

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: P321015

Luminaire Tested: **GLEON-SA1D-750-U-AFL**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P321015  
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-SA1D-750-U-AFL  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(1) 70 CRI, 5000K, 1200mA LIGHTSQUARE WITH 16 LEDS AND AUTOMOTIVE  
FRONTLINE OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 8334 lumens  
Efficiency: N/A  
Efficacy: 124.4 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 0.5' x H: 0')  
IES Classification: Type II - Short  
BUG Rating: B1 - U0 - G1

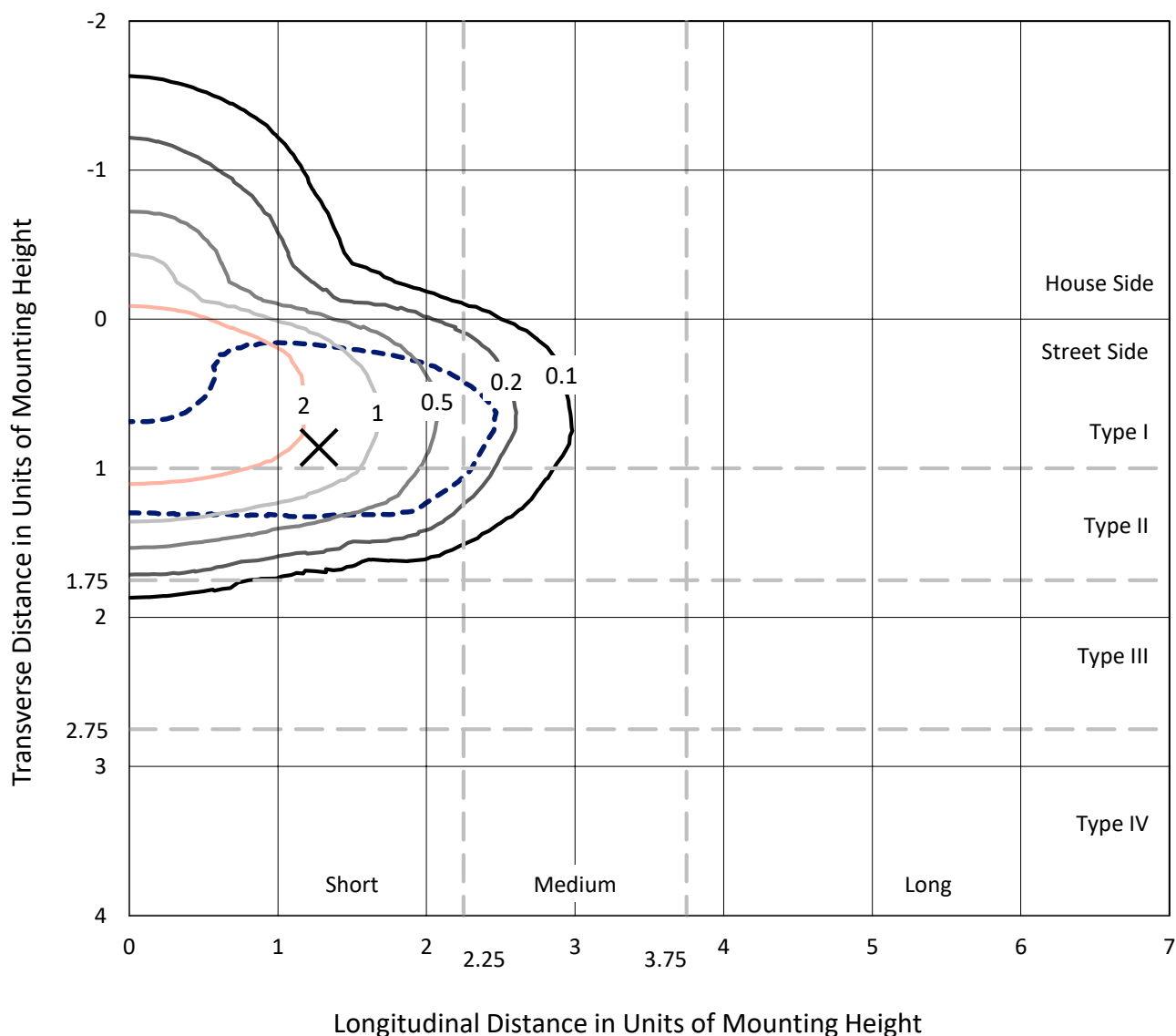
Input Watts (W): 67  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



REPORT NUMBER: P321015  
 CATALOG NUMBER: GLEON-SA1D-750-U-AFL

## Iso-Footcandle Lines of Horizontal Illumination

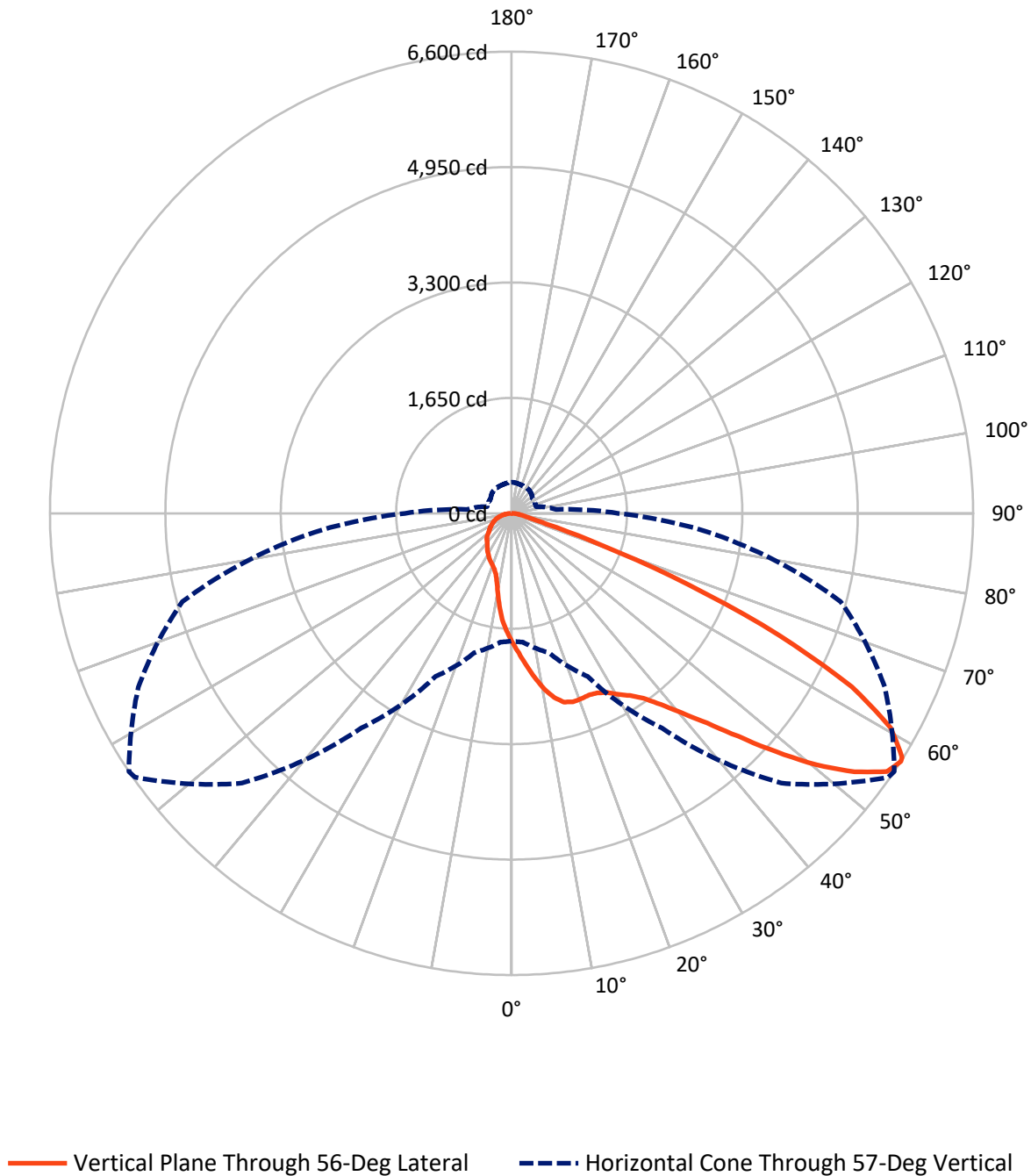
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 4.1 fc  
 Type II - Short - N/A

REPORT NUMBER: P321015  
CATALOG NUMBER: GLEON-SA1D-750-U-AFL

## Luminous Intensity Polar Plot



REPORT NUMBER: P321015

CATALOG NUMBER: GLEON-SA1D-750-U-AFL

**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 1436.6   | 0.0    | 1436.6 |
|                    | % Fixture | 17.2     | 0.0    | 17.2   |
| <b>Street Side</b> | Lumens    | 6897.4   | 0.0    | 6897.4 |
|                    | % Fixture | 82.8     | 0.0    | 82.8   |
| <b>Total</b>       | Lumens    | 8334.0   | 0.0    | 8334.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 176.6  | 2.1       |
| 10°-20°   | 499.2  | 6.0       |
| 20°-30°   | 813.1  | 9.8       |
| 30°-40°   | 1215.6 | 14.6      |
| 40°-50°   | 1843.7 | 22.1      |
| 50°-60°   | 2066.5 | 24.8      |
| 60°-70°   | 1220.6 | 14.6      |
| 70°-80°   | 399.9  | 4.8       |
| 80°-90°   | 98.8   | 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°    | 8334.0 | 100.0     |
| 0°-180°   | 8334.0 | 100.0     |

**Coefficient of Utilization**



REPORT NUMBER: P321015

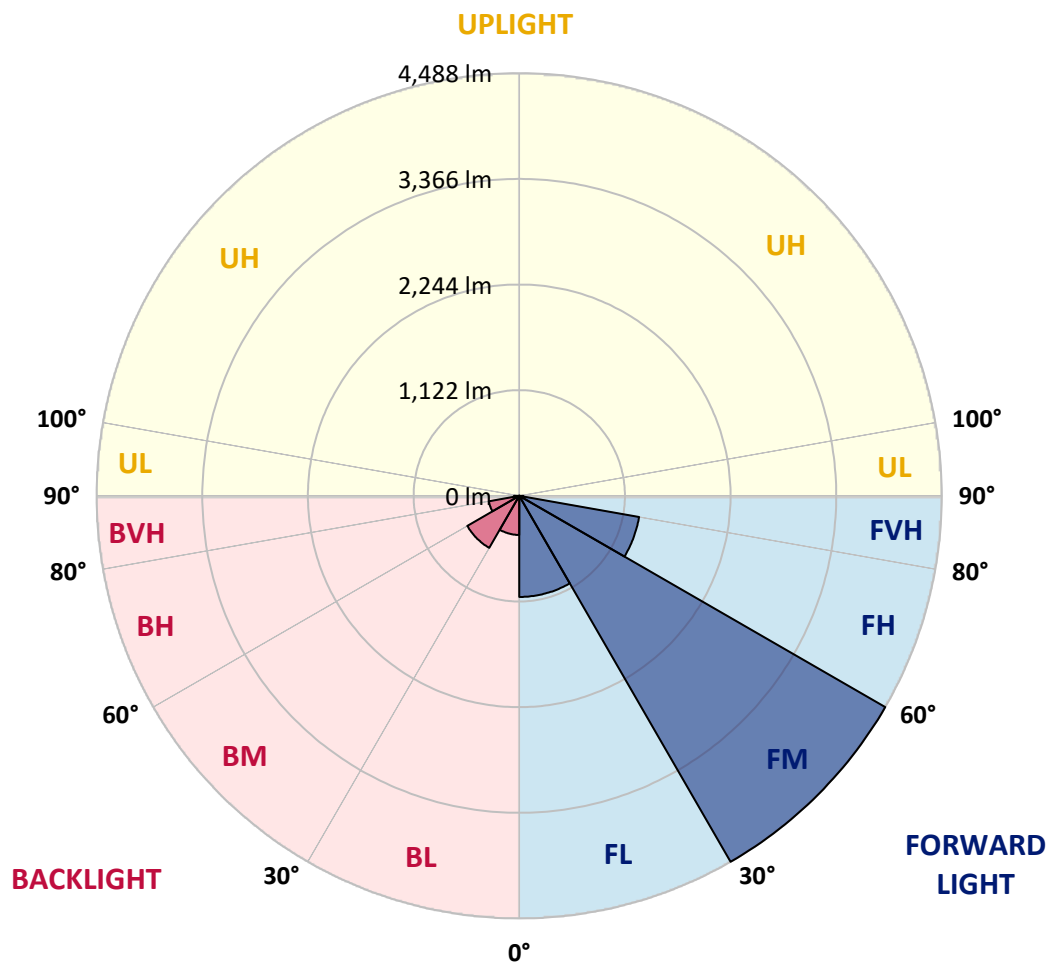
CATALOG NUMBER: GLEON-SA1D-750-U-AFL

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 1073.5 | 12.9      |                         |      |         |
| FM   | (30°-60°)   | 4488.1 | 53.9      |                         |      |         |
| FH   | (60°-80°)   | 1292.2 | 15.5      |                         |      | G1/1800 |
| FVH  | (80°-90°)   | 43.5   | 0.5       |                         |      | G1/100  |
| BL   | (0°-30°)    | 415.4  | 5.0       | B1/500                  |      |         |
| BM   | (30°-60°)   | 637.7  | 7.7       | B1/1000                 |      |         |
| BH   | (60°-80°)   | 328.2  | 3.9       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 55.3   | 0.7       |                         |      | G1/100  |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B1-U0-G1**

Type II Short





REPORT NUMBER: P321015

CATALOG NUMBER: GLEON-SA1D-750-U-AFL

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 56°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1848.5 | 1848.5 | 1848.5 | 1848.5 | 1848.5 | 1848.5 | 1848.5 | 1848.5 | 1848.5 | 1848.5 | 1848.5 |
| 2.5°  | 2122.6 | 2142.1 | 2133.5 | 2103.7 | 2080.8 | 2048.4 | 2012.3 | 2001.4 | 1963.3 | 1920.7 | 1869.4 |
| 5°    | 2458.5 | 2448.8 | 2434.8 | 2388.4 | 2339.4 | 2282.4 | 2191.9 | 2177.6 | 2092.8 | 1996.3 | 1894.3 |
| 7.5°  | 2649.9 | 2649.0 | 2640.7 | 2613.5 | 2568.8 | 2494.3 | 2385.2 | 2368.3 | 2240.3 | 2085.1 | 1927.0 |
| 10°   | 2622.1 | 2620.1 | 2633.8 | 2662.2 | 2675.6 | 2660.2 | 2568.2 | 2551.3 | 2394.1 | 2183.3 | 1964.8 |
| 12.5° | 2464.3 | 2465.4 | 2487.5 | 2547.0 | 2628.1 | 2725.5 | 2710.6 | 2702.3 | 2553.6 | 2294.4 | 2010.6 |
| 15°   | 2341.4 | 2344.0 | 2361.4 | 2413.3 | 2508.9 | 2685.7 | 2797.1 | 2799.9 | 2708.0 | 2417.0 | 2064.2 |
| 17.5° | 2287.6 | 2293.0 | 2301.0 | 2337.4 | 2425.0 | 2606.3 | 2817.7 | 2833.2 | 2843.2 | 2544.2 | 2115.7 |
| 20°   | 2304.7 | 2309.9 | 2312.2 | 2335.4 | 2407.3 | 2558.2 | 2803.4 | 2831.2 | 2946.9 | 2663.9 | 2167.3 |
| 22.5° | 2381.8 | 2384.9 | 2386.4 | 2392.4 | 2448.2 | 2572.0 | 2793.9 | 2823.1 | 3021.9 | 2771.3 | 2206.2 |
| 25°   | 2509.5 | 2507.2 | 2498.1 | 2490.3 | 2527.9 | 2626.4 | 2815.7 | 2843.5 | 3082.9 | 2868.7 | 2231.7 |
| 27.5° | 2662.5 | 2659.6 | 2641.8 | 2620.6 | 2642.1 | 2711.2 | 2878.4 | 2900.5 | 3137.6 | 2959.8 | 2244.6 |
| 30°   | 2846.1 | 2838.6 | 2805.1 | 2779.9 | 2788.2 | 2838.3 | 2981.8 | 3001.9 | 3222.1 | 3063.2 | 2257.2 |
| 32.5° | 3058.3 | 3050.3 | 3001.9 | 2960.0 | 2960.0 | 3001.9 | 3088.4 | 3105.0 | 3293.7 | 3180.0 | 2277.5 |
| 35°   | 3324.1 | 3314.0 | 3251.0 | 3180.9 | 3161.1 | 3182.3 | 3233.6 | 3245.3 | 3422.6 | 3327.2 | 2314.5 |
| 37.5° | 3637.4 | 3623.9 | 3542.3 | 3448.4 | 3405.1 | 3404.0 | 3440.9 | 3465.0 | 3628.5 | 3520.5 | 2377.2 |
| 40°   | 3951.6 | 3942.1 | 3870.8 | 3796.9 | 3712.2 | 3684.9 | 3741.9 | 3749.4 | 3897.8 | 3760.6 | 2457.4 |
| 42.5° | 4194.5 | 4192.8 | 4179.6 | 4189.3 | 4102.5 | 4047.5 | 4092.2 | 4098.2 | 4226.5 | 4020.3 | 2542.7 |
| 45°   | 4322.8 | 4325.6 | 4389.5 | 4531.0 | 4563.1 | 4523.0 | 4545.0 | 4546.8 | 4602.3 | 4282.4 | 2620.9 |
| 47.5° | 4220.0 | 4234.9 | 4396.4 | 4712.9 | 4975.5 | 5108.7 | 5072.0 | 5093.2 | 4966.6 | 4507.5 | 2682.2 |
| 50°   | 3819.3 | 3837.6 | 4112.6 | 4631.8 | 5168.0 | 5675.5 | 5656.3 | 5651.4 | 5260.5 | 4672.5 | 2715.5 |
| 52.5° | 3322.9 | 3337.2 | 3564.1 | 4210.5 | 5026.8 | 5988.8 | 6165.0 | 6139.8 | 5521.7 | 4795.9 | 2721.8 |
| 55°   | 2567.1 | 2589.4 | 2806.8 | 3369.6 | 4455.7 | 5869.1 | 6539.0 | 6516.4 | 5759.7 | 4860.7 | 2714.3 |
| 57°   | 1825.0 | 1848.5 | 2064.4 | 2571.7 | 3748.2 | 5454.7 | 6576.3 | 6600.3 | 5888.3 | 4871.5 | 2722.6 |
| 57.5° | 1628.5 | 1652.6 | 1866.5 | 2359.2 | 3527.7 | 5304.9 | 6544.2 | 6584.3 | 5911.5 | 4869.8 | 2727.2 |
| 60°   | 820.0  | 829.2  | 965.5  | 1316.9 | 2230.0 | 4288.7 | 6125.7 | 6229.1 | 5932.4 | 4785.6 | 2747.0 |
| 62.5° | 509.8  | 503.2  | 498.9  | 606.6  | 1084.9 | 2844.0 | 5262.2 | 5461.3 | 5532.3 | 4581.7 | 2699.1 |
| 65°   | 448.2  | 435.9  | 388.7  | 380.1  | 479.2  | 1381.4 | 3962.8 | 4210.5 | 4677.4 | 4260.3 | 2585.1 |
| 67.5° | 421.0  | 409.0  | 355.7  | 323.6  | 323.9  | 547.6  | 2460.3 | 2739.2 | 3643.7 | 3717.0 | 2316.2 |
| 70°   | 393.0  | 382.1  | 332.2  | 294.4  | 275.8  | 303.3  | 1131.9 | 1343.5 | 2375.2 | 2921.7 | 1935.8 |
| 72.5° | 356.9  | 349.4  | 302.2  | 263.2  | 243.4  | 227.1  | 433.3  | 511.8  | 1375.1 | 1962.2 | 1344.4 |
| 75°   | 319.1  | 312.2  | 271.8  | 234.6  | 210.5  | 178.7  | 244.0  | 262.9  | 698.6  | 1003.9 | 661.9  |
| 77.5° | 277.5  | 273.5  | 241.7  | 207.4  | 188.2  | 148.1  | 172.7  | 181.9  | 299.6  | 430.5  | 331.9  |
| 80°   | 220.8  | 228.6  | 211.4  | 184.7  | 167.0  | 118.6  | 122.3  | 128.3  | 174.4  | 210.2  | 188.5  |
| 82.5° | 143.8  | 157.2  | 165.5  | 150.1  | 137.5  | 93.4   | 87.9   | 90.5   | 113.7  | 128.3  | 81.9   |
| 85°   | 59.9   | 67.3   | 108.8  | 98.2   | 91.4   | 68.2   | 59.0   | 60.1   | 70.5   | 73.0   | 33.5   |
| 87.5° | 26.6   | 28.4   | 47.8   | 45.0   | 38.7   | 23.5   | 25.2   | 27.5   | 37.5   | 35.5   | 12.9   |
| 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-SA1D-750-U-AFL

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1848.5 | 1848.5 | 1848.5 | 1848.5 | 1848.5 | 1848.5 | 1848.5 | 1848.5 | 1848.5 | 1848.5 | 1848.5 |
| 2.5°  | 1850.2 | 1826.1 | 1784.9 | 1739.4 | 1702.1 | 1672.3 | 1642.3 | 1621.7 | 1597.6 | 1584.7 | 1578.1 |
| 5°    | 1851.6 | 1804.4 | 1717.6 | 1628.5 | 1548.9 | 1476.2 | 1406.8 | 1353.6 | 1303.7 | 1276.8 | 1269.4 |
| 7.5°  | 1857.7 | 1786.6 | 1646.3 | 1499.6 | 1358.2 | 1229.0 | 1129.3 | 1066.9 | 1021.9 | 1001.9 | 996.1  |
| 10°   | 1862.5 | 1765.7 | 1558.1 | 1341.0 | 1148.5 | 1017.6 | 940.3  | 905.3  | 889.9  | 887.3  | 884.7  |
| 12.5° | 1874.0 | 1744.2 | 1465.3 | 1175.4 | 985.5  | 895.0  | 868.1  | 865.8  | 870.1  | 876.4  | 876.4  |
| 15°   | 1892.0 | 1723.0 | 1359.3 | 1033.4 | 881.9  | 850.1  | 855.5  | 868.1  | 879.9  | 889.6  | 891.0  |
| 17.5° | 1905.2 | 1697.0 | 1245.3 | 919.7  | 826.6  | 835.2  | 854.6  | 872.4  | 884.4  | 893.9  | 894.7  |
| 20°   | 1914.6 | 1656.6 | 1123.6 | 832.9  | 794.8  | 821.4  | 845.8  | 861.5  | 869.8  | 879.3  | 880.7  |
| 22.5° | 1909.8 | 1602.5 | 1015.6 | 770.7  | 769.0  | 801.4  | 824.6  | 843.5  | 837.2  | 828.0  | 834.0  |
| 25°   | 1886.3 | 1528.0 | 904.5  | 724.3  | 741.8  | 774.5  | 803.1  | 790.5  | 769.3  | 765.3  | 767.6  |
| 27.5° | 1844.5 | 1432.9 | 801.7  | 681.4  | 710.3  | 749.5  | 747.8  | 735.2  | 727.8  | 722.6  | 725.8  |
| 30°   | 1799.5 | 1329.8 | 711.7  | 643.8  | 675.4  | 707.7  | 701.1  | 700.8  | 693.4  | 685.1  | 689.1  |
| 32.5° | 1755.1 | 1226.1 | 640.4  | 612.9  | 649.0  | 653.3  | 667.6  | 671.9  | 657.3  | 639.8  | 638.7  |
| 35°   | 1716.5 | 1128.2 | 586.3  | 584.8  | 617.2  | 617.8  | 638.7  | 632.7  | 596.3  | 578.3  | 578.3  |
| 37.5° | 1687.5 | 1030.5 | 545.0  | 559.6  | 575.4  | 590.3  | 600.9  | 576.0  | 570.0  | 559.9  | 559.6  |
| 40°   | 1674.9 | 944.6  | 519.3  | 540.5  | 545.9  | 564.8  | 537.6  | 547.3  | 550.2  | 545.0  | 545.0  |
| 42.5° | 1661.7 | 869.8  | 496.9  | 525.8  | 525.0  | 522.4  | 508.7  | 521.3  | 532.7  | 533.0  | 532.1  |
| 45°   | 1648.6 | 805.4  | 477.2  | 494.6  | 506.7  | 478.9  | 481.5  | 494.9  | 511.0  | 516.7  | 516.7  |
| 47.5° | 1634.0 | 754.4  | 459.1  | 461.7  | 480.3  | 461.7  | 459.7  | 470.0  | 488.9  | 498.1  | 500.1  |
| 50°   | 1601.9 | 708.6  | 438.5  | 432.8  | 437.9  | 444.2  | 445.9  | 450.8  | 471.7  | 486.3  | 489.8  |
| 52.5° | 1557.5 | 667.6  | 412.1  | 406.1  | 406.1  | 429.9  | 437.9  | 439.4  | 457.1  | 474.6  | 478.0  |
| 55°   | 1520.5 | 641.6  | 384.9  | 383.8  | 382.6  | 414.7  | 428.5  | 430.8  | 443.1  | 456.8  | 458.5  |
| 57°   | 1523.1 | 639.6  | 364.0  | 365.2  | 364.9  | 399.3  | 419.6  | 424.5  | 430.8  | 442.5  | 444.5  |
| 57.5° | 1524.6 | 641.0  | 359.4  | 360.0  | 359.7  | 395.0  | 417.0  | 422.5  | 427.3  | 439.6  | 441.6  |
| 60°   | 1546.0 | 644.7  | 340.8  | 334.5  | 336.0  | 372.0  | 402.4  | 409.3  | 412.4  | 428.8  | 431.3  |
| 62.5° | 1514.2 | 628.1  | 325.9  | 310.8  | 310.8  | 348.0  | 382.1  | 393.0  | 397.8  | 419.9  | 424.2  |
| 65°   | 1422.0 | 581.4  | 308.5  | 283.8  | 286.7  | 323.9  | 357.7  | 375.5  | 382.9  | 410.4  | 415.0  |
| 67.5° | 1279.7 | 527.3  | 289.8  | 259.8  | 262.6  | 298.7  | 332.5  | 351.7  | 363.5  | 400.1  | 403.8  |
| 70°   | 1094.4 | 461.1  | 264.6  | 234.3  | 237.7  | 271.2  | 302.7  | 324.5  | 342.0  | 390.4  | 391.5  |
| 72.5° | 806.8  | 378.1  | 229.4  | 206.2  | 209.9  | 239.2  | 272.7  | 297.9  | 321.4  | 366.0  | 365.5  |
| 75°   | 479.7  | 295.6  | 190.5  | 177.9  | 180.4  | 207.6  | 245.5  | 276.1  | 311.3  | 356.6  | 362.0  |
| 77.5° | 291.0  | 222.5  | 155.2  | 148.9  | 152.1  | 179.9  | 226.0  | 258.6  | 307.0  | 336.2  | 334.5  |
| 80°   | 175.9  | 159.0  | 124.0  | 120.0  | 123.2  | 153.8  | 209.1  | 245.5  | 268.4  | 287.3  | 287.3  |
| 82.5° | 91.9   | 97.1   | 91.1   | 87.9   | 92.2   | 124.9  | 190.2  | 214.2  | 237.1  | 203.6  | 190.2  |
| 85°   | 37.5   | 50.7   | 55.3   | 55.0   | 57.6   | 86.5   | 164.1  | 183.3  | 152.9  | 145.2  | 148.6  |
| 87.5° | 12.6   | 21.5   | 26.9   | 23.2   | 24.3   | 54.4   | 113.7  | 88.5   | 105.1  | 73.3   | 69.6   |
| 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

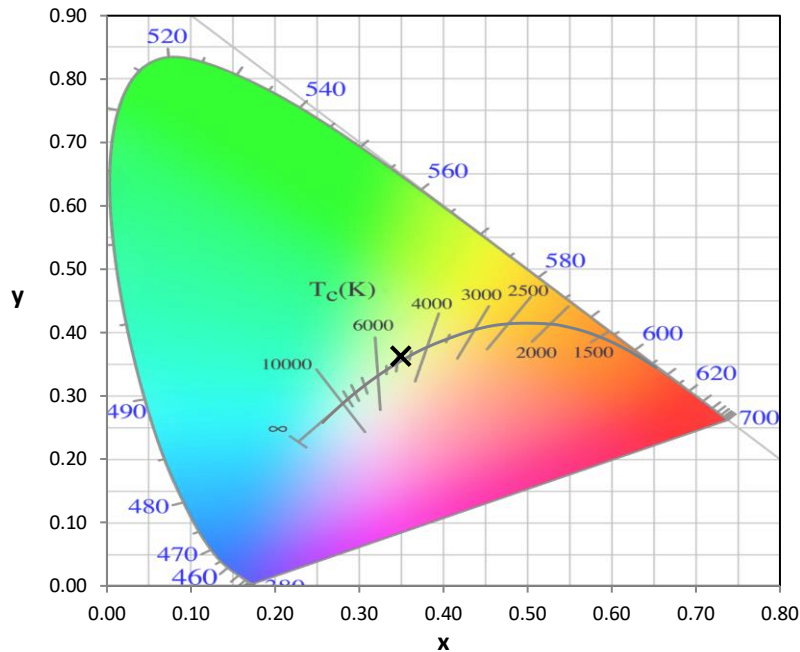
Stabilization Time: 240M  
Operation Time: 12H  
Room Temperature (°C) / RH%: 25.0./44%  
Sphere Temperature (°C): 25.7

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            |

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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**

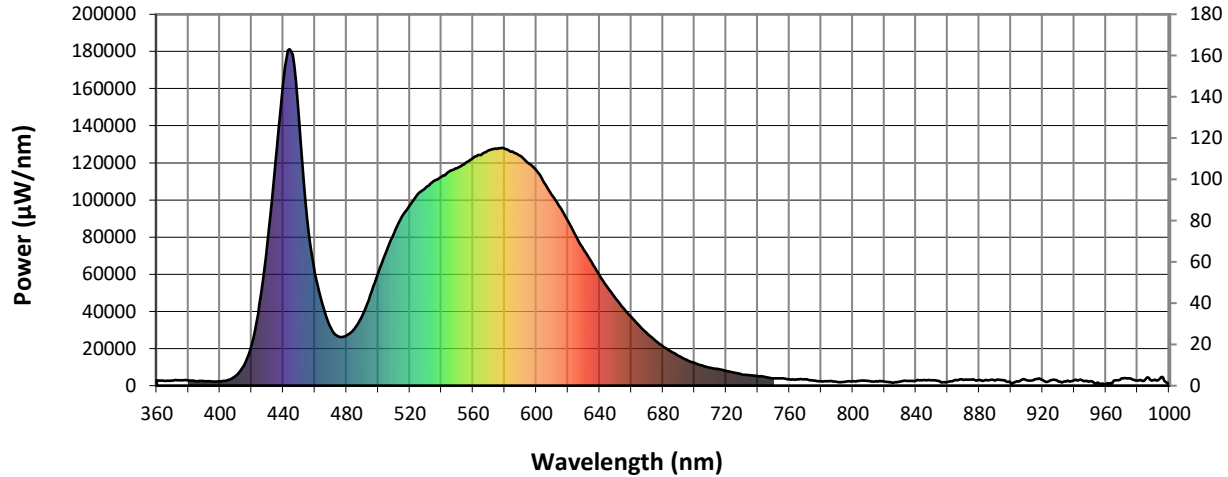


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| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 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**



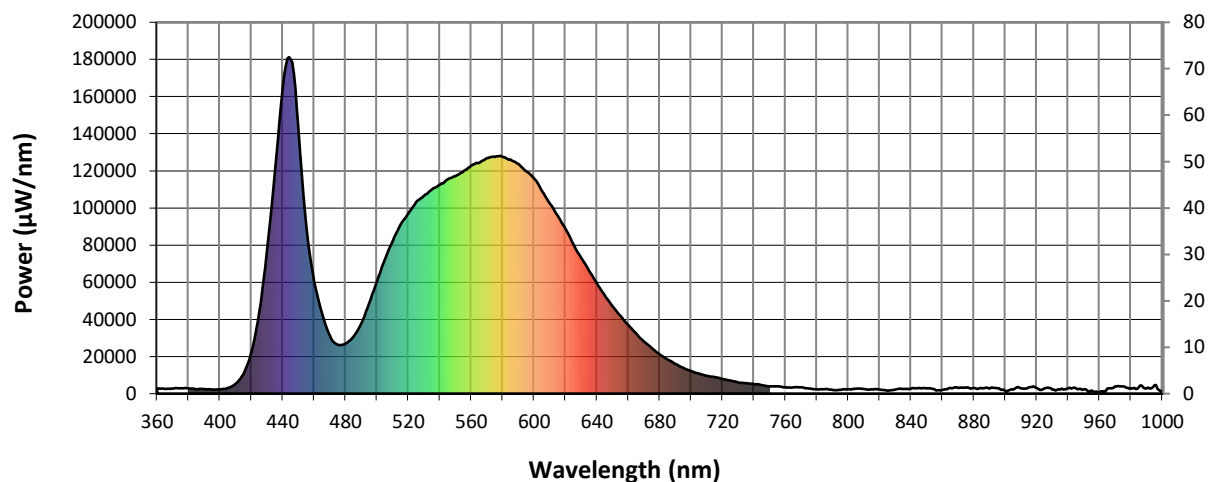
**Scotopic Lumens: 13493.5**

**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**

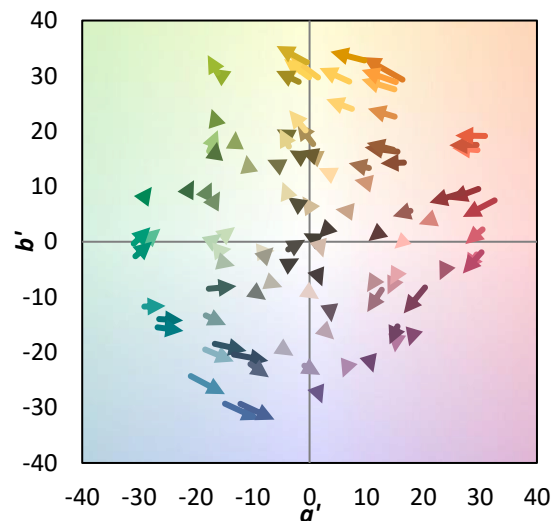
**Summary**

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

**Spectral Power Distribution Comparison**



**Color Vector Graphics**

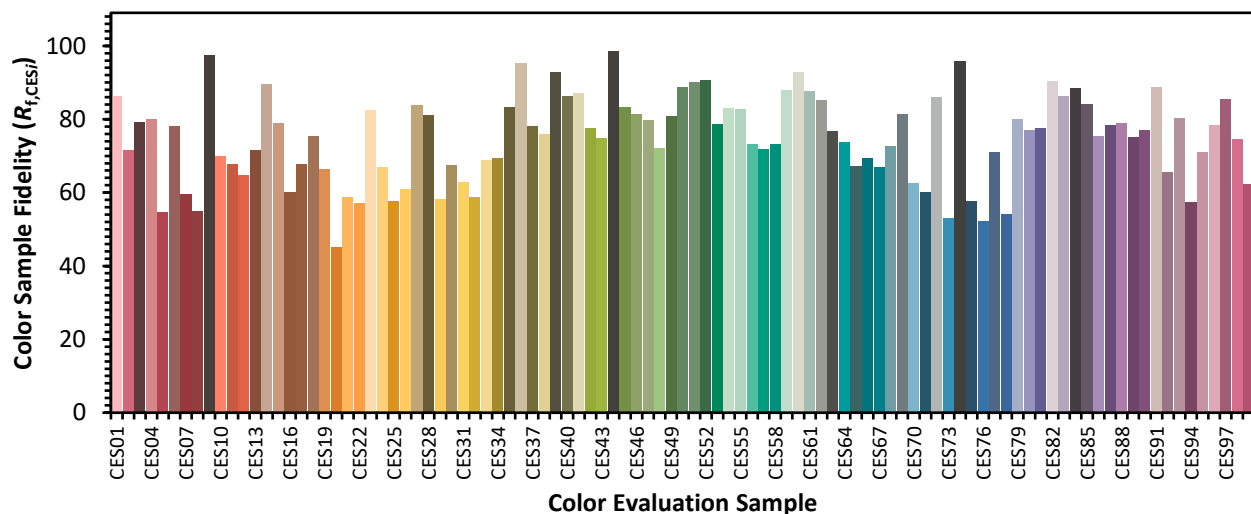


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**Individual Sample Fidelity Index ( $R_{f,i}$ )**

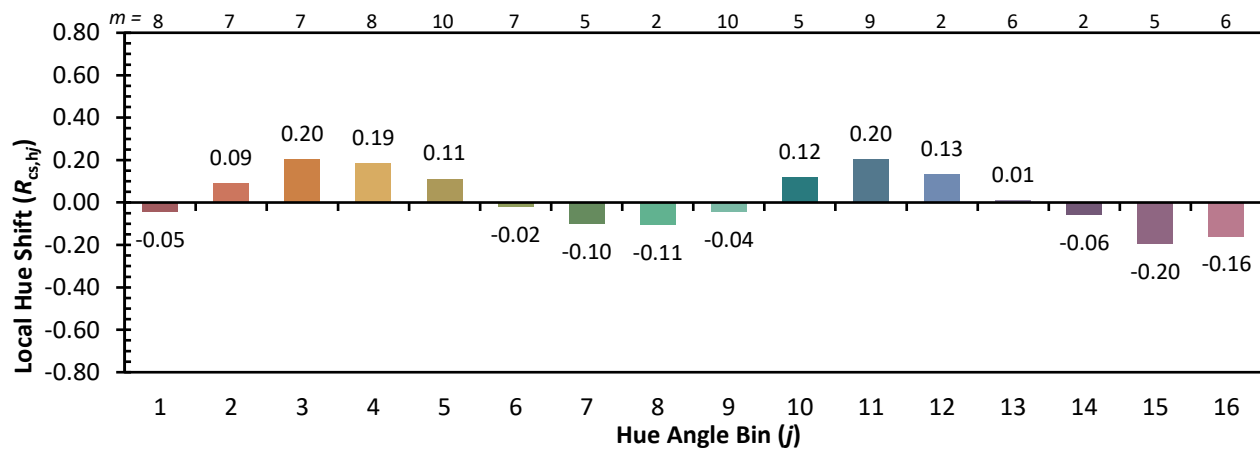
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 61 | CES51 = 90 | CES76 = 52 |
| CES02 = 60 | CES27 = 84 | CES52 = 91 | CES77 = 71 |
| CES03 = 30 | CES28 = 81 | CES53 = 79 | CES78 = 54 |
| CES04 = 69 | CES29 = 58 | CES54 = 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)