

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: STREETWORKS

Report Number: P359454

Luminaire Tested: NVN-SA2A-730-U-SL3

Issue Date: 3/3/2020

### Test Information

Test Method: LM-79-2019  
Report Number: P359454  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-22)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: STREETWORKS  
Catalog Number: NVN-SA2A-730-U-SL3  
Description: NAVION ROADWAY AND AREA LUMINAIRE  
(2) 70 CRI, 3000K, 615mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE III  
SPILL LIGHT ELIMINATOR OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

### Summary

Lumens per Lamp: N/A  
Luminaire Lumens: 8674 lumens  
Efficiency: N/A  
Efficacy: 131.4 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 1' x H: 0')  
IES Classification: Type III - Medium  
BUG Rating: B1 - U0 - G3

Input Watts (W): 66  
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: 28.75 FT



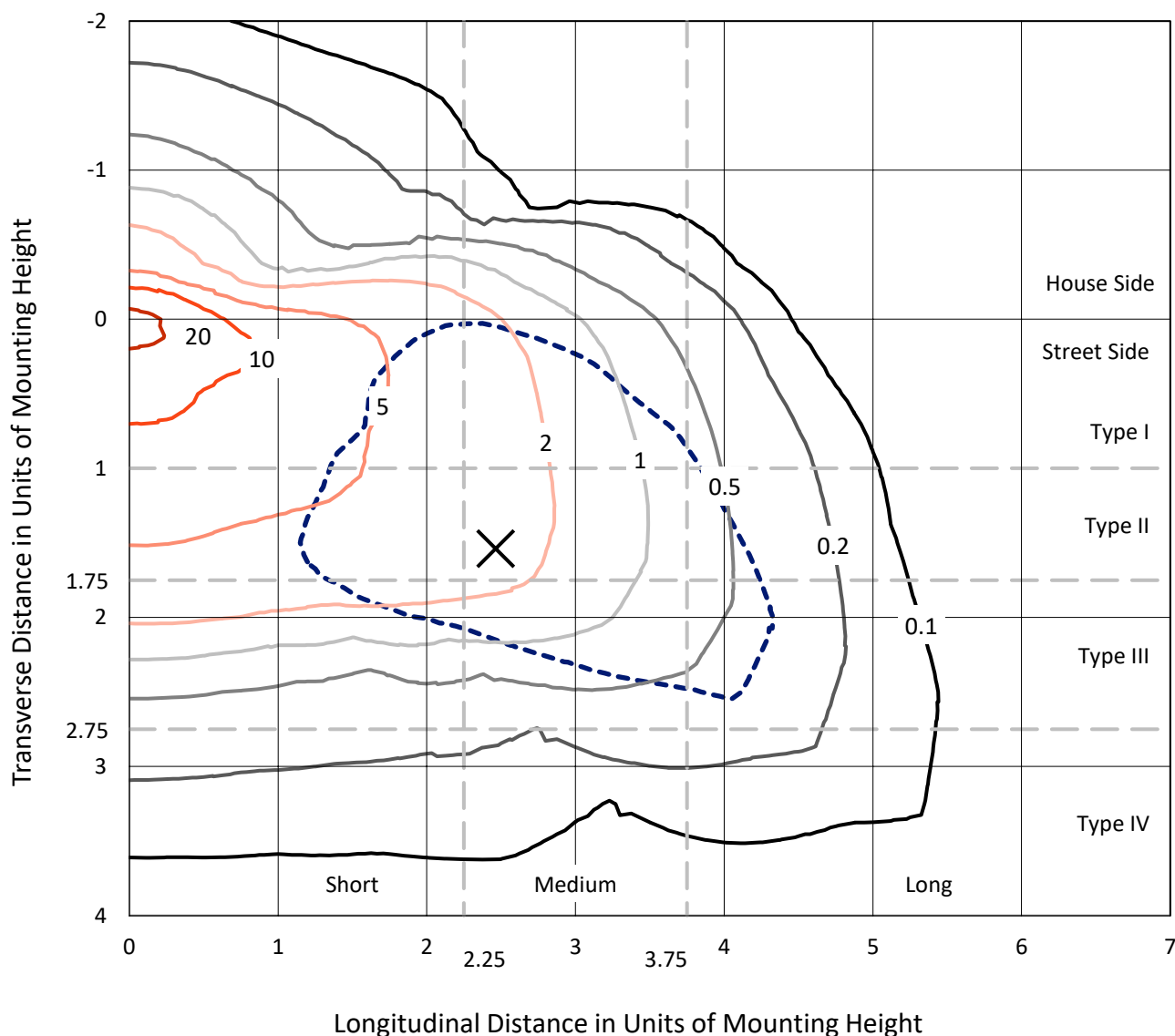
REPORT NUMBER: P359454

CATALOG NUMBER: NVN-SA2A-730-U-SL3

## Iso-Footcandle Lines of Horizontal Illumination

× Max cd

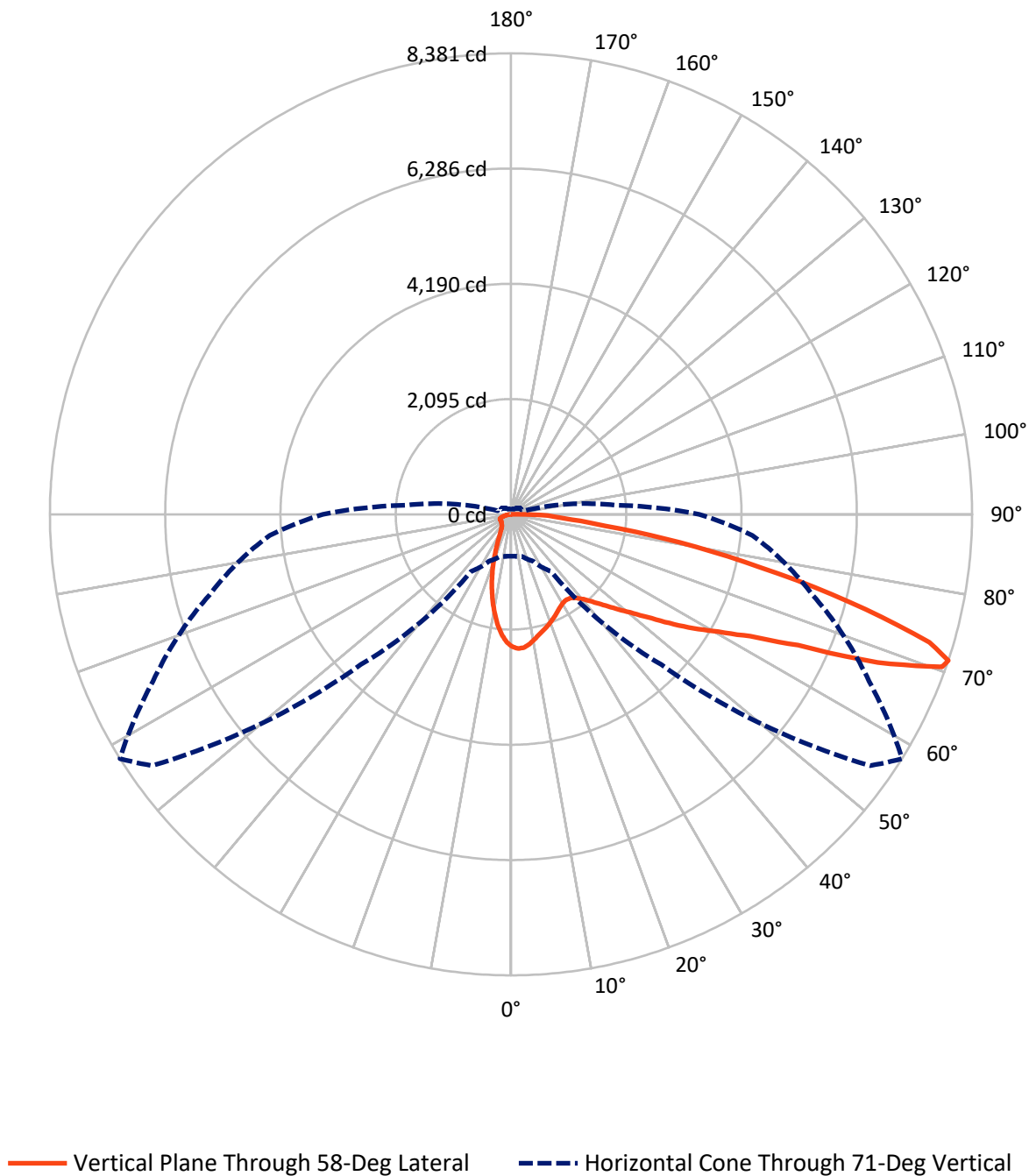
--- 1/2 Max cd



Based on 10 foot mounting height. Maximum calculated value = 24 fc  
 Type III - Medium - N/A

REPORT NUMBER: P359454  
CATALOG NUMBER: NVN-SA2A-730-U-SL3

## Luminous Intensity Polar Plot



REPORT NUMBER: P359454

CATALOG NUMBER: NVN-SA2A-730-U-SL3

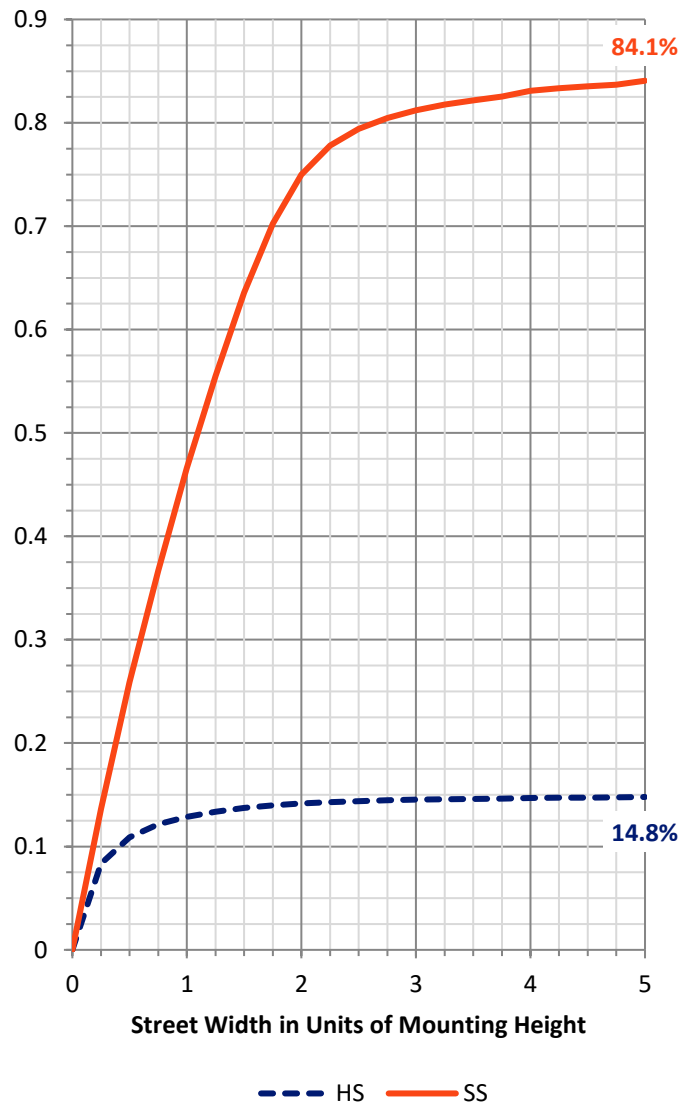
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 1296.8   | 0.0    | 1296.8 |
|                    | % Fixture | 15.0     | 0.0    | 15.0   |
| <b>Street Side</b> | Lumens    | 7377.2   | 0.0    | 7377.2 |
|                    | % Fixture | 85.0     | 0.0    | 85.0   |
| <b>Total</b>       | Lumens    | 8674.0   | 0.0    | 8674.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 207.3  | 2.4       |
| 10°-20°   | 461.0  | 5.3       |
| 20°-30°   | 585.9  | 6.8       |
| 30°-40°   | 746.3  | 8.6       |
| 40°-50°   | 1058.3 | 12.2      |
| 50°-60°   | 1637.8 | 18.9      |
| 60°-70°   | 2229.7 | 25.7      |
| 70°-80°   | 1487.5 | 17.1      |
| 80°-90°   | 260.1  | 3.0       |
| 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°    | 8674.0 | 100.0     |
| 0°-180°   | 8674.0 | 100.0     |

**Coefficient of Utilization**



REPORT NUMBER: P359454

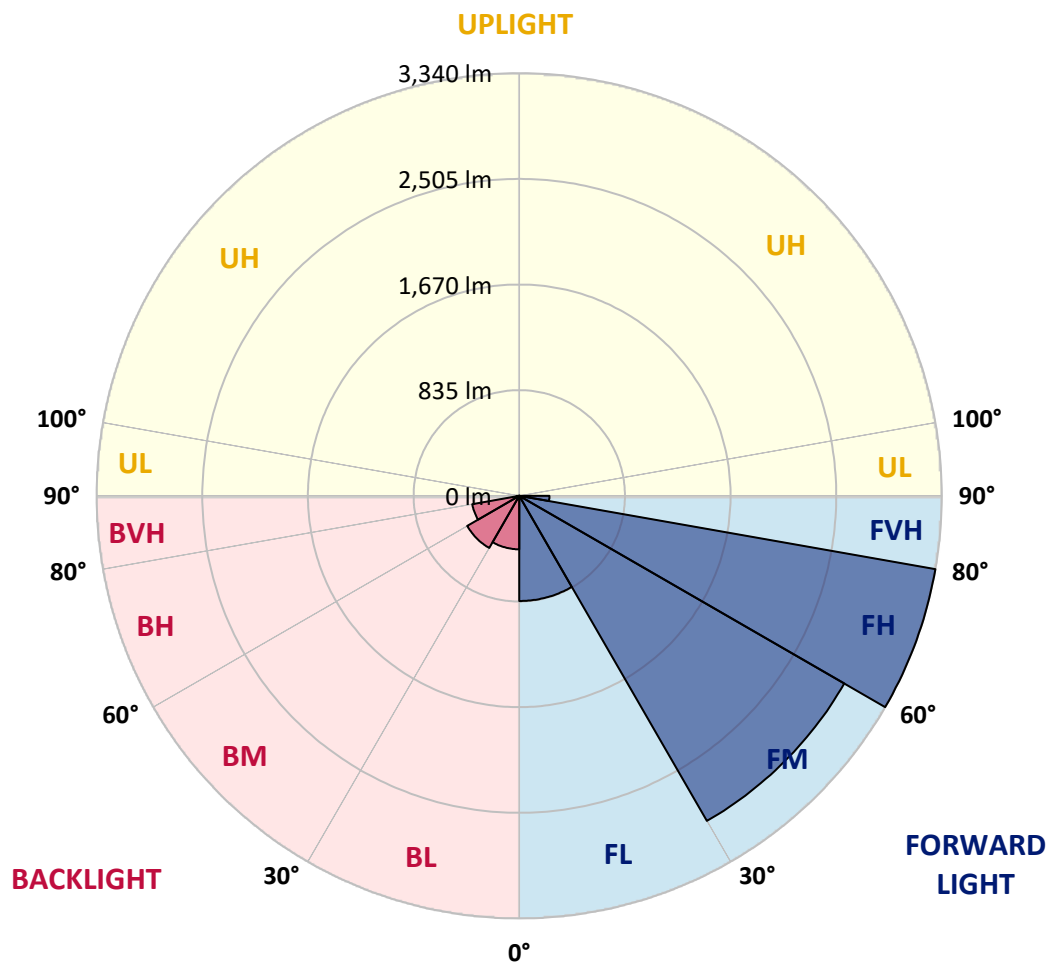
CATALOG NUMBER: NVN-SA2A-730-U-SL3

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 831.5  | 9.6       |                         |      |         |
| FM   | (30°-60°)   | 2966.9 | 34.2      |                         |      |         |
| FH   | (60°-80°)   | 3340.3 | 38.5      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 238.4  | 2.7       |                         |      | G3/500  |
| BL   | (0°-30°)    | 422.7  | 4.9       | B1/500                  |      |         |
| BM   | (30°-60°)   | 475.6  | 5.5       | B1/1000                 |      |         |
| BH   | (60°-80°)   | 376.9  | 4.3       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 21.6   | 0.2       |                         |      | G1/100  |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

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

Type III Medium





REPORT NUMBER: P359454

CATALOG NUMBER: NVN-SA2A-730-U-SL3

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 58°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 2403.3 | 2403.3 | 2403.3 | 2403.3 | 2403.3 | 2403.3 | 2403.3 | 2403.3 | 2403.3 | 2403.3 | 2403.3 |
| 2.5°  | 2467.0 | 2463.7 | 2464.9 | 2462.5 | 2456.8 | 2451.0 | 2442.6 | 2444.1 | 2432.3 | 2414.8 | 2393.0 |
| 5°    | 2420.5 | 2419.3 | 2428.4 | 2433.5 | 2437.7 | 2434.4 | 2432.0 | 2435.0 | 2417.8 | 2393.6 | 2355.8 |
| 7.5°  | 2322.9 | 2309.6 | 2321.1 | 2338.3 | 2354.6 | 2367.0 | 2383.3 | 2385.5 | 2374.6 | 2349.2 | 2299.6 |
| 10°   | 2184.2 | 2171.5 | 2188.5 | 2215.3 | 2248.0 | 2277.6 | 2310.5 | 2316.6 | 2318.7 | 2295.7 | 2235.6 |
| 12.5° | 2040.4 | 2030.7 | 2047.7 | 2085.4 | 2139.5 | 2185.1 | 2237.7 | 2246.8 | 2265.5 | 2250.1 | 2176.4 |
| 15°   | 1911.7 | 1908.1 | 1928.6 | 1965.8 | 2028.0 | 2097.8 | 2173.6 | 2190.3 | 2222.0 | 2216.9 | 2130.1 |
| 17.5° | 1800.5 | 1799.6 | 1815.3 | 1854.3 | 1923.2 | 2011.4 | 2109.9 | 2138.0 | 2185.1 | 2191.2 | 2092.1 |
| 20°   | 1717.7 | 1715.9 | 1726.8 | 1755.5 | 1826.5 | 1926.5 | 2041.0 | 2079.7 | 2147.7 | 2168.8 | 2052.8 |
| 22.5° | 1673.3 | 1673.0 | 1673.3 | 1686.9 | 1744.9 | 1838.0 | 1973.9 | 2021.1 | 2111.1 | 2151.0 | 2009.3 |
| 25°   | 1665.7 | 1664.8 | 1658.2 | 1656.7 | 1689.6 | 1763.9 | 1907.5 | 1959.4 | 2076.4 | 2138.6 | 1967.9 |
| 27.5° | 1685.4 | 1686.6 | 1677.8 | 1663.6 | 1670.3 | 1715.3 | 1849.7 | 1905.3 | 2048.6 | 2136.2 | 1939.2 |
| 30°   | 1726.2 | 1725.6 | 1718.0 | 1703.2 | 1690.2 | 1697.2 | 1808.7 | 1864.2 | 2029.8 | 2146.8 | 1919.5 |
| 32.5° | 1771.2 | 1774.5 | 1773.0 | 1764.8 | 1745.5 | 1717.7 | 1796.3 | 1850.7 | 2024.4 | 2172.1 | 1911.1 |
| 35°   | 1825.3 | 1828.9 | 1839.8 | 1846.1 | 1823.5 | 1778.7 | 1822.9 | 1870.0 | 2040.1 | 2219.9 | 1924.7 |
| 37.5° | 1876.6 | 1886.0 | 1916.5 | 1943.4 | 1924.1 | 1874.2 | 1893.6 | 1927.1 | 2088.7 | 2295.1 | 1961.2 |
| 40°   | 1935.9 | 1944.0 | 1993.9 | 2051.0 | 2048.0 | 1996.3 | 2007.5 | 2029.8 | 2174.6 | 2403.0 | 2027.4 |
| 42.5° | 1994.2 | 2010.5 | 2082.7 | 2163.7 | 2186.9 | 2141.3 | 2159.1 | 2170.9 | 2295.4 | 2545.9 | 2142.8 |
| 45°   | 2071.8 | 2089.3 | 2189.7 | 2287.3 | 2341.6 | 2316.0 | 2344.4 | 2348.9 | 2447.4 | 2740.5 | 2310.5 |
| 47.5° | 2189.4 | 2209.3 | 2326.2 | 2428.7 | 2511.7 | 2514.5 | 2561.3 | 2559.5 | 2637.1 | 2963.2 | 2521.7 |
| 50°   | 2372.5 | 2401.2 | 2496.9 | 2592.7 | 2693.6 | 2749.8 | 2812.4 | 2803.6 | 2864.7 | 3200.3 | 2764.9 |
| 52.5° | 2612.4 | 2625.7 | 2696.7 | 2767.4 | 2892.8 | 3018.8 | 3108.5 | 3100.6 | 3122.7 | 3444.2 | 3041.1 |
| 55°   | 2861.0 | 2871.0 | 2900.3 | 2939.0 | 3107.6 | 3313.0 | 3502.8 | 3490.4 | 3434.5 | 3697.4 | 3313.9 |
| 57.5° | 3084.6 | 3104.9 | 3125.1 | 3141.1 | 3323.9 | 3620.6 | 3906.2 | 3907.1 | 3772.9 | 3970.5 | 3595.9 |
| 60°   | 3119.4 | 3137.2 | 3271.0 | 3397.3 | 3694.1 | 4030.9 | 4337.9 | 4328.9 | 4123.1 | 4266.9 | 3910.1 |
| 62.5° | 2757.4 | 2797.6 | 3021.2 | 3357.2 | 4050.6 | 4781.5 | 4888.7 | 4877.6 | 4541.9 | 4632.2 | 4276.0 |
| 65°   | 1976.0 | 2021.7 | 2291.5 | 2796.4 | 3877.8 | 5608.5 | 5882.8 | 5732.3 | 5112.9 | 5081.5 | 4704.4 |
| 67.5° | 1140.0 | 1150.9 | 1267.8 | 1673.3 | 2952.6 | 5651.7 | 7399.3 | 7188.7 | 5999.7 | 5591.2 | 4914.1 |
| 70°   | 843.0  | 842.7  | 870.5  | 1029.7 | 1597.8 | 4612.6 | 8120.5 | 8309.3 | 6933.4 | 5758.9 | 4617.7 |
| 71°   | 762.3  | 763.2  | 794.3  | 937.3  | 1265.4 | 3860.8 | 7967.3 | 8380.7 | 7179.3 | 5676.1 | 4403.2 |
| 72.5° | 652.0  | 655.1  | 698.3  | 840.6  | 1064.5 | 2662.5 | 7307.4 | 7952.8 | 7295.9 | 5471.9 | 4067.5 |
| 75°   | 494.6  | 501.6  | 561.4  | 708.5  | 972.9  | 1350.3 | 5363.1 | 6350.5 | 6481.4 | 4828.3 | 3022.4 |
| 77.5° | 352.9  | 360.8  | 428.4  | 595.8  | 924.9  | 1017.6 | 3591.6 | 4632.2 | 4769.7 | 3094.3 | 1363.3 |
| 80°   | 223.0  | 232.4  | 283.4  | 474.1  | 869.0  | 966.3  | 2257.0 | 3113.6 | 2600.9 | 990.1  | 346.9  |
| 82.5° | 130.8  | 138.1  | 175.8  | 309.7  | 709.7  | 930.6  | 1327.9 | 1725.9 | 1012.2 | 299.1  | 157.7  |
| 85°   | 75.8   | 79.2   | 109.7  | 197.3  | 515.5  | 878.3  | 975.6  | 964.8  | 439.3  | 146.2  | 74.6   |
| 87.5° | 35.4   | 39.3   | 65.0   | 103.0  | 286.1  | 636.6  | 771.1  | 666.2  | 273.1  | 68.6   | 35.0   |
| 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: P359454

CATALOG NUMBER: NVN-SA2A-730-U-SL3

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 2403.3 | 2403.3 | 2403.3 | 2403.3 | 2403.3 | 2403.3 | 2403.3 | 2403.3 | 2403.3 | 2403.3 | 2403.3 |
| 2.5°  | 2382.4 | 2377.3 | 2355.8 | 2336.8 | 2316.9 | 2290.9 | 2262.2 | 2258.5 | 2241.0 | 2244.3 | 2238.3 |
| 5°    | 2335.3 | 2322.3 | 2270.6 | 2223.8 | 2168.5 | 2119.0 | 2065.2 | 2040.4 | 2004.7 | 2002.3 | 1993.3 |
| 7.5°  | 2267.9 | 2243.7 | 2163.7 | 2074.8 | 1986.0 | 1901.4 | 1817.7 | 1762.7 | 1706.5 | 1682.7 | 1680.5 |
| 10°   | 2192.1 | 2151.0 | 2033.1 | 1901.7 | 1773.6 | 1650.0 | 1530.4 | 1441.8 | 1362.1 | 1324.3 | 1322.8 |
| 12.5° | 2120.2 | 2059.4 | 1897.8 | 1718.9 | 1543.7 | 1383.5 | 1219.5 | 1103.1 | 1003.1 | 969.6  | 955.4  |
| 15°   | 2059.1 | 1973.6 | 1766.0 | 1537.3 | 1324.6 | 1102.2 | 915.5  | 793.1  | 700.7  | 668.7  | 662.6  |
| 17.5° | 1999.9 | 1889.9 | 1631.0 | 1353.9 | 1096.8 | 852.4  | 665.3  | 574.4  | 525.1  | 512.1  | 511.8  |
| 20°   | 1941.0 | 1803.8 | 1489.9 | 1166.3 | 876.5  | 637.5  | 511.5  | 470.7  | 454.1  | 452.6  | 450.2  |
| 22.5° | 1874.2 | 1712.6 | 1341.5 | 978.1  | 684.1  | 501.3  | 434.8  | 418.5  | 416.4  | 421.8  | 421.8  |
| 25°   | 1811.7 | 1621.9 | 1191.1 | 793.7  | 532.1  | 418.2  | 388.3  | 384.9  | 390.7  | 400.3  | 401.3  |
| 27.5° | 1753.4 | 1534.6 | 1044.2 | 630.0  | 426.3  | 368.3  | 355.9  | 359.9  | 370.1  | 381.3  | 381.6  |
| 30°   | 1705.3 | 1452.1 | 901.6  | 496.4  | 360.2  | 331.2  | 329.0  | 336.9  | 348.1  | 356.8  | 359.0  |
| 32.5° | 1668.2 | 1381.7 | 763.8  | 399.1  | 317.0  | 303.4  | 305.2  | 311.8  | 318.8  | 323.6  | 326.9  |
| 35°   | 1650.9 | 1321.3 | 636.6  | 336.6  | 289.5  | 281.9  | 284.3  | 287.9  | 291.0  | 294.6  | 297.3  |
| 37.5° | 1654.0 | 1274.5 | 523.0  | 297.6  | 271.0  | 267.1  | 267.1  | 267.1  | 267.1  | 268.9  | 269.2  |
| 40°   | 1682.1 | 1247.6 | 430.6  | 272.8  | 258.6  | 254.4  | 251.1  | 248.1  | 245.6  | 246.9  | 246.2  |
| 42.5° | 1754.0 | 1245.1 | 362.9  | 257.1  | 248.7  | 241.7  | 235.1  | 230.8  | 227.8  | 229.0  | 229.6  |
| 45°   | 1876.0 | 1275.4 | 317.3  | 245.9  | 239.3  | 228.7  | 220.3  | 215.7  | 213.6  | 217.5  | 218.2  |
| 47.5° | 2034.1 | 1341.2 | 289.5  | 237.8  | 230.5  | 216.6  | 207.6  | 203.3  | 203.9  | 209.7  | 211.2  |
| 50°   | 2237.7 | 1448.2 | 276.2  | 232.7  | 224.5  | 206.4  | 197.0  | 193.4  | 195.2  | 203.3  | 205.2  |
| 52.5° | 2461.3 | 1602.3 | 277.7  | 231.1  | 220.6  | 198.8  | 188.8  | 184.6  | 187.6  | 195.2  | 196.7  |
| 55°   | 2719.3 | 1787.5 | 302.8  | 233.3  | 214.8  | 194.0  | 182.2  | 174.9  | 177.4  | 184.3  | 185.5  |
| 57.5° | 3006.1 | 1999.6 | 353.2  | 232.7  | 207.6  | 189.4  | 175.2  | 164.4  | 166.2  | 170.4  | 171.6  |
| 60°   | 3304.6 | 2255.8 | 431.5  | 234.5  | 204.3  | 184.0  | 165.9  | 152.3  | 151.7  | 155.3  | 155.9  |
| 62.5° | 3662.9 | 2552.2 | 520.9  | 235.7  | 206.4  | 177.1  | 153.5  | 140.2  | 138.4  | 139.3  | 139.9  |
| 65°   | 4032.2 | 2766.8 | 487.4  | 230.8  | 213.0  | 171.3  | 142.6  | 128.4  | 125.1  | 124.5  | 124.8  |
| 67.5° | 4043.6 | 2536.8 | 341.7  | 221.2  | 215.7  | 168.3  | 134.5  | 118.4  | 113.0  | 110.9  | 110.6  |
| 70°   | 3626.4 | 2060.9 | 266.2  | 210.9  | 204.9  | 163.5  | 126.9  | 110.3  | 102.1  | 98.8   | 98.5   |
| 71°   | 3422.7 | 1897.2 | 252.3  | 205.8  | 196.7  | 158.6  | 123.6  | 106.7  | 98.2   | 94.6   | 94.0   |
| 72.5° | 3103.4 | 1700.8 | 235.4  | 197.6  | 181.0  | 146.2  | 117.2  | 101.5  | 92.8   | 88.5   | 87.6   |
| 75°   | 2227.1 | 1112.2 | 202.1  | 176.2  | 149.9  | 116.6  | 102.7  | 91.2   | 83.7   | 78.6   | 78.0   |
| 77.5° | 858.1  | 442.6  | 152.9  | 146.5  | 114.8  | 91.2   | 84.6   | 78.9   | 73.4   | 68.3   | 68.0   |
| 80°   | 265.3  | 197.9  | 111.5  | 110.3  | 83.1   | 68.0   | 65.9   | 64.4   | 62.2   | 56.8   | 55.6   |
| 82.5° | 141.7  | 113.6  | 76.7   | 71.3   | 54.4   | 45.3   | 47.7   | 48.3   | 48.6   | 42.9   | 42.3   |
| 85°   | 67.7   | 60.1   | 43.2   | 40.5   | 31.7   | 25.4   | 29.3   | 31.7   | 32.0   | 26.3   | 24.5   |
| 87.5° | 32.3   | 31.4   | 20.2   | 15.4   | 11.8   | 8.5    | 10.3   | 12.7   | 13.9   | 10.0   | 8.8    |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

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

Report Prepared for

Cooper Lighting Solutions

McGRAW-EDISON

Report Number: SP1-1908-441-2-R4

Test Date: 10/03/2019

Luminaire Tested: SA1C-730-U-5WQ

Data in this report applies to families of products SA1C-730-U-5WQ .

### Test Information

Test Method: LM-79-2008  
Report Number: SP1-1908-441-2-R4  
Test Lab: COOPER LIGHTING SOLUTIONS  
Photometer: SP1 - 76IN SPHERE  
Measurement Geometry:  $4\pi$   
Issue Date: 10/28/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: MCGRAW-EDISON  
Catalog Number: **SA1C-730-U-5WQ**  
Description: MCGRAW EDISON ROADWAY AND AREA LUMINAIRE

\*\*\*THIS IS A REVISION OF SP1-1908-441-2-R3. TO UPDATE THE CATALOG INFORMATION.\*\*\*TESTED IN SITU. (1) 70 CRI, 3000K, 1050MA LIGHTSQUARE WITH 16 LEDS AND TYPE V WIDE OPTICS.

### Spectral Parameters

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 2993   | CRI (Ra): | 71.8 |      |       |
| CIE u':                   | 0.2508 | R1:       | 67.5 | R9:  | -38.3 |
| CIE v':                   | 0.5215 | R2:       | 82.9 | R10: | 62.5  |
| Duv:                      | 0.0000 | R3:       | 94.7 | R11: | 63.7  |
| CIE x:                    | 0.4374 | R4:       | 67.7 | R12: | 57.8  |
| CIE y:                    | 0.4043 | R5:       | 67.9 | R13: | 70.4  |
| CIE z:                    | 0.1583 | R6:       | 77.6 | R14: | 97.3  |
| Peak Wavelength (nm):     | 593    | R7:       | 76.0 |      |       |
| Dominant Wavelength (nm): | 582    | R8:       | 40.5 |      |       |
| Purity:                   | 53     |           |      |      |       |
| Rf:                       | 75.7   |           |      |      |       |
| Rg:                       | 93.9   |           |      |      |       |



### Test Conditions

Stabilization Time: 53M  
Operation Time: 12H  
Room Temperature (°C) / RH%: 25.0./44%  
Sphere Temperature (°C): 25.7

REPORT NUMBER: SP1-1908-441-2-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: SP1-1908-441-2-R4

**CIE 1931 Chromaticity Diagram**



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



Point lies inside the ANSI 3000K 4-step quadrangle

REPORT NUMBER: SP1-1908-441-2-R4

**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       | 2397             | NR               | 490       | 24908            | NR               | 620       | 118784           | NR               | 750       | 5037             | NR               | 880       | 2677             | NR               |
| 365       | 2084             | NR               | 495       | 30998            | NR               | 625       | 108951           | NR               | 755       | 4413             | NR               | 885       | 2940             | NR               |
| 370       | 2143             | NR               | 500       | 37103            | NR               | 630       | 99573            | NR               | 760       | 4189             | NR               | 890       | 3116             | NR               |
| 375       | 2413             | NR               | 505       | 42987            | NR               | 635       | 90444            | NR               | 765       | 3677             | NR               | 895       | 3345             | NR               |
| 380       | 2172             | NR               | 510       | 48702            | NR               | 640       | 80749            | NR               | 770       | 3366             | NR               | 900       | 2312             | NR               |
| 385       | 1997             | NR               | 515       | 53741            | NR               | 645       | 71664            | NR               | 775       | 3211             | NR               | 905       | 2829             | NR               |
| 390       | 1830             | NR               | 520       | 57283            | NR               | 650       | 63936            | NR               | 780       | 2682             | NR               | 910       | 2783             | NR               |
| 395       | 1861             | NR               | 525       | 61876            | NR               | 655       | 56611            | NR               | 785       | 2804             | NR               | 915       | 2662             | NR               |
| 400       | 1717             | NR               | 530       | 65398            | NR               | 660       | 49763            | NR               | 790       | 2581             | NR               | 920       | 3047             | NR               |
| 405       | 1761             | NR               | 535       | 69597            | NR               | 665       | 42891            | NR               | 795       | 2711             | NR               | 925       | 2256             | NR               |
| 410       | 2680             | NR               | 540       | 74214            | NR               | 670       | 36939            | NR               | 800       | 2609             | NR               | 930       | 2976             | NR               |
| 415       | 4374             | NR               | 545       | 79911            | NR               | 675       | 31946            | NR               | 805       | 2581             | NR               | 935       | 3503             | NR               |
| 420       | 8071             | NR               | 550       | 86153            | NR               | 680       | 27385            | NR               | 810       | 2404             | NR               | 940       | 4226             | NR               |
| 425       | 15169            | NR               | 555       | 93952            | NR               | 685       | 23504            | NR               | 815       | 2556             | NR               | 945       | 2930             | NR               |
| 430       | 26038            | NR               | 560       | 102904           | NR               | 690       | 20210            | NR               | 820       | 2742             | NR               | 950       | 2115             | NR               |
| 435       | 41316            | NR               | 565       | 112009           | NR               | 695       | 17459            | NR               | 825       | 2014             | NR               | 955       | 2634             | NR               |
| 440       | 59674            | NR               | 570       | 121662           | NR               | 700       | 15207            | NR               | 830       | 2488             | NR               | 960       | 4200             | NR               |
| 445       | 72751            | NR               | 575       | 130476           | NR               | 705       | 13322            | NR               | 835       | 2625             | NR               | 965       | 1982             | NR               |
| 450       | 65091            | NR               | 580       | 137926           | NR               | 710       | 11676            | NR               | 840       | 2754             | NR               | 970       | 3613             | NR               |
| 455       | 44894            | NR               | 585       | 143406           | NR               | 715       | 10626            | NR               | 845       | 2708             | NR               | 975       | 4034             | NR               |
| 460       | 32712            | NR               | 590       | 147039           | NR               | 720       | 9416             | NR               | 850       | 2608             | NR               | 980       | 3922             | NR               |
| 465       | 25296            | NR               | 595       | 147365           | NR               | 725       | 8333             | NR               | 855       | 2605             | NR               | 985       | 1909             | NR               |
| 470       | 19318            | NR               | 600       | 145800           | NR               | 730       | 7134             | NR               | 860       | 1765             | NR               | 990       | 3617             | NR               |
| 475       | 17265            | NR               | 605       | 141363           | NR               | 735       | 6437             | NR               | 865       | 2581             | NR               | 995       | 4767             | NR               |
| 480       | 18260            | NR               | 610       | 134199           | NR               | 740       | 5834             | NR               | 870       | 3016             | NR               | 1000      | 2528             | NR               |
| 485       | 20845            | NR               | 615       | 127683           | NR               | 745       | 5500             | NR               | 875       | 3952             | NR               |           |                  |                  |

REPORT NUMBER: SP1-1908-441-2-R4

**Scotopic Flux vs. Wavelength**



**Scotopic Lumens: 8494.8**

**S/P: 1.23**

| 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       | 2397             | NR               | 490       | 24908            | NR               | 620       | 118784           | NR               | 750       | 5037             | NR               | 880       | 2677             | NR               |
| 365       | 2084             | NR               | 495       | 30998            | NR               | 625       | 108951           | NR               | 755       | 4413             | NR               | 885       | 2940             | NR               |
| 370       | 2143             | NR               | 500       | 37103            | NR               | 630       | 99573            | NR               | 760       | 4189             | NR               | 890       | 3116             | NR               |
| 375       | 2413             | NR               | 505       | 42987            | NR               | 635       | 90444            | NR               | 765       | 3677             | NR               | 895       | 3345             | NR               |
| 380       | 2172             | NR               | 510       | 48702            | NR               | 640       | 80749            | NR               | 770       | 3366             | NR               | 900       | 2312             | NR               |
| 385       | 1997             | NR               | 515       | 53741            | NR               | 645       | 71664            | NR               | 775       | 3211             | NR               | 905       | 2829             | NR               |
| 390       | 1830             | NR               | 520       | 57283            | NR               | 650       | 63936            | NR               | 780       | 2682             | NR               | 910       | 2783             | NR               |
| 395       | 1861             | NR               | 525       | 61876            | NR               | 655       | 56611            | NR               | 785       | 2804             | NR               | 915       | 2662             | NR               |
| 400       | 1717             | NR               | 530       | 65398            | NR               | 660       | 49763            | NR               | 790       | 2581             | NR               | 920       | 3047             | NR               |
| 405       | 1761             | NR               | 535       | 69597            | NR               | 665       | 42891            | NR               | 795       | 2711             | NR               | 925       | 2256             | NR               |
| 410       | 2680             | NR               | 540       | 74214            | NR               | 670       | 36939            | NR               | 800       | 2609             | NR               | 930       | 2976             | NR               |
| 415       | 4374             | NR               | 545       | 79911            | NR               | 675       | 31946            | NR               | 805       | 2581             | NR               | 935       | 3503             | NR               |
| 420       | 8071             | NR               | 550       | 86153            | NR               | 680       | 27385            | NR               | 810       | 2404             | NR               | 940       | 4226             | NR               |
| 425       | 15169            | NR               | 555       | 93952            | NR               | 685       | 23504            | NR               | 815       | 2556             | NR               | 945       | 2930             | NR               |
| 430       | 26038            | NR               | 560       | 102904           | NR               | 690       | 20210            | NR               | 820       | 2742             | NR               | 950       | 2115             | NR               |
| 435       | 41316            | NR               | 565       | 112009           | NR               | 695       | 17459            | NR               | 825       | 2014             | NR               | 955       | 2634             | NR               |
| 440       | 59674            | NR               | 570       | 121662           | NR               | 700       | 15207            | NR               | 830       | 2488             | NR               | 960       | 4200             | NR               |
| 445       | 72751            | NR               | 575       | 130476           | NR               | 705       | 13322            | NR               | 835       | 2625             | NR               | 965       | 1982             | NR               |
| 450       | 65091            | NR               | 580       | 137926           | NR               | 710       | 11676            | NR               | 840       | 2754             | NR               | 970       | 3613             | NR               |
| 455       | 44894            | NR               | 585       | 143406           | NR               | 715       | 10626            | NR               | 845       | 2708             | NR               | 975       | 4034             | NR               |
| 460       | 32712            | NR               | 590       | 147039           | NR               | 720       | 9416             | NR               | 850       | 2608             | NR               | 980       | 3922             | NR               |
| 465       | 25296            | NR               | 595       | 147365           | NR               | 725       | 8333             | NR               | 855       | 2605             | NR               | 985       | 1909             | NR               |
| 470       | 19318            | NR               | 600       | 145800           | NR               | 730       | 7134             | NR               | 860       | 1765             | NR               | 990       | 3617             | NR               |
| 475       | 17265            | NR               | 605       | 141363           | NR               | 735       | 6437             | NR               | 865       | 2581             | NR               | 995       | 4767             | NR               |
| 480       | 18260            | NR               | 610       | 134199           | NR               | 740       | 5834             | NR               | 870       | 3016             | NR               | 1000      | 2528             | NR               |
| 485       | 20845            | NR               | 615       | 127683           | NR               | 745       | 5500             | NR               | 875       | 3952             | NR               |           |                  |                  |

REPORT NUMBER: SP1-1908-441-2-R4

**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 3101.5 M/P: 0.45**

| 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       | 2397             | NR               | 490       | 24908            | NR               | 620       | 118784           | NR               | 750       | 5037             | NR               | 880       | 2677             | NR               |
| 365       | 2084             | NR               | 495       | 30998            | NR               | 625       | 108951           | NR               | 755       | 4413             | NR               | 885       | 2940             | NR               |
| 370       | 2143             | NR               | 500       | 37103            | NR               | 630       | 99573            | NR               | 760       | 4189             | NR               | 890       | 3116             | NR               |
| 375       | 2413             | NR               | 505       | 42987            | NR               | 635       | 90444            | NR               | 765       | 3677             | NR               | 895       | 3345             | NR               |
| 380       | 2172             | NR               | 510       | 48702            | NR               | 640       | 80749            | NR               | 770       | 3366             | NR               | 900       | 2312             | NR               |
| 385       | 1997             | NR               | 515       | 53741            | NR               | 645       | 71664            | NR               | 775       | 3211             | NR               | 905       | 2829             | NR               |
| 390       | 1830             | NR               | 520       | 57283            | NR               | 650       | 63936            | NR               | 780       | 2682             | NR               | 910       | 2783             | NR               |
| 395       | 1861             | NR               | 525       | 61876            | NR               | 655       | 56611            | NR               | 785       | 2804             | NR               | 915       | 2662             | NR               |
| 400       | 1717             | NR               | 530       | 65398            | NR               | 660       | 49763            | NR               | 790       | 2581             | NR               | 920       | 3047             | NR               |
| 405       | 1761             | NR               | 535       | 69597            | NR               | 665       | 42891            | NR               | 795       | 2711             | NR               | 925       | 2256             | NR               |
| 410       | 2680             | NR               | 540       | 74214            | NR               | 670       | 36939            | NR               | 800       | 2609             | NR               | 930       | 2976             | NR               |
| 415       | 4374             | NR               | 545       | 79911            | NR               | 675       | 31946            | NR               | 805       | 2581             | NR               | 935       | 3503             | NR               |
| 420       | 8071             | NR               | 550       | 86153            | NR               | 680       | 27385            | NR               | 810       | 2404             | NR               | 940       | 4226             | NR               |
| 425       | 15169            | NR               | 555       | 93952            | NR               | 685       | 23504            | NR               | 815       | 2556             | NR               | 945       | 2930             | NR               |
| 430       | 26038            | NR               | 560       | 102904           | NR               | 690       | 20210            | NR               | 820       | 2742             | NR               | 950       | 2115             | NR               |
| 435       | 41316            | NR               | 565       | 112009           | NR               | 695       | 17459            | NR               | 825       | 2014             | NR               | 955       | 2634             | NR               |
| 440       | 59674            | NR               | 570       | 121662           | NR               | 700       | 15207            | NR               | 830       | 2488             | NR               | 960       | 4200             | NR               |
| 445       | 72751            | NR               | 575       | 130476           | NR               | 705       | 13322            | NR               | 835       | 2625             | NR               | 965       | 1982             | NR               |
| 450       | 65091            | NR               | 580       | 137926           | NR               | 710       | 11676            | NR               | 840       | 2754             | NR               | 970       | 3613             | NR               |
| 455       | 44894            | NR               | 585       | 143406           | NR               | 715       | 10626            | NR               | 845       | 2708             | NR               | 975       | 4034             | NR               |
| 460       | 32712            | NR               | 590       | 147039           | NR               | 720       | 9416             | NR               | 850       | 2608             | NR               | 980       | 3922             | NR               |
| 465       | 25296            | NR               | 595       | 147365           | NR               | 725       | 8333             | NR               | 855       | 2605             | NR               | 985       | 1909             | NR               |
| 470       | 19318            | NR               | 600       | 145800           | NR               | 730       | 7134             | NR               | 860       | 1765             | NR               | 990       | 3617             | NR               |
| 475       | 17265            | NR               | 605       | 141363           | NR               | 735       | 6437             | NR               | 865       | 2581             | NR               | 995       | 4767             | NR               |
| 480       | 18260            | NR               | 610       | 134199           | NR               | 740       | 5834             | NR               | 870       | 3016             | NR               | 1000      | 2528             | NR               |
| 485       | 20845            | NR               | 615       | 127683           | NR               | 745       | 5500             | NR               | 875       | 3952             | NR               |           |                  |                  |

REPORT NUMBER: SP1-1908-441-2-R4

**TM-30-18**

**Summary**

$R_f = 75.7$   
 $R_g = 93.9$   
 CIE  $R_a = 71.8$   
 $R_g = -38.3$



**Color Vector Graphics**



REPORT NUMBER: SP1-1908-441-2-R4

**TM-30-18**

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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 67 | CES51 = 87 | CES76 = 63 |
| CES02 = 63 | CES27 = 88 | CES52 = 86 | CES77 = 80 |
| CES03 = 31 | CES28 = 87 | CES53 = 78 | CES78 = 67 |
| CES04 = 71 | CES29 = 66 | CES54 = 84 | CES79 = 87 |
| CES05 = 49 | CES30 = 73 | CES55 = 84 | CES80 = 86 |
| CES06 = 51 | CES31 = 70 | CES56 = 75 | CES81 = 71 |
| CES07 = 41 | CES32 = 65 | CES57 = 74 | CES82 = 94 |
| CES08 = 40 | CES33 = 73 | CES58 = 76 | CES83 = 90 |
| CES09 = 29 | CES34 = 79 | CES59 = 85 | CES84 = 89 |
| CES10 = 76 | CES35 = 89 | CES60 = 93 | CES85 = 77 |
| CES11 = 59 | CES36 = 97 | CES61 = 84 | CES86 = 61 |
| CES12 = 65 | CES37 = 87 | CES62 = 91 | CES87 = 78 |
| CES13 = 43 | CES38 = 81 | CES63 = 77 | CES88 = 77 |
| CES14 = 74 | CES39 = 95 | CES64 = 72 | CES89 = 67 |
| CES15 = 71 | CES40 = 92 | CES65 = 68 | CES90 = 76 |
| CES16 = 47 | CES41 = 88 | CES66 = 69 | CES91 = 89 |
| CES17 = 50 | CES42 = 89 | CES67 = 67 | CES92 = 58 |
| CES18 = 56 | CES43 = 79 | CES68 = 72 | CES93 = 74 |
| CES19 = 73 | CES44 = 99 | CES69 = 81 | CES94 = 49 |
| CES20 = 66 | CES45 = 85 | CES70 = 66 | CES95 = 68 |
| CES21 = 87 | CES46 = 80 | CES71 = 67 | CES96 = 76 |
| CES22 = 79 | CES47 = 82 | CES72 = 88 | CES97 = 82 |
| CES23 = 92 | CES48 = 69 | CES73 = 59 | CES98 = 75 |
| CES24 = 91 | CES49 = 80 | CES74 = 95 | CES99 = 62 |
| CES25 = 73 | CES50 = 87 | CES75 = 69 |            |



REPORT NUMBER: SP1-1908-441-2-R4

**TM-30-18**

**Color Rendition by Hue-Angle Bin**



REPORT NUMBER: SP1-1908-441-2-R4

**TM-30-18**

**Measure Comparisons**



(END OF REPORT)