

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: P629693

Luminaire Tested: GWS-SA1C-727-U-T2-W

Issue Date: 1/10/2023

**Test Information**

Test Method: LM-79-2019  
Report Number: P629693  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-19)  
Test Lab: COOPER LIGHTING SOLUTIONS  
Issue Date: 1/10/2023  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: McGRAW-EDISON  
Catalog Number: GWS-SA1C-727-U-T2-W  
Description: GALLEON WALL SLIM LUMINAIRE. (1) LIGHTSQUARES WITH 16 LEDS EACH AND TYPE II OPTICS  
Light Source: (16) 2700K CCT, 70 CRI LEDS  
Ballast/Driver: -

**Summary**

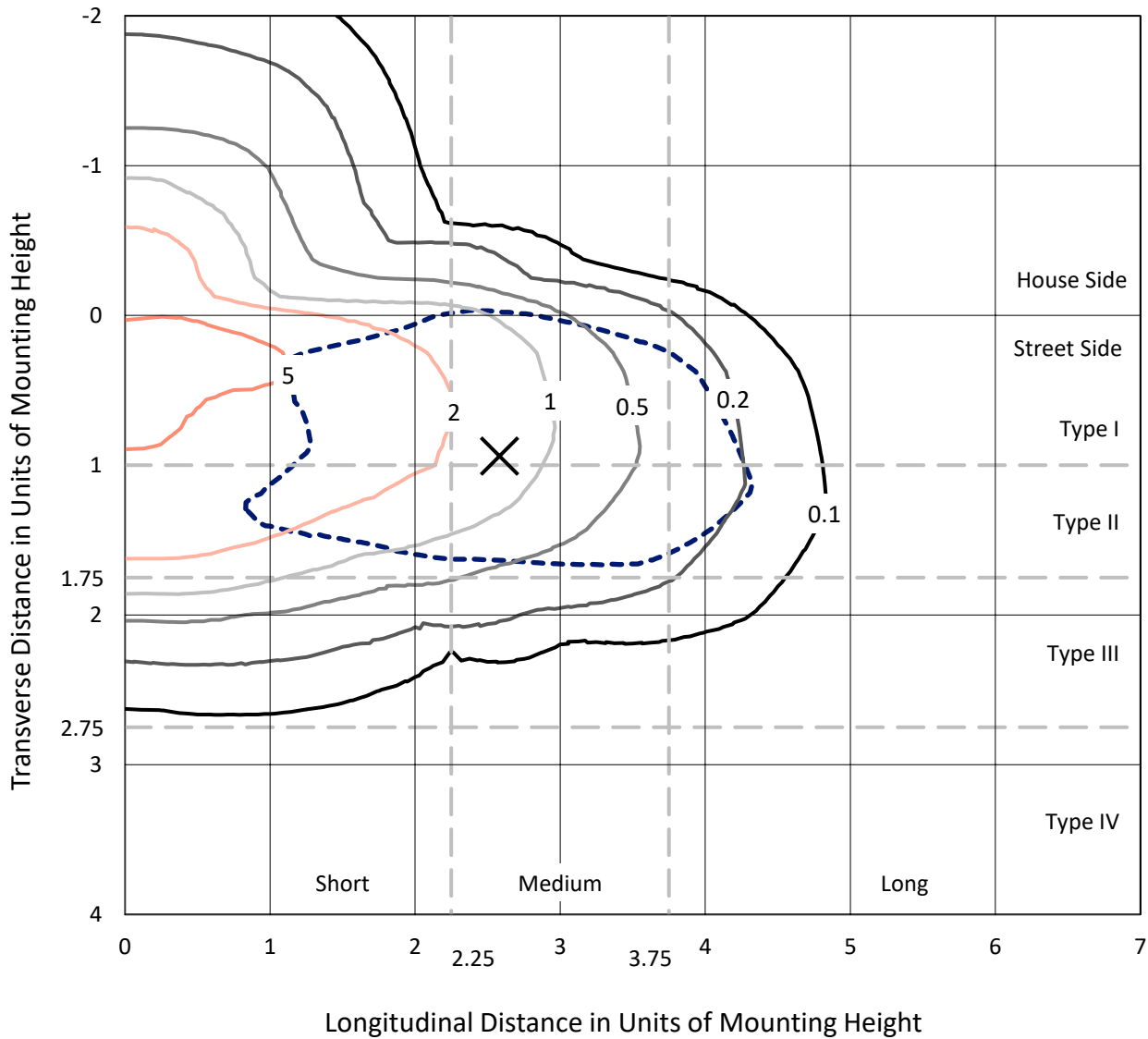
Lumens per Lamp: N/A  
Luminaire Lumens: 3988.2 lumens  
Efficiency: N/A  
Efficacy: 117.0 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 0.5' x H: 0')  
IES Classification: Type II - Medium  
BUG Rating: B1 - U0 - G1  
  
Input Watts (W): 34.1  
Input Voltage (V): 120  
Input Current (Ain): 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: P629693  
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### Iso-Footcandle Lines of Horizontal Illumination

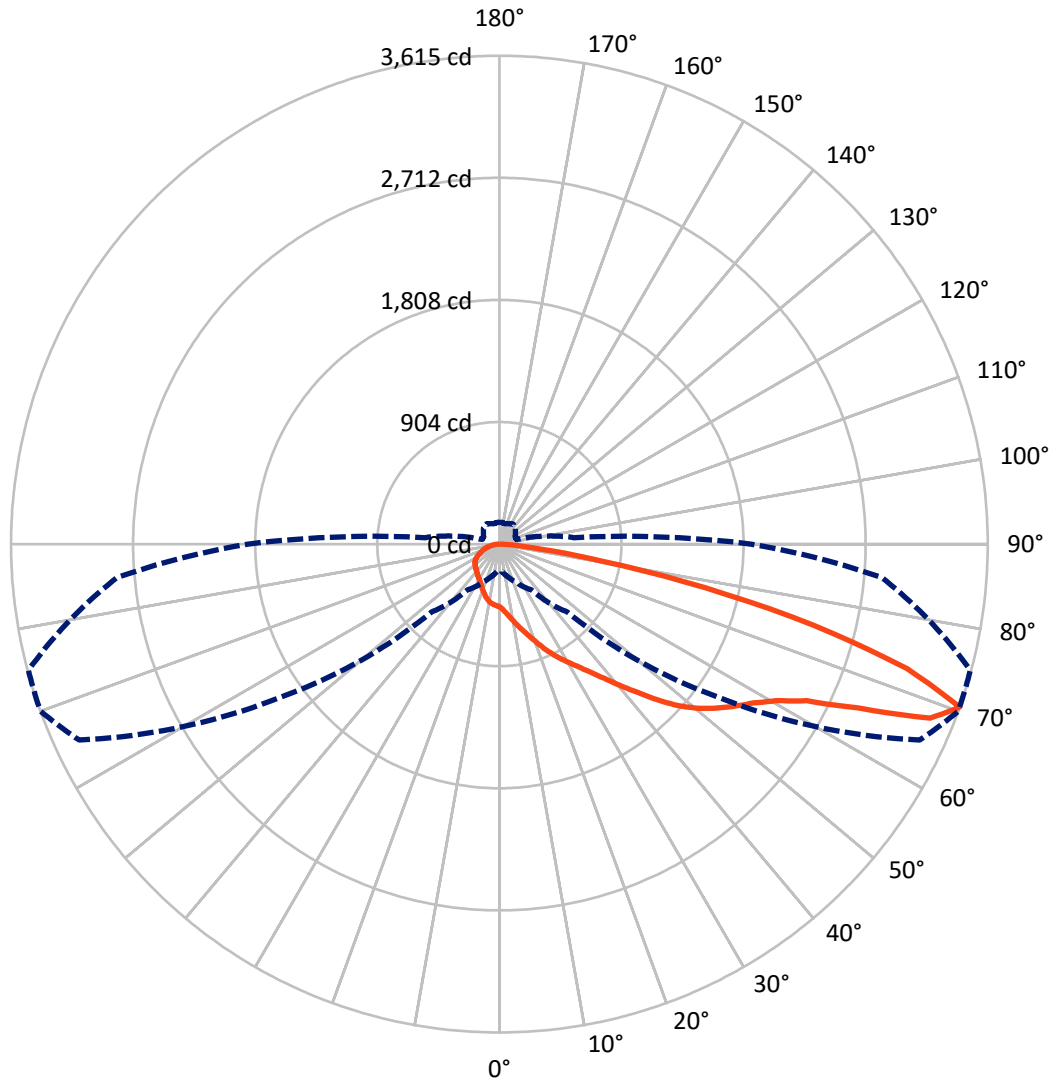
✕ Max cd  
 - - - 1/2 Max cd



Based on 10 foot mounting height. Maximum calculated value = 6.7 fc  
 Type II - Medium - N/A

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### Luminous Intensity Polar Plot



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

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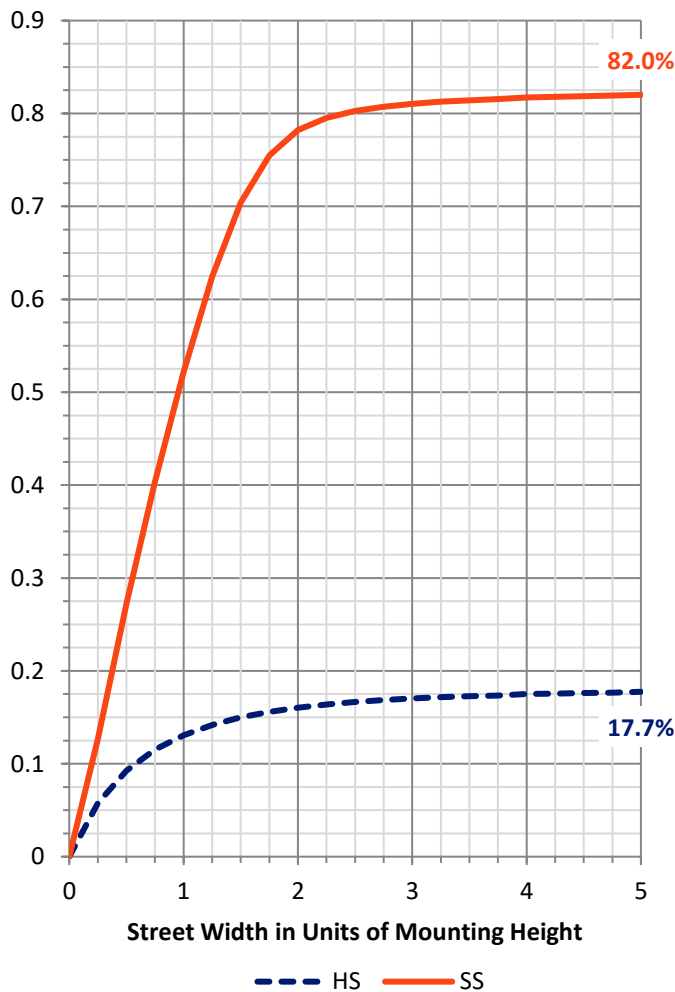
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 714.7    | 0.0    | 714.7  |
|                    | % Fixture | 17.9     | 0.0    | 17.9   |
| <b>Street Side</b> | Lumens    | 3273.5   | 0.0    | 3273.5 |
|                    | % Fixture | 82.1     | 0.0    | 82.1   |
| <b>Total</b>       | Lumens    | 3988.2   | 0.0    | 3988.2 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 47.3   | 1.2       |
| 10°-20°   | 153.8  | 3.9       |
| 20°-30°   | 272.4  | 6.8       |
| 30°-40°   | 410.0  | 10.3      |
| 40°-50°   | 620.3  | 15.6      |
| 50°-60°   | 888.6  | 22.3      |
| 60°-70°   | 982.2  | 24.6      |
| 70°-80°   | 554.3  | 13.9      |
| 80°-90°   | 59.3   | 1.5       |
| 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°    | 3988.2 | 100.0     |
| 0°-180°   | 3988.2 | 100.0     |

**Coefficient of Utilization**



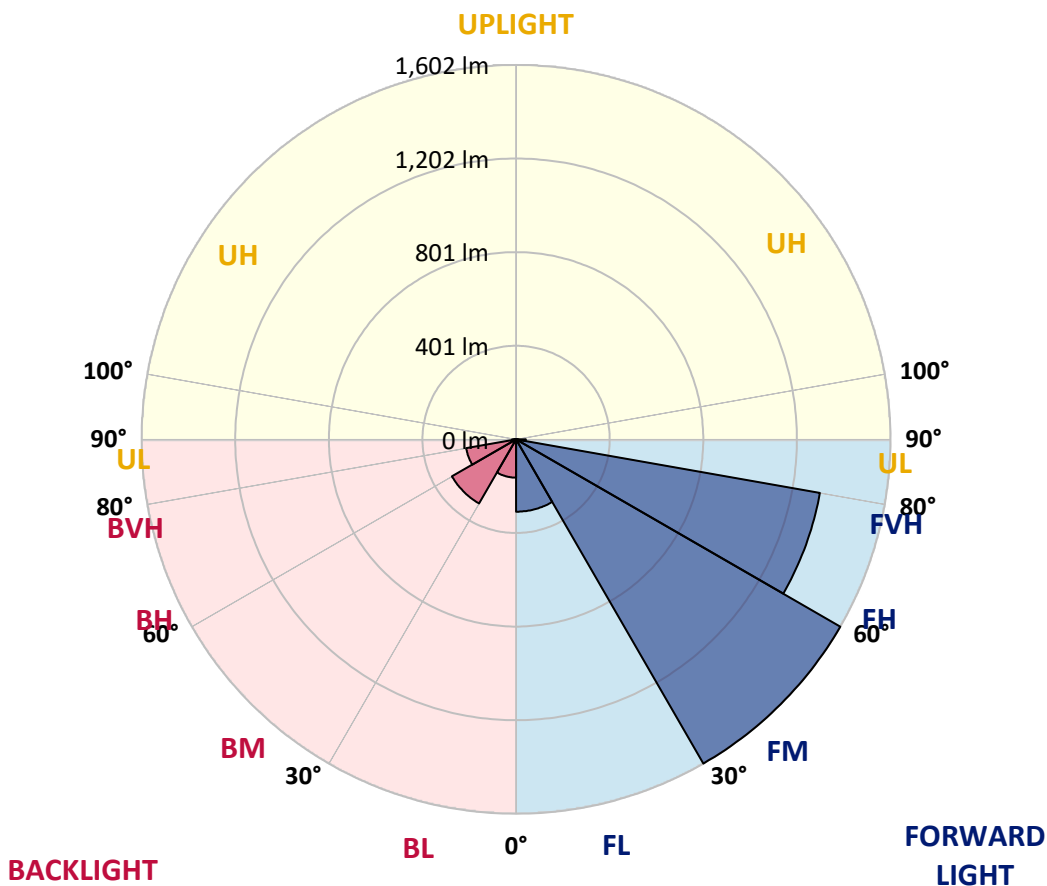
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**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone           | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|----------------|--------|-----------|-------------------------|------|---------|
|                |        |           | B                       | U    | G       |
| FL (0°-30°)    | 309.6  | 7.8       |                         |      |         |
| FM (30°-60°)   | 1602.1 | 40.2      |                         |      |         |
| FH (60°-80°)   | 1319.9 | 33.1      |                         |      | G1/1800 |
| FVH (80°-90°)  | 41.9   | 1.1       |                         |      | G1/100  |
| BL (0°-30°)    | 163.9  | 4.1       | B1/500                  |      |         |
| BM (30°-60°)   | 316.8  | 7.9       | B1/1000                 |      |         |
| BH (60°-80°)   | 216.6  | 5.4       | B1/500                  |      | G1/500  |
| BVH (80°-90°)  | 17.4   | 0.4       |                         |      | G1/100  |
| UL (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B1-U0-G1**  
 Type II Medium





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 70°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 465.1  | 465.1  | 465.1  | 465.1  | 465.1  | 465.1  | 465.1  | 465.1  | 465.1  | 465.1  | 465.1  |
| 2.5°  | 515.2  | 514.4  | 515.0  | 514.4  | 511.2  | 503.4  | 497.1  | 489.0  | 483.5  | 480.4  | 472.9  |
| 5°    | 575.8  | 574.9  | 572.9  | 570.0  | 564.2  | 553.6  | 537.7  | 520.1  | 509.5  | 501.4  | 485.6  |
| 7.5°  | 619.3  | 619.3  | 619.0  | 615.5  | 611.5  | 600.3  | 581.5  | 558.5  | 542.9  | 529.1  | 503.1  |
| 10°   | 641.5  | 642.9  | 644.9  | 649.8  | 649.0  | 642.9  | 625.3  | 600.5  | 581.0  | 564.8  | 526.2  |
| 12.5° | 653.6  | 654.4  | 657.9  | 668.0  | 678.4  | 679.8  | 669.4  | 643.5  | 622.2  | 600.5  | 551.8  |
| 15°   | 669.1  | 669.4  | 674.0  | 686.1  | 701.4  | 716.7  | 714.1  | 688.2  | 666.2  | 642.3  | 580.4  |
| 17.5° | 681.2  | 683.3  | 691.6  | 705.7  | 724.7  | 745.8  | 758.5  | 742.3  | 715.2  | 687.9  | 611.5  |
| 20°   | 685.6  | 687.0  | 697.9  | 719.6  | 745.5  | 775.2  | 803.4  | 799.1  | 771.7  | 739.4  | 646.7  |
| 22.5° | 701.1  | 701.1  | 709.2  | 727.3  | 757.9  | 801.1  | 846.9  | 858.2  | 834.0  | 796.2  | 684.4  |
| 25°   | 735.4  | 734.3  | 738.0  | 745.5  | 768.5  | 821.9  | 889.9  | 923.6  | 896.5  | 854.1  | 722.2  |
| 27.5° | 782.4  | 781.8  | 781.5  | 782.7  | 790.5  | 840.0  | 926.2  | 984.7  | 957.6  | 909.8  | 755.9  |
| 30°   | 833.4  | 831.7  | 835.4  | 831.9  | 830.2  | 861.6  | 957.0  | 1039.4 | 1018.4 | 964.8  | 783.8  |
| 32.5° | 902.8  | 899.7  | 898.8  | 887.6  | 880.6  | 895.3  | 981.8  | 1101.7 | 1085.0 | 1024.2 | 815.2  |
| 35°   | 994.5  | 991.6  | 976.9  | 959.0  | 938.6  | 945.5  | 1012.6 | 1162.5 | 1163.6 | 1098.5 | 856.4  |
| 37.5° | 1087.0 | 1087.6 | 1076.0 | 1034.0 | 1012.9 | 1008.9 | 1059.6 | 1236.5 | 1261.3 | 1187.3 | 909.8  |
| 40°   | 1163.9 | 1167.4 | 1167.4 | 1123.0 | 1091.6 | 1087.8 | 1125.6 | 1324.4 | 1373.7 | 1296.2 | 977.2  |
| 42.5° | 1222.4 | 1225.6 | 1235.7 | 1203.7 | 1170.5 | 1183.5 | 1205.7 | 1412.6 | 1501.1 | 1430.8 | 1062.5 |
| 45°   | 1286.7 | 1289.3 | 1294.7 | 1276.3 | 1257.0 | 1291.6 | 1296.5 | 1518.1 | 1646.9 | 1581.8 | 1161.6 |
| 47.5° | 1372.0 | 1369.7 | 1370.2 | 1356.7 | 1341.7 | 1397.6 | 1396.5 | 1606.8 | 1787.8 | 1747.2 | 1269.1 |
| 50°   | 1478.0 | 1482.3 | 1478.3 | 1451.5 | 1433.9 | 1484.9 | 1491.6 | 1705.1 | 1911.7 | 1910.9 | 1377.5 |
| 52.5° | 1580.0 | 1581.8 | 1603.1 | 1604.2 | 1568.2 | 1557.6 | 1574.9 | 1804.2 | 2016.3 | 2060.7 | 1481.5 |
| 55°   | 1585.2 | 1591.9 | 1655.8 | 1701.9 | 1760.1 | 1674.6 | 1659.0 | 1898.8 | 2117.5 | 2207.4 | 1589.5 |
| 57.5° | 1474.9 | 1485.5 | 1594.2 | 1693.6 | 1855.5 | 1875.4 | 1803.1 | 2020.9 | 2218.6 | 2351.8 | 1714.6 |
| 60°   | 1239.1 | 1261.3 | 1408.9 | 1561.0 | 1812.6 | 2019.8 | 2097.9 | 2186.9 | 2351.5 | 2499.3 | 1866.5 |
| 62.5° | 791.3  | 800.0  | 1006.9 | 1261.6 | 1619.2 | 2005.7 | 2418.9 | 2479.4 | 2553.8 | 2691.5 | 2100.5 |
| 65°   | 396.2  | 423.9  | 545.2  | 753.0  | 1167.7 | 1767.3 | 2581.1 | 3015.1 | 2924.1 | 3020.6 | 2479.7 |
| 67.5° | 268.9  | 277.8  | 339.2  | 452.4  | 684.7  | 1252.1 | 2480.6 | 3466.4 | 3439.6 | 3455.4 | 2884.0 |
| 70°   | 198.3  | 204.0  | 252.4  | 320.4  | 414.1  | 710.9  | 1974.8 | 3432.4 | 3615.4 | 3609.6 | 2841.6 |
| 72.5° | 144.7  | 147.5  | 184.1  | 244.7  | 306.9  | 367.7  | 1206.0 | 2772.8 | 3156.0 | 3322.3 | 2485.2 |
| 75°   | 105.2  | 108.6  | 127.9  | 183.0  | 238.6  | 229.4  | 595.4  | 2002.8 | 2406.8 | 2726.7 | 2024.7 |
| 77.5° | 78.4   | 82.7   | 91.6   | 114.7  | 167.1  | 164.3  | 257.3  | 1300.5 | 1556.7 | 1780.9 | 1229.9 |
| 80°   | 56.5   | 57.3   | 62.5   | 73.5   | 106.0  | 96.2   | 122.5  | 678.1  | 777.5  | 851.8  | 482.1  |
| 82.5° | 34.3   | 35.2   | 41.8   | 45.2   | 65.7   | 60.5   | 63.7   | 219.6  | 314.7  | 334.0  | 180.1  |
| 85°   | 10.1   | 10.7   | 19.0   | 20.7   | 27.4   | 25.9   | 25.6   | 89.3   | 106.6  | 136.3  | 70.9   |
| 87.5° | 0.0    | 0.0    | 0.0    | 0.0    | 0.3    | 1.7    | 3.2    | 15.8   | 23.9   | 33.1   | 17.3   |
| 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-SA1C-727-U-T2-W

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°   | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 465.1  | 465.1 | 465.1 | 465.1 | 465.1 | 465.1 | 465.1 | 465.1 | 465.1 | 465.1 | 465.1 |
| 2.5°  | 470.0  | 463.4 | 459.9 | 453.9 | 449.5 | 445.2 | 440.9 | 436.9 | 435.1 | 432.5 | 433.1 |
| 5°    | 478.4  | 468.0 | 457.6 | 445.8 | 435.7 | 427.4 | 419.9 | 413.2 | 410.4 | 407.8 | 408.9 |
| 7.5°  | 491.0  | 475.5 | 455.6 | 434.0 | 418.1 | 406.6 | 398.8 | 394.2 | 392.8 | 390.8 | 390.8 |
| 10°   | 507.2  | 483.8 | 449.0 | 418.1 | 399.1 | 389.9 | 386.4 | 386.1 | 387.6 | 387.9 | 387.3 |
| 12.5° | 525.0  | 491.9 | 439.2 | 399.4 | 383.3 | 380.4 | 383.0 | 387.9 | 392.8 | 395.4 | 394.8 |
| 15°   | 543.5  | 497.1 | 422.5 | 381.5 | 371.7 | 375.5 | 383.8 | 393.6 | 403.2 | 408.0 | 407.8 |
| 17.5° | 560.8  | 498.2 | 400.8 | 364.2 | 361.7 | 371.2 | 385.6 | 400.8 | 413.8 | 420.7 | 421.0 |
| 20°   | 580.1  | 496.2 | 378.7 | 348.7 | 351.6 | 367.1 | 386.1 | 404.6 | 419.9 | 426.8 | 428.5 |
| 22.5° | 597.7  | 489.3 | 357.0 | 334.0 | 342.9 | 362.2 | 381.5 | 398.8 | 412.4 | 419.0 | 421.3 |
| 25°   | 613.5  | 476.1 | 333.4 | 321.6 | 336.3 | 355.3 | 370.0 | 382.1 | 391.6 | 395.7 | 398.8 |
| 27.5° | 622.2  | 456.2 | 315.5 | 311.8 | 330.0 | 345.5 | 353.6 | 357.3 | 360.5 | 359.3 | 361.7 |
| 30°   | 623.9  | 431.4 | 300.0 | 304.0 | 320.4 | 332.0 | 333.7 | 330.0 | 324.5 | 315.5 | 317.6 |
| 32.5° | 622.2  | 402.9 | 287.0 | 295.7 | 309.8 | 316.7 | 314.4 | 304.6 | 291.3 | 277.5 | 278.4 |
| 35°   | 622.7  | 374.0 | 276.4 | 286.4 | 297.4 | 301.1 | 295.4 | 281.8 | 267.7 | 255.0 | 254.5 |
| 37.5° | 629.1  | 349.8 | 267.4 | 277.5 | 285.3 | 285.9 | 279.5 | 265.4 | 258.2 | 248.7 | 247.5 |
| 40°   | 646.7  | 332.0 | 259.4 | 268.6 | 273.5 | 273.2 | 266.0 | 255.9 | 260.8 | 257.6 | 256.8 |
| 42.5° | 675.5  | 321.0 | 252.7 | 259.1 | 262.5 | 263.1 | 257.3 | 251.0 | 261.7 | 257.6 | 256.2 |
| 45°   | 721.9  | 320.4 | 248.1 | 249.6 | 255.0 | 259.1 | 255.0 | 247.8 | 251.9 | 232.3 | 228.5 |
| 47.5° | 776.9  | 330.2 | 244.7 | 241.2 | 250.7 | 257.9 | 251.6 | 240.0 | 231.7 | 213.8 | 211.2 |
| 50°   | 843.2  | 350.1 | 241.5 | 232.3 | 244.4 | 253.6 | 247.3 | 231.4 | 218.7 | 209.2 | 207.8 |
| 52.5° | 921.9  | 376.4 | 237.5 | 222.2 | 234.9 | 251.3 | 247.3 | 230.5 | 213.8 | 205.2 | 203.7 |
| 55°   | 1004.3 | 406.6 | 232.8 | 210.1 | 224.2 | 251.9 | 249.3 | 224.5 | 210.1 | 205.5 | 204.3 |
| 57.5° | 1106.6 | 442.9 | 224.5 | 196.0 | 214.7 | 246.7 | 241.2 | 221.0 | 207.5 | 203.7 | 202.6 |
| 60°   | 1239.4 | 496.8 | 208.6 | 181.5 | 203.7 | 237.5 | 234.0 | 215.3 | 200.6 | 197.4 | 196.5 |
| 62.5° | 1449.8 | 588.2 | 189.3 | 167.7 | 190.8 | 218.1 | 223.3 | 204.3 | 191.9 | 191.6 | 191.3 |
| 65°   | 1792.7 | 697.9 | 166.6 | 155.3 | 177.2 | 202.3 | 209.2 | 193.1 | 183.0 | 186.2 | 185.9 |
| 67.5° | 2033.0 | 707.5 | 147.8 | 142.4 | 161.4 | 185.0 | 195.1 | 181.5 | 170.6 | 176.6 | 176.4 |
| 70°   | 1862.2 | 551.8 | 131.7 | 128.8 | 144.4 | 166.3 | 179.8 | 167.1 | 156.2 | 162.0 | 160.8 |
| 72.5° | 1570.5 | 423.0 | 116.4 | 114.7 | 127.1 | 146.7 | 160.2 | 152.7 | 141.2 | 141.2 | 138.6 |
| 75°   | 1262.2 | 349.0 | 100.3 | 99.4  | 107.8 | 126.8 | 142.1 | 129.4 | 118.7 | 118.1 | 116.4 |
| 77.5° | 723.9  | 228.8 | 84.1  | 83.6  | 86.2  | 106.0 | 110.4 | 107.8 | 99.7  | 96.0  | 94.8  |
| 80°   | 288.5  | 119.0 | 66.3  | 62.5  | 65.1  | 77.8  | 87.0  | 82.7  | 75.8  | 71.2  | 68.6  |
| 82.5° | 111.8  | 59.7  | 46.7  | 40.9  | 44.7  | 56.2  | 63.1  | 61.7  | 57.1  | 46.7  | 43.8  |
| 85°   | 45.5   | 29.1  | 28.0  | 23.6  | 25.9  | 30.3  | 36.3  | 31.4  | 25.9  | 18.4  | 17.6  |
| 87.5° | 12.1   | 10.7  | 10.4  | 6.3   | 4.9   | 1.4   | 0.3   | 0.0   | 0.0   | 0.0   | 0.0   |
| 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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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

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| 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**

| $\lambda$ (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)