

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: P1435704

Luminaire Tested: **GALN-SB7B-940-U-T4LG**

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: P1435704  
 Test Lab: INNOVATION CENTER(G1)  
 Issue Date: 03/24/202  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: McGRAW-EDISON  
 Catalog Number: GALN-SB7B-940-U-T4LG  
 Description: GALLEON II AREA AND ROADWAY HIGH DENSITY LUMINAIRE 450mA 7xLight  
 Square PACKAGE 90CRI 4000K FIXTURE w/ TYPE IV LOW GLARE  
 Light Source: (182) 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               |

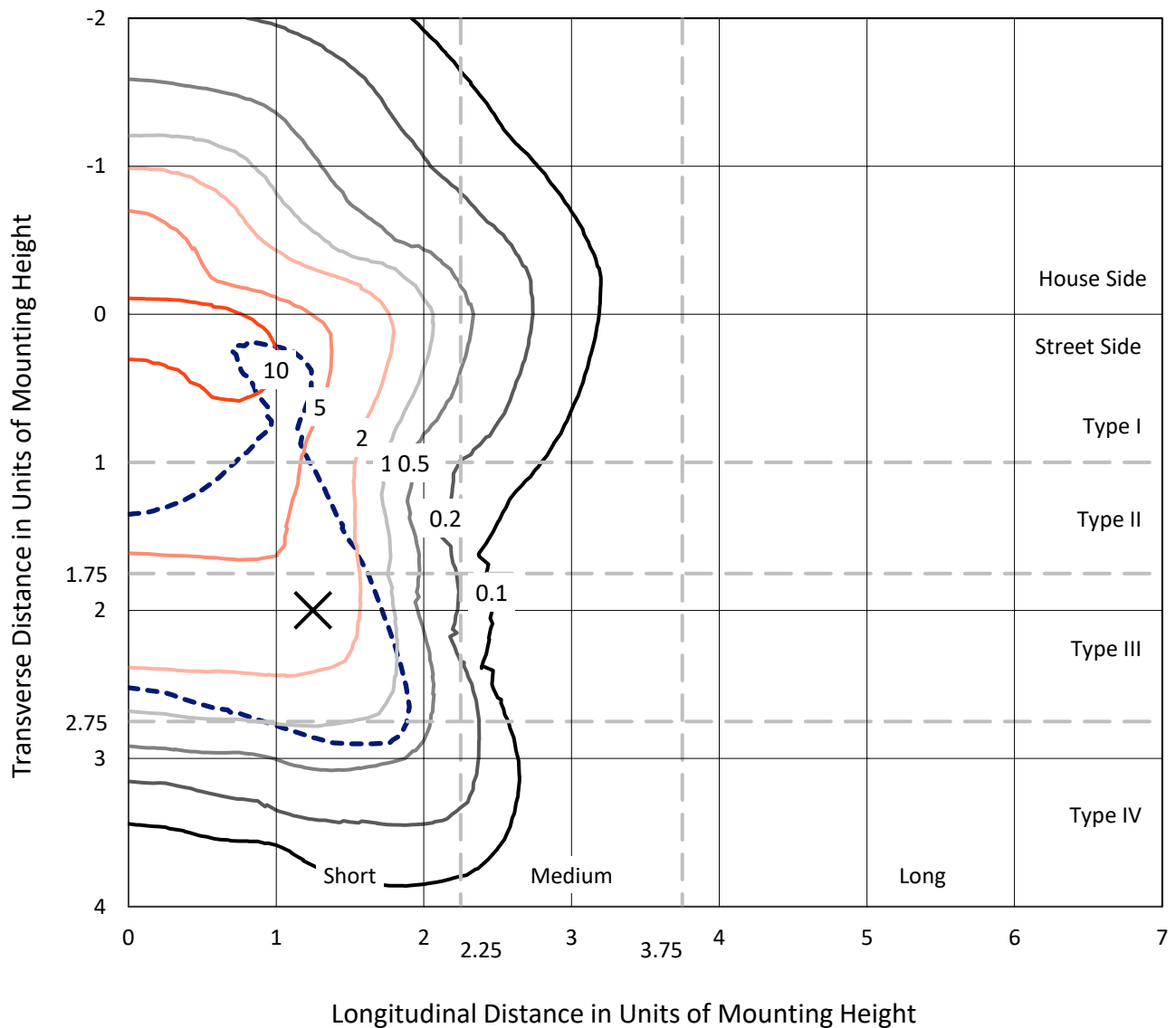
**Summary**

Lumens per Lamp: N/A  
 Luminaire Lumens: 28402.5 lumens  
 Efficiency: N/A  
 Efficacy: 110.6 lumens/watt  
 Luminous Opening: Rectangular (W 1.5' x L: 1.5' x H: 0')  
 IES Classification: Type IV - Short  
 BUG Rating: B3 - U0 - G3  
  
 Input Watts (W): 256.7  
 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: P1435704  
 CATALOG NUMBER: GALN-SB7B-940-U-T4LG

### Iso-Footcandle Lines of Horizontal Illumination

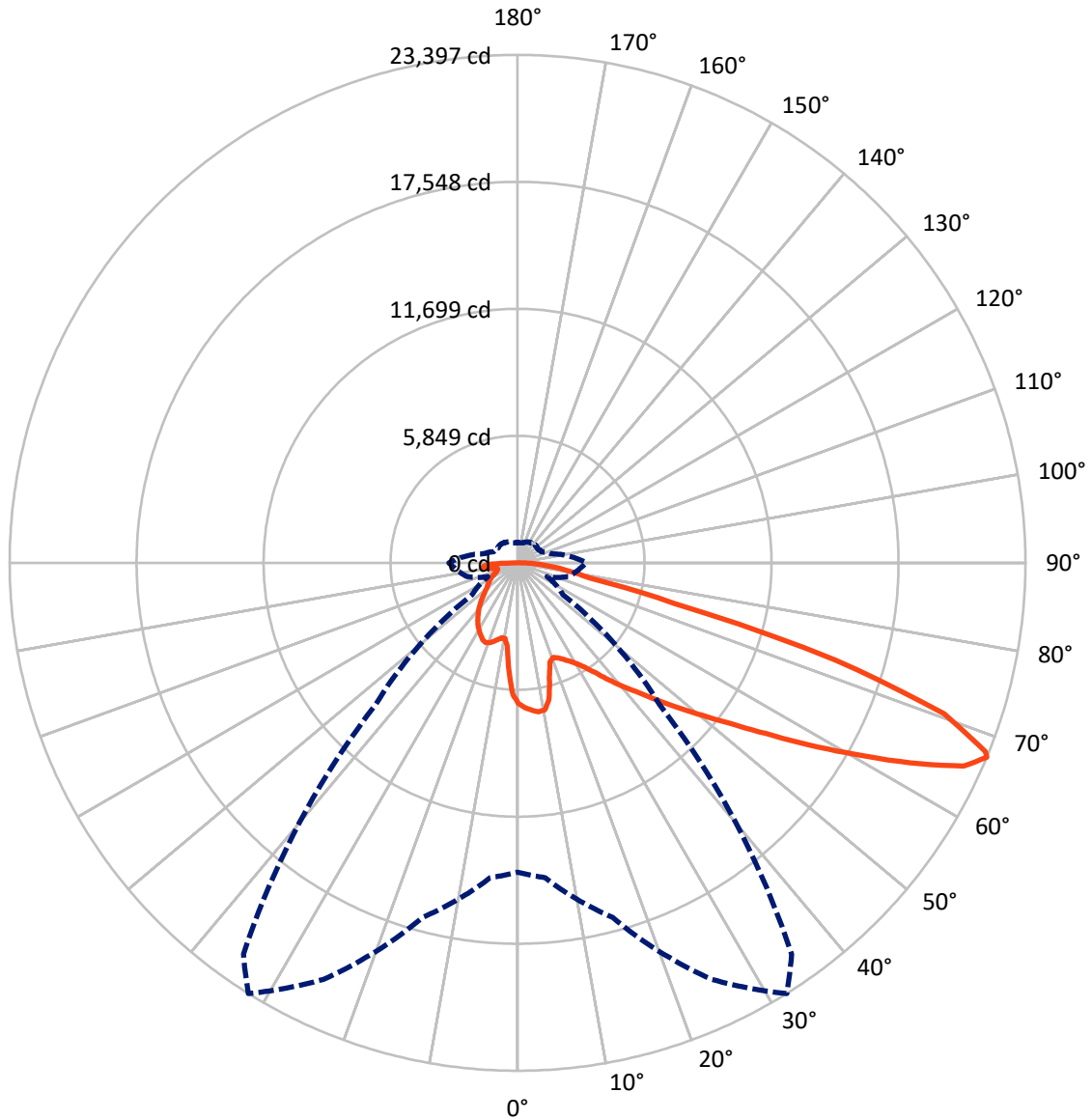
✕ Max cd  
 - - - 1/2 Max cd



Based on 20 foot mounting height. Maximum calculated value = 17.5 fc  
 Type IV - Short - N/A

REPORT NUMBER: P1435704  
CATALOG NUMBER: GALN-SB7B-940-U-T4LG

### Luminous Intensity Polar Plot



— Vertical Plane Through 32-Deg Lateral      - - - Horizontal Cone Through 67-Deg Vertical

REPORT NUMBER: P1435704  
 CATALOG NUMBER: GALN-SB7B-940-U-T4LG

**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 6724.2   | 0.0    | 6724.2  |
|                    | % Fixture | 23.7     | 0.0    | 23.7    |
| <b>Street Side</b> | Lumens    | 21678.3  | 0.0    | 21678.3 |
|                    | % Fixture | 76.3     | 0.0    | 76.3    |
| <b>Total</b>       | Lumens    | 28402.5  | 0.0    | 28402.5 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 567.0   | 2.0       |
| 10°-20°   | 1505.5  | 5.3       |
| 20°-30°   | 2458.5  | 8.7       |
| 30°-40°   | 3623.6  | 12.8      |
| 40°-50°   | 4997.2  | 17.6      |
| 50°-60°   | 6312.9  | 22.2      |
| 60°-70°   | 6109.8  | 21.5      |
| 70°-80°   | 2180.5  | 7.7       |
| 80°-90°   | 647.5   | 2.3       |
| 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°    | 28402.5 | 100.0     |
| 0°-180°   | 28402.5 | 100.0     |

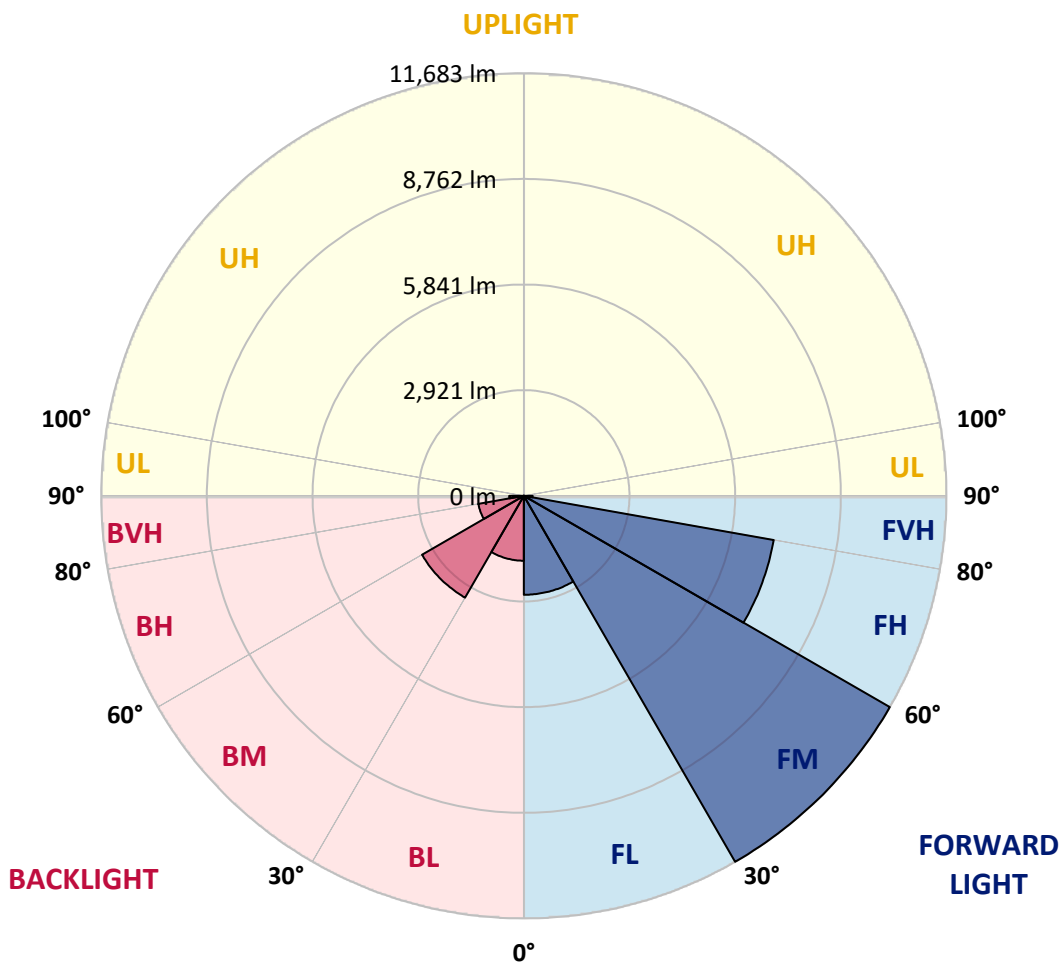


REPORT NUMBER: P1435704  
 CATALOG NUMBER: GALN-SB7B-940-U-T4LG

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

| Zone           | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |         |
|----------------|---------|-----------|-------------------------|------|---------|
|                |         |           | B                       | U    | G       |
| FL (0°-30°)    | 2736.6  | 9.6       |                         |      |         |
| FM (30°-60°)   | 11682.8 | 41.1      |                         |      |         |
| FH (60°-80°)   | 7014.8  | 24.7      |                         |      | G3/7500 |
| FVH (80°-90°)  | 244.0   | 0.9       |                         |      | G3/500  |
| BL (0°-30°)    | 1794.4  | 6.3       | B3/2500                 |      |         |
| BM (30°-60°)   | 3250.8  | 11.4      | B3/5000                 |      |         |
| BH (60°-80°)   | 1275.5  | 4.5       | B3/2500                 |      | G3/2500 |
| BVH (80°-90°)  | 403.5   | 1.4       |                         |      | 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 IV Short





REPORT NUMBER: P1435704

CATALOG NUMBER: GALN-SB7B-940-U-T4LG

**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 32°     | 35°     | 45°     | 55°     | 65°     | 75°     | 85°    |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--------|
| 0°    | 6489.4  | 6489.4  | 6489.4  | 6489.4  | 6489.4  | 6489.4  | 6489.4  | 6489.4  | 6489.4  | 6489.4  | 6489.4 |
| 2.5°  | 6735.4  | 6716.4  | 6697.5  | 6710.1  | 6684.9  | 6678.6  | 6647.1  | 6634.5  | 6596.6  | 6590.3  | 6520.9 |
| 5°    | 6874.1  | 6836.3  | 6830.0  | 6842.6  | 6817.3  | 6817.3  | 6792.1  | 6773.2  | 6716.4  | 6684.9  | 6584.0 |
| 7.5°  | 6874.1  | 6867.8  | 6880.4  | 6924.6  | 6930.9  | 6930.9  | 6930.9  | 6937.2  | 6880.4  | 6836.3  | 6678.6 |
| 10°   | 6483.1  | 6420.0  | 6558.8  | 6779.5  | 6886.7  | 6949.8  | 7063.3  | 7132.7  | 7088.5  | 7057.0  | 6842.6 |
| 12.5° | 5316.4  | 5322.7  | 5543.4  | 6016.4  | 6445.3  | 6628.1  | 7101.1  | 7353.4  | 7372.3  | 7321.9  | 7050.7 |
| 15°   | 4509.2  | 4540.7  | 4654.2  | 4994.8  | 5486.7  | 5757.8  | 6880.4  | 7548.9  | 7700.3  | 7649.8  | 7302.9 |
| 17.5° | 4263.2  | 4282.1  | 4332.6  | 4528.1  | 4805.6  | 5026.3  | 6281.3  | 7675.0  | 8097.6  | 8034.5  | 7586.7 |
| 20°   | 4225.4  | 4238.0  | 4301.0  | 4465.0  | 4654.2  | 4780.3  | 5669.6  | 7574.1  | 8469.7  | 8444.4  | 7845.3 |
| 22.5° | 4231.7  | 4244.3  | 4326.3  | 4553.3  | 4748.8  | 4856.0  | 5474.1  | 7340.8  | 8860.7  | 8885.9  | 8110.2 |
| 25°   | 4244.3  | 4250.6  | 4376.7  | 4679.4  | 4925.4  | 5057.8  | 5600.2  | 7132.7  | 9188.6  | 9403.0  | 8400.3 |
| 27.5° | 4313.7  | 4332.6  | 4502.9  | 4843.4  | 5133.5  | 5284.9  | 5896.6  | 7202.0  | 9548.1  | 9989.5  | 8747.1 |
| 30°   | 4502.9  | 4515.5  | 4723.6  | 5076.7  | 5392.1  | 5549.7  | 6249.8  | 7479.5  | 9989.5  | 10594.9 | 9087.7 |
| 32.5° | 4799.3  | 4811.9  | 5051.5  | 5417.3  | 5757.8  | 5947.0  | 6710.1  | 8009.3  | 10481.4 | 11231.9 | 9428.2 |
| 35°   | 5209.2  | 5215.5  | 5486.7  | 5877.7  | 6237.1  | 6451.6  | 7246.2  | 8608.4  | 10992.3 | 11774.3 | 9680.5 |
| 37.5° | 5694.8  | 5738.9  | 6016.4  | 6426.3  | 6848.9  | 7044.4  | 7876.8  | 9308.4  | 11446.3 | 12234.6 | 9825.6 |
| 40°   | 6363.3  | 6375.9  | 6647.1  | 7044.4  | 7492.1  | 7681.3  | 8507.5  | 9970.6  | 11944.5 | 12505.8 | 9958.0 |
| 42.5° | 7050.7  | 7157.9  | 7384.9  | 7826.4  | 8160.6  | 8312.0  | 9226.4  | 10576.0 | 12341.9 | 12518.4 | 9901.2 |
| 45°   | 7971.4  | 8053.4  | 8280.5  | 8671.5  | 9005.7  | 9182.3  | 10002.1 | 11131.0 | 12543.7 | 12411.2 | 9775.1 |
| 47.5° | 9024.6  | 9075.1  | 9258.0  | 9611.1  | 9983.2  | 10109.3 | 10809.4 | 11446.3 | 12619.3 | 12335.5 | 9718.3 |
| 50°   | 10267.0 | 10267.0 | 10399.4 | 10702.2 | 11042.7 | 11219.3 | 11553.5 | 11635.5 | 12840.1 | 12203.1 | 9863.4 |
| 52.5° | 11313.9 | 11364.3 | 11540.9 | 11969.8 | 12310.3 | 12512.1 | 12133.7 | 11925.6 | 12392.3 | 11465.2 | 9907.5 |
| 55°   | 12316.6 | 12373.4 | 12770.7 | 13306.8 | 13886.9 | 14107.7 | 12859.0 | 11780.6 | 10885.0 | 10386.8 | 9604.8 |
| 57.5° | 13275.2 | 13395.0 | 13893.3 | 14940.1 | 15816.7 | 15797.8 | 13779.7 | 10481.4 | 8885.9  | 9194.9  | 8942.6 |
| 60°   | 14612.2 | 14738.3 | 15533.0 | 16851.0 | 17923.1 | 17475.4 | 13792.4 | 8721.9  | 6924.6  | 7340.8  | 7700.3 |
| 62.5° | 15728.5 | 15942.9 | 17109.6 | 19304.2 | 20288.1 | 19588.0 | 12650.9 | 6678.6  | 4597.5  | 5120.9  | 5953.4 |
| 65°   | 15627.5 | 15911.3 | 17721.3 | 21107.9 | 22577.3 | 21927.8 | 10979.6 | 4225.4  | 2371.3  | 3500.1  | 4168.6 |
| 67°   | 14252.7 | 14561.7 | 16907.8 | 21171.0 | 23397.2 | 22009.7 | 9270.6  | 2554.1  | 1507.3  | 2428.0  | 2894.7 |
| 67.5° | 13464.4 | 13918.5 | 16504.2 | 21051.2 | 23245.8 | 21662.9 | 8501.2  | 2137.9  | 1419.0  | 2257.7  | 2636.1 |
| 70°   | 8280.5  | 9012.0  | 12386.0 | 18610.5 | 20836.7 | 18131.2 | 4723.6  | 1210.9  | 1154.1  | 1513.6  | 1822.6 |
| 72.5° | 2491.1  | 2711.8  | 4780.3  | 11938.2 | 15293.3 | 13439.2 | 2125.3  | 933.4   | 1034.3  | 1217.2  | 1406.4 |
| 75°   | 1210.9  | 1292.8  | 1973.9  | 4881.2  | 7448.0  | 7410.2  | 1185.6  | 800.9   | 958.6   | 1021.7  | 1109.9 |
| 77.5° | 775.7   | 826.2   | 1229.8  | 2730.7  | 3411.8  | 3039.7  | 857.7   | 700.0   | 851.4   | 838.8   | 826.2  |
| 80°   | 485.6   | 510.8   | 788.3   | 1582.9  | 2516.3  | 2100.1  | 630.7   | 573.9   | 731.6   | 649.6   | 586.5  |
| 82.5° | 315.3   | 346.9   | 504.5   | 964.9   | 1797.4  | 1564.0  | 416.2   | 409.9   | 605.4   | 517.1   | 454.1  |
| 85°   | 208.1   | 233.3   | 321.6   | 567.6   | 1065.8  | 1116.3  | 271.2   | 283.8   | 466.7   | 391.0   | 346.9  |
| 87.5° | 75.7    | 94.6    | 164.0   | 252.3   | 498.2   | 618.0   | 113.5   | 107.2   | 227.0   | 182.9   | 145.0  |
| 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: P1435704  
 CATALOG NUMBER: GALN-SB7B-940-U-T4LG

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 6489.4 | 6489.4 | 6489.4 | 6489.4 | 6489.4 | 6489.4 | 6489.4 | 6489.4 | 6489.4 | 6489.4 | 6489.4 |
| 2.5°  | 6508.3 | 6489.4 | 6401.1 | 6325.4 | 6268.7 | 6193.0 | 6111.0 | 6016.4 | 5953.4 | 5966.0 | 5947.0 |
| 5°    | 6539.9 | 6489.4 | 6319.1 | 6060.6 | 5808.3 | 5493.0 | 5089.4 | 4849.7 | 4666.8 | 4572.2 | 4597.5 |
| 7.5°  | 6609.2 | 6520.9 | 6161.5 | 5638.0 | 4982.1 | 4338.9 | 3941.6 | 3714.5 | 3607.3 | 3563.2 | 3556.9 |
| 10°   | 6729.1 | 6577.7 | 5959.7 | 4982.1 | 4124.5 | 3689.3 | 3544.3 | 3481.2 | 3468.6 | 3468.6 | 3462.3 |
| 12.5° | 6874.1 | 6634.5 | 5619.1 | 4345.2 | 3714.5 | 3556.9 | 3531.6 | 3538.0 | 3556.9 | 3575.8 | 3544.3 |
| 15°   | 7050.7 | 6659.7 | 5196.6 | 3960.5 | 3632.6 | 3594.7 | 3632.6 | 3676.7 | 3708.2 | 3733.5 | 3701.9 |
| 17.5° | 7227.3 | 6634.5 | 4799.3 | 3777.6 | 3645.2 | 3695.6 | 3771.3 | 3840.7 | 3859.6 | 3897.4 | 3872.2 |
| 20°   | 7353.4 | 6546.2 | 4458.7 | 3708.2 | 3676.7 | 3790.2 | 3884.8 | 3960.5 | 3998.3 | 4023.6 | 3998.3 |
| 22.5° | 7448.0 | 6432.6 | 4212.8 | 3638.9 | 3676.7 | 3815.4 | 3929.0 | 4017.3 | 4061.4 | 4086.6 | 4055.1 |
| 25°   | 7530.0 | 6275.0 | 4023.6 | 3538.0 | 3601.0 | 3733.5 | 3859.6 | 3947.9 | 4010.9 | 4048.8 | 4029.9 |
| 27.5° | 7630.9 | 6148.9 | 3847.0 | 3386.6 | 3443.4 | 3569.5 | 3701.9 | 3809.1 | 3929.0 | 3992.0 | 3979.4 |
| 30°   | 7744.4 | 6085.8 | 3676.7 | 3222.6 | 3260.5 | 3386.6 | 3544.3 | 3689.3 | 3853.3 | 3935.3 | 3935.3 |
| 32.5° | 7876.8 | 6041.6 | 3519.0 | 3065.0 | 3096.5 | 3235.2 | 3386.6 | 3519.0 | 3695.6 | 3828.1 | 3821.7 |
| 35°   | 7933.6 | 5991.2 | 3392.9 | 2919.9 | 2983.0 | 3096.5 | 3216.3 | 3304.6 | 3487.5 | 3645.2 | 3657.8 |
| 37.5° | 7990.4 | 5972.3 | 3329.8 | 2806.4 | 2856.9 | 2945.1 | 3008.2 | 3052.4 | 3222.6 | 3386.6 | 3392.9 |
| 40°   | 8059.7 | 6060.6 | 3374.0 | 2730.7 | 2686.6 | 2774.9 | 2806.4 | 2831.6 | 2919.9 | 3027.1 | 3027.1 |
| 42.5° | 8015.6 | 6123.6 | 3474.9 | 2661.4 | 2478.5 | 2579.4 | 2592.0 | 2585.7 | 2592.0 | 2598.3 | 2592.0 |
| 45°   | 7902.1 | 6060.6 | 3474.9 | 2554.1 | 2257.7 | 2364.9 | 2358.6 | 2327.1 | 2276.7 | 2144.2 | 2125.3 |
| 47.5° | 7876.8 | 6022.7 | 3342.5 | 2377.6 | 2037.0 | 2125.3 | 2137.9 | 2074.8 | 1929.8 | 1791.1 | 1746.9 |
| 50°   | 7984.1 | 6092.1 | 3134.3 | 2163.1 | 1847.8 | 1923.5 | 1955.0 | 1847.8 | 1683.8 | 1538.8 | 1513.6 |
| 52.5° | 8141.7 | 6180.4 | 2831.6 | 1929.8 | 1690.1 | 1765.8 | 1803.7 | 1683.8 | 1513.6 | 1400.0 | 1387.4 |
| 55°   | 8122.8 | 6180.4 | 2491.1 | 1715.4 | 1570.3 | 1627.1 | 1690.1 | 1564.0 | 1431.6 | 1368.5 | 1362.2 |
| 57.5° | 7712.9 | 5947.0 | 2238.8 | 1564.0 | 1456.8 | 1507.3 | 1589.2 | 1469.4 | 1343.3 | 1355.9 | 1374.8 |
| 60°   | 6911.9 | 5341.6 | 2049.6 | 1463.1 | 1355.9 | 1406.4 | 1494.6 | 1355.9 | 1191.9 | 1147.8 | 1147.8 |
| 62.5° | 5694.8 | 4401.9 | 1898.3 | 1362.2 | 1261.3 | 1324.4 | 1368.5 | 1185.6 | 1078.4 | 1028.0 | 1028.0 |
| 65°   | 4269.5 | 3405.5 | 1740.6 | 1280.2 | 1179.3 | 1248.7 | 1198.2 | 1109.9 | 1002.7 | 964.9  | 971.2  |
| 67°   | 3165.9 | 2642.4 | 1608.2 | 1210.9 | 1128.9 | 1160.4 | 1122.6 | 1059.5 | 952.3  | 920.8  | 952.3  |
| 67.5° | 2844.2 | 2510.0 | 1576.6 | 1191.9 | 1116.3 | 1141.5 | 1103.6 | 1053.2 | 939.7  | 908.1  | 939.7  |
| 70°   | 1955.0 | 1929.8 | 1406.4 | 1103.6 | 1046.9 | 1021.7 | 1040.6 | 977.5  | 882.9  | 870.3  | 901.8  |
| 72.5° | 1488.3 | 1538.8 | 1261.3 | 1028.0 | 971.2  | 939.7  | 983.8  | 920.8  | 826.2  | 845.1  | 876.6  |
| 75°   | 1166.7 | 1242.4 | 1128.9 | 920.8  | 882.9  | 889.2  | 977.5  | 952.3  | 876.6  | 895.5  | 901.8  |
| 77.5° | 864.0  | 1002.7 | 964.9  | 800.9  | 769.4  | 857.7  | 1103.6 | 1179.3 | 1046.9 | 1015.3 | 971.2  |
| 80°   | 630.7  | 718.9  | 813.5  | 662.2  | 643.3  | 826.2  | 1362.2 | 1507.3 | 1292.8 | 1166.7 | 1135.2 |
| 82.5° | 466.7  | 504.5  | 668.5  | 529.7  | 466.7  | 737.9  | 1513.6 | 1772.1 | 1538.8 | 1299.1 | 1261.3 |
| 85°   | 334.2  | 391.0  | 529.7  | 391.0  | 309.0  | 605.4  | 1482.0 | 1734.3 | 1526.2 | 1229.8 | 1198.2 |
| 87.5° | 119.8  | 170.3  | 227.0  | 176.6  | 157.7  | 416.2  | 1223.5 | 1248.7 | 952.3  | 435.1  | 441.5  |
| 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



REPORT NUMBER: SP1-2106-271-4

| 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            |

REPORT NUMBER: SP1-2106-271-4

**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

REPORT NUMBER: SP1-2106-271-4

**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            |        |               |               |

REPORT NUMBER: SP1-2106-271-4

**Scotopic Flux vs. Wavelength**



**Scotopic Lumens: 3705.7**

**S/P: 1.75**

| $\lambda$<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               | 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                             |                   |                                      |                                |

REPORT NUMBER: SP1-2106-271-4

**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 1498.3 S/P: 0.71**

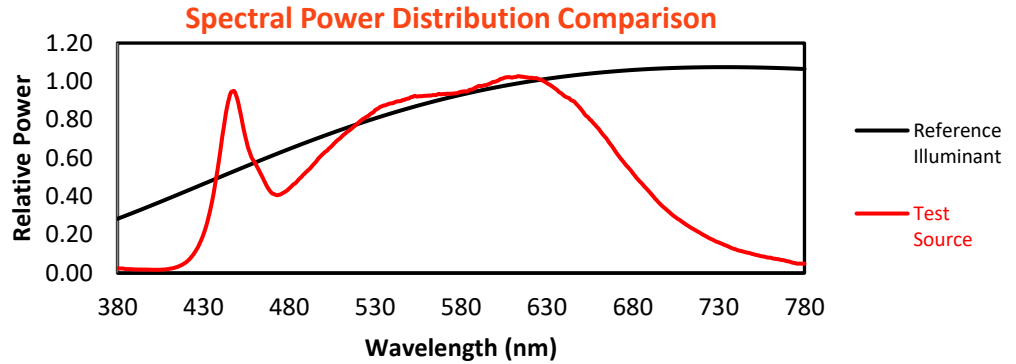
| λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) |
|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|
| 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            |        |               |               |

REPORT NUMBER: SP1-2106-271-4

TM-30-18

**Summary**

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



**Color Vector Graphics**



REPORT NUMBER: SP1-2106-271-4

TM-30-18

**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 |            |



REPORT NUMBER: SP1-2106-271-4

TM-30-18

Color Rendition by Hue-Angle Bin



REPORT NUMBER: SP1-2106-271-4

TM-30-18

Measure Comparisons



(END OF REPORT)