

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: P632220

Luminaire Tested: GWS-SA2C-730-U-T2-W-HSS

Issue Date: 1/10/2023

**Test Information**

Test Method: LM-79-2019  
Report Number: P632220  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-22)  
Test Lab: COOPER LIGHTING SOLUTIONS  
Issue Date: 1/10/2023  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: McGRAW-EDISON  
Catalog Number: GWS-SA2C-730-U-T2-W-HSS  
Description: GALLEON WALL SLIM LUMINAIRE. (2) LIGHTSQUARES WITH 16 LEDS EACH AND TYPE II OPTICS WITH HOUSE SIDE SHIELD  
Light Source: (32) 3000K CCT, 70 CRI LEDS  
Ballast/Driver: -

**Summary**

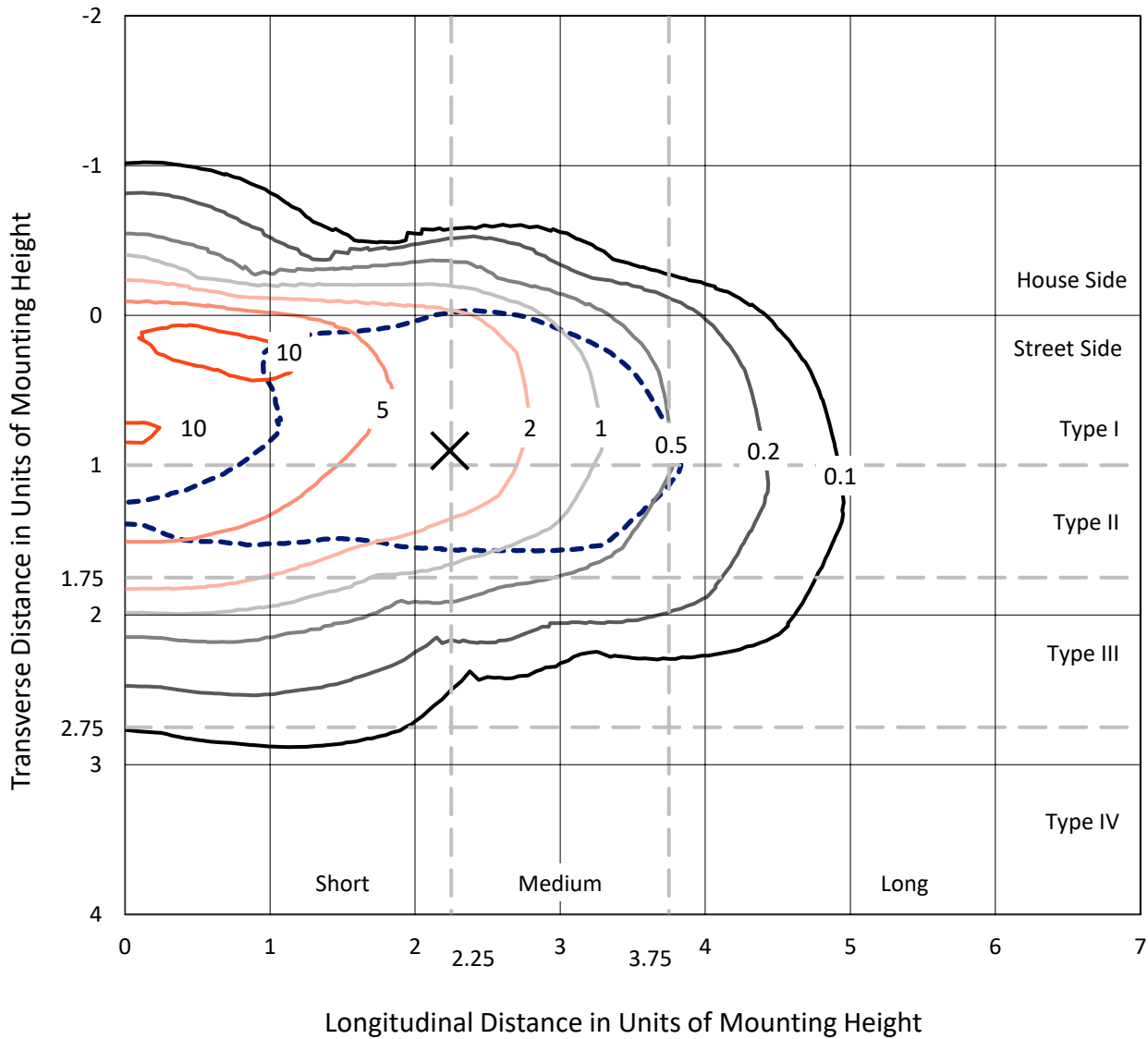
Lumens per Lamp: N/A  
Luminaire Lumens: 6313.1 lumens  
Efficiency: N/A  
Efficacy: 99.9 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 0.5' x H: 0')  
IES Classification: Type II - Short  
BUG Rating: B1 - U0 - G2  
  
Input Watts (W): 63.2  
Input Voltage (V): 120  
Input Current (Ain): NR  
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

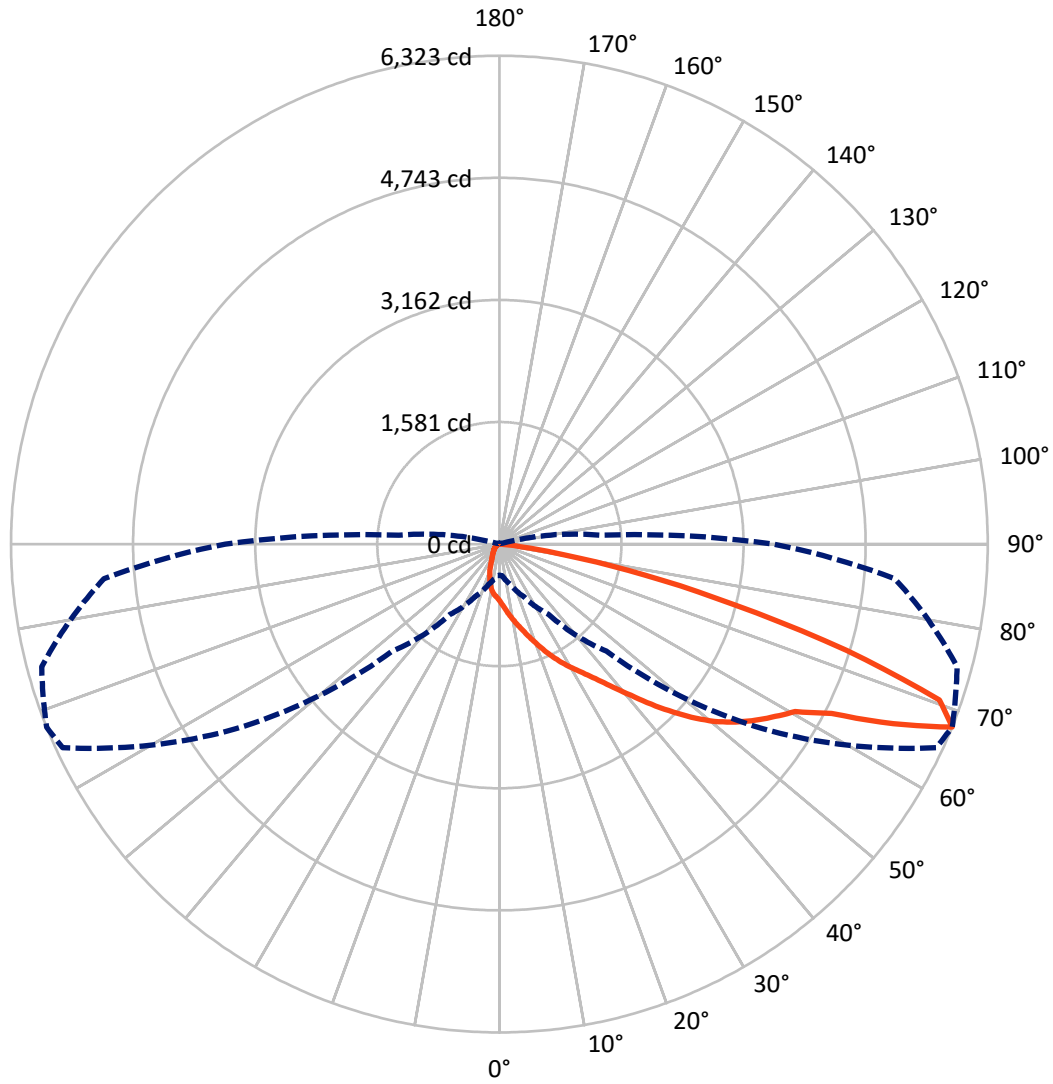
✕ Max cd  
 - - - 1/2 Max cd



Based on 10 foot mounting height. Maximum calculated value = 11.8 fc  
 Type II - Short - N/A

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### Luminous Intensity Polar Plot



— Vertical Plane Through 68-Deg Lateral    - - - Horizontal Cone Through 67.5-Deg Vertical

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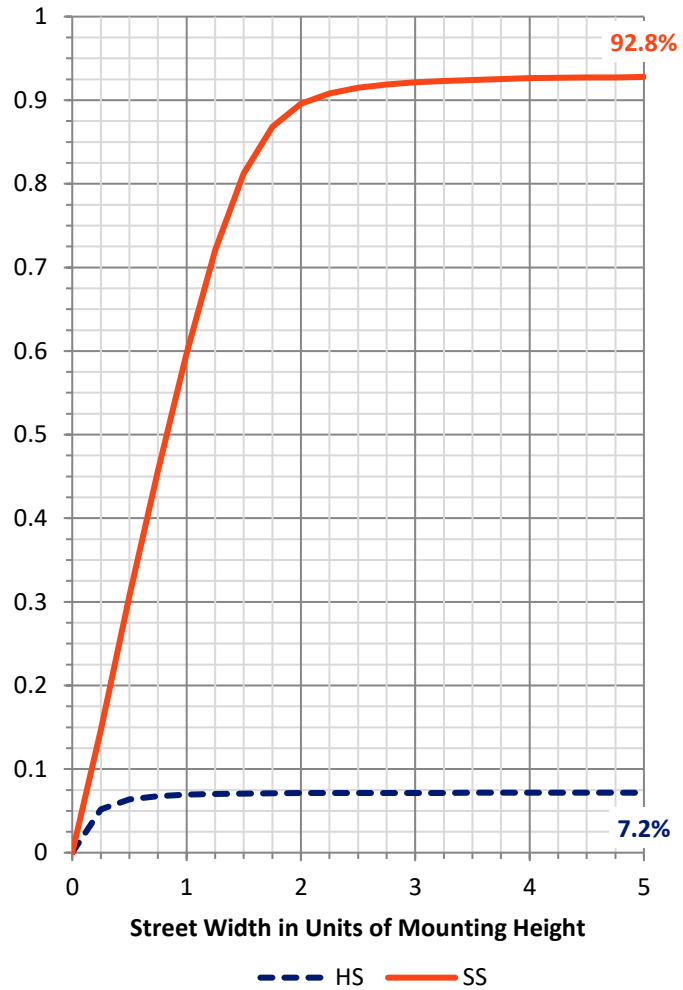
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 455.9    | 0.0    | 455.9  |
|                    | % Fixture | 7.2      | 0.0    | 7.2    |
| <b>Street Side</b> | Lumens    | 5857.2   | 0.0    | 5857.2 |
|                    | % Fixture | 92.8     | 0.0    | 92.8   |
| <b>Total</b>       | Lumens    | 6313.1   | 0.0    | 6313.1 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 71.7   | 1.1       |
| 10°-20°   | 205.8  | 3.3       |
| 20°-30°   | 353.6  | 5.6       |
| 30°-40°   | 614.8  | 9.7       |
| 40°-50°   | 1072.8 | 17.0      |
| 50°-60°   | 1618.0 | 25.6      |
| 60°-70°   | 1622.4 | 25.7      |
| 70°-80°   | 715.8  | 11.3      |
| 80°-90°   | 38.2   | 0.6       |
| 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°    | 6313.1 | 100.0     |
| 0°-180°   | 6313.1 | 100.0     |

**Coefficient of Utilization**



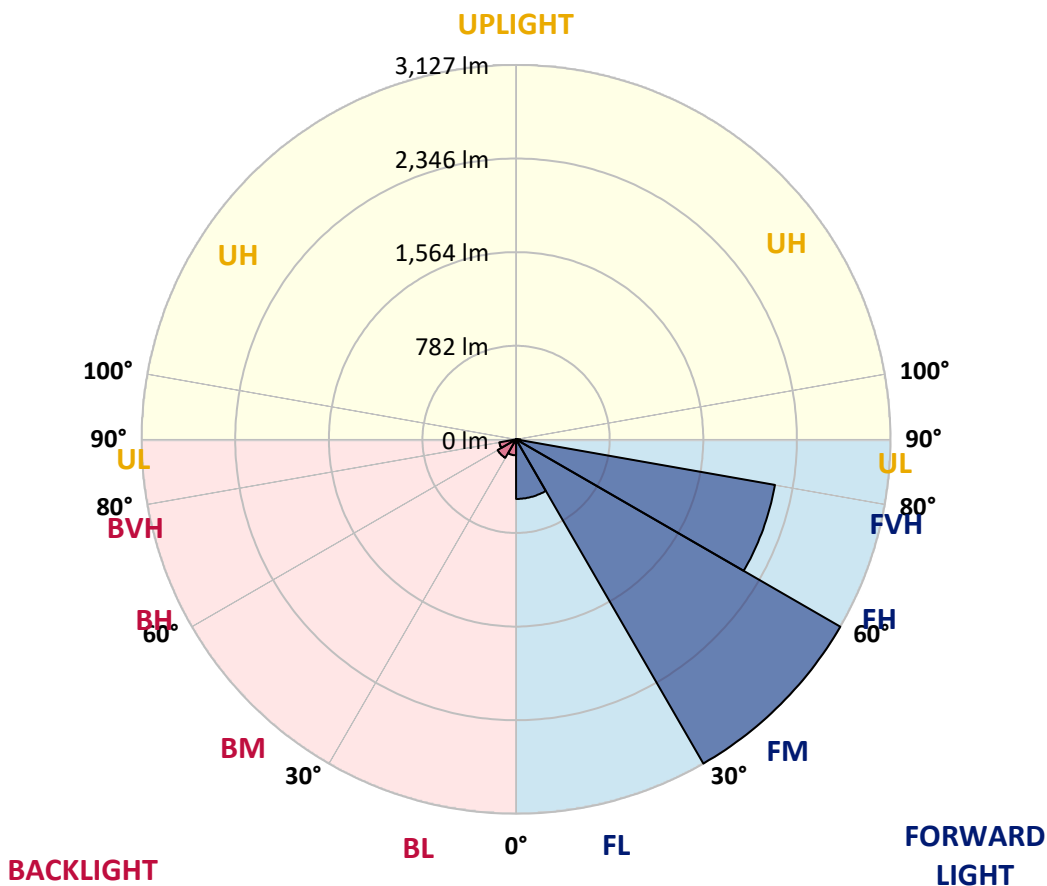
REPORT NUMBER: P632220

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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°)    | 497.7  | 7.9       |                         |      |         |
| FM (30°-60°)   | 3127.5 | 49.5      |                         |      |         |
| FH (60°-80°)   | 2196.0 | 34.8      |                         |      | G2/5000 |
| FVH (80°-90°)  | 36.1   | 0.6       |                         |      | G1/100  |
| BL (0°-30°)    | 133.4  | 2.1       | B1/500                  |      |         |
| BM (30°-60°)   | 178.1  | 2.8       | B0/220                  |      |         |
| BH (60°-80°)   | 142.3  | 2.3       | B1/500                  |      | G1/500  |
| BVH (80°-90°)  | 2.2    | 0.0       |                         |      | G0/10   |
| UL (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B1-U0-G2**  
 Type II Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 68°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 734.7  | 734.7  | 734.7  | 734.7  | 734.7  | 734.7  | 734.7  | 734.7  | 734.7  | 734.7  | 734.7  |
| 2.5°  | 855.5  | 861.0  | 855.5  | 856.7  | 841.0  | 833.8  | 818.1  | 796.3  | 790.9  | 777.0  | 755.8  |
| 5°    | 960.0  | 964.9  | 959.4  | 958.2  | 940.1  | 926.8  | 900.8  | 863.4  | 852.5  | 825.3  | 783.6  |
| 7.5°  | 1016.8 | 1019.9 | 1021.7 | 1024.7 | 1018.0 | 1007.2 | 983.6  | 937.1  | 925.6  | 881.5  | 822.9  |
| 10°   | 1022.9 | 1025.3 | 1034.4 | 1052.5 | 1065.8 | 1072.4 | 1059.1 | 1016.2 | 998.1  | 955.2  | 871.2  |
| 12.5° | 1006.0 | 1009.6 | 1024.1 | 1054.3 | 1091.2 | 1125.0 | 1133.4 | 1096.0 | 1079.7 | 1024.7 | 928.0  |
| 15°   | 983.6  | 986.6  | 1006.6 | 1047.7 | 1103.2 | 1165.5 | 1200.5 | 1184.2 | 1166.1 | 1108.7 | 990.9  |
| 17.5° | 949.2  | 953.4  | 981.2  | 1036.8 | 1108.7 | 1197.5 | 1273.0 | 1278.4 | 1265.8 | 1203.5 | 1060.3 |
| 20°   | 929.8  | 932.9  | 957.6  | 1015.0 | 1105.0 | 1221.1 | 1340.7 | 1392.0 | 1378.1 | 1312.9 | 1140.1 |
| 22.5° | 946.1  | 948.6  | 964.9  | 1009.6 | 1093.0 | 1234.3 | 1403.5 | 1505.6 | 1497.8 | 1430.1 | 1224.1 |
| 25°   | 1031.9 | 1039.8 | 1030.1 | 1038.0 | 1098.4 | 1241.6 | 1454.3 | 1619.2 | 1621.0 | 1552.7 | 1311.1 |
| 27.5° | 1205.9 | 1195.7 | 1172.7 | 1133.4 | 1140.7 | 1260.9 | 1497.8 | 1726.1 | 1741.9 | 1672.4 | 1388.4 |
| 30°   | 1383.0 | 1376.9 | 1363.0 | 1302.0 | 1251.3 | 1303.8 | 1534.6 | 1835.5 | 1860.3 | 1790.2 | 1457.3 |
| 32.5° | 1581.7 | 1587.8 | 1563.0 | 1489.9 | 1403.5 | 1390.8 | 1572.7 | 1939.4 | 1985.9 | 1923.7 | 1538.2 |
| 35°   | 1819.2 | 1821.0 | 1772.1 | 1691.1 | 1593.2 | 1534.6 | 1641.0 | 2054.2 | 2140.0 | 2094.1 | 1646.4 |
| 37.5° | 2050.6 | 2061.5 | 2034.9 | 1907.4 | 1820.4 | 1713.5 | 1753.9 | 2201.6 | 2322.5 | 2304.3 | 1782.3 |
| 40°   | 2255.4 | 2272.3 | 2263.9 | 2140.6 | 2026.4 | 1936.4 | 1929.2 | 2374.4 | 2543.0 | 2563.5 | 1961.8 |
| 42.5° | 2418.5 | 2429.4 | 2436.1 | 2348.5 | 2247.6 | 2196.8 | 2145.4 | 2575.0 | 2803.4 | 2887.4 | 2181.7 |
| 45°   | 2590.7 | 2594.4 | 2608.3 | 2549.0 | 2460.8 | 2465.1 | 2401.0 | 2818.5 | 3077.7 | 3246.3 | 2434.2 |
| 47.5° | 2810.0 | 2822.1 | 2815.5 | 2753.3 | 2673.5 | 2721.2 | 2665.0 | 3069.2 | 3348.4 | 3629.3 | 2692.8 |
| 50°   | 3077.1 | 3089.8 | 3083.7 | 3011.2 | 2922.4 | 2942.4 | 2907.3 | 3312.7 | 3609.4 | 3990.6 | 2907.9 |
| 52.5° | 3214.8 | 3225.1 | 3300.0 | 3332.7 | 3286.1 | 3159.3 | 3113.9 | 3580.4 | 3829.9 | 4287.9 | 3105.5 |
| 55°   | 3148.4 | 3155.6 | 3318.8 | 3456.5 | 3626.9 | 3500.0 | 3321.8 | 3787.0 | 4024.5 | 4519.9 | 3252.3 |
| 57.5° | 2872.9 | 2912.2 | 3133.9 | 3367.1 | 3725.4 | 3836.6 | 3658.9 | 4011.8 | 4211.7 | 4681.2 | 3396.7 |
| 60°   | 2308.0 | 2306.2 | 2624.0 | 3042.7 | 3533.3 | 3929.0 | 4135.0 | 4315.7 | 4399.6 | 4805.1 | 3590.0 |
| 62.5° | 1275.4 | 1286.9 | 1709.8 | 2261.5 | 2999.2 | 3689.7 | 4492.1 | 4840.7 | 4828.0 | 5021.3 | 3892.7 |
| 65°   | 635.0  | 658.0  | 887.5  | 1295.4 | 1995.6 | 3049.3 | 4553.7 | 5641.8 | 5605.6 | 5530.7 | 4518.1 |
| 67.5° | 403.0  | 412.1  | 538.9  | 752.8  | 1109.3 | 1960.0 | 4170.1 | 6239.4 | 6323.4 | 6134.9 | 5138.6 |
| 70°   | 261.0  | 276.1  | 374.6  | 514.8  | 669.4  | 1010.2 | 3054.7 | 5852.1 | 6044.8 | 6068.4 | 4751.9 |
| 72.5° | 142.0  | 152.9  | 239.3  | 367.3  | 483.3  | 505.1  | 1715.9 | 4391.8 | 4701.7 | 5147.6 | 3717.5 |
| 75°   | 81.0   | 88.8   | 131.1  | 249.5  | 354.7  | 307.5  | 760.7  | 2939.9 | 3137.5 | 3678.9 | 2663.8 |
| 77.5° | 48.9   | 55.6   | 73.7   | 121.4  | 222.3  | 205.4  | 287.6  | 1789.6 | 1915.3 | 2195.0 | 1398.1 |
| 80°   | 22.4   | 26.6   | 46.5   | 67.1   | 121.4  | 97.3   | 110.0  | 834.4  | 861.6  | 900.8  | 462.8  |
| 82.5° | 10.3   | 12.1   | 21.1   | 39.9   | 68.9   | 56.2   | 42.3   | 192.7  | 271.3  | 256.8  | 117.8  |
| 85°   | 1.2    | 1.2    | 7.9    | 16.3   | 19.3   | 14.5   | 17.5   | 43.5   | 55.0   | 77.3   | 33.8   |
| 87.5° | 0.0    | 0.0    | 0.6    | 0.6    | 1.2    | 1.8    | 3.6    | 5.4    | 7.9    | 12.7   | 8.5    |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |



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 CATALOG NUMBER: GWS-SA2C-730-U-T2-W-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 734.7  | 734.7  | 734.7 | 734.7 | 734.7 | 734.7 | 734.7 | 734.7 | 734.7 | 734.7 | 734.7 |
| 2.5°  | 746.2  | 729.2  | 714.1 | 691.8 | 676.7 | 659.8 | 648.3 | 634.4 | 629.0 | 624.7 | 618.7 |
| 5°    | 763.1  | 735.9  | 699.0 | 658.0 | 624.1 | 592.1 | 562.5 | 543.2 | 526.2 | 523.8 | 515.4 |
| 7.5°  | 790.9  | 750.4  | 688.2 | 621.1 | 563.7 | 510.5 | 468.8 | 435.0 | 418.1 | 412.7 | 403.0 |
| 10°   | 827.7  | 772.1  | 671.8 | 569.1 | 486.4 | 422.9 | 375.8 | 337.7 | 311.2 | 301.5 | 294.2 |
| 12.5° | 868.8  | 792.1  | 645.9 | 505.1 | 410.8 | 338.3 | 278.5 | 238.0 | 221.1 | 215.1 | 209.7 |
| 15°   | 915.9  | 810.8  | 604.8 | 441.1 | 337.1 | 248.9 | 206.6 | 189.1 | 181.9 | 180.0 | 178.2 |
| 17.5° | 961.3  | 822.9  | 555.8 | 374.6 | 259.2 | 193.3 | 173.4 | 166.8 | 164.9 | 163.1 | 161.9 |
| 20°   | 1012.6 | 831.4  | 498.4 | 311.8 | 201.2 | 163.7 | 154.1 | 149.2 | 145.6 | 142.0 | 141.4 |
| 22.5° | 1065.2 | 831.4  | 436.2 | 250.1 | 168.6 | 146.8 | 135.9 | 126.9 | 120.2 | 116.6 | 115.4 |
| 25°   | 1115.3 | 819.9  | 374.6 | 200.0 | 148.6 | 130.5 | 116.6 | 106.3 | 97.3  | 93.0  | 91.8  |
| 27.5° | 1151.0 | 790.3  | 320.8 | 169.2 | 134.7 | 116.0 | 99.1  | 87.6  | 80.4  | 76.1  | 75.5  |
| 30°   | 1173.3 | 746.2  | 271.3 | 151.0 | 122.6 | 100.9 | 84.0  | 74.3  | 68.9  | 65.9  | 64.6  |
| 32.5° | 1190.2 | 691.8  | 227.2 | 138.4 | 111.2 | 87.6  | 73.1  | 65.3  | 60.4  | 58.0  | 57.4  |
| 35°   | 1224.1 | 640.4  | 194.5 | 126.9 | 99.1  | 76.7  | 64.0  | 58.0  | 54.4  | 51.4  | 50.8  |
| 37.5° | 1271.2 | 597.5  | 168.6 | 116.6 | 87.6  | 68.3  | 58.0  | 52.6  | 49.5  | 46.5  | 45.9  |
| 40°   | 1340.7 | 570.3  | 149.2 | 106.3 | 77.3  | 61.6  | 53.2  | 48.3  | 44.1  | 41.1  | 40.5  |
| 42.5° | 1447.6 | 557.7  | 136.5 | 96.1  | 68.3  | 55.6  | 48.9  | 42.9  | 38.7  | 35.6  | 35.0  |
| 45°   | 1575.1 | 564.3  | 125.7 | 85.8  | 62.2  | 51.4  | 43.5  | 37.5  | 33.2  | 30.2  | 29.6  |
| 47.5° | 1711.6 | 587.9  | 116.6 | 76.1  | 56.2  | 47.1  | 38.7  | 32.0  | 28.4  | 25.4  | 24.8  |
| 50°   | 1854.2 | 626.5  | 108.8 | 67.1  | 51.4  | 42.3  | 33.2  | 27.8  | 24.2  | 21.8  | 21.1  |
| 52.5° | 1978.1 | 679.1  | 100.9 | 60.4  | 47.1  | 37.5  | 29.0  | 24.2  | 20.5  | 18.1  | 17.5  |
| 55°   | 2096.5 | 728.6  | 94.9  | 54.4  | 42.3  | 32.6  | 25.4  | 20.5  | 17.5  | 15.1  | 14.5  |
| 57.5° | 2225.2 | 781.2  | 87.6  | 48.9  | 38.1  | 29.0  | 22.4  | 17.5  | 15.1  | 12.7  | 12.1  |
| 60°   | 2412.5 | 859.1  | 76.7  | 44.7  | 33.2  | 25.4  | 19.3  | 15.7  | 13.3  | 10.3  | 9.7   |
| 62.5° | 2682.6 | 1001.1 | 64.6  | 38.7  | 28.4  | 21.8  | 16.3  | 13.3  | 10.9  | 8.5   | 7.3   |
| 65°   | 3187.7 | 1242.8 | 53.2  | 32.0  | 23.0  | 18.1  | 13.9  | 10.9  | 8.5   | 6.0   | 5.4   |
| 67.5° | 3551.4 | 1305.6 | 42.9  | 26.0  | 18.7  | 13.9  | 11.5  | 8.5   | 6.0   | 4.2   | 3.6   |
| 70°   | 3104.9 | 937.7  | 33.2  | 21.1  | 15.7  | 10.9  | 9.1   | 6.6   | 4.2   | 3.0   | 2.4   |
| 72.5° | 2339.4 | 612.6  | 24.8  | 16.3  | 12.1  | 9.1   | 6.6   | 5.4   | 3.6   | 2.4   | 1.8   |
| 75°   | 1648.8 | 354.1  | 18.1  | 12.1  | 8.5   | 6.6   | 5.4   | 4.2   | 3.0   | 1.8   | 1.8   |
| 77.5° | 845.2  | 146.2  | 12.7  | 8.5   | 6.0   | 4.2   | 3.6   | 2.4   | 2.4   | 1.8   | 1.2   |
| 80°   | 256.8  | 48.3   | 7.3   | 5.4   | 4.2   | 3.0   | 1.8   | 1.8   | 1.8   | 1.2   | 0.6   |
| 82.5° | 58.6   | 15.7   | 4.2   | 4.2   | 3.0   | 2.4   | 1.8   | 0.6   | 0.6   | 0.0   | 0.0   |
| 85°   | 15.1   | 4.8    | 3.6   | 3.0   | 3.0   | 2.4   | 1.2   | 0.6   | 0.0   | 0.0   | 0.0   |
| 87.5° | 5.4    | 3.0    | 3.0   | 3.0   | 2.4   | 1.8   | 1.2   | 0.0   | 0.0   | 0.0   | 0.0   |
| 90°   | 0.0    | 0.0    | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |



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

Report Prepared for

Cooper Lighting Solutions

McGRAW-EDISON

Report Number: SP1-1908-441-2-R4

Test Date: 10/03/2019

Luminaire Tested: SA1C-730-U-5WQ

Data in this report applies to families of products SA1C-730-U-5WQ .

**Test Information**

Test Method: LM-79-2008  
 Report Number: SP1-1908-441-2-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-730-U-5WQ**  
 Description: McGRAW EDISON ROADWAY AND AREA LUMINAIRE

\*\*\*THIS IS A REVISION OF SP1-1908-441-2-R3. TO UPDATE THE CATALOG INFORMATION.\*\*\*TESTED IN SITU. (1) 70 CRI, 3000K, 1050MA LIGHTSQUARE WITH 16 LEDS AND TYPE V WIDE OPTICS.

**Spectral Parameters**

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 2993   | CRI (Ra): | 71.8 | R9:  | -38.3 |
| CIE u':                   | 0.2508 | R1:       | 67.5 | R10: | 62.5  |
| CIE v':                   | 0.5215 | R2:       | 82.9 | R11: | 63.7  |
| Duv:                      | 0.0000 | R3:       | 94.7 | R12: | 57.8  |
| CIE x:                    | 0.4374 | R4:       | 67.7 | R13: | 70.4  |
| CIE y:                    | 0.4043 | R5:       | 67.9 | R14: | 97.3  |
| CIE z:                    | 0.1583 | R6:       | 77.6 |      |       |
| Peak Wavelength (nm):     | 593    | R7:       | 76.0 |      |       |
| Dominant Wavelength (nm): | 582    | R8:       | 40.5 |      |       |
| Purity:                   | 53     |           |      |      |       |
| Rf:                       | 75.7   |           |      |      |       |
| Rg:                       | 93.9   |           |      |      |       |



**Test Conditions**

Stabilization Time: 53M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.0./44%  
 Sphere Temperature (°C): 25.7

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

REPORT NUMBER: SP1-1908-441-2-R4

CIE 1931 Chromaticity Diagram



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



Point lies inside the ANSI 3000K 4-step quadrangle

REPORT NUMBER: SP1-1908-441-2-R4

**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               | 2397                                 | NR                             | 490               | 24908                                | NR                             | 620               | 118784                               | NR                             | 750               | 5037                                 | NR                             | 880               | 2677                                 | NR                             |
| 365               | 2084                                 | NR                             | 495               | 30998                                | NR                             | 625               | 108951                               | NR                             | 755               | 4413                                 | NR                             | 885               | 2940                                 | NR                             |
| 370               | 2143                                 | NR                             | 500               | 37103                                | NR                             | 630               | 99573                                | NR                             | 760               | 4189                                 | NR                             | 890               | 3116                                 | NR                             |
| 375               | 2413                                 | NR                             | 505               | 42987                                | NR                             | 635               | 90444                                | NR                             | 765               | 3677                                 | NR                             | 895               | 3345                                 | NR                             |
| 380               | 2172                                 | NR                             | 510               | 48702                                | NR                             | 640               | 80749                                | NR                             | 770               | 3366                                 | NR                             | 900               | 2312                                 | NR                             |
| 385               | 1997                                 | NR                             | 515               | 53741                                | NR                             | 645               | 71664                                | NR                             | 775               | 3211                                 | NR                             | 905               | 2829                                 | NR                             |
| 390               | 1830                                 | NR                             | 520               | 57283                                | NR                             | 650               | 63936                                | NR                             | 780               | 2682                                 | NR                             | 910               | 2783                                 | NR                             |
| 395               | 1861                                 | NR                             | 525               | 61876                                | NR                             | 655               | 56611                                | NR                             | 785               | 2804                                 | NR                             | 915               | 2662                                 | NR                             |
| 400               | 1717                                 | NR                             | 530               | 65398                                | NR                             | 660               | 49763                                | NR                             | 790               | 2581                                 | NR                             | 920               | 3047                                 | NR                             |
| 405               | 1761                                 | NR                             | 535               | 69597                                | NR                             | 665               | 42891                                | NR                             | 795               | 2711                                 | NR                             | 925               | 2256                                 | NR                             |
| 410               | 2680                                 | NR                             | 540               | 74214                                | NR                             | 670               | 36939                                | NR                             | 800               | 2609                                 | NR                             | 930               | 2976                                 | NR                             |
| 415               | 4374                                 | NR                             | 545               | 79911                                | NR                             | 675               | 31946                                | NR                             | 805               | 2581                                 | NR                             | 935               | 3503                                 | NR                             |
| 420               | 8071                                 | NR                             | 550               | 86153                                | NR                             | 680               | 27385                                | NR                             | 810               | 2404                                 | NR                             | 940               | 4226                                 | NR                             |
| 425               | 15169                                | NR                             | 555               | 93952                                | NR                             | 685               | 23504                                | NR                             | 815               | 2556                                 | NR                             | 945               | 2930                                 | NR                             |
| 430               | 26038                                | NR                             | 560               | 102904                               | NR                             | 690               | 20210                                | NR                             | 820               | 2742                                 | NR                             | 950               | 2115                                 | NR                             |
| 435               | 41316                                | NR                             | 565               | 112009                               | NR                             | 695               | 17459                                | NR                             | 825               | 2014                                 | NR                             | 955               | 2634                                 | NR                             |
| 440               | 59674                                | NR                             | 570               | 121662                               | NR                             | 700               | 15207                                | NR                             | 830               | 2488                                 | NR                             | 960               | 4200                                 | NR                             |
| 445               | 72751                                | NR                             | 575               | 130476                               | NR                             | 705               | 13322                                | NR                             | 835               | 2625                                 | NR                             | 965               | 1982                                 | NR                             |
| 450               | 65091                                | NR                             | 580               | 137926                               | NR                             | 710               | 11676                                | NR                             | 840               | 2754                                 | NR                             | 970               | 3613                                 | NR                             |
| 455               | 44894                                | NR                             | 585               | 143406                               | NR                             | 715               | 10626                                | NR                             | 845               | 2708                                 | NR                             | 975               | 4034                                 | NR                             |
| 460               | 32712                                | NR                             | 590               | 147039                               | NR                             | 720               | 9416                                 | NR                             | 850               | 2608                                 | NR                             | 980               | 3922                                 | NR                             |
| 465               | 25296                                | NR                             | 595               | 147365                               | NR                             | 725               | 8333                                 | NR                             | 855               | 2605                                 | NR                             | 985               | 1909                                 | NR                             |
| 470               | 19318                                | NR                             | 600               | 145800                               | NR                             | 730               | 7134                                 | NR                             | 860               | 1765                                 | NR                             | 990               | 3617                                 | NR                             |
| 475               | 17265                                | NR                             | 605               | 141363                               | NR                             | 735               | 6437                                 | NR                             | 865               | 2581                                 | NR                             | 995               | 4767                                 | NR                             |
| 480               | 18260                                | NR                             | 610               | 134199                               | NR                             | 740               | 5834                                 | NR                             | 870               | 3016                                 | NR                             | 1000              | 2528                                 | NR                             |
| 485               | 20845                                | NR                             | 615               | 127683                               | NR                             | 745               | 5500                                 | NR                             | 875               | 3952                                 | NR                             |                   |                                      |                                |

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Scotopic Flux vs. Wavelength



Scotopic Lumens: 8494.8

S/P: 1.23

| 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    | 2397          | NR            | 490    | 24908         | NR            | 620    | 118784        | NR            | 750    | 5037          | NR            | 880    | 2677          | NR            |
| 365    | 2084          | NR            | 495    | 30998         | NR            | 625    | 108951        | NR            | 755    | 4413          | NR            | 885    | 2940          | NR            |
| 370    | 2143          | NR            | 500    | 37103         | NR            | 630    | 99573         | NR            | 760    | 4189          | NR            | 890    | 3116          | NR            |
| 375    | 2413          | NR            | 505    | 42987         | NR            | 635    | 90444         | NR            | 765    | 3677          | NR            | 895    | 3345          | NR            |
| 380    | 2172          | NR            | 510    | 48702         | NR            | 640    | 80749         | NR            | 770    | 3366          | NR            | 900    | 2312          | NR            |
| 385    | 1997          | NR            | 515    | 53741         | NR            | 645    | 71664         | NR            | 775    | 3211          | NR            | 905    | 2829          | NR            |
| 390    | 1830          | NR            | 520    | 57283         | NR            | 650    | 63936         | NR            | 780    | 2682          | NR            | 910    | 2783          | NR            |
| 395    | 1861          | NR            | 525    | 61876         | NR            | 655    | 56611         | NR            | 785    | 2804          | NR            | 915    | 2662          | NR            |
| 400    | 1717          | NR            | 530    | 65398         | NR            | 660    | 49763         | NR            | 790    | 2581          | NR            | 920    | 3047          | NR            |
| 405    | 1761          | NR            | 535    | 69597         | NR            | 665    | 42891         | NR            | 795    | 2711          | NR            | 925    | 2256          | NR            |
| 410    | 2680          | NR            | 540    | 74214         | NR            | 670    | 36939         | NR            | 800    | 2609          | NR            | 930    | 2976          | NR            |
| 415    | 4374          | NR            | 545    | 79911         | NR            | 675    | 31946         | NR            | 805    | 2581          | NR            | 935    | 3503          | NR            |
| 420    | 8071          | NR            | 550    | 86153         | NR            | 680    | 27385         | NR            | 810    | 2404          | NR            | 940    | 4226          | NR            |
| 425    | 15169         | NR            | 555    | 93952         | NR            | 685    | 23504         | NR            | 815    | 2556          | NR            | 945    | 2930          | NR            |
| 430    | 26038         | NR            | 560    | 102904        | NR            | 690    | 20210         | NR            | 820    | 2742          | NR            | 950    | 2115          | NR            |
| 435    | 41316         | NR            | 565    | 112009        | NR            | 695    | 17459         | NR            | 825    | 2014          | NR            | 955    | 2634          | NR            |
| 440    | 59674         | NR            | 570    | 121662        | NR            | 700    | 15207         | NR            | 830    | 2488          | NR            | 960    | 4200          | NR            |
| 445    | 72751         | NR            | 575    | 130476        | NR            | 705    | 13322         | NR            | 835    | 2625          | NR            | 965    | 1982          | NR            |
| 450    | 65091         | NR            | 580    | 137926        | NR            | 710    | 11676         | NR            | 840    | 2754          | NR            | 970    | 3613          | NR            |
| 455    | 44894         | NR            | 585    | 143406        | NR            | 715    | 10626         | NR            | 845    | 2708          | NR            | 975    | 4034          | NR            |
| 460    | 32712         | NR            | 590    | 147039        | NR            | 720    | 9416          | NR            | 850    | 2608          | NR            | 980    | 3922          | NR            |
| 465    | 25296         | NR            | 595    | 147365        | NR            | 725    | 8333          | NR            | 855    | 2605          | NR            | 985    | 1909          | NR            |
| 470    | 19318         | NR            | 600    | 145800        | NR            | 730    | 7134          | NR            | 860    | 1765          | NR            | 990    | 3617          | NR            |
| 475    | 17265         | NR            | 605    | 141363        | NR            | 735    | 6437          | NR            | 865    | 2581          | NR            | 995    | 4767          | NR            |
| 480    | 18260         | NR            | 610    | 134199        | NR            | 740    | 5834          | NR            | 870    | 3016          | NR            | 1000   | 2528          | NR            |
| 485    | 20845         | NR            | 615    | 127683        | NR            | 745    | 5500          | NR            | 875    | 3952          | NR            |        |               |               |

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Melanopic Flux vs. Wavelength



Melanopic Lumens: 3101.5 M/P: 0.45

| 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    | 2397          | NR            | 490    | 24908         | NR            | 620    | 118784        | NR            | 750    | 5037          | NR            | 880    | 2677          | NR            |
| 365    | 2084          | NR            | 495    | 30998         | NR            | 625    | 108951        | NR            | 755    | 4413          | NR            | 885    | 2940          | NR            |
| 370    | 2143          | NR            | 500    | 37103         | NR            | 630    | 99573         | NR            | 760    | 4189          | NR            | 890    | 3116          | NR            |
| 375    | 2413          | NR            | 505    | 42987         | NR            | 635    | 90444         | NR            | 765    | 3677          | NR            | 895    | 3345          | NR            |
| 380    | 2172          | NR            | 510    | 48702         | NR            | 640    | 80749         | NR            | 770    | 3366          | NR            | 900    | 2312          | NR            |
| 385    | 1997          | NR            | 515    | 53741         | NR            | 645    | 71664         | NR            | 775    | 3211          | NR            | 905    | 2829          | NR            |
| 390    | 1830          | NR            | 520    | 57283         | NR            | 650    | 63936         | NR            | 780    | 2682          | NR            | 910    | 2783          | NR            |
| 395    | 1861          | NR            | 525    | 61876         | NR            | 655    | 56611         | NR            | 785    | 2804          | NR            | 915    | 2662          | NR            |
| 400    | 1717          | NR            | 530    | 65398         | NR            | 660    | 49763         | NR            | 790    | 2581          | NR            | 920    | 3047          | NR            |
| 405    | 1761          | NR            | 535    | 69597         | NR            | 665    | 42891         | NR            | 795    | 2711          | NR            | 925    | 2256          | NR            |
| 410    | 2680          | NR            | 540    | 74214         | NR            | 670    | 36939         | NR            | 800    | 2609          | NR            | 930    | 2976          | NR            |
| 415    | 4374          | NR            | 545    | 79911         | NR            | 675    | 31946         | NR            | 805    | 2581          | NR            | 935    | 3503          | NR            |
| 420    | 8071          | NR            | 550    | 86153         | NR            | 680    | 27385         | NR            | 810    | 2404          | NR            | 940    | 4226          | NR            |
| 425    | 15169         | NR            | 555    | 93952         | NR            | 685    | 23504         | NR            | 815    | 2556          | NR            | 945    | 2930          | NR            |
| 430    | 26038         | NR            | 560    | 102904        | NR            | 690    | 20210         | NR            | 820    | 2742          | NR            | 950    | 2115          | NR            |
| 435    | 41316         | NR            | 565    | 112009        | NR            | 695    | 17459         | NR            | 825    | 2014          | NR            | 955    | 2634          | NR            |
| 440    | 59674         | NR            | 570    | 121662        | NR            | 700    | 15207         | NR            | 830    | 2488          | NR            | 960    | 4200          | NR            |
| 445    | 72751         | NR            | 575    | 130476        | NR            | 705    | 13322         | NR            | 835    | 2625          | NR            | 965    | 1982          | NR            |
| 450    | 65091         | NR            | 580    | 137926        | NR            | 710    | 11676         | NR            | 840    | 2754          | NR            | 970    | 3613          | NR            |
| 455    | 44894         | NR            | 585    | 143406        | NR            | 715    | 10626         | NR            | 845    | 2708          | NR            | 975    | 4034          | NR            |
| 460    | 32712         | NR            | 590    | 147039        | NR            | 720    | 9416          | NR            | 850    | 2608          | NR            | 980    | 3922          | NR            |
| 465    | 25296         | NR            | 595    | 147365        | NR            | 725    | 8333          | NR            | 855    | 2605          | NR            | 985    | 1909          | NR            |
| 470    | 19318         | NR            | 600    | 145800        | NR            | 730    | 7134          | NR            | 860    | 1765          | NR            | 990    | 3617          | NR            |
| 475    | 17265         | NR            | 605    | 141363        | NR            | 735    | 6437          | NR            | 865    | 2581          | NR            | 995    | 4767          | NR            |
| 480    | 18260         | NR            | 610    | 134199        | NR            | 740    | 5834          | NR            | 870    | 3016          | NR            | 1000   | 2528          | NR            |
| 485    | 20845         | NR            | 615    | 127683        | NR            | 745    | 5500          | NR            | 875    | 3952          | NR            |        |               |               |

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**Summary**

$R_f = 75.7$   
 $R_g = 93.9$   
 CIE  $R_a = 71.8$   
 $R_9 = -38.3$



**Color Vector Graphics**





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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 67 | CES51 = 87 | CES76 = 63 |
| CES02 = 63 | CES27 = 88 | CES52 = 86 | CES77 = 80 |
| CES03 = 31 | CES28 = 87 | CES53 = 78 | CES78 = 67 |
| CES04 = 71 | CES29 = 66 | CES54 = 84 | CES79 = 87 |
| CES05 = 49 | CES30 = 73 | CES55 = 84 | CES80 = 86 |
| CES06 = 51 | CES31 = 70 | CES56 = 75 | CES81 = 71 |
| CES07 = 41 | CES32 = 65 | CES57 = 74 | CES82 = 94 |
| CES08 = 40 | CES33 = 73 | CES58 = 76 | CES83 = 90 |
| CES09 = 29 | CES34 = 79 | CES59 = 85 | CES84 = 89 |
| CES10 = 76 | CES35 = 89 | CES60 = 93 | CES85 = 77 |
| CES11 = 59 | CES36 = 97 | CES61 = 84 | CES86 = 61 |
| CES12 = 65 | CES37 = 87 | CES62 = 91 | CES87 = 78 |
| CES13 = 43 | CES38 = 81 | CES63 = 77 | CES88 = 77 |
| CES14 = 74 | CES39 = 95 | CES64 = 72 | CES89 = 67 |
| CES15 = 71 | CES40 = 92 | CES65 = 68 | CES90 = 76 |
| CES16 = 47 | CES41 = 88 | CES66 = 69 | CES91 = 89 |
| CES17 = 50 | CES42 = 89 | CES67 = 67 | CES92 = 58 |
| CES18 = 56 | CES43 = 79 | CES68 = 72 | CES93 = 74 |
| CES19 = 73 | CES44 = 99 | CES69 = 81 | CES94 = 49 |
| CES20 = 66 | CES45 = 85 | CES70 = 66 | CES95 = 68 |
| CES21 = 87 | CES46 = 80 | CES71 = 67 | CES96 = 76 |
| CES22 = 79 | CES47 = 82 | CES72 = 88 | CES97 = 82 |
| CES23 = 92 | CES48 = 69 | CES73 = 59 | CES98 = 75 |
| CES24 = 91 | CES49 = 80 | CES74 = 95 | CES99 = 62 |
| CES25 = 73 | CES50 = 87 | CES75 = 69 |            |



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Color Rendition by Hue-Angle Bin



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Measure Comparisons



(END OF REPORT)