

Signify Classified - Internal  
Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269



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

Test Report Prepared for

Cooper Lighting Solutions

Brand: McGRAW-EDISON

Report Number: P639080

Luminaire Tested: GWS-SA5B-727-U-SL3-W-HSS

Issue Date: 1/10/2023

**Test Information**

Test Method: LM-79-2019  
Report Number: P639080  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-34)  
Test Lab: COOPER LIGHTING SOLUTIONS  
Issue Date: 1/10/2023  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: McGRAW-EDISON  
Catalog Number: GWS-SA5B-727-U-SL3-W-HSS  
Description: GALLEON WALL SLIM LUMINAIRE. (5) LIGHTSQUARES WITH 16 LEDS EACH AND TYPE III SPILL LIGHT ELIMINATOR OPTICS WITH HOUSE SIDE SHIELD  
Light Source: (80) 2700K CCT, 70 CRI LEDS  
Ballast/Driver: -

**Summary**

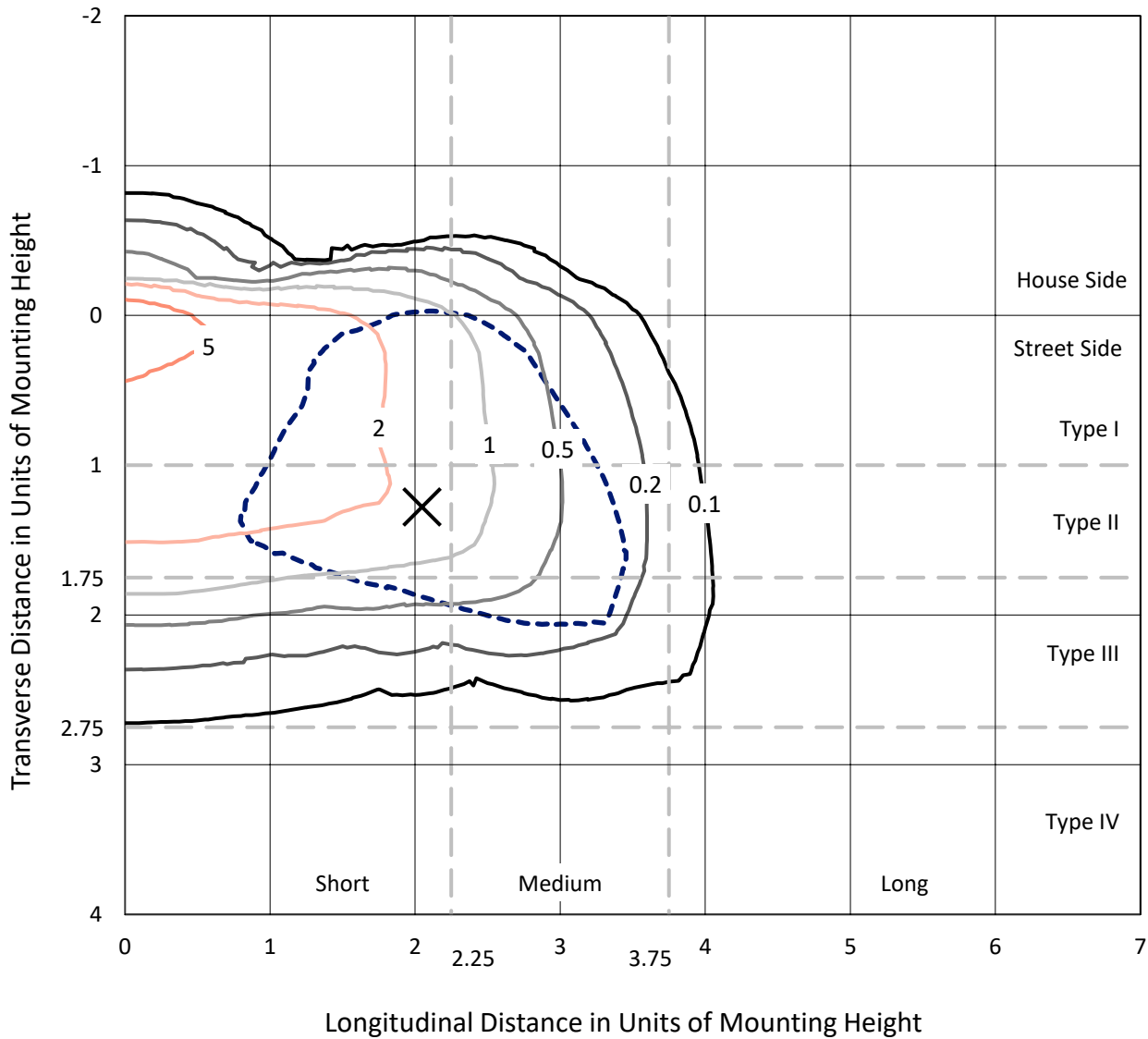
Lumens per Lamp: N/A  
Luminaire Lumens: 12026.6 lumens  
Efficiency: N/A  
Efficacy: 103.9 lumens/watt  
Luminous Opening: Rectangular (W 1.5' x L: 1' x H: 0')  
IES Classification: Type III - Short  
BUG Rating: B1 - U0 - G2  
  
Input Watts (W): 115.7  
Input Voltage (V): 120  
Input Current (Ain): 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

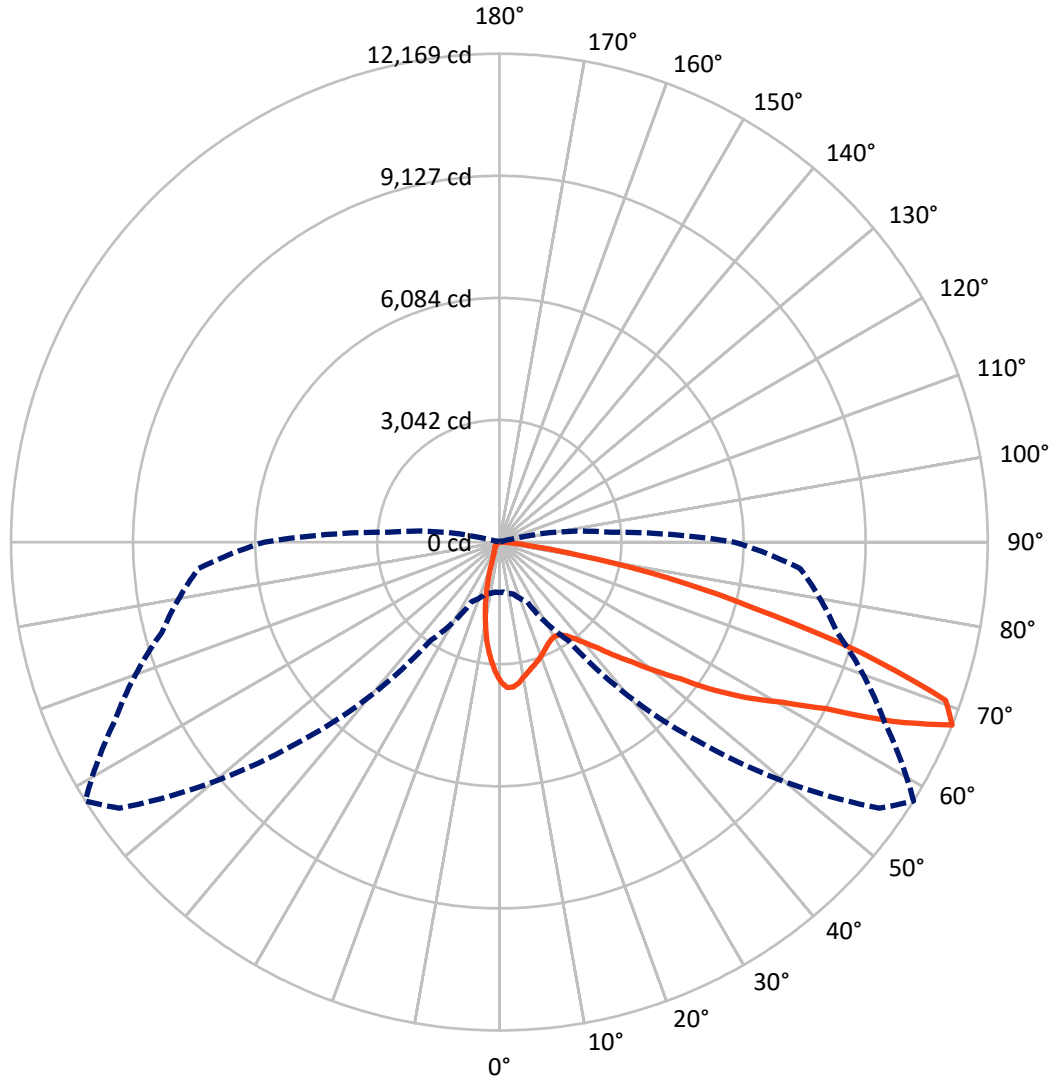
✕ Max cd  
 - - - 1/2 Max cd



Based on 20 foot mounting height. Maximum calculated value = 8.7 fc  
 Type III - Short - N/A

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### Luminous Intensity Polar Plot



— Vertical Plane Through 58-Deg Lateral    - - - Horizontal Cone Through 67.5-Deg Vertical

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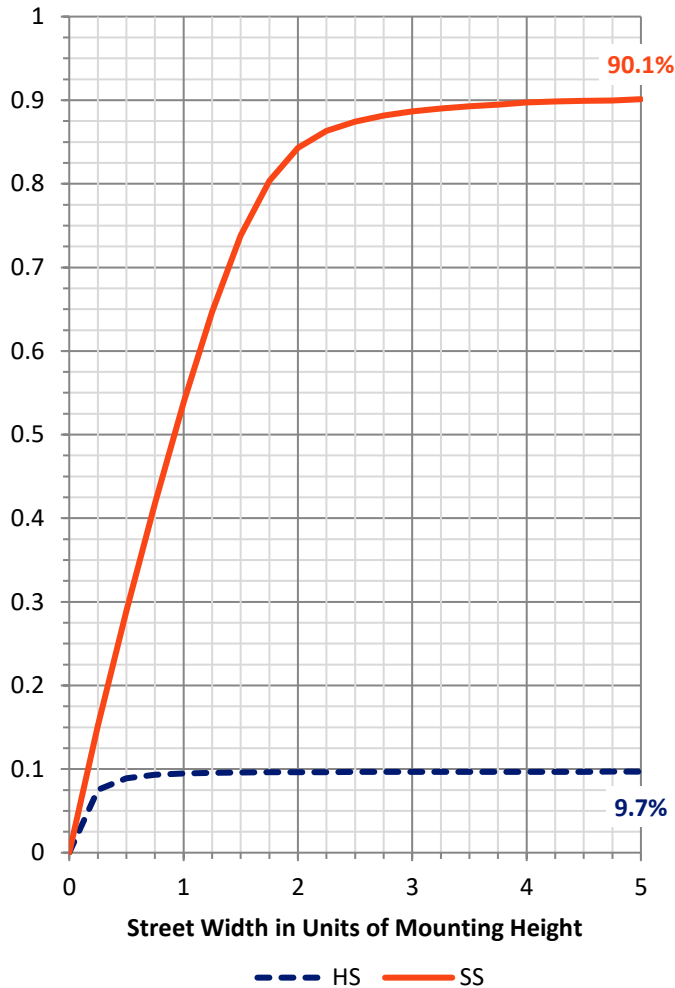
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 1174.9   | 0.0    | 1174.9  |
|                    | % Fixture | 9.8      | 0.0    | 9.8     |
| <b>Street Side</b> | Lumens    | 10851.7  | 0.0    | 10851.7 |
|                    | % Fixture | 90.2     | 0.0    | 90.2    |
| <b>Total</b>       | Lumens    | 12026.6  | 0.0    | 12026.6 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 281.9   | 2.3       |
| 10°-20°   | 586.8   | 4.9       |
| 20°-30°   | 791.3   | 6.6       |
| 30°-40°   | 1112.0  | 9.2       |
| 40°-50°   | 1717.4  | 14.3      |
| 50°-60°   | 2746.3  | 22.8      |
| 60°-70°   | 3251.8  | 27.0      |
| 70°-80°   | 1438.5  | 12.0      |
| 80°-90°   | 100.6   | 0.8       |
| 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°    | 12026.6 | 100.0     |
| 0°-180°   | 12026.6 | 100.0     |

**Coefficient of Utilization**



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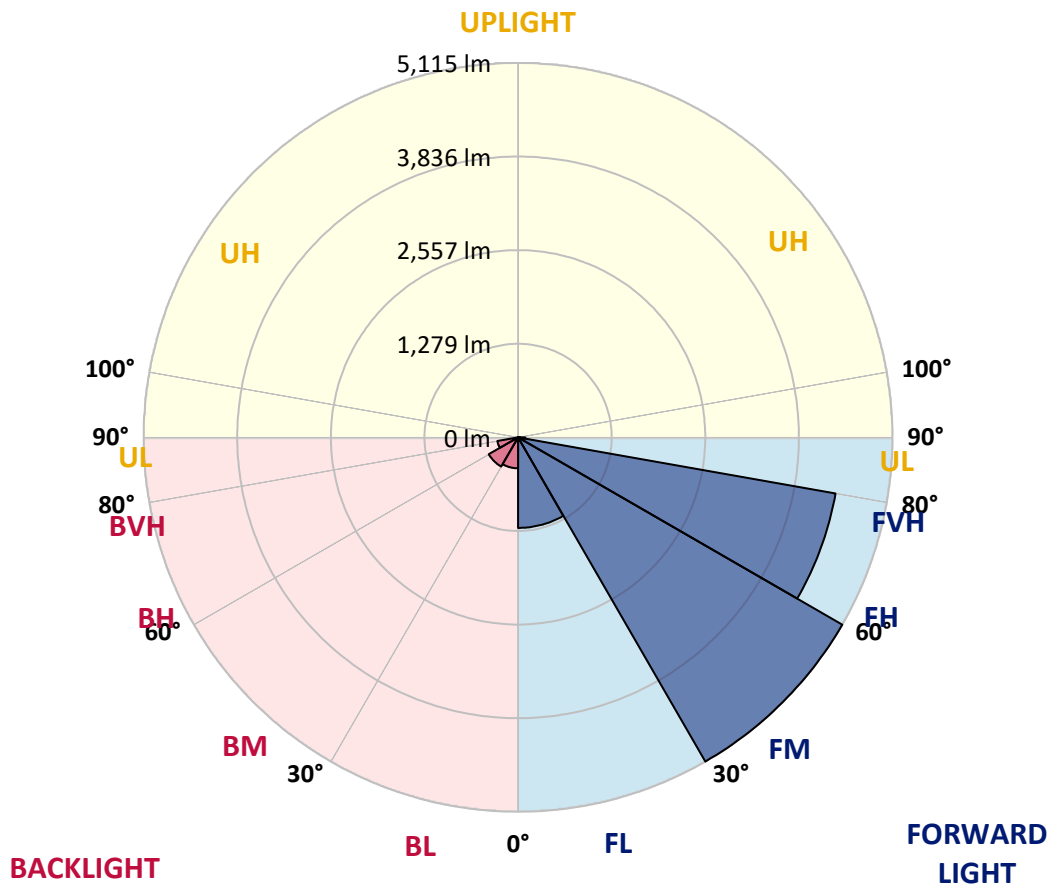
CATALOG NUMBER: GWS-SA5B-727-U-SL3-W-HSS

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

| Zone           | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|----------------|--------|-----------|-------------------------|------|---------|
|                |        |           | B                       | U    | G       |
| FL (0°-30°)    | 1237.2 | 10.3      |                         |      |         |
| FM (30°-60°)   | 5114.7 | 42.5      |                         |      |         |
| FH (60°-80°)   | 4403.5 | 36.6      |                         |      | G2/5000 |
| FVH (80°-90°)  | 96.3   | 0.8       |                         |      | G1/100  |
| BL (0°-30°)    | 422.8  | 3.5       | B1/500                  |      |         |
| BM (30°-60°)   | 461.0  | 3.8       | B1/1000                 |      |         |
| BH (60°-80°)   | 286.8  | 2.4       | B1/500                  |      | G1/500  |
| BVH (80°-90°)  | 4.3    | 0.0       |                         |      | G0/10   |
| UL (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B1-U0-G2**

Type III Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°     | 58°     | 65°     | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|---------|---------|---------|--------|--------|
| 0°    | 3469.0 | 3469.0 | 3469.0 | 3469.0 | 3469.0 | 3469.0 | 3469.0  | 3469.0  | 3469.0  | 3469.0 | 3469.0 |
| 2.5°  | 3648.9 | 3655.3 | 3663.8 | 3674.5 | 3672.3 | 3662.8 | 3651.1  | 3624.4  | 3607.4  | 3554.2 | 3489.3 |
| 5°    | 3531.8 | 3530.8 | 3552.1 | 3572.3 | 3608.5 | 3627.6 | 3654.2  | 3629.8  | 3621.3  | 3557.4 | 3452.0 |
| 7.5°  | 3303.0 | 3314.7 | 3339.2 | 3371.1 | 3423.3 | 3479.7 | 3543.5  | 3536.1  | 3561.6  | 3519.1 | 3388.1 |
| 10°   | 3078.4 | 3072.0 | 3110.3 | 3158.2 | 3238.1 | 3310.4 | 3403.0  | 3402.0  | 3469.0  | 3464.8 | 3315.8 |
| 12.5° | 2881.5 | 2880.4 | 2910.2 | 2964.5 | 3058.2 | 3159.3 | 3284.9  | 3288.1  | 3371.1  | 3405.2 | 3254.0 |
| 15°   | 2715.4 | 2717.5 | 2746.3 | 2802.7 | 2899.6 | 3023.0 | 3168.9  | 3195.5  | 3289.1  | 3358.3 | 3193.3 |
| 17.5° | 2597.3 | 2598.3 | 2615.3 | 2664.3 | 2759.0 | 2891.0 | 3066.7  | 3102.9  | 3223.1  | 3323.2 | 3144.4 |
| 20°   | 2543.0 | 2538.7 | 2541.9 | 2566.4 | 2639.8 | 2760.1 | 2962.4  | 3009.2  | 3162.5  | 3298.7 | 3099.7 |
| 22.5° | 2550.4 | 2544.0 | 2529.1 | 2525.9 | 2558.9 | 2650.5 | 2851.7  | 2909.1  | 3096.5  | 3283.8 | 3059.2 |
| 25°   | 2616.4 | 2602.6 | 2581.3 | 2549.4 | 2536.6 | 2582.4 | 2754.8  | 2814.4  | 3034.7  | 3284.9 | 3028.4 |
| 27.5° | 2717.5 | 2702.6 | 2676.0 | 2633.4 | 2583.4 | 2564.3 | 2688.8  | 2745.2  | 2991.1  | 3309.4 | 3013.5 |
| 30°   | 2846.3 | 2834.6 | 2809.1 | 2758.0 | 2690.9 | 2612.2 | 2675.0  | 2721.8  | 2969.8  | 3359.4 | 3019.8 |
| 32.5° | 2998.5 | 2990.0 | 2968.7 | 2921.9 | 2845.3 | 2725.0 | 2721.8  | 2758.0  | 2986.8  | 3431.8 | 3044.3 |
| 35°   | 3145.4 | 3148.6 | 3149.7 | 3124.2 | 3042.2 | 2896.4 | 2850.6  | 2863.4  | 3057.1  | 3540.4 | 3099.7 |
| 37.5° | 3304.0 | 3296.6 | 3334.9 | 3353.0 | 3274.2 | 3118.8 | 3049.6  | 3050.7  | 3191.2  | 3701.1 | 3204.0 |
| 40°   | 3424.3 | 3426.5 | 3509.5 | 3584.0 | 3551.0 | 3400.9 | 3301.9  | 3300.9  | 3397.7  | 3921.4 | 3372.2 |
| 42.5° | 3537.2 | 3551.0 | 3673.4 | 3801.1 | 3846.9 | 3713.9 | 3642.5  | 3615.9  | 3687.2  | 4219.5 | 3624.4 |
| 45°   | 3657.4 | 3677.7 | 3849.0 | 4031.1 | 4151.3 | 4072.6 | 4016.2  | 4026.8  | 4035.3  | 4566.5 | 3964.0 |
| 47.5° | 3798.0 | 3810.7 | 4022.5 | 4279.1 | 4503.7 | 4483.5 | 4486.6  | 4473.9  | 4469.6  | 5004.0 | 4413.2 |
| 50°   | 3968.3 | 3998.1 | 4241.8 | 4548.4 | 4854.9 | 4989.1 | 5033.8  | 5039.1  | 4969.9  | 5480.8 | 4878.4 |
| 52.5° | 4330.2 | 4366.4 | 4575.0 | 4843.2 | 5238.1 | 5520.2 | 5702.2  | 5666.1  | 5559.6  | 5942.8 | 5388.2 |
| 55°   | 4757.0 | 4784.7 | 4985.9 | 5263.7 | 5706.5 | 6102.5 | 6534.6  | 6519.7  | 6259.0  | 6429.3 | 5807.6 |
| 57.5° | 4797.5 | 4828.3 | 5140.2 | 5566.0 | 6307.9 | 6822.0 | 7276.6  | 7324.5  | 6942.3  | 6774.1 | 6182.3 |
| 60°   | 4342.9 | 4405.8 | 4831.5 | 5404.2 | 6537.8 | 7789.6 | 8089.8  | 8099.4  | 7443.7  | 7124.4 | 6640.0 |
| 62.5° | 3480.7 | 3510.5 | 3939.5 | 4686.8 | 6183.4 | 8353.8 | 9332.0  | 9129.8  | 8087.7  | 7666.2 | 7364.9 |
| 65°   | 1824.5 | 1945.8 | 2319.4 | 3146.5 | 5014.6 | 8156.9 | 10826.5 | 10771.1 | 9245.8  | 8442.1 | 7929.1 |
| 67.5° | 1251.8 | 1250.7 | 1339.1 | 1640.3 | 2990.0 | 7023.2 | 11559.9 | 12168.8 | 10584.9 | 8708.2 | 7520.3 |
| 70°   | 952.7  | 955.9  | 1034.6 | 1230.5 | 1548.8 | 4675.1 | 10755.2 | 11796.2 | 10834.0 | 7906.7 | 6082.3 |
| 72.5° | 632.3  | 638.7  | 769.6  | 994.2  | 1236.9 | 2291.8 | 8358.0  | 9438.5  | 9115.9  | 6350.5 | 4281.2 |
| 75°   | 377.9  | 383.2  | 476.9  | 722.8  | 1099.6 | 1282.7 | 5310.5  | 6525.1  | 6274.9  | 4377.0 | 2294.9 |
| 77.5° | 155.4  | 159.7  | 244.8  | 450.3  | 804.7  | 996.3  | 2936.8  | 4269.5  | 3758.6  | 1740.4 | 627.0  |
| 80°   | 64.9   | 67.1   | 118.2  | 315.1  | 580.1  | 624.8  | 1360.4  | 2006.5  | 1540.3  | 374.7  | 191.6  |
| 82.5° | 23.4   | 24.5   | 43.6   | 173.5  | 360.8  | 470.5  | 686.6   | 793.0   | 434.3   | 122.4  | 103.3  |
| 85°   | 1.1    | 1.1    | 10.6   | 58.5   | 137.3  | 133.1  | 392.8   | 380.0   | 143.7   | 51.1   | 61.7   |
| 87.5° | 0.0    | 0.0    | 1.1    | 1.1    | 2.1    | 5.3    | 37.3    | 66.0    | 30.9    | 12.8   | 26.6   |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0     | 0.0     | 0.0     | 0.0    | 0.0    |



REPORT NUMBER: P639080

CATALOG NUMBER: GWS-SA5B-727-U-SL3-W-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 3469.0 | 3469.0 | 3469.0 | 3469.0 | 3469.0 | 3469.0 | 3469.0 | 3469.0 | 3469.0 | 3469.0 | 3469.0 |
| 2.5°  | 3446.7 | 3390.3 | 3328.5 | 3271.0 | 3179.5 | 3125.2 | 3058.2 | 3028.4 | 2985.8 | 2975.1 | 2981.5 |
| 5°    | 3376.4 | 3279.6 | 3131.6 | 2997.5 | 2824.0 | 2684.5 | 2544.0 | 2484.4 | 2407.8 | 2356.7 | 2335.4 |
| 7.5°  | 3277.4 | 3150.8 | 2919.8 | 2676.0 | 2437.6 | 2183.2 | 1989.5 | 1861.7 | 1745.7 | 1681.8 | 1669.1 |
| 10°   | 3177.4 | 3012.4 | 2681.3 | 2332.2 | 1962.8 | 1658.4 | 1396.6 | 1202.8 | 1045.3 | 974.0  | 918.6  |
| 12.5° | 3074.1 | 2868.7 | 2438.7 | 1983.1 | 1554.1 | 1139.0 | 815.4  | 627.0  | 514.1  | 469.4  | 476.9  |
| 15°   | 2979.4 | 2730.3 | 2198.1 | 1633.9 | 1094.3 | 687.6  | 450.3  | 380.0  | 353.4  | 344.9  | 343.8  |
| 17.5° | 2888.9 | 2599.4 | 1958.6 | 1294.4 | 721.7  | 421.5  | 344.9  | 327.8  | 320.4  | 316.1  | 316.1  |
| 20°   | 2806.9 | 2473.8 | 1724.4 | 975.0  | 466.2  | 334.2  | 311.9  | 303.4  | 297.0  | 293.8  | 293.8  |
| 22.5° | 2730.3 | 2352.4 | 1495.5 | 689.8  | 343.8  | 300.2  | 286.3  | 277.8  | 270.4  | 266.1  | 266.1  |
| 25°   | 2661.1 | 2242.8 | 1277.3 | 474.7  | 295.9  | 274.6  | 259.7  | 250.1  | 237.4  | 229.9  | 229.9  |
| 27.5° | 2611.1 | 2144.9 | 1067.6 | 345.9  | 267.2  | 247.0  | 229.9  | 217.1  | 203.3  | 194.8  | 192.7  |
| 30°   | 2581.3 | 2061.8 | 855.8  | 284.2  | 240.6  | 220.3  | 201.2  | 185.2  | 169.2  | 160.7  | 159.7  |
| 32.5° | 2564.3 | 1985.2 | 662.1  | 248.0  | 218.2  | 194.8  | 173.5  | 156.5  | 140.5  | 130.9  | 129.9  |
| 35°   | 2570.6 | 1925.6 | 496.0  | 223.5  | 196.9  | 172.4  | 149.0  | 132.0  | 118.2  | 109.6  | 107.5  |
| 37.5° | 2626.0 | 1899.0 | 372.6  | 204.4  | 178.8  | 153.3  | 128.8  | 112.8  | 100.1  | 93.7   | 92.6   |
| 40°   | 2733.5 | 1904.3 | 292.7  | 189.5  | 163.9  | 134.1  | 110.7  | 95.8   | 86.2   | 80.9   | 79.8   |
| 42.5° | 2900.6 | 1949.0 | 241.6  | 176.7  | 148.0  | 117.1  | 95.8   | 84.1   | 74.5   | 69.2   | 68.1   |
| 45°   | 3149.7 | 2041.6 | 210.8  | 161.8  | 130.9  | 101.1  | 83.0   | 72.4   | 63.9   | 57.5   | 56.4   |
| 47.5° | 3510.5 | 2202.3 | 190.5  | 148.0  | 116.0  | 87.3   | 71.3   | 60.7   | 53.2   | 47.9   | 46.8   |
| 50°   | 3894.8 | 2395.0 | 173.5  | 134.1  | 103.3  | 75.6   | 60.7   | 50.0   | 43.6   | 38.3   | 37.3   |
| 52.5° | 4304.6 | 2602.6 | 160.7  | 121.3  | 91.5   | 64.9   | 51.1   | 41.5   | 35.1   | 29.8   | 28.7   |
| 55°   | 4698.5 | 2811.2 | 145.8  | 112.8  | 77.7   | 55.4   | 42.6   | 34.1   | 27.7   | 23.4   | 23.4   |
| 57.5° | 5081.7 | 3002.8 | 129.9  | 99.0   | 63.9   | 46.8   | 35.1   | 27.7   | 22.4   | 19.2   | 18.1   |
| 60°   | 5539.4 | 3267.9 | 111.8  | 84.1   | 53.2   | 39.4   | 28.7   | 22.4   | 18.1   | 14.9   | 14.9   |
| 62.5° | 6219.6 | 3543.5 | 95.8   | 70.3   | 44.7   | 33.0   | 23.4   | 18.1   | 14.9   | 12.8   | 11.7   |
| 65°   | 6442.0 | 3394.5 | 80.9   | 57.5   | 36.2   | 26.6   | 19.2   | 16.0   | 12.8   | 11.7   | 10.6   |
| 67.5° | 5848.1 | 2782.5 | 67.1   | 46.8   | 29.8   | 22.4   | 17.0   | 13.8   | 11.7   | 10.6   | 9.6    |
| 70°   | 4563.3 | 1974.6 | 52.2   | 35.1   | 24.5   | 18.1   | 14.9   | 12.8   | 10.6   | 9.6    | 9.6    |
| 72.5° | 3103.9 | 1167.7 | 41.5   | 26.6   | 20.2   | 16.0   | 12.8   | 11.7   | 10.6   | 9.6    | 8.5    |
| 75°   | 1528.5 | 415.1  | 31.9   | 20.2   | 16.0   | 13.8   | 11.7   | 10.6   | 9.6    | 8.5    | 8.5    |
| 77.5° | 411.9  | 115.0  | 24.5   | 16.0   | 12.8   | 10.6   | 10.6   | 10.6   | 9.6    | 7.5    | 7.5    |
| 80°   | 139.4  | 47.9   | 18.1   | 11.7   | 10.6   | 8.5    | 7.5    | 9.6    | 8.5    | 7.5    | 6.4    |
| 82.5° | 76.6   | 23.4   | 12.8   | 9.6    | 7.5    | 6.4    | 6.4    | 6.4    | 6.4    | 5.3    | 5.3    |
| 85°   | 49.0   | 12.8   | 8.5    | 7.5    | 7.5    | 5.3    | 4.3    | 4.3    | 3.2    | 3.2    | 3.2    |
| 87.5° | 22.4   | 7.5    | 7.5    | 6.4    | 6.4    | 5.3    | 3.2    | 2.1    | 1.1    | 1.1    | 1.1    |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |



Signify Classified - Internal  
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1121 Highway 74 South  
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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

**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            |

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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 2700K 4-step quadrangle

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**Photopic Flux vs. Wavelength**



**Photopic Lumens: 6211.7**

| 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          | 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

| $\lambda$ (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                              | 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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**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 ( $R_{f,i}$ )**

|            |            |            |            |
|------------|------------|------------|------------|
| 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)