

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: P322557

Luminaire Tested: **GLEON-SA3B-740-U-T4FT-HSS**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P322557  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-17)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA3B-740-U-T4FT-HSS  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(3) 70 CRI, 4000K, 800mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE IV  
FORWARD THROW OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 12389 lumens  
Efficiency: N/A  
Efficacy: 99.9 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 1' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B1 - U0 - G3

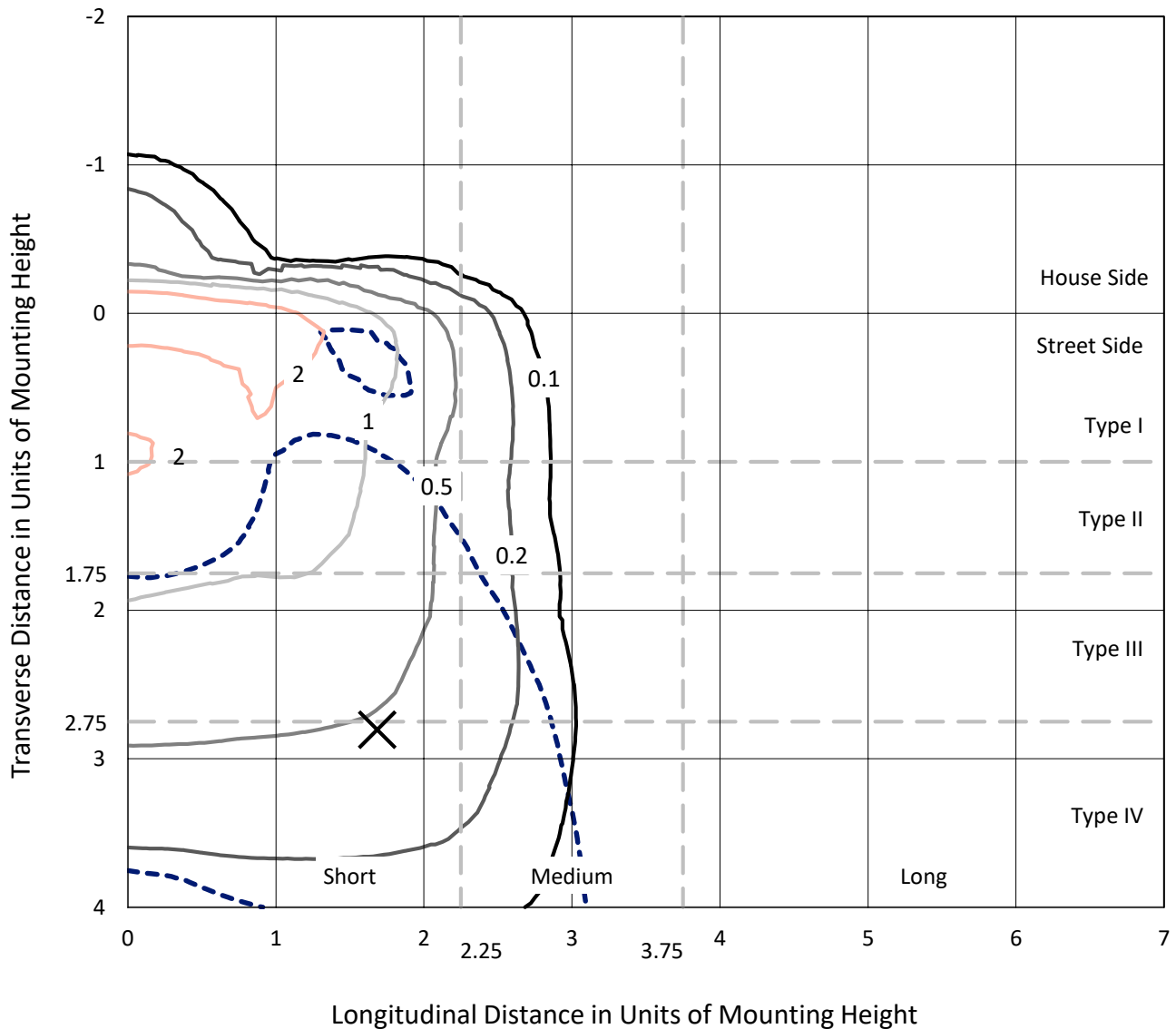
Input Watts (W): 124  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



REPORT NUMBER: P322557  
 CATALOG NUMBER: GLEON-SA3B-740-U-T4FT-HSS

## Iso-Footcandle Lines of Horizontal Illumination

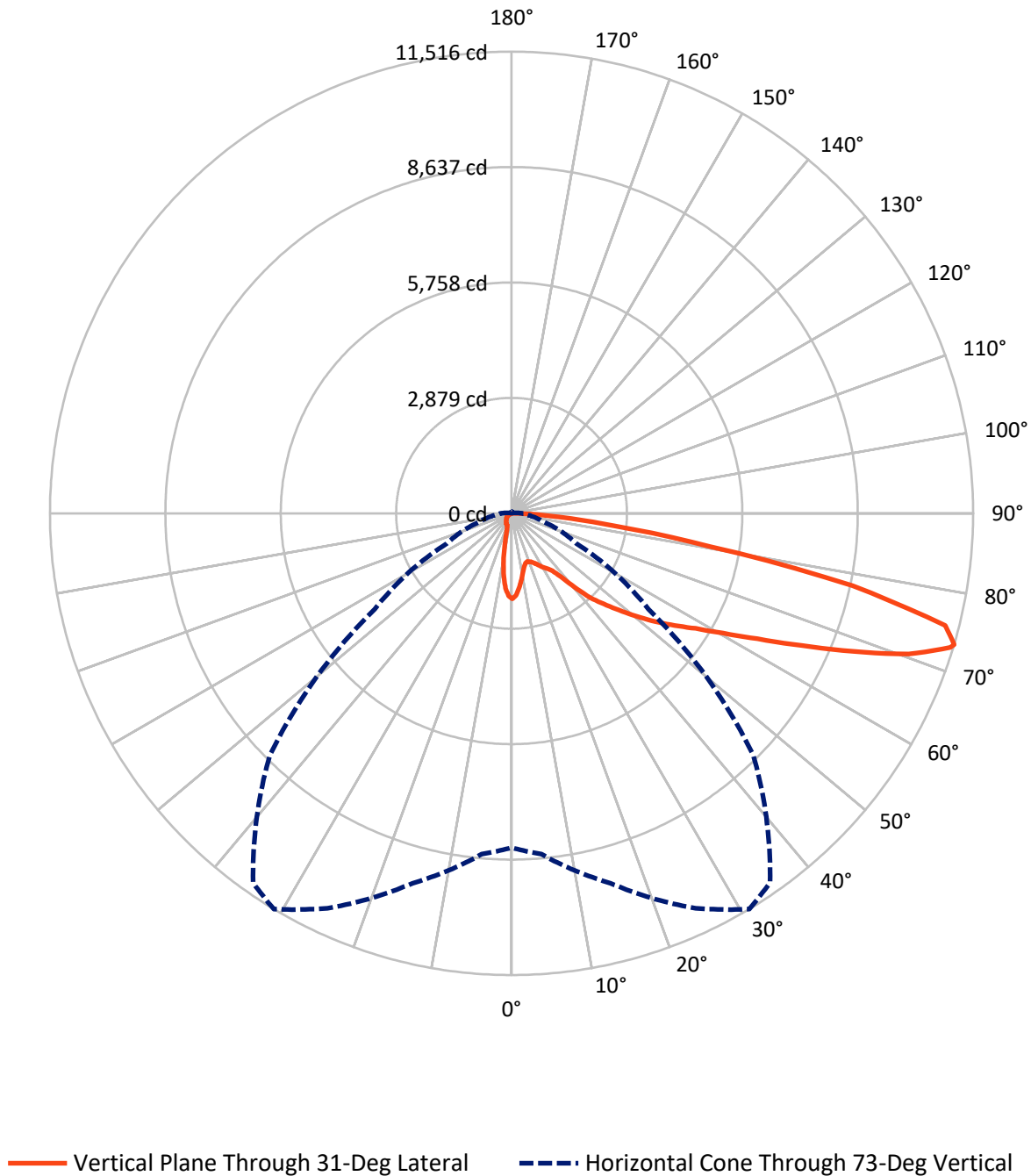
× Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 3.4 fc  
 Type IV - Short - N/A

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## Luminous Intensity Polar Plot



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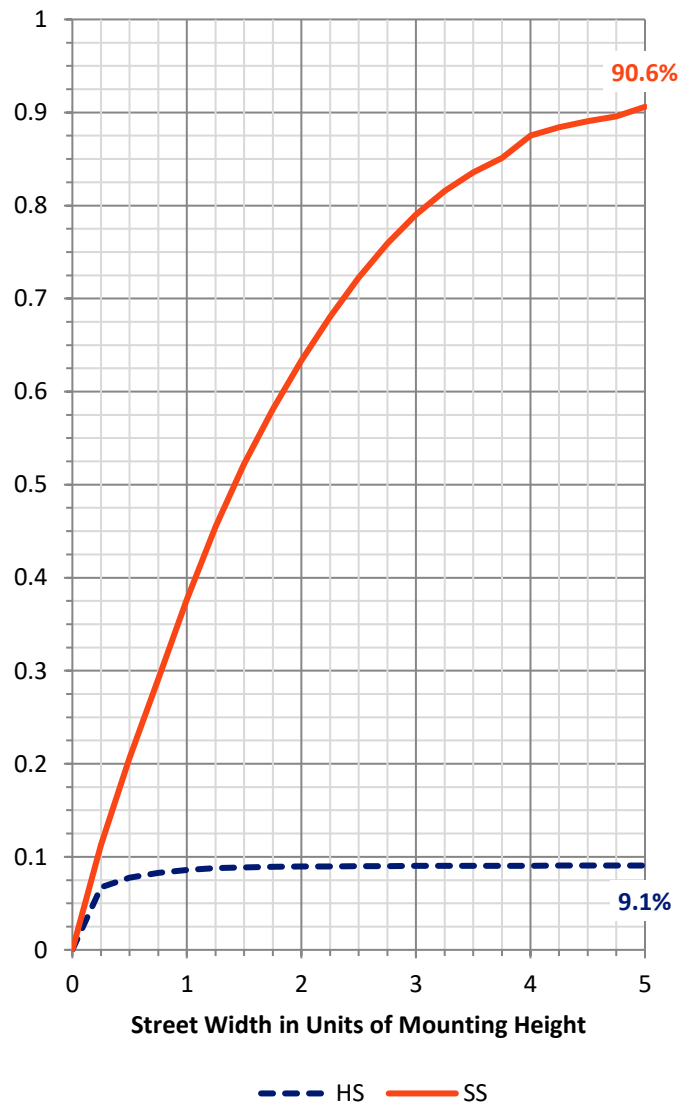
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 1129.3   | 0.0    | 1129.3  |
|                    | % Fixture | 9.1      | 0.0    | 9.1     |
| <b>Street Side</b> | Lumens    | 11259.7  | 0.0    | 11259.7 |
|                    | % Fixture | 90.9     | 0.0    | 90.9    |
| <b>Total</b>       | Lumens    | 12389.0  | 0.0    | 12389.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 176.7   | 1.4       |
| 10°-20°   | 383.7   | 3.1       |
| 20°-30°   | 575.0   | 4.6       |
| 30°-40°   | 914.8   | 7.4       |
| 40°-50°   | 1633.5  | 13.2      |
| 50°-60°   | 2534.7  | 20.5      |
| 60°-70°   | 3369.6  | 27.2      |
| 70°-80°   | 2534.6  | 20.5      |
| 80°-90°   | 266.3   | 2.1       |
| 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°    | 12389.0 | 100.0     |
| 0°-180°   | 12389.0 | 100.0     |

**Coefficient of Utilization**



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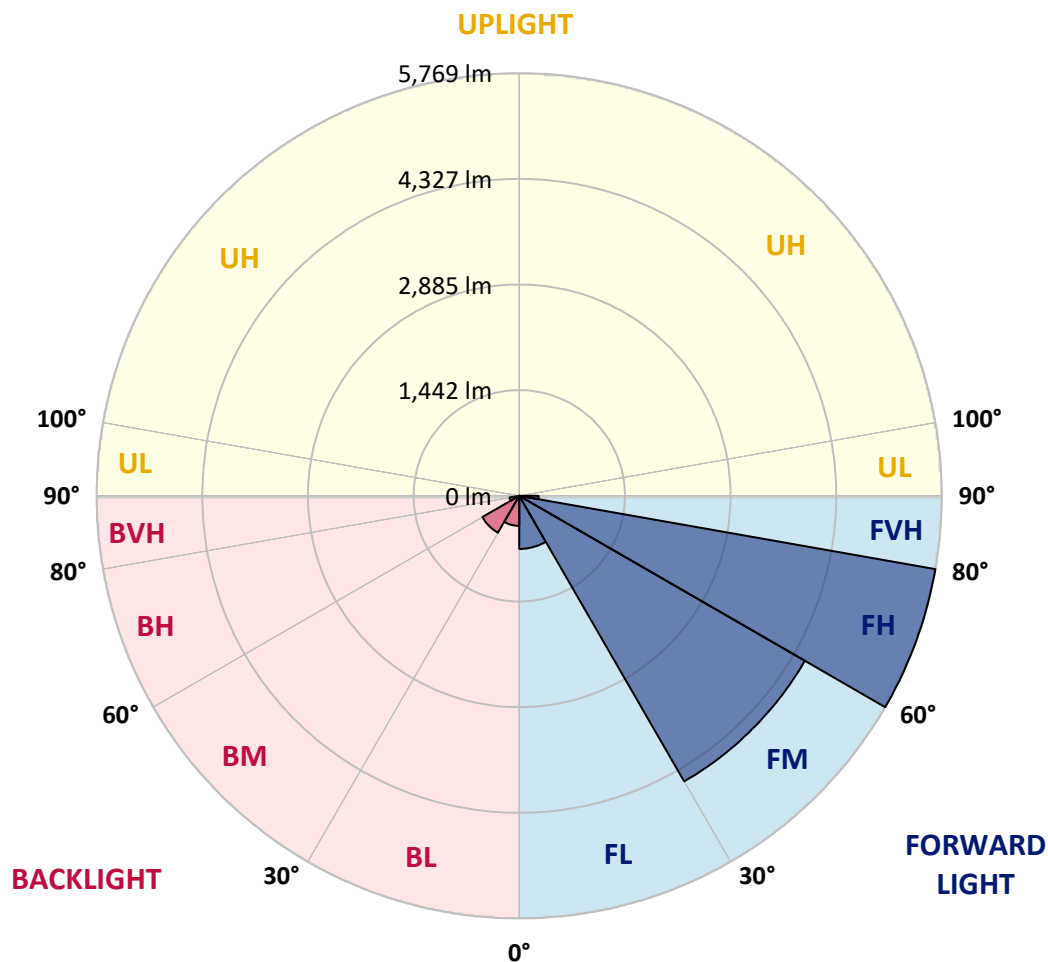
CATALOG NUMBER: GLEON-SA3B-740-U-T4FT-HSS

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 724.8  | 5.9       |                         |      |         |
| FM   | (30°-60°)   | 4501.7 | 36.3      |                         |      |         |
| FH   | (60°-80°)   | 5769.1 | 46.6      |                         |      | G3/7500 |
| FVH  | (80°-90°)   | 264.1  | 2.1       |                         |      | G3/500  |
| BL   | (0°-30°)    | 410.7  | 3.3       | B1/500                  |      |         |
| BM   | (30°-60°)   | 581.3  | 4.7       | B1/1000                 |      |         |
| BH   | (60°-80°)   | 135.1  | 1.1       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 2.2    | 0.0       |                         |      | G0/10   |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B1-U0-G3**

Type IV Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°     | 31°     | 35°     | 45°    | 55°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|---------|---------|---------|--------|--------|--------|--------|--------|
| 0°    | 2131.6 | 2131.6 | 2131.6 | 2131.6  | 2131.6  | 2131.6  | 2131.6 | 2131.6 | 2131.6 | 2131.6 | 2131.6 |
| 2.5°  | 2020.0 | 2028.5 | 2037.6 | 2039.4  | 2054.6  | 2055.2  | 2077.0 | 2093.4 | 2109.7 | 2125.5 | 2130.9 |
| 5°    | 1812.7 | 1826.6 | 1843.0 | 1859.3  | 1891.5  | 1904.2  | 1957.6 | 2012.1 | 2064.3 | 2114.0 | 2138.2 |
| 7.5°  | 1591.4 | 1607.2 | 1630.2 | 1670.8  | 1706.6  | 1731.4  | 1815.7 | 1912.7 | 2009.7 | 2101.2 | 2154.0 |
| 10°   | 1389.5 | 1404.1 | 1428.3 | 1471.4  | 1526.5  | 1560.5  | 1673.8 | 1808.4 | 1950.9 | 2089.7 | 2177.6 |
| 12.5° | 1261.0 | 1268.9 | 1282.2 | 1328.3  | 1378.0  | 1416.2  | 1549.6 | 1716.3 | 1902.4 | 2089.1 | 2215.8 |
| 15°   | 1237.3 | 1239.8 | 1228.9 | 1249.5  | 1288.3  | 1325.2  | 1460.4 | 1641.7 | 1865.4 | 2098.8 | 2265.5 |
| 17.5° | 1274.9 | 1273.7 | 1237.3 | 1234.9  | 1265.8  | 1296.1  | 1416.8 | 1590.2 | 1839.3 | 2121.2 | 2329.8 |
| 20°   | 1331.9 | 1327.7 | 1264.6 | 1253.1  | 1285.8  | 1314.3  | 1413.8 | 1570.8 | 1829.6 | 2158.8 | 2408.0 |
| 22.5° | 1407.7 | 1400.4 | 1301.6 | 1289.5  | 1324.6  | 1354.3  | 1451.3 | 1589.6 | 1838.1 | 2209.2 | 2498.9 |
| 25°   | 1501.7 | 1490.8 | 1365.3 | 1351.9  | 1387.7  | 1417.4  | 1518.6 | 1643.5 | 1863.6 | 2270.4 | 2614.1 |
| 27.5° | 1607.8 | 1592.0 | 1467.1 | 1432.6  | 1473.2  | 1504.1  | 1608.4 | 1726.0 | 1903.6 | 2335.3 | 2755.4 |
| 30°   | 1707.8 | 1687.2 | 1574.4 | 1517.4  | 1567.1  | 1601.7  | 1705.4 | 1824.2 | 1967.9 | 2435.3 | 2948.8 |
| 32.5° | 1808.4 | 1785.4 | 1670.2 | 1602.3  | 1647.2  | 1684.8  | 1805.4 | 1959.4 | 2088.5 | 2588.1 | 3205.8 |
| 35°   | 2040.0 | 2015.8 | 1874.5 | 1762.4  | 1761.7  | 1783.0  | 1945.4 | 2144.3 | 2248.0 | 2800.8 | 3512.6 |
| 37.5° | 2429.8 | 2415.9 | 2281.3 | 2068.5  | 2011.5  | 1987.9  | 2136.4 | 2365.0 | 2477.1 | 3093.7 | 3858.7 |
| 40°   | 2856.6 | 2844.5 | 2693.5 | 2500.8  | 2414.1  | 2355.9  | 2410.4 | 2672.3 | 2800.8 | 3451.3 | 4212.2 |
| 42.5° | 3338.6 | 3281.0 | 3011.8 | 2954.2  | 2876.6  | 2832.4  | 2783.3 | 3051.2 | 3198.5 | 3840.6 | 4562.6 |
| 45°   | 3776.3 | 3679.3 | 3330.1 | 3242.8  | 3225.2  | 3236.1  | 3263.4 | 3560.5 | 3645.9 | 4303.1 | 4911.8 |
| 47.5° | 4037.0 | 3960.6 | 3692.6 | 3609.0  | 3604.1  | 3676.3  | 3882.4 | 4135.8 | 4091.5 | 4706.3 | 5219.2 |
| 50°   | 4284.9 | 4215.8 | 3993.3 | 4013.9  | 4036.4  | 4134.6  | 4585.0 | 4727.5 | 4498.3 | 5071.8 | 5501.1 |
| 52.5° | 4485.6 | 4380.1 | 4263.7 | 4379.5  | 4489.8  | 4648.1  | 5310.1 | 5258.6 | 4786.9 | 5362.8 | 5742.3 |
| 55°   | 4601.4 | 4553.5 | 4609.9 | 4726.3  | 4933.6  | 5190.7  | 5994.5 | 5700.5 | 4997.9 | 5628.4 | 5903.0 |
| 57.5° | 5025.8 | 4931.8 | 5043.9 | 5144.6  | 5415.0  | 5774.5  | 6580.8 | 6029.7 | 5150.0 | 5792.7 | 5940.0 |
| 60°   | 5539.2 | 5463.5 | 5529.5 | 5696.9  | 6061.8  | 6484.4  | 7128.8 | 6298.3 | 5229.5 | 5898.1 | 5844.2 |
| 62.5° | 6356.5 | 6256.4 | 6215.2 | 6402.5  | 6886.3  | 7347.7  | 7544.7 | 6484.4 | 5211.9 | 5851.5 | 5515.6 |
| 65°   | 7451.3 | 7347.7 | 7163.4 | 7333.1  | 7948.5  | 8274.0  | 8009.7 | 6523.8 | 5090.6 | 5473.8 | 4685.1 |
| 67.5° | 8572.9 | 8497.7 | 8340.1 | 8626.2  | 9181.6  | 9286.4  | 8501.4 | 6428.0 | 4700.2 | 4438.3 | 3310.1 |
| 70°   | 9313.7 | 9281.6 | 9384.0 | 10017.0 | 10512.3 | 10482.0 | 8952.4 | 5913.3 | 3663.5 | 2729.3 | 1637.5 |
| 72.5° | 8779.6 | 8933.6 | 9690.2 | 10837.8 | 11442.8 | 11195.5 | 8720.8 | 4540.8 | 2094.0 | 1050.0 | 473.5  |
| 73°   | 8337.1 | 8534.1 | 9552.6 | 10868.7 | 11516.2 | 11245.2 | 8526.2 | 4167.9 | 1784.8 | 828.7  | 358.9  |
| 75°   | 5799.9 | 6041.8 | 7908.4 | 10122.5 | 11173.1 | 10714.1 | 7107.0 | 2551.1 | 826.9  | 367.4  | 144.9  |
| 77.5° | 2816.0 | 2994.8 | 4354.6 | 7313.7  | 8689.3  | 8371.0  | 4424.4 | 950.6  | 373.4  | 229.8  | 66.7   |
| 80°   | 1051.2 | 1168.8 | 1890.3 | 3722.3  | 5021.5  | 5153.1  | 1946.0 | 359.5  | 248.6  | 184.9  | 33.9   |
| 82.5° | 275.2  | 306.8  | 697.2  | 1659.9  | 2573.5  | 2693.5  | 613.5  | 181.3  | 181.9  | 152.2  | 20.6   |
| 85°   | 87.9   | 100.6  | 217.6  | 745.1   | 1212.5  | 1064.6  | 160.0  | 87.9   | 132.2  | 113.4  | 11.5   |
| 87.5° | 10.9   | 13.9   | 69.1   | 175.2   | 267.4   | 148.5   | 24.9   | 26.1   | 56.4   | 63.0   | 6.7    |
| 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-SA3B-740-U-T4FT-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 2131.6 | 2131.6 | 2131.6 | 2131.6 | 2131.6 | 2131.6 | 2131.6 | 2131.6 | 2131.6 | 2131.6 | 2131.6 |
| 2.5°  | 2136.4 | 2133.4 | 2134.0 | 2118.2 | 2107.9 | 2087.3 | 2066.1 | 2056.4 | 2046.1 | 2041.8 | 2046.1 |
| 5°    | 2147.3 | 2141.9 | 2126.1 | 2077.6 | 2026.1 | 1959.4 | 1896.9 | 1849.6 | 1790.2 | 1773.9 | 1790.8 |
| 7.5°  | 2164.3 | 2153.4 | 2107.3 | 2008.5 | 1893.9 | 1766.6 | 1623.5 | 1519.2 | 1433.8 | 1378.6 | 1398.6 |
| 10°   | 2189.1 | 2168.5 | 2075.8 | 1907.8 | 1702.9 | 1477.4 | 1274.3 | 1116.1 | 1003.9 | 957.9  | 956.0  |
| 12.5° | 2231.0 | 2192.2 | 2037.0 | 1776.9 | 1469.5 | 1168.8 | 902.7  | 731.1  | 640.2  | 581.4  | 580.2  |
| 15°   | 2277.1 | 2220.1 | 1987.9 | 1619.9 | 1197.9 | 837.2  | 581.4  | 451.0  | 392.2  | 373.4  | 371.0  |
| 17.5° | 2333.4 | 2252.2 | 1924.2 | 1426.5 | 913.6  | 554.7  | 379.5  | 341.9  | 339.5  | 337.7  | 337.7  |
| 20°   | 2404.4 | 2290.4 | 1842.4 | 1205.2 | 648.1  | 370.4  | 322.5  | 324.9  | 326.2  | 323.7  | 324.3  |
| 22.5° | 2486.8 | 2329.2 | 1744.8 | 967.6  | 438.3  | 309.8  | 308.6  | 311.6  | 312.8  | 311.6  | 312.2  |
| 25°   | 2582.6 | 2374.1 | 1625.9 | 718.4  | 316.5  | 294.0  | 297.1  | 301.3  | 304.3  | 304.3  | 304.3  |
| 27.5° | 2701.4 | 2428.6 | 1482.9 | 501.4  | 273.4  | 277.7  | 286.1  | 294.0  | 298.3  | 299.5  | 299.5  |
| 30°   | 2856.0 | 2496.5 | 1311.3 | 343.7  | 248.6  | 255.8  | 271.6  | 286.8  | 294.6  | 295.8  | 296.5  |
| 32.5° | 3051.2 | 2572.9 | 1112.5 | 254.0  | 227.3  | 232.8  | 249.8  | 275.2  | 290.4  | 292.8  | 292.8  |
| 35°   | 3274.9 | 2661.4 | 898.5  | 221.3  | 212.2  | 214.0  | 227.3  | 256.4  | 283.1  | 289.8  | 290.4  |
| 37.5° | 3519.9 | 2748.7 | 683.2  | 206.7  | 199.5  | 199.5  | 209.2  | 234.0  | 265.5  | 286.1  | 288.6  |
| 40°   | 3748.4 | 2801.5 | 478.9  | 195.2  | 187.9  | 187.9  | 196.4  | 214.6  | 244.3  | 275.2  | 281.9  |
| 42.5° | 3959.4 | 2819.6 | 333.4  | 184.3  | 177.0  | 178.8  | 186.1  | 200.7  | 223.1  | 254.0  | 260.1  |
| 45°   | 4176.4 | 2816.6 | 243.1  | 171.6  | 166.1  | 171.6  | 177.0  | 187.9  | 204.3  | 221.9  | 223.1  |
| 47.5° | 4340.1 | 2791.1 | 192.8  | 159.4  | 155.8  | 163.1  | 167.9  | 175.2  | 184.3  | 183.1  | 183.1  |
| 50°   | 4493.5 | 2729.3 | 155.2  | 143.1  | 145.5  | 154.0  | 156.4  | 158.8  | 159.4  | 147.9  | 146.7  |
| 52.5° | 4609.9 | 2632.9 | 124.3  | 125.5  | 135.2  | 143.7  | 141.3  | 137.6  | 131.6  | 117.6  | 115.2  |
| 55°   | 4648.7 | 2447.4 | 97.6   | 103.7  | 120.0  | 130.9  | 121.9  | 114.0  | 102.5  | 90.9   | 88.5   |
| 57.5° | 4578.4 | 2207.9 | 79.4   | 80.6   | 101.2  | 110.3  | 100.0  | 90.9   | 78.2   | 68.5   | 66.7   |
| 60°   | 4429.2 | 1941.8 | 65.5   | 60.6   | 78.2   | 86.1   | 79.4   | 70.3   | 58.8   | 51.5   | 50.9   |
| 62.5° | 4133.4 | 1658.1 | 54.0   | 47.3   | 59.4   | 66.1   | 61.8   | 55.2   | 45.5   | 40.6   | 40.0   |
| 65°   | 3511.4 | 1326.5 | 43.6   | 38.2   | 46.1   | 51.5   | 47.9   | 43.0   | 35.8   | 32.1   | 31.5   |
| 67.5° | 2451.0 | 896.6  | 35.8   | 31.5   | 36.4   | 40.6   | 37.6   | 35.2   | 28.5   | 27.9   | 28.5   |
| 70°   | 1182.2 | 432.3  | 29.7   | 25.5   | 28.5   | 31.5   | 30.3   | 28.5   | 27.3   | 31.5   | 36.4   |
| 72.5° | 338.9  | 144.9  | 23.6   | 21.2   | 23.0   | 24.9   | 26.1   | 25.5   | 29.7   | 38.2   | 44.3   |
| 73°   | 260.7  | 117.0  | 22.4   | 20.0   | 21.8   | 24.2   | 25.5   | 24.9   | 30.3   | 38.8   | 44.3   |
| 75°   | 111.5  | 56.4   | 17.0   | 16.4   | 18.2   | 21.2   | 22.4   | 22.4   | 30.3   | 39.4   | 42.4   |
| 77.5° | 50.3   | 30.3   | 10.9   | 12.7   | 15.8   | 17.0   | 18.8   | 18.8   | 24.2   | 30.3   | 30.3   |
| 80°   | 28.5   | 16.4   | 8.5    | 9.7    | 11.5   | 11.5   | 11.5   | 10.3   | 10.9   | 12.1   | 13.3   |
| 82.5° | 18.2   | 10.9   | 6.7    | 7.9    | 7.3    | 6.1    | 4.8    | 4.8    | 4.2    | 4.8    | 6.1    |
| 85°   | 10.3   | 6.1    | 6.1    | 4.8    | 3.0    | 2.4    | 3.0    | 2.4    | 0.6    | 0.0    | 0.6    |
| 87.5° | 6.1    | 3.6    | 1.8    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |



LM-79-08: Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Report Prepared for

Cooper Lighting Solutions

MCGRAW, INVUE, LUMARK AND STREETWORKS

DATA VALID FOR LUMINAIRES UTILIZING SA LIGHT ENGINES

Report Number: SP1-2101-121-2

Luminaire Tested: IFLD-S-SA2A-740-U-T3R-HSS

Test Date: 03/05/2021

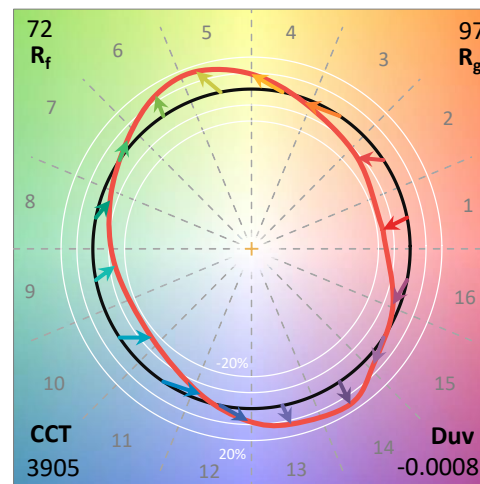
### Test Information

Test Method: LM-79-08  
 Report Number: SP1-2101-121-2  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1  
 Measurement Geometry:  $4\pi$   
 Issue Date: 03/05/2021  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: STREETWORKS  
 Catalog Number: **IFLD-S-SA2A-740-U-T3R-HSS**  
 Description: STREETWORKS INF FLOOD

SHIELD, DRIVER PROGRAMMED @ 615mA.

### Spectral Parameters

|                           |         |           |      |      |       |
|---------------------------|---------|-----------|------|------|-------|
| CCT (K):                  | 3905    | CRI (Ra): | 71.2 |      |       |
| CIE u':                   | 0.2273  | R1:       | 68.9 | R9:  | -29.7 |
| CIE v':                   | 0.5024  | R2:       | 77.0 | R10: | 46.2  |
| Duv:                      | -0.0008 | R3:       | 84.0 | R11: | 68.8  |
| CIE x:                    | 0.3841  | R4:       | 71.6 | R12: | 45.6  |
| CIE y:                    | 0.3774  | R5:       | 68.9 | R13: | 69.5  |
| CIE z:                    | 0.2385  | R6:       | 68.3 | R14: | 90.7  |
| Peak Wavelength (nm):     | 443     | R7:       | 78.7 |      |       |
| Dominant Wavelength (nm): | 579     | R8:       | 52.2 |      |       |
| Purity:                   | 28.7    |           |      |      |       |
| Rf:                       | 71.7    |           |      |      |       |
| Rg:                       | 96.9    |           |      |      |       |



### Test Conditions

Stabilization Time: 211M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.8/312%  
 Sphere Temperature (°C): 24.1

REPORT NUMBER: SP1-2101-121-2

| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 1/31/2021        | 7/31/2021            |
| Power Meter                    | IN0071                | 12/1/2020        | 12/1/2021            |
| AC Power Source                | IN0063                | 12/1/2020        | 12/1/2021            |
| DC Power Source                | IN0208                | 12/1/2020        | 12/1/2021            |
| Sphere Thermometer             | IN0085                | 12/1/2020        | 12/1/2021            |
| Room Thermometer               | IN0046                | 12/1/2020        | 12/1/2021            |

REPORT NUMBER: SP1-2101-121-2

**CIE 1931 Chromaticity Diagram**



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

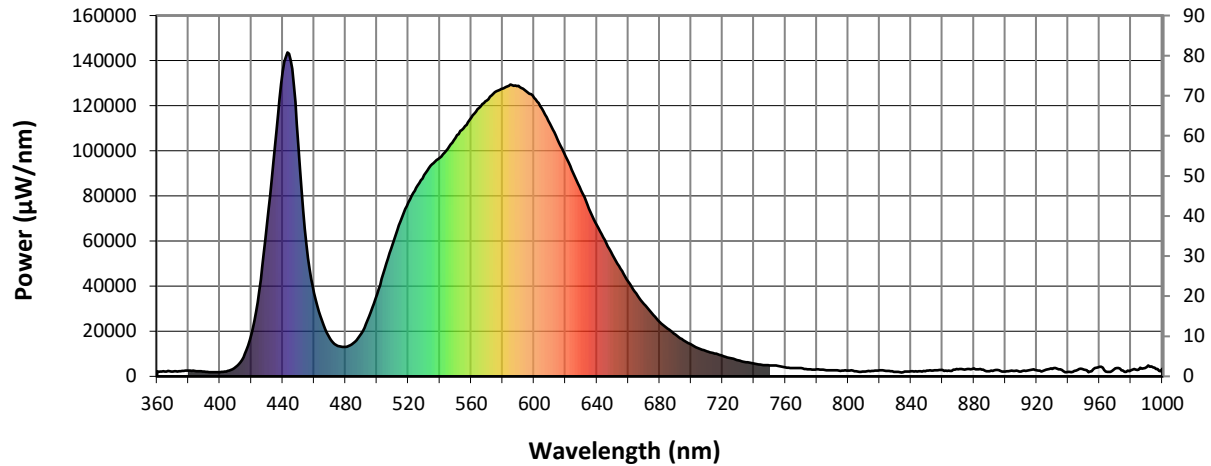


CCT = 3905K  
 CIE  $x$  = 0.3841  
 CIE  $y$  = 0.3774  
 Duv = -0.0008

Point lies inside the ANSI 4000K 4-step quadrangle

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### Photopic Flux vs. Wavelength

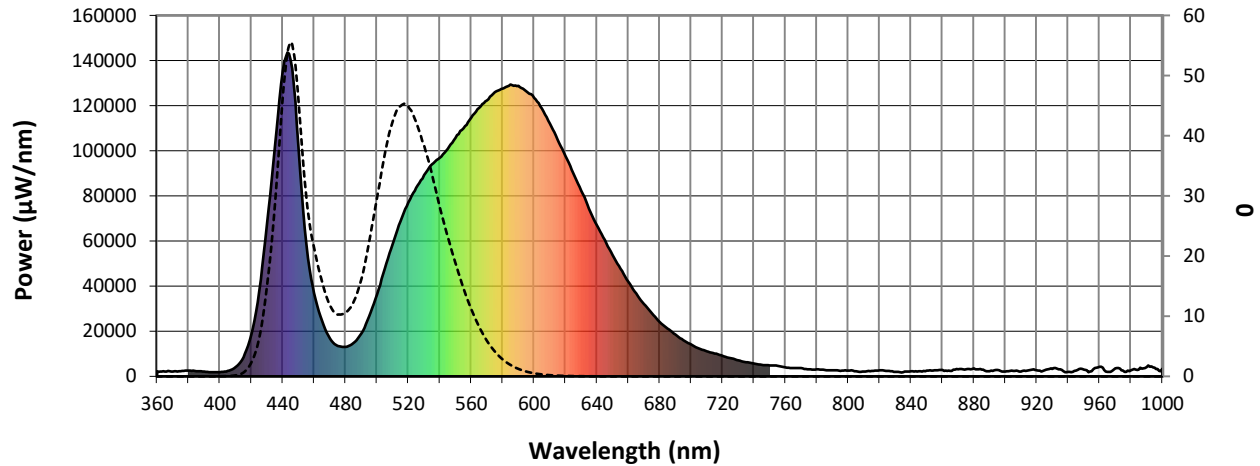


#####

| 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       | 2304             | 0.0              | 490       | 19043            | 2.7              | 620       | 97577            | 25.4             | 750       | 4830             | 0.0              | 880       | 3505             | 0.0              |
| 365       | 2150             | 0.0              | 495       | 26606            | 4.8              | 625       | 90158            | 19.9             | 755       | 4664             | 0.0              | 885       | 2991             | 0.0              |
| 370       | 2146             | 0.0              | 500       | 36376            | 8.0              | 630       | 82240            | 14.9             | 760       | 4006             | 0.0              | 890       | 2327             | 0.0              |
| 375       | 2332             | 0.0              | 505       | 47714            | 13.3             | 635       | 74361            | 11.2             | 765       | 3715             | 0.0              | 895       | 2775             | 0.0              |
| 380       | 2527             | 0.0              | 510       | 58741            | 20.2             | 640       | 66994            | 8.0              | 770       | 3696             | 0.0              | 900       | 2141             | 0.0              |
| 385       | 2304             | 0.0              | 515       | 68716            | 28.5             | 645       | 60405            | 5.8              | 775       | 3117             | 0.0              | 905       | 2421             | 0.0              |
| 390       | 2064             | 0.0              | 520       | 77136            | 37.4             | 650       | 53806            | 3.9              | 780       | 3062             | 0.0              | 910       | 2200             | 0.0              |
| 395       | 1856             | 0.0              | 525       | 83567            | 44.9             | 655       | 47610            | 2.7              | 785       | 2907             | 0.0              | 915       | 2716             | 0.0              |
| 400       | 1856             | 0.0              | 530       | 89283            | 52.6             | 660       | 42018            | 1.8              | 790       | 2655             | 0.0              | 920       | 2656             | 0.0              |
| 405       | 2374             | 0.0              | 535       | 94097            | 58.4             | 665       | 36742            | 1.2              | 795       | 2467             | 0.0              | 925       | 2671             | 0.0              |
| 410       | 4084             | 0.0              | 540       | 96845            | 63.1             | 670       | 32105            | 0.7              | 800       | 2609             | 0.0              | 930       | 3292             | 0.0              |
| 415       | 8543             | 0.0              | 545       | 100829           | 67.1             | 675       | 27946            | 0.5              | 805       | 2293             | 0.0              | 935       | 3188             | 0.0              |
| 420       | 18394            | 0.1              | 550       | 105648           | 71.8             | 680       | 24146            | 0.3              | 810       | 2188             | 0.0              | 940       | 1997             | 0.0              |
| 425       | 37987            | 0.2              | 555       | 110017           | 75.1             | 685       | 21191            | 0.2              | 815       | 2386             | 0.0              | 945       | 2623             | 0.0              |
| 430       | 67605            | 0.5              | 560       | 114586           | 77.9             | 690       | 18544            | 0.1              | 820       | 2712             | 0.0              | 950       | 2969             | 0.0              |
| 435       | 102160           | 1.2              | 565       | 118987           | 79.1             | 695       | 16058            | 0.1              | 825       | 2473             | 0.0              | 955       | 2277             | 0.0              |
| 440       | 135103           | 2.1              | 570       | 122326           | 79.5             | 700       | 14133            | 0.0              | 830       | 1969             | 0.0              | 960       | 4267             | 0.0              |
| 445       | 140126           | 2.9              | 575       | 125968           | 78.4             | 705       | 12309            | 0.0              | 835       | 1917             | 0.0              | 965       | 2034             | 0.0              |
| 450       | 102339           | 2.7              | 580       | 127613           | 75.8             | 710       | 11142            | 0.0              | 840       | 2248             | 0.0              | 970       | 3586             | 0.0              |
| 455       | 58751            | 2.0              | 585       | 129466           | 71.9             | 715       | 10143            | 0.0              | 845       | 2266             | 0.0              | 975       | 2505             | 0.0              |
| 460       | 36892            | 1.5              | 590       | 128813           | 66.6             | 720       | 9072             | 0.0              | 850       | 2558             | 0.0              | 980       | 2666             | 0.0              |
| 465       | 24637            | 1.3              | 595       | 126387           | 59.9             | 725       | 8130             | 0.0              | 855       | 2767             | 0.0              | 985       | 2934             | 0.0              |
| 470       | 16738            | 1.0              | 600       | 123477           | 53.2             | 730       | 7149             | 0.0              | 860       | 2826             | 0.0              | 990       | 4120             | 0.0              |
| 475       | 13456            | 1.1              | 605       | 118718           | 46.0             | 735       | 6311             | 0.0              | 865       | 2385             | 0.0              | 995       | 3858             | 0.0              |
| 480       | 13081            | 1.2              | 610       | 112091           | 38.5             | 740       | 5711             | 0.0              | 870       | 3194             | 0.0              | 1000      | 3405             | 0.0              |
| 485       | 14734            | 1.7              | 615       | 105039           | 31.7             | 745       | 5111             | 0.0              | 875       | 3189             | 0.0              |           |                  |                  |

REPORT NUMBER: SP1-2101-121-2

### Scotopic Flux vs. Wavelength



Scotopic Lumens: 10425.8

S/P: 1.47

| 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       | 2304             | 0.0              | 490       | 19043            | 29.3             | 620       | 97577            | 1.2              | 750       | 4830             | 0.0              | 880       | 3505             | 0.0              |
| 365       | 2150             | 0.0              | 495       | 26606            | 43.0             | 625       | 90158            | 0.8              | 755       | 4664             | 0.0              | 885       | 2991             | 0.0              |
| 370       | 2146             | 0.0              | 500       | 36376            | 60.8             | 630       | 82240            | 0.5              | 760       | 4006             | 0.0              | 890       | 2327             | 0.0              |
| 375       | 2332             | 0.0              | 505       | 47714            | 81.1             | 635       | 74361            | 0.3              | 765       | 3715             | 0.0              | 895       | 2775             | 0.0              |
| 380       | 2527             | 0.0              | 510       | 58741            | 99.6             | 640       | 66994            | 0.2              | 770       | 3696             | 0.0              | 900       | 2141             | 0.0              |
| 385       | 2304             | 0.0              | 515       | 68716            | 113.9            | 645       | 60405            | 0.1              | 775       | 3117             | 0.0              | 905       | 2421             | 0.0              |
| 390       | 2064             | 0.0              | 520       | 77136            | 122.6            | 650       | 53806            | 0.1              | 780       | 3062             | 0.0              | 910       | 2200             | 0.0              |
| 395       | 1856             | 0.0              | 525       | 83567            | 125.0            | 655       | 47610            | 0.0              | 785       | 2907             | 0.0              | 915       | 2716             | 0.0              |
| 400       | 1856             | 0.0              | 530       | 89283            | 123.1            | 660       | 42018            | 0.0              | 790       | 2655             | 0.0              | 920       | 2656             | 0.0              |
| 405       | 2374             | 0.1              | 535       | 94097            | 117.3            | 665       | 36742            | 0.0              | 795       | 2467             | 0.0              | 925       | 2671             | 0.0              |
| 410       | 4084             | 0.2              | 540       | 96845            | 107.0            | 670       | 32105            | 0.0              | 800       | 2609             | 0.0              | 930       | 3292             | 0.0              |
| 415       | 8543             | 0.9              | 545       | 100829           | 96.7             | 675       | 27946            | 0.0              | 805       | 2293             | 0.0              | 935       | 3188             | 0.0              |
| 420       | 18394            | 3.0              | 550       | 105648           | 86.4             | 680       | 24146            | 0.0              | 810       | 2188             | 0.0              | 940       | 1997             | 0.0              |
| 425       | 37987            | 9.3              | 555       | 110017           | 75.2             | 685       | 21191            | 0.0              | 815       | 2386             | 0.0              | 945       | 2623             | 0.0              |
| 430       | 67605            | 23.0             | 560       | 114586           | 64.0             | 690       | 18544            | 0.0              | 820       | 2712             | 0.0              | 950       | 2969             | 0.0              |
| 435       | 102160           | 45.7             | 565       | 118987           | 53.4             | 695       | 16058            | 0.0              | 825       | 2473             | 0.0              | 955       | 2277             | 0.0              |
| 440       | 135103           | 75.5             | 570       | 122326           | 43.2             | 700       | 14133            | 0.0              | 830       | 1969             | 0.0              | 960       | 4267             | 0.0              |
| 445       | 140126           | 93.8             | 575       | 125968           | 34.3             | 705       | 12309            | 0.0              | 835       | 1917             | 0.0              | 965       | 2034             | 0.0              |
| 450       | 102339           | 79.3             | 580       | 127613           | 26.3             | 710       | 11142            | 0.0              | 840       | 2248             | 0.0              | 970       | 3586             | 0.0              |
| 455       | 58751            | 51.3             | 585       | 129466           | 19.8             | 715       | 10143            | 0.0              | 845       | 2266             | 0.0              | 975       | 2505             | 0.0              |
| 460       | 36892            | 35.6             | 590       | 128813           | 14.3             | 720       | 9072             | 0.0              | 850       | 2558             | 0.0              | 980       | 2666             | 0.0              |
| 465       | 24637            | 26.0             | 595       | 126387           | 10.1             | 725       | 8130             | 0.0              | 855       | 2767             | 0.0              | 985       | 2934             | 0.0              |
| 470       | 16738            | 19.3             | 600       | 123477           | 7.0              | 730       | 7149             | 0.0              | 860       | 2826             | 0.0              | 990       | 4120             | 0.0              |
| 475       | 13456            | 16.8             | 605       | 118718           | 4.7              | 735       | 6311             | 0.0              | 865       | 2385             | 0.0              | 995       | 3858             | 0.0              |
| 480       | 13081            | 17.7             | 610       | 112091           | 3.0              | 740       | 5711             | 0.0              | 870       | 3194             | 0.0              | 1000      | 3405             | 0.0              |
| 485       | 14734            | 21.4             | 615       | 105039           | 1.9              | 745       | 5111             | 0.0              | 875       | 3189             | 0.0              |           |                  |                  |

REPORT NUMBER: SP1-2101-121-2

### Melanopic Flux vs. Wavelength



**Melanopic Lumens: 3927.2**

**M/P: 0.55**

| 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       | 2304             | 0.0              | 490       | 19043            | 15.8             | 620       | 97577            | 0.1              | 750       | 4830             | 0.0              | 880       | 3505             | 0.0              |
| 365       | 2150             | 0.0              | 495       | 26606            | 22.0             | 625       | 90158            | 0.0              | 755       | 4664             | 0.0              | 885       | 2991             | 0.0              |
| 370       | 2146             | 0.0              | 500       | 36376            | 29.2             | 630       | 82240            | 0.0              | 760       | 4006             | 0.0              | 890       | 2327             | 0.0              |
| 375       | 2332             | 0.0              | 505       | 47714            | 36.6             | 635       | 74361            | 0.0              | 765       | 3715             | 0.0              | 895       | 2775             | 0.0              |
| 380       | 2527             | 0.0              | 510       | 58741            | 42.2             | 640       | 66994            | 0.0              | 770       | 3696             | 0.0              | 900       | 2141             | 0.0              |
| 385       | 2304             | 0.0              | 515       | 68716            | 44.9             | 645       | 60405            | 0.0              | 775       | 3117             | 0.0              | 905       | 2421             | 0.0              |
| 390       | 2064             | 0.0              | 520       | 77136            | 44.9             | 650       | 53806            | 0.0              | 780       | 3062             | 0.0              | 910       | 2200             | 0.0              |
| 395       | 1856             | 0.0              | 525       | 83567            | 42.4             | 655       | 47610            | 0.0              | 785       | 2907             | 0.0              | 915       | 2716             | 0.0              |
| 400       | 1856             | 0.0              | 530       | 89283            | 38.6             | 660       | 42018            | 0.0              | 790       | 2655             | 0.0              | 920       | 2656             | 0.0              |
| 405       | 2374             | 0.0              | 535       | 94097            | 33.9             | 665       | 36742            | 0.0              | 795       | 2467             | 0.0              | 925       | 2671             | 0.0              |
| 410       | 4084             | 0.2              | 540       | 96845            | 28.3             | 670       | 32105            | 0.0              | 800       | 2609             | 0.0              | 930       | 3292             | 0.0              |
| 415       | 8543             | 0.6              | 545       | 100829           | 23.4             | 675       | 27946            | 0.0              | 805       | 2293             | 0.0              | 935       | 3188             | 0.0              |
| 420       | 18394            | 2.1              | 550       | 105648           | 19.0             | 680       | 24146            | 0.0              | 810       | 2188             | 0.0              | 940       | 1997             | 0.0              |
| 425       | 37987            | 5.9              | 555       | 110017           | 14.8             | 685       | 21191            | 0.0              | 815       | 2386             | 0.0              | 945       | 2623             | 0.0              |
| 430       | 67605            | 14.3             | 560       | 114586           | 11.3             | 690       | 18544            | 0.0              | 820       | 2712             | 0.0              | 950       | 2969             | 0.0              |
| 435       | 102160           | 27.3             | 565       | 118987           | 8.4              | 695       | 16058            | 0.0              | 825       | 2473             | 0.0              | 955       | 2277             | 0.0              |
| 440       | 135103           | 45.1             | 570       | 122326           | 6.0              | 700       | 14133            | 0.0              | 830       | 1969             | 0.0              | 960       | 4267             | 0.0              |
| 445       | 140126           | 55.3             | 575       | 125968           | 4.2              | 705       | 12309            | 0.0              | 835       | 1917             | 0.0              | 965       | 2034             | 0.0              |
| 450       | 102339           | 47.2             | 580       | 127613           | 2.9              | 710       | 11142            | 0.0              | 840       | 2248             | 0.0              | 970       | 3586             | 0.0              |
| 455       | 58751            | 30.8             | 585       | 129466           | 1.9              | 715       | 10143            | 0.0              | 845       | 2266             | 0.0              | 975       | 2505             | 0.0              |
| 460       | 36892            | 21.7             | 590       | 128813           | 1.3              | 720       | 9072             | 0.0              | 850       | 2558             | 0.0              | 980       | 2666             | 0.0              |
| 465       | 24637            | 16.1             | 595       | 126387           | 0.8              | 725       | 8130             | 0.0              | 855       | 2767             | 0.0              | 985       | 2934             | 0.0              |
| 470       | 16738            | 12.0             | 600       | 123477           | 0.5              | 730       | 7149             | 0.0              | 860       | 2826             | 0.0              | 990       | 4120             | 0.0              |
| 475       | 13456            | 10.3             | 605       | 118718           | 0.3              | 735       | 6311             | 0.0              | 865       | 2385             | 0.0              | 995       | 3858             | 0.0              |
| 480       | 13081            | 10.5             | 610       | 112091           | 0.2              | 740       | 5711             | 0.0              | 870       | 3194             | 0.0              | 1000      | 3405             | 0.0              |
| 485       | 14734            | 12.1             | 615       | 105039           | 0.1              | 745       | 5111             | 0.0              | 875       | 3189             | 0.0              |           |                  |                  |

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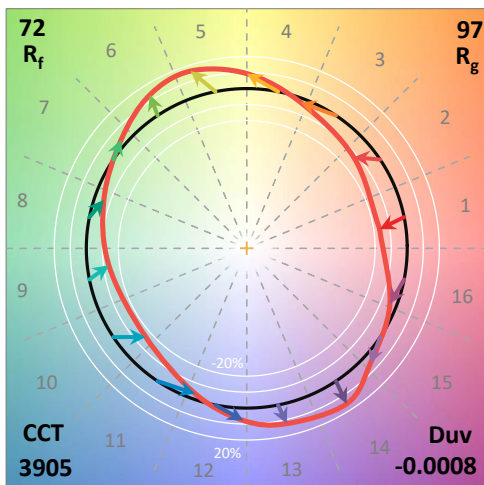
TM-30-18

### Summary

$R_f = 71.7$   
 $R_g = 96.9$   
 CIE  $R_a = 71.2$   
 $R_g = -29.7$



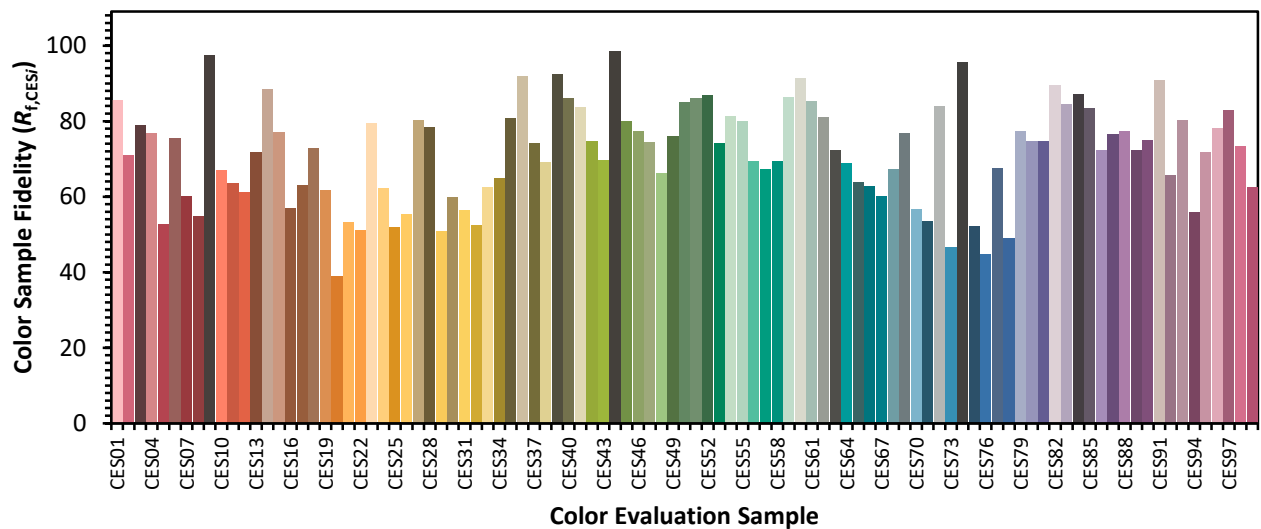
### Color Vector Graphics



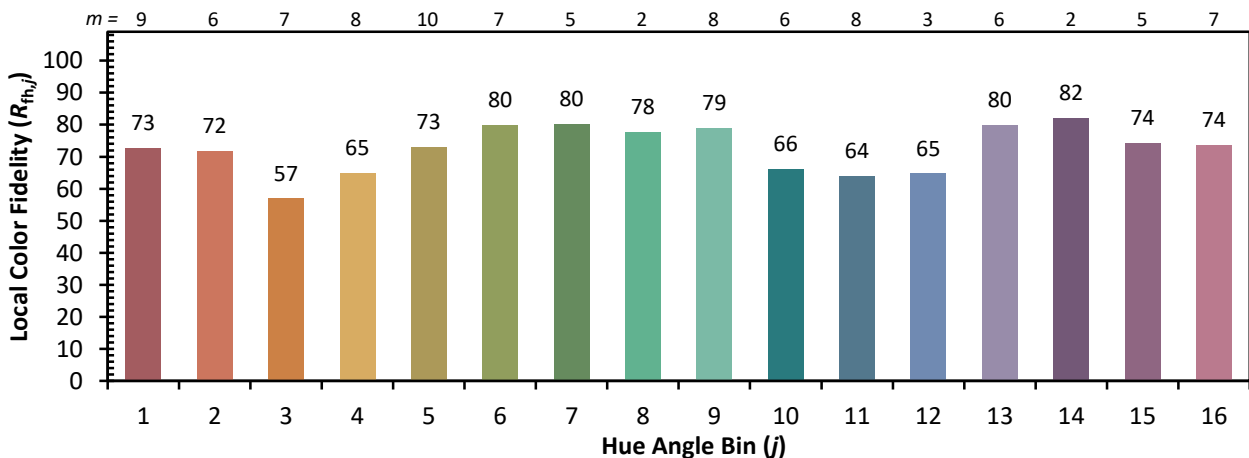
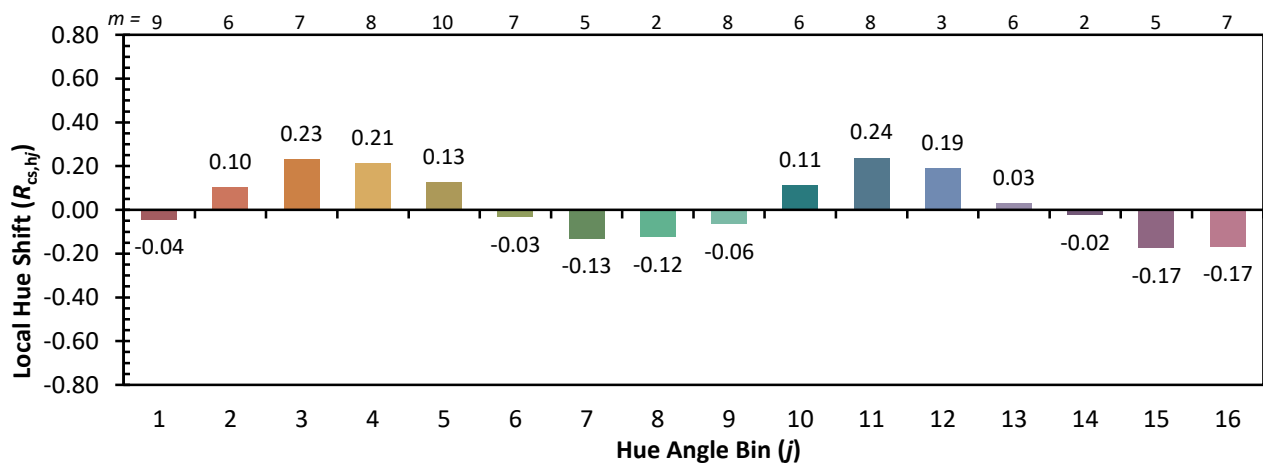
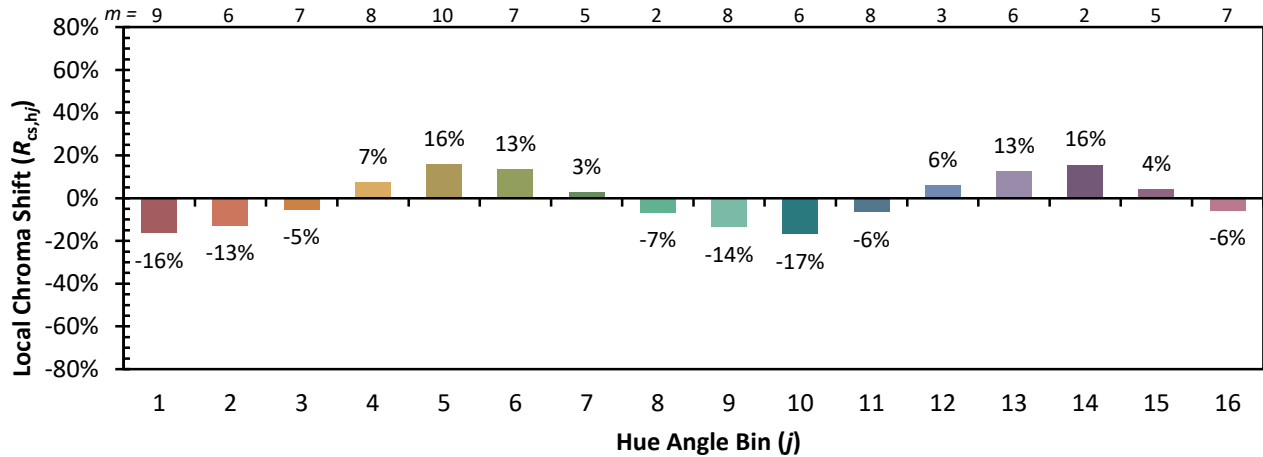


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 55 | CES51 = 86 | CES76 = 45 |
| CES02 = 61 | CES27 = 80 | CES52 = 87 | CES77 = 68 |
| CES03 = 30 | CES28 = 79 | CES53 = 74 | CES78 = 49 |
| CES04 = 70 | CES29 = 51 | CES54 = 81 | CES79 = 77 |
| CES05 = 47 | CES30 = 60 | CES55 = 80 | CES80 = 75 |
| CES06 = 50 | CES31 = 56 | CES56 = 69 | CES81 = 75 |
| CES07 = 40 | CES32 = 52 | CES57 = 67 | CES82 = 90 |
| CES08 = 39 | CES33 = 62 | CES58 = 69 | CES83 = 85 |
| CES09 = 29 | CES34 = 65 | CES59 = 86 | CES84 = 87 |
| CES10 = 74 | CES35 = 81 | CES60 = 91 | CES85 = 83 |
| CES11 = 57 | CES36 = 92 | CES61 = 85 | CES86 = 72 |
| CES12 = 63 | CES37 = 74 | CES62 = 81 | CES87 = 77 |
| CES13 = 42 | CES38 = 69 | CES63 = 72 | CES88 = 77 |
| CES14 = 74 | CES39 = 92 | CES64 = 69 | CES89 = 72 |
| CES15 = 71 | CES40 = 86 | CES65 = 64 | CES90 = 75 |
| CES16 = 46 | CES41 = 84 | CES66 = 63 | CES91 = 91 |
| CES17 = 49 | CES42 = 75 | CES67 = 60 | CES92 = 66 |
| CES18 = 56 | CES43 = 70 | CES68 = 67 | CES93 = 80 |
| CES19 = 72 | CES44 = 98 | CES69 = 77 | CES94 = 56 |
| CES20 = 65 | CES45 = 80 | CES70 = 57 | CES95 = 72 |
| CES21 = 86 | CES46 = 77 | CES71 = 53 | CES96 = 78 |
| CES22 = 78 | CES47 = 74 | CES72 = 84 | CES97 = 83 |
| CES23 = 92 | CES48 = 66 | CES73 = 47 | CES98 = 73 |
| CES24 = 91 | CES49 = 76 | CES74 = 96 | CES99 = 63 |
| CES25 = 72 | CES50 = 85 | CES75 = 52 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)