

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: P321170

Luminaire Tested: **GLEON-SA6C-722-U-AFL**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P321170  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-29)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA6C-722-U-AFL  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(6) 70 CRI, 2200K, 1050mA LIGHTSQUARES WITH 16 LEDS EACH AND AUTOMOTIVE  
FRONTLINE OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 31904 lumens  
Efficiency: N/A  
Efficacy: 95.8 lumens/watt  
Luminous Opening: Rectangular (W 1.5' x L: 1' x H: 0')  
IES Classification: Type II - Short  
BUG Rating: B3 - U0 - G3

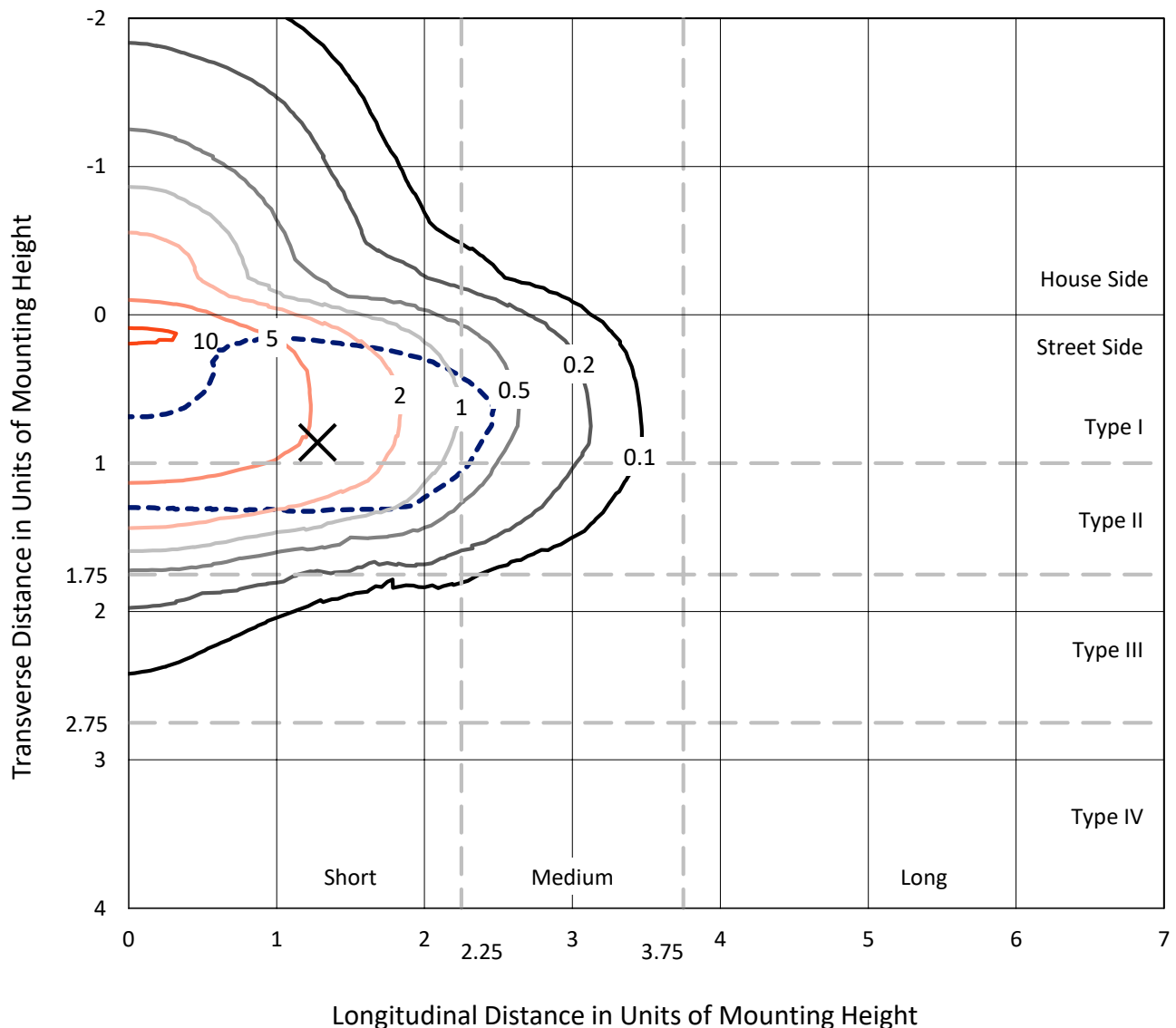
Input Watts (W): 333  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



REPORT NUMBER: P321170  
 CATALOG NUMBER: GLEON-SA6C-722-U-AFL

## Iso-Footcandle Lines of Horizontal Illumination

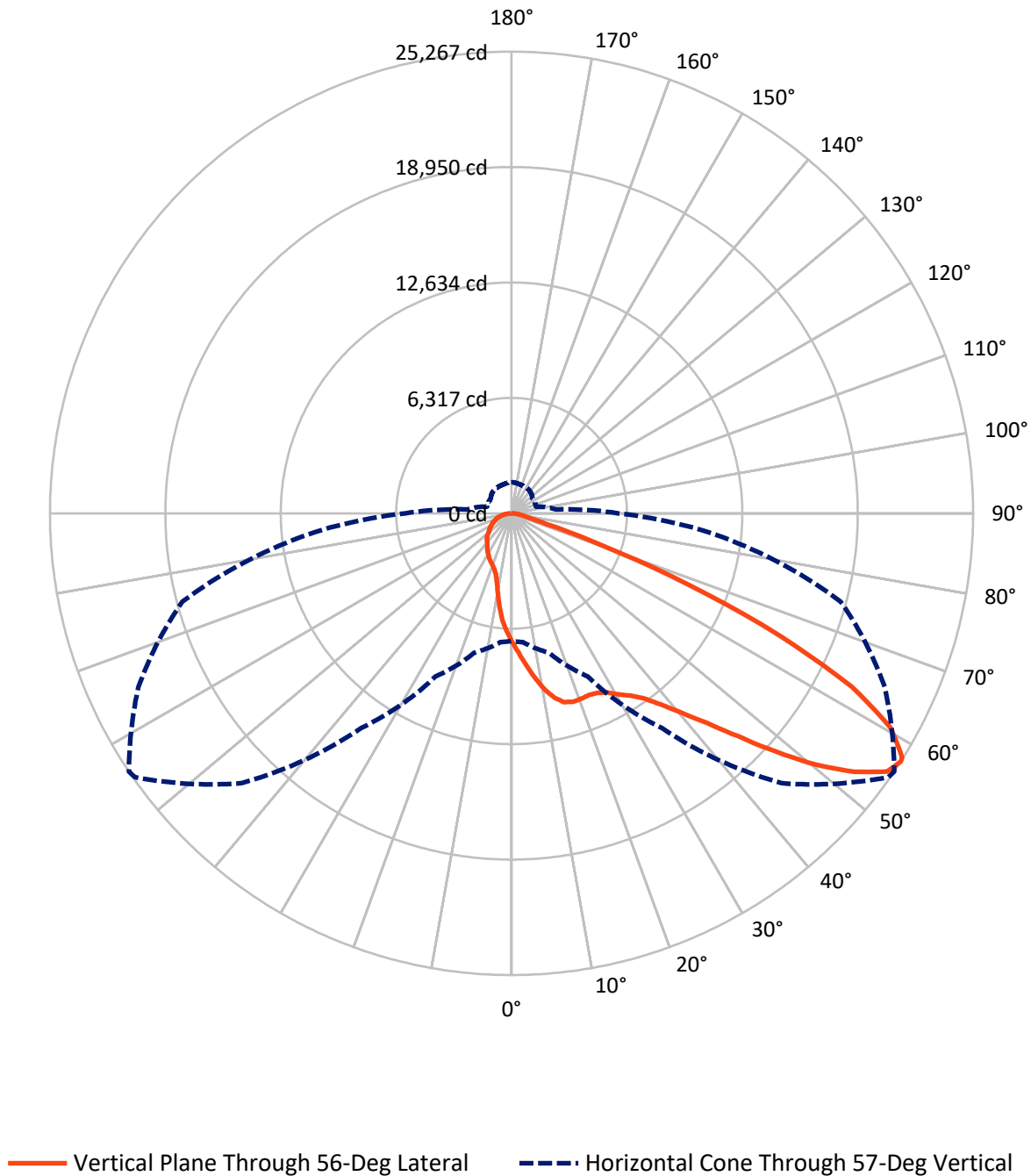
✕ Max cd  
 - - - 1/2 Max cd



Based on 30 foot mounting height. Maximum calculated value = 10.9 fc  
 Type II - Short - N/A

REPORT NUMBER: P321170  
CATALOG NUMBER: GLEON-SA6C-722-U-AFL

## Luminous Intensity Polar Plot



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CATALOG NUMBER: GLEON-SA6C-722-U-AFL

**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 5499.6   | 0.0    | 5499.6  |
|                    | % Fixture | 17.2     | 0.0    | 17.2    |
| <b>Street Side</b> | Lumens    | 26404.4  | 0.0    | 26404.4 |
|                    | % Fixture | 82.8     | 0.0    | 82.8    |
| <b>Total</b>       | Lumens    | 31904.0  | 0.0    | 31904.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 676.0   | 2.1       |
| 10°-20°   | 1911.1  | 6.0       |
| 20°-30°   | 3112.8  | 9.8       |
| 30°-40°   | 4653.3  | 14.6      |
| 40°-50°   | 7058.1  | 22.1      |
| 50°-60°   | 7910.9  | 24.8      |
| 60°-70°   | 4672.5  | 14.6      |
| 70°-80°   | 1530.9  | 4.8       |
| 80°-90°   | 378.2   | 1.2       |
| 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°    | 31904.0 | 100.0     |
| 0°-180°   | 31904.0 | 100.0     |

**Coefficient of Utilization**



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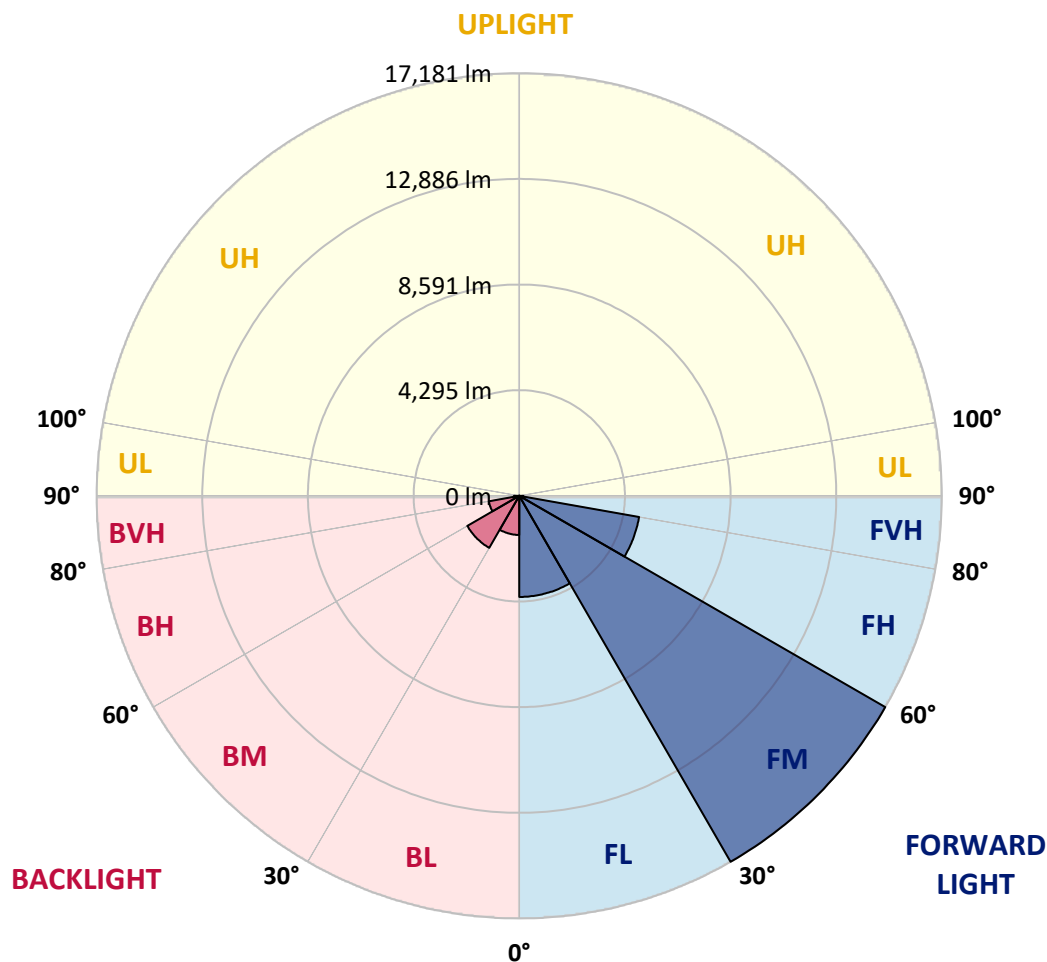
CATALOG NUMBER: GLEON-SA6C-722-U-AFL

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|---------|-----------|-------------------------|------|---------|
|      |             |         |           | B                       | U    | G       |
| FL   | (0°-30°)    | 4109.7  | 12.9      |                         |      |         |
| FM   | (30°-60°)   | 17181.4 | 53.9      |                         |      |         |
| FH   | (60°-80°)   | 4946.8  | 15.5      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 166.5   | 0.5       |                         |      | G2/225  |
| BL   | (0°-30°)    | 1590.2  | 5.0       | B3/2500                 |      |         |
| BM   | (30°-60°)   | 2441.1  | 7.7       | B2/2500                 |      |         |
| BH   | (60°-80°)   | 1256.6  | 3.9       | B3/2500                 |      | G3/2500 |
| BVH  | (80°-90°)   | 211.7   | 0.7       |                         |      | G2/225  |
| UL   | (90°-100°)  | 0.0     | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0     | 0.0       |                         | U0/0 |         |

**BUG Rating: B3-U0-G3**

Type II Short





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CATALOG NUMBER: GLEON-SA6C-722-U-AFL

**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 55°     | 56°     | 65°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 7076.3  | 7076.3  | 7076.3  | 7076.3  | 7076.3  | 7076.3  | 7076.3  | 7076.3  | 7076.3  | 7076.3  | 7076.3  |
| 2.5°  | 8125.6  | 8200.2  | 8167.3  | 8053.3  | 7965.5  | 7841.6  | 7703.5  | 7661.8  | 7516.0  | 7352.6  | 7156.4  |
| 5°    | 9411.7  | 9374.4  | 9320.7  | 9143.1  | 8955.6  | 8737.4  | 8391.0  | 8336.1  | 8011.6  | 7642.1  | 7251.8  |
| 7.5°  | 10144.1 | 10140.8 | 10109.1 | 10004.9 | 9833.8  | 9548.8  | 9131.0  | 9066.4  | 8576.2  | 7982.0  | 7376.8  |
| 10°   | 10037.8 | 10030.1 | 10082.7 | 10191.3 | 10242.8 | 10183.6 | 9831.7  | 9767.0  | 9165.0  | 8358.1  | 7521.5  |
| 12.5° | 9433.7  | 9438.0  | 9522.5  | 9750.5  | 10060.8 | 10433.6 | 10376.6 | 10344.8 | 9775.7  | 8783.5  | 7696.9  |
| 15°   | 8963.3  | 8973.2  | 9040.0  | 9238.5  | 9604.7  | 10281.2 | 10707.7 | 10718.7 | 10366.7 | 9252.7  | 7901.9  |
| 17.5° | 8757.2  | 8778.0  | 8808.7  | 8947.9  | 9283.4  | 9977.5  | 10786.6 | 10845.9 | 10884.2 | 9739.6  | 8099.3  |
| 20°   | 8822.9  | 8842.7  | 8851.5  | 8940.3  | 9215.5  | 9793.3  | 10731.8 | 10838.2 | 11281.1 | 10197.9 | 8296.7  |
| 22.5° | 9117.9  | 9129.9  | 9135.4  | 9158.5  | 9372.3  | 9845.9  | 10695.6 | 10807.5 | 11568.4 | 10609.0 | 8445.8  |
| 25°   | 9606.9  | 9598.1  | 9563.0  | 9533.4  | 9677.1  | 10054.2 | 10779.0 | 10885.3 | 11801.9 | 10981.8 | 8543.4  |
| 27.5° | 10192.4 | 10181.4 | 10113.4 | 10032.3 | 10114.5 | 10378.8 | 11019.1 | 11103.5 | 12011.4 | 11330.5 | 8592.7  |
| 30°   | 10895.2 | 10866.7 | 10738.4 | 10641.9 | 10673.7 | 10865.6 | 11414.9 | 11491.6 | 12334.8 | 11726.3 | 8640.9  |
| 32.5° | 11707.6 | 11676.9 | 11491.6 | 11331.6 | 11331.6 | 11491.6 | 11822.8 | 11886.4 | 12608.9 | 12173.6 | 8718.8  |
| 35°   | 12725.1 | 12686.8 | 12445.5 | 12176.9 | 12101.3 | 12182.4 | 12378.7 | 12423.6 | 13102.3 | 12737.2 | 8860.2  |
| 37.5° | 13924.6 | 13873.1 | 13560.6 | 13201.0 | 13035.4 | 13031.0 | 13172.5 | 13264.6 | 13890.6 | 13477.3 | 9100.3  |
| 40°   | 15127.4 | 15091.2 | 14818.2 | 14535.3 | 14210.8 | 14106.6 | 14324.8 | 14353.3 | 14921.3 | 14396.1 | 9407.3  |
| 42.5° | 16057.2 | 16050.6 | 16000.2 | 16037.4 | 15705.2 | 15494.7 | 15665.7 | 15688.8 | 16180.0 | 15390.5 | 9734.1  |
| 45°   | 16548.4 | 16559.3 | 16803.8 | 17345.5 | 17468.3 | 17314.8 | 17399.2 | 17405.8 | 17618.5 | 16393.8 | 10033.4 |
| 47.5° | 16154.7 | 16211.8 | 16830.1 | 18041.7 | 19047.1 | 19557.0 | 19416.6 | 19497.8 | 19013.1 | 17255.6 | 10268.0 |
| 50°   | 14620.8 | 14691.0 | 15743.6 | 17731.4 | 19783.9 | 21726.8 | 21653.3 | 21634.7 | 20138.1 | 17887.1 | 10395.2 |
| 52.5° | 12720.7 | 12775.6 | 13643.9 | 16118.6 | 19243.4 | 22926.3 | 23600.6 | 23504.1 | 21138.0 | 18359.7 | 10419.3 |
| 55°   | 9827.3  | 9912.8  | 10745.0 | 12899.5 | 17057.1 | 22468.0 | 25032.5 | 24945.9 | 22049.1 | 18607.5 | 10390.8 |
| 57°   | 6986.4  | 7076.3  | 7903.0  | 9844.8  | 14348.9 | 20881.4 | 25175.0 | 25267.1 | 22541.4 | 18649.1 | 10422.6 |
| 57.5° | 6234.3  | 6326.4  | 7145.4  | 9031.3  | 13504.7 | 20308.0 | 25052.2 | 25205.7 | 22630.2 | 18642.5 | 10440.2 |
| 60°   | 3139.1  | 3174.2  | 3696.1  | 5041.4  | 8536.8  | 16417.9 | 23450.4 | 23846.2 | 22710.3 | 18320.2 | 10515.8 |
| 62.5° | 1951.6  | 1926.4  | 1910.0  | 2322.2  | 4153.3  | 10887.5 | 20144.6 | 20906.7 | 21178.6 | 17539.5 | 10332.7 |
| 65°   | 1715.9  | 1668.8  | 1487.9  | 1455.0  | 1834.3  | 5288.1  | 15170.2 | 16118.6 | 17905.7 | 16309.3 | 9896.3  |
| 67.5° | 1611.7  | 1565.7  | 1361.8  | 1239.0  | 1240.1  | 2096.4  | 9418.3  | 10486.2 | 13948.7 | 14229.4 | 8866.8  |
| 70°   | 1504.3  | 1462.6  | 1271.9  | 1127.1  | 1055.9  | 1161.1  | 4333.1  | 5143.3  | 9092.7  | 11184.6 | 7410.7  |
| 72.5° | 1366.1  | 1337.6  | 1156.7  | 1007.6  | 932.0   | 869.5   | 1658.9  | 1959.3  | 5263.9  | 7511.6  | 5146.6  |
| 75°   | 1221.4  | 1195.1  | 1040.5  | 898.0   | 805.9   | 684.2   | 934.2   | 1006.5  | 2674.2  | 3843.0  | 2533.8  |
| 77.5° | 1062.4  | 1047.1  | 925.4   | 793.8   | 720.4   | 566.9   | 661.1   | 696.2   | 1146.9  | 1647.9  | 1270.8  |
| 80°   | 845.3   | 874.9   | 809.2   | 707.2   | 639.2   | 453.9   | 468.2   | 491.2   | 667.7   | 804.8   | 721.4   |
| 82.5° | 550.4   | 601.9   | 633.7   | 574.5   | 526.3   | 357.4   | 336.6   | 346.5   | 435.3   | 491.2   | 313.6   |
| 85°   | 229.2   | 257.7   | 416.6   | 376.1   | 349.8   | 260.9   | 225.9   | 230.2   | 269.7   | 279.6   | 128.3   |
| 87.5° | 102.0   | 108.5   | 183.1   | 172.1   | 148.0   | 89.9    | 96.5    | 105.3   | 143.6   | 136.0   | 49.3    |
| 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: P321170

CATALOG NUMBER: GLEON-SA6C-722-U-AFL

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 7076.3 | 7076.3 | 7076.3 | 7076.3 | 7076.3 | 7076.3 | 7076.3 | 7076.3 | 7076.3 | 7076.3 | 7076.3 |
| 2.5°  | 7082.9 | 6990.8 | 6832.9 | 6658.6 | 6516.1 | 6402.0 | 6286.9 | 6208.0 | 6115.9 | 6066.5 | 6041.3 |
| 5°    | 7088.4 | 6907.5 | 6575.3 | 6234.3 | 5929.5 | 5651.0 | 5385.6 | 5181.7 | 4990.9 | 4887.9 | 4859.4 |
| 7.5°  | 7111.4 | 6839.5 | 6302.3 | 5740.9 | 5199.3 | 4704.8 | 4323.2 | 4084.2 | 3912.0 | 3835.3 | 3813.4 |
| 10°   | 7130.1 | 6759.5 | 5964.6 | 5133.5 | 4396.7 | 3895.6 | 3599.6 | 3465.8 | 3406.6 | 3396.7 | 3386.9 |
| 12.5° | 7173.9 | 6677.2 | 5609.3 | 4499.7 | 3772.8 | 3426.3 | 3323.3 | 3314.5 | 3330.9 | 3355.1 | 3355.1 |
| 15°   | 7243.0 | 6596.1 | 5203.6 | 3955.9 | 3375.9 | 3254.2 | 3275.0 | 3323.3 | 3368.2 | 3405.5 | 3411.0 |
| 17.5° | 7293.4 | 6496.3 | 4767.3 | 3520.6 | 3164.3 | 3197.2 | 3271.7 | 3339.7 | 3385.8 | 3421.9 | 3425.2 |
| 20°   | 7329.6 | 6341.7 | 4301.3 | 3188.4 | 3042.6 | 3144.6 | 3237.7 | 3298.1 | 3329.8 | 3366.0 | 3371.5 |
| 22.5° | 7311.0 | 6134.5 | 3887.9 | 2950.5 | 2943.9 | 3067.8 | 3156.6 | 3229.0 | 3204.9 | 3169.8 | 3192.8 |
| 25°   | 7221.1 | 5849.4 | 3462.5 | 2772.9 | 2839.7 | 2964.7 | 3074.4 | 3026.1 | 2945.0 | 2929.7 | 2938.4 |
| 27.5° | 7061.0 | 5485.4 | 3068.9 | 2608.4 | 2719.1 | 2869.3 | 2862.8 | 2814.5 | 2786.0 | 2766.3 | 2778.3 |
| 30°   | 6888.8 | 5090.7 | 2724.6 | 2464.8 | 2585.4 | 2709.3 | 2684.1 | 2683.0 | 2654.4 | 2622.7 | 2638.0 |
| 32.5° | 6718.9 | 4693.8 | 2451.6 | 2346.4 | 2484.5 | 2500.9 | 2555.8 | 2572.2 | 2516.3 | 2449.4 | 2445.0 |
| 35°   | 6570.9 | 4318.8 | 2244.4 | 2238.9 | 2362.8 | 2365.0 | 2445.0 | 2422.0 | 2282.8 | 2213.7 | 2213.7 |
| 37.5° | 6460.1 | 3944.9 | 2086.5 | 2142.4 | 2202.7 | 2259.7 | 2300.3 | 2204.9 | 2181.9 | 2143.5 | 2142.4 |
| 40°   | 6411.9 | 3616.0 | 1987.8 | 2069.0 | 2089.8 | 2162.2 | 2058.0 | 2095.3 | 2106.2 | 2086.5 | 2086.5 |
| 42.5° | 6361.5 | 3329.8 | 1902.3 | 2013.0 | 2009.7 | 1999.9 | 1947.3 | 1995.5 | 2039.4 | 2040.4 | 2037.2 |
| 45°   | 6311.0 | 3083.2 | 1826.6 | 1893.5 | 1939.6 | 1833.2 | 1843.1 | 1894.6 | 1956.0 | 1978.0 | 1978.0 |
| 47.5° | 6255.1 | 2888.0 | 1757.6 | 1767.4 | 1838.7 | 1767.4 | 1759.8 | 1799.2 | 1871.6 | 1906.7 | 1914.4 |
| 50°   | 6132.3 | 2712.6 | 1678.6 | 1656.7 | 1676.4 | 1700.6 | 1707.1 | 1725.8 | 1805.8 | 1861.7 | 1874.9 |
| 52.5° | 5962.4 | 2555.8 | 1577.8 | 1554.7 | 1554.7 | 1645.7 | 1676.4 | 1681.9 | 1749.9 | 1816.8 | 1829.9 |
| 55°   | 5820.9 | 2456.0 | 1473.6 | 1469.2 | 1464.8 | 1587.6 | 1640.3 | 1649.0 | 1696.2 | 1748.8 | 1755.4 |
| 57°   | 5830.8 | 2448.3 | 1393.6 | 1397.9 | 1396.8 | 1528.4 | 1606.3 | 1624.9 | 1649.0 | 1694.0 | 1701.7 |
| 57.5° | 5836.3 | 2453.8 | 1376.0 | 1378.2 | 1377.1 | 1512.0 | 1596.4 | 1617.2 | 1635.9 | 1683.0 | 1690.7 |
| 60°   | 5918.5 | 2468.1 | 1304.7 | 1280.6 | 1286.1 | 1424.3 | 1540.5 | 1566.8 | 1578.9 | 1641.4 | 1651.2 |
| 62.5° | 5796.8 | 2404.5 | 1247.7 | 1189.6 | 1189.6 | 1332.2 | 1462.6 | 1504.3 | 1522.9 | 1607.4 | 1623.8 |
| 65°   | 5443.8 | 2225.7 | 1180.9 | 1086.6 | 1097.5 | 1240.1 | 1369.4 | 1437.4 | 1465.9 | 1571.2 | 1588.7 |
| 67.5° | 4898.8 | 2018.5 | 1109.6 | 994.5  | 1005.4 | 1143.6 | 1273.0 | 1346.4 | 1391.4 | 1531.7 | 1546.0 |
| 70°   | 4189.4 | 1765.2 | 1013.1 | 896.9  | 910.0  | 1038.3 | 1158.9 | 1242.3 | 1309.1 | 1494.4 | 1498.8 |
| 72.5° | 3088.6 | 1447.3 | 878.2  | 789.4  | 803.7  | 915.5  | 1043.8 | 1140.3 | 1230.2 | 1401.2 | 1399.0 |
| 75°   | 1836.5 | 1131.5 | 729.1  | 680.9  | 690.7  | 794.9  | 939.6  | 1057.0 | 1191.8 | 1365.1 | 1385.9 |
| 77.5° | 1114.0 | 851.9  | 594.3  | 570.1  | 582.2  | 688.6  | 865.1  | 990.1  | 1175.4 | 1287.2 | 1280.6 |
| 80°   | 673.2  | 608.5  | 474.8  | 459.4  | 471.5  | 588.8  | 800.4  | 939.6  | 1027.4 | 1099.7 | 1099.7 |
| 82.5° | 352.0  | 371.7  | 348.7  | 336.6  | 353.0  | 478.0  | 728.0  | 820.1  | 907.8  | 779.6  | 728.0  |
| 85°   | 143.6  | 194.1  | 211.6  | 210.5  | 220.4  | 331.1  | 628.3  | 701.7  | 585.5  | 555.9  | 569.0  |
| 87.5° | 48.2   | 82.2   | 103.1  | 88.8   | 93.2   | 208.3  | 435.3  | 338.8  | 402.4  | 280.7  | 266.4  |
| 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            |

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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

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**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               |           |                  |                  |

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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               |           |                  |                  |

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**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               |           |                  |                  |

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### Summary

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



### Color Vector Graphics



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**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 |            |



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Color Rendition by Hue-Angle Bin



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**Measure Comparisons**



(END OF REPORT)