

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: P629183

Luminaire Tested: GWS-SA1B-727-U-SL3-W

Issue Date: 1/10/2023

**Test Information**

Test Method: LM-79-2019  
Report Number: P629183  
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-SA1B-727-U-SL3-W  
Description: GALLEON WALL SLIM LUMINAIRE. (1) LIGHTSQUARES WITH 16 LEDS EACH AND TYPE III SPILL LIGHT ELIMINATOR OPTICS  
Light Source: (16) 2700K CCT, 70 CRI LEDS  
Ballast/Driver: -

**Summary**

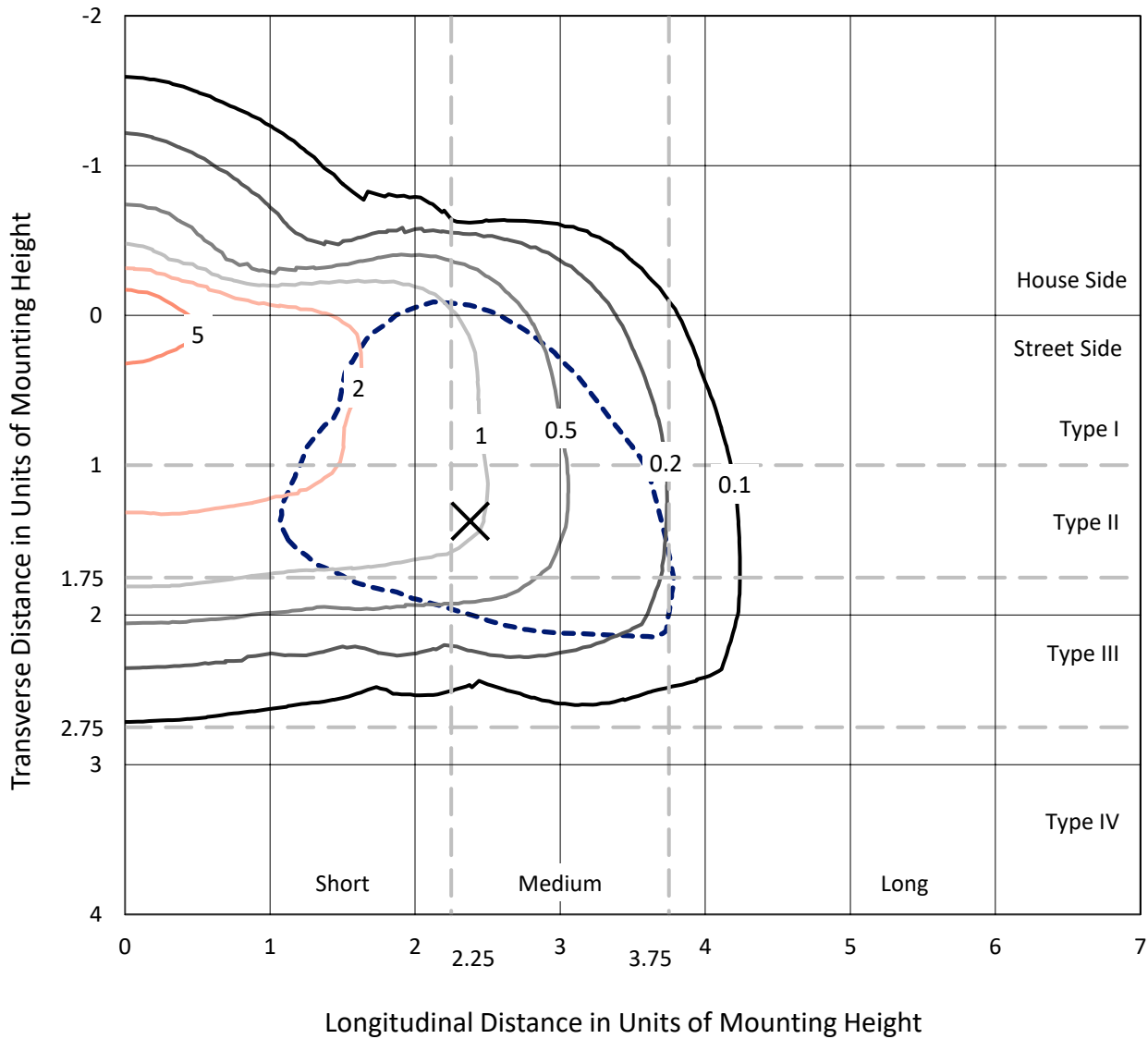
Lumens per Lamp: N/A  
Luminaire Lumens: 2936.8 lumens  
Efficiency: N/A  
Efficacy: 117.5 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 0.5' x H: 0')  
IES Classification: Type III - Medium  
BUG Rating: B1 - U0 - G1  
  
Input Watts (W): 25  
Input Voltage (V): 120  
Input Current (Ain): 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

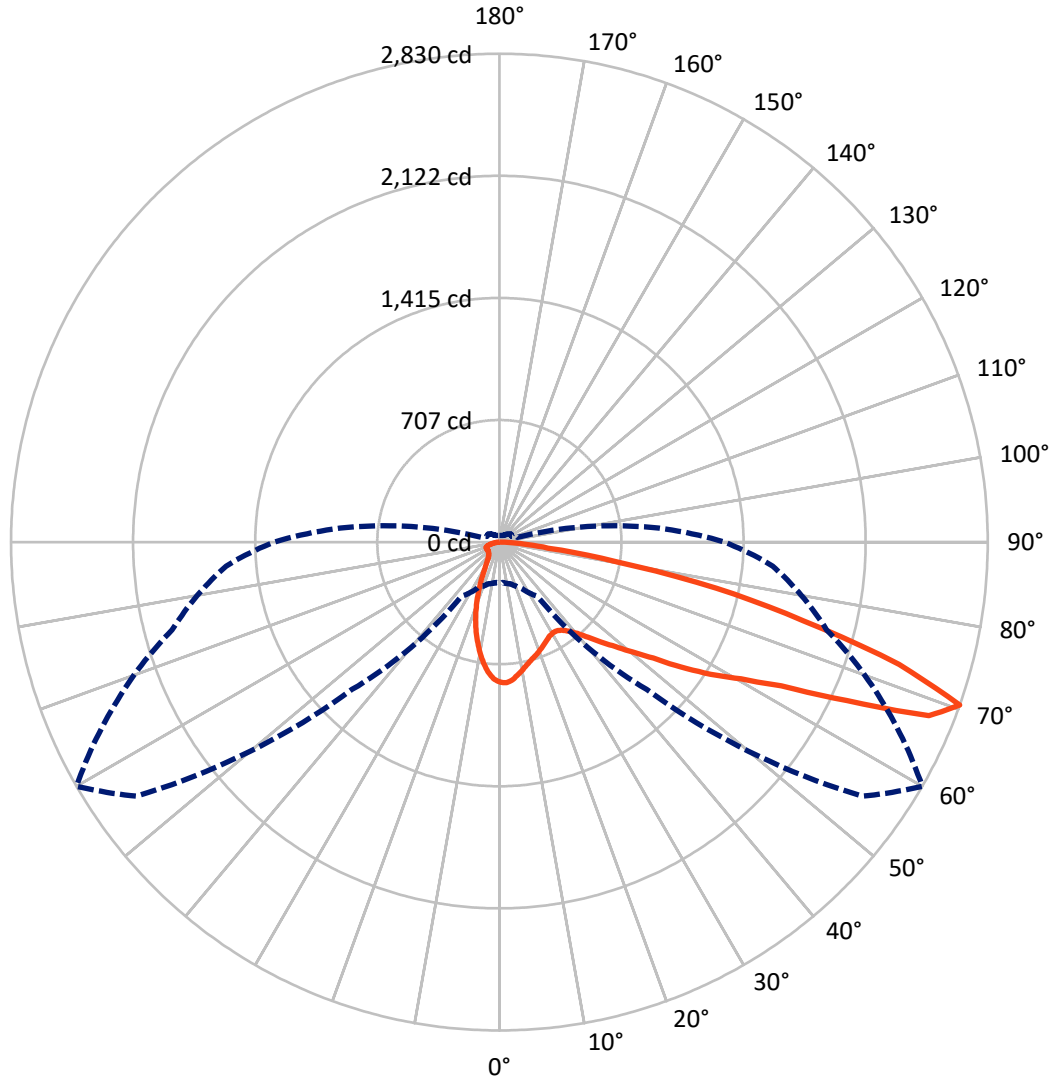
✕ Max cd  
 - - - 1/2 Max cd



Based on 10 foot mounting height. Maximum calculated value = 8.1 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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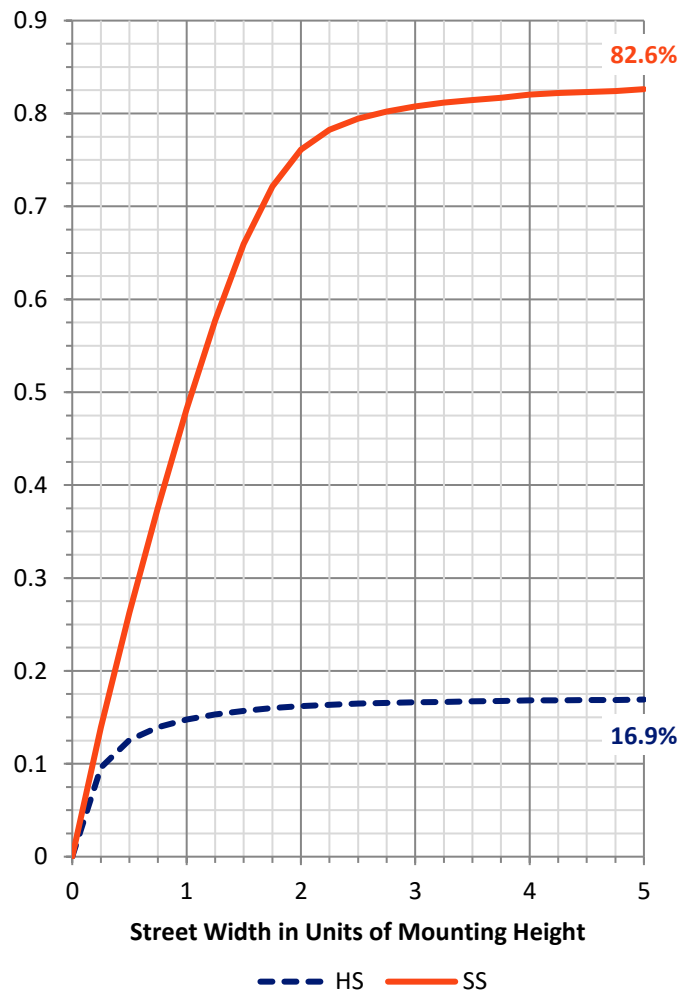
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 502.3    | 0.0    | 502.3  |
|                    | % Fixture | 17.1     | 0.0    | 17.1   |
| <b>Street Side</b> | Lumens    | 2434.5   | 0.0    | 2434.5 |
|                    | % Fixture | 82.9     | 0.0    | 82.9   |
| <b>Total</b>       | Lumens    | 2936.8   | 0.0    | 2936.8 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 70.0   | 2.4       |
| 10°-20°   | 156.9  | 5.3       |
| 20°-30°   | 201.0  | 6.8       |
| 30°-40°   | 264.1  | 9.0       |
| 40°-50°   | 383.2  | 13.0      |
| 50°-60°   | 597.9  | 20.4      |
| 60°-70°   | 782.8  | 26.7      |
| 70°-80°   | 432.8  | 14.7      |
| 80°-90°   | 48.0   | 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°    | 2936.8 | 100.0     |
| 0°-180°   | 2936.8 | 100.0     |

**Coefficient of Utilization**



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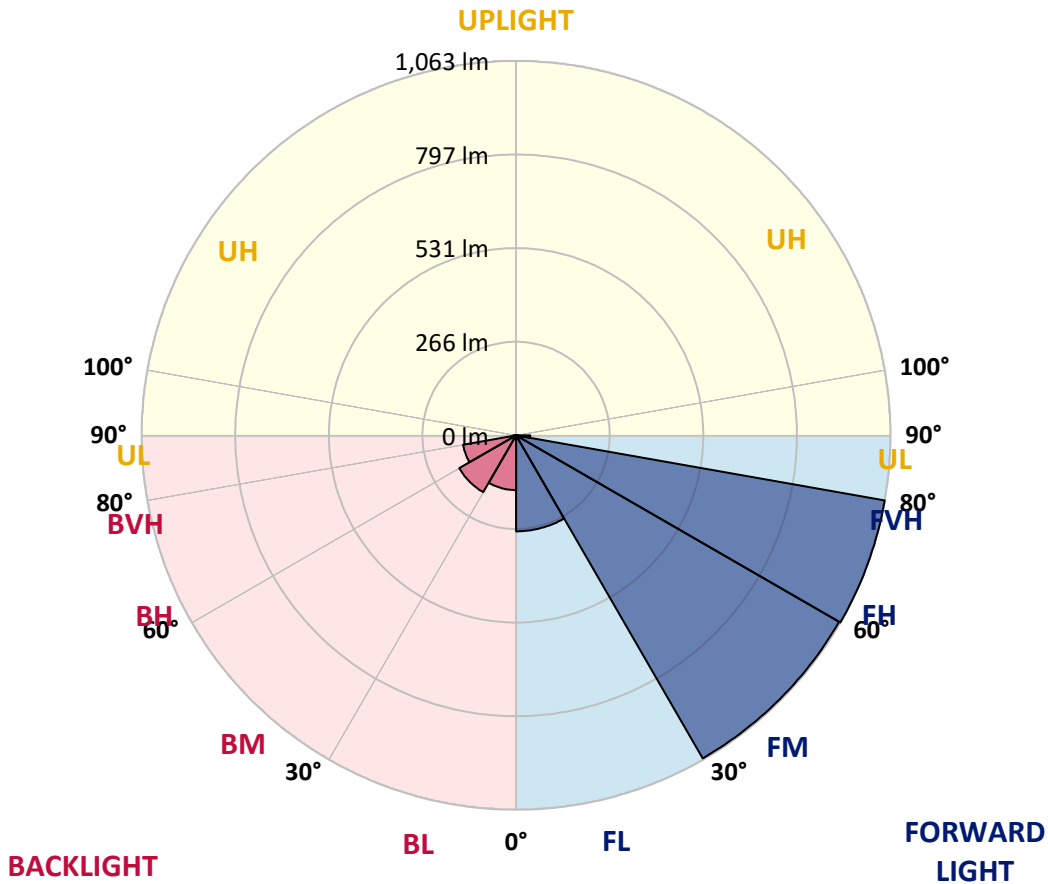
CATALOG NUMBER: GWS-SA1B-727-U-SL3-W

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

| Zone           | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|----------------|--------|-----------|-------------------------|------|---------|
|                |        |           | B                       | U    | G       |
| FL (0°-30°)    | 272.6  | 9.3       |                         |      |         |
| FM (30°-60°)   | 1059.0 | 36.1      |                         |      |         |
| FH (60°-80°)   | 1063.0 | 36.2      |                         |      | G1/1800 |
| FVH (80°-90°)  | 40.0   | 1.4       |                         |      | G1/100  |
| BL (0°-30°)    | 155.4  | 5.3       | B1/500                  |      |         |
| BM (30°-60°)   | 186.2  | 6.3       | B0/220                  |      |         |
| BH (60°-80°)   | 152.6  | 5.2       | B1/500                  |      | G1/500  |
| BVH (80°-90°)  | 8.0    | 0.3       |                         |      | G0/10   |
| UL (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

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

Type III Medium





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 60°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 812.7  | 812.7  | 812.7  | 812.7  | 812.7  | 812.7  | 812.7  | 812.7  | 812.7  | 812.7  | 812.7  |
| 2.5°  | 801.3  | 802.1  | 804.5  | 807.9  | 811.4  | 813.1  | 817.4  | 816.1  | 815.2  | 813.5  | 811.4  |
| 5°    | 765.8  | 767.5  | 769.7  | 776.3  | 783.9  | 789.9  | 799.5  | 800.6  | 801.0  | 801.9  | 798.5  |
| 7.5°  | 720.7  | 721.1  | 726.3  | 735.1  | 745.0  | 755.3  | 771.4  | 775.9  | 779.8  | 784.1  | 781.3  |
| 10°   | 670.8  | 671.9  | 675.8  | 688.5  | 705.4  | 720.7  | 742.4  | 749.9  | 758.1  | 767.5  | 763.7  |
| 12.5° | 630.0  | 630.2  | 636.5  | 650.0  | 668.5  | 689.1  | 716.2  | 725.2  | 735.9  | 750.8  | 747.3  |
| 15°   | 597.6  | 597.6  | 603.4  | 615.0  | 636.2  | 660.5  | 692.8  | 704.4  | 719.0  | 738.9  | 732.9  |
| 17.5° | 571.8  | 572.0  | 575.6  | 587.9  | 606.8  | 633.7  | 671.9  | 687.6  | 703.7  | 730.1  | 721.1  |
| 20°   | 558.2  | 557.2  | 557.8  | 565.3  | 581.4  | 607.4  | 651.1  | 669.3  | 691.0  | 724.1  | 710.4  |
| 22.5° | 557.6  | 555.7  | 552.9  | 553.5  | 563.0  | 584.5  | 628.7  | 650.9  | 678.1  | 719.2  | 699.4  |
| 25°   | 568.6  | 566.4  | 561.5  | 555.9  | 555.0  | 567.9  | 607.7  | 632.8  | 664.8  | 717.0  | 688.9  |
| 27.5° | 587.0  | 585.5  | 579.1  | 570.7  | 561.9  | 561.5  | 591.8  | 618.0  | 655.1  | 719.2  | 681.4  |
| 30°   | 611.5  | 609.0  | 604.9  | 594.1  | 580.8  | 567.1  | 585.5  | 610.0  | 648.7  | 726.1  | 678.1  |
| 32.5° | 639.2  | 637.7  | 633.9  | 623.1  | 609.0  | 587.0  | 590.5  | 611.7  | 648.7  | 738.1  | 678.8  |
| 35°   | 668.7  | 668.5  | 668.5  | 661.4  | 645.7  | 618.4  | 610.0  | 626.4  | 658.6  | 757.4  | 685.7  |
| 37.5° | 697.3  | 697.0  | 703.9  | 706.5  | 688.7  | 659.2  | 643.3  | 655.6  | 680.3  | 786.0  | 702.6  |
| 40°   | 720.5  | 721.3  | 736.4  | 749.3  | 739.4  | 712.1  | 689.7  | 696.0  | 715.5  | 826.6  | 732.3  |
| 42.5° | 743.9  | 746.3  | 768.8  | 791.6  | 795.5  | 771.8  | 749.3  | 752.9  | 766.0  | 880.3  | 776.6  |
| 45°   | 769.5  | 770.5  | 802.1  | 833.9  | 852.6  | 838.7  | 820.2  | 825.1  | 828.1  | 946.7  | 842.5  |
| 47.5° | 794.2  | 797.0  | 837.8  | 881.4  | 916.9  | 915.6  | 905.3  | 903.8  | 904.4  | 1027.5 | 920.5  |
| 50°   | 827.9  | 832.0  | 879.9  | 932.5  | 984.5  | 1008.4 | 1011.4 | 1000.0 | 995.3  | 1117.3 | 1017.6 |
| 52.5° | 891.9  | 891.9  | 934.9  | 986.7  | 1056.5 | 1115.6 | 1135.8 | 1117.1 | 1102.1 | 1212.3 | 1120.8 |
| 55°   | 972.1  | 975.5  | 1009.7 | 1051.6 | 1140.1 | 1228.4 | 1296.8 | 1276.1 | 1233.6 | 1315.7 | 1228.9 |
| 57.5° | 1007.8 | 1012.1 | 1066.2 | 1131.3 | 1249.5 | 1356.7 | 1451.5 | 1444.2 | 1382.1 | 1423.1 | 1341.0 |
| 60°   | 943.3  | 952.3  | 1026.9 | 1136.0 | 1348.5 | 1563.6 | 1630.5 | 1609.2 | 1520.4 | 1535.9 | 1462.6 |
| 62.5° | 786.9  | 796.7  | 879.5  | 1031.8 | 1334.8 | 1787.3 | 1912.6 | 1834.2 | 1693.2 | 1678.4 | 1624.7 |
| 65°   | 469.5  | 469.1  | 568.6  | 770.5  | 1165.3 | 1849.4 | 2359.1 | 2212.8 | 1960.1 | 1873.9 | 1791.4 |
| 67.5° | 298.5  | 297.8  | 318.7  | 408.3  | 775.5  | 1697.3 | 2646.2 | 2684.2 | 2322.6 | 2017.7 | 1805.2 |
| 70°   | 235.5  | 235.3  | 250.3  | 291.2  | 383.5  | 1207.8 | 2566.2 | 2829.5 | 2541.5 | 1962.9 | 1589.4 |
| 72.5° | 171.7  | 172.1  | 195.3  | 243.9  | 295.9  | 606.4  | 2078.0 | 2421.0 | 2337.6 | 1732.7 | 1290.3 |
| 75°   | 123.3  | 124.0  | 137.9  | 186.7  | 272.9  | 331.5  | 1381.8 | 1820.4 | 1778.5 | 1388.9 | 887.6  |
| 77.5° | 78.4   | 79.3   | 91.5   | 130.9  | 220.5  | 267.7  | 837.8  | 1285.2 | 1183.3 | 782.6  | 315.6  |
| 80°   | 47.9   | 50.7   | 61.0   | 97.6   | 176.2  | 200.9  | 418.8  | 677.1  | 592.6  | 214.7  | 106.1  |
| 82.5° | 24.7   | 26.9   | 36.7   | 60.4   | 121.4  | 176.4  | 237.0  | 284.5  | 183.5  | 89.8   | 56.5   |
| 85°   | 7.7    | 9.0    | 12.9   | 24.5   | 57.8   | 109.4  | 156.9  | 141.4  | 84.2   | 42.3   | 26.2   |
| 87.5° | 1.9    | 1.9    | 2.1    | 2.1    | 2.4    | 4.9    | 30.3   | 32.0   | 22.3   | 13.3   | 10.7   |
| 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: P629183  
 CATALOG NUMBER: GWS-SA1B-727-U-SL3-W

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 812.7  | 812.7  | 812.7 | 812.7 | 812.7 | 812.7 | 812.7 | 812.7 | 812.7 | 812.7 | 812.7 |
| 2.5°  | 807.1  | 801.9  | 799.8 | 799.5 | 794.2 | 786.4 | 781.3 | 777.6 | 775.5 | 775.0 | 775.0 |
| 5°    | 792.7  | 786.0  | 777.2 | 770.5 | 756.1 | 741.5 | 729.3 | 722.4 | 714.5 | 713.4 | 713.2 |
| 7.5°  | 773.5  | 763.9  | 747.1 | 728.4 | 703.3 | 679.0 | 658.4 | 644.4 | 630.4 | 627.9 | 627.0 |
| 10°   | 752.9  | 739.8  | 711.2 | 678.4 | 640.8 | 604.4 | 572.9 | 548.1 | 531.8 | 520.2 | 518.1 |
| 12.5° | 732.5  | 715.1  | 673.2 | 624.2 | 572.6 | 523.0 | 475.5 | 435.1 | 405.9 | 388.9 | 385.9 |
| 15°   | 713.4  | 689.1  | 631.7 | 569.2 | 502.2 | 434.3 | 367.0 | 314.6 | 273.5 | 258.9 | 255.5 |
| 17.5° | 696.0  | 665.7  | 591.5 | 512.3 | 428.7 | 339.9 | 263.4 | 216.8 | 192.7 | 185.4 | 183.7 |
| 20°   | 678.6  | 641.6  | 550.7 | 452.3 | 350.7 | 251.2 | 192.5 | 170.6 | 161.6 | 158.8 | 157.9 |
| 22.5° | 659.9  | 615.2  | 506.2 | 393.2 | 271.8 | 188.0 | 157.5 | 147.8 | 145.0 | 145.3 | 145.0 |
| 25°   | 641.2  | 588.3  | 459.6 | 329.0 | 202.4 | 152.6 | 137.5 | 133.9 | 134.5 | 136.4 | 136.9 |
| 27.5° | 625.7  | 564.5  | 413.8 | 258.5 | 158.1 | 131.3 | 124.2 | 124.0 | 126.3 | 128.9 | 129.4 |
| 30°   | 614.5  | 543.2  | 368.7 | 198.8 | 130.2 | 116.7 | 113.9 | 115.2 | 118.0 | 119.9 | 120.5 |
| 32.5° | 606.6  | 524.9  | 320.6 | 156.2 | 114.1 | 106.4 | 105.1 | 106.4 | 108.1 | 110.0 | 110.4 |
| 35°   | 603.8  | 511.6  | 273.3 | 127.4 | 103.1 | 98.8  | 98.0  | 98.6  | 99.5  | 100.6 | 101.0 |
| 37.5° | 610.0  | 505.0  | 223.9 | 110.9 | 96.5  | 93.9  | 92.6  | 92.2  | 92.4  | 92.8  | 93.0  |
| 40°   | 628.5  | 508.0  | 183.5 | 101.2 | 92.2  | 89.8  | 87.7  | 86.8  | 86.6  | 87.0  | 86.8  |
| 42.5° | 660.3  | 520.6  | 154.3 | 95.6  | 88.7  | 85.3  | 82.9  | 82.1  | 82.1  | 83.2  | 83.2  |
| 45°   | 706.9  | 545.6  | 133.2 | 91.5  | 85.7  | 81.4  | 78.9  | 78.4  | 79.3  | 81.0  | 81.2  |
| 47.5° | 775.3  | 582.1  | 120.5 | 88.5  | 82.9  | 78.0  | 75.4  | 75.2  | 76.9  | 79.7  | 79.9  |
| 50°   | 856.3  | 634.7  | 113.7 | 86.4  | 81.0  | 75.2  | 72.6  | 72.8  | 74.8  | 77.8  | 78.4  |
| 52.5° | 953.8  | 706.5  | 114.1 | 85.5  | 79.9  | 73.5  | 70.9  | 70.5  | 72.4  | 75.4  | 76.1  |
| 55°   | 1054.6 | 793.7  | 122.5 | 85.7  | 78.4  | 72.6  | 69.2  | 67.7  | 69.4  | 71.6  | 71.8  |
| 57.5° | 1165.5 | 892.2  | 143.3 | 85.3  | 76.5  | 71.8  | 67.7  | 64.2  | 65.3  | 66.6  | 67.3  |
| 60°   | 1290.5 | 1008.0 | 188.2 | 86.2  | 75.6  | 69.8  | 64.7  | 60.2  | 59.9  | 60.8  | 61.0  |
| 62.5° | 1457.7 | 1165.5 | 238.7 | 87.7  | 77.6  | 67.5  | 60.2  | 55.4  | 54.6  | 55.0  | 55.2  |
| 65°   | 1585.5 | 1240.7 | 222.8 | 86.4  | 81.7  | 65.8  | 55.9  | 50.9  | 49.2  | 48.8  | 48.8  |
| 67.5° | 1533.6 | 1141.2 | 155.1 | 82.9  | 83.6  | 66.0  | 52.4  | 46.2  | 44.0  | 43.0  | 42.8  |
| 70°   | 1304.9 | 927.0  | 107.9 | 79.5  | 81.4  | 65.5  | 48.8  | 42.3  | 39.5  | 38.0  | 37.8  |
| 72.5° | 1031.0 | 707.8  | 87.2  | 72.6  | 73.9  | 59.1  | 43.4  | 38.0  | 35.7  | 33.7  | 33.7  |
| 75°   | 663.5  | 431.9  | 72.8  | 64.7  | 60.4  | 46.0  | 37.6  | 33.9  | 31.6  | 29.7  | 29.7  |
| 77.5° | 223.3  | 160.3  | 56.5  | 54.8  | 45.1  | 34.6  | 31.6  | 29.2  | 27.3  | 25.6  | 25.4  |
| 80°   | 90.7   | 76.1   | 41.5  | 41.5  | 31.6  | 26.4  | 24.7  | 23.6  | 22.3  | 20.2  | 20.2  |
| 82.5° | 52.6   | 46.2   | 29.0  | 25.1  | 21.1  | 18.3  | 17.2  | 16.1  | 16.1  | 14.6  | 14.6  |
| 85°   | 25.4   | 25.6   | 17.4  | 15.5  | 12.0  | 10.5  | 10.1  | 9.5   | 9.2   | 8.4   | 8.2   |
| 87.5° | 13.8   | 14.0   | 8.8   | 6.9   | 4.7   | 4.1   | 3.4   | 3.2   | 3.0   | 2.8   | 2.8   |
| 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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Peachtree City, GA 30269



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            |

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

CIE 1931 Chromaticity Diagram



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



Point lies inside the ANSI 2700K 4-step quadrangle

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

**Photopic Flux vs. Wavelength**



**Photopic Lumens: 6211.7**

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

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Scotopic Flux vs. Wavelength



Scotopic Lumens: 6474.3

S/P: 1.04

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

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Melanopic Flux vs. Wavelength



Melanopic Lumens: 2145.7 M/P: 0.35

| $\lambda$ (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)