

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: P382961

Luminaire Tested: **GLEON-SA3A-735-U-T4W**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P382961  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-18)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA3A-735-U-T4W  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(3) 70 CRI, 3500K, 615mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE IV WIDE OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 13160.9 lumens  
Efficiency: N/A  
Efficacy: 137.1 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 1' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B2 - U0 - G3

Input Watts (W): 96  
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

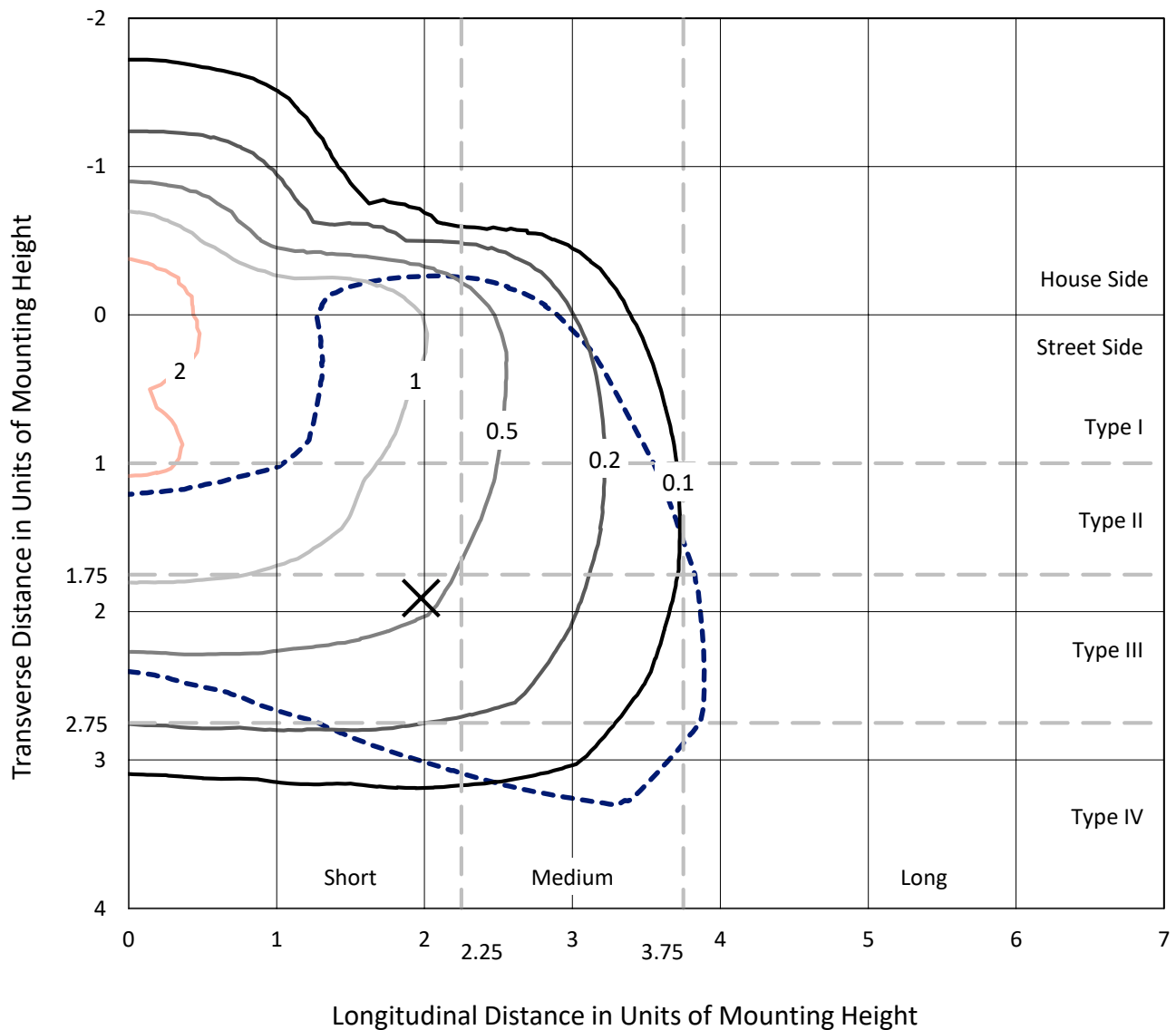


REPORT NUMBER: P382961

CATALOG NUMBER: GLEON-SA3A-735-U-T4W

## Iso-Footcandle Lines of Horizontal Illumination

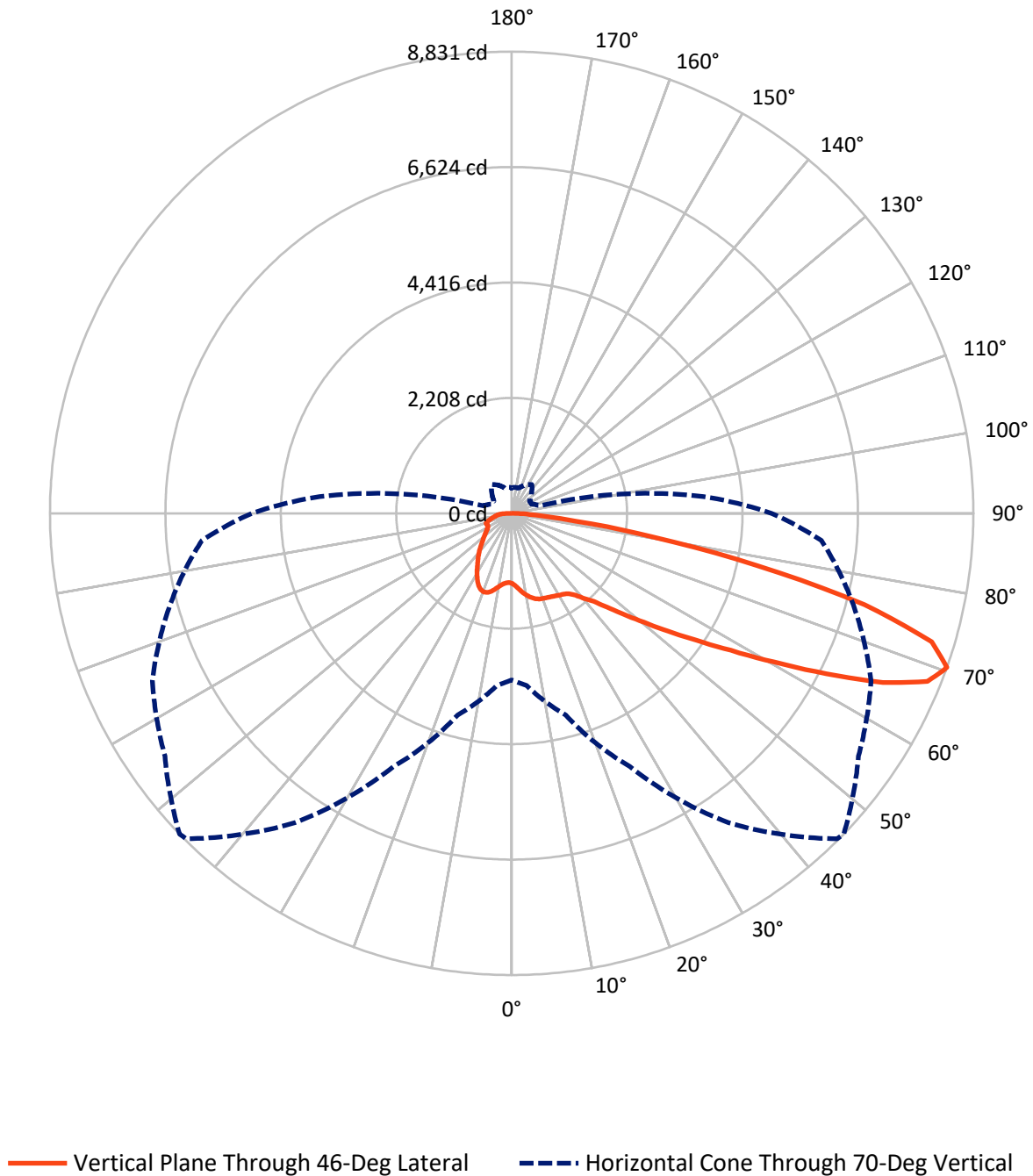
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 2.7 fc  
 Type IV - Short - N/A

REPORT NUMBER: P382961  
CATALOG NUMBER: GLEON-SA3A-735-U-T4W

## Luminous Intensity Polar Plot



REPORT NUMBER: P382961

CATALOG NUMBER: GLEON-SA3A-735-U-T4W

**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 3016.4   | 0.0    | 3016.4  |
|                    | % Fixture | 22.9     | 0.0    | 22.9    |
| <b>Street Side</b> | Lumens    | 10144.5  | 0.0    | 10144.5 |
|                    | % Fixture | 77.1     | 0.0    | 77.1    |
| <b>Total</b>       | Lumens    | 13160.9  | 0.0    | 13160.9 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 136.7   | 1.0       |
| 10°-20°   | 455.4   | 3.5       |
| 20°-30°   | 759.3   | 5.8       |
| 30°-40°   | 1077.5  | 8.2       |
| 40°-50°   | 1585.0  | 12.0      |
| 50°-60°   | 2684.2  | 20.4      |
| 60°-70°   | 3810.2  | 29.0      |
| 70°-80°   | 2314.7  | 17.6      |
| 80°-90°   | 337.8   | 2.6       |
| 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°    | 13160.9 | 100.0     |
| 0°-180°   | 13160.9 | 100.0     |

**Coefficient of Utilization**



REPORT NUMBER: P382961

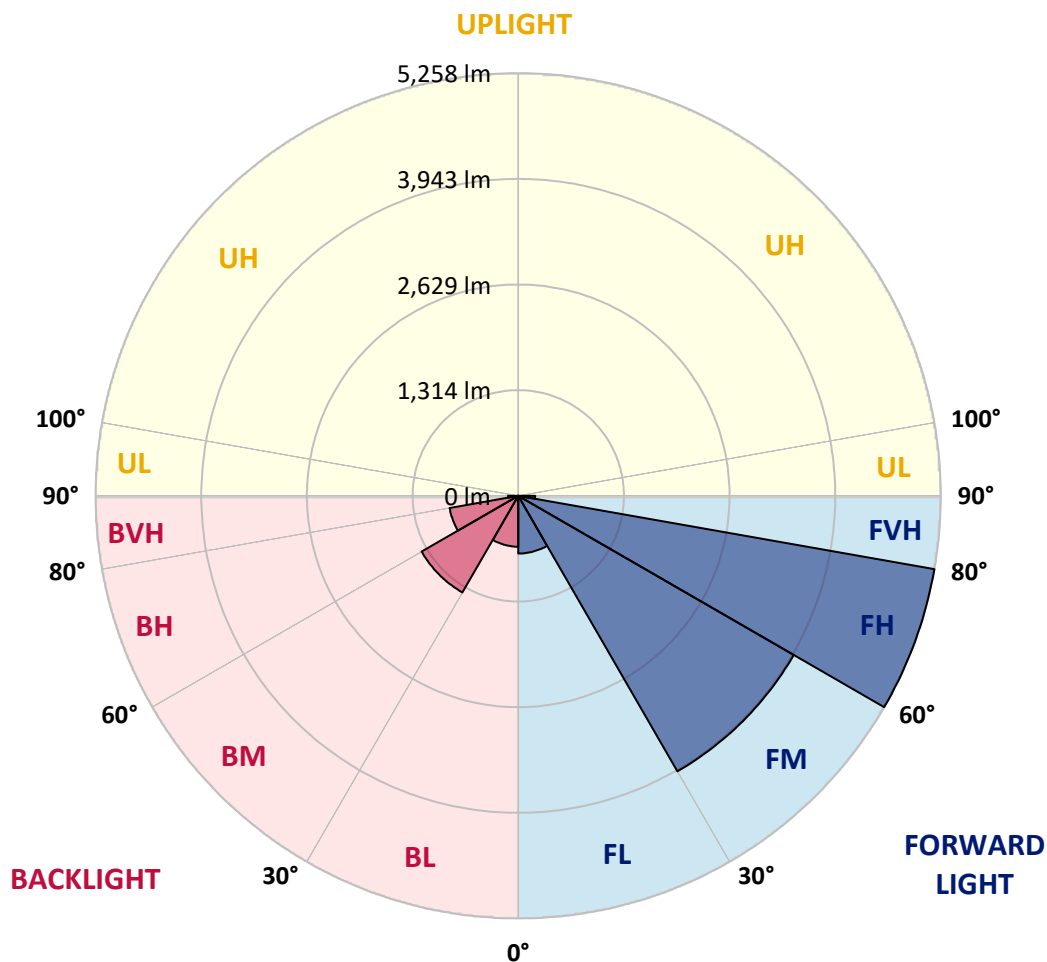
CATALOG NUMBER: GLEON-SA3A-735-U-T4W

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 718.1  | 5.5       |                         |      |         |
| FM   | (30°-60°)   | 3958.2 | 30.1      |                         |      |         |
| FH   | (60°-80°)   | 5257.7 | 39.9      |                         |      | G3/7500 |
| FVH  | (80°-90°)   | 210.4  | 1.6       |                         |      | G2/225  |
| BL   | (0°-30°)    | 633.3  | 4.8       | B2/1000                 |      |         |
| BM   | (30°-60°)   | 1388.6 | 10.6      | B2/2500                 |      |         |
| BH   | (60°-80°)   | 867.2  | 6.6       | B2/1000                 |      | G2/1000 |
| BVH  | (80°-90°)   | 127.4  | 1.0       |                         |      | G2/225  |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B2-U0-G3**

Type IV Short





REPORT NUMBER: P382961

CATALOG NUMBER: GLEON-SA3A-735-U-T4W

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 46°    | 55°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1340.9 | 1340.9 | 1340.9 | 1340.9 | 1340.9 | 1340.9 | 1340.9 | 1340.9 | 1340.9 | 1340.9 | 1340.9 |
| 2.5°  | 1407.9 | 1408.9 | 1410.6 | 1406.2 | 1393.5 | 1390.0 | 1388.6 | 1375.5 | 1367.0 | 1354.4 | 1343.6 |
| 5°    | 1520.6 | 1521.4 | 1518.7 | 1506.1 | 1478.2 | 1457.5 | 1455.7 | 1425.9 | 1398.9 | 1370.1 | 1348.5 |
| 7.5°  | 1638.1 | 1639.4 | 1630.9 | 1607.0 | 1567.8 | 1531.8 | 1529.6 | 1489.0 | 1448.0 | 1404.3 | 1371.9 |
| 10°   | 1742.2 | 1736.8 | 1722.8 | 1689.5 | 1643.1 | 1598.9 | 1597.1 | 1554.8 | 1507.5 | 1454.8 | 1411.6 |
| 12.5° | 1811.5 | 1807.0 | 1788.9 | 1748.4 | 1697.6 | 1657.0 | 1653.4 | 1614.2 | 1568.3 | 1510.6 | 1458.8 |
| 15°   | 1849.8 | 1852.9 | 1828.6 | 1782.7 | 1733.1 | 1698.9 | 1695.8 | 1667.8 | 1626.9 | 1568.7 | 1509.3 |
| 17.5° | 1854.7 | 1857.4 | 1834.0 | 1788.6 | 1748.0 | 1724.6 | 1723.3 | 1704.7 | 1675.0 | 1619.2 | 1557.0 |
| 20°   | 1825.9 | 1827.7 | 1808.3 | 1771.0 | 1744.4 | 1737.1 | 1736.8 | 1728.7 | 1706.6 | 1657.0 | 1596.7 |
| 22.5° | 1784.0 | 1785.4 | 1771.4 | 1744.4 | 1735.4 | 1746.7 | 1749.8 | 1746.7 | 1730.9 | 1684.5 | 1627.8 |
| 25°   | 1773.7 | 1772.7 | 1758.4 | 1730.9 | 1738.5 | 1762.4 | 1766.5 | 1767.8 | 1757.0 | 1716.5 | 1667.4 |
| 27.5° | 1823.7 | 1820.5 | 1793.0 | 1748.9 | 1753.8 | 1782.7 | 1788.1 | 1801.1 | 1794.3 | 1758.9 | 1712.5 |
| 30°   | 1968.3 | 1962.9 | 1906.5 | 1817.4 | 1793.0 | 1807.9 | 1814.7 | 1835.3 | 1836.7 | 1807.0 | 1772.4 |
| 32.5° | 2212.3 | 2205.6 | 2104.7 | 1945.3 | 1859.3 | 1833.6 | 1839.9 | 1870.9 | 1887.6 | 1864.7 | 1827.2 |
| 35°   | 2520.9 | 2513.2 | 2380.8 | 2162.8 | 1970.0 | 1882.7 | 1887.1 | 1911.9 | 1945.3 | 1912.8 | 1863.3 |
| 37.5° | 2842.4 | 2824.0 | 2696.6 | 2418.7 | 2146.2 | 1987.6 | 1987.6 | 1990.8 | 2006.6 | 1938.9 | 1905.7 |
| 40°   | 3162.2 | 3143.8 | 3028.5 | 2719.5 | 2374.0 | 2152.9 | 2142.6 | 2072.7 | 2060.1 | 2002.0 | 1990.8 |
| 42.5° | 3459.5 | 3454.1 | 3386.1 | 3059.6 | 2641.6 | 2315.5 | 2301.1 | 2182.6 | 2185.3 | 2149.3 | 2149.7 |
| 45°   | 3775.7 | 3775.7 | 3720.3 | 3402.8 | 2953.3 | 2576.8 | 2562.3 | 2388.0 | 2415.0 | 2398.4 | 2438.4 |
| 47.5° | 4033.8 | 4041.9 | 4034.3 | 3760.4 | 3315.8 | 2908.7 | 2882.6 | 2672.7 | 2748.3 | 2805.5 | 2922.2 |
| 50°   | 4297.2 | 4309.9 | 4311.2 | 4152.7 | 3754.0 | 3303.3 | 3273.5 | 3050.5 | 3219.4 | 3383.4 | 3612.6 |
| 52.5° | 4679.6 | 4708.0 | 4595.0 | 4544.1 | 4291.0 | 3771.6 | 3742.4 | 3536.5 | 3818.5 | 4048.6 | 4443.7 |
| 55°   | 5034.1 | 5009.3 | 4928.7 | 4960.2 | 4865.7 | 4305.0 | 4282.9 | 4102.3 | 4486.0 | 4785.1 | 5298.1 |
| 57.5° | 5226.0 | 5224.2 | 5305.3 | 5440.3 | 5485.4 | 4962.5 | 4944.0 | 4768.4 | 5238.6 | 5463.3 | 6100.2 |
| 60°   | 5451.1 | 5454.3 | 5655.2 | 5961.9 | 6147.5 | 5781.4 | 5773.2 | 5639.9 | 5969.6 | 6096.6 | 6729.4 |
| 62.5° | 5482.7 | 5539.4 | 5885.3 | 6413.2 | 6767.2 | 6738.0 | 6756.0 | 6425.0 | 6623.6 | 6602.0 | 7199.2 |
| 65°   | 5120.2 | 5194.9 | 5821.0 | 6549.7 | 7383.4 | 7784.3 | 7800.9 | 7214.5 | 7139.3 | 7033.9 | 7367.1 |
| 67.5° | 4377.0 | 4487.8 | 5167.9 | 6252.9 | 7586.5 | 8557.6 | 8581.0 | 7826.6 | 7567.1 | 7180.3 | 6962.8 |
| 70°   | 3185.2 | 3308.2 | 3992.8 | 5340.4 | 7224.4 | 8804.9 | 8831.4 | 8097.3 | 7583.4 | 6763.7 | 5943.9 |
| 72.5° | 1924.1 | 2020.5 | 2584.9 | 3931.5 | 6097.5 | 8354.5 | 8401.7 | 7754.1 | 6923.5 | 5729.1 | 4389.2 |
| 75°   | 844.9  | 908.0  | 1249.9 | 2265.5 | 4365.2 | 6912.3 | 6971.2 | 6637.1 | 5625.5 | 4163.5 | 2594.3 |
| 77.5° | 359.9  | 377.9  | 512.5  | 984.1  | 2467.8 | 4723.3 | 4804.4 | 4849.5 | 3816.6 | 2265.5 | 1096.2 |
| 80°   | 224.3  | 231.5  | 290.1  | 445.5  | 1154.8 | 2652.9 | 2740.2 | 2853.2 | 1895.2 | 832.8  | 382.9  |
| 82.5° | 136.5  | 144.6  | 192.7  | 269.3  | 601.3  | 1202.5 | 1244.5 | 1324.2 | 735.5  | 359.9  | 198.1  |
| 85°   | 82.0   | 87.8   | 118.0  | 170.3  | 342.3  | 472.9  | 472.5  | 522.5  | 346.3  | 231.5  | 104.5  |
| 87.5° | 39.2   | 43.7   | 63.1   | 88.3   | 172.5  | 177.5  | 166.2  | 188.3  | 210.3  | 151.7  | 52.7   |
| 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: P382961

CATALOG NUMBER: GLEON-SA3A-735-U-T4W

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1340.9 | 1340.9 | 1340.9 | 1340.9 | 1340.9 | 1340.9 | 1340.9 | 1340.9 | 1340.9 | 1340.9 | 1340.9 |
| 2.5°  | 1339.9 | 1338.2 | 1332.3 | 1327.7 | 1326.9 | 1324.2 | 1322.0 | 1323.3 | 1325.0 | 1325.5 | 1325.5 |
| 5°    | 1339.5 | 1334.5 | 1326.9 | 1323.7 | 1327.7 | 1333.1 | 1339.9 | 1349.0 | 1354.4 | 1358.4 | 1361.1 |
| 7.5°  | 1361.1 | 1351.7 | 1343.1 | 1341.3 | 1349.4 | 1363.8 | 1379.2 | 1398.1 | 1411.1 | 1420.1 | 1421.9 |
| 10°   | 1397.1 | 1385.4 | 1376.8 | 1378.7 | 1393.1 | 1413.8 | 1435.4 | 1459.7 | 1479.6 | 1491.7 | 1492.6 |
| 12.5° | 1438.6 | 1427.3 | 1419.2 | 1426.9 | 1450.7 | 1475.9 | 1498.5 | 1519.6 | 1537.7 | 1549.8 | 1549.8 |
| 15°   | 1486.3 | 1478.2 | 1468.8 | 1486.3 | 1518.7 | 1541.2 | 1550.7 | 1561.1 | 1571.0 | 1580.0 | 1578.2 |
| 17.5° | 1532.3 | 1524.6 | 1519.6 | 1540.4 | 1574.1 | 1584.5 | 1578.2 | 1570.5 | 1570.5 | 1575.5 | 1576.4 |
| 20°   | 1571.9 | 1565.1 | 1568.3 | 1588.6 | 1606.1 | 1595.3 | 1571.9 | 1547.6 | 1537.7 | 1540.4 | 1543.1 |
| 22.5° | 1606.5 | 1603.4 | 1612.9 | 1622.4 | 1609.7 | 1571.9 | 1528.7 | 1495.8 | 1483.6 | 1482.7 | 1483.6 |
| 25°   | 1647.1 | 1646.7 | 1658.3 | 1641.3 | 1585.4 | 1515.6 | 1457.5 | 1425.5 | 1418.7 | 1424.1 | 1433.2 |
| 27.5° | 1697.6 | 1702.5 | 1708.4 | 1645.8 | 1535.8 | 1430.5 | 1371.4 | 1349.4 | 1356.1 | 1369.2 | 1377.8 |
| 30°   | 1761.9 | 1775.4 | 1762.9 | 1634.5 | 1464.7 | 1333.1 | 1276.9 | 1270.5 | 1289.1 | 1307.5 | 1316.6 |
| 32.5° | 1824.5 | 1845.8 | 1815.1 | 1605.2 | 1372.8 | 1230.0 | 1186.3 | 1184.6 | 1207.1 | 1225.1 | 1237.7 |
| 35°   | 1875.0 | 1916.9 | 1854.3 | 1547.1 | 1266.5 | 1135.0 | 1103.0 | 1090.8 | 1098.9 | 1120.2 | 1134.5 |
| 37.5° | 1940.8 | 2010.6 | 1881.4 | 1458.4 | 1151.2 | 1056.7 | 1019.3 | 991.4  | 984.1  | 992.7  | 999.9  |
| 40°   | 2061.0 | 2153.4 | 1893.9 | 1334.5 | 1038.6 | 978.3  | 940.4  | 899.4  | 871.1  | 850.3  | 850.8  |
| 42.5° | 2257.4 | 2339.4 | 1885.8 | 1184.1 | 934.6  | 901.7  | 858.9  | 811.7  | 765.6  | 718.9  | 715.2  |
| 45°   | 2576.3 | 2615.9 | 1861.5 | 1024.7 | 843.1  | 821.5  | 781.5  | 734.2  | 672.9  | 619.8  | 614.8  |
| 47.5° | 3086.6 | 2998.7 | 1823.7 | 885.5  | 762.6  | 753.5  | 716.5  | 662.1  | 597.2  | 554.5  | 550.8  |
| 50°   | 3782.5 | 3551.4 | 1805.2 | 774.7  | 691.4  | 694.1  | 663.9  | 606.3  | 545.0  | 513.5  | 509.8  |
| 52.5° | 4614.8 | 4195.0 | 1840.7 | 689.1  | 634.2  | 643.6  | 621.1  | 567.0  | 515.7  | 490.9  | 487.3  |
| 55°   | 5478.2 | 4861.7 | 1879.0 | 626.9  | 580.1  | 598.6  | 590.9  | 546.4  | 500.0  | 477.0  | 473.8  |
| 57.5° | 6217.3 | 5359.3 | 1802.5 | 576.5  | 531.9  | 560.8  | 567.5  | 533.3  | 491.9  | 471.1  | 467.5  |
| 60°   | 6682.5 | 5559.8 | 1601.6 | 529.2  | 493.6  | 530.6  | 554.0  | 529.7  | 495.0  | 493.2  | 490.5  |
| 62.5° | 6903.2 | 5542.1 | 1300.3 | 491.9  | 469.8  | 517.5  | 563.9  | 549.9  | 531.0  | 547.2  | 548.6  |
| 65°   | 6804.2 | 5277.3 | 968.3  | 467.1  | 452.6  | 522.5  | 593.6  | 588.2  | 541.4  | 557.6  | 559.9  |
| 67.5° | 6152.0 | 4645.4 | 717.0  | 445.5  | 433.7  | 536.4  | 647.7  | 600.8  | 521.1  | 532.8  | 525.6  |
| 70°   | 4972.4 | 3682.9 | 553.1  | 421.2  | 414.4  | 534.6  | 672.0  | 593.2  | 499.0  | 501.7  | 482.4  |
| 72.5° | 3428.9 | 2511.5 | 449.9  | 398.6  | 386.4  | 487.3  | 654.9  | 574.3  | 480.6  | 459.8  | 434.2  |
| 75°   | 1864.7 | 1348.0 | 382.4  | 375.2  | 337.3  | 427.9  | 623.4  | 560.8  | 463.9  | 436.4  | 422.0  |
| 77.5° | 733.7  | 559.4  | 331.9  | 343.2  | 295.0  | 377.9  | 588.2  | 535.1  | 440.9  | 404.9  | 397.7  |
| 80°   | 299.5  | 285.5  | 275.2  | 296.8  | 253.6  | 330.6  | 545.9  | 504.9  | 413.4  | 375.6  | 361.3  |
| 82.5° | 169.8  | 177.5  | 214.0  | 234.2  | 205.9  | 304.4  | 525.6  | 480.6  | 380.6  | 336.5  | 319.3  |
| 85°   | 86.9   | 104.1  | 149.0  | 168.0  | 151.4  | 259.0  | 484.2  | 420.7  | 305.4  | 257.7  | 259.0  |
| 87.5° | 41.9   | 58.1   | 94.2   | 105.4  | 98.2   | 187.3  | 361.6  | 304.9  | 237.8  | 188.3  | 182.4  |
| 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

REPORT NUMBER: SP1-2101-121-7

| 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: SP1-2101-121-7

**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

REPORT NUMBER: SP1-2101-121-7

### 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       | 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              |           |                  |                  |

REPORT NUMBER: SP1-2101-121-7

### 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              |           |                  |                  |

REPORT NUMBER: SP1-2101-121-7

### 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              |           |                  |                  |

REPORT NUMBER: SP1-2101-121-7

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)