

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: P317403

Luminaire Tested: **GLEON-SA9B-730-U-T2R**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P317403  
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-SA9B-730-U-T2R  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(9) 70 CRI, 3000K, 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: 48470 lumens  
Efficiency: N/A  
Efficacy: 129.6 lumens/watt  
Luminous Opening: Rectangular (W 2.5' x L: 1' x H: 0')  
IES Classification: Type II - Short  
BUG Rating: B3 - U0 - G5

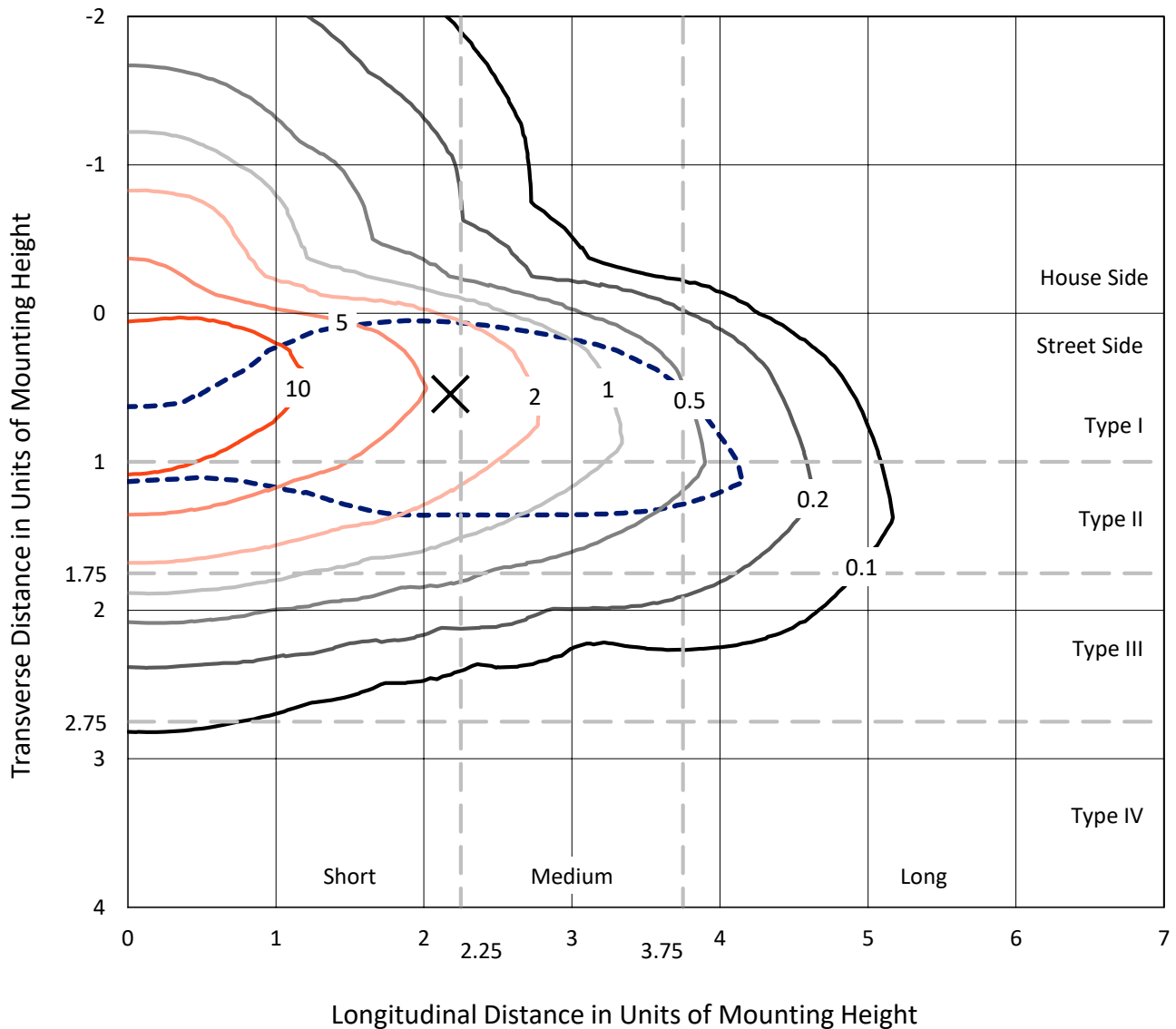
Input Watts (W): 374  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



REPORT NUMBER: P317403  
 CATALOG NUMBER: GLEON-SA9B-730-U-T2R

## Iso-Footcandle Lines of Horizontal Illumination

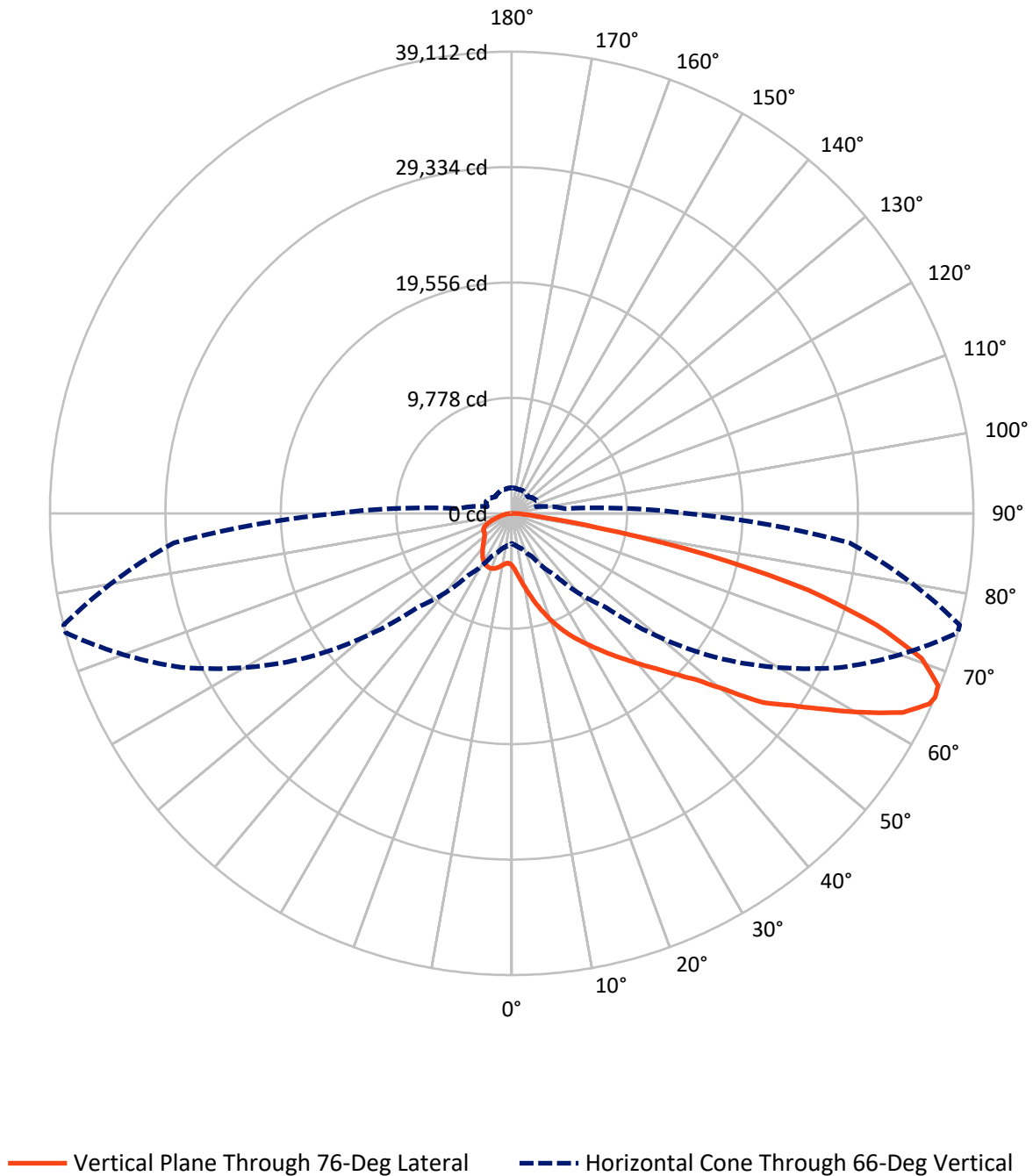
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 18.8 fc  
 Type II - Short - N/A

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## Luminous Intensity Polar Plot



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CATALOG NUMBER: GLEON-SA9B-730-U-T2R

**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 8155.8   | 0.0    | 8155.8  |
|                    | % Fixture | 16.8     | 0.0    | 16.8    |
| <b>Street Side</b> | Lumens    | 40314.2  | 0.0    | 40314.2 |
|                    | % Fixture | 83.2     | 0.0    | 83.2    |
| <b>Total</b>       | Lumens    | 48470.0  | 0.0    | 48470.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 535.3   | 1.1       |
| 10°-20°   | 2113.8  | 4.4       |
| 20°-30°   | 4107.5  | 8.5       |
| 30°-40°   | 6704.4  | 13.8      |
| 40°-50°   | 9159.9  | 18.9      |
| 50°-60°   | 10669.4 | 22.0      |
| 60°-70°   | 9565.3  | 19.7      |
| 70°-80°   | 4833.9  | 10.0      |
| 80°-90°   | 780.6   | 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°    | 48470.0 | 100.0     |
| 0°-180°   | 48470.0 | 100.0     |

**Coefficient of Utilization**



REPORT NUMBER: P317403

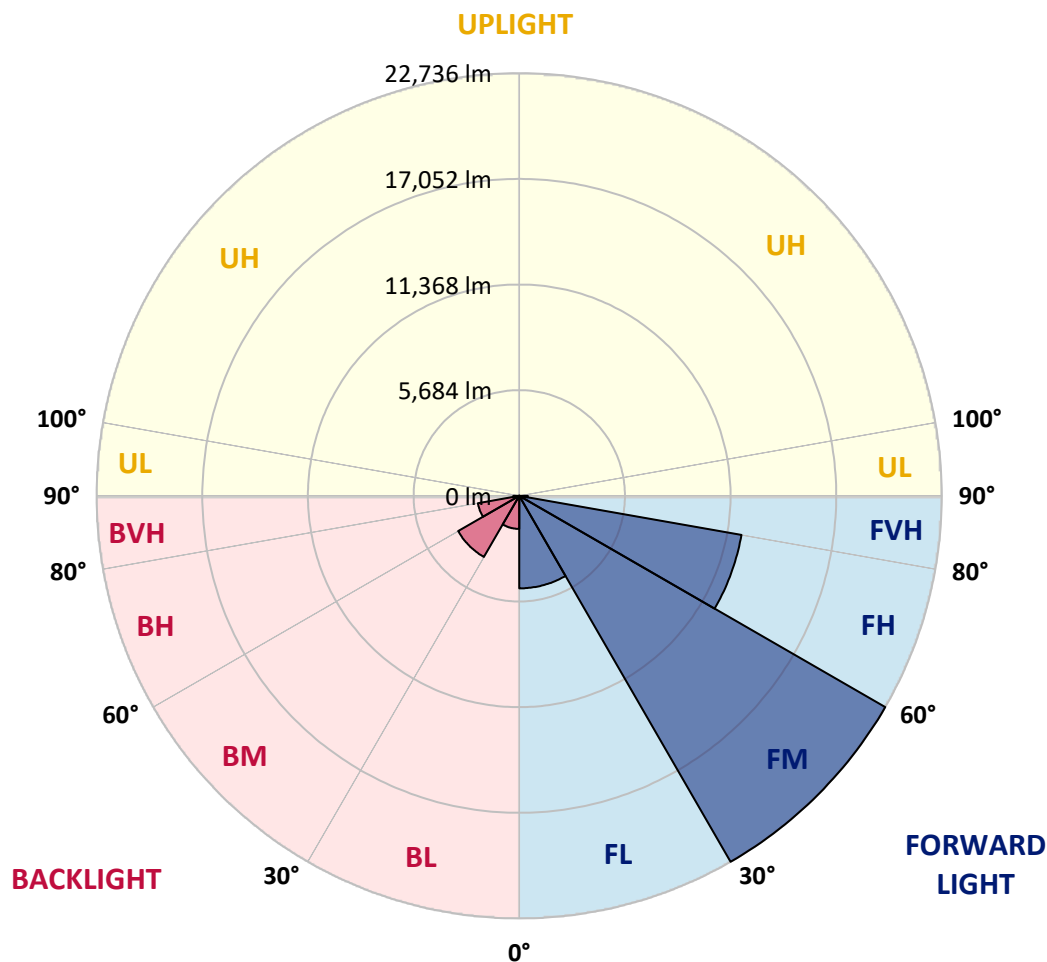
CATALOG NUMBER: GLEON-SA9B-730-U-T2R

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|---------|-----------|-------------------------|------|---------|
|      |             |         |           | B                       | U    | G       |
| FL   | (0°-30°)    | 4977.7  | 10.3      |                         |      |         |
| FM   | (30°-60°)   | 22735.8 | 46.9      |                         |      |         |
| FH   | (60°-80°)   | 12139.6 | 25.0      |                         |      | G5      |
| FVH  | (80°-90°)   | 461.0   | 1.0       |                         |      | G3/500  |
| BL   | (0°-30°)    | 1778.8  | 3.7       | B3/2500                 |      |         |
| BM   | (30°-60°)   | 3797.9  | 7.8       | B3/5000                 |      |         |
| BH   | (60°-80°)   | 2259.6  | 4.7       | B3/2500                 |      | G3/2500 |
| BVH  | (80°-90°)   | 319.6   | 0.7       |                         |      | 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 II Short





REPORT NUMBER: P317403

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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 55°     | 65°     | 75°     | 76°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 4426.4  | 4426.4  | 4426.4  | 4426.4  | 4426.4  | 4426.4  | 4426.4  | 4426.4  | 4426.4  | 4426.4  | 4426.4  |
| 2.5°  | 5876.1  | 5787.2  | 5779.0  | 5649.0  | 5619.4  | 5370.9  | 5188.3  | 4997.4  | 4780.2  | 4737.4  | 4566.3  |
| 5°    | 7547.9  | 7539.7  | 7426.2  | 7213.9  | 7047.7  | 6623.2  | 6203.5  | 5759.3  | 5272.2  | 5193.2  | 4808.2  |
| 7.5°  | 9051.9  | 9038.8  | 8951.5  | 8722.8  | 8482.6  | 7960.9  | 7362.0  | 6680.7  | 5890.9  | 5774.1  | 5135.6  |
| 10°   | 10193.9 | 10189.0 | 10159.3 | 9991.5  | 9787.5  | 9287.2  | 8625.7  | 7696.0  | 6610.0  | 6450.4  | 5545.3  |
| 12.5° | 11075.9 | 11085.8 | 11105.5 | 11046.3 | 10949.2 | 10523.0 | 9845.0  | 8772.2  | 7376.8  | 7218.8  | 6001.2  |
| 15°   | 11673.2 | 11702.8 | 11804.8 | 11888.8 | 11939.8 | 11678.1 | 11021.6 | 9873.0  | 8235.7  | 8046.5  | 6506.3  |
| 17.5° | 11974.3 | 12007.2 | 12183.3 | 12436.7 | 12670.4 | 12644.0 | 12122.4 | 10922.9 | 9060.1  | 8877.5  | 7049.3  |
| 20°   | 12234.3 | 12259.0 | 12456.5 | 12760.9 | 13173.9 | 13356.6 | 13063.7 | 11933.2 | 9963.5  | 9746.3  | 7625.3  |
| 22.5° | 12988.0 | 13019.2 | 13078.5 | 13251.2 | 13616.5 | 13952.2 | 13810.7 | 12889.2 | 10791.2 | 10588.8 | 8171.6  |
| 25°   | 14442.6 | 14480.4 | 14352.1 | 14205.6 | 14274.7 | 14508.4 | 14534.7 | 13761.3 | 11630.4 | 11401.7 | 8759.0  |
| 27.5° | 16195.0 | 16249.3 | 16030.5 | 15653.7 | 15324.6 | 15234.1 | 15202.8 | 14475.5 | 12431.8 | 12166.9 | 9339.9  |
| 30°   | 17911.3 | 18005.1 | 17720.4 | 17231.7 | 16627.8 | 16203.3 | 15889.0 | 15174.8 | 13221.6 | 12968.2 | 9887.8  |
| 32.5° | 19588.1 | 19550.2 | 19137.2 | 18660.0 | 17952.4 | 17420.9 | 16660.7 | 15925.2 | 14110.2 | 13818.9 | 10432.5 |
| 35°   | 20736.6 | 20749.8 | 20366.4 | 19800.3 | 19125.7 | 18717.6 | 17694.1 | 16734.8 | 15016.9 | 14748.6 | 11051.2 |
| 37.5° | 21714.1 | 21653.2 | 21218.8 | 20690.6 | 20109.7 | 19935.3 | 18903.5 | 17626.6 | 15999.2 | 15706.3 | 11709.4 |
| 40°   | 22039.9 | 21969.1 | 21684.4 | 21304.3 | 20838.7 | 20823.8 | 20238.0 | 18637.0 | 17109.9 | 16820.3 | 12451.5 |
| 42.5° | 21842.4 | 21751.9 | 21635.1 | 21531.4 | 21388.3 | 21454.1 | 21491.9 | 19821.7 | 18330.9 | 18006.7 | 13310.5 |
| 45°   | 21113.5 | 20976.9 | 21059.2 | 21284.6 | 21595.6 | 21967.5 | 22624.0 | 21133.2 | 19698.3 | 19426.8 | 14319.2 |
| 47.5° | 19992.9 | 19869.5 | 20126.2 | 20608.3 | 21454.1 | 22395.3 | 23695.2 | 22581.2 | 21330.7 | 21060.8 | 15755.7 |
| 50°   | 18416.5 | 18452.7 | 18819.6 | 19696.7 | 20975.2 | 22592.8 | 25014.9 | 24498.3 | 23703.5 | 23451.7 | 17715.5 |
| 52.5° | 15829.7 | 15836.3 | 16869.7 | 18309.5 | 20126.2 | 22490.7 | 25747.2 | 26948.4 | 26943.5 | 26639.1 | 19581.5 |
| 55°   | 13427.3 | 13573.8 | 14391.6 | 16305.3 | 18750.5 | 22082.7 | 26258.9 | 28139.8 | 29071.1 | 28714.0 | 21320.8 |
| 57.5° | 11080.8 | 11166.4 | 11941.4 | 13863.4 | 16787.4 | 20995.0 | 26783.9 | 29569.7 | 31522.9 | 31297.5 | 23483.0 |
| 60°   | 8411.8  | 8543.5  | 9344.8  | 11120.3 | 14276.4 | 19064.8 | 26833.2 | 31062.2 | 34453.6 | 34226.5 | 25896.9 |
| 62.5° | 5459.8  | 5686.9  | 6437.2  | 8100.8  | 11238.8 | 16288.8 | 25688.0 | 32038.0 | 37231.2 | 37150.5 | 28039.4 |
| 65°   | 3138.0  | 3309.1  | 3830.7  | 5114.2  | 7753.6  | 12803.7 | 22964.6 | 31662.8 | 38940.8 | 38894.8 | 28840.7 |
| 66°   | 2563.7  | 2670.7  | 3070.5  | 3996.9  | 6397.7  | 11243.7 | 21381.7 | 30871.3 | 39110.3 | 39112.0 | 28748.6 |
| 67.5° | 2050.3  | 2098.0  | 2277.4  | 2861.5  | 4720.9  | 8912.0  | 18553.1 | 29125.4 | 38899.7 | 38957.3 | 28154.6 |
| 70°   | 1696.5  | 1721.2  | 1777.1  | 1918.7  | 2576.9  | 5374.2  | 13169.0 | 24588.8 | 36785.2 | 36829.7 | 25836.0 |
| 72.5° | 1522.1  | 1536.9  | 1558.3  | 1578.0  | 1818.3  | 3003.0  | 8043.2  | 19670.3 | 32251.9 | 32309.5 | 22303.2 |
| 75°   | 1378.9  | 1387.2  | 1383.9  | 1385.5  | 1525.4  | 1913.7  | 4156.5  | 14686.1 | 26077.9 | 25962.8 | 17085.3 |
| 77.5° | 1211.1  | 1219.3  | 1202.9  | 1206.2  | 1349.3  | 1471.1  | 2068.4  | 10281.1 | 17598.7 | 16785.8 | 9626.2  |
| 80°   | 1023.5  | 1030.1  | 1023.5  | 1035.0  | 1174.9  | 1110.7  | 1202.9  | 5783.9  | 7781.6  | 7360.3  | 3422.6  |
| 82.5° | 773.4   | 801.4   | 821.1   | 867.2   | 967.6   | 789.8   | 804.7   | 2252.7  | 2369.5  | 2256.0  | 1049.8  |
| 85°   | 339.0   | 413.0   | 618.7   | 663.1   | 727.3   | 473.9   | 528.2   | 918.2   | 964.3   | 934.6   | 381.8   |
| 87.5° | 88.9    | 97.1    | 306.1   | 385.0   | 403.1   | 213.9   | 274.8   | 418.0   | 441.0   | 418.0   | 126.7   |
| 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: P317403

CATALOG NUMBER: GLEON-SA9B-730-U-T2R

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 4426.4  | 4426.4 | 4426.4 | 4426.4 | 4426.4 | 4426.4 | 4426.4 | 4426.4 | 4426.4 | 4426.4 | 4426.4 |
| 2.5°  | 4475.8  | 4395.1 | 4250.3 | 4122.0 | 4024.9 | 3959.1 | 3893.3 | 3860.4 | 3840.6 | 3820.9 | 3824.1 |
| 5°    | 4618.9  | 4456.0 | 4207.6 | 4031.5 | 3932.8 | 3870.2 | 3837.3 | 3824.1 | 3815.9 | 3796.2 | 3796.2 |
| 7.5°  | 4834.5  | 4604.1 | 4261.9 | 4080.8 | 4003.5 | 3955.8 | 3936.0 | 3929.5 | 3919.6 | 3896.6 | 3899.8 |
| 10°   | 5106.0  | 4783.5 | 4375.4 | 4199.3 | 4128.6 | 4075.9 | 4047.9 | 4038.1 | 4020.0 | 3993.6 | 3996.9 |
| 12.5° | 5425.2  | 5005.6 | 4525.1 | 4340.8 | 4255.3 | 4184.5 | 4138.4 | 4110.5 | 4079.2 | 4044.6 | 4046.3 |
| 15°   | 5774.1  | 5247.5 | 4686.4 | 4467.5 | 4350.7 | 4252.0 | 4177.9 | 4130.2 | 4080.8 | 4038.1 | 4036.4 |
| 17.5° | 6127.9  | 5481.2 | 4809.8 | 4536.7 | 4378.7 | 4248.7 | 4148.3 | 4074.3 | 4013.4 | 3960.7 | 3955.8 |
| 20°   | 6509.6  | 5691.8 | 4878.9 | 4530.1 | 4326.0 | 4171.4 | 4038.1 | 3945.9 | 3878.5 | 3825.8 | 3817.6 |
| 22.5° | 6898.0  | 5889.3 | 4890.4 | 4462.6 | 4209.2 | 4020.0 | 3880.1 | 3778.1 | 3709.0 | 3654.7 | 3634.9 |
| 25°   | 7253.4  | 6042.3 | 4842.7 | 4332.6 | 4046.3 | 3842.3 | 3705.7 | 3602.0 | 3546.1 | 3481.9 | 3462.1 |
| 27.5° | 7577.5  | 6149.2 | 4747.3 | 4166.4 | 3863.6 | 3662.9 | 3534.5 | 3445.7 | 3384.8 | 3335.4 | 3319.0 |
| 30°   | 7868.8  | 6206.8 | 4591.0 | 3969.0 | 3676.1 | 3493.4 | 3384.8 | 3323.9 | 3271.3 | 3208.7 | 3197.2 |
| 32.5° | 8145.2  | 6206.8 | 4390.2 | 3753.4 | 3490.1 | 3343.7 | 3279.5 | 3241.6 | 3182.4 | 3121.5 | 3105.1 |
| 35°   | 8421.7  | 6169.0 | 4153.3 | 3528.0 | 3319.0 | 3236.7 | 3233.4 | 3189.0 | 3098.5 | 3016.2 | 2994.8 |
| 37.5° | 8712.9  | 6091.7 | 3886.7 | 3317.3 | 3179.1 | 3189.0 | 3217.0 | 3118.2 | 2989.9 | 2873.0 | 2841.8 |
| 40°   | 9042.0  | 5984.7 | 3610.2 | 3134.7 | 3062.3 | 3167.6 | 3172.5 | 3016.2 | 2766.1 | 2659.1 | 2631.2 |
| 42.5° | 9428.7  | 5877.7 | 3353.5 | 2973.4 | 2970.1 | 3103.4 | 3088.6 | 2795.7 | 2646.0 | 2591.7 | 2576.9 |
| 45°   | 9937.2  | 5816.9 | 3110.0 | 2820.4 | 2897.7 | 2999.8 | 2945.5 | 2673.9 | 2611.4 | 2580.1 | 2567.0 |
| 47.5° | 10738.6 | 5848.1 | 2886.2 | 2698.6 | 2825.3 | 2896.1 | 2678.9 | 2624.6 | 2580.1 | 2542.3 | 2529.1 |
| 50°   | 11742.3 | 5830.0 | 2705.2 | 2614.7 | 2743.1 | 2787.5 | 2558.8 | 2560.4 | 2537.4 | 2494.6 | 2474.8 |
| 52.5° | 12497.6 | 5688.5 | 2588.4 | 2567.0 | 2670.7 | 2595.0 | 2483.1 | 2497.9 | 2486.4 | 2423.8 | 2402.4 |
| 55°   | 13226.6 | 5566.7 | 2529.1 | 2548.9 | 2618.0 | 2354.7 | 2394.2 | 2430.4 | 2418.9 | 2358.0 | 2348.1 |
| 57.5° | 14133.2 | 5543.7 | 2492.9 | 2553.8 | 2573.6 | 2234.6 | 2308.6 | 2356.4 | 2348.1 | 2321.8 | 2316.9 |
| 60°   | 15243.9 | 5550.3 | 2460.0 | 2562.0 | 2524.2 | 2145.7 | 2228.0 | 2288.9 | 2293.8 | 2288.9 | 2285.6 |
| 62.5° | 15854.4 | 5370.9 | 2377.8 | 2539.0 | 2437.0 | 2068.4 | 2144.1 | 2232.9 | 2234.6 | 2244.5 | 2242.8 |
| 65°   | 15336.1 | 4834.5 | 2224.7 | 2458.4 | 2290.5 | 2004.2 | 2071.7 | 2168.8 | 2144.1 | 2188.5 | 2188.5 |
| 66°   | 14832.6 | 4525.1 | 2149.0 | 2405.7 | 2228.0 | 1979.5 | 2048.7 | 2135.9 | 2104.6 | 2165.5 | 2165.5 |
| 67.5° | 13804.1 | 4003.5 | 2012.5 | 2293.8 | 2139.2 | 1945.0 | 2022.3 | 2081.6 | 2038.8 | 2129.3 | 2122.7 |
| 70°   | 11925.0 | 3096.8 | 1737.7 | 2040.4 | 1992.7 | 1894.0 | 1986.1 | 1973.0 | 1910.4 | 2048.7 | 2022.3 |
| 72.5° | 10054.0 | 2353.1 | 1395.4 | 1708.0 | 1770.6 | 1829.8 | 1935.1 | 1834.7 | 1755.8 | 1852.8 | 1795.2 |
| 75°   | 7801.3  | 1768.9 | 1102.5 | 1327.9 | 1495.8 | 1729.4 | 1874.2 | 1675.1 | 1561.6 | 1551.7 | 1520.4 |
| 77.5° | 4217.4  | 1214.4 | 873.8  | 1013.6 | 1188.1 | 1604.4 | 1833.1 | 1504.0 | 1332.9 | 1293.4 | 1268.7 |
| 80°   | 1670.2  | 789.8  | 635.2  | 768.5  | 831.0  | 1423.4 | 1734.4 | 1304.9 | 1099.2 | 1059.7 | 1021.9 |
| 82.5° | 689.5   | 467.3  | 409.7  | 515.0  | 541.4  | 1217.7 | 1556.6 | 1069.6 | 849.1  | 1174.9 | 1247.3 |
| 85°   | 296.2   | 256.7  | 243.5  | 266.6  | 306.1  | 854.0  | 1239.1 | 816.2  | 916.5  | 817.8  | 650.0  |
| 87.5° | 88.9    | 108.6  | 103.7  | 102.0  | 111.9  | 204.0  | 659.8  | 454.2  | 673.0  | 255.1  | 190.9  |
| 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: SP1-1908-441-2-R4

Test Date: 10/03/2019

Luminaire Tested: SA1C-730-U-5WQ

Data in this report applies to families of products SA1C-730-U-5WQ .

### Test Information

Test Method: LM-79-2008  
Report Number: SP1-1908-441-2-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-730-U-5WQ**  
Description: MCGRAW EDISON ROADWAY AND AREA LUMINAIRE

\*\*\*THIS IS A REVISION OF SP1-1908-441-2-R3. TO UPDATE THE CATALOG INFORMATION.\*\*\*TESTED IN SITU. (1) 70 CRI, 3000K, 1050MA LIGHTSQUARE WITH 16 LEDS AND TYPE V WIDE OPTICS.

### Spectral Parameters

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 2993   | CRI (Ra): | 71.8 |      |       |
| CIE u':                   | 0.2508 | R1:       | 67.5 | R9:  | -38.3 |
| CIE v':                   | 0.5215 | R2:       | 82.9 | R10: | 62.5  |
| Duv:                      | 0.0000 | R3:       | 94.7 | R11: | 63.7  |
| CIE x:                    | 0.4374 | R4:       | 67.7 | R12: | 57.8  |
| CIE y:                    | 0.4043 | R5:       | 67.9 | R13: | 70.4  |
| CIE z:                    | 0.1583 | R6:       | 77.6 | R14: | 97.3  |
| Peak Wavelength (nm):     | 593    | R7:       | 76.0 |      |       |
| Dominant Wavelength (nm): | 582    | R8:       | 40.5 |      |       |
| Purity:                   | 53     |           |      |      |       |
| Rf:                       | 75.7   |           |      |      |       |
| Rg:                       | 93.9   |           |      |      |       |



### Test Conditions

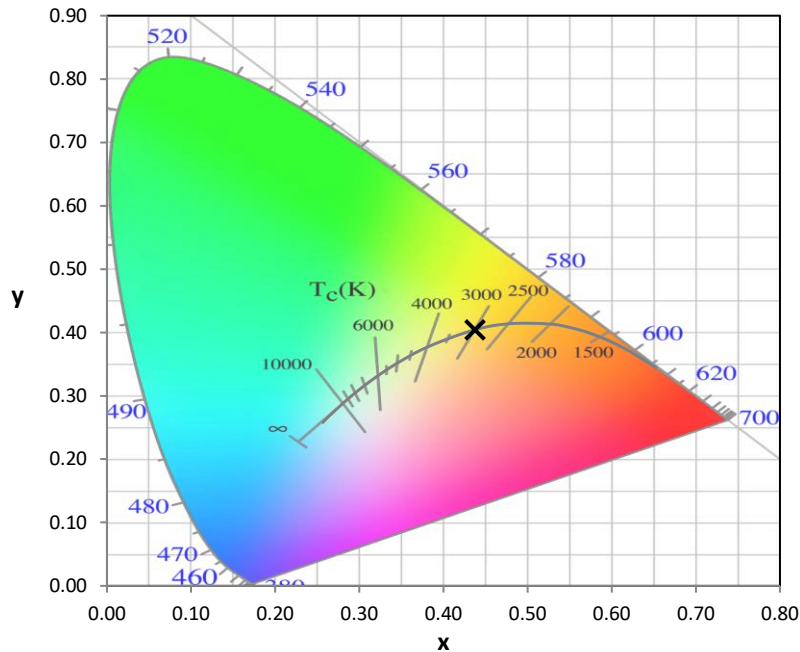
Stabilization Time: 53M  
Operation Time: 12H  
Room Temperature (°C) / RH%: 25.0./44%  
Sphere Temperature (°C): 25.7

REPORT NUMBER: SP1-1908-441-2-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: SP1-1908-441-2-R4

CIE 1931 Chromaticity Diagram



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



Point lies inside the ANSI 3000K 4-step quadrangle

REPORT NUMBER: SP1-1908-441-2-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       | 2397             | NR               | 490       | 24908            | NR               | 620       | 118784           | NR               | 750       | 5037             | NR               | 880       | 2677             | NR               |
| 365       | 2084             | NR               | 495       | 30998            | NR               | 625       | 108951           | NR               | 755       | 4413             | NR               | 885       | 2940             | NR               |
| 370       | 2143             | NR               | 500       | 37103            | NR               | 630       | 99573            | NR               | 760       | 4189             | NR               | 890       | 3116             | NR               |
| 375       | 2413             | NR               | 505       | 42987            | NR               | 635       | 90444            | NR               | 765       | 3677             | NR               | 895       | 3345             | NR               |
| 380       | 2172             | NR               | 510       | 48702            | NR               | 640       | 80749            | NR               | 770       | 3366             | NR               | 900       | 2312             | NR               |
| 385       | 1997             | NR               | 515       | 53741            | NR               | 645       | 71664            | NR               | 775       | 3211             | NR               | 905       | 2829             | NR               |
| 390       | 1830             | NR               | 520       | 57283            | NR               | 650       | 63936            | NR               | 780       | 2682             | NR               | 910       | 2783             | NR               |
| 395       | 1861             | NR               | 525       | 61876            | NR               | 655       | 56611            | NR               | 785       | 2804             | NR               | 915       | 2662             | NR               |
| 400       | 1717             | NR               | 530       | 65398            | NR               | 660       | 49763            | NR               | 790       | 2581             | NR               | 920       | 3047             | NR               |
| 405       | 1761             | NR               | 535       | 69597            | NR               | 665       | 42891            | NR               | 795       | 2711             | NR               | 925       | 2256             | NR               |
| 410       | 2680             | NR               | 540       | 74214            | NR               | 670       | 36939            | NR               | 800       | 2609             | NR               | 930       | 2976             | NR               |
| 415       | 4374             | NR               | 545       | 79911            | NR               | 675       | 31946            | NR               | 805       | 2581             | NR               | 935       | 3503             | NR               |
| 420       | 8071             | NR               | 550       | 86153            | NR               | 680       | 27385            | NR               | 810       | 2404             | NR               | 940       | 4226             | NR               |
| 425       | 15169            | NR               | 555       | 93952            | NR               | 685       | 23504            | NR               | 815       | 2556             | NR               | 945       | 2930             | NR               |
| 430       | 26038            | NR               | 560       | 102904           | NR               | 690       | 20210            | NR               | 820       | 2742             | NR               | 950       | 2115             | NR               |
| 435       | 41316            | NR               | 565       | 112009           | NR               | 695       | 17459            | NR               | 825       | 2014             | NR               | 955       | 2634             | NR               |
| 440       | 59674            | NR               | 570       | 121662           | NR               | 700       | 15207            | NR               | 830       | 2488             | NR               | 960       | 4200             | NR               |
| 445       | 72751            | NR               | 575       | 130476           | NR               | 705       | 13322            | NR               | 835       | 2625             | NR               | 965       | 1982             | NR               |
| 450       | 65091            | NR               | 580       | 137926           | NR               | 710       | 11676            | NR               | 840       | 2754             | NR               | 970       | 3613             | NR               |
| 455       | 44894            | NR               | 585       | 143406           | NR               | 715       | 10626            | NR               | 845       | 2708             | NR               | 975       | 4034             | NR               |
| 460       | 32712            | NR               | 590       | 147039           | NR               | 720       | 9416             | NR               | 850       | 2608             | NR               | 980       | 3922             | NR               |
| 465       | 25296            | NR               | 595       | 147365           | NR               | 725       | 8333             | NR               | 855       | 2605             | NR               | 985       | 1909             | NR               |
| 470       | 19318            | NR               | 600       | 145800           | NR               | 730       | 7134             | NR               | 860       | 1765             | NR               | 990       | 3617             | NR               |
| 475       | 17265            | NR               | 605       | 141363           | NR               | 735       | 6437             | NR               | 865       | 2581             | NR               | 995       | 4767             | NR               |
| 480       | 18260            | NR               | 610       | 134199           | NR               | 740       | 5834             | NR               | 870       | 3016             | NR               | 1000      | 2528             | NR               |
| 485       | 20845            | NR               | 615       | 127683           | NR               | 745       | 5500             | NR               | 875       | 3952             | NR               |           |                  |                  |

REPORT NUMBER: SP1-1908-441-2-R4

Scotopic Flux vs. Wavelength



Scotopic Lumens: 8494.8

S/P: 1.23

| 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       | 2397             | NR               | 490       | 24908            | NR               | 620       | 118784           | NR               | 750       | 5037             | NR               | 880       | 2677             | NR               |
| 365       | 2084             | NR               | 495       | 30998            | NR               | 625       | 108951           | NR               | 755       | 4413             | NR               | 885       | 2940             | NR               |
| 370       | 2143             | NR               | 500       | 37103            | NR               | 630       | 99573            | NR               | 760       | 4189             | NR               | 890       | 3116             | NR               |
| 375       | 2413             | NR               | 505       | 42987            | NR               | 635       | 90444            | NR               | 765       | 3677             | NR               | 895       | 3345             | NR               |
| 380       | 2172             | NR               | 510       | 48702            | NR               | 640       | 80749            | NR               | 770       | 3366             | NR               | 900       | 2312             | NR               |
| 385       | 1997             | NR               | 515       | 53741            | NR               | 645       | 71664            | NR               | 775       | 3211             | NR               | 905       | 2829             | NR               |
| 390       | 1830             | NR               | 520       | 57283            | NR               | 650       | 63936            | NR               | 780       | 2682             | NR               | 910       | 2783             | NR               |
| 395       | 1861             | NR               | 525       | 61876            | NR               | 655       | 56611            | NR               | 785       | 2804             | NR               | 915       | 2662             | NR               |
| 400       | 1717             | NR               | 530       | 65398            | NR               | 660       | 49763            | NR               | 790       | 2581             | NR               | 920       | 3047             | NR               |
| 405       | 1761             | NR               | 535       | 69597            | NR               | 665       | 42891            | NR               | 795       | 2711             | NR               | 925       | 2256             | NR               |
| 410       | 2680             | NR               | 540       | 74214            | NR               | 670       | 36939            | NR               | 800       | 2609             | NR               | 930       | 2976             | NR               |
| 415       | 4374             | NR               | 545       | 79911            | NR               | 675       | 31946            | NR               | 805       | 2581             | NR               | 935       | 3503             | NR               |
| 420       | 8071             | NR               | 550       | 86153            | NR               | 680       | 27385            | NR               | 810       | 2404             | NR               | 940       | 4226             | NR               |
| 425       | 15169            | NR               | 555       | 93952            | NR               | 685       | 23504            | NR               | 815       | 2556             | NR               | 945       | 2930             | NR               |
| 430       | 26038            | NR               | 560       | 102904           | NR               | 690       | 20210            | NR               | 820       | 2742             | NR               | 950       | 2115             | NR               |
| 435       | 41316            | NR               | 565       | 112009           | NR               | 695       | 17459            | NR               | 825       | 2014             | NR               | 955       | 2634             | NR               |
| 440       | 59674            | NR               | 570       | 121662           | NR               | 700       | 15207            | NR               | 830       | 2488             | NR               | 960       | 4200             | NR               |
| 445       | 72751            | NR               | 575       | 130476           | NR               | 705       | 13322            | NR               | 835       | 2625             | NR               | 965       | 1982             | NR               |
| 450       | 65091            | NR               | 580       | 137926           | NR               | 710       | 11676            | NR               | 840       | 2754             | NR               | 970       | 3613             | NR               |
| 455       | 44894            | NR               | 585       | 143406           | NR               | 715       | 10626            | NR               | 845       | 2708             | NR               | 975       | 4034             | NR               |
| 460       | 32712            | NR               | 590       | 147039           | NR               | 720       | 9416             | NR               | 850       | 2608             | NR               | 980       | 3922             | NR               |
| 465       | 25296            | NR               | 595       | 147365           | NR               | 725       | 8333             | NR               | 855       | 2605             | NR               | 985       | 1909             | NR               |
| 470       | 19318            | NR               | 600       | 145800           | NR               | 730       | 7134             | NR               | 860       | 1765             | NR               | 990       | 3617             | NR               |
| 475       | 17265            | NR               | 605       | 141363           | NR               | 735       | 6437             | NR               | 865       | 2581             | NR               | 995       | 4767             | NR               |
| 480       | 18260            | NR               | 610       | 134199           | NR               | 740       | 5834             | NR               | 870       | 3016             | NR               | 1000      | 2528             | NR               |
| 485       | 20845            | NR               | 615       | 127683           | NR               | 745       | 5500             | NR               | 875       | 3952             | NR               |           |                  |                  |

REPORT NUMBER: SP1-1908-441-2-R4

**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 3101.5**

**M/P: 0.45**

| 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       | 2397             | NR               | 490       | 24908            | NR               | 620       | 118784           | NR               | 750       | 5037             | NR               | 880       | 2677             | NR               |
| 365       | 2084             | NR               | 495       | 30998            | NR               | 625       | 108951           | NR               | 755       | 4413             | NR               | 885       | 2940             | NR               |
| 370       | 2143             | NR               | 500       | 37103            | NR               | 630       | 99573            | NR               | 760       | 4189             | NR               | 890       | 3116             | NR               |
| 375       | 2413             | NR               | 505       | 42987            | NR               | 635       | 90444            | NR               | 765       | 3677             | NR               | 895       | 3345             | NR               |
| 380       | 2172             | NR               | 510       | 48702            | NR               | 640       | 80749            | NR               | 770       | 3366             | NR               | 900       | 2312             | NR               |
| 385       | 1997             | NR               | 515       | 53741            | NR               | 645       | 71664            | NR               | 775       | 3211             | NR               | 905       | 2829             | NR               |
| 390       | 1830             | NR               | 520       | 57283            | NR               | 650       | 63936            | NR               | 780       | 2682             | NR               | 910       | 2783             | NR               |
| 395       | 1861             | NR               | 525       | 61876            | NR               | 655       | 56611            | NR               | 785       | 2804             | NR               | 915       | 2662             | NR               |
| 400       | 1717             | NR               | 530       | 65398            | NR               | 660       | 49763            | NR               | 790       | 2581             | NR               | 920       | 3047             | NR               |
| 405       | 1761             | NR               | 535       | 69597            | NR               | 665       | 42891            | NR               | 795       | 2711             | NR               | 925       | 2256             | NR               |
| 410       | 2680             | NR               | 540       | 74214            | NR               | 670       | 36939            | NR               | 800       | 2609             | NR               | 930       | 2976             | NR               |
| 415       | 4374             | NR               | 545       | 79911            | NR               | 675       | 31946            | NR               | 805       | 2581             | NR               | 935       | 3503             | NR               |
| 420       | 8071             | NR               | 550       | 86153            | NR               | 680       | 27385            | NR               | 810       | 2404             | NR               | 940       | 4226             | NR               |
| 425       | 15169            | NR               | 555       | 93952            | NR               | 685       | 23504            | NR               | 815       | 2556             | NR               | 945       | 2930             | NR               |
| 430       | 26038            | NR               | 560       | 102904           | NR               | 690       | 20210            | NR               | 820       | 2742             | NR               | 950       | 2115             | NR               |
| 435       | 41316            | NR               | 565       | 112009           | NR               | 695       | 17459            | NR               | 825       | 2014             | NR               | 955       | 2634             | NR               |
| 440       | 59674            | NR               | 570       | 121662           | NR               | 700       | 15207            | NR               | 830       | 2488             | NR               | 960       | 4200             | NR               |
| 445       | 72751            | NR               | 575       | 130476           | NR               | 705       | 13322            | NR               | 835       | 2625             | NR               | 965       | 1982             | NR               |
| 450       | 65091            | NR               | 580       | 137926           | NR               | 710       | 11676            | NR               | 840       | 2754             | NR               | 970       | 3613             | NR               |
| 455       | 44894            | NR               | 585       | 143406           | NR               | 715       | 10626            | NR               | 845       | 2708             | NR               | 975       | 4034             | NR               |
| 460       | 32712            | NR               | 590       | 147039           | NR               | 720       | 9416             | NR               | 850       | 2608             | NR               | 980       | 3922             | NR               |
| 465       | 25296            | NR               | 595       | 147365           | NR               | 725       | 8333             | NR               | 855       | 2605             | NR               | 985       | 1909             | NR               |
| 470       | 19318            | NR               | 600       | 145800           | NR               | 730       | 7134             | NR               | 860       | 1765             | NR               | 990       | 3617             | NR               |
| 475       | 17265            | NR               | 605       | 141363           | NR               | 735       | 6437             | NR               | 865       | 2581             | NR               | 995       | 4767             | NR               |
| 480       | 18260            | NR               | 610       | 134199           | NR               | 740       | 5834             | NR               | 870       | 3016             | NR               | 1000      | 2528             | NR               |
| 485       | 20845            | NR               | 615       | 127683           | NR               | 745       | 5500             | NR               | 875       | 3952             | NR               |           |                  |                  |

REPORT NUMBER: SP1-1908-441-2-R4

**TM-30-18**

**Summary**

$R_f = 75.7$   
 $R_g = 93.9$   
 CIE  $R_a = 71.8$   
 $R_g = -38.3$



**Color Vector Graphics**





REPORT NUMBER: SP1-1908-441-2-R4

TM-30-18

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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 67 | CES51 = 87 | CES76 = 63 |
| CES02 = 63 | CES27 = 88 | CES52 = 86 | CES77 = 80 |
| CES03 = 31 | CES28 = 87 | CES53 = 78 | CES78 = 67 |
| CES04 = 71 | CES29 = 66 | CES54 = 84 | CES79 = 87 |
| CES05 = 49 | CES30 = 73 | CES55 = 84 | CES80 = 86 |
| CES06 = 51 | CES31 = 70 | CES56 = 75 | CES81 = 71 |
| CES07 = 41 | CES32 = 65 | CES57 = 74 | CES82 = 94 |
| CES08 = 40 | CES33 = 73 | CES58 = 76 | CES83 = 90 |
| CES09 = 29 | CES34 = 79 | CES59 = 85 | CES84 = 89 |
| CES10 = 76 | CES35 = 89 | CES60 = 93 | CES85 = 77 |
| CES11 = 59 | CES36 = 97 | CES61 = 84 | CES86 = 61 |
| CES12 = 65 | CES37 = 87 | CES62 = 91 | CES87 = 78 |
| CES13 = 43 | CES38 = 81 | CES63 = 77 | CES88 = 77 |
| CES14 = 74 | CES39 = 95 | CES64 = 72 | CES89 = 67 |
| CES15 = 71 | CES40 = 92 | CES65 = 68 | CES90 = 76 |
| CES16 = 47 | CES41 = 88 | CES66 = 69 | CES91 = 89 |
| CES17 = 50 | CES42 = 89 | CES67 = 67 | CES92 = 58 |
| CES18 = 56 | CES43 = 79 | CES68 = 72 | CES93 = 74 |
| CES19 = 73 | CES44 = 99 | CES69 = 81 | CES94 = 49 |
| CES20 = 66 | CES45 = 85 | CES70 = 66 | CES95 = 68 |
| CES21 = 87 | CES46 = 80 | CES71 = 67 | CES96 = 76 |
| CES22 = 79 | CES47 = 82 | CES72 = 88 | CES97 = 82 |
| CES23 = 92 | CES48 = 69 | CES73 = 59 | CES98 = 75 |
| CES24 = 91 | CES49 = 80 | CES74 = 95 | CES99 = 62 |
| CES25 = 73 | CES50 = 87 | CES75 = 69 |            |



REPORT NUMBER: SP1-1908-441-2-R4

**TM-30-18**

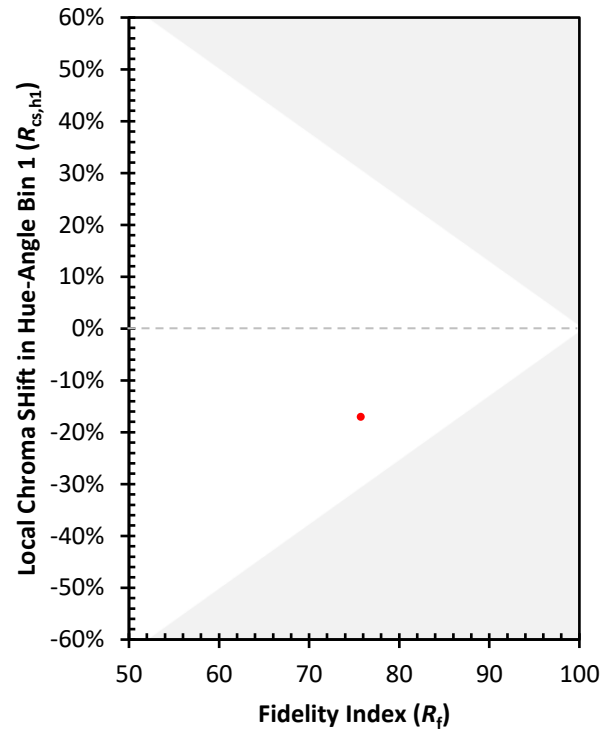
**Color Rendition by Hue-Angle Bin**



REPORT NUMBER: SP1-1908-441-2-R4

**TM-30-18**

**Measure Comparisons**



(END OF REPORT)