

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: P318260

Luminaire Tested: **GLEON-SA6D-830-U-T2**

Issue Date: 3/3/2020

### Test Information

Test Method: LM-79-08  
Report Number: P318260  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-12)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA6D-830-U-T2  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(6) 80 CRI, 3000K, 1200mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE II OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

### Summary

Lumens per Lamp: N/A  
Luminaire Lumens: 36189 lumens  
Efficiency: N/A  
Efficacy: 94.7 lumens/watt  
Luminous Opening: Rectangular (W 1.5' x L: 1' x H: 0')  
IES Classification: Type III - Medium  
BUG Rating: B3 - U0 - G5

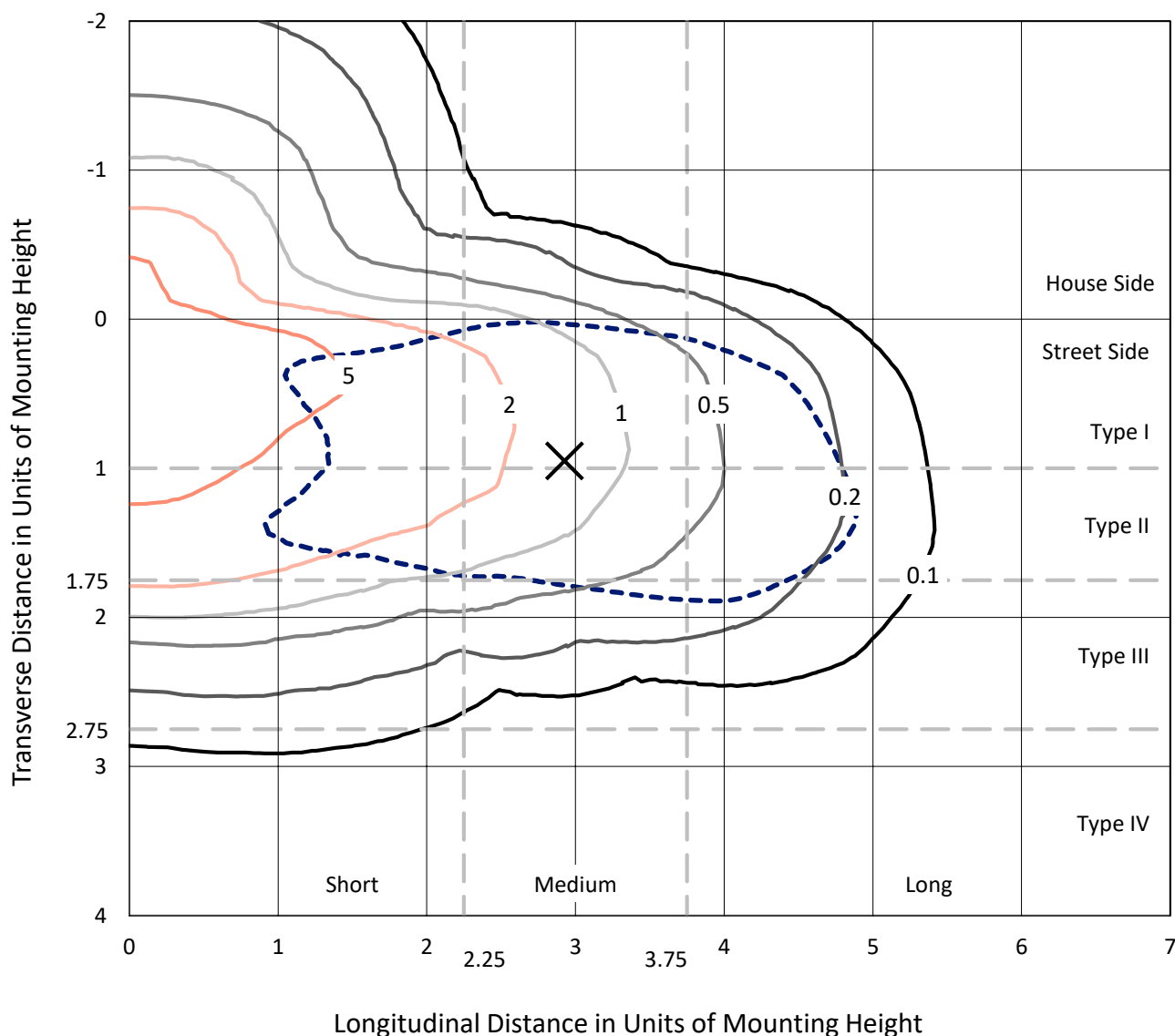
Input Watts (W): 382  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



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## Iso-Footcandle Lines of Horizontal Illumination

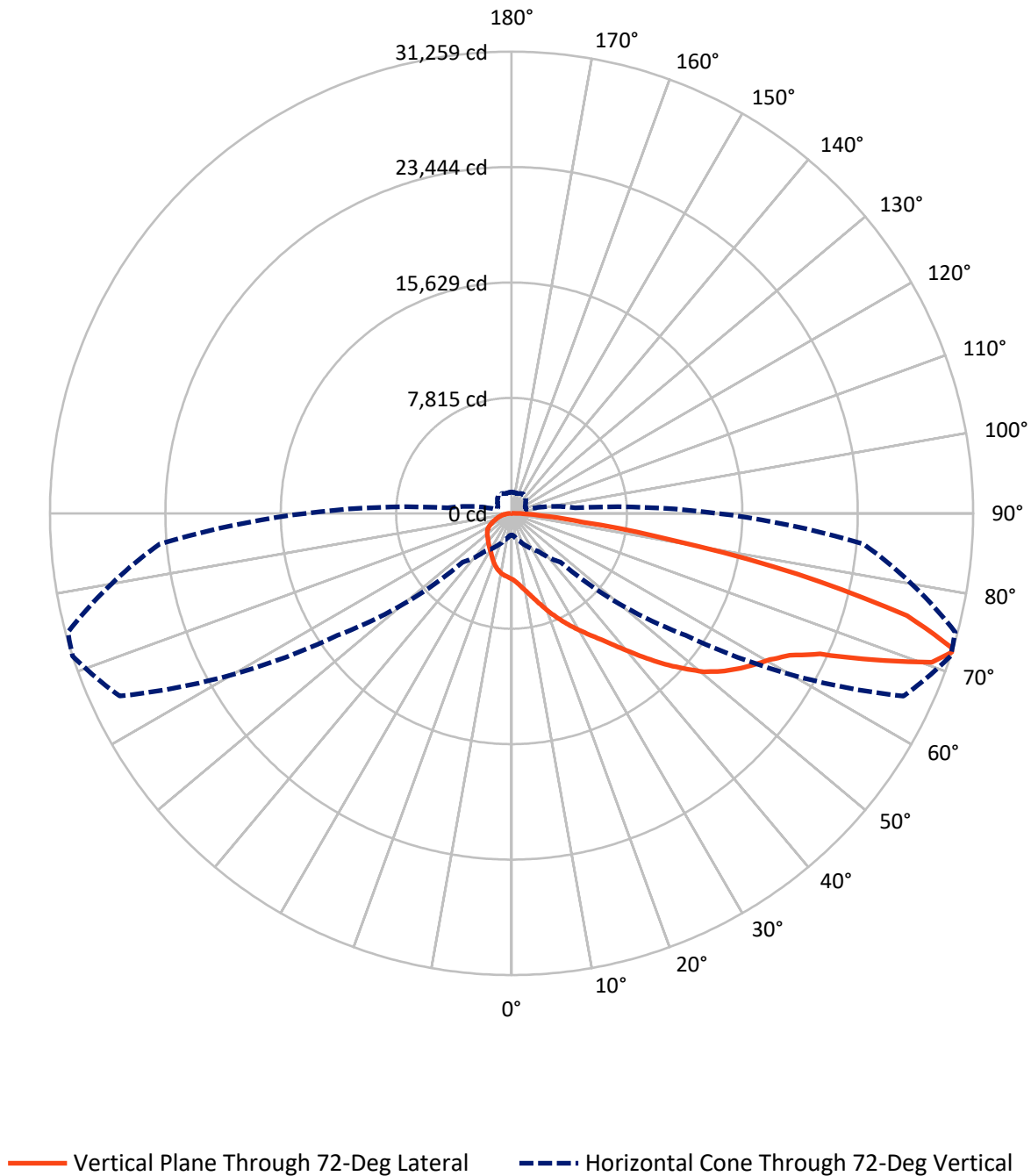
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 9.8 fc  
 Type III - Medium - N/A

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## Luminous Intensity Polar Plot



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CATALOG NUMBER: GLEON-SA6D-830-U-T2

**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 6713.3   | 0.0    | 6713.3  |
|                    | % Fixture | 18.6     | 0.0    | 18.6    |
| <b>Street Side</b> | Lumens    | 29475.7  | 0.0    | 29475.7 |
|                    | % Fixture | 81.4     | 0.0    | 81.4    |
| <b>Total</b>       | Lumens    | 36189.0  | 0.0    | 36189.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 446.1   | 1.2       |
| 10°-20°   | 1441.7  | 4.0       |
| 20°-30°   | 2526.2  | 7.0       |
| 30°-40°   | 3745.6  | 10.4      |
| 40°-50°   | 5478.2  | 15.1      |
| 50°-60°   | 7538.0  | 20.8      |
| 60°-70°   | 8392.1  | 23.2      |
| 70°-80°   | 5686.5  | 15.7      |
| 80°-90°   | 934.6   | 2.6       |
| 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°    | 36189.0 | 100.0     |
| 0°-180°   | 36189.0 | 100.0     |

**Coefficient of Utilization**



REPORT NUMBER: P318260

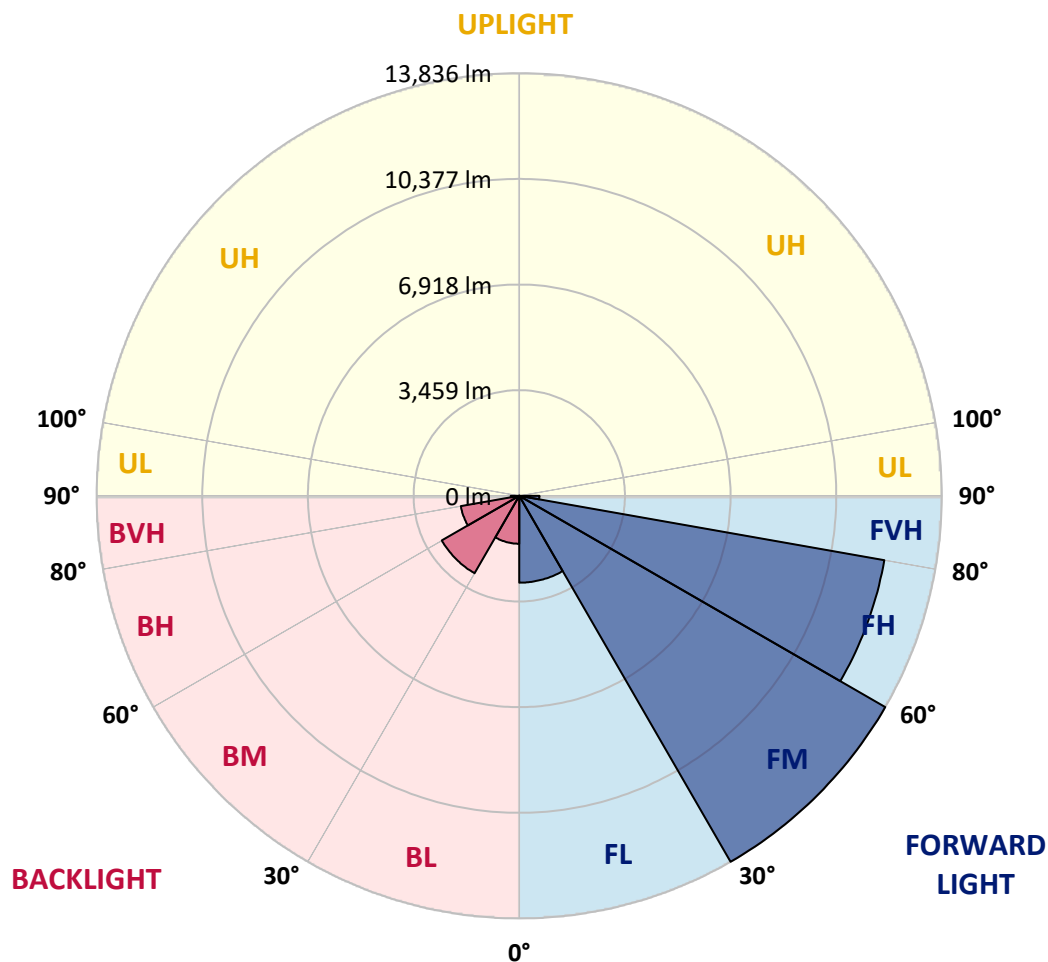
CATALOG NUMBER: GLEON-SA6D-830-U-T2

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|---------|-----------|-------------------------|------|---------|
|      |             |         |           | B                       | U    | G       |
| FL   | (0°-30°)    | 2844.7  | 7.9       |                         |      |         |
| FM   | (30°-60°)   | 13835.5 | 38.2      |                         |      |         |
| FH   | (60°-80°)   | 12136.3 | 33.5      |                         |      | G5      |
| FVH  | (80°-90°)   | 659.3   | 1.8       |                         |      | G4/750  |
| BL   | (0°-30°)    | 1569.3  | 4.3       | B3/2500                 |      |         |
| BM   | (30°-60°)   | 2926.4  | 8.1       | B3/5000                 |      |         |
| BH   | (60°-80°)   | 1942.2  | 5.4       | B3/2500                 |      | G3/2500 |
| BVH  | (80°-90°)   | 275.4   | 0.8       |                         |      | G3/500  |
| UL   | (90°-100°)  | 0.0     | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0     | 0.0       |                         | U0/0 |         |

**BUG Rating: B3-U0-G5**

Type III Medium





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 55°     | 65°     | 72°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 4452.2  | 4452.2  | 4452.2  | 4452.2  | 4452.2  | 4452.2  | 4452.2  | 4452.2  | 4452.2  | 4452.2  | 4452.2  |
| 2.5°  | 4918.2  | 4910.7  | 4884.6  | 4884.6  | 4834.7  | 4792.4  | 4712.6  | 4659.0  | 4595.5  | 4573.1  | 4498.3  |
| 5°    | 5394.2  | 5396.7  | 5364.3  | 5341.9  | 5268.4  | 5178.6  | 5042.8  | 4919.5  | 4796.1  | 4746.3  | 4593.0  |
| 7.5°  | 5794.2  | 5789.2  | 5780.5  | 5761.8  | 5693.3  | 5601.1  | 5417.9  | 5234.7  | 5052.8  | 4978.0  | 4713.9  |
| 10°   | 6050.9  | 6062.1  | 6069.6  | 6078.3  | 6049.6  | 5983.6  | 5810.4  | 5587.4  | 5349.4  | 5247.2  | 4858.4  |
| 12.5° | 6180.5  | 6200.4  | 6235.3  | 6295.1  | 6342.5  | 6335.0  | 6209.1  | 5972.4  | 5689.5  | 5561.2  | 5039.1  |
| 15°   | 6256.5  | 6282.7  | 6337.5  | 6444.6  | 6578.0  | 6654.0  | 6620.3  | 6406.0  | 6090.8  | 5932.5  | 5259.6  |
| 17.5° | 6303.8  | 6325.0  | 6409.8  | 6553.1  | 6751.2  | 6953.0  | 7041.5  | 6862.1  | 6544.3  | 6363.7  | 5512.6  |
| 20°   | 6336.2  | 6352.4  | 6458.4  | 6626.6  | 6883.3  | 7204.7  | 7451.5  | 7406.6  | 7044.0  | 6809.7  | 5776.8  |
| 22.5° | 6408.5  | 6422.2  | 6523.2  | 6692.6  | 6976.7  | 7391.7  | 7846.5  | 7913.8  | 7571.1  | 7305.7  | 6059.6  |
| 25°   | 6610.4  | 6610.4  | 6695.1  | 6813.5  | 7080.1  | 7553.6  | 8180.4  | 8478.2  | 8109.4  | 7800.4  | 6321.3  |
| 27.5° | 6995.4  | 6991.7  | 7022.8  | 7063.9  | 7265.8  | 7718.1  | 8478.2  | 8976.7  | 8667.6  | 8329.9  | 6575.5  |
| 30°   | 7451.5  | 7476.4  | 7480.1  | 7460.2  | 7554.9  | 7923.7  | 8753.6  | 9502.5  | 9229.6  | 8865.8  | 6835.9  |
| 32.5° | 8038.4  | 8054.6  | 8035.9  | 7969.8  | 7956.1  | 8215.3  | 9024.0  | 10053.3 | 9837.7  | 9425.2  | 7073.9  |
| 35°   | 8783.5  | 8752.4  | 8693.8  | 8559.2  | 8430.9  | 8605.3  | 9333.0  | 10604.0 | 10520.5 | 10101.9 | 7401.6  |
| 37.5° | 9582.2  | 9583.5  | 9511.2  | 9205.9  | 9029.0  | 9103.8  | 9759.2  | 11228.3 | 11346.7 | 10906.8 | 7821.6  |
| 40°   | 10222.7 | 10256.4 | 10301.2 | 9900.0  | 9670.7  | 9774.1  | 10301.2 | 11952.3 | 12323.6 | 11861.3 | 8368.6  |
| 42.5° | 10670.1 | 10708.7 | 10835.8 | 10584.1 | 10346.1 | 10538.0 | 10939.2 | 12724.8 | 13420.1 | 12962.8 | 9009.1  |
| 45°   | 11143.6 | 11164.7 | 11254.5 | 11146.1 | 10994.0 | 11426.4 | 11658.2 | 13524.8 | 14580.2 | 14136.6 | 9725.5  |
| 47.5° | 11642.0 | 11664.4 | 11756.6 | 11684.4 | 11604.6 | 12256.3 | 12408.3 | 14278.7 | 15691.7 | 15426.3 | 10490.6 |
| 50°   | 12257.5 | 12272.5 | 12359.7 | 12228.9 | 12253.8 | 12881.8 | 13078.7 | 14970.2 | 16856.8 | 16585.1 | 11258.2 |
| 52.5° | 13097.4 | 13101.1 | 13222.0 | 13103.6 | 12986.5 | 13340.4 | 13655.6 | 15621.9 | 17770.1 | 17641.8 | 12025.8 |
| 55°   | 13755.3 | 13795.2 | 14191.4 | 14166.5 | 14099.2 | 13756.6 | 14137.9 | 16242.5 | 18585.1 | 18646.1 | 12840.7 |
| 57.5° | 13335.4 | 13491.1 | 14293.6 | 14859.3 | 15410.1 | 14792.0 | 14789.5 | 16941.5 | 19342.7 | 19631.8 | 13736.6 |
| 60°   | 11679.4 | 11891.2 | 13073.7 | 14328.5 | 16051.8 | 16593.9 | 16142.8 | 17795.1 | 20107.8 | 20608.7 | 14859.3 |
| 62.5° | 8341.2  | 8690.1  | 10292.5 | 12296.2 | 15172.1 | 17787.6 | 18896.6 | 19149.5 | 21148.2 | 21740.1 | 16318.5 |
| 65°   | 4216.7  | 4480.9  | 5824.1  | 8237.7  | 12121.7 | 17007.5 | 21889.6 | 22115.2 | 22956.3 | 23482.1 | 18565.1 |
| 67.5° | 2561.9  | 2661.6  | 3317.0  | 4581.8  | 7431.5  | 13248.2 | 22866.5 | 27058.3 | 26455.2 | 26734.3 | 21768.8 |
| 70°   | 1887.8  | 1961.3  | 2370.0  | 3042.9  | 4274.0  | 7774.2  | 19868.5 | 30585.9 | 30189.7 | 30158.5 | 24136.3 |
| 72°   | 1470.4  | 1523.9  | 1885.3  | 2458.5  | 3125.1  | 4664.0  | 14400.8 | 29283.8 | 31258.8 | 31101.8 | 23919.5 |
| 72.5° | 1394.3  | 1441.7  | 1770.7  | 2313.9  | 2953.2  | 4227.9  | 12947.9 | 28405.3 | 31181.5 | 31110.5 | 23639.1 |
| 75°   | 1097.8  | 1131.4  | 1310.9  | 1789.3  | 2311.5  | 2398.7  | 7095.1  | 22013.0 | 27661.4 | 28811.5 | 21261.6 |
| 77.5° | 908.4   | 913.4   | 1008.1  | 1302.1  | 1801.8  | 1695.9  | 3485.2  | 15273.0 | 19807.5 | 21072.2 | 15061.2 |
| 80°   | 740.2   | 746.4   | 791.3   | 913.4   | 1363.2  | 1254.8  | 1654.8  | 8782.3  | 11090.0 | 11103.7 | 7162.4  |
| 82.5° | 589.4   | 590.6   | 640.5   | 667.9   | 979.4   | 897.2   | 948.3   | 4123.2  | 4845.9  | 4661.5  | 2574.4  |
| 85°   | 414.9   | 406.2   | 625.5   | 548.3   | 640.5   | 575.7   | 523.3   | 1632.3  | 2003.7  | 1916.4  | 806.2   |
| 87.5° | 138.3   | 143.3   | 277.9   | 355.1   | 373.8   | 326.5   | 233.0   | 625.5   | 756.4   | 750.1   | 255.4   |
| 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: P318260

CATALOG NUMBER: GLEON-SA6D-830-U-T2

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 4452.2  | 4452.2 | 4452.2 | 4452.2 | 4452.2 | 4452.2 | 4452.2 | 4452.2 | 4452.2 | 4452.2 | 4452.2 |
| 2.5°  | 4474.6  | 4434.7 | 4376.2 | 4311.4 | 4260.3 | 4208.0 | 4169.3 | 4149.4 | 4127.0 | 4108.3 | 4130.7 |
| 5°    | 4522.0  | 4447.2 | 4322.6 | 4200.5 | 4110.8 | 4031.0 | 3973.7 | 3943.8 | 3916.4 | 3897.7 | 3900.2 |
| 7.5°  | 4599.2  | 4478.4 | 4269.0 | 4090.8 | 3966.2 | 3880.2 | 3821.7 | 3801.7 | 3784.3 | 3779.3 | 3785.5 |
| 10°   | 4681.5  | 4503.3 | 4198.0 | 3961.2 | 3819.2 | 3748.2 | 3722.0 | 3735.7 | 3748.2 | 3759.4 | 3771.8 |
| 12.5° | 4774.9  | 4525.7 | 4094.6 | 3809.2 | 3688.4 | 3660.9 | 3687.1 | 3746.9 | 3790.5 | 3816.7 | 3832.9 |
| 15°   | 4897.0  | 4545.6 | 3974.9 | 3657.2 | 3576.2 | 3607.4 | 3695.8 | 3799.3 | 3875.3 | 3923.9 | 3931.3 |
| 17.5° | 5009.2  | 4544.4 | 3821.7 | 3503.9 | 3485.2 | 3576.2 | 3709.5 | 3855.3 | 3957.5 | 4026.0 | 4039.7 |
| 20°   | 5125.1  | 4510.8 | 3643.5 | 3354.4 | 3393.0 | 3542.6 | 3715.8 | 3891.5 | 4014.8 | 4094.6 | 4113.3 |
| 22.5° | 5233.5  | 4452.2 | 3447.9 | 3218.6 | 3315.8 | 3497.7 | 3692.1 | 3870.3 | 3993.6 | 4058.4 | 4078.4 |
| 25°   | 5307.0  | 4350.0 | 3249.7 | 3103.9 | 3247.2 | 3442.9 | 3614.8 | 3758.1 | 3850.3 | 3882.7 | 3887.7 |
| 27.5° | 5344.4  | 4216.7 | 3062.8 | 3004.3 | 3176.2 | 3353.2 | 3471.5 | 3542.6 | 3568.7 | 3566.2 | 3561.3 |
| 30°   | 5349.4  | 4041.0 | 2902.1 | 2923.3 | 3094.0 | 3221.1 | 3277.2 | 3263.4 | 3229.8 | 3172.5 | 3177.5 |
| 32.5° | 5333.2  | 3842.9 | 2767.5 | 2846.0 | 2989.3 | 3060.3 | 3062.8 | 2996.8 | 2907.1 | 2816.1 | 2791.2 |
| 35°   | 5338.1  | 3648.5 | 2649.1 | 2758.8 | 2862.2 | 2893.4 | 2864.7 | 2767.5 | 2645.4 | 2528.3 | 2503.3 |
| 37.5° | 5393.0  | 3479.0 | 2547.0 | 2657.9 | 2721.4 | 2728.9 | 2687.8 | 2585.6 | 2495.9 | 2381.2 | 2371.3 |
| 40°   | 5523.8  | 3358.1 | 2449.8 | 2544.5 | 2580.6 | 2584.3 | 2525.8 | 2453.5 | 2461.0 | 2399.9 | 2398.7 |
| 42.5° | 5759.3  | 3305.8 | 2363.8 | 2426.1 | 2448.5 | 2456.0 | 2411.1 | 2365.0 | 2429.8 | 2390.0 | 2376.2 |
| 45°   | 6063.4  | 3318.3 | 2291.5 | 2310.2 | 2351.3 | 2386.2 | 2358.8 | 2302.7 | 2327.6 | 2154.4 | 2097.1 |
| 47.5° | 6414.7  | 3398.0 | 2234.2 | 2210.5 | 2281.5 | 2347.6 | 2305.2 | 2220.5 | 2132.0 | 1960.1 | 1927.7 |
| 50°   | 6825.9  | 3521.4 | 2181.9 | 2112.1 | 2205.5 | 2295.3 | 2252.9 | 2132.0 | 1998.7 | 1915.2 | 1904.0 |
| 52.5° | 7254.6  | 3672.2 | 2129.5 | 2003.7 | 2109.6 | 2255.4 | 2234.2 | 2112.1 | 1947.6 | 1865.4 | 1850.4 |
| 55°   | 7740.6  | 3824.2 | 2063.5 | 1877.8 | 2006.2 | 2236.7 | 2225.5 | 2039.8 | 1909.0 | 1862.9 | 1851.7 |
| 57.5° | 8344.9  | 3997.4 | 1976.3 | 1747.0 | 1909.0 | 2169.4 | 2134.5 | 1996.2 | 1869.1 | 1834.2 | 1830.5 |
| 60°   | 9132.4  | 4252.8 | 1850.4 | 1607.4 | 1790.6 | 2066.0 | 2058.5 | 1932.6 | 1805.5 | 1780.6 | 1775.6 |
| 62.5° | 10313.7 | 4675.2 | 1677.2 | 1467.9 | 1658.5 | 1890.3 | 1958.8 | 1846.7 | 1738.3 | 1737.0 | 1739.5 |
| 65°   | 12145.4 | 5310.7 | 1489.0 | 1345.8 | 1525.2 | 1742.0 | 1842.9 | 1758.2 | 1669.7 | 1694.6 | 1698.4 |
| 67.5° | 14268.7 | 5837.8 | 1304.6 | 1226.1 | 1389.4 | 1601.2 | 1738.3 | 1669.7 | 1578.8 | 1643.6 | 1644.8 |
| 70°   | 14975.2 | 5366.8 | 1142.6 | 1107.8 | 1248.6 | 1465.4 | 1624.9 | 1572.5 | 1480.3 | 1545.1 | 1538.9 |
| 72°   | 13936.0 | 4332.6 | 1038.0 | 1018.0 | 1142.6 | 1353.2 | 1523.9 | 1481.6 | 1390.6 | 1434.2 | 1418.0 |
| 72.5° | 13608.3 | 4130.7 | 1011.8 | 995.6  | 1114.0 | 1324.6 | 1497.8 | 1459.1 | 1368.2 | 1405.6 | 1390.6 |
| 75°   | 12139.2 | 3587.4 | 869.8  | 873.5  | 971.9  | 1185.0 | 1350.7 | 1338.3 | 1244.8 | 1248.6 | 1243.6 |
| 77.5° | 8804.7  | 2630.4 | 732.7  | 757.6  | 827.4  | 1041.7 | 1202.5 | 1195.0 | 1092.8 | 1074.1 | 1070.4 |
| 80°   | 4085.8  | 1342.0 | 596.9  | 608.1  | 680.4  | 871.0  | 1025.5 | 1015.5 | 933.3  | 909.6  | 895.9  |
| 82.5° | 1399.3  | 638.0  | 448.6  | 456.1  | 527.1  | 701.5  | 889.7  | 883.5  | 814.9  | 768.8  | 740.2  |
| 85°   | 499.7   | 317.7  | 314.0  | 306.5  | 376.3  | 552.0  | 775.1  | 741.4  | 640.5  | 545.8  | 543.3  |
| 87.5° | 162.0   | 135.8  | 162.0  | 160.7  | 219.3  | 373.8  | 563.2  | 479.7  | 464.8  | 386.3  | 378.8  |
| 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.

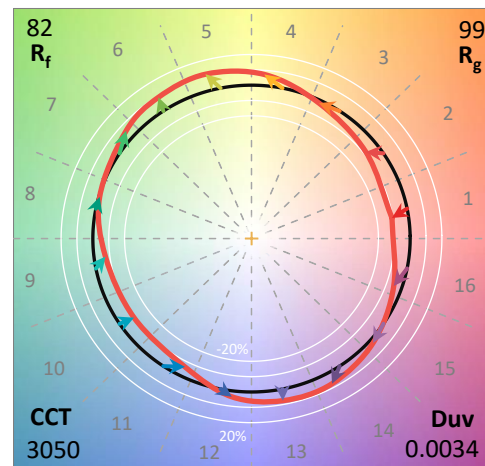
### Test Information

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  
 R<sub>f</sub>: 81.5  
 R<sub>g</sub>: 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

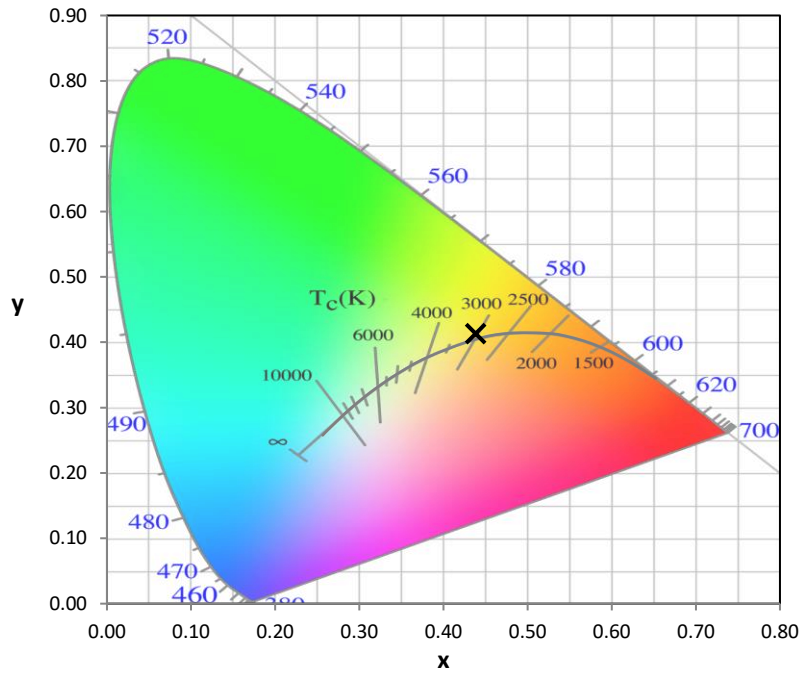
Stabilization Time: 20M  
 Operation Time: 1H 20M  
 Sphere Temperature (°C): 24.2

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           |

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**CIE 1931 Chromaticity Diagram**



**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 3000K 4-step quadrangle

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### Photopic Flux vs. Wavelength

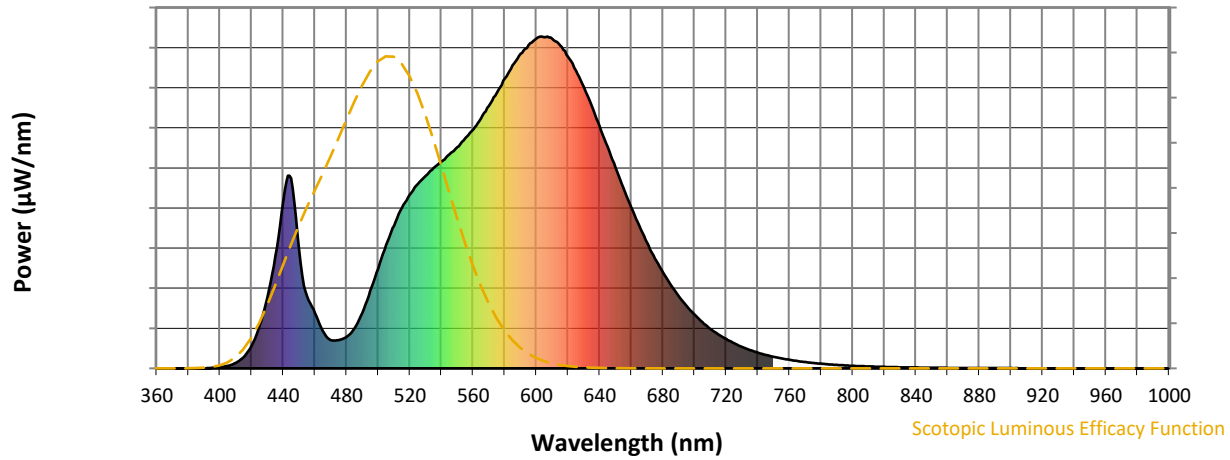


### Photopic Lumens: NR

| $\lambda$<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



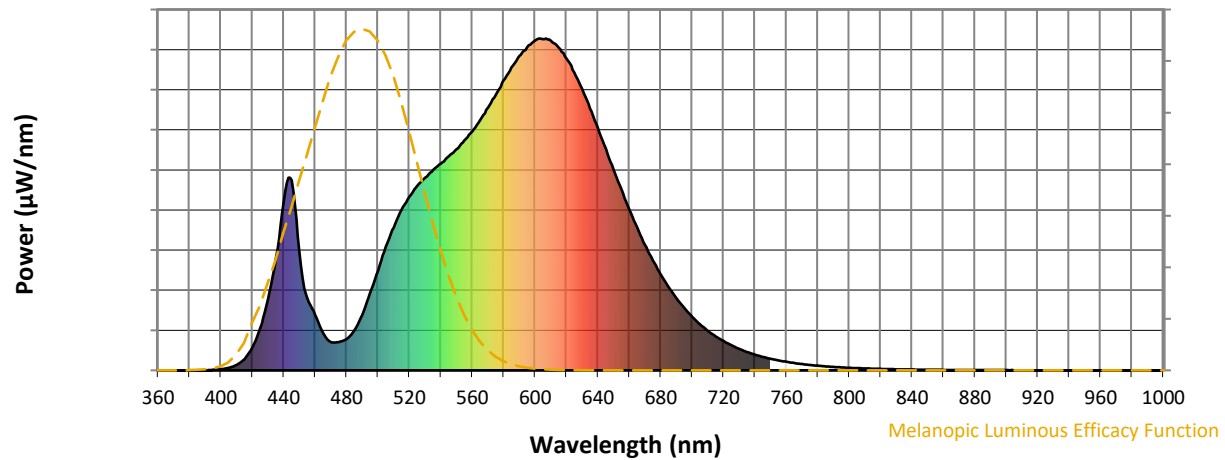
Scotopic Lumens: NR

S/P: 1.27

| λ (nm) | Power W <sup>Λ</sup> /nm | Lumens (Φ/nm) | λ (nm) | Power W <sup>Λ</sup> /nm | Lumens (Φ/nm) | λ (nm) | Power W <sup>Λ</sup> /nm | Lumens (Φ/nm) | λ (nm) | Power W <sup>Λ</sup> /nm | Lumens (Φ/nm) | λ (nm) | Power W <sup>Λ</sup> /nm | Lumens (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            |        |                          |               |

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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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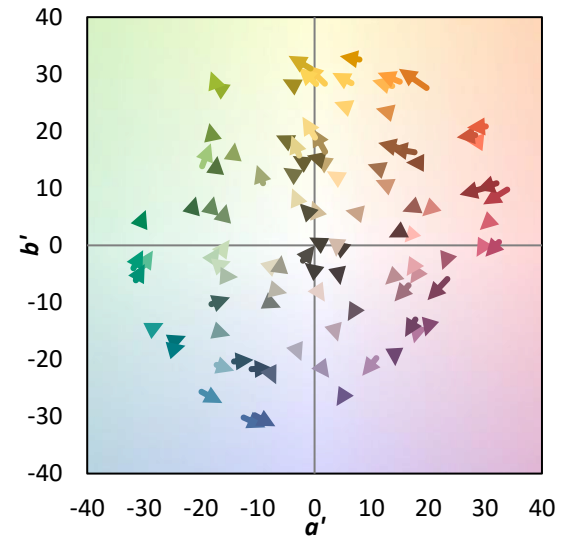
TM-30-18

### Summary

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



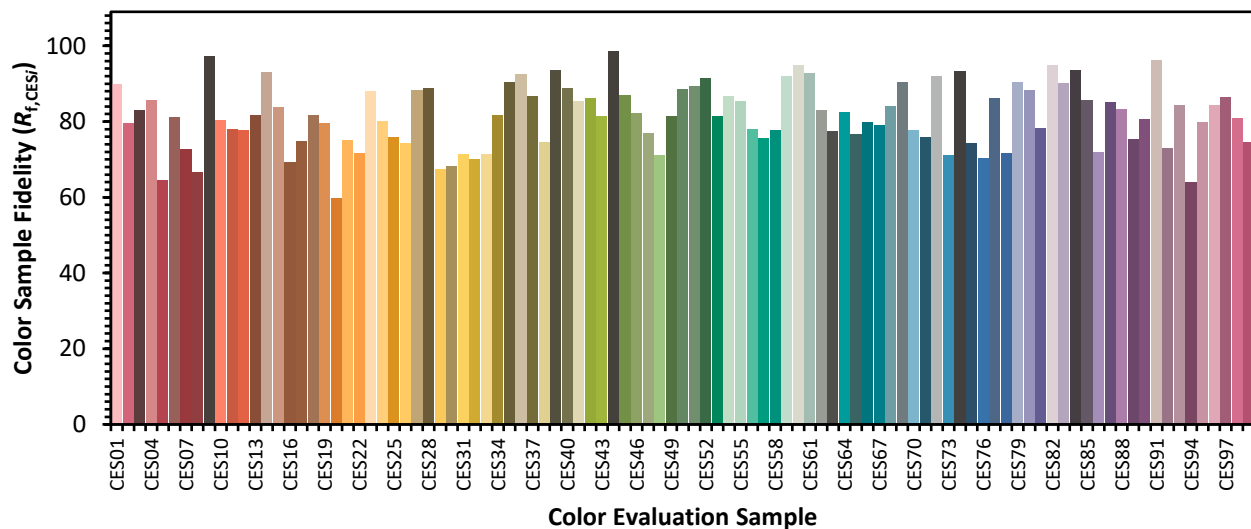
### Color Vector Graphics



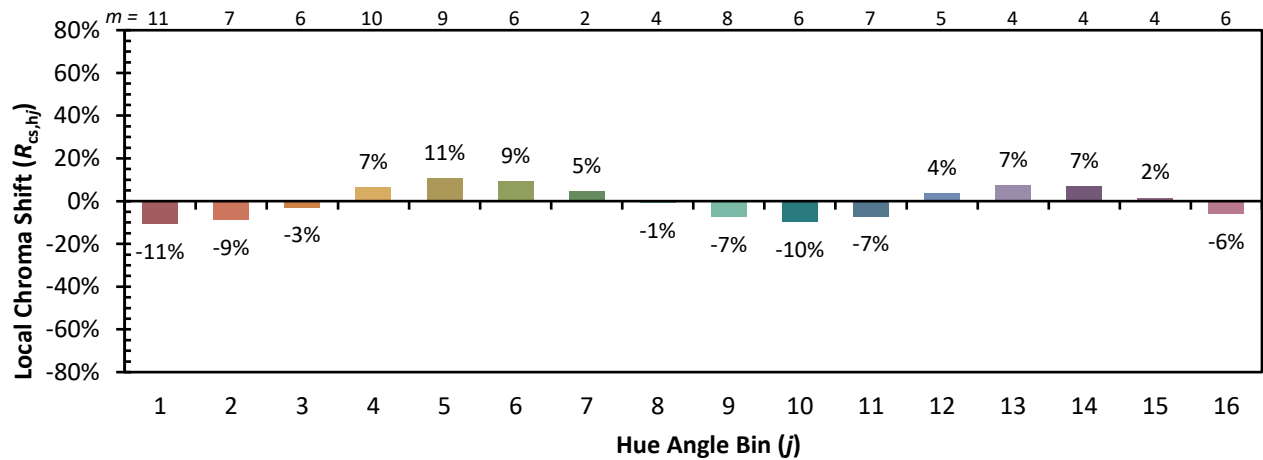


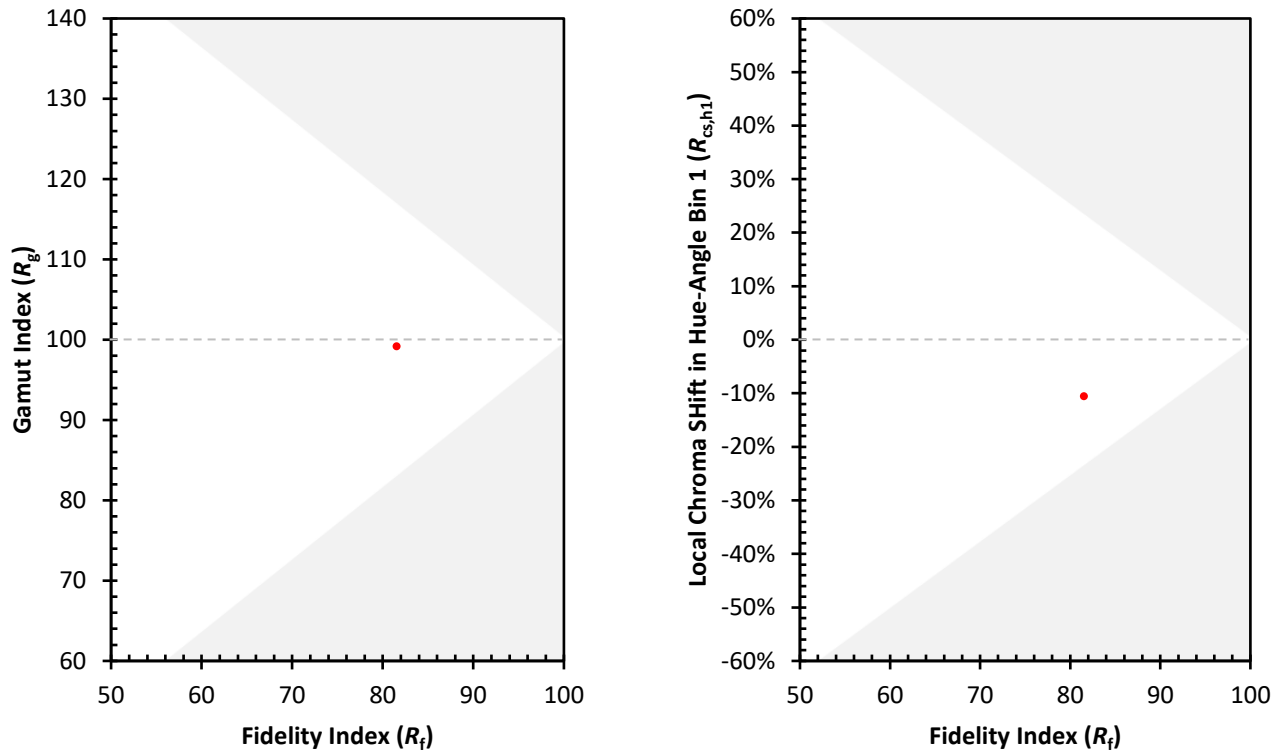
**Individual Sample Fidelity Index ( $R_{f,i}$ )**

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