

Scaled data based on original data using  
LM-79-2019 Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Test Report Prepared for

Cooper Lighting Solutions

Brand: McGRAW-EDISON

Report Number: P633412

Luminaire Tested: GWS-SA2E-760-U-SL2-W

Issue Date: 1/10/2023

**Test Information**

Test Method: LM-79-2019  
Report Number: P633412  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-27)  
Test Lab: COOPER LIGHTING SOLUTIONS  
Issue Date: 1/10/2023  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: McGRAW-EDISON  
Catalog Number: GWS-SA2E-760-U-SL2-W  
Description: GALLEON WALL SLIM LUMINAIRE. (2) LIGHTSQUARES WITH 16 LEDS EACH AND  
TYPE II SPILL LIGHT ELIMINATOR OPTICS  
Light Source: (32) 5700K CCT, 70 CRI LEDS  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 14466 lumens  
Efficiency: N/A  
Efficacy: 133.7 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 0.5' x H: 0')  
IES Classification: Type II - Short  
BUG Rating: B3 - U0 - G3

Input Watts (W): 108.2  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 0  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT



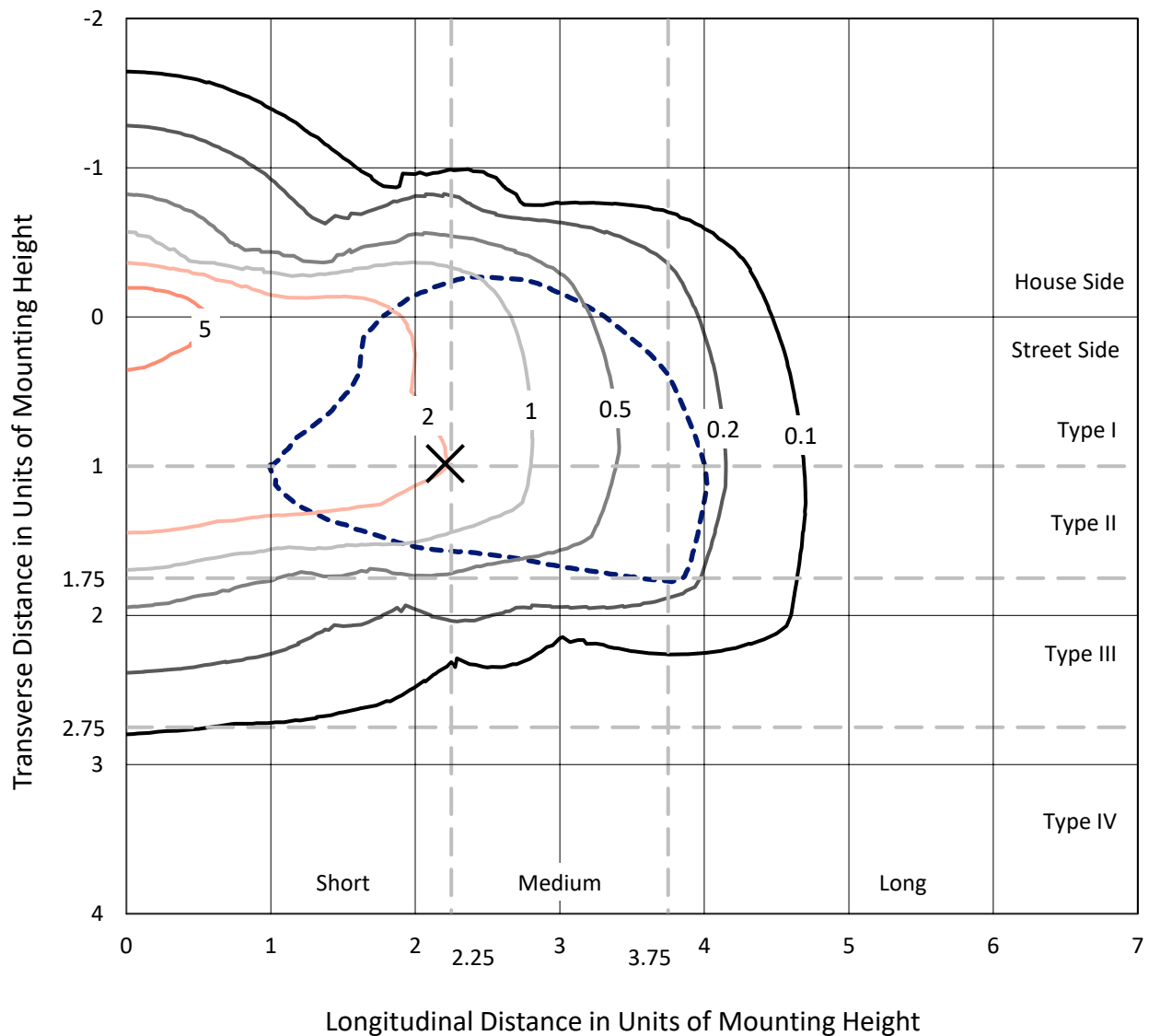
REPORT NUMBER: P633412

CATALOG NUMBER: GWS-SA2E-760-U-SL2-W

## Iso-Footcandle Lines of Horizontal Illumination

✕ Max cd

--- 1/2 Max cd

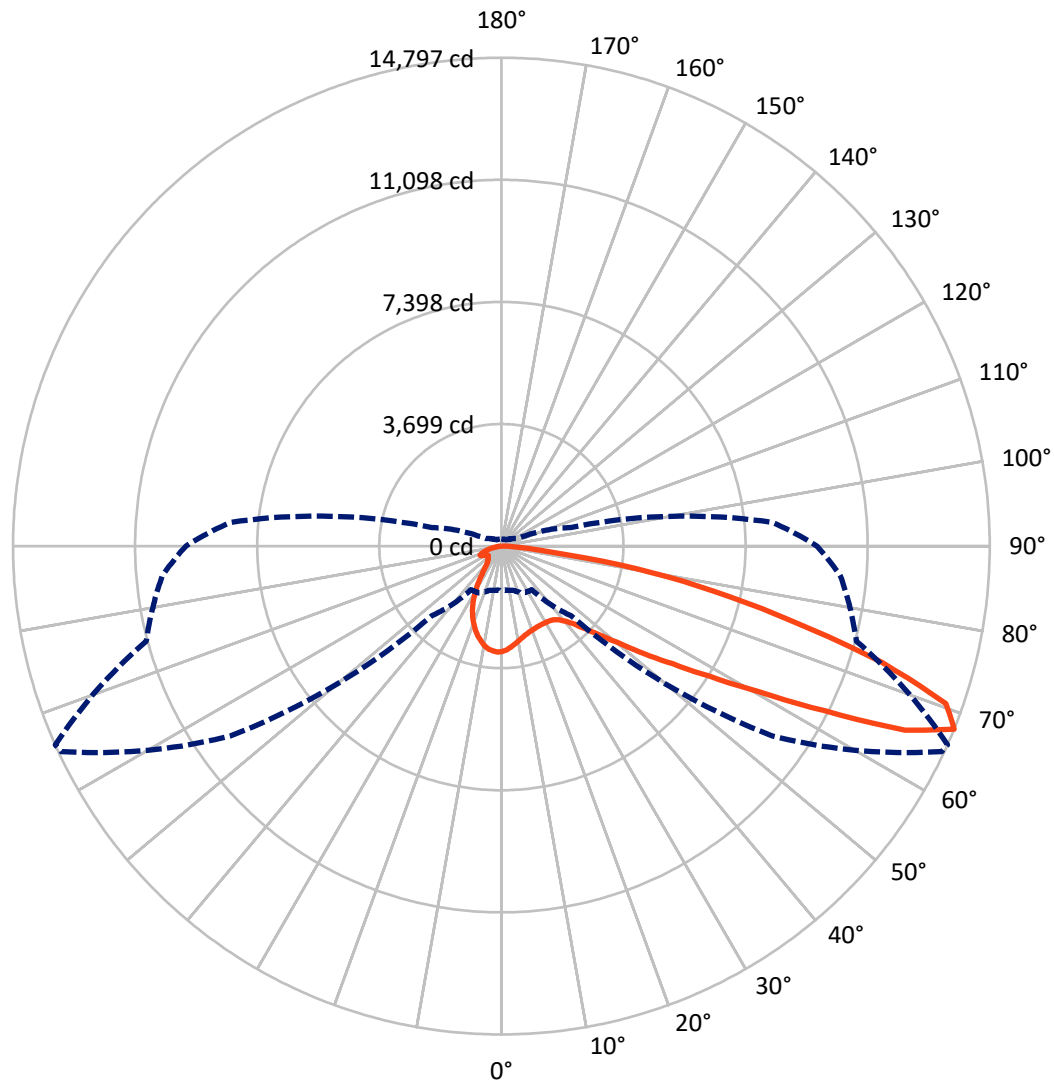


Based on 20 foot mounting height. Maximum calculated value = 8 fc  
 Type II - Short - N/A

REPORT NUMBER: P633412

CATALOG NUMBER: GWS-SA2E-760-U-SL2-W

## Luminous Intensity Polar Plot



— Vertical Plane Through 66-Deg Lateral    - - - Horizontal Cone Through 67.5-Deg Vertical

REPORT NUMBER: P633412

CATALOG NUMBER: GWS-SA2E-760-U-SL2-W

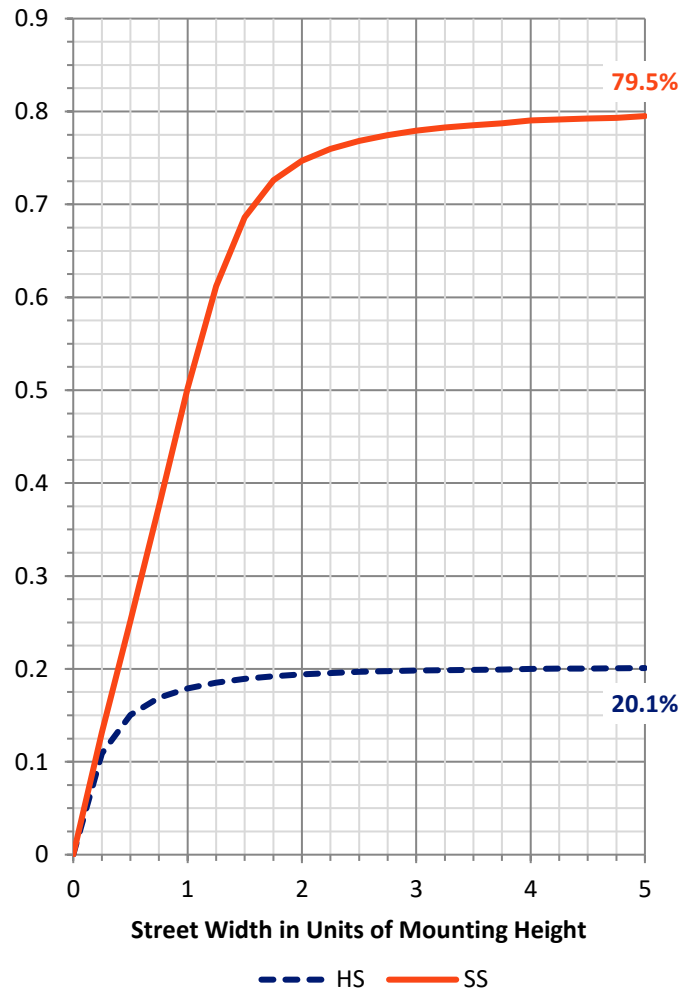
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 2935.5   | 0.0    | 2935.5  |
|                    | % Fixture | 20.3     | 0.0    | 20.3    |
| <b>Street Side</b> | Lumens    | 11530.5  | 0.0    | 11530.5 |
|                    | % Fixture | 79.7     | 0.0    | 79.7    |
| <b>Total</b>       | Lumens    | 14466.0  | 0.0    | 14466.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 280.5   | 1.9       |
| 10°-20°   | 689.5   | 4.8       |
| 20°-30°   | 947.7   | 6.6       |
| 30°-40°   | 1295.6  | 9.0       |
| 40°-50°   | 1963.2  | 13.6      |
| 50°-60°   | 3051.9  | 21.1      |
| 60°-70°   | 3715.6  | 25.7      |
| 70°-80°   | 2263.4  | 15.6      |
| 80°-90°   | 258.5   | 1.8       |
| 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°    | 14466.0 | 100.0     |
| 0°-180°   | 14466.0 | 100.0     |

**Coefficient of Utilization**



REPORT NUMBER: P633412

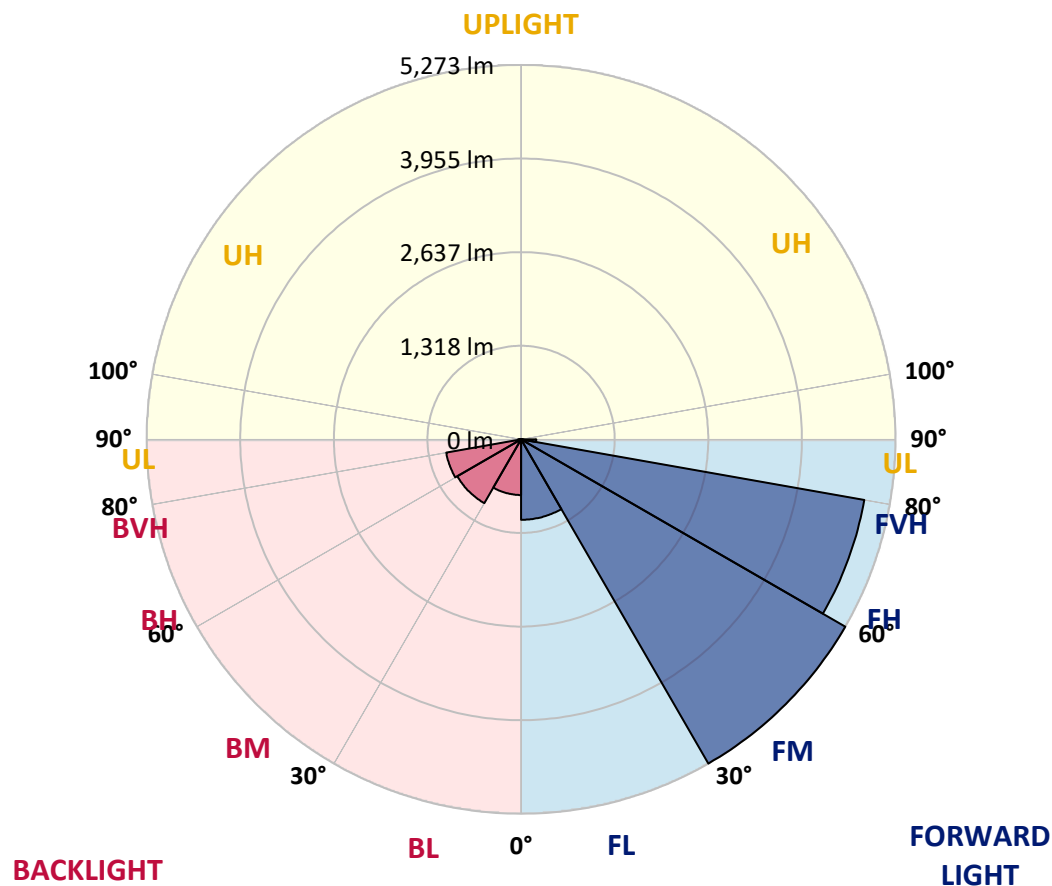
CATALOG NUMBER: GWS-SA2E-760-U-SL2-W

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 1133.5 | 7.8       |                         |      |         |
| FM   | (30°-60°)   | 5273.4 | 36.5      |                         |      |         |
| FH   | (60°-80°)   | 4908.7 | 33.9      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 214.9  | 1.5       |                         |      | G2/225  |
| BL   | (0°-30°)    | 784.2  | 5.4       | B2/1000                 |      |         |
| BM   | (30°-60°)   | 1037.4 | 7.2       | B2/2500                 |      |         |
| BH   | (60°-80°)   | 1070.3 | 7.4       | B3/2500                 |      | G3/2500 |
| BVH  | (80°-90°)   | 43.6   | 0.3       |                         |      | G1/100  |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B3-U0-G3**

Type II Short



REPORT NUMBER: P633412

CATALOG NUMBER: GWS-SA2E-760-U-SL2-W

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°     | 65°     | 66°     | 75°     | 85°     |
|-------|--------|--------|--------|--------|--------|--------|---------|---------|---------|---------|---------|
| 0°    | 3196.6 | 3196.6 | 3196.6 | 3196.6 | 3196.6 | 3196.6 | 3196.6  | 3196.6  | 3196.6  | 3196.6  | 3196.6  |
| 2.5°  | 2994.0 | 3004.5 | 2998.2 | 3038.3 | 3040.4 | 3091.0 | 3119.5  | 3143.8  | 3145.9  | 3177.6  | 3198.7  |
| 5°    | 2789.2 | 2795.6 | 2795.6 | 2833.5 | 2858.9 | 2926.4 | 2991.8  | 3061.5  | 3066.8  | 3142.8  | 3200.8  |
| 7.5°  | 2623.5 | 2629.9 | 2625.6 | 2676.3 | 2709.0 | 2783.9 | 2867.3  | 2973.9  | 2984.5  | 3106.9  | 3208.2  |
| 10°   | 2493.7 | 2491.6 | 2502.2 | 2548.6 | 2590.8 | 2680.5 | 2773.4  | 2894.8  | 2910.6  | 3065.7  | 3216.6  |
| 12.5° | 2405.1 | 2407.2 | 2413.5 | 2462.1 | 2507.4 | 2596.1 | 2692.1  | 2824.0  | 2840.9  | 3018.2  | 3212.4  |
| 15°   | 2362.9 | 2358.6 | 2363.9 | 2408.2 | 2451.5 | 2529.6 | 2628.8  | 2764.9  | 2781.8  | 2976.0  | 3213.5  |
| 17.5° | 2353.4 | 2350.2 | 2349.2 | 2380.8 | 2413.5 | 2486.3 | 2581.3  | 2719.6  | 2737.5  | 2948.6  | 3219.8  |
| 20°   | 2382.9 | 2378.7 | 2367.1 | 2380.8 | 2394.5 | 2455.7 | 2547.6  | 2686.9  | 2706.9  | 2930.6  | 3232.5  |
| 22.5° | 2464.2 | 2456.8 | 2438.9 | 2422.0 | 2404.0 | 2441.0 | 2526.4  | 2662.6  | 2682.6  | 2919.0  | 3245.1  |
| 25°   | 2587.7 | 2581.3 | 2562.3 | 2524.3 | 2458.9 | 2452.6 | 2522.2  | 2652.0  | 2672.1  | 2910.6  | 3250.4  |
| 27.5° | 2757.6 | 2748.1 | 2729.1 | 2674.2 | 2567.6 | 2495.8 | 2538.1  | 2651.0  | 2670.0  | 2901.1  | 3245.1  |
| 30°   | 2959.1 | 2952.8 | 2942.2 | 2875.8 | 2733.3 | 2587.7 | 2573.9  | 2659.4  | 2674.2  | 2895.8  | 3234.6  |
| 32.5° | 3163.9 | 3157.5 | 3166.0 | 3134.3 | 2959.1 | 2739.6 | 2652.0  | 2682.6  | 2693.2  | 2894.8  | 3225.1  |
| 35°   | 3344.3 | 3351.7 | 3412.9 | 3418.2 | 3246.2 | 2945.4 | 2775.5  | 2736.5  | 2738.6  | 2915.9  | 3229.3  |
| 37.5° | 3533.2 | 3561.7 | 3641.9 | 3710.5 | 3567.0 | 3217.7 | 2959.1  | 2837.8  | 2835.7  | 2969.7  | 3255.7  |
| 40°   | 3783.3 | 3796.0 | 3898.4 | 4027.1 | 3937.4 | 3591.3 | 3219.8  | 3003.5  | 2988.7  | 3079.4  | 3326.4  |
| 42.5° | 4027.1 | 4057.7 | 4221.3 | 4369.0 | 4339.5 | 4012.3 | 3548.0  | 3251.5  | 3225.1  | 3273.6  | 3472.0  |
| 45°   | 4337.4 | 4366.9 | 4550.6 | 4740.5 | 4794.3 | 4488.3 | 3968.0  | 3603.9  | 3577.5  | 3565.9  | 3739.0  |
| 47.5° | 4647.6 | 4678.2 | 4842.9 | 5117.3 | 5306.2 | 5083.5 | 4514.7  | 4069.3  | 4026.1  | 3980.7  | 4142.1  |
| 50°   | 4856.6 | 4892.5 | 5049.7 | 5379.0 | 5822.2 | 5826.4 | 5162.6  | 4679.3  | 4624.4  | 4552.7  | 4709.9  |
| 52.5° | 4849.2 | 4872.4 | 5022.3 | 5402.2 | 6193.7 | 6680.2 | 6030.1  | 5456.0  | 5411.7  | 5255.5  | 5392.7  |
| 55°   | 4468.2 | 4503.1 | 4654.0 | 5128.9 | 6233.8 | 7489.6 | 7305.0  | 6372.0  | 6292.9  | 6013.2  | 6164.1  |
| 57.5° | 3703.1 | 3732.7 | 3884.6 | 4470.4 | 5878.2 | 7904.4 | 8923.8  | 7539.2  | 7430.5  | 6838.5  | 7012.6  |
| 60°   | 2795.6 | 2759.7 | 2831.4 | 3344.3 | 5027.6 | 7914.9 | 10352.7 | 9122.2  | 8940.7  | 7720.7  | 7866.4  |
| 62.5° | 2098.0 | 2062.1 | 2077.9 | 2222.5 | 3408.7 | 7275.4 | 11167.4 | 11287.7 | 10988.0 | 8717.0  | 8688.5  |
| 65°   | 1657.9 | 1637.9 | 1683.2 | 1782.4 | 1987.2 | 5540.4 | 11173.8 | 13629.5 | 13440.6 | 9871.5  | 9531.7  |
| 67.5° | 1350.8 | 1338.2 | 1384.6 | 1568.2 | 1611.5 | 2977.1 | 10019.2 | 14722.8 | 14796.7 | 11135.8 | 10313.7 |
| 70°   | 1088.0 | 1069.0 | 1141.9 | 1383.5 | 1498.6 | 1801.4 | 7177.3  | 14165.6 | 14284.9 | 11889.3 | 10093.1 |
| 72.5° | 751.4  | 752.4  | 789.4  | 1120.8 | 1446.8 | 1555.5 | 4059.8  | 11795.4 | 12053.9 | 11206.5 | 8873.2  |
| 75°   | 506.6  | 510.8  | 521.3  | 739.8  | 1332.9 | 1509.1 | 2163.4  | 8930.1  | 9112.7  | 9262.6  | 7334.5  |
| 77.5° | 306.0  | 308.2  | 332.4  | 447.5  | 919.2  | 1408.9 | 1465.8  | 6473.4  | 6616.9  | 6106.1  | 4546.3  |
| 80°   | 177.3  | 184.7  | 206.8  | 299.7  | 620.5  | 1058.5 | 1134.5  | 3969.1  | 4131.6  | 2714.3  | 1444.7  |
| 82.5° | 78.1   | 83.4   | 112.9  | 174.1  | 362.0  | 900.2  | 885.4   | 1568.2  | 1545.0  | 756.7   | 501.3   |
| 85°   | 13.7   | 16.9   | 24.3   | 54.9   | 133.0  | 474.9  | 687.0   | 692.3   | 651.1   | 287.0   | 207.9   |
| 87.5° | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 3.2    | 103.4   | 185.7   | 184.7   | 81.3    | 71.8    |
| 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: P633412

CATALOG NUMBER: GWS-SA2E-760-U-SL2-W

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 3196.6 | 3196.6 | 3196.6 | 3196.6 | 3196.6 | 3196.6 | 3196.6 | 3196.6 | 3196.6 | 3196.6 | 3196.6 |
| 2.5°  | 3212.4 | 3183.9 | 3209.2 | 3212.4 | 3207.1 | 3202.9 | 3171.2 | 3143.8 | 3140.6 | 3111.1 | 3111.1 |
| 5°    | 3224.0 | 3197.6 | 3210.3 | 3186.0 | 3148.0 | 3109.0 | 3041.4 | 2995.0 | 2973.9 | 2935.9 | 2935.9 |
| 7.5°  | 3239.8 | 3212.4 | 3197.6 | 3137.5 | 3048.8 | 2963.3 | 2854.7 | 2763.9 | 2727.0 | 2673.1 | 2671.0 |
| 10°   | 3254.6 | 3219.8 | 3169.1 | 3052.0 | 2910.6 | 2774.4 | 2616.1 | 2487.4 | 2399.8 | 2335.4 | 2335.4 |
| 12.5° | 3253.6 | 3208.2 | 3107.9 | 2934.9 | 2739.6 | 2542.3 | 2331.2 | 2137.0 | 2020.9 | 1920.7 | 1914.4 |
| 15°   | 3251.5 | 3189.2 | 3029.8 | 2798.7 | 2540.2 | 2266.8 | 1979.8 | 1726.5 | 1554.5 | 1456.3 | 1447.9 |
| 17.5° | 3249.3 | 3164.9 | 2942.2 | 2643.6 | 2297.4 | 1924.9 | 1546.0 | 1271.7 | 1128.1 | 1068.0 | 1070.1 |
| 20°   | 3249.3 | 3137.5 | 2848.3 | 2465.2 | 2017.8 | 1515.4 | 1134.5 | 935.0  | 899.1  | 902.3  | 905.5  |
| 22.5° | 3239.8 | 3103.7 | 2743.8 | 2271.1 | 1706.5 | 1114.4 | 836.9  | 769.3  | 788.3  | 817.9  | 822.1  |
| 25°   | 3217.7 | 3047.8 | 2622.5 | 2055.8 | 1336.0 | 811.5  | 682.8  | 670.1  | 705.0  | 741.9  | 752.4  |
| 27.5° | 3182.9 | 2983.4 | 2486.3 | 1803.5 | 983.6  | 652.2  | 600.5  | 599.4  | 626.9  | 654.3  | 663.8  |
| 30°   | 3145.9 | 2911.6 | 2342.8 | 1522.8 | 712.3  | 567.8  | 547.7  | 547.7  | 561.4  | 578.3  | 576.2  |
| 32.5° | 3102.7 | 2838.8 | 2188.7 | 1230.5 | 580.4  | 520.3  | 513.9  | 510.8  | 512.9  | 519.2  | 519.2  |
| 35°   | 3065.7 | 2774.4 | 2030.4 | 921.3  | 520.3  | 493.9  | 487.6  | 480.2  | 477.0  | 472.8  | 474.9  |
| 37.5° | 3052.0 | 2723.8 | 1866.9 | 694.4  | 490.7  | 474.9  | 464.3  | 453.8  | 446.4  | 444.3  | 443.2  |
| 40°   | 3074.2 | 2702.7 | 1703.3 | 572.0  | 469.6  | 454.8  | 443.2  | 429.5  | 423.2  | 423.2  | 423.2  |
| 42.5° | 3160.7 | 2718.5 | 1536.6 | 517.1  | 454.8  | 438.0  | 421.1  | 408.4  | 406.3  | 408.4  | 409.5  |
| 45°   | 3319.0 | 2779.7 | 1363.5 | 489.7  | 442.2  | 421.1  | 401.0  | 391.5  | 391.5  | 393.6  | 393.6  |
| 47.5° | 3601.8 | 2940.1 | 1192.5 | 472.8  | 429.5  | 407.4  | 386.2  | 376.8  | 375.7  | 377.8  | 377.8  |
| 50°   | 4091.5 | 3229.3 | 1038.4 | 461.2  | 420.0  | 396.8  | 375.7  | 363.0  | 359.9  | 358.8  | 358.8  |
| 52.5° | 4708.9 | 3730.6 | 940.3  | 452.7  | 408.4  | 385.2  | 364.1  | 347.2  | 340.9  | 337.7  | 337.7  |
| 55°   | 5455.0 | 4398.6 | 940.3  | 446.4  | 393.6  | 371.5  | 347.2  | 330.3  | 320.8  | 316.6  | 316.6  |
| 57.5° | 6300.3 | 5176.4 | 1102.8 | 441.1  | 382.0  | 355.6  | 329.3  | 312.4  | 301.8  | 295.5  | 295.5  |
| 60°   | 7160.4 | 5998.5 | 1504.9 | 433.7  | 371.5  | 335.6  | 309.2  | 293.4  | 279.7  | 272.3  | 271.2  |
| 62.5° | 8052.1 | 6903.9 | 2034.7 | 438.0  | 364.1  | 316.6  | 288.1  | 270.2  | 258.6  | 251.2  | 250.1  |
| 65°   | 8868.9 | 7766.1 | 2498.0 | 470.7  | 365.1  | 299.7  | 263.8  | 248.0  | 238.5  | 229.0  | 227.9  |
| 67.5° | 9562.3 | 8242.1 | 2172.9 | 537.2  | 387.3  | 279.7  | 239.6  | 223.7  | 215.3  | 209.0  | 207.9  |
| 70°   | 9076.8 | 7516.0 | 1232.6 | 578.3  | 417.9  | 258.6  | 212.1  | 201.6  | 193.1  | 188.9  | 187.8  |
| 72.5° | 7761.9 | 6363.6 | 824.2  | 510.8  | 381.0  | 231.1  | 186.8  | 178.3  | 172.0  | 166.7  | 165.7  |
| 75°   | 6287.6 | 5046.6 | 630.0  | 419.0  | 296.5  | 187.8  | 160.4  | 154.1  | 147.7  | 142.5  | 141.4  |
| 77.5° | 3720.0 | 2915.9 | 464.3  | 331.4  | 209.0  | 146.7  | 133.0  | 127.7  | 121.4  | 117.1  | 116.1  |
| 80°   | 1187.2 | 1013.1 | 294.4  | 227.9  | 138.2  | 112.9  | 102.4  | 98.1   | 91.8   | 86.5   | 85.5   |
| 82.5° | 452.7  | 391.5  | 156.2  | 116.1  | 91.8   | 77.0   | 68.6   | 64.4   | 60.2   | 54.9   | 53.8   |
| 85°   | 200.5  | 187.8  | 86.5   | 62.3   | 49.6   | 38.0   | 33.8   | 31.7   | 26.4   | 22.2   | 21.1   |
| 87.5° | 70.7   | 70.7   | 36.9   | 17.9   | 10.6   | 5.3    | 3.2    | 1.1    | 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-79-2008: Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Report Prepared for

Cooper Lighting Solutions

McGRAW-EDISON

Report Number: SP1-1908-441-9-R4

Test Date: 10/23/2019

Luminaire Tested: SA1C-760-U-5WQ

Data in this report applies to families of products SA1C-760-U-5WQ .

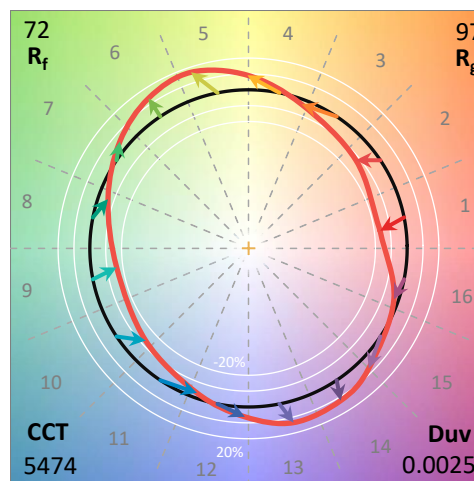
### Test Information

Test Method: LM-79-2008  
 Report Number: SP1-1908-441-9-R4  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry:  $4\pi$   
 Issue Date: 10/28/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: MCGRAW-EDISON  
 Catalog Number: **SA1C-760-U-5WQ**  
 Description: MCGRAW EDISON ROADWAY AND AREA LUMINAIRE

\*\*\*THIS IS A REVISION OF SP1-1908-441-4-R3. TO UPDATE THE CATALOG INFORMATION.\*\*\*TESTED IN SITU. ROADWAY AND AREA LUMINAIRE. (1) 70 CRI, 5000K, 1050MA LIGHTSQUARE WITH 16 LEDS AND TYPE V WIDE OPTICS.

### Spectral Parameters

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 5474   | CRI (Ra): | 71.7 |      |       |
| CIE u':                   | 0.2052 | R1:       | 70.6 | R9:  | -27.1 |
| CIE v':                   | 0.4804 | R2:       | 74.6 | R10: | 40.8  |
| Duv:                      | 0.0025 | R3:       | 78.3 | R11: | 74.6  |
| CIE x:                    | 0.3330 | R4:       | 73.8 | R12: | 50.4  |
| CIE y:                    | 0.3466 | R5:       | 72.4 | R13: | 70.0  |
| CIE z:                    | 0.3204 | R6:       | 67.5 | R14: | 87.8  |
| Peak Wavelength (nm):     | 442    | R7:       | 77.5 |      |       |
| Dominant Wavelength (nm): | 554    | R8:       | 58.9 |      |       |
| Purity:                   | 4.1    |           |      |      |       |
| Rf:                       | 72.1   |           |      |      |       |
| Rg:                       | 97.2   |           |      |      |       |



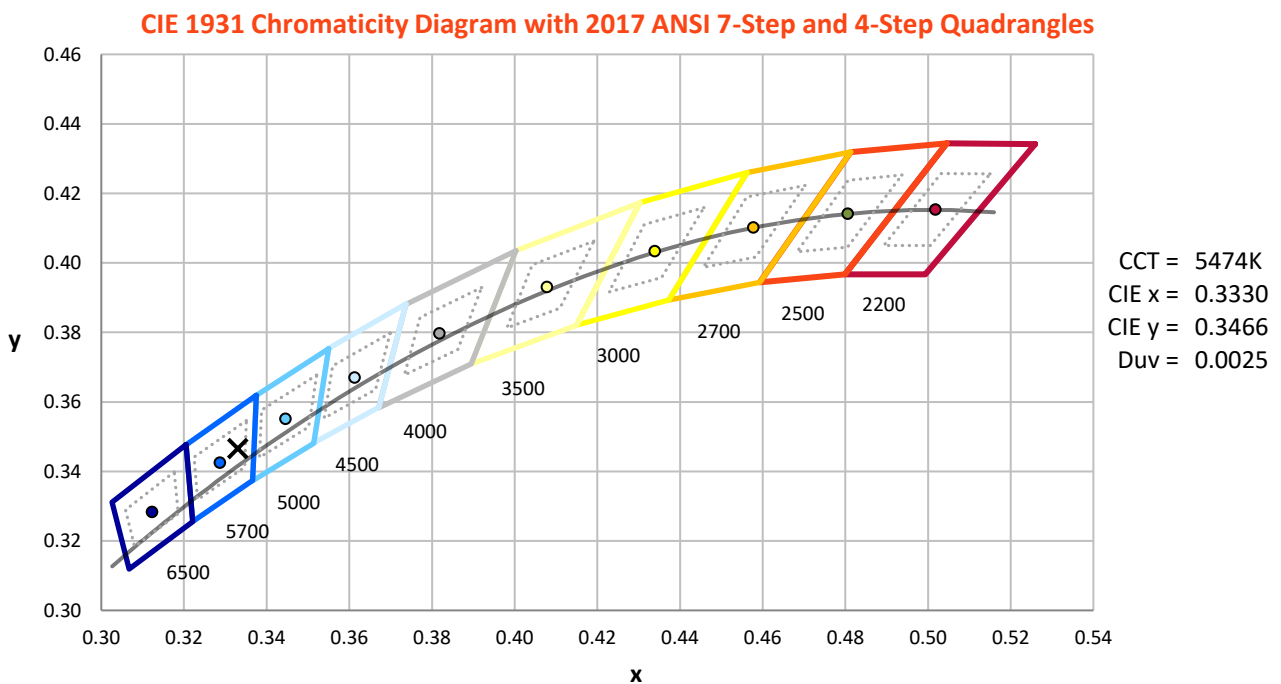
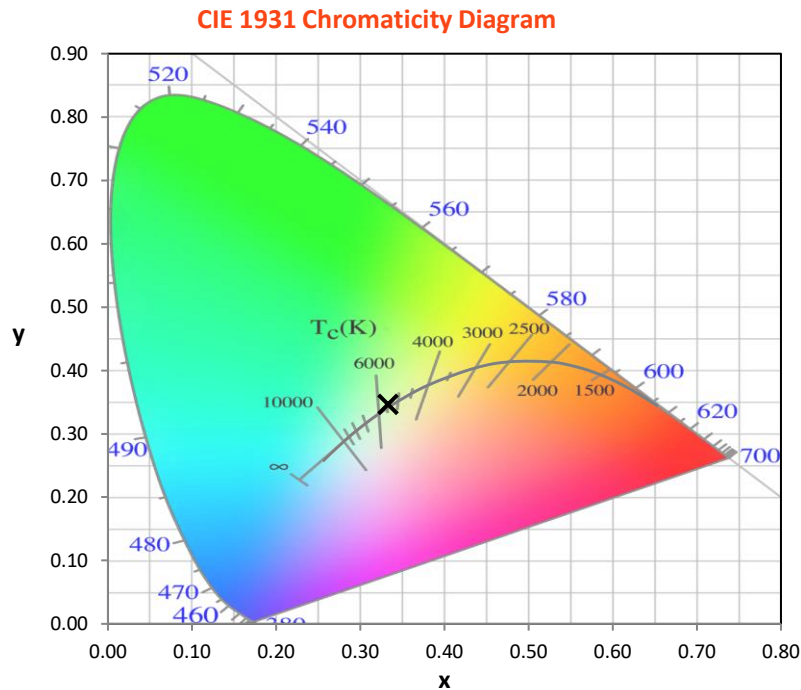
### Test Conditions

Stabilization Time: 240M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.6/31%  
 Sphere Temperature (°C): 25.9

REPORT NUMBER: SP1-1908-441-9-R4

| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 6/28/2019        | 12/28/2019           |
| Power Meter                    | IN0071                | 12/5/2018        | 12/5/2019            |
| AC Power Source                | IN0063                | 12/5/2018        | 12/5/2019            |
| DC Power Source                | IN0208                | 12/5/2018        | 12/5/2019            |
| Sphere Thermometer             | IN0085                | 12/5/2018        | 12/5/2019            |
| Room Thermometer               | IN0046                | 12/5/2018        | 12/5/2019            |

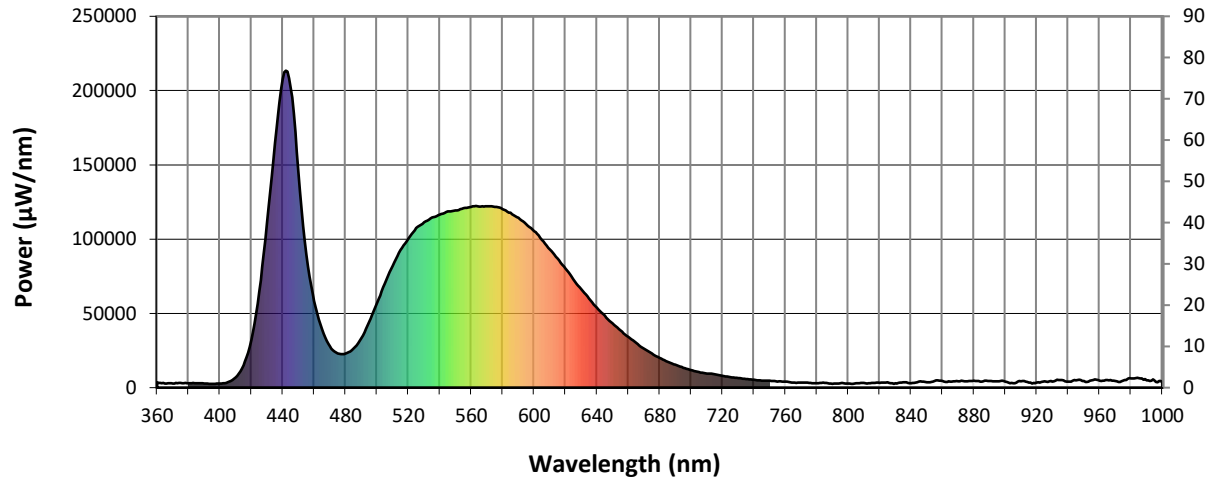
REPORT NUMBER: SP1-1908-441-9-R4



Point lies inside the ANSI 5700K 4-step quadrangle

REPORT NUMBER: SP1-1908-441-9-R4

**Photopic Flux vs. Wavelength**

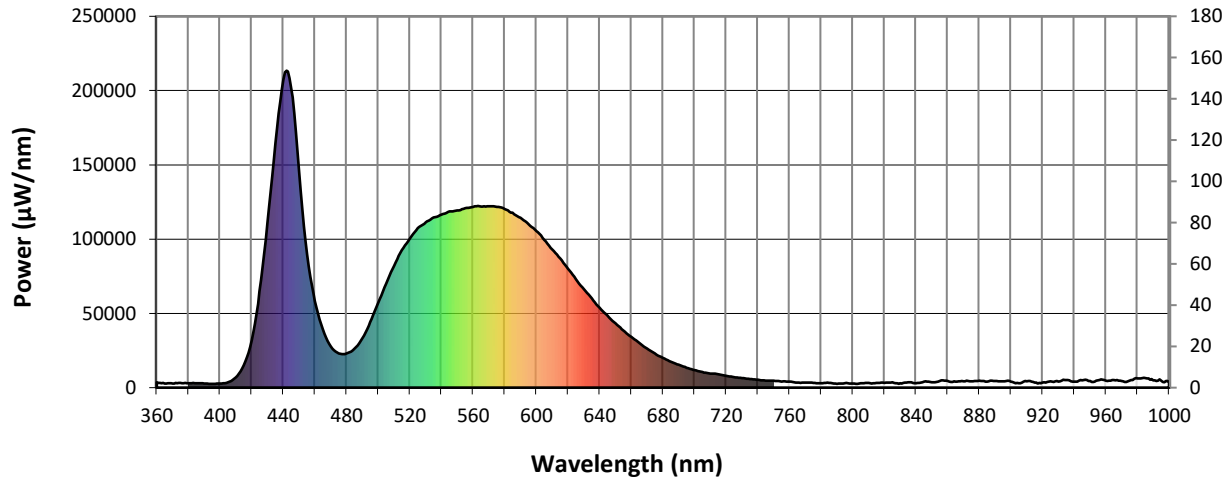


#####

| 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       | 3540             | NR               | 490       | 33363            | NR               | 620       | 80193            | NR               | 750       | 4663             | NR               | 880       | 4678             | NR               |
| 365       | 2862             | NR               | 495       | 44177            | NR               | 625       | 73091            | NR               | 755       | 4147             | NR               | 885       | 4128             | NR               |
| 370       | 2865             | NR               | 500       | 57019            | NR               | 630       | 66269            | NR               | 760       | 4040             | NR               | 890       | 4504             | NR               |
| 375       | 3254             | NR               | 505       | 70030            | NR               | 635       | 60012            | NR               | 765       | 3474             | NR               | 895       | 4371             | NR               |
| 380       | 3076             | NR               | 510       | 81972            | NR               | 640       | 53914            | NR               | 770       | 3469             | NR               | 900       | 4082             | NR               |
| 385       | 2904             | NR               | 515       | 92590            | NR               | 645       | 48385            | NR               | 775       | 3181             | NR               | 905       | 2982             | NR               |
| 390       | 2689             | NR               | 520       | 100305           | NR               | 650       | 43219            | NR               | 780       | 2969             | NR               | 910       | 4351             | NR               |
| 395       | 2619             | NR               | 525       | 107452           | NR               | 655       | 38562            | NR               | 785       | 3132             | NR               | 915       | 3365             | NR               |
| 400       | 2679             | NR               | 530       | 111373           | NR               | 660       | 34110            | NR               | 790       | 2507             | NR               | 920       | 3430             | NR               |
| 405       | 3515             | NR               | 535       | 114505           | NR               | 665       | 30085            | NR               | 795       | 2968             | NR               | 925       | 4264             | NR               |
| 410       | 6934             | NR               | 540       | 116408           | NR               | 670       | 26205            | NR               | 800       | 2758             | NR               | 930       | 4095             | NR               |
| 415       | 14943            | NR               | 545       | 118700           | NR               | 675       | 22906            | NR               | 805       | 2872             | NR               | 935       | 5048             | NR               |
| 420       | 31939            | NR               | 550       | 119209           | NR               | 680       | 20058            | NR               | 810       | 3094             | NR               | 940       | 4074             | NR               |
| 425       | 64701            | NR               | 555       | 120742           | NR               | 685       | 17413            | NR               | 815       | 3222             | NR               | 945       | 4949             | NR               |
| 430       | 110939           | NR               | 560       | 121594           | NR               | 690       | 15447            | NR               | 820       | 3238             | NR               | 950       | 4387             | NR               |
| 435       | 164597           | NR               | 565       | 121913           | NR               | 695       | 13398            | NR               | 825       | 3524             | NR               | 955       | 4978             | NR               |
| 440       | 207696           | NR               | 570       | 122147           | NR               | 700       | 11777            | NR               | 830       | 2921             | NR               | 960       | 4706             | NR               |
| 445       | 201830           | NR               | 575       | 121605           | NR               | 705       | 10412            | NR               | 835       | 3595             | NR               | 965       | 5083             | NR               |
| 450       | 145410           | NR               | 580       | 120248           | NR               | 710       | 9544             | NR               | 840       | 3016             | NR               | 970       | 4522             | NR               |
| 455       | 89594            | NR               | 585       | 117717           | NR               | 715       | 8940             | NR               | 845       | 4032             | NR               | 975       | 4740             | NR               |
| 460       | 58321            | NR               | 590       | 114359           | NR               | 720       | 7897             | NR               | 850       | 3579             | NR               | 980       | 6122             | NR               |
| 465       | 39318            | NR               | 595       | 109974           | NR               | 725       | 7045             | NR               | 855       | 4571             | NR               | 985       | 6450             | NR               |
| 470       | 27693            | NR               | 600       | 105269           | NR               | 730       | 6483             | NR               | 860       | 4485             | NR               | 990       | 4875             | NR               |
| 475       | 23081            | NR               | 605       | 99453            | NR               | 735       | 5838             | NR               | 865       | 3978             | NR               | 995       | 4764             | NR               |
| 480       | 23002            | NR               | 610       | 92921            | NR               | 740       | 5261             | NR               | 870       | 4298             | NR               | 1000      | 3640             | NR               |
| 485       | 26201            | NR               | 615       | 86989            | NR               | 745       | 4760             | NR               | 875       | 4356             | NR               |           |                  |                  |

REPORT NUMBER: SP1-1908-441-9-R4

**Scotopic Flux vs. Wavelength**



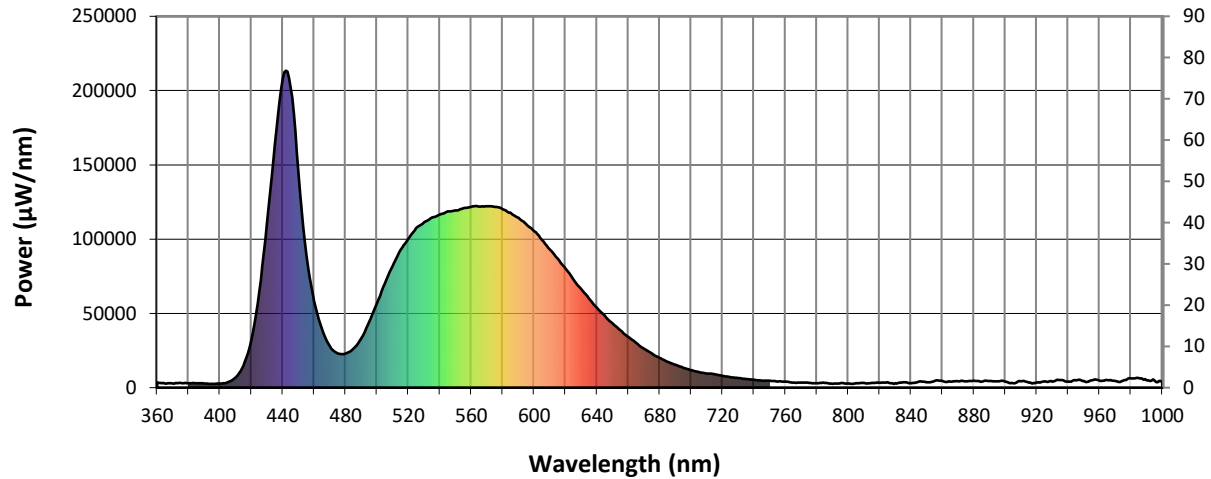
**Scotopic Lumens: 13759.3**

**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       | 3540             | NR               | 490       | 33363            | NR               | 620       | 80193            | NR               | 750       | 4663             | NR               | 880       | 4678             | NR               |
| 365       | 2862             | NR               | 495       | 44177            | NR               | 625       | 73091            | NR               | 755       | 4147             | NR               | 885       | 4128             | NR               |
| 370       | 2865             | NR               | 500       | 57019            | NR               | 630       | 66269            | NR               | 760       | 4040             | NR               | 890       | 4504             | NR               |
| 375       | 3254             | NR               | 505       | 70030            | NR               | 635       | 60012            | NR               | 765       | 3474             | NR               | 895       | 4371             | NR               |
| 380       | 3076             | NR               | 510       | 81972            | NR               | 640       | 53914            | NR               | 770       | 3469             | NR               | 900       | 4082             | NR               |
| 385       | 2904             | NR               | 515       | 92590            | NR               | 645       | 48385            | NR               | 775       | 3181             | NR               | 905       | 2982             | NR               |
| 390       | 2689             | NR               | 520       | 100305           | NR               | 650       | 43219            | NR               | 780       | 2969             | NR               | 910       | 4351             | NR               |
| 395       | 2619             | NR               | 525       | 107452           | NR               | 655       | 38562            | NR               | 785       | 3132             | NR               | 915       | 3365             | NR               |
| 400       | 2679             | NR               | 530       | 111373           | NR               | 660       | 34110            | NR               | 790       | 2507             | NR               | 920       | 3430             | NR               |
| 405       | 3515             | NR               | 535       | 114505           | NR               | 665       | 30085            | NR               | 795       | 2968             | NR               | 925       | 4264             | NR               |
| 410       | 6934             | NR               | 540       | 116408           | NR               | 670       | 26205            | NR               | 800       | 2758             | NR               | 930       | 4095             | NR               |
| 415       | 14943            | NR               | 545       | 118700           | NR               | 675       | 22906            | NR               | 805       | 2872             | NR               | 935       | 5048             | NR               |
| 420       | 31939            | NR               | 550       | 119209           | NR               | 680       | 20058            | NR               | 810       | 3094             | NR               | 940       | 4074             | NR               |
| 425       | 64701            | NR               | 555       | 120742           | NR               | 685       | 17413            | NR               | 815       | 3222             | NR               | 945       | 4949             | NR               |
| 430       | 110939           | NR               | 560       | 121594           | NR               | 690       | 15447            | NR               | 820       | 3238             | NR               | 950       | 4387             | NR               |
| 435       | 164597           | NR               | 565       | 121913           | NR               | 695       | 13398            | NR               | 825       | 3524             | NR               | 955       | 4978             | NR               |
| 440       | 207696           | NR               | 570       | 122147           | NR               | 700       | 11777            | NR               | 830       | 2921             | NR               | 960       | 4706             | NR               |
| 445       | 201830           | NR               | 575       | 121605           | NR               | 705       | 10412            | NR               | 835       | 3595             | NR               | 965       | 5083             | NR               |
| 450       | 145410           | NR               | 580       | 120248           | NR               | 710       | 9544             | NR               | 840       | 3016             | NR               | 970       | 4522             | NR               |
| 455       | 89594            | NR               | 585       | 117717           | NR               | 715       | 8940             | NR               | 845       | 4032             | NR               | 975       | 4740             | NR               |
| 460       | 58321            | NR               | 590       | 114359           | NR               | 720       | 7897             | NR               | 850       | 3579             | NR               | 980       | 6122             | NR               |
| 465       | 39318            | NR               | 595       | 109974           | NR               | 725       | 7045             | NR               | 855       | 4571             | NR               | 985       | 6450             | NR               |
| 470       | 27693            | NR               | 600       | 105269           | NR               | 730       | 6483             | NR               | 860       | 4485             | NR               | 990       | 4875             | NR               |
| 475       | 23081            | NR               | 605       | 99453            | NR               | 735       | 5838             | NR               | 865       | 3978             | NR               | 995       | 4764             | NR               |
| 480       | 23002            | NR               | 610       | 92921            | NR               | 740       | 5261             | NR               | 870       | 4298             | NR               | 1000      | 3640             | NR               |
| 485       | 26201            | NR               | 615       | 86989            | NR               | 745       | 4760             | NR               | 875       | 4356             | NR               |           |                  |                  |

REPORT NUMBER: SP1-1908-441-9-R4

**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 5527.6 M/P: 0.74**

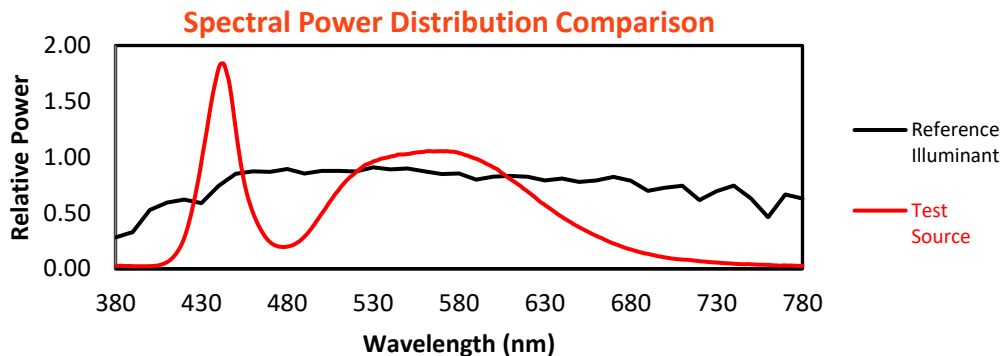
| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 3540             | NR               | 490       | 33363            | NR               | 620       | 80193            | NR               | 750       | 4663             | NR               | 880       | 4678             | NR               |
| 365       | 2862             | NR               | 495       | 44177            | NR               | 625       | 73091            | NR               | 755       | 4147             | NR               | 885       | 4128             | NR               |
| 370       | 2865             | NR               | 500       | 57019            | NR               | 630       | 66269            | NR               | 760       | 4040             | NR               | 890       | 4504             | NR               |
| 375       | 3254             | NR               | 505       | 70030            | NR               | 635       | 60012            | NR               | 765       | 3474             | NR               | 895       | 4371             | NR               |
| 380       | 3076             | NR               | 510       | 81972            | NR               | 640       | 53914            | NR               | 770       | 3469             | NR               | 900       | 4082             | NR               |
| 385       | 2904             | NR               | 515       | 92590            | NR               | 645       | 48385            | NR               | 775       | 3181             | NR               | 905       | 2982             | NR               |
| 390       | 2689             | NR               | 520       | 100305           | NR               | 650       | 43219            | NR               | 780       | 2969             | NR               | 910       | 4351             | NR               |
| 395       | 2619             | NR               | 525       | 107452           | NR               | 655       | 38562            | NR               | 785       | 3132             | NR               | 915       | 3365             | NR               |
| 400       | 2679             | NR               | 530       | 111373           | NR               | 660       | 34110            | NR               | 790       | 2507             | NR               | 920       | 3430             | NR               |
| 405       | 3515             | NR               | 535       | 114505           | NR               | 665       | 30085            | NR               | 795       | 2968             | NR               | 925       | 4264             | NR               |
| 410       | 6934             | NR               | 540       | 116408           | NR               | 670       | 26205            | NR               | 800       | 2758             | NR               | 930       | 4095             | NR               |
| 415       | 14943            | NR               | 545       | 118700           | NR               | 675       | 22906            | NR               | 805       | 2872             | NR               | 935       | 5048             | NR               |
| 420       | 31939            | NR               | 550       | 119209           | NR               | 680       | 20058            | NR               | 810       | 3094             | NR               | 940       | 4074             | NR               |
| 425       | 64701            | NR               | 555       | 120742           | NR               | 685       | 17413            | NR               | 815       | 3222             | NR               | 945       | 4949             | NR               |
| 430       | 110939           | NR               | 560       | 121594           | NR               | 690       | 15447            | NR               | 820       | 3238             | NR               | 950       | 4387             | NR               |
| 435       | 164597           | NR               | 565       | 121913           | NR               | 695       | 13398            | NR               | 825       | 3524             | NR               | 955       | 4978             | NR               |
| 440       | 207696           | NR               | 570       | 122147           | NR               | 700       | 11777            | NR               | 830       | 2921             | NR               | 960       | 4706             | NR               |
| 445       | 201830           | NR               | 575       | 121605           | NR               | 705       | 10412            | NR               | 835       | 3595             | NR               | 965       | 5083             | NR               |
| 450       | 145410           | NR               | 580       | 120248           | NR               | 710       | 9544             | NR               | 840       | 3016             | NR               | 970       | 4522             | NR               |
| 455       | 89594            | NR               | 585       | 117717           | NR               | 715       | 8940             | NR               | 845       | 4032             | NR               | 975       | 4740             | NR               |
| 460       | 58321            | NR               | 590       | 114359           | NR               | 720       | 7897             | NR               | 850       | 3579             | NR               | 980       | 6122             | NR               |
| 465       | 39318            | NR               | 595       | 109974           | NR               | 725       | 7045             | NR               | 855       | 4571             | NR               | 985       | 6450             | NR               |
| 470       | 27693            | NR               | 600       | 105269           | NR               | 730       | 6483             | NR               | 860       | 4485             | NR               | 990       | 4875             | NR               |
| 475       | 23081            | NR               | 605       | 99453            | NR               | 735       | 5838             | NR               | 865       | 3978             | NR               | 995       | 4764             | NR               |
| 480       | 23002            | NR               | 610       | 92921            | NR               | 740       | 5261             | NR               | 870       | 4298             | NR               | 1000      | 3640             | NR               |
| 485       | 26201            | NR               | 615       | 86989            | NR               | 745       | 4760             | NR               | 875       | 4356             | NR               |           |                  |                  |

REPORT NUMBER: SP1-1908-441-9-R4

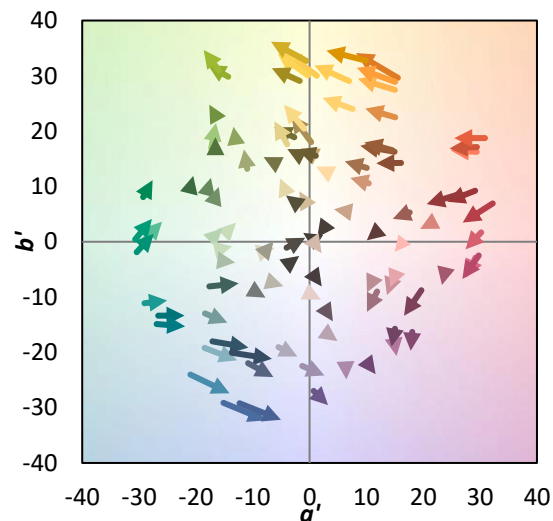
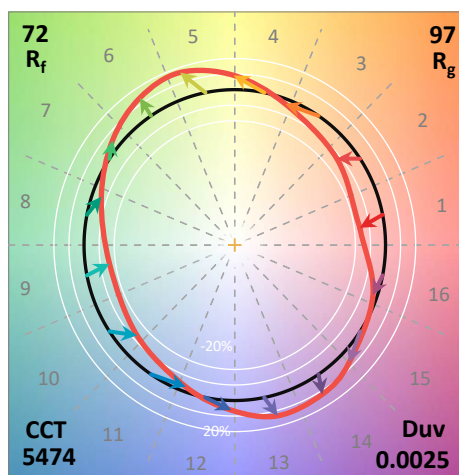
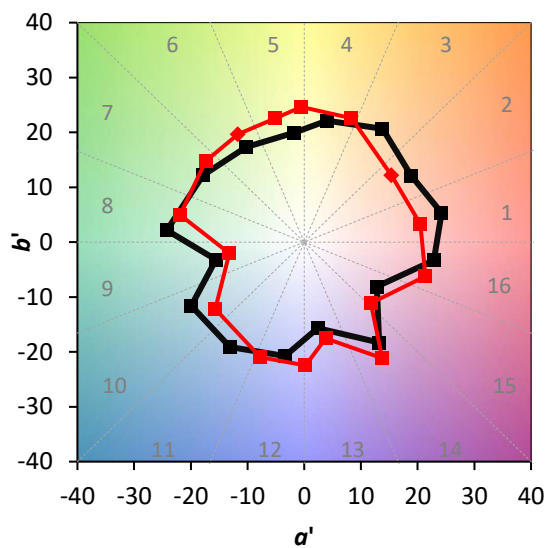
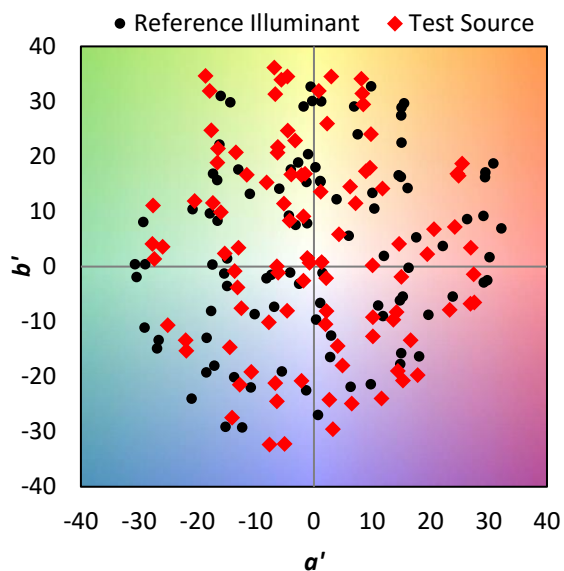
**TM-30-18**

**Summary**

$R_f = 72.1$   
 $R_g = 97.2$   
 CIE  $R_a = 71.7$   
 $R_g = -27.1$



**Color Vector Graphics**



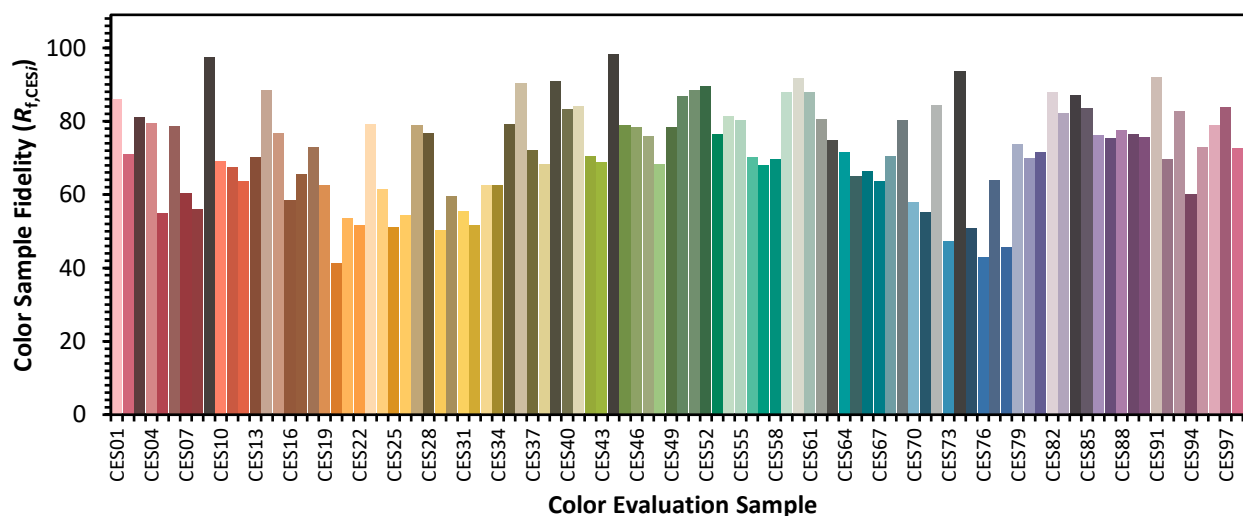


REPORT NUMBER: SP1-1908-441-9-R4

**TM-30-18**

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

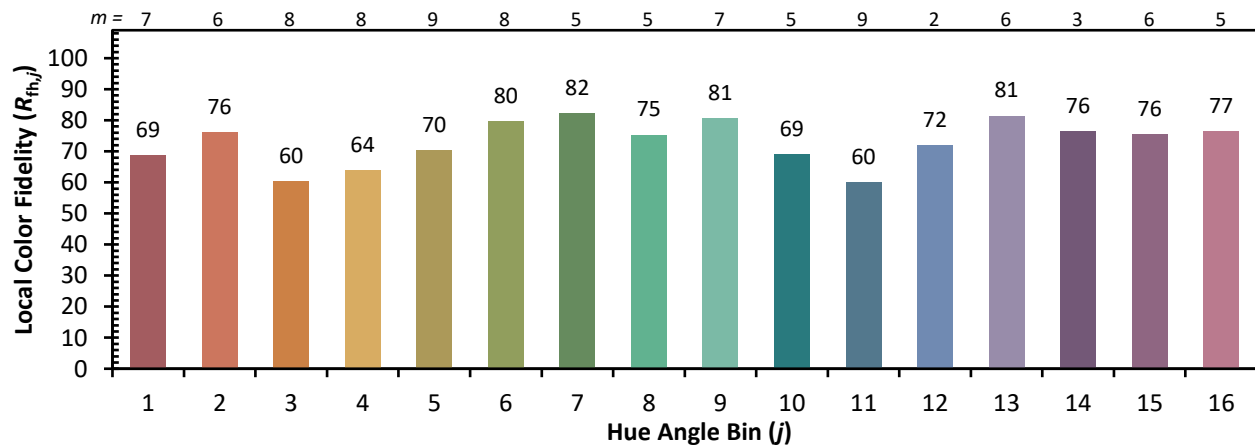
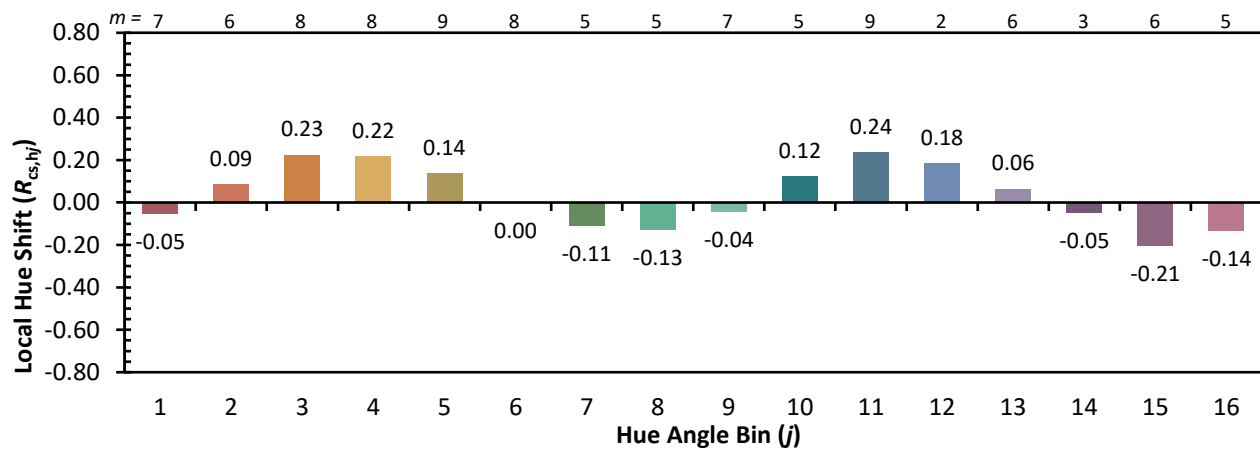
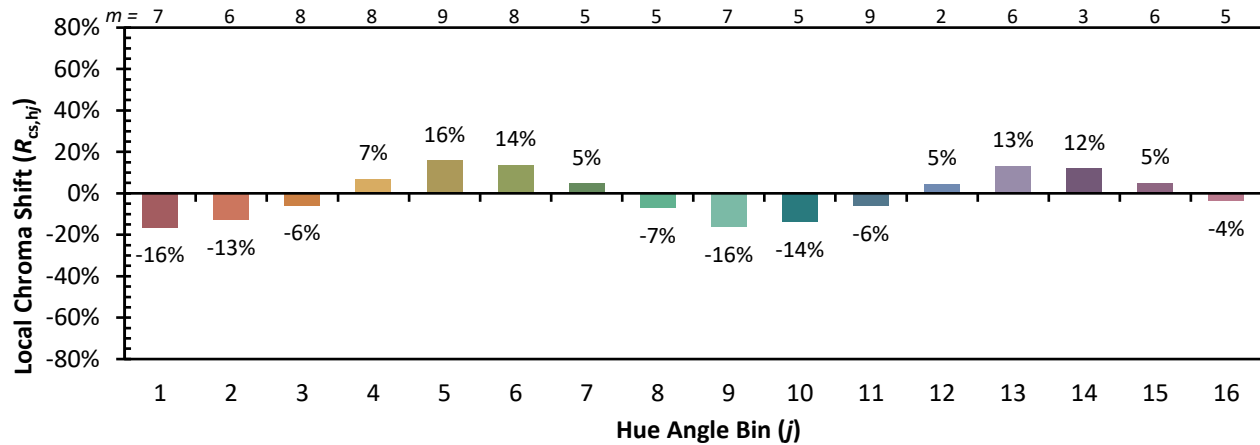
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 54 | CES51 = 88 | CES76 = 43 |
| CES02 = 59 | CES27 = 79 | CES52 = 90 | CES77 = 64 |
| CES03 = 30 | CES28 = 77 | CES53 = 77 | CES78 = 46 |
| CES04 = 69 | CES29 = 50 | CES54 = 81 | CES79 = 74 |
| CES05 = 46 | CES30 = 59 | CES55 = 80 | CES80 = 70 |
| CES06 = 50 | CES31 = 55 | CES56 = 70 | CES81 = 71 |
| CES07 = 38 | CES32 = 52 | CES57 = 68 | CES82 = 88 |
| CES08 = 38 | CES33 = 63 | CES58 = 70 | CES83 = 82 |
| CES09 = 29 | CES34 = 63 | CES59 = 88 | CES84 = 87 |
| CES10 = 72 | CES35 = 79 | CES60 = 92 | CES85 = 84 |
| CES11 = 55 | CES36 = 90 | CES61 = 88 | CES86 = 76 |
| CES12 = 61 | CES37 = 72 | CES62 = 81 | CES87 = 75 |
| CES13 = 41 | CES38 = 68 | CES63 = 75 | CES88 = 77 |
| CES14 = 74 | CES39 = 91 | CES64 = 72 | CES89 = 76 |
| CES15 = 70 | CES40 = 83 | CES65 = 65 | CES90 = 76 |
| CES16 = 46 | CES41 = 84 | CES66 = 66 | CES91 = 92 |
| CES17 = 48 | CES42 = 70 | CES67 = 64 | CES92 = 70 |
| CES18 = 55 | CES43 = 69 | CES68 = 71 | CES93 = 83 |
| CES19 = 70 | CES44 = 98 | CES69 = 80 | CES94 = 60 |
| CES20 = 64 | CES45 = 79 | CES70 = 58 | CES95 = 73 |
| CES21 = 85 | CES46 = 78 | CES71 = 55 | CES96 = 79 |
| CES22 = 77 | CES47 = 76 | CES72 = 84 | CES97 = 84 |
| CES23 = 91 | CES48 = 68 | CES73 = 47 | CES98 = 73 |
| CES24 = 90 | CES49 = 78 | CES74 = 94 | CES99 = 62 |
| CES25 = 71 | CES50 = 87 | CES75 = 51 |            |



REPORT NUMBER: SP1-1908-441-9-R4

**TM-30-18**

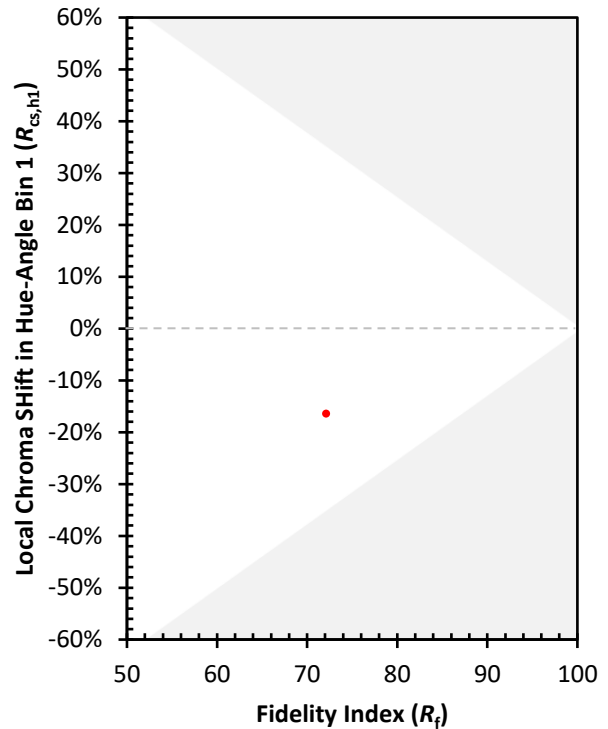
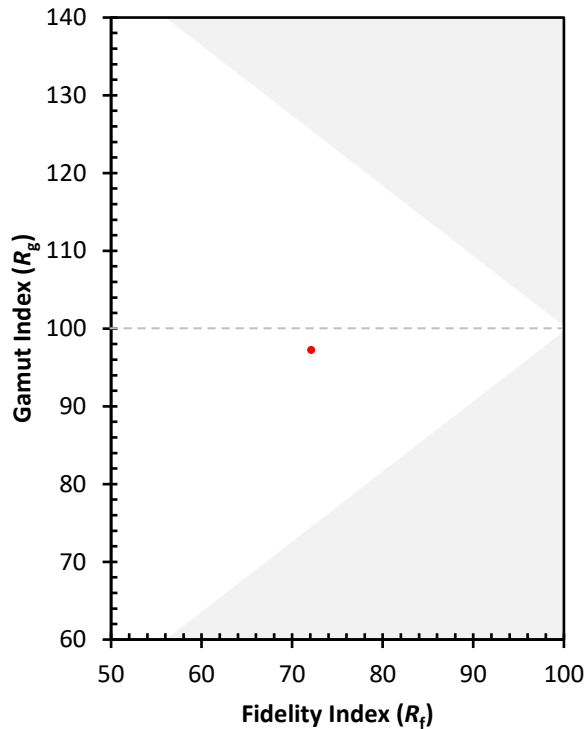
Color Rendition by Hue-Angle Bin



REPORT NUMBER: SP1-1908-441-9-R4

**TM-30-18**

**Measure Comparisons**



(END OF REPORT)