

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: P386666

Luminaire Tested: **GWC-SA2B-760-U-SL3-HSS**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P386666  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-23)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GWC-SA2B-760-U-SL3-HSS  
Description: GALLEON WALL LUMINAIRE  
(2) 70 CRI, 5700K, 800mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE III  
SPILL LIGHT ELIMINATOR OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 10189 lumens  
Efficiency: N/A  
Efficacy: 118.5 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): 86  
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

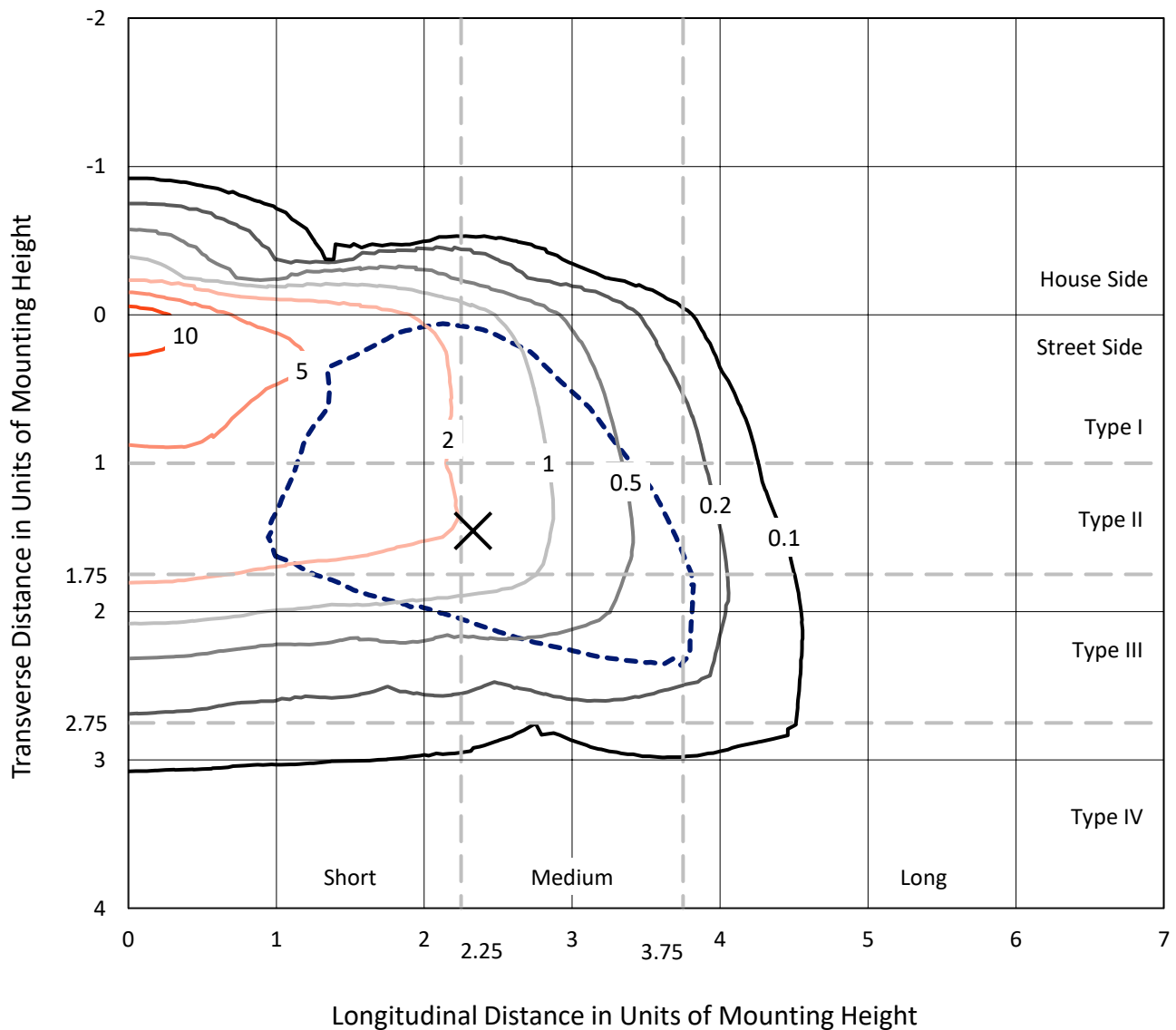


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## Iso-Footcandle Lines of Horizontal Illumination

× Max cd  
 - - - 1/2 Max cd

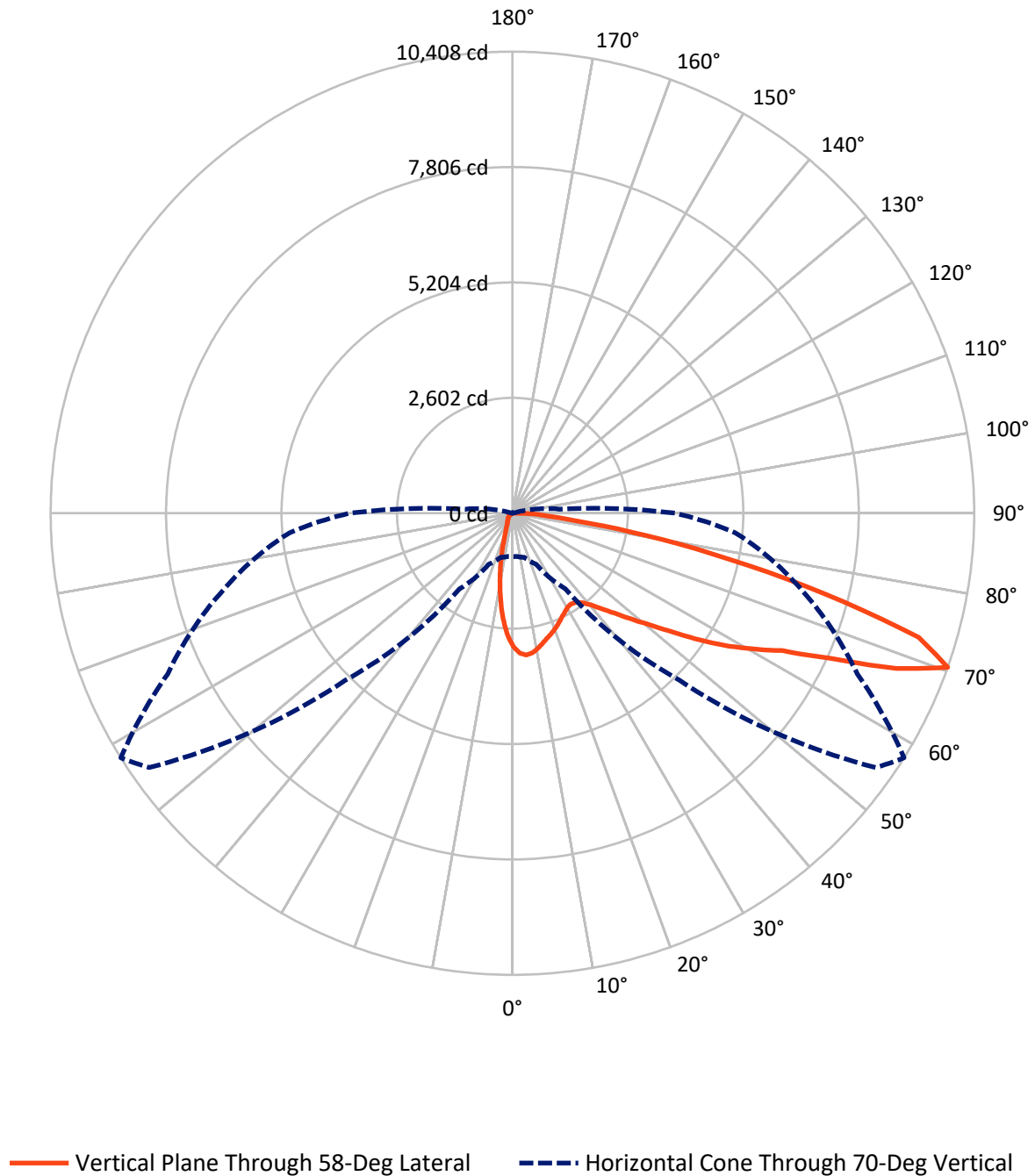


Based on 15 foot mounting height. Maximum calculated value = 13.6 fc  
 Type III - Medium - N/A

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CATALOG NUMBER: GWC-SA2B-760-U-SL3-HSS

## Luminous Intensity Polar Plot



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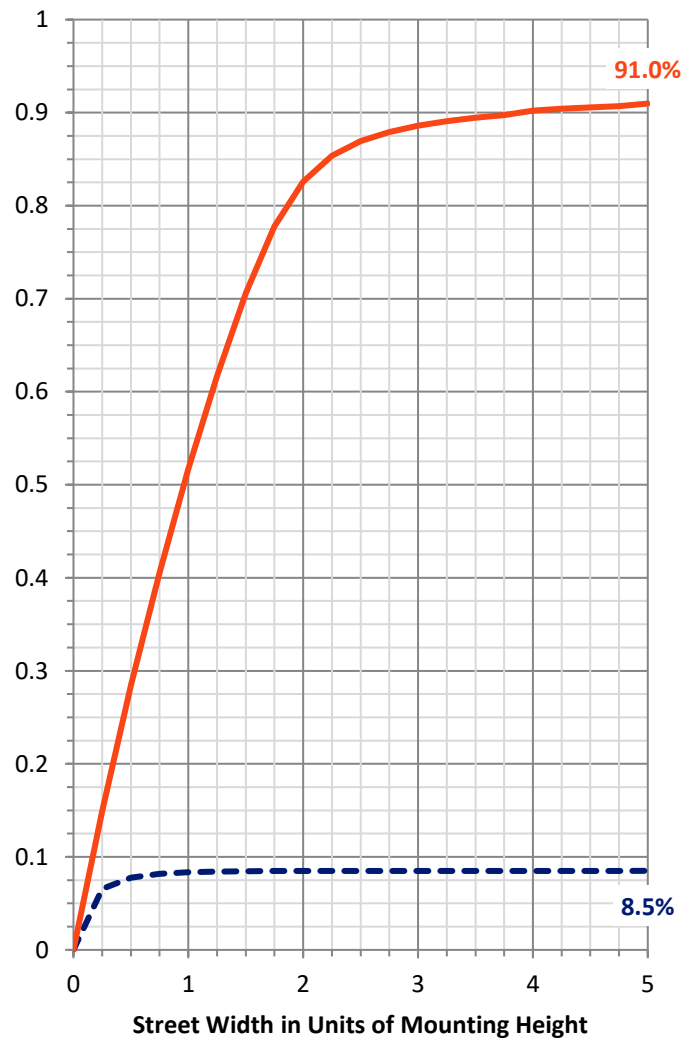
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 872.0    | 0.0    | 872.0   |
|                    | % Fixture | 8.6      | 0.0    | 8.6     |
| <b>Street Side</b> | Lumens    | 9317.0   | 0.0    | 9317.0  |
|                    | % Fixture | 91.4     | 0.0    | 91.4    |
| <b>Total</b>       | Lumens    | 10189.0  | 0.0    | 10189.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 246.1   | 2.4       |
| 10°-20°   | 516.6   | 5.1       |
| 20°-30°   | 679.1   | 6.7       |
| 30°-40°   | 899.4   | 8.8       |
| 40°-50°   | 1344.3  | 13.2      |
| 50°-60°   | 2153.5  | 21.1      |
| 60°-70°   | 2714.5  | 26.6      |
| 70°-80°   | 1464.2  | 14.4      |
| 80°-90°   | 171.4   | 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°    | 10189.0 | 100.0     |
| 0°-180°   | 10189.0 | 100.0     |

**Coefficient of Utilization**



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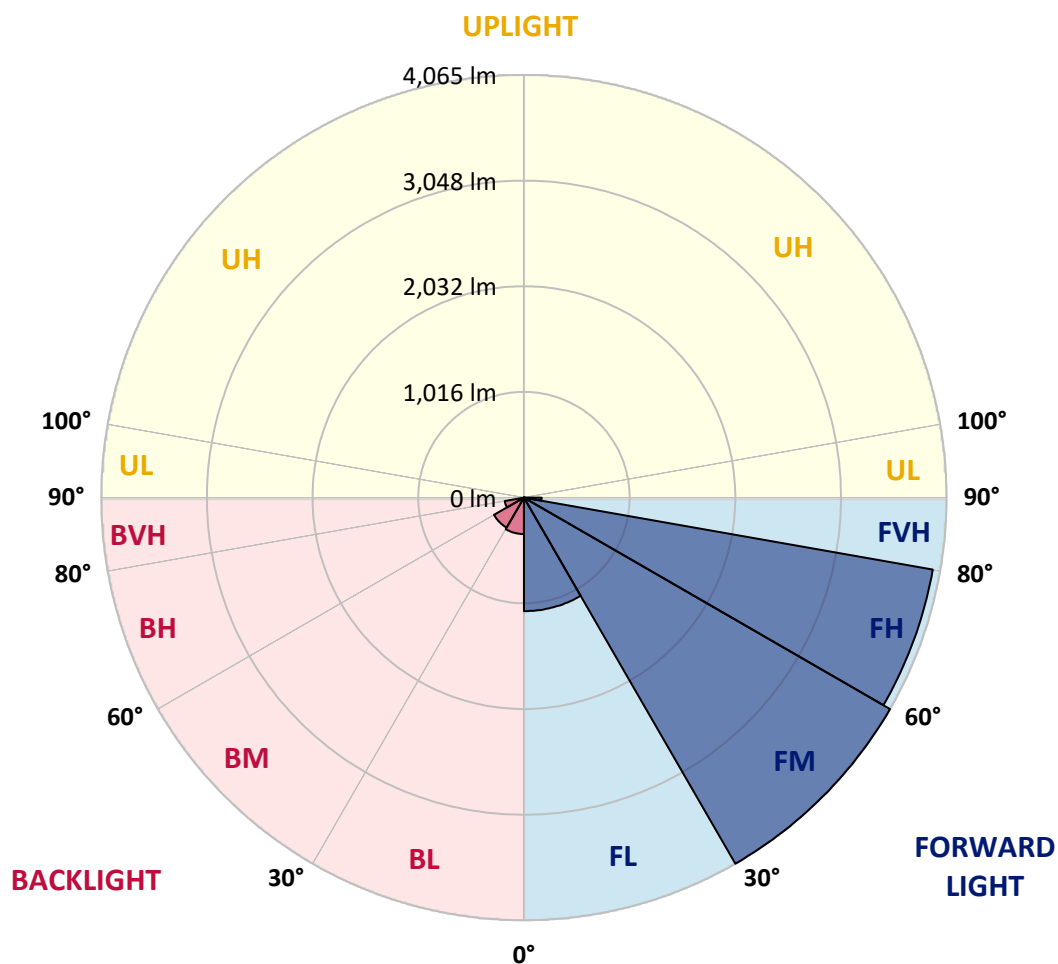
CATALOG NUMBER: GWC-SA2B-760-U-SL3-HSS

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 1091.5 | 10.7      |                         |      |         |
| FM   | (30°-60°)   | 4064.5 | 39.9      |                         |      |         |
| FH   | (60°-80°)   | 3991.1 | 39.2      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 169.9  | 1.7       |                         |      | G2/225  |
| BL   | (0°-30°)    | 350.3  | 3.4       | B1/500                  |      |         |
| BM   | (30°-60°)   | 332.6  | 3.3       | B1/1000                 |      |         |
| BH   | (60°-80°)   | 187.5  | 1.8       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 1.5    | 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



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 58°     | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|---------|--------|--------|--------|
| 0°    | 3009.8 | 3009.8 | 3009.8 | 3009.8 | 3009.8 | 3009.8 | 3009.8 | 3009.8  | 3009.8 | 3009.8 | 3009.8 |
| 2.5°  | 3259.3 | 3251.3 | 3248.3 | 3243.2 | 3223.7 | 3204.7 | 3167.0 | 3156.4  | 3132.6 | 3076.3 | 3016.6 |
| 5°    | 3261.9 | 3261.4 | 3270.3 | 3268.2 | 3261.4 | 3252.5 | 3225.4 | 3211.5  | 3171.2 | 3090.7 | 2981.4 |
| 7.5°  | 3104.7 | 3112.7 | 3132.6 | 3148.7 | 3167.4 | 3191.5 | 3194.9 | 3181.4  | 3148.3 | 3061.5 | 2916.6 |
| 10°   | 2893.7 | 2906.4 | 2934.4 | 2966.1 | 3014.9 | 3063.2 | 3106.4 | 3104.7  | 3093.2 | 3007.7 | 2838.6 |
| 12.5° | 2682.3 | 2697.1 | 2729.3 | 2776.3 | 2845.4 | 2924.2 | 3001.3 | 3011.9  | 3031.0 | 2959.4 | 2766.6 |
| 15°   | 2497.1 | 2509.8 | 2541.6 | 2599.2 | 2684.8 | 2790.7 | 2903.9 | 2923.4  | 2972.5 | 2921.7 | 2706.4 |
| 17.5° | 2340.0 | 2348.0 | 2371.3 | 2435.3 | 2534.4 | 2662.8 | 2809.8 | 2847.9  | 2921.2 | 2892.0 | 2654.3 |
| 20°   | 2230.2 | 2231.5 | 2246.7 | 2291.7 | 2390.8 | 2534.4 | 2712.4 | 2767.0  | 2867.0 | 2866.6 | 2600.5 |
| 22.5° | 2176.0 | 2171.8 | 2174.7 | 2200.6 | 2273.4 | 2412.0 | 2614.9 | 2679.7  | 2818.3 | 2845.0 | 2545.9 |
| 25°   | 2165.8 | 2162.4 | 2154.0 | 2157.3 | 2201.4 | 2304.8 | 2516.6 | 2591.6  | 2775.5 | 2831.8 | 2498.4 |
| 27.5° | 2197.6 | 2201.0 | 2186.6 | 2171.3 | 2174.7 | 2235.3 | 2429.3 | 2516.2  | 2740.7 | 2831.8 | 2464.9 |
| 30°   | 2261.6 | 2263.3 | 2252.7 | 2232.8 | 2206.1 | 2215.8 | 2368.8 | 2455.6  | 2723.4 | 2851.3 | 2443.8 |
| 32.5° | 2332.3 | 2341.6 | 2340.4 | 2324.3 | 2286.1 | 2246.7 | 2354.4 | 2433.6  | 2722.1 | 2894.5 | 2441.6 |
| 35°   | 2420.0 | 2430.6 | 2448.4 | 2445.0 | 2405.2 | 2340.4 | 2403.5 | 2465.8  | 2747.1 | 2965.7 | 2464.5 |
| 37.5° | 2513.2 | 2529.3 | 2567.5 | 2585.7 | 2559.8 | 2486.5 | 2513.7 | 2558.1  | 2814.0 | 3081.0 | 2522.6 |
| 40°   | 2603.5 | 2621.7 | 2691.2 | 2762.8 | 2743.3 | 2667.9 | 2680.6 | 2716.2  | 2933.1 | 3246.6 | 2632.7 |
| 42.5° | 2692.0 | 2719.1 | 2821.2 | 2939.0 | 2962.3 | 2902.2 | 2908.9 | 2937.3  | 3109.8 | 3474.6 | 2812.8 |
| 45°   | 2797.9 | 2828.4 | 2979.7 | 3125.0 | 3187.3 | 3161.0 | 3189.8 | 3208.5  | 3340.7 | 3775.8 | 3055.5 |
| 47.5° | 2953.4 | 2988.6 | 3174.2 | 3339.8 | 3449.1 | 3466.1 | 3524.1 | 3536.4  | 3632.6 | 4126.6 | 3372.0 |
| 50°   | 3256.8 | 3266.5 | 3434.3 | 3584.7 | 3742.3 | 3844.0 | 3910.1 | 3919.4  | 3985.9 | 4510.0 | 3767.3 |
| 52.5° | 3638.5 | 3644.9 | 3739.8 | 3840.6 | 4019.8 | 4227.4 | 4382.1 | 4395.2  | 4409.2 | 4883.7 | 4157.5 |
| 55°   | 4017.7 | 4016.9 | 4079.6 | 4138.9 | 4343.9 | 4645.6 | 4981.1 | 4989.2  | 4888.8 | 5238.3 | 4455.8 |
| 57.5° | 4254.5 | 4277.4 | 4372.7 | 4449.0 | 4735.4 | 5122.2 | 5587.8 | 5617.5  | 5392.5 | 5501.0 | 4750.7 |
| 60°   | 4179.1 | 4190.1 | 4401.6 | 4683.7 | 5223.1 | 5799.7 | 6201.7 | 6209.4  | 5771.3 | 5763.2 | 5123.5 |
| 62.5° | 3560.6 | 3566.5 | 3898.7 | 4480.4 | 5470.1 | 6678.4 | 6942.3 | 6818.2  | 6206.8 | 6127.2 | 5569.6 |
| 65°   | 2440.4 | 2478.9 | 2756.4 | 3475.4 | 5016.3 | 7229.6 | 8088.8 | 7883.3  | 6870.7 | 6651.7 | 5973.0 |
| 67.5° | 1437.1 | 1429.1 | 1566.3 | 2095.9 | 3684.3 | 6863.5 | 9539.0 | 9334.8  | 7776.1 | 7002.9 | 5854.8 |
| 70°   | 981.7  | 976.1  | 1028.7 | 1268.9 | 2079.8 | 5324.3 | 9995.3 | 10407.6 | 8575.6 | 6766.5 | 5038.8 |
| 72.5° | 700.8  | 703.7  | 781.3  | 985.9  | 1305.8 | 3102.1 | 8595.5 | 9571.2  | 8325.2 | 5898.8 | 3830.0 |
| 75°   | 475.8  | 483.8  | 594.8  | 808.8  | 1144.8 | 1578.2 | 6099.6 | 7275.8  | 6779.2 | 4287.2 | 2201.4 |
| 77.5° | 255.9  | 264.8  | 395.7  | 651.6  | 1035.0 | 1096.5 | 3923.6 | 5007.4  | 4258.4 | 1927.3 | 638.1  |
| 80°   | 106.8  | 111.9  | 185.1  | 473.7  | 894.4  | 963.0  | 2308.6 | 3036.5  | 1814.6 | 380.0  | 142.4  |
| 82.5° | 46.2   | 48.7   | 77.1   | 282.6  | 668.6  | 813.0  | 1222.3 | 1460.8  | 549.9  | 83.5   | 71.6   |
| 85°   | 8.9    | 9.3    | 31.8   | 149.6  | 426.6  | 458.8  | 792.3  | 776.6   | 247.0  | 36.0   | 52.1   |
| 87.5° | 0.0    | 0.0    | 7.6    | 47.0   | 125.4  | 250.0  | 483.4  | 477.5   | 83.9   | 17.4   | 19.5   |
| 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: P386666

CATALOG NUMBER: GWC-SA2B-760-U-SL3-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 3009.8 | 3009.8 | 3009.8 | 3009.8 | 3009.8 | 3009.8 | 3009.8 | 3009.8 | 3009.8 | 3009.8 | 3009.8 |
| 2.5°  | 2986.1 | 2956.8 | 2895.4 | 2819.6 | 2761.5 | 2697.5 | 2646.7 | 2582.3 | 2554.3 | 2555.6 | 2540.4 |
| 5°    | 2919.1 | 2859.0 | 2723.0 | 2551.4 | 2419.2 | 2282.8 | 2165.4 | 2048.5 | 1979.4 | 1957.0 | 1935.8 |
| 7.5°  | 2823.4 | 2728.0 | 2511.1 | 2246.7 | 2023.0 | 1804.4 | 1614.2 | 1446.8 | 1340.9 | 1289.2 | 1270.2 |
| 10°   | 2715.3 | 2581.4 | 2267.5 | 1919.2 | 1599.8 | 1304.1 | 1057.5 | 843.1  | 757.5  | 699.5  | 684.7  |
| 12.5° | 2620.4 | 2439.1 | 2029.4 | 1583.3 | 1204.1 | 847.3  | 612.2  | 478.8  | 420.7  | 397.8  | 394.0  |
| 15°   | 2531.0 | 2306.1 | 1800.2 | 1279.1 | 833.8  | 521.5  | 389.4  | 344.0  | 330.5  | 326.7  | 326.7  |
| 17.5° | 2446.7 | 2179.4 | 1576.1 | 979.5  | 551.6  | 365.6  | 322.4  | 312.2  | 308.0  | 307.6  | 308.0  |
| 20°   | 2358.6 | 2052.7 | 1355.8 | 717.7  | 385.1  | 309.7  | 297.8  | 292.3  | 291.1  | 291.1  | 291.1  |
| 22.5° | 2274.3 | 1926.0 | 1141.4 | 512.6  | 308.9  | 282.6  | 276.7  | 272.8  | 271.6  | 271.2  | 270.3  |
| 25°   | 2193.4 | 1805.7 | 932.1  | 362.2  | 271.2  | 258.9  | 253.8  | 248.7  | 244.9  | 242.8  | 241.5  |
| 27.5° | 2126.8 | 1698.5 | 737.2  | 290.6  | 244.9  | 234.3  | 227.9  | 220.3  | 211.0  | 206.8  | 205.1  |
| 30°   | 2073.9 | 1600.6 | 568.1  | 245.3  | 220.3  | 209.7  | 200.0  | 186.8  | 173.3  | 166.1  | 165.7  |
| 32.5° | 2032.4 | 1504.5 | 431.3  | 216.9  | 198.3  | 185.1  | 171.2  | 154.6  | 139.0  | 130.9  | 130.5  |
| 35°   | 2012.0 | 1419.7 | 329.6  | 196.2  | 178.8  | 162.3  | 144.9  | 126.7  | 111.4  | 103.8  | 103.0  |
| 37.5° | 2025.6 | 1348.1 | 257.2  | 178.8  | 162.3  | 143.2  | 122.9  | 103.8  | 90.2   | 83.5   | 83.0   |
| 40°   | 2075.2 | 1302.4 | 208.9  | 164.0  | 148.3  | 125.0  | 103.0  | 85.2   | 73.7   | 68.2   | 67.8   |
| 42.5° | 2180.7 | 1285.4 | 178.4  | 151.7  | 134.7  | 108.0  | 85.6   | 70.3   | 59.7   | 55.9   | 55.1   |
| 45°   | 2356.9 | 1310.4 | 157.6  | 139.8  | 120.7  | 91.9   | 70.8   | 57.6   | 48.3   | 45.3   | 44.9   |
| 47.5° | 2591.6 | 1376.1 | 142.8  | 128.4  | 108.0  | 77.5   | 58.9   | 46.6   | 39.4   | 36.4   | 36.0   |
| 50°   | 2894.1 | 1480.3 | 130.5  | 116.9  | 96.2   | 65.7   | 48.7   | 36.9   | 30.5   | 28.4   | 28.4   |
| 52.5° | 3223.3 | 1604.5 | 119.5  | 106.3  | 84.3   | 54.7   | 39.4   | 28.4   | 24.1   | 21.6   | 21.6   |
| 55°   | 3495.3 | 1712.9 | 107.6  | 98.3   | 69.9   | 45.3   | 30.1   | 21.6   | 17.8   | 16.5   | 16.5   |
| 57.5° | 3766.9 | 1828.6 | 94.1   | 84.3   | 55.9   | 36.9   | 22.9   | 16.1   | 13.1   | 12.3   | 12.3   |
| 60°   | 4119.0 | 1970.1 | 80.9   | 68.6   | 44.1   | 28.0   | 16.9   | 11.4   | 9.7    | 9.3    | 9.3    |
| 62.5° | 4506.2 | 2053.1 | 69.1   | 55.1   | 34.3   | 20.8   | 12.3   | 7.6    | 7.2    | 7.2    | 6.8    |
| 65°   | 4743.0 | 1935.8 | 58.0   | 44.1   | 26.7   | 15.7   | 8.0    | 5.5    | 6.4    | 5.9    | 5.1    |
| 67.5° | 4441.0 | 1515.5 | 47.5   | 34.3   | 20.8   | 11.9   | 5.1    | 3.8    | 6.8    | 5.5    | 4.2    |
| 70°   | 3677.1 | 1060.9 | 36.9   | 24.1   | 16.5   | 10.2   | 3.4    | 2.5    | 7.2    | 5.5    | 3.4    |
| 72.5° | 2751.8 | 710.1  | 29.2   | 16.1   | 12.3   | 8.9    | 3.0    | 1.3    | 6.4    | 4.7    | 3.0    |
| 75°   | 1503.6 | 286.0  | 23.3   | 10.2   | 7.6    | 6.4    | 2.1    | 0.8    | 4.2    | 3.4    | 2.1    |
| 77.5° | 395.7  | 75.4   | 16.9   | 6.8    | 4.2    | 2.5    | 1.3    | 0.4    | 2.1    | 1.7    | 0.8    |
| 80°   | 100.8  | 29.2   | 11.0   | 4.7    | 3.0    | 1.3    | 0.0    | 0.0    | 0.4    | 0.0    | 0.0    |
| 82.5° | 53.8   | 12.3   | 6.8    | 3.4    | 1.7    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 85°   | 40.7   | 8.0    | 3.8    | 2.1    | 0.4    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 87.5° | 15.7   | 2.5    | 1.3    | 0.0    | 0.0    | 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: SP1-2012-088-5-R3

Luminaire Tested: CCW-SA1A-760-U-SL2-HSS

Test Date: 01/19/2021

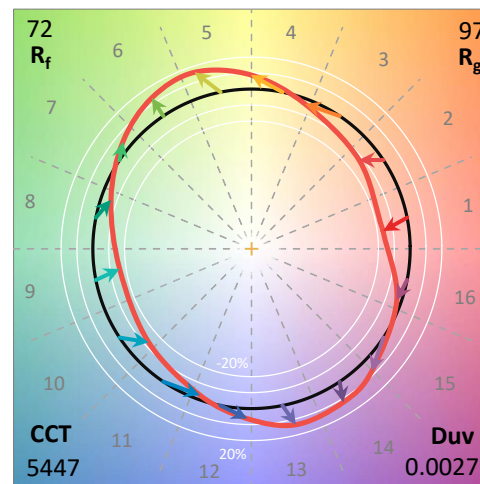
### Test Information

Test Method: LM-79-08  
 Report Number: SP1-2012-088-5-R3  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1  
 Measurement Geometry:  $4\pi$   
 Issue Date: 01/19/2021  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: INVUE  
 Catalog Number: **CCW-SA1A-760-U-SL2-HSS**  
 Description: INVUE WALL PACK

\*\*\*THIS IS A REVISION OF SP1-2012-088-5-R2. TO UPDATE THE CATALOG  
 INFORMATION.\*\*\*TESTED IN SITU. INVUE WALL PACK LIGHT SQUARE T2 OPTICS 1-SQUARE WITH  
 HOUSE SIDE SHIELD

### Spectral Parameters

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 5447   | CRI (Ra): | 71.9 |      |       |
| CIE u':                   | 0.2053 | R1:       | 70.7 | R9:  | -27.5 |
| CIE v':                   | 0.4809 | R2:       | 74.8 | R10: | 41.5  |
| Duv:                      | 0.0027 | R3:       | 78.7 | R11: | 74.9  |
| CIE x:                    | 0.3337 | R4:       | 74.0 | R12: | 49.9  |
| CIE y:                    | 0.3473 | R5:       | 72.5 | R13: | 70.2  |
| CIE z:                    | 0.3190 | R6:       | 67.7 | R14: | 88.1  |
| Peak Wavelength (nm):     | 443    | R7:       | 77.7 |      |       |
| Dominant Wavelength (nm): | 556    | R8:       | 58.8 |      |       |
| Purity:                   | 4.5    |           |      |      |       |
| Rf:                       | 72.3   |           |      |      |       |
| Rg:                       | 97.2   |           |      |      |       |



### Test Conditions

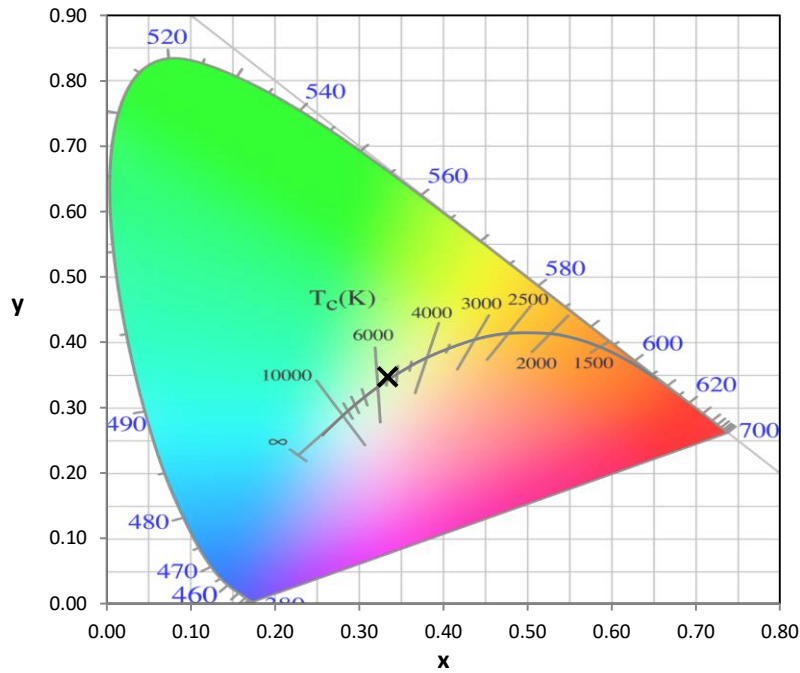
Stabilization Time: 75M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.4/18%  
 Sphere Temperature (°C): 25.3

REPORT NUMBER: SP1-2012-088-5-R3

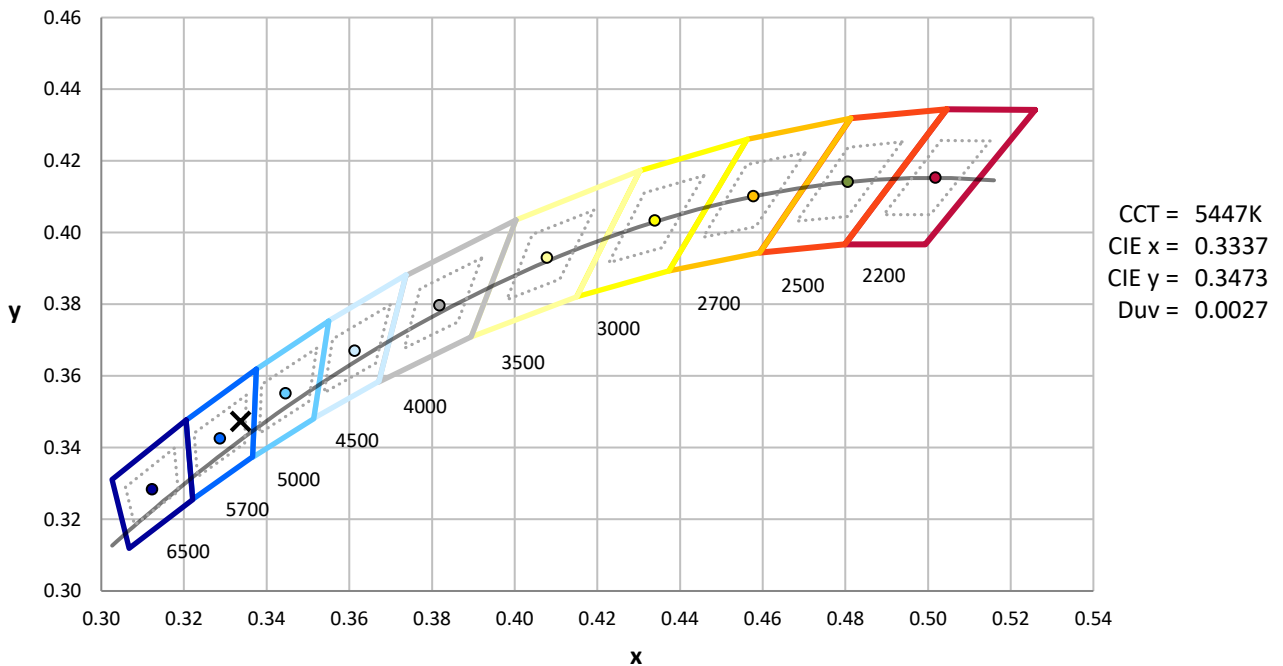
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| 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**



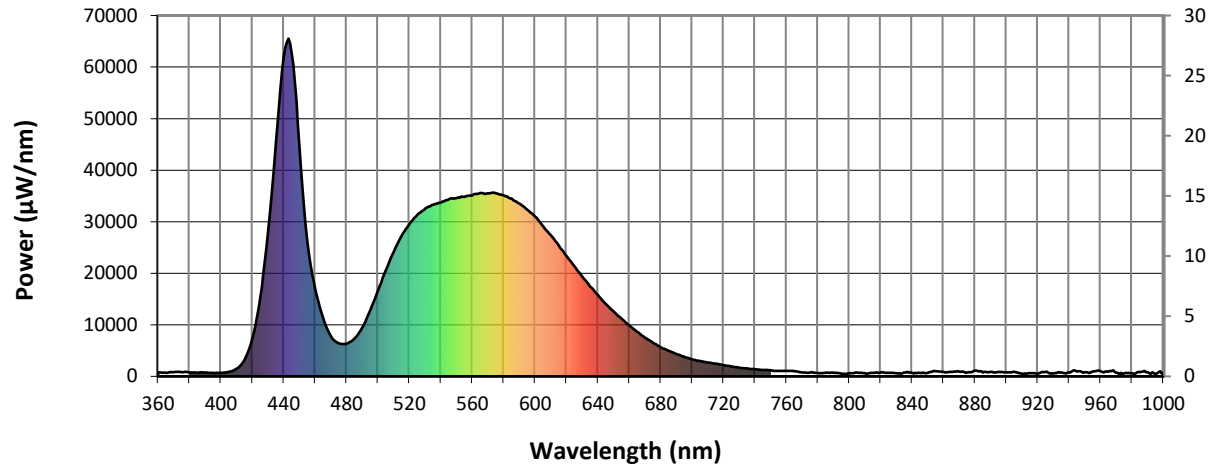
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 5700K 4-step quadrangle

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### Photopic Flux vs. Wavelength

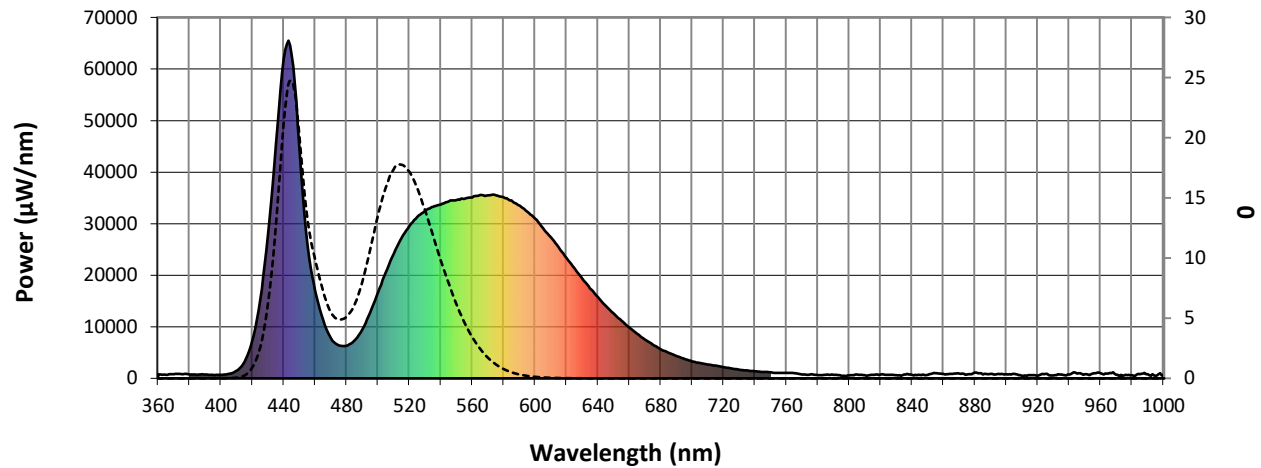


#####

| 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       | 828              | 0.0              | 490       | 9471             | 1.3              | 620       | 23317            | 6.1              | 750       | 1157             | 0.0              | 880       | 1136             | 0.0              |
| 365       | 696              | 0.0              | 495       | 12752            | 2.3              | 625       | 21413            | 4.7              | 755       | 1067             | 0.0              | 885       | 773              | 0.0              |
| 370       | 807              | 0.0              | 500       | 16685            | 3.7              | 630       | 19344            | 3.5              | 760       | 1059             | 0.0              | 890       | 872              | 0.0              |
| 375       | 837              | 0.0              | 505       | 20565            | 5.8              | 635       | 17464            | 2.6              | 765       | 1009             | 0.0              | 895       | 891              | 0.0              |
| 380       | 757              | 0.0              | 510       | 24119            | 8.3              | 640       | 15745            | 1.9              | 770       | 774              | 0.0              | 900       | 807              | 0.0              |
| 385       | 706              | 0.0              | 515       | 27181            | 11.3             | 645       | 14060            | 1.4              | 775       | 761              | 0.0              | 905       | 899              | 0.0              |
| 390       | 746              | 0.0              | 520       | 29555            | 14.3             | 650       | 12579            | 0.9              | 780       | 653              | 0.0              | 910       | 506              | 0.0              |
| 395       | 660              | 0.0              | 525       | 31307            | 16.8             | 655       | 11181            | 0.6              | 785       | 704              | 0.0              | 915       | 598              | 0.0              |
| 400       | 671              | 0.0              | 530       | 32558            | 19.2             | 660       | 9847             | 0.4              | 790       | 663              | 0.0              | 920       | 510              | 0.0              |
| 405       | 848              | 0.0              | 535       | 33301            | 20.7             | 665       | 8641             | 0.3              | 795       | 493              | 0.0              | 925       | 874              | 0.0              |
| 410       | 1490             | 0.0              | 540       | 33727            | 22.0             | 670       | 7535             | 0.2              | 800       | 584              | 0.0              | 930       | 549              | 0.0              |
| 415       | 3203             | 0.0              | 545       | 34356            | 22.9             | 675       | 6542             | 0.1              | 805       | 739              | 0.0              | 935       | 720              | 0.0              |
| 420       | 7298             | 0.0              | 550       | 34589            | 23.5             | 680       | 5664             | 0.1              | 810       | 601              | 0.0              | 940       | 754              | 0.0              |
| 425       | 15315            | 0.1              | 555       | 34855            | 23.8             | 685       | 4962             | 0.0              | 815       | 677              | 0.0              | 945       | 931              | 0.0              |
| 430       | 27886            | 0.2              | 560       | 35083            | 23.8             | 690       | 4369             | 0.0              | 820       | 726              | 0.0              | 950       | 811              | 0.0              |
| 435       | 45485            | 0.5              | 565       | 35553            | 23.6             | 695       | 3785             | 0.0              | 825       | 693              | 0.0              | 955       | 955              | 0.0              |
| 440       | 61965            | 1.0              | 570       | 35511            | 23.1             | 700       | 3318             | 0.0              | 830       | 619              | 0.0              | 960       | 1025             | 0.0              |
| 445       | 62721            | 1.3              | 575       | 35515            | 22.1             | 705       | 2962             | 0.0              | 835       | 738              | 0.0              | 965       | 916              | 0.0              |
| 450       | 44754            | 1.2              | 580       | 35114            | 20.9             | 710       | 2689             | 0.0              | 840       | 681              | 0.0              | 970       | 695              | 0.0              |
| 455       | 26152            | 0.9              | 585       | 34546            | 19.2             | 715       | 2476             | 0.0              | 845       | 691              | 0.0              | 975       | 568              | 0.0              |
| 460       | 17101            | 0.7              | 590       | 33522            | 17.3             | 720       | 2192             | 0.0              | 850       | 710              | 0.0              | 980       | 643              | 0.0              |
| 465       | 11400            | 0.6              | 595       | 32326            | 15.3             | 725       | 1939             | 0.0              | 855       | 1025             | 0.0              | 985       | 804              | 0.0              |
| 470       | 7763             | 0.5              | 600       | 30973            | 13.3             | 730       | 1698             | 0.0              | 860       | 889              | 0.0              | 990       | 812              | 0.0              |
| 475       | 6419             | 0.5              | 605       | 29160            | 11.3             | 735       | 1533             | 0.0              | 865       | 885              | 0.0              | 995       | 496              | 0.0              |
| 480       | 6330             | 0.6              | 610       | 27373            | 9.4              | 740       | 1375             | 0.0              | 870       | 905              | 0.0              | 1000      | 659              | 0.0              |
| 485       | 7299             | 0.9              | 615       | 25423            | 7.7              | 745       | 1254             | 0.0              | 875       | 739              | 0.0              |           |                  |                  |

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### Scotopic Flux vs. Wavelength



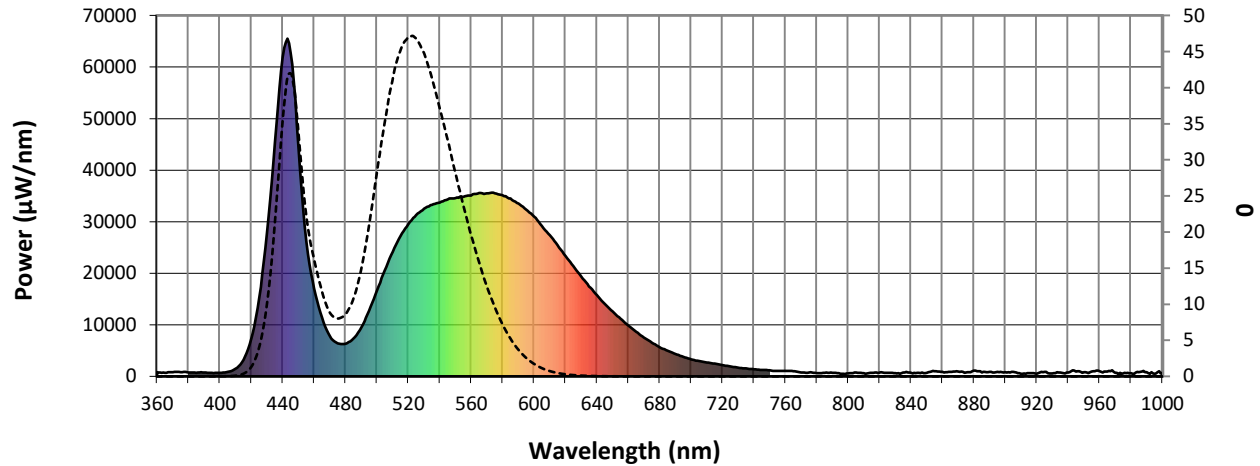
Scotopic Lumens: 1610.2

S/P: 0.74

| 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       | 828              | 0.0              | 490       | 9471             | 14.6             | 620       | 23317            | 0.3              | 750       | 1157             | 0.0              | 880       | 1136             | 0.0              |
| 365       | 696              | 0.0              | 495       | 12752            | 20.6             | 625       | 21413            | 0.2              | 755       | 1067             | 0.0              | 885       | 773              | 0.0              |
| 370       | 807              | 0.0              | 500       | 16685            | 27.9             | 630       | 19344            | 0.1              | 760       | 1059             | 0.0              | 890       | 872              | 0.0              |
| 375       | 837              | 0.0              | 505       | 20565            | 35.0             | 635       | 17464            | 0.1              | 765       | 1009             | 0.0              | 895       | 891              | 0.0              |
| 380       | 757              | 0.0              | 510       | 24119            | 40.9             | 640       | 15745            | 0.0              | 770       | 774              | 0.0              | 900       | 807              | 0.0              |
| 385       | 706              | 0.0              | 515       | 27181            | 45.1             | 645       | 14060            | 0.0              | 775       | 761              | 0.0              | 905       | 899              | 0.0              |
| 390       | 746              | 0.0              | 520       | 29555            | 47.0             | 650       | 12579            | 0.0              | 780       | 653              | 0.0              | 910       | 506              | 0.0              |
| 395       | 660              | 0.0              | 525       | 31307            | 46.8             | 655       | 11181            | 0.0              | 785       | 704              | 0.0              | 915       | 598              | 0.0              |
| 400       | 671              | 0.0              | 530       | 32558            | 44.9             | 660       | 9847             | 0.0              | 790       | 663              | 0.0              | 920       | 510              | 0.0              |
| 405       | 848              | 0.0              | 535       | 33301            | 41.5             | 665       | 8641             | 0.0              | 795       | 493              | 0.0              | 925       | 874              | 0.0              |
| 410       | 1490             | 0.1              | 540       | 33727            | 37.3             | 670       | 7535             | 0.0              | 800       | 584              | 0.0              | 930       | 549              | 0.0              |
| 415       | 3203             | 0.3              | 545       | 34356            | 32.9             | 675       | 6542             | 0.0              | 805       | 739              | 0.0              | 935       | 720              | 0.0              |
| 420       | 7298             | 1.2              | 550       | 34589            | 28.3             | 680       | 5664             | 0.0              | 810       | 601              | 0.0              | 940       | 754              | 0.0              |
| 425       | 15315            | 3.7              | 555       | 34855            | 23.8             | 685       | 4962             | 0.0              | 815       | 677              | 0.0              | 945       | 931              | 0.0              |
| 430       | 27886            | 9.5              | 560       | 35083            | 19.6             | 690       | 4369             | 0.0              | 820       | 726              | 0.0              | 950       | 811              | 0.0              |
| 435       | 45485            | 20.3             | 565       | 35553            | 16.0             | 695       | 3785             | 0.0              | 825       | 693              | 0.0              | 955       | 955              | 0.0              |
| 440       | 61965            | 34.6             | 570       | 35511            | 12.5             | 700       | 3318             | 0.0              | 830       | 619              | 0.0              | 960       | 1025             | 0.0              |
| 445       | 62721            | 42.0             | 575       | 35515            | 9.7              | 705       | 2962             | 0.0              | 835       | 738              | 0.0              | 965       | 916              | 0.0              |
| 450       | 44754            | 34.7             | 580       | 35114            | 7.2              | 710       | 2689             | 0.0              | 840       | 681              | 0.0              | 970       | 695              | 0.0              |
| 455       | 26152            | 22.9             | 585       | 34546            | 5.3              | 715       | 2476             | 0.0              | 845       | 691              | 0.0              | 975       | 568              | 0.0              |
| 460       | 17101            | 16.5             | 590       | 33522            | 3.7              | 720       | 2192             | 0.0              | 850       | 710              | 0.0              | 980       | 643              | 0.0              |
| 465       | 11400            | 12.0             | 595       | 32326            | 2.6              | 725       | 1939             | 0.0              | 855       | 1025             | 0.0              | 985       | 804              | 0.0              |
| 470       | 7763             | 8.9              | 600       | 30973            | 1.7              | 730       | 1698             | 0.0              | 860       | 889              | 0.0              | 990       | 812              | 0.0              |
| 475       | 6419             | 8.0              | 605       | 29160            | 1.1              | 735       | 1533             | 0.0              | 865       | 885              | 0.0              | 995       | 496              | 0.0              |
| 480       | 6330             | 8.5              | 610       | 27373            | 0.7              | 740       | 1375             | 0.0              | 870       | 905              | 0.0              | 1000      | 659              | 0.0              |
| 485       | 7299             | 10.6             | 615       | 25423            | 0.5              | 745       | 1254             | 0.0              | 875       | 739              | 0.0              |           |                  |                  |

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### Melanopic Flux vs. Wavelength

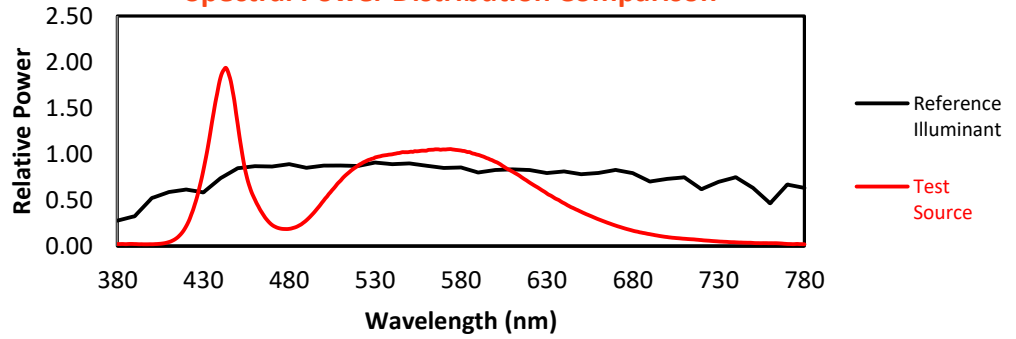

**Melanopic Lumens: 4010.3**
**S/P: 1.85**

| 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       | 828              | 0.0              | 490       | 9471             | 7.9              | 620       | 23317            | 0.0              | 750       | 1157             | 0.0              | 880       | 1136             | 0.0              |
| 365       | 696              | 0.0              | 495       | 12752            | 10.5             | 625       | 21413            | 0.0              | 755       | 1067             | 0.0              | 885       | 773              | 0.0              |
| 370       | 807              | 0.0              | 500       | 16685            | 13.4             | 630       | 19344            | 0.0              | 760       | 1059             | 0.0              | 890       | 872              | 0.0              |
| 375       | 837              | 0.0              | 505       | 20565            | 15.8             | 635       | 17464            | 0.0              | 765       | 1009             | 0.0              | 895       | 891              | 0.0              |
| 380       | 757              | 0.0              | 510       | 24119            | 17.3             | 640       | 15745            | 0.0              | 770       | 774              | 0.0              | 900       | 807              | 0.0              |
| 385       | 706              | 0.0              | 515       | 27181            | 17.8             | 645       | 14060            | 0.0              | 775       | 761              | 0.0              | 905       | 899              | 0.0              |
| 390       | 746              | 0.0              | 520       | 29555            | 17.2             | 650       | 12579            | 0.0              | 780       | 653              | 0.0              | 910       | 506              | 0.0              |
| 395       | 660              | 0.0              | 525       | 31307            | 15.9             | 655       | 11181            | 0.0              | 785       | 704              | 0.0              | 915       | 598              | 0.0              |
| 400       | 671              | 0.0              | 530       | 32558            | 14.1             | 660       | 9847             | 0.0              | 790       | 663              | 0.0              | 920       | 510              | 0.0              |
| 405       | 848              | 0.0              | 535       | 33301            | 12.0             | 665       | 8641             | 0.0              | 795       | 493              | 0.0              | 925       | 874              | 0.0              |
| 410       | 1490             | 0.1              | 540       | 33727            | 9.9              | 670       | 7535             | 0.0              | 800       | 584              | 0.0              | 930       | 549              | 0.0              |
| 415       | 3203             | 0.2              | 545       | 34356            | 8.0              | 675       | 6542             | 0.0              | 805       | 739              | 0.0              | 935       | 720              | 0.0              |
| 420       | 7298             | 0.8              | 550       | 34589            | 6.2              | 680       | 5664             | 0.0              | 810       | 601              | 0.0              | 940       | 754              | 0.0              |
| 425       | 15315            | 2.4              | 555       | 34855            | 4.7              | 685       | 4962             | 0.0              | 815       | 677              | 0.0              | 945       | 931              | 0.0              |
| 430       | 27886            | 5.9              | 560       | 35083            | 3.5              | 690       | 4369             | 0.0              | 820       | 726              | 0.0              | 950       | 811              | 0.0              |
| 435       | 45485            | 12.1             | 565       | 35553            | 2.5              | 695       | 3785             | 0.0              | 825       | 693              | 0.0              | 955       | 955              | 0.0              |
| 440       | 61965            | 20.7             | 570       | 35511            | 1.7              | 700       | 3318             | 0.0              | 830       | 619              | 0.0              | 960       | 1025             | 0.0              |
| 445       | 62721            | 24.7             | 575       | 35515            | 1.2              | 705       | 2962             | 0.0              | 835       | 738              | 0.0              | 965       | 916              | 0.0              |
| 450       | 44754            | 20.6             | 580       | 35114            | 0.8              | 710       | 2689             | 0.0              | 840       | 681              | 0.0              | 970       | 695              | 0.0              |
| 455       | 26152            | 13.7             | 585       | 34546            | 0.5              | 715       | 2476             | 0.0              | 845       | 691              | 0.0              | 975       | 568              | 0.0              |
| 460       | 17101            | 10.1             | 590       | 33522            | 0.3              | 720       | 2192             | 0.0              | 850       | 710              | 0.0              | 980       | 643              | 0.0              |
| 465       | 11400            | 7.4              | 595       | 32326            | 0.2              | 725       | 1939             | 0.0              | 855       | 1025             | 0.0              | 985       | 804              | 0.0              |
| 470       | 7763             | 5.6              | 600       | 30973            | 0.1              | 730       | 1698             | 0.0              | 860       | 889              | 0.0              | 990       | 812              | 0.0              |
| 475       | 6419             | 4.9              | 605       | 29160            | 0.1              | 735       | 1533             | 0.0              | 865       | 885              | 0.0              | 995       | 496              | 0.0              |
| 480       | 6330             | 5.1              | 610       | 27373            | 0.0              | 740       | 1375             | 0.0              | 870       | 905              | 0.0              | 1000      | 659              | 0.0              |
| 485       | 7299             | 6.0              | 615       | 25423            | 0.0              | 745       | 1254             | 0.0              | 875       | 739              | 0.0              |           |                  |                  |

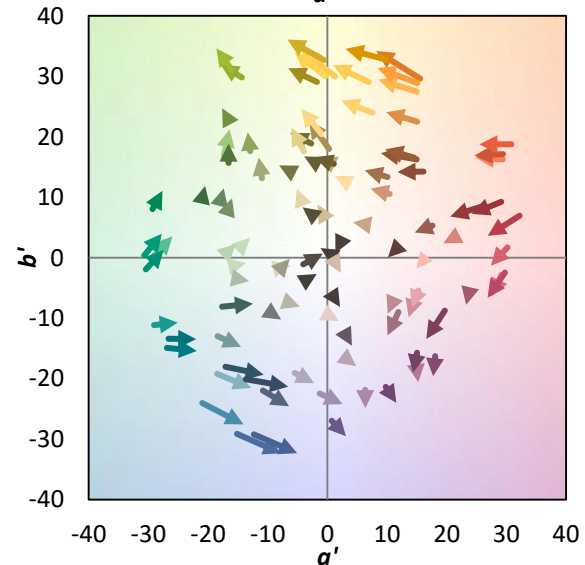
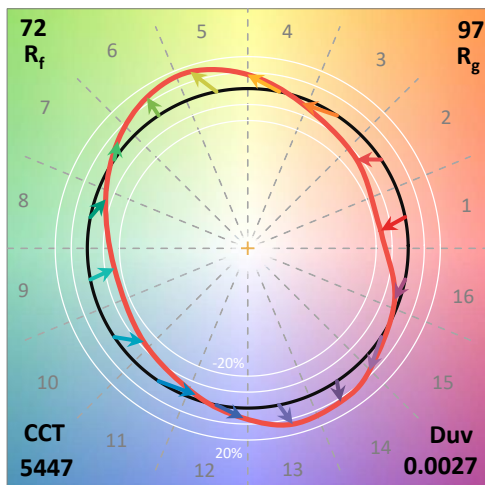
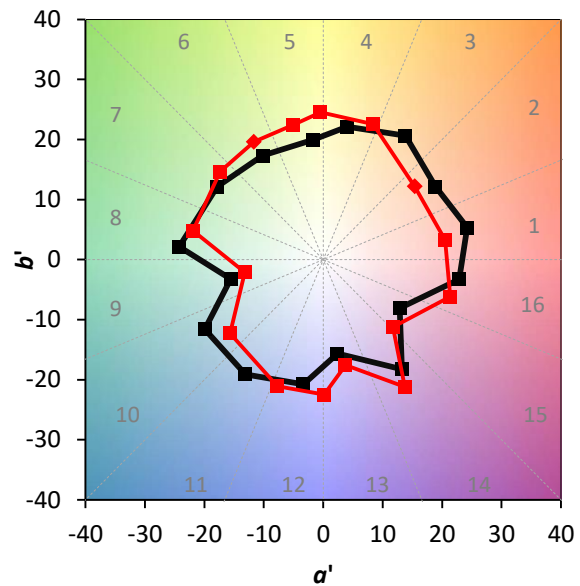
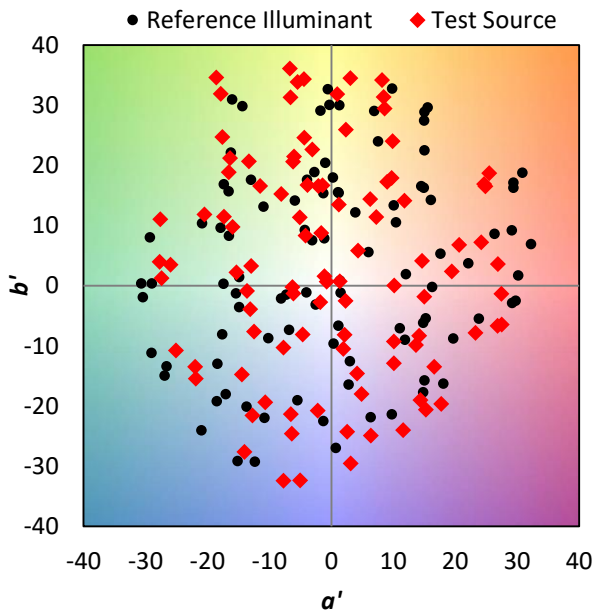
### Summary

$R_f = 72.3$   
 $R_g = 97.2$   
 CIE  $R_a = 71.9$   
 $R_g = -27.5$

### Spectral Power Distribution Comparison

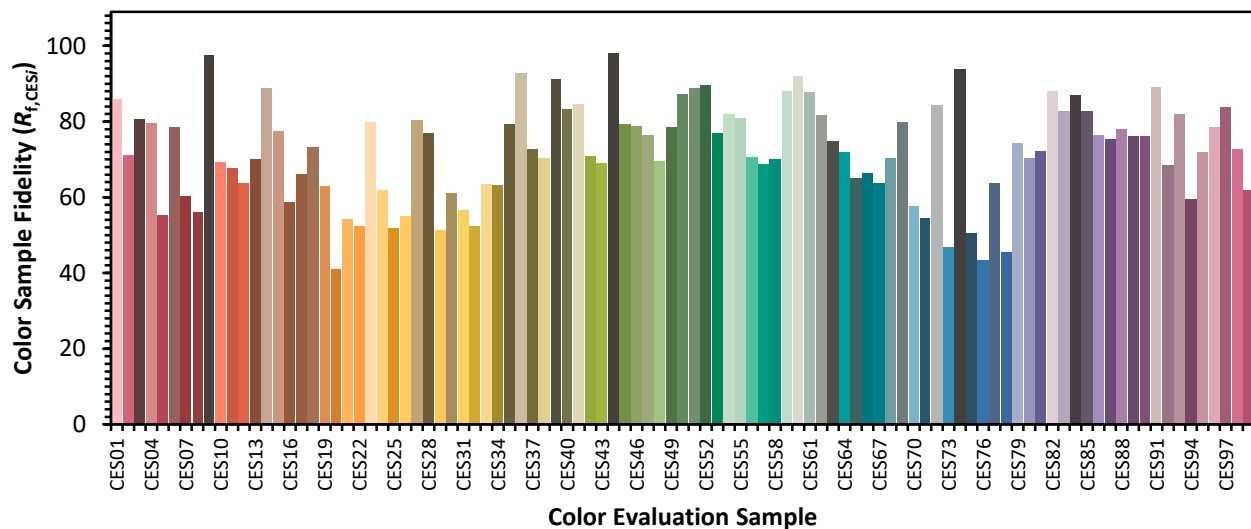


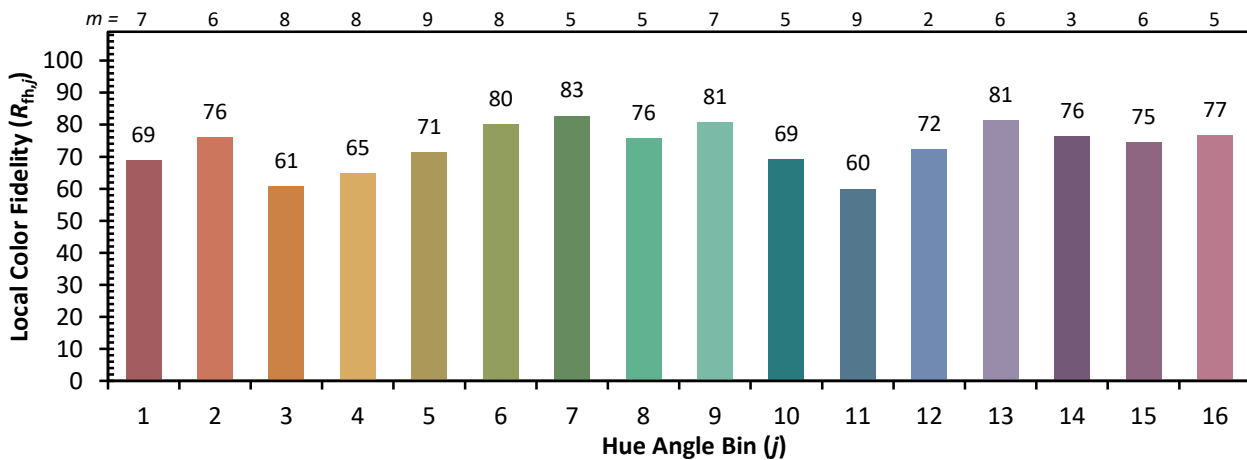
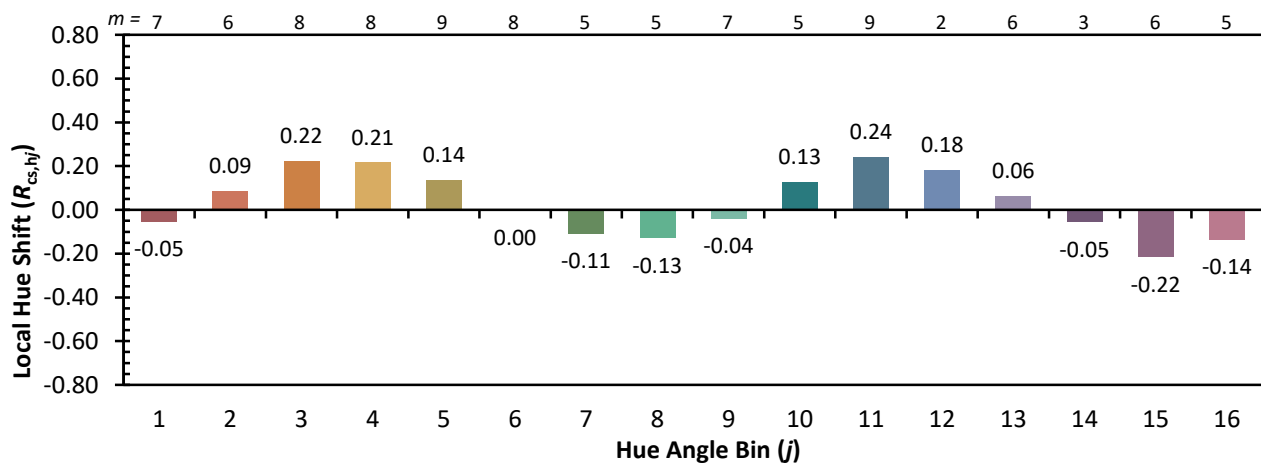
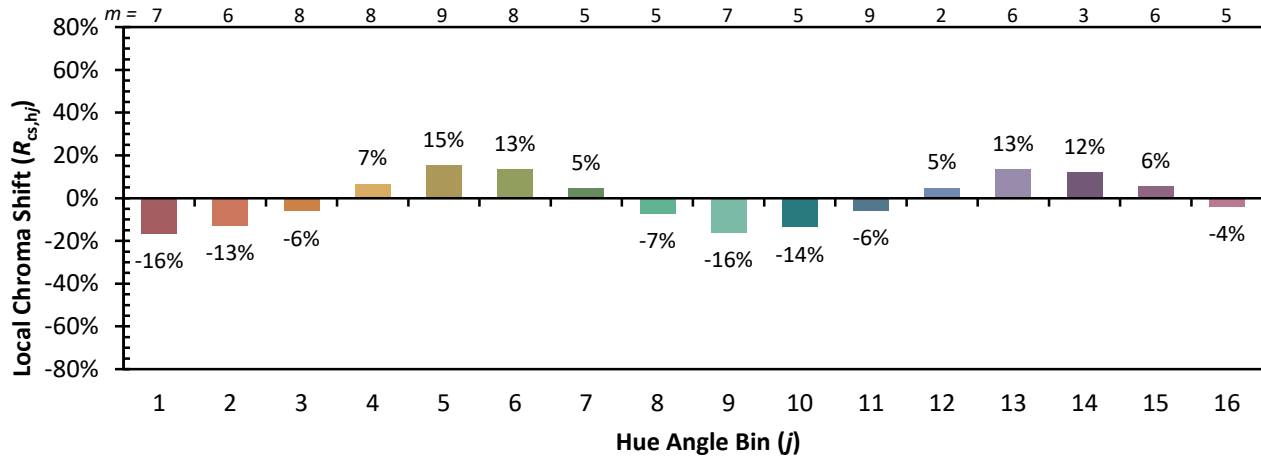
### Color Vector Graphics



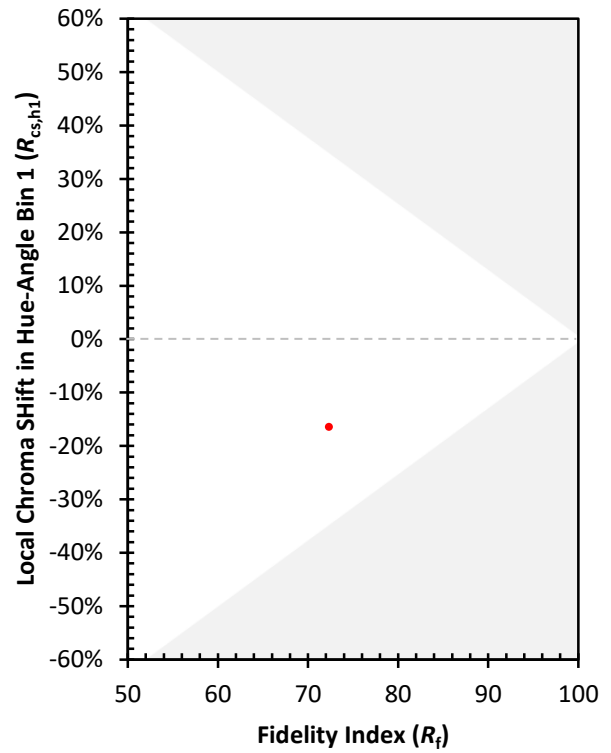
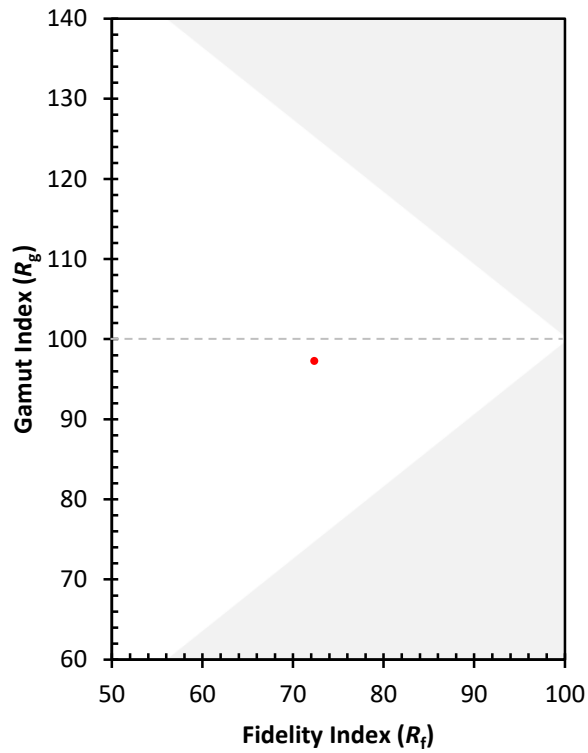
**Individual Sample Fidelity Index ( $R_{f,i}$ )**

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 55 | CES51 = 89 | CES76 = 43 |
| CES02 = 59 | CES27 = 80 | CES52 = 90 | CES77 = 64 |
| CES03 = 30 | CES28 = 77 | CES53 = 77 | CES78 = 46 |
| CES04 = 69 | CES29 = 51 | CES54 = 82 | CES79 = 74 |
| CES05 = 46 | CES30 = 61 | CES55 = 81 | CES80 = 70 |
| CES06 = 50 | CES31 = 56 | CES56 = 71 | CES81 = 72 |
| CES07 = 38 | CES32 = 52 | CES57 = 69 | CES82 = 88 |
| CES08 = 38 | CES33 = 63 | CES58 = 70 | CES83 = 83 |
| CES09 = 29 | CES34 = 63 | CES59 = 88 | CES84 = 87 |
| CES10 = 72 | CES35 = 79 | CES60 = 92 | CES85 = 83 |
| CES11 = 55 | CES36 = 93 | CES61 = 88 | CES86 = 76 |
| CES12 = 61 | CES37 = 73 | CES62 = 82 | CES87 = 75 |
| CES13 = 41 | CES38 = 70 | CES63 = 75 | CES88 = 78 |
| CES14 = 74 | CES39 = 91 | CES64 = 72 | CES89 = 76 |
| CES15 = 70 | CES40 = 83 | CES65 = 65 | CES90 = 76 |
| CES16 = 46 | CES41 = 85 | CES66 = 66 | CES91 = 89 |
| CES17 = 48 | CES42 = 71 | CES67 = 64 | CES92 = 69 |
| CES18 = 55 | CES43 = 69 | CES68 = 70 | CES93 = 82 |
| CES19 = 71 | CES44 = 98 | CES69 = 80 | CES94 = 60 |
| CES20 = 64 | CES45 = 79 | CES70 = 58 | CES95 = 72 |
| CES21 = 85 | CES46 = 79 | CES71 = 54 | CES96 = 79 |
| CES22 = 77 | CES47 = 76 | CES72 = 84 | CES97 = 84 |
| CES23 = 91 | CES48 = 69 | CES73 = 47 | CES98 = 73 |
| CES24 = 90 | CES49 = 79 | CES74 = 94 | CES99 = 62 |
| CES25 = 71 | CES50 = 87 | CES75 = 50 |            |



**Color Rendition by Hue-Angle Bin**


**Measure Comparisons**



(END OF REPORT)