

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: P318776

Luminaire Tested: **GLEON-SA2D-750-U-T4FT**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P318776  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-16)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA2D-750-U-T4FT  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(2) 70 CRI, 5000K, 1200mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE IV  
FORWARD THROW OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 15970 lumens  
Efficiency: N/A  
Efficacy: 123.8 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 1' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B2 - U0 - G3

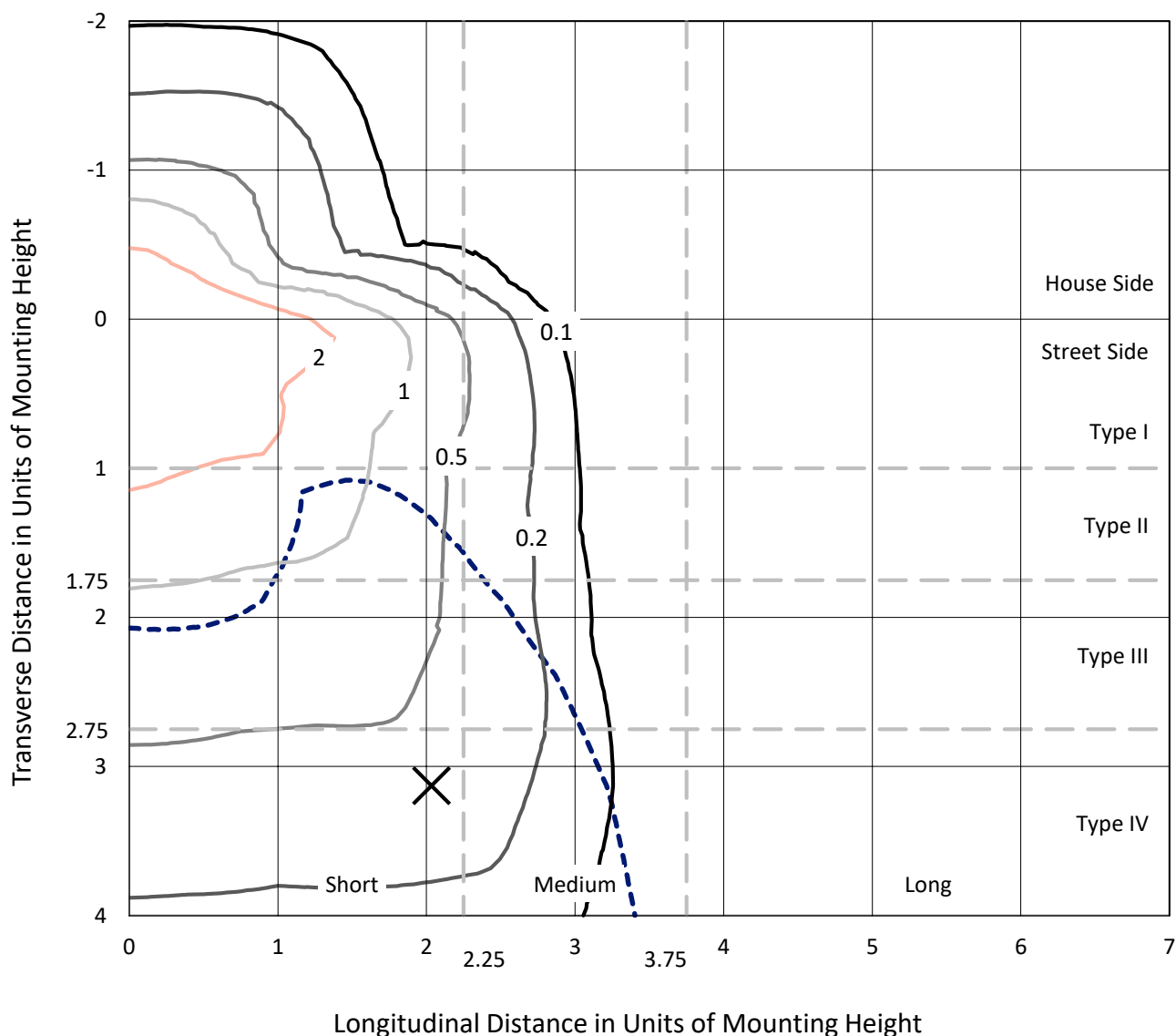
Input Watts (W): 129  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



REPORT NUMBER: P318776  
 CATALOG NUMBER: GLEON-SA2D-750-U-T4FT

## Iso-Footcandle Lines of Horizontal Illumination

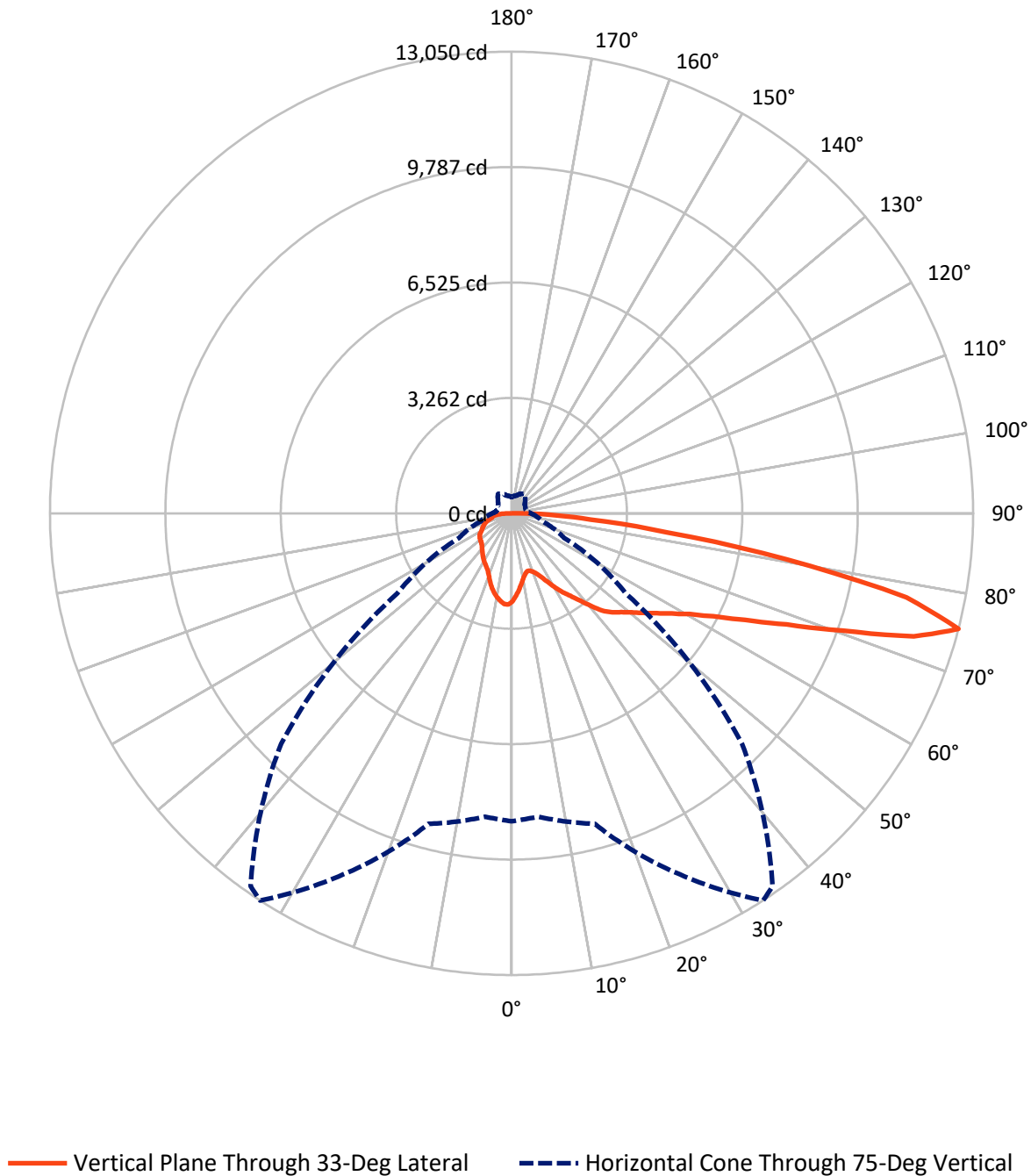
× Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 4 fc  
 Type IV - Short - N/A

REPORT NUMBER: P318776  
CATALOG NUMBER: GLEON-SA2D-750-U-T4FT

## Luminous Intensity Polar Plot



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CATALOG NUMBER: GLEON-SA2D-750-U-T4FT

**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 3429.2   | 0.0    | 3429.2  |
|                    | % Fixture | 21.5     | 0.0    | 21.5    |
| <b>Street Side</b> | Lumens    | 12540.8  | 0.0    | 12540.8 |
|                    | % Fixture | 78.5     | 0.0    | 78.5    |
| <b>Total</b>       | Lumens    | 15970.0  | 0.0    | 15970.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 225.7   | 1.4       |
| 10°-20°   | 611.4   | 3.8       |
| 20°-30°   | 998.6   | 6.3       |
| 30°-40°   | 1487.1  | 9.3       |
| 40°-50°   | 2132.9  | 13.4      |
| 50°-60°   | 2928.1  | 18.3      |
| 60°-70°   | 3665.8  | 23.0      |
| 70°-80°   | 3316.3  | 20.8      |
| 80°-90°   | 604.1   | 3.8       |
| 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°    | 15970.0 | 100.0     |
| 0°-180°   | 15970.0 | 100.0     |

**Coefficient of Utilization**



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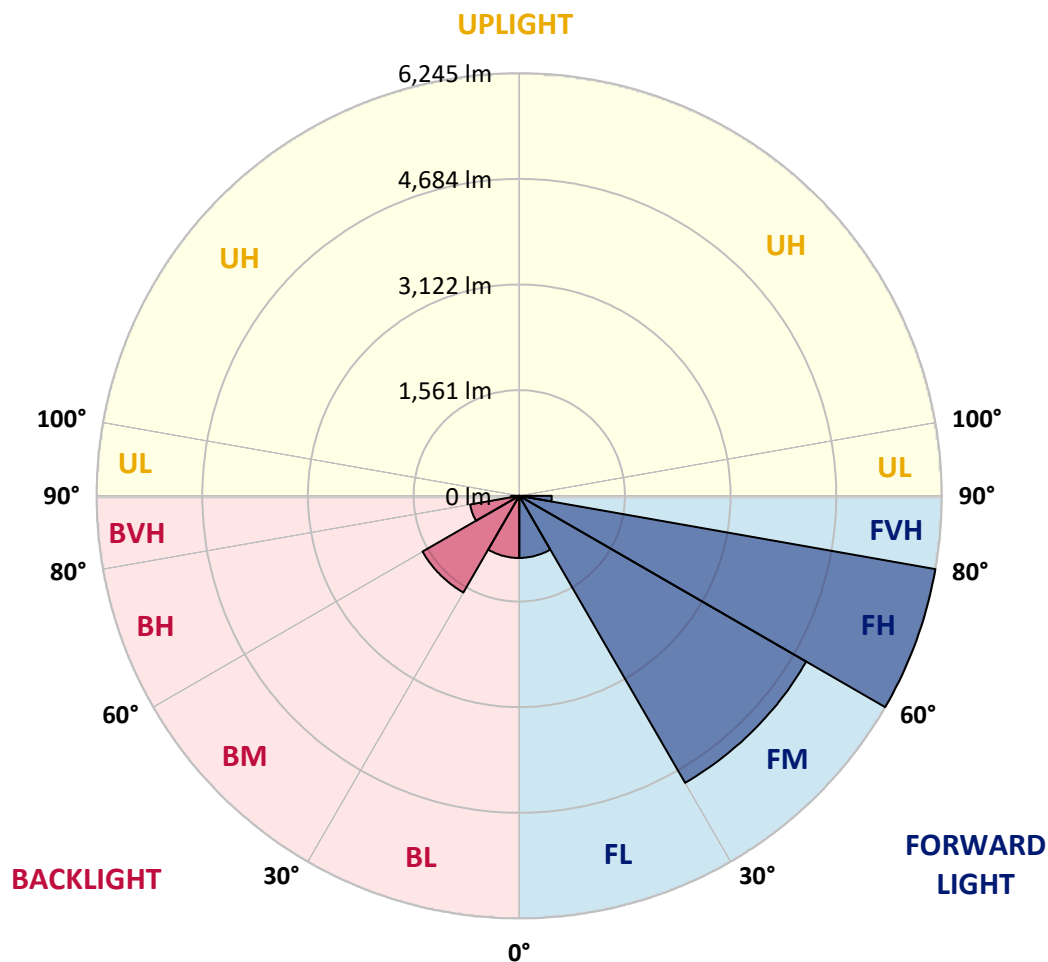
CATALOG NUMBER: GLEON-SA2D-750-U-T4FT

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 917.2  | 5.7       |                         |      |         |
| FM   | (30°-60°)   | 4897.7 | 30.7      |                         |      |         |
| FH   | (60°-80°)   | 6244.8 | 39.1      |                         |      | G3/7500 |
| FVH  | (80°-90°)   | 481.1  | 3.0       |                         |      | G3/500  |
| BL   | (0°-30°)    | 918.5  | 5.8       | B2/1000                 |      |         |
| BM   | (30°-60°)   | 1650.4 | 10.3      | B2/2500                 |      |         |
| BH   | (60°-80°)   | 737.3  | 4.6       | B2/1000                 |      | G2/1000 |
| BVH  | (80°-90°)   | 123.0  | 0.8       |                         |      | G2/225  |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B2-U0-G3**

Type IV Short



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CATALOG NUMBER: GLEON-SA2D-750-U-T4FT

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°     | 33°     | 35°     | 45°    | 55°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|---------|---------|---------|--------|--------|--------|--------|--------|
| 0°    | 2496.2 | 2496.2 | 2496.2 | 2496.2  | 2496.2  | 2496.2  | 2496.2 | 2496.2 | 2496.2 | 2496.2 | 2496.2 |
| 2.5°  | 2318.0 | 2309.2 | 2325.7 | 2327.9  | 2342.3  | 2347.8  | 2367.7 | 2398.6 | 2423.9 | 2453.2 | 2479.7 |
| 5°    | 2107.8 | 2101.8 | 2124.9 | 2141.5  | 2172.9  | 2186.2  | 2233.1 | 2298.7 | 2357.2 | 2423.4 | 2483.5 |
| 7.5°  | 1908.1 | 1904.8 | 1930.8 | 1968.3  | 2004.7  | 2022.9  | 2104.0 | 2199.4 | 2297.1 | 2404.1 | 2496.2 |
| 10°   | 1739.9 | 1738.8 | 1763.6 | 1800.6  | 1854.1  | 1874.5  | 1979.3 | 2105.1 | 2241.9 | 2389.2 | 2517.7 |
| 12.5° | 1645.6 | 1649.4 | 1661.0 | 1691.9  | 1741.5  | 1762.0  | 1878.4 | 2026.2 | 2195.6 | 2384.2 | 2549.2 |
| 15°   | 1668.7 | 1674.8 | 1654.9 | 1653.8  | 1689.1  | 1705.1  | 1814.4 | 1969.9 | 2162.5 | 2392.5 | 2594.9 |
| 17.5° | 1767.5 | 1768.6 | 1716.2 | 1683.1  | 1704.6  | 1712.9  | 1794.5 | 1937.9 | 2143.1 | 2411.2 | 2652.3 |
| 20°   | 1906.5 | 1903.7 | 1811.1 | 1755.9  | 1767.5  | 1769.7  | 1822.6 | 1938.5 | 2141.5 | 2443.8 | 2726.8 |
| 22.5° | 2090.7 | 2070.3 | 1945.7 | 1870.6  | 1867.9  | 1864.6  | 1894.9 | 1979.3 | 2165.8 | 2496.8 | 2815.6 |
| 25°   | 2331.3 | 2312.0 | 2140.4 | 2037.8  | 2015.7  | 2007.4  | 2011.9 | 2066.5 | 2213.8 | 2553.6 | 2914.9 |
| 27.5° | 2598.8 | 2565.2 | 2399.7 | 2254.6  | 2208.8  | 2197.2  | 2170.7 | 2189.5 | 2266.2 | 2608.2 | 3033.0 |
| 30°   | 2822.8 | 2804.6 | 2660.0 | 2487.9  | 2433.9  | 2417.3  | 2347.8 | 2327.4 | 2341.7 | 2682.7 | 3181.9 |
| 32.5° | 2948.0 | 2935.9 | 2848.2 | 2709.1  | 2658.9  | 2635.8  | 2537.6 | 2496.8 | 2463.1 | 2800.2 | 3383.8 |
| 35°   | 3099.7 | 3092.0 | 3039.0 | 2938.1  | 2863.6  | 2839.3  | 2763.2 | 2720.7 | 2634.1 | 2961.8 | 3644.7 |
| 37.5° | 3292.8 | 3284.5 | 3285.6 | 3204.0  | 3115.1  | 3092.5  | 3042.3 | 2997.6 | 2855.9 | 3174.2 | 3928.3 |
| 40°   | 3511.2 | 3495.2 | 3489.2 | 3485.3  | 3429.0  | 3416.3  | 3389.9 | 3329.2 | 3133.9 | 3427.9 | 4208.0 |
| 42.5° | 3840.0 | 3783.2 | 3661.8 | 3707.6  | 3763.3  | 3756.7  | 3778.2 | 3691.1 | 3442.8 | 3728.0 | 4481.0 |
| 45°   | 4157.2 | 4064.0 | 3854.4 | 3864.3  | 3986.2  | 4023.2  | 4184.2 | 4122.5 | 3777.7 | 4056.8 | 4763.5 |
| 47.5° | 4301.7 | 4231.1 | 4052.9 | 4053.5  | 4174.3  | 4251.0  | 4604.0 | 4559.9 | 4129.6 | 4430.3 | 5108.2 |
| 50°   | 4463.4 | 4392.8 | 4232.8 | 4292.9  | 4398.3  | 4479.9  | 5009.5 | 4986.9 | 4464.5 | 4839.0 | 5521.4 |
| 52.5° | 4639.9 | 4520.2 | 4418.7 | 4526.3  | 4674.1  | 4769.0  | 5415.5 | 5353.7 | 4771.7 | 5250.6 | 5996.4 |
| 55°   | 4642.1 | 4609.6 | 4686.8 | 4765.7  | 4986.9  | 5103.3  | 5840.8 | 5677.5 | 5022.2 | 5654.9 | 6383.1 |
| 57.5° | 4906.3 | 4853.4 | 5017.2 | 5053.6  | 5342.7  | 5474.0  | 6263.9 | 5959.4 | 5277.1 | 5965.0 | 6591.6 |
| 60°   | 5256.1 | 5210.9 | 5344.9 | 5440.9  | 5782.9  | 5958.3  | 6715.7 | 6249.1 | 5477.3 | 6198.9 | 6581.7 |
| 62.5° | 5860.1 | 5808.8 | 5807.2 | 5941.8  | 6402.4  | 6606.5  | 7222.7 | 6533.1 | 5556.7 | 6245.2 | 6300.9 |
| 65°   | 6744.4 | 6662.8 | 6508.9 | 6572.9  | 7258.0  | 7461.6  | 7789.2 | 6738.9 | 5451.9 | 5996.9 | 5577.7 |
| 67.5° | 7605.0 | 7602.2 | 7413.0 | 7544.3  | 8387.8  | 8551.1  | 8434.7 | 6759.3 | 5124.8 | 5132.5 | 4294.6 |
| 70°   | 8462.8 | 8473.8 | 8441.8 | 8898.6  | 9914.2  | 10084.1 | 9122.0 | 6485.2 | 4389.5 | 3706.5 | 2572.9 |
| 72.5° | 9142.4 | 9139.7 | 9300.8 | 10478.5 | 11895.2 | 11857.1 | 9701.3 | 5654.4 | 3151.6 | 2000.8 | 1229.6 |
| 75°   | 8702.2 | 8606.2 | 9086.2 | 11260.8 | 13049.8 | 12863.8 | 9208.6 | 3944.3 | 1635.6 | 910.8  | 662.0  |
| 77.5° | 5675.9 | 5766.9 | 6471.4 | 9302.4  | 11414.7 | 11188.5 | 6756.0 | 1840.3 | 770.7  | 597.4  | 479.9  |
| 80°   | 2055.4 | 2151.4 | 3030.2 | 5269.3  | 7864.3  | 7827.3  | 3327.0 | 756.3  | 521.3  | 451.2  | 349.7  |
| 82.5° | 707.2  | 742.5  | 1195.4 | 2340.1  | 4440.2  | 4605.7  | 1251.7 | 429.7  | 379.0  | 320.0  | 239.4  |
| 85°   | 277.5  | 317.7  | 546.7  | 1125.9  | 2239.7  | 2256.2  | 507.0  | 257.1  | 263.7  | 209.6  | 131.3  |
| 87.5° | 105.4  | 128.0  | 261.5  | 523.0   | 1022.8  | 939.5   | 181.5  | 122.5  | 150.0  | 124.7  | 62.3   |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0     | 0.0     | 0.0     | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |



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CATALOG NUMBER: GLEON-SA2D-750-U-T4FT

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 2496.2 | 2496.2 | 2496.2 | 2496.2 | 2496.2 | 2496.2 | 2496.2 | 2496.2 | 2496.2 | 2496.2 | 2496.2 |
| 2.5°  | 2500.1 | 2511.6 | 2535.9 | 2552.5 | 2570.1 | 2575.1 | 2577.3 | 2581.7 | 2586.1 | 2584.5 | 2585.0 |
| 5°    | 2515.5 | 2538.1 | 2577.3 | 2593.8 | 2601.6 | 2592.7 | 2575.6 | 2561.8 | 2551.9 | 2546.4 | 2544.7 |
| 7.5°  | 2540.9 | 2572.9 | 2614.8 | 2612.0 | 2594.4 | 2555.2 | 2511.1 | 2478.0 | 2450.4 | 2440.5 | 2435.0 |
| 10°   | 2574.5 | 2612.0 | 2641.3 | 2609.8 | 2558.5 | 2490.7 | 2424.5 | 2373.2 | 2331.8 | 2315.8 | 2313.1 |
| 12.5° | 2617.6 | 2655.6 | 2661.1 | 2594.4 | 2509.4 | 2416.8 | 2326.8 | 2259.0 | 2197.2 | 2177.3 | 2172.9 |
| 15°   | 2673.3 | 2709.1 | 2674.9 | 2567.4 | 2448.8 | 2324.1 | 2207.7 | 2115.6 | 2050.5 | 2026.2 | 2017.4 |
| 17.5° | 2731.8 | 2766.0 | 2677.7 | 2522.7 | 2369.3 | 2214.3 | 2068.1 | 1973.8 | 1899.3 | 1871.2 | 1867.9 |
| 20°   | 2801.8 | 2817.3 | 2666.1 | 2458.7 | 2260.1 | 2072.0 | 1918.1 | 1829.3 | 1789.5 | 1769.7 | 1767.5 |
| 22.5° | 2888.4 | 2871.9 | 2639.6 | 2372.1 | 2121.6 | 1907.6 | 1782.4 | 1741.0 | 1731.1 | 1726.7 | 1728.3 |
| 25°   | 2980.0 | 2929.2 | 2600.5 | 2259.0 | 1946.8 | 1743.2 | 1683.1 | 1694.7 | 1707.9 | 1706.2 | 1706.2 |
| 27.5° | 3080.9 | 2987.7 | 2540.3 | 2108.9 | 1753.1 | 1608.6 | 1615.8 | 1658.2 | 1678.1 | 1677.6 | 1677.0 |
| 30°   | 3210.6 | 3053.9 | 2463.7 | 1928.6 | 1572.2 | 1513.7 | 1557.3 | 1609.2 | 1636.2 | 1635.1 | 1635.6 |
| 32.5° | 3370.0 | 3126.7 | 2359.4 | 1727.2 | 1441.5 | 1443.7 | 1493.9 | 1545.2 | 1576.6 | 1573.8 | 1574.4 |
| 35°   | 3556.5 | 3208.4 | 2218.2 | 1528.6 | 1354.8 | 1387.9 | 1427.7 | 1463.5 | 1493.3 | 1489.4 | 1485.6 |
| 37.5° | 3759.5 | 3288.4 | 2030.6 | 1351.0 | 1284.2 | 1336.1 | 1369.2 | 1375.3 | 1389.0 | 1379.1 | 1371.9 |
| 40°   | 3952.5 | 3349.6 | 1789.0 | 1205.3 | 1213.1 | 1292.0 | 1313.5 | 1289.2 | 1264.4 | 1261.1 | 1251.1 |
| 42.5° | 4120.8 | 3370.0 | 1544.6 | 1089.0 | 1138.0 | 1245.6 | 1258.9 | 1208.1 | 1163.4 | 1142.5 | 1133.6 |
| 45°   | 4298.4 | 3377.2 | 1316.8 | 991.3  | 1065.8 | 1204.2 | 1218.6 | 1150.7 | 1087.8 | 1042.6 | 1027.7 |
| 47.5° | 4530.7 | 3429.0 | 1139.7 | 919.0  | 1010.6 | 1176.7 | 1197.1 | 1104.9 | 1023.3 | 958.8  | 945.0  |
| 50°   | 4834.6 | 3531.6 | 995.7  | 863.9  | 974.8  | 1158.5 | 1181.6 | 1060.3 | 970.3  | 892.6  | 878.8  |
| 52.5° | 5172.2 | 3626.0 | 879.3  | 819.2  | 940.0  | 1126.5 | 1161.8 | 1028.3 | 920.7  | 831.3  | 816.4  |
| 55°   | 5408.3 | 3553.7 | 785.5  | 772.9  | 894.8  | 1080.7 | 1134.2 | 1001.2 | 849.5  | 771.8  | 758.5  |
| 57.5° | 5453.6 | 3306.6 | 714.4  | 724.9  | 840.2  | 1023.3 | 1091.7 | 941.1  | 810.9  | 745.8  | 732.0  |
| 60°   | 5330.0 | 2962.3 | 661.4  | 680.7  | 781.7  | 951.0  | 1012.3 | 898.6  | 774.0  | 718.2  | 706.7  |
| 62.5° | 5019.4 | 2609.8 | 622.3  | 641.0  | 727.1  | 877.7  | 962.6  | 853.9  | 736.4  | 686.8  | 675.2  |
| 65°   | 4392.2 | 2191.1 | 584.7  | 605.7  | 676.3  | 814.2  | 917.9  | 812.6  | 699.5  | 661.4  | 650.4  |
| 67.5° | 3315.4 | 1641.1 | 549.4  | 568.2  | 631.1  | 759.1  | 869.4  | 771.8  | 663.6  | 639.4  | 626.1  |
| 70°   | 1952.3 | 1027.7 | 509.2  | 529.0  | 583.6  | 701.7  | 817.5  | 727.1  | 618.9  | 607.9  | 590.8  |
| 72.5° | 908.6  | 618.4  | 463.4  | 482.7  | 524.1  | 625.0  | 750.8  | 668.6  | 566.0  | 541.7  | 518.5  |
| 75°   | 542.3  | 452.4  | 409.3  | 426.4  | 455.7  | 543.4  | 666.9  | 609.0  | 515.8  | 483.8  | 459.5  |
| 77.5° | 405.5  | 345.9  | 349.7  | 367.9  | 391.7  | 475.5  | 590.8  | 562.1  | 477.2  | 452.4  | 435.8  |
| 80°   | 291.8  | 262.6  | 285.2  | 305.1  | 329.9  | 432.5  | 566.0  | 519.7  | 431.4  | 398.3  | 382.8  |
| 82.5° | 194.7  | 188.7  | 214.6  | 235.0  | 259.3  | 378.4  | 531.8  | 455.1  | 368.5  | 326.6  | 292.4  |
| 85°   | 107.6  | 113.6  | 144.5  | 153.4  | 174.3  | 266.4  | 435.8  | 365.7  | 277.5  | 223.4  | 213.5  |
| 87.5° | 44.7   | 52.4   | 77.8   | 75.0   | 92.7   | 158.9  | 286.9  | 220.7  | 176.5  | 131.8  | 102.6  |
| 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: SP1-1908-441-4-R4

Test Date: 10/02/2019

Luminaire Tested: SA1C-750-U-5WQ

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

### Test Information

Test Method: LM-79-2008  
 Report Number: SP1-1908-441-4-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-750-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):                  | 4884   | CRI (Ra): | 73.5 |      |       |
| CIE u':                   | 0.2101 | R1:       | 70.5 | R9:  | -28.4 |
| CIE v':                   | 0.4904 | R2:       | 77.7 | R10: | 48.6  |
| Duv:                      | 0.0037 | R3:       | 84.6 | R11: | 73.2  |
| CIE x:                    | 0.3493 | R4:       | 74.7 | R12: | 50.7  |
| CIE y:                    | 0.3624 | R5:       | 71.9 | R13: | 71.2  |
| CIE z:                    | 0.2884 | R6:       | 70.7 | R14: | 91.4  |
| Peak Wavelength (nm):     | 444    | R7:       | 81.2 |      |       |
| Dominant Wavelength (nm): | 571    | R8:       | 56.9 |      |       |
| Purity:                   | 13.7   |           |      |      |       |
| Rf:                       | 74.9   |           |      |      |       |
| Rg:                       | 96.3   |           |      |      |       |



### Test Conditions

Stabilization Time: 240M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.0./44%  
 Sphere Temperature (°C): 25.7

REPORT NUMBER: SP1-1908-441-4-R4

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

REPORT NUMBER: SP1-1908-441-4-R4

**CIE 1931 Chromaticity Diagram**



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



Point lies inside the ANSI 5000K 4-step quadrangle

REPORT NUMBER: SP1-1908-441-4-R4

**Photopic Flux vs. Wavelength**



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| 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       | 2945             | NR               | 490       | 37941            | NR               | 620       | 88803            | NR               | 750       | 3908             | NR               | 880       | 2997             | NR               |
| 365       | 2596             | NR               | 495       | 48525            | NR               | 625       | 80578            | NR               | 755       | 3988             | NR               | 885       | 2927             | NR               |
| 370       | 2732             | NR               | 500       | 60609            | NR               | 630       | 73127            | NR               | 760       | 3335             | NR               | 890       | 2649             | NR               |
| 375       | 2894             | NR               | 505       | 72036            | NR               | 635       | 66244            | NR               | 765       | 3438             | NR               | 895       | 2828             | NR               |
| 380       | 2822             | NR               | 510       | 82168            | NR               | 640       | 59440            | NR               | 770       | 3427             | NR               | 900       | 1407             | NR               |
| 385       | 2394             | NR               | 515       | 90898            | NR               | 645       | 52864            | NR               | 775       | 2759             | NR               | 905       | 2224             | NR               |
| 390       | 2370             | NR               | 520       | 97142            | NR               | 650       | 47085            | NR               | 780       | 2340             | NR               | 910       | 2905             | NR               |
| 395       | 2267             | NR               | 525       | 103255           | NR               | 655       | 41789            | NR               | 785       | 2412             | NR               | 915       | 3350             | NR               |
| 400       | 2262             | NR               | 530       | 106697           | NR               | 660       | 37064            | NR               | 790       | 1999             | NR               | 920       | 3114             | NR               |
| 405       | 3000             | NR               | 535       | 110081           | NR               | 665       | 32299            | NR               | 795       | 2054             | NR               | 925       | 2834             | NR               |
| 410       | 5324             | NR               | 540       | 112494           | NR               | 670       | 28142            | NR               | 800       | 2331             | NR               | 930       | 2271             | NR               |
| 415       | 10725            | NR               | 545       | 115513           | NR               | 675       | 24505            | NR               | 805       | 2648             | NR               | 935       | 2228             | NR               |
| 420       | 22128            | NR               | 550       | 117203           | NR               | 680       | 21162            | NR               | 810       | 2485             | NR               | 940       | 2833             | NR               |
| 425       | 44095            | NR               | 555       | 119753           | NR               | 685       | 18400            | NR               | 815       | 2409             | NR               | 945       | 2941             | NR               |
| 430       | 77002            | NR               | 560       | 122602           | NR               | 690       | 16065            | NR               | 820       | 2221             | NR               | 950       | 2323             | NR               |
| 435       | 119881           | NR               | 565       | 124314           | NR               | 695       | 13860            | NR               | 825       | 1562             | NR               | 955       | 1667             | NR               |
| 440       | 164454           | NR               | 570       | 126775           | NR               | 700       | 12177            | NR               | 830       | 2249             | NR               | 960       | 749              | NR               |
| 445       | 179997           | NR               | 575       | 127511           | NR               | 705       | 10757            | NR               | 835       | 2573             | NR               | 965       | 2669             | NR               |
| 450       | 142822           | NR               | 580       | 127577           | NR               | 710       | 9601             | NR               | 840       | 2764             | NR               | 970       | 3968             | NR               |
| 455       | 90008            | NR               | 585       | 126153           | NR               | 715       | 8944             | NR               | 845       | 3109             | NR               | 975       | 3886             | NR               |
| 460       | 60557            | NR               | 590       | 123678           | NR               | 720       | 7947             | NR               | 850       | 2963             | NR               | 980       | 2788             | NR               |
| 465       | 43305            | NR               | 595       | 119774           | NR               | 725       | 7062             | NR               | 855       | 2336             | NR               | 985       | 3496             | NR               |
| 470       | 31089            | NR               | 600       | 115733           | NR               | 730       | 6004             | NR               | 860       | 2118             | NR               | 990       | 2913             | NR               |
| 475       | 26278            | NR               | 605       | 109231           | NR               | 735       | 5594             | NR               | 865       | 3144             | NR               | 995       | 4659             | NR               |
| 480       | 27060            | NR               | 610       | 102408           | NR               | 740       | 5165             | NR               | 870       | 3069             | NR               | 1000      | 1308             | NR               |
| 485       | 30698            | NR               | 615       | 96015            | NR               | 745       | 4687             | NR               | 875       | 3311             | NR               |           |                  |                  |

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Scotopic Flux vs. Wavelength



Scotopic Lumens: 13493.5

S/P: 1.77

| 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       | 2945             | NR               | 490       | 37941            | NR               | 620       | 88803            | NR               | 750       | 3908             | NR               | 880       | 2997             | NR               |
| 365       | 2596             | NR               | 495       | 48525            | NR               | 625       | 80578            | NR               | 755       | 3988             | NR               | 885       | 2927             | NR               |
| 370       | 2732             | NR               | 500       | 60609            | NR               | 630       | 73127            | NR               | 760       | 3335             | NR               | 890       | 2649             | NR               |
| 375       | 2894             | NR               | 505       | 72036            | NR               | 635       | 66244            | NR               | 765       | 3438             | NR               | 895       | 2828             | NR               |
| 380       | 2822             | NR               | 510       | 82168            | NR               | 640       | 59440            | NR               | 770       | 3427             | NR               | 900       | 1407             | NR               |
| 385       | 2394             | NR               | 515       | 90898            | NR               | 645       | 52864            | NR               | 775       | 2759             | NR               | 905       | 2224             | NR               |
| 390       | 2370             | NR               | 520       | 97142            | NR               | 650       | 47085            | NR               | 780       | 2340             | NR               | 910       | 2905             | NR               |
| 395       | 2267             | NR               | 525       | 103255           | NR               | 655       | 41789            | NR               | 785       | 2412             | NR               | 915       | 3350             | NR               |
| 400       | 2262             | NR               | 530       | 106697           | NR               | 660       | 37064            | NR               | 790       | 1999             | NR               | 920       | 3114             | NR               |
| 405       | 3000             | NR               | 535       | 110081           | NR               | 665       | 32299            | NR               | 795       | 2054             | NR               | 925       | 2834             | NR               |
| 410       | 5324             | NR               | 540       | 112494           | NR               | 670       | 28142            | NR               | 800       | 2331             | NR               | 930       | 2271             | NR               |
| 415       | 10725            | NR               | 545       | 115513           | NR               | 675       | 24505            | NR               | 805       | 2648             | NR               | 935       | 2228             | NR               |
| 420       | 22128            | NR               | 550       | 117203           | NR               | 680       | 21162            | NR               | 810       | 2485             | NR               | 940       | 2833             | NR               |
| 425       | 44095            | NR               | 555       | 119753           | NR               | 685       | 18400            | NR               | 815       | 2409             | NR               | 945       | 2941             | NR               |
| 430       | 77002            | NR               | 560       | 122602           | NR               | 690       | 16065            | NR               | 820       | 2221             | NR               | 950       | 2323             | NR               |
| 435       | 119881           | NR               | 565       | 124314           | NR               | 695       | 13860            | NR               | 825       | 1562             | NR               | 955       | 1667             | NR               |
| 440       | 164454           | NR               | 570       | 126775           | NR               | 700       | 12177            | NR               | 830       | 2249             | NR               | 960       | 749              | NR               |
| 445       | 179997           | NR               | 575       | 127511           | NR               | 705       | 10757            | NR               | 835       | 2573             | NR               | 965       | 2669             | NR               |
| 450       | 142822           | NR               | 580       | 127577           | NR               | 710       | 9601             | NR               | 840       | 2764             | NR               | 970       | 3968             | NR               |
| 455       | 90008            | NR               | 585       | 126153           | NR               | 715       | 8944             | NR               | 845       | 3109             | NR               | 975       | 3886             | NR               |
| 460       | 60557            | NR               | 590       | 123678           | NR               | 720       | 7947             | NR               | 850       | 2963             | NR               | 980       | 2788             | NR               |
| 465       | 43305            | NR               | 595       | 119774           | NR               | 725       | 7062             | NR               | 855       | 2336             | NR               | 985       | 3496             | NR               |
| 470       | 31089            | NR               | 600       | 115733           | NR               | 730       | 6004             | NR               | 860       | 2118             | NR               | 990       | 2913             | NR               |
| 475       | 26278            | NR               | 605       | 109231           | NR               | 735       | 5594             | NR               | 865       | 3144             | NR               | 995       | 4659             | NR               |
| 480       | 27060            | NR               | 610       | 102408           | NR               | 740       | 5165             | NR               | 870       | 3069             | NR               | 1000      | 1308             | NR               |
| 485       | 30698            | NR               | 615       | 96015            | NR               | 745       | 4687             | NR               | 875       | 3311             | NR               |           |                  |                  |

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**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 5378.9**

**M/P: 0.71**

| 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       | 2945             | NR               | 490       | 37941            | NR               | 620       | 88803            | NR               | 750       | 3908             | NR               | 880       | 2997             | NR               |
| 365       | 2596             | NR               | 495       | 48525            | NR               | 625       | 80578            | NR               | 755       | 3988             | NR               | 885       | 2927             | NR               |
| 370       | 2732             | NR               | 500       | 60609            | NR               | 630       | 73127            | NR               | 760       | 3335             | NR               | 890       | 2649             | NR               |
| 375       | 2894             | NR               | 505       | 72036            | NR               | 635       | 66244            | NR               | 765       | 3438             | NR               | 895       | 2828             | NR               |
| 380       | 2822             | NR               | 510       | 82168            | NR               | 640       | 59440            | NR               | 770       | 3427             | NR               | 900       | 1407             | NR               |
| 385       | 2394             | NR               | 515       | 90898            | NR               | 645       | 52864            | NR               | 775       | 2759             | NR               | 905       | 2224             | NR               |
| 390       | 2370             | NR               | 520       | 97142            | NR               | 650       | 47085            | NR               | 780       | 2340             | NR               | 910       | 2905             | NR               |
| 395       | 2267             | NR               | 525       | 103255           | NR               | 655       | 41789            | NR               | 785       | 2412             | NR               | 915       | 3350             | NR               |
| 400       | 2262             | NR               | 530       | 106697           | NR               | 660       | 37064            | NR               | 790       | 1999             | NR               | 920       | 3114             | NR               |
| 405       | 3000             | NR               | 535       | 110081           | NR               | 665       | 32299            | NR               | 795       | 2054             | NR               | 925       | 2834             | NR               |
| 410       | 5324             | NR               | 540       | 112494           | NR               | 670       | 28142            | NR               | 800       | 2331             | NR               | 930       | 2271             | NR               |
| 415       | 10725            | NR               | 545       | 115513           | NR               | 675       | 24505            | NR               | 805       | 2648             | NR               | 935       | 2228             | NR               |
| 420       | 22128            | NR               | 550       | 117203           | NR               | 680       | 21162            | NR               | 810       | 2485             | NR               | 940       | 2833             | NR               |
| 425       | 44095            | NR               | 555       | 119753           | NR               | 685       | 18400            | NR               | 815       | 2409             | NR               | 945       | 2941             | NR               |
| 430       | 77002            | NR               | 560       | 122602           | NR               | 690       | 16065            | NR               | 820       | 2221             | NR               | 950       | 2323             | NR               |
| 435       | 119881           | NR               | 565       | 124314           | NR               | 695       | 13860            | NR               | 825       | 1562             | NR               | 955       | 1667             | NR               |
| 440       | 164454           | NR               | 570       | 126775           | NR               | 700       | 12177            | NR               | 830       | 2249             | NR               | 960       | 749              | NR               |
| 445       | 179997           | NR               | 575       | 127511           | NR               | 705       | 10757            | NR               | 835       | 2573             | NR               | 965       | 2669             | NR               |
| 450       | 142822           | NR               | 580       | 127577           | NR               | 710       | 9601             | NR               | 840       | 2764             | NR               | 970       | 3968             | NR               |
| 455       | 90008            | NR               | 585       | 126153           | NR               | 715       | 8944             | NR               | 845       | 3109             | NR               | 975       | 3886             | NR               |
| 460       | 60557            | NR               | 590       | 123678           | NR               | 720       | 7947             | NR               | 850       | 2963             | NR               | 980       | 2788             | NR               |
| 465       | 43305            | NR               | 595       | 119774           | NR               | 725       | 7062             | NR               | 855       | 2336             | NR               | 985       | 3496             | NR               |
| 470       | 31089            | NR               | 600       | 115733           | NR               | 730       | 6004             | NR               | 860       | 2118             | NR               | 990       | 2913             | NR               |
| 475       | 26278            | NR               | 605       | 109231           | NR               | 735       | 5594             | NR               | 865       | 3144             | NR               | 995       | 4659             | NR               |
| 480       | 27060            | NR               | 610       | 102408           | NR               | 740       | 5165             | NR               | 870       | 3069             | NR               | 1000      | 1308             | NR               |
| 485       | 30698            | NR               | 615       | 96015            | NR               | 745       | 4687             | NR               | 875       | 3311             | NR               |           |                  |                  |

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**TM-30-18**

**Summary**

$R_f = 74.9$   
 $R_g = 96.3$   
 CIE  $R_a = 73.5$   
 $R_g = -28.4$

**Spectral Power Distribution Comparison**



**Color Vector Graphics**



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 61 | CES51 = 90 | CES76 = 52 |
| CES02 = 60 | CES27 = 84 | CES52 = 91 | CES77 = 71 |
| CES03 = 30 | CES28 = 81 | CES53 = 79 | CES78 = 54 |
| CES04 = 69 | CES29 = 58 | CES54 = 83 | CES79 = 80 |
| CES05 = 46 | CES30 = 67 | CES55 = 83 | CES80 = 77 |
| CES06 = 50 | CES31 = 63 | CES56 = 73 | CES81 = 77 |
| CES07 = 39 | CES32 = 59 | CES57 = 72 | CES82 = 90 |
| CES08 = 38 | CES33 = 69 | CES58 = 73 | CES83 = 86 |
| CES09 = 29 | CES34 = 69 | CES59 = 88 | CES84 = 88 |
| CES10 = 73 | CES35 = 83 | CES60 = 93 | CES85 = 84 |
| CES11 = 56 | CES36 = 95 | CES61 = 88 | CES86 = 75 |
| CES12 = 61 | CES37 = 78 | CES62 = 85 | CES87 = 78 |
| CES13 = 41 | CES38 = 76 | CES63 = 77 | CES88 = 79 |
| CES14 = 74 | CES39 = 93 | CES64 = 74 | CES89 = 75 |
| CES15 = 70 | CES40 = 86 | CES65 = 67 | CES90 = 77 |
| CES16 = 46 | CES41 = 87 | CES66 = 69 | CES91 = 89 |
| CES17 = 49 | CES42 = 78 | CES67 = 67 | CES92 = 66 |
| CES18 = 55 | CES43 = 75 | CES68 = 73 | CES93 = 80 |
| CES19 = 71 | CES44 = 99 | CES69 = 81 | CES94 = 57 |
| CES20 = 64 | CES45 = 83 | CES70 = 63 | CES95 = 71 |
| CES21 = 85 | CES46 = 81 | CES71 = 60 | CES96 = 78 |
| CES22 = 77 | CES47 = 80 | CES72 = 86 | CES97 = 85 |
| CES23 = 91 | CES48 = 72 | CES73 = 53 | CES98 = 75 |
| CES24 = 90 | CES49 = 81 | CES74 = 96 | CES99 = 62 |
| CES25 = 71 | CES50 = 89 | CES75 = 58 |            |



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**Color Rendition by Hue-Angle Bin**



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**Measure Comparisons**



(END OF REPORT)