

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: P317659

Luminaire Tested: **GLEON-SA5D-722-U-T2R**

Issue Date: 3/3/2020

### Test Information

Test Method: LM-79-08  
Report Number: P317659  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-8)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA5D-722-U-T2R  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(5) 70 CRI, 2200K, 1200mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE II  
ROADWAY OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

### Summary

Lumens per Lamp: N/A  
Luminaire Lumens: 29700 lumens  
Efficiency: N/A  
Efficacy: 92.8 lumens/watt  
Luminous Opening: Rectangular (W 1.5' x L: 1' x H: 0')  
IES Classification: Type II - Short  
BUG Rating: B3 - U0 - G3

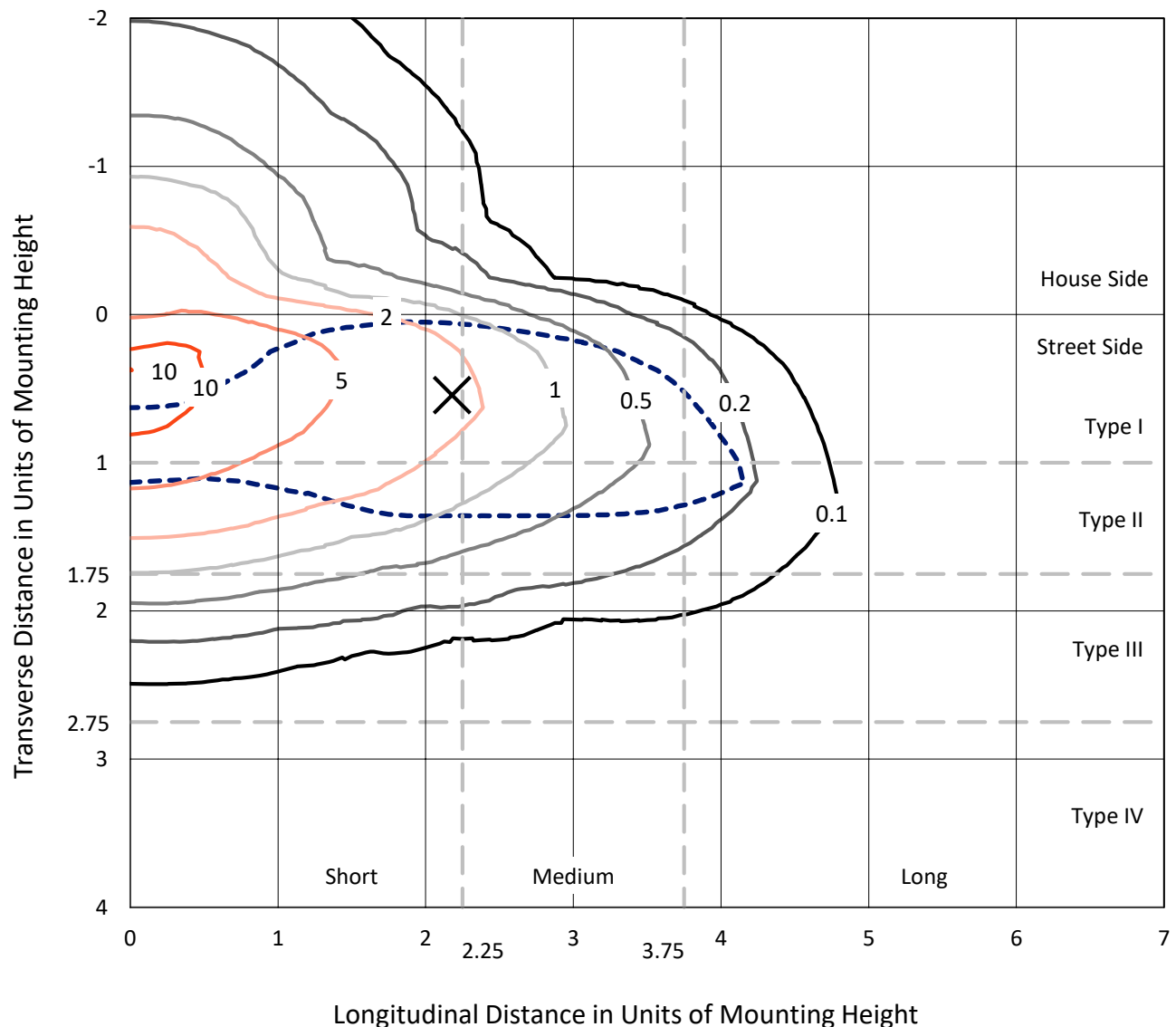
Input Watts (W): 320  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



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## Iso-Footcandle Lines of Horizontal Illumination

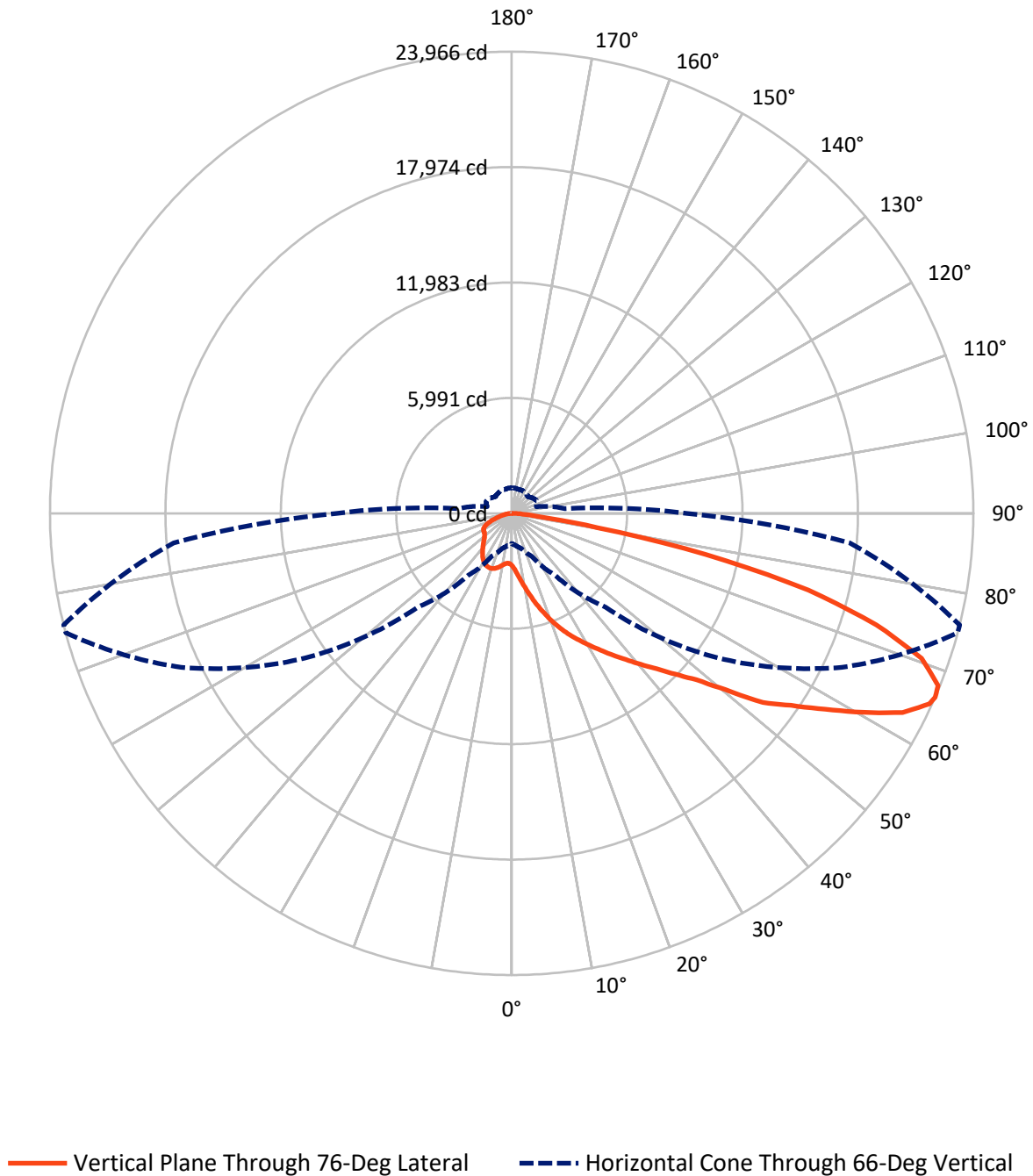
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 11.5 fc  
 Type II - Short - N/A

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## Luminous Intensity Polar Plot



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CATALOG NUMBER: GLEON-SA5D-722-U-T2R

**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 4997.5   | 0.0    | 4997.5  |
|                    | % Fixture | 16.8     | 0.0    | 16.8    |
| <b>Street Side</b> | Lumens    | 24702.5  | 0.0    | 24702.5 |
|                    | % Fixture | 83.2     | 0.0    | 83.2    |
| <b>Total</b>       | Lumens    | 29700.0  | 0.0    | 29700.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 328.0   | 1.1       |
| 10°-20°   | 1295.2  | 4.4       |
| 20°-30°   | 2516.9  | 8.5       |
| 30°-40°   | 4108.1  | 13.8      |
| 40°-50°   | 5612.7  | 18.9      |
| 50°-60°   | 6537.7  | 22.0      |
| 60°-70°   | 5861.1  | 19.7      |
| 70°-80°   | 2962.0  | 10.0      |
| 80°-90°   | 478.3   | 1.6       |
| 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°    | 29700.0 | 100.0     |
| 0°-180°   | 29700.0 | 100.0     |

**Coefficient of Utilization**



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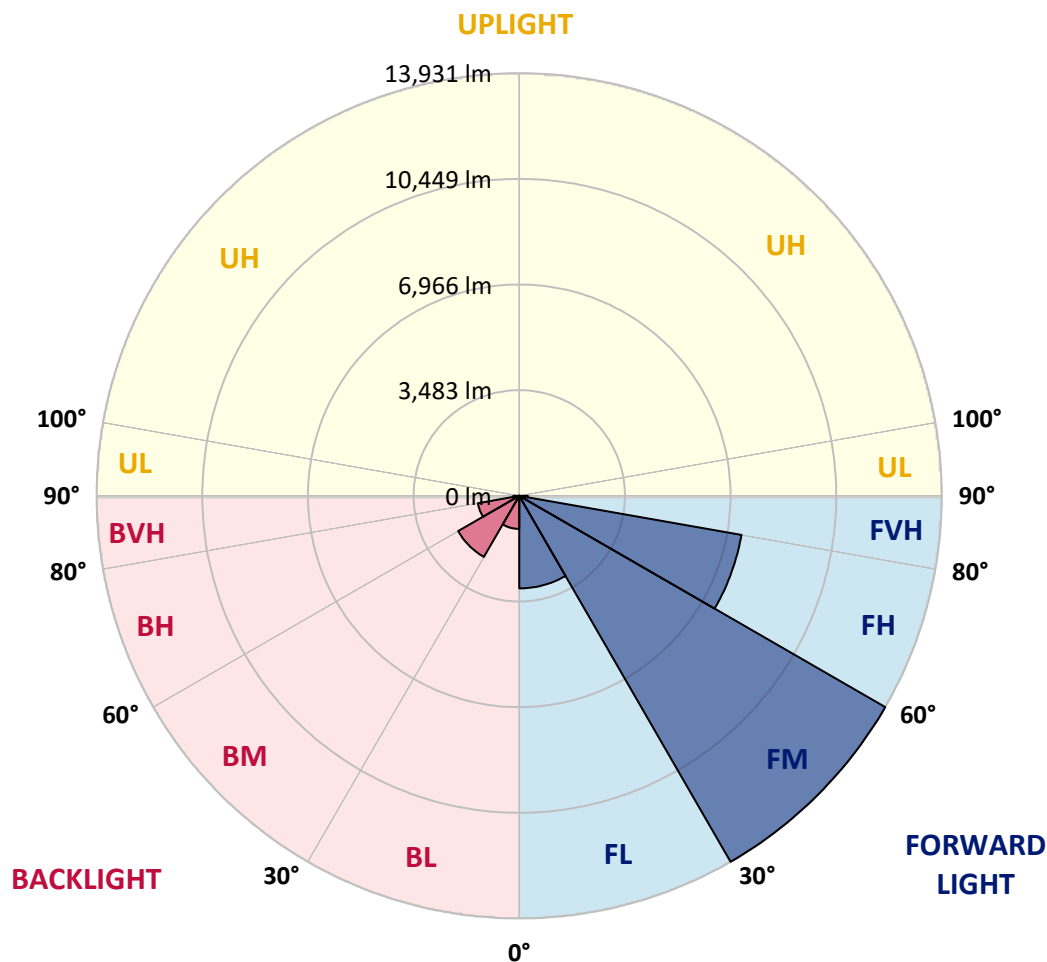
CATALOG NUMBER: GLEON-SA5D-722-U-T2R

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|---------|-----------|-------------------------|------|---------|
|      |             |         |           | B                       | U    | G       |
| FL   | (0°-30°)    | 3050.1  | 10.3      |                         |      |         |
| FM   | (30°-60°)   | 13931.4 | 46.9      |                         |      |         |
| FH   | (60°-80°)   | 7438.6  | 25.0      |                         |      | G3/7500 |
| FVH  | (80°-90°)   | 282.5   | 1.0       |                         |      | G3/500  |
| BL   | (0°-30°)    | 1090.0  | 3.7       | B3/2500                 |      |         |
| BM   | (30°-60°)   | 2327.1  | 7.8       | B2/2500                 |      |         |
| BH   | (60°-80°)   | 1384.5  | 4.7       | B3/2500                 |      | G3/2500 |
| BVH  | (80°-90°)   | 195.8   | 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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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 55°     | 65°     | 75°     | 76°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 2712.3  | 2712.3  | 2712.3  | 2712.3  | 2712.3  | 2712.3  | 2712.3  | 2712.3  | 2712.3  | 2712.3  | 2712.3  |
| 2.5°  | 3600.6  | 3546.1  | 3541.1  | 3461.4  | 3443.3  | 3291.0  | 3179.1  | 3062.2  | 2929.1  | 2902.8  | 2798.0  |
| 5°    | 4625.0  | 4620.0  | 4550.4  | 4420.3  | 4318.5  | 4058.3  | 3801.2  | 3529.0  | 3230.5  | 3182.1  | 2946.2  |
| 7.5°  | 5546.6  | 5538.5  | 5485.1  | 5344.9  | 5197.7  | 4878.1  | 4511.1  | 4093.6  | 3609.7  | 3538.1  | 3146.8  |
| 10°   | 6246.3  | 6243.3  | 6225.1  | 6122.3  | 5997.3  | 5690.7  | 5285.4  | 4715.7  | 4050.3  | 3952.5  | 3397.9  |
| 12.5° | 6786.7  | 6792.8  | 6804.9  | 6768.6  | 6709.1  | 6448.0  | 6032.6  | 5375.2  | 4520.1  | 4423.3  | 3677.2  |
| 15°   | 7152.8  | 7170.9  | 7233.4  | 7284.8  | 7316.1  | 7155.8  | 6753.5  | 6049.7  | 5046.5  | 4930.5  | 3986.7  |
| 17.5° | 7337.3  | 7357.4  | 7465.3  | 7620.6  | 7763.8  | 7747.6  | 7428.0  | 6693.0  | 5551.6  | 5439.7  | 4319.5  |
| 20°   | 7496.6  | 7511.7  | 7632.7  | 7819.2  | 8072.3  | 8184.2  | 8004.8  | 7312.1  | 6105.2  | 5972.1  | 4672.4  |
| 22.5° | 7958.4  | 7977.5  | 8013.8  | 8119.7  | 8343.5  | 8549.2  | 8462.5  | 7897.9  | 6612.3  | 6488.3  | 5007.1  |
| 25°   | 8849.7  | 8872.9  | 8794.2  | 8704.5  | 8746.9  | 8890.0  | 8906.2  | 8432.3  | 7126.5  | 6986.4  | 5367.1  |
| 27.5° | 9923.5  | 9956.8  | 9822.7  | 9591.8  | 9390.1  | 9334.7  | 9315.5  | 8869.9  | 7617.6  | 7455.2  | 5723.0  |
| 30°   | 10975.2 | 11032.6 | 10858.2 | 10558.7 | 10188.7 | 9928.6  | 9736.0  | 9298.4  | 8101.5  | 7946.3  | 6058.8  |
| 32.5° | 12002.6 | 11979.4 | 11726.3 | 11433.9 | 11000.4 | 10674.7 | 10208.9 | 9758.2  | 8646.0  | 8467.6  | 6392.5  |
| 35°   | 12706.4 | 12714.4 | 12479.5 | 12132.7 | 11719.3 | 11469.2 | 10842.1 | 10254.2 | 9201.6  | 9037.2  | 6771.6  |
| 37.5° | 13305.3 | 13268.0 | 13001.8 | 12678.1 | 12322.2 | 12215.3 | 11583.1 | 10800.7 | 9803.5  | 9624.1  | 7174.9  |
| 40°   | 13504.9 | 13461.6 | 13287.1 | 13054.2 | 12768.9 | 12759.8 | 12400.9 | 11419.8 | 10484.1 | 10306.7 | 7629.7  |
| 42.5° | 13383.9 | 13328.5 | 13256.9 | 13193.4 | 13105.7 | 13146.0 | 13169.2 | 12145.8 | 11232.3 | 11033.6 | 8156.0  |
| 45°   | 12937.3 | 12853.6 | 12904.0 | 13042.1 | 13232.7 | 13460.6 | 13862.9 | 12949.4 | 12070.1 | 11903.8 | 8774.1  |
| 47.5° | 12250.6 | 12175.0 | 12332.3 | 12627.7 | 13146.0 | 13722.7 | 14519.3 | 13836.7 | 13070.4 | 12905.0 | 9654.3  |
| 50°   | 11284.7 | 11306.9 | 11531.7 | 12069.1 | 12852.6 | 13843.7 | 15327.9 | 15011.3 | 14524.3 | 14370.0 | 10855.2 |
| 52.5° | 9699.7  | 9703.7  | 10336.9 | 11219.2 | 12332.3 | 13781.2 | 15776.6 | 16512.6 | 16509.6 | 16323.1 | 11998.6 |
| 55°   | 8227.6  | 8317.3  | 8818.4  | 9991.1  | 11489.4 | 13531.2 | 16090.2 | 17242.6 | 17813.3 | 17594.5 | 13064.3 |
| 57.5° | 6789.8  | 6842.2  | 7317.1  | 8494.8  | 10286.5 | 12864.7 | 16411.8 | 18118.8 | 19315.7 | 19177.5 | 14389.2 |
| 60°   | 5154.3  | 5235.0  | 5726.0  | 6814.0  | 8747.9  | 11682.0 | 16442.1 | 19033.3 | 21111.4 | 20972.3 | 15868.3 |
| 62.5° | 3345.5  | 3484.6  | 3944.4  | 4963.8  | 6886.6  | 9981.0  | 15740.3 | 19631.3 | 22813.4 | 22764.0 | 17181.1 |
| 65°   | 1922.8  | 2027.7  | 2347.3  | 3133.7  | 4751.0  | 7845.4  | 14071.6 | 19401.4 | 23861.0 | 23832.8 | 17672.2 |
| 66°   | 1570.9  | 1636.4  | 1881.5  | 2449.1  | 3920.2  | 6889.6  | 13101.6 | 18916.4 | 23964.9 | 23965.9 | 17615.7 |
| 67.5° | 1256.3  | 1285.6  | 1395.5  | 1753.4  | 2892.8  | 5460.9  | 11368.4 | 17846.6 | 23835.8 | 23871.1 | 17251.7 |
| 70°   | 1039.5  | 1054.7  | 1088.9  | 1175.7  | 1579.0  | 3293.1  | 8069.3  | 15066.8 | 22540.2 | 22567.4 | 15831.0 |
| 72.5° | 932.7   | 941.7   | 954.8   | 966.9   | 1114.2  | 1840.1  | 4928.5  | 12053.0 | 19762.3 | 19797.6 | 13666.3 |
| 75°   | 844.9   | 850.0   | 848.0   | 849.0   | 934.7   | 1172.6  | 2546.9  | 8998.9  | 15979.3 | 15908.7 | 10469.0 |
| 77.5° | 742.1   | 747.1   | 737.1   | 739.1   | 826.8   | 901.4   | 1267.4  | 6299.7  | 10783.6 | 10285.5 | 5898.5  |
| 80°   | 627.2   | 631.2   | 627.2   | 634.2   | 719.9   | 680.6   | 737.1   | 3544.1  | 4768.2  | 4510.0  | 2097.2  |
| 82.5° | 473.9   | 491.0   | 503.1   | 531.4   | 592.9   | 484.0   | 493.1   | 1380.3  | 1451.9  | 1382.4  | 643.3   |
| 85°   | 207.7   | 253.1   | 379.1   | 406.3   | 445.7   | 290.4   | 323.7   | 562.6   | 590.9   | 572.7   | 233.9   |
| 87.5° | 54.4    | 59.5    | 187.5   | 235.9   | 247.0   | 131.1   | 168.4   | 256.1   | 270.2   | 256.1   | 77.6    |
| 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: P317659

CATALOG NUMBER: GLEON-SA5D-722-U-T2R

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 2712.3 | 2712.3 | 2712.3 | 2712.3 | 2712.3 | 2712.3 | 2712.3 | 2712.3 | 2712.3 | 2712.3 | 2712.3 |
| 2.5°  | 2742.5 | 2693.1 | 2604.4 | 2525.7 | 2466.3 | 2425.9 | 2385.6 | 2365.4 | 2353.3 | 2341.2 | 2343.2 |
| 5°    | 2830.2 | 2730.4 | 2578.2 | 2470.3 | 2409.8 | 2371.5 | 2351.3 | 2343.2 | 2338.2 | 2326.1 | 2326.1 |
| 7.5°  | 2962.3 | 2821.2 | 2611.5 | 2500.5 | 2453.2 | 2423.9 | 2411.8 | 2407.8 | 2401.7 | 2387.6 | 2389.6 |
| 10°   | 3128.7 | 2931.1 | 2681.0 | 2573.1 | 2529.8 | 2497.5 | 2480.4 | 2474.3 | 2463.2 | 2447.1 | 2449.1 |
| 12.5° | 3324.3 | 3067.2 | 2772.8 | 2659.8 | 2607.4 | 2564.1 | 2535.8 | 2518.7 | 2499.5 | 2478.4 | 2479.4 |
| 15°   | 3538.1 | 3215.4 | 2871.6 | 2737.5 | 2665.9 | 2605.4 | 2560.0 | 2530.8 | 2500.5 | 2474.3 | 2473.3 |
| 17.5° | 3754.8 | 3358.6 | 2947.2 | 2779.8 | 2683.0 | 2603.4 | 2541.9 | 2496.5 | 2459.2 | 2426.9 | 2423.9 |
| 20°   | 3988.8 | 3487.6 | 2989.6 | 2775.8 | 2650.8 | 2556.0 | 2474.3 | 2417.9 | 2376.5 | 2344.3 | 2339.2 |
| 22.5° | 4226.7 | 3608.6 | 2996.6 | 2734.5 | 2579.2 | 2463.2 | 2377.5 | 2315.0 | 2272.7 | 2239.4 | 2227.3 |
| 25°   | 4444.5 | 3702.4 | 2967.4 | 2654.8 | 2479.4 | 2354.3 | 2270.7 | 2207.1 | 2172.8 | 2133.5 | 2121.4 |
| 27.5° | 4643.1 | 3768.0 | 2908.9 | 2553.0 | 2367.4 | 2244.4 | 2165.8 | 2111.3 | 2074.0 | 2043.8 | 2033.7 |
| 30°   | 4821.6 | 3803.2 | 2813.1 | 2432.0 | 2252.5 | 2140.6 | 2074.0 | 2036.7 | 2004.5 | 1966.2 | 1959.1 |
| 32.5° | 4991.0 | 3803.2 | 2690.1 | 2299.9 | 2138.6 | 2048.8 | 2009.5 | 1986.3 | 1950.0 | 1912.7 | 1902.6 |
| 35°   | 5160.4 | 3780.1 | 2544.9 | 2161.8 | 2033.7 | 1983.3 | 1981.3 | 1954.1 | 1898.6 | 1848.2 | 1835.1 |
| 37.5° | 5338.9 | 3732.7 | 2381.6 | 2032.7 | 1948.0 | 1954.1 | 1971.2 | 1910.7 | 1832.0 | 1760.5 | 1741.3 |
| 40°   | 5540.5 | 3667.1 | 2212.2 | 1920.8 | 1876.4 | 1940.9 | 1944.0 | 1848.2 | 1694.9 | 1629.4 | 1612.2 |
| 42.5° | 5777.5 | 3601.6 | 2054.9 | 1822.0 | 1819.9 | 1901.6 | 1892.5 | 1713.1 | 1621.3 | 1588.0 | 1579.0 |
| 45°   | 6089.0 | 3564.3 | 1905.7 | 1728.2 | 1775.6 | 1838.1 | 1804.8 | 1638.5 | 1600.1 | 1581.0 | 1572.9 |
| 47.5° | 6580.1 | 3583.4 | 1768.5 | 1653.6 | 1731.2 | 1774.6 | 1641.5 | 1608.2 | 1581.0 | 1557.8 | 1549.7 |
| 50°   | 7195.1 | 3572.3 | 1657.6 | 1602.2 | 1680.8 | 1708.0 | 1567.9 | 1568.9 | 1554.8 | 1528.6 | 1516.5 |
| 52.5° | 7657.9 | 3485.6 | 1586.0 | 1572.9 | 1636.4 | 1590.1 | 1521.5 | 1530.6 | 1523.5 | 1485.2 | 1472.1 |
| 55°   | 8104.6 | 3411.0 | 1549.7 | 1561.8 | 1604.2 | 1442.9 | 1467.1 | 1489.2 | 1482.2 | 1444.9 | 1438.8 |
| 57.5° | 8660.1 | 3396.9 | 1527.5 | 1564.9 | 1577.0 | 1369.2 | 1414.6 | 1443.9 | 1438.8 | 1422.7 | 1419.7 |
| 60°   | 9340.7 | 3400.9 | 1507.4 | 1569.9 | 1546.7 | 1314.8 | 1365.2 | 1402.5 | 1405.5 | 1402.5 | 1400.5 |
| 62.5° | 9714.8 | 3291.0 | 1457.0 | 1555.8 | 1493.3 | 1267.4 | 1313.8 | 1368.2 | 1369.2 | 1375.3 | 1374.3 |
| 65°   | 9397.2 | 2962.3 | 1363.2 | 1506.4 | 1403.5 | 1228.1 | 1269.4 | 1328.9 | 1313.8 | 1341.0 | 1341.0 |
| 66°   | 9088.7 | 2772.8 | 1316.8 | 1474.1 | 1365.2 | 1213.0 | 1255.3 | 1308.8 | 1289.6 | 1326.9 | 1326.9 |
| 67.5° | 8458.5 | 2453.2 | 1233.1 | 1405.5 | 1310.8 | 1191.8 | 1239.2 | 1275.5 | 1249.3 | 1304.7 | 1300.7 |
| 70°   | 7307.0 | 1897.6 | 1064.7 | 1250.3 | 1221.0 | 1160.5 | 1217.0 | 1208.9 | 1170.6 | 1255.3 | 1239.2 |
| 72.5° | 6160.6 | 1441.8 | 855.0  | 1046.6 | 1084.9 | 1121.2 | 1185.7 | 1124.2 | 1075.8 | 1135.3 | 1100.0 |
| 75°   | 4780.3 | 1083.9 | 675.5  | 813.7  | 916.5  | 1059.7 | 1148.4 | 1026.4 | 956.9  | 950.8  | 931.7  |
| 77.5° | 2584.2 | 744.1  | 535.4  | 621.1  | 728.0  | 983.1  | 1123.2 | 921.6  | 816.7  | 792.5  | 777.4  |
| 80°   | 1023.4 | 484.0  | 389.2  | 470.9  | 509.2  | 872.2  | 1062.7 | 799.6  | 673.5  | 649.3  | 626.1  |
| 82.5° | 422.5  | 286.4  | 251.1  | 315.6  | 331.7  | 746.1  | 953.8  | 655.4  | 520.3  | 719.9  | 764.3  |
| 85°   | 181.5  | 157.3  | 149.2  | 163.3  | 187.5  | 523.3  | 759.2  | 500.1  | 561.6  | 501.1  | 398.3  |
| 87.5° | 54.4   | 66.5   | 63.5   | 62.5   | 68.6   | 125.0  | 404.3  | 278.3  | 412.4  | 156.3  | 117.0  |
| 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            |

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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)