

Signify Classified - Internal  
Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269



Scaled data based on original data using  
LM-79-08 Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Test Report Prepared for  
Cooper Lighting Solutions  
(formerly Eaton)

Brand: McGRAW-EDISON

Report Number: P1434559

Luminaire Tested: **GALN-SB9A-940-U-T2LG**

Issue Date: 03/24/202

This test was performed under the Supervised Manufacturer's Testing Program. The results of this test have not been influenced by sources from within Cooper Lighting Solutions or from external interests.

Report Generated By 670245763



**Test Information**

Test Method: LM-79-08  
 Report Number: P1434559  
 Test Lab: INNOVATION CENTER(G1)  
 Issue Date: 03/24/202  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: McGRAW-EDISON  
 Catalog Number: GALN-SB9A-940-U-T2LG  
 Description: GALLEON II AREA AND ROADWAY HIGH DENSITY LUMINAIRE 350mA 9xLight  
 Square PACKAGE 90CRI 4000K FIXTURE w/ TYPE II LOW GLARE  
 Light Source: (234) 4000K CCT, 90 CRI LEDS  
 Ballast/Driver: ELECTRONIC DRIVER  
 Luminaire Equipment:

| <u>Sample No.</u> | <u>Condition</u> | <u>Description</u> |
|-------------------|------------------|--------------------|
| a                 | good             | reflector          |
| b                 | good             | lens               |
| c                 | good             | housing            |
| d                 | good             | cord               |

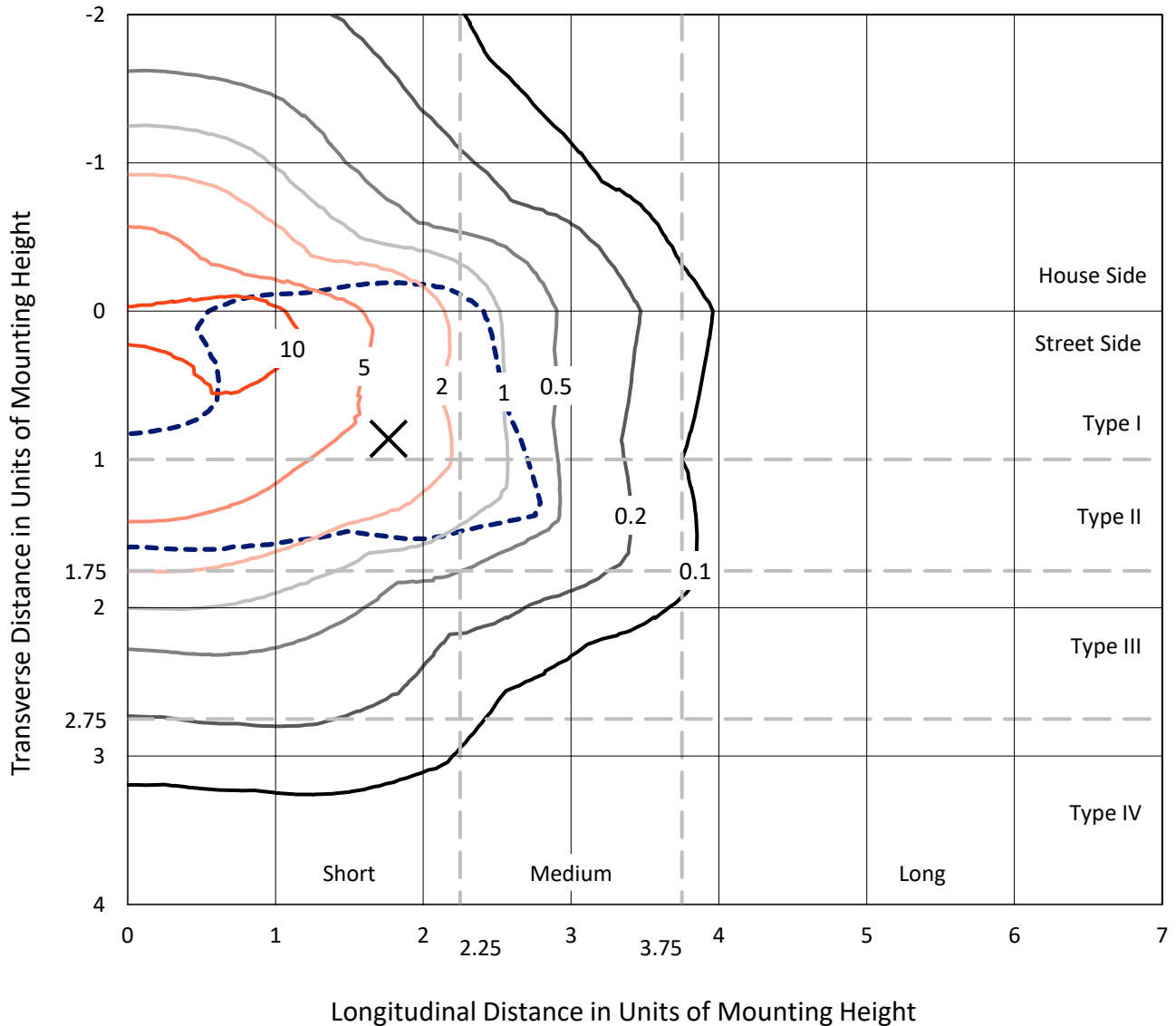
**Summary**

Lumens per Lamp: N/A  
 Luminaire Lumens: 28645.5 lumens  
 Efficiency: N/A  
 Efficacy: 112.1 lumens/watt  
 Luminous Opening: Rectangular (W 1.5' x L: 1.5' x H: 0')  
 IES Classification: Type II - Short  
 BUG Rating: B3 - U0 - G3  
  
 Input Watts (W): 255.5  
 Input Voltage (V): 120  
 Input Current (A<sub>in</sub>): NR  
 Voltage Rise (V): NR  
 Power Factor: 0.97  
 Total Harmonic Distortion (THDi): NR  
 Frequency (hertz): 60  
 Stabilization Time: NR  
 Operation Time: NR  
 Ambient Temperature (°C): NR  
 Test Distance: 28.75 FT

REPORT NUMBER: P1434559  
 CATALOG NUMBER: GALN-SB9A-940-U-T2LG

### Iso-Footcandle Lines of Horizontal Illumination

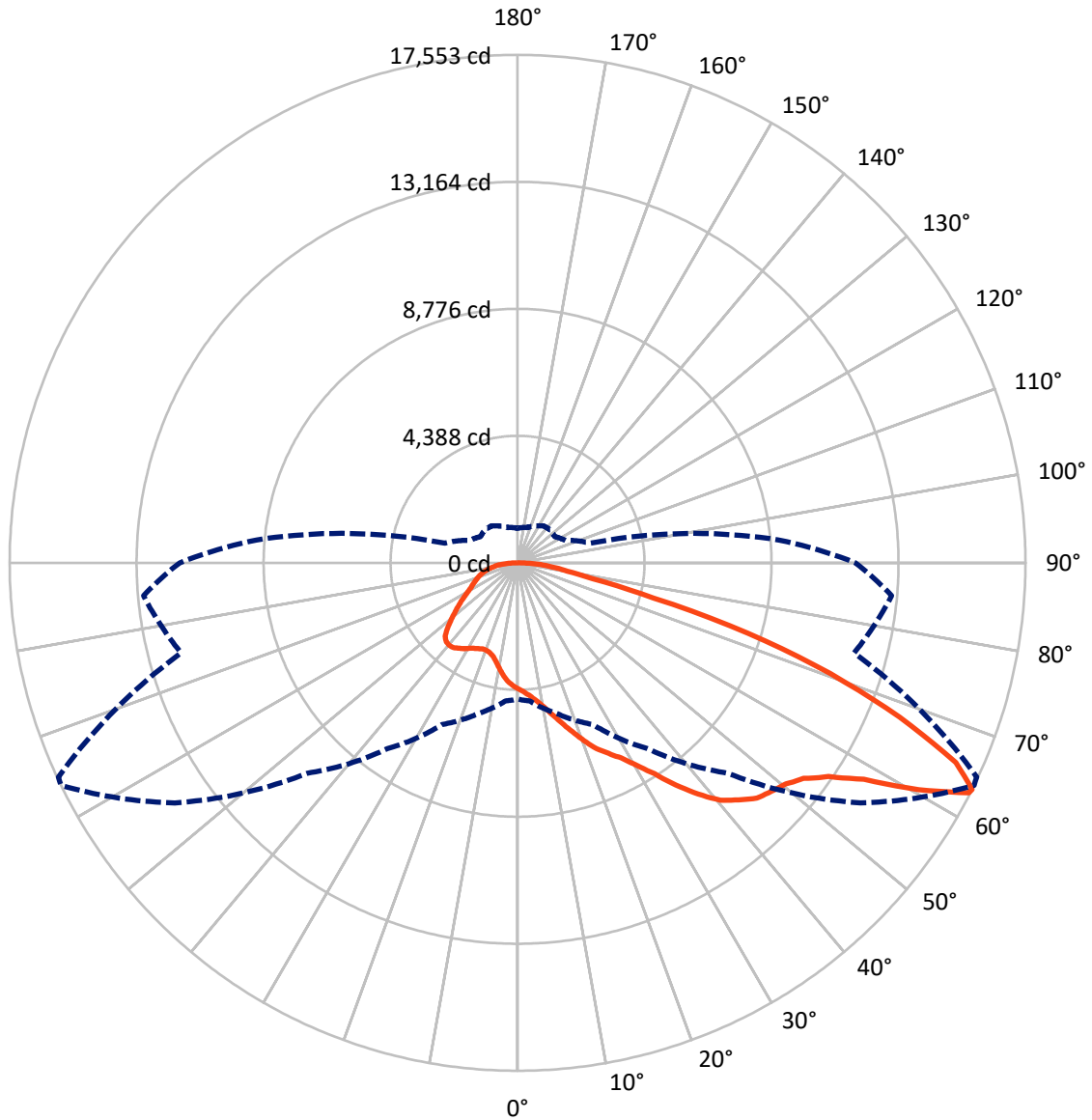
✕ Max cd  
 - - - 1/2 Max cd



Based on 20 foot mounting height. Maximum calculated value = 16.8 fc  
 Type II - Short - N/A

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### Luminous Intensity Polar Plot



— Vertical Plane Through 64-Deg Lateral    - - - Horizontal Cone Through 63-Deg Vertical

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**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 7696.3   | 0.0    | 7696.3  |
|                    | % Fixture | 26.9     | 0.0    | 26.9    |
| <b>Street Side</b> | Lumens    | 20949.3  | 0.0    | 20949.3 |
|                    | % Fixture | 73.1     | 0.0    | 73.1    |
| <b>Total</b>       | Lumens    | 28645.5  | 0.0    | 28645.5 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 400.5   | 1.4       |
| 10°-20°   | 1233.0  | 4.3       |
| 20°-30°   | 2254.8  | 7.9       |
| 30°-40°   | 3878.6  | 13.5      |
| 40°-50°   | 5719.9  | 20.0      |
| 50°-60°   | 6855.7  | 23.9      |
| 60°-70°   | 5502.4  | 19.2      |
| 70°-80°   | 2211.0  | 7.7       |
| 80°-90°   | 589.6   | 2.1       |
| 90°-100°  | 0.0     | 0.0       |
| 100°-110° | 0.0     | 0.0       |
| 110°-120° | 0.0     | 0.0       |
| 120°-130° | 0.0     | 0.0       |
| 130°-140° | 0.0     | 0.0       |
| 140°-150° | 0.0     | 0.0       |
| 150°-160° | 0.0     | 0.0       |
| 160°-170° | 0.0     | 0.0       |
| 170°-180° | 0.0     | 0.0       |
| 0°-90°    | 28645.5 | 100.0     |
| 0°-180°   | 28645.5 | 100.0     |

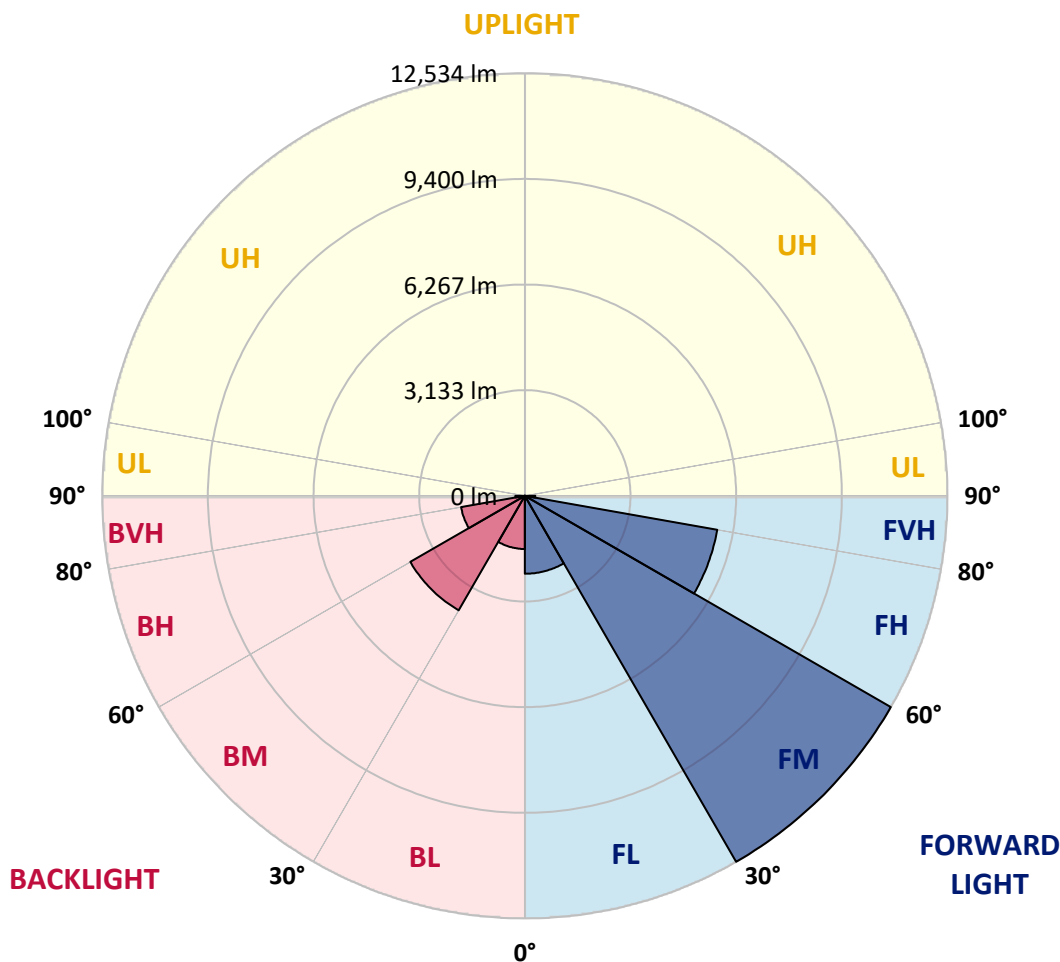


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**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|---------|-----------|-------------------------|------|---------|
|      |             |         |           | B                       | U    | G       |
| FL   | (0°-30°)    | 2311.1  | 8.1       |                         |      |         |
| FM   | (30°-60°)   | 12533.9 | 43.8      |                         |      |         |
| FH   | (60°-80°)   | 5794.4  | 20.2      |                         |      | G3/7500 |
| FVH  | (80°-90°)   | 309.8   | 1.1       |                         |      | G3/500  |
| BL   | (0°-30°)    | 1577.2  | 5.5       | B3/2500                 |      |         |
| BM   | (30°-60°)   | 3920.3  | 13.7      | B3/5000                 |      |         |
| BH   | (60°-80°)   | 1918.9  | 6.7       | B3/2500                 |      | G3/2500 |
| BVH  | (80°-90°)   | 279.8   | 1.0       |                         |      | G3/500  |
| UL   | (90°-100°)  | 0.0     | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0     | 0.0       |                         | U0/0 |         |

**BUG Rating: B3-U0-G3**  
 Type II Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 55°     | 64°     | 65°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 4362.4  | 4362.4  | 4362.4  | 4362.4  | 4362.4  | 4362.4  | 4362.4  | 4362.4  | 4362.4  | 4362.4  | 4362.4  |
| 2.5°  | 4542.5  | 4549.0  | 4529.7  | 4523.2  | 4536.1  | 4510.4  | 4503.9  | 4478.2  | 4465.3  | 4439.6  | 4407.4  |
| 5°    | 4671.2  | 4677.7  | 4664.8  | 4664.8  | 4677.7  | 4658.4  | 4651.9  | 4626.2  | 4613.3  | 4587.6  | 4523.2  |
| 7.5°  | 4664.8  | 4671.2  | 4684.1  | 4735.6  | 4799.9  | 4825.7  | 4845.0  | 4825.7  | 4819.2  | 4780.6  | 4716.3  |
| 10°   | 4561.9  | 4568.3  | 4600.5  | 4677.7  | 4838.5  | 4954.3  | 5076.6  | 5076.6  | 5089.5  | 5057.3  | 4941.5  |
| 12.5° | 4420.3  | 4426.7  | 4503.9  | 4626.2  | 4838.5  | 5038.0  | 5288.9  | 5391.9  | 5385.4  | 5366.1  | 5231.0  |
| 15°   | 4079.3  | 4079.3  | 4195.1  | 4426.7  | 4767.7  | 5095.9  | 5469.1  | 5745.7  | 5752.2  | 5771.5  | 5610.6  |
| 17.5° | 3789.7  | 3796.2  | 3892.7  | 4098.6  | 4542.5  | 5063.7  | 5662.1  | 6138.2  | 6157.5  | 6266.9  | 6035.3  |
| 20°   | 3815.5  | 3815.5  | 3847.7  | 3937.7  | 4298.0  | 4935.0  | 5771.5  | 6556.5  | 6620.8  | 6878.2  | 6588.6  |
| 22.5° | 4014.9  | 4014.9  | 4040.7  | 4034.2  | 4253.0  | 4851.4  | 5842.3  | 6974.7  | 7090.5  | 7624.5  | 7251.3  |
| 25°   | 4381.7  | 4375.3  | 4349.5  | 4310.9  | 4439.6  | 4941.5  | 6003.1  | 7296.4  | 7521.6  | 8448.1  | 8017.0  |
| 27.5° | 4832.1  | 4819.2  | 4780.6  | 4716.3  | 4806.4  | 5211.7  | 6279.8  | 7637.4  | 7881.9  | 9348.9  | 8827.7  |
| 30°   | 5391.9  | 5353.3  | 5314.7  | 5231.0  | 5327.5  | 5655.7  | 6691.6  | 8120.0  | 8351.6  | 10371.9 | 9805.7  |
| 32.5° | 6054.6  | 6099.6  | 5970.9  | 5855.1  | 5958.1  | 6260.5  | 7302.8  | 8692.6  | 8943.5  | 11440.0 | 10822.3 |
| 35°   | 7045.5  | 7180.6  | 7142.0  | 6556.5  | 6653.0  | 6987.5  | 8017.0  | 9432.5  | 9657.7  | 12411.6 | 11864.7 |
| 37.5° | 8023.5  | 7991.3  | 8023.5  | 7534.5  | 7380.0  | 7785.4  | 8782.7  | 10140.3 | 10359.1 | 13203.0 | 12784.8 |
| 40°   | 8808.4  | 8904.9  | 8904.9  | 8506.0  | 8306.6  | 8576.8  | 9477.6  | 10790.2 | 11002.5 | 13640.5 | 13447.5 |
| 42.5° | 9664.2  | 9677.0  | 9651.3  | 9303.9  | 9226.6  | 9297.4  | 10088.8 | 11202.0 | 11375.7 | 13865.7 | 13897.9 |
| 45°   | 10629.3 | 10622.9 | 10513.5 | 10224.0 | 10108.1 | 10043.8 | 10468.5 | 11600.9 | 11774.6 | 13968.7 | 14142.4 |
| 47.5° | 11427.1 | 11459.3 | 11465.8 | 11156.9 | 10963.9 | 10687.2 | 10796.6 | 11800.3 | 11999.8 | 13852.8 | 14193.9 |
| 50°   | 11472.2 | 11523.7 | 11768.2 | 11858.2 | 11819.6 | 11375.7 | 11099.0 | 12012.7 | 12212.1 | 13878.6 | 14380.4 |
| 52.5° | 11189.1 | 11240.6 | 11555.8 | 11929.0 | 12379.4 | 12167.1 | 11575.1 | 12379.4 | 12585.3 | 14129.5 | 14805.1 |
| 55°   | 10429.8 | 10513.5 | 10983.2 | 11504.4 | 12308.6 | 12611.0 | 12418.0 | 13042.1 | 13235.2 | 14329.0 | 15300.5 |
| 57.5° | 9078.7  | 9181.6  | 9831.5  | 10661.5 | 11761.7 | 12508.1 | 13640.5 | 14103.8 | 14264.6 | 14470.5 | 15307.0 |
| 60°   | 6788.1  | 6871.7  | 7888.3  | 9007.9  | 10661.5 | 11864.7 | 14367.6 | 15924.7 | 16014.7 | 13704.9 | 14438.4 |
| 62.5° | 4999.4  | 5083.0  | 5765.0  | 6569.3  | 8377.3  | 10680.8 | 14509.1 | 17501.0 | 17513.9 | 12321.5 | 13241.6 |
| 63°   | 4709.8  | 4793.5  | 5411.2  | 6164.0  | 7836.9  | 10281.9 | 14464.1 | 17552.5 | 17507.5 | 12038.4 | 12977.8 |
| 65°   | 3667.5  | 3815.5  | 4458.9  | 5031.5  | 5874.4  | 8184.3  | 13885.0 | 16638.9 | 16703.2 | 11202.0 | 11652.3 |
| 67.5° | 2496.5  | 2605.9  | 3423.0  | 4085.7  | 4439.6  | 5211.7  | 11388.5 | 14238.9 | 14341.8 | 10333.3 | 9297.4  |
| 70°   | 1930.3  | 1981.7  | 2457.9  | 3236.4  | 3590.3  | 3313.6  | 7425.1  | 11465.8 | 11465.8 | 8068.5  | 6588.6  |
| 72.5° | 1512.0  | 1531.3  | 1853.1  | 2528.6  | 2889.0  | 2547.9  | 4137.2  | 8338.7  | 8029.9  | 4787.0  | 4394.6  |
| 75°   | 1080.9  | 1106.7  | 1396.2  | 1885.2  | 2303.4  | 2007.5  | 2644.5  | 4857.8  | 4671.2  | 2753.8  | 2934.0  |
| 77.5° | 855.7   | 868.6   | 1042.3  | 1389.8  | 1865.9  | 1531.3  | 2013.9  | 2650.9  | 2625.2  | 1936.7  | 1885.2  |
| 80°   | 675.6   | 701.3   | 817.1   | 997.3   | 1441.3  | 1196.8  | 1499.2  | 1750.1  | 1698.6  | 1331.9  | 1209.6  |
| 82.5° | 482.6   | 527.6   | 630.6   | 759.2   | 1068.1  | 855.7   | 984.4   | 1235.4  | 1235.4  | 1003.7  | 797.8   |
| 85°   | 296.0   | 334.6   | 373.2   | 469.7   | 759.2   | 553.3   | 521.2   | 797.8   | 817.1   | 752.8   | 514.7   |
| 87.5° | 141.6   | 154.4   | 180.2   | 199.5   | 276.7   | 250.9   | 205.9   | 302.4   | 308.8   | 334.6   | 212.3   |
| 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: P1434559

CATALOG NUMBER: GALN-SB9A-940-U-T2LG

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 4362.4  | 4362.4 | 4362.4 | 4362.4 | 4362.4 | 4362.4 | 4362.4 | 4362.4 | 4362.4 | 4362.4 | 4362.4 |
| 2.5°  | 4401.0  | 4388.1 | 4323.8 | 4259.4 | 4188.7 | 4124.3 | 4060.0 | 4008.5 | 3950.6 | 3963.5 | 3969.9 |
| 5°    | 4484.6  | 4452.5 | 4310.9 | 4143.6 | 3924.9 | 3719.0 | 3519.5 | 3378.0 | 3287.9 | 3262.1 | 3210.7 |
| 7.5°  | 4664.8  | 4587.6 | 4330.2 | 3976.3 | 3571.0 | 3249.3 | 3062.7 | 2979.0 | 2953.3 | 2959.7 | 2946.9 |
| 10°   | 4870.7  | 4754.9 | 4356.0 | 3776.9 | 3262.1 | 3043.4 | 3017.6 | 3069.1 | 3094.9 | 3120.6 | 3127.0 |
| 12.5° | 5140.9  | 4954.3 | 4343.1 | 3558.1 | 3114.2 | 3075.5 | 3172.1 | 3268.6 | 3326.5 | 3365.1 | 3358.7 |
| 15°   | 5456.2  | 5205.3 | 4304.5 | 3378.0 | 3094.9 | 3197.8 | 3320.0 | 3429.4 | 3500.2 | 3538.8 | 3519.5 |
| 17.5° | 5835.8  | 5501.2 | 4259.4 | 3262.1 | 3152.8 | 3275.0 | 3403.7 | 3513.1 | 3590.3 | 3616.0 | 3596.7 |
| 20°   | 6305.5  | 5835.8 | 4182.2 | 3210.7 | 3197.8 | 3307.2 | 3423.0 | 3525.9 | 3590.3 | 3616.0 | 3590.3 |
| 22.5° | 6858.9  | 6234.7 | 4117.9 | 3210.7 | 3217.1 | 3307.2 | 3390.8 | 3468.0 | 3525.9 | 3545.2 | 3513.1 |
| 25°   | 7566.6  | 6698.0 | 4092.2 | 3262.1 | 3223.5 | 3275.0 | 3320.0 | 3365.1 | 3397.3 | 3410.1 | 3397.3 |
| 27.5° | 8287.3  | 7232.0 | 4105.0 | 3326.5 | 3217.1 | 3230.0 | 3230.0 | 3236.4 | 3242.8 | 3249.3 | 3242.8 |
| 30°   | 9117.3  | 7772.5 | 4156.5 | 3410.1 | 3230.0 | 3165.6 | 3146.3 | 3107.7 | 3075.5 | 3049.8 | 3024.1 |
| 32.5° | 9921.5  | 8287.3 | 4246.6 | 3532.4 | 3217.1 | 3094.9 | 3056.2 | 2959.7 | 2869.7 | 2792.4 | 2792.4 |
| 35°   | 10790.2 | 8821.3 | 4407.4 | 3622.5 | 3204.2 | 3030.5 | 2921.1 | 2811.7 | 2715.2 | 2605.9 | 2605.9 |
| 37.5° | 11536.5 | 9278.1 | 4536.1 | 3725.4 | 3191.4 | 2953.3 | 2779.6 | 2657.3 | 2554.4 | 2445.0 | 2432.1 |
| 40°   | 12057.7 | 9541.9 | 4613.3 | 3764.0 | 3146.3 | 2850.4 | 2644.5 | 2490.0 | 2342.1 | 2194.1 | 2187.6 |
| 42.5° | 12308.6 | 9529.1 | 4568.3 | 3751.1 | 3062.7 | 2721.7 | 2528.6 | 2322.7 | 2123.3 | 1988.2 | 1975.3 |
| 45°   | 12443.8 | 9445.4 | 4394.6 | 3641.8 | 2927.6 | 2586.6 | 2380.7 | 2161.9 | 1962.4 | 1840.2 | 1814.4 |
| 47.5° | 12418.0 | 9239.5 | 4156.5 | 3371.5 | 2747.4 | 2438.6 | 2232.7 | 2007.5 | 1846.6 | 1775.8 | 1775.8 |
| 50°   | 12488.8 | 9078.7 | 3886.3 | 3062.7 | 2502.9 | 2264.8 | 2097.6 | 1891.7 | 1795.1 | 1705.1 | 1672.9 |
| 52.5° | 12804.1 | 9213.8 | 3654.6 | 2773.1 | 2271.3 | 2097.6 | 1981.7 | 1808.0 | 1685.8 | 1627.9 | 1608.6 |
| 55°   | 13222.3 | 9503.3 | 3435.9 | 2515.8 | 2046.1 | 1949.6 | 1891.7 | 1730.8 | 1589.2 | 1531.3 | 1499.2 |
| 57.5° | 13299.5 | 9702.8 | 3223.5 | 2264.8 | 1859.5 | 1833.7 | 1814.4 | 1595.7 | 1479.9 | 1434.8 | 1409.1 |
| 60°   | 12765.5 | 9554.8 | 2946.9 | 2039.6 | 1711.5 | 1724.4 | 1672.9 | 1512.0 | 1376.9 | 1331.9 | 1306.1 |
| 62.5° | 11858.2 | 9168.7 | 2670.2 | 1846.6 | 1595.7 | 1621.4 | 1569.9 | 1409.1 | 1274.0 | 1228.9 | 1216.1 |
| 63°   | 11678.1 | 9065.8 | 2605.9 | 1827.3 | 1569.9 | 1602.1 | 1557.1 | 1396.2 | 1261.1 | 1216.1 | 1196.8 |
| 65°   | 10603.6 | 8448.1 | 2380.7 | 1724.4 | 1486.3 | 1486.3 | 1492.7 | 1331.9 | 1216.1 | 1196.8 | 1183.9 |
| 67.5° | 8647.6  | 7051.9 | 2136.2 | 1602.1 | 1396.2 | 1415.5 | 1447.7 | 1357.6 | 1312.6 | 1299.7 | 1286.8 |
| 70°   | 6537.2  | 5308.2 | 1923.8 | 1486.3 | 1299.7 | 1364.1 | 1582.8 | 1544.2 | 1376.9 | 1261.1 | 1235.4 |
| 72.5° | 4632.6  | 3616.0 | 1737.2 | 1370.5 | 1183.9 | 1344.7 | 1640.7 | 1473.4 | 1241.8 | 1106.7 | 1080.9 |
| 75°   | 3101.3  | 2329.2 | 1550.6 | 1248.2 | 1055.2 | 1241.8 | 1550.6 | 1344.7 | 1080.9 | 1048.8 | 1010.2 |
| 77.5° | 1949.6  | 1660.0 | 1364.1 | 1106.7 | 913.7  | 1106.7 | 1409.1 | 1196.8 | 933.0  | 945.8  | 887.9  |
| 80°   | 1190.3  | 1183.9 | 1145.3 | 939.4  | 733.5  | 881.5  | 1183.9 | 1010.2 | 746.4  | 746.4  | 662.7  |
| 82.5° | 707.8   | 855.7  | 971.6  | 778.5  | 534.0  | 630.6  | 855.7  | 759.2  | 624.1  | 604.8  | 566.2  |
| 85°   | 476.1   | 579.1  | 772.1  | 598.4  | 341.0  | 386.1  | 591.9  | 637.0  | 572.6  | 501.9  | 469.7  |
| 87.5° | 173.7   | 231.6  | 353.9  | 244.5  | 148.0  | 231.6  | 444.0  | 463.3  | 347.4  | 270.2  | 244.5  |
| 90°   | 0.0     | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

Signify Classified - Internal  
Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269



LM-79-08: Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

McGRAW-EDISON

Report Number: SP1-2106-271-4

Luminaire Tested: GFLD-SA1-A-940-U-WR-X-BK

Test Date: 06/15/2021

**Test Information**

Test Method: LM-79-08  
 Report Number: SP1-2106-271-4  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1  
 Measurement Geometry: 4π  
 Issue Date: 06/15/2021  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: MCGRAW-EDISON  
 Catalog Number: **GFLD-SA1-A-940-U-WR-X-BK**  
 Description: MCGRAW EDISON

N6, BLACK

**Spectral Parameters**

CCT (K): 3952  
 CIE u': 0.2242  
 CIE v': 0.5064  
 Duv: 0.0032  
 CIE x: 0.3848  
 CIE y: 0.3864  
 CIE z: 0.2287  
 Peak Wavelength (nm): 614  
 Dominant Wavelength (nm): 577  
 Purity: 31.6  
 Rf: 92.2  
 Rg: 98.9

CRI (Ra): 92.2

|          |           |
|----------|-----------|
| R1: 92.0 | R9: 63.3  |
| R2: 93.7 | R10: 84.3 |
| R3: 94.4 | R11: 92.7 |
| R4: 93.1 | R12: 75.6 |
| R5: 91.2 | R13: 92.2 |
| R6: 91.1 | R14: 96.5 |
| R7: 95.4 |           |
| R8: 86.5 |           |



**Test Conditions**

Stabilization Time: 72M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.8/42%  
 Sphere Temperature (°C): 24.9

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| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | 76INCH SPHERE IN0058  | 1/31/2021        | 7/31/2021            |
| Power Meter                    | XITRON 2801 IN0071    | 12/1/2020        | 12/1/2021            |
| AC Power Source                | CHROMA 61603 IN0063   | 12/1/2020        | 12/1/2021            |
| DC Power Source                | AGILENT E3634A IN0208 | 12/1/2020        | 12/1/2021            |
| Sphere Thermometer             | ONSET IN0085          | 12/1/2020        | 12/1/2021            |
| Room Thermometer               | ONSET IN0046          | 12/1/2020        | 12/1/2021            |

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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 4000K 4-step quadrangle

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**Photopic Flux vs. Wavelength**

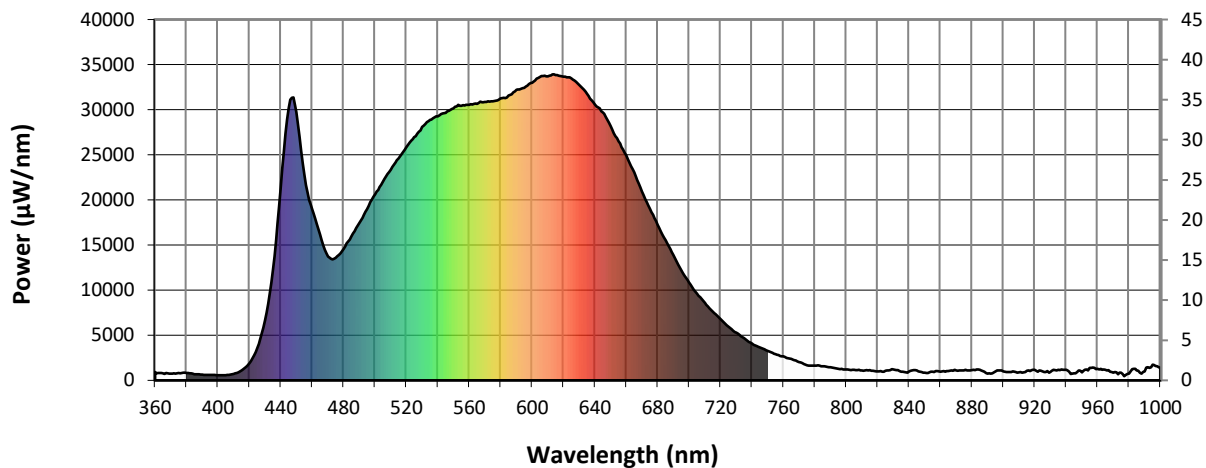


#####

| 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    | 910           | NR            | 490    | 17463         | NR            | 620    | 33665         | NR            | 750    | 3275          | NR            | 880    | 1122          | NR            |
| 365    | 784           | NR            | 495    | 18986         | NR            | 625    | 33477         | NR            | 755    | 2901          | NR            | 885    | 1170          | NR            |
| 370    | 741           | NR            | 500    | 20627         | NR            | 630    | 32742         | NR            | 760    | 2665          | NR            | 890    | 751           | NR            |
| 375    | 805           | NR            | 505    | 21980         | NR            | 635    | 31767         | NR            | 765    | 2371          | NR            | 895    | 990           | NR            |
| 380    | 830           | NR            | 510    | 23346         | NR            | 640    | 30561         | NR            | 770    | 2039          | NR            | 900    | 982           | NR            |
| 385    | 690           | NR            | 515    | 24600         | NR            | 645    | 29699         | NR            | 775    | 1676          | NR            | 905    | 936           | NR            |
| 390    | 625           | NR            | 520    | 25854         | NR            | 650    | 28202         | NR            | 780    | 1616          | NR            | 910    | 888           | NR            |
| 395    | 599           | NR            | 525    | 26952         | NR            | 655    | 26484         | NR            | 785    | 1573          | NR            | 915    | 1068          | NR            |
| 400    | 568           | NR            | 530    | 28081         | NR            | 660    | 24930         | NR            | 790    | 1452          | NR            | 920    | 1179          | NR            |
| 405    | 577           | NR            | 535    | 28884         | NR            | 665    | 23070         | NR            | 795    | 1263          | NR            | 925    | 1008          | NR            |
| 410    | 720           | NR            | 540    | 29271         | NR            | 670    | 20926         | NR            | 800    | 1203          | NR            | 930    | 927           | NR            |
| 415    | 1084          | NR            | 545    | 29657         | NR            | 675    | 19011         | NR            | 805    | 1175          | NR            | 935    | 1185          | NR            |
| 420    | 1884          | NR            | 550    | 30152         | NR            | 680    | 17237         | NR            | 810    | 1108          | NR            | 940    | 1166          | NR            |
| 425    | 3574          | NR            | 555    | 30445         | NR            | 685    | 15540         | NR            | 815    | 1125          | NR            | 945    | 779           | NR            |
| 430    | 6636          | NR            | 560    | 30559         | NR            | 690    | 13894         | NR            | 820    | 988           | NR            | 950    | 905           | NR            |
| 435    | 12267         | NR            | 565    | 30663         | NR            | 695    | 12196         | NR            | 825    | 1070          | NR            | 955    | 1369          | NR            |
| 440    | 21326         | NR            | 570    | 30877         | NR            | 700    | 10840         | NR            | 830    | 1219          | NR            | 960    | 1280          | NR            |
| 445    | 30150         | NR            | 575    | 30916         | NR            | 705    | 9613          | NR            | 835    | 944           | NR            | 965    | 1177          | NR            |
| 450    | 29740         | NR            | 580    | 31248         | NR            | 710    | 8583          | NR            | 840    | 983           | NR            | 970    | 868           | NR            |
| 455    | 22827         | NR            | 585    | 31581         | NR            | 715    | 7631          | NR            | 845    | 1097          | NR            | 975    | 843           | NR            |
| 460    | 19023         | NR            | 590    | 32218         | NR            | 720    | 6779          | NR            | 850    | 856           | NR            | 980    | 744           | NR            |
| 465    | 16163         | NR            | 595    | 32417         | NR            | 725    | 5950          | NR            | 855    | 949           | NR            | 985    | 1113          | NR            |
| 470    | 13739         | NR            | 600    | 32976         | NR            | 730    | 5282          | NR            | 860    | 954           | NR            | 990    | 1002          | NR            |
| 475    | 13571         | NR            | 605    | 33620         | NR            | 735    | 4673          | NR            | 865    | 1019          | NR            | 995    | 1732          | NR            |
| 480    | 14597         | NR            | 610    | 33704         | NR            | 740    | 4087          | NR            | 870    | 1089          | NR            | 1000   | 1390          | NR            |
| 485    | 15964         | NR            | 615    | 33846         | NR            | 745    | 3658          | NR            | 875    | 1089          | NR            |        |               |               |

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**Scotopic Flux vs. Wavelength**



**Scotopic Lumens: 3705.7**

**S/P: 1.75**

| 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    | 910           | NR            | 490    | 17463         | NR            | 620    | 33665         | NR            | 750    | 3275          | NR            | 880    | 1122          | NR            |
| 365    | 784           | NR            | 495    | 18986         | NR            | 625    | 33477         | NR            | 755    | 2901          | NR            | 885    | 1170          | NR            |
| 370    | 741           | NR            | 500    | 20627         | NR            | 630    | 32742         | NR            | 760    | 2665          | NR            | 890    | 751           | NR            |
| 375    | 805           | NR            | 505    | 21980         | NR            | 635    | 31767         | NR            | 765    | 2371          | NR            | 895    | 990           | NR            |
| 380    | 830           | NR            | 510    | 23346         | NR            | 640    | 30561         | NR            | 770    | 2039          | NR            | 900    | 982           | NR            |
| 385    | 690           | NR            | 515    | 24600         | NR            | 645    | 29699         | NR            | 775    | 1676          | NR            | 905    | 936           | NR            |
| 390    | 625           | NR            | 520    | 25854         | NR            | 650    | 28202         | NR            | 780    | 1616          | NR            | 910    | 888           | NR            |
| 395    | 599           | NR            | 525    | 26952         | NR            | 655    | 26484         | NR            | 785    | 1573          | NR            | 915    | 1068          | NR            |
| 400    | 568           | NR            | 530    | 28081         | NR            | 660    | 24930         | NR            | 790    | 1452          | NR            | 920    | 1179          | NR            |
| 405    | 577           | NR            | 535    | 28884         | NR            | 665    | 23070         | NR            | 795    | 1263          | NR            | 925    | 1008          | NR            |
| 410    | 720           | NR            | 540    | 29271         | NR            | 670    | 20926         | NR            | 800    | 1203          | NR            | 930    | 927           | NR            |
| 415    | 1084          | NR            | 545    | 29657         | NR            | 675    | 19011         | NR            | 805    | 1175          | NR            | 935    | 1185          | NR            |
| 420    | 1884          | NR            | 550    | 30152         | NR            | 680    | 17237         | NR            | 810    | 1108          | NR            | 940    | 1166          | NR            |
| 425    | 3574          | NR            | 555    | 30445         | NR            | 685    | 15540         | NR            | 815    | 1125          | NR            | 945    | 779           | NR            |
| 430    | 6636          | NR            | 560    | 30559         | NR            | 690    | 13894         | NR            | 820    | 988           | NR            | 950    | 905           | NR            |
| 435    | 12267         | NR            | 565    | 30663         | NR            | 695    | 12196         | NR            | 825    | 1070          | NR            | 955    | 1369          | NR            |
| 440    | 21326         | NR            | 570    | 30877         | NR            | 700    | 10840         | NR            | 830    | 1219          | NR            | 960    | 1280          | NR            |
| 445    | 30150         | NR            | 575    | 30916         | NR            | 705    | 9613          | NR            | 835    | 944           | NR            | 965    | 1177          | NR            |
| 450    | 29740         | NR            | 580    | 31248         | NR            | 710    | 8583          | NR            | 840    | 983           | NR            | 970    | 868           | NR            |
| 455    | 22827         | NR            | 585    | 31581         | NR            | 715    | 7631          | NR            | 845    | 1097          | NR            | 975    | 843           | NR            |
| 460    | 19023         | NR            | 590    | 32218         | NR            | 720    | 6779          | NR            | 850    | 856           | NR            | 980    | 744           | NR            |
| 465    | 16163         | NR            | 595    | 32417         | NR            | 725    | 5950          | NR            | 855    | 949           | NR            | 985    | 1113          | NR            |
| 470    | 13739         | NR            | 600    | 32976         | NR            | 730    | 5282          | NR            | 860    | 954           | NR            | 990    | 1002          | NR            |
| 475    | 13571         | NR            | 605    | 33620         | NR            | 735    | 4673          | NR            | 865    | 1019          | NR            | 995    | 1732          | NR            |
| 480    | 14597         | NR            | 610    | 33704         | NR            | 740    | 4087          | NR            | 870    | 1089          | NR            | 1000   | 1390          | NR            |
| 485    | 15964         | NR            | 615    | 33846         | NR            | 745    | 3658          | NR            | 875    | 1089          | NR            |        |               |               |

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Melanopic Flux vs. Wavelength



Melanopic Lumens: 1498.3 S/P: 0.71

| 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    | 910           | NR            | 490    | 17463         | NR            | 620    | 33665         | NR            | 750    | 3275          | NR            | 880    | 1122          | NR            |
| 365    | 784           | NR            | 495    | 18986         | NR            | 625    | 33477         | NR            | 755    | 2901          | NR            | 885    | 1170          | NR            |
| 370    | 741           | NR            | 500    | 20627         | NR            | 630    | 32742         | NR            | 760    | 2665          | NR            | 890    | 751           | NR            |
| 375    | 805           | NR            | 505    | 21980         | NR            | 635    | 31767         | NR            | 765    | 2371          | NR            | 895    | 990           | NR            |
| 380    | 830           | NR            | 510    | 23346         | NR            | 640    | 30561         | NR            | 770    | 2039          | NR            | 900    | 982           | NR            |
| 385    | 690           | NR            | 515    | 24600         | NR            | 645    | 29699         | NR            | 775    | 1676          | NR            | 905    | 936           | NR            |
| 390    | 625           | NR            | 520    | 25854         | NR            | 650    | 28202         | NR            | 780    | 1616          | NR            | 910    | 888           | NR            |
| 395    | 599           | NR            | 525    | 26952         | NR            | 655    | 26484         | NR            | 785    | 1573          | NR            | 915    | 1068          | NR            |
| 400    | 568           | NR            | 530    | 28081         | NR            | 660    | 24930         | NR            | 790    | 1452          | NR            | 920    | 1179          | NR            |
| 405    | 577           | NR            | 535    | 28884         | NR            | 665    | 23070         | NR            | 795    | 1263          | NR            | 925    | 1008          | NR            |
| 410    | 720           | NR            | 540    | 29271         | NR            | 670    | 20926         | NR            | 800    | 1203          | NR            | 930    | 927           | NR            |
| 415    | 1084          | NR            | 545    | 29657         | NR            | 675    | 19011         | NR            | 805    | 1175          | NR            | 935    | 1185          | NR            |
| 420    | 1884          | NR            | 550    | 30152         | NR            | 680    | 17237         | NR            | 810    | 1108          | NR            | 940    | 1166          | NR            |
| 425    | 3574          | NR            | 555    | 30445         | NR            | 685    | 15540         | NR            | 815    | 1125          | NR            | 945    | 779           | NR            |
| 430    | 6636          | NR            | 560    | 30559         | NR            | 690    | 13894         | NR            | 820    | 988           | NR            | 950    | 905           | NR            |
| 435    | 12267         | NR            | 565    | 30663         | NR            | 695    | 12196         | NR            | 825    | 1070          | NR            | 955    | 1369          | NR            |
| 440    | 21326         | NR            | 570    | 30877         | NR            | 700    | 10840         | NR            | 830    | 1219          | NR            | 960    | 1280          | NR            |
| 445    | 30150         | NR            | 575    | 30916         | NR            | 705    | 9613          | NR            | 835    | 944           | NR            | 965    | 1177          | NR            |
| 450    | 29740         | NR            | 580    | 31248         | NR            | 710    | 8583          | NR            | 840    | 983           | NR            | 970    | 868           | NR            |
| 455    | 22827         | NR            | 585    | 31581         | NR            | 715    | 7631          | NR            | 845    | 1097          | NR            | 975    | 843           | NR            |
| 460    | 19023         | NR            | 590    | 32218         | NR            | 720    | 6779          | NR            | 850    | 856           | NR            | 980    | 744           | NR            |
| 465    | 16163         | NR            | 595    | 32417         | NR            | 725    | 5950          | NR            | 855    | 949           | NR            | 985    | 1113          | NR            |
| 470    | 13739         | NR            | 600    | 32976         | NR            | 730    | 5282          | NR            | 860    | 954           | NR            | 990    | 1002          | NR            |
| 475    | 13571         | NR            | 605    | 33620         | NR            | 735    | 4673          | NR            | 865    | 1019          | NR            | 995    | 1732          | NR            |
| 480    | 14597         | NR            | 610    | 33704         | NR            | 740    | 4087          | NR            | 870    | 1089          | NR            | 1000   | 1390          | NR            |
| 485    | 15964         | NR            | 615    | 33846         | NR            | 745    | 3658          | NR            | 875    | 1089          | NR            |        |               |               |

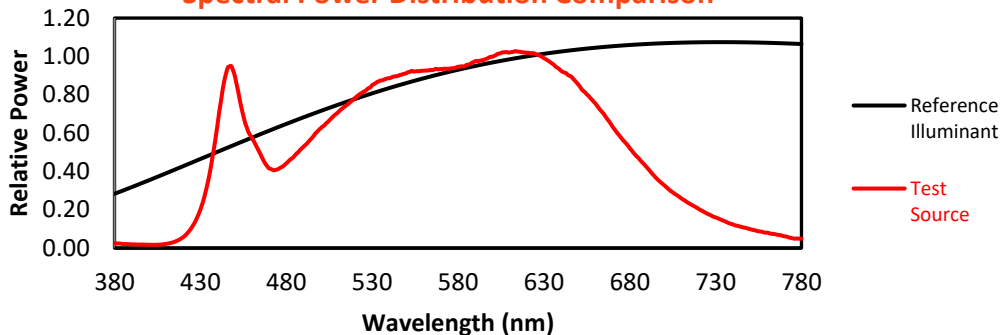
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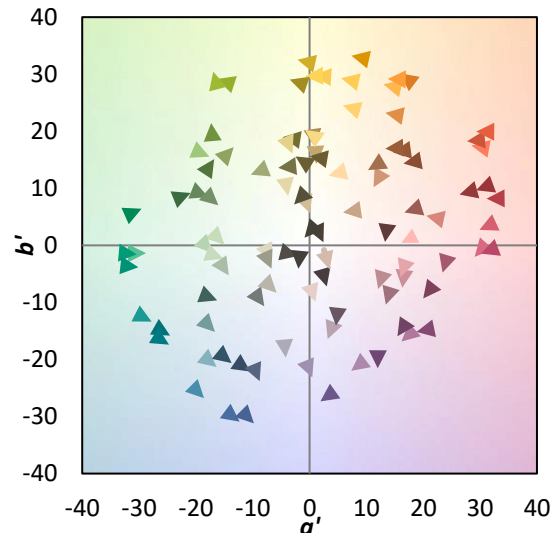
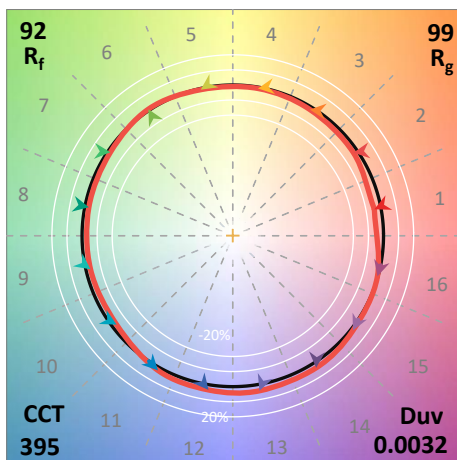
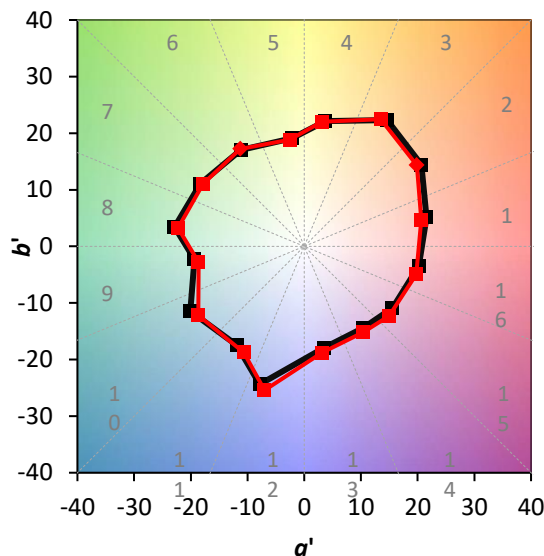
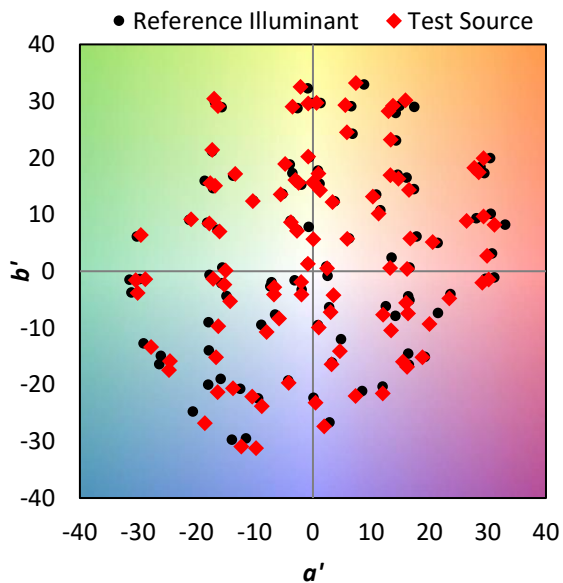
**Summary**

$R_f = 92.2$   
 $R_g = 98.9$   
 CIE  $R_a = 92.2$   
 $R_9 = 63.3$

**Spectral Power Distribution Comparison**



**Color Vector Graphics**



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

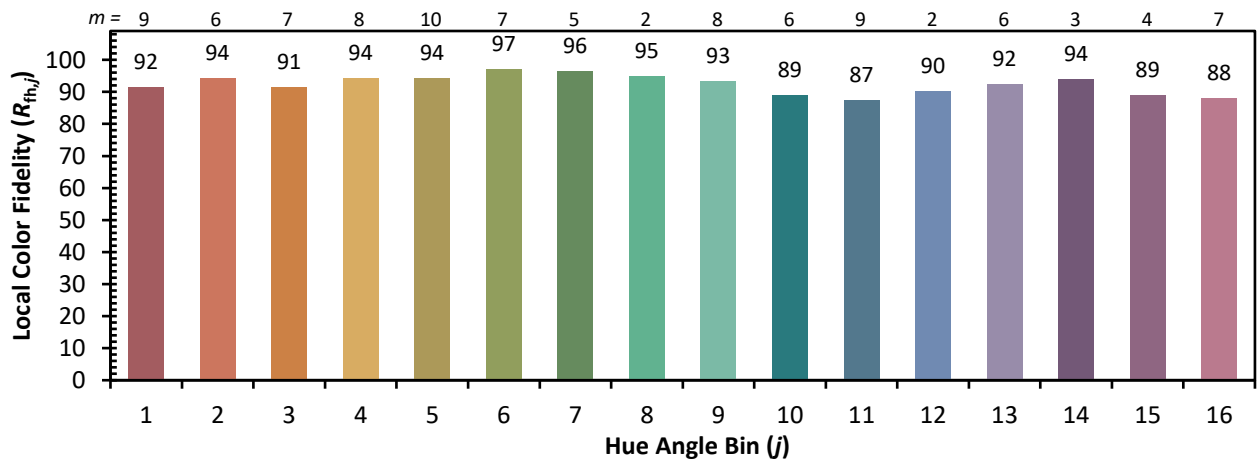
|            |             |            |            |
|------------|-------------|------------|------------|
| CES01 = 85 | CES26 = 93  | CES51 = 97 | CES76 = 86 |
| CES02 = 61 | CES27 = 92  | CES52 = 98 | CES77 = 90 |
| CES03 = 31 | CES28 = 96  | CES53 = 95 | CES78 = 84 |
| CES04 = 69 | CES29 = 95  | CES54 = 95 | CES79 = 97 |
| CES05 = 49 | CES30 = 97  | CES55 = 94 | CES80 = 94 |
| CES06 = 50 | CES31 = 96  | CES56 = 94 | CES81 = 91 |
| CES07 = 42 | CES32 = 91  | CES57 = 93 | CES82 = 97 |
| CES08 = 41 | CES33 = 98  | CES58 = 93 | CES83 = 98 |
| CES09 = 29 | CES34 = 93  | CES59 = 96 | CES84 = 94 |
| CES10 = 74 | CES35 = 96  | CES60 = 94 | CES85 = 86 |
| CES11 = 57 | CES36 = 85  | CES61 = 93 | CES86 = 90 |
| CES12 = 63 | CES37 = 94  | CES62 = 90 | CES87 = 92 |
| CES13 = 43 | CES38 = 91  | CES63 = 92 | CES88 = 96 |
| CES14 = 74 | CES39 = 99  | CES64 = 90 | CES89 = 88 |
| CES15 = 71 | CES40 = 98  | CES65 = 88 | CES90 = 96 |
| CES16 = 47 | CES41 = 98  | CES66 = 88 | CES91 = 76 |
| CES17 = 49 | CES42 = 95  | CES67 = 87 | CES92 = 82 |
| CES18 = 56 | CES43 = 95  | CES68 = 88 | CES93 = 89 |
| CES19 = 71 | CES44 = 100 | CES69 = 90 | CES94 = 83 |
| CES20 = 66 | CES45 = 97  | CES70 = 86 | CES95 = 84 |
| CES21 = 85 | CES46 = 97  | CES71 = 82 | CES96 = 92 |
| CES22 = 78 | CES47 = 98  | CES72 = 94 | CES97 = 95 |
| CES23 = 91 | CES48 = 93  | CES73 = 81 | CES98 = 93 |
| CES24 = 90 | CES49 = 96  | CES74 = 94 | CES99 = 92 |
| CES25 = 71 | CES50 = 98  | CES75 = 83 |            |



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Color Rendition by Hue-Angle Bin



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Measure Comparisons



(END OF REPORT)