

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: P629618

Luminaire Tested: GWS-SA1C-722-U-SL2-W-HSS

Issue Date: 1/10/2023

**Test Information**

Test Method: LM-79-2019  
Report Number: P629618  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-30)  
Test Lab: COOPER LIGHTING SOLUTIONS  
Issue Date: 1/10/2023  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: McGRAW-EDISON  
Catalog Number: GWS-SA1C-722-U-SL2-W-HSS  
Description: GALLEON WALL SLIM LUMINAIRE. (1) LIGHTSQUARES WITH 16 LEDS EACH AND  
TYPE II SPILL LIGHT ELIMINATOR OPTICS WITH HOUSE SIDE SHIELD  
Light Source: (16) 2200K CCT, 70 CRI LEDS  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 2806.6 lumens  
Efficiency: N/A  
Efficacy: 82.3 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 0.5' x H: 0')  
IES Classification: Type II - Short  
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

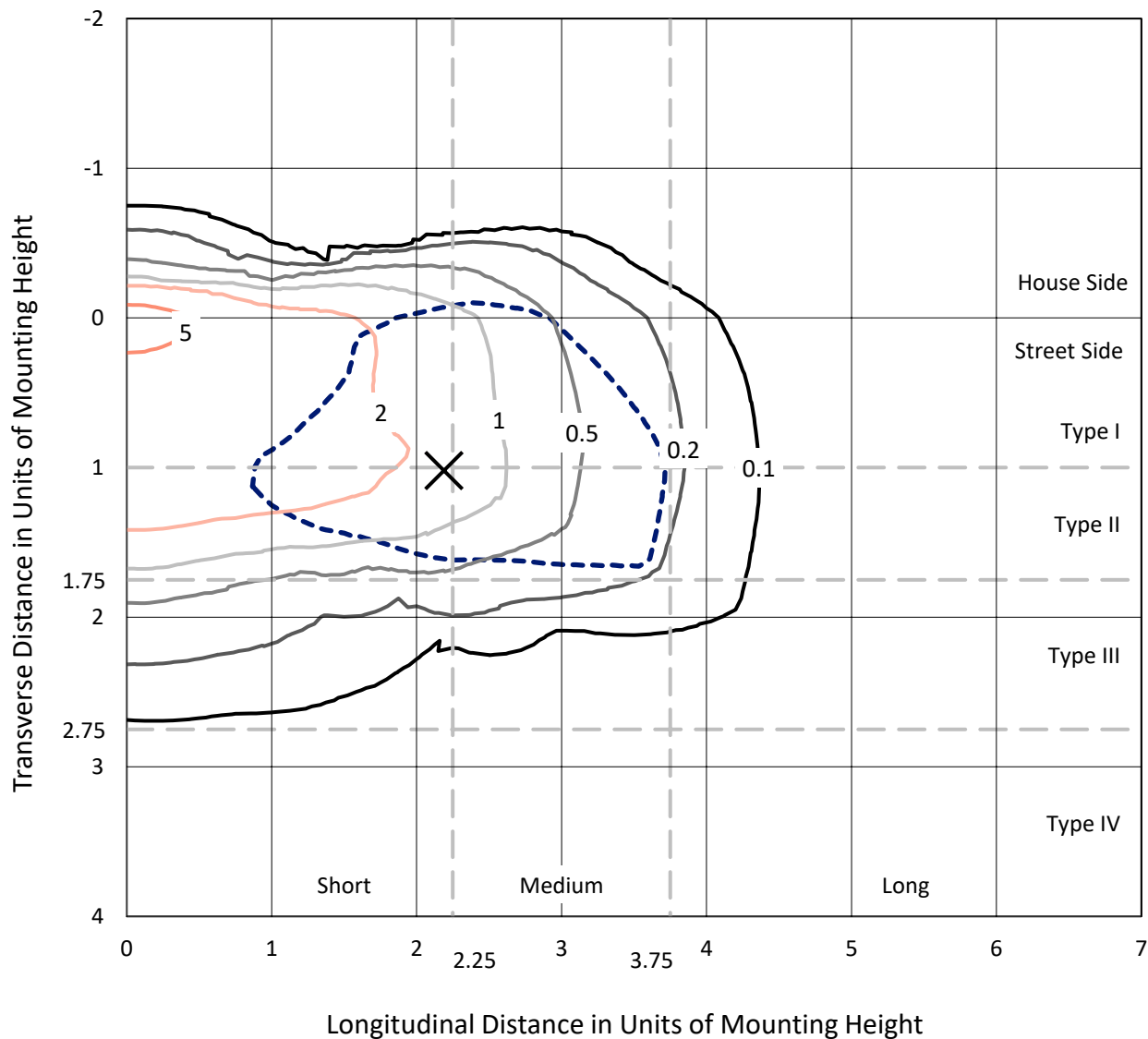


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## Iso-Footcandle Lines of Horizontal Illumination

✕ Max cd

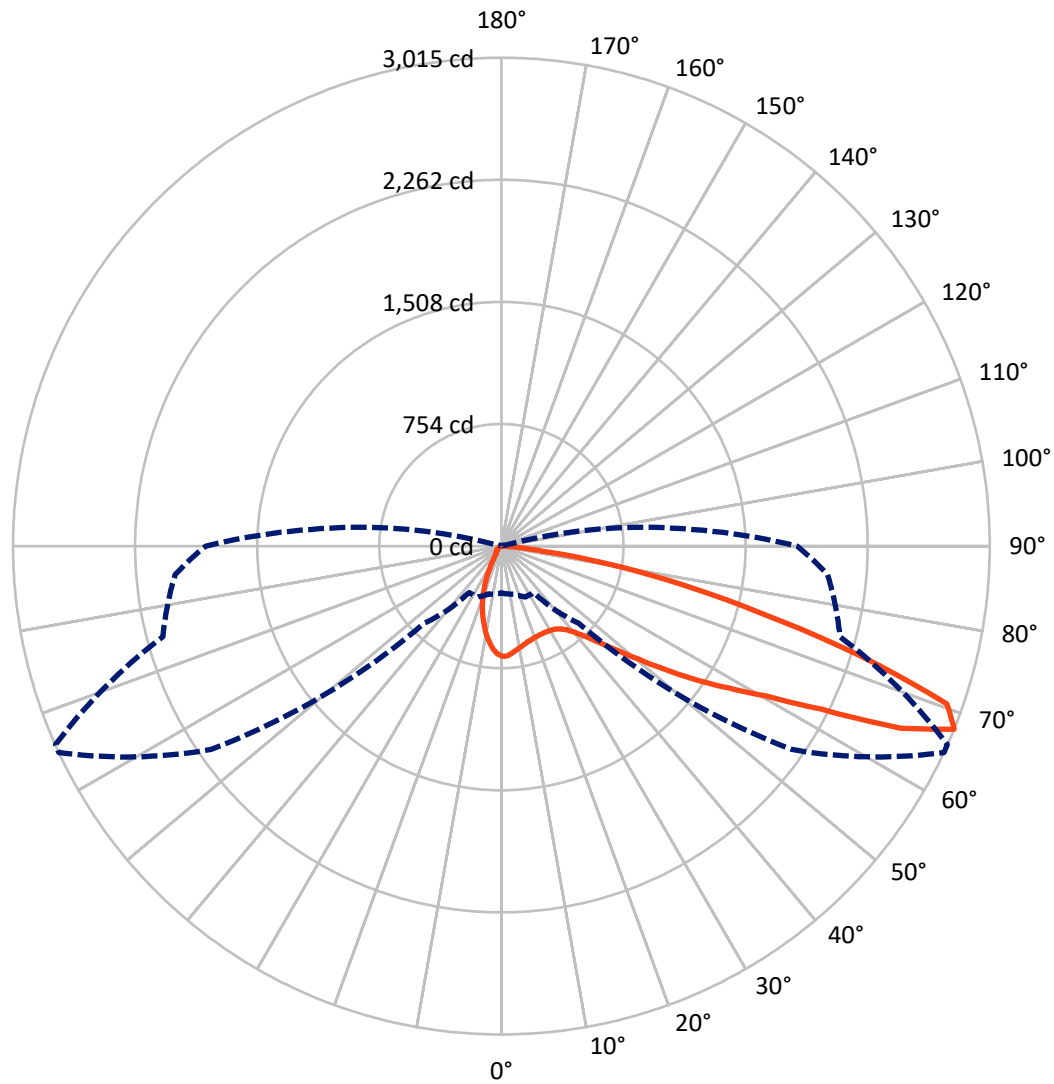
--- 1/2 Max cd



Based on 10 foot mounting height. Maximum calculated value = 6.8 fc  
 Type II - Short - N/A

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CATALOG NUMBER: GWS-SA1C-722-U-SL2-W-HSS

## Luminous Intensity Polar Plot



— Vertical Plane Through 65-Deg Lateral    - - - Horizontal Cone Through 67.5-Deg Vertical

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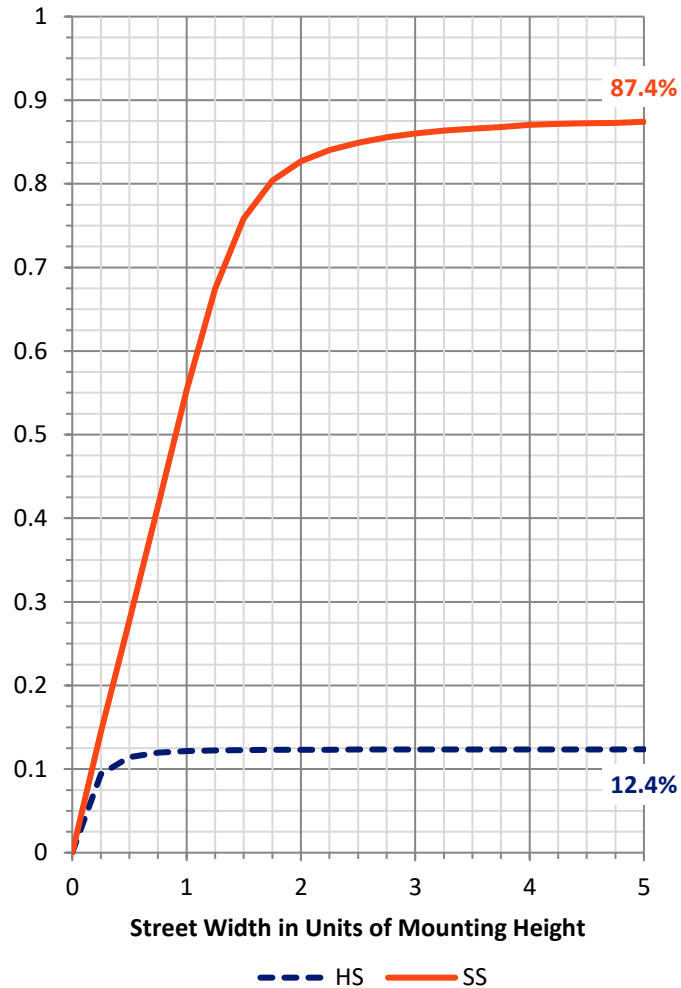
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 350.5    | 0.0    | 350.5  |
|                    | % Fixture | 12.5     | 0.0    | 12.5   |
| <b>Street Side</b> | Lumens    | 2456.1   | 0.0    | 2456.1 |
|                    | % Fixture | 87.5     | 0.0    | 87.5   |
| <b>Total</b>       | Lumens    | 2806.6   | 0.0    | 2806.6 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 56.5   | 2.0       |
| 10°-20°   | 127.1  | 4.5       |
| 20°-30°   | 181.6  | 6.5       |
| 30°-40°   | 264.2  | 9.4       |
| 40°-50°   | 413.8  | 14.7      |
| 50°-60°   | 645.5  | 23.0      |
| 60°-70°   | 709.1  | 25.3      |
| 70°-80°   | 377.4  | 13.4      |
| 80°-90°   | 31.4   | 1.1       |
| 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°    | 2806.6 | 100.0     |
| 0°-180°   | 2806.6 | 100.0     |

**Coefficient of Utilization**



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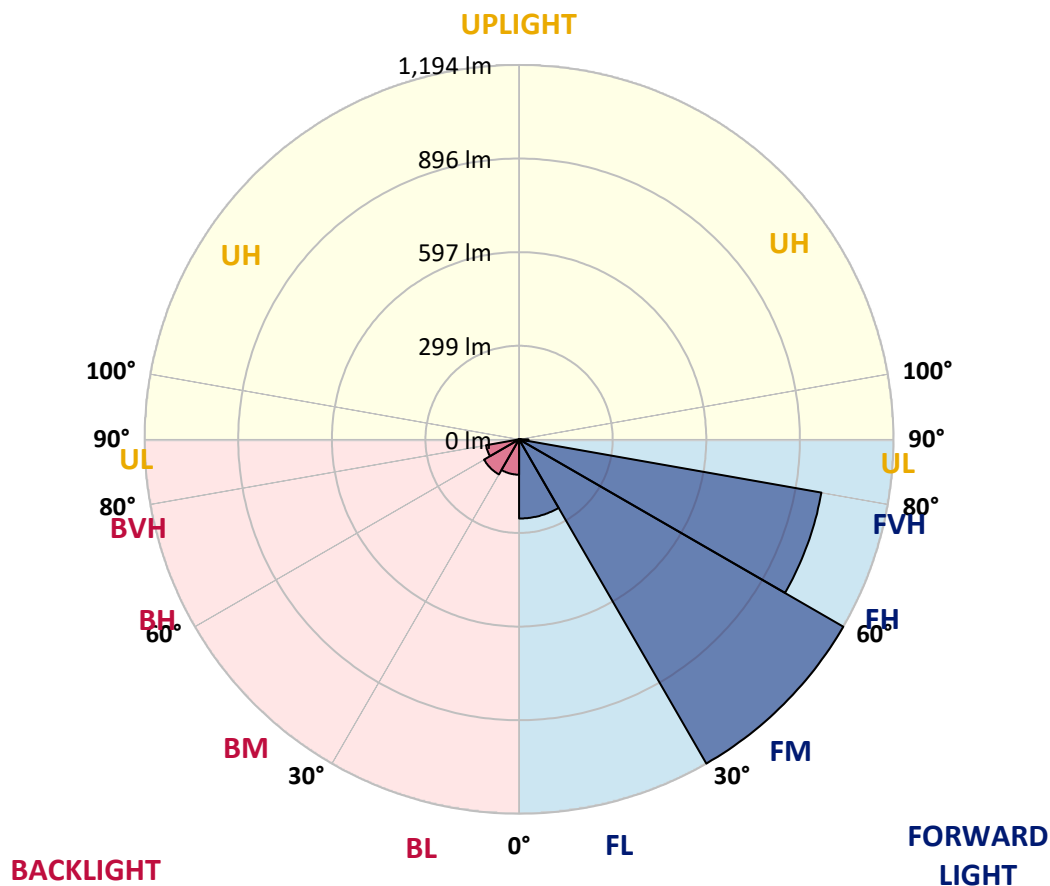
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**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 252.6  | 9.0       |                         |      |         |
| FM   | (30°-60°)   | 1194.4 | 42.6      |                         |      |         |
| FH   | (60°-80°)   | 979.4  | 34.9      |                         |      | G1/1800 |
| FVH  | (80°-90°)   | 29.7   | 1.1       |                         |      | G1/100  |
| BL   | (0°-30°)    | 112.6  | 4.0       | B1/500                  |      |         |
| BM   | (30°-60°)   | 129.1  | 4.6       | B0/220                  |      |         |
| BH   | (60°-80°)   | 107.0  | 3.8       | B0/110                  |      | G0/110  |
| BVH  | (80°-90°)   | 1.7    | 0.1       |                         |      | 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 II Short



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 66°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 680.7  | 680.7  | 680.7  | 680.7  | 680.7  | 680.7  | 680.7  | 680.7  | 680.7  | 680.7  | 680.7  |
| 2.5°  | 657.1  | 659.1  | 656.3  | 663.2  | 664.4  | 672.1  | 676.4  | 679.4  | 679.2  | 683.0  | 683.0  |
| 5°    | 618.5  | 620.5  | 619.0  | 626.4  | 632.2  | 644.1  | 654.0  | 665.5  | 666.0  | 677.6  | 682.0  |
| 7.5°  | 585.8  | 586.0  | 586.0  | 595.2  | 602.8  | 617.5  | 632.2  | 649.7  | 651.8  | 669.8  | 681.2  |
| 10°   | 558.9  | 559.6  | 559.9  | 570.3  | 578.7  | 596.4  | 615.2  | 636.3  | 638.6  | 662.9  | 680.7  |
| 12.5° | 540.3  | 540.6  | 541.6  | 552.5  | 561.7  | 580.2  | 599.2  | 623.3  | 626.4  | 655.1  | 678.4  |
| 15°   | 531.5  | 530.9  | 531.5  | 540.6  | 549.7  | 567.5  | 587.0  | 612.9  | 616.2  | 648.5  | 678.7  |
| 17.5° | 530.9  | 530.2  | 529.7  | 536.5  | 542.4  | 558.1  | 577.9  | 606.1  | 609.6  | 645.4  | 681.5  |
| 20°   | 538.3  | 537.8  | 535.3  | 538.3  | 539.6  | 552.5  | 572.1  | 600.7  | 604.3  | 644.9  | 687.5  |
| 22.5° | 557.6  | 556.3  | 552.5  | 549.7  | 542.9  | 550.5  | 568.0  | 596.9  | 601.0  | 646.2  | 695.4  |
| 25°   | 586.3  | 585.8  | 580.9  | 574.1  | 556.6  | 553.5  | 568.3  | 596.9  | 600.7  | 647.7  | 703.8  |
| 27.5° | 629.4  | 626.4  | 620.3  | 608.4  | 583.2  | 565.5  | 573.3  | 598.5  | 602.3  | 649.7  | 710.6  |
| 30°   | 673.3  | 673.1  | 671.0  | 658.9  | 621.6  | 588.3  | 584.0  | 602.5  | 606.1  | 651.5  | 717.0  |
| 32.5° | 718.8  | 719.5  | 724.6  | 715.2  | 674.3  | 622.3  | 603.3  | 610.9  | 613.4  | 655.1  | 722.6  |
| 35°   | 761.9  | 763.4  | 776.9  | 780.2  | 738.6  | 673.8  | 634.8  | 627.6  | 627.9  | 662.9  | 729.9  |
| 37.5° | 803.3  | 808.3  | 829.9  | 845.9  | 818.5  | 736.3  | 680.2  | 656.1  | 654.0  | 678.7  | 741.1  |
| 40°   | 850.2  | 859.9  | 887.0  | 914.2  | 905.6  | 818.8  | 742.1  | 699.7  | 695.4  | 707.6  | 761.1  |
| 42.5° | 902.3  | 912.7  | 948.7  | 986.8  | 990.8  | 918.5  | 819.5  | 763.4  | 756.1  | 756.3  | 798.7  |
| 45°   | 958.1  | 972.1  | 1013.9 | 1068.7 | 1093.4 | 1029.7 | 914.9  | 849.5  | 842.1  | 831.2  | 859.1  |
| 47.5° | 1031.4 | 1043.6 | 1084.0 | 1147.2 | 1194.4 | 1148.9 | 1040.1 | 960.1  | 946.7  | 930.7  | 953.0  |
| 50°   | 1094.6 | 1105.3 | 1140.1 | 1219.3 | 1317.5 | 1302.8 | 1181.9 | 1098.4 | 1085.5 | 1058.3 | 1076.9 |
| 52.5° | 1108.6 | 1117.0 | 1148.9 | 1238.0 | 1411.6 | 1496.9 | 1355.8 | 1265.7 | 1256.6 | 1206.3 | 1213.4 |
| 55°   | 1045.9 | 1058.6 | 1087.3 | 1186.3 | 1436.2 | 1686.7 | 1581.4 | 1454.3 | 1435.2 | 1355.0 | 1367.7 |
| 57.5° | 887.5  | 910.1  | 937.0  | 1065.7 | 1369.5 | 1787.8 | 1896.6 | 1654.0 | 1636.7 | 1498.2 | 1498.4 |
| 60°   | 650.5  | 668.8  | 686.8  | 804.5  | 1211.1 | 1780.9 | 2182.7 | 1878.4 | 1846.9 | 1615.2 | 1610.9 |
| 62.5° | 473.1  | 482.5  | 482.2  | 524.1  | 831.7  | 1663.7 | 2332.9 | 2216.4 | 2143.1 | 1740.3 | 1715.7 |
| 65°   | 372.1  | 371.8  | 382.7  | 396.4  | 464.5  | 1284.2 | 2351.4 | 2710.1 | 2630.9 | 1908.1 | 1856.8 |
| 67.5° | 289.6  | 295.2  | 306.1  | 346.4  | 349.0  | 672.1  | 2188.5 | 3015.4 | 3013.9 | 2164.1 | 2022.0 |
| 70°   | 223.3  | 231.0  | 246.4  | 305.3  | 322.3  | 376.1  | 1637.5 | 2918.7 | 2943.3 | 2278.6 | 1905.0 |
| 72.5° | 143.4  | 142.9  | 165.7  | 246.7  | 309.6  | 313.4  | 905.6  | 2318.5 | 2346.4 | 2063.9 | 1540.3 |
| 75°   | 80.2   | 80.7   | 93.7   | 151.0  | 288.6  | 294.9  | 448.5  | 1653.2 | 1675.3 | 1609.1 | 1183.5 |
| 77.5° | 31.5   | 32.5   | 43.9   | 79.4   | 190.3  | 263.4  | 266.5  | 1127.4 | 1130.7 | 997.2  | 725.9  |
| 80°   | 12.7   | 13.5   | 22.3   | 49.2   | 116.0  | 177.4  | 190.3  | 664.2  | 650.7  | 386.0  | 211.2  |
| 82.5° | 3.8    | 4.1    | 8.9    | 27.9   | 60.7   | 126.1  | 128.4  | 254.8  | 240.6  | 83.0   | 53.8   |
| 85°   | 0.3    | 0.3    | 2.0    | 8.6    | 21.6   | 31.7   | 85.5   | 83.0   | 73.6   | 20.8   | 23.9   |
| 87.5° | 0.0    | 0.0    | 0.3    | 0.3    | 0.5    | 1.0    | 9.1    | 15.2   | 15.5   | 3.8    | 10.7   |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |



REPORT NUMBER: P629618

CATALOG NUMBER: GWS-SA1C-722-U-SL2-W-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 680.7  | 680.7  | 680.7 | 680.7 | 680.7 | 680.7 | 680.7 | 680.7 | 680.7 | 680.7 | 680.7 |
| 2.5°  | 683.0  | 673.8  | 673.1 | 666.0 | 658.9 | 650.0 | 639.6 | 632.0 | 626.6 | 617.2 | 615.5 |
| 5°    | 682.0  | 669.8  | 658.4 | 638.1 | 615.5 | 591.1 | 569.8 | 550.0 | 537.5 | 529.2 | 525.6 |
| 7.5°  | 679.9  | 664.4  | 638.1 | 599.7 | 561.9 | 519.3 | 486.0 | 455.6 | 434.8 | 422.6 | 417.2 |
| 10°   | 678.4  | 657.6  | 614.7 | 556.6 | 498.0 | 439.1 | 388.6 | 343.4 | 318.3 | 298.5 | 295.2 |
| 12.5° | 675.4  | 647.7  | 584.8 | 506.1 | 430.4 | 352.3 | 287.8 | 232.5 | 194.2 | 176.9 | 170.8 |
| 15°   | 672.3  | 637.3  | 554.8 | 452.8 | 356.8 | 260.4 | 182.2 | 128.9 | 102.5 | 94.4  | 93.9  |
| 17.5° | 671.8  | 627.9  | 522.3 | 402.3 | 279.7 | 170.6 | 103.8 | 83.5  | 77.9  | 75.9  | 75.9  |
| 20°   | 673.3  | 620.0  | 490.3 | 344.2 | 203.8 | 103.8 | 77.4  | 72.3  | 69.0  | 67.3  | 67.3  |
| 22.5° | 674.9  | 611.9  | 459.6 | 285.5 | 135.3 | 75.9  | 68.3  | 64.0  | 60.2  | 58.1  | 57.1  |
| 25°   | 675.9  | 603.0  | 425.6 | 226.6 | 88.3  | 66.0  | 59.9  | 54.3  | 49.7  | 47.2  | 47.2  |
| 27.5° | 675.6  | 592.4  | 391.4 | 169.0 | 68.5  | 58.6  | 51.3  | 45.4  | 40.9  | 38.1  | 38.3  |
| 30°   | 673.6  | 580.7  | 355.8 | 118.0 | 59.9  | 51.3  | 43.9  | 37.8  | 33.2  | 31.0  | 30.7  |
| 32.5° | 672.1  | 568.3  | 314.7 | 83.0  | 53.8  | 44.9  | 37.3  | 31.5  | 27.7  | 25.9  | 25.6  |
| 35°   | 670.3  | 556.1  | 275.6 | 63.2  | 48.5  | 38.8  | 31.5  | 26.6  | 23.6  | 22.1  | 22.1  |
| 37.5° | 670.8  | 543.4  | 233.2 | 54.3  | 43.1  | 33.8  | 26.9  | 22.8  | 20.3  | 18.8  | 18.5  |
| 40°   | 678.7  | 535.8  | 191.6 | 49.2  | 38.3  | 29.2  | 23.3  | 19.8  | 17.3  | 15.7  | 15.5  |
| 42.5° | 698.2  | 536.0  | 151.8 | 45.4  | 34.0  | 24.9  | 20.3  | 17.0  | 14.7  | 12.9  | 12.7  |
| 45°   | 737.3  | 546.7  | 116.5 | 41.4  | 29.4  | 21.6  | 17.5  | 14.5  | 12.2  | 10.7  | 10.4  |
| 47.5° | 801.2  | 578.4  | 88.3  | 37.8  | 25.6  | 18.8  | 15.0  | 12.2  | 10.2  | 8.9   | 8.6   |
| 50°   | 903.0  | 635.8  | 69.5  | 33.5  | 21.6  | 16.2  | 12.7  | 10.2  | 8.4   | 7.1   | 6.9   |
| 52.5° | 1025.3 | 721.8  | 59.6  | 29.7  | 18.5  | 14.2  | 10.9  | 8.4   | 6.9   | 5.8   | 5.6   |
| 55°   | 1166.0 | 824.6  | 55.1  | 25.9  | 15.7  | 12.2  | 8.9   | 6.9   | 5.6   | 4.8   | 4.3   |
| 57.5° | 1294.9 | 917.2  | 54.8  | 22.1  | 13.5  | 10.4  | 7.4   | 5.8   | 4.8   | 3.8   | 3.6   |
| 60°   | 1420.5 | 994.6  | 51.5  | 18.3  | 11.7  | 8.6   | 6.3   | 4.8   | 4.1   | 3.3   | 3.0   |
| 62.5° | 1534.5 | 1057.6 | 43.1  | 14.7  | 9.9   | 7.1   | 5.3   | 4.3   | 3.6   | 2.8   | 2.8   |
| 65°   | 1677.6 | 1137.8 | 33.0  | 11.9  | 8.1   | 5.8   | 4.6   | 3.8   | 3.3   | 2.5   | 2.5   |
| 67.5° | 1825.6 | 1180.2 | 23.6  | 9.9   | 6.6   | 5.1   | 4.1   | 3.6   | 2.8   | 2.3   | 2.3   |
| 70°   | 1653.5 | 997.2  | 17.0  | 8.1   | 5.6   | 4.3   | 3.6   | 3.3   | 2.8   | 2.3   | 2.0   |
| 72.5° | 1291.3 | 719.0  | 12.7  | 6.3   | 4.8   | 4.1   | 3.3   | 3.0   | 2.5   | 2.0   | 2.0   |
| 75°   | 957.6  | 419.3  | 9.6   | 5.1   | 3.8   | 3.3   | 3.3   | 3.0   | 2.5   | 2.0   | 1.8   |
| 77.5° | 520.5  | 146.2  | 7.4   | 4.1   | 3.0   | 2.5   | 2.8   | 2.8   | 2.3   | 1.8   | 1.5   |
| 80°   | 137.8  | 40.1   | 5.1   | 3.0   | 2.5   | 2.0   | 2.0   | 2.5   | 2.0   | 1.5   | 1.5   |
| 82.5° | 40.1   | 11.7   | 3.6   | 2.5   | 2.0   | 1.8   | 1.8   | 1.8   | 1.5   | 1.3   | 1.0   |
| 85°   | 19.5   | 4.3    | 2.5   | 2.0   | 1.8   | 1.5   | 1.3   | 1.3   | 1.0   | 0.8   | 0.8   |
| 87.5° | 8.6    | 1.8    | 2.0   | 1.8   | 1.8   | 1.3   | 1.0   | 0.8   | 0.8   | 0.5   | 0.3   |
| 90°   | 0.0    | 0.0    | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |

LM-79-2008: Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Report Prepared for

Cooper Lighting Solutions

McGRAW-EDISON

Report Number: SP1-1908-441-10-R4

Test Date: 10/25/2019

Luminaire Tested: SA1C-722-U-5WQ

Data in this report applies to families of products SA1C-722-U-5WQ.

### Test Information

Test Method: LM-79-2008 Report  
 Number: SP1-1908-441-10-R4  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry:  $4\pi$   
 Issue Date: 10/28/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: MCGRAW-EDISON  
 Catalog Number: **SA1C-722-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):                  | 2237    | CRI (Ra): | 72.0 |      |       |
| CIE u':                   | 0.2876  | R1:       | 68.9 | R9:  | -17.4 |
| CIE v':                   | 0.5346  | R2:       | 83.0 | R10: | 61.3  |
| Duv:                      | -0.0006 | R3:       | 95.2 | R11: | 59.8  |
| CIE x:                    | 0.5005  | R4:       | 66.2 | R12: | 50.5  |
| CIE y:                    | 0.4134  | R5:       | 65.9 | R13: | 71.1  |
| CIE z:                    | 0.0860  | R6:       | 76.3 | R14: | 96.9  |
| Peak Wavelength (nm):     | 603     | R7:       | 76.7 |      |       |
| Dominant Wavelength (nm): | 587     | R8:       | 43.8 |      |       |
| Purity:                   | 74.5    |           |      |      |       |
| Rf:                       | 69.8    |           |      |      |       |
| Rg:                       | 99.2    |           |      |      |       |



### Test Conditions

Stabilization Time: 71M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.7/41%  
 Sphere Temperature (°C): 25.6

REPORT NUMBER: SP1-1908-441-10-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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Point lies inside the ANSI 2200K 4-step quadrangle

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**Photopic Flux vs. Wavelength**



#####

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 1768             | NR               | 490       | 5206             | NR               | 620       | 130919           | NR               | 750       | 8553             | NR               | 880       | 2713             | NR               |
| 365       | 1569             | NR               | 495       | 7286             | NR               | 625       | 125335           | NR               | 755       | 7696             | NR               | 885       | 2316             | NR               |
| 370       | 1594             | NR               | 500       | 10654            | NR               | 630       | 118388           | NR               | 760       | 6978             | NR               | 890       | 2539             | NR               |
| 375       | 1744             | NR               | 505       | 15189            | NR               | 635       | 111855           | NR               | 765       | 6377             | NR               | 895       | 1933             | NR               |
| 380       | 1659             | NR               | 510       | 20541            | NR               | 640       | 104062           | NR               | 770       | 5600             | NR               | 900       | 2216             | NR               |
| 385       | 1504             | NR               | 515       | 26492            | NR               | 645       | 96365            | NR               | 775       | 5000             | NR               | 905       | 2067             | NR               |
| 390       | 1541             | NR               | 520       | 32294            | NR               | 650       | 88651            | NR               | 780       | 4709             | NR               | 910       | 1959             | NR               |
| 395       | 1355             | NR               | 525       | 38123            | NR               | 655       | 81152            | NR               | 785       | 4305             | NR               | 915       | 1874             | NR               |
| 400       | 1243             | NR               | 530       | 43232            | NR               | 660       | 73523            | NR               | 790       | 4040             | NR               | 920       | 1484             | NR               |
| 405       | 1417             | NR               | 535       | 48012            | NR               | 665       | 66123            | NR               | 795       | 3642             | NR               | 925       | 1914             | NR               |
| 410       | 2147             | NR               | 540       | 52623            | NR               | 670       | 58677            | NR               | 800       | 3594             | NR               | 930       | 1948             | NR               |
| 415       | 3837             | NR               | 545       | 57516            | NR               | 675       | 52349            | NR               | 805       | 3190             | NR               | 935       | 2079             | NR               |
| 420       | 7159             | NR               | 550       | 62613            | NR               | 680       | 46159            | NR               | 810       | 3241             | NR               | 940       | 2263             | NR               |
| 425       | 12599            | NR               | 555       | 68554            | NR               | 685       | 40525            | NR               | 815       | 2732             | NR               | 945       | 1688             | NR               |
| 430       | 19019            | NR               | 560       | 75325            | NR               | 690       | 35615            | NR               | 820       | 2612             | NR               | 950       | 1560             | NR               |
| 435       | 24875            | NR               | 565       | 82533            | NR               | 695       | 31158            | NR               | 825       | 2966             | NR               | 955       | 2826             | NR               |
| 440       | 29103            | NR               | 570       | 90909            | NR               | 700       | 27409            | NR               | 830       | 2574             | NR               | 960       | 1477             | NR               |
| 445       | 29901            | NR               | 575       | 99621            | NR               | 705       | 24204            | NR               | 835       | 2633             | NR               | 965       | 1568             | NR               |
| 450       | 24862            | NR               | 580       | 108484           | NR               | 710       | 21558            | NR               | 840       | 2526             | NR               | 970       | 2030             | NR               |
| 455       | 15942            | NR               | 585       | 116679           | NR               | 715       | 19222            | NR               | 845       | 2631             | NR               | 975       | 1986             | NR               |
| 460       | 9916             | NR               | 590       | 123752           | NR               | 720       | 17310            | NR               | 850       | 2079             | NR               | 980       | 2540             | NR               |
| 465       | 7051             | NR               | 595       | 129324           | NR               | 725       | 15280            | NR               | 855       | 2309             | NR               | 985       | 1139             | NR               |
| 470       | 5227             | NR               | 600       | 134082           | NR               | 730       | 13282            | NR               | 860       | 2528             | NR               | 990       | 2018             | NR               |
| 475       | 4257             | NR               | 605       | 135698           | NR               | 735       | 11753            | NR               | 865       | 2121             | NR               | 995       | 3445             | NR               |
| 480       | 4052             | NR               | 610       | 135144           | NR               | 740       | 10654            | NR               | 870       | 2751             | NR               | 1000      | 3704             | NR               |
| 485       | 4298             | NR               | 615       | 134180           | NR               | 745       | 9451             | NR               | 875       | 2317             | NR               |           |                  |                  |

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**Scotopic Flux vs. Wavelength**



**Scotopic Lumens: 4696.9**

**S/P: 0.85**

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 1768             | NR               | 490       | 5206             | NR               | 620       | 130919           | NR               | 750       | 8553             | NR               | 880       | 2713             | NR               |
| 365       | 1569             | NR               | 495       | 7286             | NR               | 625       | 125335           | NR               | 755       | 7696             | NR               | 885       | 2316             | NR               |
| 370       | 1594             | NR               | 500       | 10654            | NR               | 630       | 118388           | NR               | 760       | 6978             | NR               | 890       | 2539             | NR               |
| 375       | 1744             | NR               | 505       | 15189            | NR               | 635       | 111855           | NR               | 765       | 6377             | NR               | 895       | 1933             | NR               |
| 380       | 1659             | NR               | 510       | 20541            | NR               | 640       | 104062           | NR               | 770       | 5600             | NR               | 900       | 2216             | NR               |
| 385       | 1504             | NR               | 515       | 26492            | NR               | 645       | 96365            | NR               | 775       | 5000             | NR               | 905       | 2067             | NR               |
| 390       | 1541             | NR               | 520       | 32294            | NR               | 650       | 88651            | NR               | 780       | 4709             | NR               | 910       | 1959             | NR               |
| 395       | 1355             | NR               | 525       | 38123            | NR               | 655       | 81152            | NR               | 785       | 4305             | NR               | 915       | 1874             | NR               |
| 400       | 1243             | NR               | 530       | 43232            | NR               | 660       | 73523            | NR               | 790       | 4040             | NR               | 920       | 1484             | NR               |
| 405       | 1417             | NR               | 535       | 48012            | NR               | 665       | 66123            | NR               | 795       | 3642             | NR               | 925       | 1914             | NR               |
| 410       | 2147             | NR               | 540       | 52623            | NR               | 670       | 58677            | NR               | 800       | 3594             | NR               | 930       | 1948             | NR               |
| 415       | 3837             | NR               | 545       | 57516            | NR               | 675       | 52349            | NR               | 805       | 3190             | NR               | 935       | 2079             | NR               |
| 420       | 7159             | NR               | 550       | 62613            | NR               | 680       | 46159            | NR               | 810       | 3241             | NR               | 940       | 2263             | NR               |
| 425       | 12599            | NR               | 555       | 68554            | NR               | 685       | 40525            | NR               | 815       | 2732             | NR               | 945       | 1688             | NR               |
| 430       | 19019            | NR               | 560       | 75325            | NR               | 690       | 35615            | NR               | 820       | 2612             | NR               | 950       | 1560             | NR               |
| 435       | 24875            | NR               | 565       | 82533            | NR               | 695       | 31158            | NR               | 825       | 2966             | NR               | 955       | 2826             | NR               |
| 440       | 29103            | NR               | 570       | 90909            | NR               | 700       | 27409            | NR               | 830       | 2574             | NR               | 960       | 1477             | NR               |
| 445       | 29901            | NR               | 575       | 99621            | NR               | 705       | 24204            | NR               | 835       | 2633             | NR               | 965       | 1568             | NR               |
| 450       | 24862            | NR               | 580       | 108484           | NR               | 710       | 21558            | NR               | 840       | 2526             | NR               | 970       | 2030             | NR               |
| 455       | 15942            | NR               | 585       | 116679           | NR               | 715       | 19222            | NR               | 845       | 2631             | NR               | 975       | 1986             | NR               |
| 460       | 9916             | NR               | 590       | 123752           | NR               | 720       | 17310            | NR               | 850       | 2079             | NR               | 980       | 2540             | NR               |
| 465       | 7051             | NR               | 595       | 129324           | NR               | 725       | 15280            | NR               | 855       | 2309             | NR               | 985       | 1139             | NR               |
| 470       | 5227             | NR               | 600       | 134082           | NR               | 730       | 13282            | NR               | 860       | 2528             | NR               | 990       | 2018             | NR               |
| 475       | 4257             | NR               | 605       | 135698           | NR               | 735       | 11753            | NR               | 865       | 2121             | NR               | 995       | 3445             | NR               |
| 480       | 4052             | NR               | 610       | 135144           | NR               | 740       | 10654            | NR               | 870       | 2751             | NR               | 1000      | 3704             | NR               |
| 485       | 4298             | NR               | 615       | 134180           | NR               | 745       | 9451             | NR               | 875       | 2317             | NR               |           |                  |                  |

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**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 1470.8**

**M/P: 0.27**

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 1768             | NR               | 490       | 5206             | NR               | 620       | 130919           | NR               | 750       | 8553             | NR               | 880       | 2713             | NR               |
| 365       | 1569             | NR               | 495       | 7286             | NR               | 625       | 125335           | NR               | 755       | 7696             | NR               | 885       | 2316             | NR               |
| 370       | 1594             | NR               | 500       | 10654            | NR               | 630       | 118388           | NR               | 760       | 6978             | NR               | 890       | 2539             | NR               |
| 375       | 1744             | NR               | 505       | 15189            | NR               | 635       | 111855           | NR               | 765       | 6377             | NR               | 895       | 1933             | NR               |
| 380       | 1659             | NR               | 510       | 20541            | NR               | 640       | 104062           | NR               | 770       | 5600             | NR               | 900       | 2216             | NR               |
| 385       | 1504             | NR               | 515       | 26492            | NR               | 645       | 96365            | NR               | 775       | 5000             | NR               | 905       | 2067             | NR               |
| 390       | 1541             | NR               | 520       | 32294            | NR               | 650       | 88651            | NR               | 780       | 4709             | NR               | 910       | 1959             | NR               |
| 395       | 1355             | NR               | 525       | 38123            | NR               | 655       | 81152            | NR               | 785       | 4305             | NR               | 915       | 1874             | NR               |
| 400       | 1243             | NR               | 530       | 43232            | NR               | 660       | 73523            | NR               | 790       | 4040             | NR               | 920       | 1484             | NR               |
| 405       | 1417             | NR               | 535       | 48012            | NR               | 665       | 66123            | NR               | 795       | 3642             | NR               | 925       | 1914             | NR               |
| 410       | 2147             | NR               | 540       | 52623            | NR               | 670       | 58677            | NR               | 800       | 3594             | NR               | 930       | 1948             | NR               |
| 415       | 3837             | NR               | 545       | 57516            | NR               | 675       | 52349            | NR               | 805       | 3190             | NR               | 935       | 2079             | NR               |
| 420       | 7159             | NR               | 550       | 62613            | NR               | 680       | 46159            | NR               | 810       | 3241             | NR               | 940       | 2263             | NR               |
| 425       | 12599            | NR               | 555       | 68554            | NR               | 685       | 40525            | NR               | 815       | 2732             | NR               | 945       | 1688             | NR               |
| 430       | 19019            | NR               | 560       | 75325            | NR               | 690       | 35615            | NR               | 820       | 2612             | NR               | 950       | 1560             | NR               |
| 435       | 24875            | NR               | 565       | 82533            | NR               | 695       | 31158            | NR               | 825       | 2966             | NR               | 955       | 2826             | NR               |
| 440       | 29103            | NR               | 570       | 90909            | NR               | 700       | 27409            | NR               | 830       | 2574             | NR               | 960       | 1477             | NR               |
| 445       | 29901            | NR               | 575       | 99621            | NR               | 705       | 24204            | NR               | 835       | 2633             | NR               | 965       | 1568             | NR               |
| 450       | 24862            | NR               | 580       | 108484           | NR               | 710       | 21558            | NR               | 840       | 2526             | NR               | 970       | 2030             | NR               |
| 455       | 15942            | NR               | 585       | 116679           | NR               | 715       | 19222            | NR               | 845       | 2631             | NR               | 975       | 1986             | NR               |
| 460       | 9916             | NR               | 590       | 123752           | NR               | 720       | 17310            | NR               | 850       | 2079             | NR               | 980       | 2540             | NR               |
| 465       | 7051             | NR               | 595       | 129324           | NR               | 725       | 15280            | NR               | 855       | 2309             | NR               | 985       | 1139             | NR               |
| 470       | 5227             | NR               | 600       | 134082           | NR               | 730       | 13282            | NR               | 860       | 2528             | NR               | 990       | 2018             | NR               |
| 475       | 4257             | NR               | 605       | 135698           | NR               | 735       | 11753            | NR               | 865       | 2121             | NR               | 995       | 3445             | NR               |
| 480       | 4052             | NR               | 610       | 135144           | NR               | 740       | 10654            | NR               | 870       | 2751             | NR               | 1000      | 3704             | NR               |
| 485       | 4298             | NR               | 615       | 134180           | NR               | 745       | 9451             | NR               | 875       | 2317             | NR               |           |                  |                  |

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### Summary

$R_f = 69.8$   
 $R_g = 99.2$   
 CIE  $R_a = 72.0$   
 $R_g = -17.4$



### Color Vector Graphics



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 87 | CES26 = 56 | CES51 = 74 | CES76 = 56 |
| CES02 = 65 | CES27 = 76 | CES52 = 76 | CES77 = 81 |
| CES03 = 32 | CES28 = 83 | CES53 = 65 | CES78 = 63 |
| CES04 = 72 | CES29 = 46 | CES54 = 78 | CES79 = 84 |
| CES05 = 52 | CES30 = 48 | CES55 = 75 | CES80 = 84 |
| CES06 = 52 | CES31 = 51 | CES56 = 65 | CES81 = 63 |
| CES07 = 44 | CES32 = 51 | CES57 = 62 | CES82 = 92 |
| CES08 = 42 | CES33 = 53 | CES58 = 66 | CES83 = 83 |
| CES09 = 29 | CES34 = 70 | CES59 = 84 | CES84 = 92 |
| CES10 = 78 | CES35 = 85 | CES60 = 90 | CES85 = 81 |
| CES11 = 61 | CES36 = 78 | CES61 = 84 | CES86 = 56 |
| CES12 = 68 | CES37 = 80 | CES62 = 70 | CES87 = 78 |
| CES13 = 45 | CES38 = 53 | CES63 = 68 | CES88 = 72 |
| CES14 = 75 | CES39 = 90 | CES64 = 69 | CES89 = 62 |
| CES15 = 72 | CES40 = 84 | CES65 = 67 | CES90 = 67 |
| CES16 = 49 | CES41 = 75 | CES66 = 64 | CES91 = 90 |
| CES17 = 51 | CES42 = 79 | CES67 = 63 | CES92 = 67 |
| CES18 = 57 | CES43 = 64 | CES68 = 69 | CES93 = 79 |
| CES19 = 74 | CES44 = 98 | CES69 = 80 | CES94 = 52 |
| CES20 = 68 | CES45 = 73 | CES70 = 63 | CES95 = 76 |
| CES21 = 89 | CES46 = 67 | CES71 = 63 | CES96 = 78 |
| CES22 = 81 | CES47 = 60 | CES72 = 87 | CES97 = 77 |
| CES23 = 92 | CES48 = 48 | CES73 = 56 | CES98 = 71 |
| CES24 = 92 | CES49 = 64 | CES74 = 87 | CES99 = 65 |
| CES25 = 74 | CES50 = 74 | CES75 = 66 |            |



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Color Rendition by Hue-Angle Bin



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**Measure Comparisons**



(END OF REPORT)