

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: P628963

Luminaire Tested: GWS-SA1A-760-U-SL3-W

Issue Date: 1/10/2023

**Test Information**

Test Method: LM-79-2019  
Report Number: P628963  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-31)  
Test Lab: COOPER LIGHTING SOLUTIONS  
Issue Date: 1/10/2023  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: McGRAW-EDISON  
Catalog Number: GWS-SA1A-760-U-SL3-W  
Description: GALLEON WALL SLIM LUMINAIRE. (1) LIGHTSQUARES WITH 16 LEDS EACH AND TYPE III SPILL LIGHT ELIMINATOR OPTICS  
Light Source: (16) 5700K CCT, 70 CRI LEDS  
Ballast/Driver: -

**Summary**

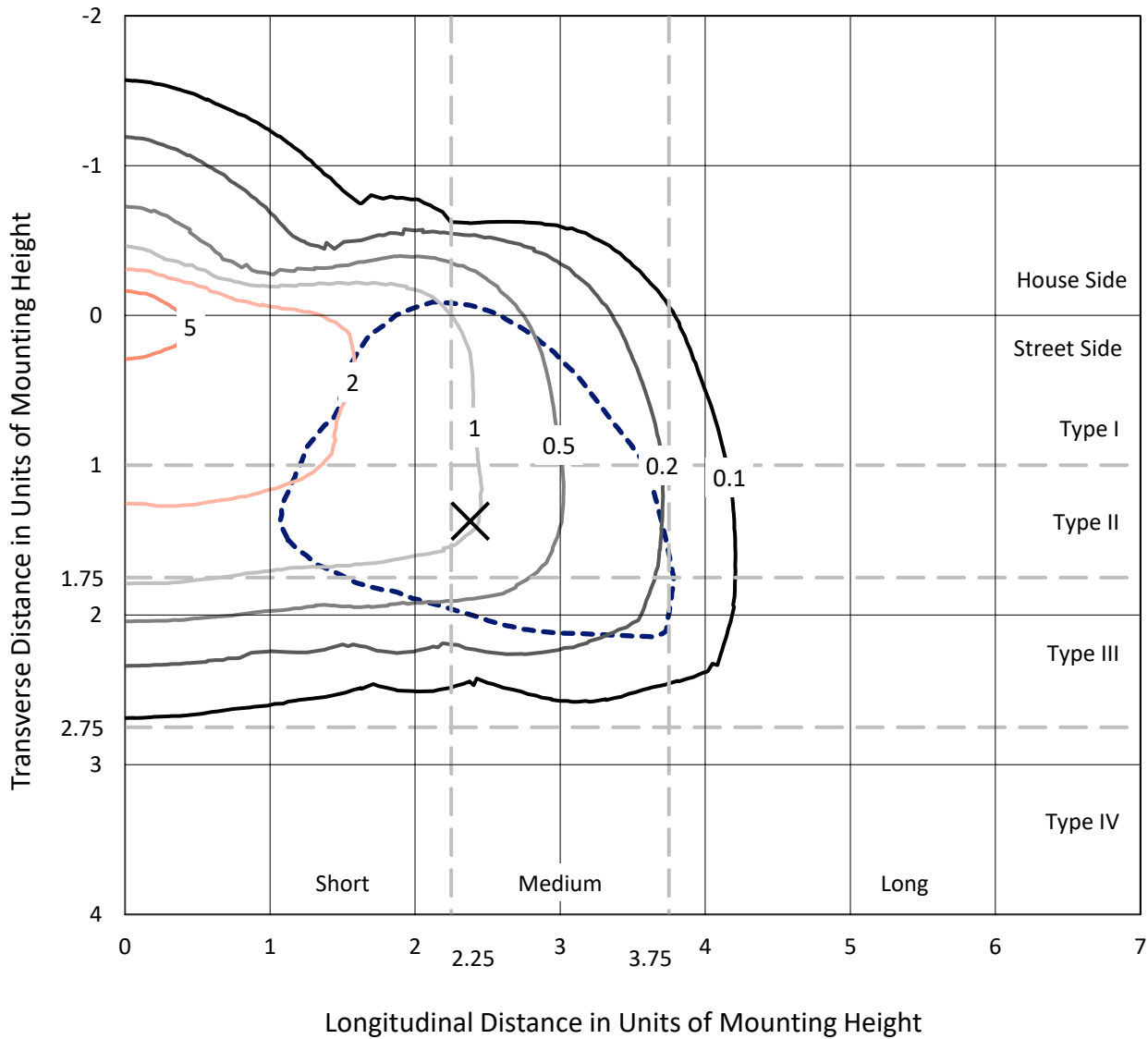
Lumens per Lamp: N/A  
Luminaire Lumens: 2811.2 lumens  
Efficiency: N/A  
Efficacy: 142.7 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 0.5' x H: 0')  
IES Classification: Type III - Medium  
BUG Rating: B1 - U0 - G1  
  
Input Watts (W): 19.7  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 0  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT



REPORT NUMBER: P628963  
 CATALOG NUMBER: GWS-SA1A-760-U-SL3-W

### Iso-Footcandle Lines of Horizontal Illumination

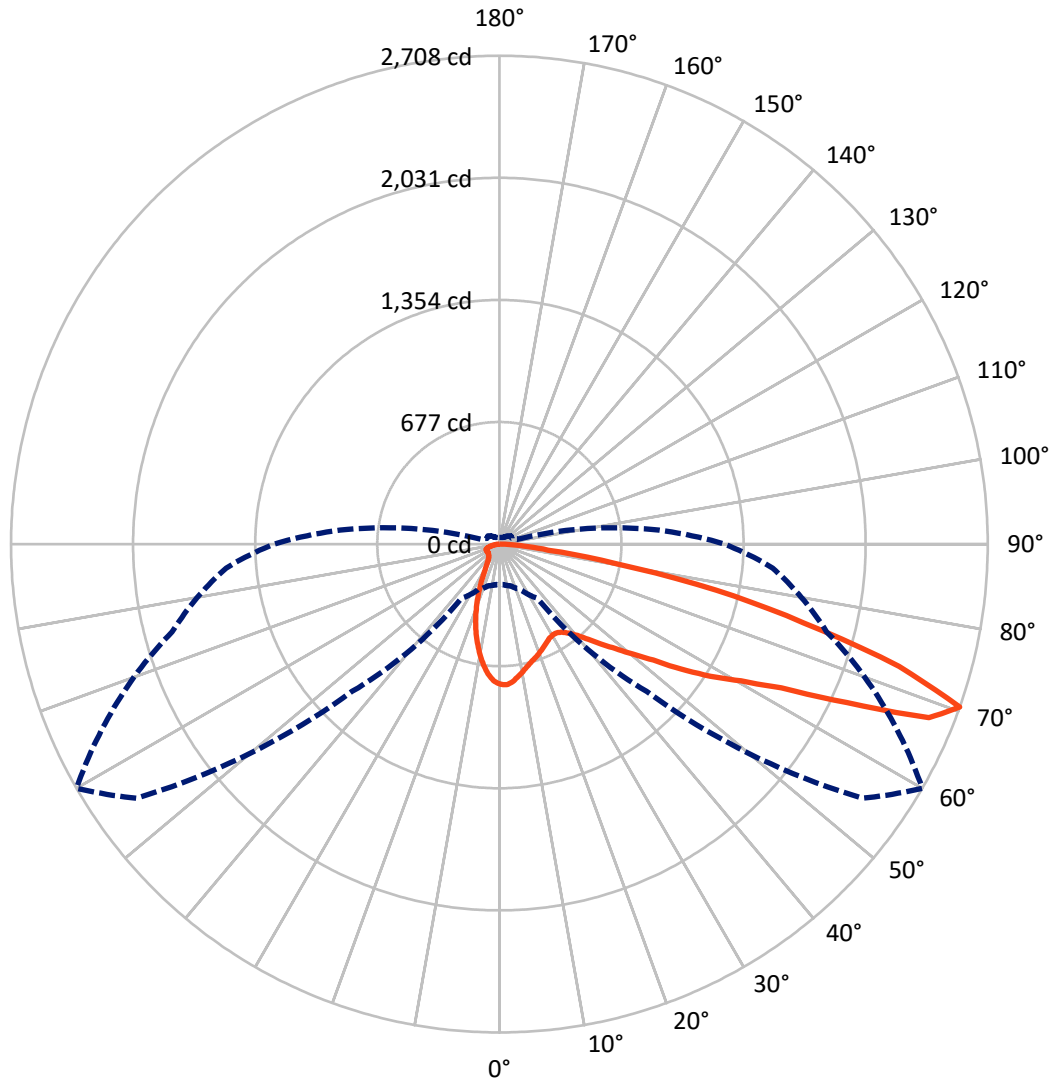
✕ Max cd  
 - - - 1/2 Max cd



Based on 10 foot mounting height. Maximum calculated value = 7.8 fc  
 Type III - Medium - N/A

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### Luminous Intensity Polar Plot



— Vertical Plane Through 60-Deg Lateral    - - - Horizontal Cone Through 70-Deg Vertical

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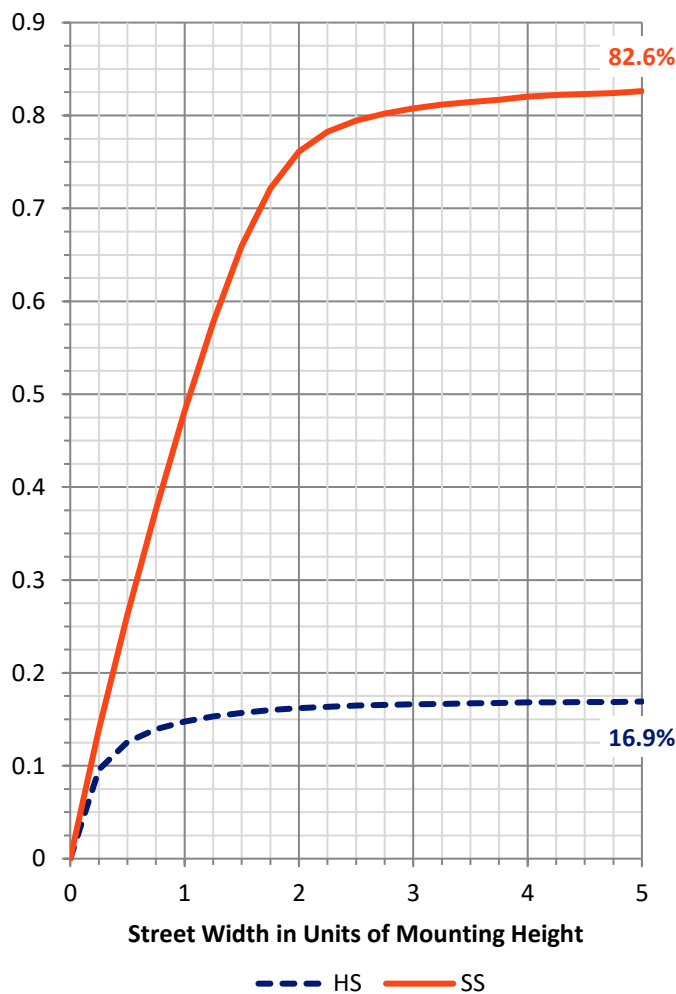
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 480.8    | 0.0    | 480.8  |
|                    | % Fixture | 17.1     | 0.0    | 17.1   |
| <b>Street Side</b> | Lumens    | 2330.4   | 0.0    | 2330.4 |
|                    | % Fixture | 82.9     | 0.0    | 82.9   |
| <b>Total</b>       | Lumens    | 2811.2   | 0.0    | 2811.2 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 67.1   | 2.4       |
| 10°-20°   | 150.2  | 5.3       |
| 20°-30°   | 192.4  | 6.8       |
| 30°-40°   | 252.8  | 9.0       |
| 40°-50°   | 366.8  | 13.0      |
| 50°-60°   | 572.3  | 20.4      |
| 60°-70°   | 749.3  | 26.7      |
| 70°-80°   | 414.3  | 14.7      |
| 80°-90°   | 46.0   | 1.6       |
| 90°-100°  | 0.0    | 0.0       |
| 100°-110° | 0.0    | 0.0       |
| 110°-120° | 0.0    | 0.0       |
| 120°-130° | 0.0    | 0.0       |
| 130°-140° | 0.0    | 0.0       |
| 140°-150° | 0.0    | 0.0       |
| 150°-160° | 0.0    | 0.0       |
| 160°-170° | 0.0    | 0.0       |
| 170°-180° | 0.0    | 0.0       |
| 0°-90°    | 2811.2 | 100.0     |
| 0°-180°   | 2811.2 | 100.0     |

**Coefficient of Utilization**



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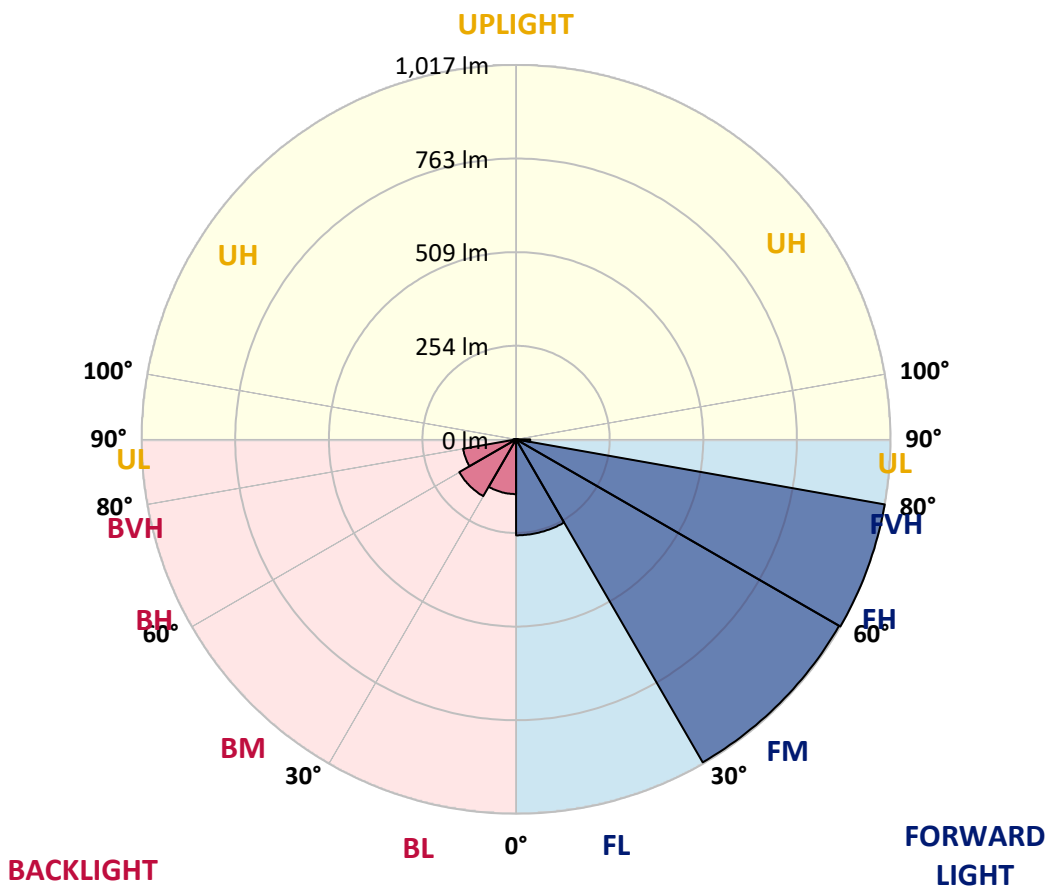
CATALOG NUMBER: GWS-SA1A-760-U-SL3-W

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

| Zone           | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|----------------|--------|-----------|-------------------------|------|---------|
|                |        |           | B                       | U    | G       |
| FL (0°-30°)    | 260.9  | 9.3       |                         |      |         |
| FM (30°-60°)   | 1013.7 | 36.1      |                         |      |         |
| FH (60°-80°)   | 1017.5 | 36.2      |                         |      | G1/1800 |
| FVH (80°-90°)  | 38.3   | 1.4       |                         |      | G1/100  |
| BL (0°-30°)    | 148.7  | 5.3       | B1/500                  |      |         |
| BM (30°-60°)   | 178.3  | 6.3       | B0/220                  |      |         |
| BH (60°-80°)   | 146.1  | 5.2       | B1/500                  |      | G1/500  |
| BVH (80°-90°)  | 7.7    | 0.3       |                         |      | G0/10   |
| UL (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

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

Type III Medium





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°    | 5°    | 15°    | 25°    | 35°    | 45°    | 55°    | 60°    | 65°    | 75°    | 85°    |
|-------|-------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 777.9 | 777.9 | 777.9  | 777.9  | 777.9  | 777.9  | 777.9  | 777.9  | 777.9  | 777.9  | 777.9  |
| 2.5°  | 767.0 | 767.8 | 770.1  | 773.4  | 776.7  | 778.3  | 782.4  | 781.2  | 780.4  | 778.7  | 776.7  |
| 5°    | 733.1 | 734.7 | 736.8  | 743.1  | 750.3  | 756.1  | 765.3  | 766.4  | 766.8  | 767.6  | 764.3  |
| 7.5°  | 689.9 | 690.3 | 695.2  | 703.6  | 713.1  | 723.0  | 738.4  | 742.7  | 746.4  | 750.5  | 747.9  |
| 10°   | 642.1 | 643.2 | 646.9  | 659.0  | 675.3  | 689.9  | 710.6  | 717.8  | 725.7  | 734.7  | 731.0  |
| 12.5° | 603.1 | 603.3 | 609.2  | 622.2  | 639.9  | 659.6  | 685.5  | 694.2  | 704.5  | 718.7  | 715.4  |
| 15°   | 572.0 | 572.0 | 577.6  | 588.7  | 609.0  | 632.3  | 663.1  | 674.2  | 688.2  | 707.3  | 701.6  |
| 17.5° | 547.3 | 547.5 | 551.0  | 562.8  | 580.9  | 606.6  | 643.2  | 658.2  | 673.6  | 698.9  | 690.3  |
| 20°   | 534.4 | 533.3 | 534.0  | 541.2  | 556.6  | 581.5  | 623.2  | 640.7  | 661.5  | 693.2  | 680.0  |
| 22.5° | 533.7 | 531.9 | 529.2  | 529.8  | 538.9  | 559.5  | 601.8  | 623.0  | 649.1  | 688.4  | 669.5  |
| 25°   | 544.2 | 542.2 | 537.5  | 532.1  | 531.3  | 543.6  | 581.7  | 605.7  | 636.4  | 686.4  | 659.4  |
| 27.5° | 561.9 | 560.5 | 554.3  | 546.3  | 537.9  | 537.5  | 566.5  | 591.5  | 627.1  | 688.4  | 652.2  |
| 30°   | 585.4 | 582.9 | 579.0  | 568.7  | 556.0  | 542.8  | 560.5  | 583.9  | 621.0  | 695.0  | 649.1  |
| 32.5° | 611.9 | 610.5 | 606.8  | 596.5  | 582.9  | 561.9  | 565.2  | 585.6  | 621.0  | 706.5  | 649.8  |
| 35°   | 640.1 | 639.9 | 639.9  | 633.1  | 618.1  | 592.0  | 583.9  | 599.6  | 630.4  | 725.0  | 656.3  |
| 37.5° | 667.4 | 667.2 | 673.8  | 676.3  | 659.2  | 631.0  | 615.8  | 627.5  | 651.2  | 752.4  | 672.6  |
| 40°   | 689.7 | 690.5 | 704.9  | 717.2  | 707.8  | 681.6  | 660.2  | 666.2  | 684.9  | 791.3  | 701.0  |
| 42.5° | 712.1 | 714.3 | 735.9  | 757.7  | 761.4  | 738.8  | 717.2  | 720.7  | 733.3  | 842.7  | 743.3  |
| 45°   | 736.6 | 737.6 | 767.8  | 798.3  | 816.2  | 802.8  | 785.1  | 789.8  | 792.7  | 906.2  | 806.5  |
| 47.5° | 760.2 | 762.9 | 802.0  | 843.7  | 877.7  | 876.4  | 866.5  | 865.1  | 865.7  | 983.6  | 881.1  |
| 50°   | 792.5 | 796.4 | 842.3  | 892.7  | 942.4  | 965.3  | 968.2  | 957.3  | 952.7  | 1069.6 | 974.1  |
| 52.5° | 853.8 | 853.8 | 894.9  | 944.5  | 1011.3 | 1067.9 | 1087.2 | 1069.3 | 1055.0 | 1160.5 | 1072.8 |
| 55°   | 930.5 | 933.8 | 966.5  | 1006.6 | 1091.4 | 1175.9 | 1241.3 | 1221.6 | 1180.8 | 1259.4 | 1176.3 |
| 57.5° | 964.7 | 968.8 | 1020.6 | 1082.9 | 1196.1 | 1298.7 | 1389.4 | 1382.4 | 1323.0 | 1362.2 | 1283.7 |
| 60°   | 903.0 | 911.6 | 983.0  | 1087.4 | 1290.9 | 1496.8 | 1560.7 | 1540.4 | 1455.4 | 1470.2 | 1400.1 |
| 62.5° | 753.2 | 762.7 | 841.9  | 987.7  | 1277.7 | 1710.9 | 1830.8 | 1755.7 | 1620.8 | 1606.6 | 1555.2 |
| 65°   | 449.4 | 449.0 | 544.2  | 737.6  | 1115.4 | 1770.3 | 2258.2 | 2118.1 | 1876.2 | 1793.8 | 1714.8 |
| 67.5° | 285.7 | 285.1 | 305.0  | 390.8  | 742.3  | 1624.7 | 2533.0 | 2569.4 | 2223.2 | 1931.4 | 1727.9 |
| 70°   | 225.4 | 225.2 | 239.6  | 278.7  | 367.1  | 1156.1 | 2456.5 | 2708.4 | 2432.8 | 1878.9 | 1521.4 |
| 72.5° | 164.3 | 164.8 | 187.0  | 233.5  | 283.2  | 580.4  | 1989.2 | 2317.4 | 2237.6 | 1658.6 | 1235.1 |
| 75°   | 118.1 | 118.7 | 132.0  | 178.7  | 261.2  | 317.4  | 1322.8 | 1742.6 | 1702.4 | 1329.5 | 849.7  |
| 77.5° | 75.1  | 75.9  | 87.6   | 125.3  | 211.0  | 256.3  | 802.0  | 1230.2 | 1132.7 | 749.1  | 302.1  |
| 80°   | 45.9  | 48.5  | 58.4   | 93.4   | 168.7  | 192.3  | 400.9  | 648.1  | 567.3  | 205.5  | 101.6  |
| 82.5° | 23.7  | 25.7  | 35.2   | 57.8   | 116.2  | 168.9  | 226.9  | 272.3  | 175.7  | 86.0   | 54.1   |
| 85°   | 7.4   | 8.6   | 12.3   | 23.4   | 55.3   | 104.7  | 150.1  | 135.3  | 80.6   | 40.5   | 25.1   |
| 87.5° | 1.9   | 1.9   | 2.1    | 2.1    | 2.3    | 4.7    | 29.0   | 30.6   | 21.4   | 12.8   | 10.3   |
| 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: P628963  
 CATALOG NUMBER: GWS-SA1A-760-U-SL3-W

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 777.9  | 777.9  | 777.9 | 777.9 | 777.9 | 777.9 | 777.9 | 777.9 | 777.9 | 777.9 | 777.9 |
| 2.5°  | 772.5  | 767.6  | 765.6 | 765.3 | 760.2 | 752.8 | 747.9 | 744.4 | 742.3 | 741.9 | 741.9 |
| 5°    | 758.8  | 752.4  | 744.0 | 737.6 | 723.8 | 709.8 | 698.1 | 691.5 | 683.9 | 682.9 | 682.7 |
| 7.5°  | 740.5  | 731.2  | 715.2 | 697.3 | 673.2 | 650.0 | 630.2 | 616.8 | 603.5 | 601.0 | 600.2 |
| 10°   | 720.7  | 708.2  | 680.8 | 649.3 | 613.3 | 578.6 | 548.4 | 524.7 | 509.1 | 498.0 | 495.9 |
| 12.5° | 701.2  | 684.5  | 644.4 | 597.5 | 548.1 | 500.6 | 455.2 | 416.5 | 388.5 | 372.3 | 369.4 |
| 15°   | 682.9  | 659.6  | 604.7 | 544.9 | 480.7 | 415.7 | 351.3 | 301.1 | 261.8 | 247.8 | 244.6 |
| 17.5° | 666.2  | 637.2  | 566.2 | 490.3 | 410.3 | 325.4 | 252.2 | 207.5 | 184.5 | 177.5 | 175.9 |
| 20°   | 649.5  | 614.2  | 527.2 | 433.0 | 335.7 | 240.4 | 184.3 | 163.3 | 154.7 | 152.0 | 151.2 |
| 22.5° | 631.7  | 588.9  | 484.6 | 376.4 | 260.2 | 180.0 | 150.8 | 141.5 | 138.8 | 139.0 | 138.8 |
| 25°   | 613.8  | 563.2  | 440.0 | 314.9 | 193.8 | 146.0 | 131.6 | 128.1 | 128.8 | 130.6 | 131.0 |
| 27.5° | 599.0  | 540.3  | 396.1 | 247.4 | 151.4 | 125.7 | 118.9 | 118.7 | 120.9 | 123.4 | 123.8 |
| 30°   | 588.3  | 520.0  | 353.0 | 190.3 | 124.6 | 111.7 | 109.0 | 110.2 | 112.9 | 114.8 | 115.4 |
| 32.5° | 580.6  | 502.5  | 306.9 | 149.5 | 109.2 | 101.8 | 100.6 | 101.8 | 103.5 | 105.3 | 105.7 |
| 35°   | 578.0  | 489.7  | 261.6 | 122.0 | 98.7  | 94.6  | 93.8  | 94.4  | 95.2  | 96.3  | 96.7  |
| 37.5° | 583.9  | 483.4  | 214.3 | 106.1 | 92.4  | 89.9  | 88.6  | 88.2  | 88.4  | 88.9  | 89.1  |
| 40°   | 601.6  | 486.2  | 175.7 | 96.9  | 88.2  | 86.0  | 83.9  | 83.1  | 82.9  | 83.3  | 83.1  |
| 42.5° | 632.1  | 498.4  | 147.7 | 91.5  | 84.9  | 81.7  | 79.4  | 78.6  | 78.6  | 79.6  | 79.6  |
| 45°   | 676.7  | 522.2  | 127.5 | 87.6  | 82.1  | 78.0  | 75.5  | 75.1  | 75.9  | 77.5  | 77.7  |
| 47.5° | 742.1  | 557.2  | 115.4 | 84.7  | 79.4  | 74.7  | 72.2  | 72.0  | 73.6  | 76.3  | 76.5  |
| 50°   | 819.6  | 607.6  | 108.8 | 82.7  | 77.5  | 72.0  | 69.5  | 69.7  | 71.6  | 74.5  | 75.1  |
| 52.5° | 913.0  | 676.3  | 109.2 | 81.9  | 76.5  | 70.3  | 67.9  | 67.5  | 69.3  | 72.2  | 72.8  |
| 55°   | 1009.5 | 759.8  | 117.2 | 82.1  | 75.1  | 69.5  | 66.2  | 64.8  | 66.4  | 68.5  | 68.7  |
| 57.5° | 1115.6 | 854.0  | 137.2 | 81.7  | 73.2  | 68.7  | 64.8  | 61.5  | 62.5  | 63.8  | 64.4  |
| 60°   | 1235.3 | 964.9  | 180.2 | 82.5  | 72.4  | 66.8  | 61.9  | 57.6  | 57.4  | 58.2  | 58.4  |
| 62.5° | 1395.4 | 1115.6 | 228.5 | 83.9  | 74.3  | 64.6  | 57.6  | 53.1  | 52.2  | 52.7  | 52.9  |
| 65°   | 1517.7 | 1187.6 | 213.3 | 82.7  | 78.2  | 62.9  | 53.5  | 48.7  | 47.1  | 46.7  | 46.7  |
| 67.5° | 1468.0 | 1092.4 | 148.5 | 79.4  | 80.0  | 63.1  | 50.2  | 44.2  | 42.2  | 41.1  | 40.9  |
| 70°   | 1249.1 | 887.3  | 103.3 | 76.1  | 78.0  | 62.7  | 46.7  | 40.5  | 37.8  | 36.4  | 36.2  |
| 72.5° | 986.9  | 677.5  | 83.5  | 69.5  | 70.8  | 56.6  | 41.5  | 36.4  | 34.1  | 32.3  | 32.3  |
| 75°   | 635.2  | 413.4  | 69.7  | 61.9  | 57.8  | 44.0  | 36.0  | 32.5  | 30.2  | 28.4  | 28.4  |
| 77.5° | 213.7  | 153.4  | 54.1  | 52.4  | 43.2  | 33.1  | 30.2  | 28.0  | 26.1  | 24.5  | 24.3  |
| 80°   | 86.8   | 72.8   | 39.7  | 39.7  | 30.2  | 25.3  | 23.7  | 22.6  | 21.4  | 19.3  | 19.3  |
| 82.5° | 50.4   | 44.2   | 27.8  | 24.1  | 20.2  | 17.5  | 16.5  | 15.4  | 15.4  | 14.0  | 14.0  |
| 85°   | 24.3   | 24.5   | 16.7  | 14.8  | 11.5  | 10.1  | 9.7   | 9.1   | 8.8   | 8.0   | 7.8   |
| 87.5° | 13.2   | 13.4   | 8.4   | 6.6   | 4.5   | 3.9   | 3.3   | 3.1   | 2.9   | 2.7   | 2.7   |
| 90°   | 0.0    | 0.0    | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |



Signify Classified - Internal  
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1121 Highway 74 South  
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 .

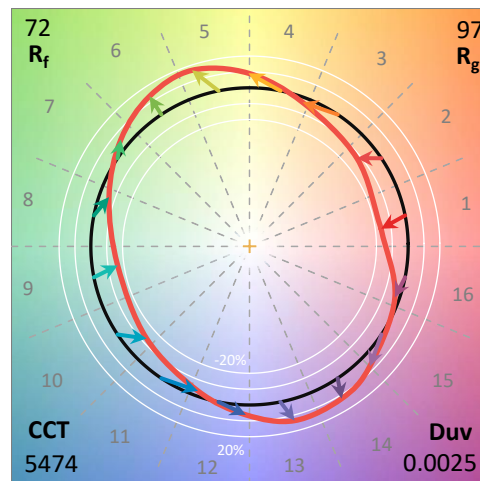
**Test Information**

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

REPORT NUMBER: SP1-1908-441-9-R4

| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 6/28/2019        | 12/28/2019           |
| Power Meter                    | IN0071                | 12/5/2018        | 12/5/2019            |
| AC Power Source                | IN0063                | 12/5/2018        | 12/5/2019            |
| DC Power Source                | IN0208                | 12/5/2018        | 12/5/2019            |
| Sphere Thermometer             | IN0085                | 12/5/2018        | 12/5/2019            |
| Room Thermometer               | IN0046                | 12/5/2018        | 12/5/2019            |

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CIE 1931 Chromaticity Diagram



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



Point lies inside the ANSI 5700K 4-step quadrangle

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**Photopic Flux vs. Wavelength**



#####

| $\lambda$<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)