

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: P629982

Luminaire Tested: GWS-SA1C-760-U-T4W-W

Issue Date: 1/10/2023

**Test Information**

Test Method: LM-79-2019  
Report Number: P629982  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-52)  
Test Lab: COOPER LIGHTING SOLUTIONS  
Issue Date: 1/10/2023  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: McGRAW-EDISON  
Catalog Number: GWS-SA1C-760-U-T4W-W  
Description: GALLEON WALL SLIM LUMINAIRE. (1) LIGHTSQUARES WITH 16 LEDS EACH AND TYPE IV WIDE OPTICS  
Light Source: (16) 5700K CCT, 70 CRI LEDS  
Ballast/Driver: -

**Summary**

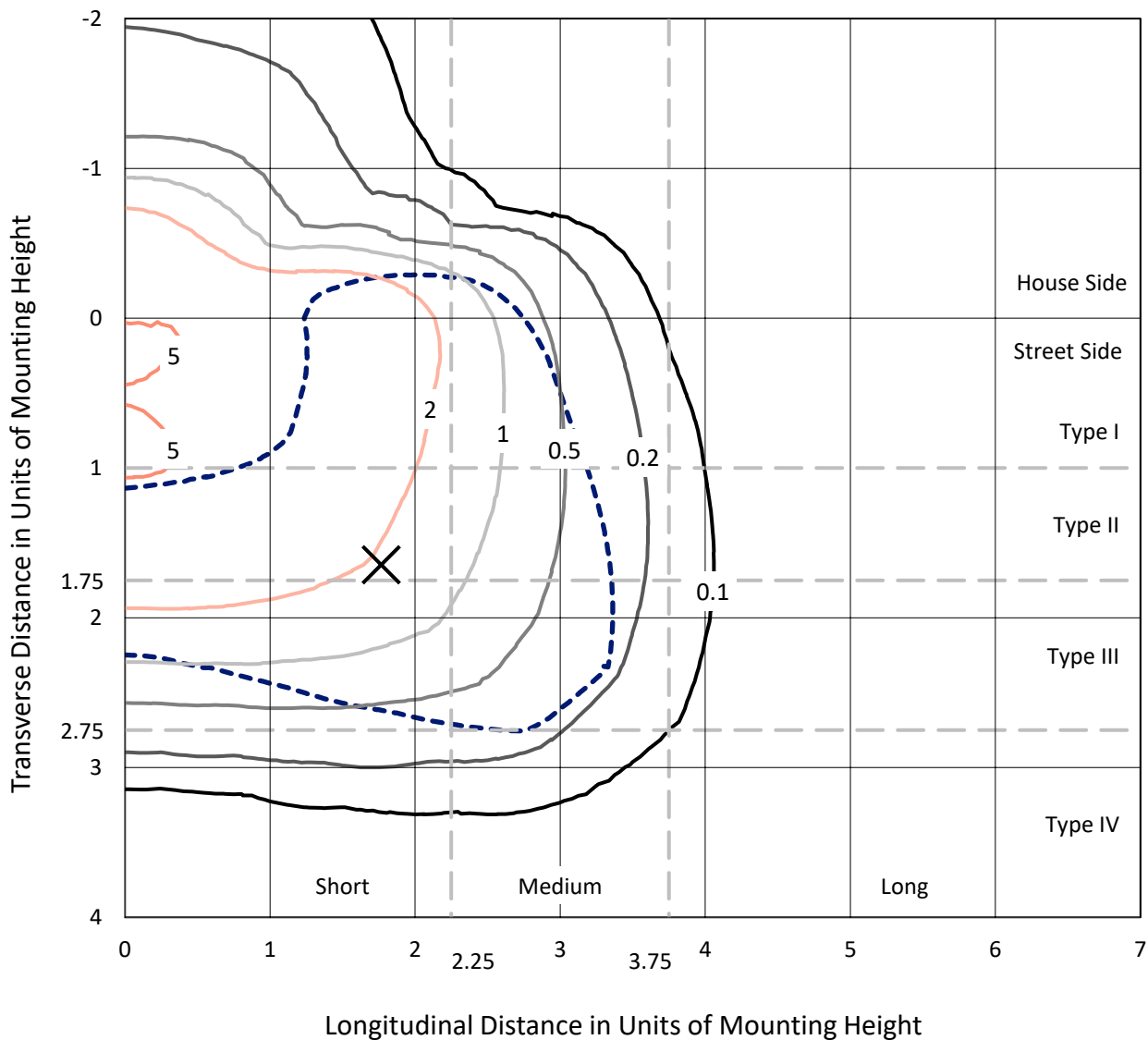
Lumens per Lamp: N/A  
Luminaire Lumens: 4807.8 lumens  
Efficiency: N/A  
Efficacy: 141.0 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 0.5' x H: 0')  
IES Classification: Type III - Short  
BUG Rating: B1 - U0 - G2  
  
Input Watts (W): 34.1  
Input Voltage (V): 120  
Input Current (Ain): 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: P629982  
 CATALOG NUMBER: GWS-SA1C-760-U-T4W-W

### Iso-Footcandle Lines of Horizontal Illumination

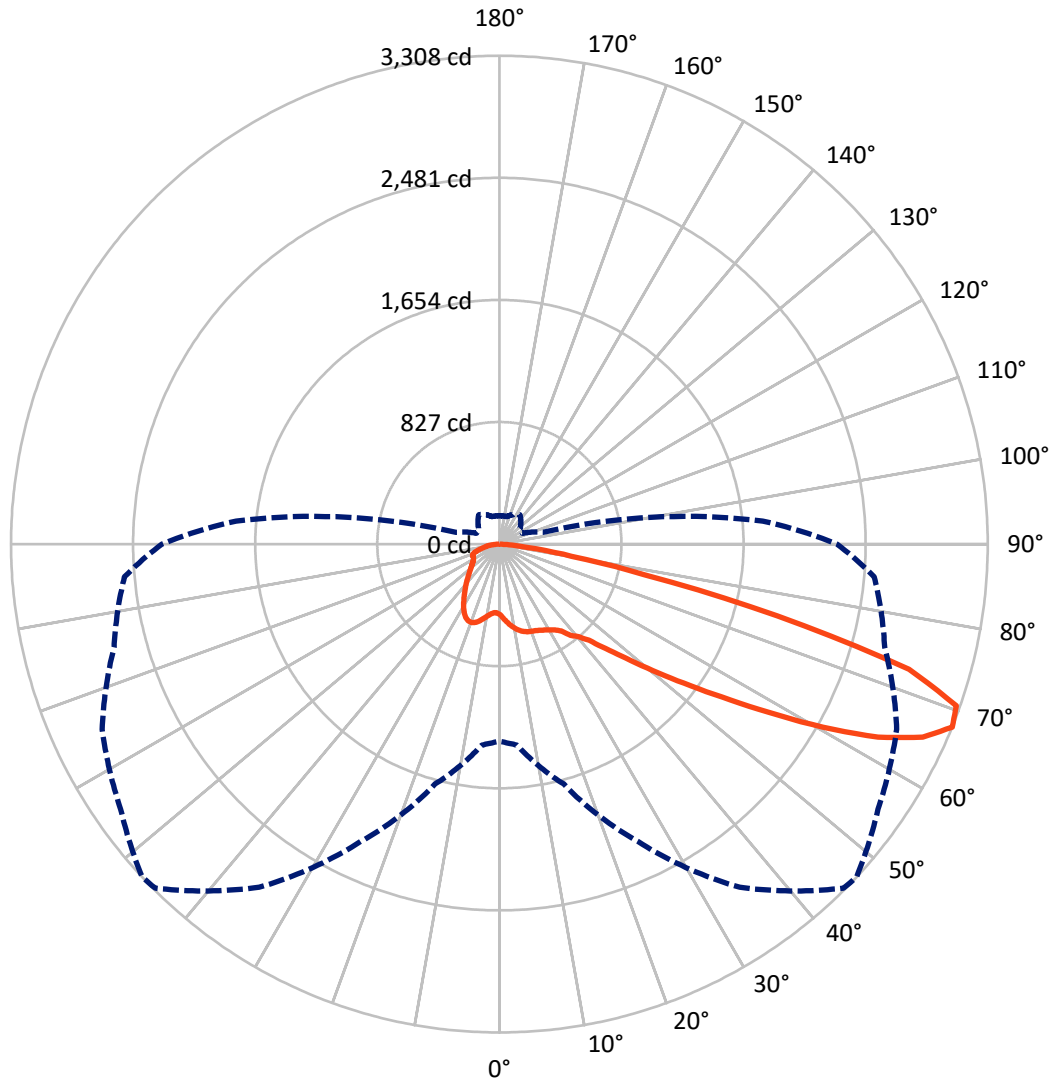
✕ Max cd  
 - - - 1/2 Max cd



Based on 10 foot mounting height. Maximum calculated value = 6 fc  
 Type III - Short - N/A

REPORT NUMBER: P629982  
CATALOG NUMBER: GWS-SA1C-760-U-T4W-W

### Luminous Intensity Polar Plot



— Vertical Plane Through 47-Deg Lateral    - - - Horizontal Cone Through 67.5-Deg Vertical

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CATALOG NUMBER: GWS-SA1C-760-U-T4W-W

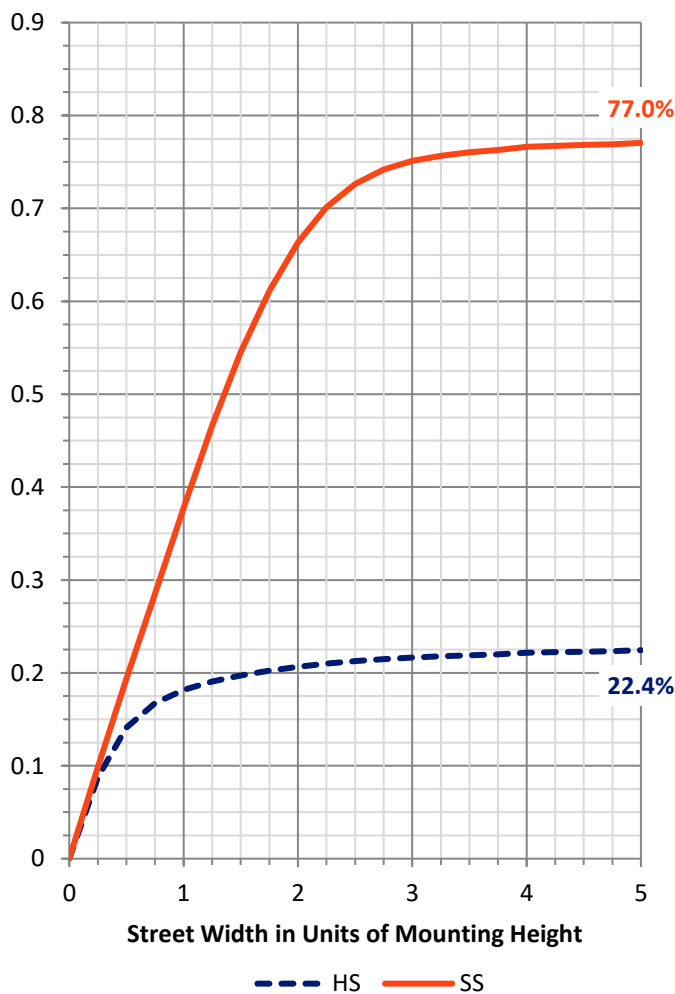
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 1095.7   | 0.0    | 1095.7 |
|                    | % Fixture | 22.8     | 0.0    | 22.8   |
| <b>Street Side</b> | Lumens    | 3712.1   | 0.0    | 3712.1 |
|                    | % Fixture | 77.2     | 0.0    | 77.2   |
| <b>Total</b>       | Lumens    | 4807.8   | 0.0    | 4807.8 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 48.7   | 1.0       |
| 10°-20°   | 162.3  | 3.4       |
| 20°-30°   | 275.8  | 5.7       |
| 30°-40°   | 404.1  | 8.4       |
| 40°-50°   | 615.7  | 12.8      |
| 50°-60°   | 1101.5 | 22.9      |
| 60°-70°   | 1469.9 | 30.6      |
| 70°-80°   | 664.7  | 13.8      |
| 80°-90°   | 65.1   | 1.4       |
| 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°    | 4807.8 | 100.0     |
| 0°-180°   | 4807.8 | 100.0     |

**Coefficient of Utilization**



REPORT NUMBER: P629982

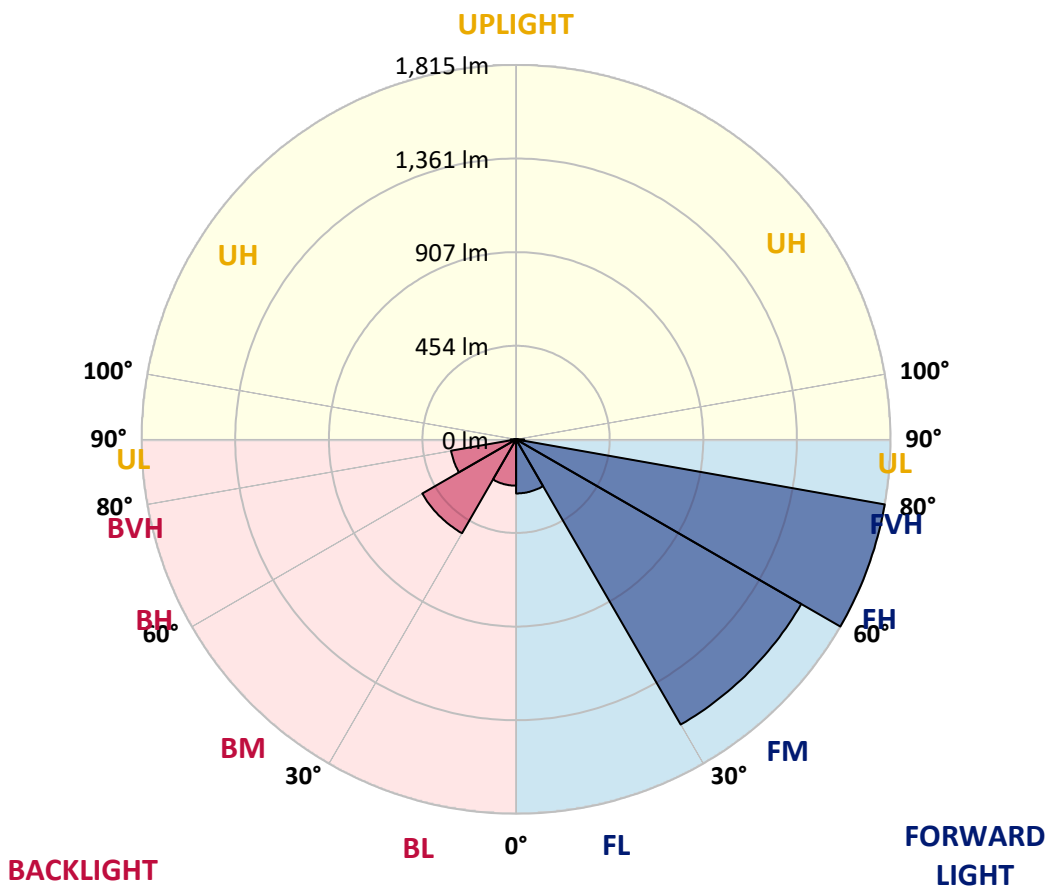
CATALOG NUMBER: GWS-SA1C-760-U-T4W-W

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

| Zone           | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|----------------|--------|-----------|-------------------------|------|---------|
|                |        |           | B                       | U    | G       |
| FL (0°-30°)    | 262.2  | 5.5       |                         |      |         |
| FM (30°-60°)   | 1596.2 | 33.2      |                         |      |         |
| FH (60°-80°)   | 1814.9 | 37.7      |                         |      | G2/5000 |
| FVH (80°-90°)  | 38.7   | 0.8       |                         |      | G1/100  |
| BL (0°-30°)    | 224.6  | 4.7       | B1/500                  |      |         |
| BM (30°-60°)   | 525.0  | 10.9      | B1/1000                 |      |         |
| BH (60°-80°)   | 319.7  | 6.6       | B1/500                  |      | G1/500  |
| BVH (80°-90°)  | 26.4   | 0.5       |                         |      | G1/100  |
| UL (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

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

Type III Short





REPORT NUMBER: P629982  
 CATALOG NUMBER: GWS-SA1C-760-U-T4W-W

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 47°    | 55°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 476.6  | 476.6  | 476.6  | 476.6  | 476.6  | 476.6  | 476.6  | 476.6  | 476.6  | 476.6  | 476.6  |
| 2.5°  | 508.2  | 510.0  | 509.6  | 506.8  | 505.1  | 502.0  | 502.3  | 497.5  | 490.2  | 485.3  | 479.7  |
| 5°    | 553.1  | 555.9  | 552.4  | 547.9  | 540.9  | 530.8  | 529.8  | 518.7  | 504.8  | 495.0  | 484.9  |
| 7.5°  | 592.0  | 593.8  | 589.6  | 581.9  | 571.9  | 558.3  | 555.9  | 542.7  | 525.3  | 510.0  | 495.4  |
| 10°   | 622.3  | 624.3  | 618.8  | 608.7  | 595.5  | 581.9  | 580.2  | 566.6  | 548.2  | 530.1  | 511.7  |
| 12.5° | 648.0  | 648.7  | 642.8  | 629.2  | 615.0  | 601.1  | 599.3  | 586.8  | 569.8  | 551.3  | 531.2  |
| 15°   | 662.9  | 663.3  | 656.0  | 641.0  | 627.5  | 615.3  | 614.3  | 603.5  | 587.8  | 570.5  | 548.9  |
| 17.5° | 661.9  | 662.6  | 657.4  | 644.2  | 632.3  | 625.0  | 624.0  | 617.0  | 604.9  | 589.2  | 567.7  |
| 20°   | 649.0  | 649.7  | 646.3  | 637.6  | 631.3  | 629.2  | 629.6  | 627.5  | 620.2  | 607.3  | 585.4  |
| 22.5° | 638.9  | 640.0  | 636.9  | 630.6  | 629.9  | 634.8  | 635.8  | 636.9  | 633.4  | 621.9  | 600.7  |
| 25°   | 643.8  | 645.6  | 640.7  | 632.0  | 633.4  | 644.2  | 646.3  | 649.7  | 646.9  | 637.2  | 618.8  |
| 27.5° | 677.5  | 678.6  | 666.1  | 648.3  | 644.2  | 655.6  | 658.8  | 664.3  | 662.2  | 653.2  | 638.9  |
| 30°   | 755.8  | 755.1  | 728.3  | 684.8  | 667.5  | 672.0  | 674.4  | 682.4  | 683.1  | 677.2  | 663.6  |
| 32.5° | 866.0  | 862.5  | 821.1  | 751.9  | 701.5  | 690.4  | 693.2  | 704.0  | 712.0  | 705.7  | 687.3  |
| 35°   | 982.4  | 979.3  | 933.7  | 852.7  | 764.4  | 725.9  | 722.7  | 731.1  | 743.2  | 725.9  | 699.4  |
| 37.5° | 1093.3 | 1088.4 | 1041.9 | 941.7  | 842.0  | 788.1  | 783.6  | 775.2  | 767.9  | 734.5  | 714.4  |
| 40°   | 1216.4 | 1210.8 | 1170.1 | 1056.8 | 927.5  | 835.7  | 824.2  | 791.2  | 784.6  | 763.4  | 753.3  |
| 42.5° | 1347.8 | 1347.8 | 1314.1 | 1202.5 | 1030.7 | 903.8  | 888.9  | 839.2  | 846.1  | 832.2  | 820.4  |
| 45°   | 1479.2 | 1483.0 | 1456.2 | 1349.2 | 1168.7 | 1032.5 | 1008.5 | 937.9  | 954.6  | 948.3  | 942.4  |
| 47.5° | 1591.1 | 1598.4 | 1593.2 | 1499.0 | 1337.7 | 1188.9 | 1152.4 | 1079.1 | 1114.9 | 1129.8 | 1146.5 |
| 50°   | 1711.7 | 1719.7 | 1714.5 | 1677.3 | 1535.5 | 1378.4 | 1345.7 | 1269.9 | 1331.4 | 1376.3 | 1430.9 |
| 52.5° | 1890.8 | 1902.2 | 1858.8 | 1844.5 | 1775.7 | 1593.6 | 1564.3 | 1478.1 | 1589.7 | 1664.1 | 1785.8 |
| 55°   | 2042.0 | 2041.6 | 2026.4 | 2059.0 | 2033.7 | 1856.7 | 1824.4 | 1746.2 | 1888.7 | 1967.6 | 2145.6 |
| 57.5° | 2112.2 | 2120.6 | 2173.1 | 2265.5 | 2316.3 | 2178.3 | 2147.3 | 2067.4 | 2209.6 | 2250.6 | 2442.8 |
| 60°   | 2148.4 | 2158.8 | 2260.3 | 2443.2 | 2579.8 | 2529.4 | 2517.2 | 2415.4 | 2495.3 | 2490.4 | 2693.5 |
| 62.5° | 2097.6 | 2118.5 | 2281.5 | 2524.5 | 2767.9 | 2882.2 | 2878.4 | 2724.4 | 2738.3 | 2690.7 | 2848.9 |
| 65°   | 1864.7 | 1887.3 | 2143.2 | 2483.8 | 2875.3 | 3150.6 | 3151.6 | 3004.2 | 2925.0 | 2788.0 | 2822.8 |
| 67.5° | 1333.5 | 1365.9 | 1682.2 | 2222.4 | 2837.4 | 3295.6 | 3307.7 | 3131.1 | 2968.8 | 2701.8 | 2548.8 |
| 70°   | 726.9  | 750.5  | 998.4  | 1615.5 | 2496.0 | 3260.8 | 3283.4 | 3069.9 | 2775.5 | 2337.1 | 1962.0 |
| 72.5° | 330.3  | 337.9  | 464.4  | 886.5  | 1705.1 | 2806.8 | 2901.3 | 2739.7 | 2279.4 | 1726.3 | 1247.7 |
| 75°   | 151.2  | 154.7  | 202.3  | 424.1  | 891.0  | 1878.3 | 1944.7 | 2040.6 | 1586.3 | 1090.2 | 650.4  |
| 77.5° | 94.9   | 95.9   | 115.1  | 194.0  | 444.3  | 937.6  | 1007.4 | 1215.0 | 928.9  | 539.5  | 271.8  |
| 80°   | 56.0   | 57.0   | 71.6   | 105.0  | 208.6  | 429.0  | 495.4  | 480.4  | 436.6  | 232.9  | 123.8  |
| 82.5° | 28.2   | 29.2   | 41.4   | 59.8   | 113.7  | 170.7  | 200.9  | 202.0  | 162.7  | 126.2  | 69.9   |
| 85°   | 10.1   | 10.4   | 13.6   | 23.6   | 48.3   | 56.3   | 62.9   | 76.8   | 79.6   | 73.4   | 33.7   |
| 87.5° | 0.0    | 0.0    | 0.3    | 0.7    | 1.4    | 5.6    | 5.9    | 11.1   | 23.3   | 26.1   | 13.6   |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |



REPORT NUMBER: P629982  
 CATALOG NUMBER: GWS-SA1C-760-U-T4W-W

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 476.6  | 476.6  | 476.6 | 476.6 | 476.6 | 476.6 | 476.6 | 476.6 | 476.6 | 476.6 | 476.6 |
| 2.5°  | 478.0  | 472.8  | 471.0 | 469.3 | 466.5 | 465.5 | 463.4 | 461.3 | 461.3 | 459.2 | 458.2 |
| 5°    | 480.4  | 473.5  | 469.0 | 466.9 | 465.1 | 466.2 | 466.2 | 466.9 | 469.3 | 467.9 | 468.6 |
| 7.5°  | 489.1  | 481.1  | 474.9 | 473.1 | 473.1 | 477.3 | 480.1 | 483.6 | 488.1 | 488.8 | 488.8 |
| 10°   | 504.4  | 495.0  | 488.4 | 487.4 | 489.1 | 495.0 | 499.2 | 503.4 | 508.9 | 509.3 | 510.0 |
| 12.5° | 521.1  | 511.7  | 505.1 | 506.5 | 508.2 | 515.9 | 520.4 | 523.9 | 529.4 | 529.4 | 529.1 |
| 15°   | 538.5  | 528.1  | 522.5 | 525.3 | 530.5 | 539.2 | 539.9 | 540.2 | 543.0 | 542.3 | 542.0 |
| 17.5° | 556.6  | 545.4  | 541.3 | 545.4 | 551.0 | 555.2 | 551.7 | 546.8 | 545.8 | 544.4 | 543.7 |
| 20°   | 574.3  | 562.8  | 561.1 | 564.2 | 565.9 | 562.5 | 551.7 | 542.7 | 538.5 | 536.4 | 535.7 |
| 22.5° | 589.6  | 579.9  | 578.8 | 578.8 | 570.1 | 558.0 | 542.0 | 529.8 | 524.2 | 521.4 | 520.8 |
| 25°   | 607.7  | 598.6  | 596.9 | 587.5 | 565.3 | 543.0 | 521.4 | 510.3 | 505.8 | 504.4 | 504.8 |
| 27.5° | 628.9  | 622.6  | 617.0 | 590.3 | 551.3 | 516.6 | 492.2 | 487.4 | 485.6 | 487.4 | 488.4 |
| 30°   | 654.9  | 648.7  | 636.2 | 586.8 | 529.1 | 482.2 | 458.9 | 458.5 | 463.7 | 468.3 | 469.0 |
| 32.5° | 676.1  | 673.4  | 652.9 | 575.7 | 497.8 | 444.3 | 424.5 | 425.9 | 435.2 | 441.5 | 442.5 |
| 35°   | 692.8  | 697.4  | 666.8 | 557.3 | 460.6 | 408.5 | 392.8 | 393.5 | 398.7 | 407.4 | 407.8 |
| 37.5° | 716.5  | 731.8  | 679.3 | 529.1 | 417.9 | 377.5 | 363.3 | 358.1 | 357.4 | 359.8 | 360.5 |
| 40°   | 764.1  | 787.0  | 688.3 | 488.1 | 376.5 | 349.7 | 333.7 | 323.6 | 315.0 | 308.4 | 306.3 |
| 42.5° | 836.1  | 862.5  | 693.5 | 438.4 | 339.6 | 322.3 | 304.2 | 291.3 | 276.0 | 262.1 | 257.2 |
| 45°   | 968.2  | 976.8  | 693.5 | 385.5 | 307.0 | 296.5 | 278.5 | 263.2 | 243.7 | 227.4 | 223.9 |
| 47.5° | 1179.5 | 1151.7 | 694.2 | 334.4 | 278.1 | 273.9 | 258.3 | 240.9 | 219.4 | 205.8 | 203.7 |
| 50°   | 1498.0 | 1400.3 | 708.5 | 292.0 | 254.1 | 254.8 | 243.3 | 224.2 | 204.8 | 194.7 | 192.9 |
| 52.5° | 1858.8 | 1706.5 | 746.7 | 260.7 | 234.0 | 239.2 | 232.9 | 214.5 | 197.1 | 188.4 | 186.7 |
| 55°   | 2198.1 | 1988.1 | 779.4 | 238.5 | 216.9 | 226.0 | 225.6 | 208.6 | 192.9 | 184.2 | 183.2 |
| 57.5° | 2486.6 | 2181.1 | 774.5 | 220.4 | 202.3 | 213.8 | 219.0 | 204.8 | 190.2 | 182.9 | 181.8 |
| 60°   | 2666.0 | 2283.3 | 705.3 | 203.7 | 191.2 | 205.1 | 215.2 | 203.7 | 191.5 | 189.8 | 190.2 |
| 62.5° | 2743.9 | 2264.5 | 572.6 | 191.2 | 183.9 | 200.9 | 219.4 | 211.0 | 204.4 | 208.6 | 211.0 |
| 65°   | 2622.9 | 2103.2 | 421.3 | 181.8 | 176.9 | 202.0 | 229.1 | 222.5 | 204.4 | 207.2 | 208.2 |
| 67.5° | 2287.1 | 1790.3 | 304.5 | 172.4 | 168.3 | 205.1 | 243.0 | 220.7 | 192.6 | 192.6 | 190.5 |
| 70°   | 1648.1 | 1287.6 | 221.1 | 163.0 | 159.6 | 200.6 | 243.7 | 208.9 | 179.0 | 178.0 | 172.8 |
| 72.5° | 991.8  | 759.6  | 172.4 | 152.6 | 146.4 | 178.0 | 228.4 | 195.0 | 165.8 | 157.1 | 150.9 |
| 75°   | 515.2  | 380.7  | 144.6 | 141.1 | 125.5 | 150.9 | 208.9 | 173.5 | 141.8 | 134.2 | 130.7 |
| 77.5° | 220.7  | 178.0  | 124.1 | 125.8 | 104.3 | 126.9 | 168.6 | 150.2 | 125.8 | 116.1 | 113.0 |
| 80°   | 108.8  | 101.2  | 98.0  | 100.8 | 83.4  | 98.0  | 145.3 | 131.4 | 106.7 | 95.6  | 91.1  |
| 82.5° | 62.2   | 59.1   | 70.6  | 71.6  | 59.4  | 82.0  | 122.7 | 111.2 | 88.3  | 76.1  | 68.8  |
| 85°   | 28.9   | 30.9   | 42.8  | 43.1  | 36.8  | 56.3  | 80.3  | 62.6  | 46.9  | 38.9  | 37.2  |
| 87.5° | 11.5   | 13.6   | 18.8  | 18.4  | 10.8  | 10.4  | 7.0   | 3.8   | 3.1   | 2.8   | 2.4   |
| 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  
Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
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: SP1-1908-441-9-R4

Test Date: 10/23/2019

Luminaire Tested: SA1C-760-U-5WQ

Data in this report applies to families of products SA1C-760-U-5WQ .

**Test Information**

Test Method: LM-79-2008  
 Report Number: SP1-1908-441-9-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-760-U-5WQ**  
 Description: McGRAW EDISON ROADWAY AND AREA LUMINAIRE

\*\*\*THIS IS A REVISION OF SP1-1908-441-4-R3. TO UPDATE THE CATALOG INFORMATION.\*\*\*TESTED IN SITU. ROADWAY AND AREA LUMINAIRE. (1) 70 CRI, 5000K, 1050MA LIGHTSQUARE WITH 16 LEDS AND TYPE V WIDE OPTICS.

**Spectral Parameters**

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 5474   | CRI (Ra): | 71.7 | R9:  | -27.1 |
| CIE u':                   | 0.2052 | R1:       | 70.6 | R10: | 40.8  |
| CIE v':                   | 0.4804 | R2:       | 74.6 | R11: | 74.6  |
| Duv:                      | 0.0025 | R3:       | 78.3 | R12: | 50.4  |
| CIE x:                    | 0.3330 | R4:       | 73.8 | R13: | 70.0  |
| CIE y:                    | 0.3466 | R5:       | 72.4 | R14: | 87.8  |
| CIE z:                    | 0.3204 | R6:       | 67.5 |      |       |
| Peak Wavelength (nm):     | 442    | R7:       | 77.5 |      |       |
| Dominant Wavelength (nm): | 554    | R8:       | 58.9 |      |       |
| Purity:                   | 4.1    |           |      |      |       |
| Rf:                       | 72.1   |           |      |      |       |
| Rg:                       | 97.2   |           |      |      |       |



**Test Conditions**

Stabilization Time: 240M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.6/31%  
 Sphere Temperature (°C): 25.9

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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



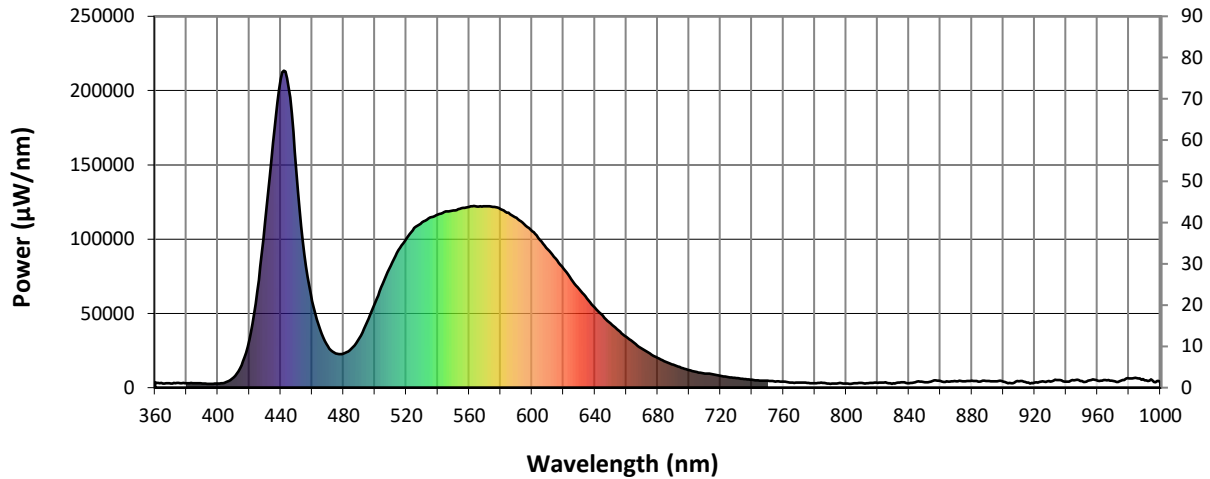
CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies inside the ANSI 5700K 4-step quadrangle

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**Photopic Flux vs. Wavelength**



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| $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) |
|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|
| 360               | 3540                                 | NR                             | 490               | 33363                                | NR                             | 620               | 80193                                | NR                             | 750               | 4663                                 | NR                             | 880               | 4678                                 | NR                             |
| 365               | 2862                                 | NR                             | 495               | 44177                                | NR                             | 625               | 73091                                | NR                             | 755               | 4147                                 | NR                             | 885               | 4128                                 | NR                             |
| 370               | 2865                                 | NR                             | 500               | 57019                                | NR                             | 630               | 66269                                | NR                             | 760               | 4040                                 | NR                             | 890               | 4504                                 | NR                             |
| 375               | 3254                                 | NR                             | 505               | 70030                                | NR                             | 635               | 60012                                | NR                             | 765               | 3474                                 | NR                             | 895               | 4371                                 | NR                             |
| 380               | 3076                                 | NR                             | 510               | 81972                                | NR                             | 640               | 53914                                | NR                             | 770               | 3469                                 | NR                             | 900               | 4082                                 | NR                             |
| 385               | 2904                                 | NR                             | 515               | 92590                                | NR                             | 645               | 48385                                | NR                             | 775               | 3181                                 | NR                             | 905               | 2982                                 | NR                             |
| 390               | 2689                                 | NR                             | 520               | 100305                               | NR                             | 650               | 43219                                | NR                             | 780               | 2969                                 | NR                             | 910               | 4351                                 | NR                             |
| 395               | 2619                                 | NR                             | 525               | 107452                               | NR                             | 655               | 38562                                | NR                             | 785               | 3132                                 | NR                             | 915               | 3365                                 | NR                             |
| 400               | 2679                                 | NR                             | 530               | 111373                               | NR                             | 660               | 34110                                | NR                             | 790               | 2507                                 | NR                             | 920               | 3430                                 | NR                             |
| 405               | 3515                                 | NR                             | 535               | 114505                               | NR                             | 665               | 30085                                | NR                             | 795               | 2968                                 | NR                             | 925               | 4264                                 | NR                             |
| 410               | 6934                                 | NR                             | 540               | 116408                               | NR                             | 670               | 26205                                | NR                             | 800               | 2758                                 | NR                             | 930               | 4095                                 | NR                             |
| 415               | 14943                                | NR                             | 545               | 118700                               | NR                             | 675               | 22906                                | NR                             | 805               | 2872                                 | NR                             | 935               | 5048                                 | NR                             |
| 420               | 31939                                | NR                             | 550               | 119209                               | NR                             | 680               | 20058                                | NR                             | 810               | 3094                                 | NR                             | 940               | 4074                                 | NR                             |
| 425               | 64701                                | NR                             | 555               | 120742                               | NR                             | 685               | 17413                                | NR                             | 815               | 3222                                 | NR                             | 945               | 4949                                 | NR                             |
| 430               | 110939                               | NR                             | 560               | 121594                               | NR                             | 690               | 15447                                | NR                             | 820               | 3238                                 | NR                             | 950               | 4387                                 | NR                             |
| 435               | 164597                               | NR                             | 565               | 121913                               | NR                             | 695               | 13398                                | NR                             | 825               | 3524                                 | NR                             | 955               | 4978                                 | NR                             |
| 440               | 207696                               | NR                             | 570               | 122147                               | NR                             | 700               | 11777                                | NR                             | 830               | 2921                                 | NR                             | 960               | 4706                                 | NR                             |
| 445               | 201830                               | NR                             | 575               | 121605                               | NR                             | 705               | 10412                                | NR                             | 835               | 3595                                 | NR                             | 965               | 5083                                 | NR                             |
| 450               | 145410                               | NR                             | 580               | 120248                               | NR                             | 710               | 9544                                 | NR                             | 840               | 3016                                 | NR                             | 970               | 4522                                 | NR                             |
| 455               | 89594                                | NR                             | 585               | 117717                               | NR                             | 715               | 8940                                 | NR                             | 845               | 4032                                 | NR                             | 975               | 4740                                 | NR                             |
| 460               | 58321                                | NR                             | 590               | 114359                               | NR                             | 720               | 7897                                 | NR                             | 850               | 3579                                 | NR                             | 980               | 6122                                 | NR                             |
| 465               | 39318                                | NR                             | 595               | 109974                               | NR                             | 725               | 7045                                 | NR                             | 855               | 4571                                 | NR                             | 985               | 6450                                 | NR                             |
| 470               | 27693                                | NR                             | 600               | 105269                               | NR                             | 730               | 6483                                 | NR                             | 860               | 4485                                 | NR                             | 990               | 4875                                 | NR                             |
| 475               | 23081                                | NR                             | 605               | 99453                                | NR                             | 735               | 5838                                 | NR                             | 865               | 3978                                 | NR                             | 995               | 4764                                 | NR                             |
| 480               | 23002                                | NR                             | 610               | 92921                                | NR                             | 740               | 5261                                 | NR                             | 870               | 4298                                 | NR                             | 1000              | 3640                                 | NR                             |
| 485               | 26201                                | NR                             | 615               | 86989                                | NR                             | 745               | 4760                                 | NR                             | 875               | 4356                                 | NR                             |                   |                                      |                                |

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Scotopic Flux vs. Wavelength



Scotopic Lumens: 13759.3 S/P: 1.85

| 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    | 3540          | NR            | 490    | 33363         | NR            | 620    | 80193         | NR            | 750    | 4663          | NR            | 880    | 4678          | NR            |
| 365    | 2862          | NR            | 495    | 44177         | NR            | 625    | 73091         | NR            | 755    | 4147          | NR            | 885    | 4128          | NR            |
| 370    | 2865          | NR            | 500    | 57019         | NR            | 630    | 66269         | NR            | 760    | 4040          | NR            | 890    | 4504          | NR            |
| 375    | 3254          | NR            | 505    | 70030         | NR            | 635    | 60012         | NR            | 765    | 3474          | NR            | 895    | 4371          | NR            |
| 380    | 3076          | NR            | 510    | 81972         | NR            | 640    | 53914         | NR            | 770    | 3469          | NR            | 900    | 4082          | NR            |
| 385    | 2904          | NR            | 515    | 92590         | NR            | 645    | 48385         | NR            | 775    | 3181          | NR            | 905    | 2982          | NR            |
| 390    | 2689          | NR            | 520    | 100305        | NR            | 650    | 43219         | NR            | 780    | 2969          | NR            | 910    | 4351          | NR            |
| 395    | 2619          | NR            | 525    | 107452        | NR            | 655    | 38562         | NR            | 785    | 3132          | NR            | 915    | 3365          | NR            |
| 400    | 2679          | NR            | 530    | 111373        | NR            | 660    | 34110         | NR            | 790    | 2507          | NR            | 920    | 3430          | NR            |
| 405    | 3515          | NR            | 535    | 114505        | NR            | 665    | 30085         | NR            | 795    | 2968          | NR            | 925    | 4264          | NR            |
| 410    | 6934          | NR            | 540    | 116408        | NR            | 670    | 26205         | NR            | 800    | 2758          | NR            | 930    | 4095          | NR            |
| 415    | 14943         | NR            | 545    | 118700        | NR            | 675    | 22906         | NR            | 805    | 2872          | NR            | 935    | 5048          | NR            |
| 420    | 31939         | NR            | 550    | 119209        | NR            | 680    | 20058         | NR            | 810    | 3094          | NR            | 940    | 4074          | NR            |
| 425    | 64701         | NR            | 555    | 120742        | NR            | 685    | 17413         | NR            | 815    | 3222          | NR            | 945    | 4949          | NR            |
| 430    | 110939        | NR            | 560    | 121594        | NR            | 690    | 15447         | NR            | 820    | 3238          | NR            | 950    | 4387          | NR            |
| 435    | 164597        | NR            | 565    | 121913        | NR            | 695    | 13398         | NR            | 825    | 3524          | NR            | 955    | 4978          | NR            |
| 440    | 207696        | NR            | 570    | 122147        | NR            | 700    | 11777         | NR            | 830    | 2921          | NR            | 960    | 4706          | NR            |
| 445    | 201830        | NR            | 575    | 121605        | NR            | 705    | 10412         | NR            | 835    | 3595          | NR            | 965    | 5083          | NR            |
| 450    | 145410        | NR            | 580    | 120248        | NR            | 710    | 9544          | NR            | 840    | 3016          | NR            | 970    | 4522          | NR            |
| 455    | 89594         | NR            | 585    | 117717        | NR            | 715    | 8940          | NR            | 845    | 4032          | NR            | 975    | 4740          | NR            |
| 460    | 58321         | NR            | 590    | 114359        | NR            | 720    | 7897          | NR            | 850    | 3579          | NR            | 980    | 6122          | NR            |
| 465    | 39318         | NR            | 595    | 109974        | NR            | 725    | 7045          | NR            | 855    | 4571          | NR            | 985    | 6450          | NR            |
| 470    | 27693         | NR            | 600    | 105269        | NR            | 730    | 6483          | NR            | 860    | 4485          | NR            | 990    | 4875          | NR            |
| 475    | 23081         | NR            | 605    | 99453         | NR            | 735    | 5838          | NR            | 865    | 3978          | NR            | 995    | 4764          | NR            |
| 480    | 23002         | NR            | 610    | 92921         | NR            | 740    | 5261          | NR            | 870    | 4298          | NR            | 1000   | 3640          | NR            |
| 485    | 26201         | NR            | 615    | 86989         | NR            | 745    | 4760          | NR            | 875    | 4356          | NR            |        |               |               |

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**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 5527.6 M/P: 0.74**

| 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    | 3540          | NR            | 490    | 33363         | NR            | 620    | 80193         | NR            | 750    | 4663          | NR            | 880    | 4678          | NR            |
| 365    | 2862          | NR            | 495    | 44177         | NR            | 625    | 73091         | NR            | 755    | 4147          | NR            | 885    | 4128          | NR            |
| 370    | 2865          | NR            | 500    | 57019         | NR            | 630    | 66269         | NR            | 760    | 4040          | NR            | 890    | 4504          | NR            |
| 375    | 3254          | NR            | 505    | 70030         | NR            | 635    | 60012         | NR            | 765    | 3474          | NR            | 895    | 4371          | NR            |
| 380    | 3076          | NR            | 510    | 81972         | NR            | 640    | 53914         | NR            | 770    | 3469          | NR            | 900    | 4082          | NR            |
| 385    | 2904          | NR            | 515    | 92590         | NR            | 645    | 48385         | NR            | 775    | 3181          | NR            | 905    | 2982          | NR            |
| 390    | 2689          | NR            | 520    | 100305        | NR            | 650    | 43219         | NR            | 780    | 2969          | NR            | 910    | 4351          | NR            |
| 395    | 2619          | NR            | 525    | 107452        | NR            | 655    | 38562         | NR            | 785    | 3132          | NR            | 915    | 3365          | NR            |
| 400    | 2679          | NR            | 530    | 111373        | NR            | 660    | 34110         | NR            | 790    | 2507          | NR            | 920    | 3430          | NR            |
| 405    | 3515          | NR            | 535    | 114505        | NR            | 665    | 30085         | NR            | 795    | 2968          | NR            | 925    | 4264          | NR            |
| 410    | 6934          | NR            | 540    | 116408        | NR            | 670    | 26205         | NR            | 800    | 2758          | NR            | 930    | 4095          | NR            |
| 415    | 14943         | NR            | 545    | 118700        | NR            | 675    | 22906         | NR            | 805    | 2872          | NR            | 935    | 5048          | NR            |
| 420    | 31939         | NR            | 550    | 119209        | NR            | 680    | 20058         | NR            | 810    | 3094          | NR            | 940    | 4074          | NR            |
| 425    | 64701         | NR            | 555    | 120742        | NR            | 685    | 17413         | NR            | 815    | 3222          | NR            | 945    | 4949          | NR            |
| 430    | 110939        | NR            | 560    | 121594        | NR            | 690    | 15447         | NR            | 820    | 3238          | NR            | 950    | 4387          | NR            |
| 435    | 164597        | NR            | 565    | 121913        | NR            | 695    | 13398         | NR            | 825    | 3524          | NR            | 955    | 4978          | NR            |
| 440    | 207696        | NR            | 570    | 122147        | NR            | 700    | 11777         | NR            | 830    | 2921          | NR            | 960    | 4706          | NR            |
| 445    | 201830        | NR            | 575    | 121605        | NR            | 705    | 10412         | NR            | 835    | 3595          | NR            | 965    | 5083          | NR            |
| 450    | 145410        | NR            | 580    | 120248        | NR            | 710    | 9544          | NR            | 840    | 3016          | NR            | 970    | 4522          | NR            |
| 455    | 89594         | NR            | 585    | 117717        | NR            | 715    | 8940          | NR            | 845    | 4032          | NR            | 975    | 4740          | NR            |
| 460    | 58321         | NR            | 590    | 114359        | NR            | 720    | 7897          | NR            | 850    | 3579          | NR            | 980    | 6122          | NR            |
| 465    | 39318         | NR            | 595    | 109974        | NR            | 725    | 7045          | NR            | 855    | 4571          | NR            | 985    | 6450          | NR            |
| 470    | 27693         | NR            | 600    | 105269        | NR            | 730    | 6483          | NR            | 860    | 4485          | NR            | 990    | 4875          | NR            |
| 475    | 23081         | NR            | 605    | 99453         | NR            | 735    | 5838          | NR            | 865    | 3978          | NR            | 995    | 4764          | NR            |
| 480    | 23002         | NR            | 610    | 92921         | NR            | 740    | 5261          | NR            | 870    | 4298          | NR            | 1000   | 3640          | NR            |
| 485    | 26201         | NR            | 615    | 86989         | NR            | 745    | 4760          | NR            | 875    | 4356          | NR            |        |               |               |

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**Summary**

$R_f = 72.1$   
 $R_g = 97.2$   
 CIE  $R_a = 71.7$   
 $R_g = -27.1$



**Color Vector Graphics**





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

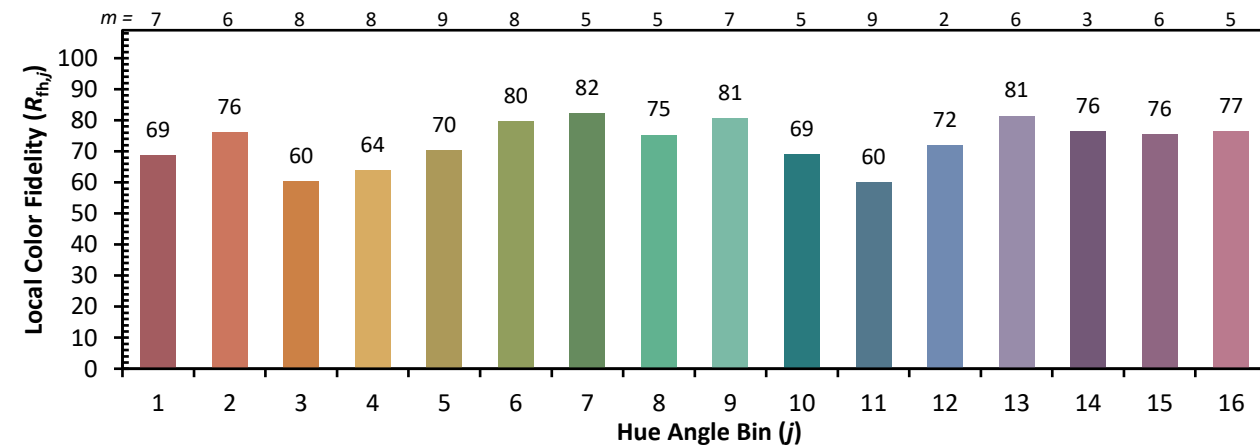
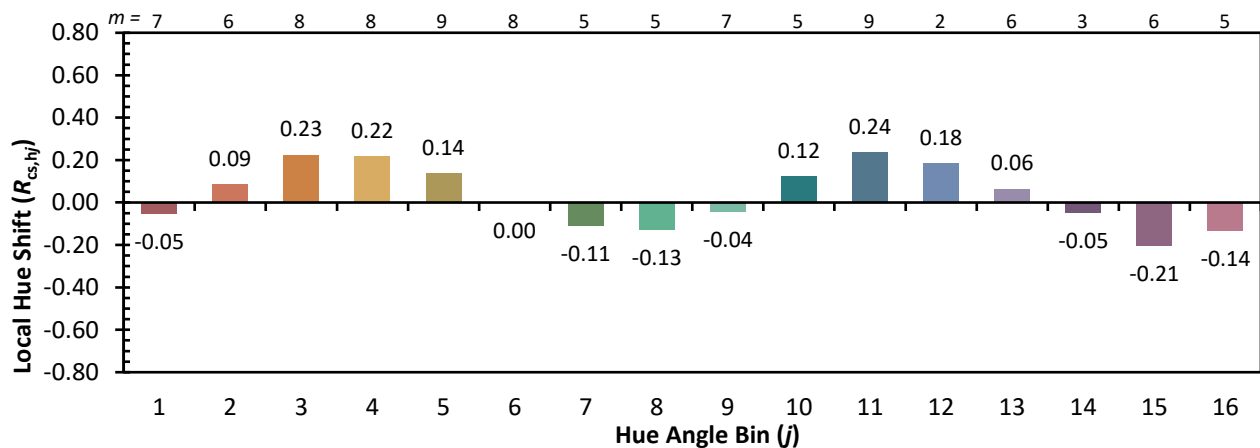
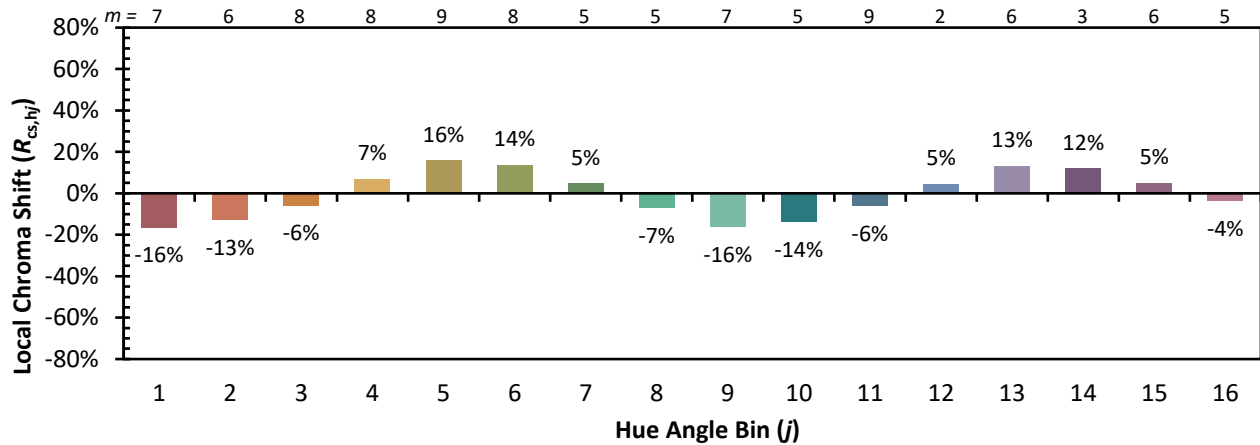
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 54 | CES51 = 88 | CES76 = 43 |
| CES02 = 59 | CES27 = 79 | CES52 = 90 | CES77 = 64 |
| CES03 = 30 | CES28 = 77 | CES53 = 77 | CES78 = 46 |
| CES04 = 69 | CES29 = 50 | CES54 = 81 | CES79 = 74 |
| CES05 = 46 | CES30 = 59 | CES55 = 80 | CES80 = 70 |
| CES06 = 50 | CES31 = 55 | CES56 = 70 | CES81 = 71 |
| CES07 = 38 | CES32 = 52 | CES57 = 68 | CES82 = 88 |
| CES08 = 38 | CES33 = 63 | CES58 = 70 | CES83 = 82 |
| CES09 = 29 | CES34 = 63 | CES59 = 88 | CES84 = 87 |
| CES10 = 72 | CES35 = 79 | CES60 = 92 | CES85 = 84 |
| CES11 = 55 | CES36 = 90 | CES61 = 88 | CES86 = 76 |
| CES12 = 61 | CES37 = 72 | CES62 = 81 | CES87 = 75 |
| CES13 = 41 | CES38 = 68 | CES63 = 75 | CES88 = 77 |
| CES14 = 74 | CES39 = 91 | CES64 = 72 | CES89 = 76 |
| CES15 = 70 | CES40 = 83 | CES65 = 65 | CES90 = 76 |
| CES16 = 46 | CES41 = 84 | CES66 = 66 | CES91 = 92 |
| CES17 = 48 | CES42 = 70 | CES67 = 64 | CES92 = 70 |
| CES18 = 55 | CES43 = 69 | CES68 = 71 | CES93 = 83 |
| CES19 = 70 | CES44 = 98 | CES69 = 80 | CES94 = 60 |
| CES20 = 64 | CES45 = 79 | CES70 = 58 | CES95 = 73 |
| CES21 = 85 | CES46 = 78 | CES71 = 55 | CES96 = 79 |
| CES22 = 77 | CES47 = 76 | CES72 = 84 | CES97 = 84 |
| CES23 = 91 | CES48 = 68 | CES73 = 47 | CES98 = 73 |
| CES24 = 90 | CES49 = 78 | CES74 = 94 | CES99 = 62 |
| CES25 = 71 | CES50 = 87 | CES75 = 51 |            |



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Color Rendition by Hue-Angle Bin



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Measure Comparisons



(END OF REPORT)