

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: P387015

Luminaire Tested: **GPC-SA2D-727-U-T3**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P387015  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-14)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GPC-SA2D-727-U-T3  
Description: GALLEON PEDESTRIAN LUMINAIRE  
(2) 70 CRI, 2700K, 1200mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE III OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 13544 lumens  
Efficiency: N/A  
Efficacy: 105.0 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 0.5' x H: 0')  
IES Classification: Type III - Short  
BUG Rating: B2 - U0 - G2

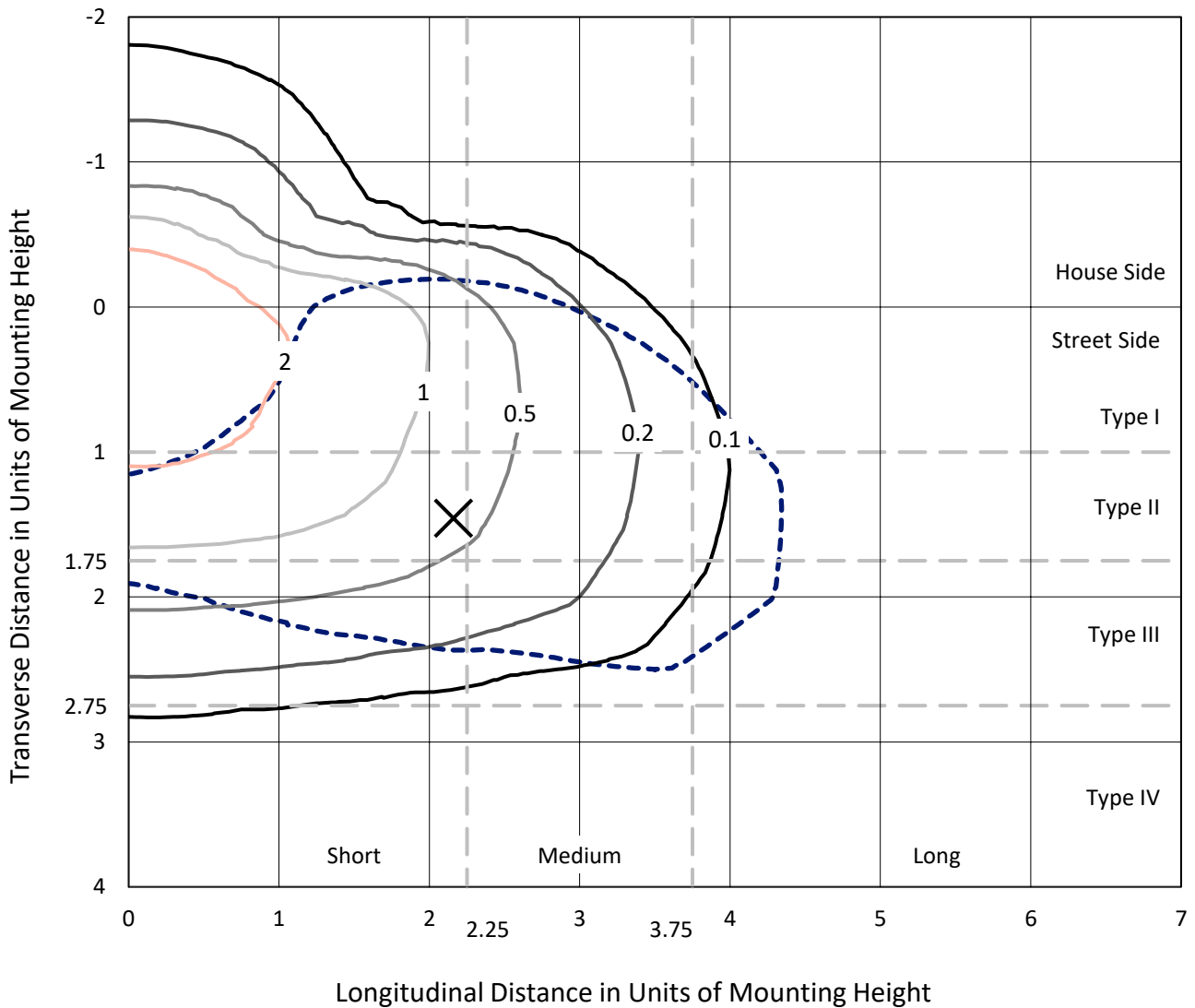
Input Watts (W): 129  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT



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### Iso-Footcandle Lines of Horizontal Illumination

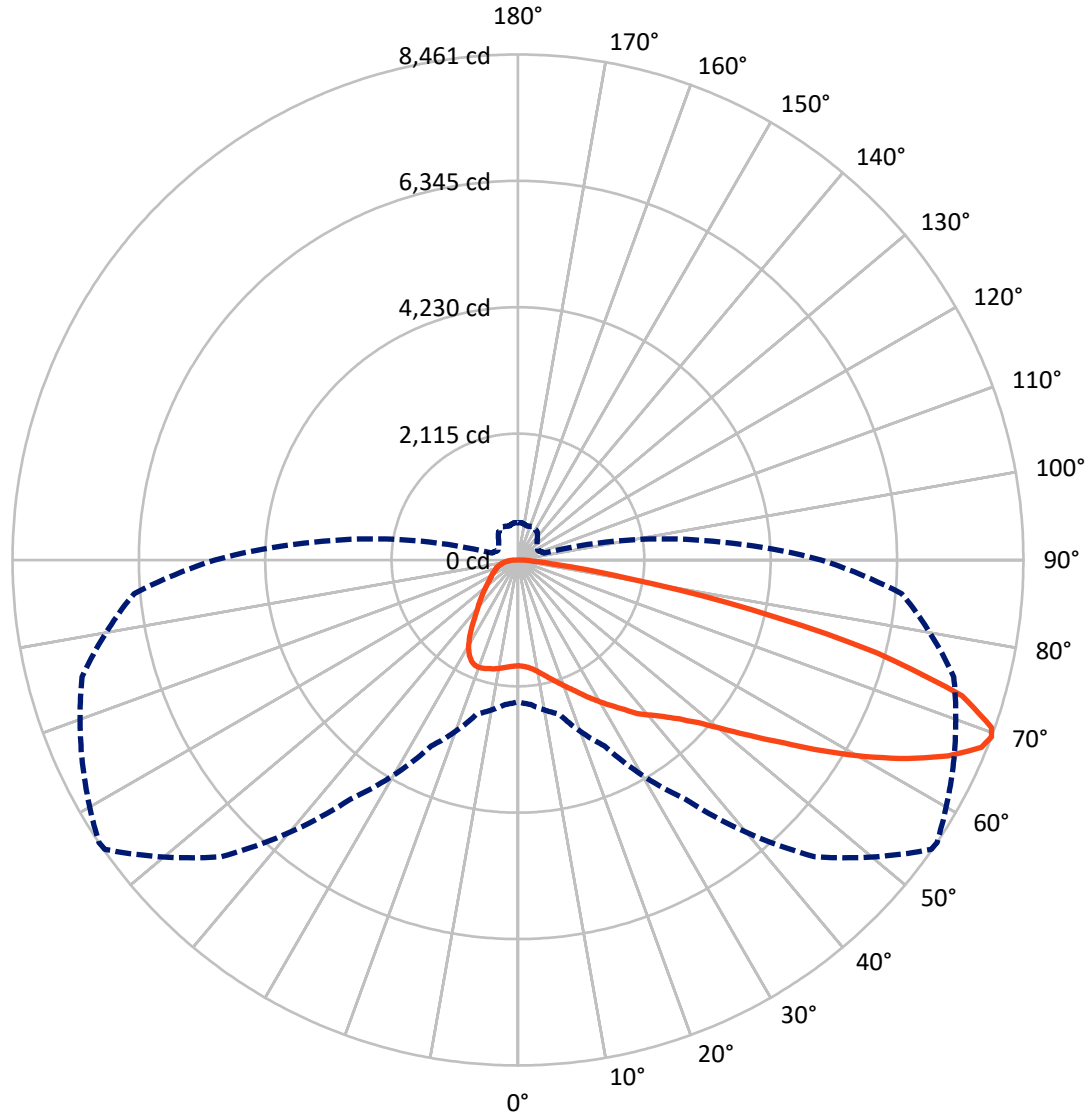
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 3.1 fc  
 Type III - Short - N/A

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### Luminous Intensity Polar Plot



— Vertical Plane Through 56-Deg Lateral      - - - Horizontal Cone Through 69-Deg Vertical

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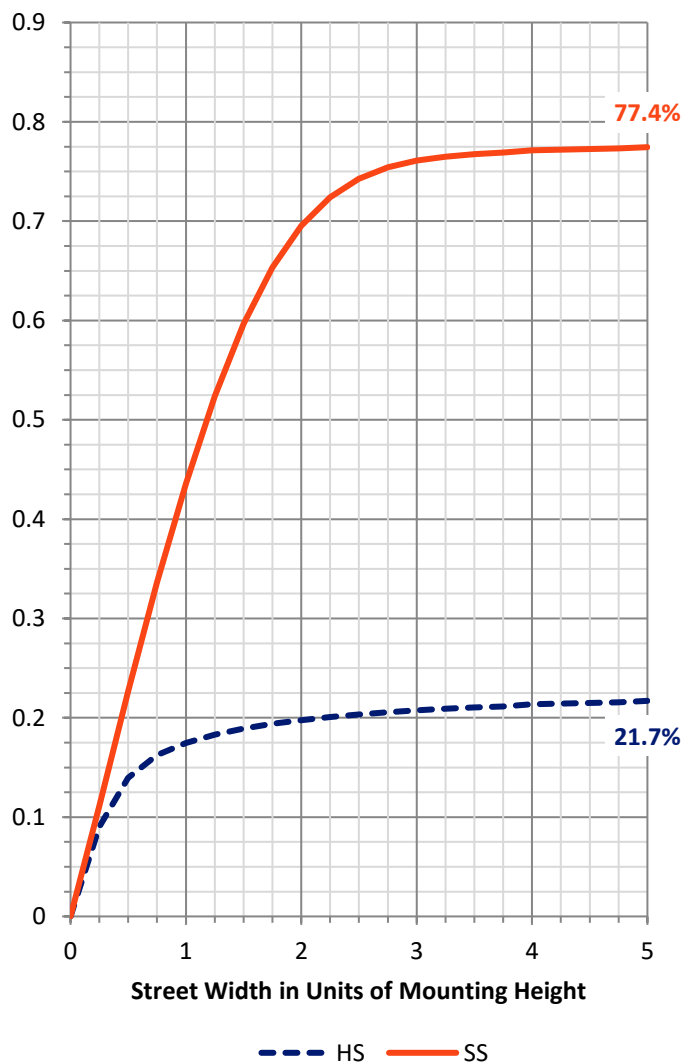
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 3016.2   | 0.0    | 3016.2  |
|                    | % Fixture | 22.3     | 0.0    | 22.3    |
| <b>Street Side</b> | Lumens    | 10527.8  | 0.0    | 10527.8 |
|                    | % Fixture | 77.7     | 0.0    | 77.7    |
| <b>Total</b>       | Lumens    | 13544.0  | 0.0    | 13544.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 173.9   | 1.3       |
| 10°-20°   | 559.2   | 4.1       |
| 20°-30°   | 976.2   | 7.2       |
| 30°-40°   | 1402.3  | 10.4      |
| 40°-50°   | 1940.6  | 14.3      |
| 50°-60°   | 2843.3  | 21.0      |
| 60°-70°   | 3466.5  | 25.6      |
| 70°-80°   | 1916.5  | 14.2      |
| 80°-90°   | 265.4   | 2.0       |
| 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°    | 13544.0 | 100.0     |
| 0°-180°   | 13544.0 | 100.0     |

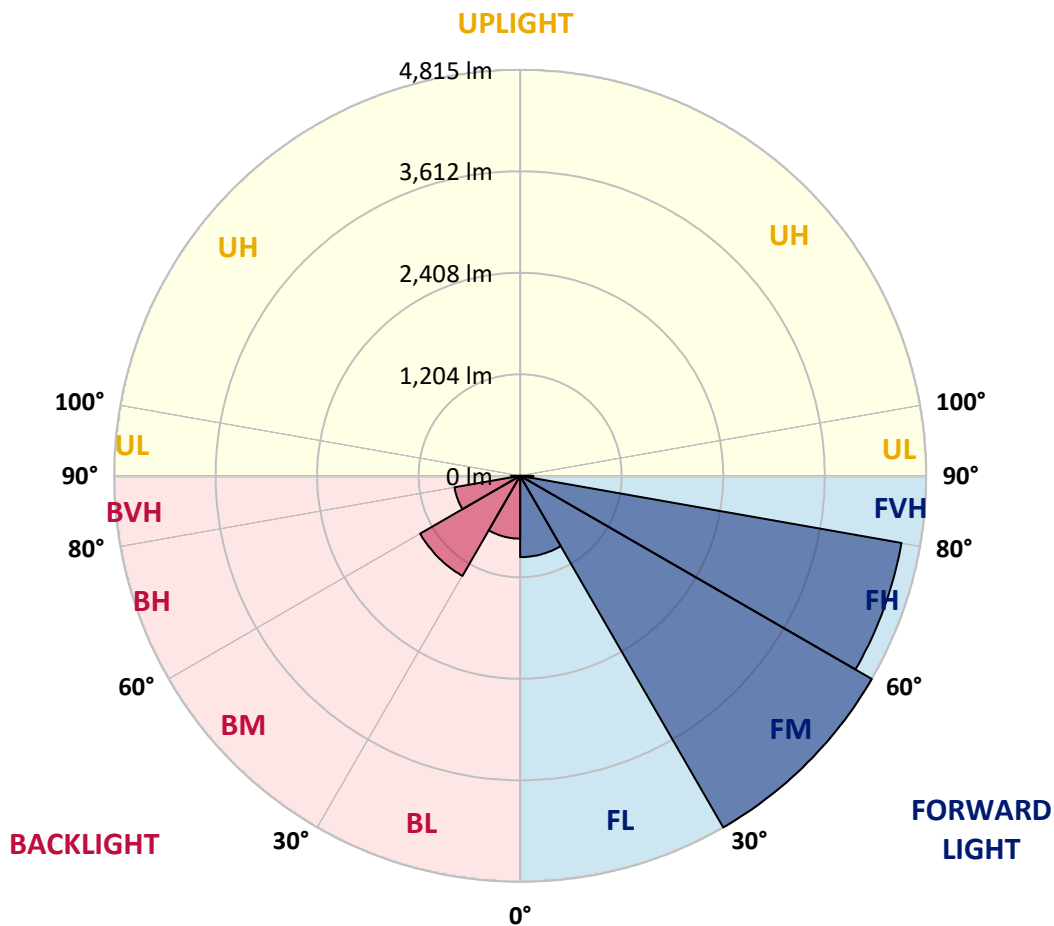


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**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone           | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|----------------|--------|-----------|-------------------------|------|---------|
|                |        |           | B                       | U    | G       |
| FL (0°-30°)    | 963.9  | 7.1       |                         |      |         |
| FM (30°-60°)   | 4815.4 | 35.6      |                         |      |         |
| FH (60°-80°)   | 4592.1 | 33.9      |                         |      | G2/5000 |
| FVH (80°-90°)  | 156.4  | 1.2       |                         |      | G2/225  |
| BL (0°-30°)    | 745.4  | 5.5       | B2/1000                 |      |         |
| BM (30°-60°)   | 1370.8 | 10.1      | B2/2500                 |      |         |
| BH (60°-80°)   | 791.0  | 5.8       | B2/1000                 |      | G2/1000 |
| BVH (80°-90°)  | 109.1  | 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-G2**  
 Type III Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 56°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1770.7 | 1770.7 | 1770.7 | 1770.7 | 1770.7 | 1770.7 | 1770.7 | 1770.7 | 1770.7 | 1770.7 | 1770.7 |
| 2.5°  | 1781.9 | 1783.7 | 1782.3 | 1786.1 | 1781.9 | 1784.7 | 1782.3 | 1782.3 | 1780.9 | 1776.7 | 1772.1 |
| 5°    | 1809.9 | 1813.6 | 1811.3 | 1815.0 | 1809.9 | 1810.8 | 1806.6 | 1806.6 | 1802.4 | 1793.5 | 1784.2 |
| 7.5°  | 1853.7 | 1857.9 | 1856.1 | 1859.8 | 1852.8 | 1852.8 | 1847.2 | 1846.7 | 1838.3 | 1823.9 | 1813.1 |
| 10°   | 1906.0 | 1911.6 | 1909.7 | 1915.3 | 1909.7 | 1911.6 | 1906.0 | 1906.0 | 1894.8 | 1874.3 | 1860.7 |
| 12.5° | 1982.0 | 1989.0 | 1983.9 | 1983.4 | 1981.1 | 1984.8 | 1980.2 | 1979.2 | 1969.0 | 1941.0 | 1922.3 |
| 15°   | 2083.7 | 2091.2 | 2080.5 | 2079.6 | 2066.5 | 2065.1 | 2065.1 | 2063.7 | 2057.2 | 2023.6 | 1992.8 |
| 17.5° | 2200.9 | 2203.2 | 2193.9 | 2178.9 | 2162.1 | 2151.4 | 2150.0 | 2153.7 | 2153.7 | 2114.5 | 2065.6 |
| 20°   | 2315.6 | 2319.8 | 2312.4 | 2295.6 | 2274.1 | 2258.3 | 2247.1 | 2254.5 | 2254.1 | 2207.4 | 2137.9 |
| 22.5° | 2440.7 | 2450.5 | 2439.3 | 2417.8 | 2392.6 | 2374.9 | 2355.3 | 2361.8 | 2362.3 | 2304.9 | 2208.8 |
| 25°   | 2602.6 | 2593.7 | 2586.7 | 2556.4 | 2520.5 | 2502.3 | 2484.1 | 2490.6 | 2488.7 | 2409.9 | 2282.0 |
| 27.5° | 2745.8 | 2747.7 | 2738.4 | 2706.2 | 2664.6 | 2624.5 | 2623.6 | 2627.8 | 2620.8 | 2519.1 | 2351.1 |
| 30°   | 2912.4 | 2913.3 | 2900.3 | 2871.3 | 2826.1 | 2774.3 | 2762.2 | 2769.2 | 2754.2 | 2622.7 | 2423.9 |
| 32.5° | 3078.0 | 3082.7 | 3068.2 | 3033.2 | 2996.8 | 2933.9 | 2909.6 | 2914.3 | 2876.9 | 2728.6 | 2499.0 |
| 35°   | 3223.1 | 3229.7 | 3225.0 | 3201.7 | 3162.0 | 3107.9 | 3079.0 | 3076.2 | 3030.0 | 2858.3 | 2598.4 |
| 37.5° | 3371.0 | 3377.1 | 3372.0 | 3352.4 | 3336.5 | 3279.1 | 3263.7 | 3263.7 | 3183.5 | 2990.8 | 2724.8 |
| 40°   | 3523.2 | 3532.5 | 3526.4 | 3499.4 | 3485.8 | 3459.7 | 3422.8 | 3414.0 | 3327.2 | 3149.9 | 2931.1 |
| 42.5° | 3664.5 | 3676.7 | 3700.9 | 3685.1 | 3657.5 | 3661.3 | 3587.1 | 3582.4 | 3519.0 | 3385.0 | 3190.0 |
| 45°   | 3865.2 | 3882.9 | 3923.9 | 3911.8 | 3906.2 | 3885.7 | 3797.5 | 3793.3 | 3769.0 | 3701.4 | 3511.5 |
| 47.5° | 4084.0 | 4108.2 | 4182.4 | 4184.8 | 4245.0 | 4206.2 | 4086.3 | 4071.9 | 4077.4 | 4080.2 | 3903.9 |
| 50°   | 4285.5 | 4312.1 | 4433.9 | 4491.3 | 4633.1 | 4641.5 | 4449.8 | 4436.7 | 4458.6 | 4523.0 | 4361.1 |
| 52.5° | 4446.5 | 4480.1 | 4632.2 | 4809.5 | 5052.6 | 5121.7 | 4897.2 | 4887.4 | 4903.8 | 5014.8 | 4878.1 |
| 55°   | 4564.6 | 4601.0 | 4766.6 | 5089.5 | 5477.7 | 5599.4 | 5412.3 | 5403.0 | 5413.3 | 5554.6 | 5440.3 |
| 57.5° | 4592.1 | 4601.0 | 4841.2 | 5278.0 | 5836.5 | 6129.0 | 6042.7 | 6024.0 | 5973.6 | 6096.8 | 6060.9 |
| 60°   | 4462.8 | 4498.3 | 4779.7 | 5344.2 | 6114.1 | 6651.1 | 6701.5 | 6678.2 | 6536.8 | 6637.6 | 6608.7 |
| 62.5° | 4200.6 | 4264.1 | 4549.6 | 5243.4 | 6222.8 | 7077.6 | 7347.7 | 7319.7 | 7076.2 | 7141.5 | 7002.4 |
| 65°   | 3772.3 | 3799.4 | 4099.4 | 4895.8 | 6084.7 | 7350.5 | 7923.9 | 7909.9 | 7603.4 | 7501.2 | 7075.2 |
| 67.5° | 3006.2 | 3057.0 | 3311.8 | 4169.4 | 5519.7 | 7318.3 | 8369.5 | 8368.1 | 7947.7 | 7634.7 | 6817.2 |
| 69°   | 2374.9 | 2427.6 | 2670.2 | 3434.5 | 4884.2 | 7023.9 | 8444.2 | 8460.5 | 8044.8 | 7553.5 | 6448.6 |
| 70°   | 1893.4 | 1954.5 | 2121.1 | 2892.8 | 4320.1 | 6635.7 | 8382.1 | 8411.5 | 8026.1 | 7419.6 | 6108.5 |
| 72.5° | 805.8  | 855.2  | 973.8  | 1491.2 | 2632.9 | 4955.1 | 7664.1 | 7775.1 | 7593.6 | 6790.6 | 5048.4 |
| 75°   | 351.8  | 367.2  | 420.9  | 608.0  | 1168.8 | 2696.8 | 6004.0 | 6209.3 | 6492.9 | 5739.9 | 3760.6 |
| 77.5° | 257.6  | 264.1  | 293.5  | 356.9  | 524.4  | 1018.5 | 3861.0 | 3980.4 | 4682.6 | 4176.8 | 2306.8 |
| 80°   | 199.2  | 203.9  | 226.8  | 262.2  | 342.5  | 412.0  | 1760.9 | 1863.5 | 2632.9 | 2145.3 | 960.7  |
| 82.5° | 158.6  | 161.9  | 177.8  | 193.2  | 236.6  | 249.6  | 584.6  | 648.5  | 971.9  | 592.6  | 254.3  |
| 85°   | 147.4  | 151.2  | 156.8  | 140.9  | 151.6  | 146.5  | 252.9  | 264.6  | 293.5  | 232.8  | 106.4  |
| 87.5° | 66.7   | 78.9   | 155.4  | 109.6  | 80.7   | 64.4   | 103.6  | 108.2  | 121.8  | 122.2  | 47.1   |
| 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: GPC-SA2D-727-U-T3

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1770.7 | 1770.7 | 1770.7 | 1770.7 | 1770.7 | 1770.7 | 1770.7 | 1770.7 | 1770.7 | 1770.7 | 1770.7 |
| 2.5°  | 1774.9 | 1773.5 | 1775.8 | 1770.2 | 1777.2 | 1776.7 | 1774.4 | 1775.3 | 1780.0 | 1779.5 | 1780.0 |
| 5°    | 1785.6 | 1784.7 | 1787.5 | 1783.3 | 1791.7 | 1794.5 | 1794.9 | 1799.1 | 1804.3 | 1805.7 | 1805.7 |
| 7.5°  | 1812.7 | 1812.7 | 1814.1 | 1808.5 | 1814.1 | 1813.6 | 1811.3 | 1815.5 | 1820.6 | 1821.1 | 1820.6 |
| 10°   | 1859.3 | 1859.8 | 1857.5 | 1843.0 | 1838.3 | 1825.7 | 1814.1 | 1814.5 | 1821.1 | 1826.2 | 1827.6 |
| 12.5° | 1918.1 | 1916.2 | 1906.0 | 1879.4 | 1859.8 | 1834.1 | 1822.0 | 1821.5 | 1828.1 | 1832.3 | 1833.7 |
| 15°   | 1985.3 | 1980.2 | 1953.6 | 1910.2 | 1875.7 | 1850.5 | 1830.9 | 1826.2 | 1822.5 | 1817.8 | 1818.3 |
| 17.5° | 2048.8 | 2037.1 | 1992.8 | 1932.6 | 1896.2 | 1862.6 | 1824.8 | 1794.5 | 1773.5 | 1761.3 | 1757.6 |
| 20°   | 2113.1 | 2090.3 | 2026.4 | 1953.6 | 1907.4 | 1846.3 | 1773.5 | 1711.9 | 1673.6 | 1655.9 | 1652.6 |
| 22.5° | 2171.9 | 2135.1 | 2057.6 | 1975.5 | 1898.5 | 1791.2 | 1676.9 | 1587.3 | 1534.1 | 1510.3 | 1512.2 |
| 25°   | 2229.3 | 2178.0 | 2090.3 | 1990.9 | 1853.7 | 1694.2 | 1542.5 | 1432.4 | 1370.8 | 1344.2 | 1343.3 |
| 27.5° | 2279.7 | 2221.4 | 2125.7 | 1978.3 | 1770.2 | 1556.0 | 1383.4 | 1276.1 | 1224.8 | 1201.9 | 1198.2 |
| 30°   | 2337.6 | 2276.0 | 2172.9 | 1930.2 | 1648.0 | 1396.5 | 1228.0 | 1152.5 | 1116.1 | 1093.2 | 1089.0 |
| 32.5° | 2408.0 | 2350.2 | 2211.6 | 1843.0 | 1491.7 | 1229.9 | 1106.7 | 1054.0 | 1020.9 | 995.2  | 990.6  |
| 35°   | 2510.7 | 2448.1 | 2221.4 | 1718.0 | 1320.0 | 1098.3 | 1017.6 | 963.5  | 918.7  | 885.6  | 882.3  |
| 37.5° | 2639.4 | 2570.9 | 2199.0 | 1556.0 | 1153.4 | 1012.9 | 943.4  | 876.7  | 818.4  | 771.7  | 764.3  |
| 40°   | 2825.1 | 2721.6 | 2136.9 | 1369.4 | 1030.7 | 947.2  | 871.1  | 795.1  | 722.7  | 668.1  | 657.4  |
| 42.5° | 3048.2 | 2898.4 | 2041.8 | 1183.7 | 940.6  | 880.4  | 799.3  | 705.0  | 635.9  | 597.2  | 591.6  |
| 45°   | 3331.9 | 3082.2 | 1909.7 | 1021.3 | 852.0  | 813.7  | 721.8  | 635.0  | 592.1  | 563.6  | 559.0  |
| 47.5° | 3655.7 | 3288.5 | 1771.1 | 889.3  | 776.9  | 751.2  | 659.7  | 603.8  | 569.7  | 547.3  | 543.1  |
| 50°   | 4053.7 | 3521.3 | 1624.2 | 781.1  | 701.3  | 676.1  | 630.4  | 586.5  | 559.4  | 542.2  | 538.0  |
| 52.5° | 4502.5 | 3784.0 | 1518.3 | 695.7  | 638.7  | 620.6  | 615.0  | 577.2  | 555.2  | 542.2  | 538.0  |
| 55°   | 4985.9 | 4051.3 | 1403.9 | 623.8  | 584.6  | 589.8  | 604.7  | 578.1  | 563.2  | 547.3  | 541.2  |
| 57.5° | 5469.7 | 4327.5 | 1276.6 | 563.2  | 541.7  | 566.9  | 597.7  | 580.0  | 567.4  | 552.0  | 546.4  |
| 60°   | 5852.3 | 4502.5 | 1079.2 | 512.3  | 507.6  | 541.7  | 580.9  | 566.0  | 549.6  | 550.1  | 549.2  |
| 62.5° | 6031.0 | 4493.2 | 861.3  | 467.0  | 473.6  | 507.6  | 553.8  | 544.0  | 530.5  | 548.7  | 550.1  |
| 65°   | 5930.7 | 4269.2 | 670.5  | 426.0  | 437.2  | 472.2  | 525.8  | 533.3  | 538.0  | 573.0  | 577.6  |
| 67.5° | 5509.9 | 3833.4 | 519.3  | 390.1  | 404.1  | 447.9  | 528.6  | 580.9  | 587.0  | 623.8  | 623.4  |
| 69°   | 5074.5 | 3424.7 | 451.2  | 371.4  | 387.7  | 454.0  | 565.0  | 611.2  | 588.4  | 627.6  | 622.0  |
| 70°   | 4709.7 | 3101.4 | 414.8  | 358.8  | 380.3  | 464.7  | 589.3  | 610.8  | 581.4  | 615.0  | 605.6  |
| 72.5° | 3627.2 | 2231.2 | 351.8  | 335.5  | 355.1  | 444.7  | 596.3  | 597.2  | 565.0  | 571.6  | 555.7  |
| 75°   | 2487.8 | 1410.0 | 307.0  | 303.7  | 316.8  | 400.8  | 573.9  | 570.6  | 522.6  | 513.2  | 500.2  |
| 77.5° | 1371.7 | 716.2  | 260.8  | 273.4  | 282.3  | 355.1  | 521.6  | 517.0  | 477.3  | 457.7  | 453.0  |
| 80°   | 529.1  | 313.5  | 220.2  | 243.1  | 248.7  | 307.5  | 457.2  | 453.0  | 419.9  | 394.7  | 387.7  |
| 82.5° | 199.7  | 164.2  | 182.0  | 210.4  | 208.6  | 253.8  | 387.3  | 384.9  | 352.7  | 315.9  | 304.7  |
| 85°   | 92.4   | 98.4   | 144.2  | 173.6  | 160.0  | 188.0  | 309.8  | 314.0  | 274.8  | 231.0  | 231.0  |
| 87.5° | 39.2   | 55.1   | 102.2  | 131.1  | 107.8  | 126.9  | 227.2  | 217.0  | 199.2  | 138.1  | 129.7  |
| 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: SP1-1908-441-1-R4

Test Date: 08/20/2019

Luminaire Tested: SA1C-727-U-5WQ

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**Test Information**

Test Method: LM-79-2008  
 Report Number: SP1-1908-441-1-R4  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry: 4π  
 Issue Date: 10/28/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: MCGRAW-EDISON  
 Catalog Number: **SA1C-727-U-5WQ**  
 Description: MCGRAW EDISON ROADWAY AND AREA LUMINAIRE

\*\*\*THIS IS A REVISION OF SP1-1908-441-1-R3. TO UPDATE THE CATALOG NUMBER.\*\*\*TESTED IN  
 SITU. (1) 70 CRI, 2700K, 1050MA LIGHTSQUARE WITH 16 LEDS AND TYPE V WIDE OPTICS.

**Spectral Parameters**

CCT (K): 2741  
 CIE u': 0.2605  
 CIE v': 0.5272  
 Duv: 0.0005  
 CIE x: 0.4573  
 CIE y: 0.4113  
 CIE z: 0.1313  
 Peak Wavelength (nm): 602  
 Dominant Wavelength (nm): 583  
 Purity: 61.2

|           |      |      |       |
|-----------|------|------|-------|
| CRI (Ra): | 71.5 |      |       |
| R1:       | 69.2 | R9:  | -16.1 |
| R2:       | 79.4 | R10: | 51.4  |
| R3:       | 87.8 | R11: | 63.1  |
| R4:       | 69.4 | R12: | 42.0  |
| R5:       | 66.4 | R13: | 70.2  |
| R6:       | 69.8 | R14: | 92.4  |
| R7:       | 79.8 |      |       |
| R8:       | 50.1 |      |       |

Rf: 69.9  
 Rg: 98.3



**Test Conditions**

Stabilization Time: 56M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.3./42%  
 Sphere Temperature (°C): 25.7

REPORT NUMBER: SP1-1908-441-1-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: SP1-1908-441-1-R4

CIE 1931 Chromaticity Diagram



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



Point lies inside the ANSI 2700K 4-step quadrangle

REPORT NUMBER: SP1-1908-441-1-R4

**Photopic Flux vs. Wavelength**



**Photopic Lumens: 6211.7**

| $\lambda$ (nm) | Power ( $\mu\text{W}/\text{nm}$ ) | Lumens ( $\phi/\text{nm}$ ) | $\lambda$ (nm) | Power ( $\mu\text{W}/\text{nm}$ ) | Lumens ( $\phi/\text{nm}$ ) | $\lambda$ (nm) | Power ( $\mu\text{W}/\text{nm}$ ) | Lumens ( $\phi/\text{nm}$ ) | $\lambda$ (nm) | Power ( $\mu\text{W}/\text{nm}$ ) | Lumens ( $\phi/\text{nm}$ ) | $\lambda$ (nm) | Power ( $\mu\text{W}/\text{nm}$ ) | Lumens ( $\phi/\text{nm}$ ) |
|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|
| 360            | 2044                              | 0.0                         | 490            | 7179                              | 1.0                         | 620            | 118034                            | 30.7                        | 750            | 8362                              | 0.0                         | 880            | 3128                              | 0.0                         |
| 365            | 2016                              | 0.0                         | 495            | 10476                             | 1.9                         | 625            | 111884                            | 24.7                        | 755            | 7635                              | 0.0                         | 885            | 3110                              | 0.0                         |
| 370            | 2020                              | 0.0                         | 500            | 15549                             | 3.4                         | 630            | 106119                            | 19.2                        | 760            | 6582                              | 0.0                         | 890            | 2632                              | 0.0                         |
| 375            | 2137                              | 0.0                         | 505            | 22477                             | 6.3                         | 635            | 99706                             | 15.0                        | 765            | 5777                              | 0.0                         | 895            | 2709                              | 0.0                         |
| 380            | 2046                              | 0.0                         | 510            | 30417                             | 10.4                        | 640            | 92142                             | 11.0                        | 770            | 5474                              | 0.0                         | 900            | 2016                              | 0.0                         |
| 385            | 1925                              | 0.0                         | 515            | 39274                             | 16.3                        | 645            | 84987                             | 8.2                         | 775            | 4977                              | 0.0                         | 905            | 1748                              | 0.0                         |
| 390            | 1893                              | 0.0                         | 520            | 47282                             | 22.9                        | 650            | 78016                             | 5.7                         | 780            | 4723                              | 0.0                         | 910            | 2046                              | 0.0                         |
| 395            | 1695                              | 0.0                         | 525            | 55413                             | 29.7                        | 655            | 71541                             | 4.1                         | 785            | 4219                              | 0.0                         | 915            | 1844                              | 0.0                         |
| 400            | 1633                              | 0.0                         | 530            | 62377                             | 36.7                        | 660            | 64863                             | 2.7                         | 790            | 3969                              | 0.0                         | 920            | 2734                              | 0.0                         |
| 405            | 2065                              | 0.0                         | 535            | 68520                             | 42.5                        | 665            | 58485                             | 1.9                         | 795            | 4122                              | 0.0                         | 925            | 2307                              | 0.0                         |
| 410            | 3449                              | 0.0                         | 540            | 73435                             | 47.8                        | 670            | 51641                             | 1.1                         | 800            | 2864                              | 0.0                         | 930            | 2039                              | 0.0                         |
| 415            | 7117                              | 0.0                         | 545            | 78677                             | 52.4                        | 675            | 46030                             | 0.8                         | 805            | 3151                              | 0.0                         | 935            | 1784                              | 0.0                         |
| 420            | 13992                             | 0.0                         | 550            | 83331                             | 56.6                        | 680            | 40590                             | 0.5                         | 810            | 3022                              | 0.0                         | 940            | 2464                              | 0.0                         |
| 425            | 25176                             | 0.1                         | 555            | 89120                             | 60.9                        | 685            | 35691                             | 0.3                         | 815            | 3471                              | 0.0                         | 945            | 2794                              | 0.0                         |
| 430            | 38151                             | 0.3                         | 560            | 94613                             | 64.3                        | 690            | 31631                             | 0.2                         | 820            | 2749                              | 0.0                         | 950            | 3090                              | 0.0                         |
| 435            | 49673                             | 0.6                         | 565            | 99818                             | 66.4                        | 695            | 27437                             | 0.1                         | 825            | 2729                              | 0.0                         | 955            | 1866                              | 0.0                         |
| 440            | 57273                             | 0.9                         | 570            | 106526                            | 69.3                        | 700            | 24589                             | 0.1                         | 830            | 2282                              | 0.0                         | 960            | 3110                              | 0.0                         |
| 445            | 54802                             | 1.1                         | 575            | 111610                            | 69.4                        | 705            | 21832                             | 0.0                         | 835            | 3140                              | 0.0                         | 965            | 3880                              | 0.0                         |
| 450            | 39184                             | 1.0                         | 580            | 117163                            | 69.6                        | 710            | 19500                             | 0.0                         | 840            | 2365                              | 0.0                         | 970            | 3243                              | 0.0                         |
| 455            | 22506                             | 0.8                         | 585            | 122201                            | 67.9                        | 715            | 17870                             | 0.0                         | 845            | 3024                              | 0.0                         | 975            | 2014                              | 0.0                         |
| 460            | 13692                             | 0.6                         | 590            | 125662                            | 65.0                        | 720            | 15924                             | 0.0                         | 850            | 2510                              | 0.0                         | 980            | 1688                              | 0.0                         |
| 465            | 9446                              | 0.5                         | 595            | 127415                            | 60.4                        | 725            | 14268                             | 0.0                         | 855            | 2739                              | 0.0                         | 985            | 2827                              | 0.0                         |
| 470            | 6698                              | 0.4                         | 600            | 129155                            | 55.7                        | 730            | 12438                             | 0.0                         | 860            | 3515                              | 0.0                         | 990            | 4172                              | 0.0                         |
| 475            | 5328                              | 0.4                         | 605            | 128057                            | 49.6                        | 735            | 11255                             | 0.0                         | 865            | 3600                              | 0.0                         | 995            | 3177                              | 0.0                         |
| 480            | 5081                              | 0.5                         | 610            | 126031                            | 43.3                        | 740            | 9951                              | 0.0                         | 870            | 3609                              | 0.0                         | 1000           | 3241                              | 0.0                         |
| 485            | 5579                              | 0.7                         | 615            | 123059                            | 37.1                        | 745            | 8870                              | 0.0                         | 875            | 3208                              | 0.0                         |                |                                   |                             |

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Scotopic Flux vs. Wavelength



Scotopic Lumens: 6474.3

S/P: 1.04

| λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) |
|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|
| 360    | 2044          | 0.0           | 490    | 7179          | 6.0           | 620    | 118034        | 0.1           | 750    | 8362          | 0.0           | 880    | 3128          | 0.0           |
| 365    | 2016          | 0.0           | 495    | 10476         | 8.6           | 625    | 111884        | 0.1           | 755    | 7635          | 0.0           | 885    | 3110          | 0.0           |
| 370    | 2020          | 0.0           | 500    | 15549         | 12.5          | 630    | 106119        | 0.0           | 760    | 6582          | 0.0           | 890    | 2632          | 0.0           |
| 375    | 2137          | 0.0           | 505    | 22477         | 17.3          | 635    | 99706         | 0.0           | 765    | 5777          | 0.0           | 895    | 2709          | 0.0           |
| 380    | 2046          | 0.0           | 510    | 30417         | 21.8          | 640    | 92142         | 0.0           | 770    | 5474          | 0.0           | 900    | 2016          | 0.0           |
| 385    | 1925          | 0.0           | 515    | 39274         | 25.7          | 645    | 84987         | 0.0           | 775    | 4977          | 0.0           | 905    | 1748          | 0.0           |
| 390    | 1893          | 0.0           | 520    | 47282         | 27.5          | 650    | 78016         | 0.0           | 780    | 4723          | 0.0           | 910    | 2046          | 0.0           |
| 395    | 1695          | 0.0           | 525    | 55413         | 28.1          | 655    | 71541         | 0.0           | 785    | 4219          | 0.0           | 915    | 1844          | 0.0           |
| 400    | 1633          | 0.0           | 530    | 62377         | 27.0          | 660    | 64863         | 0.0           | 790    | 3969          | 0.0           | 920    | 2734          | 0.0           |
| 405    | 2065          | 0.0           | 535    | 68520         | 24.7          | 665    | 58485         | 0.0           | 795    | 4122          | 0.0           | 925    | 2307          | 0.0           |
| 410    | 3449          | 0.1           | 540    | 73435         | 21.5          | 670    | 51641         | 0.0           | 800    | 2864          | 0.0           | 930    | 2039          | 0.0           |
| 415    | 7117          | 0.5           | 545    | 78677         | 18.3          | 675    | 46030         | 0.0           | 805    | 3151          | 0.0           | 935    | 1784          | 0.0           |
| 420    | 13992         | 1.6           | 550    | 83331         | 15.0          | 680    | 40590         | 0.0           | 810    | 3022          | 0.0           | 940    | 2464          | 0.0           |
| 425    | 25176         | 3.9           | 555    | 89120         | 12.0          | 685    | 35691         | 0.0           | 815    | 3471          | 0.0           | 945    | 2794          | 0.0           |
| 430    | 38151         | 8.1           | 560    | 94613         | 9.3           | 690    | 31631         | 0.0           | 820    | 2749          | 0.0           | 950    | 3090          | 0.0           |
| 435    | 49673         | 13.3          | 565    | 99818         | 7.0           | 695    | 27437         | 0.0           | 825    | 2729          | 0.0           | 955    | 1866          | 0.0           |
| 440    | 57273         | 19.1          | 570    | 106526        | 5.2           | 700    | 24589         | 0.0           | 830    | 2282          | 0.0           | 960    | 3110          | 0.0           |
| 445    | 54802         | 21.6          | 575    | 111610        | 3.7           | 705    | 21832         | 0.0           | 835    | 3140          | 0.0           | 965    | 3880          | 0.0           |
| 450    | 39184         | 18.1          | 580    | 117163        | 2.6           | 710    | 19500         | 0.0           | 840    | 2365          | 0.0           | 970    | 3243          | 0.0           |
| 455    | 22506         | 11.8          | 585    | 122201        | 1.8           | 715    | 17870         | 0.0           | 845    | 3024          | 0.0           | 975    | 2014          | 0.0           |
| 460    | 13692         | 8.1           | 590    | 125662        | 1.2           | 720    | 15924         | 0.0           | 850    | 2510          | 0.0           | 980    | 1688          | 0.0           |
| 465    | 9446          | 6.2           | 595    | 127415        | 0.8           | 725    | 14268         | 0.0           | 855    | 2739          | 0.0           | 985    | 2827          | 0.0           |
| 470    | 6698          | 4.8           | 600    | 129155        | 0.5           | 730    | 12438         | 0.0           | 860    | 3515          | 0.0           | 990    | 4172          | 0.0           |
| 475    | 5328          | 4.1           | 605    | 128057        | 0.4           | 735    | 11255         | 0.0           | 865    | 3600          | 0.0           | 995    | 3177          | 0.0           |
| 480    | 5081          | 4.1           | 610    | 126031        | 0.2           | 740    | 9951          | 0.0           | 870    | 3609          | 0.0           | 1000   | 3241          | 0.0           |
| 485    | 5579          | 4.6           | 615    | 123059        | 0.1           | 745    | 8870          | 0.0           | 875    | 3208          | 0.0           |        |               |               |

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Melanopic Flux vs. Wavelength



Melanopic Lumens: 2145.7 M/P: 0.35

| λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) |
|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|
| 360    | 2044          | 0.0           | 490    | 7179          | 11.1          | 620    | 118034        | 1.5           | 750    | 8362          | 0.0           | 880    | 3128          | 0.0           |
| 365    | 2016          | 0.0           | 495    | 10476         | 16.9          | 625    | 111884        | 0.9           | 755    | 7635          | 0.0           | 885    | 3110          | 0.0           |
| 370    | 2020          | 0.0           | 500    | 15549         | 26.0          | 630    | 106119        | 0.6           | 760    | 6582          | 0.0           | 890    | 2632          | 0.0           |
| 375    | 2137          | 0.0           | 505    | 22477         | 38.2          | 635    | 99706         | 0.4           | 765    | 5777          | 0.0           | 895    | 2709          | 0.0           |
| 380    | 2046          | 0.0           | 510    | 30417         | 51.6          | 640    | 92142         | 0.2           | 770    | 5474          | 0.0           | 900    | 2016          | 0.0           |
| 385    | 1925          | 0.0           | 515    | 39274         | 65.1          | 645    | 84987         | 0.1           | 775    | 4977          | 0.0           | 905    | 1748          | 0.0           |
| 390    | 1893          | 0.0           | 520    | 47282         | 75.2          | 650    | 78016         | 0.1           | 780    | 4723          | 0.0           | 910    | 2046          | 0.0           |
| 395    | 1695          | 0.0           | 525    | 55413         | 82.9          | 655    | 71541         | 0.1           | 785    | 4219          | 0.0           | 915    | 1844          | 0.0           |
| 400    | 1633          | 0.0           | 530    | 62377         | 86.0          | 660    | 64863         | 0.0           | 790    | 3969          | 0.0           | 920    | 2734          | 0.0           |
| 405    | 2065          | 0.1           | 535    | 68520         | 85.4          | 665    | 58485         | 0.0           | 795    | 4122          | 0.0           | 925    | 2307          | 0.0           |
| 410    | 3449          | 0.2           | 540    | 73435         | 81.1          | 670    | 51641         | 0.0           | 800    | 2864          | 0.0           | 930    | 2039          | 0.0           |
| 415    | 7117          | 0.7           | 545    | 78677         | 75.4          | 675    | 46030         | 0.0           | 805    | 3151          | 0.0           | 935    | 1784          | 0.0           |
| 420    | 13992         | 2.3           | 550    | 83331         | 68.1          | 680    | 40590         | 0.0           | 810    | 3022          | 0.0           | 940    | 2464          | 0.0           |
| 425    | 25176         | 6.2           | 555    | 89120         | 60.9          | 685    | 35691         | 0.0           | 815    | 3471          | 0.0           | 945    | 2794          | 0.0           |
| 430    | 38151         | 13.0          | 560    | 94613         | 52.9          | 690    | 31631         | 0.0           | 820    | 2749          | 0.0           | 950    | 3090          | 0.0           |
| 435    | 49673         | 22.2          | 565    | 99818         | 44.8          | 695    | 27437         | 0.0           | 825    | 2729          | 0.0           | 955    | 1866          | 0.0           |
| 440    | 57273         | 32.0          | 570    | 106526        | 37.6          | 700    | 24589         | 0.0           | 830    | 2282          | 0.0           | 960    | 3110          | 0.0           |
| 445    | 54802         | 36.7          | 575    | 111610        | 30.4          | 705    | 21832         | 0.0           | 835    | 3140          | 0.0           | 965    | 3880          | 0.0           |
| 450    | 39184         | 30.4          | 580    | 117163        | 24.1          | 710    | 19500         | 0.0           | 840    | 2365          | 0.0           | 970    | 3243          | 0.0           |
| 455    | 22506         | 19.7          | 585    | 122201        | 18.7          | 715    | 17870         | 0.0           | 845    | 3024          | 0.0           | 975    | 2014          | 0.0           |
| 460    | 13692         | 13.2          | 590    | 125662        | 14.0          | 720    | 15924         | 0.0           | 850    | 2510          | 0.0           | 980    | 1688          | 0.0           |
| 465    | 9446          | 10.0          | 595    | 127415        | 10.2          | 725    | 14268         | 0.0           | 855    | 2739          | 0.0           | 985    | 2827          | 0.0           |
| 470    | 6698          | 7.7           | 600    | 129155        | 7.3           | 730    | 12438         | 0.0           | 860    | 3515          | 0.0           | 990    | 4172          | 0.0           |
| 475    | 5328          | 6.7           | 605    | 128057        | 5.0           | 735    | 11255         | 0.0           | 865    | 3600          | 0.0           | 995    | 3177          | 0.0           |
| 480    | 5081          | 6.9           | 610    | 126031        | 3.4           | 740    | 9951          | 0.0           | 870    | 3609          | 0.0           | 1000   | 3241          | 0.0           |
| 485    | 5579          | 8.1           | 615    | 123059        | 2.3           | 745    | 8870          | 0.0           | 875    | 3208          | 0.0           |        |               |               |

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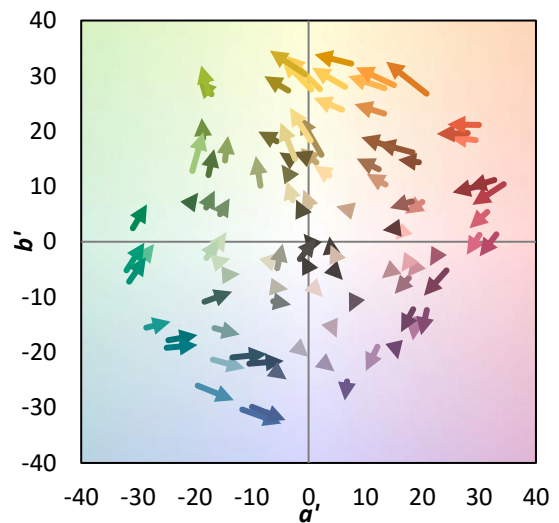
TM-30-18

**Summary**

$R_f = 69.9$   
 $R_g = 98.3$   
 CIE  $R_a = 71.5$   
 $R_9 = -16.1$



**Color Vector Graphics**





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

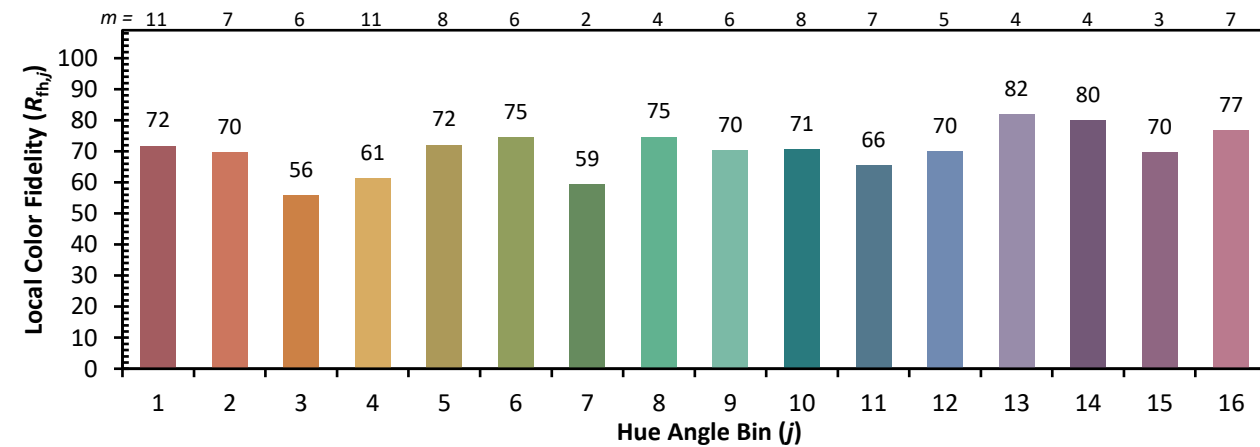
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|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 54 | CES51 = 77 | CES76 = 48 |
| CES02 = 63 | CES27 = 74 | CES52 = 80 | CES77 = 75 |
| CES03 = 31 | CES28 = 80 | CES53 = 66 | CES78 = 56 |
| CES04 = 71 | CES29 = 44 | CES54 = 77 | CES79 = 81 |
| CES05 = 50 | CES30 = 46 | CES55 = 74 | CES80 = 80 |
| CES06 = 52 | CES31 = 50 | CES56 = 63 | CES81 = 73 |
| CES07 = 42 | CES32 = 49 | CES57 = 60 | CES82 = 91 |
| CES08 = 41 | CES33 = 53 | CES58 = 63 | CES83 = 84 |
| CES09 = 29 | CES34 = 66 | CES59 = 85 | CES84 = 90 |
| CES10 = 77 | CES35 = 82 | CES60 = 89 | CES85 = 87 |
| CES11 = 60 | CES36 = 78 | CES61 = 85 | CES86 = 65 |
| CES12 = 66 | CES37 = 75 | CES62 = 69 | CES87 = 78 |
| CES13 = 43 | CES38 = 53 | CES63 = 68 | CES88 = 73 |
| CES14 = 74 | CES39 = 91 | CES64 = 68 | CES89 = 68 |
| CES15 = 71 | CES40 = 85 | CES65 = 65 | CES90 = 68 |
| CES16 = 48 | CES41 = 76 | CES66 = 62 | CES91 = 91 |
| CES17 = 50 | CES42 = 76 | CES67 = 60 | CES92 = 71 |
| CES18 = 57 | CES43 = 65 | CES68 = 68 | CES93 = 82 |
| CES19 = 73 | CES44 = 98 | CES69 = 77 | CES94 = 57 |
| CES20 = 67 | CES45 = 75 | CES70 = 60 | CES95 = 78 |
| CES21 = 88 | CES46 = 70 | CES71 = 57 | CES96 = 80 |
| CES22 = 80 | CES47 = 63 | CES72 = 86 | CES97 = 79 |
| CES23 = 92 | CES48 = 51 | CES73 = 52 | CES98 = 71 |
| CES24 = 91 | CES49 = 68 | CES74 = 90 | CES99 = 64 |
| CES25 = 73 | CES50 = 77 | CES75 = 58 |            |



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Color Rendition by Hue-Angle Bin



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Measure Comparisons



(END OF REPORT)