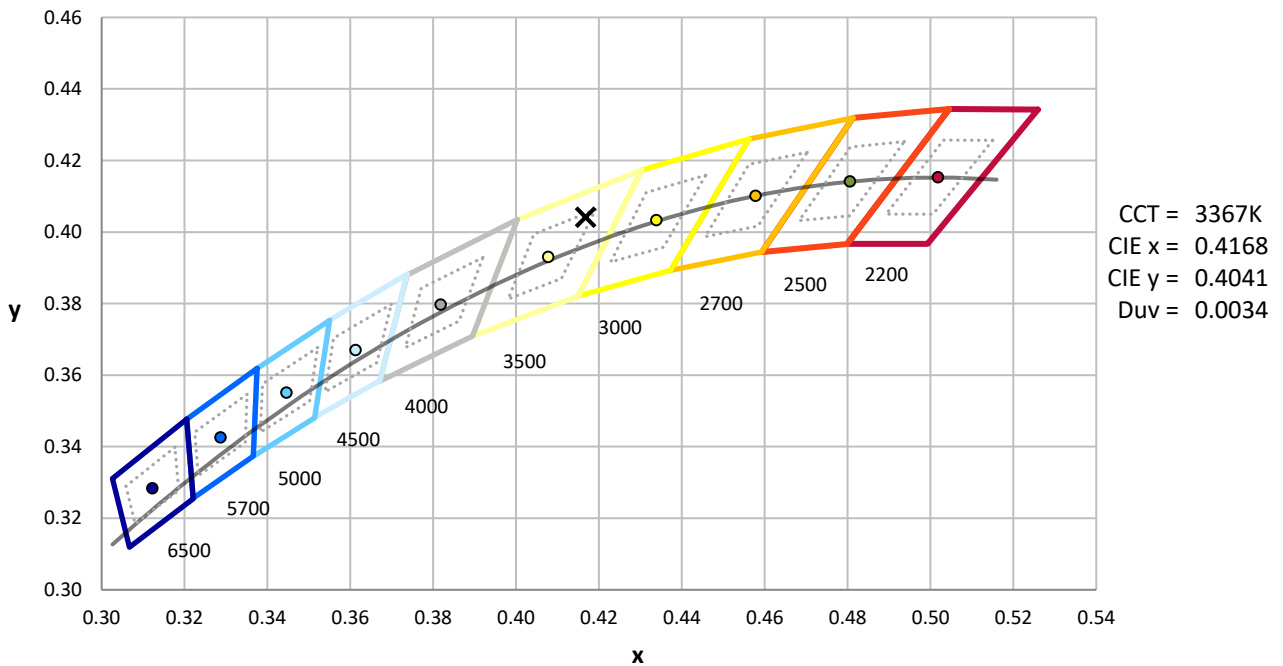
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 1/31/2021        | 7/31/2021            |
| 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            |

REPORT NUMBER: SP1-2104-224-2

**CIE 1931 Chromaticity Diagram**



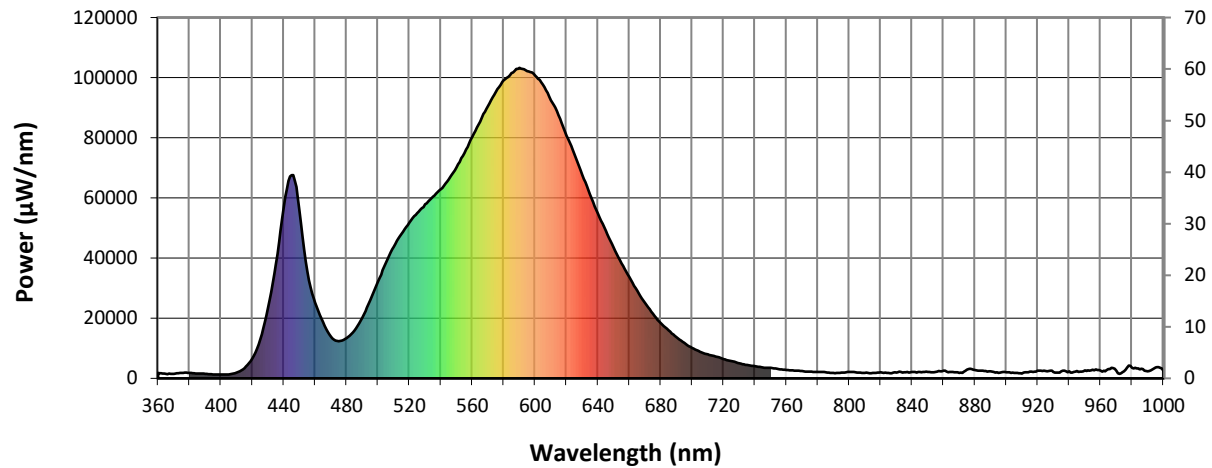
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 3500K 4-step quadrangle

REPORT NUMBER: SP1-2104-224-2

### Photopic Flux vs. Wavelength

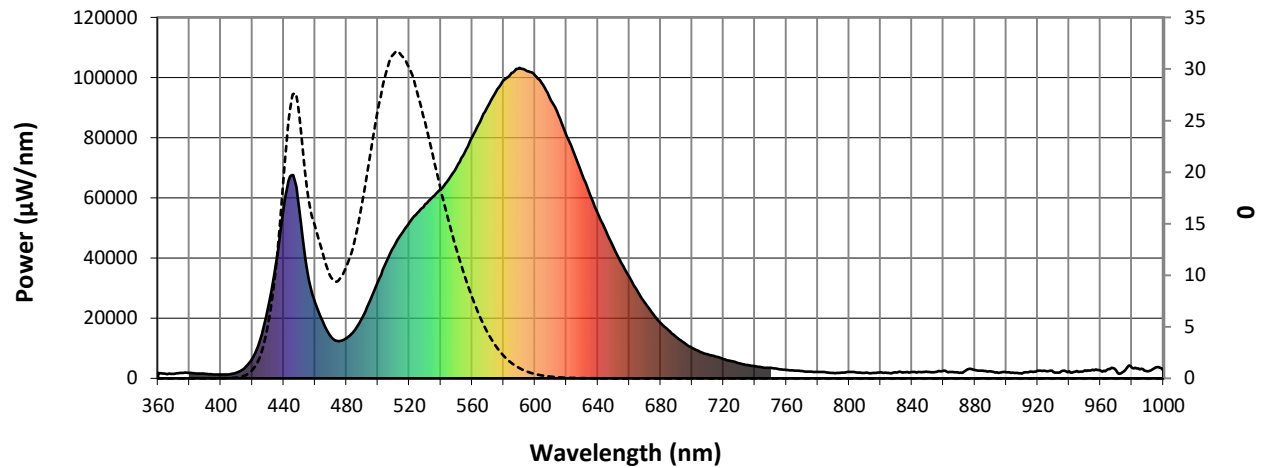


#####

| 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       | 1840             | 0.0              | 490       | 20271            | 2.9              | 620       | 80709            | 21.0             | 750       | 3465             | 0.0              | 880       | 2800             | 0.0              |
| 365       | 1514             | 0.0              | 495       | 25910            | 4.7              | 625       | 74695            | 16.5             | 755       | 3075             | 0.0              | 885       | 2582             | 0.0              |
| 370       | 1514             | 0.0              | 500       | 32216            | 7.1              | 630       | 67709            | 12.3             | 760       | 2794             | 0.0              | 890       | 2353             | 0.0              |
| 375       | 1843             | 0.0              | 505       | 38336            | 10.7             | 635       | 61156            | 9.2              | 765       | 2593             | 0.0              | 895       | 1819             | 0.0              |
| 380       | 1796             | 0.0              | 510       | 43738            | 15.0             | 640       | 54795            | 6.5              | 770       | 2401             | 0.0              | 900       | 2024             | 0.0              |
| 385       | 1575             | 0.0              | 515       | 47977            | 19.9             | 645       | 49111            | 4.7              | 775       | 2233             | 0.0              | 905       | 1851             | 0.0              |
| 390       | 1527             | 0.0              | 520       | 51818            | 25.1             | 650       | 43533            | 3.2              | 780       | 2166             | 0.0              | 910       | 1602             | 0.0              |
| 395       | 1326             | 0.0              | 525       | 54890            | 29.5             | 655       | 38234            | 2.2              | 785       | 2051             | 0.0              | 915       | 2200             | 0.0              |
| 400       | 1233             | 0.0              | 530       | 57872            | 34.1             | 660       | 33754            | 1.4              | 790       | 1765             | 0.0              | 920       | 2530             | 0.0              |
| 405       | 1329             | 0.0              | 535       | 60410            | 37.5             | 665       | 29162            | 0.9              | 795       | 1903             | 0.0              | 925       | 2487             | 0.0              |
| 410       | 1902             | 0.0              | 540       | 62857            | 41.0             | 670       | 25117            | 0.5              | 800       | 2127             | 0.0              | 930       | 2089             | 0.0              |
| 415       | 3436             | 0.0              | 545       | 66165            | 44.0             | 675       | 21511            | 0.4              | 805       | 1867             | 0.0              | 935       | 2293             | 0.0              |
| 420       | 6571             | 0.0              | 550       | 70124            | 47.7             | 680       | 18435            | 0.2              | 810       | 1775             | 0.0              | 940       | 2315             | 0.0              |
| 425       | 12957            | 0.1              | 555       | 74973            | 51.2             | 685       | 16004            | 0.1              | 815       | 1812             | 0.0              | 945       | 2481             | 0.0              |
| 430       | 23376            | 0.2              | 560       | 80227            | 54.5             | 690       | 13701            | 0.1              | 820       | 1973             | 0.0              | 950       | 2701             | 0.0              |
| 435       | 38205            | 0.5              | 565       | 85358            | 56.8             | 695       | 11765            | 0.0              | 825       | 1773             | 0.0              | 955       | 2892             | 0.0              |
| 440       | 56691            | 0.9              | 570       | 90422            | 58.8             | 700       | 10145            | 0.0              | 830       | 1925             | 0.0              | 960       | 2609             | 0.0              |
| 445       | 67585            | 1.4              | 575       | 95259            | 59.3             | 705       | 8865             | 0.0              | 835       | 2001             | 0.0              | 965       | 3066             | 0.0              |
| 450       | 55963            | 1.5              | 580       | 99033            | 58.8             | 710       | 7954             | 0.0              | 840       | 2142             | 0.0              | 970       | 2566             | 0.0              |
| 455       | 35549            | 1.2              | 585       | 101572           | 56.4             | 715       | 7285             | 0.0              | 845       | 2101             | 0.0              | 975       | 2375             | 0.0              |
| 460       | 25268            | 1.0              | 590       | 103264           | 53.4             | 720       | 6412             | 0.0              | 850       | 2097             | 0.0              | 980       | 3526             | 0.0              |
| 465       | 18712            | 1.0              | 595       | 102194           | 48.4             | 725       | 5721             | 0.0              | 855       | 2090             | 0.0              | 985       | 2982             | 0.0              |
| 470       | 13835            | 0.9              | 600       | 100645           | 43.4             | 730       | 5017             | 0.0              | 860       | 2535             | 0.0              | 990       | 2305             | 0.0              |
| 475       | 12398            | 1.0              | 605       | 97644            | 37.8             | 735       | 4459             | 0.0              | 865       | 2101             | 0.0              | 995       | 3671             | 0.0              |
| 480       | 13406            | 1.3              | 610       | 92487            | 31.8             | 740       | 4062             | 0.0              | 870       | 1798             | 0.0              | 1000      | 2560             | 0.0              |
| 485       | 15865            | 1.9              | 615       | 87436            | 26.4             | 745       | 3636             | 0.0              | 875       | 2857             | 0.0              |           |                  |                  |

REPORT NUMBER: SP1-2104-224-2

### Scotopic Flux vs. Wavelength



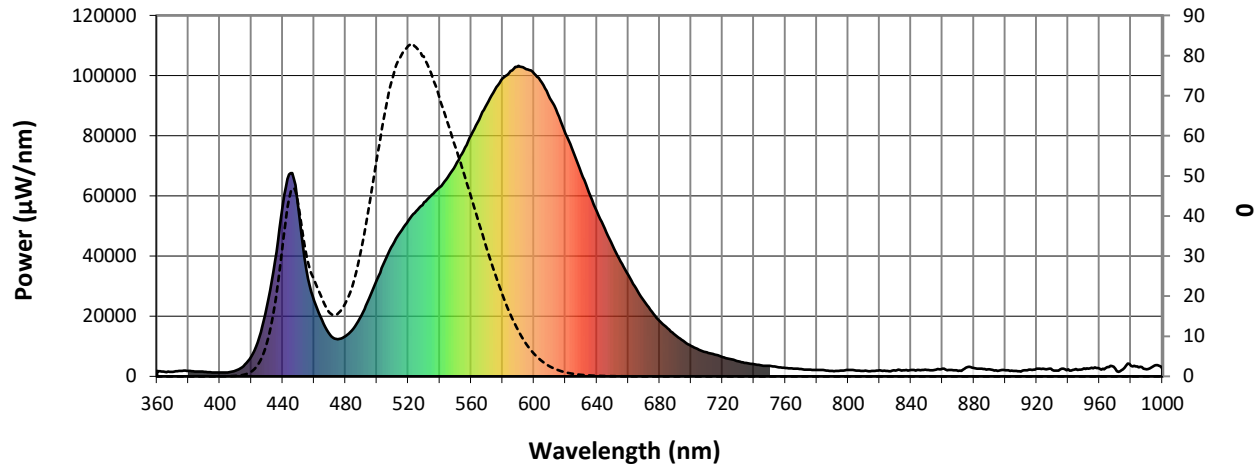
Scotopic Lumens: 7088.7

S/P: 1.35

| 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       | 1840             | 0.0              | 490       | 20271            | 31.2             | 620       | 80709            | 1.0              | 750       | 3465             | 0.0              | 880       | 2800             | 0.0              |
| 365       | 1514             | 0.0              | 495       | 25910            | 41.9             | 625       | 74695            | 0.6              | 755       | 3075             | 0.0              | 885       | 2582             | 0.0              |
| 370       | 1514             | 0.0              | 500       | 32216            | 53.9             | 630       | 67709            | 0.4              | 760       | 2794             | 0.0              | 890       | 2353             | 0.0              |
| 375       | 1843             | 0.0              | 505       | 38336            | 65.2             | 635       | 61156            | 0.2              | 765       | 2593             | 0.0              | 895       | 1819             | 0.0              |
| 380       | 1796             | 0.0              | 510       | 43738            | 74.1             | 640       | 54795            | 0.1              | 770       | 2401             | 0.0              | 900       | 2024             | 0.0              |
| 385       | 1575             | 0.0              | 515       | 47977            | 79.5             | 645       | 49111            | 0.1              | 775       | 2233             | 0.0              | 905       | 1851             | 0.0              |
| 390       | 1527             | 0.0              | 520       | 51818            | 82.4             | 650       | 43533            | 0.1              | 780       | 2166             | 0.0              | 910       | 1602             | 0.0              |
| 395       | 1326             | 0.0              | 525       | 54890            | 82.1             | 655       | 38234            | 0.0              | 785       | 2051             | 0.0              | 915       | 2200             | 0.0              |
| 400       | 1233             | 0.0              | 530       | 57872            | 79.8             | 660       | 33754            | 0.0              | 790       | 1765             | 0.0              | 920       | 2530             | 0.0              |
| 405       | 1329             | 0.0              | 535       | 60410            | 75.3             | 665       | 29162            | 0.0              | 795       | 1903             | 0.0              | 925       | 2487             | 0.0              |
| 410       | 1902             | 0.1              | 540       | 62857            | 69.5             | 670       | 25117            | 0.0              | 800       | 2127             | 0.0              | 930       | 2089             | 0.0              |
| 415       | 3436             | 0.4              | 545       | 66165            | 63.4             | 675       | 21511            | 0.0              | 805       | 1867             | 0.0              | 935       | 2293             | 0.0              |
| 420       | 6571             | 1.1              | 550       | 70124            | 57.3             | 680       | 18435            | 0.0              | 810       | 1775             | 0.0              | 940       | 2315             | 0.0              |
| 425       | 12957            | 3.2              | 555       | 74973            | 51.2             | 685       | 16004            | 0.0              | 815       | 1812             | 0.0              | 945       | 2481             | 0.0              |
| 430       | 23376            | 8.0              | 560       | 80227            | 44.8             | 690       | 13701            | 0.0              | 820       | 1973             | 0.0              | 950       | 2701             | 0.0              |
| 435       | 38205            | 17.1             | 565       | 85358            | 38.3             | 695       | 11765            | 0.0              | 825       | 1773             | 0.0              | 955       | 2892             | 0.0              |
| 440       | 56691            | 31.7             | 570       | 90422            | 31.9             | 700       | 10145            | 0.0              | 830       | 1925             | 0.0              | 960       | 2609             | 0.0              |
| 445       | 67585            | 45.3             | 575       | 95259            | 25.9             | 705       | 8865             | 0.0              | 835       | 2001             | 0.0              | 965       | 3066             | 0.0              |
| 450       | 55963            | 43.4             | 580       | 99033            | 20.4             | 710       | 7954             | 0.0              | 840       | 2142             | 0.0              | 970       | 2566             | 0.0              |
| 455       | 35549            | 31.1             | 585       | 101572           | 15.5             | 715       | 7285             | 0.0              | 845       | 2101             | 0.0              | 975       | 2375             | 0.0              |
| 460       | 25268            | 24.4             | 590       | 103264           | 11.5             | 720       | 6412             | 0.0              | 850       | 2097             | 0.0              | 980       | 3526             | 0.0              |
| 465       | 18712            | 19.8             | 595       | 102194           | 8.1              | 725       | 5721             | 0.0              | 855       | 2090             | 0.0              | 985       | 2982             | 0.0              |
| 470       | 13835            | 15.9             | 600       | 100645           | 5.7              | 730       | 5017             | 0.0              | 860       | 2535             | 0.0              | 990       | 2305             | 0.0              |
| 475       | 12398            | 15.5             | 605       | 97644            | 3.8              | 735       | 4459             | 0.0              | 865       | 2101             | 0.0              | 995       | 3671             | 0.0              |
| 480       | 13406            | 18.1             | 610       | 92487            | 2.5              | 740       | 4062             | 0.0              | 870       | 1798             | 0.0              | 1000      | 2560             | 0.0              |
| 485       | 15865            | 23.0             | 615       | 87436            | 1.6              | 745       | 3636             | 0.0              | 875       | 2857             | 0.0              |           |                  |                  |

REPORT NUMBER: SP1-2104-224-2

### Melanopic Flux vs. Wavelength



Melanopic Lumens: 2621

M/P: 0.5

| 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       | 1840             | 0.0              | 490       | 20271            | 16.9             | 620       | 80709            | 0.1              | 750       | 3465             | 0.0              | 880       | 2800             | 0.0              |
| 365       | 1514             | 0.0              | 495       | 25910            | 21.4             | 625       | 74695            | 0.0              | 755       | 3075             | 0.0              | 885       | 2582             | 0.0              |
| 370       | 1514             | 0.0              | 500       | 32216            | 25.9             | 630       | 67709            | 0.0              | 760       | 2794             | 0.0              | 890       | 2353             | 0.0              |
| 375       | 1843             | 0.0              | 505       | 38336            | 29.4             | 635       | 61156            | 0.0              | 765       | 2593             | 0.0              | 895       | 1819             | 0.0              |
| 380       | 1796             | 0.0              | 510       | 43738            | 31.4             | 640       | 54795            | 0.0              | 770       | 2401             | 0.0              | 900       | 2024             | 0.0              |
| 385       | 1575             | 0.0              | 515       | 47977            | 31.3             | 645       | 49111            | 0.0              | 775       | 2233             | 0.0              | 905       | 1851             | 0.0              |
| 390       | 1527             | 0.0              | 520       | 51818            | 30.2             | 650       | 43533            | 0.0              | 780       | 2166             | 0.0              | 910       | 1602             | 0.0              |
| 395       | 1326             | 0.0              | 525       | 54890            | 27.8             | 655       | 38234            | 0.0              | 785       | 2051             | 0.0              | 915       | 2200             | 0.0              |
| 400       | 1233             | 0.0              | 530       | 57872            | 25.0             | 660       | 33754            | 0.0              | 790       | 1765             | 0.0              | 920       | 2530             | 0.0              |
| 405       | 1329             | 0.0              | 535       | 60410            | 21.7             | 665       | 29162            | 0.0              | 795       | 1903             | 0.0              | 925       | 2487             | 0.0              |
| 410       | 1902             | 0.1              | 540       | 62857            | 18.4             | 670       | 25117            | 0.0              | 800       | 2127             | 0.0              | 930       | 2089             | 0.0              |
| 415       | 3436             | 0.2              | 545       | 66165            | 15.4             | 675       | 21511            | 0.0              | 805       | 1867             | 0.0              | 935       | 2293             | 0.0              |
| 420       | 6571             | 0.8              | 550       | 70124            | 12.6             | 680       | 18435            | 0.0              | 810       | 1775             | 0.0              | 940       | 2315             | 0.0              |
| 425       | 12957            | 2.0              | 555       | 74973            | 10.1             | 685       | 16004            | 0.0              | 815       | 1812             | 0.0              | 945       | 2481             | 0.0              |
| 430       | 23376            | 4.9              | 560       | 80227            | 7.9              | 690       | 13701            | 0.0              | 820       | 1973             | 0.0              | 950       | 2701             | 0.0              |
| 435       | 38205            | 10.2             | 565       | 85358            | 6.0              | 695       | 11765            | 0.0              | 825       | 1773             | 0.0              | 955       | 2892             | 0.0              |
| 440       | 56691            | 18.9             | 570       | 90422            | 4.4              | 700       | 10145            | 0.0              | 830       | 1925             | 0.0              | 960       | 2609             | 0.0              |
| 445       | 67585            | 26.7             | 575       | 95259            | 3.2              | 705       | 8865             | 0.0              | 835       | 2001             | 0.0              | 965       | 3066             | 0.0              |
| 450       | 55963            | 25.8             | 580       | 99033            | 2.2              | 710       | 7954             | 0.0              | 840       | 2142             | 0.0              | 970       | 2566             | 0.0              |
| 455       | 35549            | 18.6             | 585       | 101572           | 1.5              | 715       | 7285             | 0.0              | 845       | 2101             | 0.0              | 975       | 2375             | 0.0              |
| 460       | 25268            | 14.9             | 590       | 103264           | 1.0              | 720       | 6412             | 0.0              | 850       | 2097             | 0.0              | 980       | 3526             | 0.0              |
| 465       | 18712            | 12.2             | 595       | 102194           | 0.7              | 725       | 5721             | 0.0              | 855       | 2090             | 0.0              | 985       | 2982             | 0.0              |
| 470       | 13835            | 9.9              | 600       | 100645           | 0.4              | 730       | 5017             | 0.0              | 860       | 2535             | 0.0              | 990       | 2305             | 0.0              |
| 475       | 12398            | 9.5              | 605       | 97644            | 0.3              | 735       | 4459             | 0.0              | 865       | 2101             | 0.0              | 995       | 3671             | 0.0              |
| 480       | 13406            | 10.8             | 610       | 92487            | 0.2              | 740       | 4062             | 0.0              | 870       | 1798             | 0.0              | 1000      | 2560             | 0.0              |
| 485       | 15865            | 13.1             | 615       | 87436            | 0.1              | 745       | 3636             | 0.0              | 875       | 2857             | 0.0              |           |                  |                  |

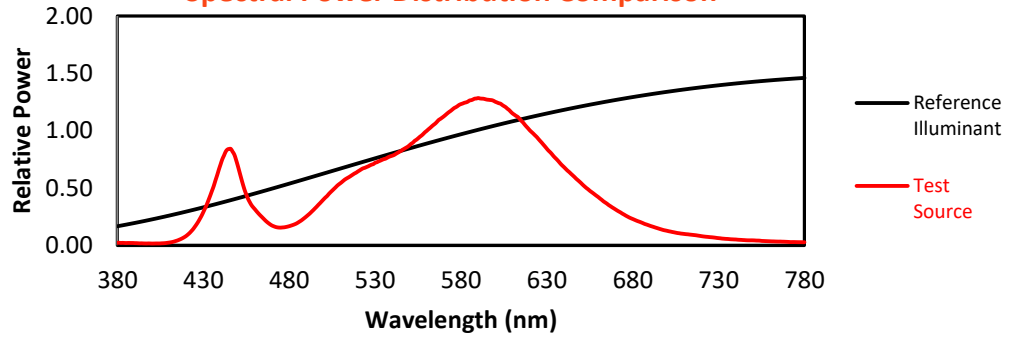
REPORT NUMBER: SP1-2104-224-2

TM-30-18

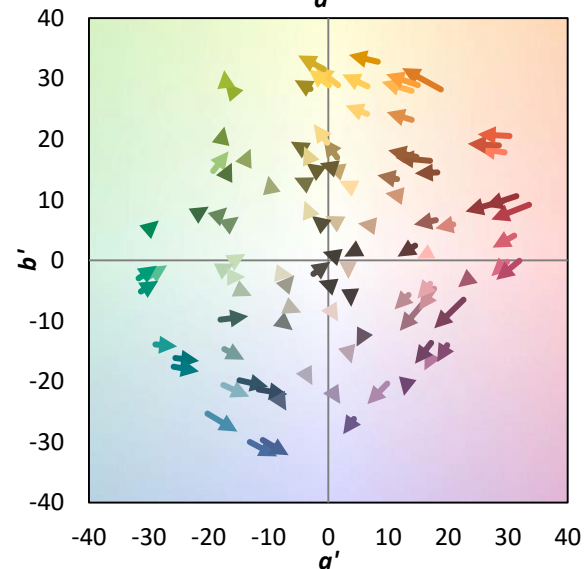
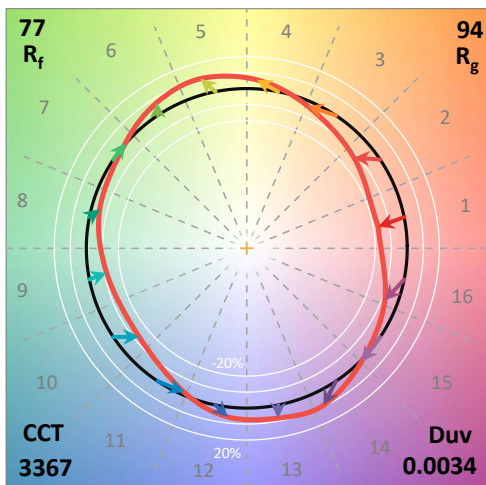
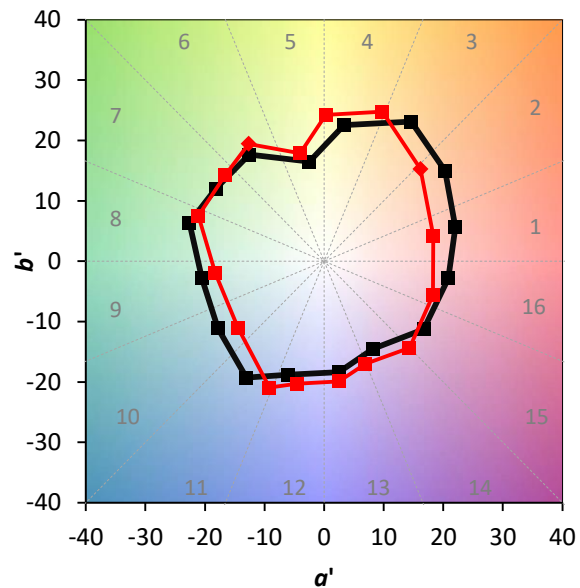
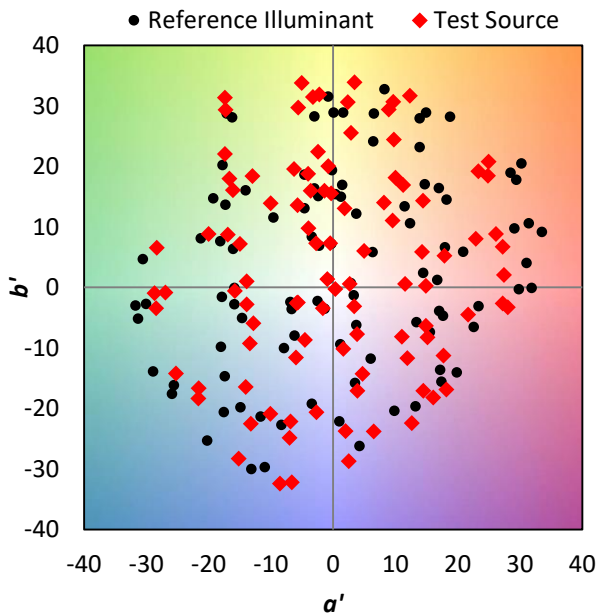
### Summary

$R_f = 77.2$   
 $R_g = 94.4$   
 CIE  $R_a = 73.3$   
 $R_g = -34.3$

### Spectral Power Distribution Comparison

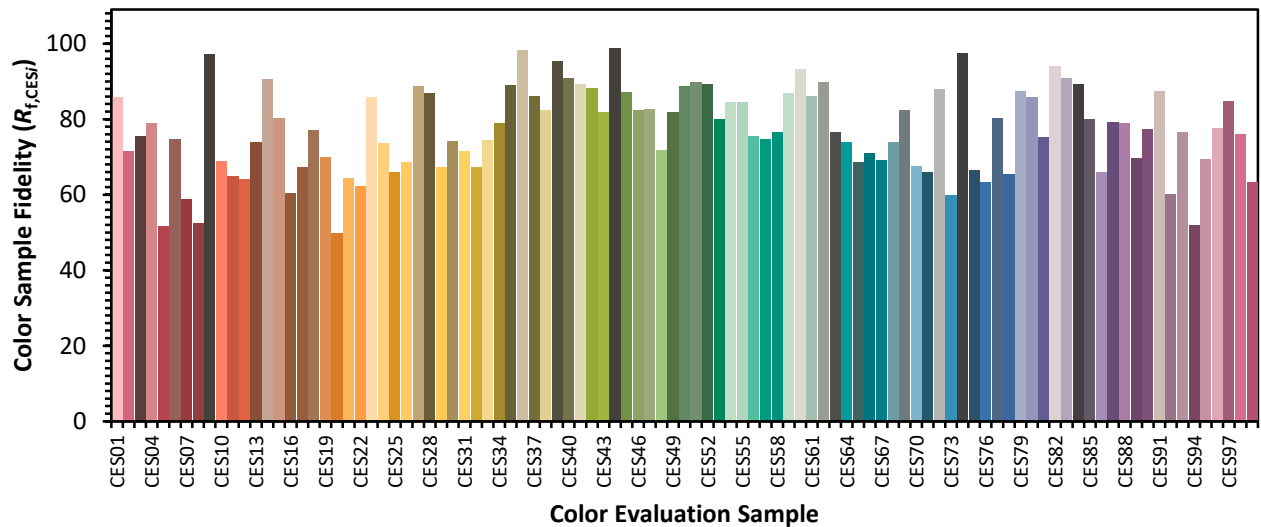


### Color Vector Graphics

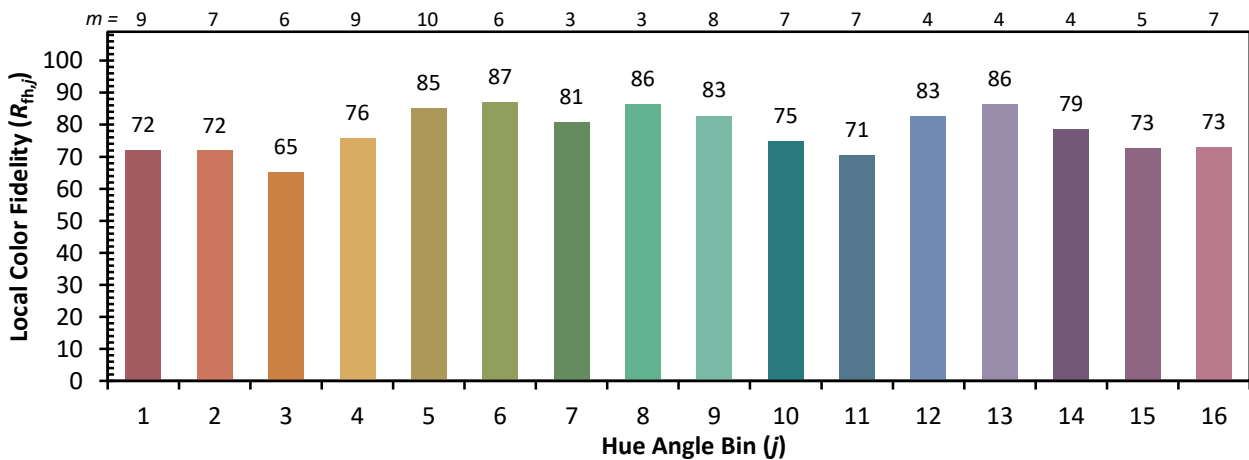
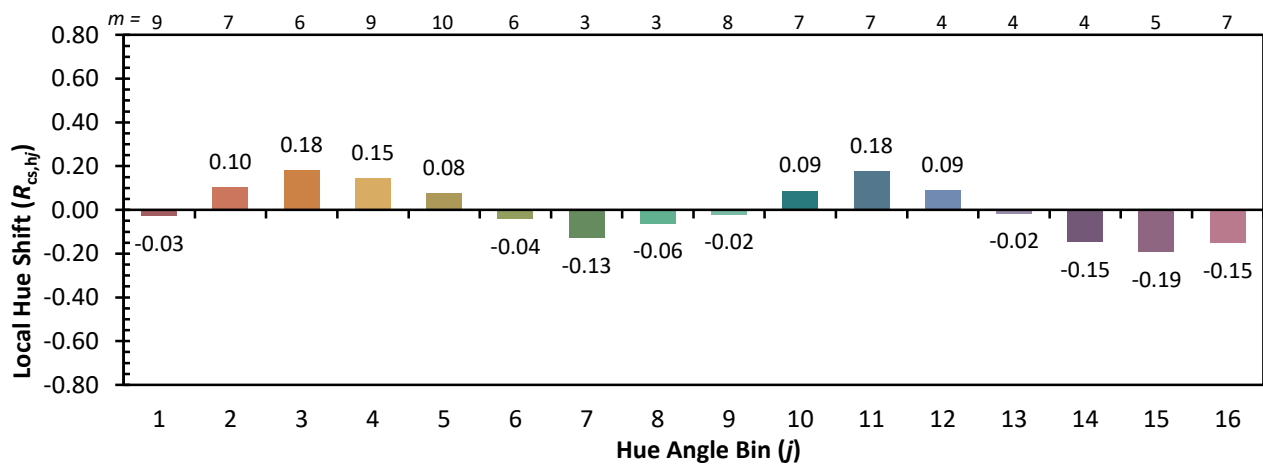
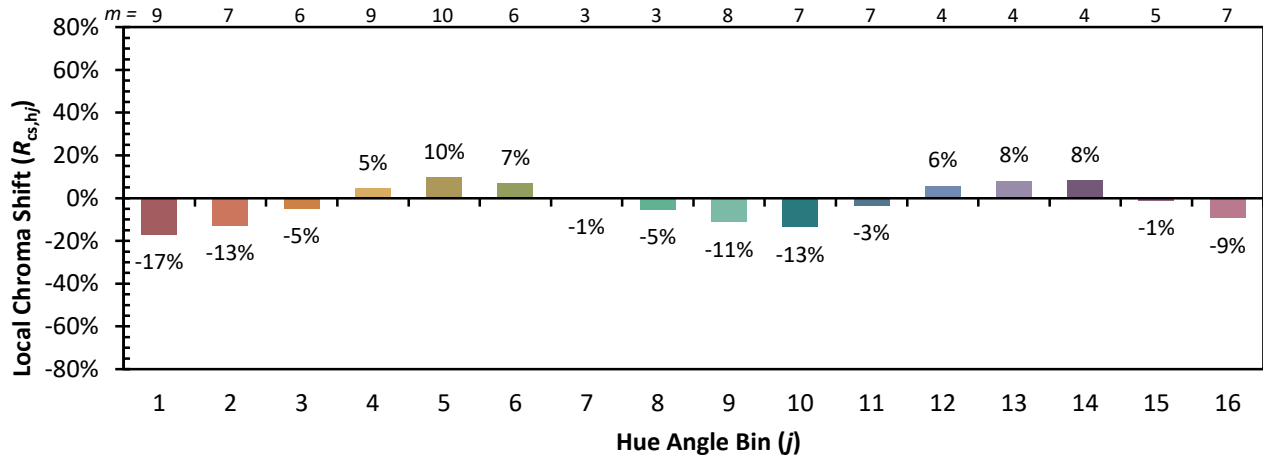


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

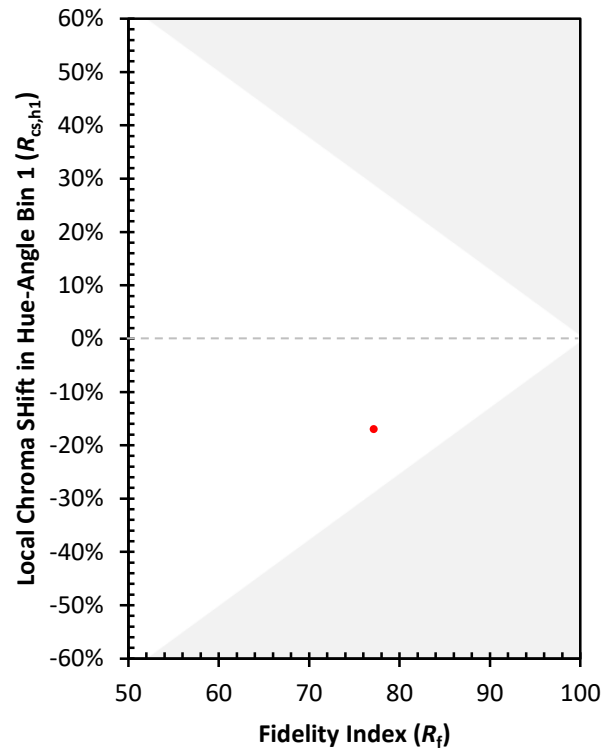
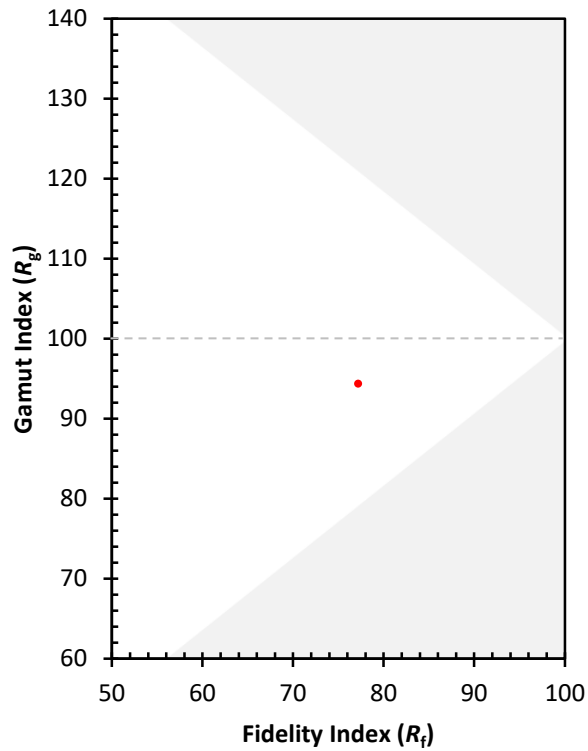
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 69 | CES51 = 90 | CES76 = 63 |
| CES02 = 62 | CES27 = 89 | CES52 = 89 | CES77 = 80 |
| CES03 = 31 | CES28 = 87 | CES53 = 80 | CES78 = 65 |
| CES04 = 70 | CES29 = 67 | CES54 = 85 | CES79 = 87 |
| CES05 = 48 | CES30 = 74 | CES55 = 84 | CES80 = 86 |
| CES06 = 51 | CES31 = 71 | CES56 = 76 | CES81 = 75 |
| CES07 = 41 | CES32 = 67 | CES57 = 75 | CES82 = 94 |
| CES08 = 39 | CES33 = 75 | CES58 = 77 | CES83 = 91 |
| CES09 = 29 | CES34 = 79 | CES59 = 87 | CES84 = 89 |
| CES10 = 75 | CES35 = 89 | CES60 = 93 | CES85 = 80 |
| CES11 = 58 | CES36 = 98 | CES61 = 86 | CES86 = 66 |
| CES12 = 64 | CES37 = 86 | CES62 = 90 | CES87 = 79 |
| CES13 = 43 | CES38 = 82 | CES63 = 77 | CES88 = 79 |
| CES14 = 74 | CES39 = 95 | CES64 = 74 | CES89 = 70 |
| CES15 = 71 | CES40 = 91 | CES65 = 69 | CES90 = 77 |
| CES16 = 47 | CES41 = 89 | CES66 = 71 | CES91 = 87 |
| CES17 = 50 | CES42 = 88 | CES67 = 69 | CES92 = 60 |
| CES18 = 56 | CES43 = 82 | CES68 = 74 | CES93 = 76 |
| CES19 = 72 | CES44 = 99 | CES69 = 82 | CES94 = 52 |
| CES20 = 65 | CES45 = 87 | CES70 = 67 | CES95 = 69 |
| CES21 = 86 | CES46 = 82 | CES71 = 66 | CES96 = 78 |
| CES22 = 79 | CES47 = 83 | CES72 = 88 | CES97 = 85 |
| CES23 = 92 | CES48 = 72 | CES73 = 60 | CES98 = 76 |
| CES24 = 91 | CES49 = 82 | CES74 = 97 | CES99 = 63 |
| CES25 = 72 | CES50 = 89 | CES75 = 67 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)