

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: P321171

Luminaire Tested: **GLEON-SA7C-722-U-AFL**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P321171  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-29)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA7C-722-U-AFL  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(7) 70 CRI, 2200K, 1050mA LIGHTSQUARES WITH 16 LEDS EACH AND AUTOMOTIVE  
FRONTLINE OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 37731 lumens  
Efficiency: N/A  
Efficacy: 96.5 lumens/watt  
Luminous Opening: Rectangular (W 2' x L: 1' x H: 0')  
IES Classification: Type II - Short  
BUG Rating: B3 - U0 - G3

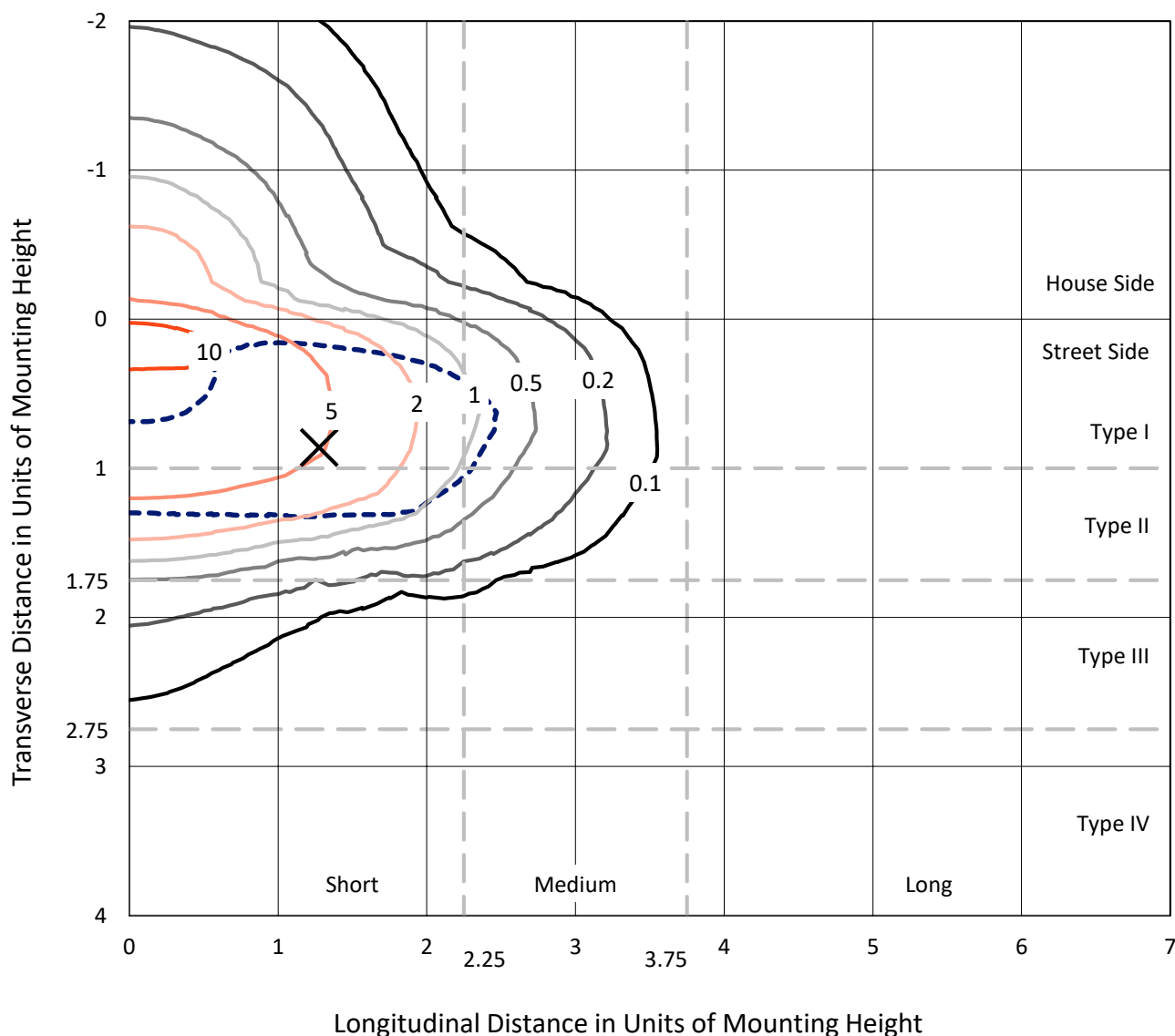
Input Watts (W): 391  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



REPORT NUMBER: P321171  
 CATALOG NUMBER: GLEON-SA7C-722-U-AFL

## Iso-Footcandle Lines of Horizontal Illumination

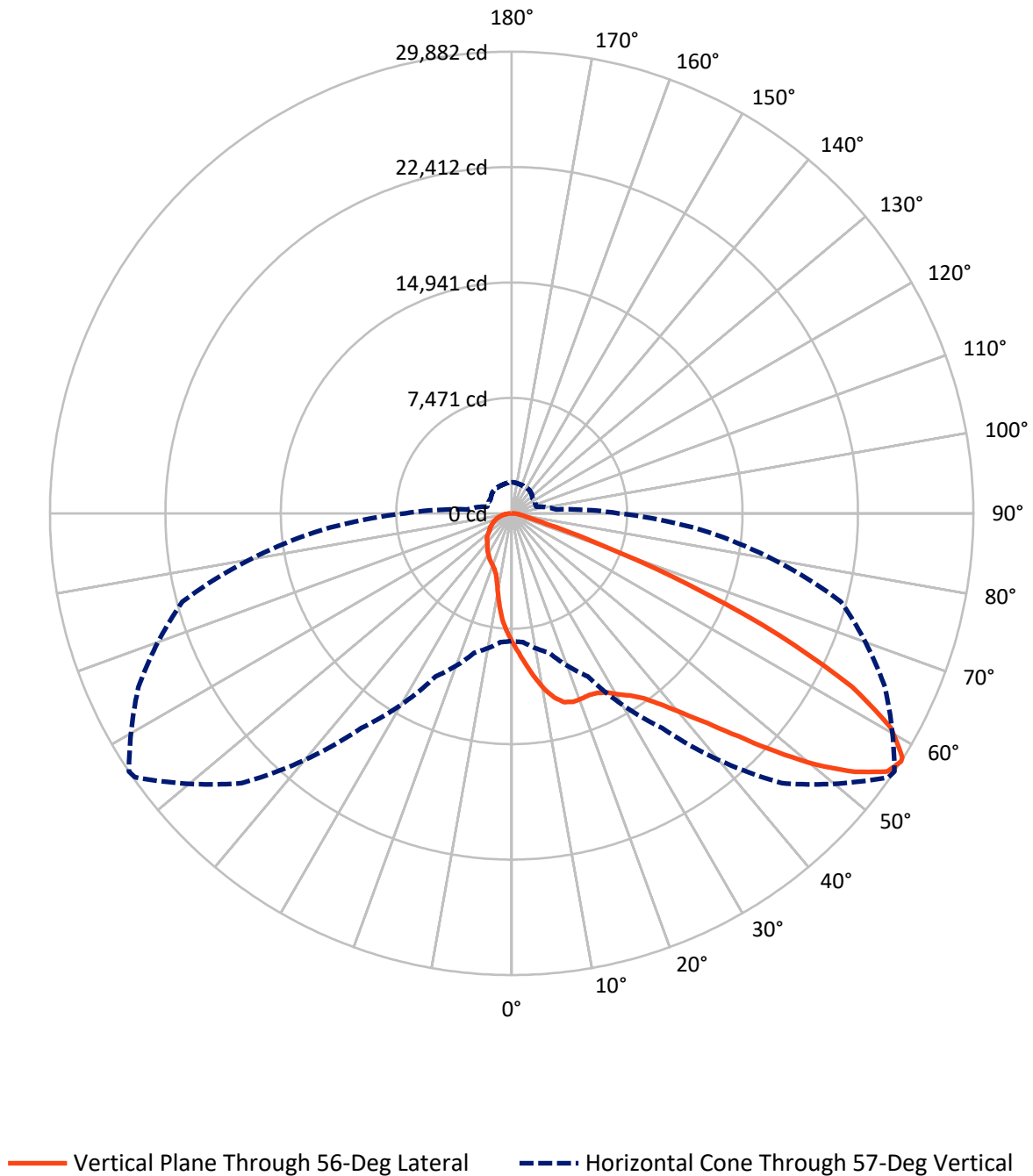
✕ Max cd  
 - - - 1/2 Max cd



Based on 30 foot mounting height. Maximum calculated value = 12.9 fc  
 Type II - Short - N/A

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## Luminous Intensity Polar Plot



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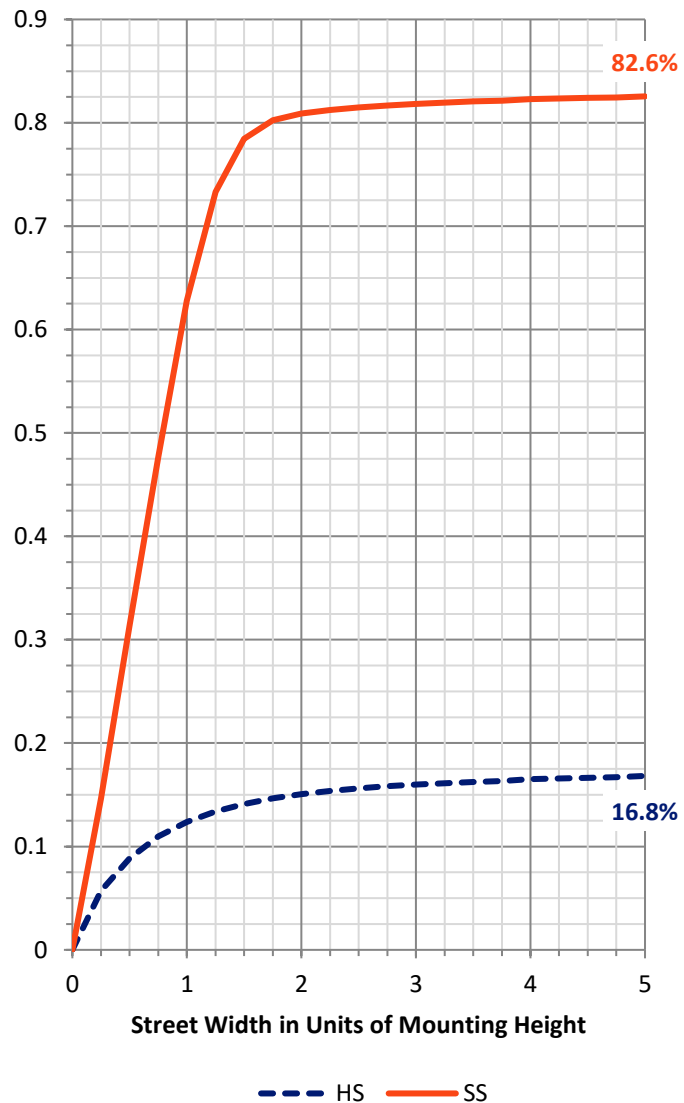
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 6504.0   | 0.0    | 6504.0  |
|                    | % Fixture | 17.2     | 0.0    | 17.2    |
| <b>Street Side</b> | Lumens    | 31227.0  | 0.0    | 31227.0 |
|                    | % Fixture | 82.8     | 0.0    | 82.8    |
| <b>Total</b>       | Lumens    | 37731.0  | 0.0    | 37731.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 799.4   | 2.1       |
| 10°-20°   | 2260.2  | 6.0       |
| 20°-30°   | 3681.4  | 9.8       |
| 30°-40°   | 5503.2  | 14.6      |
| 40°-50°   | 8347.3  | 22.1      |
| 50°-60°   | 9355.8  | 24.8      |
| 60°-70°   | 5525.9  | 14.6      |
| 70°-80°   | 1810.5  | 4.8       |
| 80°-90°   | 447.3   | 1.2       |
| 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°    | 37731.0 | 100.0     |
| 0°-180°   | 37731.0 | 100.0     |

**Coefficient of Utilization**



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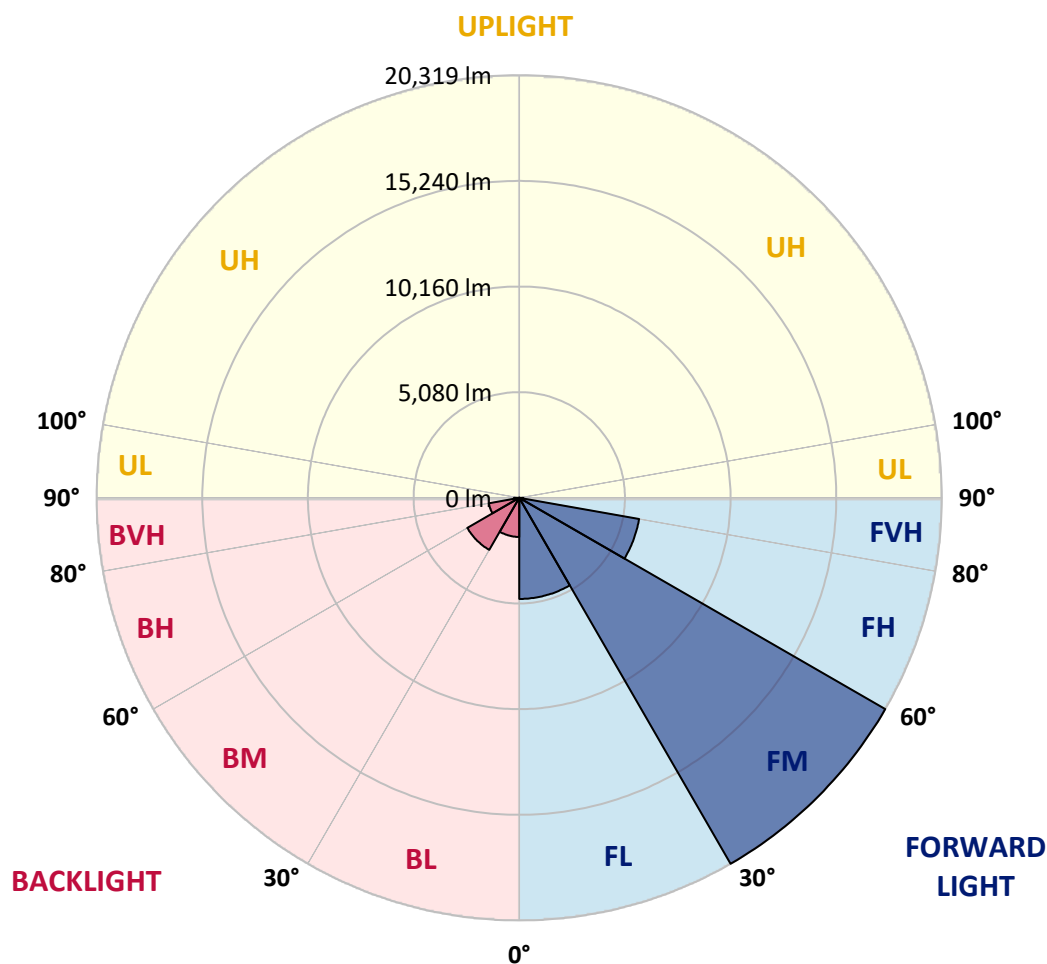
CATALOG NUMBER: GLEON-SA7C-722-U-AFL

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|---------|-----------|-------------------------|------|---------|
|      |             |         |           | B                       | U    | G       |
| FL   | (0°-30°)    | 4860.3  | 12.9      |                         |      |         |
| FM   | (30°-60°)   | 20319.4 | 53.9      |                         |      |         |
| FH   | (60°-80°)   | 5850.3  | 15.5      |                         |      | G3/7500 |
| FVH  | (80°-90°)   | 197.0   | 0.5       |                         |      | G2/225  |
| BL   | (0°-30°)    | 1880.7  | 5.0       | B3/2500                 |      |         |
| BM   | (30°-60°)   | 2886.9  | 7.7       | B3/5000                 |      |         |
| BH   | (60°-80°)   | 1486.1  | 3.9       | B3/2500                 |      | G3/2500 |
| BVH  | (80°-90°)   | 250.4   | 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-G3**

Type II Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 55°     | 56°     | 65°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 8368.8  | 8368.8  | 8368.8  | 8368.8  | 8368.8  | 8368.8  | 8368.8  | 8368.8  | 8368.8  | 8368.8  | 8368.8  |
| 2.5°  | 9609.7  | 9697.9  | 9659.0  | 9524.1  | 9420.4  | 9273.9  | 9110.5  | 9061.2  | 8888.7  | 8695.5  | 8463.4  |
| 5°    | 11130.7 | 11086.6 | 11023.1 | 10813.0 | 10591.3 | 10333.2 | 9923.5  | 9858.7  | 9474.8  | 9037.9  | 8576.2  |
| 7.5°  | 11996.9 | 11993.0 | 11955.4 | 11832.2 | 11629.9 | 11292.8 | 10798.7 | 10722.2 | 10142.6 | 9439.8  | 8724.1  |
| 10°   | 11871.1 | 11862.0 | 11924.3 | 12052.6 | 12113.6 | 12043.6 | 11627.3 | 11550.8 | 10838.9 | 9884.6  | 8895.2  |
| 12.5° | 11156.6 | 11161.8 | 11261.7 | 11531.4 | 11898.3 | 12339.2 | 12271.8 | 12234.2 | 11561.2 | 10387.7 | 9102.7  |
| 15°   | 10600.4 | 10612.0 | 10691.1 | 10925.8 | 11358.9 | 12159.0 | 12663.4 | 12676.3 | 12260.1 | 10942.7 | 9345.2  |
| 17.5° | 10356.6 | 10381.2 | 10417.5 | 10582.2 | 10979.0 | 11799.8 | 12756.7 | 12826.8 | 12872.1 | 11518.4 | 9578.6  |
| 20°   | 10434.4 | 10457.7 | 10468.1 | 10573.1 | 10898.6 | 11581.9 | 12691.9 | 12817.7 | 13341.5 | 12060.4 | 9812.0  |
| 22.5° | 10783.2 | 10797.5 | 10803.9 | 10831.2 | 11084.0 | 11644.2 | 12649.1 | 12781.4 | 13681.3 | 12546.7 | 9988.3  |
| 25°   | 11361.5 | 11351.1 | 11309.6 | 11274.6 | 11444.5 | 11890.6 | 12747.7 | 12873.4 | 13957.5 | 12987.5 | 10103.7 |
| 27.5° | 12053.9 | 12041.0 | 11960.6 | 11864.6 | 11961.9 | 12274.4 | 13031.6 | 13131.5 | 14205.1 | 13399.9 | 10162.1 |
| 30°   | 12885.1 | 12851.4 | 12699.7 | 12585.6 | 12623.2 | 12850.1 | 13499.7 | 13590.5 | 14587.6 | 13868.0 | 10219.1 |
| 32.5° | 13845.9 | 13809.6 | 13590.5 | 13401.2 | 13401.2 | 13590.5 | 13982.1 | 14057.3 | 14911.8 | 14397.0 | 10311.2 |
| 35°   | 15049.3 | 15003.9 | 14718.6 | 14400.9 | 14311.5 | 14407.4 | 14639.5 | 14692.7 | 15495.3 | 15063.5 | 10478.5 |
| 37.5° | 16467.8 | 16406.9 | 16037.3 | 15612.0 | 15416.2 | 15411.0 | 15578.3 | 15687.2 | 16427.6 | 15938.8 | 10762.4 |
| 40°   | 17890.3 | 17847.5 | 17524.6 | 17190.1 | 16806.3 | 16683.1 | 16941.1 | 16974.8 | 17646.5 | 17025.4 | 11125.5 |
| 42.5° | 18989.9 | 18982.1 | 18922.4 | 18966.5 | 18573.6 | 18324.7 | 18527.0 | 18554.2 | 19135.1 | 18201.5 | 11511.9 |
| 45°   | 19570.8 | 19583.8 | 19872.9 | 20513.5 | 20658.7 | 20477.2 | 20577.0 | 20584.8 | 20836.3 | 19388.0 | 11865.9 |
| 47.5° | 19105.3 | 19172.7 | 19904.0 | 21336.9 | 22525.9 | 23128.9 | 22962.9 | 23058.9 | 22485.7 | 20407.1 | 12143.4 |
| 50°   | 17291.2 | 17374.2 | 18619.0 | 20969.9 | 23397.3 | 25695.0 | 25608.1 | 25586.1 | 23816.1 | 21154.0 | 12293.8 |
| 52.5° | 15044.1 | 15108.9 | 16135.9 | 19062.5 | 22758.0 | 27113.6 | 27911.0 | 27796.9 | 24998.7 | 21712.9 | 12322.3 |
| 55°   | 11622.1 | 11723.3 | 12707.5 | 15255.4 | 20172.4 | 26571.6 | 29604.5 | 29502.1 | 26076.2 | 22005.9 | 12288.6 |
| 57°   | 8262.4  | 8368.8  | 9346.5  | 11642.9 | 16969.6 | 24695.3 | 29773.1 | 29882.0 | 26658.4 | 22055.2 | 12326.2 |
| 57.5° | 7372.9  | 7481.8  | 8450.5  | 10680.7 | 15971.2 | 24017.1 | 29627.8 | 29809.4 | 26763.5 | 22047.4 | 12347.0 |
| 60°   | 3712.4  | 3753.9  | 4371.1  | 5962.1  | 10095.9 | 19416.5 | 27733.4 | 28201.5 | 26858.1 | 21666.2 | 12436.5 |
| 62.5° | 2308.1  | 2278.3  | 2258.8  | 2746.4  | 4911.8  | 12876.0 | 23823.9 | 24725.1 | 25046.7 | 20743.0 | 12219.9 |
| 65°   | 2029.3  | 1973.5  | 1759.6  | 1720.7  | 2169.3  | 6253.9  | 17940.9 | 19062.5 | 21176.1 | 19288.1 | 11703.8 |
| 67.5° | 1906.1  | 1851.7  | 1610.5  | 1465.2  | 1466.5  | 2479.3  | 11138.5 | 12401.4 | 16496.4 | 16828.3 | 10486.2 |
| 70°   | 1779.0  | 1729.8  | 1504.1  | 1333.0  | 1248.7  | 1373.2  | 5124.5  | 6082.7  | 10753.4 | 13227.4 | 8764.3  |
| 72.5° | 1615.7  | 1581.9  | 1368.0  | 1191.6  | 1102.2  | 1028.3  | 1961.9  | 2317.2  | 6225.4  | 8883.6  | 6086.6  |
| 75°   | 1444.5  | 1413.4  | 1230.5  | 1062.0  | 953.1   | 809.1   | 1104.8  | 1190.4  | 3162.6  | 4544.9  | 2996.6  |
| 77.5° | 1256.5  | 1238.3  | 1094.4  | 938.8   | 851.9   | 670.4   | 781.9   | 823.4   | 1356.3  | 1948.9  | 1502.9  |
| 80°   | 999.7   | 1034.8  | 956.9   | 836.4   | 756.0   | 536.8   | 553.7   | 580.9   | 789.7   | 951.8   | 853.2   |
| 82.5° | 650.9   | 711.9   | 749.5   | 679.5   | 622.4   | 422.7   | 398.1   | 409.8   | 514.8   | 580.9   | 370.9   |
| 85°   | 271.0   | 304.7   | 492.7   | 444.8   | 413.6   | 308.6   | 267.1   | 272.3   | 319.0   | 330.7   | 151.7   |
| 87.5° | 120.6   | 128.4   | 216.5   | 203.6   | 175.1   | 106.3   | 114.1   | 124.5   | 169.9   | 160.8   | 58.4    |
| 90°   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |



REPORT NUMBER: P321171

CATALOG NUMBER: GLEON-SA7C-722-U-AFL

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 8368.8 | 8368.8 | 8368.8 | 8368.8 | 8368.8 | 8368.8 | 8368.8 | 8368.8 | 8368.8 | 8368.8 | 8368.8 |
| 2.5°  | 8376.6 | 8267.6 | 8080.9 | 7874.7 | 7706.2 | 7571.3 | 7435.2 | 7341.8 | 7232.9 | 7174.5 | 7144.7 |
| 5°    | 8383.0 | 8169.1 | 7776.2 | 7372.9 | 7012.4 | 6683.1 | 6369.3 | 6128.1 | 5902.5 | 5780.6 | 5746.9 |
| 7.5°  | 8410.3 | 8088.7 | 7453.3 | 6789.4 | 6148.9 | 5564.1 | 5112.8 | 4830.1 | 4626.6 | 4535.8 | 4509.9 |
| 10°   | 8432.3 | 7994.0 | 7053.9 | 6071.1 | 5199.7 | 4607.1 | 4257.0 | 4098.8 | 4028.8 | 4017.1 | 4005.4 |
| 12.5° | 8484.2 | 7896.8 | 6633.8 | 5321.6 | 4461.9 | 4052.1 | 3930.2 | 3919.9 | 3939.3 | 3967.8 | 3967.8 |
| 15°   | 8565.9 | 7800.8 | 6154.0 | 4678.4 | 3992.5 | 3848.5 | 3873.2 | 3930.2 | 3983.4 | 4027.5 | 4034.0 |
| 17.5° | 8625.5 | 7682.8 | 5638.0 | 4163.6 | 3742.2 | 3781.1 | 3869.3 | 3949.7 | 4004.1 | 4046.9 | 4050.8 |
| 20°   | 8668.3 | 7500.0 | 5086.9 | 3770.7 | 3598.3 | 3718.9 | 3829.1 | 3900.4 | 3938.0 | 3980.8 | 3987.3 |
| 22.5° | 8646.3 | 7254.9 | 4598.0 | 3489.4 | 3481.6 | 3628.1 | 3733.1 | 3818.7 | 3790.2 | 3748.7 | 3775.9 |
| 25°   | 8539.9 | 6917.8 | 4094.9 | 3279.3 | 3358.4 | 3506.2 | 3635.9 | 3578.8 | 3482.9 | 3464.7 | 3475.1 |
| 27.5° | 8350.6 | 6487.3 | 3629.4 | 3084.8 | 3215.8 | 3393.4 | 3385.6 | 3328.6 | 3294.9 | 3271.5 | 3285.8 |
| 30°   | 8147.0 | 6020.5 | 3222.2 | 2914.9 | 3057.6 | 3204.1 | 3174.3 | 3173.0 | 3139.3 | 3101.7 | 3119.8 |
| 32.5° | 7946.1 | 5551.1 | 2899.4 | 2774.9 | 2938.3 | 2957.7 | 3022.6 | 3042.0 | 2975.9 | 2896.8 | 2891.6 |
| 35°   | 7771.0 | 5107.6 | 2654.3 | 2647.8 | 2794.3 | 2796.9 | 2891.6 | 2864.4 | 2699.7 | 2618.0 | 2618.0 |
| 37.5° | 7640.0 | 4665.5 | 2467.6 | 2533.7 | 2605.0 | 2672.5 | 2720.4 | 2607.6 | 2580.4 | 2535.0 | 2533.7 |
| 40°   | 7583.0 | 4276.4 | 2350.9 | 2446.8 | 2471.5 | 2557.1 | 2433.9 | 2478.0 | 2490.9 | 2467.6 | 2467.6 |
| 42.5° | 7523.3 | 3938.0 | 2249.7 | 2380.7 | 2376.8 | 2365.1 | 2302.9 | 2360.0 | 2411.8 | 2413.1 | 2409.2 |
| 45°   | 7463.7 | 3646.3 | 2160.3 | 2239.4 | 2293.8 | 2168.0 | 2179.7 | 2240.7 | 2313.3 | 2339.2 | 2339.2 |
| 47.5° | 7397.6 | 3415.5 | 2078.6 | 2090.2 | 2174.5 | 2090.2 | 2081.2 | 2127.9 | 2213.4 | 2254.9 | 2264.0 |
| 50°   | 7252.3 | 3208.0 | 1985.2 | 1959.3 | 1982.6 | 2011.2 | 2018.9 | 2041.0 | 2135.6 | 2201.8 | 2217.3 |
| 52.5° | 7051.3 | 3022.6 | 1865.9 | 1838.7 | 1838.7 | 1946.3 | 1982.6 | 1989.1 | 2069.5 | 2148.6 | 2164.2 |
| 55°   | 6884.1 | 2904.6 | 1742.7 | 1737.6 | 1732.4 | 1877.6 | 1939.8 | 1950.2 | 2006.0 | 2068.2 | 2076.0 |
| 57°   | 6895.7 | 2895.5 | 1648.1 | 1653.3 | 1652.0 | 1807.6 | 1899.6 | 1921.7 | 1950.2 | 2003.4 | 2012.4 |
| 57.5° | 6902.2 | 2902.0 | 1627.3 | 1629.9 | 1628.6 | 1788.1 | 1888.0 | 1912.6 | 1934.6 | 1990.4 | 1999.5 |
| 60°   | 6999.5 | 2918.8 | 1543.0 | 1514.5 | 1521.0 | 1684.4 | 1821.8 | 1853.0 | 1867.2 | 1941.1 | 1952.8 |
| 62.5° | 6855.5 | 2843.6 | 1475.6 | 1406.9 | 1406.9 | 1575.5 | 1729.8 | 1779.0 | 1801.1 | 1900.9 | 1920.4 |
| 65°   | 6438.0 | 2632.3 | 1396.5 | 1285.0 | 1298.0 | 1466.5 | 1619.6 | 1699.9 | 1733.7 | 1858.1 | 1878.9 |
| 67.5° | 5793.6 | 2387.2 | 1312.2 | 1176.1 | 1189.1 | 1352.4 | 1505.4 | 1592.3 | 1645.5 | 1811.5 | 1828.3 |
| 70°   | 4954.6 | 2087.7 | 1198.1 | 1060.7 | 1076.2 | 1228.0 | 1370.6 | 1469.1 | 1548.2 | 1767.4 | 1772.6 |
| 72.5° | 3652.7 | 1711.6 | 1038.6 | 933.6  | 950.5  | 1082.7 | 1234.4 | 1348.5 | 1454.9 | 1657.2 | 1654.6 |
| 75°   | 2171.9 | 1338.2 | 862.3  | 805.2  | 816.9  | 940.1  | 1111.3 | 1250.0 | 1409.5 | 1614.4 | 1639.0 |
| 77.5° | 1317.4 | 1007.5 | 702.8  | 674.3  | 688.5  | 814.3  | 1023.1 | 1170.9 | 1390.0 | 1522.3 | 1514.5 |
| 80°   | 796.2  | 719.7  | 561.5  | 543.3  | 557.6  | 696.3  | 946.6  | 1111.3 | 1215.0 | 1300.6 | 1300.6 |
| 82.5° | 416.2  | 439.6  | 412.3  | 398.1  | 417.5  | 565.4  | 861.0  | 969.9  | 1073.7 | 921.9  | 861.0  |
| 85°   | 169.9  | 229.5  | 250.3  | 249.0  | 260.6  | 391.6  | 743.0  | 829.9  | 692.4  | 657.4  | 673.0  |
| 87.5° | 57.1   | 97.3   | 121.9  | 105.0  | 110.2  | 246.4  | 514.8  | 400.7  | 475.9  | 331.9  | 315.1  |
| 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: SP1-1908-441-10-R4

Test Date: 10/25/2019

Luminaire Tested: SA1C-722-U-5WQ

Data in this report applies to families of products SA1C-722-U-5WQ.

### Test Information

Test Method: LM-79-2008 Report  
 Number: SP1-1908-441-10-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-722-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):                  | 2237    | CRI (Ra): | 72.0 |      |       |
| CIE u':                   | 0.2876  | R1:       | 68.9 | R9:  | -17.4 |
| CIE v':                   | 0.5346  | R2:       | 83.0 | R10: | 61.3  |
| Duv:                      | -0.0006 | R3:       | 95.2 | R11: | 59.8  |
| CIE x:                    | 0.5005  | R4:       | 66.2 | R12: | 50.5  |
| CIE y:                    | 0.4134  | R5:       | 65.9 | R13: | 71.1  |
| CIE z:                    | 0.0860  | R6:       | 76.3 | R14: | 96.9  |
| Peak Wavelength (nm):     | 603     | R7:       | 76.7 |      |       |
| Dominant Wavelength (nm): | 587     | R8:       | 43.8 |      |       |
| Purity:                   | 74.5    |           |      |      |       |
| Rf:                       | 69.8    |           |      |      |       |
| Rg:                       | 99.2    |           |      |      |       |



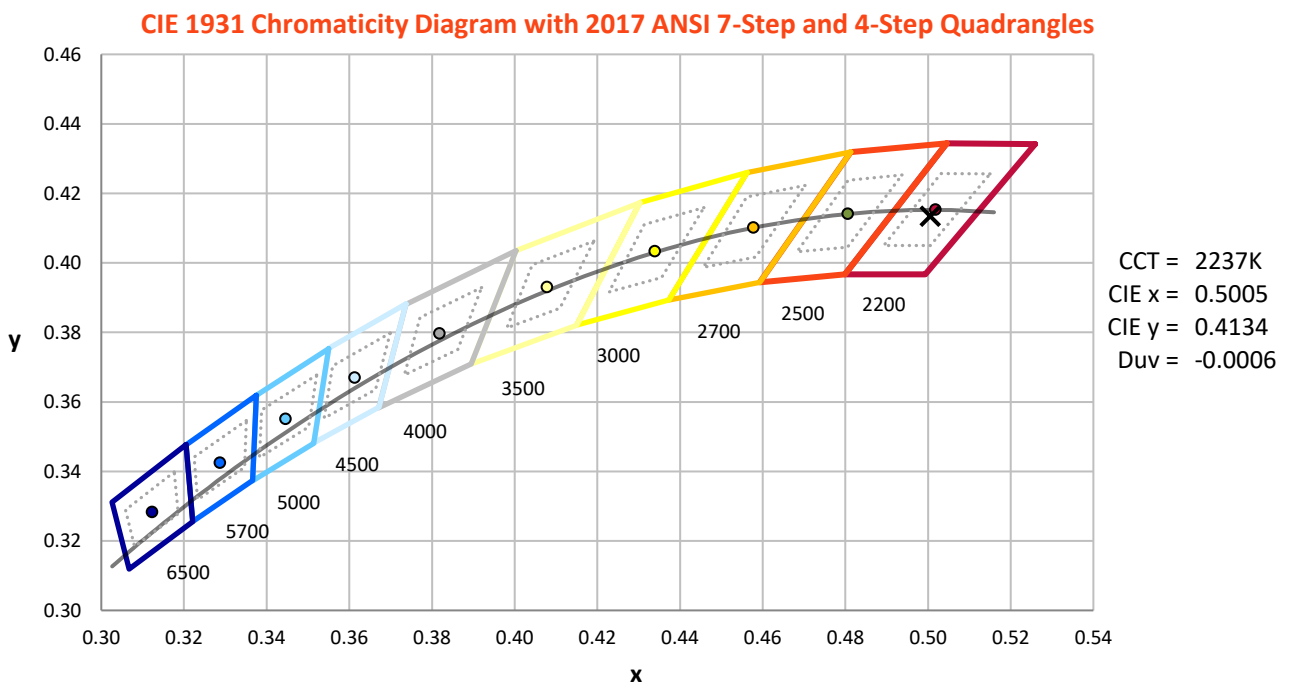
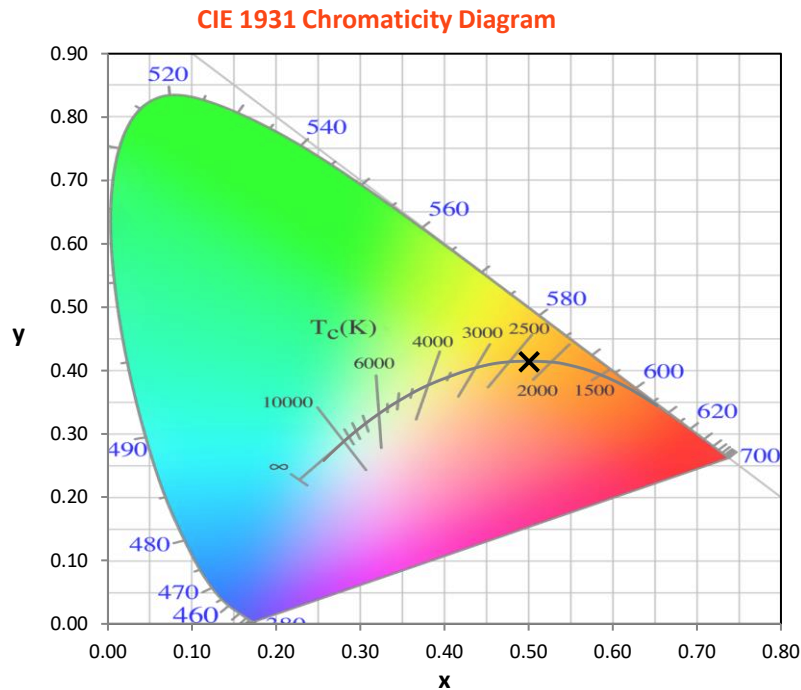
### Test Conditions

Stabilization Time: 71M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.7/41%  
 Sphere Temperature (°C): 25.6

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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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Point lies inside the ANSI 2200K 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       | 1768             | NR               | 490       | 5206             | NR               | 620       | 130919           | NR               | 750       | 8553             | NR               | 880       | 2713             | NR               |
| 365       | 1569             | NR               | 495       | 7286             | NR               | 625       | 125335           | NR               | 755       | 7696             | NR               | 885       | 2316             | NR               |
| 370       | 1594             | NR               | 500       | 10654            | NR               | 630       | 118388           | NR               | 760       | 6978             | NR               | 890       | 2539             | NR               |
| 375       | 1744             | NR               | 505       | 15189            | NR               | 635       | 111855           | NR               | 765       | 6377             | NR               | 895       | 1933             | NR               |
| 380       | 1659             | NR               | 510       | 20541            | NR               | 640       | 104062           | NR               | 770       | 5600             | NR               | 900       | 2216             | NR               |
| 385       | 1504             | NR               | 515       | 26492            | NR               | 645       | 96365            | NR               | 775       | 5000             | NR               | 905       | 2067             | NR               |
| 390       | 1541             | NR               | 520       | 32294            | NR               | 650       | 88651            | NR               | 780       | 4709             | NR               | 910       | 1959             | NR               |
| 395       | 1355             | NR               | 525       | 38123            | NR               | 655       | 81152            | NR               | 785       | 4305             | NR               | 915       | 1874             | NR               |
| 400       | 1243             | NR               | 530       | 43232            | NR               | 660       | 73523            | NR               | 790       | 4040             | NR               | 920       | 1484             | NR               |
| 405       | 1417             | NR               | 535       | 48012            | NR               | 665       | 66123            | NR               | 795       | 3642             | NR               | 925       | 1914             | NR               |
| 410       | 2147             | NR               | 540       | 52623            | NR               | 670       | 58677            | NR               | 800       | 3594             | NR               | 930       | 1948             | NR               |
| 415       | 3837             | NR               | 545       | 57516            | NR               | 675       | 52349            | NR               | 805       | 3190             | NR               | 935       | 2079             | NR               |
| 420       | 7159             | NR               | 550       | 62613            | NR               | 680       | 46159            | NR               | 810       | 3241             | NR               | 940       | 2263             | NR               |
| 425       | 12599            | NR               | 555       | 68554            | NR               | 685       | 40525            | NR               | 815       | 2732             | NR               | 945       | 1688             | NR               |
| 430       | 19019            | NR               | 560       | 75325            | NR               | 690       | 35615            | NR               | 820       | 2612             | NR               | 950       | 1560             | NR               |
| 435       | 24875            | NR               | 565       | 82533            | NR               | 695       | 31158            | NR               | 825       | 2966             | NR               | 955       | 2826             | NR               |
| 440       | 29103            | NR               | 570       | 90909            | NR               | 700       | 27409            | NR               | 830       | 2574             | NR               | 960       | 1477             | NR               |
| 445       | 29901            | NR               | 575       | 99621            | NR               | 705       | 24204            | NR               | 835       | 2633             | NR               | 965       | 1568             | NR               |
| 450       | 24862            | NR               | 580       | 108484           | NR               | 710       | 21558            | NR               | 840       | 2526             | NR               | 970       | 2030             | NR               |
| 455       | 15942            | NR               | 585       | 116679           | NR               | 715       | 19222            | NR               | 845       | 2631             | NR               | 975       | 1986             | NR               |
| 460       | 9916             | NR               | 590       | 123752           | NR               | 720       | 17310            | NR               | 850       | 2079             | NR               | 980       | 2540             | NR               |
| 465       | 7051             | NR               | 595       | 129324           | NR               | 725       | 15280            | NR               | 855       | 2309             | NR               | 985       | 1139             | NR               |
| 470       | 5227             | NR               | 600       | 134082           | NR               | 730       | 13282            | NR               | 860       | 2528             | NR               | 990       | 2018             | NR               |
| 475       | 4257             | NR               | 605       | 135698           | NR               | 735       | 11753            | NR               | 865       | 2121             | NR               | 995       | 3445             | NR               |
| 480       | 4052             | NR               | 610       | 135144           | NR               | 740       | 10654            | NR               | 870       | 2751             | NR               | 1000      | 3704             | NR               |
| 485       | 4298             | NR               | 615       | 134180           | NR               | 745       | 9451             | NR               | 875       | 2317             | NR               |           |                  |                  |

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**Scotopic Flux vs. Wavelength**



**Scotopic Lumens: 4696.9**

**S/P: 0.85**

| 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       | 1768             | NR               | 490       | 5206             | NR               | 620       | 130919           | NR               | 750       | 8553             | NR               | 880       | 2713             | NR               |
| 365       | 1569             | NR               | 495       | 7286             | NR               | 625       | 125335           | NR               | 755       | 7696             | NR               | 885       | 2316             | NR               |
| 370       | 1594             | NR               | 500       | 10654            | NR               | 630       | 118388           | NR               | 760       | 6978             | NR               | 890       | 2539             | NR               |
| 375       | 1744             | NR               | 505       | 15189            | NR               | 635       | 111855           | NR               | 765       | 6377             | NR               | 895       | 1933             | NR               |
| 380       | 1659             | NR               | 510       | 20541            | NR               | 640       | 104062           | NR               | 770       | 5600             | NR               | 900       | 2216             | NR               |
| 385       | 1504             | NR               | 515       | 26492            | NR               | 645       | 96365            | NR               | 775       | 5000             | NR               | 905       | 2067             | NR               |
| 390       | 1541             | NR               | 520       | 32294            | NR               | 650       | 88651            | NR               | 780       | 4709             | NR               | 910       | 1959             | NR               |
| 395       | 1355             | NR               | 525       | 38123            | NR               | 655       | 81152            | NR               | 785       | 4305             | NR               | 915       | 1874             | NR               |
| 400       | 1243             | NR               | 530       | 43232            | NR               | 660       | 73523            | NR               | 790       | 4040             | NR               | 920       | 1484             | NR               |
| 405       | 1417             | NR               | 535       | 48012            | NR               | 665       | 66123            | NR               | 795       | 3642             | NR               | 925       | 1914             | NR               |
| 410       | 2147             | NR               | 540       | 52623            | NR               | 670       | 58677            | NR               | 800       | 3594             | NR               | 930       | 1948             | NR               |
| 415       | 3837             | NR               | 545       | 57516            | NR               | 675       | 52349            | NR               | 805       | 3190             | NR               | 935       | 2079             | NR               |
| 420       | 7159             | NR               | 550       | 62613            | NR               | 680       | 46159            | NR               | 810       | 3241             | NR               | 940       | 2263             | NR               |
| 425       | 12599            | NR               | 555       | 68554            | NR               | 685       | 40525            | NR               | 815       | 2732             | NR               | 945       | 1688             | NR               |
| 430       | 19019            | NR               | 560       | 75325            | NR               | 690       | 35615            | NR               | 820       | 2612             | NR               | 950       | 1560             | NR               |
| 435       | 24875            | NR               | 565       | 82533            | NR               | 695       | 31158            | NR               | 825       | 2966             | NR               | 955       | 2826             | NR               |
| 440       | 29103            | NR               | 570       | 90909            | NR               | 700       | 27409            | NR               | 830       | 2574             | NR               | 960       | 1477             | NR               |
| 445       | 29901            | NR               | 575       | 99621            | NR               | 705       | 24204            | NR               | 835       | 2633             | NR               | 965       | 1568             | NR               |
| 450       | 24862            | NR               | 580       | 108484           | NR               | 710       | 21558            | NR               | 840       | 2526             | NR               | 970       | 2030             | NR               |
| 455       | 15942            | NR               | 585       | 116679           | NR               | 715       | 19222            | NR               | 845       | 2631             | NR               | 975       | 1986             | NR               |
| 460       | 9916             | NR               | 590       | 123752           | NR               | 720       | 17310            | NR               | 850       | 2079             | NR               | 980       | 2540             | NR               |
| 465       | 7051             | NR               | 595       | 129324           | NR               | 725       | 15280            | NR               | 855       | 2309             | NR               | 985       | 1139             | NR               |
| 470       | 5227             | NR               | 600       | 134082           | NR               | 730       | 13282            | NR               | 860       | 2528             | NR               | 990       | 2018             | NR               |
| 475       | 4257             | NR               | 605       | 135698           | NR               | 735       | 11753            | NR               | 865       | 2121             | NR               | 995       | 3445             | NR               |
| 480       | 4052             | NR               | 610       | 135144           | NR               | 740       | 10654            | NR               | 870       | 2751             | NR               | 1000      | 3704             | NR               |
| 485       | 4298             | NR               | 615       | 134180           | NR               | 745       | 9451             | NR               | 875       | 2317             | NR               |           |                  |                  |

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**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 1470.8**

**M/P: 0.27**

| 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       | 1768             | NR               | 490       | 5206             | NR               | 620       | 130919           | NR               | 750       | 8553             | NR               | 880       | 2713             | NR               |
| 365       | 1569             | NR               | 495       | 7286             | NR               | 625       | 125335           | NR               | 755       | 7696             | NR               | 885       | 2316             | NR               |
| 370       | 1594             | NR               | 500       | 10654            | NR               | 630       | 118388           | NR               | 760       | 6978             | NR               | 890       | 2539             | NR               |
| 375       | 1744             | NR               | 505       | 15189            | NR               | 635       | 111855           | NR               | 765       | 6377             | NR               | 895       | 1933             | NR               |
| 380       | 1659             | NR               | 510       | 20541            | NR               | 640       | 104062           | NR               | 770       | 5600             | NR               | 900       | 2216             | NR               |
| 385       | 1504             | NR               | 515       | 26492            | NR               | 645       | 96365            | NR               | 775       | 5000             | NR               | 905       | 2067             | NR               |
| 390       | 1541             | NR               | 520       | 32294            | NR               | 650       | 88651            | NR               | 780       | 4709             | NR               | 910       | 1959             | NR               |
| 395       | 1355             | NR               | 525       | 38123            | NR               | 655       | 81152            | NR               | 785       | 4305             | NR               | 915       | 1874             | NR               |
| 400       | 1243             | NR               | 530       | 43232            | NR               | 660       | 73523            | NR               | 790       | 4040             | NR               | 920       | 1484             | NR               |
| 405       | 1417             | NR               | 535       | 48012            | NR               | 665       | 66123            | NR               | 795       | 3642             | NR               | 925       | 1914             | NR               |
| 410       | 2147             | NR               | 540       | 52623            | NR               | 670       | 58677            | NR               | 800       | 3594             | NR               | 930       | 1948             | NR               |
| 415       | 3837             | NR               | 545       | 57516            | NR               | 675       | 52349            | NR               | 805       | 3190             | NR               | 935       | 2079             | NR               |
| 420       | 7159             | NR               | 550       | 62613            | NR               | 680       | 46159            | NR               | 810       | 3241             | NR               | 940       | 2263             | NR               |
| 425       | 12599            | NR               | 555       | 68554            | NR               | 685       | 40525            | NR               | 815       | 2732             | NR               | 945       | 1688             | NR               |
| 430       | 19019            | NR               | 560       | 75325            | NR               | 690       | 35615            | NR               | 820       | 2612             | NR               | 950       | 1560             | NR               |
| 435       | 24875            | NR               | 565       | 82533            | NR               | 695       | 31158            | NR               | 825       | 2966             | NR               | 955       | 2826             | NR               |
| 440       | 29103            | NR               | 570       | 90909            | NR               | 700       | 27409            | NR               | 830       | 2574             | NR               | 960       | 1477             | NR               |
| 445       | 29901            | NR               | 575       | 99621            | NR               | 705       | 24204            | NR               | 835       | 2633             | NR               | 965       | 1568             | NR               |
| 450       | 24862            | NR               | 580       | 108484           | NR               | 710       | 21558            | NR               | 840       | 2526             | NR               | 970       | 2030             | NR               |
| 455       | 15942            | NR               | 585       | 116679           | NR               | 715       | 19222            | NR               | 845       | 2631             | NR               | 975       | 1986             | NR               |
| 460       | 9916             | NR               | 590       | 123752           | NR               | 720       | 17310            | NR               | 850       | 2079             | NR               | 980       | 2540             | NR               |
| 465       | 7051             | NR               | 595       | 129324           | NR               | 725       | 15280            | NR               | 855       | 2309             | NR               | 985       | 1139             | NR               |
| 470       | 5227             | NR               | 600       | 134082           | NR               | 730       | 13282            | NR               | 860       | 2528             | NR               | 990       | 2018             | NR               |
| 475       | 4257             | NR               | 605       | 135698           | NR               | 735       | 11753            | NR               | 865       | 2121             | NR               | 995       | 3445             | NR               |
| 480       | 4052             | NR               | 610       | 135144           | NR               | 740       | 10654            | NR               | 870       | 2751             | NR               | 1000      | 3704             | NR               |
| 485       | 4298             | NR               | 615       | 134180           | NR               | 745       | 9451             | NR               | 875       | 2317             | NR               |           |                  |                  |

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### Summary

$R_f = 69.8$   
 $R_g = 99.2$   
 CIE  $R_a = 72.0$   
 $R_g = -17.4$



### Color Vector Graphics





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

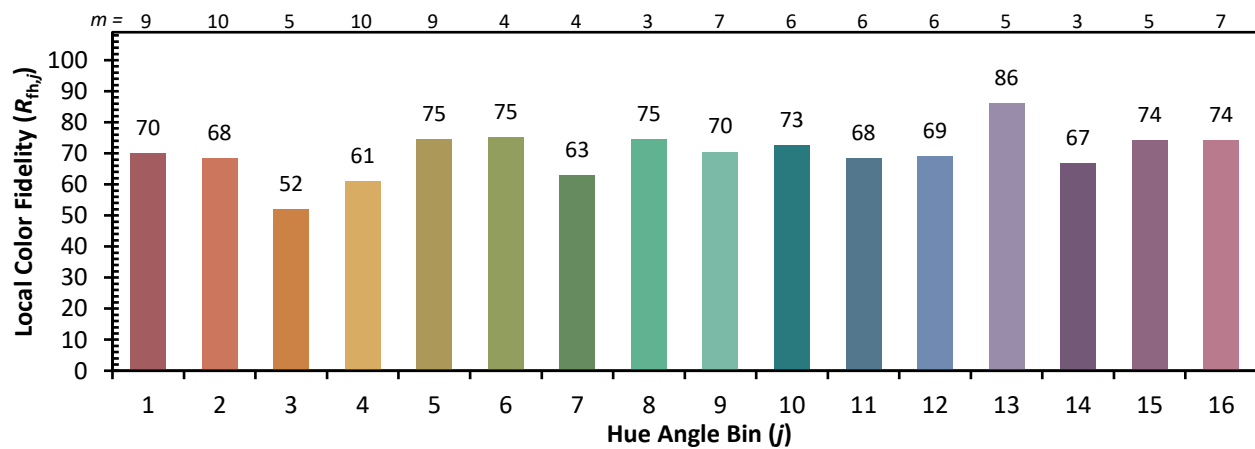
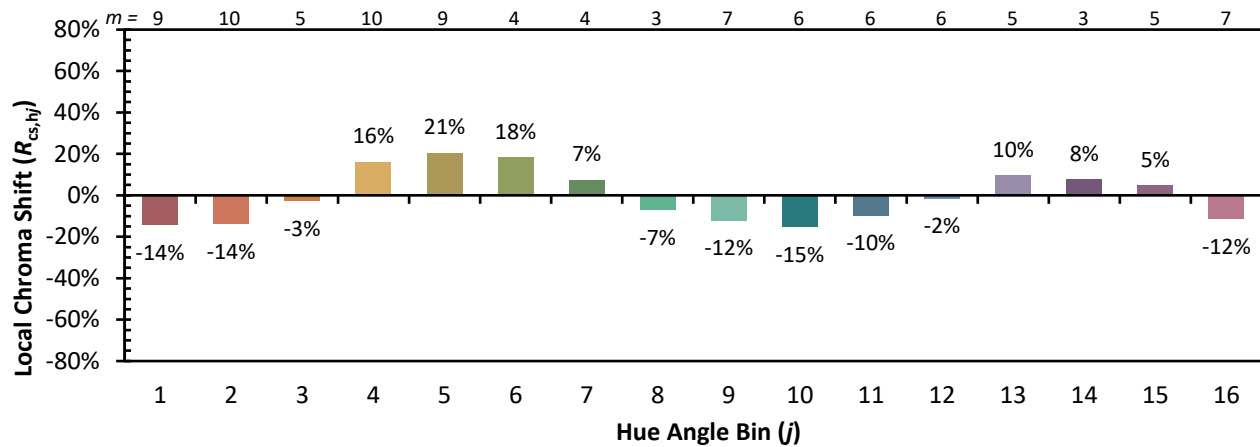
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 87 | CES26 = 56 | CES51 = 74 | CES76 = 56 |
| CES02 = 65 | CES27 = 76 | CES52 = 76 | CES77 = 81 |
| CES03 = 32 | CES28 = 83 | CES53 = 65 | CES78 = 63 |
| CES04 = 72 | CES29 = 46 | CES54 = 78 | CES79 = 84 |
| CES05 = 52 | CES30 = 48 | CES55 = 75 | CES80 = 84 |
| CES06 = 52 | CES31 = 51 | CES56 = 65 | CES81 = 63 |
| CES07 = 44 | CES32 = 51 | CES57 = 62 | CES82 = 92 |
| CES08 = 42 | CES33 = 53 | CES58 = 66 | CES83 = 83 |
| CES09 = 29 | CES34 = 70 | CES59 = 84 | CES84 = 92 |
| CES10 = 78 | CES35 = 85 | CES60 = 90 | CES85 = 81 |
| CES11 = 61 | CES36 = 78 | CES61 = 84 | CES86 = 56 |
| CES12 = 68 | CES37 = 80 | CES62 = 70 | CES87 = 78 |
| CES13 = 45 | CES38 = 53 | CES63 = 68 | CES88 = 72 |
| CES14 = 75 | CES39 = 90 | CES64 = 69 | CES89 = 62 |
| CES15 = 72 | CES40 = 84 | CES65 = 67 | CES90 = 67 |
| CES16 = 49 | CES41 = 75 | CES66 = 64 | CES91 = 90 |
| CES17 = 51 | CES42 = 79 | CES67 = 63 | CES92 = 67 |
| CES18 = 57 | CES43 = 64 | CES68 = 69 | CES93 = 79 |
| CES19 = 74 | CES44 = 98 | CES69 = 80 | CES94 = 52 |
| CES20 = 68 | CES45 = 73 | CES70 = 63 | CES95 = 76 |
| CES21 = 89 | CES46 = 67 | CES71 = 63 | CES96 = 78 |
| CES22 = 81 | CES47 = 60 | CES72 = 87 | CES97 = 77 |
| CES23 = 92 | CES48 = 48 | CES73 = 56 | CES98 = 71 |
| CES24 = 92 | CES49 = 64 | CES74 = 87 | CES99 = 65 |
| CES25 = 74 | CES50 = 74 | CES75 = 66 |            |



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Color Rendition by Hue-Angle Bin



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**Measure Comparisons**



(END OF REPORT)