

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: P643309

Luminaire Tested: GWS-SA6E-760-U-SL2-W-GRSBK

Issue Date: 1/10/2023

**Test Information**

Test Method: LM-79-2019  
Report Number: P643309  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-28)  
Test Lab: COOPER LIGHTING SOLUTIONS  
Issue Date: 1/10/2023  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: McGRAW-EDISON  
Catalog Number: GWS-SAGE-760-U-SL2-W-GRSBK  
Description: GALLEON WALL SLIM LUMINAIRE. (6) LIGHTSQUARES WITH 16 LEDS EACH AND TYPE II SPILL LIGHT ELIMINATOR OPTICS W/ FACTORY INSTALLED GLARE SHIELD, BK  
Light Source: (96) 5700K CCT, 70 CRI LEDS  
Ballast/Driver: -

**Summary**

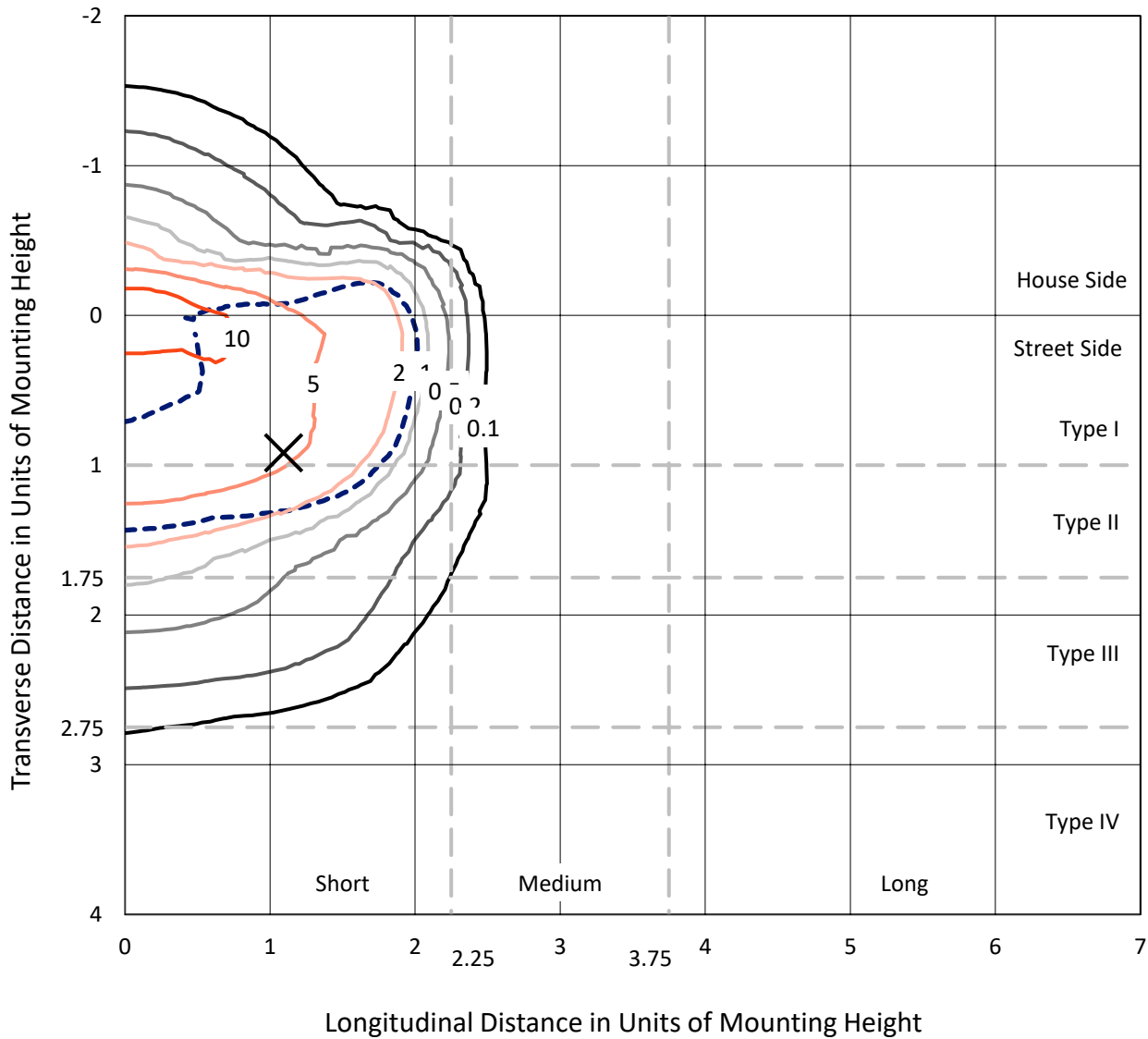
Lumens per Lamp: N/A  
Luminaire Lumens: 26519.1 lumens  
Efficiency: N/A  
Efficacy: 81.9 lumens/watt  
Luminous Opening: Rectangular (W 2' x L: 1' x H: 0')  
IES Classification: Type II - Short  
BUG Rating: B3 - U0 - G2  
  
Input Watts (W): 323.8  
Input Voltage (V): 120  
Input Current (Ain): NR  
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: P643309  
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### Iso-Footcandle Lines of Horizontal Illumination

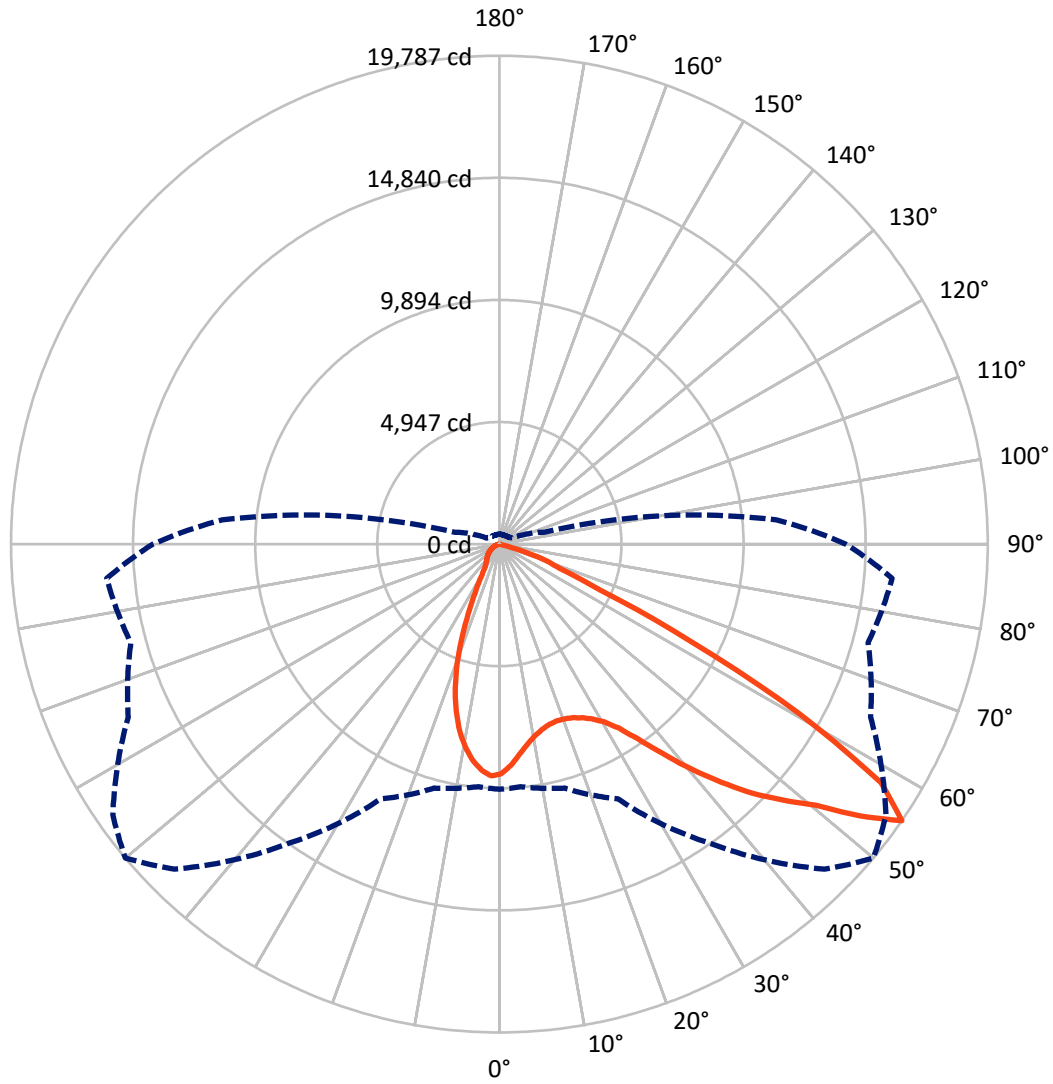
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 14.9 fc  
 Type II - Short - N/A

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### Luminous Intensity Polar Plot



— Vertical Plane Through 50-Deg Lateral    - - - Horizontal Cone Through 55-Deg Vertical

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**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 5225.5   | 0.0    | 5225.5  |
|                    | % Fixture | 19.7     | 0.0    | 19.7    |
| <b>Street Side</b> | Lumens    | 21293.6  | 0.0    | 21293.6 |
|                    | % Fixture | 80.3     | 0.0    | 80.3    |
| <b>Total</b>       | Lumens    | 26519.1  | 0.0    | 26519.1 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 817.1   | 3.1       |
| 10°-20°   | 2010.8  | 7.6       |
| 20°-30°   | 2836.3  | 10.7      |
| 30°-40°   | 4197.2  | 15.8      |
| 40°-50°   | 6055.1  | 22.8      |
| 50°-60°   | 7142.5  | 26.9      |
| 60°-70°   | 3186.1  | 12.0      |
| 70°-80°   | 273.9   | 1.0       |
| 80°-90°   | 0.1     | 0.0       |
| 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°    | 26519.1 | 100.0     |
| 0°-180°   | 26519.1 | 100.0     |

**Coefficient of Utilization**



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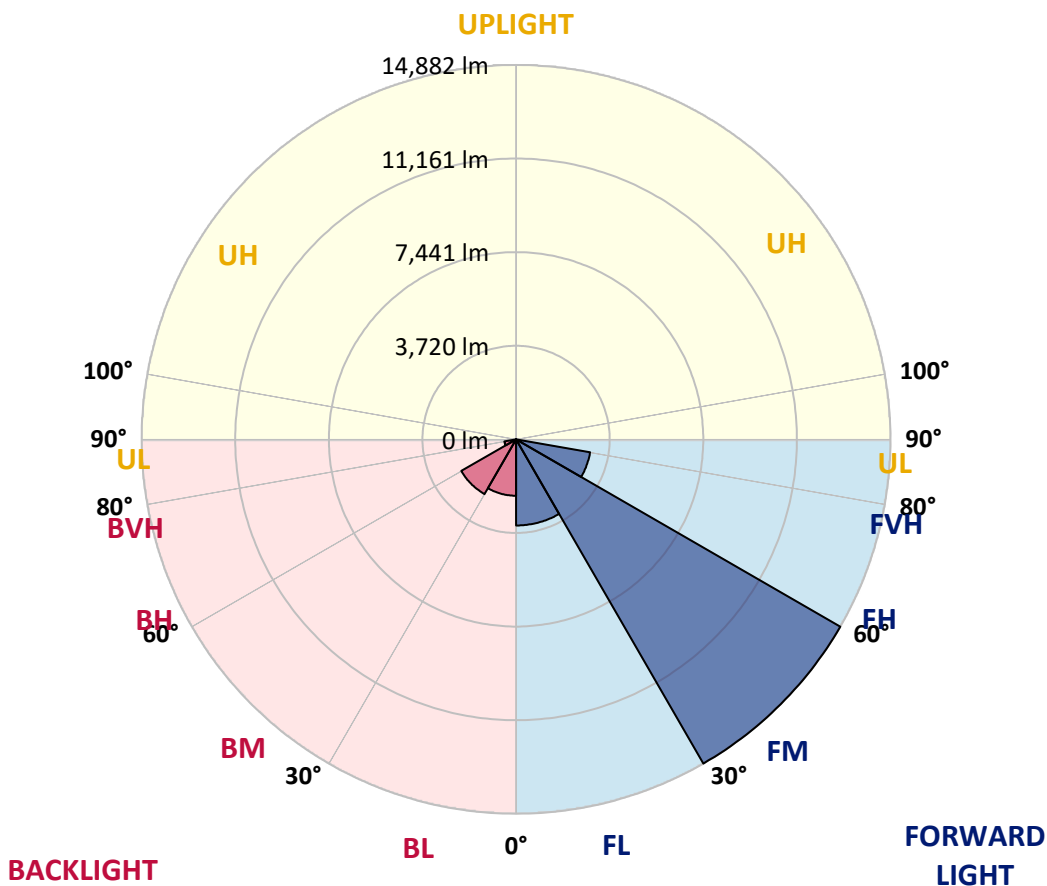
CATALOG NUMBER: GWS-SA6E-760-U-SL2-W-GRSBK

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

| Zone           | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |         |
|----------------|---------|-----------|-------------------------|------|---------|
|                |         |           | B                       | U    | G       |
| FL (0°-30°)    | 3423.7  | 12.9      |                         |      |         |
| FM (30°-60°)   | 14881.6 | 56.1      |                         |      |         |
| FH (60°-80°)   | 2988.2  | 11.3      |                         |      | G2/5000 |
| FVH (80°-90°)  | 0.0     | 0.0       |                         |      | G0/10   |
| BL (0°-30°)    | 2240.5  | 8.4       | B3/2500                 |      |         |
| BM (30°-60°)   | 2513.1  | 9.5       | B3/5000                 |      |         |
| BH (60°-80°)   | 471.8   | 1.8       | B1/500                  |      | G1/500  |
| BVH (80°-90°)  | 0.1     | 0.0       |                         |      | G0/10   |
| UL (90°-100°)  | 0.0     | 0.0       |                         | U0/0 |         |
| UH (100°-180°) | 0.0     | 0.0       |                         | U0/0 |         |

**BUG Rating: B3-U0-G2**

Type II Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 50°     | 55°     | 65°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 9304.4  | 9304.4  | 9304.4  | 9304.4  | 9304.4  | 9304.4  | 9304.4  | 9304.4  | 9304.4  | 9304.4  | 9304.4  |
| 2.5°  | 8643.9  | 8650.4  | 8653.7  | 8741.1  | 8773.4  | 8902.9  | 8970.9  | 9006.5  | 9100.4  | 9210.5  | 9301.1  |
| 5°    | 8064.4  | 8054.7  | 8070.9  | 8181.0  | 8252.2  | 8443.2  | 8546.8  | 8618.0  | 8825.2  | 9084.2  | 9301.1  |
| 7.5°  | 7559.4  | 7578.8  | 7598.2  | 7718.0  | 7824.9  | 8032.1  | 8181.0  | 8287.8  | 8576.0  | 8961.2  | 9327.0  |
| 10°   | 7203.3  | 7203.3  | 7232.4  | 7368.4  | 7494.7  | 7750.4  | 7899.3  | 8035.3  | 8378.5  | 8851.1  | 9356.2  |
| 12.5° | 6941.1  | 6944.3  | 6979.9  | 7135.3  | 7281.0  | 7546.5  | 7701.8  | 7834.6  | 8213.4  | 8741.1  | 9362.6  |
| 15°   | 6818.0  | 6808.3  | 6837.5  | 7002.6  | 7164.4  | 7413.7  | 7575.6  | 7705.1  | 8096.8  | 8679.6  | 9395.0  |
| 17.5° | 6785.7  | 6779.2  | 6801.8  | 6963.7  | 7128.8  | 7371.6  | 7530.3  | 7659.8  | 8080.6  | 8699.0  | 9492.1  |
| 20°   | 6879.5  | 6866.6  | 6856.9  | 6996.1  | 7151.5  | 7391.1  | 7556.2  | 7701.8  | 8158.3  | 8805.8  | 9641.1  |
| 22.5° | 7102.9  | 7102.9  | 7080.3  | 7148.2  | 7251.8  | 7468.8  | 7640.3  | 7831.3  | 8362.3  | 9019.5  | 9861.2  |
| 25°   | 7514.1  | 7481.7  | 7439.6  | 7468.8  | 7455.8  | 7591.8  | 7795.7  | 8061.2  | 8747.5  | 9372.4  | 10129.9 |
| 27.5° | 7983.5  | 8012.6  | 7941.4  | 7944.7  | 7831.3  | 7782.8  | 8019.1  | 8420.6  | 9320.6  | 9870.9  | 10528.1 |
| 30°   | 8621.3  | 8598.6  | 8601.9  | 8592.1  | 8329.9  | 8100.1  | 8355.8  | 8890.0  | 10042.5 | 10631.7 | 11046.1 |
| 32.5° | 9119.8  | 9152.2  | 9259.1  | 9320.6  | 8977.4  | 8608.3  | 8880.3  | 9527.8  | 10864.8 | 11499.4 | 11680.6 |
| 35°   | 9647.5  | 9705.8  | 9922.7  | 10123.4 | 9835.3  | 9411.2  | 9702.6  | 10372.7 | 11638.6 | 12357.3 | 12409.1 |
| 37.5° | 10204.4 | 10320.9 | 10579.9 | 10932.8 | 10887.5 | 10511.9 | 10777.4 | 11366.6 | 12247.2 | 12875.3 | 13011.2 |
| 40°   | 10842.2 | 10955.5 | 11379.6 | 11887.8 | 11994.7 | 11910.5 | 11997.9 | 12341.1 | 12648.6 | 12897.9 | 13270.2 |
| 42.5° | 11541.4 | 11696.8 | 12234.2 | 12914.1 | 13315.6 | 13390.0 | 13186.1 | 13150.4 | 12823.5 | 12638.9 | 13215.2 |
| 45°   | 12367.0 | 12548.3 | 13156.9 | 14037.5 | 14675.3 | 14775.6 | 14422.8 | 13966.3 | 12933.5 | 12447.9 | 13050.1 |
| 47.5° | 13292.9 | 13464.5 | 14069.9 | 15128.5 | 16077.1 | 16115.9 | 15500.8 | 14765.9 | 13260.5 | 12668.1 | 13176.3 |
| 50°   | 13603.7 | 13710.5 | 14235.0 | 15478.2 | 17226.4 | 17524.2 | 16633.9 | 15665.9 | 13917.7 | 13315.6 | 13791.5 |
| 52.5° | 12535.3 | 12577.4 | 13033.9 | 14290.0 | 16993.3 | 18906.6 | 18288.2 | 17009.5 | 15086.4 | 14303.0 | 14740.0 |
| 55°   | 9932.4  | 9864.5  | 10233.5 | 11386.0 | 14769.2 | 18624.9 | 19787.2 | 19120.3 | 16591.8 | 15462.0 | 15973.5 |
| 57.5° | 6947.5  | 6866.6  | 6782.4  | 7562.6  | 11020.2 | 15788.9 | 18233.2 | 19414.9 | 18026.0 | 16611.3 | 17304.1 |
| 60°   | 5710.8  | 5633.1  | 5225.2  | 4865.9  | 6662.6  | 11337.5 | 14005.1 | 16229.2 | 17909.5 | 16553.0 | 17262.0 |
| 62.5° | 4933.8  | 4888.5  | 4723.4  | 4234.6  | 3920.5  | 6471.6  | 8770.2  | 10900.4 | 13742.9 | 12998.3 | 13037.1 |
| 65°   | 3875.2  | 3862.3  | 3975.6  | 4027.4  | 3467.3  | 3580.6  | 4474.1  | 5665.5  | 7429.9  | 7005.8  | 6643.2  |
| 67.5° | 2648.2  | 2619.1  | 2832.8  | 3483.5  | 3334.6  | 2826.3  | 2619.1  | 2641.7  | 3214.8  | 1965.1  | 1560.4  |
| 70°   | 1683.5  | 1615.5  | 1618.7  | 2159.4  | 2713.0  | 2230.6  | 2020.2  | 1777.3  | 1599.3  | 291.4   | 330.2   |
| 72.5° | 1078.1  | 1036.0  | 890.3   | 974.5   | 1256.1  | 1087.8  | 1097.5  | 945.3   | 631.3   | 155.4   | 181.3   |
| 75°   | 453.2   | 417.6   | 320.5   | 255.8   | 252.5   | 158.6   | 139.2   | 129.5   | 87.4    | 87.4    | 93.9    |
| 77.5° | 3.2     | 0.0     | 0.0     | 3.2     | 6.5     | 3.2     | 3.2     | 6.5     | 12.9    | 19.4    | 22.7    |
| 80°   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 3.2     |
| 82.5° | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| 85°   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| 87.5° | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 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     |



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CATALOG NUMBER: GWS-SA6E-760-U-SL2-W-GRSBK

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°     | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|---------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 9304.4  | 9304.4  | 9304.4 | 9304.4 | 9304.4 | 9304.4 | 9304.4 | 9304.4 | 9304.4 | 9304.4 | 9304.4 |
| 2.5°  | 9356.2  | 9278.5  | 9365.9 | 9398.3 | 9395.0 | 9398.3 | 9304.4 | 9239.6 | 9236.4 | 9155.5 | 9116.6 |
| 5°    | 9391.8  | 9330.3  | 9395.0 | 9352.9 | 9252.6 | 9126.3 | 8958.0 | 8812.3 | 8747.5 | 8653.7 | 8608.3 |
| 7.5°  | 9459.8  | 9395.0  | 9385.3 | 9217.0 | 8967.7 | 8702.2 | 8404.4 | 8138.9 | 7996.5 | 7824.9 | 7834.6 |
| 10°   | 9508.3  | 9433.9  | 9307.6 | 8964.4 | 8550.1 | 8126.0 | 7682.4 | 7287.5 | 7038.2 | 6808.3 | 6769.5 |
| 12.5° | 9527.8  | 9417.7  | 9123.1 | 8605.1 | 8022.4 | 7468.8 | 6818.0 | 6254.7 | 5866.2 | 5565.1 | 5523.1 |
| 15°   | 9563.4  | 9385.3  | 8886.7 | 8171.3 | 7371.6 | 6588.2 | 5759.4 | 4988.9 | 4474.1 | 4127.7 | 4156.9 |
| 17.5° | 9618.4  | 9349.7  | 8621.3 | 7685.7 | 6672.3 | 5565.1 | 4445.0 | 3561.2 | 3088.5 | 2887.8 | 2891.0 |
| 20°   | 9696.1  | 9307.6  | 8329.9 | 7151.5 | 5833.8 | 4409.4 | 3107.9 | 2441.0 | 2308.3 | 2301.8 | 2292.1 |
| 22.5° | 9799.7  | 9265.5  | 8019.1 | 6565.5 | 4840.0 | 3088.5 | 2068.7 | 1861.5 | 1916.6 | 2023.4 | 2042.8 |
| 25°   | 9922.7  | 9213.7  | 7672.7 | 5905.1 | 3755.4 | 2026.6 | 1550.7 | 1518.4 | 1651.1 | 1793.5 | 1825.9 |
| 27.5° | 10113.7 | 9187.8  | 7277.7 | 5154.0 | 2635.3 | 1453.6 | 1269.1 | 1288.5 | 1408.3 | 1528.1 | 1557.2 |
| 30°   | 10437.5 | 9236.4  | 6847.2 | 4312.3 | 1693.2 | 1159.0 | 1100.7 | 1129.9 | 1194.6 | 1256.1 | 1282.0 |
| 32.5° | 10877.8 | 9378.8  | 6429.5 | 3392.8 | 1207.6 | 1006.8 | 993.9  | 1010.1 | 1036.0 | 1071.6 | 1081.3 |
| 35°   | 11392.5 | 9624.9  | 5999.0 | 2428.1 | 997.1  | 919.4  | 906.5  | 906.5  | 919.4  | 925.9  | 929.1  |
| 37.5° | 11816.6 | 9883.9  | 5594.3 | 1615.5 | 893.5  | 851.4  | 832.0  | 822.3  | 819.1  | 825.5  | 828.8  |
| 40°   | 12001.2 | 9990.7  | 5154.0 | 1175.2 | 819.1  | 789.9  | 760.8  | 731.7  | 731.7  | 754.3  | 757.6  |
| 42.5° | 11871.7 | 9870.9  | 4645.7 | 971.2  | 767.3  | 725.2  | 679.9  | 654.0  | 666.9  | 689.6  | 696.0  |
| 45°   | 11596.5 | 9576.3  | 4085.6 | 857.9  | 715.5  | 660.4  | 608.6  | 592.4  | 605.4  | 634.5  | 641.0  |
| 47.5° | 11551.2 | 9382.1  | 3415.5 | 783.5  | 660.4  | 605.4  | 550.4  | 534.2  | 550.4  | 573.0  | 579.5  |
| 50°   | 12001.2 | 9550.4  | 2670.9 | 718.7  | 608.6  | 547.1  | 501.8  | 485.6  | 495.3  | 508.3  | 514.8  |
| 52.5° | 12823.5 | 10175.2 | 2156.1 | 657.2  | 547.1  | 488.9  | 459.7  | 440.3  | 440.3  | 453.2  | 456.5  |
| 55°   | 14037.5 | 11266.3 | 1861.5 | 586.0  | 475.9  | 443.5  | 417.6  | 398.2  | 398.2  | 404.7  | 407.9  |
| 57.5° | 15436.1 | 12587.1 | 1929.5 | 492.1  | 417.6  | 401.4  | 378.8  | 362.6  | 369.1  | 369.1  | 369.1  |
| 60°   | 15241.8 | 12490.0 | 2065.5 | 414.4  | 369.1  | 362.6  | 343.2  | 336.7  | 352.9  | 339.9  | 333.5  |
| 62.5° | 11227.4 | 8627.8  | 1081.3 | 339.9  | 317.3  | 310.8  | 297.8  | 310.8  | 333.5  | 297.8  | 284.9  |
| 65°   | 5451.8  | 4176.3  | 433.8  | 278.4  | 268.7  | 262.2  | 255.8  | 275.2  | 288.1  | 233.1  | 220.1  |
| 67.5° | 1282.0  | 1042.5  | 281.7  | 236.3  | 223.4  | 210.4  | 216.9  | 220.1  | 210.4  | 158.6  | 152.2  |
| 70°   | 333.5   | 327.0   | 220.1  | 197.5  | 178.1  | 165.1  | 165.1  | 161.9  | 139.2  | 100.4  | 93.9   |
| 72.5° | 181.3   | 178.1   | 158.6  | 148.9  | 123.0  | 110.1  | 113.3  | 100.4  | 77.7   | 58.3   | 55.0   |
| 75°   | 90.6    | 97.1    | 90.6   | 84.2   | 68.0   | 61.5   | 61.5   | 55.0   | 38.8   | 22.7   | 22.7   |
| 77.5° | 19.4    | 22.7    | 22.7   | 19.4   | 16.2   | 12.9   | 12.9   | 16.2   | 6.5    | 0.0    | 0.0    |
| 80°   | 3.2     | 3.2     | 3.2    | 3.2    | 3.2    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 82.5° | 0.0     | 0.0     | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 85°   | 0.0     | 0.0     | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 87.5° | 0.0     | 0.0     | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 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    |



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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: SP1-1908-441-9-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)