

Scaled data based on original data using  
LM-79-08 Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Test Report Prepared for  
Cooper Lighting Solutions  
(formerly Eaton)

Brand: McGRAW-EDISON

Report Number: P323622

Luminaire Tested: **GLEON-SA8D-760-U-SL3-HSS**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P323622  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-23)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA8D-760-U-SL3-HSS  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(8) 70 CRI, 5700K, 1200mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE III  
SPILL LIGHT ELIMINATOR OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 53124 lumens  
Efficiency: N/A  
Efficacy: 104.0 lumens/watt  
Luminous Opening: Rectangular (W 2' x L: 1' x H: 0')  
IES Classification: Type III - Medium  
BUG Rating: B3 - U0 - G5

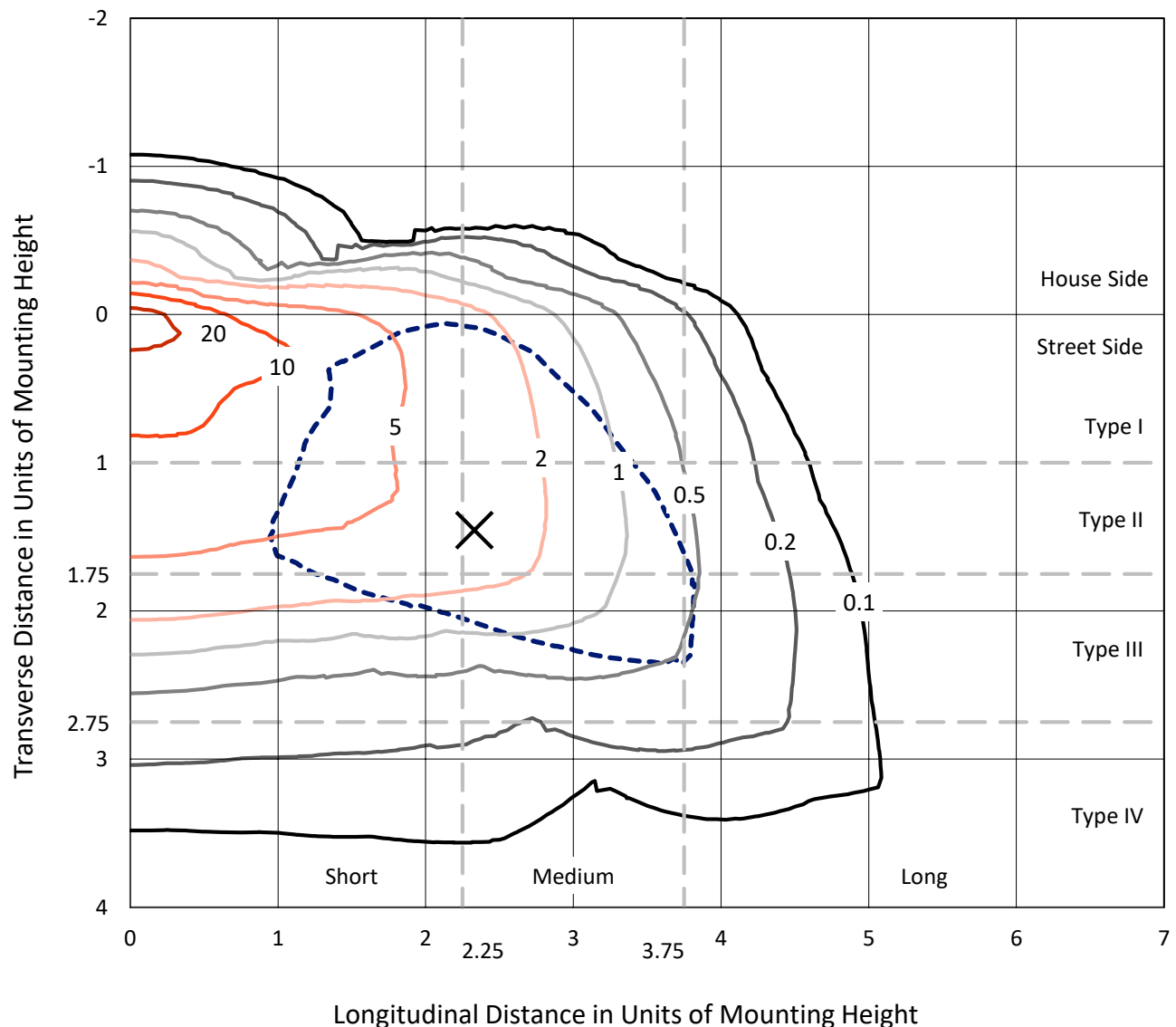
Input Watts (W): 511  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



REPORT NUMBER: P323622  
 CATALOG NUMBER: GLEON-SA8D-760-U-SL3-HSS

## Iso-Footcandle Lines of Horizontal Illumination

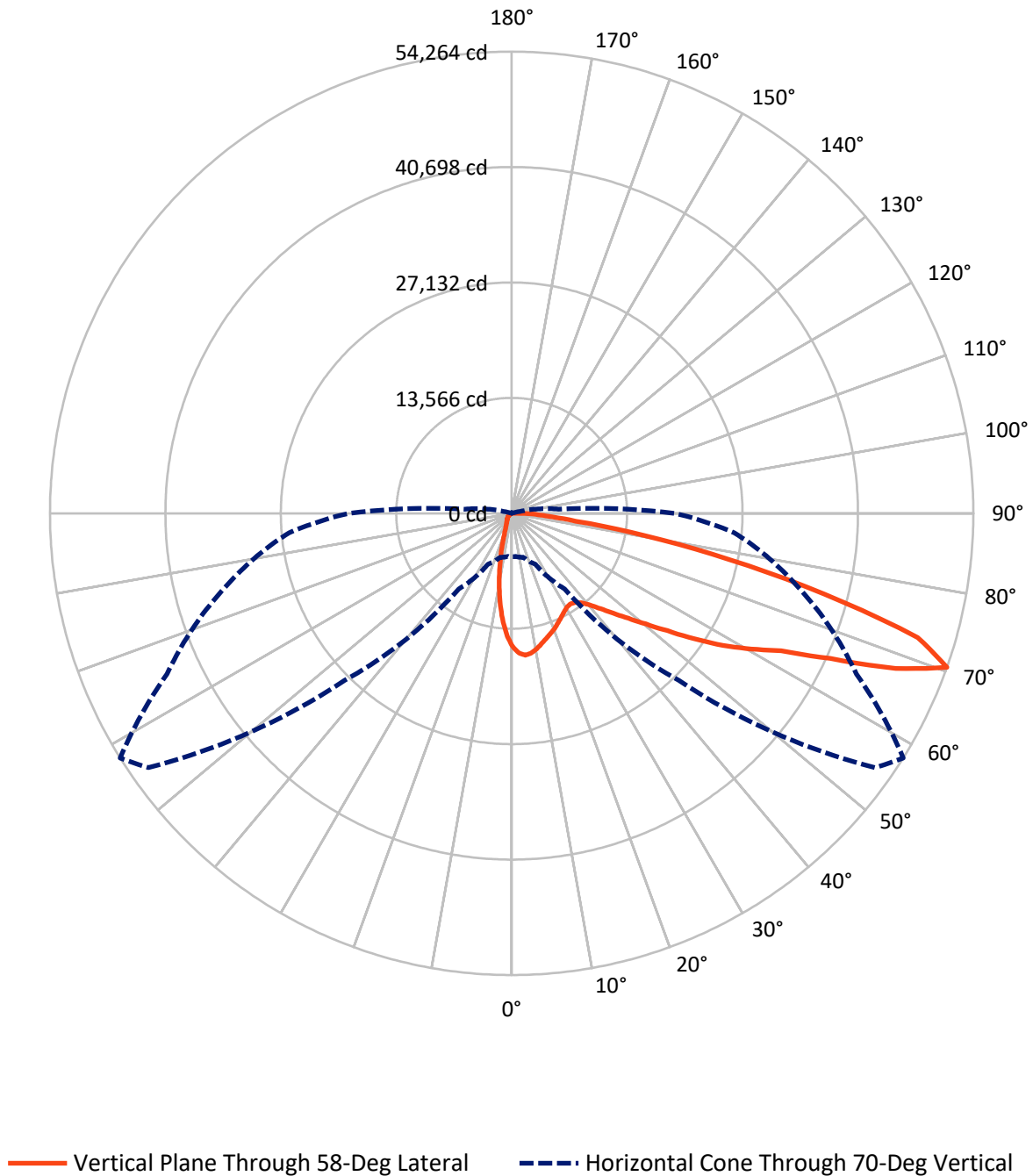
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 25.5 fc  
 Type III - Medium - N/A

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## Luminous Intensity Polar Plot



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**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 4546.2   | 0.0    | 4546.2  |
|                    | % Fixture | 8.6      | 0.0    | 8.6     |
| <b>Street Side</b> | Lumens    | 48577.8  | 0.0    | 48577.8 |
|                    | % Fixture | 91.4     | 0.0    | 91.4    |
| <b>Total</b>       | Lumens    | 53124.0  | 0.0    | 53124.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 1283.2  | 2.4       |
| 10°-20°   | 2693.2  | 5.1       |
| 20°-30°   | 3540.7  | 6.7       |
| 30°-40°   | 4689.2  | 8.8       |
| 40°-50°   | 7009.0  | 13.2      |
| 50°-60°   | 11228.1 | 21.1      |
| 60°-70°   | 14152.9 | 26.6      |
| 70°-80°   | 7634.0  | 14.4      |
| 80°-90°   | 893.6   | 1.7       |
| 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°    | 53124.0 | 100.0     |
| 0°-180°   | 53124.0 | 100.0     |

**Coefficient of Utilization**



REPORT NUMBER: P323622

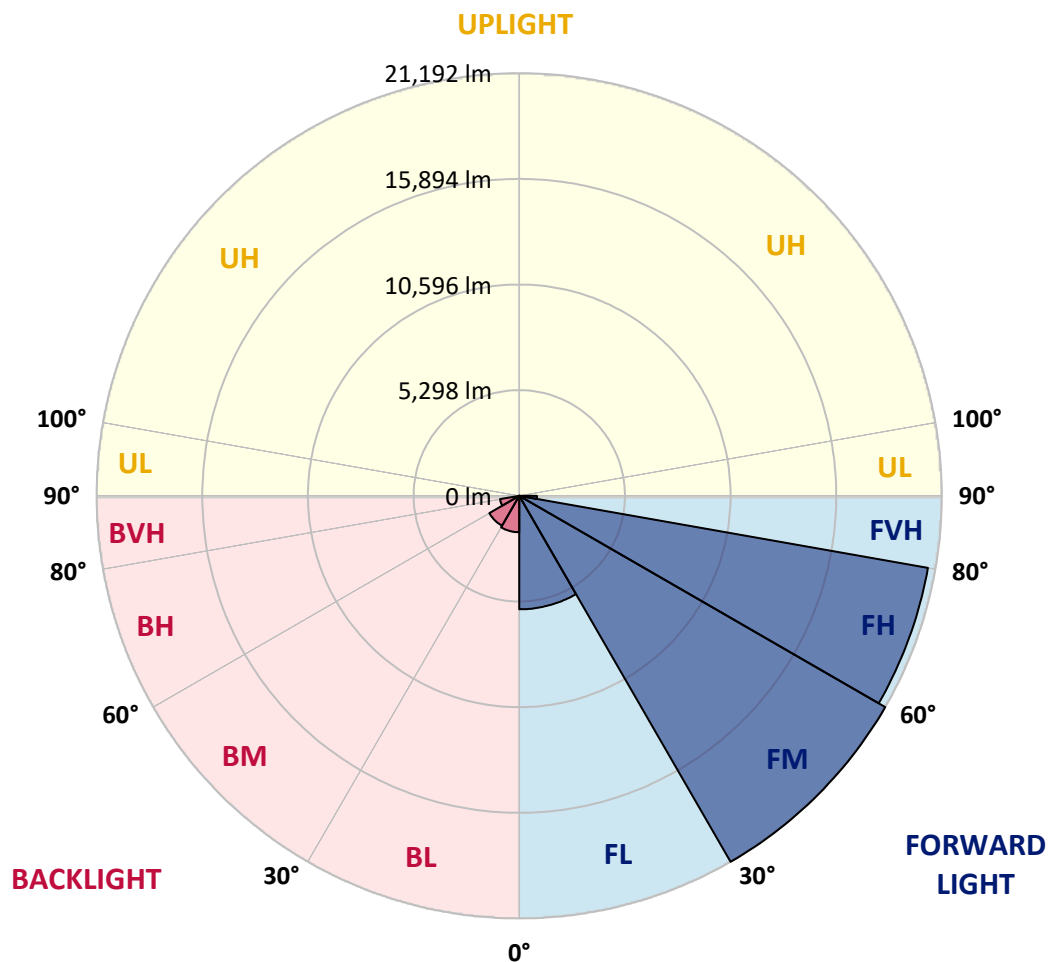
CATALOG NUMBER: GLEON-SA8D-760-U-SL3-HSS

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|---------|-----------|-------------------------|------|---------|
|      |             |         |           | B                       | U    | G       |
| FL   | (0°-30°)    | 5690.7  | 10.7      |                         |      |         |
| FM   | (30°-60°)   | 21192.0 | 39.9      |                         |      |         |
| FH   | (60°-80°)   | 20809.2 | 39.2      |                         |      | G5      |
| FVH  | (80°-90°)   | 885.9   | 1.7       |                         |      | G5      |
| BL   | (0°-30°)    | 1826.5  | 3.4       | B3/2500                 |      |         |
| BM   | (30°-60°)   | 1734.3  | 3.3       | B2/2500                 |      |         |
| BH   | (60°-80°)   | 977.7   | 1.8       | B2/1000                 |      | G2/1000 |
| BVH  | (80°-90°)   | 7.7     | 0.0       |                         |      | G0/10   |
| UL   | (90°-100°)  | 0.0     | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0     | 0.0       |                         | U0/0 |         |

**BUG Rating: B3-U0-G5**

Type III Medium





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CATALOG NUMBER: GLEON-SA8D-760-U-SL3-HSS

**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 55°     | 58°     | 65°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 15692.6 | 15692.6 | 15692.6 | 15692.6 | 15692.6 | 15692.6 | 15692.6 | 15692.6 | 15692.6 | 15692.6 | 15692.6 |
| 2.5°  | 16993.7 | 16951.7 | 16936.2 | 16909.7 | 16808.1 | 16708.7 | 16512.1 | 16456.9 | 16333.2 | 16039.4 | 15727.9 |
| 5°    | 17006.9 | 17004.7 | 17051.1 | 17040.1 | 17004.7 | 16958.3 | 16816.9 | 16744.1 | 16534.2 | 16114.5 | 15544.6 |
| 7.5°  | 16187.4 | 16229.4 | 16333.2 | 16417.1 | 16514.3 | 16640.2 | 16657.9 | 16587.2 | 16414.9 | 15962.1 | 15206.6 |
| 10°   | 15087.3 | 15153.6 | 15299.4 | 15465.1 | 15719.1 | 15970.9 | 16196.2 | 16187.4 | 16127.7 | 15681.5 | 14800.2 |
| 12.5° | 13985.0 | 14062.4 | 14230.2 | 14475.4 | 14835.5 | 15246.4 | 15648.4 | 15703.6 | 15803.0 | 15429.7 | 14424.6 |
| 15°   | 13019.7 | 13086.0 | 13251.7 | 13552.1 | 13998.3 | 14550.5 | 15140.3 | 15241.9 | 15498.2 | 15233.1 | 14111.0 |
| 17.5° | 12200.2 | 12242.2 | 12363.6 | 12697.2 | 13214.1 | 13883.4 | 14649.9 | 14848.7 | 15230.9 | 15078.5 | 13839.2 |
| 20°   | 11628.1 | 11634.7 | 11714.2 | 11948.4 | 12465.3 | 13214.1 | 14141.9 | 14426.8 | 14948.2 | 14945.9 | 13558.7 |
| 22.5° | 11345.3 | 11323.2 | 11338.7 | 11473.4 | 11853.4 | 12575.7 | 13633.8 | 13971.8 | 14694.1 | 14833.3 | 13273.7 |
| 25°   | 11292.3 | 11274.6 | 11230.4 | 11248.1 | 11477.8 | 12016.8 | 13121.3 | 13512.3 | 14471.0 | 14764.8 | 13026.3 |
| 27.5° | 11458.0 | 11475.6 | 11400.5 | 11321.0 | 11338.7 | 11654.6 | 12666.3 | 13119.1 | 14289.9 | 14764.8 | 12851.8 |
| 30°   | 11791.5 | 11800.4 | 11745.1 | 11641.3 | 11502.1 | 11553.0 | 12350.4 | 12803.2 | 14199.3 | 14866.4 | 12741.4 |
| 32.5° | 12160.4 | 12209.0 | 12202.4 | 12118.5 | 11919.6 | 11714.2 | 12275.3 | 12688.4 | 14192.7 | 15091.7 | 12730.3 |
| 35°   | 12617.7 | 12672.9 | 12765.7 | 12748.0 | 12540.4 | 12202.4 | 12531.5 | 12856.3 | 14323.0 | 15462.8 | 12849.6 |
| 37.5° | 13103.7 | 13187.6 | 13386.4 | 13481.4 | 13346.6 | 12964.5 | 13105.9 | 13337.8 | 14672.0 | 16063.7 | 13152.3 |
| 40°   | 13574.2 | 13669.2 | 14031.4 | 14404.7 | 14303.1 | 13909.9 | 13976.2 | 14161.8 | 15292.8 | 16927.4 | 13726.6 |
| 42.5° | 14035.8 | 14177.2 | 14709.6 | 15323.7 | 15445.2 | 15131.5 | 15166.8 | 15314.8 | 16213.9 | 18115.8 | 14665.4 |
| 45°   | 14588.1 | 14747.1 | 15535.7 | 16293.4 | 16618.1 | 16481.2 | 16631.4 | 16728.6 | 17417.8 | 19686.4 | 15931.1 |
| 47.5° | 15398.8 | 15582.1 | 16549.7 | 17413.4 | 17983.3 | 18071.6 | 18374.3 | 18438.3 | 18939.8 | 21515.4 | 17581.3 |
| 50°   | 16980.4 | 17031.2 | 17906.0 | 18690.2 | 19511.9 | 20042.1 | 20386.7 | 20435.3 | 20782.1 | 23514.6 | 19642.2 |
| 52.5° | 18970.7 | 19003.8 | 19498.6 | 20024.4 | 20958.8 | 22041.2 | 22847.5 | 22915.9 | 22988.8 | 25462.9 | 21676.7 |
| 55°   | 20947.7 | 20943.3 | 21270.2 | 21579.5 | 22648.6 | 24221.4 | 25971.0 | 26012.9 | 25489.4 | 27311.8 | 23231.8 |
| 57.5° | 22182.6 | 22301.8 | 22798.9 | 23196.5 | 24689.7 | 26706.5 | 29134.2 | 29288.8 | 28115.9 | 28681.4 | 24769.3 |
| 60°   | 21789.4 | 21846.8 | 22949.1 | 24420.2 | 27232.3 | 30238.7 | 32335.0 | 32374.8 | 30090.7 | 30048.7 | 26713.2 |
| 62.5° | 18564.2 | 18595.2 | 20327.0 | 23359.9 | 28520.1 | 34820.1 | 36196.3 | 35549.1 | 32361.5 | 31946.2 | 29039.2 |
| 65°   | 12723.7 | 12924.7 | 14371.6 | 18120.2 | 26154.3 | 37694.0 | 42173.8 | 41102.4 | 35823.0 | 34681.0 | 31142.2 |
| 67.5° | 7492.9  | 7450.9  | 8166.6  | 10927.8 | 19209.3 | 35785.4 | 49735.1 | 48670.4 | 40543.6 | 36512.2 | 30525.9 |
| 70°   | 5118.2  | 5089.5  | 5363.4  | 6615.9  | 10843.9 | 27760.2 | 52114.2 | 54263.5 | 44711.9 | 35279.6 | 26271.4 |
| 72.5° | 3653.6  | 3669.1  | 4073.4  | 5140.3  | 6808.1  | 16174.1 | 44815.7 | 49903.0 | 43406.4 | 30755.6 | 19969.2 |
| 75°   | 2480.7  | 2522.7  | 3101.4  | 4216.9  | 5968.7  | 8228.4  | 31802.7 | 37934.8 | 35345.9 | 22352.6 | 11477.8 |
| 77.5° | 1334.2  | 1380.6  | 2063.2  | 3397.4  | 5396.5  | 5716.8  | 20457.3 | 26107.9 | 22202.4 | 10048.6 | 3326.7  |
| 80°   | 556.7   | 583.2   | 965.3   | 2469.6  | 4663.2  | 5021.0  | 12036.7 | 15831.7 | 9461.1  | 1981.5  | 742.2   |
| 82.5° | 240.8   | 254.0   | 402.0   | 1473.4  | 3485.8  | 4239.0  | 6372.9  | 7616.6  | 2867.3  | 435.2   | 373.3   |
| 85°   | 46.4    | 48.6    | 165.7   | 779.8   | 2224.4  | 2392.3  | 4130.8  | 4049.1  | 1287.8  | 187.8   | 271.7   |
| 87.5° | 0.0     | 0.0     | 39.8    | 245.2   | 653.9   | 1303.3  | 2520.4  | 2489.5  | 437.4   | 90.6    | 101.6   |
| 90°   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |



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CATALOG NUMBER: GLEON-SA8D-760-U-SL3-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°     | 105°    | 115°    | 125°    | 135°    | 145°    | 155°    | 165°    | 175°    | 180°    |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 15692.6 | 15692.6 | 15692.6 | 15692.6 | 15692.6 | 15692.6 | 15692.6 | 15692.6 | 15692.6 | 15692.6 | 15692.6 |
| 2.5°  | 15568.9 | 15416.5 | 15096.2 | 14700.7 | 14398.1 | 14064.6 | 13799.5 | 13463.7 | 13317.9 | 13324.6 | 13245.0 |
| 5°    | 15219.9 | 14906.2 | 14197.1 | 13302.5 | 12613.3 | 11902.0 | 11290.1 | 10680.4 | 10320.3 | 10203.3 | 10092.8 |
| 7.5°  | 14720.6 | 14223.6 | 13092.6 | 11714.2 | 10547.9 | 9408.0  | 8416.2  | 7543.7  | 6991.4  | 6721.9  | 6622.5  |
| 10°   | 14157.3 | 13459.3 | 11822.4 | 10006.7 | 8341.1  | 6799.2  | 5513.6  | 4395.9  | 3949.7  | 3647.0  | 3569.7  |
| 12.5° | 13662.5 | 12717.1 | 10581.0 | 8254.9  | 6277.9  | 4418.0  | 3192.0  | 2496.1  | 2193.5  | 2074.2  | 2054.3  |
| 15°   | 13196.4 | 12023.5 | 9385.9  | 6668.9  | 4347.3  | 2719.3  | 2030.1  | 1793.7  | 1723.0  | 1703.1  | 1703.1  |
| 17.5° | 12756.8 | 11363.0 | 8217.4  | 5107.2  | 2876.1  | 1906.3  | 1681.0  | 1628.0  | 1605.9  | 1603.7  | 1605.9  |
| 20°   | 12297.4 | 10702.5 | 7068.7  | 3742.0  | 2008.0  | 1614.8  | 1552.9  | 1524.2  | 1517.6  | 1517.6  | 1517.6  |
| 22.5° | 11857.8 | 10042.0 | 5951.0  | 2672.9  | 1610.3  | 1473.4  | 1442.5  | 1422.6  | 1416.0  | 1413.7  | 1409.3  |
| 25°   | 11435.9 | 9414.7  | 4859.8  | 1888.7  | 1413.7  | 1349.7  | 1323.2  | 1296.7  | 1276.8  | 1265.7  | 1259.1  |
| 27.5° | 11089.1 | 8855.8  | 3843.6  | 1515.4  | 1276.8  | 1221.6  | 1188.4  | 1148.7  | 1100.1  | 1078.0  | 1069.1  |
| 30°   | 10812.9 | 8345.5  | 2962.2  | 1279.0  | 1148.7  | 1093.4  | 1042.6  | 974.2   | 903.5   | 865.9   | 863.7   |
| 32.5° | 10596.5 | 7844.1  | 2248.7  | 1131.0  | 1033.8  | 965.3   | 892.4   | 806.3   | 724.5   | 682.6   | 680.4   |
| 35°   | 10490.4 | 7402.3  | 1718.6  | 1022.8  | 932.2   | 846.0   | 755.5   | 660.5   | 581.0   | 541.2   | 536.8   |
| 37.5° | 10561.1 | 7029.0  | 1340.8  | 932.2   | 846.0   | 746.6   | 640.6   | 541.2   | 470.5   | 435.2   | 433.0   |
| 40°   | 10819.6 | 6790.4  | 1089.0  | 854.9   | 773.1   | 651.6   | 536.8   | 444.0   | 384.4   | 355.6   | 353.4   |
| 42.5° | 11369.6 | 6702.0  | 930.0   | 790.8   | 702.5   | 563.3   | 446.2   | 366.7   | 311.5   | 291.6   | 287.2   |
| 45°   | 12288.5 | 6832.4  | 821.7   | 729.0   | 629.6   | 479.3   | 368.9   | 300.4   | 251.8   | 236.4   | 234.2   |
| 47.5° | 13512.3 | 7174.8  | 744.4   | 669.3   | 563.3   | 404.2   | 307.0   | 243.0   | 205.4   | 190.0   | 187.8   |
| 50°   | 15089.5 | 7718.2  | 680.4   | 609.7   | 501.4   | 342.4   | 254.0   | 192.2   | 159.0   | 148.0   | 148.0   |
| 52.5° | 16805.9 | 8365.4  | 622.9   | 554.5   | 439.6   | 285.0   | 205.4   | 148.0   | 125.9   | 112.7   | 112.7   |
| 55°   | 18224.1 | 8930.9  | 561.1   | 512.5   | 364.5   | 236.4   | 156.8   | 112.7   | 92.8    | 86.2    | 86.2    |
| 57.5° | 19640.0 | 9533.9  | 490.4   | 439.6   | 291.6   | 192.2   | 119.3   | 83.9    | 68.5    | 64.1    | 64.1    |
| 60°   | 21475.7 | 10271.7 | 421.9   | 357.9   | 229.7   | 145.8   | 88.4    | 59.6    | 50.8    | 48.6    | 48.6    |
| 62.5° | 23494.7 | 10704.7 | 360.1   | 287.2   | 178.9   | 108.2   | 64.1    | 39.8    | 37.6    | 37.6    | 35.3    |
| 65°   | 24729.5 | 10092.8 | 302.6   | 229.7   | 139.2   | 81.7    | 42.0    | 28.7    | 33.1    | 30.9    | 26.5    |
| 67.5° | 23154.5 | 7901.5  | 247.4   | 178.9   | 108.2   | 61.9    | 26.5    | 19.9    | 35.3    | 28.7    | 22.1    |
| 70°   | 19171.7 | 5531.3  | 192.2   | 125.9   | 86.2    | 53.0    | 17.7    | 13.3    | 37.6    | 28.7    | 17.7    |
| 72.5° | 14347.3 | 3702.2  | 152.4   | 83.9    | 64.1    | 46.4    | 15.5    | 6.6     | 33.1    | 24.3    | 15.5    |
| 75°   | 7839.7  | 1491.1  | 121.5   | 53.0    | 39.8    | 33.1    | 11.0    | 4.4     | 22.1    | 17.7    | 11.0    |
| 77.5° | 2063.2  | 393.2   | 88.4    | 35.3    | 22.1    | 13.3    | 6.6     | 2.2     | 11.0    | 8.8     | 4.4     |
| 80°   | 525.7   | 152.4   | 57.4    | 24.3    | 15.5    | 6.6     | 0.0     | 0.0     | 2.2     | 0.0     | 0.0     |
| 82.5° | 280.5   | 64.1    | 35.3    | 17.7    | 8.8     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| 85°   | 212.1   | 42.0    | 19.9    | 11.0    | 2.2     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| 87.5° | 81.7    | 13.3    | 6.6     | 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: SP1-1908-441-9-R4

Test Date: 10/23/2019

Luminaire Tested: SA1C-760-U-5WQ

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

### Test Information

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

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

### Spectral Parameters

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



### Test Conditions

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

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

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

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

CIE 1931 Chromaticity Diagram



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



Point lies inside the ANSI 5700K 4-step quadrangle

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

**Photopic Flux vs. Wavelength**



#####

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

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

Scotopic Flux vs. Wavelength



Scotopic Lumens: 13759.3

S/P: 1.85

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

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

**Melanopic Flux vs. Wavelength**



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

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

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

**TM-30-18**

### Summary

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



### Color Vector Graphics



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

**TM-30-18**

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

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



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

**TM-30-18**

Color Rendition by Hue-Angle Bin



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

**TM-30-18**

**Measure Comparisons**



(END OF REPORT)