

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: P640527

Luminaire Tested: GWS-SA5E-722-U-T2R-W-GRSBK

Issue Date: 1/10/2023

**Test Information**

Test Method: LM-79-2019  
Report Number: P640527  
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-SA5E-722-U-T2R-W-GRSBK  
Description: GALLEON WALL SLIM LUMINAIRE. (5) LIGHTSQUARES WITH 16 LEDS EACH AND  
TYPE II ROADWAY OPTICS W/ FACTORY INSTALLED GLARE SHIELD, BK  
Light Source: (80) 2200K CCT, 70 CRI LEDS  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 18536.6 lumens  
Efficiency: N/A  
Efficacy: 68.8 lumens/watt  
Luminous Opening: Rectangular (W 1.5' x L: 1' x H: 0')  
IES Classification: Type II - Short  
BUG Rating: B2 - U0 - G1

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

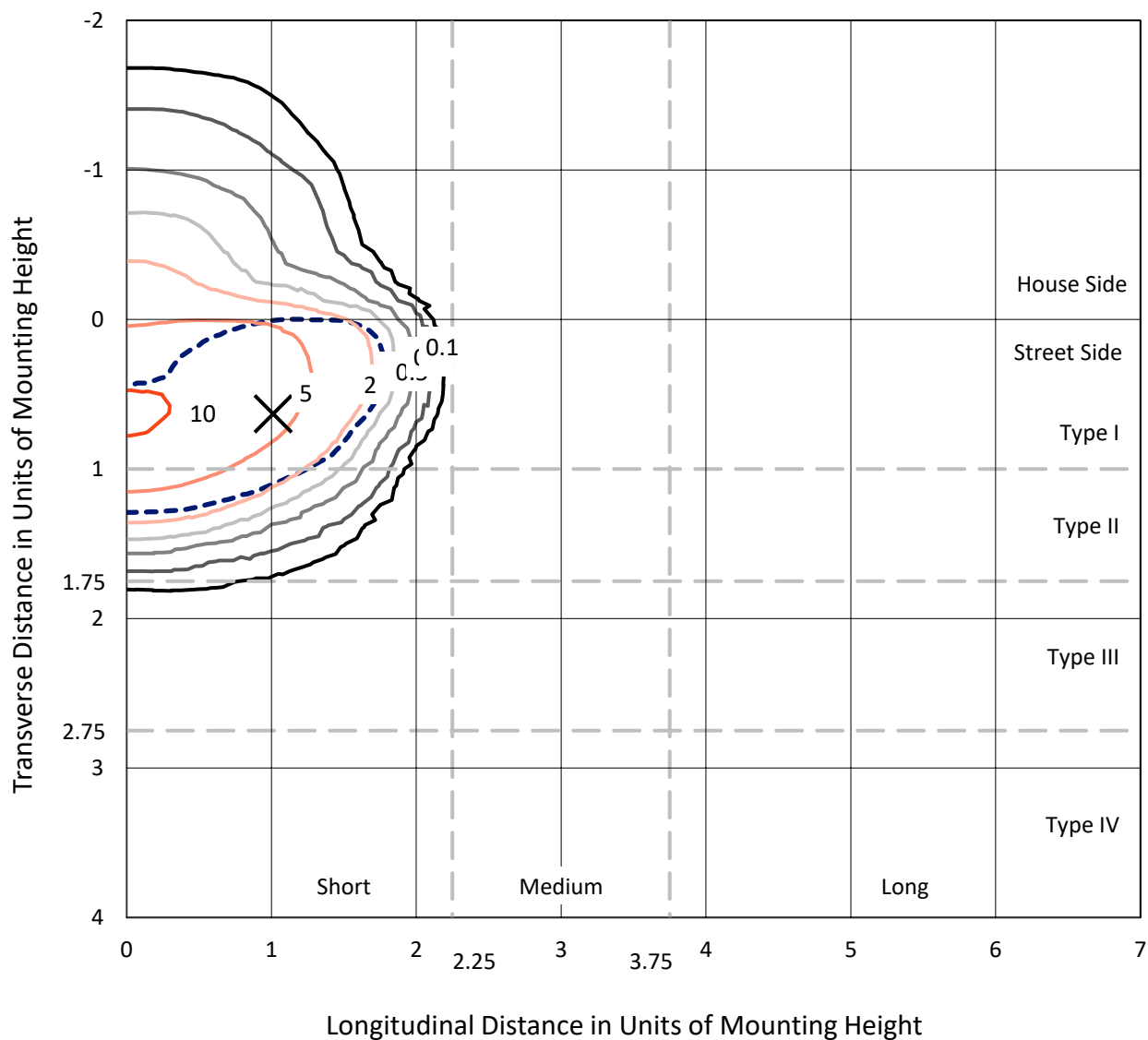


REPORT NUMBER: P640527

CATALOG NUMBER: GWS-SA5E-722-U-T2R-W-GRSBK

## Iso-Footcandle Lines of Horizontal Illumination

✕ Max cd  
 - - - 1/2 Max cd

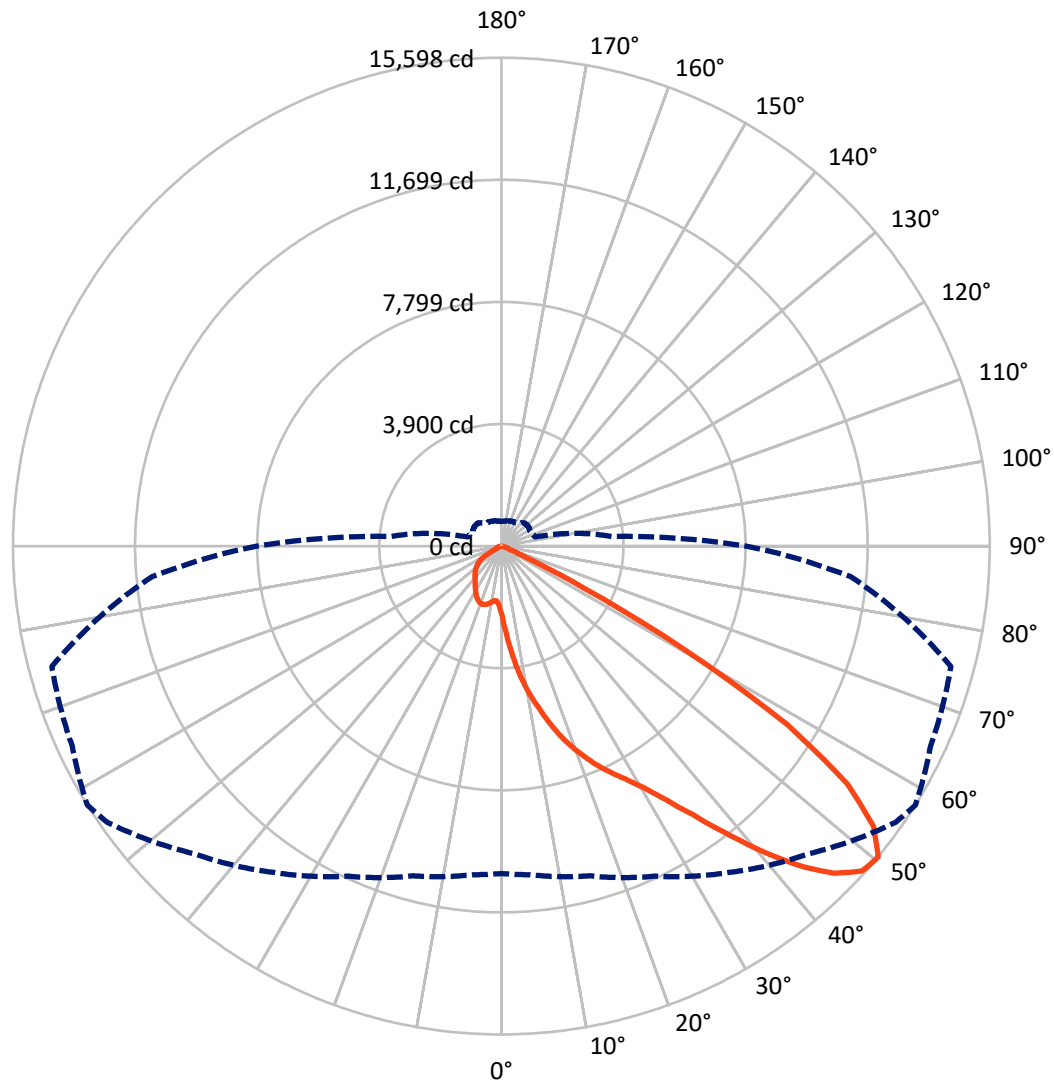


Based on 25 foot mounting height. Maximum calculated value = 10.9 fc  
 Type II - Short - N/A

REPORT NUMBER: P640527

CATALOG NUMBER: GWS-SA5E-722-U-T2R-W-GRSBK

## Luminous Intensity Polar Plot



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

REPORT NUMBER: P640527

CATALOG NUMBER: GWS-SA5E-722-U-T2R-W-GRSBK

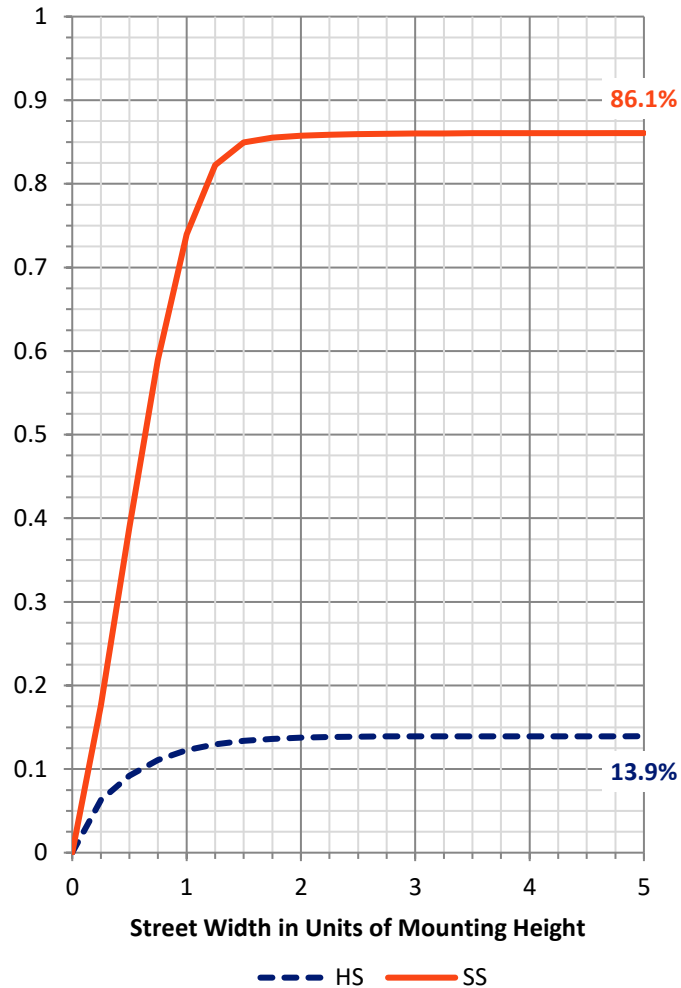
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 2596.3   | 0.0    | 2596.3  |
|                    | % Fixture | 14.0     | 0.0    | 14.0    |
| <b>Street Side</b> | Lumens    | 15940.3  | 0.0    | 15940.3 |
|                    | % Fixture | 86.0     | 0.0    | 86.0    |
| <b>Total</b>       | Lumens    | 18536.6  | 0.0    | 18536.6 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 274.3   | 1.5       |
| 10°-20°   | 1085.9  | 5.9       |
| 20°-30°   | 2197.3  | 11.9      |
| 30°-40°   | 3887.3  | 21.0      |
| 40°-50°   | 5666.8  | 30.6      |
| 50°-60°   | 4542.1  | 24.5      |
| 60°-70°   | 818.3   | 4.4       |
| 70°-80°   | 64.5    | 0.3       |
| 80°-90°   | 0.0     | 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°    | 18536.6 | 100.0     |
| 0°-180°   | 18536.6 | 100.0     |

**Coefficient of Utilization**



REPORT NUMBER: P640527

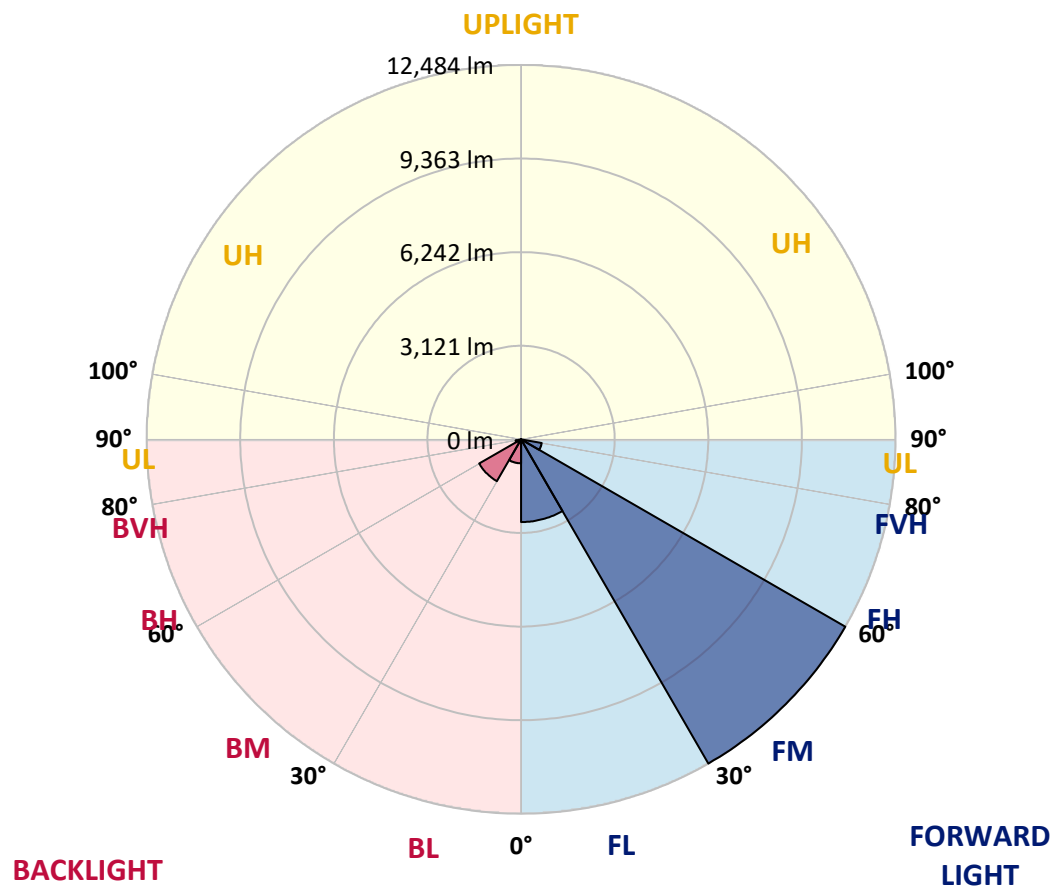
CATALOG NUMBER: GWS-SA5E-722-U-T2R-W-GRSBK

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|---------|-----------|-------------------------|------|---------|
|      |             |         |           | B                       | U    | G       |
| FL   | (0°-30°)    | 2758.2  | 14.9      |                         |      |         |
| FM   | (30°-60°)   | 12483.8 | 67.3      |                         |      |         |
| FH   | (60°-80°)   | 698.3   | 3.8       |                         |      | G1/1800 |
| FVH  | (80°-90°)   | 0.0     | 0.0       |                         |      | G0/10   |
| BL   | (0°-30°)    | 799.3   | 4.3       | B2/1000                 |      |         |
| BM   | (30°-60°)   | 1612.4  | 8.7       | B2/2500                 |      |         |
| BH   | (60°-80°)   | 184.5   | 1.0       | 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: P640527

CATALOG NUMBER: GWS-SA5E-722-U-T2R-W-GRSBK

**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 55°     | 58°     | 65°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 2214.2  | 2214.2  | 2214.2  | 2214.2  | 2214.2  | 2214.2  | 2214.2  | 2214.2  | 2214.2  | 2214.2  | 2214.2  |
| 2.5°  | 3276.6  | 3225.1  | 3195.4  | 3171.6  | 3066.5  | 2900.0  | 2791.0  | 2733.5  | 2638.4  | 2477.8  | 2339.0  |
| 5°    | 4275.7  | 4238.0  | 4168.7  | 4121.1  | 3986.3  | 3750.4  | 3506.6  | 3409.5  | 3193.4  | 2830.6  | 2505.6  |
| 7.5°  | 4937.8  | 4910.0  | 4884.2  | 4820.8  | 4694.0  | 4479.9  | 4210.3  | 4109.2  | 3776.2  | 3260.8  | 2727.6  |
| 10°   | 5447.2  | 5425.4  | 5395.7  | 5393.7  | 5294.6  | 5102.3  | 4838.7  | 4733.6  | 4372.8  | 3728.6  | 2989.2  |
| 12.5° | 5895.2  | 5877.3  | 5871.4  | 5926.9  | 5863.5  | 5720.8  | 5435.3  | 5304.5  | 4921.9  | 4206.3  | 3278.6  |
| 15°   | 6202.4  | 6198.5  | 6224.2  | 6333.3  | 6368.9  | 6303.5  | 6063.7  | 5922.9  | 5482.9  | 4686.0  | 3597.8  |
| 17.5° | 6343.2  | 6355.1  | 6404.6  | 6592.9  | 6751.5  | 6807.0  | 6622.7  | 6503.7  | 6039.9  | 5171.7  | 3938.7  |
| 20°   | 6583.0  | 6579.1  | 6608.8  | 6787.2  | 6981.5  | 7179.7  | 7124.2  | 7023.1  | 6602.9  | 5685.1  | 4317.3  |
| 22.5° | 7259.0  | 7201.5  | 7138.1  | 7165.8  | 7235.2  | 7467.1  | 7570.2  | 7518.6  | 7183.6  | 6212.3  | 4707.8  |
| 25°   | 8297.7  | 8238.2  | 8034.0  | 7835.8  | 7705.0  | 7810.0  | 7950.8  | 7976.5  | 7760.5  | 6753.5  | 5116.2  |
| 27.5° | 9399.8  | 9346.3  | 9116.3  | 8819.0  | 8444.4  | 8262.0  | 8367.0  | 8418.6  | 8327.4  | 7397.7  | 5550.3  |
| 30°   | 10432.5 | 10361.2 | 10109.4 | 9740.7  | 9306.6  | 9027.1  | 8908.2  | 8943.9  | 8997.4  | 8160.9  | 6059.7  |
| 32.5° | 11328.5 | 11275.0 | 10973.7 | 10585.2 | 10166.9 | 9875.5  | 9598.0  | 9657.5  | 9788.3  | 9094.5  | 6711.9  |
| 35°   | 12087.7 | 12060.0 | 11740.8 | 11354.3 | 10912.2 | 10763.6 | 10525.7 | 10537.6 | 10668.4 | 10222.4 | 7506.8  |
| 37.5° | 12747.8 | 12700.2 | 12410.8 | 12052.0 | 11701.2 | 11677.4 | 11612.0 | 11617.9 | 11685.3 | 11536.7 | 8420.6  |
| 40°   | 13164.1 | 13120.5 | 12914.3 | 12692.3 | 12442.5 | 12446.5 | 12785.5 | 12811.2 | 12733.9 | 12827.1 | 9385.9  |
| 42.5° | 13320.7 | 13289.0 | 13177.9 | 13179.9 | 13154.2 | 13271.1 | 13907.4 | 13955.0 | 13677.5 | 13840.0 | 10210.5 |
| 45°   | 13049.1 | 13035.2 | 13043.2 | 13328.6 | 13637.8 | 13998.6 | 14825.2 | 14908.4 | 14516.0 | 14512.0 | 10854.8 |
| 47.5° | 12173.0 | 12145.2 | 12377.1 | 12862.8 | 13578.4 | 14280.1 | 15380.2 | 15509.1 | 15102.7 | 14896.6 | 11259.1 |
| 50°   | 10456.3 | 10535.6 | 10902.3 | 11631.8 | 12720.1 | 13893.5 | 15374.3 | 15598.3 | 15124.5 | 14862.9 | 11191.7 |
| 52.5° | 7574.1  | 7558.3  | 8361.1  | 9364.1  | 10688.3 | 12656.6 | 14557.6 | 14884.7 | 14595.3 | 14531.8 | 11041.1 |
| 55°   | 4121.1  | 4265.8  | 4806.9  | 6135.0  | 7788.2  | 10315.6 | 12692.3 | 13405.9 | 13740.9 | 14410.9 | 11312.7 |
| 57.5° | 1514.4  | 1577.9  | 1916.8  | 2856.4  | 4123.1  | 6414.5  | 9695.1  | 10771.5 | 11806.2 | 14073.9 | 11267.1 |
| 60°   | 610.5   | 622.4   | 757.2   | 1050.6  | 1732.5  | 3264.8  | 5815.9  | 6771.3  | 7746.6  | 10773.5 | 8646.5  |
| 62.5° | 444.0   | 459.9   | 513.4   | 614.5   | 876.2   | 1427.2  | 2507.5  | 2915.9  | 3187.4  | 5336.2  | 4259.8  |
| 65°   | 358.8   | 370.7   | 414.3   | 459.9   | 578.8   | 767.1   | 808.8   | 779.0   | 775.1   | 1379.6  | 977.2   |
| 67.5° | 297.3   | 309.2   | 340.9   | 372.7   | 416.3   | 382.6   | 277.5   | 291.4   | 237.9   | 235.9   | 192.3   |
| 70°   | 218.0   | 231.9   | 263.6   | 297.3   | 249.8   | 103.1   | 160.6   | 237.9   | 180.4   | 150.7   | 146.7   |
| 72.5° | 164.5   | 174.4   | 204.2   | 194.3   | 73.3    | 39.6    | 107.0   | 172.5   | 138.8   | 111.0   | 109.0   |
| 75°   | 122.9   | 128.8   | 103.1   | 31.7    | 7.9     | 9.9     | 39.6    | 71.4    | 77.3    | 63.4    | 63.4    |
| 77.5° | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 4.0     | 5.9     | 7.9     | 9.9     | 11.9    |
| 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: P640527

CATALOG NUMBER: GWS-SA5E-722-U-T2R-W-GRSBK

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 2214.2 | 2214.2 | 2214.2 | 2214.2 | 2214.2 | 2214.2 | 2214.2 | 2214.2 | 2214.2 | 2214.2 | 2214.2 |
| 2.5°  | 2259.8 | 2176.5 | 2057.6 | 1958.5 | 1883.1 | 1809.8 | 1754.3 | 1698.8 | 1696.8 | 1669.0 | 1663.1 |
| 5°    | 2354.9 | 2204.3 | 1986.2 | 1829.6 | 1734.5 | 1677.0 | 1637.3 | 1617.5 | 1607.6 | 1597.7 | 1593.7 |
| 7.5°  | 2491.7 | 2275.6 | 1974.3 | 1807.8 | 1728.5 | 1690.9 | 1663.1 | 1651.2 | 1645.3 | 1637.3 | 1635.4 |
| 10°   | 2660.2 | 2378.7 | 2017.9 | 1849.4 | 1780.1 | 1744.4 | 1714.6 | 1696.8 | 1686.9 | 1673.0 | 1669.0 |
| 12.5° | 2862.4 | 2505.6 | 2087.3 | 1918.8 | 1845.5 | 1797.9 | 1758.2 | 1732.5 | 1718.6 | 1700.8 | 1696.8 |
| 15°   | 3080.4 | 2642.3 | 2164.6 | 1982.2 | 1895.0 | 1833.6 | 1784.0 | 1744.4 | 1718.6 | 1696.8 | 1690.9 |
| 17.5° | 3306.4 | 2781.1 | 2234.0 | 2025.9 | 1918.8 | 1845.5 | 1774.1 | 1720.6 | 1688.9 | 1661.1 | 1653.2 |
| 20°   | 3560.1 | 2923.8 | 2279.6 | 2033.8 | 1910.9 | 1813.8 | 1730.5 | 1663.1 | 1631.4 | 1593.7 | 1585.8 |
| 22.5° | 3825.7 | 3056.6 | 2299.4 | 2015.9 | 1867.3 | 1754.3 | 1665.1 | 1595.7 | 1550.1 | 1510.5 | 1498.6 |
| 25°   | 4083.4 | 3175.6 | 2289.5 | 1966.4 | 1801.9 | 1671.0 | 1579.8 | 1508.5 | 1458.9 | 1419.3 | 1409.4 |
| 27.5° | 4357.0 | 3274.7 | 2253.8 | 1893.0 | 1712.7 | 1579.8 | 1492.6 | 1431.2 | 1385.6 | 1342.0 | 1332.1 |
| 30°   | 4664.2 | 3365.8 | 2196.3 | 1803.8 | 1607.6 | 1486.7 | 1419.3 | 1377.7 | 1328.1 | 1282.5 | 1268.6 |
| 32.5° | 5034.9 | 3447.1 | 2113.1 | 1696.8 | 1514.4 | 1405.4 | 1367.7 | 1336.0 | 1278.5 | 1231.0 | 1221.1 |
| 35°   | 5459.1 | 3514.5 | 2008.0 | 1585.8 | 1423.3 | 1353.9 | 1345.9 | 1304.3 | 1229.0 | 1173.5 | 1161.6 |
| 37.5° | 5950.7 | 3579.9 | 1883.1 | 1476.8 | 1355.9 | 1330.1 | 1332.1 | 1260.7 | 1169.5 | 1102.1 | 1094.2 |
| 40°   | 6480.0 | 3645.3 | 1744.4 | 1381.6 | 1294.4 | 1316.2 | 1298.4 | 1197.3 | 1048.6 | 983.2  | 975.3  |
| 42.5° | 7031.0 | 3716.7 | 1603.6 | 1292.4 | 1242.9 | 1262.7 | 1236.9 | 1070.4 | 963.4  | 929.7  | 925.7  |
| 45°   | 7528.6 | 3801.9 | 1451.0 | 1203.2 | 1191.3 | 1185.4 | 1141.8 | 969.3  | 923.7  | 899.9  | 898.0  |
| 47.5° | 7887.3 | 3788.1 | 1288.5 | 1118.0 | 1135.8 | 1116.0 | 983.2  | 921.7  | 884.1  | 852.4  | 844.4  |
| 50°   | 7821.9 | 3546.2 | 1120.0 | 1022.8 | 1064.5 | 1046.6 | 884.1  | 866.2  | 832.5  | 798.8  | 787.0  |
| 52.5° | 7655.4 | 3217.2 | 973.3  | 921.7  | 987.2  | 945.5  | 816.7  | 798.8  | 769.1  | 725.5  | 711.6  |
| 55°   | 7744.6 | 2907.9 | 858.3  | 840.5  | 907.9  | 783.0  | 741.4  | 713.6  | 681.9  | 634.3  | 628.4  |
| 57.5° | 7457.2 | 2372.7 | 689.8  | 701.7  | 802.8  | 668.0  | 650.2  | 606.6  | 553.0  | 521.3  | 517.4  |
| 60°   | 5161.8 | 1274.6 | 432.1  | 446.0  | 580.8  | 561.0  | 582.8  | 543.1  | 477.7  | 448.0  | 442.0  |
| 62.5° | 2370.8 | 511.4  | 235.9  | 226.0  | 305.3  | 380.6  | 499.5  | 495.6  | 414.3  | 366.7  | 362.8  |
| 65°   | 574.9  | 233.9  | 168.5  | 158.6  | 172.5  | 228.0  | 325.1  | 390.5  | 335.0  | 279.5  | 273.5  |
| 67.5° | 186.3  | 190.3  | 154.6  | 144.7  | 152.6  | 170.5  | 194.3  | 216.1  | 214.1  | 196.2  | 192.3  |
| 70°   | 148.7  | 172.5  | 142.7  | 130.8  | 130.8  | 136.8  | 130.8  | 105.1  | 91.2   | 99.1   | 103.1  |
| 72.5° | 111.0  | 130.8  | 113.0  | 101.1  | 97.1   | 95.1   | 81.3   | 59.5   | 41.6   | 37.7   | 35.7   |
| 75°   | 65.4   | 73.3   | 69.4   | 59.5   | 55.5   | 49.6   | 39.6   | 25.8   | 13.9   | 9.9    | 5.9    |
| 77.5° | 11.9   | 13.9   | 15.9   | 11.9   | 9.9    | 7.9    | 5.9    | 2.0    | 0.0    | 0.0    | 0.0    |
| 80°   | 0.0    | 2.0    | 2.0    | 2.0    | 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    |

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)