

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: P382802

Luminaire Tested: **GLEON-SA1D-735-U-SL3-HSS**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P382802  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-23)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA1D-735-U-SL3-HSS  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(1) 70 CRI, 3500K, 1200mA LIGHTSQUARE WITH 16 LEDS AND TYPE III SPILL  
LIGHT ELIMINATOR OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 6465.9 lumens  
Efficiency: N/A  
Efficacy: 96.5 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 0.5' x H: 0')  
IES Classification: Type III - Medium  
BUG Rating: B1 - U0 - G2

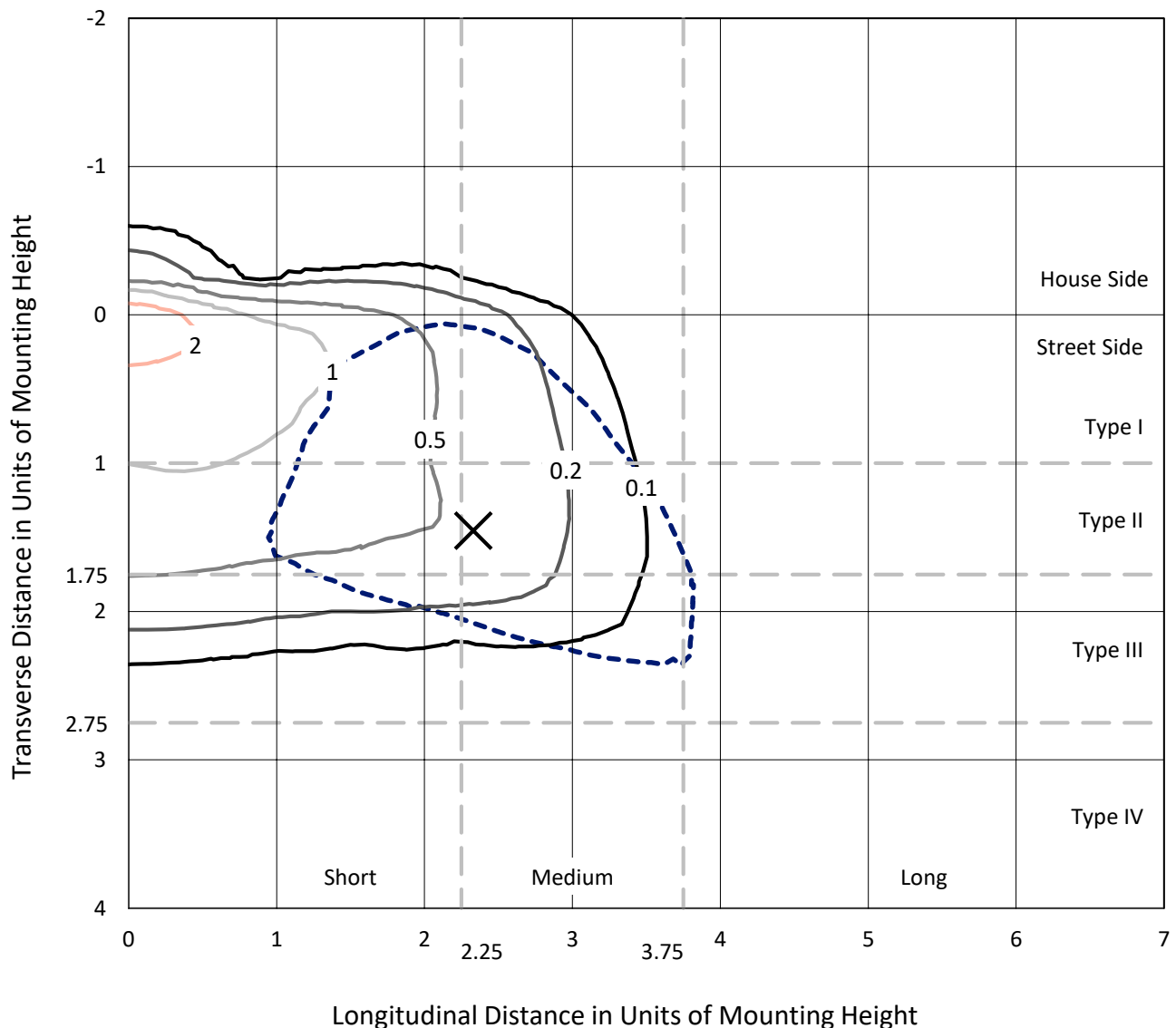
Input Watts (W): 67  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



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## Iso-Footcandle Lines of Horizontal Illumination

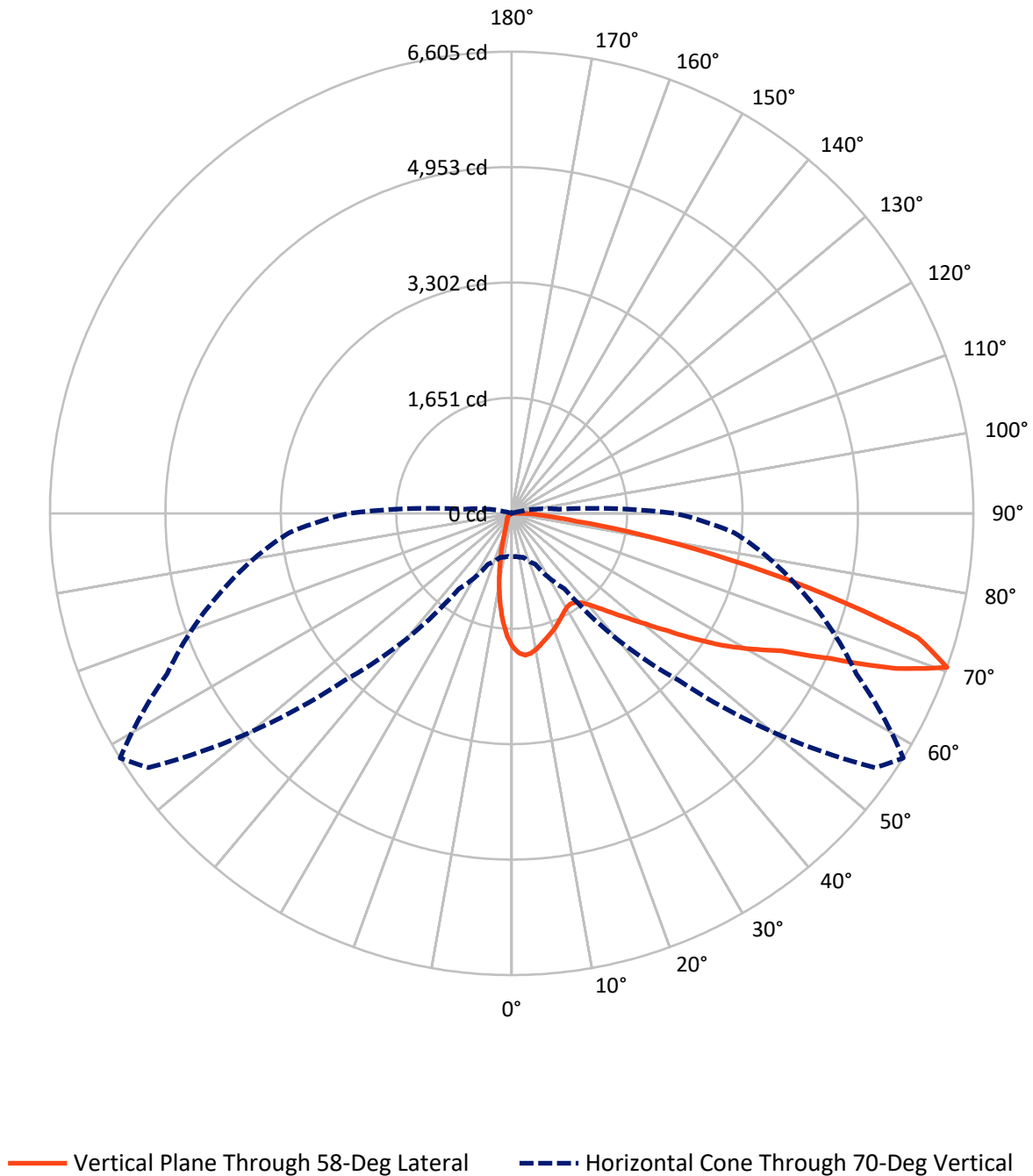
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 3.1 fc  
 Type III - Medium - N/A

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## Luminous Intensity Polar Plot



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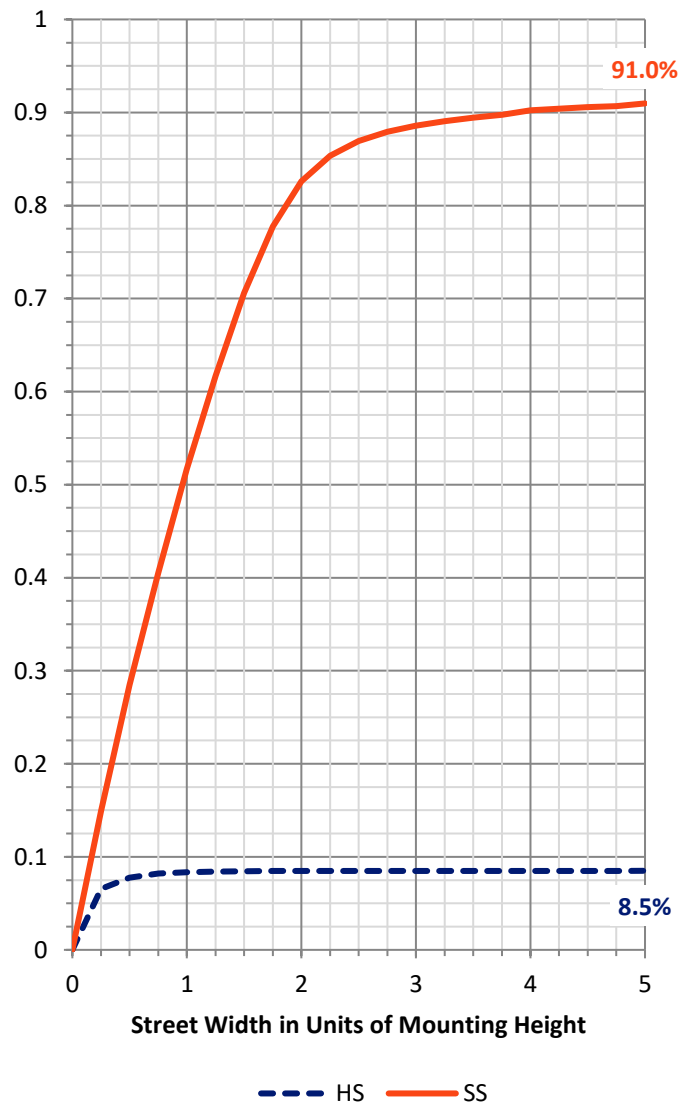
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 553.3    | 0.0    | 553.3  |
|                    | % Fixture | 8.6      | 0.0    | 8.6    |
| <b>Street Side</b> | Lumens    | 5912.5   | 0.0    | 5912.5 |
|                    | % Fixture | 91.4     | 0.0    | 91.4   |
| <b>Total</b>       | Lumens    | 6465.9   | 0.0    | 6465.9 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 156.2  | 2.4       |
| 10°-20°   | 327.8  | 5.1       |
| 20°-30°   | 430.9  | 6.7       |
| 30°-40°   | 570.7  | 8.8       |
| 40°-50°   | 853.1  | 13.2      |
| 50°-60°   | 1366.6 | 21.1      |
| 60°-70°   | 1722.6 | 26.6      |
| 70°-80°   | 929.2  | 14.4      |
| 80°-90°   | 108.8  | 1.7       |
| 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°    | 6465.9 | 100.0     |
| 0°-180°   | 6465.9 | 100.0     |

**Coefficient of Utilization**



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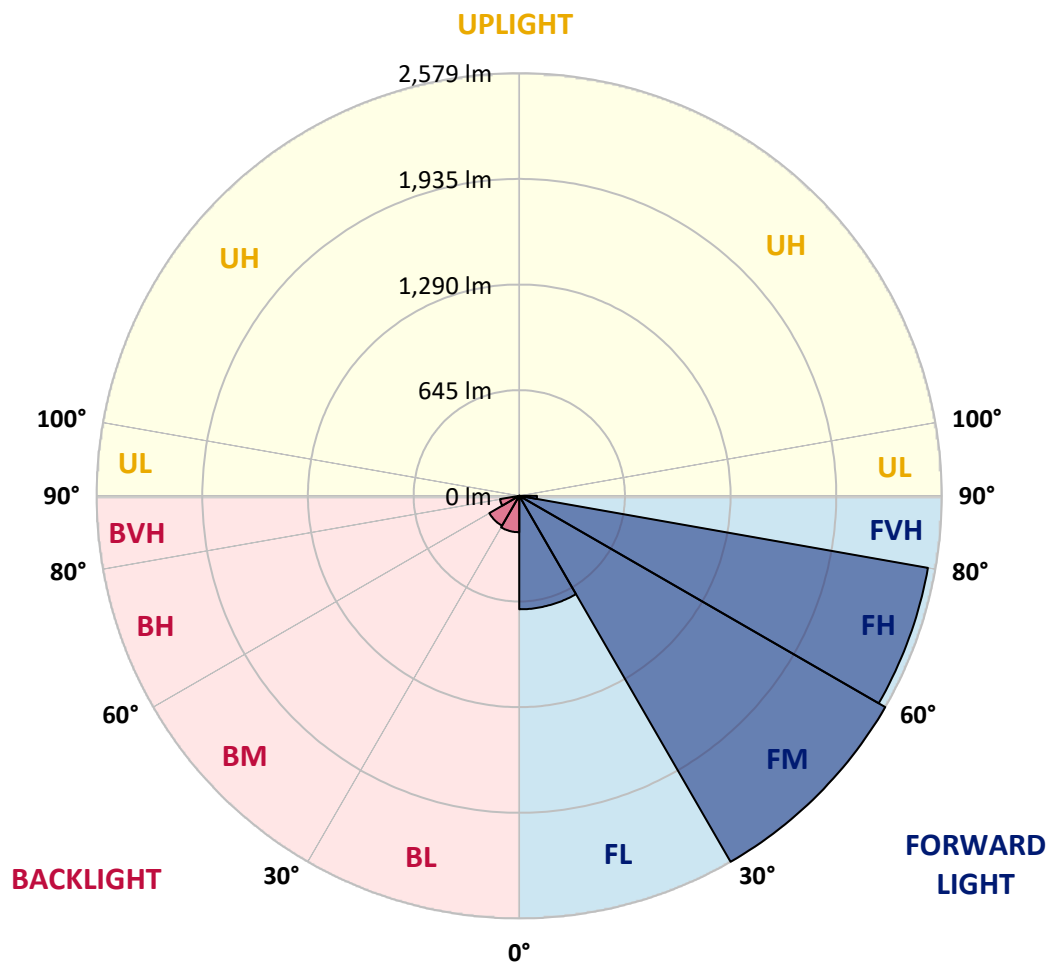
CATALOG NUMBER: GLEON-SA1D-735-U-SL3-HSS

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 692.6  | 10.7      |                         |      |         |
| FM   | (30°-60°)   | 2579.3 | 39.9      |                         |      |         |
| FH   | (60°-80°)   | 2532.8 | 39.2      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 107.8  | 1.7       |                         |      | G2/225  |
| BL   | (0°-30°)    | 222.3  | 3.4       | B1/500                  |      |         |
| BM   | (30°-60°)   | 211.1  | 3.3       | B0/220                  |      |         |
| BH   | (60°-80°)   | 119.0  | 1.8       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 0.9    | 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-G2**

Type III Medium





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 58°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1910.0 | 1910.0 | 1910.0 | 1910.0 | 1910.0 | 1910.0 | 1910.0 | 1910.0 | 1910.0 | 1910.0 | 1910.0 |
| 2.5°  | 2068.3 | 2063.3 | 2061.3 | 2058.2 | 2045.8 | 2033.7 | 2009.7 | 2003.0 | 1987.9 | 1952.2 | 1914.3 |
| 5°    | 2070.0 | 2069.7 | 2075.3 | 2074.0 | 2069.7 | 2064.0 | 2046.8 | 2037.9 | 2012.4 | 1961.4 | 1892.0 |
| 7.5°  | 1970.2 | 1975.3 | 1987.9 | 1998.2 | 2010.0 | 2025.4 | 2027.5 | 2018.8 | 1997.9 | 1942.7 | 1850.8 |
| 10°   | 1836.4 | 1844.4 | 1862.2 | 1882.3 | 1913.2 | 1943.9 | 1971.2 | 1970.2 | 1963.0 | 1908.6 | 1801.3 |
| 12.5° | 1702.1 | 1711.5 | 1732.0 | 1761.8 | 1805.7 | 1855.6 | 1904.6 | 1911.3 | 1923.5 | 1878.0 | 1755.7 |
| 15°   | 1584.7 | 1592.8 | 1612.9 | 1649.5 | 1703.8 | 1771.0 | 1842.8 | 1855.2 | 1886.3 | 1854.1 | 1717.5 |
| 17.5° | 1484.9 | 1490.0 | 1504.8 | 1545.4 | 1608.3 | 1689.8 | 1783.1 | 1807.3 | 1853.8 | 1835.2 | 1684.4 |
| 20°   | 1415.3 | 1416.0 | 1425.7 | 1454.2 | 1517.2 | 1608.3 | 1721.2 | 1756.0 | 1819.4 | 1819.1 | 1650.2 |
| 22.5° | 1380.8 | 1378.2 | 1380.1 | 1396.5 | 1442.7 | 1530.6 | 1659.4 | 1700.5 | 1788.5 | 1805.4 | 1615.6 |
| 25°   | 1374.4 | 1372.3 | 1366.9 | 1369.0 | 1397.0 | 1462.6 | 1597.0 | 1644.6 | 1761.3 | 1797.0 | 1585.5 |
| 27.5° | 1394.6 | 1396.8 | 1387.6 | 1377.9 | 1380.1 | 1418.5 | 1541.6 | 1596.8 | 1739.3 | 1797.0 | 1564.3 |
| 30°   | 1435.1 | 1436.3 | 1429.6 | 1416.9 | 1399.9 | 1406.2 | 1503.2 | 1558.3 | 1728.2 | 1809.4 | 1550.7 |
| 32.5° | 1480.0 | 1486.0 | 1485.2 | 1475.0 | 1450.8 | 1425.7 | 1494.0 | 1544.3 | 1727.5 | 1836.8 | 1549.4 |
| 35°   | 1535.7 | 1542.5 | 1553.7 | 1551.6 | 1526.3 | 1485.2 | 1525.2 | 1564.8 | 1743.3 | 1882.0 | 1564.0 |
| 37.5° | 1594.9 | 1605.1 | 1629.3 | 1640.8 | 1624.4 | 1577.9 | 1595.2 | 1623.4 | 1785.8 | 1955.1 | 1600.8 |
| 40°   | 1652.2 | 1663.7 | 1707.8 | 1753.3 | 1740.9 | 1693.0 | 1701.1 | 1723.6 | 1861.3 | 2060.3 | 1670.7 |
| 42.5° | 1708.4 | 1725.5 | 1790.3 | 1865.1 | 1879.9 | 1841.7 | 1846.0 | 1864.0 | 1973.5 | 2205.0 | 1784.9 |
| 45°   | 1775.5 | 1794.9 | 1890.9 | 1983.1 | 2022.7 | 2006.0 | 2024.3 | 2036.1 | 2119.9 | 2396.1 | 1939.0 |
| 47.5° | 1874.3 | 1896.5 | 2014.3 | 2119.5 | 2188.8 | 2199.6 | 2236.4 | 2244.2 | 2305.2 | 2618.7 | 2139.9 |
| 50°   | 2066.7 | 2072.9 | 2179.4 | 2274.8 | 2374.9 | 2439.4 | 2481.4 | 2487.2 | 2529.4 | 2862.0 | 2390.7 |
| 52.5° | 2308.9 | 2313.0 | 2373.2 | 2437.2 | 2550.9 | 2682.7 | 2780.9 | 2789.1 | 2798.0 | 3099.2 | 2638.3 |
| 55°   | 2549.6 | 2549.1 | 2588.9 | 2626.5 | 2756.6 | 2948.1 | 3161.0 | 3166.1 | 3102.4 | 3324.2 | 2827.6 |
| 57.5° | 2699.9 | 2714.4 | 2774.9 | 2823.3 | 3005.1 | 3250.5 | 3546.0 | 3564.8 | 3422.0 | 3490.9 | 3014.8 |
| 60°   | 2652.0 | 2659.0 | 2793.2 | 2972.3 | 3314.5 | 3680.5 | 3935.6 | 3940.4 | 3662.4 | 3657.3 | 3251.4 |
| 62.5° | 2259.5 | 2263.3 | 2474.1 | 2843.2 | 3471.2 | 4238.1 | 4405.6 | 4326.8 | 3938.8 | 3888.3 | 3534.5 |
| 65°   | 1548.6 | 1573.1 | 1749.2 | 2205.4 | 3183.3 | 4587.9 | 5133.1 | 5002.7 | 4360.1 | 4221.1 | 3790.4 |
| 67.5° | 912.0  | 906.9  | 994.0  | 1330.1 | 2338.0 | 4355.5 | 6053.4 | 5923.8 | 4934.7 | 4444.0 | 3715.4 |
| 70°   | 622.9  | 619.5  | 652.8  | 805.2  | 1319.8 | 3378.8 | 6343.0 | 6604.6 | 5442.0 | 4294.0 | 3197.5 |
| 72.5° | 444.7  | 446.6  | 495.8  | 625.6  | 828.6  | 1968.6 | 5454.7 | 6073.9 | 5283.1 | 3743.3 | 2430.5 |
| 75°   | 301.9  | 307.0  | 377.5  | 513.3  | 726.4  | 1001.5 | 3870.8 | 4617.1 | 4302.1 | 2720.6 | 1397.0 |
| 77.5° | 162.4  | 168.1  | 251.1  | 413.5  | 656.8  | 695.8  | 2489.9 | 3177.7 | 2702.3 | 1223.0 | 404.9  |
| 80°   | 67.7   | 71.0   | 117.5  | 300.6  | 567.6  | 611.1  | 1465.0 | 1926.9 | 1151.5 | 241.2  | 90.4   |
| 82.5° | 29.3   | 30.9   | 48.9   | 179.3  | 424.2  | 516.0  | 775.7  | 927.1  | 349.0  | 53.0   | 45.5   |
| 85°   | 5.7    | 5.9    | 20.1   | 94.9   | 270.7  | 291.2  | 502.8  | 492.8  | 156.8  | 22.8   | 33.1   |
| 87.5° | 0.0    | 0.0    | 4.8    | 29.8   | 79.6   | 158.6  | 306.8  | 303.0  | 53.2   | 11.0   | 12.4   |
| 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-SA1D-735-U-SL3-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1910.0 | 1910.0 | 1910.0 | 1910.0 | 1910.0 | 1910.0 | 1910.0 | 1910.0 | 1910.0 | 1910.0 | 1910.0 |
| 2.5°  | 1895.0 | 1876.4 | 1837.4 | 1789.2 | 1752.4 | 1711.8 | 1679.6 | 1638.7 | 1621.0 | 1621.7 | 1612.1 |
| 5°    | 1852.5 | 1814.3 | 1727.9 | 1619.1 | 1535.2 | 1448.6 | 1374.1 | 1300.0 | 1256.1 | 1241.8 | 1228.4 |
| 7.5°  | 1791.6 | 1731.2 | 1593.5 | 1425.7 | 1283.8 | 1145.1 | 1024.3 | 918.1  | 851.0  | 818.2  | 806.1  |
| 10°   | 1723.1 | 1638.1 | 1439.0 | 1217.9 | 1015.2 | 827.6  | 671.1  | 535.0  | 480.7  | 443.9  | 434.5  |
| 12.5° | 1662.9 | 1547.9 | 1287.9 | 1004.8 | 764.1  | 537.7  | 388.5  | 303.8  | 267.0  | 252.4  | 250.0  |
| 15°   | 1606.2 | 1463.4 | 1142.4 | 811.7  | 529.1  | 331.0  | 247.0  | 218.4  | 209.7  | 207.3  | 207.3  |
| 17.5° | 1552.7 | 1383.0 | 1000.2 | 621.6  | 350.1  | 232.0  | 204.6  | 198.1  | 195.4  | 195.2  | 195.4  |
| 20°   | 1496.7 | 1302.7 | 860.4  | 455.4  | 244.4  | 196.6  | 189.0  | 185.5  | 184.7  | 184.7  | 184.7  |
| 22.5° | 1443.2 | 1222.3 | 724.3  | 325.3  | 196.0  | 179.3  | 175.6  | 173.2  | 172.3  | 172.1  | 171.5  |
| 25°   | 1391.9 | 1145.9 | 591.5  | 229.9  | 172.1  | 164.2  | 161.1  | 157.8  | 155.4  | 154.1  | 153.2  |
| 27.5° | 1349.7 | 1077.9 | 467.8  | 184.4  | 155.4  | 148.7  | 144.7  | 139.8  | 133.9  | 131.2  | 130.1  |
| 30°   | 1316.1 | 1015.8 | 360.5  | 155.7  | 139.8  | 133.1  | 126.9  | 118.6  | 109.9  | 105.4  | 105.1  |
| 32.5° | 1289.7 | 954.7  | 273.7  | 137.7  | 125.9  | 117.5  | 108.6  | 98.1   | 88.2   | 83.1   | 82.8   |
| 35°   | 1276.8 | 901.0  | 209.1  | 124.5  | 113.5  | 102.9  | 91.9   | 80.4   | 70.7   | 65.9   | 65.3   |
| 37.5° | 1285.4 | 855.5  | 163.2  | 113.5  | 102.9  | 90.9   | 78.0   | 65.9   | 57.3   | 53.0   | 52.7   |
| 40°   | 1316.8 | 826.5  | 132.6  | 104.1  | 94.1   | 79.3   | 65.3   | 54.0   | 46.8   | 43.3   | 43.0   |
| 42.5° | 1383.8 | 815.8  | 113.2  | 96.2   | 85.5   | 68.6   | 54.3   | 44.6   | 37.9   | 35.5   | 34.9   |
| 45°   | 1495.7 | 831.6  | 100.0  | 88.7   | 76.7   | 58.3   | 44.9   | 36.6   | 30.6   | 28.8   | 28.5   |
| 47.5° | 1644.6 | 873.2  | 90.6   | 81.5   | 68.6   | 49.2   | 37.4   | 29.5   | 25.0   | 23.1   | 22.8   |
| 50°   | 1836.5 | 939.4  | 82.8   | 74.2   | 61.0   | 41.6   | 30.9   | 23.4   | 19.4   | 18.0   | 18.0   |
| 52.5° | 2045.5 | 1018.2 | 75.8   | 67.4   | 53.5   | 34.7   | 25.0   | 18.0   | 15.4   | 13.7   | 13.7   |
| 55°   | 2218.1 | 1087.0 | 68.3   | 62.4   | 44.3   | 28.8   | 19.1   | 13.7   | 11.3   | 10.5   | 10.5   |
| 57.5° | 2390.4 | 1160.4 | 59.7   | 53.5   | 35.5   | 23.4   | 14.5   | 10.2   | 8.3    | 7.8    | 7.8    |
| 60°   | 2613.8 | 1250.2 | 51.3   | 43.6   | 27.9   | 17.7   | 10.7   | 7.3    | 6.1    | 5.9    | 5.9    |
| 62.5° | 2859.6 | 1302.9 | 43.8   | 34.9   | 21.8   | 13.1   | 7.8    | 4.8    | 4.6    | 4.6    | 4.3    |
| 65°   | 3009.9 | 1228.4 | 36.8   | 27.9   | 17.0   | 10.0   | 5.1    | 3.5    | 4.0    | 3.7    | 3.3    |
| 67.5° | 2818.2 | 961.7  | 30.1   | 21.8   | 13.1   | 7.5    | 3.3    | 2.4    | 4.3    | 3.5    | 2.7    |
| 70°   | 2333.4 | 673.2  | 23.4   | 15.4   | 10.5   | 6.4    | 2.1    | 1.6    | 4.6    | 3.5    | 2.1    |
| 72.5° | 1746.3 | 450.6  | 18.5   | 10.2   | 7.8    | 5.7    | 1.9    | 0.8    | 4.0    | 3.0    | 1.9    |
| 75°   | 954.2  | 181.5  | 14.8   | 6.4    | 4.8    | 4.0    | 1.3    | 0.6    | 2.7    | 2.1    | 1.3    |
| 77.5° | 251.1  | 47.9   | 10.7   | 4.3    | 2.7    | 1.6    | 0.8    | 0.3    | 1.3    | 1.1    | 0.6    |
| 80°   | 64.0   | 18.5   | 7.0    | 3.0    | 1.9    | 0.8    | 0.0    | 0.0    | 0.3    | 0.0    | 0.0    |
| 82.5° | 34.2   | 7.8    | 4.3    | 2.1    | 1.1    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 85°   | 25.8   | 5.1    | 2.4    | 1.3    | 0.3    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 87.5° | 10.0   | 1.6    | 0.8    | 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

All Brands

Data applicable to all product families using SA light engines

Report Number: SP1-2101-121-7

Luminaire Tested: IFLD-S-SA2A-735-U-T2

Test Date: 03/04/2021

### Test Information

Test Method: LM-79-08  
 Report Number: SP1-2101-121-7  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1  
 Measurement Geometry:  $4\pi$   
 Issue Date: 03/04/2021  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: STREETWORKS  
 Catalog Number: **IFLD-S-SA2A-735-U-T2**  
 Description: STREETWORKS INF FLOOD

PROGRAMMED @ 615mA.

### Spectral Parameters

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 3388   | CRI (Ra): | 73.1 |      |       |
| CIE u':                   | 0.2371 | R1:       | 68.9 | R9:  | -34.6 |
| CIE v':                   | 0.5177 | R2:       | 81.1 | R10: | 57.8  |
| Duv:                      | 0.0032 | R3:       | 93.1 | R11: | 68.6  |
| CIE x:                    | 0.4153 | R4:       | 71.6 | R12: | 53.9  |
| CIE y:                    | 0.4030 | R5:       | 69.4 | R13: | 70.9  |
| CIE z:                    | 0.1817 | R6:       | 75.0 | R14: | 96.2  |
| Peak Wavelength (nm):     | 590    | R7:       | 79.5 |      |       |
| Dominant Wavelength (nm): | 580    | R8:       | 46.4 |      |       |
| Purity:                   | 45.7   |           |      |      |       |
| Rf:                       | 76.9   |           |      |      |       |
| Rg:                       | 94.4   |           |      |      |       |



### Test Conditions

Stabilization Time: 81M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.0/30%  
 Sphere Temperature (°C): 24.1

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| 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            |

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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 3500K 4-step quadrangle

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### Photopic Flux vs. Wavelength



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| 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       | 2672             | 0.0              | 490       | 34553            | 4.9              | 620       | 136720           | 35.6             | 750       | 5870             | 0.0              | 880       | 4216             | 0.0              |
| 365       | 2252             | 0.0              | 495       | 44336            | 8.0              | 625       | 126308           | 27.9             | 755       | 5421             | 0.0              | 885       | 4132             | 0.0              |
| 370       | 2217             | 0.0              | 500       | 54643            | 12.1             | 630       | 114625           | 20.7             | 760       | 5097             | 0.0              | 890       | 3992             | 0.0              |
| 375       | 2697             | 0.0              | 505       | 64676            | 18.1             | 635       | 103216           | 15.5             | 765       | 4626             | 0.0              | 895       | 3214             | 0.0              |
| 380       | 3039             | 0.0              | 510       | 73825            | 25.4             | 640       | 92605            | 11.1             | 770       | 3782             | 0.0              | 900       | 2580             | 0.0              |
| 385       | 2655             | 0.0              | 515       | 81872            | 33.9             | 645       | 83234            | 8.0              | 775       | 3506             | 0.0              | 905       | 1776             | 0.0              |
| 390       | 2357             | 0.0              | 520       | 88574            | 43.0             | 650       | 73263            | 5.4              | 780       | 3507             | 0.0              | 910       | 3995             | 0.0              |
| 395       | 2186             | 0.0              | 525       | 93289            | 50.1             | 655       | 64627            | 3.7              | 785       | 3267             | 0.0              | 915       | 4288             | 0.0              |
| 400       | 2015             | 0.0              | 530       | 98393            | 57.9             | 660       | 56614            | 2.4              | 790       | 2849             | 0.0              | 920       | 2446             | 0.0              |
| 405       | 2234             | 0.0              | 535       | 103269           | 64.0             | 665       | 49537            | 1.6              | 795       | 3037             | 0.0              | 925       | 3009             | 0.0              |
| 410       | 3412             | 0.0              | 540       | 107316           | 69.9             | 670       | 42866            | 0.9              | 800       | 2716             | 0.0              | 930       | 3026             | 0.0              |
| 415       | 6135             | 0.0              | 545       | 113101           | 75.3             | 675       | 36708            | 0.6              | 805       | 2648             | 0.0              | 935       | 4734             | 0.0              |
| 420       | 12146            | 0.0              | 550       | 120690           | 82.0             | 680       | 31814            | 0.4              | 810       | 3187             | 0.0              | 940       | 3719             | 0.0              |
| 425       | 23983            | 0.1              | 555       | 128583           | 87.8             | 685       | 27485            | 0.2              | 815       | 2931             | 0.0              | 945       | 1480             | 0.0              |
| 430       | 42142            | 0.3              | 560       | 137796           | 93.6             | 690       | 23698            | 0.1              | 820       | 2717             | 0.0              | 950       | 3450             | 0.0              |
| 435       | 68228            | 0.8              | 565       | 146577           | 97.5             | 695       | 20309            | 0.1              | 825       | 2236             | 0.0              | 955       | 5051             | 0.0              |
| 440       | 99323            | 1.6              | 570       | 154581           | 100.5            | 700       | 17890            | 0.1              | 830       | 2628             | 0.0              | 960       | 3176             | 0.0              |
| 445       | 115584           | 2.4              | 575       | 162633           | 101.2            | 705       | 15500            | 0.0              | 835       | 3140             | 0.0              | 965       | 5178             | 0.0              |
| 450       | 94997            | 2.5              | 580       | 168101           | 99.9             | 710       | 13699            | 0.0              | 840       | 3675             | 0.0              | 970       | 6385             | 0.0              |
| 455       | 61433            | 2.1              | 585       | 173145           | 96.2             | 715       | 12398            | 0.0              | 845       | 3283             | 0.0              | 975       | 3810             | 0.0              |
| 460       | 43373            | 1.8              | 590       | 174675           | 90.3             | 720       | 11147            | 0.0              | 850       | 3055             | 0.0              | 980       | 4322             | 0.0              |
| 465       | 32472            | 1.7              | 595       | 173724           | 82.3             | 725       | 9761             | 0.0              | 855       | 2932             | 0.0              | 985       | 4200             | 0.0              |
| 470       | 24257            | 1.5              | 600       | 171241           | 73.8             | 730       | 8651             | 0.0              | 860       | 3382             | 0.0              | 990       | 4661             | 0.0              |
| 475       | 21690            | 1.7              | 605       | 165134           | 64.0             | 735       | 7730             | 0.0              | 865       | 2605             | 0.0              | 995       | 6746             | 0.0              |
| 480       | 23173            | 2.2              | 610       | 156652           | 53.8             | 740       | 6847             | 0.0              | 870       | 3325             | 0.0              | 1000      | 4150             | 0.0              |
| 485       | 27564            | 3.3              | 615       | 147879           | 44.6             | 745       | 6124             | 0.0              | 875       | 3325             | 0.0              |           |                  |                  |

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### Scotopic Flux vs. Wavelength



Scotopic Lumens: 12126

S/P: 1.36

| 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       | 2672             | 0.0              | 490       | 34553            | 53.2             | 620       | 136720           | 1.7              | 750       | 5870             | 0.0              | 880       | 4216             | 0.0              |
| 365       | 2252             | 0.0              | 495       | 44336            | 71.7             | 625       | 126308           | 1.1              | 755       | 5421             | 0.0              | 885       | 4132             | 0.0              |
| 370       | 2217             | 0.0              | 500       | 54643            | 91.4             | 630       | 114625           | 0.6              | 760       | 5097             | 0.0              | 890       | 3992             | 0.0              |
| 375       | 2697             | 0.0              | 505       | 64676            | 110.0            | 635       | 103216           | 0.4              | 765       | 4626             | 0.0              | 895       | 3214             | 0.0              |
| 380       | 3039             | 0.0              | 510       | 73825            | 125.1            | 640       | 92605            | 0.2              | 770       | 3782             | 0.0              | 900       | 2580             | 0.0              |
| 385       | 2655             | 0.0              | 515       | 81872            | 135.7            | 645       | 83234            | 0.1              | 775       | 3506             | 0.0              | 905       | 1776             | 0.0              |
| 390       | 2357             | 0.0              | 520       | 88574            | 140.8            | 650       | 73263            | 0.1              | 780       | 3507             | 0.0              | 910       | 3995             | 0.0              |
| 395       | 2186             | 0.0              | 525       | 93289            | 139.6            | 655       | 64627            | 0.1              | 785       | 3267             | 0.0              | 915       | 4288             | 0.0              |
| 400       | 2015             | 0.0              | 530       | 98393            | 135.7            | 660       | 56614            | 0.0              | 790       | 2849             | 0.0              | 920       | 2446             | 0.0              |
| 405       | 2234             | 0.1              | 535       | 103269           | 128.7            | 665       | 49537            | 0.0              | 795       | 3037             | 0.0              | 925       | 3009             | 0.0              |
| 410       | 3412             | 0.2              | 540       | 107316           | 118.6            | 670       | 42866            | 0.0              | 800       | 2716             | 0.0              | 930       | 3026             | 0.0              |
| 415       | 6135             | 0.6              | 545       | 113101           | 108.4            | 675       | 36708            | 0.0              | 805       | 2648             | 0.0              | 935       | 4734             | 0.0              |
| 420       | 12146            | 2.0              | 550       | 120690           | 98.7             | 680       | 31814            | 0.0              | 810       | 3187             | 0.0              | 940       | 3719             | 0.0              |
| 425       | 23983            | 5.9              | 555       | 128583           | 87.9             | 685       | 27485            | 0.0              | 815       | 2931             | 0.0              | 945       | 1480             | 0.0              |
| 430       | 42142            | 14.3             | 560       | 137796           | 77.0             | 690       | 23698            | 0.0              | 820       | 2717             | 0.0              | 950       | 3450             | 0.0              |
| 435       | 68228            | 30.5             | 565       | 146577           | 65.8             | 695       | 20309            | 0.0              | 825       | 2236             | 0.0              | 955       | 5051             | 0.0              |
| 440       | 99323            | 55.5             | 570       | 154581           | 54.6             | 700       | 17890            | 0.0              | 830       | 2628             | 0.0              | 960       | 3176             | 0.0              |
| 445       | 115584           | 77.4             | 575       | 162633           | 44.3             | 705       | 15500            | 0.0              | 835       | 3140             | 0.0              | 965       | 5178             | 0.0              |
| 450       | 94997            | 73.6             | 580       | 168101           | 34.6             | 710       | 13699            | 0.0              | 840       | 3675             | 0.0              | 970       | 6385             | 0.0              |
| 455       | 61433            | 53.7             | 585       | 173145           | 26.5             | 715       | 12398            | 0.0              | 845       | 3283             | 0.0              | 975       | 3810             | 0.0              |
| 460       | 43373            | 41.9             | 590       | 174675           | 19.5             | 720       | 11147            | 0.0              | 850       | 3055             | 0.0              | 980       | 4322             | 0.0              |
| 465       | 32472            | 34.3             | 595       | 173724           | 13.9             | 725       | 9761             | 0.0              | 855       | 2932             | 0.0              | 985       | 4200             | 0.0              |
| 470       | 24257            | 27.9             | 600       | 171241           | 9.7              | 730       | 8651             | 0.0              | 860       | 3382             | 0.0              | 990       | 4661             | 0.0              |
| 475       | 21690            | 27.1             | 605       | 165134           | 6.5              | 735       | 7730             | 0.0              | 865       | 2605             | 0.0              | 995       | 6746             | 0.0              |
| 480       | 23173            | 31.3             | 610       | 156652           | 4.2              | 740       | 6847             | 0.0              | 870       | 3325             | 0.0              | 1000      | 4150             | 0.0              |
| 485       | 27564            | 40.0             | 615       | 147879           | 2.7              | 745       | 6124             | 0.0              | 875       | 3325             | 0.0              |           |                  |                  |

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### Melanopic Flux vs. Wavelength



**Melanopic Lumens: 4490.7**

**M/P: 0.5**

| 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       | 2672             | 0.0              | 490       | 34553            | 28.8             | 620       | 136720           | 0.1              | 750       | 5870             | 0.0              | 880       | 4216             | 0.0              |
| 365       | 2252             | 0.0              | 495       | 44336            | 36.6             | 625       | 126308           | 0.1              | 755       | 5421             | 0.0              | 885       | 4132             | 0.0              |
| 370       | 2217             | 0.0              | 500       | 54643            | 43.9             | 630       | 114625           | 0.0              | 760       | 5097             | 0.0              | 890       | 3992             | 0.0              |
| 375       | 2697             | 0.0              | 505       | 64676            | 49.6             | 635       | 103216           | 0.0              | 765       | 4626             | 0.0              | 895       | 3214             | 0.0              |
| 380       | 3039             | 0.0              | 510       | 73825            | 53.0             | 640       | 92605            | 0.0              | 770       | 3782             | 0.0              | 900       | 2580             | 0.0              |
| 385       | 2655             | 0.0              | 515       | 81872            | 53.5             | 645       | 83234            | 0.0              | 775       | 3506             | 0.0              | 905       | 1776             | 0.0              |
| 390       | 2357             | 0.0              | 520       | 88574            | 51.6             | 650       | 73263            | 0.0              | 780       | 3507             | 0.0              | 910       | 3995             | 0.0              |
| 395       | 2186             | 0.0              | 525       | 93289            | 47.3             | 655       | 64627            | 0.0              | 785       | 3267             | 0.0              | 915       | 4288             | 0.0              |
| 400       | 2015             | 0.0              | 530       | 98393            | 42.5             | 660       | 56614            | 0.0              | 790       | 2849             | 0.0              | 920       | 2446             | 0.0              |
| 405       | 2234             | 0.0              | 535       | 103269           | 37.2             | 665       | 49537            | 0.0              | 795       | 3037             | 0.0              | 925       | 3009             | 0.0              |
| 410       | 3412             | 0.1              | 540       | 107316           | 31.4             | 670       | 42866            | 0.0              | 800       | 2716             | 0.0              | 930       | 3026             | 0.0              |
| 415       | 6135             | 0.4              | 545       | 113101           | 26.3             | 675       | 36708            | 0.0              | 805       | 2648             | 0.0              | 935       | 4734             | 0.0              |
| 420       | 12146            | 1.4              | 550       | 120690           | 21.7             | 680       | 31814            | 0.0              | 810       | 3187             | 0.0              | 940       | 3719             | 0.0              |
| 425       | 23983            | 3.7              | 555       | 128583           | 17.3             | 685       | 27485            | 0.0              | 815       | 2931             | 0.0              | 945       | 1480             | 0.0              |
| 430       | 42142            | 8.9              | 560       | 137796           | 13.6             | 690       | 23698            | 0.0              | 820       | 2717             | 0.0              | 950       | 3450             | 0.0              |
| 435       | 68228            | 18.2             | 565       | 146577           | 10.3             | 695       | 20309            | 0.0              | 825       | 2236             | 0.0              | 955       | 5051             | 0.0              |
| 440       | 99323            | 33.2             | 570       | 154581           | 7.6              | 700       | 17890            | 0.0              | 830       | 2628             | 0.0              | 960       | 3176             | 0.0              |
| 445       | 115584           | 45.6             | 575       | 162633           | 5.4              | 705       | 15500            | 0.0              | 835       | 3140             | 0.0              | 965       | 5178             | 0.0              |
| 450       | 94997            | 43.8             | 580       | 168101           | 3.8              | 710       | 13699            | 0.0              | 840       | 3675             | 0.0              | 970       | 6385             | 0.0              |
| 455       | 61433            | 32.2             | 585       | 173145           | 2.6              | 715       | 12398            | 0.0              | 845       | 3283             | 0.0              | 975       | 3810             | 0.0              |
| 460       | 43373            | 25.6             | 590       | 174675           | 1.7              | 720       | 11147            | 0.0              | 850       | 3055             | 0.0              | 980       | 4322             | 0.0              |
| 465       | 32472            | 21.2             | 595       | 173724           | 1.1              | 725       | 9761             | 0.0              | 855       | 2932             | 0.0              | 985       | 4200             | 0.0              |
| 470       | 24257            | 17.4             | 600       | 171241           | 0.7              | 730       | 8651             | 0.0              | 860       | 3382             | 0.0              | 990       | 4661             | 0.0              |
| 475       | 21690            | 16.6             | 605       | 165134           | 0.5              | 735       | 7730             | 0.0              | 865       | 2605             | 0.0              | 995       | 6746             | 0.0              |
| 480       | 23173            | 18.6             | 610       | 156652           | 0.3              | 740       | 6847             | 0.0              | 870       | 3325             | 0.0              | 1000      | 4150             | 0.0              |
| 485       | 27564            | 22.7             | 615       | 147879           | 0.2              | 745       | 6124             | 0.0              | 875       | 3325             | 0.0              |           |                  |                  |

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TM-30-18

### Summary

$R_f = 76.9$   
 $R_g = 94.4$   
 CIE  $R_a = 73.1$   
 $R_g = -34.6$

### Spectral Power Distribution Comparison



### Color Vector Graphics



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 68 | CES51 = 90 | CES76 = 63 |
| CES02 = 62 | CES27 = 88 | CES52 = 89 | CES77 = 80 |
| CES03 = 31 | CES28 = 87 | CES53 = 80 | CES78 = 65 |
| CES04 = 70 | CES29 = 67 | CES54 = 84 | CES79 = 87 |
| CES05 = 48 | CES30 = 74 | CES55 = 84 | CES80 = 86 |
| CES06 = 51 | CES31 = 71 | CES56 = 75 | CES81 = 75 |
| CES07 = 40 | CES32 = 67 | CES57 = 74 | CES82 = 94 |
| CES08 = 39 | CES33 = 74 | CES58 = 76 | CES83 = 91 |
| CES09 = 29 | CES34 = 78 | CES59 = 87 | CES84 = 89 |
| CES10 = 75 | CES35 = 89 | CES60 = 93 | CES85 = 80 |
| CES11 = 58 | CES36 = 98 | CES61 = 86 | CES86 = 66 |
| CES12 = 64 | CES37 = 86 | CES62 = 89 | CES87 = 79 |
| CES13 = 43 | CES38 = 82 | CES63 = 77 | CES88 = 79 |
| CES14 = 74 | CES39 = 95 | CES64 = 74 | CES89 = 70 |
| CES15 = 71 | CES40 = 91 | CES65 = 68 | CES90 = 77 |
| CES16 = 47 | CES41 = 89 | CES66 = 71 | CES91 = 88 |
| CES17 = 50 | CES42 = 88 | CES67 = 69 | CES92 = 60 |
| CES18 = 56 | CES43 = 82 | CES68 = 74 | CES93 = 77 |
| CES19 = 72 | CES44 = 99 | CES69 = 82 | CES94 = 52 |
| CES20 = 65 | CES45 = 87 | CES70 = 67 | CES95 = 69 |
| CES21 = 86 | CES46 = 82 | CES71 = 66 | CES96 = 78 |
| CES22 = 79 | CES47 = 82 | CES72 = 88 | CES97 = 85 |
| CES23 = 92 | CES48 = 72 | CES73 = 59 | CES98 = 76 |
| CES24 = 91 | CES49 = 82 | CES74 = 97 | CES99 = 63 |
| CES25 = 72 | CES50 = 88 | CES75 = 66 |            |



**Color Rendition by Hue-Angle Bin**


**Measure Comparisons**



(END OF REPORT)