

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: P317724

Luminaire Tested: **GLEON-SA0B-730-U-T3R**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P317724  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-10)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA0B-730-U-T3R  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(10) 70 CRI, 3000K, 800mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE III  
ROADWAY OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 52667 lumens  
Efficiency: N/A  
Efficacy: 125.7 lumens/watt  
Luminous Opening: Rectangular (W 2.5' x L: 1' x H: 0')  
IES Classification: Type IV - Medium  
BUG Rating: B4 - U0 - G5

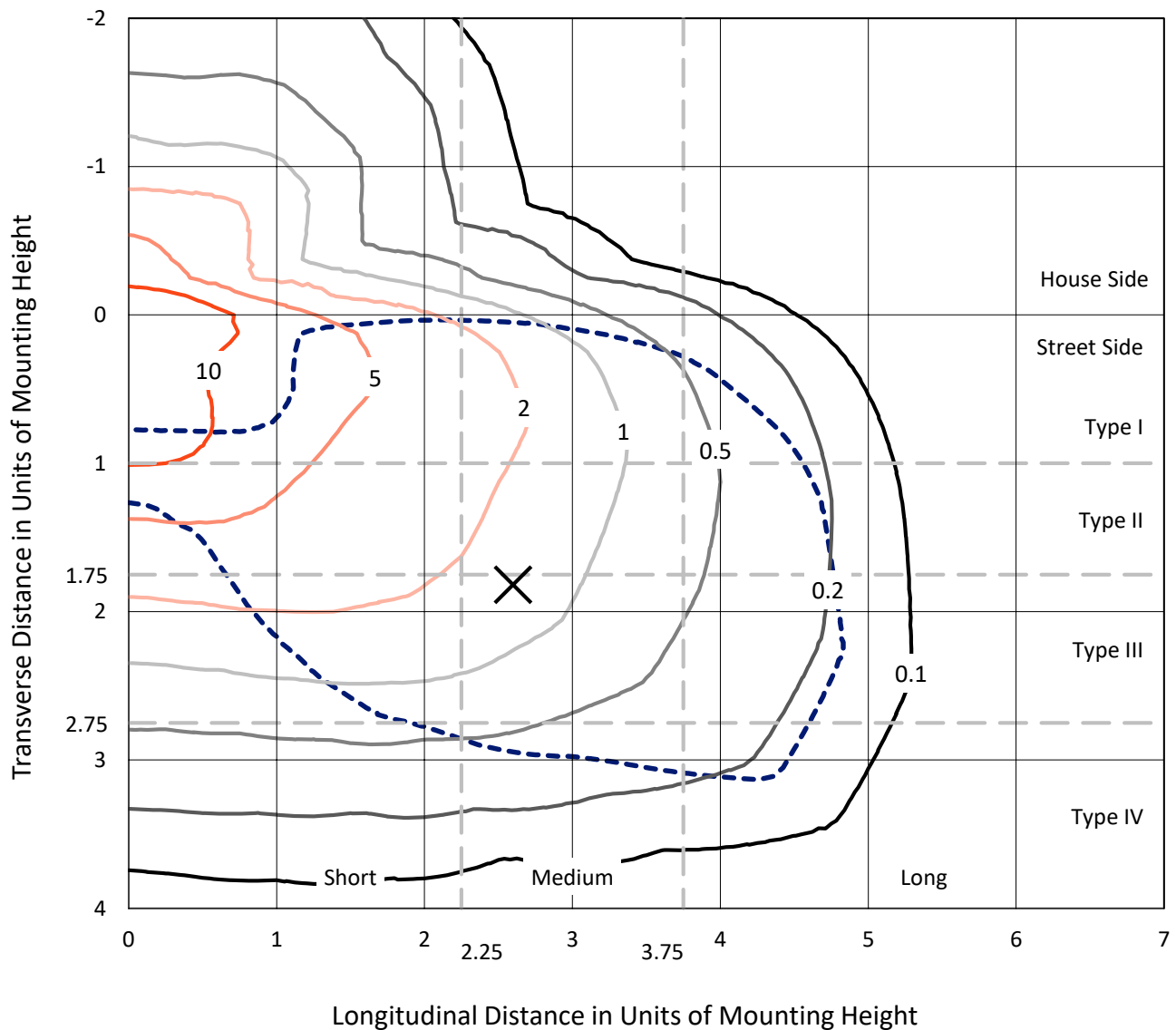
Input Watts (W): 419  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



REPORT NUMBER: P317724  
 CATALOG NUMBER: GLEON-SA0B-730-U-T3R

## Iso-Footcandle Lines of Horizontal Illumination

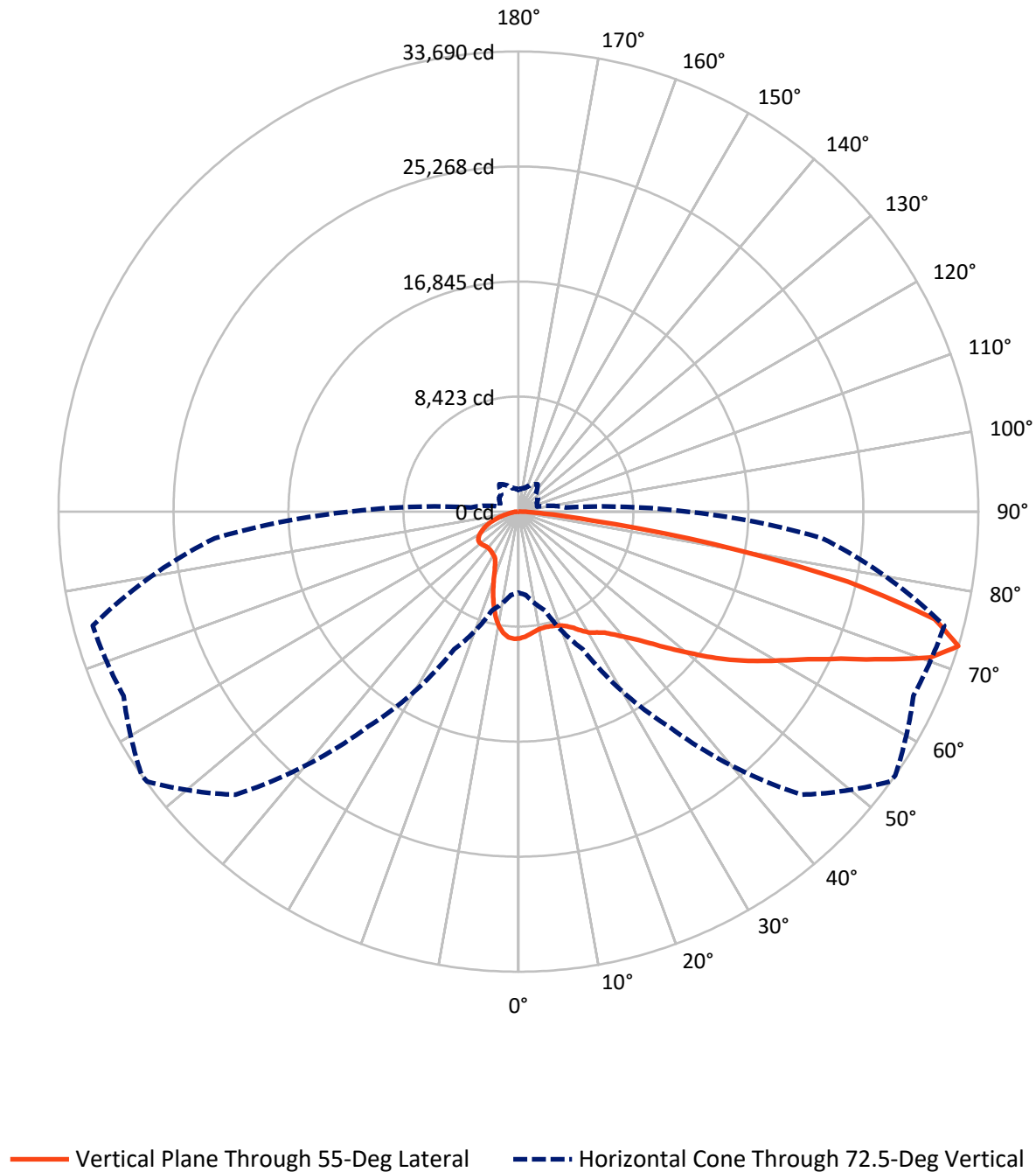
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 15 fc  
 Type IV - Medium - N/A

REPORT NUMBER: P317724  
CATALOG NUMBER: GLEON-SA0B-730-U-T3R

## Luminous Intensity Polar Plot



REPORT NUMBER: P317724

CATALOG NUMBER: GLEON-SA0B-730-U-T3R

**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 9789.1   | 0.0    | 9789.1  |
|                    | % Fixture | 18.6     | 0.0    | 18.6    |
| <b>Street Side</b> | Lumens    | 42877.9  | 0.0    | 42877.9 |
|                    | % Fixture | 81.4     | 0.0    | 81.4    |
| <b>Total</b>       | Lumens    | 52667.0  | 0.0    | 52667.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 840.6   | 1.6       |
| 10°-20°   | 2237.9  | 4.2       |
| 20°-30°   | 3689.8  | 7.0       |
| 30°-40°   | 5458.1  | 10.4      |
| 40°-50°   | 7618.4  | 14.5      |
| 50°-60°   | 9919.3  | 18.8      |
| 60°-70°   | 12190.6 | 23.1      |
| 70°-80°   | 9555.9  | 18.1      |
| 80°-90°   | 1156.4  | 2.2       |
| 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°    | 52667.0 | 100.0     |
| 0°-180°   | 52667.0 | 100.0     |

**Coefficient of Utilization**



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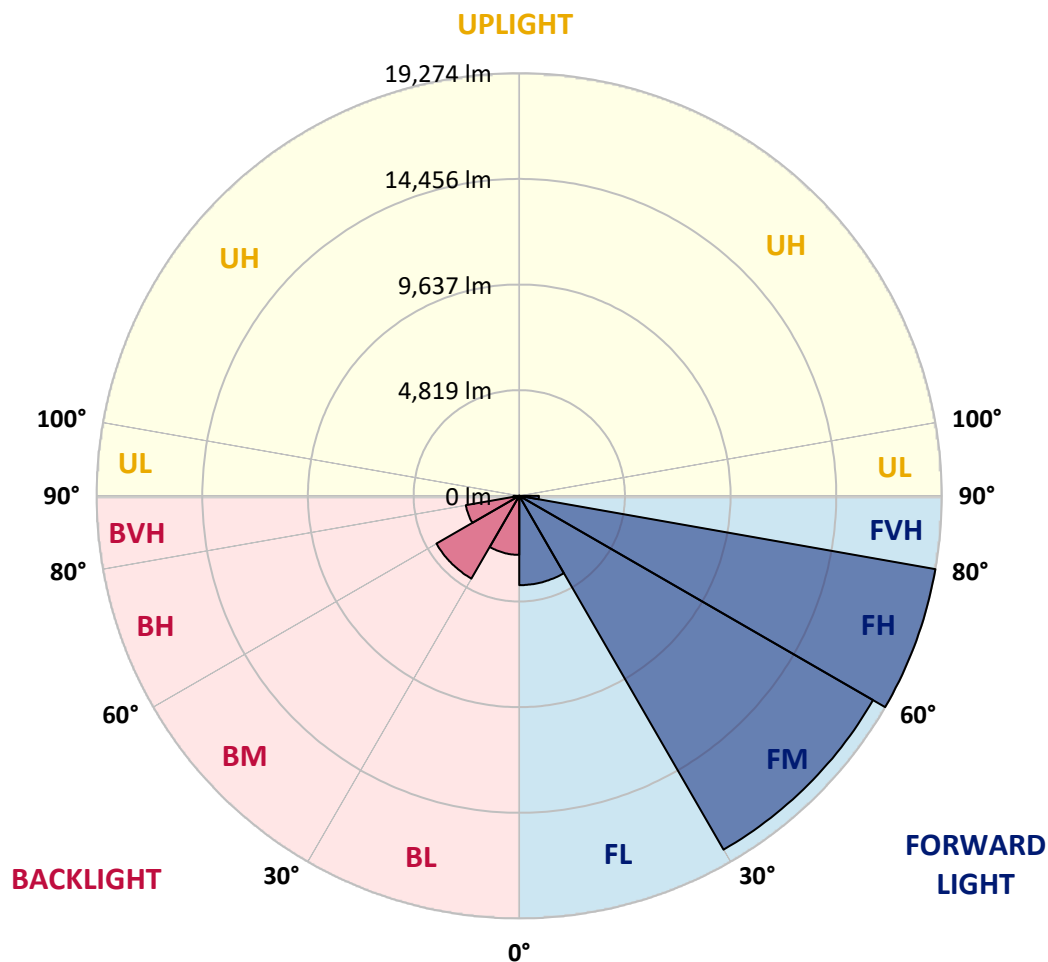
CATALOG NUMBER: GLEON-SA0B-730-U-T3R

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|---------|-----------|-------------------------|------|---------|
|      |             |         |           | B                       | U    | G       |
| FL   | (0°-30°)    | 4074.9  | 7.7       |                         |      |         |
| FM   | (30°-60°)   | 18634.6 | 35.4      |                         |      |         |
| FH   | (60°-80°)   | 19274.3 | 36.6      |                         |      | G5      |
| FVH  | (80°-90°)   | 894.1   | 1.7       |                         |      | G5      |
| BL   | (0°-30°)    | 2693.4  | 5.1       | B4/5000                 |      |         |
| BM   | (30°-60°)   | 4361.2  | 8.3       | B3/5000                 |      |         |
| BH   | (60°-80°)   | 2472.2  | 4.7       | B3/2500                 |      | G3/2500 |
| BVH  | (80°-90°)   | 262.3   | 0.5       |                         |      | G3/500  |
| UL   | (90°-100°)  | 0.0     | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0     | 0.0       |                         | U0/0 |         |

**BUG Rating: B4-U0-G5**

Type IV Medium





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CATALOG NUMBER: GLEON-SA0B-730-U-T3R

**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 54°     | 55°     | 65°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 9289.3  | 9289.3  | 9289.3  | 9289.3  | 9289.3  | 9289.3  | 9289.3  | 9289.3  | 9289.3  | 9289.3  | 9289.3  |
| 2.5°  | 8986.9  | 8965.6  | 8992.3  | 9029.6  | 9070.5  | 9125.7  | 9157.7  | 9171.9  | 9227.1  | 9248.4  | 9294.7  |
| 5°    | 8570.7  | 8560.0  | 8604.5  | 8668.5  | 8759.2  | 8887.3  | 8990.5  | 9010.0  | 9155.9  | 9259.1  | 9353.4  |
| 7.5°  | 8268.2  | 8268.2  | 8319.8  | 8396.3  | 8497.7  | 8670.3  | 8816.1  | 8842.8  | 9090.1  | 9312.5  | 9486.8  |
| 10°   | 8028.1  | 8037.0  | 8097.5  | 8188.2  | 8307.4  | 8490.6  | 8684.5  | 8714.7  | 9072.3  | 9437.0  | 9714.5  |
| 12.5° | 7868.0  | 7889.3  | 7944.5  | 8026.3  | 8174.0  | 8396.3  | 8641.8  | 8682.7  | 9109.7  | 9614.9  | 9988.4  |
| 15°   | 7969.4  | 8005.0  | 8010.3  | 8044.1  | 8125.9  | 8367.9  | 8666.7  | 8709.4  | 9189.7  | 9796.3  | 10299.7 |
| 17.5° | 8414.1  | 8426.6  | 8371.4  | 8300.3  | 8261.1  | 8415.9  | 8741.4  | 8785.9  | 9285.8  | 9976.0  | 10598.6 |
| 20°   | 9090.1  | 9083.0  | 8963.8  | 8771.7  | 8572.4  | 8597.3  | 8864.2  | 8910.4  | 9415.6  | 10134.3 | 10897.4 |
| 22.5° | 9944.0  | 9919.1  | 9735.8  | 9381.8  | 9042.1  | 8899.8  | 9079.4  | 9118.6  | 9611.3  | 10360.2 | 11217.6 |
| 25°   | 10979.3 | 10924.1 | 10682.2 | 10207.2 | 9707.4  | 9340.9  | 9403.2  | 9440.5  | 9895.9  | 10612.8 | 11511.2 |
| 27.5° | 12071.5 | 12016.4 | 11708.6 | 11134.0 | 10468.7 | 9897.7  | 9849.7  | 9881.7  | 10219.7 | 10799.6 | 11728.2 |
| 30°   | 13213.5 | 13154.8 | 12873.8 | 12229.8 | 11276.3 | 10474.1 | 10265.9 | 10278.4 | 10447.4 | 10901.0 | 11906.1 |
| 32.5° | 14360.9 | 14305.8 | 13990.9 | 13243.8 | 12153.3 | 11093.1 | 10566.6 | 10550.6 | 10584.4 | 11005.9 | 12107.1 |
| 35°   | 15524.3 | 15545.7 | 15177.4 | 14350.2 | 13124.6 | 11781.5 | 10922.3 | 10888.5 | 10813.8 | 11221.2 | 12391.7 |
| 37.5° | 16769.5 | 16755.3 | 16278.6 | 15414.0 | 14140.3 | 12528.7 | 11432.9 | 11427.5 | 11169.6 | 11628.6 | 12838.2 |
| 40°   | 17602.0 | 17610.9 | 17321.0 | 16502.7 | 15166.8 | 13355.9 | 12087.5 | 12075.1 | 11737.1 | 12238.7 | 13423.4 |
| 42.5° | 17927.6 | 17986.3 | 18061.0 | 17541.6 | 16241.2 | 14314.7 | 12868.4 | 12850.6 | 12528.7 | 13113.9 | 14111.9 |
| 45°   | 17950.7 | 18068.1 | 18530.6 | 18464.8 | 17329.9 | 15412.2 | 13866.4 | 13816.6 | 13585.3 | 14277.3 | 14933.7 |
| 47.5° | 17751.5 | 17872.4 | 18640.9 | 19014.5 | 18302.9 | 16570.3 | 15033.3 | 14994.2 | 14795.0 | 15732.4 | 15823.2 |
| 50°   | 17315.6 | 17431.3 | 18413.2 | 19283.1 | 19103.4 | 17683.9 | 16378.2 | 16275.0 | 16168.3 | 17413.5 | 16840.7 |
| 52.5° | 16499.1 | 16721.5 | 18109.0 | 19347.1 | 19581.9 | 18672.9 | 17792.4 | 17724.8 | 17783.5 | 19187.0 | 17860.0 |
| 55°   | 14565.5 | 14814.5 | 17324.5 | 19293.8 | 19935.9 | 19503.7 | 19206.6 | 19203.0 | 19507.2 | 21047.7 | 18954.0 |
| 57.5° | 13482.2 | 13658.3 | 15727.1 | 19203.0 | 20355.8 | 20329.1 | 20606.6 | 20640.4 | 21232.7 | 23073.9 | 20099.6 |
| 60°   | 12870.2 | 13055.2 | 14917.7 | 18866.8 | 21006.8 | 21396.4 | 22035.0 | 22102.6 | 22986.7 | 25317.1 | 21478.2 |
| 62.5° | 12313.4 | 12516.2 | 14416.1 | 18182.0 | 21773.5 | 22922.7 | 23746.3 | 23806.8 | 24843.9 | 27622.5 | 22810.6 |
| 65°   | 11361.7 | 11591.2 | 13681.4 | 17731.9 | 22470.8 | 24913.3 | 25921.9 | 25962.8 | 26976.8 | 30038.2 | 23829.9 |
| 67.5° | 10016.9 | 10226.8 | 12295.6 | 16737.5 | 22986.7 | 27330.8 | 28814.3 | 28837.5 | 29091.8 | 31744.2 | 24351.1 |
| 70°   | 8446.1  | 8526.2  | 10321.1 | 14684.7 | 22376.6 | 29591.7 | 31984.3 | 31989.6 | 31020.2 | 32836.4 | 24265.7 |
| 72.5° | 5934.4  | 6122.9  | 7492.7  | 11116.2 | 19229.7 | 29316.0 | 33629.8 | 33690.3 | 31916.7 | 32284.9 | 22326.8 |
| 75°   | 3639.6  | 3838.8  | 4699.8  | 6736.6  | 12199.6 | 23056.1 | 31071.7 | 31491.6 | 30235.7 | 28785.9 | 18238.9 |
| 77.5° | 2433.5  | 2508.2  | 3066.8  | 3927.8  | 5527.0  | 13265.1 | 23888.6 | 24678.4 | 25117.8 | 20992.6 | 11664.1 |
| 80°   | 1357.3  | 1499.6  | 2033.3  | 2440.6  | 2458.4  | 5270.8  | 14323.6 | 14508.6 | 13974.9 | 8359.0  | 3598.7  |
| 82.5° | 718.7   | 796.9   | 1357.3  | 1433.8  | 1341.3  | 1764.7  | 5338.4  | 5343.8  | 4465.0  | 2241.4  | 1069.1  |
| 85°   | 556.8   | 622.6   | 930.4   | 875.2   | 684.9   | 782.7   | 1761.1  | 1857.2  | 1519.2  | 917.9   | 348.7   |
| 87.5° | 277.5   | 345.1   | 631.5   | 555.0   | 268.6   | 224.1   | 629.7   | 672.4   | 599.5   | 359.3   | 126.3   |
| 90°   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |

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CATALOG NUMBER: GLEON-SA0B-730-U-T3R

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°     | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|---------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 9289.3  | 9289.3  | 9289.3 | 9289.3 | 9289.3 | 9289.3 | 9289.3 | 9289.3 | 9289.3 | 9289.3 | 9289.3 |
| 2.5°  | 9312.5  | 9328.5  | 9348.0 | 9326.7 | 9319.6 | 9291.1 | 9243.1 | 9232.4 | 9207.5 | 9209.3 | 9223.5 |
| 5°    | 9394.3  | 9421.0  | 9410.3 | 9328.5 | 9230.6 | 9093.6 | 8951.3 | 8830.4 | 8750.3 | 8745.0 | 8739.7 |
| 7.5°  | 9550.8  | 9568.6  | 9485.0 | 9252.0 | 8978.0 | 8661.4 | 8362.5 | 8101.0 | 7942.7 | 7903.6 | 7894.7 |
| 10°   | 9796.3  | 9792.7  | 9563.3 | 9093.6 | 8547.5 | 7981.8 | 7501.5 | 7138.7 | 6927.0 | 6864.7 | 6848.7 |
| 12.5° | 10070.3 | 10029.3 | 9590.0 | 8805.5 | 7939.2 | 7154.7 | 6546.3 | 6142.5 | 5921.9 | 5850.7 | 5833.0 |
| 15°   | 10353.1 | 10251.7 | 9524.1 | 8375.0 | 7192.0 | 6263.4 | 5624.8 | 5251.3 | 5132.1 | 5092.9 | 5085.8 |
| 17.5° | 10616.4 | 10420.7 | 9335.6 | 7791.5 | 6339.9 | 5375.8 | 4877.7 | 4728.3 | 4756.7 | 4808.3 | 4810.1 |
| 20°   | 10874.3 | 10534.5 | 9033.2 | 7055.0 | 5441.6 | 4644.7 | 4475.7 | 4586.0 | 4721.2 | 4826.1 | 4840.3 |
| 22.5° | 11128.7 | 10614.6 | 8643.6 | 6204.7 | 4637.5 | 4233.7 | 4352.9 | 4553.9 | 4708.7 | 4822.6 | 4842.1 |
| 25°   | 11342.2 | 10634.2 | 8106.4 | 5297.5 | 4079.0 | 4079.0 | 4294.2 | 4484.6 | 4637.5 | 4749.6 | 4769.2 |
| 27.5° | 11420.4 | 10502.5 | 7348.6 | 4457.9 | 3797.9 | 4007.8 | 4212.4 | 4370.7 | 4500.6 | 4619.8 | 4641.1 |
| 30°   | 11450.7 | 10258.8 | 6473.4 | 3783.7 | 3682.3 | 3931.3 | 4102.1 | 4237.3 | 4360.0 | 4472.1 | 4491.7 |
| 32.5° | 11456.0 | 9965.3  | 5544.8 | 3401.2 | 3602.2 | 3851.3 | 3965.1 | 4084.3 | 4216.0 | 4260.4 | 4267.5 |
| 35°   | 11489.8 | 9618.4  | 4566.4 | 3205.5 | 3527.5 | 3776.6 | 3867.3 | 3952.7 | 3739.2 | 3755.2 | 3769.5 |
| 37.5° | 11587.6 | 9275.1  | 3748.1 | 3095.3 | 3479.5 | 3737.4 | 3845.9 | 3536.4 | 3369.2 | 3330.1 | 3324.7 |
| 40°   | 11770.9 | 8908.6  | 3141.5 | 3006.3 | 3461.7 | 3757.0 | 3709.0 | 3301.6 | 3013.4 | 2798.2 | 2766.2 |
| 42.5° | 12025.2 | 8513.7  | 2753.7 | 2947.6 | 3474.2 | 3851.3 | 3518.6 | 3075.7 | 2597.2 | 2458.4 | 2440.6 |
| 45°   | 12311.6 | 8099.3  | 2543.8 | 2906.7 | 3516.9 | 3924.2 | 3479.5 | 2775.1 | 2403.3 | 2298.3 | 2289.4 |
| 47.5° | 12589.2 | 7592.3  | 2435.3 | 2888.9 | 3575.6 | 3865.5 | 3314.1 | 2682.6 | 2310.8 | 2255.6 | 2261.0 |
| 50°   | 12907.6 | 7135.1  | 2369.5 | 2869.3 | 3627.1 | 3828.2 | 3127.3 | 2634.5 | 2275.2 | 2342.8 | 2413.9 |
| 52.5° | 13176.2 | 6661.9  | 2310.8 | 2830.2 | 3646.7 | 3762.3 | 3079.2 | 2643.4 | 2275.2 | 2405.0 | 2472.6 |
| 55°   | 13494.6 | 6304.4  | 2243.2 | 2748.4 | 3609.4 | 3575.6 | 3045.4 | 2696.8 | 2301.9 | 2220.0 | 2227.2 |
| 57.5° | 13905.5 | 6187.0  | 2168.5 | 2620.3 | 3484.8 | 3303.4 | 3029.4 | 2748.4 | 2285.9 | 2234.3 | 2252.1 |
| 60°   | 14474.8 | 6311.5  | 2138.2 | 2453.1 | 3290.9 | 3089.9 | 3031.2 | 2721.7 | 2173.8 | 2084.9 | 2086.6 |
| 62.5° | 15017.3 | 6450.2  | 2136.4 | 2348.1 | 3052.6 | 2899.6 | 2990.3 | 2634.5 | 2116.9 | 2065.3 | 2084.9 |
| 65°   | 15195.2 | 6309.7  | 2051.1 | 2230.7 | 2784.0 | 2671.9 | 2915.6 | 2542.0 | 2074.2 | 1995.9 | 1992.3 |
| 67.5° | 14956.8 | 5873.9  | 1878.5 | 2040.4 | 2476.2 | 2406.8 | 2817.8 | 2431.7 | 2006.6 | 1942.5 | 1931.9 |
| 70°   | 14248.9 | 4900.8  | 1665.0 | 1789.6 | 2125.8 | 2108.0 | 2663.0 | 2303.7 | 1915.9 | 1860.7 | 1814.5 |
| 72.5° | 12343.7 | 3491.9  | 1403.5 | 1488.9 | 1730.9 | 1787.8 | 2449.5 | 2136.4 | 1787.8 | 1668.6 | 1597.4 |
| 75°   | 10137.9 | 2584.7  | 1152.7 | 1170.5 | 1314.6 | 1469.4 | 2156.0 | 1940.8 | 1636.6 | 1433.8 | 1378.6 |
| 77.5° | 6208.3  | 1581.4  | 917.9  | 925.0  | 942.8  | 1172.3 | 1775.3 | 1722.0 | 1444.5 | 1195.4 | 1156.3 |
| 80°   | 2010.1  | 862.8   | 663.5  | 697.3  | 644.0  | 859.2  | 1373.3 | 1465.8 | 1239.9 | 999.7  | 957.0  |
| 82.5° | 764.9   | 503.4   | 448.3  | 471.4  | 446.5  | 576.4  | 1001.5 | 1174.1 | 1015.7 | 821.8  | 668.9  |
| 85°   | 370.0   | 284.6   | 265.1  | 297.1  | 275.7  | 295.3  | 640.4  | 864.5  | 770.3  | 535.4  | 498.1  |
| 87.5° | 131.6   | 126.3   | 101.4  | 137.0  | 117.4  | 105.0  | 195.7  | 435.8  | 508.8  | 368.2  | 329.1  |
| 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

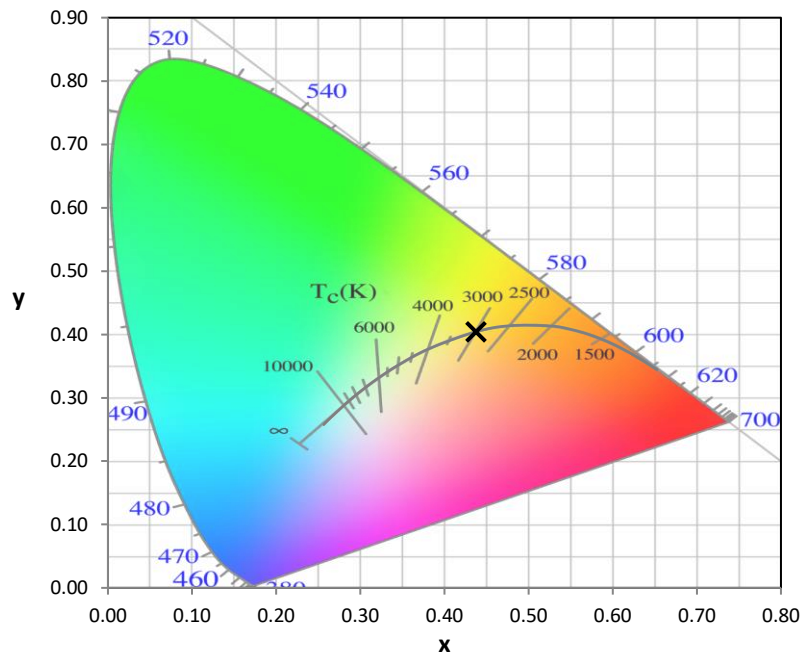
Stabilization Time: 53M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.0./44%  
 Sphere Temperature (°C): 25.7

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            |

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**CIE 1931 Chromaticity Diagram**



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



Point lies inside the ANSI 3000K 4-step quadrangle

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**Photopic Flux vs. Wavelength**



#####

| 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               |           |                  |                  |

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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               |           |                  |                  |

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**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               |           |                  |                  |

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**Summary**

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



**Color Vector Graphics**



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

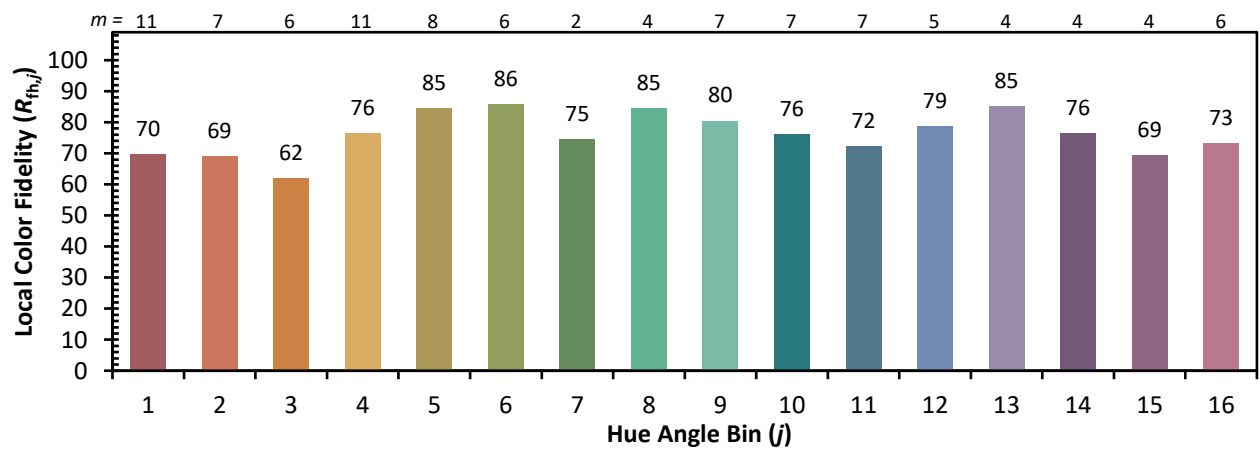
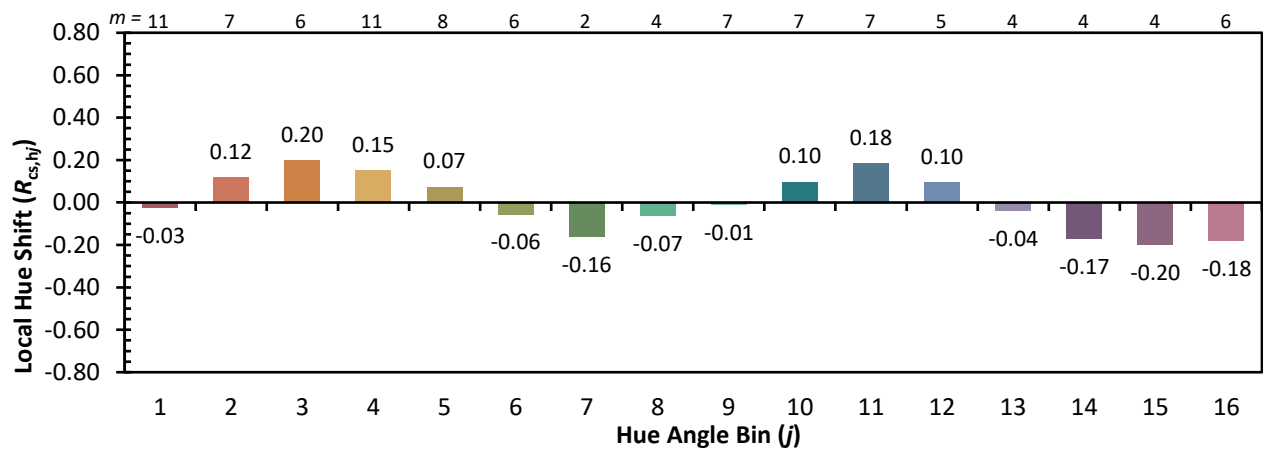
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 67 | CES51 = 87 | CES76 = 63 |
| CES02 = 63 | CES27 = 88 | CES52 = 86 | CES77 = 80 |
| CES03 = 31 | CES28 = 87 | CES53 = 78 | CES78 = 67 |
| CES04 = 71 | CES29 = 66 | CES54 = 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 |            |



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**Color Rendition by Hue-Angle Bin**



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**Measure Comparisons**



(END OF REPORT)