

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: P642025

Luminaire Tested: GWS-SA6C-722-U-T4FT-W

Issue Date: 1/10/2023

**Test Information**

Test Method: LM-79-2019  
Report Number: P642025  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-54)  
Test Lab: COOPER LIGHTING SOLUTIONS  
Issue Date: 1/10/2023  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: McGRAW-EDISON  
Catalog Number: GWS-SA6C-722-U-T4FT-W  
Description: GALLEON WALL SLIM LUMINAIRE. (6) LIGHTSQUARES WITH 16 LEDS EACH AND  
TYPE IV FORWARD THROW OPTICS  
Light Source: (96) 2200K CCT, 70 CRI LEDS  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 20202.5 lumens  
Efficiency: N/A  
Efficacy: 106.8 lumens/watt  
Luminous Opening: Rectangular (W 2' x L: 1' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B3 - U0 - G4

Input Watts (W): 189.2  
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



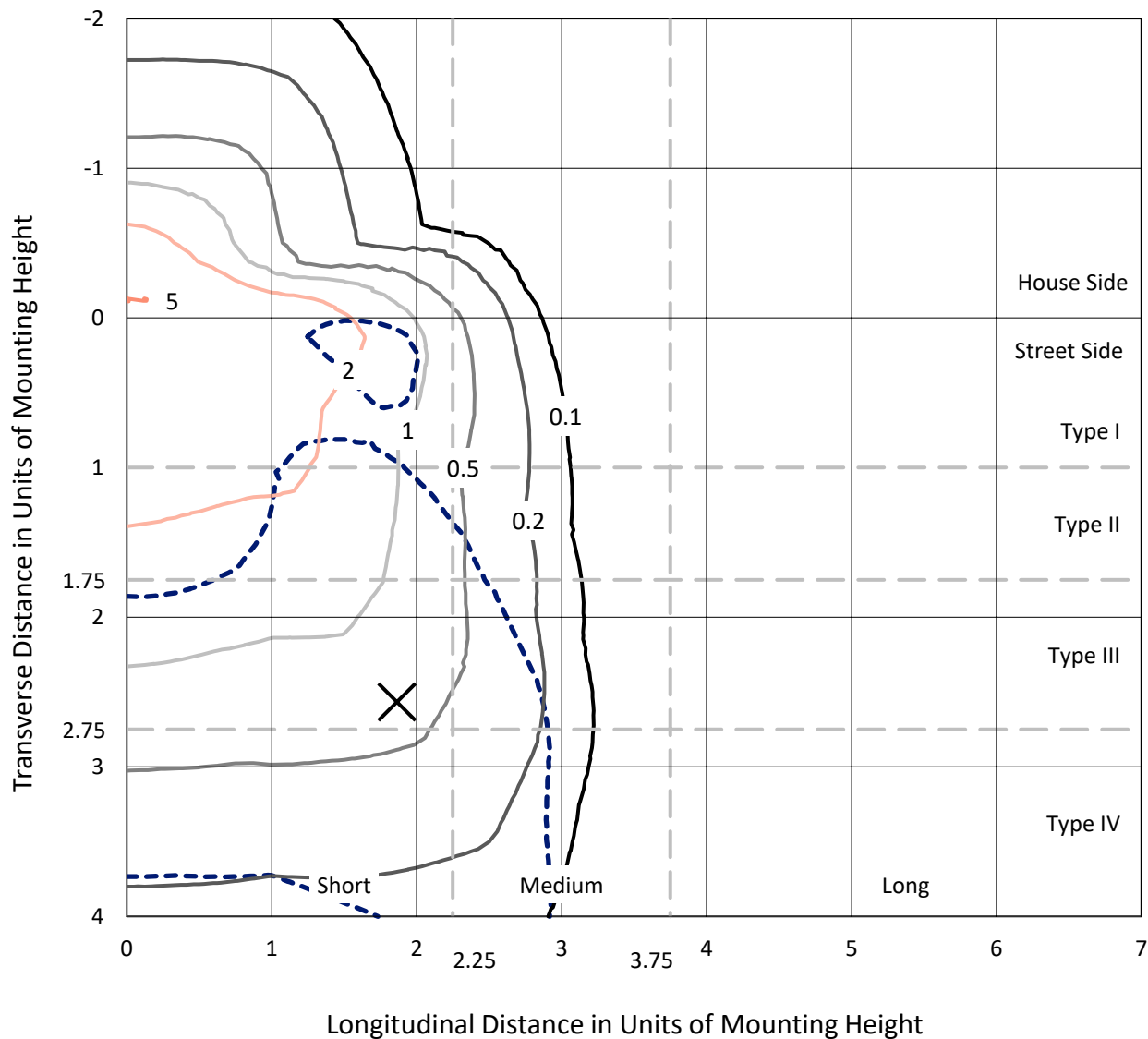
REPORT NUMBER: P642025

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## Iso-Footcandle Lines of Horizontal Illumination

✕ Max cd

--- 1/2 Max cd

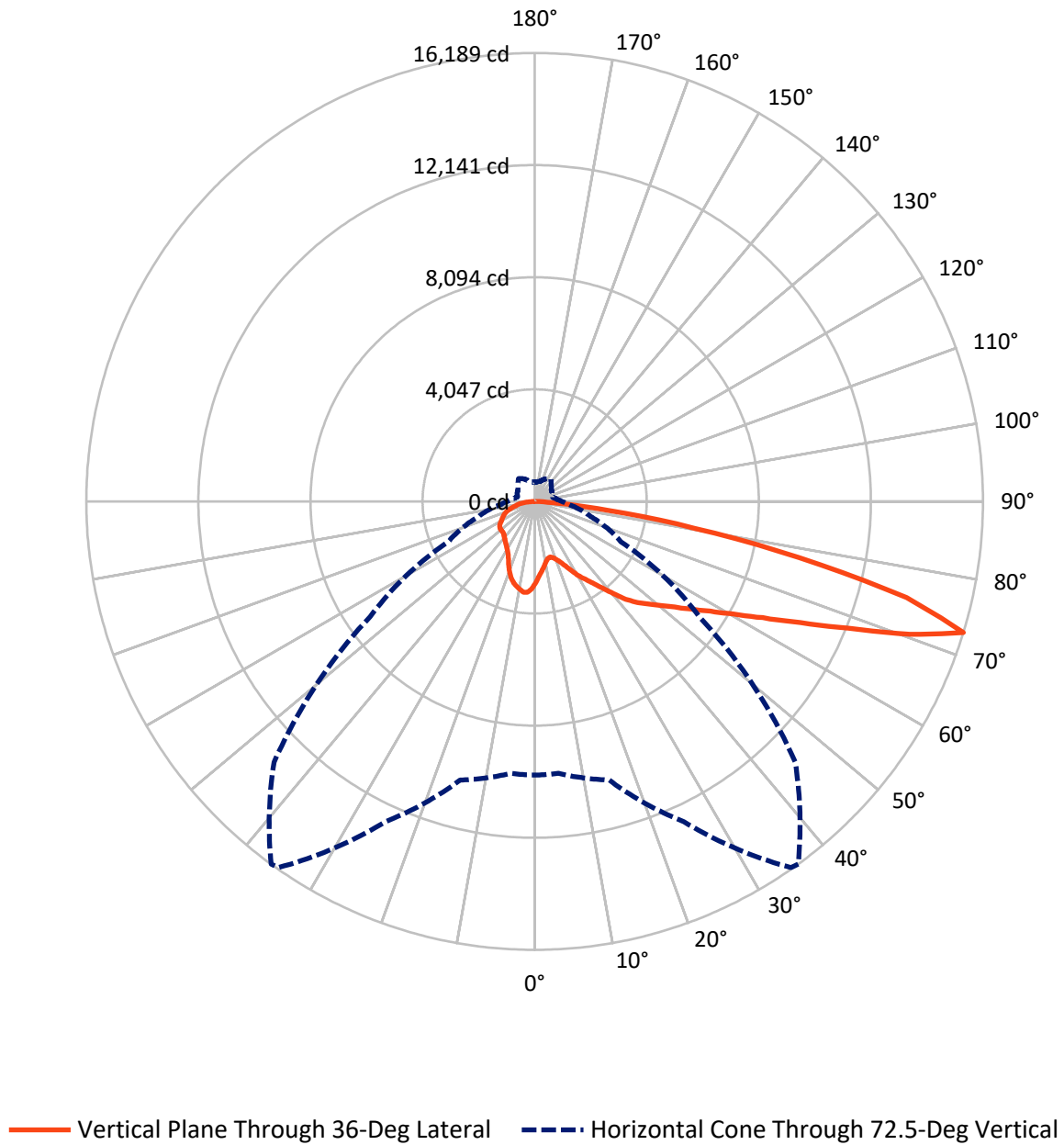


Based on 25 foot mounting height. Maximum calculated value = 5 fc  
 Type IV - Short - N/A

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## Luminous Intensity Polar Plot



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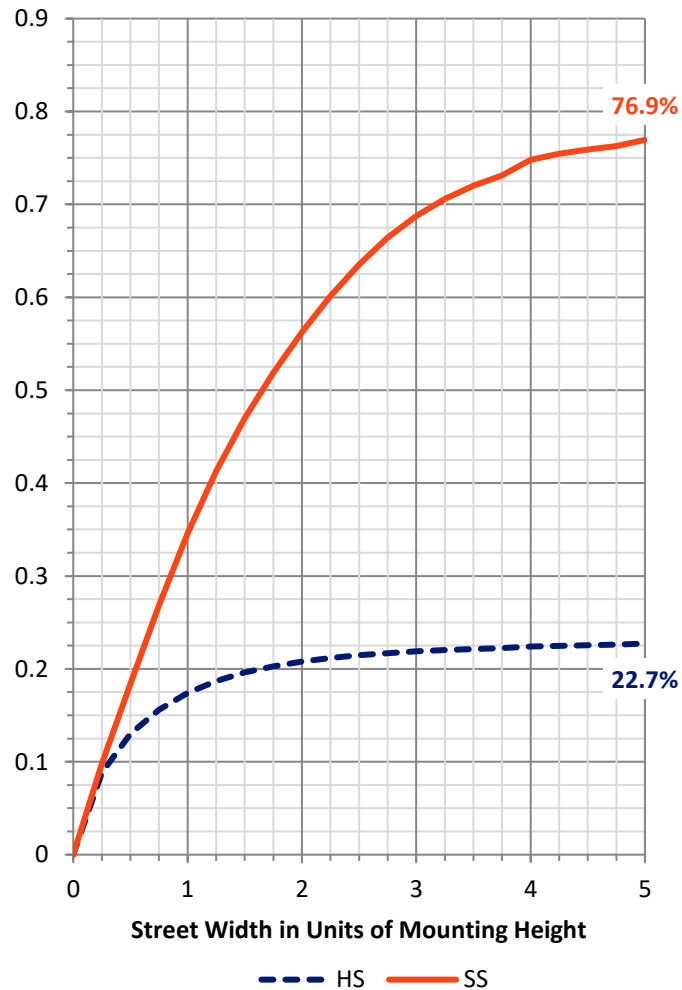
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 4657.5   | 0.0    | 4657.5  |
|                    | % Fixture | 23.1     | 0.0    | 23.1    |
| <b>Street Side</b> | Lumens    | 15544.9  | 0.0    | 15544.9 |
|                    | % Fixture | 76.9     | 0.0    | 76.9    |
| <b>Total</b>       | Lumens    | 20202.5  | 0.0    | 20202.5 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 276.4   | 1.4       |
| 10°-20°   | 779.8   | 3.9       |
| 20°-30°   | 1291.4  | 6.4       |
| 30°-40°   | 1933.9  | 9.6       |
| 40°-50°   | 2821.5  | 14.0      |
| 50°-60°   | 4015.8  | 19.9      |
| 60°-70°   | 5073.7  | 25.1      |
| 70°-80°   | 3615.4  | 17.9      |
| 80°-90°   | 394.7   | 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°    | 20202.5 | 100.0     |
| 0°-180°   | 20202.5 | 100.0     |

**Coefficient of Utilization**



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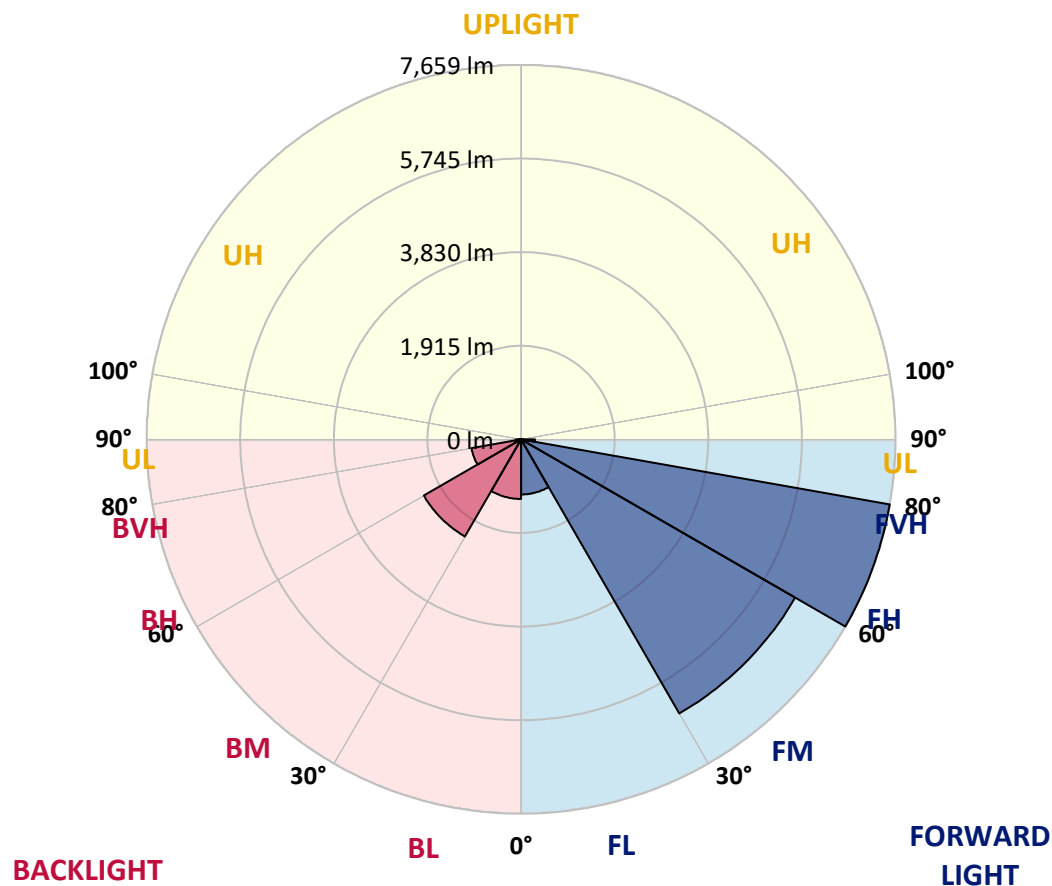
CATALOG NUMBER: GWS-SA6C-722-U-T4FT-W

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |          |
|------|-------------|--------|-----------|-------------------------|------|----------|
|      |             |        |           | B                       | U    | G        |
| FL   | (0°-30°)    | 1127.8 | 5.6       |                         |      |          |
| FM   | (30°-60°)   | 6474.4 | 32.0      |                         |      |          |
| FH   | (60°-80°)   | 7659.4 | 37.9      |                         |      | G4/12000 |
| FVH  | (80°-90°)   | 283.3  | 1.4       |                         |      | G3/500   |
| BL   | (0°-30°)    | 1219.7 | 6.0       | B3/2500                 |      |          |
| BM   | (30°-60°)   | 2296.8 | 11.4      | B2/2500                 |      |          |
| BH   | (60°-80°)   | 1029.7 | 5.1       | B3/2500                 |      | G3/2500  |
| BVH  | (80°-90°)   | 111.4  | 0.6       |                         |      | G2/225   |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |          |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |          |

**BUG Rating: B3-U0-G4**

Type IV Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 36°     | 45°     | 55°    | 65°    | 75°    | 85°    |
|-------|---------|---------|---------|---------|---------|---------|---------|--------|--------|--------|--------|
| 0°    | 2956.7  | 2956.7  | 2956.7  | 2956.7  | 2956.7  | 2956.7  | 2956.7  | 2956.7 | 2956.7 | 2956.7 | 2956.7 |
| 2.5°  | 2697.3  | 2692.8  | 2683.8  | 2710.8  | 2737.8  | 2734.8  | 2772.3  | 2808.3 | 2847.3 | 2887.8 | 2941.7 |
| 5°    | 2481.4  | 2478.4  | 2470.9  | 2511.4  | 2551.9  | 2550.4  | 2611.9  | 2670.3 | 2749.8 | 2836.8 | 2944.7 |
| 7.5°  | 2265.5  | 2258.0  | 2268.5  | 2319.5  | 2376.5  | 2382.5  | 2466.4  | 2562.4 | 2677.8 | 2808.3 | 2961.2 |
| 10°   | 2075.1  | 2073.6  | 2078.1  | 2135.1  | 2220.5  | 2226.5  | 2334.5  | 2467.9 | 2620.9 | 2794.8 | 2998.7 |
| 12.5° | 2025.6  | 2022.6  | 2010.6  | 2039.1  | 2103.6  | 2112.6  | 2231.0  | 2394.5 | 2581.9 | 2802.3 | 3049.7 |
| 15°   | 2106.6  | 2099.1  | 2057.1  | 2043.6  | 2075.1  | 2082.6  | 2183.1  | 2351.0 | 2559.4 | 2815.8 | 3114.2 |
| 17.5° | 2246.0  | 2241.5  | 2162.1  | 2106.6  | 2127.6  | 2133.6  | 2208.5  | 2343.5 | 2553.4 | 2842.8 | 3193.6 |
| 20°   | 2449.9  | 2430.5  | 2306.0  | 2222.0  | 2222.0  | 2231.0  | 2276.0  | 2376.5 | 2560.9 | 2875.8 | 3283.6 |
| 22.5° | 2719.8  | 2680.8  | 2505.4  | 2391.5  | 2361.5  | 2373.5  | 2393.0  | 2458.9 | 2592.4 | 2931.2 | 3396.0 |
| 25°   | 3022.7  | 2986.7  | 2778.3  | 2617.9  | 2575.9  | 2580.4  | 2563.9  | 2575.9 | 2661.4 | 3007.7 | 3535.5 |
| 27.5° | 3345.1  | 3321.1  | 3099.2  | 2895.3  | 2829.3  | 2829.3  | 2770.8  | 2742.3 | 2757.3 | 3094.7 | 3691.4 |
| 30°   | 3632.9  | 3599.9  | 3412.5  | 3189.1  | 3102.2  | 3102.2  | 2991.2  | 2929.7 | 2893.8 | 3201.1 | 3899.8 |
| 32.5° | 3784.4  | 3764.9  | 3640.4  | 3469.5  | 3363.1  | 3346.6  | 3250.6  | 3178.6 | 3094.7 | 3358.6 | 4181.7 |
| 35°   | 3982.3  | 3977.8  | 3902.8  | 3769.4  | 3634.4  | 3610.4  | 3544.5  | 3487.5 | 3342.1 | 3555.0 | 4556.5 |
| 37.5° | 4231.2  | 4223.7  | 4211.7  | 4132.2  | 3970.3  | 3965.8  | 3907.3  | 3838.3 | 3649.4 | 3838.3 | 5010.8 |
| 40°   | 4510.1  | 4496.6  | 4481.6  | 4480.1  | 4382.6  | 4366.1  | 4361.6  | 4283.7 | 4019.8 | 4180.2 | 5484.6 |
| 42.5° | 4893.9  | 4847.4  | 4706.5  | 4769.4  | 4841.4  | 4826.4  | 4883.4  | 4766.4 | 4481.6 | 4586.5 | 5932.9 |
| 45°   | 5366.2  | 5252.2  | 4973.4  | 4991.3  | 5172.8  | 5202.8  | 5400.7  | 5372.2 | 4989.9 | 5055.8 | 6405.2 |
| 47.5° | 5649.6  | 5550.6  | 5291.2  | 5276.2  | 5502.6  | 5540.1  | 5970.4  | 6024.4 | 5537.1 | 5621.1 | 6988.5 |
| 50°   | 5882.0  | 5813.0  | 5600.1  | 5621.1  | 5861.0  | 5898.5  | 6535.7  | 6651.1 | 6052.9 | 6199.8 | 7666.2 |
| 52.5° | 6162.3  | 6063.4  | 5898.5  | 5997.4  | 6291.3  | 6336.3  | 7163.9  | 7288.4 | 6517.7 | 6835.6 | 8367.9 |
| 55°   | 6319.8  | 6279.3  | 6282.3  | 6433.7  | 6802.6  | 6864.0  | 7822.1  | 7801.1 | 6943.5 | 7379.8 | 8895.7 |
| 57.5° | 6682.6  | 6667.6  | 6805.6  | 6862.5  | 7399.3  | 7478.8  | 8480.3  | 8300.4 | 7330.3 | 7801.1 | 9149.1 |
| 60°   | 7322.8  | 7285.4  | 7405.3  | 7492.3  | 8137.0  | 8249.4  | 9215.0  | 8789.2 | 7592.7 | 8114.5 | 9063.6 |
| 62.5° | 8222.5  | 8176.0  | 8180.5  | 8318.4  | 9125.1  | 9243.5  | 10032.2 | 9197.0 | 7673.7 | 8162.5 | 8522.3 |
| 65°   | 9341.0  | 9273.5  | 9197.0  | 9384.5  | 10437.0 | 10536.0 | 10921.3 | 9493.9 | 7480.3 | 7700.7 | 7391.8 |
| 67.5° | 10521.0 | 10465.5 | 10375.5 | 10768.4 | 12135.8 | 12195.7 | 11918.4 | 9468.4 | 6867.0 | 6465.2 | 5184.8 |
| 70°   | 10589.9 | 10603.4 | 11029.2 | 12450.6 | 14353.3 | 14368.3 | 12861.5 | 8955.6 | 5561.1 | 4190.7 | 2583.4 |
| 72.5° | 9879.2  | 9856.8  | 10411.5 | 12758.0 | 16137.5 | 16188.5 | 13306.8 | 7255.4 | 3436.5 | 2090.1 | 1211.5 |
| 75°   | 8024.5  | 8063.5  | 8646.8  | 11162.7 | 13831.5 | 13876.5 | 10847.8 | 4277.7 | 1632.8 | 1022.6 | 775.2  |
| 77.5° | 3454.5  | 3671.9  | 4821.9  | 7864.1  | 9906.2  | 9766.8  | 5591.1  | 1733.3 | 871.1  | 728.7  | 593.7  |
| 80°   | 997.1   | 1082.5  | 1718.3  | 3739.4  | 5935.9  | 5831.0  | 2213.0  | 649.2  | 607.2  | 547.3  | 425.8  |
| 82.5° | 322.4   | 356.8   | 629.7   | 1488.9  | 2659.9  | 2656.9  | 839.6   | 383.8  | 397.3  | 371.8  | 274.4  |
| 85°   | 90.0    | 103.5   | 193.4   | 451.3   | 823.1   | 806.7   | 242.9   | 181.4  | 211.4  | 214.4  | 136.4  |
| 87.5° | 0.0     | 0.0     | 1.5     | 3.0     | 3.0     | 3.0     | 6.0     | 27.0   | 61.5   | 78.0   | 55.5   |
| 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: GWS-SA6C-722-U-T4FT-W

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 2956.7 | 2956.7 | 2956.7 | 2956.7 | 2956.7 | 2956.7 | 2956.7 | 2956.7 | 2956.7 | 2956.7 | 2956.7 |
| 2.5°  | 2974.7 | 2970.2 | 3031.7 | 3079.7 | 3124.7 | 3154.6 | 3163.6 | 3169.6 | 3181.6 | 3187.6 | 3181.6 |
| 5°    | 2995.7 | 3018.2 | 3120.2 | 3195.1 | 3255.1 | 3291.1 | 3292.6 | 3289.6 | 3298.6 | 3291.1 | 3286.6 |
| 7.5°  | 3040.7 | 3084.2 | 3213.1 | 3292.6 | 3331.6 | 3333.1 | 3297.1 | 3255.1 | 3234.1 | 3216.1 | 3210.1 |
| 10°   | 3100.7 | 3165.1 | 3306.1 | 3358.6 | 3346.6 | 3291.1 | 3211.6 | 3145.6 | 3108.2 | 3081.2 | 3075.2 |
| 12.5° | 3183.1 | 3255.1 | 3388.5 | 3387.0 | 3312.1 | 3213.1 | 3120.2 | 3040.7 | 2986.7 | 2955.2 | 2944.7 |
| 15°   | 3261.1 | 3352.6 | 3448.5 | 3378.0 | 3259.6 | 3139.6 | 3019.7 | 2913.2 | 2841.3 | 2791.8 | 2782.8 |
| 17.5° | 3357.1 | 3454.5 | 3492.0 | 3349.6 | 3193.6 | 3039.2 | 2878.8 | 2739.3 | 2641.9 | 2583.4 | 2578.9 |
| 20°   | 3468.0 | 3555.0 | 3513.0 | 3300.1 | 3108.2 | 2905.7 | 2688.3 | 2532.4 | 2427.5 | 2370.5 | 2375.0 |
| 22.5° | 3597.0 | 3659.9 | 3519.0 | 3232.6 | 2989.7 | 2716.8 | 2473.9 | 2324.0 | 2253.5 | 2223.5 | 2225.0 |
| 25°   | 3734.9 | 3775.4 | 3508.5 | 3141.1 | 2808.3 | 2485.9 | 2253.5 | 2184.6 | 2178.6 | 2171.1 | 2174.1 |
| 27.5° | 3898.3 | 3889.3 | 3477.0 | 3012.2 | 2563.9 | 2217.5 | 2099.1 | 2117.1 | 2141.1 | 2138.1 | 2141.1 |
| 30°   | 4117.2 | 4031.8 | 3436.5 | 2833.8 | 2273.0 | 1992.6 | 2007.6 | 2058.6 | 2090.1 | 2093.1 | 2102.1 |
| 32.5° | 4367.6 | 4189.2 | 3372.0 | 2590.9 | 1995.6 | 1866.7 | 1922.2 | 1983.6 | 2021.1 | 2028.6 | 2040.6 |
| 35°   | 4666.0 | 4369.1 | 3258.1 | 2288.0 | 1796.2 | 1791.7 | 1842.7 | 1884.7 | 1925.2 | 1928.2 | 1928.2 |
| 37.5° | 5009.3 | 4549.0 | 3076.7 | 1953.7 | 1673.3 | 1727.3 | 1775.2 | 1784.2 | 1794.7 | 1785.7 | 1790.2 |
| 40°   | 5324.2 | 4723.0 | 2818.8 | 1649.3 | 1572.8 | 1670.3 | 1710.8 | 1680.8 | 1647.8 | 1625.3 | 1629.8 |
| 42.5° | 5588.1 | 4841.4 | 2476.9 | 1436.4 | 1470.9 | 1619.3 | 1650.8 | 1589.3 | 1524.8 | 1482.9 | 1488.9 |
| 45°   | 5885.0 | 4950.9 | 2075.1 | 1292.4 | 1383.9 | 1583.3 | 1604.3 | 1524.8 | 1442.4 | 1379.4 | 1370.4 |
| 47.5° | 6294.3 | 5174.3 | 1718.3 | 1192.0 | 1322.4 | 1563.8 | 1598.3 | 1490.4 | 1382.4 | 1287.9 | 1277.4 |
| 50°   | 6799.6 | 5490.6 | 1419.9 | 1126.0 | 1293.9 | 1553.3 | 1596.8 | 1452.9 | 1323.9 | 1213.0 | 1205.5 |
| 52.5° | 7351.3 | 5799.5 | 1199.5 | 1075.0 | 1265.5 | 1521.8 | 1589.3 | 1410.9 | 1262.5 | 1142.5 | 1133.5 |
| 55°   | 7718.7 | 5920.9 | 1051.0 | 1027.1 | 1219.0 | 1472.4 | 1559.3 | 1370.4 | 1169.5 | 1060.0 | 1046.5 |
| 57.5° | 7826.6 | 5765.0 | 947.6  | 983.6  | 1159.0 | 1403.4 | 1502.4 | 1284.9 | 1112.5 | 1025.6 | 1015.1 |
| 60°   | 7640.7 | 5372.2 | 883.1  | 947.6  | 1093.0 | 1314.9 | 1403.4 | 1235.5 | 1067.5 | 989.6  | 982.1  |
| 62.5° | 7115.9 | 4766.4 | 833.6  | 910.1  | 1025.6 | 1222.0 | 1340.4 | 1175.5 | 1018.1 | 956.6  | 946.1  |
| 65°   | 6060.4 | 3908.8 | 793.2  | 871.1  | 961.1  | 1133.5 | 1271.5 | 1115.5 | 964.1  | 917.6  | 905.6  |
| 67.5° | 4238.7 | 2745.3 | 749.7  | 824.6  | 896.6  | 1048.0 | 1199.5 | 1060.0 | 908.6  | 874.1  | 862.1  |
| 70°   | 2072.1 | 1455.9 | 697.2  | 770.7  | 827.6  | 961.1  | 1127.5 | 992.6  | 835.1  | 815.6  | 799.2  |
| 72.5° | 986.6  | 814.1  | 635.7  | 697.2  | 733.2  | 845.6  | 1007.6 | 895.1  | 748.2  | 706.2  | 677.7  |
| 75°   | 661.2  | 578.8  | 554.8  | 610.2  | 619.2  | 709.2  | 863.6  | 772.2  | 659.7  | 611.7  | 587.7  |
| 77.5° | 500.8  | 442.3  | 466.3  | 515.8  | 497.8  | 583.2  | 710.7  | 688.2  | 595.2  | 551.8  | 539.8  |
| 80°   | 352.3  | 322.4  | 370.3  | 400.3  | 386.8  | 496.3  | 640.2  | 589.2  | 490.3  | 442.3  | 433.3  |
| 82.5° | 221.9  | 215.9  | 272.9  | 277.4  | 281.9  | 392.8  | 526.3  | 463.3  | 380.8  | 313.4  | 290.9  |
| 85°   | 111.0  | 122.9  | 163.4  | 163.4  | 161.9  | 202.4  | 299.9  | 260.9  | 205.4  | 163.4  | 158.9  |
| 87.5° | 37.5   | 52.5   | 70.5   | 57.0   | 43.5   | 34.5   | 39.0   | 48.0   | 51.0   | 49.5   | 49.5   |
| 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

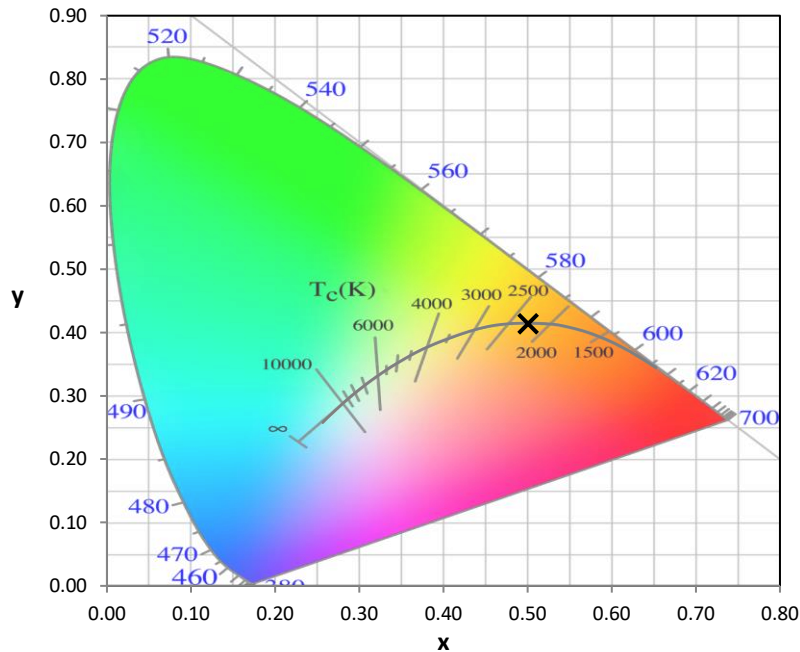
Stabilization Time: 71M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.7/41%  
 Sphere Temperature (°C): 25.6

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)