

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: P323896

Luminaire Tested: **GLEON-SA2D-750-U-SL4-HSS**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P323896  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-25)  
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-SL4-HSS  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(2) 70 CRI, 5000K, 1200mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE IV  
SPILL LIGHT ELIMINATOR OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 12884 lumens  
Efficiency: N/A  
Efficacy: 99.9 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 1' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B1 - U0 - G3

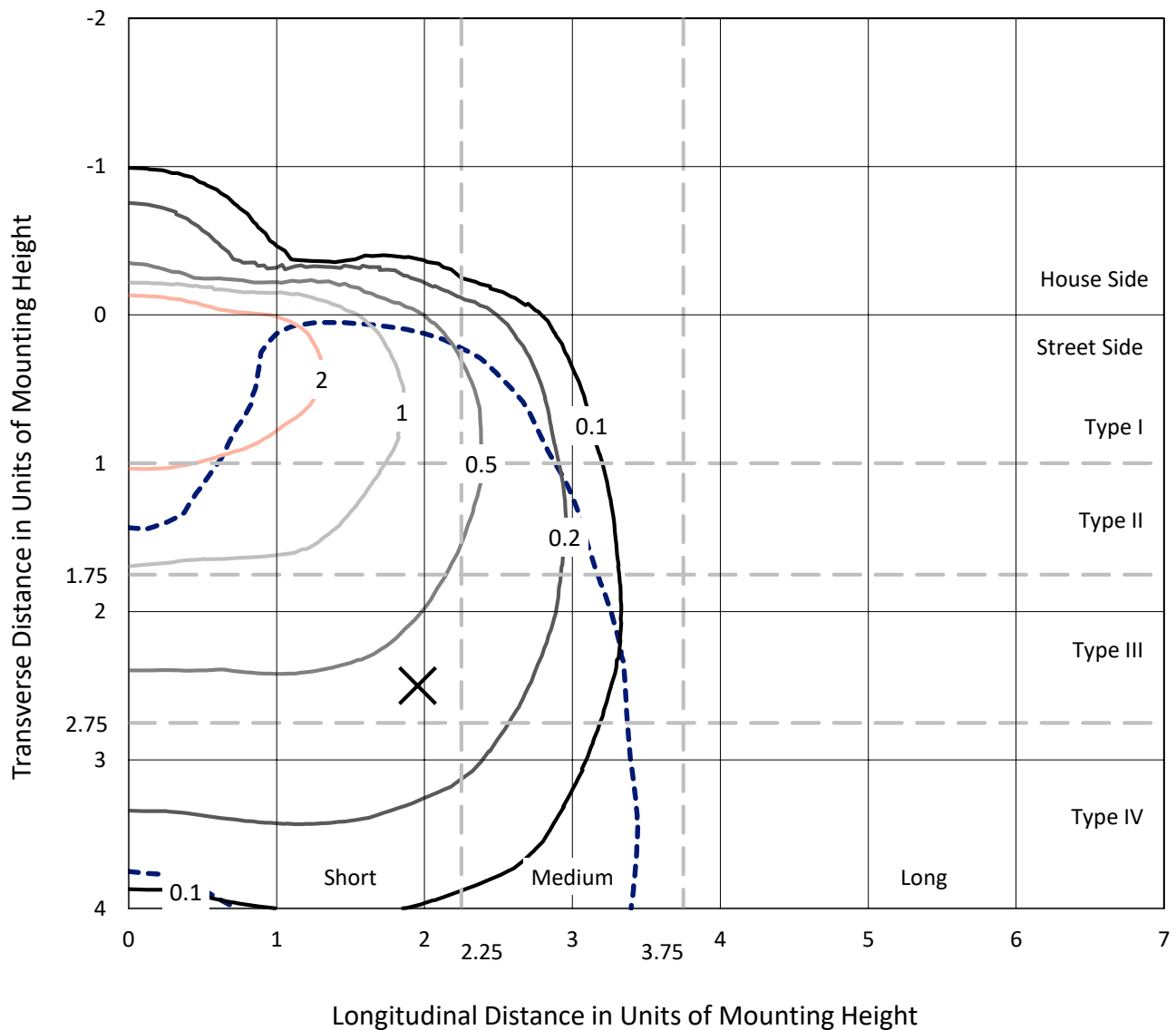
Input Watts (W): 129  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



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## Iso-Footcandle Lines of Horizontal Illumination

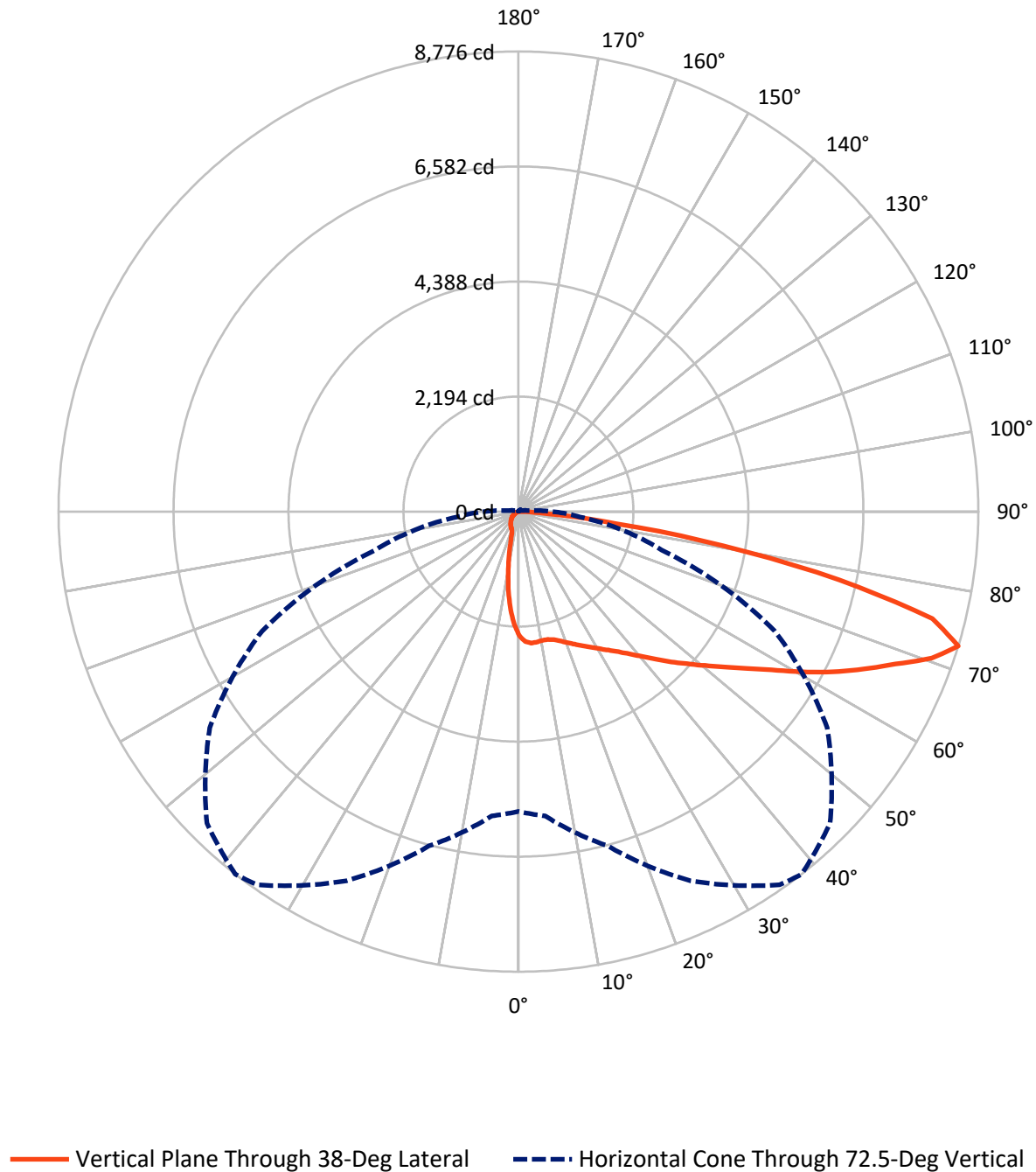
✕ Max cd  
 - - - 1/2 Max cd



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

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## Luminous Intensity Polar Plot



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**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 1084.2   | 0.0    | 1084.2  |
|                    | % Fixture | 8.4      | 0.0    | 8.4     |
| <b>Street Side</b> | Lumens    | 11799.8  | 0.0    | 11799.8 |
|                    | % Fixture | 91.6     | 0.0    | 91.6    |
| <b>Total</b>       | Lumens    | 12884.0  | 0.0    | 12884.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 201.9   | 1.6       |
| 10°-20°   | 493.7   | 3.8       |
| 20°-30°   | 785.3   | 6.1       |
| 30°-40°   | 1180.5  | 9.2       |
| 40°-50°   | 1801.0  | 14.0      |
| 50°-60°   | 2545.4  | 19.8      |
| 60°-70°   | 3192.8  | 24.8      |
| 70°-80°   | 2387.3  | 18.5      |
| 80°-90°   | 296.0   | 2.3       |
| 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°    | 12884.0 | 100.0     |
| 0°-180°   | 12884.0 | 100.0     |

**Coefficient of Utilization**



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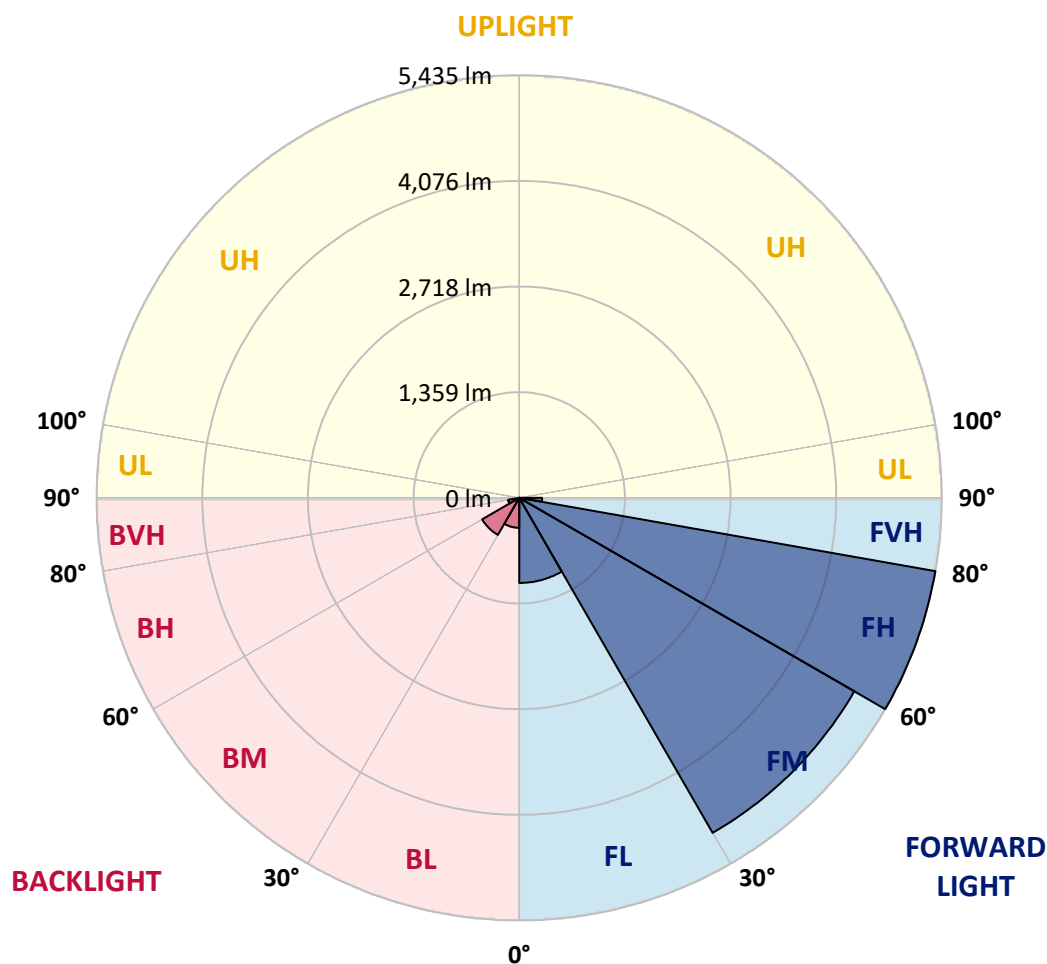
CATALOG NUMBER: GLEON-SA2D-750-U-SL4-HSS

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 1094.8 | 8.5       |                         |      |         |
| FM   | (30°-60°)   | 4976.4 | 38.6      |                         |      |         |
| FH   | (60°-80°)   | 5435.3 | 42.2      |                         |      | G3/7500 |
| FVH  | (80°-90°)   | 293.3  | 2.3       |                         |      | G3/500  |
| BL   | (0°-30°)    | 386.1  | 3.0       | B1/500                  |      |         |
| BM   | (30°-60°)   | 550.6  | 4.3       | B1/1000                 |      |         |
| BH   | (60°-80°)   | 144.8  | 1.1       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 2.8    | 0.0       |                         |      | G0/10   |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B1-U0-G3**

Type IV Short



REPORT NUMBER: P323896

CATALOG NUMBER: GLEON-SA2D-750-U-SL4-HSS

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 38°    | 45°    | 55°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 2369.3 | 2369.3 | 2369.3 | 2369.3 | 2369.3 | 2369.3 | 2369.3 | 2369.3 | 2369.3 | 2369.3 | 2369.3 |
| 2.5°  | 2514.9 | 2515.4 | 2509.5 | 2499.9 | 2487.6 | 2481.2 | 2470.5 | 2453.3 | 2435.1 | 2402.5 | 2367.2 |
| 5°    | 2566.2 | 2566.2 | 2558.7 | 2545.9 | 2526.1 | 2520.2 | 2499.9 | 2472.6 | 2435.1 | 2382.2 | 2322.8 |
| 7.5°  | 2560.9 | 2562.0 | 2551.8 | 2538.4 | 2518.6 | 2513.3 | 2488.6 | 2458.1 | 2411.6 | 2347.4 | 2271.4 |
| 10°   | 2533.1 | 2535.7 | 2527.7 | 2521.3 | 2503.1 | 2497.2 | 2474.2 | 2443.7 | 2397.1 | 2328.7 | 2241.4 |
| 12.5° | 2504.7 | 2507.4 | 2510.1 | 2515.9 | 2504.7 | 2502.6 | 2484.4 | 2458.7 | 2414.3 | 2343.1 | 2244.7 |
| 15°   | 2486.5 | 2491.9 | 2511.1 | 2534.1 | 2536.8 | 2534.7 | 2522.9 | 2498.8 | 2453.9 | 2380.0 | 2267.7 |
| 17.5° | 2486.5 | 2495.1 | 2535.2 | 2579.1 | 2594.6 | 2596.2 | 2586.0 | 2552.3 | 2498.8 | 2419.6 | 2289.1 |
| 20°   | 2507.4 | 2519.1 | 2581.8 | 2643.8 | 2669.5 | 2669.5 | 2649.7 | 2602.6 | 2540.0 | 2455.5 | 2303.5 |
| 22.5° | 2560.9 | 2576.4 | 2655.1 | 2726.8 | 2754.0 | 2748.2 | 2721.4 | 2652.9 | 2582.8 | 2496.1 | 2321.7 |
| 25°   | 2666.3 | 2678.1 | 2759.9 | 2832.2 | 2848.8 | 2835.4 | 2801.7 | 2713.9 | 2637.4 | 2551.3 | 2354.9 |
| 27.5° | 2802.2 | 2803.8 | 2888.4 | 2949.3 | 2939.2 | 2930.1 | 2887.8 | 2790.4 | 2716.1 | 2629.9 | 2412.1 |
| 30°   | 2951.5 | 2951.5 | 3025.9 | 3072.4 | 3041.4 | 3033.9 | 2991.6 | 2883.0 | 2816.7 | 2736.9 | 2493.5 |
| 32.5° | 3096.0 | 3102.4 | 3162.8 | 3192.3 | 3157.5 | 3150.0 | 3108.8 | 3000.2 | 2950.4 | 2900.1 | 2620.3 |
| 35°   | 3235.6 | 3240.4 | 3297.7 | 3313.7 | 3280.6 | 3282.7 | 3253.3 | 3161.2 | 3142.5 | 3136.1 | 2811.3 |
| 37.5° | 3371.0 | 3372.1 | 3430.4 | 3440.6 | 3424.0 | 3442.2 | 3444.8 | 3363.5 | 3398.3 | 3450.2 | 3080.4 |
| 40°   | 3494.6 | 3495.7 | 3553.5 | 3579.7 | 3608.0 | 3631.6 | 3652.4 | 3609.1 | 3724.1 | 3844.5 | 3401.0 |
| 42.5° | 3593.6 | 3604.8 | 3678.1 | 3727.9 | 3802.8 | 3847.7 | 3904.5 | 3902.3 | 4112.1 | 4292.9 | 3788.4 |
| 45°   | 3680.8 | 3700.1 | 3802.3 | 3889.5 | 4017.9 | 4089.6 | 4178.4 | 4248.0 | 4548.7 | 4792.2 | 4180.6 |
| 47.5° | 3795.8 | 3814.0 | 3930.7 | 4073.5 | 4244.8 | 4338.9 | 4486.1 | 4636.5 | 5028.7 | 5282.3 | 4563.7 |
| 50°   | 3958.0 | 3949.9 | 4065.0 | 4269.9 | 4489.8 | 4613.4 | 4823.2 | 5048.5 | 5504.9 | 5709.3 | 4788.9 |
| 52.5° | 4130.8 | 4127.6 | 4212.7 | 4483.4 | 4778.8 | 4923.3 | 5200.4 | 5474.4 | 5960.2 | 6003.6 | 4892.2 |
| 55°   | 4344.8 | 4321.8 | 4393.5 | 4726.9 | 5121.8 | 5276.9 | 5603.3 | 5896.0 | 6323.0 | 6169.4 | 4944.1 |
| 57.5° | 4569.0 | 4531.0 | 4599.5 | 4998.2 | 5508.6 | 5692.2 | 6049.6 | 6307.0 | 6564.3 | 6282.9 | 4943.6 |
| 60°   | 4800.7 | 4755.8 | 4837.1 | 5337.4 | 5989.1 | 6201.6 | 6533.3 | 6584.7 | 6789.6 | 6340.1 | 4907.2 |
| 62.5° | 4994.4 | 4967.7 | 5088.6 | 5700.2 | 6525.8 | 6734.5 | 6898.8 | 6837.2 | 6979.6 | 6384.6 | 4822.1 |
| 65°   | 5199.4 | 5201.0 | 5396.3 | 6123.4 | 7096.2 | 7236.9 | 7250.8 | 7164.7 | 7138.5 | 6375.5 | 4534.3 |
| 67.5° | 5476.5 | 5502.2 | 5828.1 | 6698.1 | 7651.1 | 7759.7 | 7758.6 | 7519.5 | 7254.6 | 6013.7 | 3895.9 |
| 70°   | 5769.7 | 5830.2 | 6325.7 | 7355.7 | 8256.8 | 8367.0 | 8310.3 | 7745.3 | 6830.8 | 4862.8 | 2757.3 |
| 72.5° | 5720.5 | 5825.4 | 6602.3 | 7770.4 | 8691.8 | 8775.8 | 8407.1 | 7190.4 | 5398.9 | 2826.3 | 1174.0 |
| 75°   | 4413.3 | 4534.8 | 6053.9 | 7359.5 | 8235.4 | 8159.9 | 7223.6 | 5595.3 | 2950.4 | 788.7  | 264.3  |
| 77.5° | 2331.3 | 2396.1 | 3999.2 | 5606.5 | 6421.5 | 6263.6 | 5088.6 | 3104.0 | 899.5  | 195.3  | 118.8  |
| 80°   | 1221.0 | 1236.0 | 1742.7 | 3181.0 | 3963.3 | 3964.4 | 3015.7 | 1363.4 | 370.8  | 100.1  | 79.7   |
| 82.5° | 653.9  | 666.7  | 920.9  | 1469.9 | 2076.6 | 1882.4 | 1154.7 | 750.2  | 215.6  | 56.7   | 76.5   |
| 85°   | 157.3  | 160.0  | 522.2  | 671.5  | 816.5  | 583.2  | 343.0  | 629.8  | 58.3   | 33.2   | 62.1   |
| 87.5° | 60.5   | 61.5   | 193.7  | 290.5  | 208.1  | 134.8  | 160.5  | 234.9  | 7.5    | 12.8   | 9.6    |
| 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: P323896

CATALOG NUMBER: GLEON-SA2D-750-U-SL4-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 2369.3 | 2369.3 | 2369.3 | 2369.3 | 2369.3 | 2369.3 | 2369.3 | 2369.3 | 2369.3 | 2369.3 | 2369.3 |
| 2.5°  | 2345.8 | 2331.9 | 2297.6 | 2254.3 | 2215.8 | 2187.9 | 2146.2 | 2118.9 | 2100.7 | 2100.2 | 2093.2 |
| 5°    | 2286.4 | 2258.0 | 2184.2 | 2096.4 | 2016.7 | 1945.0 | 1860.5 | 1793.6 | 1743.8 | 1735.8 | 1718.7 |
| 7.5°  | 2222.7 | 2176.2 | 2062.7 | 1925.7 | 1792.0 | 1656.1 | 1498.2 | 1400.3 | 1316.3 | 1276.2 | 1271.9 |
| 10°   | 2183.7 | 2118.4 | 1957.3 | 1759.3 | 1549.6 | 1328.6 | 1122.1 | 979.2  | 875.9  | 846.5  | 824.6  |
| 12.5° | 2175.6 | 2089.5 | 1876.0 | 1603.1 | 1303.4 | 1011.3 | 782.8  | 630.9  | 548.5  | 522.2  | 515.3  |
| 15°   | 2183.7 | 2076.1 | 1807.5 | 1448.5 | 1054.1 | 717.5  | 525.4  | 437.2  | 406.1  | 398.6  | 398.1  |
| 17.5° | 2188.5 | 2060.1 | 1729.9 | 1276.7 | 812.2  | 512.6  | 402.4  | 376.7  | 371.9  | 371.3  | 372.4  |
| 20°   | 2187.9 | 2035.4 | 1637.3 | 1085.1 | 604.1  | 402.9  | 363.9  | 358.5  | 357.4  | 358.0  | 357.4  |
| 22.5° | 2184.2 | 2006.5 | 1535.7 | 887.7  | 456.4  | 360.1  | 347.3  | 344.1  | 343.5  | 343.5  | 343.5  |
| 25°   | 2191.1 | 1983.5 | 1423.8 | 698.8  | 376.2  | 340.3  | 332.3  | 329.6  | 329.1  | 329.1  | 328.0  |
| 27.5° | 2216.3 | 1970.7 | 1301.3 | 537.8  | 339.8  | 322.7  | 316.2  | 315.7  | 314.1  | 313.6  | 314.6  |
| 30°   | 2257.0 | 1970.7 | 1167.0 | 418.4  | 317.8  | 304.5  | 299.6  | 298.6  | 298.0  | 297.5  | 298.0  |
| 32.5° | 2328.7 | 1985.7 | 1020.4 | 347.8  | 297.0  | 284.1  | 280.9  | 282.5  | 280.9  | 280.9  | 280.9  |
| 35°   | 2458.1 | 2030.6 | 866.8  | 303.4  | 275.0  | 264.3  | 261.1  | 263.3  | 262.2  | 262.2  | 261.7  |
| 37.5° | 2647.0 | 2114.1 | 712.2  | 276.6  | 255.8  | 244.5  | 240.2  | 243.5  | 242.4  | 242.4  | 241.9  |
| 40°   | 2877.1 | 2235.6 | 565.0  | 256.3  | 237.0  | 225.3  | 221.5  | 223.1  | 220.5  | 220.5  | 221.5  |
| 42.5° | 3161.2 | 2389.7 | 436.6  | 236.5  | 218.3  | 207.1  | 204.9  | 203.3  | 198.5  | 195.8  | 196.4  |
| 45°   | 3476.9 | 2550.2 | 340.3  | 217.2  | 200.7  | 191.6  | 188.3  | 184.1  | 176.0  | 170.7  | 171.2  |
| 47.5° | 3758.9 | 2673.8 | 276.6  | 198.5  | 184.6  | 177.6  | 172.8  | 164.8  | 153.0  | 146.6  | 147.1  |
| 50°   | 3907.1 | 2692.5 | 235.4  | 179.8  | 169.6  | 162.7  | 155.7  | 143.4  | 129.5  | 122.5  | 122.0  |
| 52.5° | 3945.1 | 2604.8 | 204.9  | 162.7  | 154.6  | 146.6  | 137.5  | 120.9  | 105.4  | 97.9   | 96.8   |
| 55°   | 3959.0 | 2471.0 | 177.6  | 146.6  | 138.6  | 129.5  | 117.7  | 99.0   | 84.5   | 77.1   | 76.5   |
| 57.5° | 3913.0 | 2271.4 | 156.2  | 132.2  | 122.5  | 111.3  | 96.8   | 79.2   | 65.3   | 59.4   | 59.4   |
| 60°   | 3810.8 | 2001.2 | 139.7  | 116.6  | 105.9  | 93.1   | 78.1   | 61.5   | 48.7   | 43.9   | 43.9   |
| 62.5° | 3607.0 | 1651.3 | 124.1  | 100.6  | 90.4   | 77.1   | 63.1   | 46.6   | 34.2   | 31.6   | 32.1   |
| 65°   | 3222.2 | 1252.6 | 108.6  | 86.1   | 77.1   | 63.7   | 49.2   | 33.2   | 23.0   | 23.0   | 24.1   |
| 67.5° | 2627.8 | 870.0  | 92.6   | 73.3   | 66.3   | 51.9   | 37.5   | 23.0   | 16.1   | 18.2   | 20.3   |
| 70°   | 1739.5 | 488.0  | 79.2   | 60.5   | 56.7   | 41.2   | 27.8   | 15.5   | 12.8   | 17.1   | 20.9   |
| 72.5° | 656.5  | 190.0  | 66.3   | 48.7   | 49.2   | 31.6   | 19.8   | 11.8   | 11.8   | 18.7   | 24.6   |
| 75°   | 183.0  | 93.1   | 47.6   | 35.9   | 38.5   | 23.0   | 14.4   | 10.2   | 11.2   | 21.4   | 28.9   |
| 77.5° | 107.6  | 68.5   | 31.0   | 20.9   | 26.2   | 16.1   | 9.6    | 8.0    | 9.6    | 18.2   | 27.8   |
| 80°   | 86.7   | 36.4   | 18.2   | 10.7   | 14.4   | 9.1    | 6.4    | 4.8    | 2.7    | 7.0    | 14.4   |
| 82.5° | 86.7   | 21.9   | 8.6    | 7.5    | 7.5    | 4.8    | 3.2    | 2.1    | 0.5    | 0.0    | 3.7    |
| 85°   | 58.3   | 9.1    | 5.4    | 4.8    | 3.7    | 1.6    | 1.1    | 0.5    | 0.0    | 0.0    | 0.0    |
| 87.5° | 9.6    | 3.7    | 2.1    | 1.1    | 0.5    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

LM-79-2008: Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Report Prepared for

Cooper Lighting Solutions

McGRAW-EDISON

Report Number: SP1-1908-441-4-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

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| 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 5000K 4-step quadrangle

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**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)