

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: P318877

Luminaire Tested: **GLEON-SA3B-830-U-T4FT**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P318877  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-16)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA3B-830-U-T4FT  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(3) 80 CRI, 3000K, 800mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE IV  
FORWARD THROW OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 13947 lumens  
Efficiency: N/A  
Efficacy: 112.5 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 1' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B2 - U0 - G3

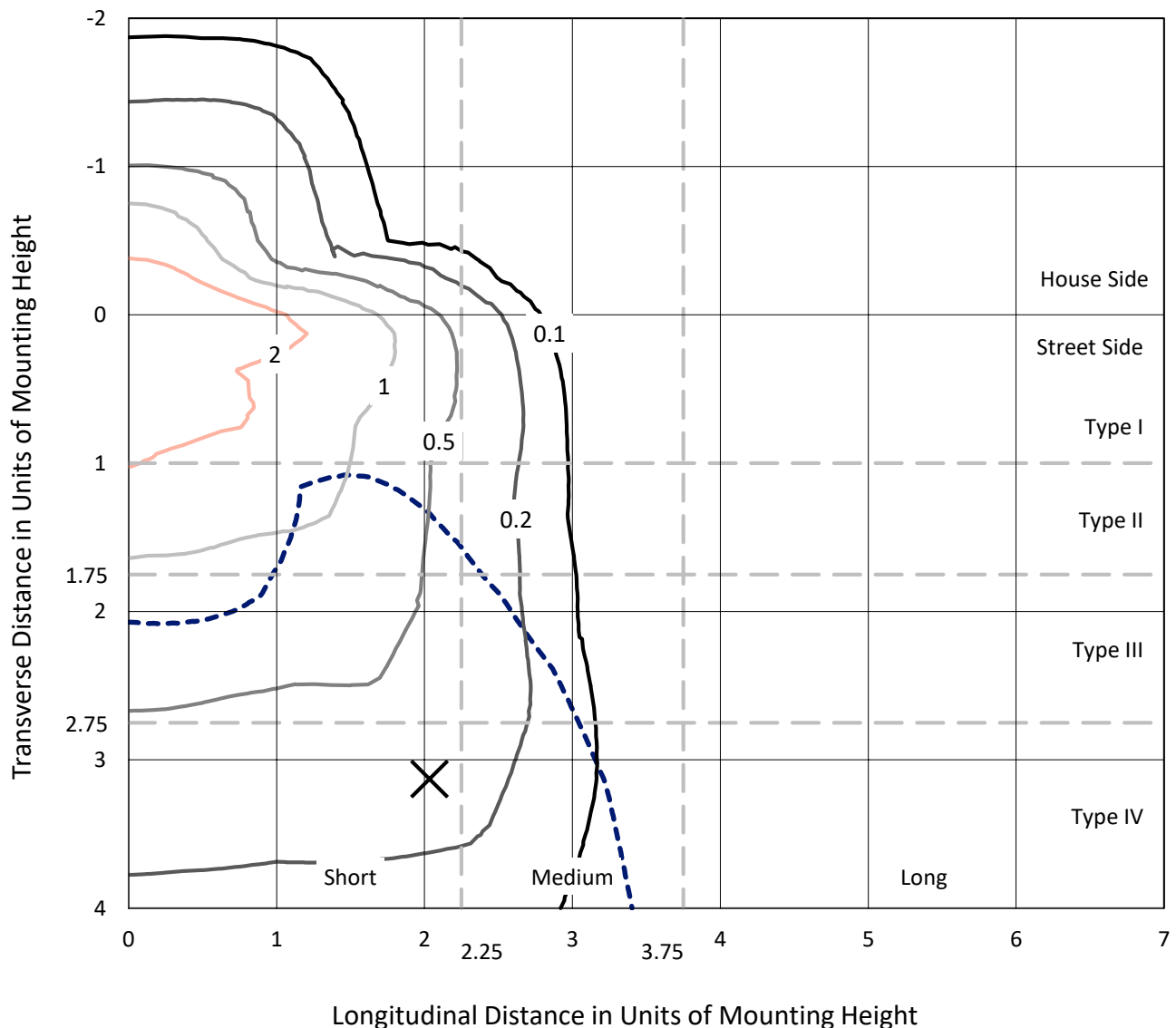
Input Watts (W): 124  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



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 CATALOG NUMBER: GLEON-SA3B-830-U-T4FT

## Iso-Footcandle Lines of Horizontal Illumination

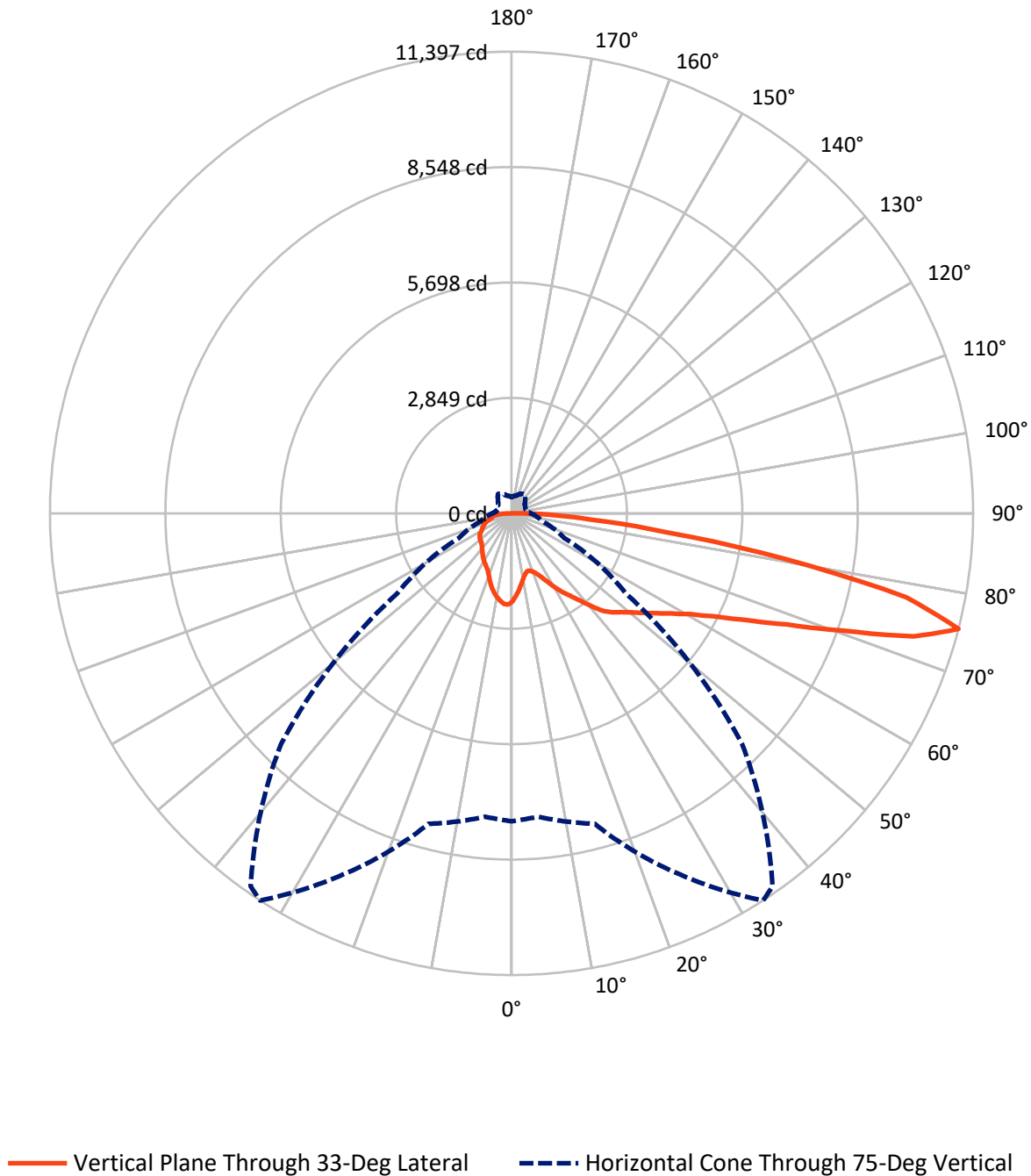
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 3.5 fc  
 Type IV - Short - N/A

REPORT NUMBER: P318877  
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## Luminous Intensity Polar Plot



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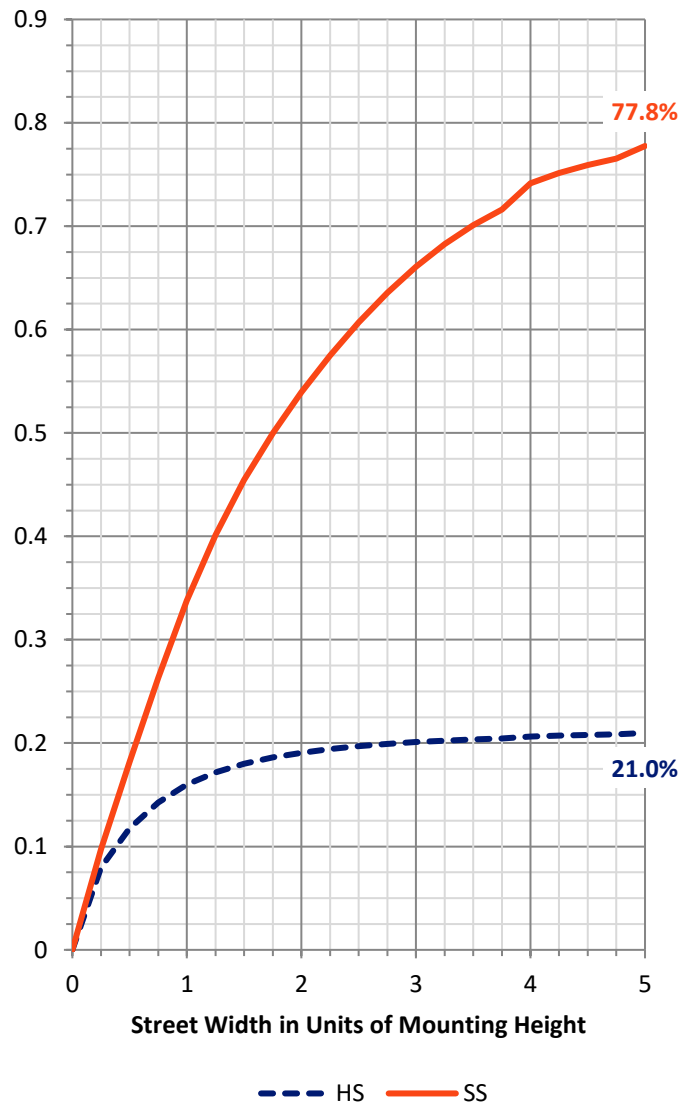
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 2994.8   | 0.0    | 2994.8  |
|                    | % Fixture | 21.5     | 0.0    | 21.5    |
| <b>Street Side</b> | Lumens    | 10952.2  | 0.0    | 10952.2 |
|                    | % Fixture | 78.5     | 0.0    | 78.5    |
| <b>Total</b>       | Lumens    | 13947.0  | 0.0    | 13947.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 197.2   | 1.4       |
| 10°-20°   | 534.0   | 3.8       |
| 20°-30°   | 872.1   | 6.3       |
| 30°-40°   | 1298.7  | 9.3       |
| 40°-50°   | 1862.7  | 13.4      |
| 50°-60°   | 2557.2  | 18.3      |
| 60°-70°   | 3201.5  | 23.0      |
| 70°-80°   | 2896.2  | 20.8      |
| 80°-90°   | 527.6   | 3.8       |
| 90°-100°  | 0.0     | 0.0       |
| 100°-110° | 0.0     | 0.0       |
| 110°-120° | 0.0     | 0.0       |
| 120°-130° | 0.0     | 0.0       |
| 130°-140° | 0.0     | 0.0       |
| 140°-150° | 0.0     | 0.0       |
| 150°-160° | 0.0     | 0.0       |
| 160°-170° | 0.0     | 0.0       |
| 170°-180° | 0.0     | 0.0       |
| 0°-90°    | 13947.0 | 100.0     |
| 0°-180°   | 13947.0 | 100.0     |

**Coefficient of Utilization**



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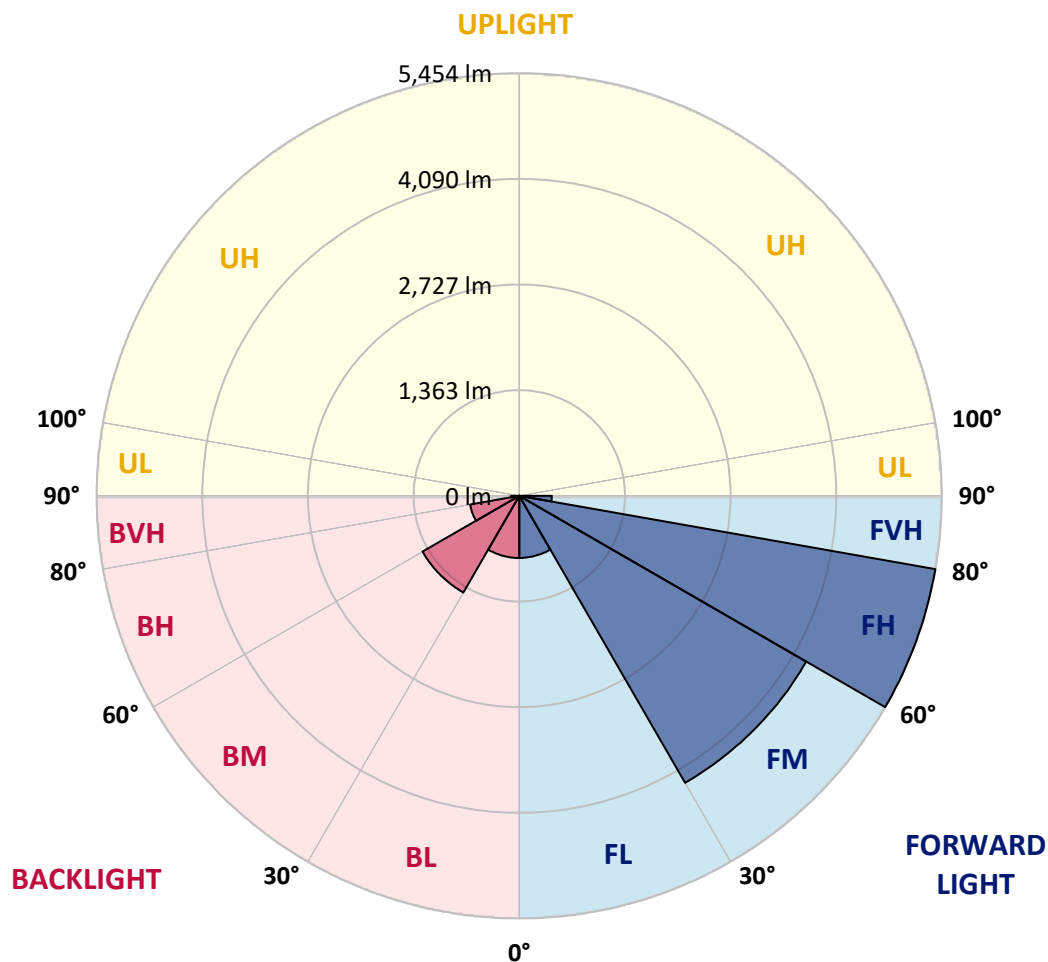
CATALOG NUMBER: GLEON-SA3B-830-U-T4FT

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 801.0  | 5.7       |                         |      |         |
| FM   | (30°-60°)   | 4277.3 | 30.7      |                         |      |         |
| FH   | (60°-80°)   | 5453.8 | 39.1      |                         |      | G3/7500 |
| FVH  | (80°-90°)   | 420.2  | 3.0       |                         |      | G3/500  |
| BL   | (0°-30°)    | 802.1  | 5.8       | B2/1000                 |      |         |
| BM   | (30°-60°)   | 1441.3 | 10.3      | B2/2500                 |      |         |
| BH   | (60°-80°)   | 643.9  | 4.6       | B2/1000                 |      | G2/1000 |
| BVH  | (80°-90°)   | 107.4  | 0.8       |                         |      | G2/225  |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B2-U0-G3**

Type IV Short





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CATALOG NUMBER: GLEON-SA3B-830-U-T4FT

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 33°     | 35°     | 45°    | 55°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|---------|---------|--------|--------|--------|--------|--------|
| 0°    | 2180.0 | 2180.0 | 2180.0 | 2180.0 | 2180.0  | 2180.0  | 2180.0 | 2180.0 | 2180.0 | 2180.0 | 2180.0 |
| 2.5°  | 2024.4 | 2016.7 | 2031.1 | 2033.1 | 2045.6  | 2050.4  | 2067.7 | 2094.7 | 2116.9 | 2142.4 | 2165.5 |
| 5°    | 1840.8 | 1835.5 | 1855.8 | 1870.2 | 1897.7  | 1909.2  | 1950.2 | 2007.5 | 2058.6 | 2116.4 | 2168.9 |
| 7.5°  | 1666.4 | 1663.5 | 1686.2 | 1718.9 | 1750.7  | 1766.6  | 1837.5 | 1920.8 | 2006.1 | 2099.5 | 2180.0 |
| 10°   | 1519.5 | 1518.5 | 1540.2 | 1572.5 | 1619.2  | 1637.0  | 1728.6 | 1838.4 | 1957.9 | 2086.5 | 2198.8 |
| 12.5° | 1437.1 | 1440.5 | 1450.6 | 1477.6 | 1520.9  | 1538.8  | 1640.4 | 1769.5 | 1917.4 | 2082.2 | 2226.2 |
| 15°   | 1457.3 | 1462.6 | 1445.3 | 1444.3 | 1475.2  | 1489.1  | 1584.5 | 1720.4 | 1888.5 | 2089.4 | 2266.2 |
| 17.5° | 1543.6 | 1544.5 | 1498.8 | 1469.9 | 1488.7  | 1495.9  | 1567.2 | 1692.4 | 1871.7 | 2105.8 | 2316.3 |
| 20°   | 1665.0 | 1662.6 | 1581.6 | 1533.5 | 1543.6  | 1545.5  | 1591.8 | 1692.9 | 1870.2 | 2134.2 | 2381.4 |
| 22.5° | 1825.9 | 1808.1 | 1699.2 | 1633.7 | 1631.3  | 1628.4  | 1654.9 | 1728.6 | 1891.4 | 2180.5 | 2458.9 |
| 25°   | 2035.9 | 2019.1 | 1869.3 | 1779.6 | 1760.4  | 1753.1  | 1757.0 | 1804.7 | 1933.3 | 2230.1 | 2545.7 |
| 27.5° | 2269.6 | 2240.2 | 2095.7 | 1969.0 | 1929.0  | 1918.9  | 1895.8 | 1912.1 | 1979.1 | 2277.8 | 2648.8 |
| 30°   | 2465.2 | 2449.3 | 2323.1 | 2172.8 | 2125.6  | 2111.1  | 2050.4 | 2032.6 | 2045.1 | 2342.8 | 2778.8 |
| 32.5° | 2574.6 | 2564.0 | 2487.4 | 2366.0 | 2322.1  | 2301.9  | 2216.1 | 2180.5 | 2151.1 | 2445.4 | 2955.2 |
| 35°   | 2707.0 | 2700.3 | 2654.1 | 2565.9 | 2500.9  | 2479.7  | 2413.2 | 2376.1 | 2300.4 | 2586.6 | 3183.0 |
| 37.5° | 2875.7 | 2868.4 | 2869.4 | 2798.1 | 2720.5  | 2700.8  | 2656.9 | 2617.9 | 2494.1 | 2772.1 | 3430.7 |
| 40°   | 3066.4 | 3052.5 | 3047.2 | 3043.8 | 2994.7  | 2983.6  | 2960.5 | 2907.5 | 2736.9 | 2993.7 | 3674.9 |
| 42.5° | 3353.6 | 3304.0 | 3198.0 | 3238.0 | 3286.6  | 3280.8  | 3299.6 | 3223.5 | 3006.7 | 3255.8 | 3913.4 |
| 45°   | 3630.6 | 3549.2 | 3366.1 | 3374.8 | 3481.2  | 3513.5  | 3654.2 | 3600.2 | 3299.1 | 3542.9 | 4160.1 |
| 47.5° | 3756.8 | 3695.2 | 3539.5 | 3540.0 | 3645.5  | 3712.5  | 4020.8 | 3982.3 | 3606.5 | 3869.1 | 4461.2 |
| 50°   | 3898.0 | 3836.3 | 3696.6 | 3749.1 | 3841.1  | 3912.4  | 4374.9 | 4355.2 | 3898.9 | 4226.1 | 4822.0 |
| 52.5° | 4052.1 | 3947.6 | 3859.0 | 3952.9 | 4082.0  | 4164.9  | 4729.5 | 4675.5 | 4167.3 | 4585.5 | 5236.8 |
| 55°   | 4054.1 | 4025.6 | 4093.1 | 4162.0 | 4355.2  | 4456.8  | 5100.9 | 4958.3 | 4386.0 | 4938.6 | 5574.5 |
| 57.5° | 4284.8 | 4238.6 | 4381.7 | 4413.5 | 4665.9  | 4780.6  | 5470.5 | 5204.5 | 4608.6 | 5209.3 | 5756.6 |
| 60°   | 4590.3 | 4550.8 | 4667.8 | 4751.7 | 5050.4  | 5203.6  | 5865.0 | 5457.5 | 4783.5 | 5413.6 | 5748.0 |
| 62.5° | 5117.8 | 5073.0 | 5071.6 | 5189.1 | 5591.4  | 5769.6  | 6307.8 | 5705.6 | 4852.8 | 5454.1 | 5502.7 |
| 65°   | 5890.1 | 5818.8 | 5684.4 | 5740.3 | 6338.6  | 6516.4  | 6802.5 | 5885.3 | 4761.3 | 5237.3 | 4871.1 |
| 67.5° | 6641.6 | 6639.2 | 6474.0 | 6588.6 | 7325.3  | 7467.9  | 7366.2 | 5903.1 | 4475.6 | 4482.4 | 3750.6 |
| 70°   | 7390.8 | 7400.4 | 7372.5 | 7771.4 | 8658.3  | 8806.7  | 7966.5 | 5663.6 | 3833.4 | 3237.0 | 2247.0 |
| 72.5° | 7984.3 | 7981.9 | 8122.6 | 9151.2 | 10388.3 | 10355.1 | 8472.3 | 4938.1 | 2752.3 | 1747.4 | 1073.9 |
| 75°   | 7599.9 | 7516.0 | 7935.2 | 9834.3 | 11396.7 | 11234.3 | 8042.1 | 3444.6 | 1428.4 | 795.4  | 578.1  |
| 77.5° | 4956.9 | 5036.4 | 5651.6 | 8124.0 | 9968.7  | 9771.2  | 5900.2 | 1607.2 | 673.0  | 521.8  | 419.1  |
| 80°   | 1795.1 | 1878.9 | 2646.3 | 4601.8 | 6868.1  | 6835.8  | 2905.5 | 660.5  | 455.3  | 394.1  | 305.4  |
| 82.5° | 617.6  | 648.5  | 1044.0 | 2043.7 | 3877.7  | 4022.3  | 1093.1 | 375.3  | 331.0  | 279.4  | 209.1  |
| 85°   | 242.3  | 277.5  | 477.4  | 983.3  | 1956.0  | 1970.4  | 442.7  | 224.5  | 230.3  | 183.1  | 114.7  |
| 87.5° | 92.0   | 111.8  | 228.4  | 456.7  | 893.2   | 820.4   | 158.5  | 107.0  | 131.0  | 108.9  | 54.4   |
| 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: P318877

CATALOG NUMBER: GLEON-SA3B-830-U-T4FT

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 2180.0 | 2180.0 | 2180.0 | 2180.0 | 2180.0 | 2180.0 | 2180.0 | 2180.0 | 2180.0 | 2180.0 | 2180.0 |
| 2.5°  | 2183.4 | 2193.5 | 2214.7 | 2229.1 | 2244.6 | 2248.9 | 2250.8 | 2254.7 | 2258.5 | 2257.1 | 2257.6 |
| 5°    | 2196.9 | 2216.6 | 2250.8 | 2265.3 | 2272.0 | 2264.3 | 2249.4 | 2237.3 | 2228.7 | 2223.8 | 2222.4 |
| 7.5°  | 2219.0 | 2247.0 | 2283.6 | 2281.2 | 2265.7 | 2231.5 | 2193.0 | 2164.1 | 2140.0 | 2131.3 | 2126.5 |
| 10°   | 2248.4 | 2281.2 | 2306.7 | 2279.2 | 2234.4 | 2175.2 | 2117.4 | 2072.6 | 2036.4 | 2022.5 | 2020.0 |
| 12.5° | 2286.0 | 2319.2 | 2324.0 | 2265.7 | 2191.6 | 2110.6 | 2032.1 | 1972.8 | 1918.9 | 1901.5 | 1897.7 |
| 15°   | 2334.6 | 2366.0 | 2336.1 | 2242.1 | 2138.6 | 2029.7 | 1928.0 | 1847.6 | 1790.7 | 1769.5 | 1761.8 |
| 17.5° | 2385.7 | 2415.6 | 2338.5 | 2203.1 | 2069.2 | 1933.8 | 1806.1 | 1723.8 | 1658.7 | 1634.2 | 1631.3 |
| 20°   | 2446.9 | 2460.4 | 2328.4 | 2147.2 | 1973.8 | 1809.5 | 1675.1 | 1597.5 | 1562.9 | 1545.5 | 1543.6 |
| 22.5° | 2522.5 | 2508.1 | 2305.3 | 2071.6 | 1852.9 | 1665.9 | 1556.6 | 1520.5 | 1511.8 | 1507.9 | 1509.4 |
| 25°   | 2602.5 | 2558.2 | 2271.0 | 1972.8 | 1700.2 | 1522.4 | 1469.9 | 1480.0 | 1491.5 | 1490.1 | 1490.1 |
| 27.5° | 2690.7 | 2609.2 | 2218.5 | 1841.8 | 1531.1 | 1404.8 | 1411.1 | 1448.2 | 1465.5 | 1465.1 | 1464.6 |
| 30°   | 2803.9 | 2667.1 | 2151.6 | 1684.3 | 1373.0 | 1322.0 | 1360.0 | 1405.3 | 1428.9 | 1428.0 | 1428.4 |
| 32.5° | 2943.1 | 2730.7 | 2060.5 | 1508.4 | 1258.9 | 1260.8 | 1304.6 | 1349.4 | 1376.9 | 1374.5 | 1375.0 |
| 35°   | 3105.9 | 2802.0 | 1937.2 | 1335.0 | 1183.2 | 1212.1 | 1246.8 | 1278.1 | 1304.1 | 1300.8 | 1297.4 |
| 37.5° | 3283.2 | 2871.8 | 1773.4 | 1179.8 | 1121.6 | 1166.8 | 1195.7 | 1201.0 | 1213.1 | 1204.4 | 1198.2 |
| 40°   | 3451.9 | 2925.3 | 1562.4 | 1052.7 | 1059.4 | 1128.3 | 1147.1 | 1125.9 | 1104.2 | 1101.3 | 1092.6 |
| 42.5° | 3598.8 | 2943.1 | 1348.9 | 951.0  | 993.9  | 1087.8 | 1099.4 | 1055.1 | 1016.0 | 997.7  | 990.0  |
| 45°   | 3753.9 | 2949.4 | 1150.0 | 865.7  | 930.8  | 1051.7 | 1064.2 | 1005.0 | 950.0  | 910.5  | 897.5  |
| 47.5° | 3956.7 | 2994.7 | 995.3  | 802.6  | 882.6  | 1027.6 | 1045.4 | 965.0  | 893.7  | 837.3  | 825.3  |
| 50°   | 4222.2 | 3084.3 | 869.6  | 754.4  | 851.3  | 1011.7 | 1031.9 | 926.0  | 847.4  | 779.5  | 767.5  |
| 52.5° | 4517.0 | 3166.7 | 767.9  | 715.4  | 820.9  | 983.8  | 1014.6 | 898.0  | 804.1  | 726.0  | 713.0  |
| 55°   | 4723.2 | 3103.5 | 686.0  | 675.0  | 781.4  | 943.8  | 990.5  | 874.4  | 741.9  | 674.0  | 662.4  |
| 57.5° | 4762.7 | 2887.7 | 623.9  | 633.0  | 733.7  | 893.7  | 953.4  | 821.9  | 708.2  | 651.3  | 639.3  |
| 60°   | 4654.8 | 2587.1 | 577.6  | 594.5  | 682.7  | 830.6  | 884.0  | 784.8  | 675.9  | 627.3  | 617.1  |
| 62.5° | 4383.6 | 2279.2 | 543.4  | 559.8  | 635.0  | 766.5  | 840.7  | 745.8  | 643.2  | 599.8  | 589.7  |
| 65°   | 3835.8 | 1913.6 | 510.7  | 529.0  | 590.6  | 711.1  | 801.7  | 709.6  | 610.9  | 577.6  | 568.0  |
| 67.5° | 2895.4 | 1433.3 | 479.8  | 496.2  | 551.1  | 662.9  | 759.3  | 674.0  | 579.6  | 558.4  | 546.8  |
| 70°   | 1705.0 | 897.5  | 444.7  | 462.0  | 509.7  | 612.8  | 714.0  | 635.0  | 540.5  | 530.9  | 516.0  |
| 72.5° | 793.5  | 540.1  | 404.7  | 421.5  | 457.7  | 545.8  | 655.7  | 583.9  | 494.3  | 473.1  | 452.9  |
| 75°   | 473.6  | 395.0  | 357.5  | 372.4  | 397.9  | 474.5  | 582.5  | 531.9  | 450.5  | 422.5  | 401.3  |
| 77.5° | 354.1  | 302.1  | 305.4  | 321.3  | 342.1  | 415.3  | 516.0  | 490.9  | 416.7  | 395.0  | 380.6  |
| 80°   | 254.9  | 229.3  | 249.1  | 266.4  | 288.1  | 377.7  | 494.3  | 453.8  | 376.7  | 347.8  | 334.3  |
| 82.5° | 170.1  | 164.8  | 187.4  | 205.2  | 226.4  | 330.5  | 464.4  | 397.5  | 321.8  | 285.2  | 255.3  |
| 85°   | 93.9   | 99.2   | 126.2  | 133.9  | 152.2  | 232.7  | 380.6  | 319.4  | 242.3  | 195.1  | 186.4  |
| 87.5° | 39.0   | 45.8   | 67.9   | 65.5   | 80.9   | 138.7  | 250.5  | 192.7  | 154.2  | 115.1  | 89.6   |
| 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

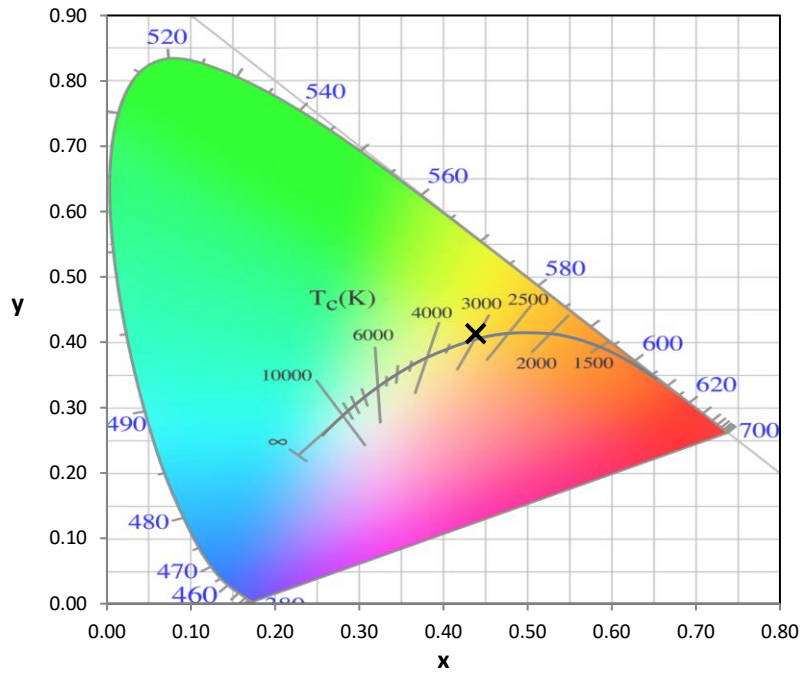
Stabilization Time: 20M  
 Operation Time: 1H 20M  
 Sphere Temperature (°C): 24.2

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                             |                   |                                        |                                |

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### Scotopic Flux vs. Wavelength



Scotopic Lumens: NR

S/P: 1.27

| $\lambda$<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                             |                   |                                      |                                |

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**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                             |                   |                                      |                                |

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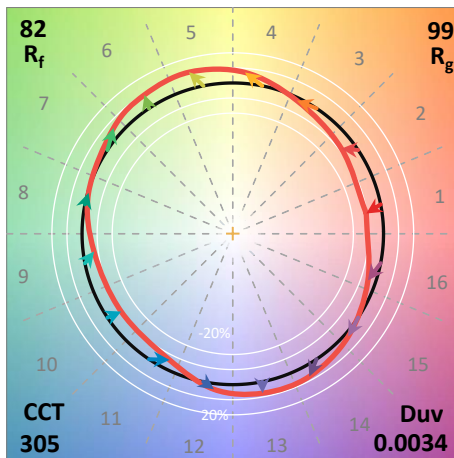
TM-30-18

### Summary

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



### Color Vector Graphics



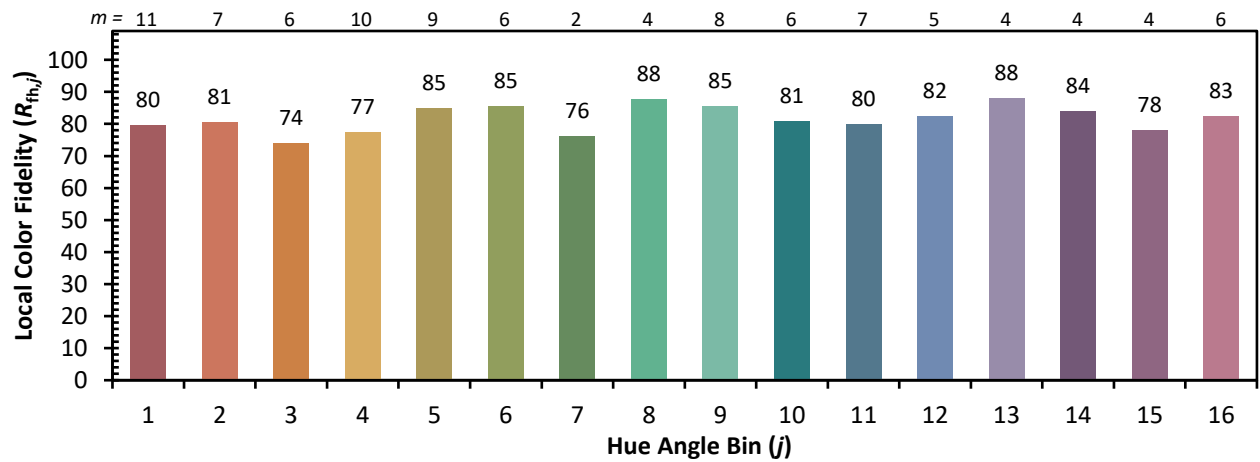
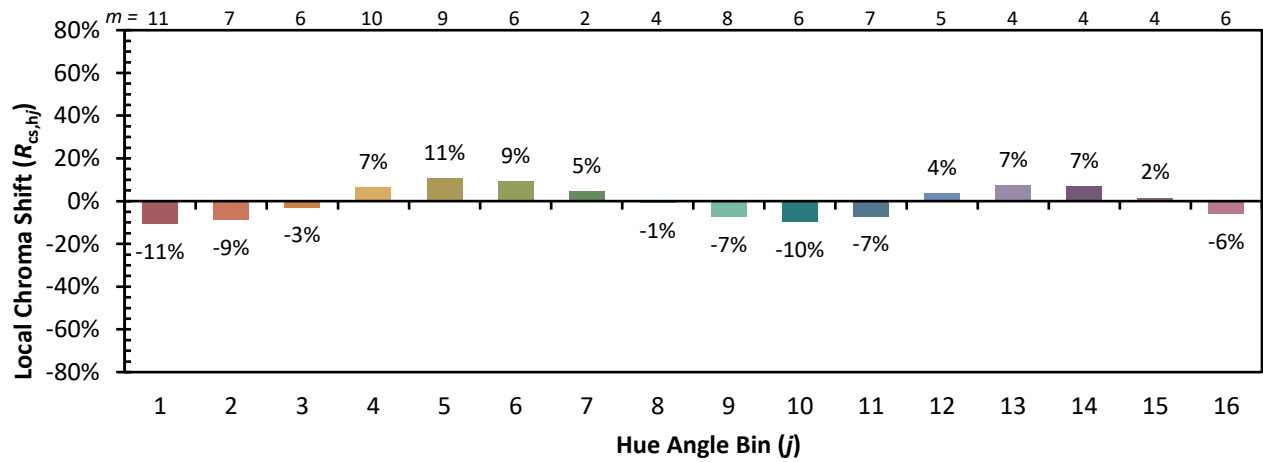


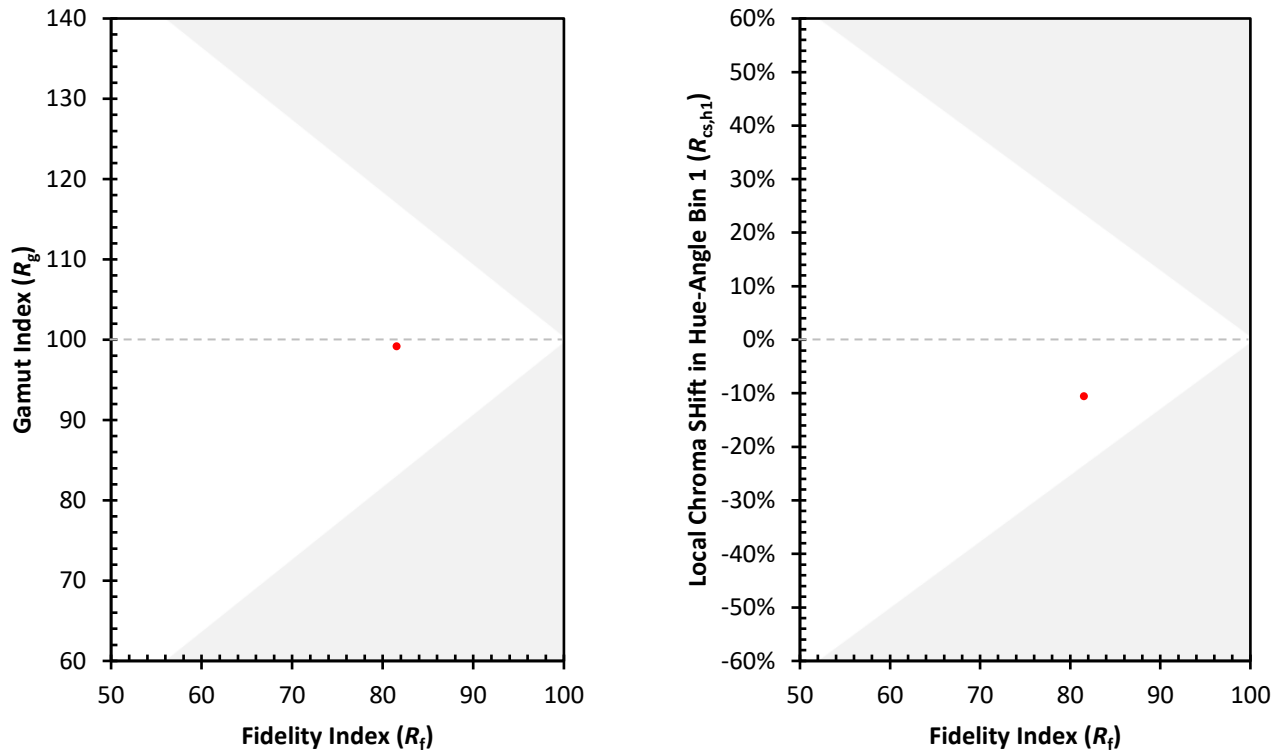
**Individual Sample Fidelity Index ( $R_{f,i}$ )**

|            |            |            |            |
|------------|------------|------------|------------|
| 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)