

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: P643582

Luminaire Tested: GWS-SA6F-730-U-RW-W-GRSWH

Issue Date: 1/10/2023

**Test Information**

Test Method: LM-79-2019  
Report Number: P643582  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-51)  
Test Lab: COOPER LIGHTING SOLUTIONS  
Issue Date: 1/10/2023  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: McGRAW-EDISON  
Catalog Number: GWS-SA6F-730-U-RW-W-GRSWH  
Description: GALLEON WALL SLIM LUMINAIRE. (6) LIGHTSQUARES WITH 16 LEDS EACH AND RECTANGULAR WIDE OPTICS W/ FACTORY INSTALLED GLARE SHIELD, WH  
Light Source: (96) 3000K CCT, 70 CRI LEDS  
Ballast/Driver: -

**Summary**

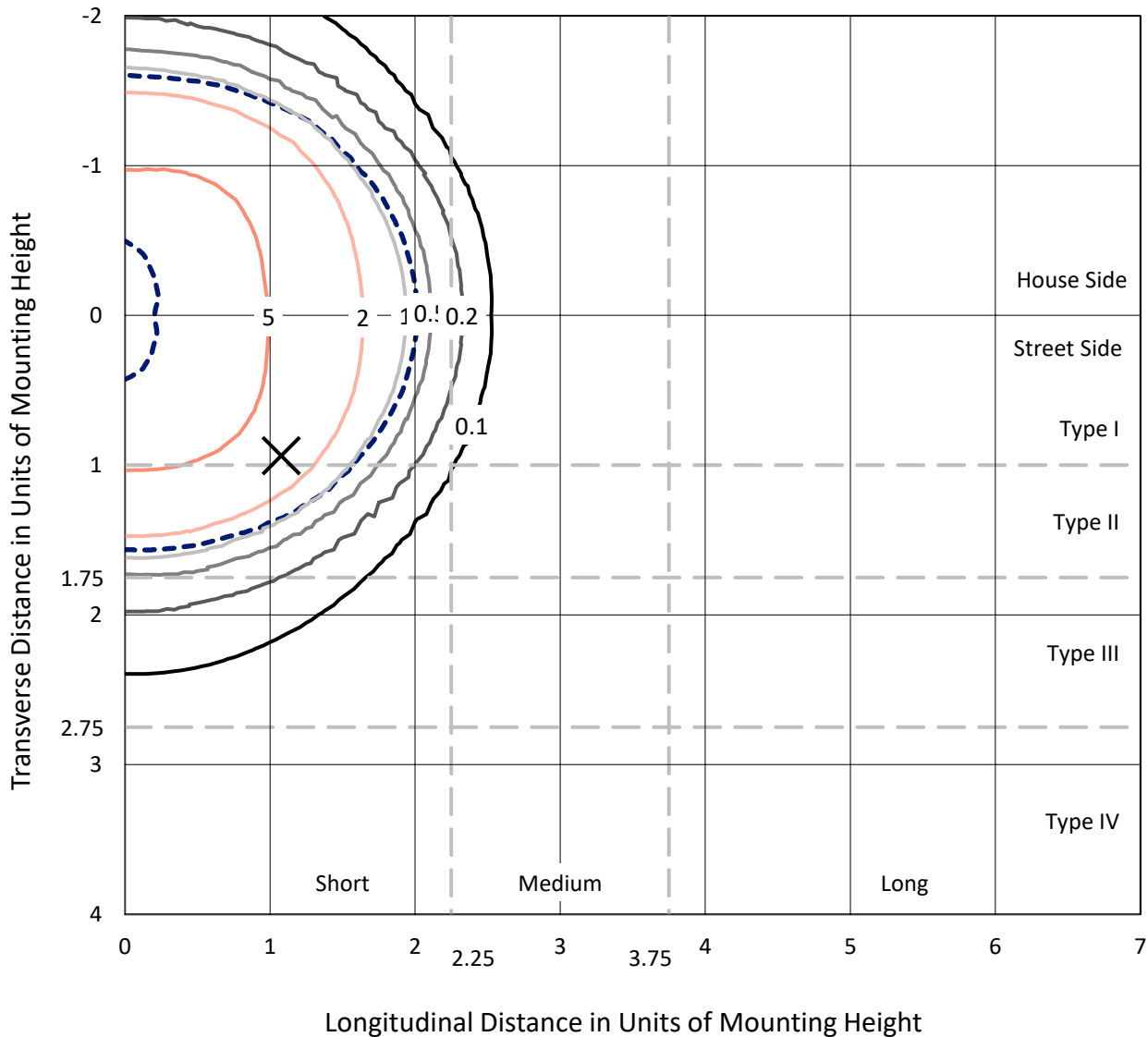
Lumens per Lamp: N/A  
Luminaire Lumens: 39952.5 lumens  
Efficiency: N/A  
Efficacy: 107.2 lumens/watt  
Luminous Opening: Rectangular (W 2' x L: 1' x H: 0')  
IES Classification: Type V - Short  
BUG Rating: B5 - U0 - G2  
  
Input Watts (W): 372.6  
Input Voltage (V): 120  
Input Current (Ain): NR  
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: P643582  
 CATALOG NUMBER: GWS-SA6F-730-U-RW-W-GRSWH

### Iso-Footcandle Lines of Horizontal Illumination

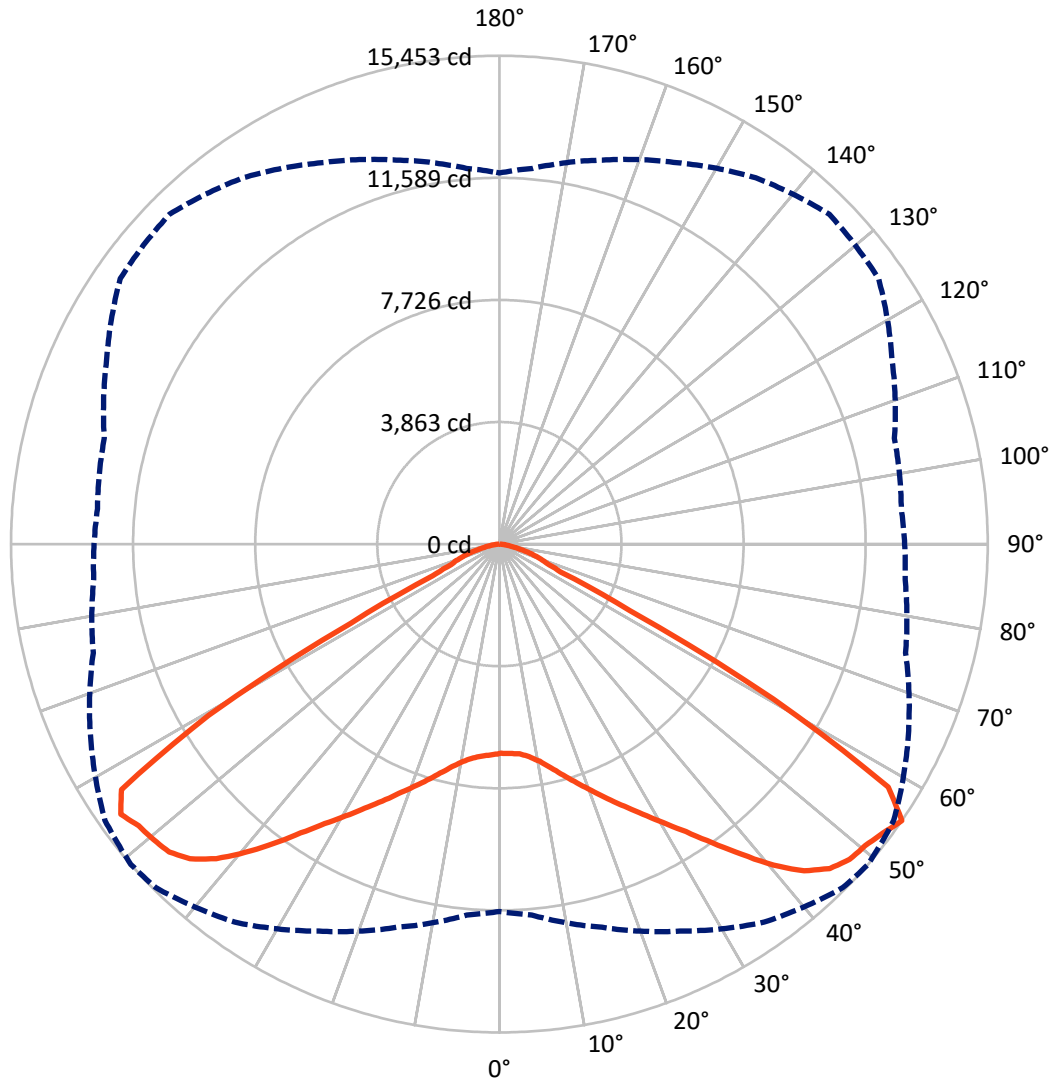
✕ Max cd  
 - - - 1/2 Max cd



Based on 30 foot mounting height. Maximum calculated value = 8.2 fc  
 Type V - Short - N/A

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### Luminous Intensity Polar Plot



— Vertical Plane Through 49-Deg Lateral    - - - Horizontal Cone Through 55-Deg Vertical

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**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 19780.3  | 0.0    | 19780.3 |
|                    | % Fixture | 49.5     | 0.0    | 49.5    |
| <b>Street Side</b> | Lumens    | 20172.2  | 0.0    | 20172.2 |
|                    | % Fixture | 50.5     | 0.0    | 50.5    |
| <b>Total</b>       | Lumens    | 39952.5  | 0.0    | 39952.5 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 645.6   | 1.6       |
| 10°-20°   | 2129.6  | 5.3       |
| 20°-30°   | 4056.2  | 10.2      |
| 30°-40°   | 6876.1  | 17.2      |
| 40°-50°   | 10348.0 | 25.9      |
| 50°-60°   | 11326.9 | 28.4      |
| 60°-70°   | 3581.6  | 9.0       |
| 70°-80°   | 859.6   | 2.2       |
| 80°-90°   | 129.0   | 0.3       |
| 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°    | 39952.5 | 100.0     |
| 0°-180°   | 39952.5 | 100.0     |

**Coefficient of Utilization**



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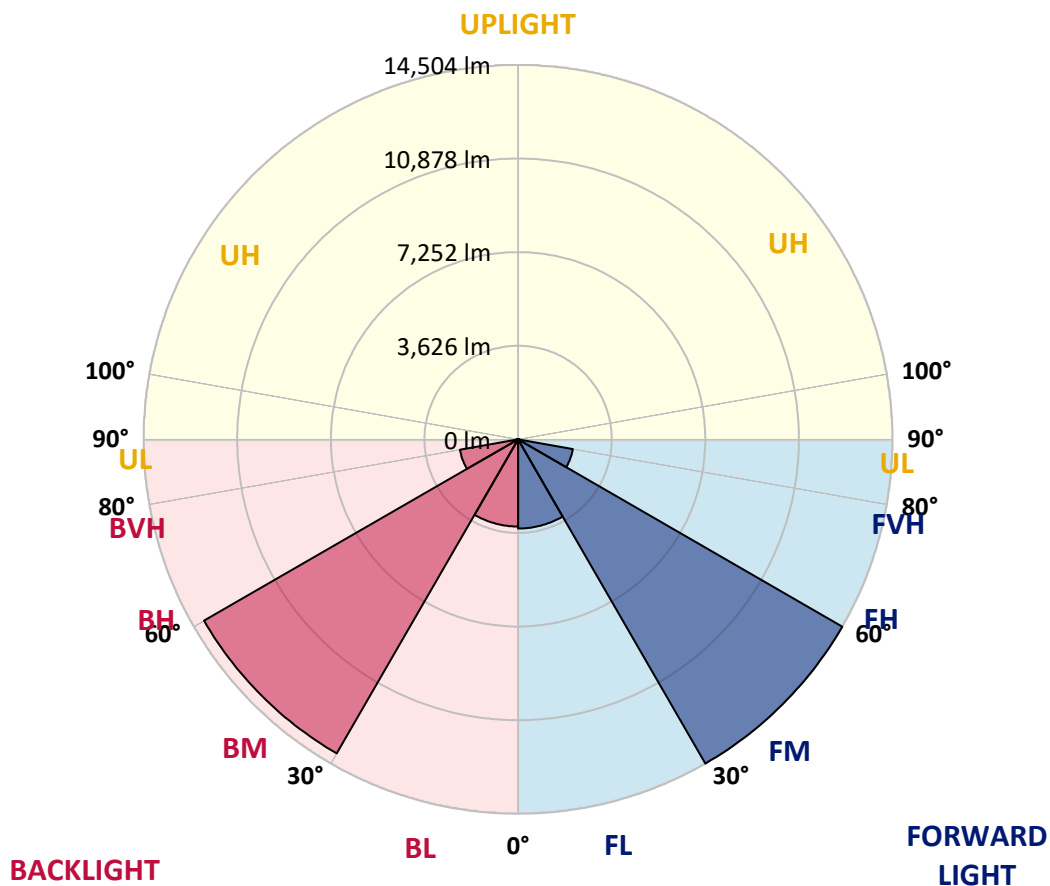
CATALOG NUMBER: GWS-SA6F-730-U-RW-W-GRSWH

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

| Zone           | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |         |
|----------------|---------|-----------|-------------------------|------|---------|
|                |         |           | B                       | U    | G       |
| FL (0°-30°)    | 3454.3  | 8.6       |                         |      |         |
| FM (30°-60°)   | 14503.9 | 36.3      |                         |      |         |
| FH (60°-80°)   | 2154.4  | 5.4       |                         |      | G2/5000 |
| FVH (80°-90°)  | 59.7    | 0.1       |                         |      | G1/100  |
| BL (0°-30°)    | 3377.1  | 8.5       | B4/5000                 |      |         |
| BM (30°-60°)   | 14047.1 | 35.2      | B5                      |      |         |
| BH (60°-80°)   | 2286.8  | 5.7       | B3/2500                 |      | G2/5000 |
| BVH (80°-90°)  | 69.3    | 0.2       |                         |      | G1/100  |
| UL (90°-100°)  | 0.0     | 0.0       |                         | U0/0 |         |
| UH (100°-180°) | 0.0     | 0.0       |                         | U0/0 |         |

**BUG Rating: B5-U0-G2**

Type V Short





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CATALOG NUMBER: GWS-SA6F-730-U-RW-W-GRSWH

**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 49°     | 55°     | 65°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 6618.4  | 6618.4  | 6618.4  | 6618.4  | 6618.4  | 6618.4  | 6618.4  | 6618.4  | 6618.4  | 6618.4  | 6618.4  |
| 2.5°  | 6520.9  | 6527.4  | 6540.4  | 6563.1  | 6585.9  | 6618.4  | 6631.4  | 6647.6  | 6644.4  | 6663.9  | 6663.9  |
| 5°    | 6488.4  | 6498.2  | 6517.7  | 6550.1  | 6589.1  | 6650.9  | 6667.1  | 6706.1  | 6745.1  | 6793.8  | 6810.1  |
| 7.5°  | 6527.4  | 6540.4  | 6563.1  | 6615.1  | 6673.6  | 6754.8  | 6787.3  | 6852.3  | 6927.0  | 7014.8  | 7050.5  |
| 10°   | 6602.1  | 6618.4  | 6657.4  | 6741.8  | 6836.1  | 6959.5  | 6988.8  | 7070.0  | 7190.2  | 7310.4  | 7381.9  |
| 12.5° | 6686.6  | 6712.6  | 6784.1  | 6917.3  | 7057.0  | 7219.5  | 7264.9  | 7365.7  | 7495.6  | 7651.6  | 7749.1  |
| 15°   | 6784.1  | 6806.8  | 6917.3  | 7105.7  | 7323.4  | 7537.9  | 7589.8  | 7687.3  | 7833.5  | 7986.2  | 8122.7  |
| 17.5° | 6988.8  | 7027.8  | 7157.7  | 7375.4  | 7628.8  | 7882.3  | 7940.7  | 8051.2  | 8168.2  | 8288.4  | 8418.4  |
| 20°   | 7268.2  | 7300.7  | 7466.4  | 7736.1  | 8035.0  | 8265.7  | 8324.1  | 8421.6  | 8476.8  | 8538.6  | 8649.0  |
| 22.5° | 7547.6  | 7593.1  | 7781.5  | 8100.0  | 8450.9  | 8701.0  | 8746.5  | 8837.5  | 8798.5  | 8779.0  | 8850.5  |
| 25°   | 7895.3  | 7957.0  | 8142.2  | 8489.8  | 8847.2  | 9155.9  | 9191.6  | 9269.6  | 9204.6  | 9103.9  | 9100.7  |
| 27.5° | 8327.4  | 8382.6  | 8574.3  | 8931.7  | 9285.9  | 9607.5  | 9675.8  | 9779.7  | 9636.8  | 9513.3  | 9425.6  |
| 30°   | 8840.7  | 8876.5  | 9087.7  | 9467.8  | 9831.7  | 10137.1 | 10224.9 | 10328.8 | 10221.6 | 10016.9 | 9929.2  |
| 32.5° | 9438.6  | 9487.3  | 9731.0  | 10130.6 | 10455.5 | 10760.9 | 10848.7 | 10978.6 | 10861.7 | 10631.0 | 10520.5 |
| 35°   | 10156.6 | 10205.4 | 10462.0 | 10897.4 | 11228.8 | 11544.0 | 11605.7 | 11712.9 | 11566.7 | 11300.3 | 11212.6 |
| 37.5° | 10936.4 | 10998.1 | 11323.0 | 11735.7 | 12083.3 | 12450.5 | 12453.7 | 12486.2 | 12278.3 | 11946.9 | 11849.4 |
| 40°   | 11813.7 | 11894.9 | 12219.8 | 12648.7 | 13067.8 | 13366.7 | 13363.5 | 13272.5 | 12921.6 | 12408.2 | 12258.8 |
| 42.5° | 12681.2 | 12746.1 | 13074.3 | 13516.2 | 13935.3 | 14218.0 | 14133.5 | 13912.6 | 13405.7 | 12707.1 | 12509.0 |
| 45°   | 13308.2 | 13357.0 | 13701.4 | 14198.5 | 14624.1 | 14799.6 | 14646.8 | 14380.4 | 13694.9 | 12895.6 | 12603.2 |
| 47.5° | 13603.9 | 13668.9 | 14016.5 | 14510.4 | 14991.3 | 15092.0 | 14910.0 | 14659.8 | 13863.8 | 13071.0 | 12677.9 |
| 50°   | 13444.7 | 13529.2 | 13922.3 | 14380.4 | 14923.0 | 15131.0 | 15001.0 | 14750.8 | 14042.5 | 13243.2 | 12811.1 |
| 52.5° | 13032.1 | 13113.3 | 13610.4 | 14166.0 | 14780.1 | 15192.7 | 15189.4 | 14984.8 | 14247.2 | 13292.0 | 12817.6 |
| 55°   | 11622.0 | 11781.2 | 12554.4 | 13512.9 | 14604.6 | 15374.6 | 15452.6 | 15234.9 | 14279.7 | 13305.0 | 12885.8 |
| 57.5° | 7563.9  | 7843.3  | 8577.6  | 9825.2  | 12015.1 | 13984.0 | 14510.4 | 14562.4 | 14045.8 | 13249.7 | 12898.8 |
| 60°   | 3158.1  | 3382.3  | 3963.9  | 4792.4  | 6602.1  | 8944.7  | 9964.9  | 10988.4 | 12223.0 | 12671.4 | 12778.6 |
| 62.5° | 1962.4  | 1981.9  | 2040.4  | 2228.9  | 2833.2  | 3976.9  | 4633.2  | 5591.7  | 7427.4  | 8990.2  | 9711.5  |
| 65°   | 1770.7  | 1780.5  | 1793.5  | 1780.5  | 1809.7  | 1949.4  | 2124.9  | 2459.6  | 3206.8  | 3983.4  | 4906.1  |
| 67.5° | 1559.6  | 1572.6  | 1582.3  | 1572.6  | 1582.3  | 1588.8  | 1608.3  | 1637.5  | 1774.0  | 1884.5  | 1968.9  |
| 70°   | 1260.6  | 1280.1  | 1296.4  | 1289.9  | 1328.9  | 1328.9  | 1348.4  | 1371.1  | 1439.3  | 1520.6  | 1579.1  |
| 72.5° | 961.7   | 945.5   | 965.0   | 971.5   | 1007.2  | 1026.7  | 1056.0  | 1081.9  | 1159.9  | 1208.7  | 1283.4  |
| 75°   | 623.8   | 607.6   | 636.8   | 653.1   | 701.8   | 727.8   | 753.8   | 779.8   | 835.0   | 867.5   | 939.0   |
| 77.5° | 337.9   | 334.7   | 363.9   | 386.6   | 438.6   | 471.1   | 490.6   | 510.1   | 555.6   | 565.3   | 610.8   |
| 80°   | 194.9   | 194.9   | 214.4   | 230.7   | 263.2   | 298.9   | 318.4   | 334.7   | 367.1   | 376.9   | 396.4   |
| 82.5° | 107.2   | 107.2   | 117.0   | 126.7   | 152.7   | 172.2   | 188.4   | 201.4   | 230.7   | 240.4   | 250.2   |
| 85°   | 52.0    | 48.7    | 55.2    | 61.7    | 71.5    | 81.2    | 91.0    | 97.5    | 120.2   | 126.7   | 139.7   |
| 87.5° | 6.5     | 6.5     | 6.5     | 9.7     | 13.0    | 19.5    | 22.7    | 22.7    | 35.7    | 42.2    | 48.7    |
| 90°   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |



REPORT NUMBER: P643582  
 CATALOG NUMBER: GWS-SA6F-730-U-RW-W-GRSWH

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°     | 105°    | 115°    | 125°    | 135°    | 145°    | 155°    | 165°    | 175°    | 180°    |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 6618.4  | 6618.4  | 6618.4  | 6618.4  | 6618.4  | 6618.4  | 6618.4  | 6618.4  | 6618.4  | 6618.4  | 6618.4  |
| 2.5°  | 6683.4  | 6641.1  | 6667.1  | 6676.9  | 6676.9  | 6667.1  | 6624.9  | 6611.9  | 6592.4  | 6563.1  | 6563.1  |
| 5°    | 6832.8  | 6800.3  | 6806.8  | 6790.6  | 6751.6  | 6702.8  | 6624.9  | 6585.9  | 6553.4  | 6517.7  | 6514.4  |
| 7.5°  | 7089.5  | 7047.3  | 7040.8  | 6979.0  | 6875.1  | 6771.1  | 6654.1  | 6582.6  | 6533.9  | 6488.4  | 6485.2  |
| 10°   | 7424.1  | 7385.2  | 7336.4  | 7213.0  | 7060.2  | 6907.5  | 6748.3  | 6650.9  | 6579.4  | 6514.4  | 6511.2  |
| 12.5° | 7797.8  | 7752.3  | 7661.3  | 7479.4  | 7287.7  | 7138.2  | 6956.3  | 6806.8  | 6699.6  | 6611.9  | 6595.6  |
| 15°   | 8203.9  | 8138.9  | 7983.0  | 7768.5  | 7580.1  | 7420.9  | 7226.0  | 7011.5  | 6849.1  | 6709.3  | 6693.1  |
| 17.5° | 8515.8  | 8431.4  | 8262.4  | 8061.0  | 7905.0  | 7745.8  | 7492.4  | 7222.7  | 6988.8  | 6813.3  | 6787.3  |
| 20°   | 8730.3  | 8662.0  | 8470.3  | 8320.9  | 8229.9  | 8090.2  | 7794.5  | 7489.1  | 7226.0  | 7005.0  | 6992.0  |
| 22.5° | 8928.5  | 8847.2  | 8658.8  | 8571.1  | 8571.1  | 8476.8  | 8194.2  | 7833.5  | 7524.9  | 7268.2  | 7235.7  |
| 25°   | 9152.7  | 9064.9  | 8922.0  | 8912.2  | 8957.7  | 8915.5  | 8574.3  | 8187.7  | 7827.0  | 7537.9  | 7485.9  |
| 27.5° | 9464.6  | 9367.1  | 9282.6  | 9341.1  | 9406.1  | 9360.6  | 8980.5  | 8532.1  | 8151.9  | 7859.5  | 7814.0  |
| 30°   | 9961.7  | 9841.5  | 9763.5  | 9835.0  | 9961.7  | 9828.5  | 9415.8  | 8941.5  | 8558.1  | 8236.4  | 8213.7  |
| 32.5° | 10540.0 | 10403.6 | 10322.3 | 10436.0 | 10549.8 | 10341.8 | 9932.4  | 9477.6  | 9074.7  | 8736.8  | 8697.8  |
| 35°   | 11235.3 | 11063.1 | 10942.9 | 11095.6 | 11212.6 | 11007.9 | 10601.7 | 10169.6 | 9721.2  | 9370.3  | 9318.4  |
| 37.5° | 11852.6 | 11644.7 | 11563.5 | 11777.9 | 11933.9 | 11800.7 | 11358.8 | 10952.6 | 10462.0 | 10078.6 | 10055.9 |
| 40°   | 12301.0 | 12096.3 | 12037.8 | 12392.0 | 12664.9 | 12632.4 | 12236.0 | 11771.4 | 11310.0 | 10868.2 | 10825.9 |
| 42.5° | 12496.0 | 12353.0 | 12366.0 | 12843.6 | 13266.0 | 13473.9 | 13119.8 | 12622.7 | 12177.5 | 11719.4 | 11690.2 |
| 45°   | 12538.2 | 12450.5 | 12554.4 | 13152.3 | 13707.9 | 14133.5 | 13831.3 | 13415.4 | 12911.8 | 12470.0 | 12457.0 |
| 47.5° | 12583.7 | 12534.9 | 12694.2 | 13327.7 | 13987.3 | 14481.1 | 14312.2 | 13883.3 | 13373.2 | 12941.1 | 12908.6 |
| 50°   | 12690.9 | 12671.4 | 12850.1 | 13451.2 | 14120.5 | 14575.4 | 14383.7 | 13958.0 | 13434.9 | 13009.3 | 12931.3 |
| 52.5° | 12723.4 | 12690.9 | 12947.6 | 13642.9 | 14341.4 | 14572.1 | 14159.5 | 13603.9 | 13077.5 | 12603.2 | 12522.0 |
| 55°   | 12824.1 | 12765.6 | 12941.1 | 13714.4 | 14646.8 | 14760.6 | 14146.5 | 13314.7 | 12580.4 | 11933.9 | 11742.2 |
| 57.5° | 12850.1 | 12785.1 | 12898.8 | 13597.4 | 14315.4 | 14214.7 | 12434.2 | 10744.7 | 9360.6  | 8642.6  | 8723.8  |
| 60°   | 12710.4 | 12729.9 | 12534.9 | 12457.0 | 11482.2 | 10137.1 | 7612.6  | 6085.5  | 4779.4  | 4227.1  | 4347.3  |
| 62.5° | 9675.8  | 9757.0  | 9090.9  | 7905.0  | 6079.0  | 4818.4  | 3187.3  | 2475.8  | 2095.7  | 1998.2  | 2014.4  |
| 65°   | 4883.4  | 4993.8  | 4301.8  | 3557.7  | 2644.8  | 2137.9  | 1848.7  | 1790.2  | 1770.7  | 1748.0  | 1748.0  |
| 67.5° | 1933.2  | 1965.7  | 1939.7  | 1816.2  | 1689.5  | 1644.0  | 1631.0  | 1624.5  | 1601.8  | 1588.8  | 1592.0  |
| 70°   | 1553.1  | 1579.1  | 1540.1  | 1462.1  | 1410.1  | 1406.9  | 1400.4  | 1387.4  | 1371.1  | 1371.1  | 1380.9  |
| 72.5° | 1267.1  | 1293.1  | 1237.9  | 1189.2  | 1150.2  | 1120.9  | 1104.7  | 1094.9  | 1072.2  | 1072.2  | 1081.9  |
| 75°   | 932.5   | 948.7   | 903.2   | 896.7   | 854.5   | 825.3   | 799.3   | 786.3   | 757.0   | 744.0   | 753.8   |
| 77.5° | 620.6   | 617.3   | 594.6   | 594.6   | 578.3   | 542.6   | 513.4   | 484.1   | 445.1   | 419.1   | 425.6   |
| 80°   | 402.9   | 402.9   | 393.1   | 393.1   | 376.9   | 347.7   | 311.9   | 282.7   | 259.9   | 240.4   | 240.4   |
| 82.5° | 256.7   | 253.4   | 250.2   | 246.9   | 240.4   | 211.2   | 185.2   | 165.7   | 149.5   | 136.5   | 139.7   |
| 85°   | 143.0   | 143.0   | 136.5   | 136.5   | 123.5   | 107.2   | 94.2    | 81.2    | 71.5    | 68.2    | 68.2    |
| 87.5° | 48.7    | 48.7    | 45.5    | 45.5    | 39.0    | 29.2    | 22.7    | 19.5    | 16.2    | 13.0    | 16.2    |
| 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: SP1-1908-441-2-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            |

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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 3000K 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               | 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**

| $\lambda$ (nm) | Power ( $\mu\text{W}/\text{nm}$ ) | Lumens ( $\phi/\text{nm}$ ) | $\lambda$ (nm) | Power ( $\mu\text{W}/\text{nm}$ ) | Lumens ( $\phi/\text{nm}$ ) | $\lambda$ (nm) | Power ( $\mu\text{W}/\text{nm}$ ) | Lumens ( $\phi/\text{nm}$ ) | $\lambda$ (nm) | Power ( $\mu\text{W}/\text{nm}$ ) | Lumens ( $\phi/\text{nm}$ ) | $\lambda$ (nm) | Power ( $\mu\text{W}/\text{nm}$ ) | Lumens ( $\phi/\text{nm}$ ) |
|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|
| 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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**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)