

Signify Classified - Internal  
Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269



Scaled data based on original data using  
LM-79-08 Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Test Report Prepared for  
Cooper Lighting Solutions  
(formerly Eaton)

Brand: McGRAW-EDISON

Report Number: P318158

Luminaire Tested: **GLEON-SA4B-760-U-T2**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P318158  
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-SA4B-760-U-T2  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(4) 70 CRI, 5700K, 800mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE II OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 22622 lumens  
Efficiency: N/A  
Efficacy: 132.3 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 1' x H: 0')  
IES Classification: Type III - Medium  
BUG Rating: B3 - U0 - G4

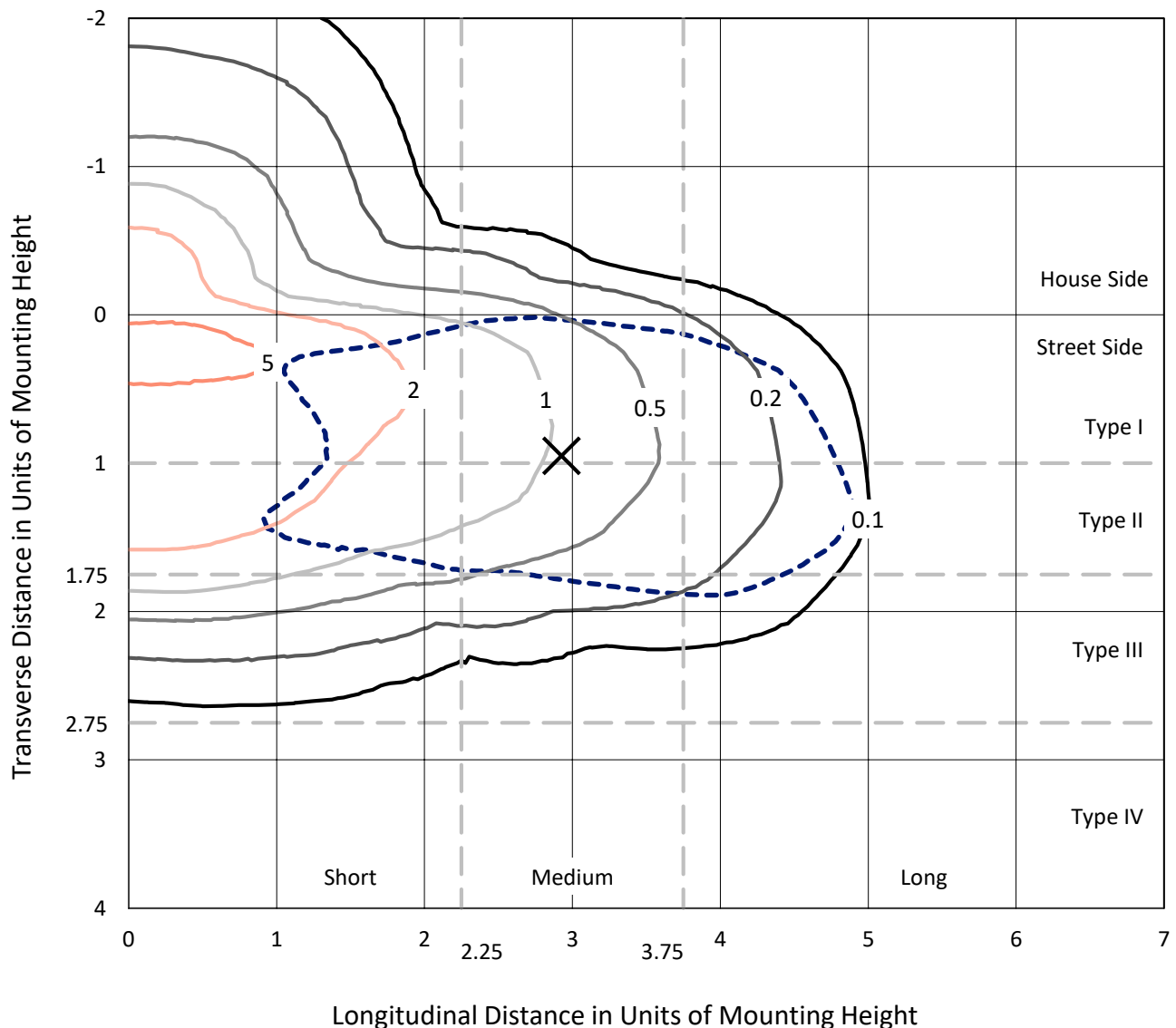
Input Watts (W): 171  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



REPORT NUMBER: P318158  
 CATALOG NUMBER: GLEON-SA4B-760-U-T2

## Iso-Footcandle Lines of Horizontal Illumination

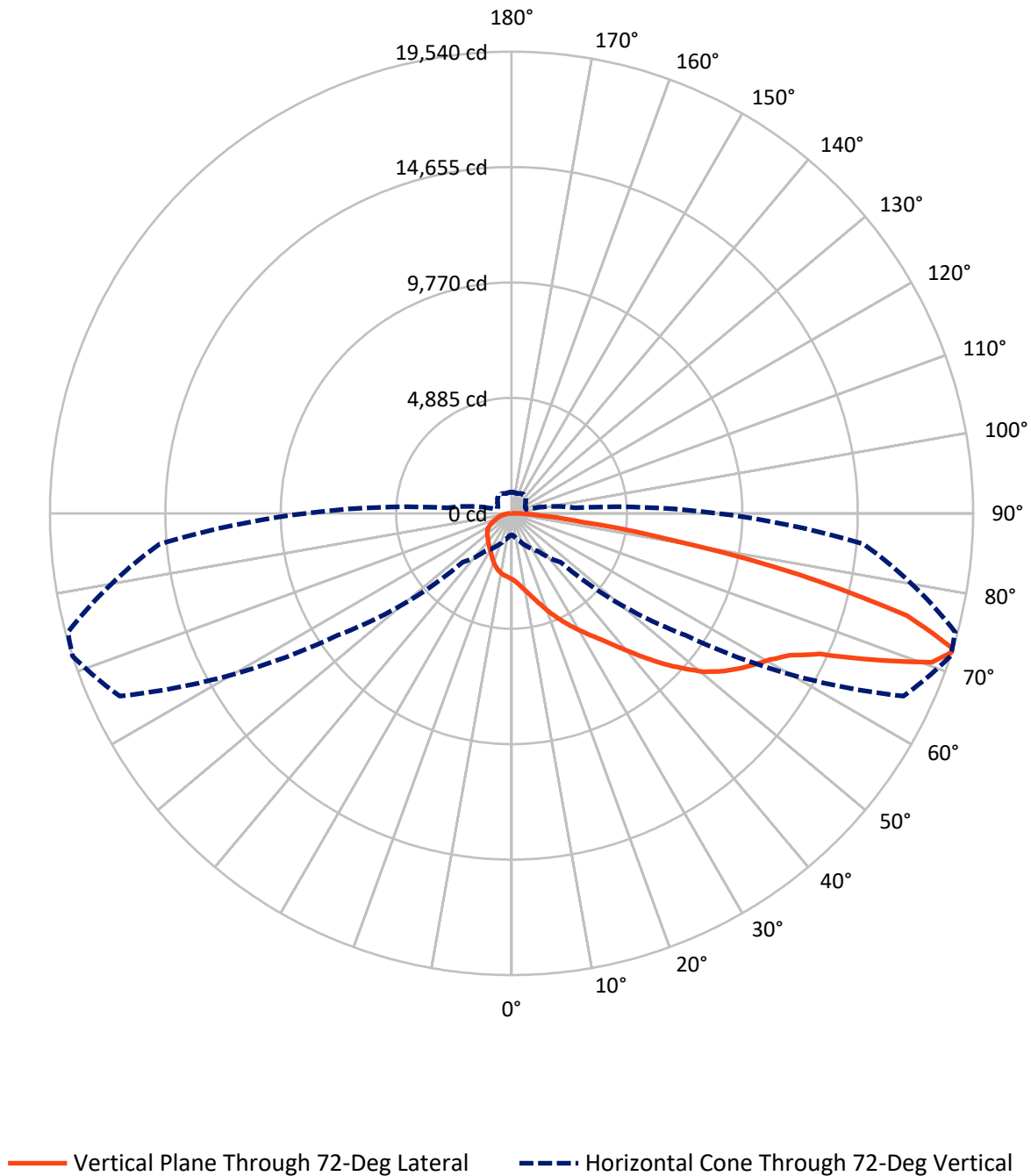
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 6.1 fc  
 Type III - Medium - N/A

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## Luminous Intensity Polar Plot



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CATALOG NUMBER: GLEON-SA4B-760-U-T2

**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 4196.5   | 0.0    | 4196.5  |
|                    | % Fixture | 18.6     | 0.0    | 18.6    |
| <b>Street Side</b> | Lumens    | 18425.5  | 0.0    | 18425.5 |
|                    | % Fixture | 81.4     | 0.0    | 81.4    |
| <b>Total</b>       | Lumens    | 22622.0  | 0.0    | 22622.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 278.9   | 1.2       |
| 10°-20°   | 901.2   | 4.0       |
| 20°-30°   | 1579.2  | 7.0       |
| 30°-40°   | 2341.4  | 10.4      |
| 40°-50°   | 3424.5  | 15.1      |
| 50°-60°   | 4712.1  | 20.8      |
| 60°-70°   | 5245.9  | 23.2      |
| 70°-80°   | 3554.6  | 15.7      |
| 80°-90°   | 584.2   | 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°    | 22622.0 | 100.0     |
| 0°-180°   | 22622.0 | 100.0     |

**Coefficient of Utilization**



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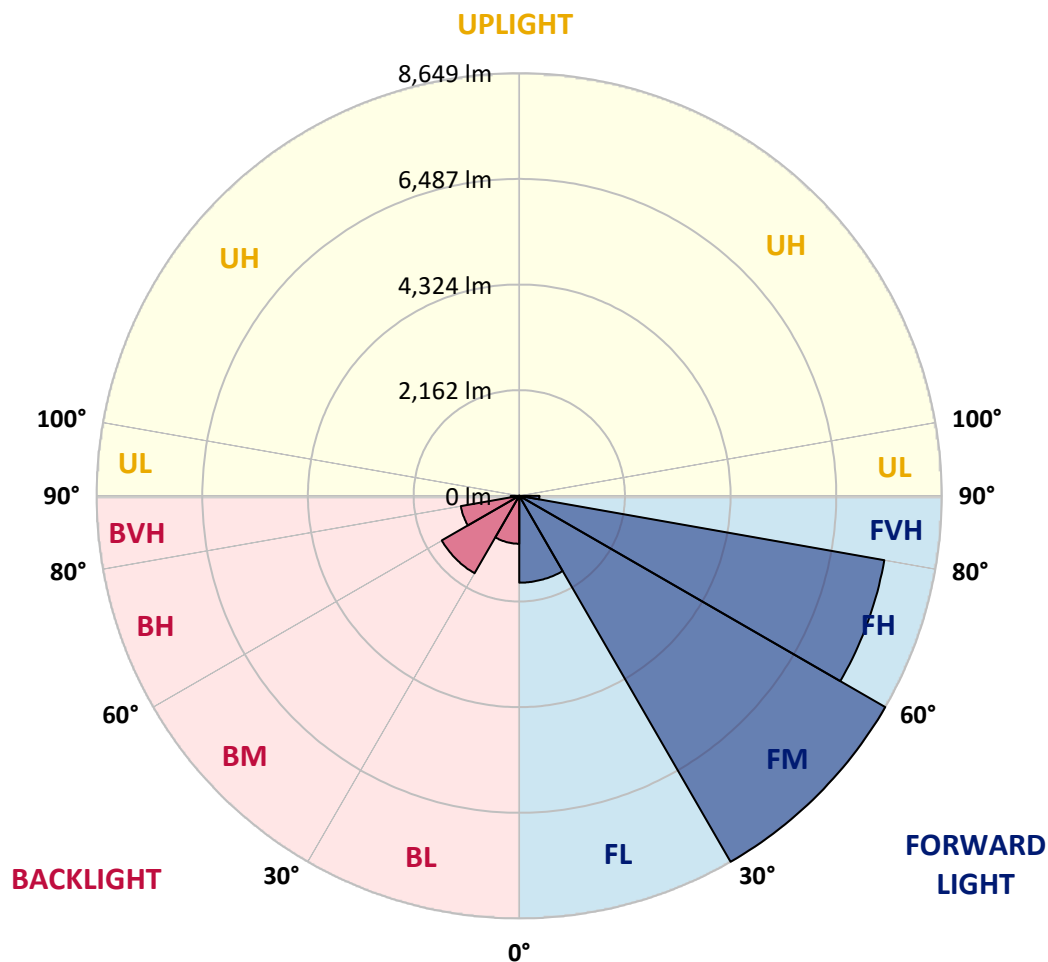
CATALOG NUMBER: GLEON-SA4B-760-U-T2

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |          |
|------|-------------|--------|-----------|-------------------------|------|----------|
|      |             |        |           | B                       | U    | G        |
| FL   | (0°-30°)    | 1778.2 | 7.9       |                         |      |          |
| FM   | (30°-60°)   | 8648.7 | 38.2      |                         |      |          |
| FH   | (60°-80°)   | 7586.5 | 33.5      |                         |      | G4/12000 |
| FVH  | (80°-90°)   | 412.1  | 1.8       |                         |      | G3/500   |
| BL   | (0°-30°)    | 981.0  | 4.3       | B2/1000                 |      |          |
| BM   | (30°-60°)   | 1829.3 | 8.1       | B2/2500                 |      |          |
| BH   | (60°-80°)   | 1214.1 | 5.4       | B3/2500                 |      | G3/2500  |
| BVH  | (80°-90°)   | 172.1  | 0.8       |                         |      | G2/225   |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |          |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |          |

**BUG Rating: B3-U0-G4**

Type III Medium





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°     | 45°     | 55°     | 65°     | 72°     | 75°     | 85°     |
|-------|--------|--------|--------|--------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 2783.1 | 2783.1 | 2783.1 | 2783.1 | 2783.1  | 2783.1  | 2783.1  | 2783.1  | 2783.1  | 2783.1  | 2783.1  |
| 2.5°  | 3074.4 | 3069.7 | 3053.4 | 3053.4 | 3022.2  | 2995.7  | 2945.9  | 2912.4  | 2872.7  | 2858.7  | 2811.9  |
| 5°    | 3372.0 | 3373.5 | 3353.3 | 3339.2 | 3293.3  | 3237.2  | 3152.3  | 3075.2  | 2998.1  | 2966.9  | 2871.1  |
| 7.5°  | 3622.0 | 3618.9 | 3613.4 | 3601.7 | 3558.9  | 3501.3  | 3386.8  | 3272.3  | 3158.5  | 3111.8  | 2946.7  |
| 10°   | 3782.5 | 3789.5 | 3794.1 | 3799.6 | 3781.7  | 3740.4  | 3632.1  | 3492.7  | 3343.9  | 3280.0  | 3037.0  |
| 12.5° | 3863.5 | 3875.9 | 3897.7 | 3935.1 | 3964.7  | 3960.1  | 3881.4  | 3733.4  | 3556.6  | 3476.3  | 3150.0  |
| 15°   | 3911.0 | 3927.3 | 3961.6 | 4028.6 | 4111.9  | 4159.5  | 4138.4  | 4004.4  | 3807.4  | 3708.5  | 3287.8  |
| 17.5° | 3940.6 | 3953.8 | 4006.8 | 4096.4 | 4220.2  | 4346.4  | 4401.7  | 4289.5  | 4090.9  | 3978.0  | 3446.0  |
| 20°   | 3960.8 | 3971.0 | 4037.2 | 4142.3 | 4302.8  | 4503.7  | 4658.0  | 4629.9  | 4403.3  | 4256.8  | 3611.1  |
| 22.5° | 4006.0 | 4014.6 | 4077.7 | 4183.6 | 4361.2  | 4620.6  | 4904.9  | 4946.9  | 4732.7  | 4566.8  | 3787.9  |
| 25°   | 4132.2 | 4132.2 | 4185.2 | 4259.2 | 4425.8  | 4721.8  | 5113.6  | 5299.8  | 5069.2  | 4876.1  | 3951.5  |
| 27.5° | 4372.9 | 4370.5 | 4390.0 | 4415.7 | 4541.9  | 4824.7  | 5299.8  | 5611.4  | 5418.2  | 5207.1  | 4110.4  |
| 30°   | 4658.0 | 4673.5 | 4675.9 | 4663.4 | 4722.6  | 4953.2  | 5471.9  | 5940.1  | 5769.5  | 5542.0  | 4273.2  |
| 32.5° | 5024.8 | 5035.0 | 5023.3 | 4982.0 | 4973.4  | 5135.4  | 5641.0  | 6284.4  | 6149.6  | 5891.8  | 4422.0  |
| 35°   | 5490.6 | 5471.2 | 5434.6 | 5350.4 | 5270.2  | 5379.3  | 5834.1  | 6628.6  | 6576.5  | 6314.7  | 4626.8  |
| 37.5° | 5989.9 | 5990.7 | 5945.5 | 5754.7 | 5644.1  | 5690.8  | 6100.5  | 7018.9  | 7092.9  | 6817.9  | 4889.3  |
| 40°   | 6390.3 | 6411.3 | 6439.4 | 6188.6 | 6045.2  | 6109.9  | 6439.4  | 7471.4  | 7703.6  | 7414.6  | 5231.3  |
| 42.5° | 6669.9 | 6694.1 | 6773.5 | 6616.2 | 6467.4  | 6587.4  | 6838.2  | 7954.4  | 8389.0  | 8103.1  | 5631.6  |
| 45°   | 6965.9 | 6979.2 | 7035.2 | 6967.5 | 6872.4  | 7142.7  | 7287.6  | 8454.4  | 9114.2  | 8836.9  | 6079.5  |
| 47.5° | 7277.5 | 7291.5 | 7349.1 | 7304.0 | 7254.1  | 7661.5  | 7756.5  | 8925.7  | 9809.0  | 9643.1  | 6557.8  |
| 50°   | 7662.3 | 7671.6 | 7726.1 | 7644.4 | 7659.9  | 8052.5  | 8175.6  | 9358.0  | 10537.3 | 10367.5 | 7037.6  |
| 52.5° | 8187.3 | 8189.6 | 8265.2 | 8191.2 | 8117.9  | 8339.2  | 8536.2  | 9765.4  | 11108.2 | 11028.0 | 7517.4  |
| 55°   | 8598.5 | 8623.5 | 8871.2 | 8855.6 | 8813.5  | 8599.3  | 8837.7  | 10153.3 | 11617.7 | 11655.8 | 8026.8  |
| 57.5° | 8336.0 | 8433.4 | 8935.0 | 9288.7 | 9633.0  | 9246.6  | 9245.1  | 10590.3 | 12091.2 | 12272.0 | 8586.9  |
| 60°   | 7300.9 | 7433.3 | 8172.5 | 8956.8 | 10034.1 | 10372.9 | 10091.0 | 11123.8 | 12569.5 | 12882.6 | 9288.7  |
| 62.5° | 5214.1 | 5432.2 | 6433.9 | 7686.4 | 9484.2  | 11119.1 | 11812.4 | 11970.5 | 13219.9 | 13589.9 | 10200.8 |
| 65°   | 2635.9 | 2801.0 | 3640.7 | 5149.5 | 7577.4  | 10631.5 | 13683.4 | 13824.3 | 14350.1 | 14678.8 | 11605.2 |
| 67.5° | 1601.5 | 1663.8 | 2073.5 | 2864.1 | 4645.5  | 8281.5  | 14294.0 | 16914.3 | 16537.3 | 16711.8 | 13607.8 |
| 70°   | 1180.1 | 1226.0 | 1481.5 | 1902.1 | 2671.7  | 4859.7  | 12419.9 | 19119.5 | 18871.8 | 18852.3 | 15087.8 |
| 72°   | 919.1  | 952.6  | 1178.5 | 1536.8 | 1953.5  | 2915.5  | 9002.0  | 18305.5 | 19540.1 | 19441.9 | 14952.2 |
| 72.5° | 871.6  | 901.2  | 1106.9 | 1446.5 | 1846.1  | 2642.9  | 8093.8  | 17756.4 | 19491.8 | 19447.4 | 14777.0 |
| 75°   | 686.2  | 707.3  | 819.4  | 1118.5 | 1444.9  | 1499.4  | 4435.2  | 13760.5 | 17291.3 | 18010.3 | 13290.8 |
| 77.5° | 567.8  | 571.0  | 630.1  | 814.0  | 1126.3  | 1060.1  | 2178.7  | 9547.3  | 12381.8 | 13172.4 | 9414.9  |
| 80°   | 462.7  | 466.6  | 494.6  | 571.0  | 852.1   | 784.4   | 1034.4  | 5489.9  | 6932.4  | 6941.0  | 4477.3  |
| 82.5° | 368.4  | 369.2  | 400.4  | 417.5  | 612.2   | 560.8   | 592.8   | 2577.5  | 3029.2  | 2914.0  | 1609.3  |
| 85°   | 259.4  | 253.9  | 391.0  | 342.7  | 400.4   | 359.9   | 327.1   | 1020.4  | 1252.5  | 1198.0  | 504.0   |
| 87.5° | 86.5   | 89.6   | 173.7  | 222.0  | 233.7   | 204.1   | 145.7   | 391.0   | 472.8   | 468.9   | 159.7   |
| 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: P318158

CATALOG NUMBER: GLEON-SA4B-760-U-T2

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 2783.1 | 2783.1 | 2783.1 | 2783.1 | 2783.1 | 2783.1 | 2783.1 | 2783.1 | 2783.1 | 2783.1 | 2783.1 |
| 2.5°  | 2797.1 | 2772.2 | 2735.6 | 2695.1 | 2663.1 | 2630.4 | 2606.3 | 2593.8 | 2579.8 | 2568.1 | 2582.1 |
| 5°    | 2826.7 | 2780.0 | 2702.1 | 2625.8 | 2569.7 | 2519.8 | 2484.0 | 2465.3 | 2448.2 | 2436.5 | 2438.0 |
| 7.5°  | 2875.0 | 2799.5 | 2668.6 | 2557.2 | 2479.3 | 2425.6 | 2389.0 | 2376.5 | 2365.6 | 2362.5 | 2366.4 |
| 10°   | 2926.4 | 2815.0 | 2624.2 | 2476.2 | 2387.4 | 2343.0 | 2326.6 | 2335.2 | 2343.0 | 2350.0 | 2357.8 |
| 12.5° | 2984.8 | 2829.1 | 2559.5 | 2381.2 | 2305.6 | 2288.5 | 2304.8 | 2342.2 | 2369.5 | 2385.8 | 2396.0 |
| 15°   | 3061.2 | 2841.5 | 2484.8 | 2286.1 | 2235.5 | 2255.0 | 2310.3 | 2374.9 | 2422.5 | 2452.8 | 2457.5 |
| 17.5° | 3131.3 | 2840.7 | 2389.0 | 2190.3 | 2178.7 | 2235.5 | 2318.9 | 2410.0 | 2473.9 | 2516.7 | 2525.3 |
| 20°   | 3203.7 | 2819.7 | 2277.6 | 2096.9 | 2121.0 | 2214.5 | 2322.8 | 2432.6 | 2509.7 | 2559.5 | 2571.2 |
| 22.5° | 3271.5 | 2783.1 | 2155.3 | 2012.0 | 2072.7 | 2186.4 | 2308.0 | 2419.3 | 2496.5 | 2537.0 | 2549.4 |
| 25°   | 3317.4 | 2719.2 | 2031.4 | 1940.3 | 2029.9 | 2152.2 | 2259.7 | 2349.2 | 2406.9 | 2427.1 | 2430.2 |
| 27.5° | 3340.8 | 2635.9 | 1914.6 | 1878.0 | 1985.5 | 2096.1 | 2170.1 | 2214.5 | 2230.8 | 2229.3 | 2226.2 |
| 30°   | 3343.9 | 2526.1 | 1814.1 | 1827.4 | 1934.1 | 2013.5 | 2048.6 | 2040.0 | 2019.0 | 1983.1 | 1986.3 |
| 32.5° | 3333.8 | 2402.2 | 1730.0 | 1779.1 | 1868.6 | 1913.0 | 1914.6 | 1873.3 | 1817.2 | 1760.4 | 1744.8 |
| 35°   | 3336.9 | 2280.7 | 1656.0 | 1724.5 | 1789.2 | 1808.7 | 1790.7 | 1730.0 | 1653.7 | 1580.4 | 1564.9 |
| 37.5° | 3371.2 | 2174.8 | 1592.1 | 1661.4 | 1701.2 | 1705.8 | 1680.1 | 1616.3 | 1560.2 | 1488.5 | 1482.3 |
| 40°   | 3453.0 | 2099.2 | 1531.4 | 1590.6 | 1613.2 | 1615.5 | 1578.9 | 1533.7 | 1538.4 | 1500.2 | 1499.4 |
| 42.5° | 3600.2 | 2066.5 | 1477.6 | 1516.6 | 1530.6 | 1535.3 | 1507.2 | 1478.4 | 1518.9 | 1494.0 | 1485.4 |
| 45°   | 3790.2 | 2074.3 | 1432.4 | 1444.1 | 1469.8 | 1491.6 | 1474.5 | 1439.5 | 1455.0 | 1346.8 | 1310.9 |
| 47.5° | 4009.9 | 2124.1 | 1396.6 | 1381.8 | 1426.2 | 1467.5 | 1441.0 | 1388.0 | 1332.7 | 1225.2 | 1205.0 |
| 50°   | 4266.9 | 2201.2 | 1363.9 | 1320.3 | 1378.7 | 1434.8 | 1408.3 | 1332.7 | 1249.4 | 1197.2 | 1190.2 |
| 52.5° | 4534.9 | 2295.5 | 1331.2 | 1252.5 | 1318.7 | 1409.9 | 1396.6 | 1320.3 | 1217.5 | 1166.0 | 1156.7 |
| 55°   | 4838.7 | 2390.5 | 1289.9 | 1173.8 | 1254.1 | 1398.2 | 1391.2 | 1275.1 | 1193.3 | 1164.5 | 1157.5 |
| 57.5° | 5216.5 | 2498.8 | 1235.4 | 1092.1 | 1193.3 | 1356.1 | 1334.3 | 1247.8 | 1168.4 | 1146.6 | 1144.2 |
| 60°   | 5708.7 | 2658.5 | 1156.7 | 1004.8 | 1119.3 | 1291.5 | 1286.8 | 1208.1 | 1128.7 | 1113.1 | 1110.0 |
| 62.5° | 6447.2 | 2922.5 | 1048.4 | 917.6  | 1036.7 | 1181.6 | 1224.5 | 1154.4 | 1086.6 | 1085.8 | 1087.4 |
| 65°   | 7592.2 | 3319.8 | 930.8  | 841.2  | 953.4  | 1088.9 | 1152.0 | 1099.1 | 1043.8 | 1059.3 | 1061.7 |
| 67.5° | 8919.5 | 3649.3 | 815.5  | 766.5  | 868.5  | 1000.9 | 1086.6 | 1043.8 | 986.9  | 1027.4 | 1028.2 |
| 70°   | 9361.1 | 3354.8 | 714.3  | 692.5  | 780.5  | 916.0  | 1015.7 | 983.0  | 925.4  | 965.9  | 962.0  |
| 72°   | 8711.5 | 2708.3 | 648.8  | 636.4  | 714.3  | 845.9  | 952.6  | 926.1  | 869.3  | 896.5  | 886.4  |
| 72.5° | 8506.6 | 2582.1 | 632.5  | 622.4  | 696.4  | 828.0  | 936.3  | 912.1  | 855.3  | 878.6  | 869.3  |
| 75°   | 7588.3 | 2242.5 | 543.7  | 546.0  | 607.6  | 740.8  | 844.4  | 836.6  | 778.1  | 780.5  | 777.4  |
| 77.5° | 5503.9 | 1644.3 | 458.0  | 473.6  | 517.2  | 651.2  | 751.7  | 747.0  | 683.1  | 671.4  | 669.1  |
| 80°   | 2554.1 | 838.9  | 373.1  | 380.1  | 425.3  | 544.5  | 641.1  | 634.8  | 583.4  | 568.6  | 560.0  |
| 82.5° | 874.7  | 398.8  | 280.4  | 285.1  | 329.5  | 438.5  | 556.2  | 552.3  | 509.4  | 480.6  | 462.7  |
| 85°   | 312.3  | 198.6  | 196.3  | 191.6  | 235.2  | 345.1  | 484.5  | 463.5  | 400.4  | 341.2  | 339.6  |
| 87.5° | 101.3  | 84.9   | 101.3  | 100.5  | 137.1  | 233.7  | 352.1  | 299.9  | 290.5  | 241.5  | 236.8  |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |



LM-79-2008: 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: 4π  
 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

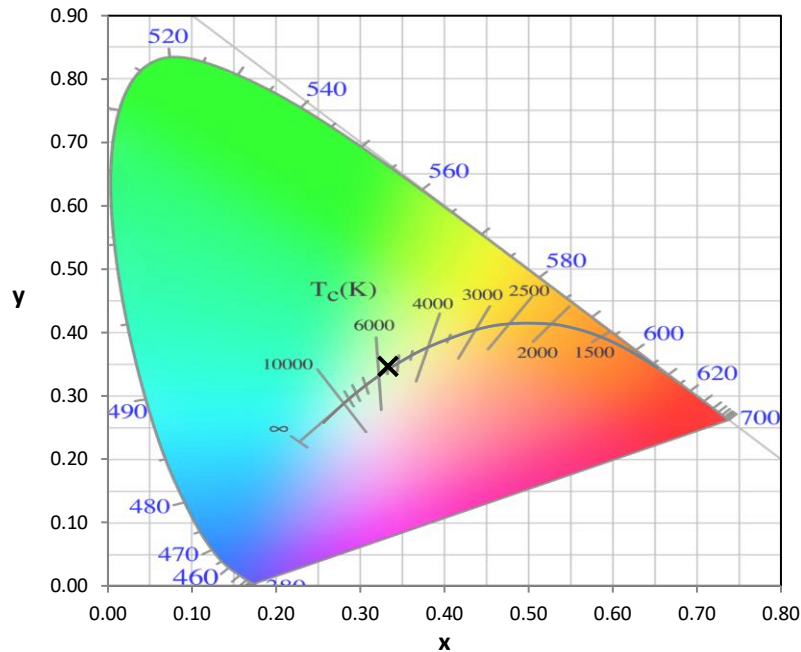
Stabilization Time: 240M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.6/31%  
 Sphere Temperature (°C): 25.9

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| 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            |

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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 5700K 4-step quadrangle

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**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               |           |                  |                  |

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**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               |           |                  |                  |

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**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               |           |                  |                  |

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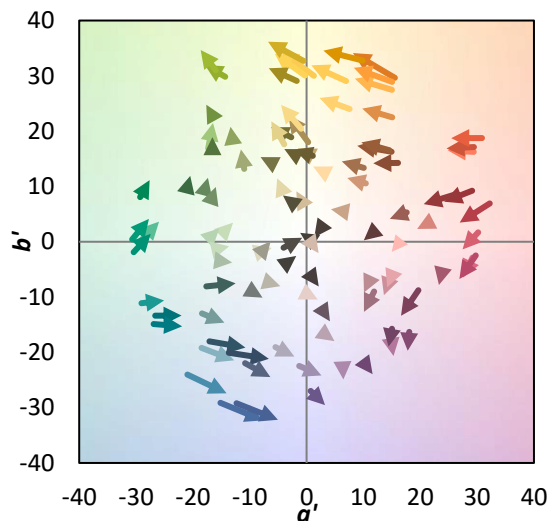
**TM-30-18**

**Summary**

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



**Color Vector Graphics**





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**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 |            |



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Color Rendition by Hue-Angle Bin



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**Measure Comparisons**



(END OF REPORT)