

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: P321110

Luminaire Tested: **GLEON-SA6A-830-U-AFL**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P321110  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-29)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA6A-830-U-AFL  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(6) 80 CRI, 3000K, 615mA LIGHTSQUARES WITH 16 LEDS EACH AND AUTOMOTIVE  
FRONTLINE OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 22722 lumens  
Efficiency: N/A  
Efficacy: 117.7 lumens/watt  
Luminous Opening: Rectangular (W 1.5' x L: 1' x H: 0')  
IES Classification: Type II - Short  
BUG Rating: B3 - U0 - G2

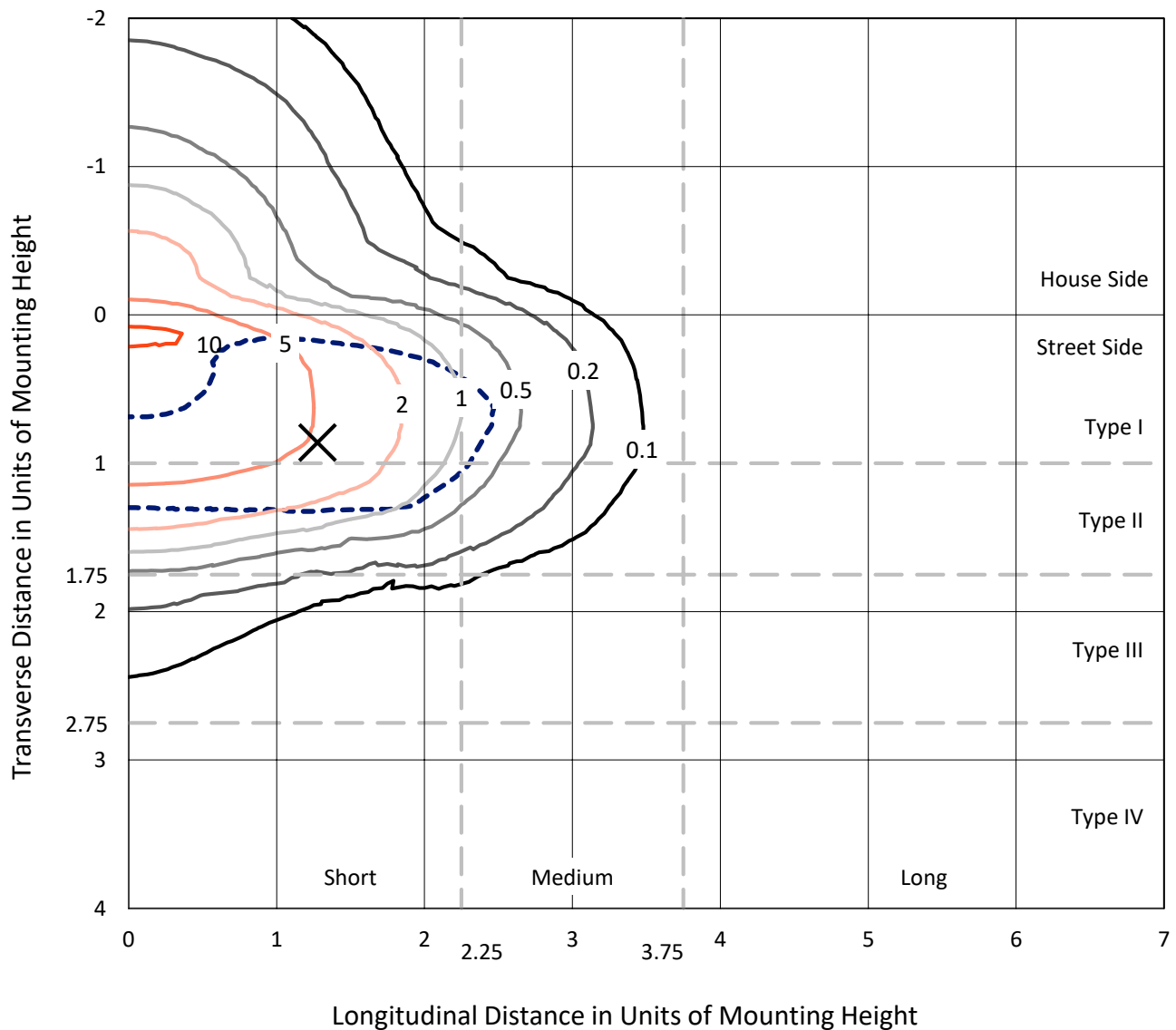
Input Watts (W): 193  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



REPORT NUMBER: P321110  
 CATALOG NUMBER: GLEON-SA6A-830-U-AFL

## Iso-Footcandle Lines of Horizontal Illumination

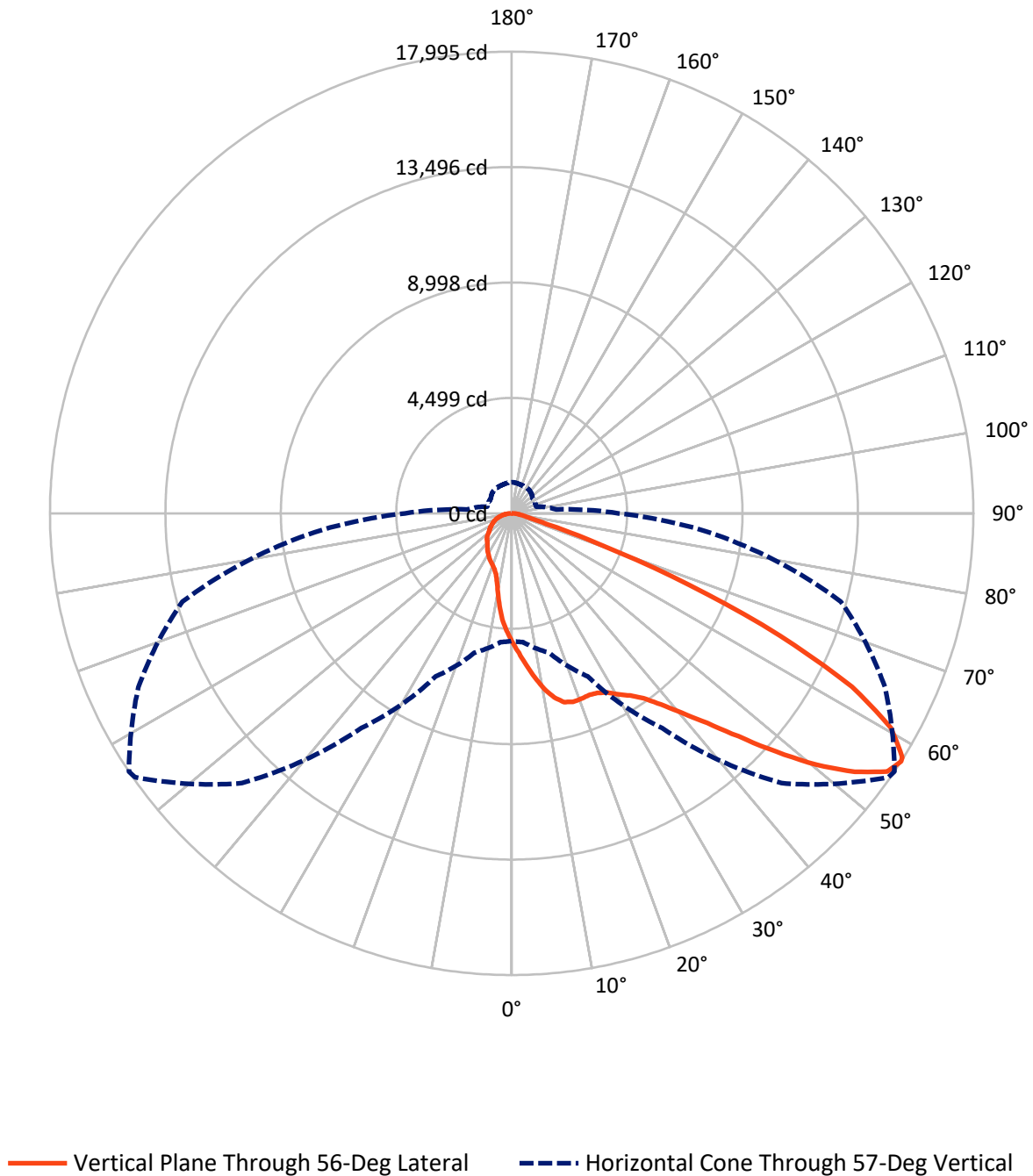
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 11.2 fc  
 Type II - Short - N/A

REPORT NUMBER: P321110  
CATALOG NUMBER: GLEON-SA6A-830-U-AFL

## Luminous Intensity Polar Plot



REPORT NUMBER: P321110

CATALOG NUMBER: GLEON-SA6A-830-U-AFL

**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 3916.8   | 0.0    | 3916.8  |
|                    | % Fixture | 17.2     | 0.0    | 17.2    |
| <b>Street Side</b> | Lumens    | 18805.2  | 0.0    | 18805.2 |
|                    | % Fixture | 82.8     | 0.0    | 82.8    |
| <b>Total</b>       | Lumens    | 22722.0  | 0.0    | 22722.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 481.4   | 2.1       |
| 10°-20°   | 1361.1  | 6.0       |
| 20°-30°   | 2217.0  | 9.8       |
| 30°-40°   | 3314.1  | 14.6      |
| 40°-50°   | 5026.8  | 22.1      |
| 50°-60°   | 5634.2  | 24.8      |
| 60°-70°   | 3327.8  | 14.6      |
| 70°-80°   | 1090.3  | 4.8       |
| 80°-90°   | 269.4   | 1.2       |
| 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°    | 22722.0 | 100.0     |
| 0°-180°   | 22722.0 | 100.0     |

**Coefficient of Utilization**



REPORT NUMBER: P321110

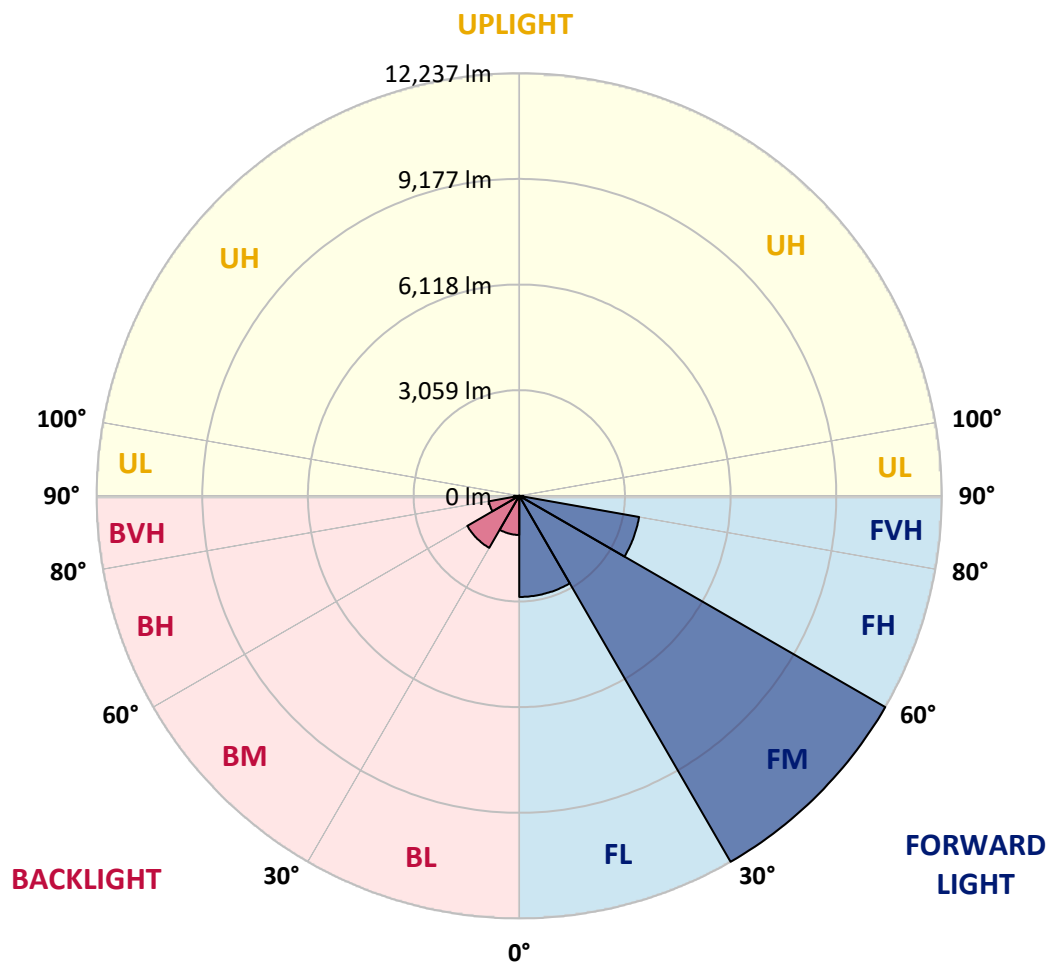
CATALOG NUMBER: GLEON-SA6A-830-U-AFL

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|---------|-----------|-------------------------|------|---------|
|      |             |         |           | B                       | U    | G       |
| FL   | (0°-30°)    | 2926.9  | 12.9      |                         |      |         |
| FM   | (30°-60°)   | 12236.5 | 53.9      |                         |      |         |
| FH   | (60°-80°)   | 3523.1  | 15.5      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 118.6   | 0.5       |                         |      | G2/225  |
| BL   | (0°-30°)    | 1132.6  | 5.0       | B3/2500                 |      |         |
| BM   | (30°-60°)   | 1738.5  | 7.7       | B2/2500                 |      |         |
| BH   | (60°-80°)   | 894.9   | 3.9       | B2/1000                 |      | G2/1000 |
| BVH  | (80°-90°)   | 150.8   | 0.7       |                         |      | G2/225  |
| UL   | (90°-100°)  | 0.0     | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0     | 0.0       |                         | U0/0 |         |

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

Type II Short





REPORT NUMBER: P321110

CATALOG NUMBER: GLEON-SA6A-830-U-AFL

**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 55°     | 56°     | 65°     | 75°     | 85°    |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--------|
| 0°    | 5039.8  | 5039.8  | 5039.8  | 5039.8  | 5039.8  | 5039.8  | 5039.8  | 5039.8  | 5039.8  | 5039.8  | 5039.8 |
| 2.5°  | 5787.1  | 5840.2  | 5816.7  | 5735.5  | 5673.0  | 5584.8  | 5486.4  | 5456.7  | 5352.9  | 5236.5  | 5096.8 |
| 5°    | 6703.0  | 6676.5  | 6638.2  | 6511.7  | 6378.2  | 6222.8  | 5976.0  | 5937.0  | 5705.8  | 5442.7  | 5164.7 |
| 7.5°  | 7224.6  | 7222.3  | 7199.7  | 7125.5  | 7003.7  | 6800.6  | 6503.1  | 6457.0  | 6108.0  | 5684.8  | 5253.7 |
| 10°   | 7148.9  | 7143.4  | 7180.9  | 7258.2  | 7294.9  | 7252.8  | 7002.1  | 6956.0  | 6527.3  | 5952.6  | 5356.8 |
| 12.5° | 6718.6  | 6721.8  | 6781.9  | 6944.3  | 7165.3  | 7430.8  | 7390.2  | 7367.5  | 6962.3  | 6255.6  | 5481.7 |
| 15°   | 6383.6  | 6390.7  | 6438.3  | 6579.6  | 6840.5  | 7322.3  | 7626.0  | 7633.8  | 7383.2  | 6589.8  | 5627.8 |
| 17.5° | 6236.8  | 6251.7  | 6273.5  | 6372.7  | 6611.7  | 7106.0  | 7682.2  | 7724.4  | 7751.7  | 6936.5  | 5768.3 |
| 20°   | 6283.7  | 6297.7  | 6304.0  | 6367.2  | 6563.2  | 6974.8  | 7643.2  | 7718.9  | 8034.4  | 7262.9  | 5908.9 |
| 22.5° | 6493.7  | 6502.3  | 6506.2  | 6522.6  | 6674.9  | 7012.2  | 7617.4  | 7697.1  | 8239.0  | 7555.7  | 6015.1 |
| 25°   | 6842.0  | 6835.8  | 6810.8  | 6789.7  | 6892.0  | 7160.6  | 7676.8  | 7752.5  | 8405.3  | 7821.2  | 6084.6 |
| 27.5° | 7259.0  | 7251.2  | 7202.8  | 7145.0  | 7203.6  | 7391.8  | 7847.8  | 7907.9  | 8554.5  | 8069.6  | 6119.7 |
| 30°   | 7759.5  | 7739.2  | 7647.9  | 7579.2  | 7601.8  | 7738.5  | 8129.7  | 8184.3  | 8784.8  | 8351.4  | 6154.1 |
| 32.5° | 8338.2  | 8316.3  | 8184.3  | 8070.3  | 8070.3  | 8184.3  | 8420.2  | 8465.5  | 8980.1  | 8670.0  | 6209.5 |
| 35°   | 9062.8  | 9035.5  | 8863.7  | 8672.4  | 8618.5  | 8676.3  | 8816.1  | 8848.1  | 9331.4  | 9071.4  | 6310.2 |
| 37.5° | 9917.1  | 9880.4  | 9657.8  | 9401.7  | 9283.8  | 9280.7  | 9381.4  | 9447.0  | 9892.9  | 9598.5  | 6481.3 |
| 40°   | 10773.7 | 10747.9 | 10553.5 | 10352.0 | 10120.9 | 10046.7 | 10202.1 | 10222.4 | 10626.9 | 10252.9 | 6699.9 |
| 42.5° | 11435.9 | 11431.2 | 11395.3 | 11421.8 | 11185.2 | 11035.3 | 11157.1 | 11173.5 | 11523.4 | 10961.1 | 6932.6 |
| 45°   | 11785.7 | 11793.5 | 11967.7 | 12353.4 | 12440.9 | 12331.6 | 12391.7 | 12396.4 | 12547.9 | 11675.6 | 7145.8 |
| 47.5° | 11505.4 | 11546.0 | 11986.4 | 12849.3 | 13565.3 | 13928.4 | 13828.5 | 13886.3 | 13541.1 | 12289.4 | 7312.9 |
| 50°   | 10413.0 | 10462.9 | 11212.6 | 12628.3 | 14090.1 | 15473.8 | 15421.5 | 15408.2 | 14342.3 | 12739.2 | 7403.5 |
| 52.5° | 9059.7  | 9098.7  | 9717.2  | 11479.6 | 13705.1 | 16328.1 | 16808.3 | 16739.6 | 15054.5 | 13075.7 | 7420.6 |
| 55°   | 6999.0  | 7059.9  | 7652.6  | 9187.0  | 12148.1 | 16001.7 | 17828.1 | 17766.4 | 15703.4 | 13252.2 | 7400.3 |
| 57°   | 4975.7  | 5039.8  | 5628.5  | 7011.5  | 10219.3 | 14871.7 | 17929.6 | 17995.2 | 16054.0 | 13281.9 | 7423.0 |
| 57.5° | 4440.0  | 4505.6  | 5089.0  | 6432.1  | 9618.0  | 14463.3 | 17842.2 | 17951.5 | 16117.2 | 13277.2 | 7435.5 |
| 60°   | 2235.6  | 2260.6  | 2632.3  | 3590.5  | 6079.9  | 11692.8 | 16701.3 | 16983.2 | 16174.2 | 13047.6 | 7489.4 |
| 62.5° | 1390.0  | 1372.0  | 1360.3  | 1653.9  | 2958.0  | 7754.1  | 14347.0 | 14889.7 | 15083.4 | 12491.6 | 7359.0 |
| 65°   | 1222.1  | 1188.5  | 1059.6  | 1036.2  | 1306.4  | 3766.2  | 10804.2 | 11479.6 | 12752.5 | 11615.5 | 7048.2 |
| 67.5° | 1147.9  | 1115.1  | 969.8   | 882.4   | 883.2   | 1493.0  | 6707.7  | 7468.3  | 9934.3  | 10134.2 | 6314.9 |
| 70°   | 1071.4  | 1041.7  | 905.8   | 802.7   | 752.0   | 826.9   | 3086.0  | 3663.1  | 6475.8  | 7965.7  | 5277.9 |
| 72.5° | 973.0   | 952.7   | 823.8   | 717.6   | 663.7   | 619.2   | 1181.5  | 1395.4  | 3749.0  | 5349.8  | 3665.4 |
| 75°   | 869.9   | 851.2   | 741.0   | 639.5   | 573.9   | 487.3   | 665.3   | 716.8   | 1904.6  | 2737.0  | 1804.6 |
| 77.5° | 756.7   | 745.7   | 659.1   | 565.4   | 513.0   | 403.7   | 470.9   | 495.9   | 816.8   | 1173.7  | 905.0  |
| 80°   | 602.1   | 623.1   | 576.3   | 503.7   | 455.2   | 323.3   | 333.4   | 349.8   | 475.6   | 573.2   | 513.8  |
| 82.5° | 392.0   | 428.7   | 451.3   | 409.2   | 374.8   | 254.6   | 239.7   | 246.8   | 310.0   | 349.8   | 223.3  |
| 85°   | 163.2   | 183.5   | 296.7   | 267.8   | 249.1   | 185.8   | 160.9   | 164.0   | 192.1   | 199.1   | 91.4   |
| 87.5° | 72.6    | 77.3    | 130.4   | 122.6   | 105.4   | 64.0    | 68.7    | 75.0    | 102.3   | 96.8    | 35.1   |
| 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: P321110

CATALOG NUMBER: GLEON-SA6A-830-U-AFL

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 5039.8 | 5039.8 | 5039.8 | 5039.8 | 5039.8 | 5039.8 | 5039.8 | 5039.8 | 5039.8 | 5039.8 | 5039.8 |
| 2.5°  | 5044.4 | 4978.9 | 4866.4 | 4742.2 | 4640.7 | 4559.5 | 4477.5 | 4421.3 | 4355.7 | 4320.6 | 4302.6 |
| 5°    | 5048.3 | 4919.5 | 4682.9 | 4440.0 | 4223.0 | 4024.6 | 3835.7 | 3690.4 | 3554.5 | 3481.1 | 3460.8 |
| 7.5°  | 5064.7 | 4871.1 | 4488.5 | 4088.7 | 3702.9 | 3350.7 | 3079.0 | 2908.8 | 2786.2 | 2731.5 | 2715.9 |
| 10°   | 5078.0 | 4814.1 | 4248.0 | 3656.1 | 3131.3 | 2774.4 | 2563.6 | 2468.3 | 2426.2 | 2419.1 | 2412.1 |
| 12.5° | 5109.3 | 4755.5 | 3995.0 | 3204.7 | 2687.0 | 2440.2 | 2366.8 | 2360.6 | 2372.3 | 2389.5 | 2389.5 |
| 15°   | 5158.5 | 4697.7 | 3706.0 | 2817.4 | 2404.3 | 2317.6 | 2332.5 | 2366.8 | 2398.8 | 2425.4 | 2429.3 |
| 17.5° | 5194.4 | 4626.7 | 3395.2 | 2507.4 | 2253.6 | 2277.0 | 2330.1 | 2378.5 | 2411.3 | 2437.1 | 2439.5 |
| 20°   | 5220.1 | 4516.6 | 3063.4 | 2270.8 | 2166.9 | 2239.5 | 2305.9 | 2348.9 | 2371.5 | 2397.3 | 2401.2 |
| 22.5° | 5206.9 | 4369.0 | 2769.0 | 2101.3 | 2096.6 | 2184.9 | 2248.1 | 2299.7 | 2282.5 | 2257.5 | 2273.9 |
| 25°   | 5142.8 | 4166.0 | 2466.0 | 1974.8 | 2022.5 | 2111.5 | 2189.6 | 2155.2 | 2097.4 | 2086.5 | 2092.7 |
| 27.5° | 5028.8 | 3906.7 | 2185.7 | 1857.7 | 1936.6 | 2043.5 | 2038.9 | 2004.5 | 1984.2 | 1970.1 | 1978.7 |
| 30°   | 4906.2 | 3625.6 | 1940.5 | 1755.4 | 1841.3 | 1929.5 | 1911.6 | 1910.8 | 1890.5 | 1867.9 | 1878.8 |
| 32.5° | 4785.2 | 3342.9 | 1746.0 | 1671.1 | 1769.5 | 1781.2 | 1820.2 | 1831.9 | 1792.1 | 1744.5 | 1741.3 |
| 35°   | 4679.8 | 3075.9 | 1598.4 | 1594.5 | 1682.8 | 1684.3 | 1741.3 | 1725.0 | 1625.8 | 1576.6 | 1576.6 |
| 37.5° | 4600.9 | 2809.6 | 1486.0 | 1525.8 | 1568.8 | 1609.4 | 1638.3 | 1570.3 | 1553.9 | 1526.6 | 1525.8 |
| 40°   | 4566.6 | 2575.3 | 1415.7 | 1473.5 | 1488.3 | 1539.9 | 1465.7 | 1492.3 | 1500.1 | 1486.0 | 1486.0 |
| 42.5° | 4530.6 | 2371.5 | 1354.8 | 1433.7 | 1431.3 | 1424.3 | 1386.8 | 1421.2 | 1452.4 | 1453.2 | 1450.9 |
| 45°   | 4494.7 | 2195.8 | 1300.9 | 1348.6 | 1381.4 | 1305.6 | 1312.6 | 1349.4 | 1393.1 | 1408.7 | 1408.7 |
| 47.5° | 4454.9 | 2056.8 | 1251.7 | 1258.8 | 1309.5 | 1258.8 | 1253.3 | 1281.4 | 1333.0 | 1357.9 | 1363.4 |
| 50°   | 4367.4 | 1931.9 | 1195.5 | 1179.9 | 1194.0 | 1211.1 | 1215.8 | 1229.1 | 1286.1 | 1325.9 | 1335.3 |
| 52.5° | 4246.4 | 1820.2 | 1123.7 | 1107.3 | 1107.3 | 1172.1 | 1194.0 | 1197.9 | 1246.3 | 1293.9 | 1303.3 |
| 55°   | 4145.7 | 1749.2 | 1049.5 | 1046.4 | 1043.2 | 1130.7 | 1168.2 | 1174.4 | 1208.0 | 1245.5 | 1250.2 |
| 57°   | 4152.7 | 1743.7 | 992.5  | 995.6  | 994.8  | 1088.5 | 1144.0 | 1157.3 | 1174.4 | 1206.5 | 1211.9 |
| 57.5° | 4156.6 | 1747.6 | 980.0  | 981.6  | 980.8  | 1076.8 | 1137.0 | 1151.8 | 1165.1 | 1198.6 | 1204.1 |
| 60°   | 4215.2 | 1757.7 | 929.2  | 912.1  | 916.0  | 1014.4 | 1097.1 | 1115.9 | 1124.5 | 1169.0 | 1176.0 |
| 62.5° | 4128.5 | 1712.5 | 888.6  | 847.2  | 847.2  | 948.8  | 1041.7 | 1071.4 | 1084.6 | 1144.8 | 1156.5 |
| 65°   | 3877.0 | 1585.2 | 841.0  | 773.8  | 781.7  | 883.2  | 975.3  | 1023.7 | 1044.0 | 1119.0 | 1131.5 |
| 67.5° | 3488.9 | 1437.6 | 790.2  | 708.3  | 716.1  | 814.5  | 906.6  | 958.9  | 990.9  | 1090.9 | 1101.0 |
| 70°   | 2983.7 | 1257.2 | 721.5  | 638.8  | 648.1  | 739.5  | 825.4  | 884.7  | 932.4  | 1064.3 | 1067.5 |
| 72.5° | 2199.7 | 1030.8 | 625.5  | 562.2  | 572.4  | 652.0  | 743.4  | 812.1  | 876.1  | 998.0  | 996.4  |
| 75°   | 1308.0 | 805.9  | 519.3  | 484.9  | 492.0  | 566.1  | 669.2  | 752.8  | 848.8  | 972.2  | 987.0  |
| 77.5° | 793.4  | 606.7  | 423.2  | 406.1  | 414.6  | 490.4  | 616.1  | 705.1  | 837.1  | 916.7  | 912.1  |
| 80°   | 479.5  | 433.4  | 338.1  | 327.2  | 335.8  | 419.3  | 570.0  | 669.2  | 731.7  | 783.2  | 783.2  |
| 82.5° | 250.7  | 264.7  | 248.3  | 239.7  | 251.4  | 340.5  | 518.5  | 584.1  | 646.6  | 555.2  | 518.5  |
| 85°   | 102.3  | 138.2  | 150.7  | 149.9  | 157.0  | 235.8  | 447.4  | 499.8  | 417.0  | 395.9  | 405.3  |
| 87.5° | 34.4   | 58.6   | 73.4   | 63.3   | 66.4   | 148.4  | 310.0  | 241.3  | 286.6  | 199.9  | 189.8  |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |



LM-79-2019: Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Report Prepared for

Cooper Lighting Solutions

MCGRAW EDISON

Report Number: SP1-2408-195-9

Test Date: 08/07/2024

Luminaire Tested: GALN-SB1A-830-U-5WQ

Data in this report applies to families of products including GALN-SB1A-830-U-5WQ.

### Test Information

Test Method: LM-79-2019  
 Report Number: SP1-2408-195-9  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry:  $4\pi$   
 Issue Date: 08/07/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: MCGRAW EDISON  
 Catalog Number: **GALN-SB1A-830-U-5WQ**  
 Description: GALLEON AREA AND ROADWAY LUMINAIRE. (1) 80 CRI, 3000K, 350MA HIGH DENSITY LIGHTSQUARE WITH 26 LEDS AND TYPE V WIDE OPTICS

### Spectral Parameters

CCT (K): 3050  
 CIE  $u'$ : 0.2476  
 CIE  $v'$ : 0.5251  
 Duv: 0.0034  
 CIE x: 0.4383  
 CIE y: 0.4131  
 CIE z: 0.1487  
 Peak Wavelength (nm): 603  
 Dominant Wavelength (nm): 581  
 Purity: 55.55201  
 Rf: 81.5  
 Rg: 99.2

CRI (Ra): 81.0  
 R1: 79.6  
 R2: 85.6  
 R3: 92.0  
 R4: 82.6  
 R5: 78.9  
 R6: 81.7  
 R7: 85.2  
 R8: 62.0  
 R9: 7.1  
 R10: 67.0  
 R11: 82.7  
 R12: 63.2  
 R13: 80.3  
 R14: 95.0  
 R15: 71.7



### Test Conditions

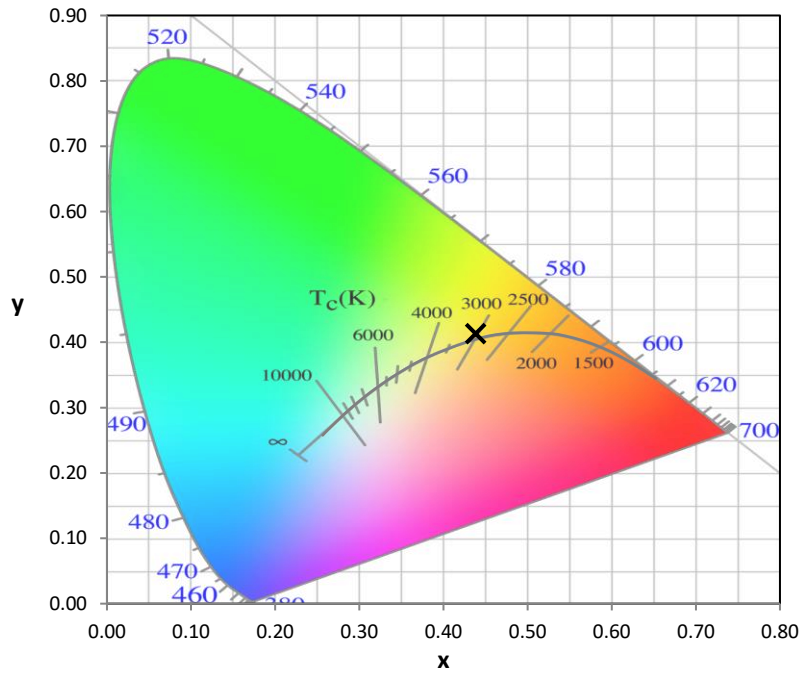
Stabilization Time: 20M  
 Operation Time: 1H 20M  
 Sphere Temperature (°C): 24.2

REPORT NUMBER: SP1-2408-195-9

| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 6/18/2024        | 12/18/2024           |
| Power Meter                    | INXT2011004           | 2/8/2024         | 2/8/2025             |
| AC Power Source                | IN0063                | 10/24/2023       | 10/24/2024           |
| DC Power Source                | IN0208                | 10/24/2023       | 10/24/2024           |
| Sphere Thermometer             | IN0085                | 10/24/2023       | 10/24/2024           |
| Room Thermometer               | IN0046                | 10/24/2023       | 10/24/2024           |

REPORT NUMBER: SP1-2408-195-9

**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

REPORT NUMBER: SP1-2408-195-9

### Photopic Flux vs. Wavelength

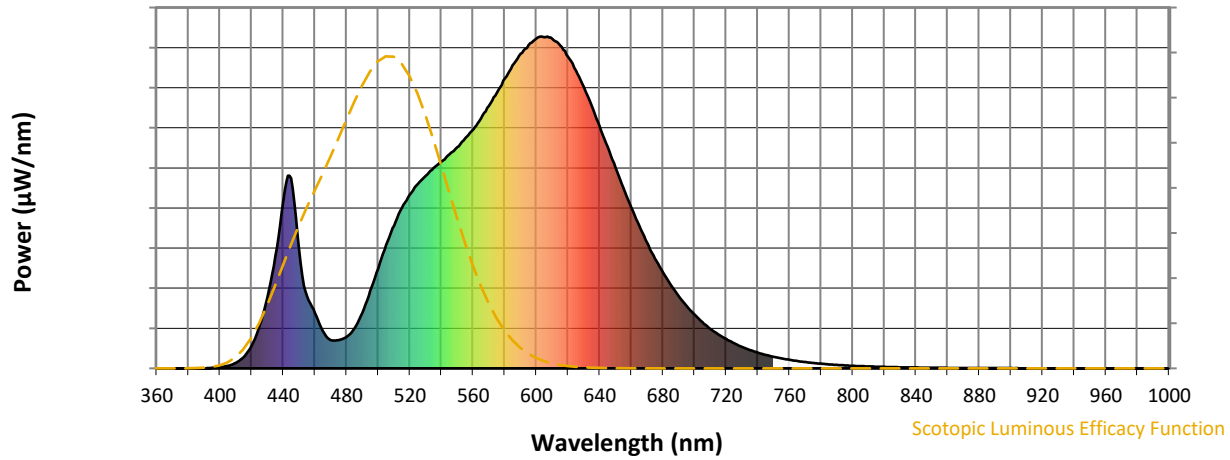


### Photopic Lumens: NR

| $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) |
|-------------------|----------------------------------------|--------------------------------|-------------------|----------------------------------------|--------------------------------|-------------------|----------------------------------------|--------------------------------|-------------------|----------------------------------------|--------------------------------|-------------------|----------------------------------------|--------------------------------|
| 360               | 0                                      | NR                             | 490               | 168                                    | NR                             | 620               | 940                                    | NR                             | 750               | 35                                     | NR                             | 880               | 1                                      | NR                             |
| 365               | 0                                      | NR                             | 495               | 233                                    | NR                             | 625               | 897                                    | NR                             | 755               | 30                                     | NR                             | 885               | 1                                      | NR                             |
| 370               | 0                                      | NR                             | 500               | 300                                    | NR                             | 630               | 847                                    | NR                             | 760               | 26                                     | NR                             | 890               | 1                                      | NR                             |
| 375               | 0                                      | NR                             | 505               | 372                                    | NR                             | 635               | 790                                    | NR                             | 765               | 22                                     | NR                             | 895               | 1                                      | NR                             |
| 380               | 0                                      | NR                             | 510               | 430                                    | NR                             | 640               | 730                                    | NR                             | 770               | 19                                     | NR                             | 900               | 1                                      | NR                             |
| 385               | 0                                      | NR                             | 515               | 483                                    | NR                             | 645               | 668                                    | NR                             | 775               | 16                                     | NR                             | 905               | 1                                      | NR                             |
| 390               | 0                                      | NR                             | 520               | 524                                    | NR                             | 650               | 605                                    | NR                             | 780               | 14                                     | NR                             | 910               | 0                                      | NR                             |
| 395               | 2                                      | NR                             | 525               | 555                                    | NR                             | 655               | 545                                    | NR                             | 785               | 12                                     | NR                             | 915               | 0                                      | NR                             |
| 400               | 4                                      | NR                             | 530               | 581                                    | NR                             | 660               | 485                                    | NR                             | 790               | 10                                     | NR                             | 920               | 0                                      | NR                             |
| 405               | 7                                      | NR                             | 535               | 604                                    | NR                             | 665               | 430                                    | NR                             | 795               | 9                                      | NR                             | 925               | 0                                      | NR                             |
| 410               | 17                                     | NR                             | 540               | 623                                    | NR                             | 670               | 378                                    | NR                             | 800               | 8                                      | NR                             | 930               | 0                                      | NR                             |
| 415               | 34                                     | NR                             | 545               | 645                                    | NR                             | 675               | 331                                    | NR                             | 805               | 7                                      | NR                             | 935               | 0                                      | NR                             |
| 420               | 68                                     | NR                             | 550               | 667                                    | NR                             | 680               | 290                                    | NR                             | 810               | 6                                      | NR                             | 940               | 0                                      | NR                             |
| 425               | 128                                    | NR                             | 555               | 693                                    | NR                             | 685               | 251                                    | NR                             | 815               | 5                                      | NR                             | 945               | 0                                      | NR                             |
| 430               | 214                                    | NR                             | 560               | 719                                    | NR                             | 690               | 218                                    | NR                             | 820               | 4                                      | NR                             | 950               | 0                                      | NR                             |
| 435               | 339                                    | NR                             | 565               | 754                                    | NR                             | 695               | 188                                    | NR                             | 825               | 4                                      | NR                             | 955               | 0                                      | NR                             |
| 440               | 507                                    | NR                             | 570               | 791                                    | NR                             | 700               | 162                                    | NR                             | 830               | 3                                      | NR                             | 960               | 0                                      | NR                             |
| 445               | 573                                    | NR                             | 575               | 830                                    | NR                             | 705               | 139                                    | NR                             | 835               | 3                                      | NR                             | 965               | 0                                      | NR                             |
| 450               | 356                                    | NR                             | 580               | 873                                    | NR                             | 710               | 119                                    | NR                             | 840               | 3                                      | NR                             | 970               | 0                                      | NR                             |
| 455               | 217                                    | NR                             | 585               | 913                                    | NR                             | 715               | 102                                    | NR                             | 845               | 2                                      | NR                             | 975               | 0                                      | NR                             |
| 460               | 168                                    | NR                             | 590               | 948                                    | NR                             | 720               | 88                                     | NR                             | 850               | 2                                      | NR                             | 980               | 0                                      | NR                             |
| 465               | 113                                    | NR                             | 595               | 974                                    | NR                             | 725               | 76                                     | NR                             | 855               | 2                                      | NR                             | 985               | 0                                      | NR                             |
| 470               | 85                                     | NR                             | 600               | 994                                    | NR                             | 730               | 65                                     | NR                             | 860               | 1                                      | NR                             | 990               | 0                                      | NR                             |
| 475               | 85                                     | NR                             | 605               | 998                                    | NR                             | 735               | 55                                     | NR                             | 865               | 1                                      | NR                             | 995               | 0                                      | NR                             |
| 480               | 94                                     | NR                             | 610               | 994                                    | NR                             | 740               | 47                                     | NR                             | 870               | 1                                      | NR                             | 1000              | 0                                      | NR                             |
| 485               | 120                                    | NR                             | 615               | 973                                    | NR                             | 745               | 41                                     | NR                             | 875               | 1                                      | NR                             |                   |                                        |                                |

REPORT NUMBER: SP1-2408-195-9

### Scotopic Flux vs. Wavelength



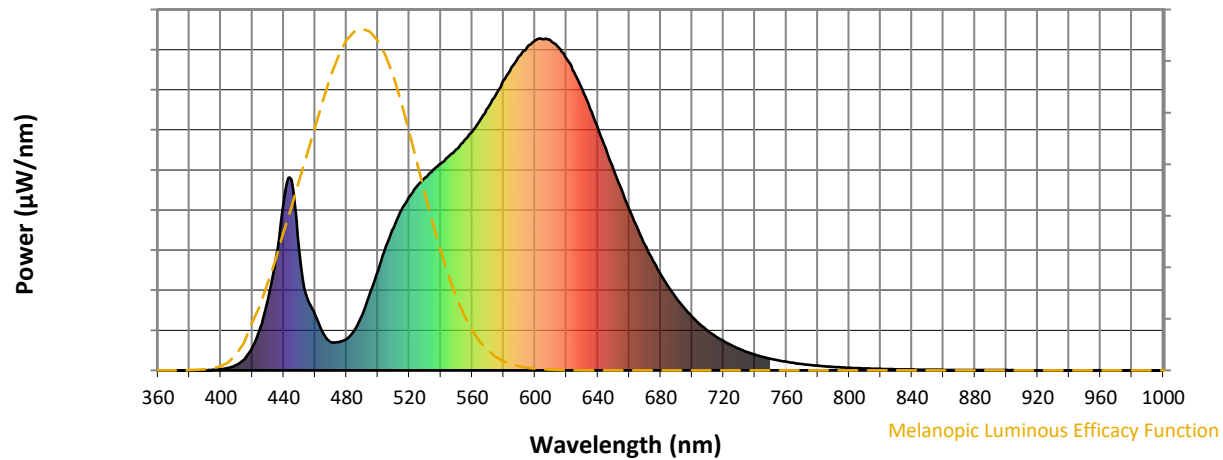
Scotopic Lumens: NR

S/P: 1.27

| λ<br>(nm) | Power<br>W <sup>Λ</sup> /nm | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>W <sup>Λ</sup> /nm | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>W <sup>Λ</sup> /nm | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>W <sup>Λ</sup> /nm | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>W <sup>Λ</sup> /nm | Lumens<br>(Φ/nm) |
|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|
| 360       | 0                           | NR               | 490       | 168                         | NR               | 620       | 940                         | NR               | 750       | 35                          | NR               | 880       | 1                           | NR               |
| 365       | 0                           | NR               | 495       | 233                         | NR               | 625       | 897                         | NR               | 755       | 30                          | NR               | 885       | 1                           | NR               |
| 370       | 0                           | NR               | 500       | 300                         | NR               | 630       | 847                         | NR               | 760       | 26                          | NR               | 890       | 1                           | NR               |
| 375       | 0                           | NR               | 505       | 372                         | NR               | 635       | 790                         | NR               | 765       | 22                          | NR               | 895       | 1                           | NR               |
| 380       | 0                           | NR               | 510       | 430                         | NR               | 640       | 730                         | NR               | 770       | 19                          | NR               | 900       | 1                           | NR               |
| 385       | 0                           | NR               | 515       | 483                         | NR               | 645       | 668                         | NR               | 775       | 16                          | NR               | 905       | 1                           | NR               |
| 390       | 0                           | NR               | 520       | 524                         | NR               | 650       | 605                         | NR               | 780       | 14                          | NR               | 910       | 0                           | NR               |
| 395       | 2                           | NR               | 525       | 555                         | NR               | 655       | 545                         | NR               | 785       | 12                          | NR               | 915       | 0                           | NR               |
| 400       | 4                           | NR               | 530       | 581                         | NR               | 660       | 485                         | NR               | 790       | 10                          | NR               | 920       | 0                           | NR               |
| 405       | 7                           | NR               | 535       | 604                         | NR               | 665       | 430                         | NR               | 795       | 9                           | NR               | 925       | 0                           | NR               |
| 410       | 17                          | NR               | 540       | 623                         | NR               | 670       | 378                         | NR               | 800       | 8                           | NR               | 930       | 0                           | NR               |
| 415       | 34                          | NR               | 545       | 645                         | NR               | 675       | 331                         | NR               | 805       | 7                           | NR               | 935       | 0                           | NR               |
| 420       | 68                          | NR               | 550       | 667                         | NR               | 680       | 290                         | NR               | 810       | 6                           | NR               | 940       | 0                           | NR               |
| 425       | 128                         | NR               | 555       | 693                         | NR               | 685       | 251                         | NR               | 815       | 5                           | NR               | 945       | 0                           | NR               |
| 430       | 214                         | NR               | 560       | 719                         | NR               | 690       | 218                         | NR               | 820       | 4                           | NR               | 950       | 0                           | NR               |
| 435       | 339                         | NR               | 565       | 754                         | NR               | 695       | 188                         | NR               | 825       | 4                           | NR               | 955       | 0                           | NR               |
| 440       | 507                         | NR               | 570       | 791                         | NR               | 700       | 162                         | NR               | 830       | 3                           | NR               | 960       | 0                           | NR               |
| 445       | 573                         | NR               | 575       | 830                         | NR               | 705       | 139                         | NR               | 835       | 3                           | NR               | 965       | 0                           | NR               |
| 450       | 356                         | NR               | 580       | 873                         | NR               | 710       | 119                         | NR               | 840       | 3                           | NR               | 970       | 0                           | NR               |
| 455       | 217                         | NR               | 585       | 913                         | NR               | 715       | 102                         | NR               | 845       | 2                           | NR               | 975       | 0                           | NR               |
| 460       | 168                         | NR               | 590       | 948                         | NR               | 720       | 88                          | NR               | 850       | 2                           | NR               | 980       | 0                           | NR               |
| 465       | 113                         | NR               | 595       | 974                         | NR               | 725       | 76                          | NR               | 855       | 2                           | NR               | 985       | 0                           | NR               |
| 470       | 85                          | NR               | 600       | 994                         | NR               | 730       | 65                          | NR               | 860       | 1                           | NR               | 990       | 0                           | NR               |
| 475       | 85                          | NR               | 605       | 998                         | NR               | 735       | 55                          | NR               | 865       | 1                           | NR               | 995       | 0                           | NR               |
| 480       | 94                          | NR               | 610       | 994                         | NR               | 740       | 47                          | NR               | 870       | 1                           | NR               | 1000      | 0                           | NR               |
| 485       | 120                         | NR               | 615       | 973                         | NR               | 745       | 41                          | NR               | 875       | 1                           | NR               |           |                             |                  |

REPORT NUMBER: SP1-2408-195-9

### Melanopic Flux vs. Wavelength


**Melanopic Lumens: NR**
**M/P: 2.32**

| $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) |
|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|
| 360               | 0                                    | NR                             | 490               | 168                                  | NR                             | 620               | 940                                  | NR                             | 750               | 35                                   | NR                             | 880               | 1                                    | NR                             |
| 365               | 0                                    | NR                             | 495               | 233                                  | NR                             | 625               | 897                                  | NR                             | 755               | 30                                   | NR                             | 885               | 1                                    | NR                             |
| 370               | 0                                    | NR                             | 500               | 300                                  | NR                             | 630               | 847                                  | NR                             | 760               | 26                                   | NR                             | 890               | 1                                    | NR                             |
| 375               | 0                                    | NR                             | 505               | 372                                  | NR                             | 635               | 790                                  | NR                             | 765               | 22                                   | NR                             | 895               | 1                                    | NR                             |
| 380               | 0                                    | NR                             | 510               | 430                                  | NR                             | 640               | 730                                  | NR                             | 770               | 19                                   | NR                             | 900               | 1                                    | NR                             |
| 385               | 0                                    | NR                             | 515               | 483                                  | NR                             | 645               | 668                                  | NR                             | 775               | 16                                   | NR                             | 905               | 1                                    | NR                             |
| 390               | 0                                    | NR                             | 520               | 524                                  | NR                             | 650               | 605                                  | NR                             | 780               | 14                                   | NR                             | 910               | 0                                    | NR                             |
| 395               | 2                                    | NR                             | 525               | 555                                  | NR                             | 655               | 545                                  | NR                             | 785               | 12                                   | NR                             | 915               | 0                                    | NR                             |
| 400               | 4                                    | NR                             | 530               | 581                                  | NR                             | 660               | 485                                  | NR                             | 790               | 10                                   | NR                             | 920               | 0                                    | NR                             |
| 405               | 7                                    | NR                             | 535               | 604                                  | NR                             | 665               | 430                                  | NR                             | 795               | 9                                    | NR                             | 925               | 0                                    | NR                             |
| 410               | 17                                   | NR                             | 540               | 623                                  | NR                             | 670               | 378                                  | NR                             | 800               | 8                                    | NR                             | 930               | 0                                    | NR                             |
| 415               | 34                                   | NR                             | 545               | 645                                  | NR                             | 675               | 331                                  | NR                             | 805               | 7                                    | NR                             | 935               | 0                                    | NR                             |
| 420               | 68                                   | NR                             | 550               | 667                                  | NR                             | 680               | 290                                  | NR                             | 810               | 6                                    | NR                             | 940               | 0                                    | NR                             |
| 425               | 128                                  | NR                             | 555               | 693                                  | NR                             | 685               | 251                                  | NR                             | 815               | 5                                    | NR                             | 945               | 0                                    | NR                             |
| 430               | 214                                  | NR                             | 560               | 719                                  | NR                             | 690               | 218                                  | NR                             | 820               | 4                                    | NR                             | 950               | 0                                    | NR                             |
| 435               | 339                                  | NR                             | 565               | 754                                  | NR                             | 695               | 188                                  | NR                             | 825               | 4                                    | NR                             | 955               | 0                                    | NR                             |
| 440               | 507                                  | NR                             | 570               | 791                                  | NR                             | 700               | 162                                  | NR                             | 830               | 3                                    | NR                             | 960               | 0                                    | NR                             |
| 445               | 573                                  | NR                             | 575               | 830                                  | NR                             | 705               | 139                                  | NR                             | 835               | 3                                    | NR                             | 965               | 0                                    | NR                             |
| 450               | 356                                  | NR                             | 580               | 873                                  | NR                             | 710               | 119                                  | NR                             | 840               | 3                                    | NR                             | 970               | 0                                    | NR                             |
| 455               | 217                                  | NR                             | 585               | 913                                  | NR                             | 715               | 102                                  | NR                             | 845               | 2                                    | NR                             | 975               | 0                                    | NR                             |
| 460               | 168                                  | NR                             | 590               | 948                                  | NR                             | 720               | 88                                   | NR                             | 850               | 2                                    | NR                             | 980               | 0                                    | NR                             |
| 465               | 113                                  | NR                             | 595               | 974                                  | NR                             | 725               | 76                                   | NR                             | 855               | 2                                    | NR                             | 985               | 0                                    | NR                             |
| 470               | 85                                   | NR                             | 600               | 994                                  | NR                             | 730               | 65                                   | NR                             | 860               | 1                                    | NR                             | 990               | 0                                    | NR                             |
| 475               | 85                                   | NR                             | 605               | 998                                  | NR                             | 735               | 55                                   | NR                             | 865               | 1                                    | NR                             | 995               | 0                                    | NR                             |
| 480               | 94                                   | NR                             | 610               | 994                                  | NR                             | 740               | 47                                   | NR                             | 870               | 1                                    | NR                             | 1000              | 0                                    | NR                             |
| 485               | 120                                  | NR                             | 615               | 973                                  | NR                             | 745               | 41                                   | NR                             | 875               | 1                                    | NR                             |                   |                                      |                                |

REPORT NUMBER: SP1-2408-195-9

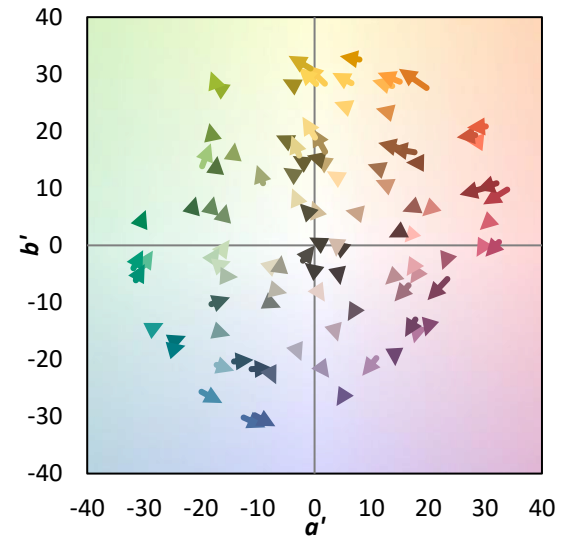
TM-30-18

### Summary

$R_f = 81.5$   
 $R_g = 99.2$   
 $CIE R_a = 81.0$   
 $R_9 = 7.1$



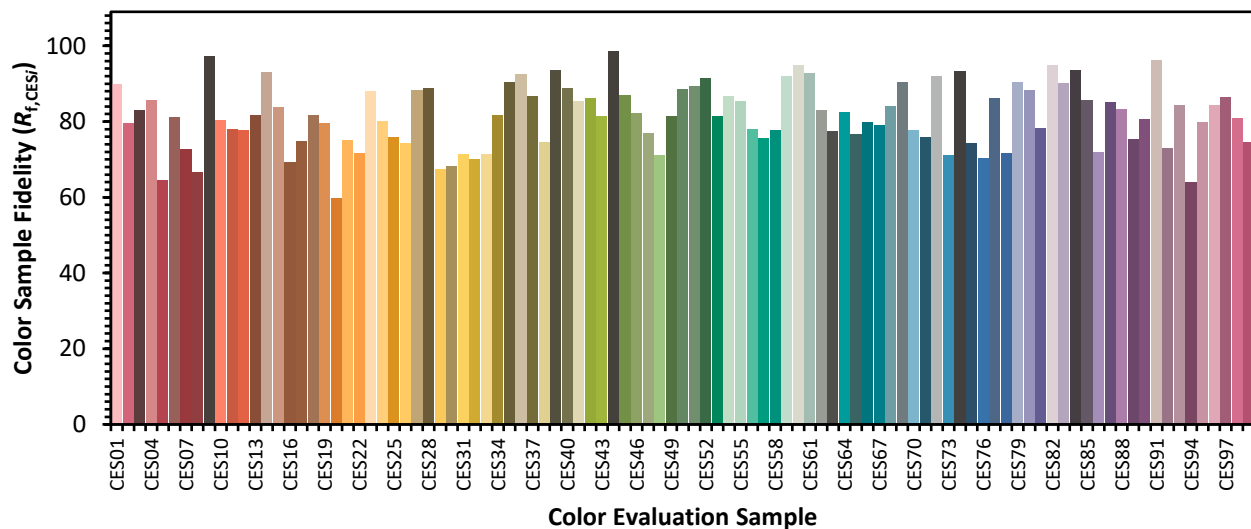
### Color Vector Graphics



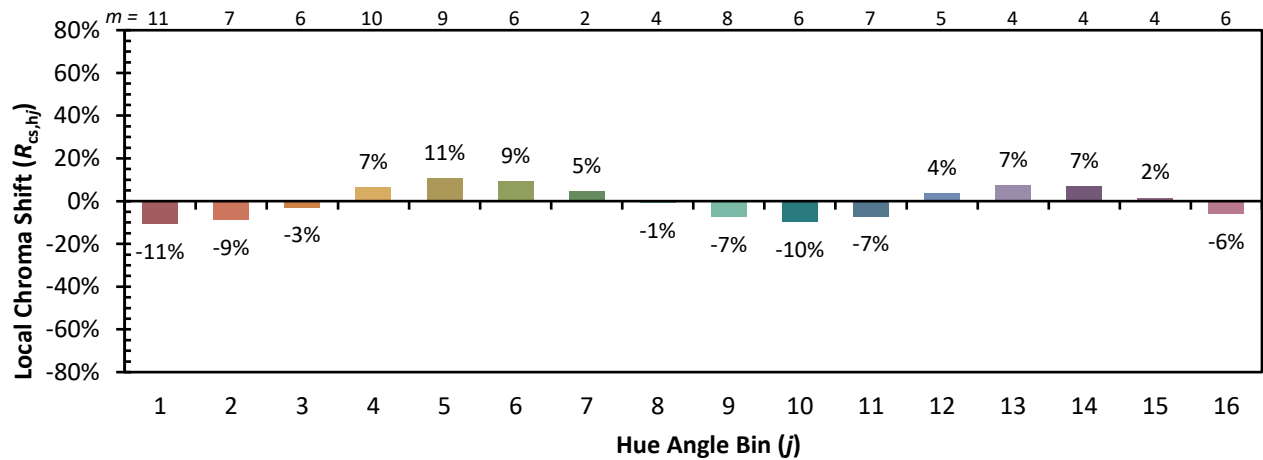


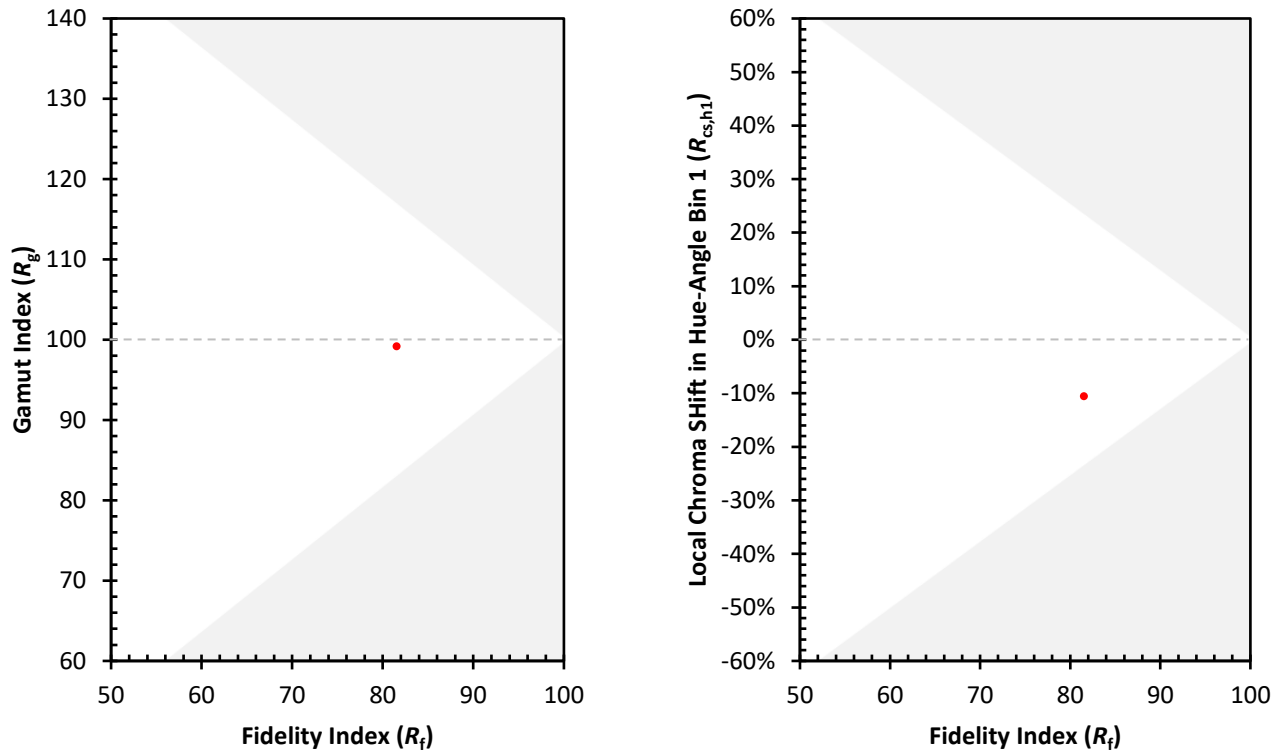
**Individual Sample Fidelity Index ( $R_{f,i}$ )**

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 74 | CES51 = 89 | CES76 = 70 |
| CES02 = 63 | CES27 = 88 | CES52 = 92 | CES77 = 86 |
| CES03 = 31 | CES28 = 89 | CES53 = 81 | CES78 = 72 |
| CES04 = 70 | CES29 = 67 | CES54 = 87 | CES79 = 90 |
| CES05 = 50 | CES30 = 68 | CES55 = 85 | CES80 = 88 |
| CES06 = 51 | CES31 = 71 | CES56 = 78 | CES81 = 78 |
| CES07 = 42 | CES32 = 70 | CES57 = 76 | CES82 = 95 |
| CES08 = 41 | CES33 = 71 | CES58 = 78 | CES83 = 90 |
| CES09 = 29 | CES34 = 82 | CES59 = 92 | CES84 = 94 |
| CES10 = 76 | CES35 = 90 | CES60 = 95 | CES85 = 86 |
| CES11 = 59 | CES36 = 93 | CES61 = 93 | CES86 = 72 |
| CES12 = 65 | CES37 = 87 | CES62 = 83 | CES87 = 85 |
| CES13 = 43 | CES38 = 75 | CES63 = 77 | CES88 = 83 |
| CES14 = 74 | CES39 = 94 | CES64 = 83 | CES89 = 75 |
| CES15 = 71 | CES40 = 89 | CES65 = 77 | CES90 = 81 |
| CES16 = 47 | CES41 = 85 | CES66 = 80 | CES91 = 96 |
| CES17 = 50 | CES42 = 86 | CES67 = 79 | CES92 = 73 |
| CES18 = 56 | CES43 = 81 | CES68 = 84 | CES93 = 84 |
| CES19 = 72 | CES44 = 99 | CES69 = 91 | CES94 = 64 |
| CES20 = 66 | CES45 = 87 | CES70 = 78 | CES95 = 80 |
| CES21 = 87 | CES46 = 82 | CES71 = 76 | CES96 = 84 |
| CES22 = 79 | CES47 = 77 | CES72 = 92 | CES97 = 87 |
| CES23 = 92 | CES48 = 71 | CES73 = 71 | CES98 = 81 |
| CES24 = 91 | CES49 = 81 | CES74 = 93 | CES99 = 74 |
| CES25 = 72 | CES50 = 89 | CES75 = 74 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**


(END OF REPORT)