

Scaled data based on original data using  
LM-79-2019 Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Test Report Prepared for

Cooper Lighting Solutions

Brand: McGRAW-EDISON

Report Number: P634571

Luminaire Tested: GWS-SA3C-722-U-SL3-W

Issue Date: 1/10/2023

**Test Information**

Test Method: LM-79-2019  
Report Number: P634571  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-31)  
Test Lab: COOPER LIGHTING SOLUTIONS  
Issue Date: 1/10/2023  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: McGRAW-EDISON  
Catalog Number: GWS-SA3C-722-U-SL3-W  
Description: GALLEON WALL SLIM LUMINAIRE. (3) LIGHTSQUARES WITH 16 LEDS EACH AND  
TYPE III SPILL LIGHT ELIMINATOR OPTICS  
Light Source: (48) 2200K CCT, 70 CRI LEDS  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 10067.8 lumens  
Efficiency: N/A  
Efficacy: 108.3 lumens/watt  
Luminous Opening: Rectangular (W 1.5' x L: 0.5' x H: 0')  
IES Classification: Type III - Medium  
BUG Rating: B2 - U0 - G2

Input Watts (W): 93  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 0  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT



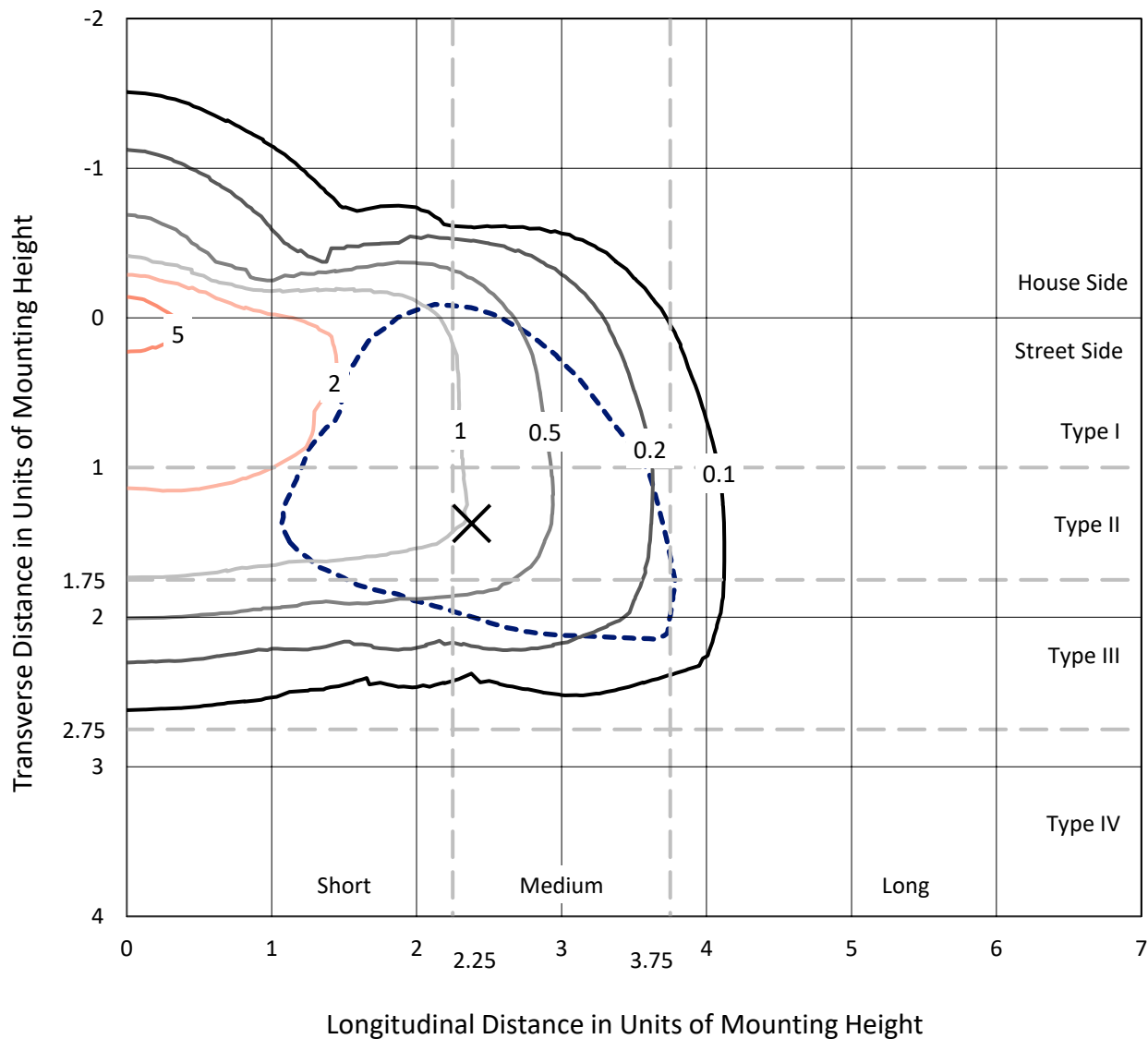
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## Iso-Footcandle Lines of Horizontal Illumination

✕ Max cd

--- 1/2 Max cd

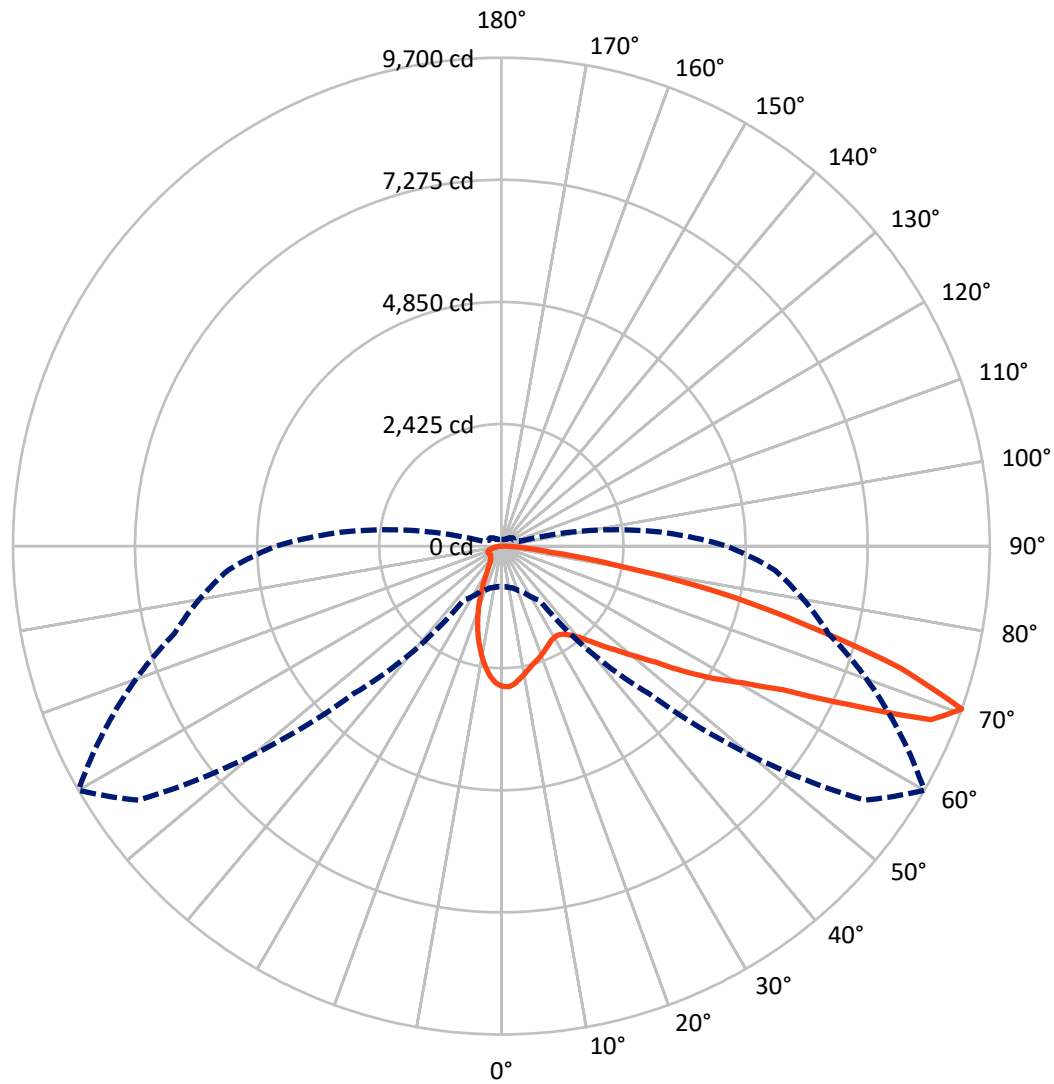


Based on 20 foot mounting height. Maximum calculated value = 7 fc  
 Type III - Medium - N/A

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## Luminous Intensity Polar Plot



— Vertical Plane Through 60-Deg Lateral    - - - Horizontal Cone Through 70-Deg Vertical

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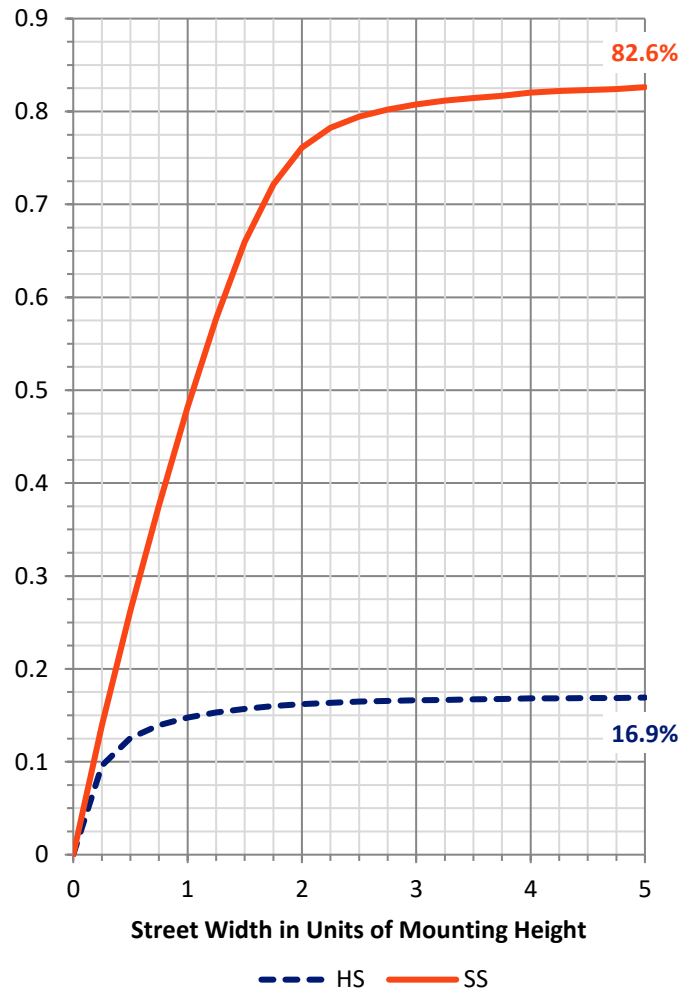
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 1721.8   | 0.0    | 1721.8  |
|                    | % Fixture | 17.1     | 0.0    | 17.1    |
| <b>Street Side</b> | Lumens    | 8346.0   | 0.0    | 8346.0  |
|                    | % Fixture | 82.9     | 0.0    | 82.9    |
| <b>Total</b>       | Lumens    | 10067.8  | 0.0    | 10067.8 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 240.1   | 2.4       |
| 10°-20°   | 538.0   | 5.3       |
| 20°-30°   | 689.0   | 6.8       |
| 30°-40°   | 905.5   | 9.0       |
| 40°-50°   | 1313.7  | 13.0      |
| 50°-60°   | 2049.7  | 20.4      |
| 60°-70°   | 2683.4  | 26.7      |
| 70°-80°   | 1483.8  | 14.7      |
| 80°-90°   | 164.7   | 1.6       |
| 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°    | 10067.8 | 100.0     |
| 0°-180°   | 10067.8 | 100.0     |

**Coefficient of Utilization**



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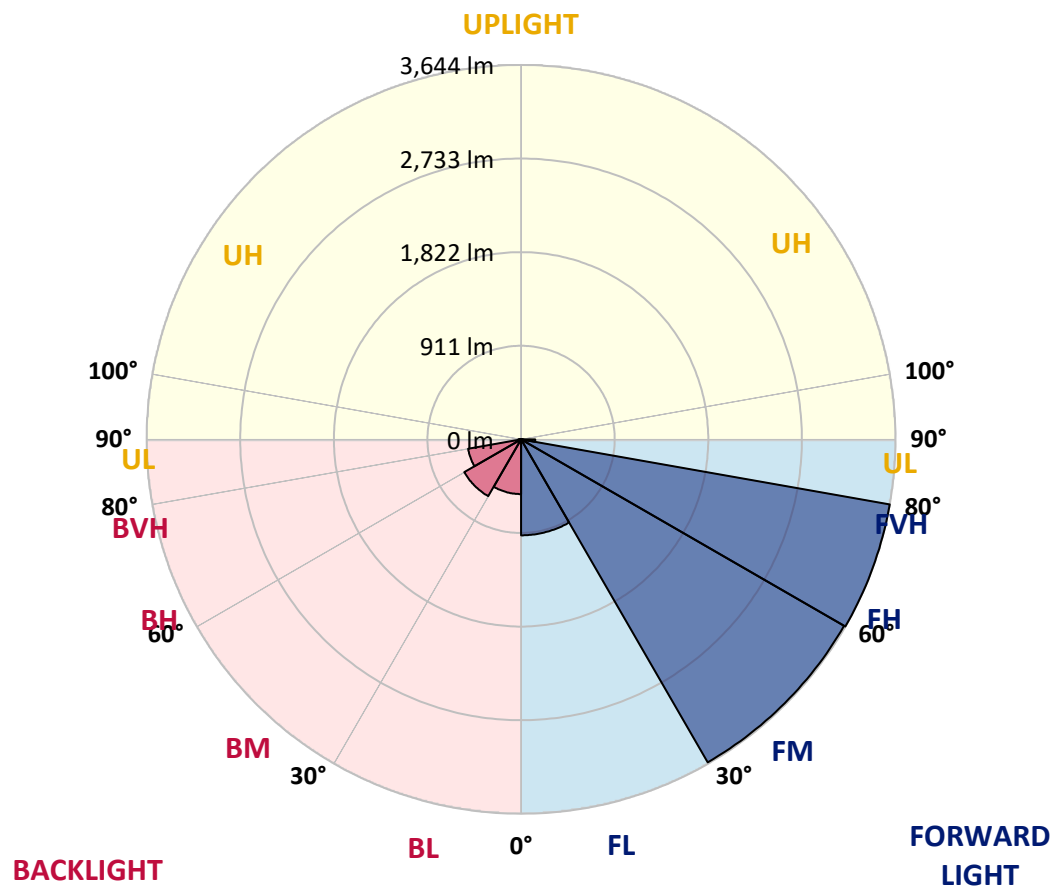
CATALOG NUMBER: GWS-SA3C-722-U-SL3-W

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 934.4  | 9.3       |                         |      |         |
| FM   | (30°-60°)   | 3630.4 | 36.1      |                         |      |         |
| FH   | (60°-80°)   | 3644.0 | 36.2      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 137.2  | 1.4       |                         |      | G2/225  |
| BL   | (0°-30°)    | 532.7  | 5.3       | B2/1000                 |      |         |
| BM   | (30°-60°)   | 638.4  | 6.3       | B1/1000                 |      |         |
| BH   | (60°-80°)   | 523.3  | 5.2       | B2/1000                 |      | G2/1000 |
| BVH  | (80°-90°)   | 27.5   | 0.3       |                         |      | G1/100  |
| 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 Medium





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 60°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 2785.9 | 2785.9 | 2785.9 | 2785.9 | 2785.9 | 2785.9 | 2785.9 | 2785.9 | 2785.9 | 2785.9 | 2785.9 |
| 2.5°  | 2746.8 | 2749.8 | 2757.9 | 2769.7 | 2781.5 | 2787.4 | 2802.1 | 2797.7 | 2794.7 | 2788.8 | 2781.5 |
| 5°    | 2625.3 | 2631.2 | 2638.6 | 2661.4 | 2687.2 | 2707.8 | 2741.0 | 2744.6 | 2746.1 | 2749.1 | 2737.3 |
| 7.5°  | 2470.6 | 2472.1 | 2489.8 | 2520.0 | 2553.9 | 2589.2 | 2644.5 | 2659.9 | 2673.2 | 2687.9 | 2678.3 |
| 10°   | 2299.7 | 2303.4 | 2316.7 | 2360.1 | 2418.3 | 2470.6 | 2545.0 | 2570.8 | 2598.8 | 2631.2 | 2617.9 |
| 12.5° | 2159.8 | 2160.5 | 2181.9 | 2228.3 | 2291.6 | 2362.3 | 2455.1 | 2486.1 | 2522.9 | 2573.7 | 2562.0 |
| 15°   | 2048.5 | 2048.5 | 2068.4 | 2108.2 | 2181.1 | 2264.4 | 2374.9 | 2414.6 | 2464.7 | 2533.2 | 2512.6 |
| 17.5° | 1960.1 | 1960.9 | 1973.4 | 2015.4 | 2080.2 | 2172.3 | 2303.4 | 2357.2 | 2412.4 | 2503.0 | 2472.1 |
| 20°   | 1913.7 | 1910.1 | 1912.3 | 1938.0 | 1993.3 | 2082.4 | 2232.0 | 2294.6 | 2369.0 | 2482.4 | 2435.3 |
| 22.5° | 1911.5 | 1904.9 | 1895.3 | 1897.5 | 1929.9 | 2003.6 | 2155.3 | 2231.2 | 2324.8 | 2465.5 | 2397.7 |
| 25°   | 1949.1 | 1941.7 | 1924.8 | 1905.6 | 1902.7 | 1946.9 | 2083.2 | 2169.3 | 2279.1 | 2458.1 | 2361.6 |
| 27.5° | 2012.4 | 2007.3 | 1985.2 | 1956.5 | 1926.3 | 1924.8 | 2028.6 | 2118.5 | 2245.9 | 2465.5 | 2335.8 |
| 30°   | 2096.4 | 2087.6 | 2073.6 | 2036.7 | 1991.1 | 1943.9 | 2007.3 | 2091.3 | 2223.9 | 2489.0 | 2324.8 |
| 32.5° | 2191.4 | 2186.3 | 2173.0 | 2136.2 | 2087.6 | 2012.4 | 2024.2 | 2097.2 | 2223.9 | 2530.3 | 2327.0 |
| 35°   | 2292.4 | 2291.6 | 2291.6 | 2267.3 | 2213.5 | 2120.0 | 2091.3 | 2147.2 | 2257.7 | 2596.6 | 2350.5 |
| 37.5° | 2390.3 | 2389.6 | 2413.2 | 2422.0 | 2360.9 | 2259.9 | 2205.4 | 2247.4 | 2332.1 | 2694.5 | 2408.7 |
| 40°   | 2469.9 | 2472.8 | 2524.4 | 2568.6 | 2534.7 | 2441.2 | 2364.5 | 2385.9 | 2452.9 | 2833.8 | 2510.4 |
| 42.5° | 2550.2 | 2558.3 | 2635.6 | 2713.7 | 2727.0 | 2645.9 | 2568.6 | 2581.1 | 2626.0 | 3017.9 | 2662.1 |
| 45°   | 2637.8 | 2641.5 | 2749.8 | 2858.8 | 2922.9 | 2875.0 | 2811.7 | 2828.6 | 2838.9 | 3245.5 | 2888.3 |
| 47.5° | 2722.5 | 2732.1 | 2872.1 | 3021.6 | 3143.2 | 3138.7 | 3103.4 | 3098.2 | 3100.4 | 3522.5 | 3155.7 |
| 50°   | 2838.2 | 2852.2 | 3016.5 | 3196.9 | 3375.2 | 3456.9 | 3467.3 | 3428.2 | 3412.0 | 3830.4 | 3488.6 |
| 52.5° | 3057.7 | 3057.7 | 3205.0 | 3382.6 | 3622.0 | 3824.5 | 3893.8 | 3829.7 | 3778.1 | 4156.0 | 3842.2 |
| 55°   | 3332.5 | 3344.2 | 3461.4 | 3605.0 | 3908.5 | 4211.2 | 4445.5 | 4374.8 | 4228.9 | 4510.3 | 4212.7 |
| 57.5° | 3454.7 | 3469.5 | 3655.1 | 3878.3 | 4283.4 | 4651.0 | 4975.9 | 4950.8 | 4737.9 | 4878.6 | 4597.2 |
| 60°   | 3233.8 | 3264.7 | 3520.3 | 3894.5 | 4623.0 | 5360.4 | 5589.5 | 5516.5 | 5212.3 | 5265.3 | 5014.2 |
| 62.5° | 2697.5 | 2731.4 | 3015.0 | 3537.2 | 4575.9 | 6127.2 | 6556.6 | 6287.8 | 5804.6 | 5753.7 | 5569.6 |
| 65°   | 1609.5 | 1608.0 | 1949.1 | 2641.5 | 3994.7 | 6340.1 | 8087.3 | 7585.7 | 6719.4 | 6424.0 | 6141.2 |
| 67.5° | 1023.2 | 1021.0 | 1092.4 | 1399.6 | 2658.5 | 5818.5 | 9071.5 | 9201.8 | 7962.1 | 6916.8 | 6188.3 |
| 70°   | 807.3  | 806.6  | 858.2  | 998.1  | 1314.9 | 4140.5 | 8797.4 | 9699.8 | 8712.7 | 6729.0 | 5448.8 |
| 72.5° | 588.6  | 590.0  | 669.6  | 836.1  | 1014.3 | 2078.7 | 7123.8 | 8299.5 | 8013.7 | 5940.1 | 4423.4 |
| 75°   | 422.8  | 425.0  | 472.9  | 640.1  | 935.5  | 1136.6 | 4737.2 | 6240.6 | 6097.0 | 4761.5 | 3043.0 |
| 77.5° | 268.9  | 271.8  | 313.8  | 448.6  | 755.8  | 917.8  | 2872.1 | 4405.7 | 4056.6 | 2682.8 | 1082.1 |
| 80°   | 164.3  | 173.8  | 209.2  | 334.4  | 604.0  | 688.7  | 1435.7 | 2321.1 | 2031.6 | 735.9  | 363.9  |
| 82.5° | 84.7   | 92.1   | 126.0  | 207.0  | 416.2  | 604.8  | 812.5  | 975.3  | 629.1  | 307.9  | 193.7  |
| 85°   | 26.5   | 30.9   | 44.2   | 84.0   | 198.2  | 374.9  | 537.7  | 484.7  | 288.8  | 145.1  | 89.9   |
| 87.5° | 6.6    | 6.6    | 7.4    | 7.4    | 8.1    | 16.9   | 103.9  | 109.8  | 76.6   | 45.7   | 36.8   |
| 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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**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 2785.9 | 2785.9 | 2785.9 | 2785.9 | 2785.9 | 2785.9 | 2785.9 | 2785.9 | 2785.9 | 2785.9 | 2785.9 |
| 2.5°  | 2766.7 | 2749.1 | 2741.7 | 2741.0 | 2722.5 | 2696.0 | 2678.3 | 2665.8 | 2658.5 | 2657.0 | 2657.0 |
| 5°    | 2717.4 | 2694.5 | 2664.3 | 2641.5 | 2592.2 | 2542.1 | 2500.1 | 2476.5 | 2449.3 | 2445.6 | 2444.8 |
| 7.5°  | 2651.8 | 2618.7 | 2561.2 | 2497.1 | 2411.0 | 2327.7 | 2257.0 | 2209.1 | 2161.2 | 2152.4 | 2149.5 |
| 10°   | 2581.1 | 2536.2 | 2438.2 | 2325.5 | 2196.6 | 2072.1 | 1963.8 | 1879.1 | 1823.1 | 1783.4 | 1776.0 |
| 12.5° | 2511.1 | 2451.5 | 2307.8 | 2139.9 | 1963.1 | 1792.9 | 1630.1 | 1491.7 | 1391.5 | 1333.3 | 1323.0 |
| 15°   | 2445.6 | 2362.3 | 2165.7 | 1951.3 | 1721.5 | 1488.7 | 1258.1 | 1078.4 | 937.7  | 887.6  | 875.8  |
| 17.5° | 2385.9 | 2282.0 | 2027.9 | 1756.1 | 1469.6 | 1165.3 | 903.1  | 743.2  | 660.7  | 635.7  | 629.8  |
| 20°   | 2326.2 | 2199.5 | 1888.0 | 1550.6 | 1202.2 | 861.1  | 660.0  | 584.9  | 553.9  | 544.4  | 541.4  |
| 22.5° | 2262.2 | 2108.9 | 1735.5 | 1348.0 | 931.8  | 644.5  | 539.9  | 506.8  | 497.2  | 498.0  | 497.2  |
| 25°   | 2198.1 | 2016.9 | 1575.6 | 1127.8 | 693.9  | 523.0  | 471.4  | 458.9  | 461.1  | 467.8  | 469.2  |
| 27.5° | 2145.0 | 1935.1 | 1418.7 | 886.2  | 542.2  | 450.1  | 425.8  | 425.0  | 433.1  | 442.0  | 443.4  |
| 30°   | 2106.7 | 1862.2 | 1264.0 | 681.4  | 446.4  | 400.0  | 390.4  | 394.8  | 404.4  | 411.0  | 413.2  |
| 32.5° | 2079.5 | 1799.6 | 1099.0 | 535.5  | 391.1  | 364.6  | 360.2  | 364.6  | 370.5  | 377.1  | 378.6  |
| 35°   | 2069.9 | 1753.9 | 937.0  | 436.8  | 353.6  | 338.8  | 335.9  | 338.1  | 341.1  | 344.7  | 346.2  |
| 37.5° | 2091.3 | 1731.1 | 767.6  | 380.1  | 330.7  | 321.9  | 317.5  | 316.0  | 316.7  | 318.2  | 319.0  |
| 40°   | 2154.6 | 1741.4 | 629.1  | 346.9  | 316.0  | 307.9  | 300.5  | 297.6  | 296.9  | 298.3  | 297.6  |
| 42.5° | 2263.6 | 1784.8 | 528.9  | 327.8  | 304.2  | 292.4  | 284.3  | 281.4  | 281.4  | 285.1  | 285.1  |
| 45°   | 2423.5 | 1870.3 | 456.7  | 313.8  | 293.9  | 279.2  | 270.3  | 268.9  | 271.8  | 277.7  | 278.4  |
| 47.5° | 2657.7 | 1995.5 | 413.2  | 303.5  | 284.3  | 267.4  | 258.6  | 257.8  | 263.7  | 273.3  | 274.0  |
| 50°   | 2935.4 | 2176.0 | 389.7  | 296.1  | 277.7  | 257.8  | 249.0  | 249.7  | 256.3  | 266.7  | 268.9  |
| 52.5° | 3269.8 | 2422.0 | 391.1  | 293.2  | 274.0  | 251.9  | 243.1  | 241.6  | 248.2  | 258.6  | 260.8  |
| 55°   | 3615.3 | 2721.1 | 419.9  | 293.9  | 268.9  | 249.0  | 237.2  | 232.0  | 237.9  | 245.3  | 246.0  |
| 57.5° | 3995.4 | 3058.4 | 491.3  | 292.4  | 262.2  | 246.0  | 232.0  | 220.2  | 223.9  | 228.4  | 230.6  |
| 60°   | 4424.1 | 3455.5 | 645.3  | 295.4  | 259.3  | 239.4  | 221.7  | 206.3  | 205.5  | 208.5  | 209.2  |
| 62.5° | 4997.2 | 3995.4 | 818.4  | 300.5  | 265.9  | 231.3  | 206.3  | 190.0  | 187.1  | 188.6  | 189.3  |
| 65°   | 5435.5 | 4253.2 | 763.9  | 296.1  | 279.9  | 225.4  | 191.5  | 174.6  | 168.7  | 167.2  | 167.2  |
| 67.5° | 5257.2 | 3912.2 | 531.8  | 284.3  | 286.5  | 226.1  | 179.7  | 158.4  | 151.0  | 147.3  | 146.6  |
| 70°   | 4473.5 | 3177.8 | 369.8  | 272.5  | 279.2  | 224.7  | 167.2  | 145.1  | 135.5  | 130.4  | 129.6  |
| 72.5° | 3534.3 | 2426.4 | 299.1  | 249.0  | 253.4  | 202.6  | 148.8  | 130.4  | 122.3  | 115.6  | 115.6  |
| 75°   | 2274.7 | 1480.6 | 249.7  | 221.7  | 207.0  | 157.6  | 128.9  | 116.4  | 108.3  | 101.7  | 101.7  |
| 77.5° | 765.3  | 549.5  | 193.7  | 187.8  | 154.7  | 118.6  | 108.3  | 100.2  | 93.6   | 87.7   | 86.9   |
| 80°   | 310.9  | 260.8  | 142.2  | 142.2  | 108.3  | 90.6   | 84.7   | 81.0   | 76.6   | 69.2   | 69.2   |
| 82.5° | 180.5  | 158.4  | 99.4   | 86.2   | 72.2   | 62.6   | 58.9   | 55.2   | 55.2   | 50.1   | 50.1   |
| 85°   | 86.9   | 87.7   | 59.7   | 53.0   | 41.3   | 36.1   | 34.6   | 32.4   | 31.7   | 28.7   | 28.0   |
| 87.5° | 47.1   | 47.9   | 30.2   | 23.6   | 16.2   | 14.0   | 11.8   | 11.0   | 10.3   | 9.6    | 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    |

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

Report Prepared for

Cooper Lighting Solutions

McGRAW-EDISON

Report Number: SP1-1908-441-10-R4

Test Date: 10/25/2019

Luminaire Tested: SA1C-722-U-5WQ

Data in this report applies to families of products SA1C-722-U-5WQ.

### Test Information

Test Method: LM-79-2008 Report  
 Number: SP1-1908-441-10-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-722-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):                  | 2237    | CRI (Ra): | 72.0 |      |       |
| CIE u':                   | 0.2876  | R1:       | 68.9 | R9:  | -17.4 |
| CIE v':                   | 0.5346  | R2:       | 83.0 | R10: | 61.3  |
| Duv:                      | -0.0006 | R3:       | 95.2 | R11: | 59.8  |
| CIE x:                    | 0.5005  | R4:       | 66.2 | R12: | 50.5  |
| CIE y:                    | 0.4134  | R5:       | 65.9 | R13: | 71.1  |
| CIE z:                    | 0.0860  | R6:       | 76.3 | R14: | 96.9  |
| Peak Wavelength (nm):     | 603     | R7:       | 76.7 |      |       |
| Dominant Wavelength (nm): | 587     | R8:       | 43.8 |      |       |
| Purity:                   | 74.5    |           |      |      |       |
| Rf:                       | 69.8    |           |      |      |       |
| Rg:                       | 99.2    |           |      |      |       |



### Test Conditions

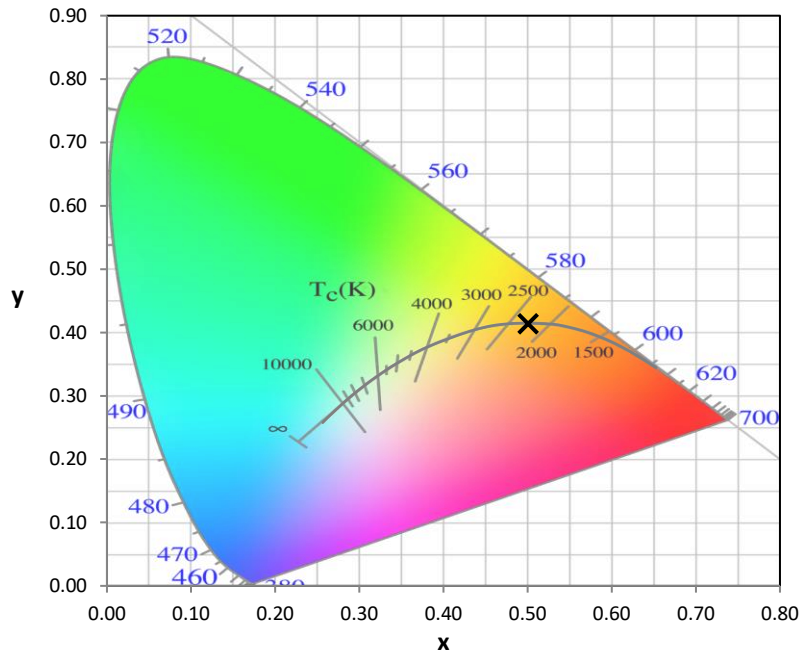
Stabilization Time: 71M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.7/41%  
 Sphere Temperature (°C): 25.6

REPORT NUMBER: SP1-1908-441-10-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 2200K 4-step quadrangle

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**Photopic Flux vs. Wavelength**



#####

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 1768             | NR               | 490       | 5206             | NR               | 620       | 130919           | NR               | 750       | 8553             | NR               | 880       | 2713             | NR               |
| 365       | 1569             | NR               | 495       | 7286             | NR               | 625       | 125335           | NR               | 755       | 7696             | NR               | 885       | 2316             | NR               |
| 370       | 1594             | NR               | 500       | 10654            | NR               | 630       | 118388           | NR               | 760       | 6978             | NR               | 890       | 2539             | NR               |
| 375       | 1744             | NR               | 505       | 15189            | NR               | 635       | 111855           | NR               | 765       | 6377             | NR               | 895       | 1933             | NR               |
| 380       | 1659             | NR               | 510       | 20541            | NR               | 640       | 104062           | NR               | 770       | 5600             | NR               | 900       | 2216             | NR               |
| 385       | 1504             | NR               | 515       | 26492            | NR               | 645       | 96365            | NR               | 775       | 5000             | NR               | 905       | 2067             | NR               |
| 390       | 1541             | NR               | 520       | 32294            | NR               | 650       | 88651            | NR               | 780       | 4709             | NR               | 910       | 1959             | NR               |
| 395       | 1355             | NR               | 525       | 38123            | NR               | 655       | 81152            | NR               | 785       | 4305             | NR               | 915       | 1874             | NR               |
| 400       | 1243             | NR               | 530       | 43232            | NR               | 660       | 73523            | NR               | 790       | 4040             | NR               | 920       | 1484             | NR               |
| 405       | 1417             | NR               | 535       | 48012            | NR               | 665       | 66123            | NR               | 795       | 3642             | NR               | 925       | 1914             | NR               |
| 410       | 2147             | NR               | 540       | 52623            | NR               | 670       | 58677            | NR               | 800       | 3594             | NR               | 930       | 1948             | NR               |
| 415       | 3837             | NR               | 545       | 57516            | NR               | 675       | 52349            | NR               | 805       | 3190             | NR               | 935       | 2079             | NR               |
| 420       | 7159             | NR               | 550       | 62613            | NR               | 680       | 46159            | NR               | 810       | 3241             | NR               | 940       | 2263             | NR               |
| 425       | 12599            | NR               | 555       | 68554            | NR               | 685       | 40525            | NR               | 815       | 2732             | NR               | 945       | 1688             | NR               |
| 430       | 19019            | NR               | 560       | 75325            | NR               | 690       | 35615            | NR               | 820       | 2612             | NR               | 950       | 1560             | NR               |
| 435       | 24875            | NR               | 565       | 82533            | NR               | 695       | 31158            | NR               | 825       | 2966             | NR               | 955       | 2826             | NR               |
| 440       | 29103            | NR               | 570       | 90909            | NR               | 700       | 27409            | NR               | 830       | 2574             | NR               | 960       | 1477             | NR               |
| 445       | 29901            | NR               | 575       | 99621            | NR               | 705       | 24204            | NR               | 835       | 2633             | NR               | 965       | 1568             | NR               |
| 450       | 24862            | NR               | 580       | 108484           | NR               | 710       | 21558            | NR               | 840       | 2526             | NR               | 970       | 2030             | NR               |
| 455       | 15942            | NR               | 585       | 116679           | NR               | 715       | 19222            | NR               | 845       | 2631             | NR               | 975       | 1986             | NR               |
| 460       | 9916             | NR               | 590       | 123752           | NR               | 720       | 17310            | NR               | 850       | 2079             | NR               | 980       | 2540             | NR               |
| 465       | 7051             | NR               | 595       | 129324           | NR               | 725       | 15280            | NR               | 855       | 2309             | NR               | 985       | 1139             | NR               |
| 470       | 5227             | NR               | 600       | 134082           | NR               | 730       | 13282            | NR               | 860       | 2528             | NR               | 990       | 2018             | NR               |
| 475       | 4257             | NR               | 605       | 135698           | NR               | 735       | 11753            | NR               | 865       | 2121             | NR               | 995       | 3445             | NR               |
| 480       | 4052             | NR               | 610       | 135144           | NR               | 740       | 10654            | NR               | 870       | 2751             | NR               | 1000      | 3704             | NR               |
| 485       | 4298             | NR               | 615       | 134180           | NR               | 745       | 9451             | NR               | 875       | 2317             | NR               |           |                  |                  |

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**Scotopic Flux vs. Wavelength**



**Scotopic Lumens: 4696.9**

**S/P: 0.85**

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 1768             | NR               | 490       | 5206             | NR               | 620       | 130919           | NR               | 750       | 8553             | NR               | 880       | 2713             | NR               |
| 365       | 1569             | NR               | 495       | 7286             | NR               | 625       | 125335           | NR               | 755       | 7696             | NR               | 885       | 2316             | NR               |
| 370       | 1594             | NR               | 500       | 10654            | NR               | 630       | 118388           | NR               | 760       | 6978             | NR               | 890       | 2539             | NR               |
| 375       | 1744             | NR               | 505       | 15189            | NR               | 635       | 111855           | NR               | 765       | 6377             | NR               | 895       | 1933             | NR               |
| 380       | 1659             | NR               | 510       | 20541            | NR               | 640       | 104062           | NR               | 770       | 5600             | NR               | 900       | 2216             | NR               |
| 385       | 1504             | NR               | 515       | 26492            | NR               | 645       | 96365            | NR               | 775       | 5000             | NR               | 905       | 2067             | NR               |
| 390       | 1541             | NR               | 520       | 32294            | NR               | 650       | 88651            | NR               | 780       | 4709             | NR               | 910       | 1959             | NR               |
| 395       | 1355             | NR               | 525       | 38123            | NR               | 655       | 81152            | NR               | 785       | 4305             | NR               | 915       | 1874             | NR               |
| 400       | 1243             | NR               | 530       | 43232            | NR               | 660       | 73523            | NR               | 790       | 4040             | NR               | 920       | 1484             | NR               |
| 405       | 1417             | NR               | 535       | 48012            | NR               | 665       | 66123            | NR               | 795       | 3642             | NR               | 925       | 1914             | NR               |
| 410       | 2147             | NR               | 540       | 52623            | NR               | 670       | 58677            | NR               | 800       | 3594             | NR               | 930       | 1948             | NR               |
| 415       | 3837             | NR               | 545       | 57516            | NR               | 675       | 52349            | NR               | 805       | 3190             | NR               | 935       | 2079             | NR               |
| 420       | 7159             | NR               | 550       | 62613            | NR               | 680       | 46159            | NR               | 810       | 3241             | NR               | 940       | 2263             | NR               |
| 425       | 12599            | NR               | 555       | 68554            | NR               | 685       | 40525            | NR               | 815       | 2732             | NR               | 945       | 1688             | NR               |
| 430       | 19019            | NR               | 560       | 75325            | NR               | 690       | 35615            | NR               | 820       | 2612             | NR               | 950       | 1560             | NR               |
| 435       | 24875            | NR               | 565       | 82533            | NR               | 695       | 31158            | NR               | 825       | 2966             | NR               | 955       | 2826             | NR               |
| 440       | 29103            | NR               | 570       | 90909            | NR               | 700       | 27409            | NR               | 830       | 2574             | NR               | 960       | 1477             | NR               |
| 445       | 29901            | NR               | 575       | 99621            | NR               | 705       | 24204            | NR               | 835       | 2633             | NR               | 965       | 1568             | NR               |
| 450       | 24862            | NR               | 580       | 108484           | NR               | 710       | 21558            | NR               | 840       | 2526             | NR               | 970       | 2030             | NR               |
| 455       | 15942            | NR               | 585       | 116679           | NR               | 715       | 19222            | NR               | 845       | 2631             | NR               | 975       | 1986             | NR               |
| 460       | 9916             | NR               | 590       | 123752           | NR               | 720       | 17310            | NR               | 850       | 2079             | NR               | 980       | 2540             | NR               |
| 465       | 7051             | NR               | 595       | 129324           | NR               | 725       | 15280            | NR               | 855       | 2309             | NR               | 985       | 1139             | NR               |
| 470       | 5227             | NR               | 600       | 134082           | NR               | 730       | 13282            | NR               | 860       | 2528             | NR               | 990       | 2018             | NR               |
| 475       | 4257             | NR               | 605       | 135698           | NR               | 735       | 11753            | NR               | 865       | 2121             | NR               | 995       | 3445             | NR               |
| 480       | 4052             | NR               | 610       | 135144           | NR               | 740       | 10654            | NR               | 870       | 2751             | NR               | 1000      | 3704             | NR               |
| 485       | 4298             | NR               | 615       | 134180           | NR               | 745       | 9451             | NR               | 875       | 2317             | NR               |           |                  |                  |

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**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 1470.8 M/P: 0.27**

| 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       | 1768             | NR               | 490       | 5206             | NR               | 620       | 130919           | NR               | 750       | 8553             | NR               | 880       | 2713             | NR               |
| 365       | 1569             | NR               | 495       | 7286             | NR               | 625       | 125335           | NR               | 755       | 7696             | NR               | 885       | 2316             | NR               |
| 370       | 1594             | NR               | 500       | 10654            | NR               | 630       | 118388           | NR               | 760       | 6978             | NR               | 890       | 2539             | NR               |
| 375       | 1744             | NR               | 505       | 15189            | NR               | 635       | 111855           | NR               | 765       | 6377             | NR               | 895       | 1933             | NR               |
| 380       | 1659             | NR               | 510       | 20541            | NR               | 640       | 104062           | NR               | 770       | 5600             | NR               | 900       | 2216             | NR               |
| 385       | 1504             | NR               | 515       | 26492            | NR               | 645       | 96365            | NR               | 775       | 5000             | NR               | 905       | 2067             | NR               |
| 390       | 1541             | NR               | 520       | 32294            | NR               | 650       | 88651            | NR               | 780       | 4709             | NR               | 910       | 1959             | NR               |
| 395       | 1355             | NR               | 525       | 38123            | NR               | 655       | 81152            | NR               | 785       | 4305             | NR               | 915       | 1874             | NR               |
| 400       | 1243             | NR               | 530       | 43232            | NR               | 660       | 73523            | NR               | 790       | 4040             | NR               | 920       | 1484             | NR               |
| 405       | 1417             | NR               | 535       | 48012            | NR               | 665       | 66123            | NR               | 795       | 3642             | NR               | 925       | 1914             | NR               |
| 410       | 2147             | NR               | 540       | 52623            | NR               | 670       | 58677            | NR               | 800       | 3594             | NR               | 930       | 1948             | NR               |
| 415       | 3837             | NR               | 545       | 57516            | NR               | 675       | 52349            | NR               | 805       | 3190             | NR               | 935       | 2079             | NR               |
| 420       | 7159             | NR               | 550       | 62613            | NR               | 680       | 46159            | NR               | 810       | 3241             | NR               | 940       | 2263             | NR               |
| 425       | 12599            | NR               | 555       | 68554            | NR               | 685       | 40525            | NR               | 815       | 2732             | NR               | 945       | 1688             | NR               |
| 430       | 19019            | NR               | 560       | 75325            | NR               | 690       | 35615            | NR               | 820       | 2612             | NR               | 950       | 1560             | NR               |
| 435       | 24875            | NR               | 565       | 82533            | NR               | 695       | 31158            | NR               | 825       | 2966             | NR               | 955       | 2826             | NR               |
| 440       | 29103            | NR               | 570       | 90909            | NR               | 700       | 27409            | NR               | 830       | 2574             | NR               | 960       | 1477             | NR               |
| 445       | 29901            | NR               | 575       | 99621            | NR               | 705       | 24204            | NR               | 835       | 2633             | NR               | 965       | 1568             | NR               |
| 450       | 24862            | NR               | 580       | 108484           | NR               | 710       | 21558            | NR               | 840       | 2526             | NR               | 970       | 2030             | NR               |
| 455       | 15942            | NR               | 585       | 116679           | NR               | 715       | 19222            | NR               | 845       | 2631             | NR               | 975       | 1986             | NR               |
| 460       | 9916             | NR               | 590       | 123752           | NR               | 720       | 17310            | NR               | 850       | 2079             | NR               | 980       | 2540             | NR               |
| 465       | 7051             | NR               | 595       | 129324           | NR               | 725       | 15280            | NR               | 855       | 2309             | NR               | 985       | 1139             | NR               |
| 470       | 5227             | NR               | 600       | 134082           | NR               | 730       | 13282            | NR               | 860       | 2528             | NR               | 990       | 2018             | NR               |
| 475       | 4257             | NR               | 605       | 135698           | NR               | 735       | 11753            | NR               | 865       | 2121             | NR               | 995       | 3445             | NR               |
| 480       | 4052             | NR               | 610       | 135144           | NR               | 740       | 10654            | NR               | 870       | 2751             | NR               | 1000      | 3704             | NR               |
| 485       | 4298             | NR               | 615       | 134180           | NR               | 745       | 9451             | NR               | 875       | 2317             | NR               |           |                  |                  |

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### Summary

$R_f = 69.8$   
 $R_g = 99.2$   
 CIE  $R_a = 72.0$   
 $R_g = -17.4$



### Color Vector Graphics



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 87 | CES26 = 56 | CES51 = 74 | CES76 = 56 |
| CES02 = 65 | CES27 = 76 | CES52 = 76 | CES77 = 81 |
| CES03 = 32 | CES28 = 83 | CES53 = 65 | CES78 = 63 |
| CES04 = 72 | CES29 = 46 | CES54 = 78 | CES79 = 84 |
| CES05 = 52 | CES30 = 48 | CES55 = 75 | CES80 = 84 |
| CES06 = 52 | CES31 = 51 | CES56 = 65 | CES81 = 63 |
| CES07 = 44 | CES32 = 51 | CES57 = 62 | CES82 = 92 |
| CES08 = 42 | CES33 = 53 | CES58 = 66 | CES83 = 83 |
| CES09 = 29 | CES34 = 70 | CES59 = 84 | CES84 = 92 |
| CES10 = 78 | CES35 = 85 | CES60 = 90 | CES85 = 81 |
| CES11 = 61 | CES36 = 78 | CES61 = 84 | CES86 = 56 |
| CES12 = 68 | CES37 = 80 | CES62 = 70 | CES87 = 78 |
| CES13 = 45 | CES38 = 53 | CES63 = 68 | CES88 = 72 |
| CES14 = 75 | CES39 = 90 | CES64 = 69 | CES89 = 62 |
| CES15 = 72 | CES40 = 84 | CES65 = 67 | CES90 = 67 |
| CES16 = 49 | CES41 = 75 | CES66 = 64 | CES91 = 90 |
| CES17 = 51 | CES42 = 79 | CES67 = 63 | CES92 = 67 |
| CES18 = 57 | CES43 = 64 | CES68 = 69 | CES93 = 79 |
| CES19 = 74 | CES44 = 98 | CES69 = 80 | CES94 = 52 |
| CES20 = 68 | CES45 = 73 | CES70 = 63 | CES95 = 76 |
| CES21 = 89 | CES46 = 67 | CES71 = 63 | CES96 = 78 |
| CES22 = 81 | CES47 = 60 | CES72 = 87 | CES97 = 77 |
| CES23 = 92 | CES48 = 48 | CES73 = 56 | CES98 = 71 |
| CES24 = 92 | CES49 = 64 | CES74 = 87 | CES99 = 65 |
| CES25 = 74 | CES50 = 74 | CES75 = 66 |            |



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Color Rendition by Hue-Angle Bin



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**Measure Comparisons**



(END OF REPORT)