

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: P640500

Luminaire Tested: GWS-SA5E-722-U-AFL-W

Issue Date: 1/10/2023

### Test Information

Test Method: LM-79-2019  
Report Number: P640500  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-45)  
Test Lab: COOPER LIGHTING SOLUTIONS  
Issue Date: 1/10/2023  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: McGRAW-EDISON  
Catalog Number: GWS-SA5E-722-U-AFL-W  
Description: GALLEON WALL SLIM LUMINAIRE. (5) LIGHTSQUARES WITH 16 LEDS EACH AND  
AUTOMOTIVE FRONTLINE OPTICS  
Light Source: (80) 2200K CCT, 70 CRI LEDS  
Ballast/Driver: -

### Summary

Lumens per Lamp: N/A  
Luminaire Lumens: 28158.7 lumens  
Efficiency: N/A  
Efficacy: 104.4 lumens/watt  
Luminous Opening: Rectangular (W 1.5' x L: 1' x H: 0')  
IES Classification: Type II - Short  
BUG Rating: B3 - U0 - G2

Input Watts (W): 269.6  
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



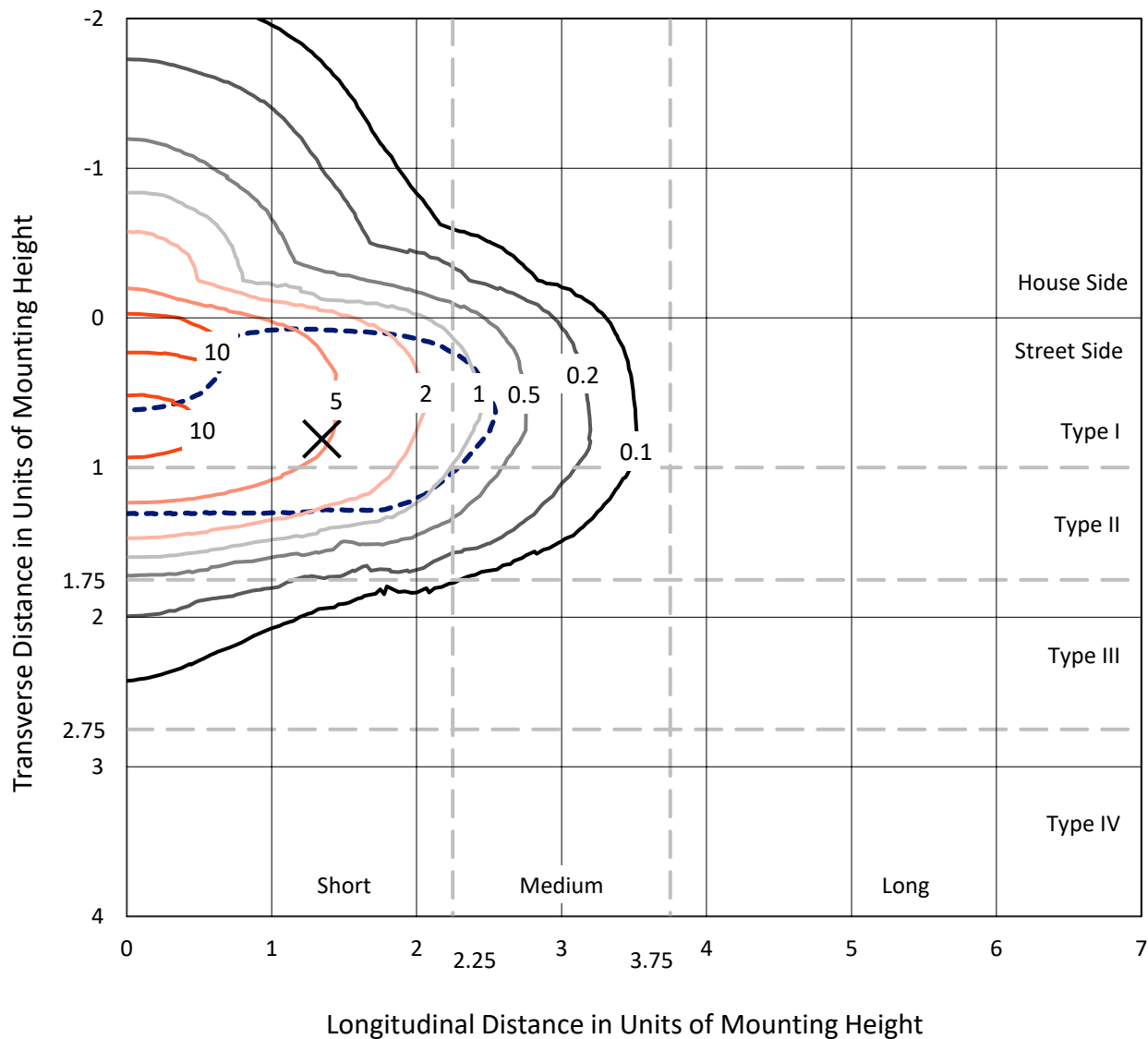
REPORT NUMBER: P640500

CATALOG NUMBER: GWS-SA5E-722-U-AFL-W

## Iso-Footcandle Lines of Horizontal Illumination

✕ Max cd

--- 1/2 Max cd

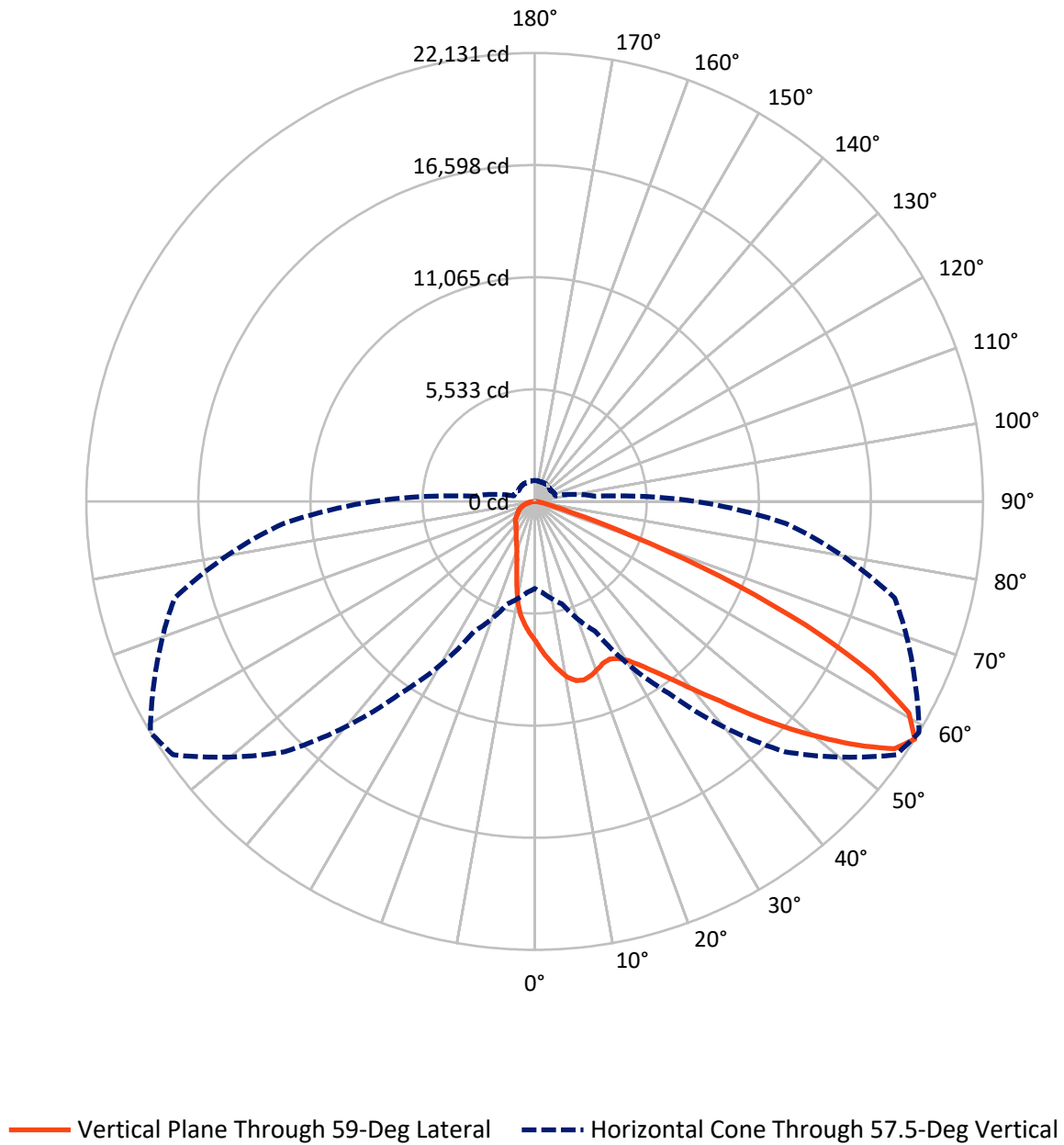


Based on 25 foot mounting height. Maximum calculated value = 13.5 fc  
 Type II - Short - N/A

REPORT NUMBER: P640500

CATALOG NUMBER: GWS-SA5E-722-U-AFL-W

## Luminous Intensity Polar Plot



REPORT NUMBER: P640500

CATALOG NUMBER: GWS-SA5E-722-U-AFL-W

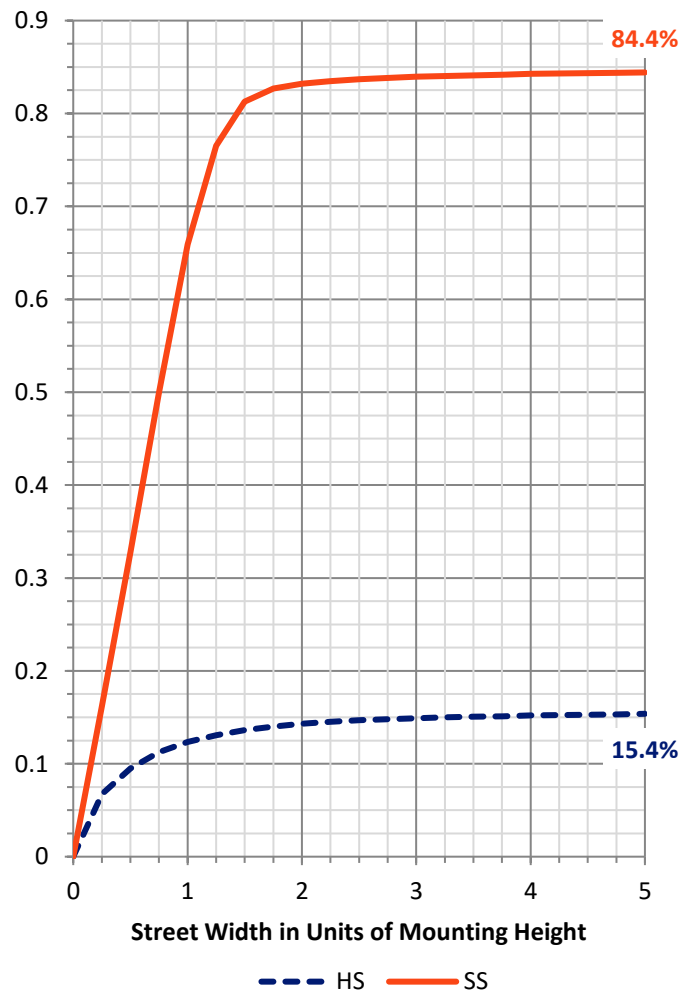
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 4370.1   | 0.0    | 4370.1  |
|                    | % Fixture | 15.5     | 0.0    | 15.5    |
| <b>Street Side</b> | Lumens    | 23788.6  | 0.0    | 23788.6 |
|                    | % Fixture | 84.5     | 0.0    | 84.5    |
| <b>Total</b>       | Lumens    | 28158.7  | 0.0    | 28158.7 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 641.8   | 2.3       |
| 10°-20°   | 1626.4  | 5.8       |
| 20°-30°   | 2636.4  | 9.4       |
| 30°-40°   | 4241.0  | 15.1      |
| 40°-50°   | 6585.9  | 23.4      |
| 50°-60°   | 7093.9  | 25.2      |
| 60°-70°   | 4117.0  | 14.6      |
| 70°-80°   | 1074.8  | 3.8       |
| 80°-90°   | 141.6   | 0.5       |
| 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°    | 28158.7 | 100.0     |
| 0°-180°   | 28158.7 | 100.0     |

**Coefficient of Utilization**



REPORT NUMBER: P640500

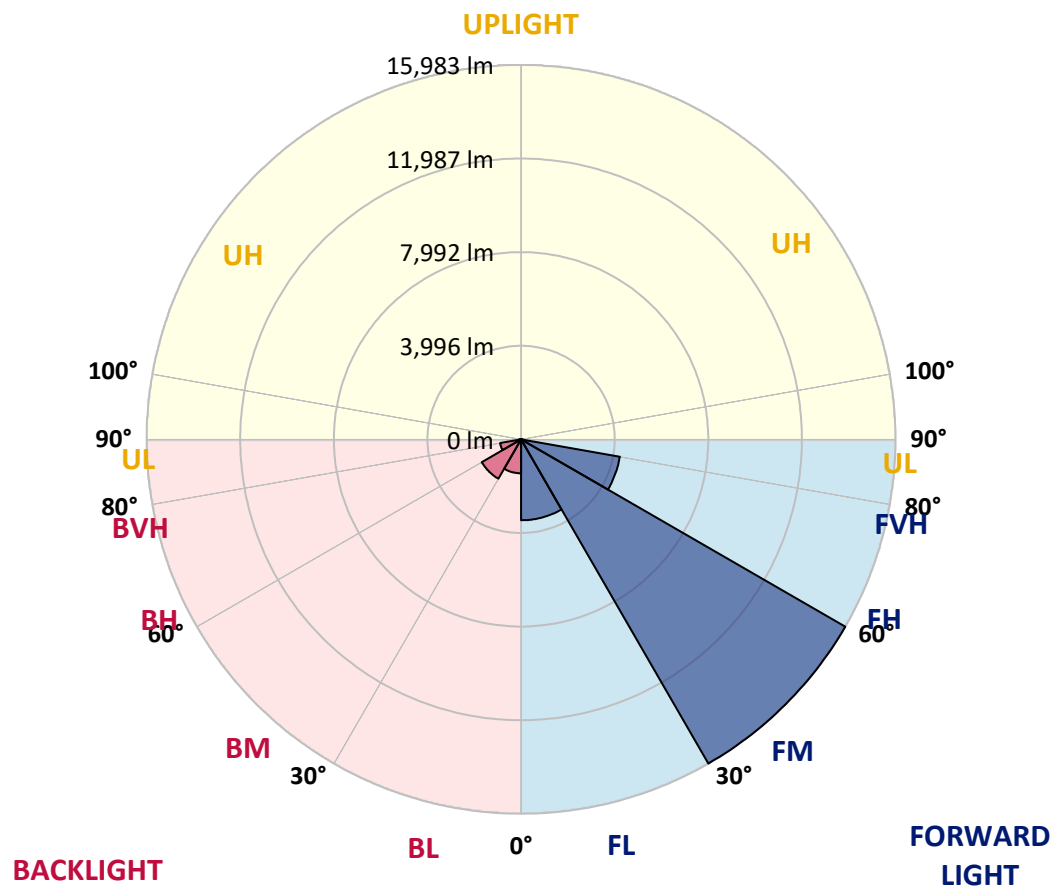
CATALOG NUMBER: GWS-SA5E-722-U-AFL-W

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|---------|-----------|-------------------------|------|---------|
|      |             |         |           | B                       | U    | G       |
| FL   | (0°-30°)    | 3454.8  | 12.3      |                         |      |         |
| FM   | (30°-60°)   | 15983.2 | 56.8      |                         |      |         |
| FH   | (60°-80°)   | 4282.8  | 15.2      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 67.8    | 0.2       |                         |      | G1/100  |
| BL   | (0°-30°)    | 1449.8  | 5.1       | B3/2500                 |      |         |
| BM   | (30°-60°)   | 1937.5  | 6.9       | B2/2500                 |      |         |
| BH   | (60°-80°)   | 909.0   | 3.2       | B2/1000                 |      | G2/1000 |
| BVH  | (80°-90°)   | 73.8    | 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-G2**

Type II Short



REPORT NUMBER: P640500

CATALOG NUMBER: GWS-SA5E-722-U-AFL-W

**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 55°     | 59°     | 65°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 6912.4  | 6912.4  | 6912.4  | 6912.4  | 6912.4  | 6912.4  | 6912.4  | 6912.4  | 6912.4  | 6912.4  | 6912.4  |
| 2.5°  | 7840.1  | 7774.7  | 7820.3  | 7739.0  | 7705.3  | 7616.1  | 7501.2  | 7423.8  | 7304.9  | 7150.3  | 7015.5  |
| 5°    | 8619.2  | 8573.6  | 8583.5  | 8496.3  | 8419.0  | 8270.3  | 8034.4  | 7903.6  | 7701.4  | 7390.1  | 7100.7  |
| 7.5°  | 8595.4  | 8648.9  | 8678.7  | 8754.0  | 8775.8  | 8761.9  | 8549.8  | 8367.4  | 8145.4  | 7677.6  | 7241.5  |
| 10°   | 7705.3  | 7806.4  | 7897.6  | 8155.3  | 8468.5  | 8865.0  | 8914.6  | 8805.5  | 8581.5  | 8044.3  | 7410.0  |
| 12.5° | 6736.0  | 6813.3  | 6894.6  | 7203.8  | 7683.5  | 8476.5  | 9013.7  | 9081.1  | 8991.9  | 8407.1  | 7600.3  |
| 15°   | 6260.2  | 6295.9  | 6373.2  | 6577.4  | 6960.0  | 7840.1  | 8841.2  | 9136.6  | 9297.1  | 8791.7  | 7814.4  |
| 17.5° | 6240.4  | 6256.2  | 6293.9  | 6402.9  | 6668.6  | 7348.5  | 8530.0  | 9025.6  | 9537.0  | 9198.0  | 8064.1  |
| 20°   | 6650.7  | 6609.1  | 6585.3  | 6583.3  | 6714.2  | 7184.0  | 8228.7  | 8847.2  | 9650.0  | 9614.3  | 8331.7  |
| 22.5° | 7219.7  | 7233.5  | 7182.0  | 7055.1  | 7039.3  | 7300.9  | 8078.0  | 8666.8  | 9683.7  | 9983.0  | 8579.5  |
| 25°   | 8026.5  | 8095.9  | 7943.2  | 7701.4  | 7582.4  | 7639.9  | 8171.2  | 8611.3  | 9679.7  | 10290.3 | 8734.2  |
| 27.5° | 8968.1  | 9021.6  | 8867.0  | 8549.8  | 8304.0  | 8165.2  | 8448.7  | 8775.8  | 9713.4  | 10555.9 | 8827.3  |
| 30°   | 10040.5 | 10058.4 | 9846.3  | 9513.2  | 9154.4  | 8857.1  | 8910.6  | 9114.8  | 9885.9  | 10904.8 | 8936.4  |
| 32.5° | 11350.8 | 11426.2 | 11105.0 | 10577.7 | 10076.2 | 9695.6  | 9531.1  | 9661.9  | 10258.6 | 11317.1 | 9104.9  |
| 35°   | 13014.0 | 13039.8 | 12631.4 | 11876.2 | 11166.5 | 10639.2 | 10294.3 | 10363.6 | 10825.5 | 11894.0 | 9358.6  |
| 37.5° | 14582.0 | 14607.8 | 14173.7 | 13471.9 | 12457.0 | 11735.4 | 11235.9 | 11204.2 | 11551.1 | 12708.7 | 9772.9  |
| 40°   | 15577.2 | 15650.5 | 15456.3 | 15016.2 | 14046.8 | 13073.5 | 12395.5 | 12286.5 | 12502.6 | 13705.9 | 10349.8 |
| 42.5° | 16112.4 | 16144.1 | 16140.2 | 16197.6 | 15620.8 | 14653.4 | 13703.9 | 13485.8 | 13630.5 | 14782.3 | 10932.6 |
| 45°   | 16116.4 | 16195.7 | 16407.8 | 16960.8 | 16986.6 | 16384.0 | 15357.1 | 15016.2 | 14883.4 | 15866.6 | 11541.1 |
| 47.5° | 15394.8 | 15480.0 | 16062.9 | 17151.2 | 17954.0 | 18090.8 | 17337.5 | 16653.6 | 16094.6 | 16800.3 | 12040.7 |
| 50°   | 13210.3 | 13424.4 | 14534.5 | 16459.3 | 18144.3 | 19458.6 | 19226.7 | 18298.9 | 17171.0 | 17521.8 | 12353.9 |
| 52.5° | 11313.2 | 11305.2 | 11989.2 | 14504.7 | 17349.4 | 20061.2 | 21054.4 | 19991.8 | 18235.5 | 17979.8 | 12433.2 |
| 55°   | 8284.2  | 8329.8  | 9029.5  | 11093.1 | 15228.3 | 19478.4 | 22059.4 | 21550.0 | 19456.6 | 18223.6 | 12401.5 |
| 57.5° | 4295.7  | 4521.7  | 5239.3  | 7078.9  | 11570.9 | 17472.3 | 21791.8 | 22130.8 | 20697.5 | 18396.1 | 12443.1 |
| 60°   | 2170.7  | 2127.0  | 2384.7  | 3379.9  | 6704.3  | 13646.4 | 20142.5 | 21222.9 | 20921.6 | 18530.9 | 12468.9 |
| 62.5° | 1449.1  | 1437.2  | 1365.8  | 1566.0  | 2739.6  | 8082.0  | 17171.0 | 18685.5 | 19365.4 | 18213.7 | 12139.8 |
| 65°   | 1254.8  | 1231.0  | 1100.2  | 1092.3  | 1330.1  | 3352.1  | 12585.8 | 14689.1 | 16005.4 | 16804.2 | 11352.8 |
| 67.5° | 1129.9  | 1094.2  | 961.4   | 896.0   | 955.5   | 1472.9  | 7092.8  | 9852.2  | 11818.7 | 14211.4 | 9628.2  |
| 70°   | 1009.0  | 991.2   | 858.4   | 763.2   | 757.3   | 898.0   | 2612.7  | 5084.7  | 7231.6  | 9695.6  | 7039.3  |
| 72.5° | 903.9   | 872.2   | 759.2   | 668.0   | 622.5   | 636.3   | 1133.9  | 1958.5  | 3742.6  | 6048.1  | 4210.5  |
| 75°   | 783.0   | 759.2   | 660.1   | 568.9   | 513.4   | 465.8   | 691.8   | 905.9   | 1706.8  | 2874.4  | 1988.3  |
| 77.5° | 604.6   | 588.8   | 521.4   | 452.0   | 420.3   | 346.9   | 420.3   | 570.9   | 789.0   | 1211.2  | 1034.8  |
| 80°   | 350.9   | 360.8   | 388.5   | 352.9   | 309.2   | 247.8   | 273.6   | 329.1   | 473.8   | 656.2   | 586.8   |
| 82.5° | 176.4   | 188.3   | 251.8   | 204.2   | 184.4   | 144.7   | 162.6   | 194.3   | 247.8   | 362.8   | 230.0   |
| 85°   | 13.9    | 13.9    | 45.6    | 51.5    | 63.4    | 51.5    | 65.4    | 79.3    | 113.0   | 144.7   | 77.3    |
| 87.5° | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 5.9     | 9.9     | 17.8    | 33.7    | 21.8    |
| 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: P640500

CATALOG NUMBER: GWS-SA5E-722-U-AFL-W

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 6912.4 | 6912.4 | 6912.4 | 6912.4 | 6912.4 | 6912.4 | 6912.4 | 6912.4 | 6912.4 | 6912.4 | 6912.4 |
| 2.5°  | 6924.3 | 6823.2 | 6702.3 | 6603.2 | 6450.5 | 6369.2 | 6266.2 | 6139.3 | 6087.7 | 6064.0 | 6050.1 |
| 5°    | 6938.2 | 6759.8 | 6502.1 | 6264.2 | 6000.5 | 5792.4 | 5560.4 | 5318.6 | 5179.8 | 5146.1 | 5122.4 |
| 7.5°  | 6989.7 | 6739.9 | 6329.6 | 5937.1 | 5447.5 | 4993.5 | 4551.4 | 4113.3 | 3889.3 | 3804.1 | 3796.2 |
| 10°   | 7061.1 | 6732.0 | 6155.1 | 5503.0 | 4676.3 | 3958.7 | 3441.3 | 3098.4 | 2953.7 | 2906.1 | 2890.2 |
| 12.5° | 7150.3 | 6726.1 | 5925.2 | 4900.3 | 3786.3 | 3108.3 | 2812.9 | 2757.4 | 2777.2 | 2773.3 | 2773.3 |
| 15°   | 7263.3 | 6734.0 | 5647.7 | 4218.4 | 3062.7 | 2698.0 | 2703.9 | 2769.3 | 2830.8 | 2840.7 | 2840.7 |
| 17.5° | 7386.2 | 6726.1 | 5245.3 | 3534.5 | 2628.6 | 2600.8 | 2692.0 | 2783.2 | 2838.7 | 2846.6 | 2846.6 |
| 20°   | 7519.0 | 6688.4 | 4737.8 | 2890.2 | 2438.3 | 2539.4 | 2638.5 | 2709.9 | 2743.5 | 2751.5 | 2751.5 |
| 22.5° | 7598.3 | 6581.3 | 4186.7 | 2446.2 | 2317.3 | 2442.2 | 2507.7 | 2581.0 | 2585.0 | 2521.5 | 2519.5 |
| 25°   | 7586.4 | 6381.1 | 3558.3 | 2160.7 | 2188.5 | 2297.5 | 2380.8 | 2329.2 | 2265.8 | 2230.1 | 2224.2 |
| 27.5° | 7511.1 | 6079.8 | 2918.0 | 1944.7 | 2035.9 | 2158.8 | 2133.0 | 2089.4 | 2073.5 | 2033.9 | 2029.9 |
| 30°   | 7415.9 | 5709.1 | 2343.1 | 1776.2 | 1877.3 | 1990.3 | 1950.6 | 1946.7 | 1930.8 | 1887.2 | 1887.2 |
| 32.5° | 7324.7 | 5326.5 | 1909.0 | 1651.3 | 1776.2 | 1784.1 | 1839.6 | 1843.6 | 1835.6 | 1760.3 | 1752.4 |
| 35°   | 7299.0 | 4943.9 | 1615.6 | 1552.2 | 1677.1 | 1673.1 | 1752.4 | 1750.4 | 1613.6 | 1508.6 | 1506.6 |
| 37.5° | 7376.3 | 4555.4 | 1441.2 | 1470.9 | 1540.3 | 1591.8 | 1655.2 | 1540.3 | 1494.7 | 1431.2 | 1427.3 |
| 40°   | 7540.8 | 4196.6 | 1352.0 | 1423.3 | 1453.1 | 1528.4 | 1429.3 | 1437.2 | 1425.3 | 1377.7 | 1371.8 |
| 42.5° | 7758.9 | 3891.3 | 1302.4 | 1407.5 | 1403.5 | 1423.3 | 1314.3 | 1346.0 | 1363.8 | 1328.2 | 1322.2 |
| 45°   | 7969.0 | 3625.7 | 1276.6 | 1348.0 | 1367.8 | 1252.8 | 1231.0 | 1260.8 | 1288.5 | 1274.6 | 1268.7 |
| 47.5° | 8123.6 | 3395.7 | 1262.7 | 1266.7 | 1322.2 | 1195.3 | 1159.7 | 1173.5 | 1207.2 | 1213.2 | 1211.2 |
| 50°   | 8171.2 | 3199.5 | 1246.9 | 1199.3 | 1187.4 | 1137.9 | 1110.1 | 1106.1 | 1145.8 | 1173.5 | 1177.5 |
| 52.5° | 8080.0 | 3025.0 | 1205.3 | 1139.8 | 1082.4 | 1090.3 | 1080.4 | 1060.5 | 1100.2 | 1137.9 | 1141.8 |
| 55°   | 7945.2 | 2925.9 | 1139.8 | 1082.4 | 1015.0 | 1046.7 | 1050.6 | 1032.8 | 1058.6 | 1084.3 | 1084.3 |
| 57.5° | 7955.1 | 2983.4 | 1076.4 | 1028.8 | 955.5  | 997.1  | 1018.9 | 1011.0 | 1011.0 | 1030.8 | 1032.8 |
| 60°   | 8020.5 | 3066.7 | 1034.8 | 961.4  | 896.0  | 939.6  | 989.2  | 981.3  | 963.4  | 989.2  | 989.2  |
| 62.5° | 7832.2 | 2955.7 | 1007.0 | 896.0  | 832.6  | 884.1  | 943.6  | 939.6  | 919.8  | 961.4  | 965.4  |
| 65°   | 7277.1 | 2658.3 | 975.3  | 814.7  | 769.1  | 828.6  | 880.2  | 894.0  | 876.2  | 931.7  | 941.6  |
| 67.5° | 6099.6 | 2236.1 | 913.9  | 737.4  | 705.7  | 761.2  | 810.8  | 830.6  | 816.7  | 882.1  | 890.1  |
| 70°   | 4547.5 | 1809.9 | 816.7  | 652.2  | 628.4  | 678.0  | 723.6  | 731.5  | 733.5  | 810.8  | 818.7  |
| 72.5° | 2900.2 | 1407.5 | 687.9  | 557.0  | 539.2  | 576.9  | 610.6  | 642.3  | 656.2  | 729.5  | 727.5  |
| 75°   | 1617.6 | 1046.7 | 553.1  | 471.8  | 440.1  | 469.8  | 509.5  | 547.1  | 586.8  | 693.8  | 705.7  |
| 77.5° | 931.7  | 735.4  | 438.1  | 378.6  | 341.0  | 372.7  | 406.4  | 459.9  | 578.8  | 672.0  | 660.1  |
| 80°   | 525.3  | 477.7  | 331.0  | 277.5  | 253.7  | 277.5  | 303.3  | 404.4  | 455.9  | 495.6  | 501.5  |
| 82.5° | 245.8  | 267.6  | 226.0  | 170.5  | 170.5  | 186.3  | 210.1  | 313.2  | 344.9  | 281.5  | 245.8  |
| 85°   | 89.2   | 120.9  | 111.0  | 87.2   | 77.3   | 75.3   | 130.8  | 178.4  | 111.0  | 99.1   | 85.2   |
| 87.5° | 23.8   | 33.7   | 31.7   | 21.8   | 11.9   | 9.9    | 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.

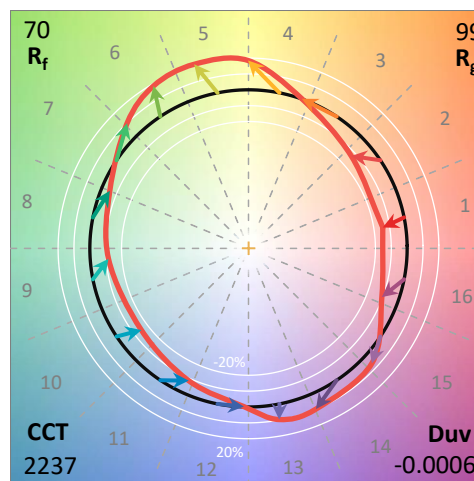
### Test Information

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    |           |      |      |       |



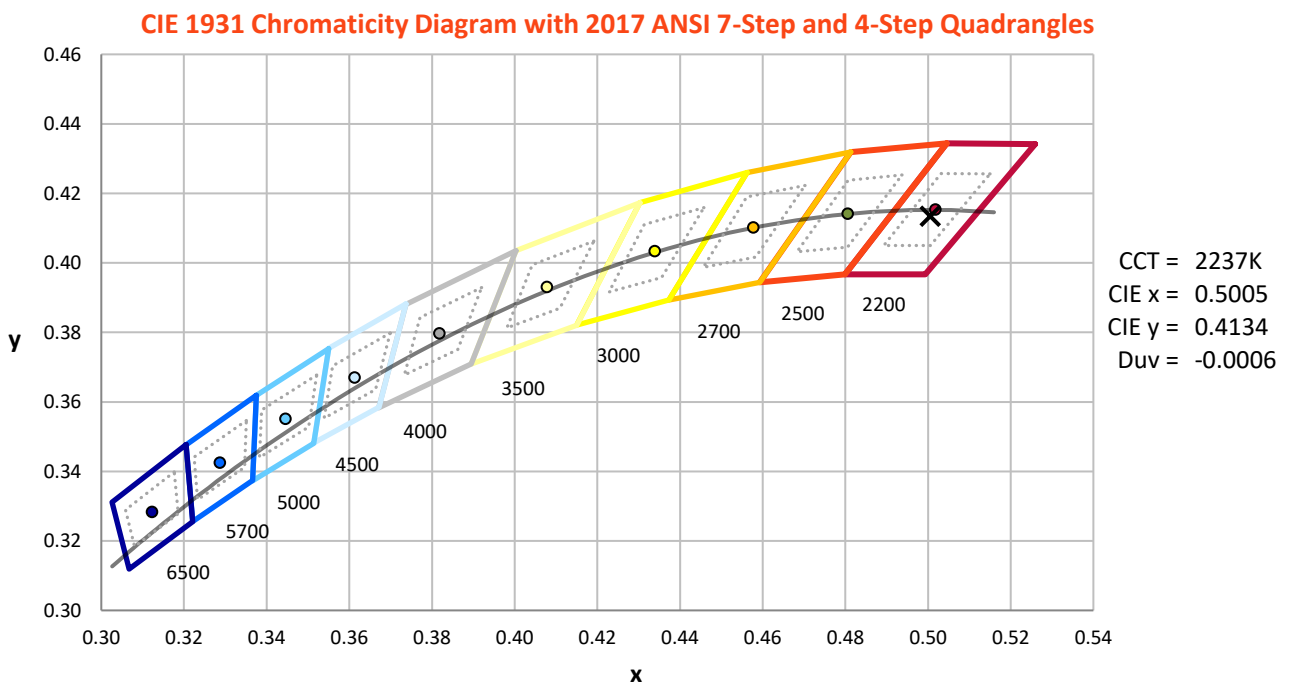
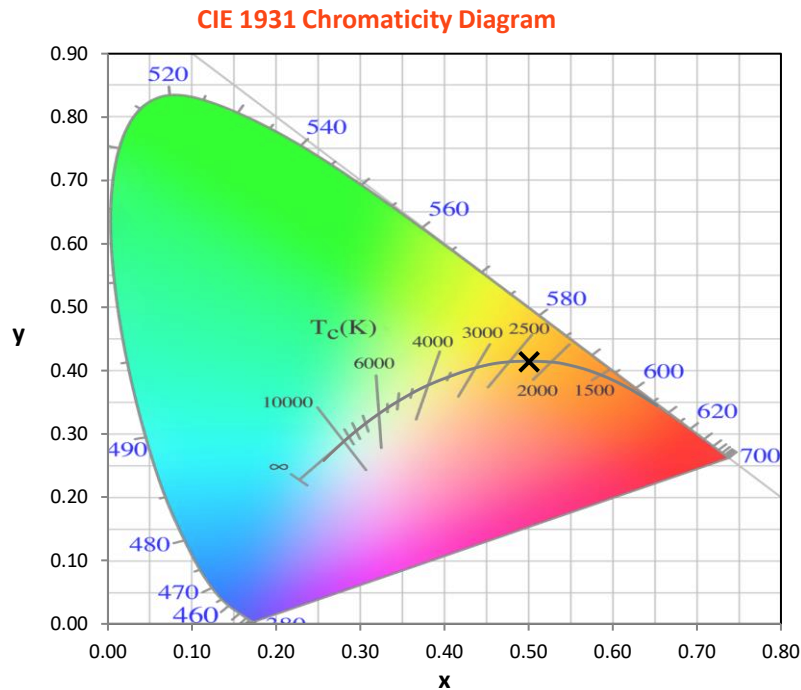
### Test Conditions

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



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 ( $R_{f,i}$ )**

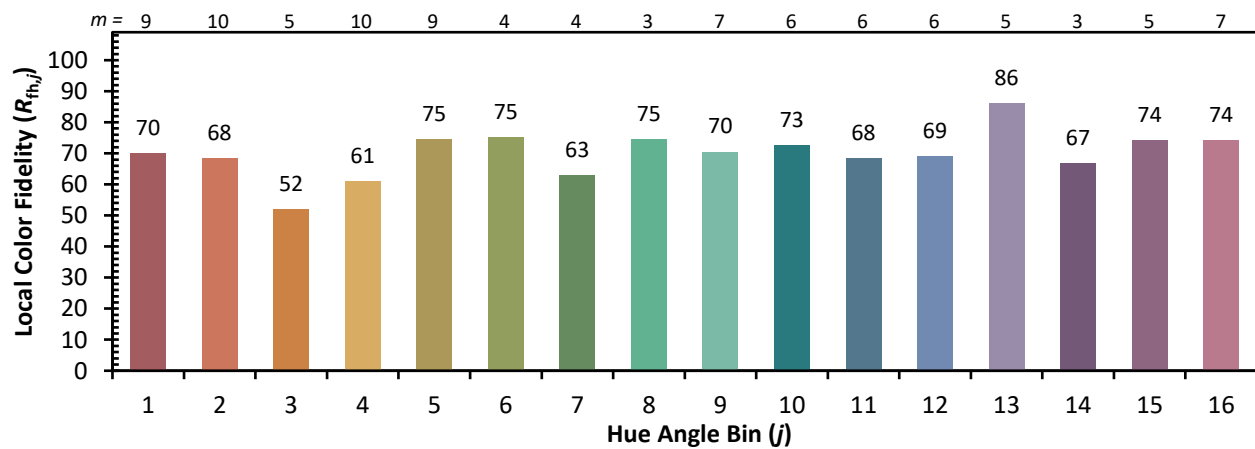
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 87 | CES26 = 56 | CES51 = 74 | CES76 = 56 |
| CES02 = 65 | CES27 = 76 | CES52 = 76 | CES77 = 81 |
| CES03 = 32 | CES28 = 83 | CES53 = 65 | CES78 = 63 |
| CES04 = 72 | CES29 = 46 | CES54 = 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**

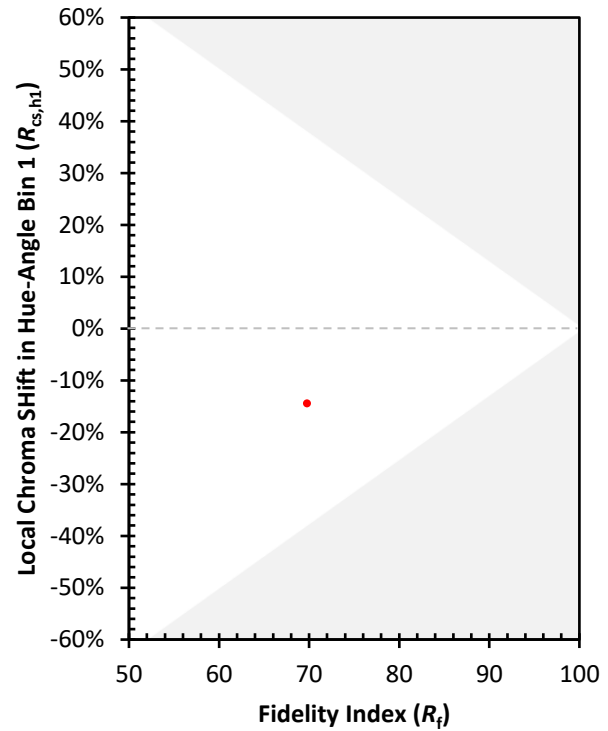
Color Rendition by Hue-Angle Bin



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

**TM-30-18**

**Measure Comparisons**



(END OF REPORT)