

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: P317700

Luminaire Tested: **GLEON-SA6D-727-U-T3R**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P317700  
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-SA6D-727-U-T3R  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(6) 70 CRI, 2700K, 1200mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE III  
ROADWAY OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 39680 lumens  
Efficiency: N/A  
Efficacy: 103.9 lumens/watt  
Luminous Opening: Rectangular (W 1.5' x L: 1' x H: 0')  
IES Classification: Type IV - Medium  
BUG Rating: B3 - U0 - G5

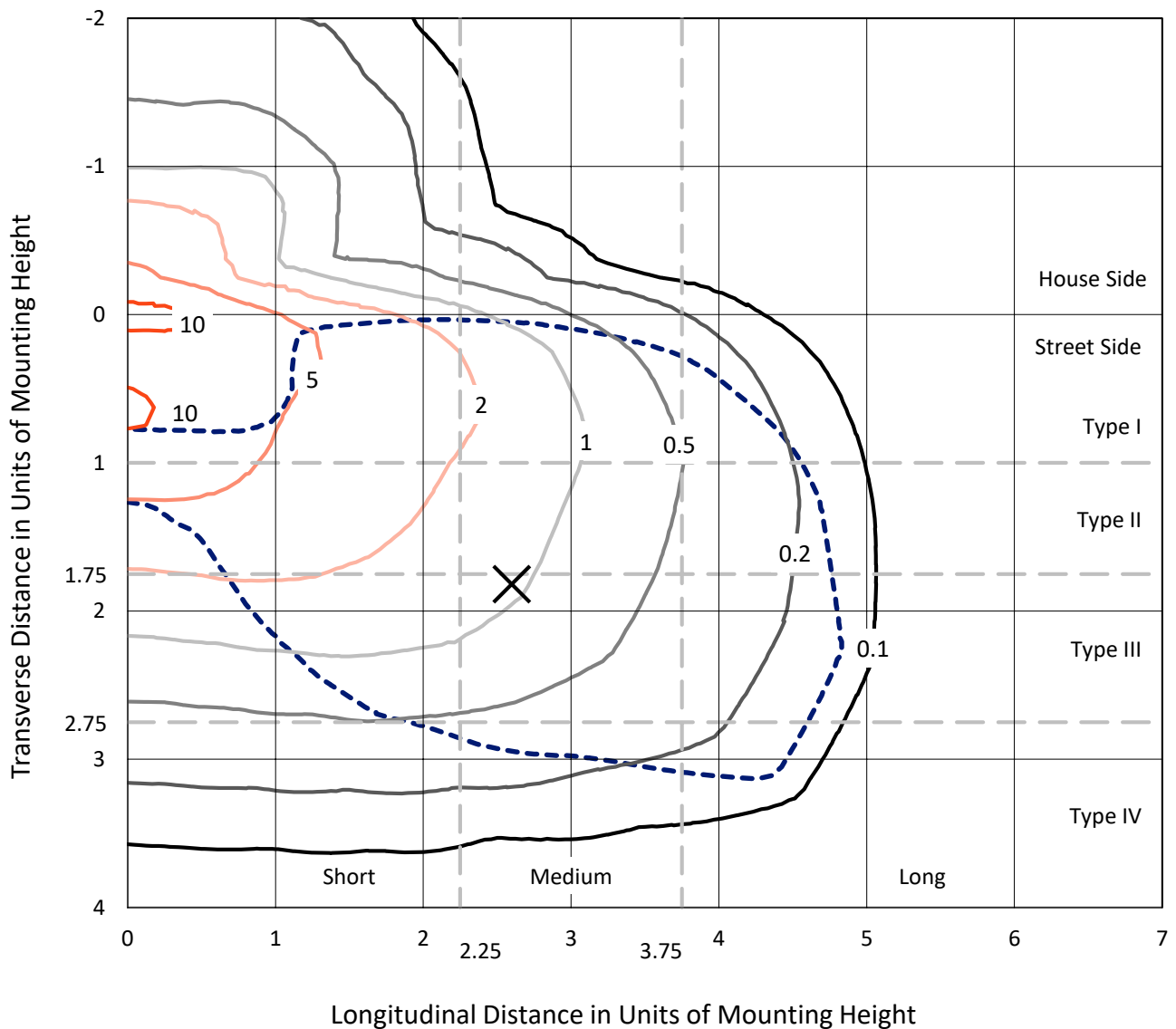
Input Watts (W): 382  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



REPORT NUMBER: P317700  
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### Iso-Footcandle Lines of Horizontal Illumination

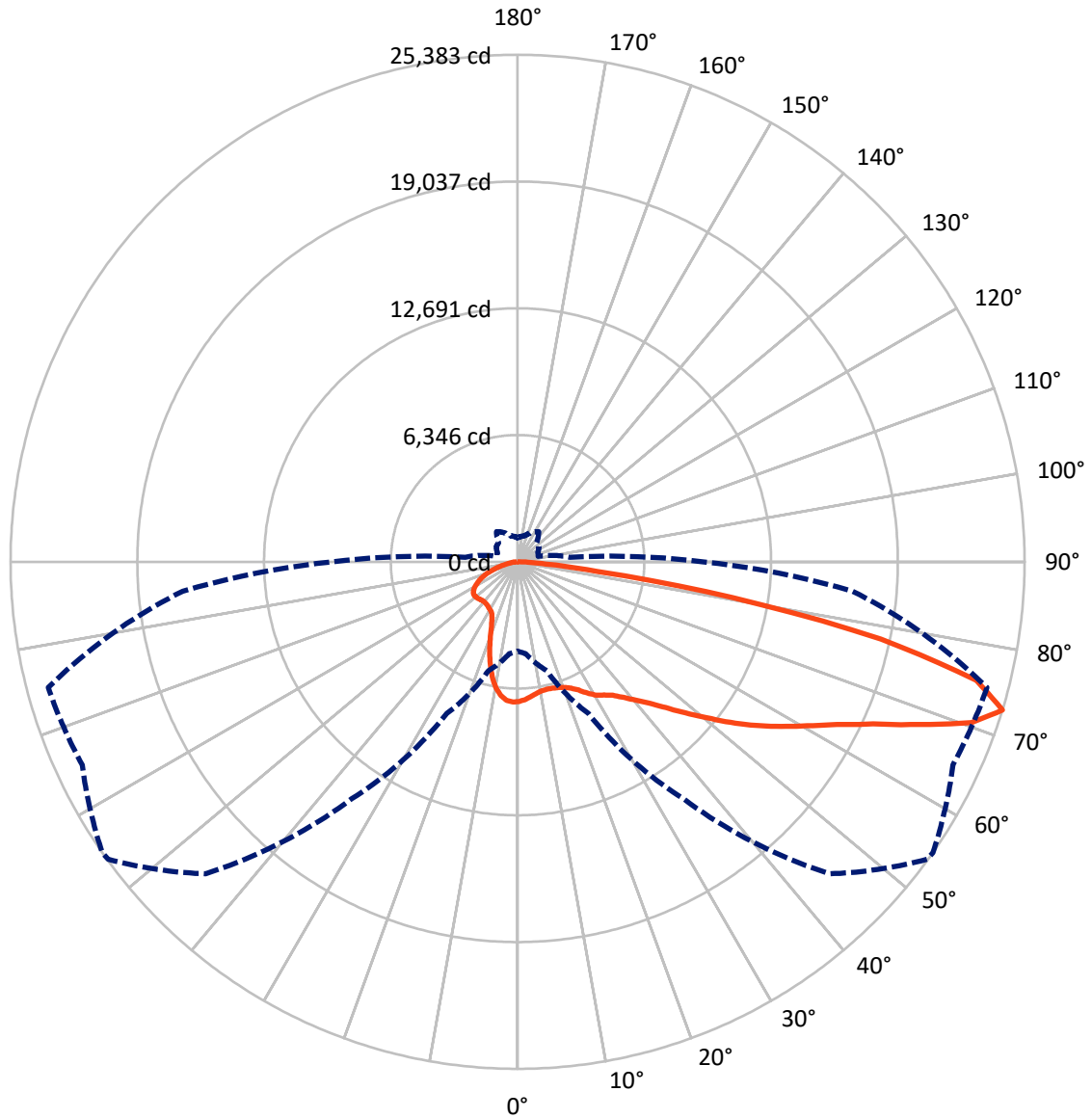
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 11.3 fc  
 Type IV - Medium - N/A

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### Luminous Intensity Polar Plot



— Vertical Plane Through 55-Deg Lateral      - - - Horizontal Cone Through 72.5-Deg Vertical

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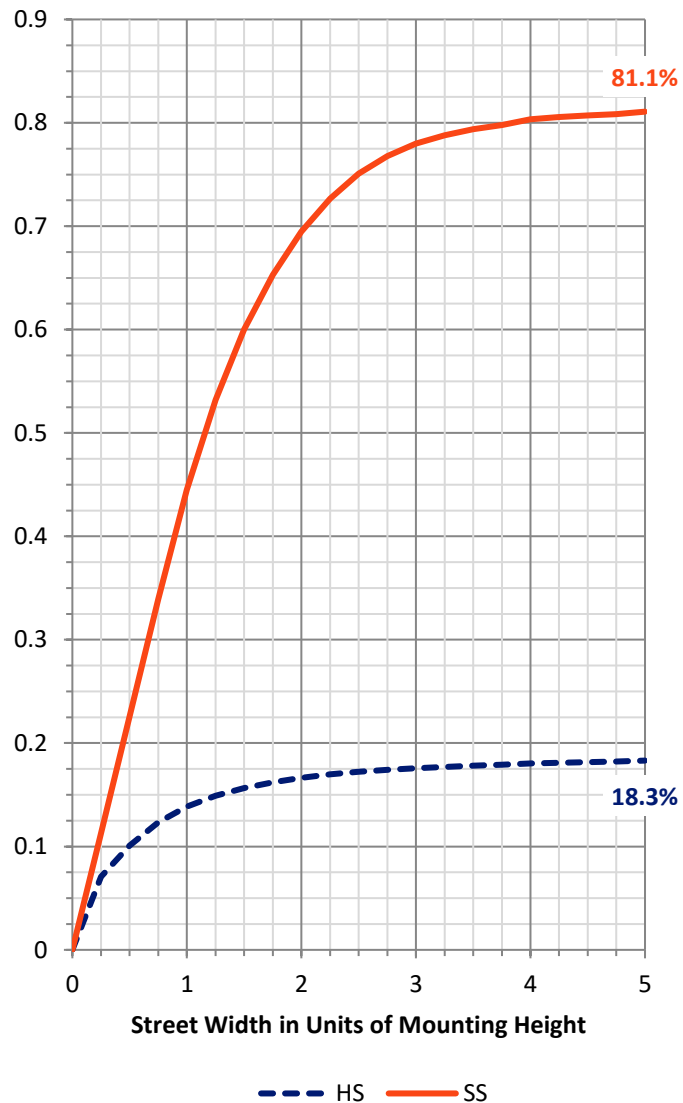
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 7375.2   | 0.0    | 7375.2  |
|                    | % Fixture | 18.6     | 0.0    | 18.6    |
| <b>Street Side</b> | Lumens    | 32304.8  | 0.0    | 32304.8 |
|                    | % Fixture | 81.4     | 0.0    | 81.4    |
| <b>Total</b>       | Lumens    | 39680.0  | 0.0    | 39680.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 633.3   | 1.6       |
| 10°-20°   | 1686.1  | 4.2       |
| 20°-30°   | 2779.9  | 7.0       |
| 30°-40°   | 4112.2  | 10.4      |
| 40°-50°   | 5739.8  | 14.5      |
| 50°-60°   | 7473.4  | 18.8      |
| 60°-70°   | 9184.5  | 23.1      |
| 70°-80°   | 7199.6  | 18.1      |
| 80°-90°   | 871.3   | 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°    | 39680.0 | 100.0     |
| 0°-180°   | 39680.0 | 100.0     |

**Coefficient of Utilization**

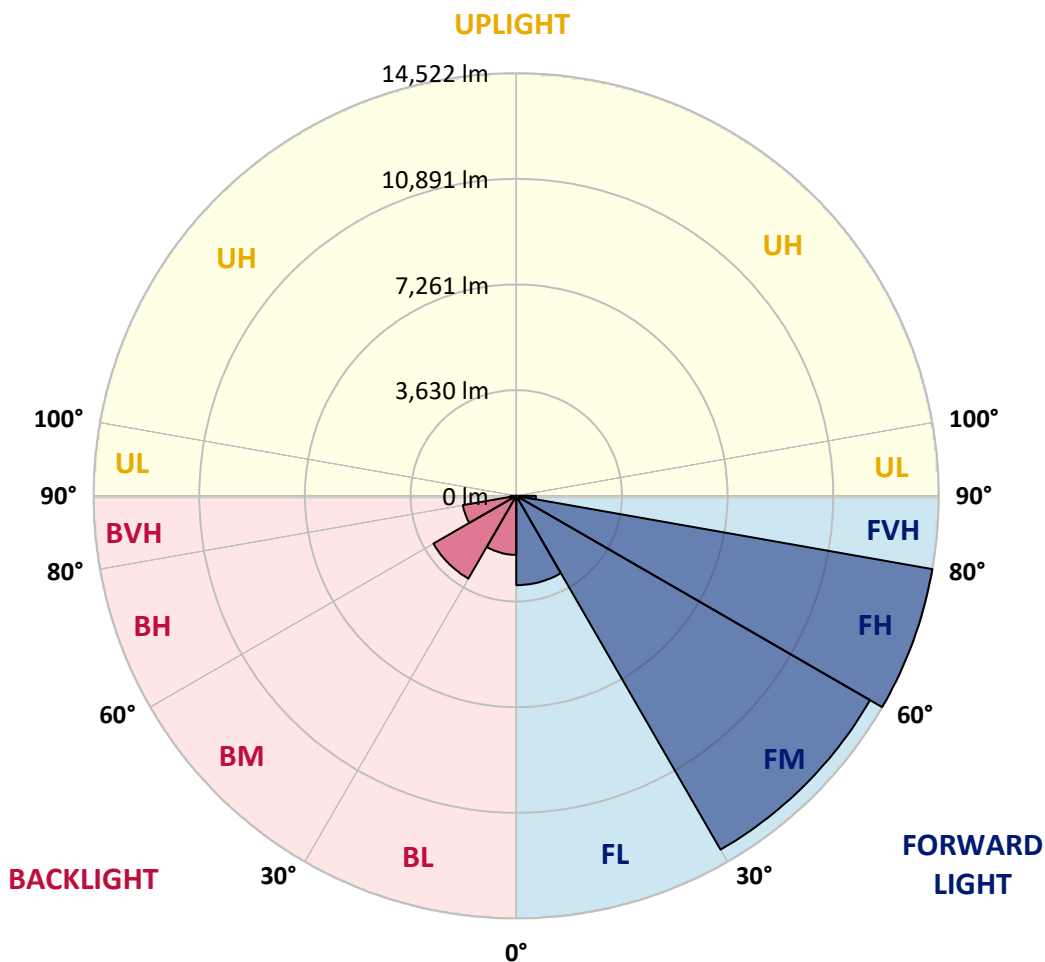


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**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone           | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |         |
|----------------|---------|-----------|-------------------------|------|---------|
|                |         |           | B                       | U    | G       |
| FL (0°-30°)    | 3070.1  | 7.7       |                         |      |         |
| FM (30°-60°)   | 14039.6 | 35.4      |                         |      |         |
| FH (60°-80°)   | 14521.5 | 36.6      |                         |      | G5      |
| FVH (80°-90°)  | 673.6   | 1.7       |                         |      | G4/750  |
| BL (0°-30°)    | 2029.2  | 5.1       | B3/2500                 |      |         |
| BM (30°-60°)   | 3285.8  | 8.3       | B3/5000                 |      |         |
| BH (60°-80°)   | 1862.6  | 4.7       | B3/2500                 |      | G3/2500 |
| BVH (80°-90°)  | 197.6   | 0.5       |                         |      | G2/225  |
| UL (90°-100°)  | 0.0     | 0.0       |                         | U0/0 |         |
| UH (100°-180°) | 0.0     | 0.0       |                         | U0/0 |         |

**BUG Rating: B3-U0-G5**  
 Type IV Medium





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 54°     | 55°     | 65°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 6998.7  | 6998.7  | 6998.7  | 6998.7  | 6998.7  | 6998.7  | 6998.7  | 6998.7  | 6998.7  | 6998.7  | 6998.7  |
| 2.5°  | 6770.9  | 6754.8  | 6774.9  | 6803.0  | 6833.8  | 6875.4  | 6899.5  | 6910.2  | 6951.8  | 6967.9  | 7002.7  |
| 5°    | 6457.2  | 6449.2  | 6482.7  | 6531.0  | 6599.3  | 6695.8  | 6773.5  | 6788.3  | 6898.2  | 6975.9  | 7046.9  |
| 7.5°  | 6229.4  | 6229.4  | 6268.3  | 6325.9  | 6402.3  | 6532.3  | 6642.2  | 6662.3  | 6848.6  | 7016.1  | 7147.5  |
| 10°   | 6048.5  | 6055.2  | 6100.7  | 6169.1  | 6258.9  | 6396.9  | 6543.0  | 6565.8  | 6835.2  | 7109.9  | 7319.0  |
| 12.5° | 5927.9  | 5943.9  | 5985.5  | 6047.1  | 6158.4  | 6325.9  | 6510.9  | 6541.7  | 6863.3  | 7244.0  | 7525.4  |
| 15°   | 6004.2  | 6031.0  | 6035.1  | 6060.5  | 6122.2  | 6304.5  | 6529.6  | 6561.8  | 6923.6  | 7380.7  | 7760.0  |
| 17.5° | 6339.3  | 6348.7  | 6307.1  | 6253.5  | 6224.0  | 6340.6  | 6585.9  | 6619.4  | 6996.0  | 7516.0  | 7985.1  |
| 20°   | 6848.6  | 6843.2  | 6753.4  | 6608.7  | 6458.6  | 6477.3  | 6678.4  | 6713.2  | 7093.9  | 7635.3  | 8210.3  |
| 22.5° | 7491.9  | 7473.1  | 7335.1  | 7068.4  | 6812.4  | 6705.2  | 6840.6  | 6870.0  | 7241.3  | 7805.5  | 8451.5  |
| 25°   | 8271.9  | 8230.4  | 8048.1  | 7690.3  | 7313.7  | 7037.6  | 7084.5  | 7112.6  | 7455.7  | 7995.8  | 8672.6  |
| 27.5° | 9094.8  | 9053.3  | 8821.4  | 8388.5  | 7887.3  | 7457.1  | 7420.9  | 7445.0  | 7699.6  | 8136.6  | 8836.2  |
| 30°   | 9955.3  | 9911.0  | 9699.3  | 9214.1  | 8495.7  | 7891.3  | 7734.5  | 7743.9  | 7871.2  | 8212.9  | 8970.2  |
| 32.5° | 10819.7 | 10778.2 | 10540.9 | 9978.0  | 9156.5  | 8357.7  | 7961.0  | 7948.9  | 7974.4  | 8292.0  | 9121.6  |
| 35°   | 11696.2 | 11712.3 | 11434.9 | 10811.7 | 9888.2  | 8876.4  | 8229.0  | 8203.6  | 8147.3  | 8454.2  | 9336.1  |
| 37.5° | 12634.4 | 12623.7 | 12264.5 | 11613.1 | 10653.5 | 9439.3  | 8613.7  | 8609.7  | 8415.3  | 8761.1  | 9672.5  |
| 40°   | 13261.6 | 13268.3 | 13049.9 | 12433.3 | 11426.8 | 10062.5 | 9106.9  | 9097.5  | 8842.9  | 9220.8  | 10113.4 |
| 42.5° | 13506.9 | 13551.1 | 13607.4 | 13216.0 | 12236.3 | 10784.9 | 9695.2  | 9681.8  | 9439.3  | 9880.2  | 10632.1 |
| 45°   | 13524.3 | 13612.7 | 13961.2 | 13911.6 | 13056.6 | 11611.8 | 10447.1 | 10409.6 | 10235.4 | 10756.7 | 11251.3 |
| 47.5° | 13374.2 | 13465.3 | 14044.3 | 14325.8 | 13789.7 | 12484.3 | 11326.3 | 11296.8 | 11146.7 | 11853.0 | 11921.4 |
| 50°   | 13045.8 | 13132.9 | 13872.8 | 14528.1 | 14392.8 | 13323.3 | 12339.5 | 12261.8 | 12181.4 | 13119.5 | 12688.0 |
| 52.5° | 12430.7 | 12598.2 | 13643.6 | 14576.4 | 14753.3 | 14068.4 | 13405.0 | 13354.1 | 13398.3 | 14455.8 | 13455.9 |
| 55°   | 10973.8 | 11161.5 | 13052.5 | 14536.2 | 15020.0 | 14694.3 | 14470.5 | 14467.8 | 14697.0 | 15857.6 | 14280.2 |
| 57.5° | 10157.6 | 10290.3 | 11849.0 | 14467.8 | 15336.3 | 15316.2 | 15525.3 | 15550.7 | 15997.0 | 17384.2 | 15143.3 |
| 60°   | 9696.6  | 9836.0  | 11239.2 | 14214.5 | 15826.8 | 16120.3 | 16601.5 | 16652.4 | 17318.5 | 19074.2 | 16182.0 |
| 62.5° | 9277.1  | 9429.9  | 10861.3 | 13698.5 | 16404.5 | 17270.2 | 17890.8 | 17936.3 | 18717.7 | 20811.1 | 17185.8 |
| 65°   | 8560.1  | 8733.0  | 10307.7 | 13359.4 | 16929.8 | 18770.0 | 19529.9 | 19560.7 | 20324.6 | 22631.2 | 17953.8 |
| 67.5° | 7546.9  | 7705.0  | 9263.7  | 12610.3 | 17318.5 | 20591.3 | 21709.1 | 21726.5 | 21918.2 | 23916.5 | 18346.5 |
| 70°   | 6363.4  | 6423.7  | 7776.0  | 11063.6 | 16858.8 | 22294.8 | 24097.4 | 24101.4 | 23371.0 | 24739.4 | 18282.1 |
| 72.5° | 4471.0  | 4613.1  | 5645.1  | 8375.1  | 14487.9 | 22087.0 | 25337.1 | 25382.7 | 24046.5 | 24323.9 | 16821.3 |
| 75°   | 2742.1  | 2892.2  | 3540.9  | 5075.5  | 9191.3  | 17370.8 | 23409.9 | 23726.1 | 22779.9 | 21687.7 | 13741.4 |
| 77.5° | 1833.4  | 1889.7  | 2310.6  | 2959.2  | 4164.1  | 9994.1  | 17998.0 | 18593.1 | 18924.1 | 15816.1 | 8787.9  |
| 80°   | 1022.6  | 1129.8  | 1531.9  | 1838.8  | 1852.2  | 3971.1  | 10791.6 | 10930.9 | 10528.9 | 6297.8  | 2711.3  |
| 82.5° | 541.5   | 600.4   | 1022.6  | 1080.2  | 1010.5  | 1329.5  | 4022.0  | 4026.1  | 3364.0  | 1688.7  | 805.5   |
| 85°   | 419.5   | 469.1   | 700.9   | 659.4   | 516.0   | 589.7   | 1326.8  | 1399.2  | 1144.6  | 691.6   | 262.7   |
| 87.5° | 209.1   | 260.0   | 475.8   | 418.2   | 202.4   | 168.9   | 474.4   | 506.6   | 451.7   | 270.7   | 95.2    |
| 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: P317700  
 CATALOG NUMBER: GLEON-SA6D-727-U-T3R

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 6998.7  | 6998.7 | 6998.7 | 6998.7 | 6998.7 | 6998.7 | 6998.7 | 6998.7 | 6998.7 | 6998.7 | 6998.7 |
| 2.5°  | 7016.1  | 7028.2 | 7042.9 | 7026.8 | 7021.5 | 7000.0 | 6963.9 | 6955.8 | 6937.0 | 6938.4 | 6949.1 |
| 5°    | 7077.8  | 7097.9 | 7089.8 | 7028.2 | 6954.5 | 6851.3 | 6744.1 | 6652.9 | 6592.6 | 6588.6 | 6584.6 |
| 7.5°  | 7195.7  | 7209.1 | 7146.1 | 6970.6 | 6764.2 | 6525.6 | 6300.4 | 6103.4 | 5984.1 | 5954.7 | 5948.0 |
| 10°   | 7380.7  | 7378.0 | 7205.1 | 6851.3 | 6439.8 | 6013.6 | 5651.8 | 5378.4 | 5218.9 | 5172.0 | 5159.9 |
| 12.5° | 7587.1  | 7556.2 | 7225.2 | 6634.2 | 5981.5 | 5390.4 | 4932.1 | 4627.8 | 4461.6 | 4408.0 | 4394.6 |
| 15°   | 7800.2  | 7723.8 | 7175.6 | 6309.8 | 5418.6 | 4719.0 | 4237.8 | 3956.4 | 3866.6 | 3837.1 | 3831.7 |
| 17.5° | 7998.5  | 7851.1 | 7033.5 | 5870.2 | 4776.6 | 4050.2 | 3674.9 | 3562.3 | 3583.8 | 3622.7 | 3624.0 |
| 20°   | 8192.8  | 7936.9 | 6805.7 | 5315.4 | 4099.8 | 3499.3 | 3372.0 | 3455.1 | 3557.0 | 3636.1 | 3646.8 |
| 22.5° | 8384.5  | 7997.2 | 6512.2 | 4674.7 | 3494.0 | 3189.8 | 3279.6 | 3431.0 | 3547.6 | 3633.4 | 3648.1 |
| 25°   | 8545.3  | 8011.9 | 6107.4 | 3991.2 | 3073.2 | 3073.2 | 3235.3 | 3378.7 | 3494.0 | 3578.4 | 3593.2 |
| 27.5° | 8604.3  | 7912.7 | 5536.5 | 3358.6 | 2861.4 | 3019.5 | 3173.7 | 3293.0 | 3390.8 | 3480.6 | 3496.7 |
| 30°   | 8627.1  | 7729.1 | 4877.1 | 2850.7 | 2774.3 | 2961.9 | 3090.6 | 3192.4 | 3284.9 | 3369.3 | 3384.1 |
| 32.5° | 8631.1  | 7508.0 | 4177.5 | 2562.5 | 2714.0 | 2901.6 | 2987.4 | 3077.2 | 3176.4 | 3209.9 | 3215.2 |
| 35°   | 8656.6  | 7246.6 | 3440.4 | 2415.1 | 2657.7 | 2845.3 | 2913.7 | 2978.0 | 2817.2 | 2829.2 | 2840.0 |
| 37.5° | 8730.3  | 6988.0 | 2823.9 | 2332.0 | 2621.5 | 2815.8 | 2897.6 | 2664.4 | 2538.4 | 2508.9 | 2504.9 |
| 40°   | 8868.3  | 6711.9 | 2366.9 | 2265.0 | 2608.1 | 2830.6 | 2794.4 | 2487.5 | 2270.4 | 2108.2 | 2084.1 |
| 42.5° | 9060.0  | 6414.4 | 2074.7 | 2220.8 | 2617.5 | 2901.6 | 2651.0 | 2317.3 | 1956.7 | 1852.2 | 1838.8 |
| 45°   | 9275.8  | 6102.1 | 1916.5 | 2189.9 | 2649.6 | 2956.6 | 2621.5 | 2090.8 | 1810.7 | 1731.6 | 1724.9 |
| 47.5° | 9484.8  | 5720.1 | 1834.8 | 2176.5 | 2693.9 | 2912.3 | 2496.9 | 2021.1 | 1741.0 | 1699.4 | 1703.4 |
| 50°   | 9724.7  | 5375.7 | 1785.2 | 2161.8 | 2732.7 | 2884.2 | 2356.1 | 1984.9 | 1714.2 | 1765.1 | 1818.7 |
| 52.5° | 9927.1  | 5019.2 | 1741.0 | 2132.3 | 2747.5 | 2834.6 | 2319.9 | 1991.6 | 1714.2 | 1812.0 | 1862.9 |
| 55°   | 10167.0 | 4749.8 | 1690.0 | 2070.7 | 2719.3 | 2693.9 | 2294.5 | 2031.8 | 1734.3 | 1672.6 | 1678.0 |
| 57.5° | 10476.6 | 4661.3 | 1633.7 | 1974.2 | 2625.5 | 2488.8 | 2282.4 | 2070.7 | 1722.2 | 1683.3 | 1696.7 |
| 60°   | 10905.5 | 4755.1 | 1611.0 | 1848.2 | 2479.4 | 2328.0 | 2283.8 | 2050.6 | 1637.8 | 1570.8 | 1572.1 |
| 62.5° | 11314.2 | 4859.7 | 1609.6 | 1769.1 | 2299.8 | 2184.6 | 2252.9 | 1984.9 | 1594.9 | 1556.0 | 1570.8 |
| 65°   | 11448.3 | 4753.8 | 1545.3 | 1680.7 | 2097.5 | 2013.0 | 2196.6 | 1915.2 | 1562.7 | 1503.7 | 1501.1 |
| 67.5° | 11268.7 | 4425.5 | 1415.3 | 1537.2 | 1865.6 | 1813.3 | 2122.9 | 1832.1 | 1511.8 | 1463.5 | 1455.5 |
| 70°   | 10735.3 | 3692.3 | 1254.5 | 1348.3 | 1601.6 | 1588.2 | 2006.3 | 1735.6 | 1443.4 | 1401.9 | 1367.0 |
| 72.5° | 9299.9  | 2630.9 | 1057.4 | 1121.8 | 1304.0 | 1346.9 | 1845.5 | 1609.6 | 1346.9 | 1257.1 | 1203.5 |
| 75°   | 7638.0  | 1947.4 | 868.5  | 881.9  | 990.4  | 1107.0 | 1624.4 | 1462.2 | 1233.0 | 1080.2 | 1038.7 |
| 77.5° | 4677.4  | 1191.5 | 691.6  | 696.9  | 710.3  | 883.2  | 1337.6 | 1297.3 | 1088.3 | 900.6  | 871.2  |
| 80°   | 1514.5  | 650.0  | 499.9  | 525.4  | 485.2  | 647.3  | 1034.7 | 1104.4 | 934.1  | 753.2  | 721.0  |
| 82.5° | 576.3   | 379.3  | 337.7  | 355.2  | 336.4  | 434.2  | 754.6  | 884.6  | 765.3  | 619.2  | 503.9  |
| 85°   | 278.8   | 214.4  | 199.7  | 223.8  | 207.7  | 222.5  | 482.5  | 651.4  | 580.3  | 403.4  | 375.3  |
| 87.5° | 99.2    | 95.2   | 76.4   | 103.2  | 88.5   | 79.1   | 147.4  | 328.4  | 383.3  | 277.4  | 247.9  |
| 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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LM-79-2008: Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Report Prepared for

Cooper Lighting Solutions

McGRAW-EDISON

Report Number: SP1-1908-441-1-R4

Test Date: 08/20/2019

Luminaire Tested: SA1C-727-U-5WQ

**Test Information**

Test Method: LM-79-2008  
 Report Number: SP1-1908-441-1-R4  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry: 4π  
 Issue Date: 10/28/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: McGRAW-EDISON  
 Catalog Number: **SA1C-727-U-5WQ**  
 Description: McGRAW EDISON ROADWAY AND AREA LUMINAIRE

\*\*\*THIS IS A REVISION OF SP1-1908-441-1-R3. TO UPDATE THE CATALOG NUMBER.\*\*\*TESTED IN SITU. (1) 70 CRI, 2700K, 1050MA LIGHTSQUARE WITH 16 LEDS AND TYPE V WIDE OPTICS.

**Spectral Parameters**

CCT (K): 2741  
 CIE u': 0.2605  
 CIE v': 0.5272  
 Duv: 0.0005  
 CIE x: 0.4573  
 CIE y: 0.4113  
 CIE z: 0.1313  
 Peak Wavelength (nm): 602  
 Dominant Wavelength (nm): 583  
 Purity: 61.2  
 Rf: 69.9  
 Rg: 98.3

|           |      |      |       |
|-----------|------|------|-------|
| CRI (Ra): | 71.5 |      |       |
| R1:       | 69.2 | R9:  | -16.1 |
| R2:       | 79.4 | R10: | 51.4  |
| R3:       | 87.8 | R11: | 63.1  |
| R4:       | 69.4 | R12: | 42.0  |
| R5:       | 66.4 | R13: | 70.2  |
| R6:       | 69.8 | R14: | 92.4  |
| R7:       | 79.8 |      |       |
| R8:       | 50.1 |      |       |



**Test Conditions**

Stabilization Time: 56M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.3./42%  
 Sphere Temperature (°C): 25.7

REPORT NUMBER: SP1-1908-441-1-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 2700K 4-step quadrangle

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**Photopic Flux vs. Wavelength**

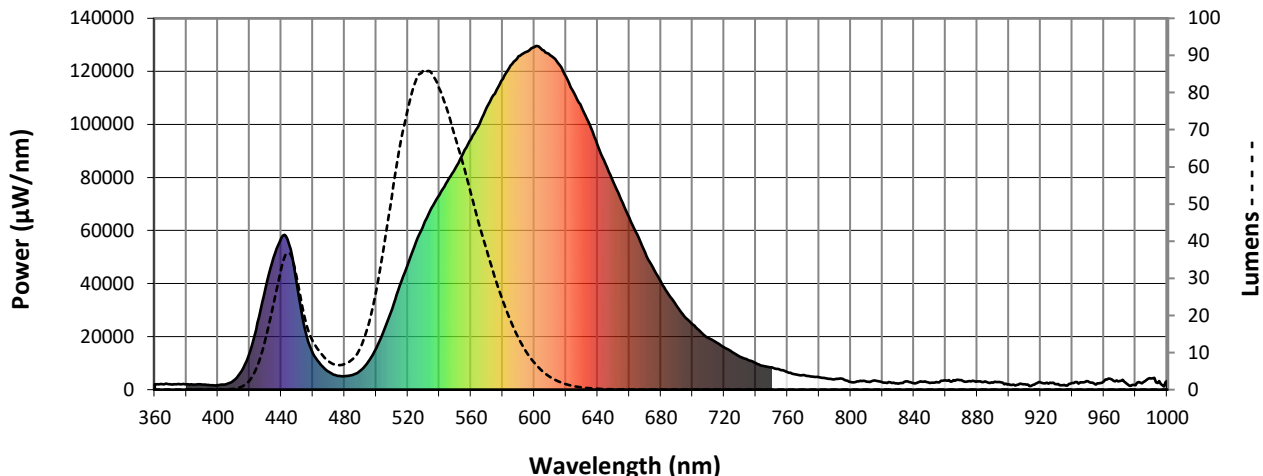


**Photopic Lumens: 6211.7**

| $\lambda$ (nm) | Power ( $\mu\text{W}/\text{nm}$ ) | Lumens ( $\phi/\text{nm}$ ) | $\lambda$ (nm) | Power ( $\mu\text{W}/\text{nm}$ ) | Lumens ( $\phi/\text{nm}$ ) | $\lambda$ (nm) | Power ( $\mu\text{W}/\text{nm}$ ) | Lumens ( $\phi/\text{nm}$ ) | $\lambda$ (nm) | Power ( $\mu\text{W}/\text{nm}$ ) | Lumens ( $\phi/\text{nm}$ ) | $\lambda$ (nm) | Power ( $\mu\text{W}/\text{nm}$ ) | Lumens ( $\phi/\text{nm}$ ) |
|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|
| 360            | 2044                              | 0.0                         | 490            | 7179                              | 1.0                         | 620            | 118034                            | 30.7                        | 750            | 8362                              | 0.0                         | 880            | 3128                              | 0.0                         |
| 365            | 2016                              | 0.0                         | 495            | 10476                             | 1.9                         | 625            | 111884                            | 24.7                        | 755            | 7635                              | 0.0                         | 885            | 3110                              | 0.0                         |
| 370            | 2020                              | 0.0                         | 500            | 15549                             | 3.4                         | 630            | 106119                            | 19.2                        | 760            | 6582                              | 0.0                         | 890            | 2632                              | 0.0                         |
| 375            | 2137                              | 0.0                         | 505            | 22477                             | 6.3                         | 635            | 99706                             | 15.0                        | 765            | 5777                              | 0.0                         | 895            | 2709                              | 0.0                         |
| 380            | 2046                              | 0.0                         | 510            | 30417                             | 10.4                        | 640            | 92142                             | 11.0                        | 770            | 5474                              | 0.0                         | 900            | 2016                              | 0.0                         |
| 385            | 1925                              | 0.0                         | 515            | 39274                             | 16.3                        | 645            | 84987                             | 8.2                         | 775            | 4977                              | 0.0                         | 905            | 1748                              | 0.0                         |
| 390            | 1893                              | 0.0                         | 520            | 47282                             | 22.9                        | 650            | 78016                             | 5.7                         | 780            | 4723                              | 0.0                         | 910            | 2046                              | 0.0                         |
| 395            | 1695                              | 0.0                         | 525            | 55413                             | 29.7                        | 655            | 71541                             | 4.1                         | 785            | 4219                              | 0.0                         | 915            | 1844                              | 0.0                         |
| 400            | 1633                              | 0.0                         | 530            | 62377                             | 36.7                        | 660            | 64863                             | 2.7                         | 790            | 3969                              | 0.0                         | 920            | 2734                              | 0.0                         |
| 405            | 2065                              | 0.0                         | 535            | 68520                             | 42.5                        | 665            | 58485                             | 1.9                         | 795            | 4122                              | 0.0                         | 925            | 2307                              | 0.0                         |
| 410            | 3449                              | 0.0                         | 540            | 73435                             | 47.8                        | 670            | 51641                             | 1.1                         | 800            | 2864                              | 0.0                         | 930            | 2039                              | 0.0                         |
| 415            | 7117                              | 0.0                         | 545            | 78677                             | 52.4                        | 675            | 46030                             | 0.8                         | 805            | 3151                              | 0.0                         | 935            | 1784                              | 0.0                         |
| 420            | 13992                             | 0.0                         | 550            | 83331                             | 56.6                        | 680            | 40590                             | 0.5                         | 810            | 3022                              | 0.0                         | 940            | 2464                              | 0.0                         |
| 425            | 25176                             | 0.1                         | 555            | 89120                             | 60.9                        | 685            | 35691                             | 0.3                         | 815            | 3471                              | 0.0                         | 945            | 2794                              | 0.0                         |
| 430            | 38151                             | 0.3                         | 560            | 94613                             | 64.3                        | 690            | 31631                             | 0.2                         | 820            | 2749                              | 0.0                         | 950            | 3090                              | 0.0                         |
| 435            | 49673                             | 0.6                         | 565            | 99818                             | 66.4                        | 695            | 27437                             | 0.1                         | 825            | 2729                              | 0.0                         | 955            | 1866                              | 0.0                         |
| 440            | 57273                             | 0.9                         | 570            | 106526                            | 69.3                        | 700            | 24589                             | 0.1                         | 830            | 2282                              | 0.0                         | 960            | 3110                              | 0.0                         |
| 445            | 54802                             | 1.1                         | 575            | 111610                            | 69.4                        | 705            | 21832                             | 0.0                         | 835            | 3140                              | 0.0                         | 965            | 3880                              | 0.0                         |
| 450            | 39184                             | 1.0                         | 580            | 117163                            | 69.6                        | 710            | 19500                             | 0.0                         | 840            | 2365                              | 0.0                         | 970            | 3243                              | 0.0                         |
| 455            | 22506                             | 0.8                         | 585            | 122201                            | 67.9                        | 715            | 17870                             | 0.0                         | 845            | 3024                              | 0.0                         | 975            | 2014                              | 0.0                         |
| 460            | 13692                             | 0.6                         | 590            | 125662                            | 65.0                        | 720            | 15924                             | 0.0                         | 850            | 2510                              | 0.0                         | 980            | 1688                              | 0.0                         |
| 465            | 9446                              | 0.5                         | 595            | 127415                            | 60.4                        | 725            | 14268                             | 0.0                         | 855            | 2739                              | 0.0                         | 985            | 2827                              | 0.0                         |
| 470            | 6698                              | 0.4                         | 600            | 129155                            | 55.7                        | 730            | 12438                             | 0.0                         | 860            | 3515                              | 0.0                         | 990            | 4172                              | 0.0                         |
| 475            | 5328                              | 0.4                         | 605            | 128057                            | 49.6                        | 735            | 11255                             | 0.0                         | 865            | 3600                              | 0.0                         | 995            | 3177                              | 0.0                         |
| 480            | 5081                              | 0.5                         | 610            | 126031                            | 43.3                        | 740            | 9951                              | 0.0                         | 870            | 3609                              | 0.0                         | 1000           | 3241                              | 0.0                         |
| 485            | 5579                              | 0.7                         | 615            | 123059                            | 37.1                        | 745            | 8870                              | 0.0                         | 875            | 3208                              | 0.0                         |                |                                   |                             |

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Scotopic Flux vs. Wavelength



Scotopic Lumens: 6474.3 S/P: 1.04

| λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) |
|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|
| 360    | 2044          | 0.0           | 490    | 7179          | 6.0           | 620    | 118034        | 0.1           | 750    | 8362          | 0.0           | 880    | 3128          | 0.0           |
| 365    | 2016          | 0.0           | 495    | 10476         | 8.6           | 625    | 111884        | 0.1           | 755    | 7635          | 0.0           | 885    | 3110          | 0.0           |
| 370    | 2020          | 0.0           | 500    | 15549         | 12.5          | 630    | 106119        | 0.0           | 760    | 6582          | 0.0           | 890    | 2632          | 0.0           |
| 375    | 2137          | 0.0           | 505    | 22477         | 17.3          | 635    | 99706         | 0.0           | 765    | 5777          | 0.0           | 895    | 2709          | 0.0           |
| 380    | 2046          | 0.0           | 510    | 30417         | 21.8          | 640    | 92142         | 0.0           | 770    | 5474          | 0.0           | 900    | 2016          | 0.0           |
| 385    | 1925          | 0.0           | 515    | 39274         | 25.7          | 645    | 84987         | 0.0           | 775    | 4977          | 0.0           | 905    | 1748          | 0.0           |
| 390    | 1893          | 0.0           | 520    | 47282         | 27.5          | 650    | 78016         | 0.0           | 780    | 4723          | 0.0           | 910    | 2046          | 0.0           |
| 395    | 1695          | 0.0           | 525    | 55413         | 28.1          | 655    | 71541         | 0.0           | 785    | 4219          | 0.0           | 915    | 1844          | 0.0           |
| 400    | 1633          | 0.0           | 530    | 62377         | 27.0          | 660    | 64863         | 0.0           | 790    | 3969          | 0.0           | 920    | 2734          | 0.0           |
| 405    | 2065          | 0.0           | 535    | 68520         | 24.7          | 665    | 58485         | 0.0           | 795    | 4122          | 0.0           | 925    | 2307          | 0.0           |
| 410    | 3449          | 0.1           | 540    | 73435         | 21.5          | 670    | 51641         | 0.0           | 800    | 2864          | 0.0           | 930    | 2039          | 0.0           |
| 415    | 7117          | 0.5           | 545    | 78677         | 18.3          | 675    | 46030         | 0.0           | 805    | 3151          | 0.0           | 935    | 1784          | 0.0           |
| 420    | 13992         | 1.6           | 550    | 83331         | 15.0          | 680    | 40590         | 0.0           | 810    | 3022          | 0.0           | 940    | 2464          | 0.0           |
| 425    | 25176         | 3.9           | 555    | 89120         | 12.0          | 685    | 35691         | 0.0           | 815    | 3471          | 0.0           | 945    | 2794          | 0.0           |
| 430    | 38151         | 8.1           | 560    | 94613         | 9.3           | 690    | 31631         | 0.0           | 820    | 2749          | 0.0           | 950    | 3090          | 0.0           |
| 435    | 49673         | 13.3          | 565    | 99818         | 7.0           | 695    | 27437         | 0.0           | 825    | 2729          | 0.0           | 955    | 1866          | 0.0           |
| 440    | 57273         | 19.1          | 570    | 106526        | 5.2           | 700    | 24589         | 0.0           | 830    | 2282          | 0.0           | 960    | 3110          | 0.0           |
| 445    | 54802         | 21.6          | 575    | 111610        | 3.7           | 705    | 21832         | 0.0           | 835    | 3140          | 0.0           | 965    | 3880          | 0.0           |
| 450    | 39184         | 18.1          | 580    | 117163        | 2.6           | 710    | 19500         | 0.0           | 840    | 2365          | 0.0           | 970    | 3243          | 0.0           |
| 455    | 22506         | 11.8          | 585    | 122201        | 1.8           | 715    | 17870         | 0.0           | 845    | 3024          | 0.0           | 975    | 2014          | 0.0           |
| 460    | 13692         | 8.1           | 590    | 125662        | 1.2           | 720    | 15924         | 0.0           | 850    | 2510          | 0.0           | 980    | 1688          | 0.0           |
| 465    | 9446          | 6.2           | 595    | 127415        | 0.8           | 725    | 14268         | 0.0           | 855    | 2739          | 0.0           | 985    | 2827          | 0.0           |
| 470    | 6698          | 4.8           | 600    | 129155        | 0.5           | 730    | 12438         | 0.0           | 860    | 3515          | 0.0           | 990    | 4172          | 0.0           |
| 475    | 5328          | 4.1           | 605    | 128057        | 0.4           | 735    | 11255         | 0.0           | 865    | 3600          | 0.0           | 995    | 3177          | 0.0           |
| 480    | 5081          | 4.1           | 610    | 126031        | 0.2           | 740    | 9951          | 0.0           | 870    | 3609          | 0.0           | 1000   | 3241          | 0.0           |
| 485    | 5579          | 4.6           | 615    | 123059        | 0.1           | 745    | 8870          | 0.0           | 875    | 3208          | 0.0           |        |               |               |

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**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 2145.7 M/P: 0.35**

| $\lambda$ (nm) | Power ( $\mu\text{W}/\text{nm}$ ) | Lumens ( $\phi/\text{nm}$ ) | $\lambda$ (nm) | Power ( $\mu\text{W}/\text{nm}$ ) | Lumens ( $\phi/\text{nm}$ ) | $\lambda$ (nm) | Power ( $\mu\text{W}/\text{nm}$ ) | Lumens ( $\phi/\text{nm}$ ) | $\lambda$ (nm) | Power ( $\mu\text{W}/\text{nm}$ ) | Lumens ( $\phi/\text{nm}$ ) | $\lambda$ (nm) | Power ( $\mu\text{W}/\text{nm}$ ) | Lumens ( $\phi/\text{nm}$ ) |
|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|
| 360            | 2044                              | 0.0                         | 490            | 7179                              | 11.1                        | 620            | 118034                            | 1.5                         | 750            | 8362                              | 0.0                         | 880            | 3128                              | 0.0                         |
| 365            | 2016                              | 0.0                         | 495            | 10476                             | 16.9                        | 625            | 111884                            | 0.9                         | 755            | 7635                              | 0.0                         | 885            | 3110                              | 0.0                         |
| 370            | 2020                              | 0.0                         | 500            | 15549                             | 26.0                        | 630            | 106119                            | 0.6                         | 760            | 6582                              | 0.0                         | 890            | 2632                              | 0.0                         |
| 375            | 2137                              | 0.0                         | 505            | 22477                             | 38.2                        | 635            | 99706                             | 0.4                         | 765            | 5777                              | 0.0                         | 895            | 2709                              | 0.0                         |
| 380            | 2046                              | 0.0                         | 510            | 30417                             | 51.6                        | 640            | 92142                             | 0.2                         | 770            | 5474                              | 0.0                         | 900            | 2016                              | 0.0                         |
| 385            | 1925                              | 0.0                         | 515            | 39274                             | 65.1                        | 645            | 84987                             | 0.1                         | 775            | 4977                              | 0.0                         | 905            | 1748                              | 0.0                         |
| 390            | 1893                              | 0.0                         | 520            | 47282                             | 75.2                        | 650            | 78016                             | 0.1                         | 780            | 4723                              | 0.0                         | 910            | 2046                              | 0.0                         |
| 395            | 1695                              | 0.0                         | 525            | 55413                             | 82.9                        | 655            | 71541                             | 0.1                         | 785            | 4219                              | 0.0                         | 915            | 1844                              | 0.0                         |
| 400            | 1633                              | 0.0                         | 530            | 62377                             | 86.0                        | 660            | 64863                             | 0.0                         | 790            | 3969                              | 0.0                         | 920            | 2734                              | 0.0                         |
| 405            | 2065                              | 0.1                         | 535            | 68520                             | 85.4                        | 665            | 58485                             | 0.0                         | 795            | 4122                              | 0.0                         | 925            | 2307                              | 0.0                         |
| 410            | 3449                              | 0.2                         | 540            | 73435                             | 81.1                        | 670            | 51641                             | 0.0                         | 800            | 2864                              | 0.0                         | 930            | 2039                              | 0.0                         |
| 415            | 7117                              | 0.7                         | 545            | 78677                             | 75.4                        | 675            | 46030                             | 0.0                         | 805            | 3151                              | 0.0                         | 935            | 1784                              | 0.0                         |
| 420            | 13992                             | 2.3                         | 550            | 83331                             | 68.1                        | 680            | 40590                             | 0.0                         | 810            | 3022                              | 0.0                         | 940            | 2464                              | 0.0                         |
| 425            | 25176                             | 6.2                         | 555            | 89120                             | 60.9                        | 685            | 35691                             | 0.0                         | 815            | 3471                              | 0.0                         | 945            | 2794                              | 0.0                         |
| 430            | 38151                             | 13.0                        | 560            | 94613                             | 52.9                        | 690            | 31631                             | 0.0                         | 820            | 2749                              | 0.0                         | 950            | 3090                              | 0.0                         |
| 435            | 49673                             | 22.2                        | 565            | 99818                             | 44.8                        | 695            | 27437                             | 0.0                         | 825            | 2729                              | 0.0                         | 955            | 1866                              | 0.0                         |
| 440            | 57273                             | 32.0                        | 570            | 106526                            | 37.6                        | 700            | 24589                             | 0.0                         | 830            | 2282                              | 0.0                         | 960            | 3110                              | 0.0                         |
| 445            | 54802                             | 36.7                        | 575            | 111610                            | 30.4                        | 705            | 21832                             | 0.0                         | 835            | 3140                              | 0.0                         | 965            | 3880                              | 0.0                         |
| 450            | 39184                             | 30.4                        | 580            | 117163                            | 24.1                        | 710            | 19500                             | 0.0                         | 840            | 2365                              | 0.0                         | 970            | 3243                              | 0.0                         |
| 455            | 22506                             | 19.7                        | 585            | 122201                            | 18.7                        | 715            | 17870                             | 0.0                         | 845            | 3024                              | 0.0                         | 975            | 2014                              | 0.0                         |
| 460            | 13692                             | 13.2                        | 590            | 125662                            | 14.0                        | 720            | 15924                             | 0.0                         | 850            | 2510                              | 0.0                         | 980            | 1688                              | 0.0                         |
| 465            | 9446                              | 10.0                        | 595            | 127415                            | 10.2                        | 725            | 14268                             | 0.0                         | 855            | 2739                              | 0.0                         | 985            | 2827                              | 0.0                         |
| 470            | 6698                              | 7.7                         | 600            | 129155                            | 7.3                         | 730            | 12438                             | 0.0                         | 860            | 3515                              | 0.0                         | 990            | 4172                              | 0.0                         |
| 475            | 5328                              | 6.7                         | 605            | 128057                            | 5.0                         | 735            | 11255                             | 0.0                         | 865            | 3600                              | 0.0                         | 995            | 3177                              | 0.0                         |
| 480            | 5081                              | 6.9                         | 610            | 126031                            | 3.4                         | 740            | 9951                              | 0.0                         | 870            | 3609                              | 0.0                         | 1000           | 3241                              | 0.0                         |
| 485            | 5579                              | 8.1                         | 615            | 123059                            | 2.3                         | 745            | 8870                              | 0.0                         | 875            | 3208                              | 0.0                         |                |                                   |                             |

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**Summary**

$R_f = 69.9$   
 $R_g = 98.3$   
 CIE  $R_a = 71.5$   
 $R_9 = -16.1$



**Color Vector Graphics**





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

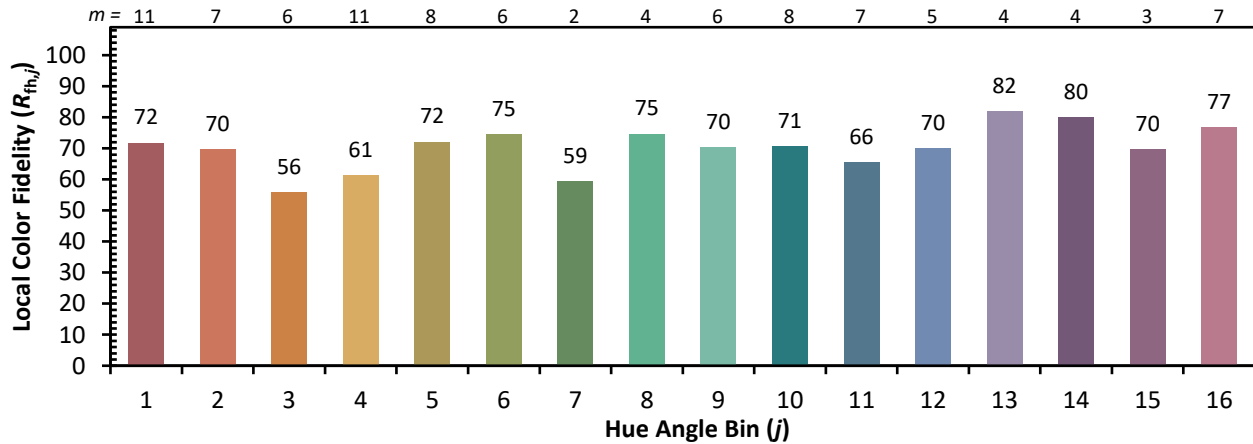
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 54 | CES51 = 77 | CES76 = 48 |
| CES02 = 63 | CES27 = 74 | CES52 = 80 | CES77 = 75 |
| CES03 = 31 | CES28 = 80 | CES53 = 66 | CES78 = 56 |
| CES04 = 71 | CES29 = 44 | CES54 = 77 | CES79 = 81 |
| CES05 = 50 | CES30 = 46 | CES55 = 74 | CES80 = 80 |
| CES06 = 52 | CES31 = 50 | CES56 = 63 | CES81 = 73 |
| CES07 = 42 | CES32 = 49 | CES57 = 60 | CES82 = 91 |
| CES08 = 41 | CES33 = 53 | CES58 = 63 | CES83 = 84 |
| CES09 = 29 | CES34 = 66 | CES59 = 85 | CES84 = 90 |
| CES10 = 77 | CES35 = 82 | CES60 = 89 | CES85 = 87 |
| CES11 = 60 | CES36 = 78 | CES61 = 85 | CES86 = 65 |
| CES12 = 66 | CES37 = 75 | CES62 = 69 | CES87 = 78 |
| CES13 = 43 | CES38 = 53 | CES63 = 68 | CES88 = 73 |
| CES14 = 74 | CES39 = 91 | CES64 = 68 | CES89 = 68 |
| CES15 = 71 | CES40 = 85 | CES65 = 65 | CES90 = 68 |
| CES16 = 48 | CES41 = 76 | CES66 = 62 | CES91 = 91 |
| CES17 = 50 | CES42 = 76 | CES67 = 60 | CES92 = 71 |
| CES18 = 57 | CES43 = 65 | CES68 = 68 | CES93 = 82 |
| CES19 = 73 | CES44 = 98 | CES69 = 77 | CES94 = 57 |
| CES20 = 67 | CES45 = 75 | CES70 = 60 | CES95 = 78 |
| CES21 = 88 | CES46 = 70 | CES71 = 57 | CES96 = 80 |
| CES22 = 80 | CES47 = 63 | CES72 = 86 | CES97 = 79 |
| CES23 = 92 | CES48 = 51 | CES73 = 52 | CES98 = 71 |
| CES24 = 91 | CES49 = 68 | CES74 = 90 | CES99 = 64 |
| CES25 = 73 | CES50 = 77 | CES75 = 58 |            |



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Color Rendition by Hue-Angle Bin



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Measure Comparisons



(END OF REPORT)