

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: P642008

Luminaire Tested: GWS-SA6C-722-U-T2-W-GRSBK

Issue Date: 1/10/2023

**Test Information**

Test Method: LM-79-2019  
Report Number: P642008  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-20)  
Test Lab: COOPER LIGHTING SOLUTIONS  
Issue Date: 1/10/2023  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: McGRAW-EDISON  
Catalog Number: GWS-SA6C-722-U-T2-W-GRSBK  
Description: GALLEON WALL SLIM LUMINAIRE. (6) LIGHTSQUARES WITH 16 LEDS EACH AND  
TYPE II 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: 12423.7 lumens  
Efficiency: N/A  
Efficacy: 65.7 lumens/watt  
Luminous Opening: Rectangular (W 2' x L: 1' x H: 0')  
IES Classification: Type II - Short  
BUG Rating: B2 - U0 - G1

Input Watts (W): 189.2  
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



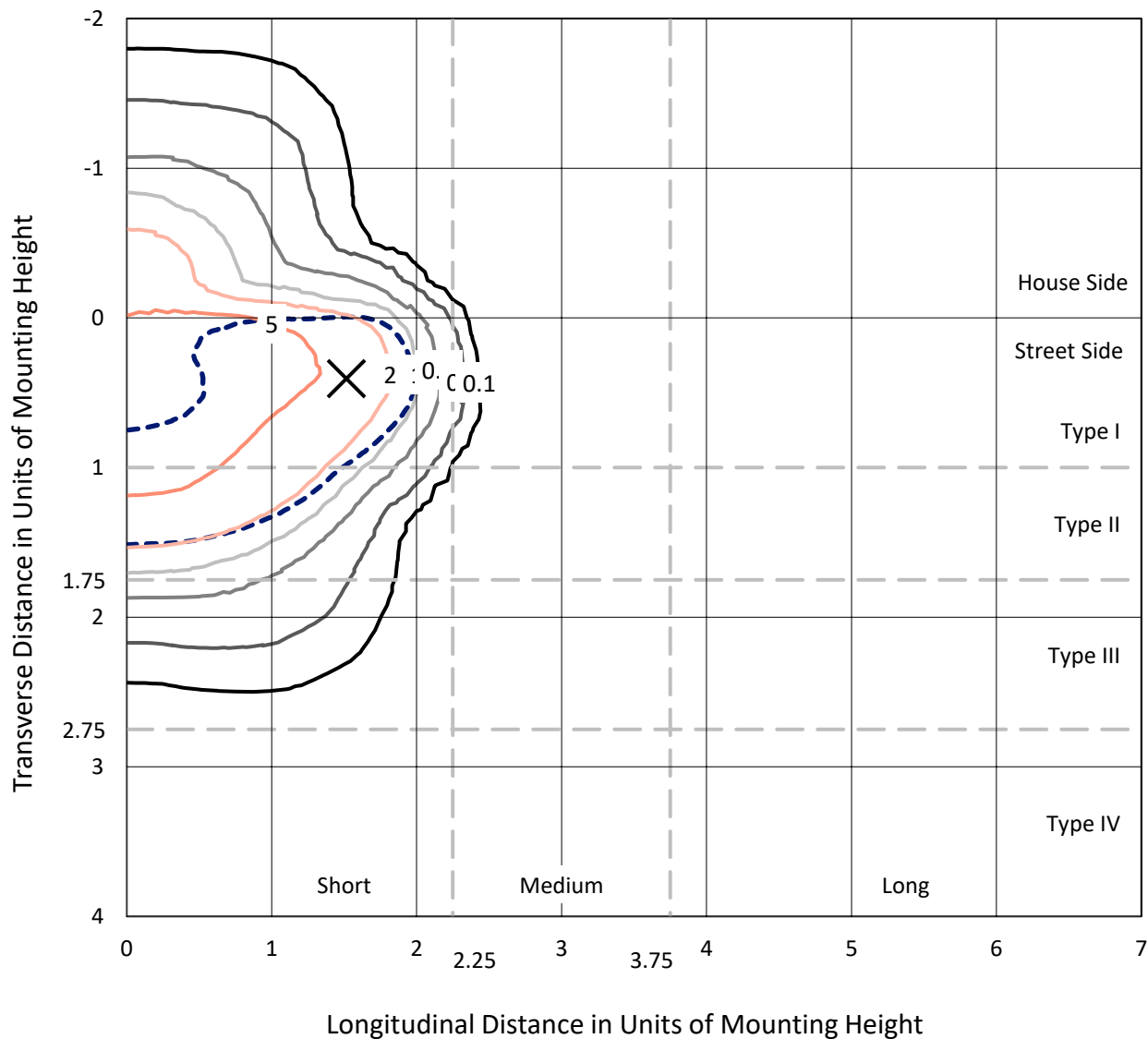
REPORT NUMBER: P642008

CATALOG NUMBER: GWS-SA6C-722-U-T2-W-GRSBK

## Iso-Footcandle Lines of Horizontal Illumination

✕ Max cd

--- 1/2 Max cd

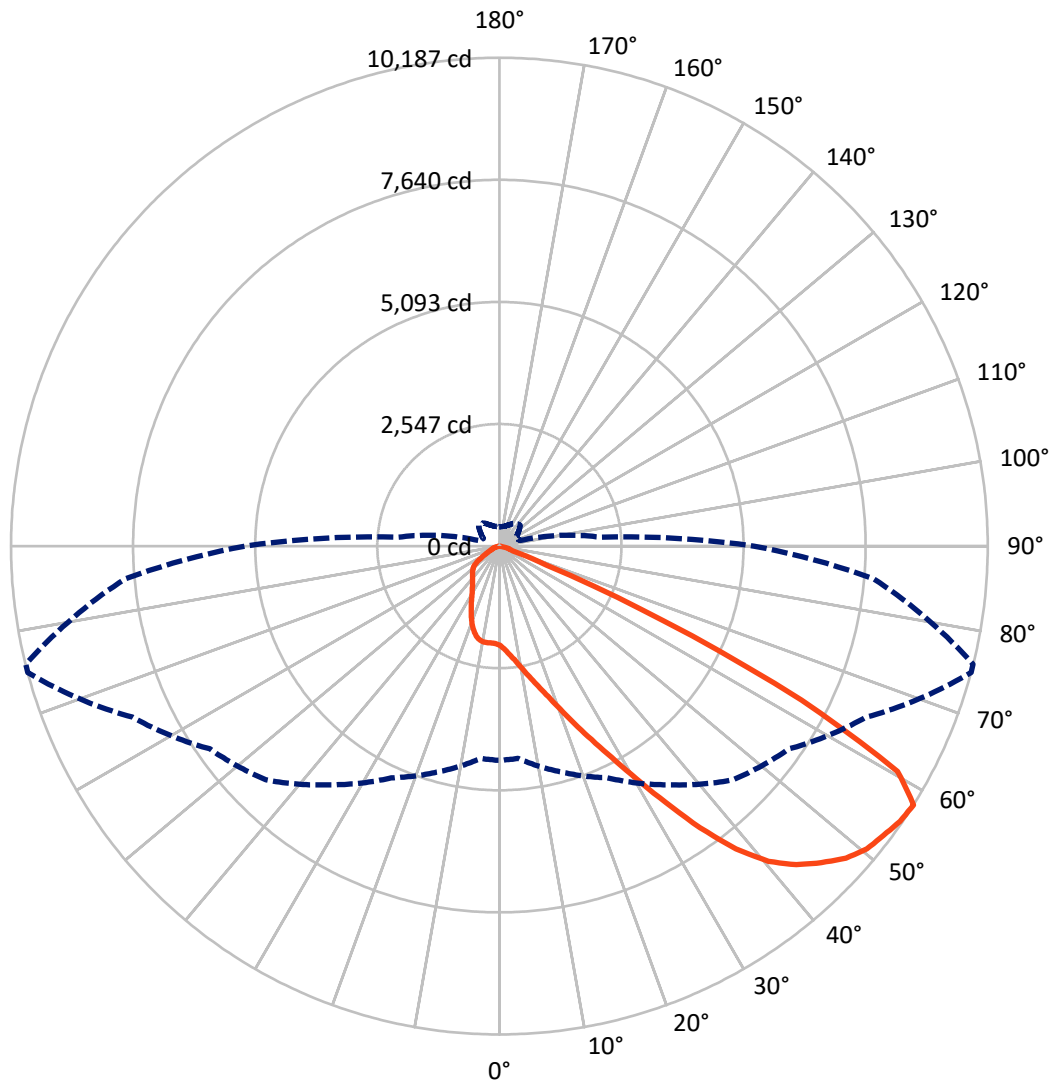


Based on 20 foot mounting height. Maximum calculated value = 9.7 fc  
 Type II - Short - N/A

REPORT NUMBER: P642008

CATALOG NUMBER: GWS-SA6C-722-U-T2-W-GRSBK

## Luminous Intensity Polar Plot



— Vertical Plane Through 75-Deg Lateral    - - - Horizontal Cone Through 57.5-Deg Vertical

REPORT NUMBER: P642008

CATALOG NUMBER: GWS-SA6C-722-U-T2-W-GRSBK

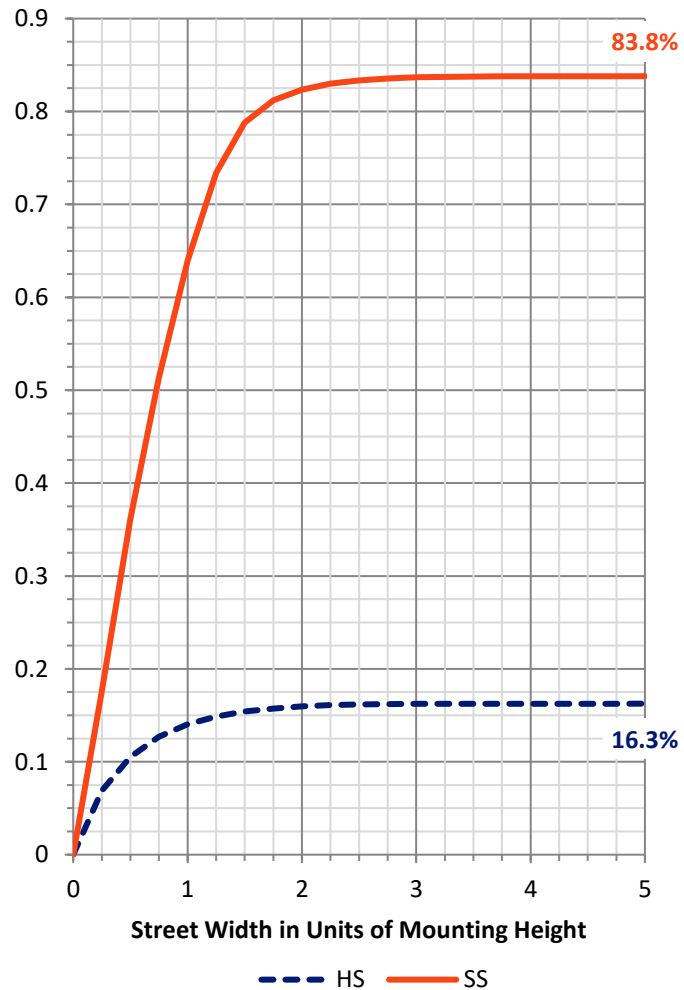
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 2029.4   | 0.0    | 2029.4  |
|                    | % Fixture | 16.3     | 0.0    | 16.3    |
| <b>Street Side</b> | Lumens    | 10394.3  | 0.0    | 10394.3 |
|                    | % Fixture | 83.7     | 0.0    | 83.7    |
| <b>Total</b>       | Lumens    | 12423.7  | 0.0    | 12423.7 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 210.9   | 1.7       |
| 10°-20°   | 684.9   | 5.5       |
| 20°-30°   | 1254.3  | 10.1      |
| 30°-40°   | 2081.0  | 16.8      |
| 40°-50°   | 3178.2  | 25.6      |
| 50°-60°   | 3571.2  | 28.7      |
| 60°-70°   | 1317.2  | 10.6      |
| 70°-80°   | 125.9   | 1.0       |
| 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°    | 12423.7 | 100.0     |
| 0°-180°   | 12423.7 | 100.0     |

**Coefficient of Utilization**



REPORT NUMBER: P642008

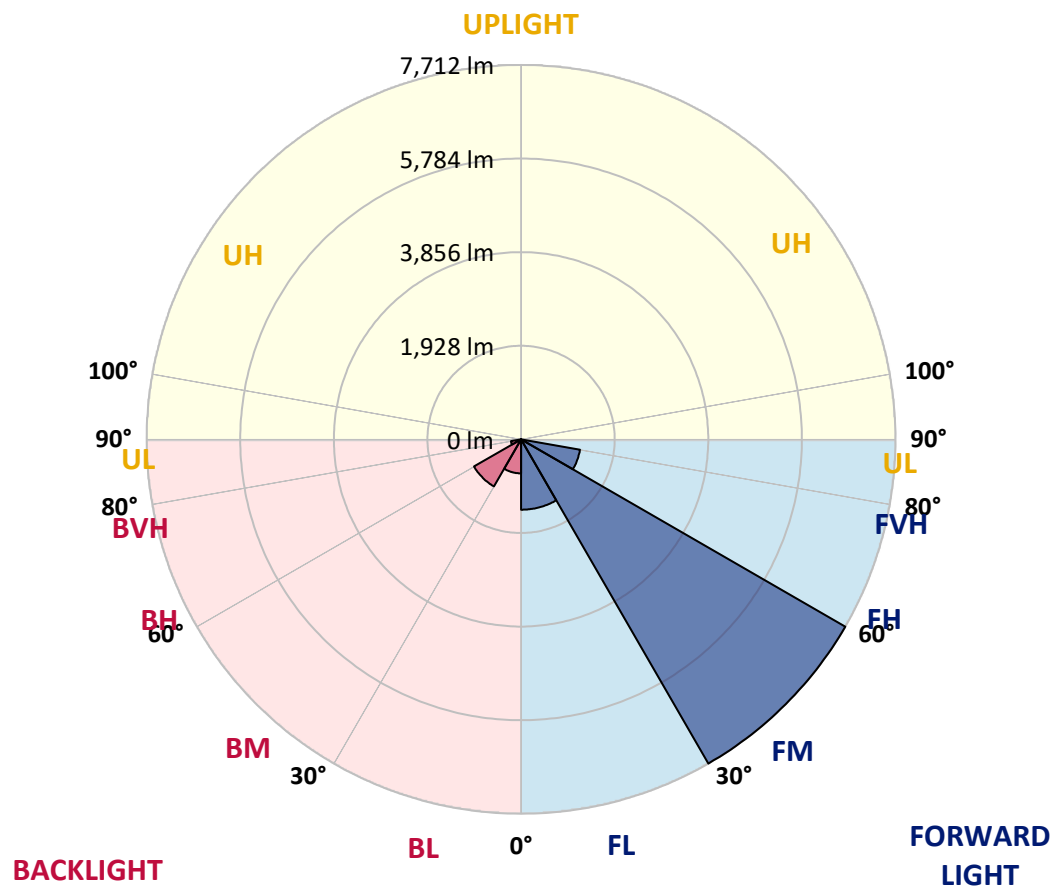
CATALOG NUMBER: GWS-SA6C-722-U-T2-W-GRSBK

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 1449.8 | 11.7      |                         |      |         |
| FM   | (30°-60°)   | 7712.1 | 62.1      |                         |      |         |
| FH   | (60°-80°)   | 1232.4 | 9.9       |                         |      | G1/1800 |
| FVH  | (80°-90°)   | 0.1    | 0.0       |                         |      | G0/10   |
| BL   | (0°-30°)    | 700.3  | 5.6       | B2/1000                 |      |         |
| BM   | (30°-60°)   | 1118.3 | 9.0       | B2/2500                 |      |         |
| BH   | (60°-80°)   | 210.7  | 1.7       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 0.0    | 0.0       |                         |      | G0/10   |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B2-U0-G1**

Type II Short





REPORT NUMBER: P642008

CATALOG NUMBER: GWS-SA6C-722-U-T2-W-GRSBK

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 75°     | 76°     | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|---------|---------|--------|
| 0°    | 2072.1 | 2072.1 | 2072.1 | 2072.1 | 2072.1 | 2072.1 | 2072.1 | 2072.1 | 2072.1  | 2072.1  | 2072.1 |
| 2.5°  | 2315.0 | 2339.0 | 2331.5 | 2316.5 | 2307.5 | 2276.0 | 2256.5 | 2199.5 | 2159.1  | 2154.6  | 2117.1 |
| 5°    | 2607.4 | 2602.9 | 2596.9 | 2578.9 | 2563.9 | 2514.4 | 2455.9 | 2360.0 | 2274.5  | 2264.0  | 2184.6 |
| 7.5°  | 2767.8 | 2770.8 | 2773.8 | 2770.8 | 2760.3 | 2722.8 | 2658.3 | 2545.9 | 2415.5  | 2406.5  | 2280.5 |
| 10°   | 2833.8 | 2839.8 | 2854.8 | 2883.2 | 2908.7 | 2905.7 | 2868.3 | 2752.8 | 2592.4  | 2577.4  | 2408.0 |
| 12.5° | 2865.3 | 2872.8 | 2896.7 | 2950.7 | 3019.7 | 3073.7 | 3079.7 | 2976.2 | 2799.3  | 2775.3  | 2559.4 |
| 15°   | 2908.7 | 2916.2 | 2946.2 | 3016.7 | 3117.1 | 3223.6 | 3292.6 | 3226.6 | 3028.7  | 3003.2  | 2725.8 |
| 17.5° | 2928.2 | 2938.7 | 2982.2 | 3075.2 | 3205.6 | 3369.0 | 3525.0 | 3519.0 | 3300.1  | 3280.6  | 2919.2 |
| 20°   | 2965.7 | 2973.2 | 3012.2 | 3112.6 | 3270.1 | 3505.5 | 3767.9 | 3862.3 | 3631.4  | 3602.9  | 3153.1 |
| 22.5° | 3084.2 | 3087.2 | 3105.2 | 3168.1 | 3315.1 | 3604.4 | 4015.3 | 4262.6 | 4022.8  | 3985.3  | 3415.5 |
| 25°   | 3277.6 | 3276.1 | 3283.6 | 3294.1 | 3402.0 | 3704.9 | 4253.7 | 4714.0 | 4471.1  | 4430.6  | 3712.4 |
| 27.5° | 3523.5 | 3523.5 | 3541.5 | 3511.5 | 3555.0 | 3829.3 | 4489.1 | 5232.7 | 4992.8  | 4935.9  | 4037.7 |
| 30°   | 3812.8 | 3811.3 | 3853.3 | 3805.3 | 3818.8 | 4025.8 | 4742.4 | 5798.0 | 5622.6  | 5552.1  | 4412.6 |
| 32.5° | 4205.7 | 4196.7 | 4244.7 | 4178.7 | 4133.7 | 4322.6 | 5051.3 | 6388.7 | 6376.7  | 6268.8  | 4883.4 |
| 35°   | 4702.0 | 4687.0 | 4702.0 | 4637.5 | 4556.5 | 4737.9 | 5456.1 | 6978.0 | 7213.4  | 7099.4  | 5444.1 |
| 37.5° | 5195.2 | 5243.2 | 5259.7 | 5148.8 | 5082.8 | 5264.2 | 5943.4 | 7505.7 | 8012.5  | 7894.1  | 6027.4 |
| 40°   | 5777.0 | 5762.0 | 5819.0 | 5694.5 | 5652.5 | 5853.5 | 6420.2 | 7898.6 | 8645.2  | 8532.8  | 6546.2 |
| 42.5° | 6205.8 | 6232.8 | 6303.3 | 6234.3 | 6201.3 | 6390.2 | 6820.5 | 8128.0 | 9084.6  | 8973.6  | 6916.5 |
| 45°   | 6720.1 | 6739.6 | 6766.6 | 6709.6 | 6675.1 | 6861.0 | 7109.9 | 8228.4 | 9418.9  | 9299.0  | 7165.4 |
| 47.5° | 7276.3 | 7291.3 | 7291.3 | 7174.4 | 7063.4 | 7139.9 | 7303.3 | 8285.4 | 9726.3  | 9610.8  | 7349.8 |
| 50°   | 7675.2 | 7682.7 | 7748.6 | 7666.2 | 7424.8 | 7306.3 | 7391.8 | 8340.9 | 9930.2  | 9822.2  | 7409.8 |
| 52.5° | 7321.3 | 7312.3 | 7529.7 | 7700.7 | 7765.1 | 7529.7 | 7544.7 | 8421.8 | 10029.1 | 9936.2  | 7457.8 |
| 55°   | 6165.3 | 6150.3 | 6456.2 | 6871.5 | 7439.8 | 7741.1 | 7729.1 | 8469.8 | 10138.6 | 10081.6 | 7631.7 |
| 57.5° | 4469.6 | 4444.1 | 4869.9 | 5331.7 | 6076.9 | 6894.0 | 7373.8 | 8442.8 | 10186.6 | 10182.1 | 7834.1 |
| 60°   | 2686.8 | 2665.8 | 3067.7 | 3553.5 | 4129.2 | 4950.9 | 5747.0 | 7562.7 | 9544.9  | 9553.9  | 7307.8 |
| 62.5° | 1653.8 | 1673.3 | 2036.1 | 2283.5 | 2497.9 | 2745.3 | 3205.6 | 5087.3 | 7070.9  | 7129.4  | 5135.3 |
| 65°   | 1112.5 | 1127.5 | 1463.4 | 1775.2 | 1775.2 | 1451.4 | 1246.0 | 2431.9 | 3772.4  | 3673.4  | 2428.9 |
| 67.5° | 746.7  | 763.2  | 1028.6 | 1392.9 | 1445.4 | 1012.1 | 505.3  | 725.7  | 1051.0  | 1019.6  | 601.2  |
| 70°   | 439.3  | 457.3  | 685.2  | 955.1  | 1052.5 | 704.7  | 337.4  | 307.4  | 298.4   | 289.4   | 233.9  |
| 72.5° | 196.4  | 203.9  | 349.3  | 485.8  | 443.8  | 296.9  | 238.4  | 245.9  | 232.4   | 227.9   | 190.4  |
| 75°   | 60.0   | 63.0   | 90.0   | 105.0  | 106.5  | 106.5  | 143.9  | 193.4  | 182.9   | 184.4   | 146.9  |
| 77.5° | 15.0   | 15.0   | 24.0   | 22.5   | 12.0   | 10.5   | 27.0   | 43.5   | 45.0    | 40.5    | 30.0   |
| 80°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 1.5    | 1.5    | 1.5    | 1.5     | 1.5     | 1.5    |
| 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: P642008

CATALOG NUMBER: GWS-SA6C-722-U-T2-W-GRSBK

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 2072.1 | 2072.1 | 2072.1 | 2072.1 | 2072.1 | 2072.1 | 2072.1 | 2072.1 | 2072.1 | 2072.1 | 2072.1 |
| 2.5°  | 2100.6 | 2061.6 | 2036.1 | 2000.1 | 1974.6 | 1947.7 | 1923.7 | 1904.2 | 1893.7 | 1890.7 | 1892.2 |
| 5°    | 2148.6 | 2087.1 | 2027.1 | 1958.1 | 1910.2 | 1865.2 | 1829.2 | 1800.7 | 1787.2 | 1782.7 | 1782.7 |
| 7.5°  | 2222.0 | 2136.6 | 2030.1 | 1922.2 | 1841.2 | 1770.7 | 1728.7 | 1697.3 | 1685.3 | 1682.3 | 1673.3 |
| 10°   | 2318.0 | 2201.0 | 2025.6 | 1857.7 | 1743.7 | 1670.3 | 1640.3 | 1631.3 | 1635.8 | 1637.3 | 1635.8 |
| 12.5° | 2433.4 | 2268.5 | 1997.1 | 1763.2 | 1640.3 | 1595.3 | 1598.3 | 1622.3 | 1649.3 | 1662.8 | 1665.8 |
| 15°   | 2556.4 | 2330.0 | 1932.7 | 1650.8 | 1551.8 | 1550.3 | 1593.8 | 1649.3 | 1701.8 | 1724.3 | 1730.2 |
| 17.5° | 2694.3 | 2379.5 | 1833.7 | 1530.8 | 1475.4 | 1518.8 | 1596.8 | 1682.3 | 1752.7 | 1790.2 | 1797.7 |
| 20°   | 2845.8 | 2419.9 | 1707.8 | 1418.4 | 1407.9 | 1485.9 | 1593.8 | 1698.8 | 1785.7 | 1827.7 | 1835.2 |
| 22.5° | 3003.2 | 2448.4 | 1562.3 | 1314.9 | 1346.4 | 1448.4 | 1565.3 | 1667.3 | 1749.7 | 1797.7 | 1803.7 |
| 25°   | 3183.1 | 2451.4 | 1413.9 | 1228.0 | 1289.4 | 1397.4 | 1496.4 | 1580.3 | 1649.3 | 1691.3 | 1695.8 |
| 27.5° | 3340.5 | 2415.5 | 1281.9 | 1157.5 | 1237.0 | 1334.4 | 1400.4 | 1446.9 | 1494.9 | 1518.8 | 1520.3 |
| 30°   | 3522.0 | 2352.5 | 1157.5 | 1100.5 | 1183.0 | 1256.5 | 1289.4 | 1299.9 | 1304.4 | 1308.9 | 1302.9 |
| 32.5° | 3737.9 | 2276.0 | 1064.5 | 1045.0 | 1121.5 | 1171.0 | 1180.0 | 1159.0 | 1133.5 | 1097.5 | 1088.5 |
| 35°   | 4003.3 | 2207.0 | 988.1  | 991.1  | 1054.0 | 1084.0 | 1076.5 | 1031.6 | 982.1  | 938.6  | 931.1  |
| 37.5° | 4291.1 | 2148.6 | 929.6  | 938.6  | 980.6  | 1001.6 | 979.1  | 929.6  | 907.1  | 869.6  | 871.1  |
| 40°   | 4546.0 | 2100.6 | 877.1  | 886.1  | 905.6  | 925.1  | 889.1  | 856.1  | 898.1  | 895.1  | 898.1  |
| 42.5° | 4727.4 | 2060.1 | 832.1  | 827.6  | 841.1  | 854.6  | 827.6  | 811.1  | 881.6  | 862.1  | 872.6  |
| 45°   | 4833.9 | 2022.6 | 794.7  | 767.7  | 788.7  | 812.6  | 794.7  | 773.7  | 797.7  | 707.7  | 700.2  |
| 47.5° | 4905.9 | 2001.6 | 761.7  | 709.2  | 746.7  | 788.7  | 751.2  | 700.2  | 665.7  | 587.7  | 581.7  |
| 50°   | 4913.4 | 1991.1 | 722.7  | 649.2  | 697.2  | 742.2  | 698.7  | 628.2  | 578.7  | 544.3  | 539.8  |
| 52.5° | 4952.3 | 2012.1 | 668.7  | 572.8  | 625.2  | 697.2  | 667.2  | 596.7  | 529.3  | 499.3  | 493.3  |
| 55°   | 5126.3 | 2100.6 | 578.7  | 467.8  | 544.3  | 662.7  | 641.7  | 532.3  | 467.8  | 449.8  | 445.3  |
| 57.5° | 5306.2 | 2118.6 | 455.8  | 370.3  | 473.8  | 613.2  | 586.2  | 490.3  | 427.3  | 406.3  | 401.8  |
| 60°   | 4851.9 | 1745.2 | 341.9  | 305.9  | 418.3  | 566.8  | 542.8  | 464.8  | 391.3  | 365.8  | 361.3  |
| 62.5° | 3187.6 | 943.1  | 271.4  | 259.4  | 352.3  | 479.8  | 494.8  | 419.8  | 349.3  | 322.4  | 320.9  |
| 65°   | 1469.4 | 437.8  | 208.4  | 205.4  | 275.9  | 382.3  | 425.8  | 367.3  | 295.4  | 271.4  | 271.4  |
| 67.5° | 400.3  | 217.4  | 163.4  | 151.4  | 187.4  | 256.4  | 310.4  | 274.4  | 209.9  | 181.4  | 179.9  |
| 70°   | 199.4  | 175.4  | 146.9  | 130.4  | 134.9  | 158.9  | 182.9  | 152.9  | 106.5  | 87.0   | 85.5   |
| 72.5° | 163.4  | 143.9  | 124.4  | 111.0  | 102.0  | 97.5   | 94.5   | 76.5   | 49.5   | 37.5   | 36.0   |
| 75°   | 121.4  | 103.5  | 88.5   | 72.0   | 61.5   | 57.0   | 51.0   | 37.5   | 21.0   | 12.0   | 10.5   |
| 77.5° | 27.0   | 25.5   | 24.0   | 18.0   | 16.5   | 13.5   | 10.5   | 7.5    | 3.0    | 0.0    | 0.0    |
| 80°   | 1.5    | 1.5    | 1.5    | 1.5    | 1.5    | 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)