

Signify Classified - Internal  
Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269



Scaled data based on original data using  
LM-79-2019 Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Test Report Prepared for

Cooper Lighting Solutions

Brand: McGRAW-EDISON

Report Number: P632148

Luminaire Tested: GWS-SA2C-727-U-SL3-W-GRSBK

Issue Date: 1/10/2023

**Test Information**

Test Method: LM-79-2019  
Report Number: P632148  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-32)  
Test Lab: COOPER LIGHTING SOLUTIONS  
Issue Date: 1/10/2023  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: McGRAW-EDISON  
Catalog Number: GWS-SA2C-727-U-SL3-W-GRSBK  
Description: GALLEON WALL SLIM LUMINAIRE. (2) LIGHTSQUARES WITH 16 LEDS EACH AND TYPE III SPILL LIGHT ELIMINATOR OPTICS W/ FACTORY INSTALLED GLARE SHIELD, BK  
Light Source: (32) 2700K CCT, 70 CRI LEDS  
Ballast/Driver: -

**Summary**

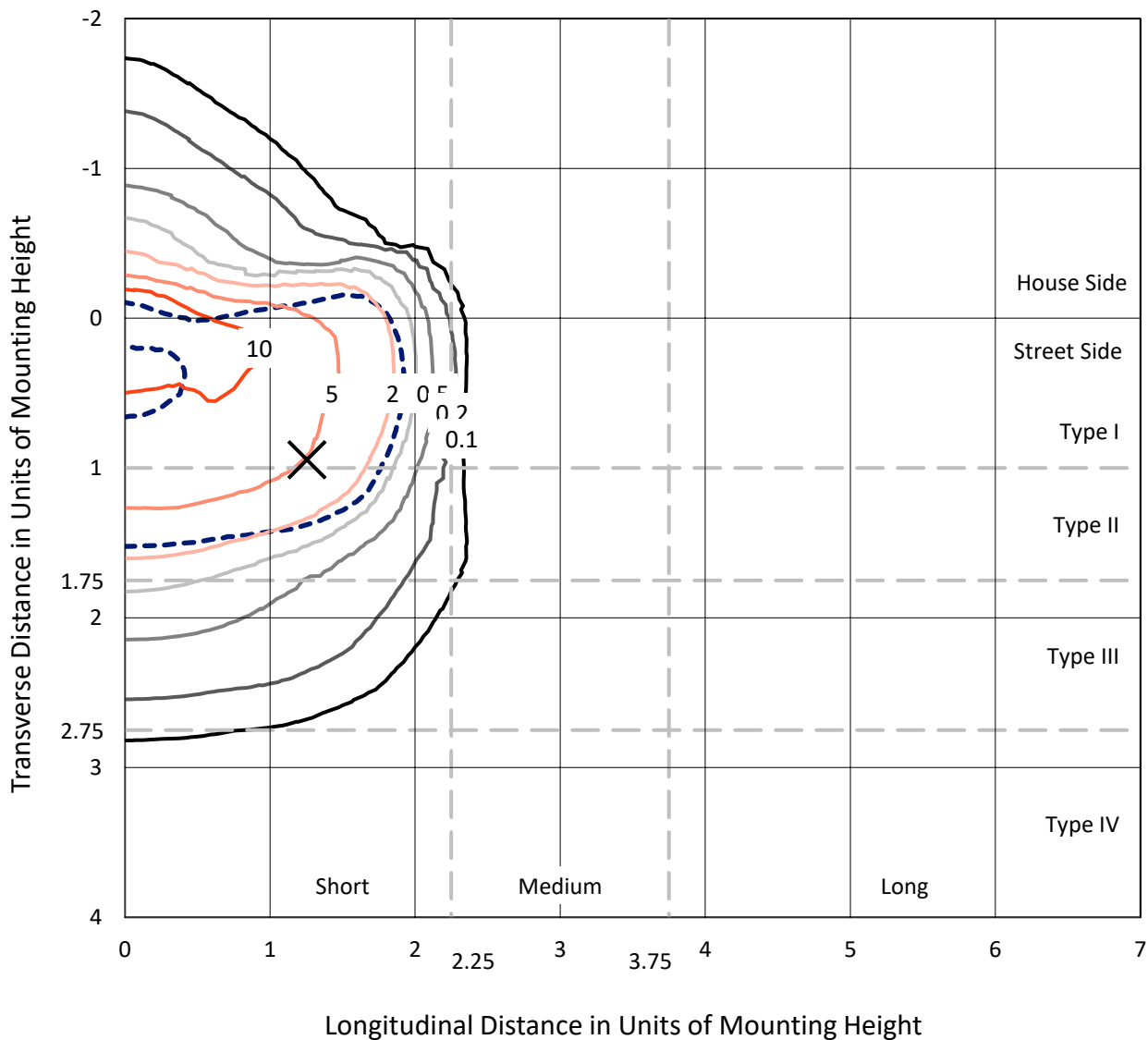
Lumens per Lamp: N/A  
Luminaire Lumens: 4527.2 lumens  
Efficiency: N/A  
Efficacy: 71.6 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 0.5' x H: 0')  
IES Classification: Type II - Short  
BUG Rating: B1 - U0 - G0  
  
Input Watts (W): 63.2  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 0  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT



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### Iso-Footcandle Lines of Horizontal Illumination

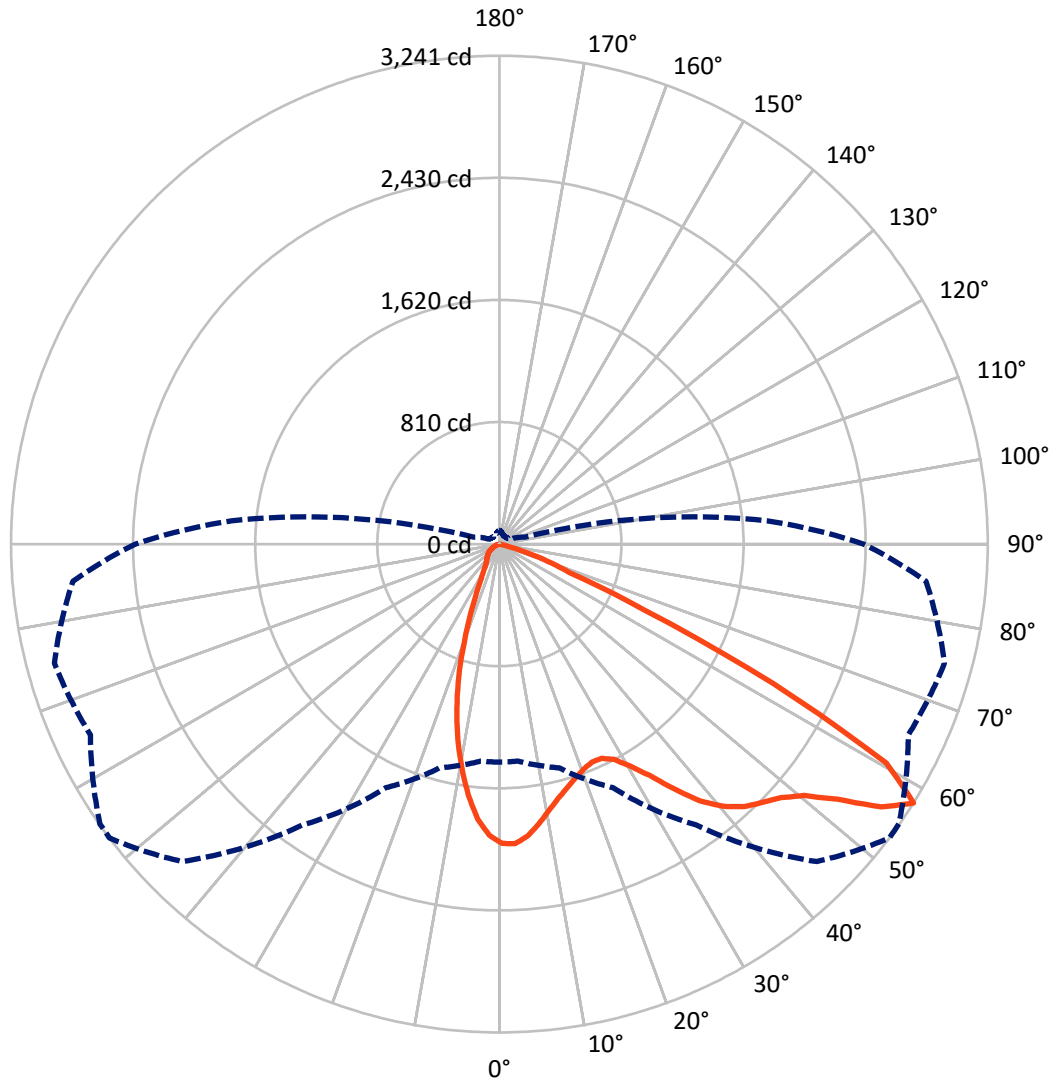
✕ Max cd  
 - - - 1/2 Max cd



Based on 10 foot mounting height. Maximum calculated value = 19.9 fc  
 Type II - Short - N/A

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### Luminous Intensity Polar Plot



— Vertical Plane Through 53-Deg Lateral    - - - Horizontal Cone Through 57.5-Deg Vertical

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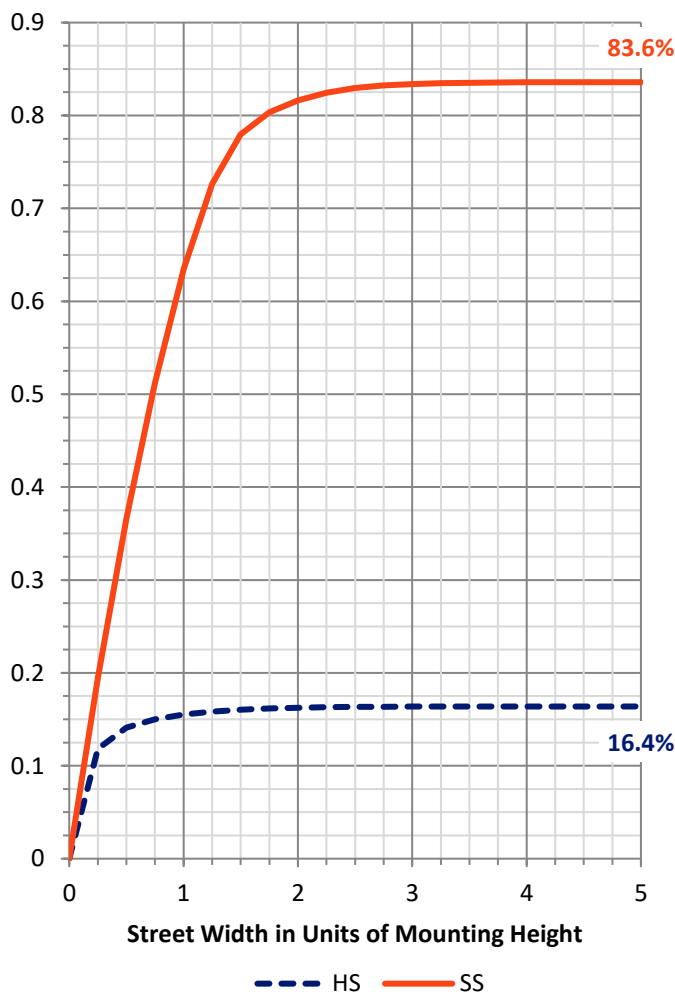
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 747.8    | 0.0    | 747.8  |
|                    | % Fixture | 16.5     | 0.0    | 16.5   |
| <b>Street Side</b> | Lumens    | 3779.4   | 0.0    | 3779.4 |
|                    | % Fixture | 83.5     | 0.0    | 83.5   |
| <b>Total</b>       | Lumens    | 4527.2   | 0.0    | 4527.2 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 169.9  | 3.8       |
| 10°-20°   | 373.0  | 8.2       |
| 20°-30°   | 485.9  | 10.7      |
| 30°-40°   | 704.9  | 15.6      |
| 40°-50°   | 1017.1 | 22.5      |
| 50°-60°   | 1230.0 | 27.2      |
| 60°-70°   | 501.3  | 11.1      |
| 70°-80°   | 45.1   | 1.0       |
| 80°-90°   | 0.0    | 0.0       |
| 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°    | 4527.2 | 100.0     |
| 0°-180°   | 4527.2 | 100.0     |

**Coefficient of Utilization**



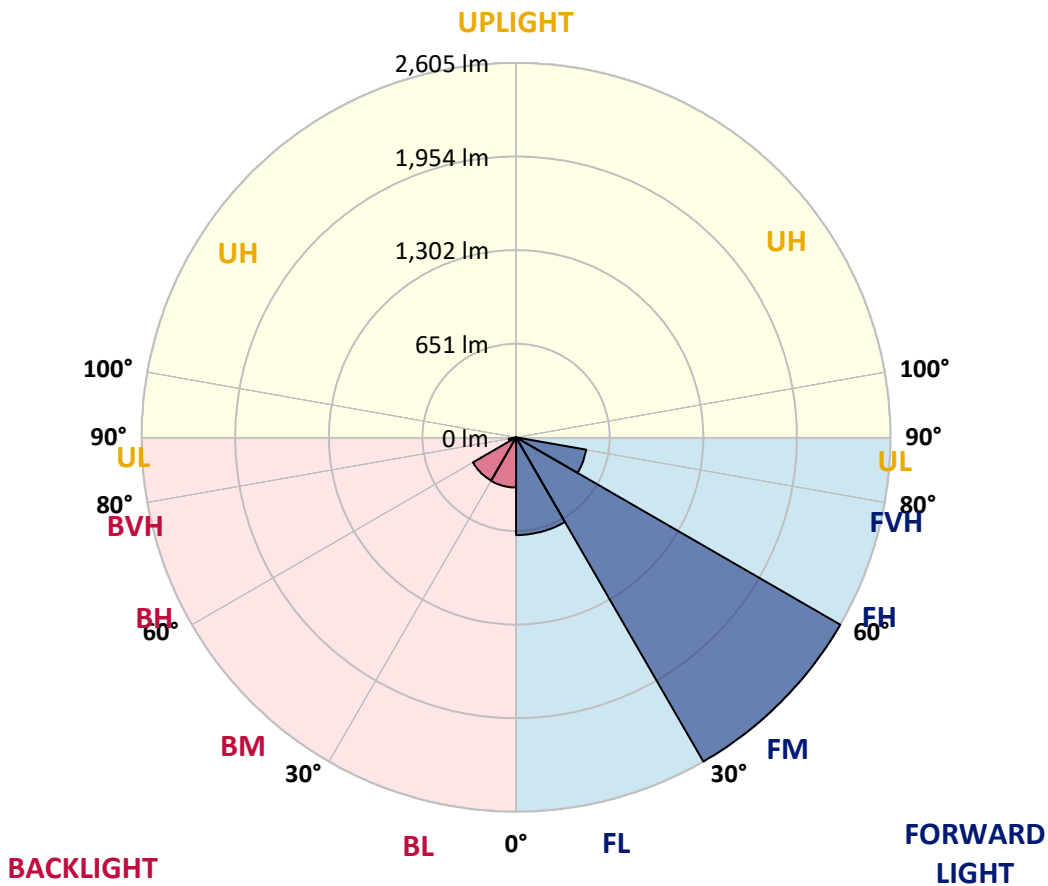
REPORT NUMBER: P632148

CATALOG NUMBER: GWS-SA2C-727-U-SL3-W-GRSBK

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

| Zone           | Lumens | % Fixture | Zone Rating/Lumen Limit |      |        |
|----------------|--------|-----------|-------------------------|------|--------|
|                |        |           | B                       | U    | G      |
| FL (0°-30°)    | 679.8  | 15.0      |                         |      |        |
| FM (30°-60°)   | 2604.9 | 57.5      |                         |      |        |
| FH (60°-80°)   | 494.7  | 10.9      |                         |      | G0/660 |
| FVH (80°-90°)  | 0.0    | 0.0       |                         |      | G0/10  |
| BL (0°-30°)    | 349.0  | 7.7       | B1/500                  |      |        |
| BM (30°-60°)   | 347.1  | 7.7       | B1/1000                 |      |        |
| BH (60°-80°)   | 51.7   | 1.1       | B0/110                  |      | G0/110 |
| BVH (80°-90°)  | 0.0    | 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-G0**  
 Type II Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 53°    | 55°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1985.9 | 1985.9 | 1985.9 | 1985.9 | 1985.9 | 1985.9 | 1985.9 | 1985.9 | 1985.9 | 1985.9 | 1985.9 |
| 2.5°  | 1958.1 | 1962.6 | 1970.4 | 1980.3 | 1987.0 | 1990.3 | 1990.3 | 1999.8 | 1993.7 | 1988.7 | 1983.1 |
| 5°    | 1874.4 | 1878.8 | 1889.3 | 1905.4 | 1921.5 | 1933.2 | 1946.5 | 1956.5 | 1960.4 | 1960.4 | 1950.9 |
| 7.5°  | 1756.2 | 1762.3 | 1768.9 | 1791.1 | 1826.1 | 1852.2 | 1874.9 | 1889.3 | 1910.4 | 1917.1 | 1903.8 |
| 10°   | 1629.1 | 1635.2 | 1650.2 | 1680.7 | 1720.7 | 1759.5 | 1798.3 | 1816.7 | 1852.7 | 1871.6 | 1856.6 |
| 12.5° | 1521.5 | 1524.2 | 1544.2 | 1580.8 | 1631.9 | 1685.1 | 1732.3 | 1751.2 | 1802.2 | 1830.5 | 1812.8 |
| 15°   | 1432.7 | 1434.3 | 1454.3 | 1494.8 | 1553.6 | 1619.1 | 1678.5 | 1697.9 | 1760.6 | 1803.3 | 1776.7 |
| 17.5° | 1365.5 | 1366.1 | 1383.3 | 1427.1 | 1488.7 | 1561.4 | 1631.9 | 1655.7 | 1736.8 | 1788.4 | 1748.4 |
| 20°   | 1331.7 | 1330.0 | 1342.2 | 1380.5 | 1438.8 | 1511.5 | 1594.7 | 1624.1 | 1723.4 | 1786.1 | 1726.8 |
| 22.5° | 1332.2 | 1328.4 | 1333.4 | 1360.5 | 1409.9 | 1478.2 | 1571.4 | 1604.7 | 1724.5 | 1795.6 | 1708.5 |
| 25°   | 1363.9 | 1358.3 | 1359.4 | 1373.9 | 1408.8 | 1471.0 | 1574.7 | 1610.2 | 1746.7 | 1827.2 | 1701.8 |
| 27.5° | 1417.1 | 1411.0 | 1411.0 | 1418.3 | 1437.1 | 1493.7 | 1616.3 | 1656.8 | 1806.1 | 1888.8 | 1715.7 |
| 30°   | 1485.9 | 1479.8 | 1477.6 | 1484.8 | 1500.4 | 1552.5 | 1709.0 | 1751.2 | 1907.7 | 1989.8 | 1760.1 |
| 32.5° | 1564.7 | 1557.5 | 1561.4 | 1571.4 | 1586.4 | 1658.5 | 1828.3 | 1884.3 | 2034.7 | 2125.7 | 1840.0 |
| 35°   | 1648.0 | 1641.9 | 1659.6 | 1681.3 | 1704.6 | 1805.6 | 1993.1 | 2041.9 | 2190.6 | 2295.0 | 1962.0 |
| 37.5° | 1727.3 | 1724.5 | 1761.7 | 1807.2 | 1855.5 | 1982.0 | 2160.7 | 2198.4 | 2324.4 | 2479.2 | 2111.3 |
| 40°   | 1806.7 | 1806.1 | 1869.9 | 1949.8 | 2026.9 | 2157.9 | 2287.7 | 2318.8 | 2405.9 | 2622.3 | 2254.4 |
| 42.5° | 1895.4 | 1895.4 | 1983.7 | 2090.2 | 2192.9 | 2306.6 | 2381.0 | 2394.8 | 2442.5 | 2705.0 | 2362.1 |
| 45°   | 1980.3 | 1985.3 | 2087.4 | 2211.2 | 2332.7 | 2422.6 | 2445.3 | 2446.4 | 2457.5 | 2753.8 | 2451.4 |
| 47.5° | 2047.5 | 2051.9 | 2174.0 | 2316.6 | 2447.5 | 2510.8 | 2514.1 | 2509.1 | 2496.9 | 2800.4 | 2520.2 |
| 50°   | 2101.9 | 2108.5 | 2236.1 | 2387.1 | 2526.3 | 2595.7 | 2621.2 | 2616.2 | 2585.2 | 2850.4 | 2568.5 |
| 52.5° | 2128.5 | 2137.9 | 2257.8 | 2422.0 | 2614.0 | 2741.1 | 2812.1 | 2823.7 | 2717.2 | 2878.1 | 2614.6 |
| 55°   | 1915.4 | 1929.3 | 2039.7 | 2264.4 | 2662.8 | 2965.8 | 3077.3 | 3075.1 | 2860.4 | 2960.8 | 2726.6 |
| 57.5° | 1446.6 | 1445.4 | 1537.0 | 1782.8 | 2274.4 | 2978.6 | 3240.5 | 3236.0 | 2994.1 | 3056.8 | 2841.5 |
| 60°   | 984.9  | 978.2  | 1002.7 | 1121.4 | 1590.3 | 2426.5 | 2949.1 | 3009.1 | 2899.2 | 2823.7 | 2412.6 |
| 62.5° | 810.7  | 804.6  | 796.8  | 764.1  | 913.3  | 1511.5 | 2037.5 | 2128.5 | 2114.1 | 1962.6 | 1513.1 |
| 65°   | 663.6  | 668.6  | 690.3  | 676.4  | 635.3  | 775.2  | 1057.6 | 1111.4 | 1016.0 | 855.1  | 528.8  |
| 67.5° | 489.4  | 491.6  | 519.9  | 593.2  | 571.0  | 516.0  | 497.7  | 506.6  | 296.9  | 136.5  | 88.2   |
| 70°   | 289.1  | 290.8  | 316.8  | 415.0  | 463.3  | 396.2  | 336.3  | 331.3  | 117.6  | 36.6   | 40.0   |
| 72.5° | 163.7  | 160.4  | 165.4  | 197.5  | 252.5  | 210.3  | 173.1  | 157.6  | 35.5   | 20.5   | 20.5   |
| 75°   | 77.7   | 75.5   | 64.9   | 61.0   | 55.5   | 35.5   | 22.2   | 18.9   | 8.9    | 8.3    | 8.3    |
| 77.5° | 0.6    | 1.7    | 1.1    | 1.7    | 1.7    | 1.1    | 0.6    | 0.6    | 1.7    | 1.7    | 2.2    |
| 80°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 82.5° | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 85°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 87.5° | 0.0    | 0.0    | 0.0    | 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    |



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 CATALOG NUMBER: GWS-SA2C-727-U-SL3-W-GRSBK

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1985.9 | 1985.9 | 1985.9 | 1985.9 | 1985.9 | 1985.9 | 1985.9 | 1985.9 | 1985.9 | 1985.9 | 1985.9 |
| 2.5°  | 1973.1 | 1956.5 | 1952.6 | 1951.5 | 1935.9 | 1919.3 | 1902.1 | 1895.4 | 1885.5 | 1879.4 | 1884.3 |
| 5°    | 1935.9 | 1912.1 | 1891.0 | 1871.6 | 1837.2 | 1799.5 | 1766.7 | 1745.6 | 1725.7 | 1712.3 | 1715.7 |
| 7.5°  | 1883.2 | 1852.2 | 1803.9 | 1754.5 | 1691.3 | 1634.7 | 1571.4 | 1532.6 | 1496.5 | 1476.5 | 1485.9 |
| 10°   | 1827.2 | 1786.1 | 1709.0 | 1625.2 | 1525.9 | 1437.1 | 1346.7 | 1272.9 | 1230.2 | 1189.6 | 1194.1 |
| 12.5° | 1772.3 | 1717.9 | 1602.5 | 1475.4 | 1350.0 | 1219.1 | 1082.6 | 980.5  | 910.5  | 860.1  | 852.3  |
| 15°   | 1721.2 | 1651.3 | 1498.7 | 1331.1 | 1160.2 | 986.0  | 811.8  | 665.8  | 584.8  | 534.9  | 531.6  |
| 17.5° | 1675.7 | 1589.2 | 1391.1 | 1180.2 | 966.0  | 743.0  | 542.7  | 433.4  | 386.7  | 365.1  | 362.9  |
| 20°   | 1631.9 | 1526.5 | 1281.2 | 1027.1 | 754.1  | 521.6  | 374.5  | 324.0  | 309.1  | 300.2  | 301.3  |
| 22.5° | 1589.7 | 1458.2 | 1165.8 | 857.3  | 565.4  | 366.2  | 290.2  | 270.8  | 269.1  | 270.2  | 270.8  |
| 25°   | 1554.2 | 1395.5 | 1047.0 | 693.6  | 403.4  | 279.1  | 242.5  | 236.9  | 241.9  | 249.1  | 250.2  |
| 27.5° | 1535.9 | 1344.5 | 931.1  | 528.8  | 291.9  | 226.9  | 210.3  | 212.5  | 221.4  | 229.2  | 230.3  |
| 30°   | 1540.9 | 1306.2 | 811.2  | 383.4  | 224.7  | 191.4  | 185.9  | 190.3  | 199.2  | 206.4  | 207.5  |
| 32.5° | 1576.4 | 1286.7 | 688.6  | 279.1  | 184.8  | 167.0  | 164.8  | 168.1  | 175.9  | 181.4  | 182.0  |
| 35°   | 1646.9 | 1291.2 | 572.1  | 213.6  | 158.7  | 148.7  | 148.2  | 150.4  | 154.3  | 158.1  | 158.7  |
| 37.5° | 1750.6 | 1327.3 | 457.2  | 177.6  | 143.7  | 136.5  | 134.3  | 134.3  | 137.1  | 138.7  | 139.8  |
| 40°   | 1862.2 | 1381.6 | 366.2  | 157.0  | 133.2  | 125.4  | 121.0  | 119.3  | 121.5  | 123.7  | 124.3  |
| 42.5° | 1954.3 | 1436.0 | 297.4  | 142.6  | 124.8  | 114.3  | 108.8  | 107.6  | 110.4  | 114.3  | 115.4  |
| 45°   | 2024.7 | 1478.2 | 248.0  | 130.9  | 115.4  | 103.8  | 97.7   | 97.7   | 102.7  | 109.3  | 110.4  |
| 47.5° | 2089.1 | 1512.0 | 211.4  | 120.4  | 106.5  | 94.3   | 88.2   | 89.3   | 97.7   | 106.5  | 108.2  |
| 50°   | 2132.9 | 1539.2 | 184.2  | 111.0  | 99.3   | 86.6   | 81.0   | 83.2   | 93.2   | 103.8  | 105.4  |
| 52.5° | 2180.1 | 1572.5 | 166.5  | 102.7  | 92.7   | 80.5   | 75.5   | 77.1   | 88.2   | 99.9   | 102.1  |
| 55°   | 2310.5 | 1684.0 | 165.9  | 91.6   | 81.0   | 72.1   | 69.9   | 70.5   | 81.6   | 94.9   | 97.7   |
| 57.5° | 2417.0 | 1782.2 | 177.0  | 77.1   | 67.7   | 63.3   | 62.1   | 62.7   | 72.7   | 87.7   | 91.0   |
| 60°   | 1999.8 | 1385.0 | 146.5  | 63.8   | 56.6   | 55.5   | 53.8   | 54.9   | 64.4   | 77.7   | 80.5   |
| 62.5° | 1183.5 | 791.8  | 69.9   | 48.8   | 48.3   | 47.2   | 45.5   | 47.7   | 56.6   | 68.2   | 69.9   |
| 65°   | 404.5  | 234.7  | 44.4   | 40.0   | 41.1   | 39.4   | 37.7   | 40.0   | 47.7   | 54.4   | 54.9   |
| 67.5° | 77.7   | 62.1   | 35.5   | 33.3   | 33.8   | 30.5   | 30.0   | 32.2   | 36.6   | 37.7   | 37.2   |
| 70°   | 40.5   | 36.1   | 27.2   | 27.2   | 26.1   | 21.6   | 21.6   | 23.9   | 23.9   | 22.2   | 21.6   |
| 72.5° | 21.1   | 20.0   | 17.8   | 20.0   | 16.6   | 13.3   | 13.3   | 14.4   | 13.3   | 11.1   | 11.1   |
| 75°   | 8.3    | 8.3    | 7.8    | 10.0   | 7.2    | 6.1    | 5.5    | 6.7    | 5.0    | 3.9    | 3.9    |
| 77.5° | 2.2    | 2.2    | 2.2    | 2.8    | 1.7    | 1.7    | 1.1    | 1.1    | 0.6    | 0.0    | 0.0    |
| 80°   | 0.0    | 0.6    | 0.0    | 0.6    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 82.5° | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 85°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 87.5° | 0.0    | 0.0    | 0.0    | 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    |



Signify Classified - Internal  
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LM-79-2008: Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Report Prepared for

Cooper Lighting Solutions

McGRAW-EDISON

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

Test Date: 08/20/2019

Luminaire Tested: SA1C-727-U-5WQ

**Test Information**

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

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

**Spectral Parameters**

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

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

Rf: 69.9  
 Rg: 98.3



**Test Conditions**

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

REPORT NUMBER: SP1-1908-441-1-R4

| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 6/28/2019        | 12/28/2019           |
| Power Meter                    | IN0071                | 12/5/2018        | 12/5/2019            |
| AC Power Source                | IN0063                | 12/5/2018        | 12/5/2019            |
| DC Power Source                | IN0208                | 12/5/2018        | 12/5/2019            |
| Sphere Thermometer             | IN0085                | 12/5/2018        | 12/5/2019            |
| Room Thermometer               | IN0046                | 12/5/2018        | 12/5/2019            |

REPORT NUMBER: SP1-1908-441-1-R4

CIE 1931 Chromaticity Diagram



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



Point lies inside the ANSI 2700K 4-step quadrangle

REPORT NUMBER: SP1-1908-441-1-R4

**Photopic Flux vs. Wavelength**



**Photopic Lumens: 6211.7**

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

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Scotopic Flux vs. Wavelength



Scotopic Lumens: 6474.3

S/P: 1.04

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

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Melanopic Flux vs. Wavelength



Melanopic Lumens: 2145.7 M/P: 0.35

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

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TM-30-18

**Summary**

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



**Color Vector Graphics**





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

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



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Color Rendition by Hue-Angle Bin



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Measure Comparisons



(END OF REPORT)