

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: P643497

Luminaire Tested: GWS-SA6F-722-U-T2R-W-GRSBK

Issue Date: 1/10/2023

### Test Information

Test Method: LM-79-2019  
Report Number: P643497  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-12)  
Test Lab: COOPER LIGHTING SOLUTIONS  
Issue Date: 1/10/2023  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: McGRAW-EDISON  
Catalog Number: GWS-SA6F-722-U-T2R-W-GRSBK  
Description: GALLEON WALL SLIM LUMINAIRE. (6) LIGHTSQUARES WITH 16 LEDS EACH AND  
TYPE II ROADWAY OPTICS W/ FACTORY INSTALLED GLARE SHIELD, BK  
Light Source: (96) 2200K CCT, 70 CRI LEDS  
Ballast/Driver: -

### Summary

Lumens per Lamp: N/A  
Luminaire Lumens: 24575.2 lumens  
Efficiency: N/A  
Efficacy: 66.0 lumens/watt  
Luminous Opening: Rectangular (W 2' x L: 1' x H: 0')  
IES Classification: Type II - Short  
BUG Rating: B3 - U0 - G1

Input Watts (W): 372.6  
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



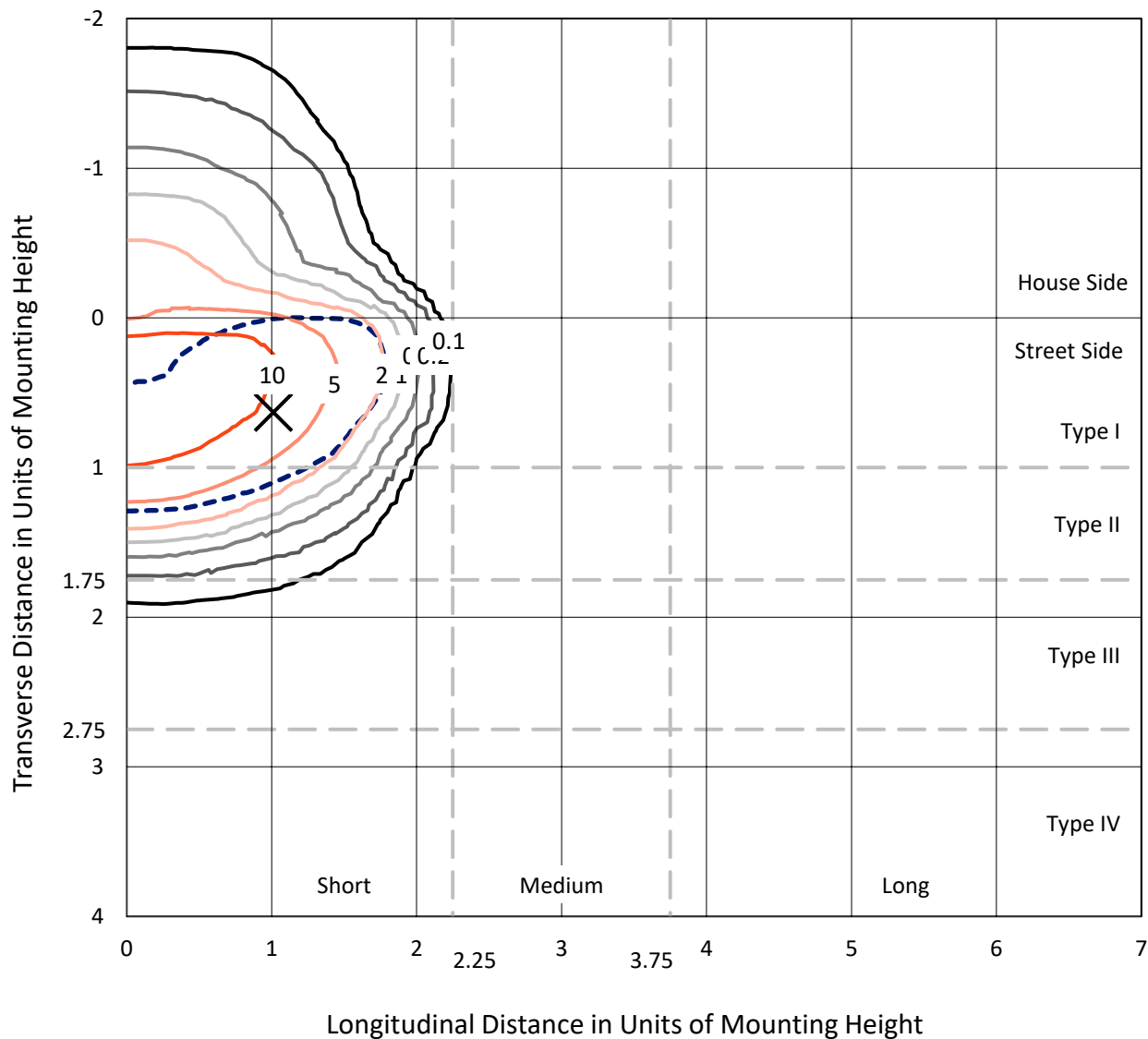
REPORT NUMBER: P643497

CATALOG NUMBER: GWS-SA6F-722-U-T2R-W-GRSBK

## Iso-Footcandle Lines of Horizontal Illumination

✕ Max cd

--- 1/2 Max cd

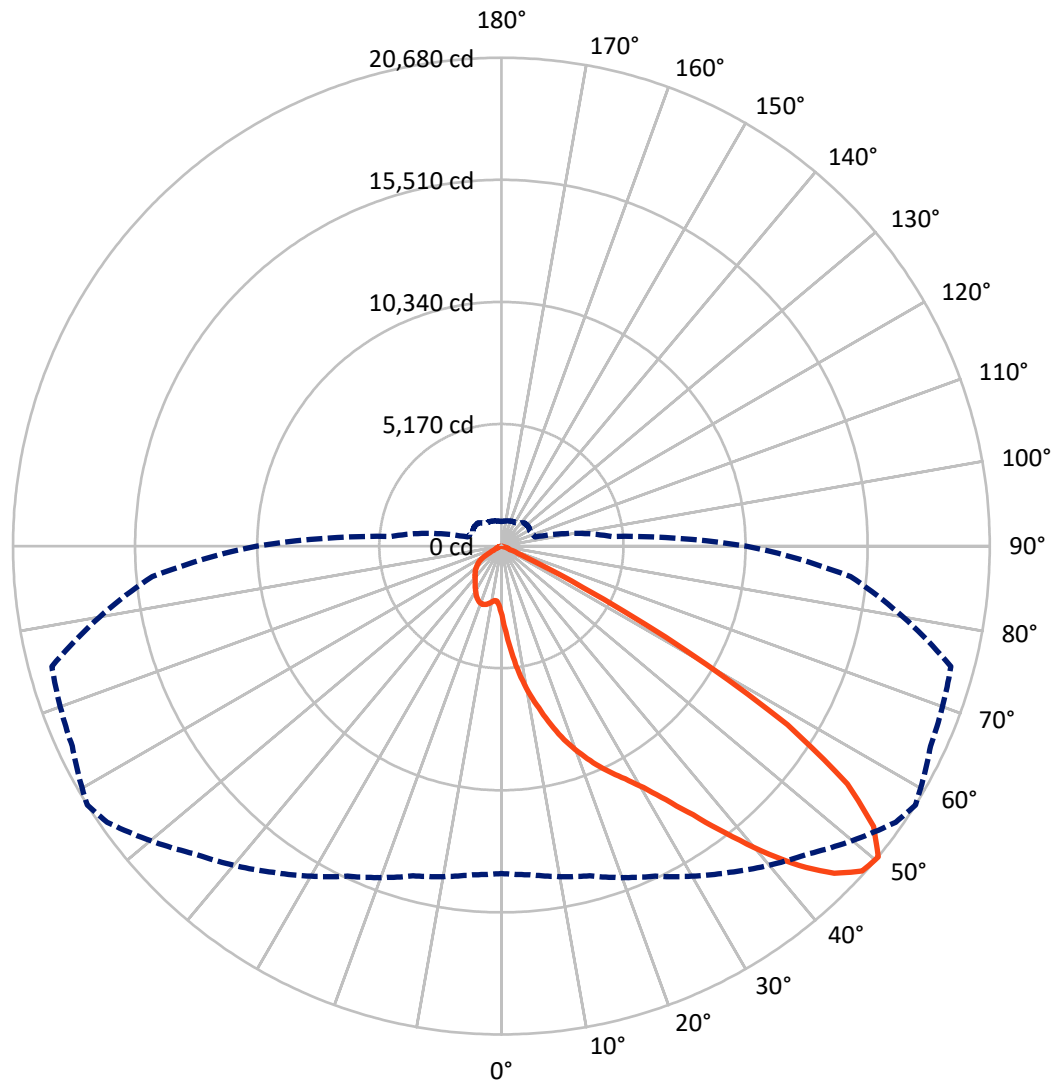


Based on 25 foot mounting height. Maximum calculated value = 14.4 fc  
 Type II - Short - N/A

REPORT NUMBER: P643497

CATALOG NUMBER: GWS-SA6F-722-U-T2R-W-GRSBK

## Luminous Intensity Polar Plot



— Vertical Plane Through 58-Deg Lateral    - - - Horizontal Cone Through 50-Deg Vertical

REPORT NUMBER: P643497

CATALOG NUMBER: GWS-SA6F-722-U-T2R-W-GRSBK

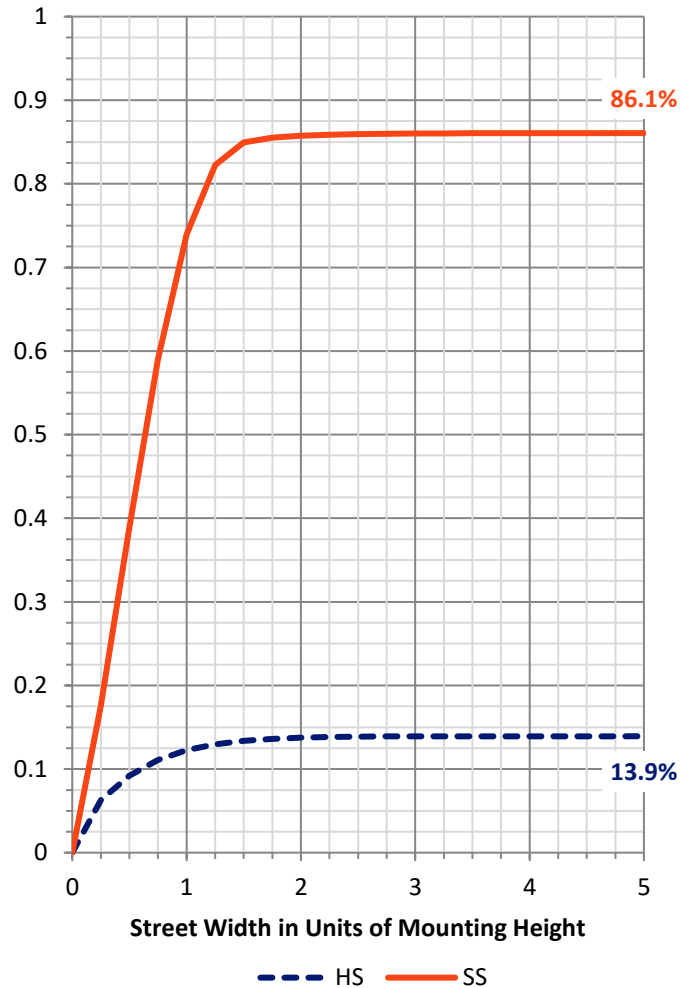
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 3442.1   | 0.0    | 3442.1  |
|                    | % Fixture | 14.0     | 0.0    | 14.0    |
| <b>Street Side</b> | Lumens    | 21133.1  | 0.0    | 21133.1 |
|                    | % Fixture | 86.0     | 0.0    | 86.0    |
| <b>Total</b>       | Lumens    | 24575.2  | 0.0    | 24575.2 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 363.7   | 1.5       |
| 10°-20°   | 1439.6  | 5.9       |
| 20°-30°   | 2913.1  | 11.9      |
| 30°-40°   | 5153.7  | 21.0      |
| 40°-50°   | 7512.9  | 30.6      |
| 50°-60°   | 6021.8  | 24.5      |
| 60°-70°   | 1084.9  | 4.4       |
| 70°-80°   | 85.5    | 0.3       |
| 80°-90°   | 0.1     | 0.0       |
| 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°    | 24575.2 | 100.0     |
| 0°-180°   | 24575.2 | 100.0     |

**Coefficient of Utilization**



REPORT NUMBER: P643497

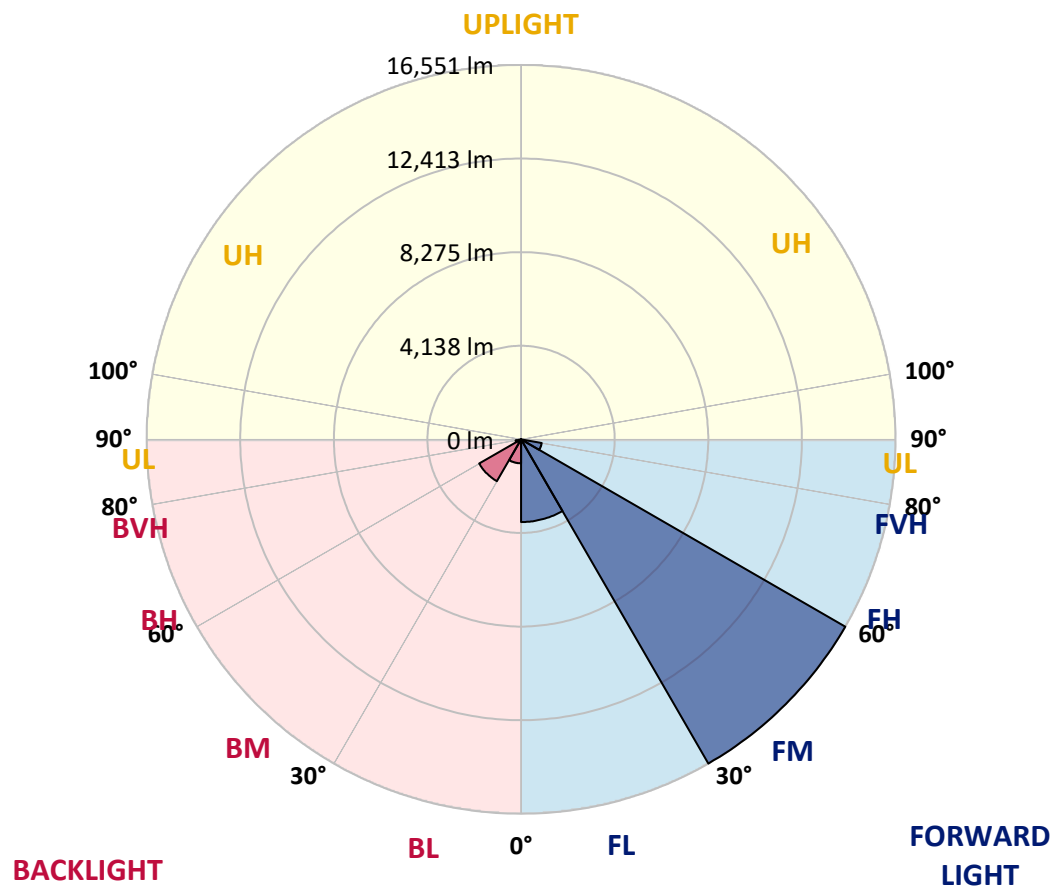
CATALOG NUMBER: GWS-SA6F-722-U-T2R-W-GRSBK

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|---------|-----------|-------------------------|------|---------|
|      |             |         |           | B                       | U    | G       |
| FL   | (0°-30°)    | 3656.7  | 14.9      |                         |      |         |
| FM   | (30°-60°)   | 16550.7 | 67.3      |                         |      |         |
| FH   | (60°-80°)   | 925.7   | 3.8       |                         |      | G1/1800 |
| FVH  | (80°-90°)   | 0.0     | 0.0       |                         |      | G0/10   |
| BL   | (0°-30°)    | 1059.7  | 4.3       | B3/2500                 |      |         |
| BM   | (30°-60°)   | 2137.7  | 8.7       | B2/2500                 |      |         |
| BH   | (60°-80°)   | 244.6   | 1.0       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 0.1     | 0.0       |                         |      | G0/10   |
| UL   | (90°-100°)  | 0.0     | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0     | 0.0       |                         | U0/0 |         |

**BUG Rating: B3-U0-G1**

Type II Short



REPORT NUMBER: P643497

CATALOG NUMBER: GWS-SA6F-722-U-T2R-W-GRSBK

**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 55°     | 58°     | 65°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 2935.5  | 2935.5  | 2935.5  | 2935.5  | 2935.5  | 2935.5  | 2935.5  | 2935.5  | 2935.5  | 2935.5  | 2935.5  |
| 2.5°  | 4344.1  | 4275.7  | 4236.3  | 4204.8  | 4065.5  | 3844.8  | 3700.2  | 3624.0  | 3497.9  | 3285.0  | 3101.0  |
| 5°    | 5668.6  | 5618.6  | 5526.7  | 5463.6  | 5284.9  | 4972.2  | 4648.9  | 4520.1  | 4233.7  | 3752.8  | 3321.8  |
| 7.5°  | 6546.3  | 6509.5  | 6475.4  | 6391.3  | 6223.1  | 5939.3  | 5581.9  | 5447.8  | 5006.3  | 4323.0  | 3616.1  |
| 10°   | 7221.7  | 7192.8  | 7153.4  | 7150.8  | 7019.4  | 6764.4  | 6414.9  | 6275.6  | 5797.3  | 4943.3  | 3963.0  |
| 12.5° | 7815.6  | 7792.0  | 7784.1  | 7857.7  | 7773.6  | 7584.4  | 7206.0  | 7032.5  | 6525.3  | 5576.6  | 4346.7  |
| 15°   | 8223.0  | 8217.7  | 8251.9  | 8396.4  | 8443.7  | 8357.0  | 8039.0  | 7852.4  | 7269.0  | 6212.6  | 4769.8  |
| 17.5° | 8409.6  | 8425.3  | 8491.0  | 8740.7  | 8950.9  | 9024.5  | 8780.1  | 8622.4  | 8007.5  | 6856.4  | 5221.8  |
| 20°   | 8727.6  | 8722.3  | 8761.7  | 8998.2  | 9255.8  | 9518.6  | 9445.0  | 9311.0  | 8753.8  | 7537.1  | 5723.8  |
| 22.5° | 9623.7  | 9547.5  | 9463.4  | 9500.2  | 9592.2  | 9899.6  | 10036.3 | 9968.0  | 9523.8  | 8236.1  | 6241.5  |
| 25°   | 11000.8 | 10921.9 | 10651.2 | 10388.4 | 10215.0 | 10354.3 | 10540.9 | 10575.0 | 10288.6 | 8953.6  | 6782.8  |
| 27.5° | 12461.9 | 12391.0 | 12086.1 | 11691.9 | 11195.2 | 10953.5 | 11092.7 | 11161.1 | 11040.2 | 9807.7  | 7358.4  |
| 30°   | 13831.1 | 13736.5 | 13402.8 | 12913.9 | 12338.4 | 11967.9 | 11810.2 | 11857.5 | 11928.4 | 10819.4 | 8033.8  |
| 32.5° | 15019.0 | 14948.0 | 14548.6 | 14033.5 | 13479.0 | 13092.6 | 12724.7 | 12803.6 | 12977.0 | 12057.2 | 8898.4  |
| 35°   | 16025.5 | 15988.7 | 15565.6 | 15053.1 | 14467.1 | 14270.0 | 13954.6 | 13970.4 | 14143.8 | 13552.5 | 9952.2  |
| 37.5° | 16900.6 | 16837.5 | 16453.8 | 15978.2 | 15513.0 | 15481.5 | 15394.8 | 15402.7 | 15492.0 | 15294.9 | 11163.7 |
| 40°   | 17452.5 | 17394.7 | 17121.4 | 16827.0 | 16495.9 | 16501.2 | 16950.5 | 16984.7 | 16882.2 | 17005.7 | 12443.5 |
| 42.5° | 17660.1 | 17618.0 | 17470.9 | 17473.5 | 17439.3 | 17594.4 | 18438.0 | 18501.1 | 18133.1 | 18348.6 | 13536.8 |
| 45°   | 17300.1 | 17281.7 | 17292.2 | 17670.6 | 18080.6 | 18558.9 | 19654.7 | 19765.1 | 19244.8 | 19239.5 | 14390.9 |
| 47.5° | 16138.5 | 16101.7 | 16409.2 | 17053.0 | 18001.7 | 18932.0 | 20390.6 | 20561.4 | 20022.7 | 19749.3 | 14927.0 |
| 50°   | 13862.7 | 13967.8 | 14453.9 | 15421.0 | 16863.8 | 18419.6 | 20382.7 | 20679.7 | 20051.6 | 19704.7 | 14837.6 |
| 52.5° | 10041.6 | 10020.5 | 11084.9 | 12414.6 | 14170.1 | 16779.7 | 19300.0 | 19733.6 | 19349.9 | 19265.8 | 14637.9 |
| 55°   | 5463.6  | 5655.4  | 6372.9  | 8133.6  | 10325.4 | 13676.1 | 16827.0 | 17773.1 | 18217.2 | 19105.5 | 14997.9 |
| 57.5° | 2007.8  | 2091.9  | 2541.3  | 3786.9  | 5466.2  | 8504.2  | 12853.5 | 14280.5 | 15652.3 | 18658.7 | 14937.5 |
| 60°   | 809.4   | 825.2   | 1003.9  | 1392.8  | 2296.9  | 4328.3  | 7710.5  | 8977.2  | 10270.2 | 14283.1 | 11463.3 |
| 62.5° | 588.7   | 609.7   | 680.6   | 814.7   | 1161.6  | 1892.2  | 3324.4  | 3865.8  | 4225.8  | 7074.6  | 5647.6  |
| 65°   | 475.7   | 491.4   | 549.3   | 609.7   | 767.4   | 1017.0  | 1072.2  | 1032.8  | 1027.5  | 1829.1  | 1295.6  |
| 67.5° | 394.2   | 410.0   | 452.0   | 494.1   | 551.9   | 507.2   | 367.9   | 386.3   | 315.4   | 312.7   | 254.9   |
| 70°   | 289.1   | 307.5   | 349.5   | 394.2   | 331.1   | 136.7   | 212.9   | 315.4   | 239.1   | 199.7   | 194.5   |
| 72.5° | 218.1   | 231.3   | 270.7   | 257.5   | 97.2    | 52.6    | 141.9   | 228.6   | 184.0   | 147.2   | 144.5   |
| 75°   | 162.9   | 170.8   | 136.7   | 42.0    | 10.5    | 13.1    | 52.6    | 94.6    | 102.5   | 84.1    | 84.1    |
| 77.5° | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 5.3     | 7.9     | 10.5    | 13.1    | 15.8    |
| 80°   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| 82.5° | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| 85°   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| 87.5° | 0.0     | 0.0     | 0.0     | 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 NUMBER: P643497

CATALOG NUMBER: GWS-SA6F-722-U-T2R-W-GRSBK

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 2935.5  | 2935.5 | 2935.5 | 2935.5 | 2935.5 | 2935.5 | 2935.5 | 2935.5 | 2935.5 | 2935.5 | 2935.5 |
| 2.5°  | 2995.9  | 2885.5 | 2727.9 | 2596.5 | 2496.6 | 2399.4 | 2325.8 | 2252.2 | 2249.6 | 2212.8 | 2204.9 |
| 5°    | 3122.1  | 2922.3 | 2633.2 | 2425.6 | 2299.5 | 2223.3 | 2170.7 | 2144.4 | 2131.3 | 2118.2 | 2112.9 |
| 7.5°  | 3303.4  | 3016.9 | 2617.5 | 2396.7 | 2291.6 | 2241.7 | 2204.9 | 2189.1 | 2181.2 | 2170.7 | 2168.1 |
| 10°   | 3526.8  | 3153.6 | 2675.3 | 2451.9 | 2359.9 | 2312.6 | 2273.2 | 2249.6 | 2236.4 | 2218.0 | 2212.8 |
| 12.5° | 3794.8  | 3321.8 | 2767.3 | 2543.9 | 2446.7 | 2383.6 | 2331.0 | 2296.9 | 2278.5 | 2254.8 | 2249.6 |
| 15°   | 4083.9  | 3503.1 | 2869.8 | 2628.0 | 2512.4 | 2430.9 | 2365.2 | 2312.6 | 2278.5 | 2249.6 | 2241.7 |
| 17.5° | 4383.5  | 3687.1 | 2961.7 | 2685.8 | 2543.9 | 2446.7 | 2352.1 | 2281.1 | 2239.0 | 2202.3 | 2191.7 |
| 20°   | 4719.9  | 3876.3 | 3022.2 | 2696.3 | 2533.4 | 2404.6 | 2294.2 | 2204.9 | 2162.8 | 2112.9 | 2102.4 |
| 22.5° | 5072.0  | 4052.4 | 3048.5 | 2672.7 | 2475.6 | 2325.8 | 2207.5 | 2115.5 | 2055.1 | 2002.5 | 1986.8 |
| 25°   | 5413.7  | 4210.0 | 3035.3 | 2607.0 | 2388.8 | 2215.4 | 2094.5 | 1999.9 | 1934.2 | 1881.6 | 1868.5 |
| 27.5° | 5776.3  | 4341.4 | 2988.0 | 2509.7 | 2270.6 | 2094.5 | 1978.9 | 1897.4 | 1837.0 | 1779.1 | 1766.0 |
| 30°   | 6183.7  | 4462.3 | 2911.8 | 2391.5 | 2131.3 | 1971.0 | 1881.6 | 1826.5 | 1760.8 | 1700.3 | 1681.9 |
| 32.5° | 6675.1  | 4570.1 | 2801.4 | 2249.6 | 2007.8 | 1863.2 | 1813.3 | 1771.3 | 1695.1 | 1632.0 | 1618.8 |
| 35°   | 7237.5  | 4659.4 | 2662.2 | 2102.4 | 1886.9 | 1794.9 | 1784.4 | 1729.2 | 1629.4 | 1555.8 | 1540.0 |
| 37.5° | 7889.2  | 4746.2 | 2496.6 | 1957.9 | 1797.5 | 1763.4 | 1766.0 | 1671.4 | 1550.5 | 1461.2 | 1450.7 |
| 40°   | 8590.9  | 4832.9 | 2312.6 | 1831.7 | 1716.1 | 1745.0 | 1721.3 | 1587.3 | 1390.2 | 1303.5 | 1293.0 |
| 42.5° | 9321.5  | 4927.5 | 2126.0 | 1713.4 | 1647.8 | 1674.0 | 1639.9 | 1419.1 | 1277.2 | 1232.5 | 1227.3 |
| 45°   | 9981.1  | 5040.5 | 1923.7 | 1595.2 | 1579.4 | 1571.5 | 1513.7 | 1285.1 | 1224.6 | 1193.1 | 1190.5 |
| 47.5° | 10456.8 | 5022.1 | 1708.2 | 1482.2 | 1505.8 | 1479.6 | 1303.5 | 1222.0 | 1172.1 | 1130.0 | 1119.5 |
| 50°   | 10370.1 | 4701.5 | 1484.8 | 1356.0 | 1411.2 | 1387.6 | 1172.1 | 1148.4 | 1103.8 | 1059.1 | 1043.3 |
| 52.5° | 10149.3 | 4265.2 | 1290.3 | 1222.0 | 1308.7 | 1253.6 | 1082.7 | 1059.1 | 1019.7 | 961.8  | 943.4  |
| 55°   | 10267.6 | 3855.3 | 1137.9 | 1114.3 | 1203.6 | 1038.1 | 982.9  | 946.1  | 904.0  | 841.0  | 833.1  |
| 57.5° | 9886.5  | 3145.7 | 914.5  | 930.3  | 1064.3 | 885.6  | 862.0  | 804.2  | 733.2  | 691.2  | 685.9  |
| 60°   | 6843.3  | 1689.8 | 572.9  | 591.3  | 770.0  | 743.7  | 772.6  | 720.1  | 633.3  | 593.9  | 586.0  |
| 62.5° | 3143.1  | 678.0  | 312.7  | 299.6  | 404.7  | 504.6  | 662.3  | 657.0  | 549.3  | 486.2  | 480.9  |
| 65°   | 762.1   | 310.1  | 223.4  | 210.2  | 228.6  | 302.2  | 431.0  | 517.7  | 444.1  | 370.5  | 362.7  |
| 67.5° | 247.0   | 252.3  | 205.0  | 191.8  | 202.4  | 226.0  | 257.5  | 286.5  | 283.8  | 260.2  | 254.9  |
| 70°   | 197.1   | 228.6  | 189.2  | 173.4  | 173.4  | 181.3  | 173.4  | 139.3  | 120.9  | 131.4  | 136.7  |
| 72.5° | 147.2   | 173.4  | 149.8  | 134.0  | 128.8  | 126.1  | 107.7  | 78.8   | 55.2   | 49.9   | 47.3   |
| 75°   | 86.7    | 97.2   | 92.0   | 78.8   | 73.6   | 65.7   | 52.6   | 34.2   | 18.4   | 13.1   | 7.9    |
| 77.5° | 15.8    | 18.4   | 21.0   | 15.8   | 13.1   | 10.5   | 7.9    | 2.6    | 0.0    | 0.0    | 0.0    |
| 80°   | 0.0     | 2.6    | 2.6    | 2.6    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 82.5° | 0.0     | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 85°   | 0.0     | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 87.5° | 0.0     | 0.0    | 0.0    | 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    |

LM-79-2008: Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Report Prepared for

Cooper Lighting Solutions

McGRAW-EDISON

Report Number: SP1-1908-441-10-R4

Test Date: 10/25/2019

Luminaire Tested: SA1C-722-U-5WQ

Data in this report applies to families of products SA1C-722-U-5WQ.

### Test Information

Test Method: LM-79-2008 Report  
 Number: SP1-1908-441-10-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-722-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):                  | 2237    | CRI (Ra): | 72.0 |      |       |
| CIE u':                   | 0.2876  | R1:       | 68.9 | R9:  | -17.4 |
| CIE v':                   | 0.5346  | R2:       | 83.0 | R10: | 61.3  |
| Duv:                      | -0.0006 | R3:       | 95.2 | R11: | 59.8  |
| CIE x:                    | 0.5005  | R4:       | 66.2 | R12: | 50.5  |
| CIE y:                    | 0.4134  | R5:       | 65.9 | R13: | 71.1  |
| CIE z:                    | 0.0860  | R6:       | 76.3 | R14: | 96.9  |
| Peak Wavelength (nm):     | 603     | R7:       | 76.7 |      |       |
| Dominant Wavelength (nm): | 587     | R8:       | 43.8 |      |       |
| Purity:                   | 74.5    |           |      |      |       |
| Rf:                       | 69.8    |           |      |      |       |
| Rg:                       | 99.2    |           |      |      |       |



### Test Conditions

Stabilization Time: 71M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.7/41%  
 Sphere Temperature (°C): 25.6

REPORT NUMBER: SP1-1908-441-10-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: SP1-1908-441-10-R4

**CIE 1931 Chromaticity Diagram**



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



Point lies inside the ANSI 2200K 4-step quadrangle

REPORT NUMBER: SP1-1908-441-10-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       | 1768             | NR               | 490       | 5206             | NR               | 620       | 130919           | NR               | 750       | 8553             | NR               | 880       | 2713             | NR               |
| 365       | 1569             | NR               | 495       | 7286             | NR               | 625       | 125335           | NR               | 755       | 7696             | NR               | 885       | 2316             | NR               |
| 370       | 1594             | NR               | 500       | 10654            | NR               | 630       | 118388           | NR               | 760       | 6978             | NR               | 890       | 2539             | NR               |
| 375       | 1744             | NR               | 505       | 15189            | NR               | 635       | 111855           | NR               | 765       | 6377             | NR               | 895       | 1933             | NR               |
| 380       | 1659             | NR               | 510       | 20541            | NR               | 640       | 104062           | NR               | 770       | 5600             | NR               | 900       | 2216             | NR               |
| 385       | 1504             | NR               | 515       | 26492            | NR               | 645       | 96365            | NR               | 775       | 5000             | NR               | 905       | 2067             | NR               |
| 390       | 1541             | NR               | 520       | 32294            | NR               | 650       | 88651            | NR               | 780       | 4709             | NR               | 910       | 1959             | NR               |
| 395       | 1355             | NR               | 525       | 38123            | NR               | 655       | 81152            | NR               | 785       | 4305             | NR               | 915       | 1874             | NR               |
| 400       | 1243             | NR               | 530       | 43232            | NR               | 660       | 73523            | NR               | 790       | 4040             | NR               | 920       | 1484             | NR               |
| 405       | 1417             | NR               | 535       | 48012            | NR               | 665       | 66123            | NR               | 795       | 3642             | NR               | 925       | 1914             | NR               |
| 410       | 2147             | NR               | 540       | 52623            | NR               | 670       | 58677            | NR               | 800       | 3594             | NR               | 930       | 1948             | NR               |
| 415       | 3837             | NR               | 545       | 57516            | NR               | 675       | 52349            | NR               | 805       | 3190             | NR               | 935       | 2079             | NR               |
| 420       | 7159             | NR               | 550       | 62613            | NR               | 680       | 46159            | NR               | 810       | 3241             | NR               | 940       | 2263             | NR               |
| 425       | 12599            | NR               | 555       | 68554            | NR               | 685       | 40525            | NR               | 815       | 2732             | NR               | 945       | 1688             | NR               |
| 430       | 19019            | NR               | 560       | 75325            | NR               | 690       | 35615            | NR               | 820       | 2612             | NR               | 950       | 1560             | NR               |
| 435       | 24875            | NR               | 565       | 82533            | NR               | 695       | 31158            | NR               | 825       | 2966             | NR               | 955       | 2826             | NR               |
| 440       | 29103            | NR               | 570       | 90909            | NR               | 700       | 27409            | NR               | 830       | 2574             | NR               | 960       | 1477             | NR               |
| 445       | 29901            | NR               | 575       | 99621            | NR               | 705       | 24204            | NR               | 835       | 2633             | NR               | 965       | 1568             | NR               |
| 450       | 24862            | NR               | 580       | 108484           | NR               | 710       | 21558            | NR               | 840       | 2526             | NR               | 970       | 2030             | NR               |
| 455       | 15942            | NR               | 585       | 116679           | NR               | 715       | 19222            | NR               | 845       | 2631             | NR               | 975       | 1986             | NR               |
| 460       | 9916             | NR               | 590       | 123752           | NR               | 720       | 17310            | NR               | 850       | 2079             | NR               | 980       | 2540             | NR               |
| 465       | 7051             | NR               | 595       | 129324           | NR               | 725       | 15280            | NR               | 855       | 2309             | NR               | 985       | 1139             | NR               |
| 470       | 5227             | NR               | 600       | 134082           | NR               | 730       | 13282            | NR               | 860       | 2528             | NR               | 990       | 2018             | NR               |
| 475       | 4257             | NR               | 605       | 135698           | NR               | 735       | 11753            | NR               | 865       | 2121             | NR               | 995       | 3445             | NR               |
| 480       | 4052             | NR               | 610       | 135144           | NR               | 740       | 10654            | NR               | 870       | 2751             | NR               | 1000      | 3704             | NR               |
| 485       | 4298             | NR               | 615       | 134180           | NR               | 745       | 9451             | NR               | 875       | 2317             | NR               |           |                  |                  |

REPORT NUMBER: SP1-1908-441-10-R4

Scotopic Flux vs. Wavelength



Scotopic Lumens: 4696.9

S/P: 0.85

| 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       | 1768             | NR               | 490       | 5206             | NR               | 620       | 130919           | NR               | 750       | 8553             | NR               | 880       | 2713             | NR               |
| 365       | 1569             | NR               | 495       | 7286             | NR               | 625       | 125335           | NR               | 755       | 7696             | NR               | 885       | 2316             | NR               |
| 370       | 1594             | NR               | 500       | 10654            | NR               | 630       | 118388           | NR               | 760       | 6978             | NR               | 890       | 2539             | NR               |
| 375       | 1744             | NR               | 505       | 15189            | NR               | 635       | 111855           | NR               | 765       | 6377             | NR               | 895       | 1933             | NR               |
| 380       | 1659             | NR               | 510       | 20541            | NR               | 640       | 104062           | NR               | 770       | 5600             | NR               | 900       | 2216             | NR               |
| 385       | 1504             | NR               | 515       | 26492            | NR               | 645       | 96365            | NR               | 775       | 5000             | NR               | 905       | 2067             | NR               |
| 390       | 1541             | NR               | 520       | 32294            | NR               | 650       | 88651            | NR               | 780       | 4709             | NR               | 910       | 1959             | NR               |
| 395       | 1355             | NR               | 525       | 38123            | NR               | 655       | 81152            | NR               | 785       | 4305             | NR               | 915       | 1874             | NR               |
| 400       | 1243             | NR               | 530       | 43232            | NR               | 660       | 73523            | NR               | 790       | 4040             | NR               | 920       | 1484             | NR               |
| 405       | 1417             | NR               | 535       | 48012            | NR               | 665       | 66123            | NR               | 795       | 3642             | NR               | 925       | 1914             | NR               |
| 410       | 2147             | NR               | 540       | 52623            | NR               | 670       | 58677            | NR               | 800       | 3594             | NR               | 930       | 1948             | NR               |
| 415       | 3837             | NR               | 545       | 57516            | NR               | 675       | 52349            | NR               | 805       | 3190             | NR               | 935       | 2079             | NR               |
| 420       | 7159             | NR               | 550       | 62613            | NR               | 680       | 46159            | NR               | 810       | 3241             | NR               | 940       | 2263             | NR               |
| 425       | 12599            | NR               | 555       | 68554            | NR               | 685       | 40525            | NR               | 815       | 2732             | NR               | 945       | 1688             | NR               |
| 430       | 19019            | NR               | 560       | 75325            | NR               | 690       | 35615            | NR               | 820       | 2612             | NR               | 950       | 1560             | NR               |
| 435       | 24875            | NR               | 565       | 82533            | NR               | 695       | 31158            | NR               | 825       | 2966             | NR               | 955       | 2826             | NR               |
| 440       | 29103            | NR               | 570       | 90909            | NR               | 700       | 27409            | NR               | 830       | 2574             | NR               | 960       | 1477             | NR               |
| 445       | 29901            | NR               | 575       | 99621            | NR               | 705       | 24204            | NR               | 835       | 2633             | NR               | 965       | 1568             | NR               |
| 450       | 24862            | NR               | 580       | 108484           | NR               | 710       | 21558            | NR               | 840       | 2526             | NR               | 970       | 2030             | NR               |
| 455       | 15942            | NR               | 585       | 116679           | NR               | 715       | 19222            | NR               | 845       | 2631             | NR               | 975       | 1986             | NR               |
| 460       | 9916             | NR               | 590       | 123752           | NR               | 720       | 17310            | NR               | 850       | 2079             | NR               | 980       | 2540             | NR               |
| 465       | 7051             | NR               | 595       | 129324           | NR               | 725       | 15280            | NR               | 855       | 2309             | NR               | 985       | 1139             | NR               |
| 470       | 5227             | NR               | 600       | 134082           | NR               | 730       | 13282            | NR               | 860       | 2528             | NR               | 990       | 2018             | NR               |
| 475       | 4257             | NR               | 605       | 135698           | NR               | 735       | 11753            | NR               | 865       | 2121             | NR               | 995       | 3445             | NR               |
| 480       | 4052             | NR               | 610       | 135144           | NR               | 740       | 10654            | NR               | 870       | 2751             | NR               | 1000      | 3704             | NR               |
| 485       | 4298             | NR               | 615       | 134180           | NR               | 745       | 9451             | NR               | 875       | 2317             | NR               |           |                  |                  |

REPORT NUMBER: SP1-1908-441-10-R4

**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 1470.8 M/P: 0.27**

| 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       | 1768             | NR               | 490       | 5206             | NR               | 620       | 130919           | NR               | 750       | 8553             | NR               | 880       | 2713             | NR               |
| 365       | 1569             | NR               | 495       | 7286             | NR               | 625       | 125335           | NR               | 755       | 7696             | NR               | 885       | 2316             | NR               |
| 370       | 1594             | NR               | 500       | 10654            | NR               | 630       | 118388           | NR               | 760       | 6978             | NR               | 890       | 2539             | NR               |
| 375       | 1744             | NR               | 505       | 15189            | NR               | 635       | 111855           | NR               | 765       | 6377             | NR               | 895       | 1933             | NR               |
| 380       | 1659             | NR               | 510       | 20541            | NR               | 640       | 104062           | NR               | 770       | 5600             | NR               | 900       | 2216             | NR               |
| 385       | 1504             | NR               | 515       | 26492            | NR               | 645       | 96365            | NR               | 775       | 5000             | NR               | 905       | 2067             | NR               |
| 390       | 1541             | NR               | 520       | 32294            | NR               | 650       | 88651            | NR               | 780       | 4709             | NR               | 910       | 1959             | NR               |
| 395       | 1355             | NR               | 525       | 38123            | NR               | 655       | 81152            | NR               | 785       | 4305             | NR               | 915       | 1874             | NR               |
| 400       | 1243             | NR               | 530       | 43232            | NR               | 660       | 73523            | NR               | 790       | 4040             | NR               | 920       | 1484             | NR               |
| 405       | 1417             | NR               | 535       | 48012            | NR               | 665       | 66123            | NR               | 795       | 3642             | NR               | 925       | 1914             | NR               |
| 410       | 2147             | NR               | 540       | 52623            | NR               | 670       | 58677            | NR               | 800       | 3594             | NR               | 930       | 1948             | NR               |
| 415       | 3837             | NR               | 545       | 57516            | NR               | 675       | 52349            | NR               | 805       | 3190             | NR               | 935       | 2079             | NR               |
| 420       | 7159             | NR               | 550       | 62613            | NR               | 680       | 46159            | NR               | 810       | 3241             | NR               | 940       | 2263             | NR               |
| 425       | 12599            | NR               | 555       | 68554            | NR               | 685       | 40525            | NR               | 815       | 2732             | NR               | 945       | 1688             | NR               |
| 430       | 19019            | NR               | 560       | 75325            | NR               | 690       | 35615            | NR               | 820       | 2612             | NR               | 950       | 1560             | NR               |
| 435       | 24875            | NR               | 565       | 82533            | NR               | 695       | 31158            | NR               | 825       | 2966             | NR               | 955       | 2826             | NR               |
| 440       | 29103            | NR               | 570       | 90909            | NR               | 700       | 27409            | NR               | 830       | 2574             | NR               | 960       | 1477             | NR               |
| 445       | 29901            | NR               | 575       | 99621            | NR               | 705       | 24204            | NR               | 835       | 2633             | NR               | 965       | 1568             | NR               |
| 450       | 24862            | NR               | 580       | 108484           | NR               | 710       | 21558            | NR               | 840       | 2526             | NR               | 970       | 2030             | NR               |
| 455       | 15942            | NR               | 585       | 116679           | NR               | 715       | 19222            | NR               | 845       | 2631             | NR               | 975       | 1986             | NR               |
| 460       | 9916             | NR               | 590       | 123752           | NR               | 720       | 17310            | NR               | 850       | 2079             | NR               | 980       | 2540             | NR               |
| 465       | 7051             | NR               | 595       | 129324           | NR               | 725       | 15280            | NR               | 855       | 2309             | NR               | 985       | 1139             | NR               |
| 470       | 5227             | NR               | 600       | 134082           | NR               | 730       | 13282            | NR               | 860       | 2528             | NR               | 990       | 2018             | NR               |
| 475       | 4257             | NR               | 605       | 135698           | NR               | 735       | 11753            | NR               | 865       | 2121             | NR               | 995       | 3445             | NR               |
| 480       | 4052             | NR               | 610       | 135144           | NR               | 740       | 10654            | NR               | 870       | 2751             | NR               | 1000      | 3704             | NR               |
| 485       | 4298             | NR               | 615       | 134180           | NR               | 745       | 9451             | NR               | 875       | 2317             | NR               |           |                  |                  |

REPORT NUMBER: SP1-1908-441-10-R4

**TM-30-18**

### Summary

$R_f = 69.8$   
 $R_g = 99.2$   
 CIE  $R_a = 72.0$   
 $R_g = -17.4$



### Color Vector Graphics



REPORT NUMBER: SP1-1908-441-10-R4

**TM-30-18**

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

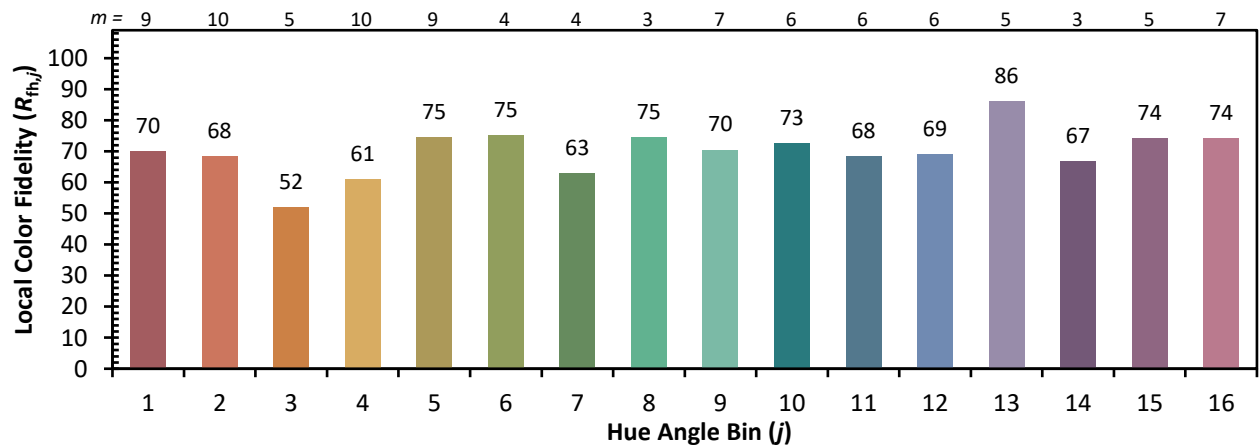
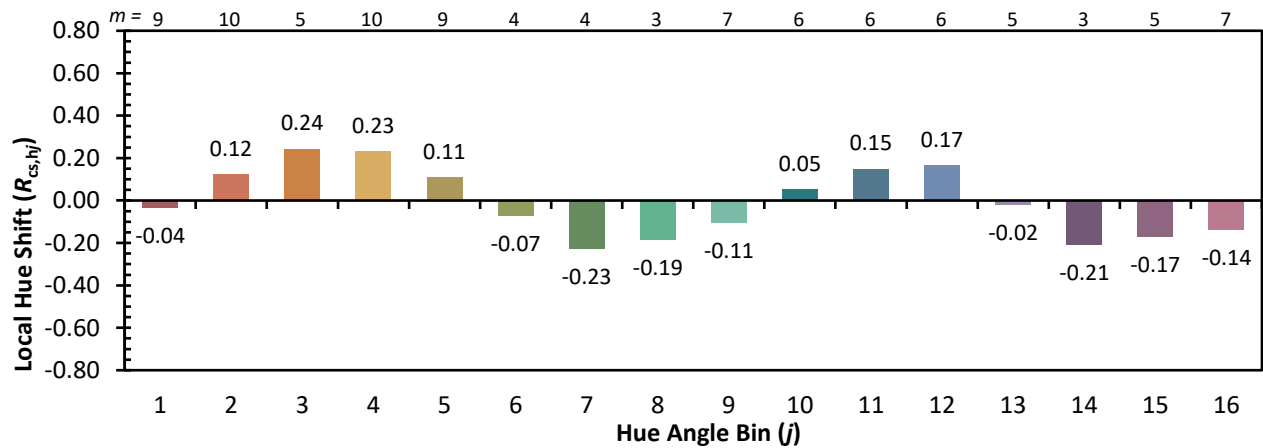
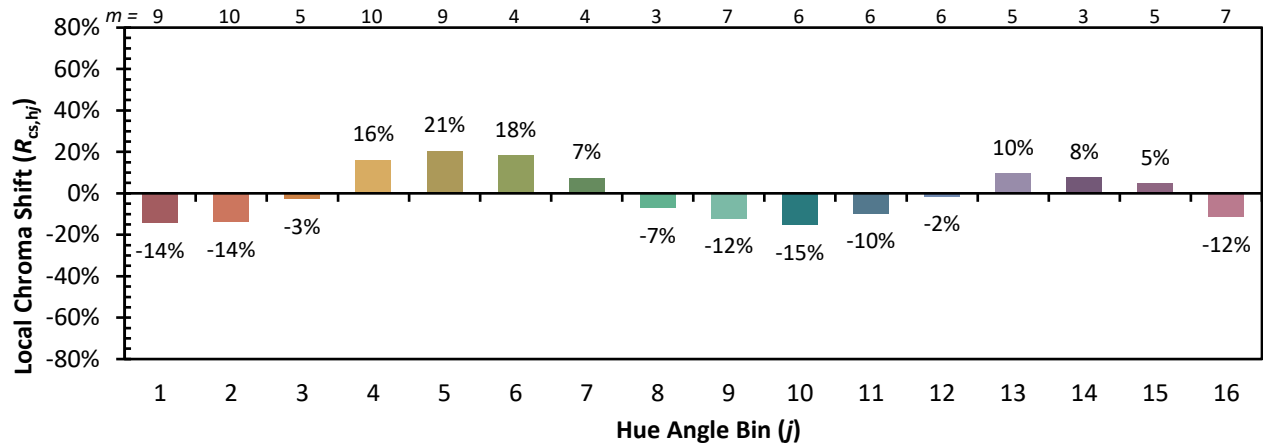
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 87 | CES26 = 56 | CES51 = 74 | CES76 = 56 |
| CES02 = 65 | CES27 = 76 | CES52 = 76 | CES77 = 81 |
| CES03 = 32 | CES28 = 83 | CES53 = 65 | CES78 = 63 |
| CES04 = 72 | CES29 = 46 | CES54 = 78 | CES79 = 84 |
| CES05 = 52 | CES30 = 48 | CES55 = 75 | CES80 = 84 |
| CES06 = 52 | CES31 = 51 | CES56 = 65 | CES81 = 63 |
| CES07 = 44 | CES32 = 51 | CES57 = 62 | CES82 = 92 |
| CES08 = 42 | CES33 = 53 | CES58 = 66 | CES83 = 83 |
| CES09 = 29 | CES34 = 70 | CES59 = 84 | CES84 = 92 |
| CES10 = 78 | CES35 = 85 | CES60 = 90 | CES85 = 81 |
| CES11 = 61 | CES36 = 78 | CES61 = 84 | CES86 = 56 |
| CES12 = 68 | CES37 = 80 | CES62 = 70 | CES87 = 78 |
| CES13 = 45 | CES38 = 53 | CES63 = 68 | CES88 = 72 |
| CES14 = 75 | CES39 = 90 | CES64 = 69 | CES89 = 62 |
| CES15 = 72 | CES40 = 84 | CES65 = 67 | CES90 = 67 |
| CES16 = 49 | CES41 = 75 | CES66 = 64 | CES91 = 90 |
| CES17 = 51 | CES42 = 79 | CES67 = 63 | CES92 = 67 |
| CES18 = 57 | CES43 = 64 | CES68 = 69 | CES93 = 79 |
| CES19 = 74 | CES44 = 98 | CES69 = 80 | CES94 = 52 |
| CES20 = 68 | CES45 = 73 | CES70 = 63 | CES95 = 76 |
| CES21 = 89 | CES46 = 67 | CES71 = 63 | CES96 = 78 |
| CES22 = 81 | CES47 = 60 | CES72 = 87 | CES97 = 77 |
| CES23 = 92 | CES48 = 48 | CES73 = 56 | CES98 = 71 |
| CES24 = 92 | CES49 = 64 | CES74 = 87 | CES99 = 65 |
| CES25 = 74 | CES50 = 74 | CES75 = 66 |            |



REPORT NUMBER: SP1-1908-441-10-R4

**TM-30-18**

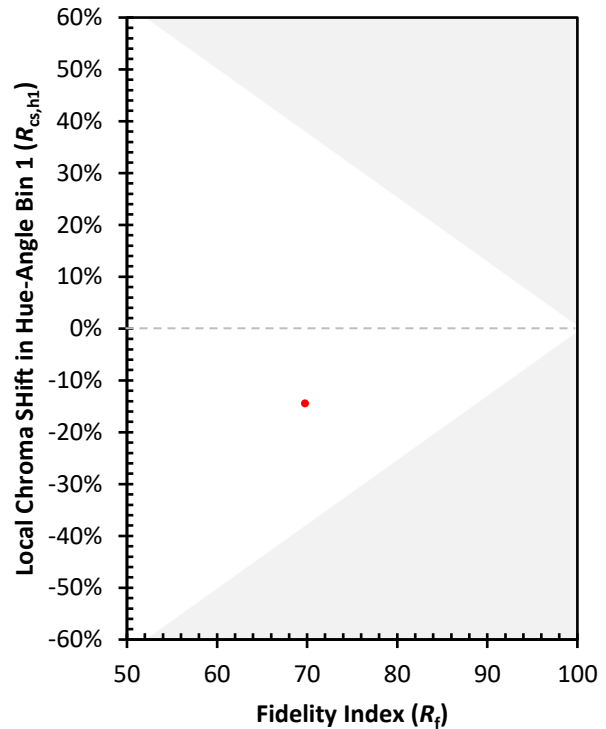
Color Rendition by Hue-Angle Bin



REPORT NUMBER: SP1-1908-441-10-R4

**TM-30-18**

**Measure Comparisons**



(END OF REPORT)