

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: P317519

Luminaire Tested: **GLEON-SA5B-760-U-T2R**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P317519  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-8)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA5B-760-U-T2R  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(5) 70 CRI, 5700K, 800mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE II  
ROADWAY OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 29755 lumens  
Efficiency: N/A  
Efficacy: 141.7 lumens/watt  
Luminous Opening: Rectangular (W 1.5' x L: 1' x H: 0')  
IES Classification: Type II - Short  
BUG Rating: B3 - U0 - G3

Input Watts (W): 210  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

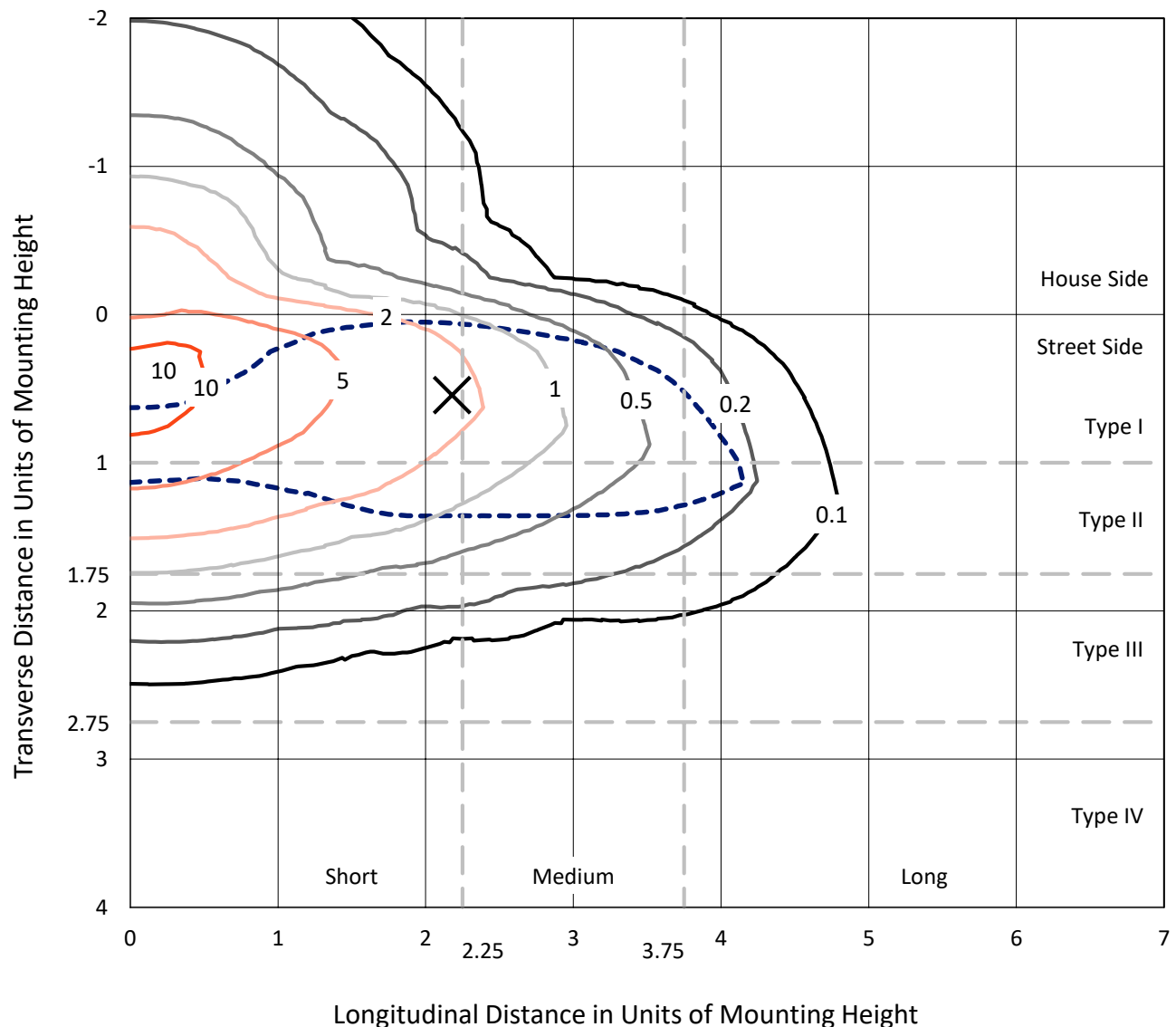


REPORT NUMBER: P317519

CATALOG NUMBER: GLEON-SA5B-760-U-T2R

## Iso-Footcandle Lines of Horizontal Illumination

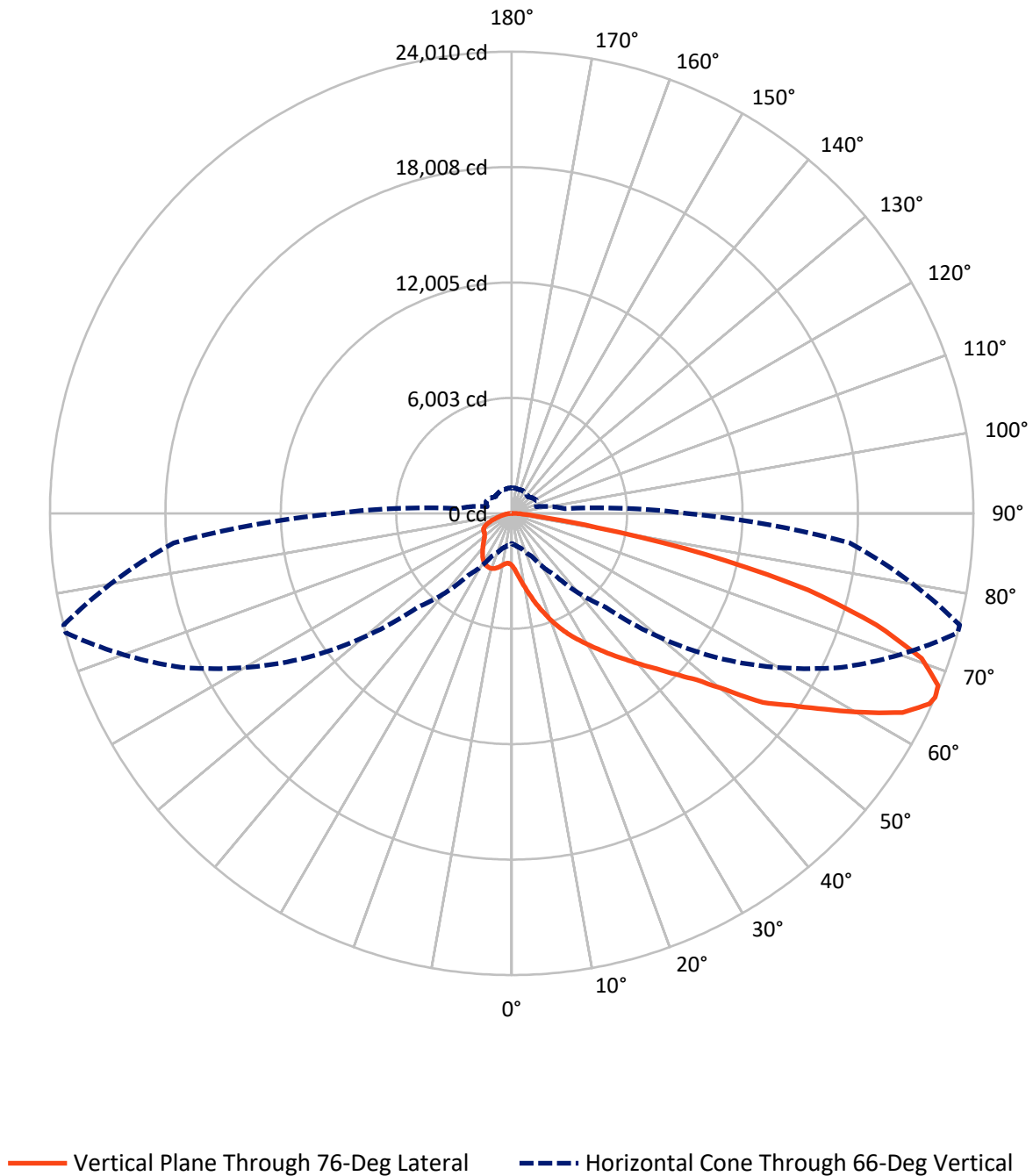
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 11.5 fc  
 Type II - Short - N/A

REPORT NUMBER: P317519  
CATALOG NUMBER: GLEON-SA5B-760-U-T2R

## Luminous Intensity Polar Plot



REPORT NUMBER: P317519

CATALOG NUMBER: GLEON-SA5B-760-U-T2R

**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 5006.7   | 0.0    | 5006.7  |
|                    | % Fixture | 16.8     | 0.0    | 16.8    |
| <b>Street Side</b> | Lumens    | 24748.3  | 0.0    | 24748.3 |
|                    | % Fixture | 83.2     | 0.0    | 83.2    |
| <b>Total</b>       | Lumens    | 29755.0  | 0.0    | 29755.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 328.6   | 1.1       |
| 10°-20°   | 1297.6  | 4.4       |
| 20°-30°   | 2521.6  | 8.5       |
| 30°-40°   | 4115.7  | 13.8      |
| 40°-50°   | 5623.1  | 18.9      |
| 50°-60°   | 6549.8  | 22.0      |
| 60°-70°   | 5872.0  | 19.7      |
| 70°-80°   | 2967.5  | 10.0      |
| 80°-90°   | 479.2   | 1.6       |
| 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°    | 29755.0 | 100.0     |
| 0°-180°   | 29755.0 | 100.0     |

**Coefficient of Utilization**



REPORT NUMBER: P317519

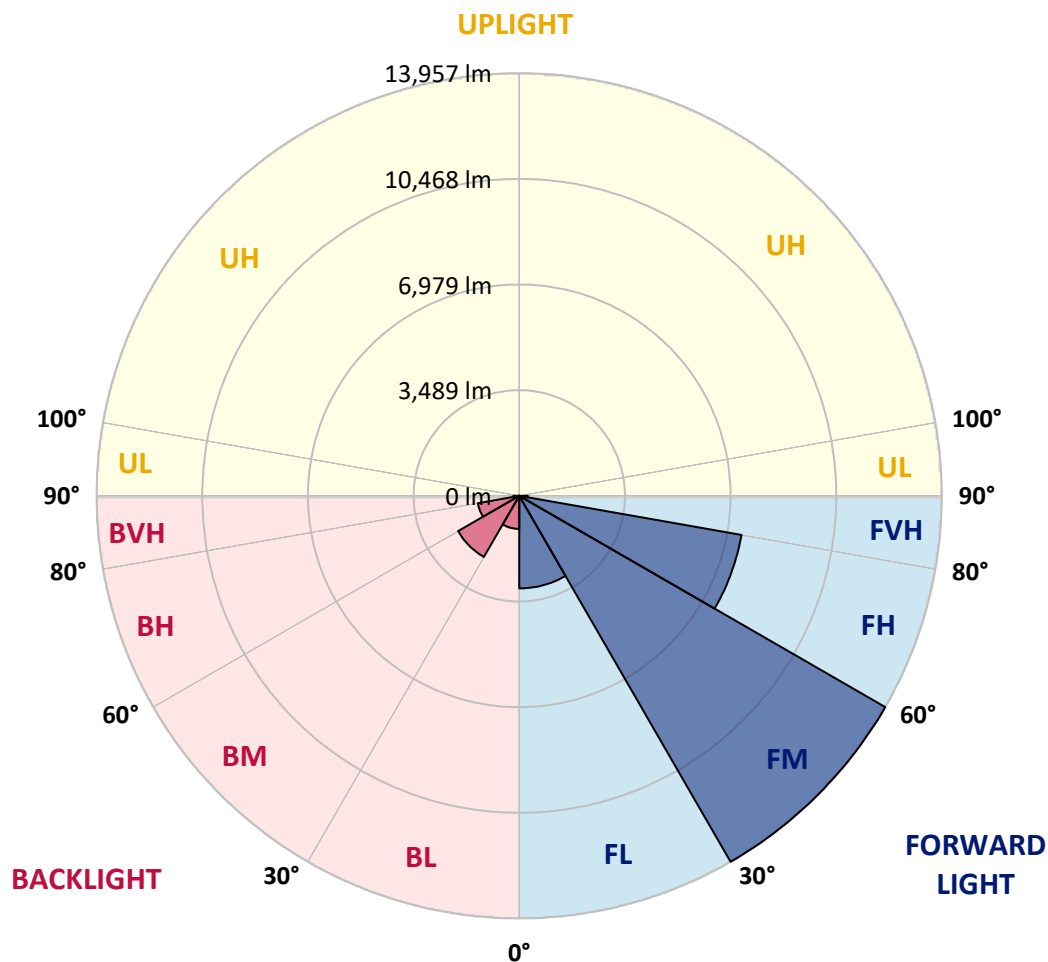
CATALOG NUMBER: GLEON-SA5B-760-U-T2R

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|---------|-----------|-------------------------|------|---------|
|      |             |         |           | B                       | U    | G       |
| FL   | (0°-30°)    | 3055.8  | 10.3      |                         |      |         |
| FM   | (30°-60°)   | 13957.2 | 46.9      |                         |      |         |
| FH   | (60°-80°)   | 7452.3  | 25.0      |                         |      | G3/7500 |
| FVH  | (80°-90°)   | 283.0   | 1.0       |                         |      | G3/500  |
| BL   | (0°-30°)    | 1092.0  | 3.7       | B3/2500                 |      |         |
| BM   | (30°-60°)   | 2331.4  | 7.8       | B2/2500                 |      |         |
| BH   | (60°-80°)   | 1387.1  | 4.7       | B3/2500                 |      | G3/2500 |
| BVH  | (80°-90°)   | 196.2   | 0.7       |                         |      | G2/225  |
| UL   | (90°-100°)  | 0.0     | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0     | 0.0       |                         | U0/0 |         |

**BUG Rating: B3-U0-G3**

Type II Short



REPORT NUMBER: P317519

CATALOG NUMBER: GLEON-SA5B-760-U-T2R

**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 55°     | 65°     | 75°     | 76°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 2717.3  | 2717.3  | 2717.3  | 2717.3  | 2717.3  | 2717.3  | 2717.3  | 2717.3  | 2717.3  | 2717.3  | 2717.3  |
| 2.5°  | 3607.2  | 3552.7  | 3547.6  | 3467.8  | 3449.7  | 3297.1  | 3185.0  | 3067.8  | 2934.5  | 2908.2  | 2803.2  |
| 5°    | 4633.6  | 4628.5  | 4558.8  | 4428.5  | 4326.5  | 4065.9  | 3808.3  | 3535.5  | 3236.5  | 3188.0  | 2951.7  |
| 7.5°  | 5556.8  | 5548.8  | 5495.2  | 5354.8  | 5207.3  | 4887.1  | 4519.4  | 4101.2  | 3616.3  | 3544.6  | 3152.7  |
| 10°   | 6257.9  | 6254.8  | 6236.7  | 6133.6  | 6008.4  | 5701.3  | 5295.2  | 4724.5  | 4057.8  | 3959.8  | 3404.2  |
| 12.5° | 6799.3  | 6805.4  | 6817.5  | 6781.1  | 6721.5  | 6459.9  | 6043.7  | 5385.1  | 4528.5  | 4431.5  | 3684.0  |
| 15°   | 7166.0  | 7184.2  | 7246.8  | 7298.3  | 7329.6  | 7169.0  | 6766.0  | 6060.9  | 5055.8  | 4939.6  | 3994.1  |
| 17.5° | 7350.9  | 7371.1  | 7479.1  | 7634.7  | 7778.2  | 7762.0  | 7441.8  | 6705.4  | 5561.9  | 5449.8  | 4327.5  |
| 20°   | 7510.5  | 7525.6  | 7646.8  | 7833.7  | 8087.3  | 8199.4  | 8019.6  | 7325.6  | 6116.5  | 5983.1  | 4681.0  |
| 22.5° | 7973.1  | 7992.3  | 8028.7  | 8134.7  | 8359.0  | 8565.1  | 8478.2  | 7912.5  | 6624.6  | 6500.3  | 5016.4  |
| 25°   | 8866.1  | 8889.3  | 8810.5  | 8720.6  | 8763.0  | 8906.5  | 8922.7  | 8447.9  | 7139.7  | 6999.3  | 5377.0  |
| 27.5° | 9941.9  | 9975.2  | 9840.9  | 9609.6  | 9407.5  | 9352.0  | 9332.8  | 8886.3  | 7631.7  | 7469.0  | 5733.6  |
| 30°   | 10995.5 | 11053.1 | 10878.3 | 10578.3 | 10207.6 | 9946.9  | 9754.0  | 9315.6  | 8116.6  | 7961.0  | 6070.0  |
| 32.5° | 12024.8 | 12001.6 | 11748.0 | 11455.1 | 11020.7 | 10694.5 | 10227.8 | 9776.2  | 8662.0  | 8483.2  | 6404.3  |
| 35°   | 12729.9 | 12738.0 | 12502.6 | 12155.1 | 11741.0 | 11490.5 | 10862.1 | 10273.2 | 9218.6  | 9054.0  | 6784.2  |
| 37.5° | 13329.9 | 13292.6 | 13025.9 | 12701.6 | 12345.0 | 12238.0 | 11604.6 | 10820.7 | 9821.7  | 9641.9  | 7188.2  |
| 40°   | 13529.9 | 13486.5 | 13311.8 | 13078.4 | 12792.5 | 12783.4 | 12423.8 | 11441.0 | 10503.5 | 10325.7 | 7643.8  |
| 42.5° | 13408.7 | 13353.2 | 13281.4 | 13217.8 | 13129.9 | 13170.3 | 13193.6 | 12168.3 | 11253.1 | 11054.1 | 8171.1  |
| 45°   | 12961.2 | 12877.4 | 12927.9 | 13066.3 | 13257.2 | 13485.5 | 13888.5 | 12973.4 | 12092.5 | 11925.8 | 8790.3  |
| 47.5° | 12273.3 | 12197.6 | 12355.1 | 12651.1 | 13170.3 | 13748.1 | 14546.2 | 13862.3 | 13094.6 | 12928.9 | 9672.2  |
| 50°   | 11305.6 | 11327.8 | 11553.1 | 12091.5 | 12876.4 | 13869.4 | 15356.3 | 15039.1 | 14551.2 | 14396.7 | 10875.3 |
| 52.5° | 9717.6  | 9721.7  | 10356.1 | 11239.9 | 12355.1 | 13806.7 | 15805.8 | 16543.2 | 16540.2 | 16353.3 | 12020.8 |
| 55°   | 8242.8  | 8332.7  | 8834.8  | 10009.6 | 11510.7 | 13556.2 | 16120.0 | 17274.6 | 17846.3 | 17627.1 | 13088.5 |
| 57.5° | 6802.3  | 6854.9  | 7330.7  | 8510.5  | 10305.5 | 12888.5 | 16442.2 | 18152.4 | 19351.4 | 19213.0 | 14415.8 |
| 60°   | 5163.9  | 5244.7  | 5736.6  | 6826.6  | 8764.1  | 11703.6 | 16472.5 | 19068.6 | 21150.5 | 21011.1 | 15897.7 |
| 62.5° | 3351.7  | 3491.1  | 3951.7  | 4973.0  | 6899.3  | 9999.5  | 15769.4 | 19667.6 | 22855.6 | 22806.1 | 17213.0 |
| 65°   | 1926.4  | 2031.4  | 2351.6  | 3139.5  | 4759.8  | 7860.0  | 14097.6 | 19437.3 | 23905.2 | 23876.9 | 17704.9 |
| 66°   | 1573.8  | 1639.5  | 1884.9  | 2453.7  | 3927.5  | 6902.4  | 13125.9 | 18951.4 | 24009.2 | 24010.2 | 17648.3 |
| 67.5° | 1258.6  | 1287.9  | 1398.0  | 1756.7  | 2898.1  | 5471.0  | 11389.4 | 17879.6 | 23879.9 | 23915.3 | 17283.7 |
| 70°   | 1041.5  | 1056.6  | 1091.0  | 1177.8  | 1581.9  | 3299.1  | 8084.2  | 15094.7 | 22581.9 | 22609.2 | 15860.4 |
| 72.5° | 934.4   | 943.5   | 956.6   | 968.7   | 1116.2  | 1843.5  | 4937.6  | 12075.3 | 19798.9 | 19834.3 | 13691.6 |
| 75°   | 846.5   | 851.6   | 849.5   | 850.5   | 936.4   | 1174.8  | 2551.6  | 9015.6  | 16008.9 | 15938.1 | 10488.4 |
| 77.5° | 743.5   | 748.5   | 738.4   | 740.4   | 828.3   | 903.1   | 1269.8  | 6311.4  | 10803.6 | 10304.5 | 5909.4  |
| 80°   | 628.3   | 632.4   | 628.3   | 635.4   | 721.2   | 681.9   | 738.4   | 3550.7  | 4777.0  | 4518.4  | 2101.1  |
| 82.5° | 474.8   | 491.9   | 504.1   | 532.3   | 594.0   | 484.9   | 494.0   | 1382.9  | 1454.6  | 1384.9  | 644.5   |
| 85°   | 208.1   | 253.5   | 379.8   | 407.1   | 446.5   | 290.9   | 324.3   | 563.7   | 591.9   | 573.8   | 234.4   |
| 87.5° | 54.5    | 59.6    | 187.9   | 236.4   | 247.5   | 131.3   | 168.7   | 256.6   | 270.7   | 256.6   | 77.8    |
| 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: P317519

CATALOG NUMBER: GLEON-SA5B-760-U-T2R

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 2717.3 | 2717.3 | 2717.3 | 2717.3 | 2717.3 | 2717.3 | 2717.3 | 2717.3 | 2717.3 | 2717.3 | 2717.3 |
| 2.5°  | 2747.6 | 2698.1 | 2609.2 | 2530.4 | 2470.8 | 2430.4 | 2390.0 | 2369.8 | 2357.7 | 2345.6 | 2347.6 |
| 5°    | 2835.5 | 2735.5 | 2583.0 | 2474.9 | 2414.3 | 2375.9 | 2355.7 | 2347.6 | 2342.5 | 2330.4 | 2330.4 |
| 7.5°  | 2967.8 | 2826.4 | 2616.3 | 2505.2 | 2457.7 | 2428.4 | 2416.3 | 2412.2 | 2406.2 | 2392.0 | 2394.1 |
| 10°   | 3134.5 | 2936.5 | 2686.0 | 2577.9 | 2534.5 | 2502.1 | 2485.0 | 2478.9 | 2467.8 | 2451.6 | 2453.7 |
| 12.5° | 3330.5 | 3072.9 | 2777.9 | 2664.8 | 2612.2 | 2568.8 | 2540.5 | 2523.4 | 2504.2 | 2482.9 | 2484.0 |
| 15°   | 3544.6 | 3221.4 | 2876.9 | 2742.6 | 2670.8 | 2610.2 | 2564.8 | 2535.5 | 2505.2 | 2478.9 | 2477.9 |
| 17.5° | 3761.8 | 3364.8 | 2952.7 | 2785.0 | 2688.0 | 2608.2 | 2546.6 | 2501.1 | 2463.8 | 2431.4 | 2428.4 |
| 20°   | 3996.2 | 3494.1 | 2995.1 | 2780.9 | 2655.7 | 2560.7 | 2478.9 | 2422.3 | 2380.9 | 2348.6 | 2343.5 |
| 22.5° | 4234.5 | 3615.3 | 3002.2 | 2739.5 | 2584.0 | 2467.8 | 2381.9 | 2319.3 | 2276.9 | 2243.5 | 2231.4 |
| 25°   | 4452.7 | 3709.3 | 2972.9 | 2659.7 | 2484.0 | 2358.7 | 2274.9 | 2211.2 | 2176.9 | 2137.5 | 2125.4 |
| 27.5° | 4651.7 | 3774.9 | 2914.3 | 2557.7 | 2371.8 | 2248.6 | 2169.8 | 2115.3 | 2077.9 | 2047.6 | 2037.5 |
| 30°   | 4830.5 | 3810.3 | 2818.3 | 2436.5 | 2256.7 | 2144.5 | 2077.9 | 2040.5 | 2008.2 | 1969.8 | 1962.7 |
| 32.5° | 5000.2 | 3810.3 | 2695.1 | 2304.2 | 2142.5 | 2052.6 | 2013.2 | 1990.0 | 1953.6 | 1916.3 | 1906.2 |
| 35°   | 5169.9 | 3787.1 | 2549.6 | 2165.8 | 2037.5 | 1987.0 | 1984.9 | 1957.7 | 1902.1 | 1851.6 | 1838.5 |
| 37.5° | 5348.7 | 3739.6 | 2386.0 | 2036.5 | 1951.6 | 1957.7 | 1974.8 | 1914.2 | 1835.4 | 1763.7 | 1744.5 |
| 40°   | 5550.8 | 3673.9 | 2216.3 | 1924.3 | 1879.9 | 1944.5 | 1947.6 | 1851.6 | 1698.1 | 1632.4 | 1615.2 |
| 42.5° | 5788.2 | 3608.3 | 2058.7 | 1825.3 | 1823.3 | 1905.1 | 1896.1 | 1716.2 | 1624.3 | 1591.0 | 1581.9 |
| 45°   | 6100.3 | 3570.9 | 1909.2 | 1731.4 | 1778.9 | 1841.5 | 1808.2 | 1641.5 | 1603.1 | 1583.9 | 1575.8 |
| 47.5° | 6592.2 | 3590.1 | 1771.8 | 1656.6 | 1734.4 | 1777.9 | 1644.5 | 1611.2 | 1583.9 | 1560.7 | 1552.6 |
| 50°   | 7208.4 | 3579.0 | 1660.7 | 1605.1 | 1683.9 | 1711.2 | 1570.8 | 1571.8 | 1557.7 | 1531.4 | 1519.3 |
| 52.5° | 7672.1 | 3492.1 | 1589.0 | 1575.8 | 1639.5 | 1593.0 | 1524.3 | 1533.4 | 1526.3 | 1488.0 | 1474.8 |
| 55°   | 8119.6 | 3417.3 | 1552.6 | 1564.7 | 1607.1 | 1445.5 | 1469.8 | 1492.0 | 1484.9 | 1447.5 | 1441.5 |
| 57.5° | 8676.2 | 3403.2 | 1530.4 | 1567.8 | 1579.9 | 1371.8 | 1417.2 | 1446.5 | 1441.5 | 1425.3 | 1422.3 |
| 60°   | 9358.0 | 3407.2 | 1510.2 | 1572.8 | 1549.6 | 1317.2 | 1367.7 | 1405.1 | 1408.1 | 1405.1 | 1403.1 |
| 62.5° | 9732.8 | 3297.1 | 1459.7 | 1558.7 | 1496.0 | 1269.8 | 1316.2 | 1370.8 | 1371.8 | 1377.8 | 1376.8 |
| 65°   | 9414.6 | 2967.8 | 1365.7 | 1509.2 | 1406.1 | 1230.4 | 1271.8 | 1331.4 | 1316.2 | 1343.5 | 1343.5 |
| 66°   | 9105.5 | 2777.9 | 1319.3 | 1476.8 | 1367.7 | 1215.2 | 1257.6 | 1311.2 | 1292.0 | 1329.4 | 1329.4 |
| 67.5° | 8474.1 | 2457.7 | 1235.4 | 1408.1 | 1313.2 | 1194.0 | 1241.5 | 1277.8 | 1251.6 | 1307.1 | 1303.1 |
| 70°   | 7320.6 | 1901.1 | 1066.7 | 1252.6 | 1223.3 | 1162.7 | 1219.3 | 1211.2 | 1172.8 | 1257.6 | 1241.5 |
| 72.5° | 6172.0 | 1444.5 | 856.6  | 1048.5 | 1086.9 | 1123.3 | 1187.9 | 1126.3 | 1077.8 | 1137.4 | 1102.1 |
| 75°   | 4789.1 | 1085.9 | 676.8  | 815.2  | 918.2  | 1061.7 | 1150.6 | 1028.3 | 958.6  | 952.6  | 933.4  |
| 77.5° | 2589.0 | 745.5  | 536.4  | 622.3  | 729.3  | 984.9  | 1125.3 | 923.3  | 818.2  | 794.0  | 778.8  |
| 80°   | 1025.3 | 484.9  | 389.9  | 471.7  | 510.1  | 873.8  | 1064.7 | 801.0  | 674.8  | 650.5  | 627.3  |
| 82.5° | 423.3  | 286.9  | 251.5  | 316.2  | 332.3  | 747.5  | 955.6  | 656.6  | 521.2  | 721.2  | 765.7  |
| 85°   | 181.8  | 157.6  | 149.5  | 163.6  | 187.9  | 524.3  | 760.6  | 501.0  | 562.7  | 502.0  | 399.0  |
| 87.5° | 54.5   | 66.7   | 63.6   | 62.6   | 68.7   | 125.3  | 405.1  | 278.8  | 413.2  | 156.6  | 117.2  |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |



LM-79-2008: Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Report Prepared for

Cooper Lighting Solutions

McGRAW-EDISON

Report Number: SP1-1908-441-9-R4

Test Date: 10/23/2019

Luminaire Tested: SA1C-760-U-5WQ

Data in this report applies to families of products SA1C-760-U-5WQ .

### Test Information

Test Method: LM-79-2008  
 Report Number: SP1-1908-441-9-R4  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry:  $4\pi$   
 Issue Date: 10/28/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: MCGRAW-EDISON  
 Catalog Number: **SA1C-760-U-5WQ**  
 Description: MCGRAW EDISON ROADWAY AND AREA LUMINAIRE

\*\*\*THIS IS A REVISION OF SP1-1908-441-4-R3. TO UPDATE THE CATALOG INFORMATION.\*\*\*TESTED IN SITU. ROADWAY AND AREA LUMINAIRE. (1) 70 CRI, 5000K, 1050MA LIGHTSQUARE WITH 16 LEDS AND TYPE V WIDE OPTICS.

### Spectral Parameters

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 5474   | CRI (Ra): | 71.7 |      |       |
| CIE u':                   | 0.2052 | R1:       | 70.6 | R9:  | -27.1 |
| CIE v':                   | 0.4804 | R2:       | 74.6 | R10: | 40.8  |
| Duv:                      | 0.0025 | R3:       | 78.3 | R11: | 74.6  |
| CIE x:                    | 0.3330 | R4:       | 73.8 | R12: | 50.4  |
| CIE y:                    | 0.3466 | R5:       | 72.4 | R13: | 70.0  |
| CIE z:                    | 0.3204 | R6:       | 67.5 | R14: | 87.8  |
| Peak Wavelength (nm):     | 442    | R7:       | 77.5 |      |       |
| Dominant Wavelength (nm): | 554    | R8:       | 58.9 |      |       |
| Purity:                   | 4.1    |           |      |      |       |
| Rf:                       | 72.1   |           |      |      |       |
| Rg:                       | 97.2   |           |      |      |       |



### Test Conditions

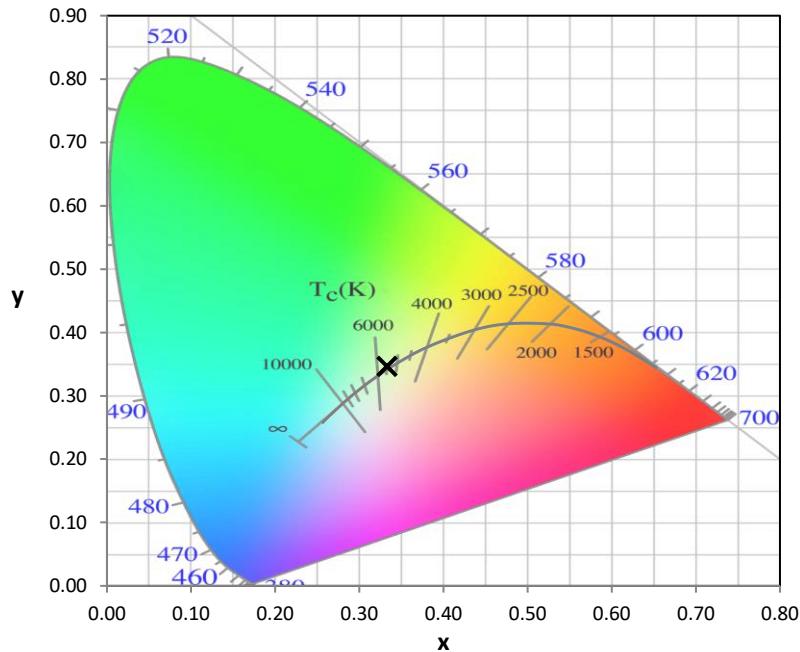
Stabilization Time: 240M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.6/31%  
 Sphere Temperature (°C): 25.9

REPORT NUMBER: SP1-1908-441-9-R4

| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 6/28/2019        | 12/28/2019           |
| Power Meter                    | IN0071                | 12/5/2018        | 12/5/2019            |
| AC Power Source                | IN0063                | 12/5/2018        | 12/5/2019            |
| DC Power Source                | IN0208                | 12/5/2018        | 12/5/2019            |
| Sphere Thermometer             | IN0085                | 12/5/2018        | 12/5/2019            |
| Room Thermometer               | IN0046                | 12/5/2018        | 12/5/2019            |

REPORT NUMBER: SP1-1908-441-9-R4

CIE 1931 Chromaticity Diagram



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



Point lies inside the ANSI 5700K 4-step quadrangle

REPORT NUMBER: SP1-1908-441-9-R4

**Photopic Flux vs. Wavelength**



#####

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 3540             | NR               | 490       | 33363            | NR               | 620       | 80193            | NR               | 750       | 4663             | NR               | 880       | 4678             | NR               |
| 365       | 2862             | NR               | 495       | 44177            | NR               | 625       | 73091            | NR               | 755       | 4147             | NR               | 885       | 4128             | NR               |
| 370       | 2865             | NR               | 500       | 57019            | NR               | 630       | 66269            | NR               | 760       | 4040             | NR               | 890       | 4504             | NR               |
| 375       | 3254             | NR               | 505       | 70030            | NR               | 635       | 60012            | NR               | 765       | 3474             | NR               | 895       | 4371             | NR               |
| 380       | 3076             | NR               | 510       | 81972            | NR               | 640       | 53914            | NR               | 770       | 3469             | NR               | 900       | 4082             | NR               |
| 385       | 2904             | NR               | 515       | 92590            | NR               | 645       | 48385            | NR               | 775       | 3181             | NR               | 905       | 2982             | NR               |
| 390       | 2689             | NR               | 520       | 100305           | NR               | 650       | 43219            | NR               | 780       | 2969             | NR               | 910       | 4351             | NR               |
| 395       | 2619             | NR               | 525       | 107452           | NR               | 655       | 38562            | NR               | 785       | 3132             | NR               | 915       | 3365             | NR               |
| 400       | 2679             | NR               | 530       | 111373           | NR               | 660       | 34110            | NR               | 790       | 2507             | NR               | 920       | 3430             | NR               |
| 405       | 3515             | NR               | 535       | 114505           | NR               | 665       | 30085            | NR               | 795       | 2968             | NR               | 925       | 4264             | NR               |
| 410       | 6934             | NR               | 540       | 116408           | NR               | 670       | 26205            | NR               | 800       | 2758             | NR               | 930       | 4095             | NR               |
| 415       | 14943            | NR               | 545       | 118700           | NR               | 675       | 22906            | NR               | 805       | 2872             | NR               | 935       | 5048             | NR               |
| 420       | 31939            | NR               | 550       | 119209           | NR               | 680       | 20058            | NR               | 810       | 3094             | NR               | 940       | 4074             | NR               |
| 425       | 64701            | NR               | 555       | 120742           | NR               | 685       | 17413            | NR               | 815       | 3222             | NR               | 945       | 4949             | NR               |
| 430       | 110939           | NR               | 560       | 121594           | NR               | 690       | 15447            | NR               | 820       | 3238             | NR               | 950       | 4387             | NR               |
| 435       | 164597           | NR               | 565       | 121913           | NR               | 695       | 13398            | NR               | 825       | 3524             | NR               | 955       | 4978             | NR               |
| 440       | 207696           | NR               | 570       | 122147           | NR               | 700       | 11777            | NR               | 830       | 2921             | NR               | 960       | 4706             | NR               |
| 445       | 201830           | NR               | 575       | 121605           | NR               | 705       | 10412            | NR               | 835       | 3595             | NR               | 965       | 5083             | NR               |
| 450       | 145410           | NR               | 580       | 120248           | NR               | 710       | 9544             | NR               | 840       | 3016             | NR               | 970       | 4522             | NR               |
| 455       | 89594            | NR               | 585       | 117717           | NR               | 715       | 8940             | NR               | 845       | 4032             | NR               | 975       | 4740             | NR               |
| 460       | 58321            | NR               | 590       | 114359           | NR               | 720       | 7897             | NR               | 850       | 3579             | NR               | 980       | 6122             | NR               |
| 465       | 39318            | NR               | 595       | 109974           | NR               | 725       | 7045             | NR               | 855       | 4571             | NR               | 985       | 6450             | NR               |
| 470       | 27693            | NR               | 600       | 105269           | NR               | 730       | 6483             | NR               | 860       | 4485             | NR               | 990       | 4875             | NR               |
| 475       | 23081            | NR               | 605       | 99453            | NR               | 735       | 5838             | NR               | 865       | 3978             | NR               | 995       | 4764             | NR               |
| 480       | 23002            | NR               | 610       | 92921            | NR               | 740       | 5261             | NR               | 870       | 4298             | NR               | 1000      | 3640             | NR               |
| 485       | 26201            | NR               | 615       | 86989            | NR               | 745       | 4760             | NR               | 875       | 4356             | NR               |           |                  |                  |

REPORT NUMBER: SP1-1908-441-9-R4

Scotopic Flux vs. Wavelength



Scotopic Lumens: 13759.3

S/P: 1.85

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 3540             | NR               | 490       | 33363            | NR               | 620       | 80193            | NR               | 750       | 4663             | NR               | 880       | 4678             | NR               |
| 365       | 2862             | NR               | 495       | 44177            | NR               | 625       | 73091            | NR               | 755       | 4147             | NR               | 885       | 4128             | NR               |
| 370       | 2865             | NR               | 500       | 57019            | NR               | 630       | 66269            | NR               | 760       | 4040             | NR               | 890       | 4504             | NR               |
| 375       | 3254             | NR               | 505       | 70030            | NR               | 635       | 60012            | NR               | 765       | 3474             | NR               | 895       | 4371             | NR               |
| 380       | 3076             | NR               | 510       | 81972            | NR               | 640       | 53914            | NR               | 770       | 3469             | NR               | 900       | 4082             | NR               |
| 385       | 2904             | NR               | 515       | 92590            | NR               | 645       | 48385            | NR               | 775       | 3181             | NR               | 905       | 2982             | NR               |
| 390       | 2689             | NR               | 520       | 100305           | NR               | 650       | 43219            | NR               | 780       | 2969             | NR               | 910       | 4351             | NR               |
| 395       | 2619             | NR               | 525       | 107452           | NR               | 655       | 38562            | NR               | 785       | 3132             | NR               | 915       | 3365             | NR               |
| 400       | 2679             | NR               | 530       | 111373           | NR               | 660       | 34110            | NR               | 790       | 2507             | NR               | 920       | 3430             | NR               |
| 405       | 3515             | NR               | 535       | 114505           | NR               | 665       | 30085            | NR               | 795       | 2968             | NR               | 925       | 4264             | NR               |
| 410       | 6934             | NR               | 540       | 116408           | NR               | 670       | 26205            | NR               | 800       | 2758             | NR               | 930       | 4095             | NR               |
| 415       | 14943            | NR               | 545       | 118700           | NR               | 675       | 22906            | NR               | 805       | 2872             | NR               | 935       | 5048             | NR               |
| 420       | 31939            | NR               | 550       | 119209           | NR               | 680       | 20058            | NR               | 810       | 3094             | NR               | 940       | 4074             | NR               |
| 425       | 64701            | NR               | 555       | 120742           | NR               | 685       | 17413            | NR               | 815       | 3222             | NR               | 945       | 4949             | NR               |
| 430       | 110939           | NR               | 560       | 121594           | NR               | 690       | 15447            | NR               | 820       | 3238             | NR               | 950       | 4387             | NR               |
| 435       | 164597           | NR               | 565       | 121913           | NR               | 695       | 13398            | NR               | 825       | 3524             | NR               | 955       | 4978             | NR               |
| 440       | 207696           | NR               | 570       | 122147           | NR               | 700       | 11777            | NR               | 830       | 2921             | NR               | 960       | 4706             | NR               |
| 445       | 201830           | NR               | 575       | 121605           | NR               | 705       | 10412            | NR               | 835       | 3595             | NR               | 965       | 5083             | NR               |
| 450       | 145410           | NR               | 580       | 120248           | NR               | 710       | 9544             | NR               | 840       | 3016             | NR               | 970       | 4522             | NR               |
| 455       | 89594            | NR               | 585       | 117717           | NR               | 715       | 8940             | NR               | 845       | 4032             | NR               | 975       | 4740             | NR               |
| 460       | 58321            | NR               | 590       | 114359           | NR               | 720       | 7897             | NR               | 850       | 3579             | NR               | 980       | 6122             | NR               |
| 465       | 39318            | NR               | 595       | 109974           | NR               | 725       | 7045             | NR               | 855       | 4571             | NR               | 985       | 6450             | NR               |
| 470       | 27693            | NR               | 600       | 105269           | NR               | 730       | 6483             | NR               | 860       | 4485             | NR               | 990       | 4875             | NR               |
| 475       | 23081            | NR               | 605       | 99453            | NR               | 735       | 5838             | NR               | 865       | 3978             | NR               | 995       | 4764             | NR               |
| 480       | 23002            | NR               | 610       | 92921            | NR               | 740       | 5261             | NR               | 870       | 4298             | NR               | 1000      | 3640             | NR               |
| 485       | 26201            | NR               | 615       | 86989            | NR               | 745       | 4760             | NR               | 875       | 4356             | NR               |           |                  |                  |

REPORT NUMBER: SP1-1908-441-9-R4

**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 5527.6 M/P: 0.74**

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 3540             | NR               | 490       | 33363            | NR               | 620       | 80193            | NR               | 750       | 4663             | NR               | 880       | 4678             | NR               |
| 365       | 2862             | NR               | 495       | 44177            | NR               | 625       | 73091            | NR               | 755       | 4147             | NR               | 885       | 4128             | NR               |
| 370       | 2865             | NR               | 500       | 57019            | NR               | 630       | 66269            | NR               | 760       | 4040             | NR               | 890       | 4504             | NR               |
| 375       | 3254             | NR               | 505       | 70030            | NR               | 635       | 60012            | NR               | 765       | 3474             | NR               | 895       | 4371             | NR               |
| 380       | 3076             | NR               | 510       | 81972            | NR               | 640       | 53914            | NR               | 770       | 3469             | NR               | 900       | 4082             | NR               |
| 385       | 2904             | NR               | 515       | 92590            | NR               | 645       | 48385            | NR               | 775       | 3181             | NR               | 905       | 2982             | NR               |
| 390       | 2689             | NR               | 520       | 100305           | NR               | 650       | 43219            | NR               | 780       | 2969             | NR               | 910       | 4351             | NR               |
| 395       | 2619             | NR               | 525       | 107452           | NR               | 655       | 38562            | NR               | 785       | 3132             | NR               | 915       | 3365             | NR               |
| 400       | 2679             | NR               | 530       | 111373           | NR               | 660       | 34110            | NR               | 790       | 2507             | NR               | 920       | 3430             | NR               |
| 405       | 3515             | NR               | 535       | 114505           | NR               | 665       | 30085            | NR               | 795       | 2968             | NR               | 925       | 4264             | NR               |
| 410       | 6934             | NR               | 540       | 116408           | NR               | 670       | 26205            | NR               | 800       | 2758             | NR               | 930       | 4095             | NR               |
| 415       | 14943            | NR               | 545       | 118700           | NR               | 675       | 22906            | NR               | 805       | 2872             | NR               | 935       | 5048             | NR               |
| 420       | 31939            | NR               | 550       | 119209           | NR               | 680       | 20058            | NR               | 810       | 3094             | NR               | 940       | 4074             | NR               |
| 425       | 64701            | NR               | 555       | 120742           | NR               | 685       | 17413            | NR               | 815       | 3222             | NR               | 945       | 4949             | NR               |
| 430       | 110939           | NR               | 560       | 121594           | NR               | 690       | 15447            | NR               | 820       | 3238             | NR               | 950       | 4387             | NR               |
| 435       | 164597           | NR               | 565       | 121913           | NR               | 695       | 13398            | NR               | 825       | 3524             | NR               | 955       | 4978             | NR               |
| 440       | 207696           | NR               | 570       | 122147           | NR               | 700       | 11777            | NR               | 830       | 2921             | NR               | 960       | 4706             | NR               |
| 445       | 201830           | NR               | 575       | 121605           | NR               | 705       | 10412            | NR               | 835       | 3595             | NR               | 965       | 5083             | NR               |
| 450       | 145410           | NR               | 580       | 120248           | NR               | 710       | 9544             | NR               | 840       | 3016             | NR               | 970       | 4522             | NR               |
| 455       | 89594            | NR               | 585       | 117717           | NR               | 715       | 8940             | NR               | 845       | 4032             | NR               | 975       | 4740             | NR               |
| 460       | 58321            | NR               | 590       | 114359           | NR               | 720       | 7897             | NR               | 850       | 3579             | NR               | 980       | 6122             | NR               |
| 465       | 39318            | NR               | 595       | 109974           | NR               | 725       | 7045             | NR               | 855       | 4571             | NR               | 985       | 6450             | NR               |
| 470       | 27693            | NR               | 600       | 105269           | NR               | 730       | 6483             | NR               | 860       | 4485             | NR               | 990       | 4875             | NR               |
| 475       | 23081            | NR               | 605       | 99453            | NR               | 735       | 5838             | NR               | 865       | 3978             | NR               | 995       | 4764             | NR               |
| 480       | 23002            | NR               | 610       | 92921            | NR               | 740       | 5261             | NR               | 870       | 4298             | NR               | 1000      | 3640             | NR               |
| 485       | 26201            | NR               | 615       | 86989            | NR               | 745       | 4760             | NR               | 875       | 4356             | NR               |           |                  |                  |

REPORT NUMBER: SP1-1908-441-9-R4

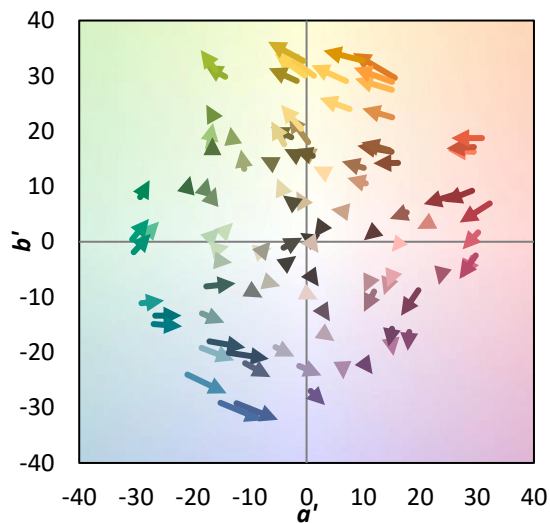
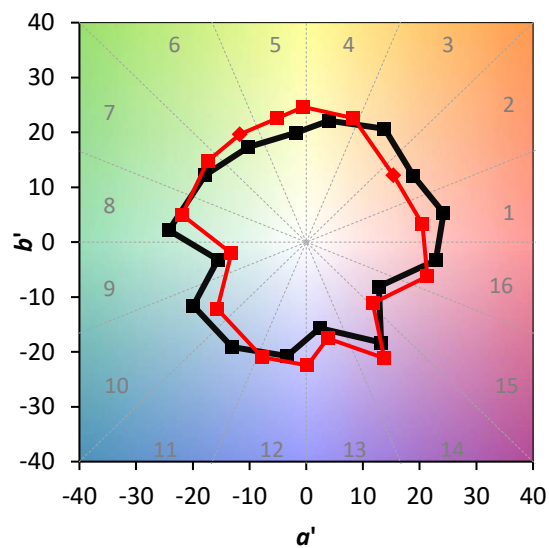
**TM-30-18**

**Summary**

$R_f = 72.1$   
 $R_g = 97.2$   
 CIE  $R_a = 71.7$   
 $R_g = -27.1$



**Color Vector Graphics**





REPORT NUMBER: SP1-1908-441-9-R4

TM-30-18

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

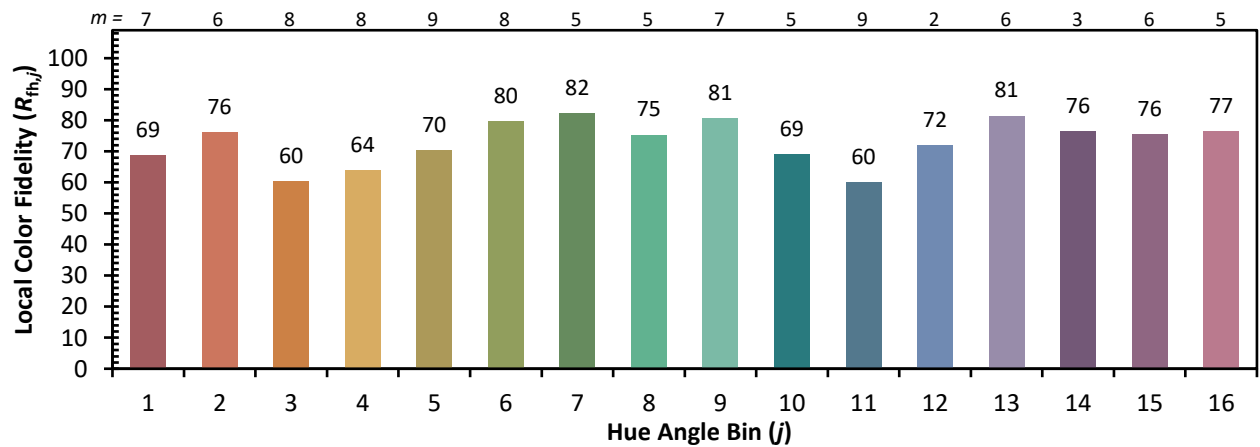
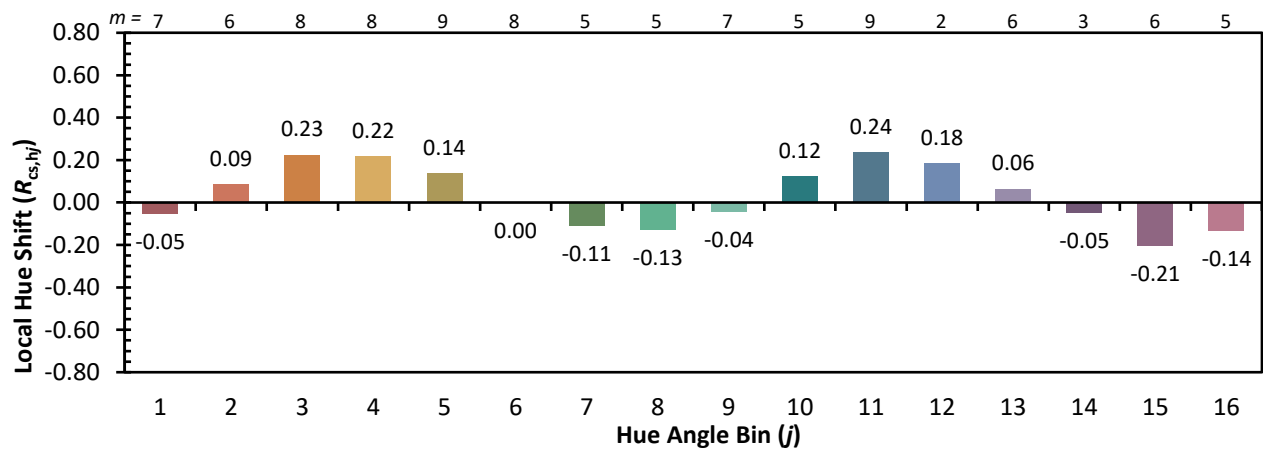
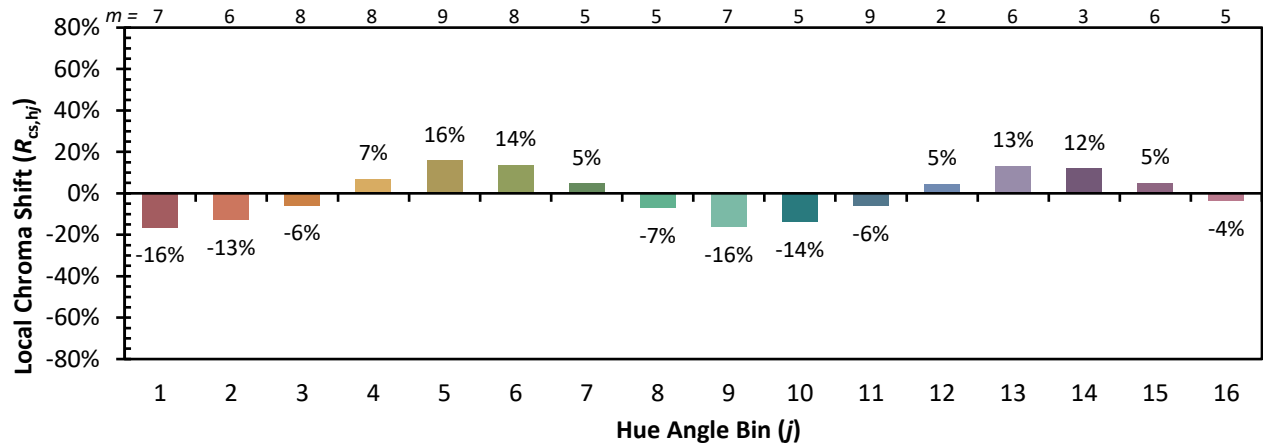
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 54 | CES51 = 88 | CES76 = 43 |
| CES02 = 59 | CES27 = 79 | CES52 = 90 | CES77 = 64 |
| CES03 = 30 | CES28 = 77 | CES53 = 77 | CES78 = 46 |
| CES04 = 69 | CES29 = 50 | CES54 = 81 | CES79 = 74 |
| CES05 = 46 | CES30 = 59 | CES55 = 80 | CES80 = 70 |
| CES06 = 50 | CES31 = 55 | CES56 = 70 | CES81 = 71 |
| CES07 = 38 | CES32 = 52 | CES57 = 68 | CES82 = 88 |
| CES08 = 38 | CES33 = 63 | CES58 = 70 | CES83 = 82 |
| CES09 = 29 | CES34 = 63 | CES59 = 88 | CES84 = 87 |
| CES10 = 72 | CES35 = 79 | CES60 = 92 | CES85 = 84 |
| CES11 = 55 | CES36 = 90 | CES61 = 88 | CES86 = 76 |
| CES12 = 61 | CES37 = 72 | CES62 = 81 | CES87 = 75 |
| CES13 = 41 | CES38 = 68 | CES63 = 75 | CES88 = 77 |
| CES14 = 74 | CES39 = 91 | CES64 = 72 | CES89 = 76 |
| CES15 = 70 | CES40 = 83 | CES65 = 65 | CES90 = 76 |
| CES16 = 46 | CES41 = 84 | CES66 = 66 | CES91 = 92 |
| CES17 = 48 | CES42 = 70 | CES67 = 64 | CES92 = 70 |
| CES18 = 55 | CES43 = 69 | CES68 = 71 | CES93 = 83 |
| CES19 = 70 | CES44 = 98 | CES69 = 80 | CES94 = 60 |
| CES20 = 64 | CES45 = 79 | CES70 = 58 | CES95 = 73 |
| CES21 = 85 | CES46 = 78 | CES71 = 55 | CES96 = 79 |
| CES22 = 77 | CES47 = 76 | CES72 = 84 | CES97 = 84 |
| CES23 = 91 | CES48 = 68 | CES73 = 47 | CES98 = 73 |
| CES24 = 90 | CES49 = 78 | CES74 = 94 | CES99 = 62 |
| CES25 = 71 | CES50 = 87 | CES75 = 51 |            |



REPORT NUMBER: SP1-1908-441-9-R4

**TM-30-18**

**Color Rendition by Hue-Angle Bin**



REPORT NUMBER: SP1-1908-441-9-R4

**TM-30-18**

**Measure Comparisons**



(END OF REPORT)