

Signify Classified - Internal  
Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269



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: P321059

Luminaire Tested: **GLEON-SA5D-760-U-AFL**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P321059  
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-SA5D-760-U-AFL  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(5) 70 CRI, 5700K, 1200mA LIGHTSQUARES WITH 16 LEDS EACH AND AUTOMOTIVE  
FRONTLINE OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 39784 lumens  
Efficiency: N/A  
Efficacy: 124.3 lumens/watt  
Luminous Opening: Rectangular (W 1.5' x L: 1' x H: 0')  
IES Classification: Type II - Short  
BUG Rating: B3 - U0 - G3

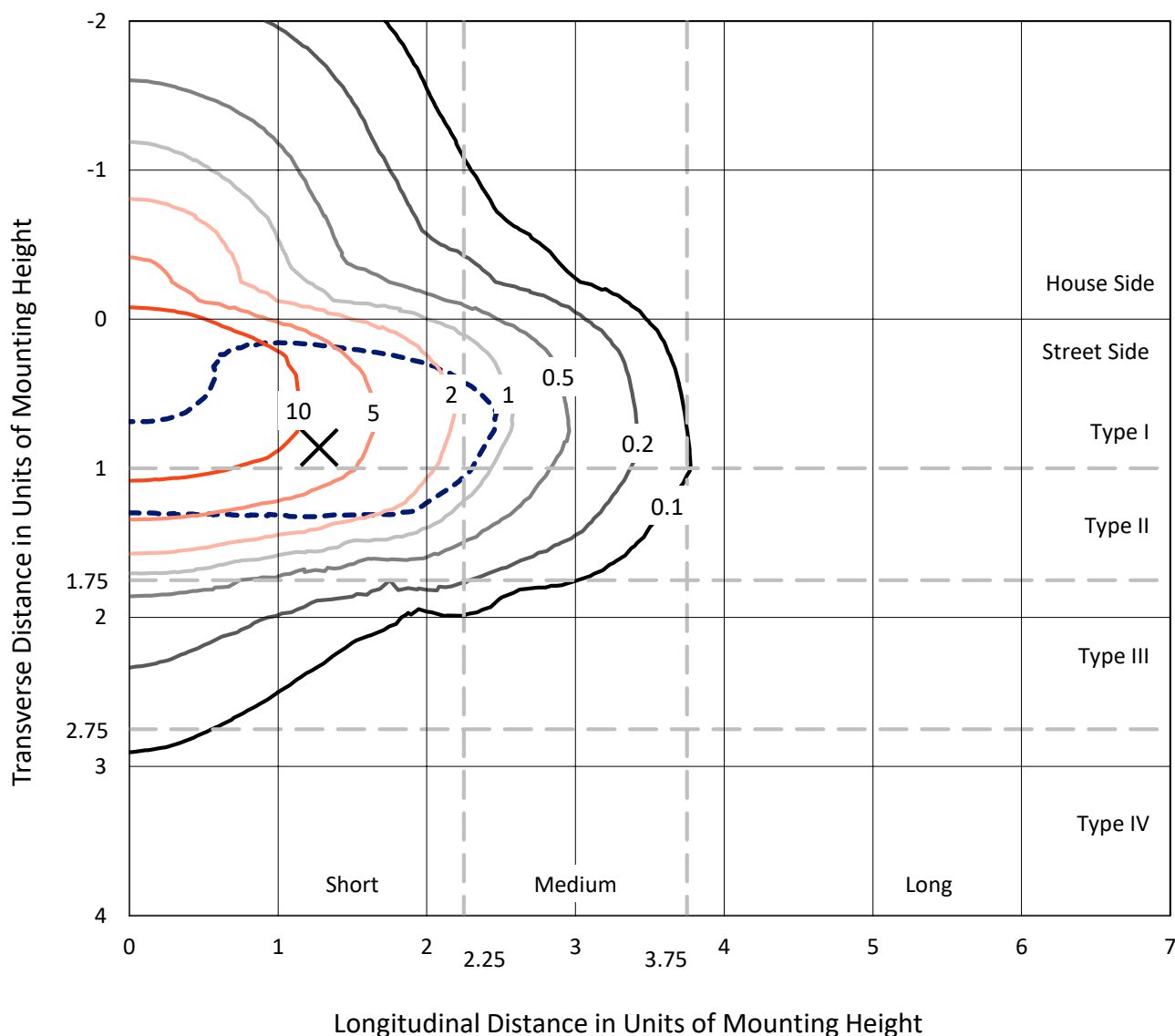
Input Watts (W): 320  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



REPORT NUMBER: P321059  
 CATALOG NUMBER: GLEON-SA5D-760-U-AFL

## Iso-Footcandle Lines of Horizontal Illumination

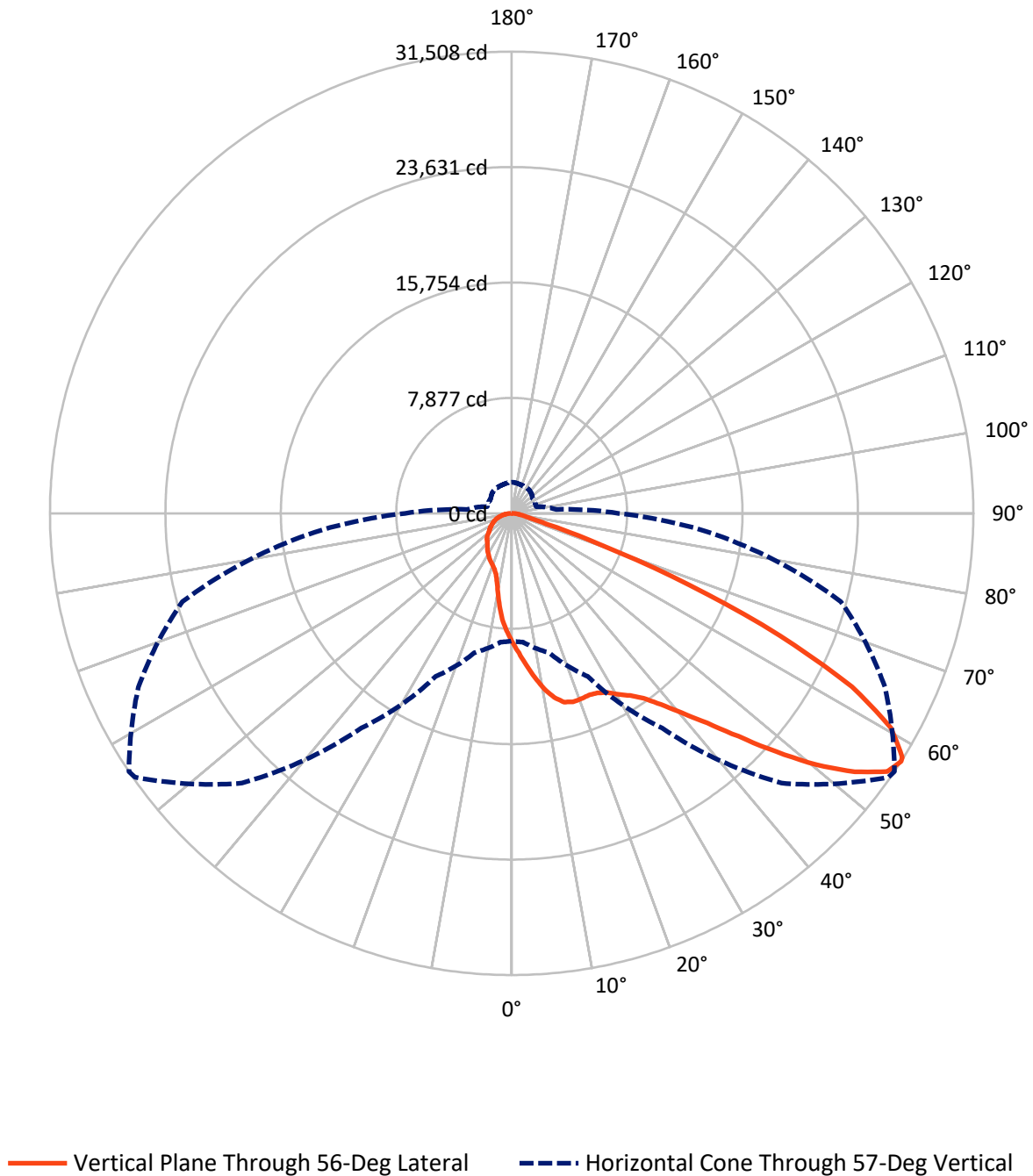
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 19.6 fc  
 Type II - Short - N/A

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CATALOG NUMBER: GLEON-SA5D-760-U-AFL

## Luminous Intensity Polar Plot



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CATALOG NUMBER: GLEON-SA5D-760-U-AFL

**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 6857.9   | 0.0    | 6857.9  |
|                    | % Fixture | 17.2     | 0.0    | 17.2    |
| <b>Street Side</b> | Lumens    | 32926.1  | 0.0    | 32926.1 |
|                    | % Fixture | 82.8     | 0.0    | 82.8    |
| <b>Total</b>       | Lumens    | 39784.0  | 0.0    | 39784.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 842.9   | 2.1       |
| 10°-20°   | 2383.1  | 6.0       |
| 20°-30°   | 3881.7  | 9.8       |
| 30°-40°   | 5802.7  | 14.6      |
| 40°-50°   | 8801.4  | 22.1      |
| 50°-60°   | 9864.9  | 24.8      |
| 60°-70°   | 5826.6  | 14.6      |
| 70°-80°   | 1909.0  | 4.8       |
| 80°-90°   | 471.6   | 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°    | 39784.0 | 100.0     |
| 0°-180°   | 39784.0 | 100.0     |

**Coefficient of Utilization**



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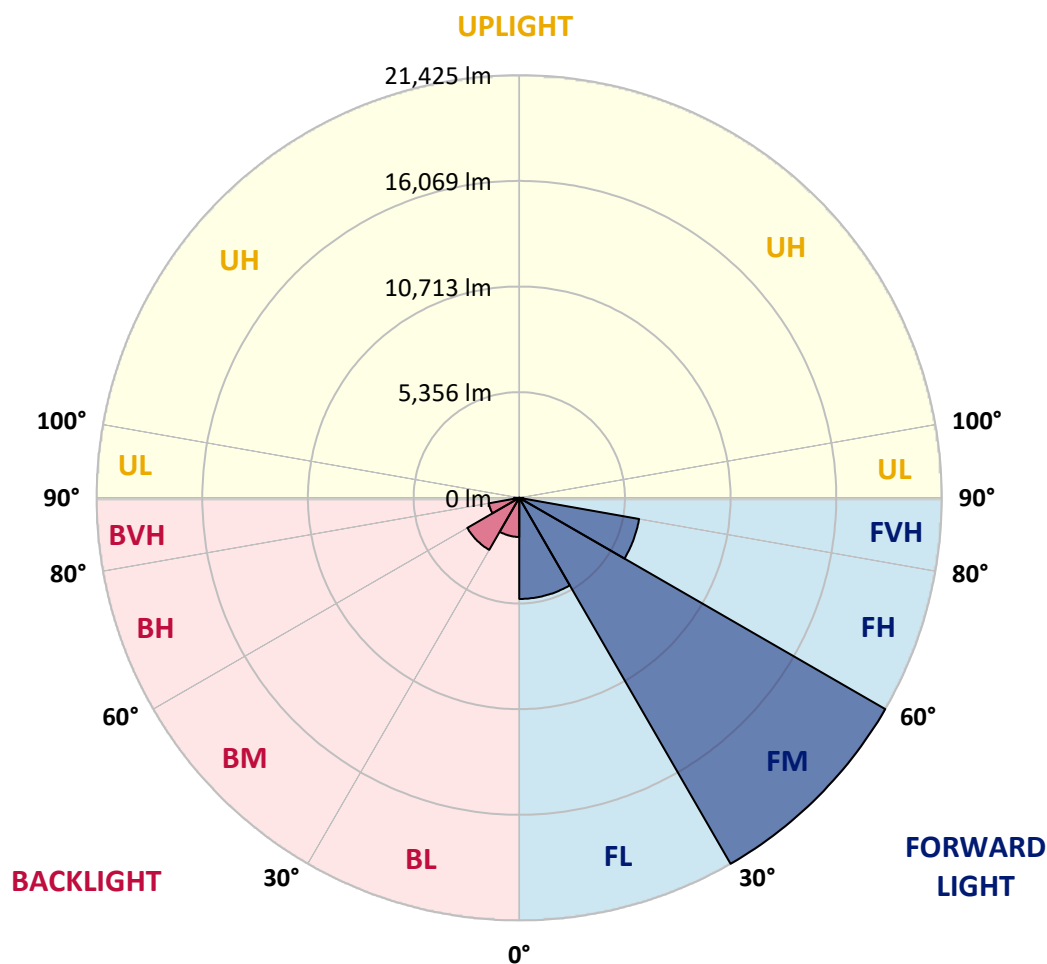
CATALOG NUMBER: GLEON-SA5D-760-U-AFL

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|---------|-----------|-------------------------|------|---------|
|      |             |         |           | B                       | U    | G       |
| FL   | (0°-30°)    | 5124.8  | 12.9      |                         |      |         |
| FM   | (30°-60°)   | 21425.0 | 53.9      |                         |      |         |
| FH   | (60°-80°)   | 6168.6  | 15.5      |                         |      | G3/7500 |
| FVH  | (80°-90°)   | 207.7   | 0.5       |                         |      | G2/225  |
| BL   | (0°-30°)    | 1983.0  | 5.0       | B3/2500                 |      |         |
| BM   | (30°-60°)   | 3044.0  | 7.7       | B3/5000                 |      |         |
| BH   | (60°-80°)   | 1566.9  | 3.9       | B3/2500                 |      | G3/2500 |
| BVH  | (80°-90°)   | 264.0   | 0.7       |                         |      | G3/500  |
| 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-SA5D-760-U-AFL

**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 55°     | 56°     | 65°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 8824.1  | 8824.1  | 8824.1  | 8824.1  | 8824.1  | 8824.1  | 8824.1  | 8824.1  | 8824.1  | 8824.1  | 8824.1  |
| 2.5°  | 10132.6 | 10225.5 | 10184.5 | 10042.3 | 9933.0  | 9778.5  | 9606.2  | 9554.2  | 9372.4  | 9168.7  | 8923.9  |
| 5°    | 11736.3 | 11689.8 | 11622.9 | 11401.4 | 11167.6 | 10895.5 | 10463.4 | 10395.1 | 9990.4  | 9529.6  | 9042.9  |
| 7.5°  | 12649.6 | 12645.5 | 12605.9 | 12476.0 | 12262.7 | 11907.2 | 11386.3 | 11305.7 | 10694.5 | 9953.5  | 9198.7  |
| 10°   | 12517.0 | 12507.5 | 12573.1 | 12708.4 | 12772.7 | 12698.9 | 12260.0 | 12179.3 | 11428.7 | 10422.4 | 9379.2  |
| 12.5° | 11763.7 | 11769.1 | 11874.4 | 12158.8 | 12545.7 | 13010.6 | 12939.5 | 12899.9 | 12190.3 | 10952.9 | 9598.0  |
| 15°   | 11177.1 | 11189.4 | 11272.8 | 11520.3 | 11977.0 | 12820.6 | 13352.4 | 13366.1 | 12927.2 | 11538.1 | 9853.7  |
| 17.5° | 10920.1 | 10946.1 | 10984.4 | 11158.0 | 11576.4 | 12441.8 | 13450.8 | 13524.7 | 13572.5 | 12145.1 | 10099.8 |
| 20°   | 11002.1 | 11026.7 | 11037.7 | 11148.4 | 11491.6 | 12212.1 | 13382.5 | 13515.1 | 14067.5 | 12716.6 | 10345.9 |
| 22.5° | 11369.9 | 11385.0 | 11391.8 | 11420.5 | 11687.1 | 12277.8 | 13337.4 | 13476.8 | 14425.7 | 13229.4 | 10531.8 |
| 25°   | 11979.7 | 11968.8 | 11925.0 | 11888.1 | 12067.2 | 12537.5 | 13441.3 | 13573.9 | 14716.9 | 13694.2 | 10653.5 |
| 27.5° | 12709.8 | 12696.1 | 12611.4 | 12510.2 | 12612.7 | 12942.2 | 13740.7 | 13846.0 | 14978.0 | 14129.0 | 10715.0 |
| 30°   | 13586.2 | 13550.7 | 13390.7 | 13270.4 | 13310.0 | 13549.3 | 14234.3 | 14330.0 | 15381.4 | 14622.6 | 10775.2 |
| 32.5° | 14599.3 | 14561.0 | 14330.0 | 14130.4 | 14130.4 | 14330.0 | 14742.9 | 14822.2 | 15723.2 | 15180.4 | 10872.2 |
| 35°   | 15868.1 | 15820.3 | 15519.5 | 15184.5 | 15090.2 | 15191.3 | 15436.1 | 15492.1 | 16338.4 | 15883.2 | 11048.6 |
| 37.5° | 17363.9 | 17299.6 | 16909.9 | 16461.5 | 16255.0 | 16249.6 | 16425.9 | 16540.8 | 17321.5 | 16806.0 | 11348.0 |
| 40°   | 18863.7 | 18818.6 | 18478.2 | 18125.4 | 17720.7 | 17590.8 | 17862.9 | 17898.5 | 18606.7 | 17951.8 | 11730.9 |
| 42.5° | 20023.1 | 20014.9 | 19952.0 | 19998.5 | 19584.3 | 19321.7 | 19535.0 | 19563.7 | 20176.3 | 19191.9 | 12138.3 |
| 45°   | 20635.7 | 20649.3 | 20954.2 | 21629.6 | 21782.8 | 21591.4 | 21696.6 | 21704.8 | 21970.1 | 20442.9 | 12511.6 |
| 47.5° | 20144.8 | 20215.9 | 20987.0 | 22497.8 | 23751.6 | 24387.4 | 24212.3 | 24313.5 | 23709.2 | 21517.5 | 12804.1 |
| 50°   | 18232.1 | 18319.6 | 19632.1 | 22110.9 | 24670.4 | 27093.1 | 27001.5 | 26978.3 | 25112.0 | 22305.1 | 12962.7 |
| 52.5° | 15862.6 | 15931.0 | 17013.9 | 20099.7 | 23996.3 | 28588.9 | 29429.7 | 29309.4 | 26358.9 | 22894.3 | 12992.8 |
| 55°   | 12254.5 | 12361.2 | 13398.9 | 16085.5 | 21270.1 | 28017.4 | 31215.3 | 31107.3 | 27495.1 | 23203.3 | 12957.3 |
| 57°   | 8712.0  | 8824.1  | 9855.0  | 12276.4 | 17893.0 | 26039.0 | 31393.1 | 31507.9 | 28109.0 | 23255.3 | 12996.9 |
| 57.5° | 7774.1  | 7888.9  | 8910.3  | 11261.9 | 16840.2 | 25323.9 | 31239.9 | 31431.3 | 28219.7 | 23247.1 | 13018.8 |
| 60°   | 3914.4  | 3958.1  | 4608.9  | 6286.5  | 10645.3 | 20473.0 | 29242.4 | 29736.0 | 28319.5 | 22845.1 | 13113.1 |
| 62.5° | 2433.7  | 2402.2  | 2381.7  | 2895.8  | 5179.1  | 13576.6 | 25120.2 | 26070.4 | 26409.5 | 21871.6 | 12884.8 |
| 65°   | 2139.7  | 2080.9  | 1855.3  | 1814.3  | 2287.4  | 6594.2  | 18917.0 | 20099.7 | 22328.3 | 20337.6 | 12340.7 |
| 67.5° | 2009.8  | 1952.4  | 1698.1  | 1545.0  | 1546.3  | 2614.2  | 11744.5 | 13076.2 | 17393.9 | 17744.0 | 11056.8 |
| 70°   | 1875.8  | 1823.9  | 1586.0  | 1405.5  | 1316.6  | 1447.9  | 5403.3  | 6413.7  | 11338.5 | 13947.2 | 9241.1  |
| 72.5° | 1703.6  | 1668.0  | 1442.4  | 1256.5  | 1162.1  | 1084.2  | 2068.6  | 2443.2  | 6564.1  | 9366.9  | 6417.8  |
| 75°   | 1523.1  | 1490.3  | 1297.5  | 1119.8  | 1004.9  | 853.2   | 1164.9  | 1255.1  | 3334.7  | 4792.2  | 3159.7  |
| 77.5° | 1324.8  | 1305.7  | 1153.9  | 989.9   | 898.3   | 706.9   | 824.4   | 868.2   | 1430.1  | 2055.0  | 1584.6  |
| 80°   | 1054.1  | 1091.1  | 1009.0  | 881.9   | 797.1   | 566.0   | 583.8   | 612.5   | 832.6   | 1003.5  | 899.6   |
| 82.5° | 686.4   | 750.6   | 790.3   | 716.4   | 656.3   | 445.7   | 419.7   | 432.0   | 542.8   | 612.5   | 391.0   |
| 85°   | 285.8   | 321.3   | 519.5   | 469.0   | 436.1   | 325.4   | 281.7   | 287.1   | 336.3   | 348.6   | 160.0   |
| 87.5° | 127.2   | 135.4   | 228.3   | 214.7   | 184.6   | 112.1   | 120.3   | 131.3   | 179.1   | 169.5   | 61.5    |
| 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: P321059

CATALOG NUMBER: GLEON-SA5D-760-U-AFL

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 8824.1 | 8824.1 | 8824.1 | 8824.1 | 8824.1 | 8824.1 | 8824.1 | 8824.1 | 8824.1 | 8824.1 | 8824.1 |
| 2.5°  | 8832.3 | 8717.5 | 8520.6 | 8303.2 | 8125.5 | 7983.3 | 7839.7 | 7741.3 | 7626.4 | 7564.9 | 7533.5 |
| 5°    | 8839.2 | 8613.6 | 8199.3 | 7774.1 | 7394.0 | 7046.7 | 6715.9 | 6461.5 | 6223.6 | 6095.1 | 6059.6 |
| 7.5°  | 8867.9 | 8528.8 | 7858.9 | 7158.8 | 6483.4 | 5866.8 | 5391.0 | 5092.9 | 4878.3 | 4782.6 | 4755.2 |
| 10°   | 8891.1 | 8429.0 | 7437.8 | 6401.4 | 5482.6 | 4857.8 | 4488.6 | 4321.8 | 4248.0 | 4235.7 | 4223.4 |
| 12.5° | 8945.8 | 8326.5 | 6994.8 | 5611.1 | 4704.7 | 4272.6 | 4144.1 | 4133.1 | 4153.7 | 4183.7 | 4183.7 |
| 15°   | 9031.9 | 8225.3 | 6488.9 | 4933.0 | 4209.7 | 4058.0 | 4083.9 | 4144.1 | 4200.1 | 4246.6 | 4253.5 |
| 17.5° | 9094.8 | 8100.9 | 5944.7 | 4390.2 | 3945.8 | 3986.9 | 4079.8 | 4164.6 | 4222.0 | 4267.1 | 4271.2 |
| 20°   | 9140.0 | 7908.1 | 5363.7 | 3975.9 | 3794.1 | 3921.2 | 4037.4 | 4112.6 | 4152.3 | 4197.4 | 4204.2 |
| 22.5° | 9116.7 | 7649.7 | 4848.2 | 3679.2 | 3671.0 | 3825.5 | 3936.3 | 4026.5 | 3996.4 | 3952.7 | 3981.4 |
| 25°   | 9004.6 | 7294.2 | 4317.7 | 3457.7 | 3541.1 | 3697.0 | 3833.7 | 3773.6 | 3672.4 | 3653.2 | 3664.2 |
| 27.5° | 8805.0 | 6840.3 | 3826.9 | 3252.6 | 3390.7 | 3578.1 | 3569.8 | 3509.7 | 3474.1 | 3449.5 | 3464.6 |
| 30°   | 8590.3 | 6348.1 | 3397.6 | 3073.5 | 3223.9 | 3378.4 | 3347.0 | 3345.6 | 3310.1 | 3270.4 | 3289.6 |
| 32.5° | 8378.4 | 5853.1 | 3057.1 | 2925.9 | 3098.2 | 3118.7 | 3187.0 | 3207.5 | 3137.8 | 3054.4 | 3048.9 |
| 35°   | 8193.8 | 5385.5 | 2798.7 | 2791.9 | 2946.4 | 2949.1 | 3048.9 | 3020.2 | 2846.6 | 2760.4 | 2760.4 |
| 37.5° | 8055.7 | 4919.3 | 2601.8 | 2671.6 | 2746.8 | 2817.9 | 2868.5 | 2749.5 | 2720.8 | 2672.9 | 2671.6 |
| 40°   | 7995.6 | 4509.1 | 2478.8 | 2580.0 | 2605.9 | 2696.2 | 2566.3 | 2612.8 | 2626.5 | 2601.8 | 2601.8 |
| 42.5° | 7932.7 | 4152.3 | 2372.2 | 2510.2 | 2506.1 | 2493.8 | 2428.2 | 2488.4 | 2543.1 | 2544.4 | 2540.3 |
| 45°   | 7869.8 | 3844.7 | 2277.8 | 2361.2 | 2418.6 | 2286.0 | 2298.3 | 2362.6 | 2439.1 | 2466.5 | 2466.5 |
| 47.5° | 7800.1 | 3601.3 | 2191.7 | 2204.0 | 2292.9 | 2204.0 | 2194.4 | 2243.6 | 2333.9 | 2377.6 | 2387.2 |
| 50°   | 7646.9 | 3382.5 | 2093.2 | 2065.9 | 2090.5 | 2120.6 | 2128.8 | 2152.0 | 2251.8 | 2321.6 | 2338.0 |
| 52.5° | 7435.0 | 3187.0 | 1967.4 | 1938.7 | 1938.7 | 2052.2 | 2090.5 | 2097.3 | 2182.1 | 2265.5 | 2281.9 |
| 55°   | 7258.6 | 3062.6 | 1837.6 | 1832.1 | 1826.6 | 1979.8 | 2045.4 | 2056.3 | 2115.1 | 2180.7 | 2188.9 |
| 57°   | 7270.9 | 3053.0 | 1737.8 | 1743.2 | 1741.9 | 1905.9 | 2003.0 | 2026.2 | 2056.3 | 2112.4 | 2121.9 |
| 57.5° | 7277.8 | 3059.9 | 1715.9 | 1718.6 | 1717.2 | 1885.4 | 1990.7 | 2016.7 | 2039.9 | 2098.7 | 2108.3 |
| 60°   | 7380.3 | 3077.6 | 1627.0 | 1596.9 | 1603.8 | 1776.0 | 1921.0 | 1953.8 | 1968.8 | 2046.7 | 2059.1 |
| 62.5° | 7228.6 | 2998.3 | 1555.9 | 1483.4 | 1483.4 | 1661.2 | 1823.9 | 1875.8 | 1899.1 | 2004.4 | 2024.9 |
| 65°   | 6788.3 | 2775.5 | 1472.5 | 1354.9 | 1368.6 | 1546.3 | 1707.7 | 1792.4 | 1828.0 | 1959.2 | 1981.1 |
| 67.5° | 6108.8 | 2517.1 | 1383.6 | 1240.1 | 1253.8 | 1426.0 | 1587.4 | 1679.0 | 1735.0 | 1910.0 | 1927.8 |
| 70°   | 5224.2 | 2201.2 | 1263.3 | 1118.4 | 1134.8 | 1294.8 | 1445.2 | 1549.1 | 1632.5 | 1863.5 | 1869.0 |
| 72.5° | 3851.5 | 1804.7 | 1095.2 | 984.4  | 1002.2 | 1141.6 | 1301.6 | 1421.9 | 1534.0 | 1747.3 | 1744.6 |
| 75°   | 2290.1 | 1411.0 | 909.2  | 849.1  | 861.4  | 991.2  | 1171.7 | 1318.0 | 1486.2 | 1702.2 | 1728.2 |
| 77.5° | 1389.1 | 1062.3 | 741.0  | 711.0  | 726.0  | 858.6  | 1078.7 | 1234.6 | 1465.7 | 1605.1 | 1596.9 |
| 80°   | 839.5  | 758.8  | 592.0  | 572.9  | 587.9  | 734.2  | 998.1  | 1171.7 | 1281.1 | 1371.3 | 1371.3 |
| 82.5° | 438.9  | 463.5  | 434.8  | 419.7  | 440.2  | 596.1  | 907.8  | 1022.7 | 1132.1 | 972.1  | 907.8  |
| 85°   | 179.1  | 242.0  | 263.9  | 262.5  | 274.8  | 412.9  | 783.4  | 875.0  | 730.1  | 693.2  | 709.6  |
| 87.5° | 60.2   | 102.5  | 128.5  | 110.7  | 116.2  | 259.8  | 542.8  | 422.5  | 501.8  | 350.0  | 332.2  |
| 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            |

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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 5700K 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       | 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               |           |                  |                  |

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**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               |           |                  |                  |

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**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               |           |                  |                  |

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**Summary**

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



**Color Vector Graphics**



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**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 |            |



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Color Rendition by Hue-Angle Bin



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**Measure Comparisons**



(END OF REPORT)