

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: P642820

Luminaire Tested: GWS-SA6D-760-U-SL3-W-HSS

Issue Date: 1/10/2023

**Test Information**

Test Method: LM-79-2019  
Report Number: P642820  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-34)  
Test Lab: COOPER LIGHTING SOLUTIONS  
Issue Date: 1/10/2023  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: McGRAW-EDISON  
Catalog Number: GWS-SA6D-760-U-SL3-W-HSS  
Description: GALLEON WALL SLIM LUMINAIRE. (6) LIGHTSQUARES WITH 16 LEDS EACH AND TYPE III SPILL LIGHT ELIMINATOR OPTICS WITH HOUSE SIDE SHIELD  
Light Source: (96) 5700K CCT, 70 CRI LEDS  
Ballast/Driver: -

**Summary**

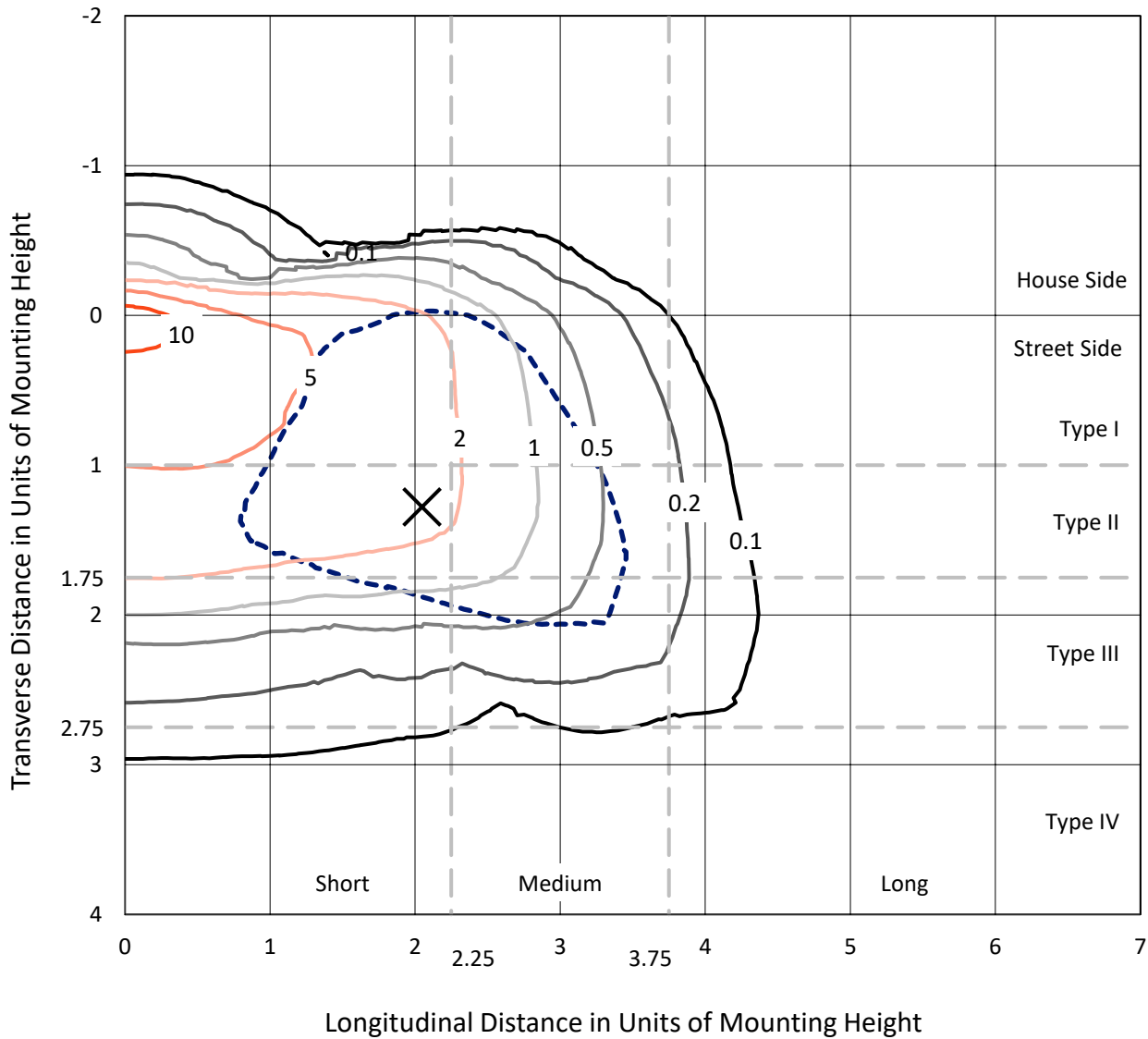
Lumens per Lamp: N/A  
Luminaire Lumens: 29270.8 lumens  
Efficiency: N/A  
Efficacy: 119.1 lumens/watt  
Luminous Opening: Rectangular (W 2' x L: 1' x H: 0')  
IES Classification: Type III - Short  
BUG Rating: B3 - U0 - G4  
  
Input Watts (W): 245.7  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 0  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT



REPORT NUMBER: P642820  
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### Iso-Footcandle Lines of Horizontal Illumination

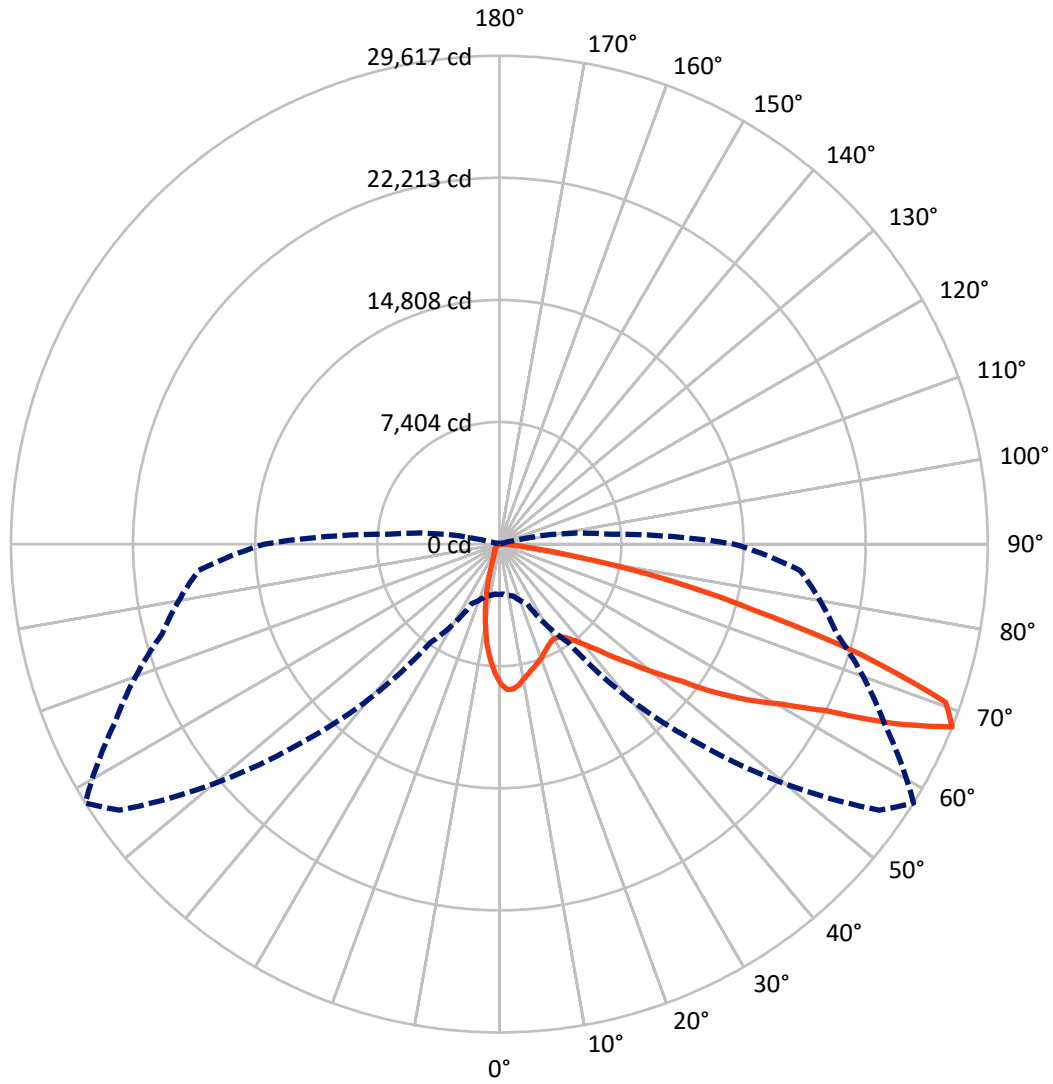
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 13.5 fc  
 Type III - Short - N/A

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### Luminous Intensity Polar Plot



— Vertical Plane Through 58-Deg Lateral    - - - Horizontal Cone Through 67.5-Deg Vertical

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**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 2859.6   | 0.0    | 2859.6  |
|                    | % Fixture | 9.8      | 0.0    | 9.8     |
| <b>Street Side</b> | Lumens    | 26411.2  | 0.0    | 26411.2 |
|                    | % Fixture | 90.2     | 0.0    | 90.2    |
| <b>Total</b>       | Lumens    | 29270.8  | 0.0    | 29270.8 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 686.1   | 2.3       |
| 10°-20°   | 1428.2  | 4.9       |
| 20°-30°   | 1926.0  | 6.6       |
| 30°-40°   | 2706.4  | 9.2       |
| 40°-50°   | 4179.8  | 14.3      |
| 50°-60°   | 6684.0  | 22.8      |
| 60°-70°   | 7914.4  | 27.0      |
| 70°-80°   | 3501.1  | 12.0      |
| 80°-90°   | 244.8   | 0.8       |
| 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°    | 29270.8 | 100.0     |
| 0°-180°   | 29270.8 | 100.0     |

**Coefficient of Utilization**

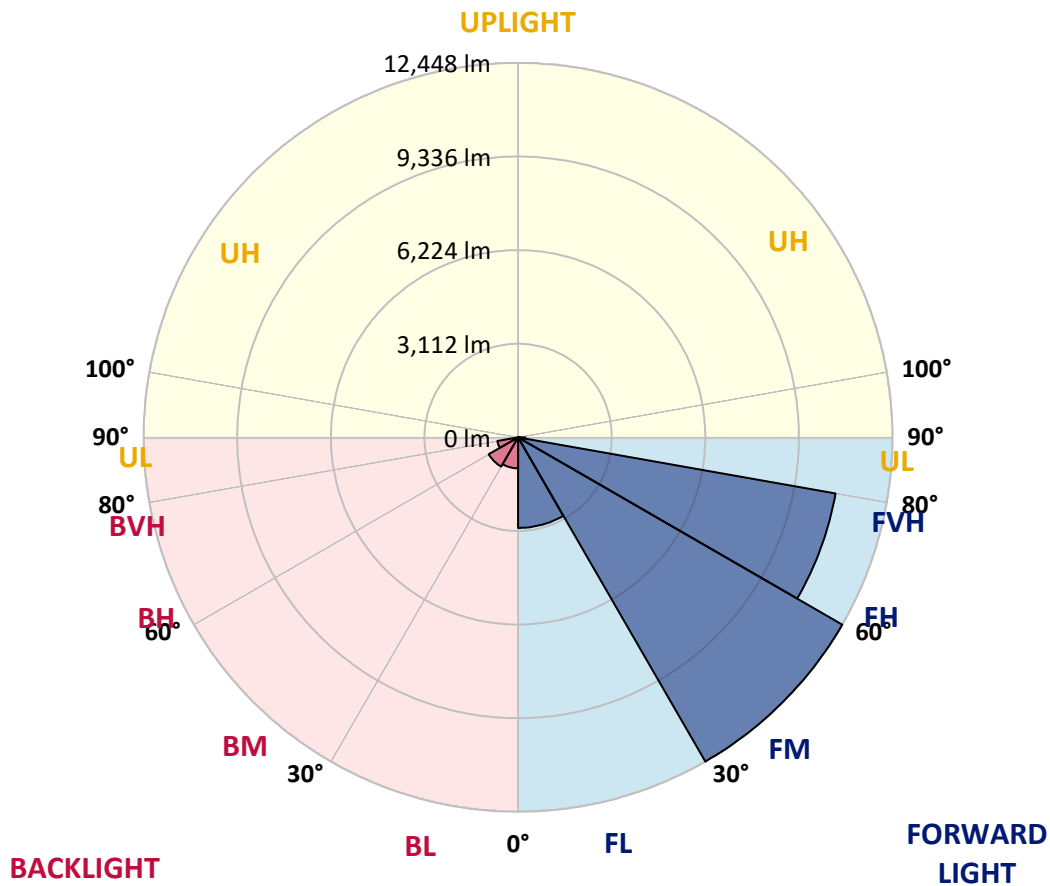


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**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone           | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |          |
|----------------|---------|-----------|-------------------------|------|----------|
|                |         |           | B                       | U    | G        |
| FL (0°-30°)    | 3011.2  | 10.3      |                         |      |          |
| FM (30°-60°)   | 12448.3 | 42.5      |                         |      |          |
| FH (60°-80°)   | 10717.4 | 36.6      |                         |      | G4/12000 |
| FVH (80°-90°)  | 234.3   | 0.8       |                         |      | G3/500   |
| BL (0°-30°)    | 1029.0  | 3.5       | B3/2500                 |      |          |
| BM (30°-60°)   | 1122.0  | 3.8       | B2/2500                 |      |          |
| BH (60°-80°)   | 698.1   | 2.4       | B2/1000                 |      | G2/1000  |
| BVH (80°-90°)  | 10.4    | 0.0       |                         |      | G1/100   |
| UL (90°-100°)  | 0.0     | 0.0       |                         | U0/0 |          |
| UH (100°-180°) | 0.0     | 0.0       |                         | U0/0 |          |

**BUG Rating: B3-U0-G4**  
 Type III Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 55°     | 58°     | 65°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 8443.1  | 8443.1  | 8443.1  | 8443.1  | 8443.1  | 8443.1  | 8443.1  | 8443.1  | 8443.1  | 8443.1  | 8443.1  |
| 2.5°  | 8880.9  | 8896.4  | 8917.2  | 8943.1  | 8937.9  | 8914.6  | 8886.1  | 8821.3  | 8779.9  | 8650.3  | 8492.3  |
| 5°    | 8595.9  | 8593.3  | 8645.1  | 8694.4  | 8782.5  | 8829.1  | 8893.9  | 8834.3  | 8813.5  | 8658.1  | 8401.6  |
| 7.5°  | 8038.9  | 8067.4  | 8127.0  | 8204.7  | 8331.7  | 8469.0  | 8624.4  | 8606.3  | 8668.5  | 8564.8  | 8246.2  |
| 10°   | 7492.3  | 7476.7  | 7570.0  | 7686.6  | 7880.9  | 8057.1  | 8282.4  | 8279.9  | 8443.1  | 8432.7  | 8070.0  |
| 12.5° | 7013.0  | 7010.4  | 7083.0  | 7215.1  | 7443.1  | 7689.2  | 7994.9  | 8002.7  | 8204.7  | 8287.6  | 7919.8  |
| 15°   | 6608.9  | 6614.0  | 6684.0  | 6821.3  | 7057.1  | 7357.6  | 7712.5  | 7777.3  | 8005.2  | 8173.6  | 7772.1  |
| 17.5° | 6321.3  | 6323.9  | 6365.3  | 6484.5  | 6715.1  | 7036.3  | 7463.8  | 7551.9  | 7844.6  | 8088.1  | 7652.9  |
| 20°   | 6189.2  | 6178.8  | 6186.6  | 6246.2  | 6424.9  | 6717.7  | 7209.9  | 7323.9  | 7697.0  | 8028.6  | 7544.1  |
| 22.5° | 6207.3  | 6191.8  | 6155.5  | 6147.7  | 6228.0  | 6450.8  | 6940.5  | 7080.4  | 7536.3  | 7992.3  | 7445.7  |
| 25°   | 6367.9  | 6334.2  | 6282.4  | 6204.7  | 6173.6  | 6285.0  | 6704.7  | 6849.8  | 7386.1  | 7994.9  | 7370.5  |
| 27.5° | 6614.0  | 6577.8  | 6513.0  | 6409.4  | 6287.6  | 6241.0  | 6544.1  | 6681.4  | 7279.9  | 8054.5  | 7334.3  |
| 30°   | 6927.5  | 6899.0  | 6836.8  | 6712.5  | 6549.3  | 6357.6  | 6510.4  | 6624.4  | 7228.0  | 8176.2  | 7349.8  |
| 32.5° | 7298.0  | 7277.3  | 7225.4  | 7111.5  | 6924.9  | 6632.2  | 6624.4  | 6712.5  | 7269.5  | 8352.4  | 7409.4  |
| 35°   | 7655.5  | 7663.3  | 7665.9  | 7603.7  | 7404.2  | 7049.3  | 6937.9  | 6969.0  | 7440.5  | 8616.6  | 7544.1  |
| 37.5° | 8041.5  | 8023.4  | 8116.6  | 8160.7  | 7969.0  | 7590.7  | 7422.3  | 7424.9  | 7766.9  | 9007.8  | 7798.0  |
| 40°   | 8334.3  | 8339.4  | 8541.5  | 8722.9  | 8642.6  | 8277.3  | 8036.3  | 8033.7  | 8269.5  | 9544.1  | 8207.3  |
| 42.5° | 8608.9  | 8642.6  | 8940.5  | 9251.4  | 9362.8  | 9038.9  | 8865.4  | 8800.6  | 8974.2  | 10269.5 | 8821.3  |
| 45°   | 8901.6  | 8950.8  | 9368.0  | 9811.0  | 10103.7 | 9912.0  | 9774.7  | 9800.6  | 9821.3  | 11114.1 | 9647.7  |
| 47.5° | 9243.6  | 9274.7  | 9790.2  | 10414.6 | 10961.2 | 10912.0 | 10919.8 | 10888.7 | 10878.3 | 12178.9 | 10741.0 |
| 50°   | 9658.1  | 9730.6  | 10323.9 | 11070.0 | 11816.2 | 12142.6 | 12251.4 | 12264.3 | 12096.0 | 13339.5 | 11873.2 |
| 52.5° | 10538.9 | 10627.0 | 11134.8 | 11787.7 | 12748.8 | 13435.3 | 13878.3 | 13790.3 | 13531.2 | 14463.8 | 13114.1 |
| 55°   | 11577.8 | 11645.2 | 12134.8 | 12811.0 | 13888.7 | 14852.5 | 15904.3 | 15868.0 | 15233.3 | 15647.8 | 14134.8 |
| 57.5° | 11676.3 | 11751.4 | 12510.5 | 13546.7 | 15352.5 | 16603.8 | 17710.0 | 17826.6 | 16896.5 | 16487.2 | 15046.8 |
| 60°   | 10570.0 | 10722.9 | 11759.2 | 13153.0 | 15912.0 | 18958.7 | 19689.3 | 19712.6 | 18116.7 | 17339.5 | 16160.8 |
| 62.5° | 8471.6  | 8544.1  | 9588.2  | 11406.8 | 15049.3 | 20331.8 | 22712.6 | 22220.4 | 19684.1 | 18658.2 | 17925.0 |
| 65°   | 4440.4  | 4735.8  | 5645.1  | 7658.1  | 12204.8 | 19852.5 | 26350.0 | 26215.2 | 22502.8 | 20546.8 | 19298.1 |
| 67.5° | 3046.7  | 3044.1  | 3259.1  | 3992.3  | 7277.3  | 17093.4 | 28134.9 | 29616.8 | 25761.9 | 21194.5 | 18303.3 |
| 70°   | 2318.7  | 2326.4  | 2518.2  | 2994.8  | 3769.5  | 11378.3 | 26176.4 | 28710.1 | 26368.1 | 19243.7 | 14803.2 |
| 72.5° | 1538.9  | 1554.4  | 1873.1  | 2419.7  | 3010.4  | 5577.8  | 20342.1 | 22971.7 | 22186.7 | 15456.1 | 10419.8 |
| 75°   | 919.7   | 932.6   | 1160.6  | 1759.1  | 2676.2  | 3121.8  | 12925.0 | 15881.0 | 15272.1 | 10652.9 | 5585.5  |
| 77.5° | 378.2   | 388.6   | 595.9   | 1095.9  | 1958.6  | 2424.9  | 7147.7  | 10391.3 | 9147.7  | 4235.8  | 1525.9  |
| 80°   | 158.0   | 163.2   | 287.6   | 766.8   | 1411.9  | 1520.7  | 3310.9  | 4883.5  | 3748.7  | 911.9   | 466.3   |
| 82.5° | 57.0    | 59.6    | 106.2   | 422.3   | 878.2   | 1145.1  | 1671.0  | 1930.1  | 1057.0  | 297.9   | 251.3   |
| 85°   | 2.6     | 2.6     | 25.9    | 142.5   | 334.2   | 323.8   | 956.0   | 924.9   | 349.7   | 124.4   | 150.3   |
| 87.5° | 0.0     | 0.0     | 2.6     | 2.6     | 5.2     | 13.0    | 90.7    | 160.6   | 75.1    | 31.1    | 64.8    |
| 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: P642820

CATALOG NUMBER: GWS-SA6D-760-U-SL3-W-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 8443.1  | 8443.1 | 8443.1 | 8443.1 | 8443.1 | 8443.1 | 8443.1 | 8443.1 | 8443.1 | 8443.1 | 8443.1 |
| 2.5°  | 8388.7  | 8251.4 | 8101.1 | 7961.2 | 7738.4 | 7606.3 | 7443.1 | 7370.5 | 7266.9 | 7241.0 | 7256.5 |
| 5°    | 8217.7  | 7981.9 | 7621.8 | 7295.4 | 6873.1 | 6533.7 | 6191.8 | 6046.7 | 5860.2 | 5735.8 | 5684.0 |
| 7.5°  | 7976.7  | 7668.5 | 7106.3 | 6513.0 | 5932.7 | 5313.5 | 4842.0 | 4531.1 | 4248.7 | 4093.3 | 4062.2 |
| 10°   | 7733.2  | 7331.7 | 6526.0 | 5676.2 | 4777.2 | 4036.3 | 3399.0 | 2927.5 | 2544.1 | 2370.5 | 2235.8 |
| 12.5° | 7481.9  | 6981.9 | 5935.3 | 4826.5 | 3782.4 | 2772.0 | 1984.5 | 1525.9 | 1251.3 | 1142.5 | 1160.6 |
| 15°   | 7251.4  | 6645.1 | 5349.8 | 3976.7 | 2663.2 | 1673.6 | 1095.9 | 924.9  | 860.1  | 839.4  | 836.8  |
| 17.5° | 7031.1  | 6326.5 | 4766.9 | 3150.3 | 1756.5 | 1025.9 | 839.4  | 797.9  | 779.8  | 769.4  | 769.4  |
| 20°   | 6831.7  | 6020.8 | 4196.9 | 2373.1 | 1134.7 | 813.5  | 759.1  | 738.3  | 722.8  | 715.0  | 715.0  |
| 22.5° | 6645.1  | 5725.4 | 3639.9 | 1678.8 | 836.8  | 730.6  | 696.9  | 676.2  | 658.0  | 647.7  | 647.7  |
| 25°   | 6476.7  | 5458.6 | 3108.8 | 1155.4 | 720.2  | 668.4  | 632.1  | 608.8  | 577.7  | 559.6  | 559.6  |
| 27.5° | 6355.0  | 5220.2 | 2598.5 | 842.0  | 650.3  | 601.0  | 559.6  | 528.5  | 494.8  | 474.1  | 468.9  |
| 30°   | 6282.4  | 5018.2 | 2082.9 | 691.7  | 585.5  | 536.3  | 489.6  | 450.8  | 411.9  | 391.2  | 388.6  |
| 32.5° | 6241.0  | 4831.6 | 1611.4 | 603.6  | 531.1  | 474.1  | 422.3  | 380.8  | 342.0  | 318.7  | 316.1  |
| 35°   | 6256.5  | 4686.6 | 1207.3 | 544.0  | 479.3  | 419.7  | 362.7  | 321.2  | 287.6  | 266.8  | 261.7  |
| 37.5° | 6391.2  | 4621.8 | 906.7  | 497.4  | 435.2  | 373.1  | 313.5  | 274.6  | 243.5  | 228.0  | 225.4  |
| 40°   | 6652.9  | 4634.8 | 712.4  | 461.1  | 399.0  | 326.4  | 269.4  | 233.2  | 209.8  | 196.9  | 194.3  |
| 42.5° | 7059.6  | 4743.6 | 588.1  | 430.1  | 360.1  | 285.0  | 233.2  | 204.7  | 181.3  | 168.4  | 165.8  |
| 45°   | 7665.9  | 4969.0 | 513.0  | 393.8  | 318.7  | 246.1  | 202.1  | 176.2  | 155.4  | 139.9  | 137.3  |
| 47.5° | 8544.1  | 5360.1 | 463.7  | 360.1  | 282.4  | 212.4  | 173.6  | 147.7  | 129.5  | 116.6  | 114.0  |
| 50°   | 9479.4  | 5829.1 | 422.3  | 326.4  | 251.3  | 183.9  | 147.7  | 121.8  | 106.2  | 93.3   | 90.7   |
| 52.5° | 10476.8 | 6334.2 | 391.2  | 295.3  | 222.8  | 158.0  | 124.4  | 101.0  | 85.5   | 72.5   | 69.9   |
| 55°   | 11435.3 | 6842.0 | 354.9  | 274.6  | 189.1  | 134.7  | 103.6  | 82.9   | 67.4   | 57.0   | 57.0   |
| 57.5° | 12368.0 | 7308.3 | 316.1  | 240.9  | 155.4  | 114.0  | 85.5   | 67.4   | 54.4   | 46.6   | 44.0   |
| 60°   | 13482.0 | 7953.4 | 272.0  | 204.7  | 129.5  | 95.9   | 69.9   | 54.4   | 44.0   | 36.3   | 36.3   |
| 62.5° | 15137.4 | 8624.4 | 233.2  | 171.0  | 108.8  | 80.3   | 57.0   | 44.0   | 36.3   | 31.1   | 28.5   |
| 65°   | 15678.9 | 8261.7 | 196.9  | 139.9  | 88.1   | 64.8   | 46.6   | 38.9   | 31.1   | 28.5   | 25.9   |
| 67.5° | 14233.3 | 6772.1 | 163.2  | 114.0  | 72.5   | 54.4   | 41.5   | 33.7   | 28.5   | 25.9   | 23.3   |
| 70°   | 11106.3 | 4805.7 | 126.9  | 85.5   | 59.6   | 44.0   | 36.3   | 31.1   | 25.9   | 23.3   | 23.3   |
| 72.5° | 7554.5  | 2842.0 | 101.0  | 64.8   | 49.2   | 38.9   | 31.1   | 28.5   | 25.9   | 23.3   | 20.7   |
| 75°   | 3720.2  | 1010.4 | 77.7   | 49.2   | 38.9   | 33.7   | 28.5   | 25.9   | 23.3   | 20.7   | 20.7   |
| 77.5° | 1002.6  | 279.8  | 59.6   | 38.9   | 31.1   | 25.9   | 25.9   | 25.9   | 23.3   | 18.1   | 18.1   |
| 80°   | 339.4   | 116.6  | 44.0   | 28.5   | 25.9   | 20.7   | 18.1   | 23.3   | 20.7   | 18.1   | 15.5   |
| 82.5° | 186.5   | 57.0   | 31.1   | 23.3   | 18.1   | 15.5   | 15.5   | 15.5   | 15.5   | 13.0   | 13.0   |
| 85°   | 119.2   | 31.1   | 20.7   | 18.1   | 18.1   | 13.0   | 10.4   | 10.4   | 7.8    | 7.8    | 7.8    |
| 87.5° | 54.4    | 18.1   | 18.1   | 15.5   | 15.5   | 13.0   | 7.8    | 5.2    | 2.6    | 2.6    | 2.6    |
| 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  
 CIE u': 0.2052  
 CIE v': 0.4804  
 Duv: 0.0025  
 CIE x: 0.3330  
 CIE y: 0.3466  
 CIE z: 0.3204  
 Peak Wavelength (nm): 442  
 Dominant Wavelength (nm): 554  
 Purity: 4.1

|           |      |      |       |
|-----------|------|------|-------|
| CRI (Ra): | 71.7 |      |       |
| R1:       | 70.6 | R9:  | -27.1 |
| R2:       | 74.6 | R10: | 40.8  |
| R3:       | 78.3 | R11: | 74.6  |
| R4:       | 73.8 | R12: | 50.4  |
| R5:       | 72.4 | R13: | 70.0  |
| R6:       | 67.5 | R14: | 87.8  |
| R7:       | 77.5 |      |       |
| R8:       | 58.9 |      |       |

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)