

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: P362922

Luminaire Tested: NVN-SA2C-760-U-T2-HSS

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-2019  
Report Number: P362922  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-13)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: STREETWORKS  
Catalog Number: NVN-SA2C-760-U-T2-HSS  
Description: NAVION ROADWAY AND AREA LUMINAIRE  
(2) 70 CRI, 5700K, 1050mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE II  
OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 10270 lumens  
Efficiency: N/A  
Efficacy: 90.9 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 1' x H: 0')  
IES Classification: Type II - Medium  
BUG Rating: B1 - U0 - G2

Input Watts (W): 113  
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

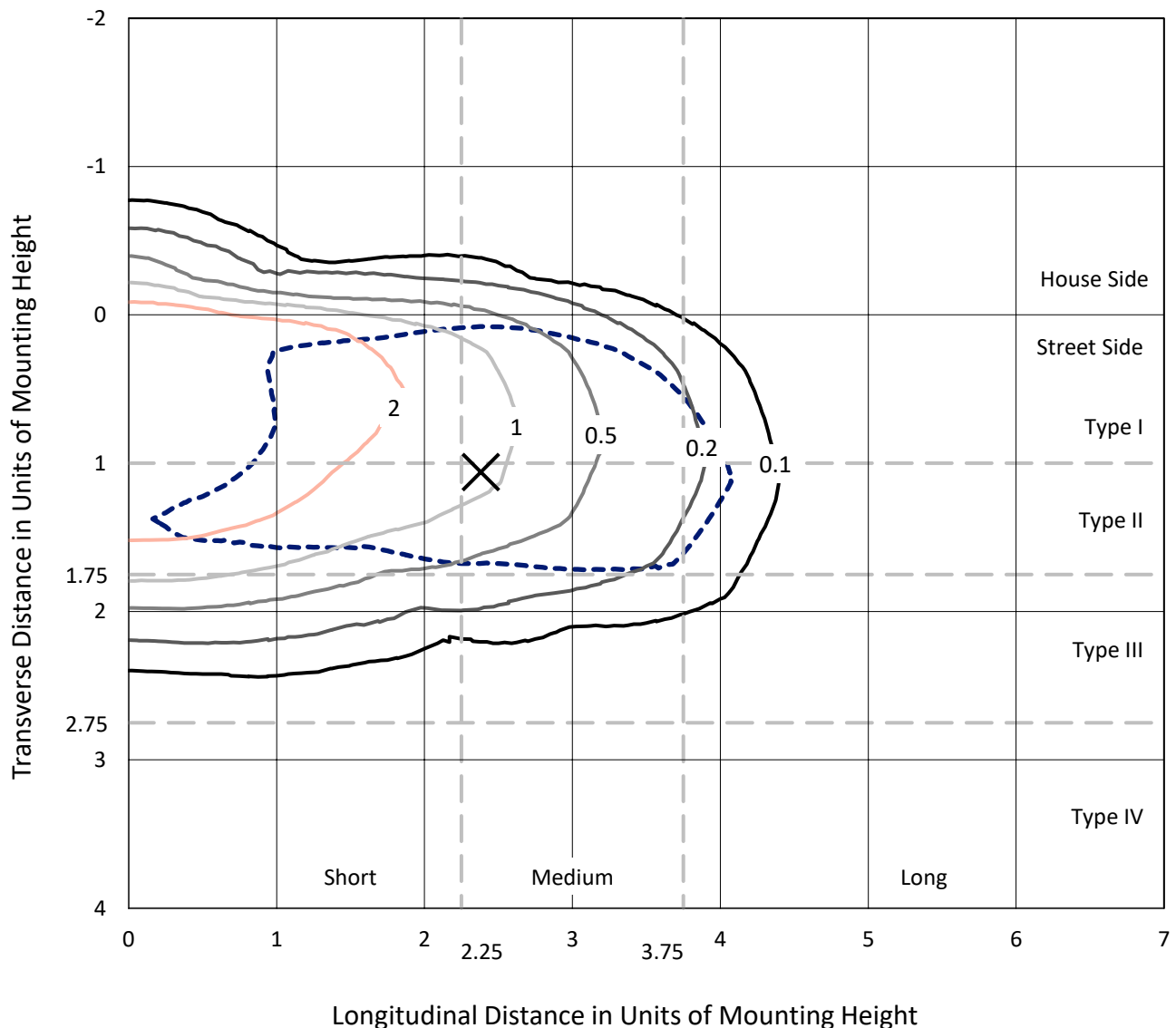


REPORT NUMBER: P362922

CATALOG NUMBER: NVN-SA2C-760-U-T2-HSS

## Iso-Footcandle Lines of Horizontal Illumination

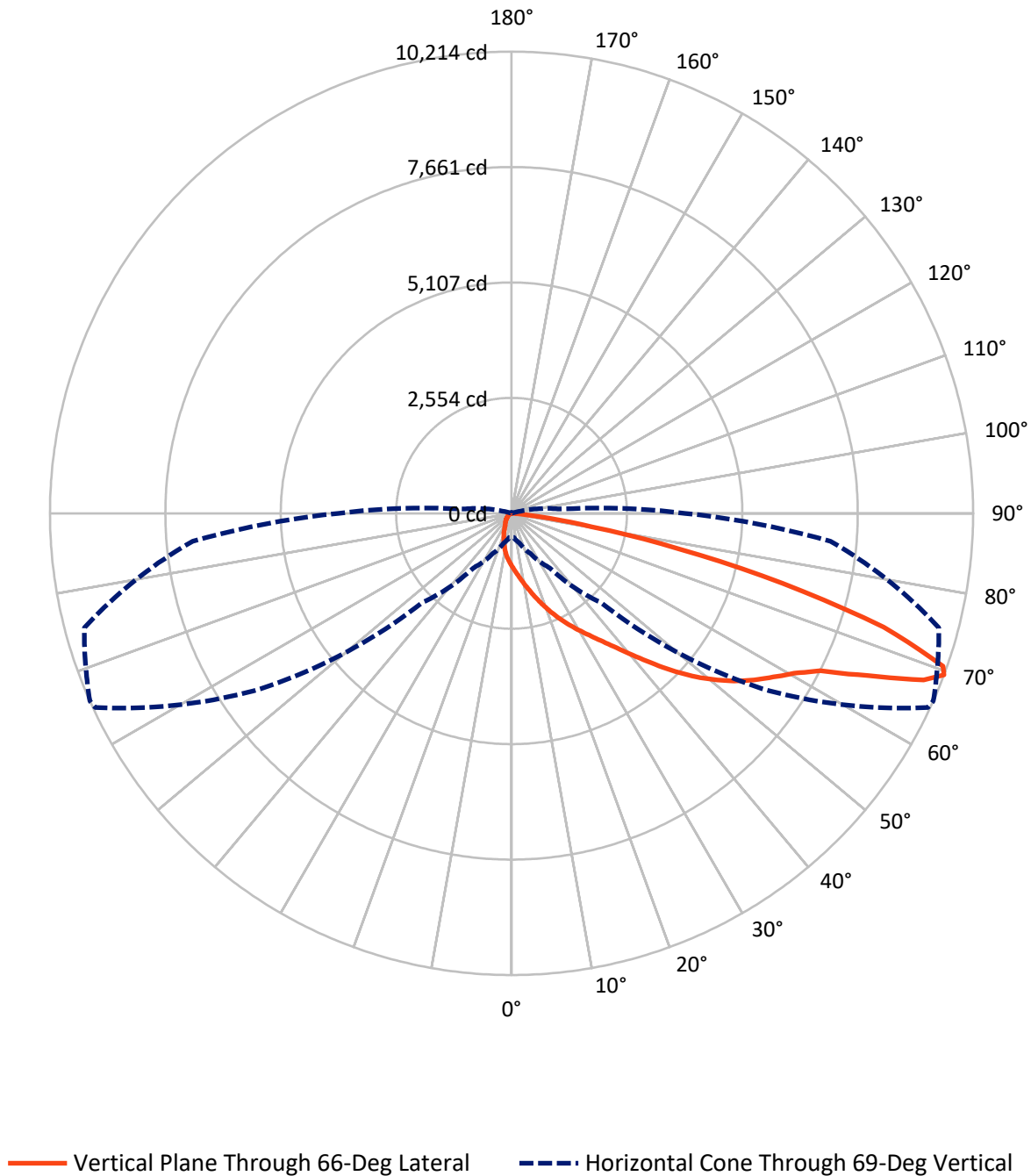
× Max cd  
 --- 1/2 Max cd



Based on 20 foot mounting height. Maximum calculated value = 4.8 fc  
 Type II - Medium - N/A

REPORT NUMBER: P362922  
CATALOG NUMBER: NVN-SA2C-760-U-T2-HSS

## Luminous Intensity Polar Plot



REPORT NUMBER: P362922

CATALOG NUMBER: NVN-SA2C-760-U-T2-HSS

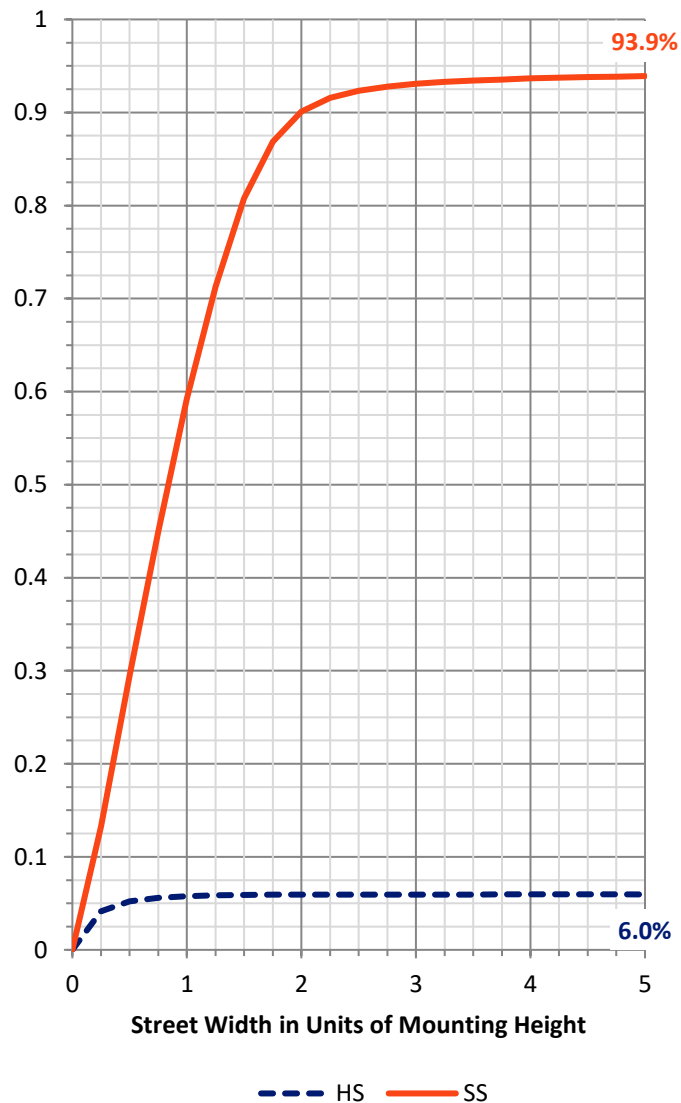
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 616.1    | 0.0    | 616.1   |
|                    | % Fixture | 6.0      | 0.0    | 6.0     |
| <b>Street Side</b> | Lumens    | 9653.9   | 0.0    | 9653.9  |
|                    | % Fixture | 94.0     | 0.0    | 94.0    |
| <b>Total</b>       | Lumens    | 10270.0  | 0.0    | 10270.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 113.0   | 1.1       |
| 10°-20°   | 336.2   | 3.3       |
| 20°-30°   | 585.5   | 5.7       |
| 30°-40°   | 1027.3  | 10.0      |
| 40°-50°   | 1719.5  | 16.7      |
| 50°-60°   | 2527.5  | 24.6      |
| 60°-70°   | 2595.1  | 25.3      |
| 70°-80°   | 1281.1  | 12.5      |
| 80°-90°   | 84.7    | 0.8       |
| 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°    | 10270.0 | 100.0     |
| 0°-180°   | 10270.0 | 100.0     |

**Coefficient of Utilization**



REPORT NUMBER: P362922

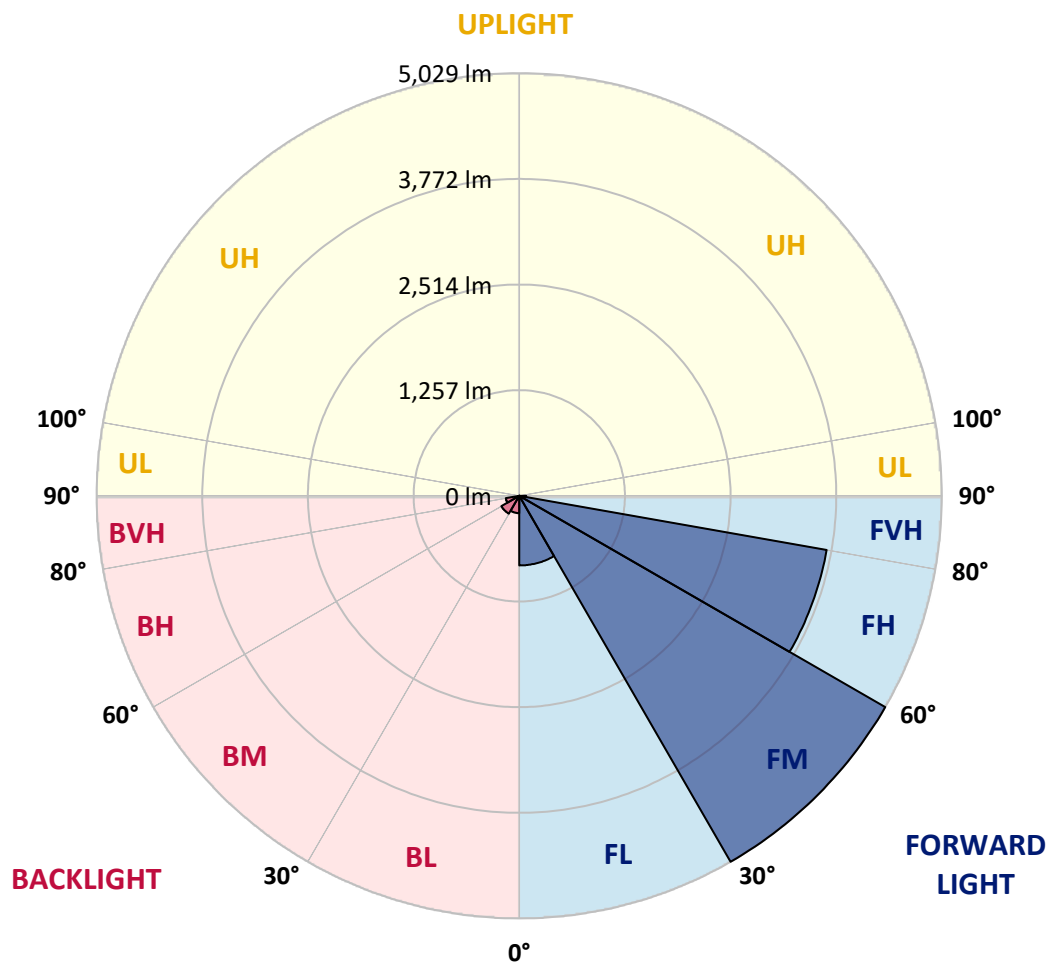
CATALOG NUMBER: NVN-SA2C-760-U-T2-HSS

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 828.7  | 8.1       |                         |      |         |
| FM   | (30°-60°)   | 5028.7 | 49.0      |                         |      |         |
| FH   | (60°-80°)   | 3713.9 | 36.2      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 82.7   | 0.8       |                         |      | G1/100  |
| BL   | (0°-30°)    | 206.0  | 2.0       | B1/500                  |      |         |
| BM   | (30°-60°)   | 245.6  | 2.4       | B1/1000                 |      |         |
| BH   | (60°-80°)   | 162.3  | 1.6       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 2.0    | 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-G2**

Type II Medium





REPORT NUMBER: P362922

CATALOG NUMBER: NVN-SA2C-760-U-T2-HSS

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°     | 66°     | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|---------|---------|--------|--------|
| 0°    | 1168.8 | 1168.8 | 1168.8 | 1168.8 | 1168.8 | 1168.8 | 1168.8 | 1168.8  | 1168.8  | 1168.8 | 1168.8 |
| 2.5°  | 1375.6 | 1369.7 | 1367.3 | 1356.6 | 1338.0 | 1323.9 | 1296.6 | 1264.9  | 1259.0  | 1228.3 | 1190.7 |
| 5°    | 1554.1 | 1549.2 | 1545.8 | 1530.7 | 1511.7 | 1476.1 | 1426.3 | 1367.3  | 1356.1  | 1297.5 | 1222.4 |
| 7.5°  | 1678.5 | 1687.3 | 1687.3 | 1677.5 | 1653.6 | 1626.8 | 1565.8 | 1485.3  | 1471.2  | 1381.4 | 1264.9 |
| 10°   | 1751.2 | 1761.9 | 1770.2 | 1778.5 | 1775.1 | 1764.4 | 1706.8 | 1616.1  | 1599.0  | 1480.0 | 1314.1 |
| 12.5° | 1758.0 | 1768.7 | 1792.2 | 1826.8 | 1860.5 | 1884.8 | 1848.7 | 1760.9  | 1741.4  | 1594.1 | 1372.7 |
| 15°   | 1720.0 | 1731.2 | 1767.3 | 1834.6 | 1916.1 | 1987.3 | 1999.0 | 1921.4  | 1901.4  | 1730.2 | 1445.8 |
| 17.5° | 1653.6 | 1660.9 | 1712.7 | 1805.8 | 1933.6 | 2064.4 | 2135.1 | 2093.6  | 2075.1  | 1885.8 | 1527.3 |
| 20°   | 1604.4 | 1609.7 | 1655.1 | 1755.1 | 1922.9 | 2112.6 | 2263.9 | 2276.5  | 2257.0  | 2052.6 | 1615.6 |
| 22.5° | 1688.7 | 1698.5 | 1700.0 | 1747.3 | 1893.6 | 2136.5 | 2377.0 | 2456.5  | 2441.9  | 2229.7 | 1702.4 |
| 25°   | 1919.5 | 1930.7 | 1893.6 | 1864.4 | 1918.5 | 2147.3 | 2474.1 | 2640.9  | 2629.2  | 2420.4 | 1789.7 |
| 27.5° | 2224.3 | 2236.1 | 2188.3 | 2100.9 | 2048.7 | 2187.8 | 2560.4 | 2828.2  | 2827.8  | 2622.4 | 1883.9 |
| 30°   | 2523.9 | 2535.6 | 2486.8 | 2399.5 | 2279.5 | 2302.4 | 2635.1 | 3024.3  | 3027.3  | 2830.7 | 1983.9 |
| 32.5° | 2838.0 | 2852.6 | 2802.4 | 2690.2 | 2564.8 | 2500.4 | 2739.9 | 3221.4  | 3238.0  | 3072.1 | 2096.5 |
| 35°   | 3195.1 | 3197.0 | 3126.3 | 3008.7 | 2864.3 | 2765.3 | 2908.2 | 3442.4  | 3481.9  | 3371.2 | 2239.5 |
| 37.5° | 3545.3 | 3559.4 | 3501.4 | 3316.0 | 3183.4 | 3071.2 | 3158.5 | 3718.5  | 3774.6  | 3736.5 | 2426.3 |
| 40°   | 3804.8 | 3834.6 | 3826.3 | 3626.3 | 3500.4 | 3420.4 | 3469.2 | 4046.8  | 4118.0  | 4161.9 | 2661.9 |
| 42.5° | 3967.7 | 3990.2 | 4028.2 | 3907.7 | 3793.6 | 3806.8 | 3836.0 | 4429.2  | 4517.0  | 4646.7 | 2932.6 |
| 45°   | 4154.6 | 4165.3 | 4197.0 | 4143.8 | 4066.8 | 4199.4 | 4225.3 | 4859.9  | 4952.1  | 5168.2 | 3233.1 |
| 47.5° | 4382.8 | 4408.2 | 4417.0 | 4368.2 | 4333.1 | 4546.7 | 4600.4 | 5251.6  | 5380.9  | 5726.7 | 3551.2 |
| 50°   | 4673.6 | 4680.4 | 4695.5 | 4663.8 | 4628.7 | 4845.3 | 4937.0 | 5662.8  | 5780.4  | 6287.2 | 3864.8 |
| 52.5° | 4958.0 | 4982.3 | 5035.0 | 5015.0 | 5000.9 | 5099.4 | 5237.0 | 6033.5  | 6164.8  | 6754.5 | 4178.0 |
| 55°   | 5039.9 | 5060.9 | 5242.8 | 5367.2 | 5482.3 | 5412.6 | 5523.8 | 6365.7  | 6507.7  | 7172.1 | 4479.4 |
| 57.5° | 4712.6 | 4755.0 | 5070.2 | 5394.0 | 5871.6 | 5899.4 | 5917.9 | 6706.7  | 6834.0  | 7492.1 | 4793.1 |
| 60°   | 3885.3 | 3893.6 | 4410.7 | 4966.3 | 5807.2 | 6324.3 | 6493.5 | 7073.0  | 7179.9  | 7790.1 | 5168.7 |
| 62.5° | 2471.2 | 2555.6 | 3122.9 | 3907.2 | 5126.2 | 6262.8 | 7189.6 | 7627.2  | 7666.2  | 8147.7 | 5707.2 |
| 65°   | 1177.1 | 1231.7 | 1640.5 | 2414.1 | 3713.1 | 5476.0 | 7670.1 | 8629.6  | 8647.2  | 8856.4 | 6426.7 |
| 67.5° | 651.7  | 678.0  | 872.7  | 1299.5 | 2170.7 | 3872.6 | 7476.0 | 9816.9  | 9833.5  | 9580.3 | 7057.9 |
| 69°   | 509.7  | 532.2  | 685.4  | 979.5  | 1471.7 | 2783.4 | 6765.2 | 10164.7 | 10214.0 | 9787.6 | 7080.4 |
| 70°   | 432.7  | 454.6  | 590.2  | 827.3  | 1183.4 | 2150.7 | 6021.8 | 10078.4 | 10130.5 | 9768.1 | 6913.0 |
| 72.5° | 264.9  | 277.6  | 393.2  | 582.4  | 793.2  | 1081.9 | 3713.6 | 8523.3  | 8611.5  | 8960.3 | 5941.4 |
| 75°   | 178.5  | 185.4  | 245.8  | 401.9  | 567.3  | 557.1  | 1929.2 | 6007.7  | 6198.9  | 6970.1 | 4388.2 |
| 77.5° | 127.8  | 134.1  | 164.9  | 260.0  | 397.6  | 367.8  | 873.6  | 3733.6  | 3774.6  | 4180.4 | 2393.1 |
| 80°   | 72.7   | 78.5   | 116.6  | 154.6  | 269.8  | 245.4  | 347.3  | 1783.4  | 1803.9  | 1792.6 | 799.0  |
| 82.5° | 38.0   | 42.9   | 63.9   | 101.9  | 173.2  | 160.5  | 144.4  | 597.1   | 600.0   | 499.0  | 175.1  |
| 85°   | 7.3    | 8.8    | 31.7   | 69.8   | 89.3   | 69.8   | 59.0   | 140.0   | 142.9   | 126.3  | 43.4   |
| 87.5° | 0.0    | 0.5    | 12.7   | 15.6   | 17.6   | 18.0   | 19.0   | 27.3    | 29.3    | 39.5   | 11.7   |
| 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: P362922

CATALOG NUMBER: NVN-SA2C-760-U-T2-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1168.8 | 1168.8 | 1168.8 | 1168.8 | 1168.8 | 1168.8 | 1168.8 | 1168.8 | 1168.8 | 1168.8 | 1168.8 |
| 2.5°  | 1174.1 | 1156.6 | 1122.9 | 1083.9 | 1053.6 | 1023.9 | 1000.5 | 976.1  | 967.3  | 962.9  | 962.4  |
| 5°    | 1185.8 | 1148.8 | 1077.5 | 1004.4 | 944.4  | 887.8  | 847.3  | 808.8  | 790.7  | 782.4  | 779.0  |
| 7.5°  | 1205.3 | 1145.8 | 1031.2 | 919.5  | 833.2  | 762.4  | 706.3  | 664.4  | 643.4  | 634.6  | 631.2  |
| 10°   | 1228.3 | 1141.9 | 977.1  | 829.7  | 719.5  | 646.3  | 590.7  | 549.3  | 526.3  | 516.6  | 511.7  |
| 12.5° | 1255.1 | 1135.1 | 914.6  | 739.0  | 622.4  | 549.3  | 481.9  | 430.7  | 404.4  | 393.2  | 387.8  |
| 15°   | 1288.3 | 1128.3 | 849.3  | 653.6  | 537.1  | 447.8  | 374.1  | 339.5  | 334.1  | 332.2  | 332.7  |
| 17.5° | 1321.0 | 1117.5 | 778.0  | 569.3  | 447.3  | 349.7  | 312.2  | 310.2  | 311.2  | 311.2  | 311.2  |
| 20°   | 1350.2 | 1093.2 | 700.5  | 497.1  | 361.9  | 295.1  | 287.3  | 283.9  | 281.5  | 279.5  | 277.1  |
| 22.5° | 1373.1 | 1060.5 | 625.8  | 425.4  | 295.6  | 270.2  | 258.0  | 247.3  | 238.5  | 232.7  | 229.8  |
| 25°   | 1388.8 | 1017.1 | 557.6  | 356.6  | 265.8  | 245.8  | 223.9  | 205.8  | 192.2  | 183.9  | 180.5  |
| 27.5° | 1400.5 | 970.2  | 496.6  | 298.5  | 245.4  | 217.6  | 188.8  | 167.3  | 153.2  | 145.9  | 142.9  |
| 30°   | 1408.8 | 917.1  | 442.9  | 262.4  | 222.4  | 187.8  | 157.1  | 136.1  | 125.9  | 121.9  | 120.0  |
| 32.5° | 1416.6 | 858.0  | 392.2  | 245.4  | 201.0  | 160.5  | 131.7  | 115.6  | 109.3  | 104.4  | 102.9  |
| 35°   | 1436.1 | 803.4  | 343.9  | 227.3  | 179.0  | 137.1  | 113.2  | 101.5  | 95.1   | 92.2   | 91.2   |
| 37.5° | 1482.4 | 762.9  | 297.6  | 208.8  | 157.1  | 118.5  | 99.0   | 90.7   | 84.9   | 81.9   | 81.0   |
| 40°   | 1557.0 | 742.4  | 258.5  | 188.8  | 135.6  | 104.4  | 89.8   | 81.9   | 75.6   | 71.2   | 70.2   |
| 42.5° | 1666.8 | 745.4  | 231.2  | 168.8  | 118.5  | 93.2   | 81.0   | 71.7   | 64.9   | 61.0   | 60.0   |
| 45°   | 1800.0 | 766.8  | 212.2  | 149.3  | 104.4  | 84.4   | 71.2   | 61.5   | 55.1   | 51.7   | 50.7   |
| 47.5° | 1944.4 | 801.4  | 196.6  | 131.7  | 93.2   | 76.1   | 61.5   | 51.2   | 45.9   | 42.9   | 42.4   |
| 50°   | 2096.5 | 835.1  | 180.5  | 114.6  | 83.4   | 67.8   | 51.7   | 42.4   | 38.0   | 35.6   | 34.6   |
| 52.5° | 2250.7 | 874.1  | 165.9  | 99.0   | 75.1   | 58.0   | 42.9   | 34.6   | 31.2   | 29.3   | 28.3   |
| 55°   | 2416.5 | 903.4  | 151.7  | 86.8   | 66.8   | 49.3   | 35.6   | 28.8   | 25.9   | 23.4   | 22.9   |
| 57.5° | 2611.7 | 948.8  | 137.1  | 75.1   | 57.1   | 41.0   | 29.3   | 22.9   | 20.5   | 18.0   | 17.6   |
| 60°   | 2875.1 | 1001.9 | 121.5  | 66.3   | 46.8   | 33.7   | 23.9   | 18.5   | 15.6   | 13.7   | 13.2   |
| 62.5° | 3222.4 | 1061.0 | 101.9  | 58.0   | 38.0   | 27.3   | 19.0   | 14.6   | 11.2   | 8.8    | 8.8    |
| 65°   | 3662.9 | 1157.1 | 83.4   | 48.8   | 31.2   | 22.4   | 14.6   | 10.7   | 6.3    | 3.9    | 3.9    |
| 67.5° | 3919.9 | 1173.6 | 67.3   | 40.0   | 25.4   | 19.0   | 12.2   | 7.3    | 2.0    | 0.5    | 0.0    |
| 69°   | 3837.5 | 1077.5 | 57.1   | 34.1   | 22.0   | 18.0   | 11.2   | 5.4    | 1.0    | 0.0    | 0.0    |
| 70°   | 3682.4 | 985.3  | 50.2   | 30.2   | 20.0   | 17.1   | 10.7   | 3.9    | 1.0    | 0.0    | 0.0    |
| 72.5° | 3042.9 | 701.5  | 38.0   | 22.4   | 14.6   | 15.1   | 9.8    | 2.4    | 1.0    | 0.0    | 0.0    |
| 75°   | 2216.5 | 426.3  | 27.3   | 15.6   | 9.3    | 11.2   | 6.8    | 1.0    | 0.5    | 0.0    | 0.0    |
| 77.5° | 1233.1 | 201.0  | 17.1   | 8.8    | 5.9    | 6.8    | 3.4    | 0.0    | 0.0    | 0.0    | 0.0    |
| 80°   | 400.5  | 54.6   | 7.8    | 4.9    | 3.4    | 3.9    | 1.5    | 0.0    | 0.0    | 0.0    | 0.0    |
| 82.5° | 74.1   | 15.6   | 4.4    | 2.4    | 1.0    | 1.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 85°   | 16.1   | 6.3    | 2.4    | 1.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 87.5° | 5.4    | 2.0    | 0.5    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

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

Report Prepared for

Cooper Lighting Solutions

McGRAW-EDISON

Report Number: SP1-1908-441-9-R4

Test Date: 10/23/2019

Luminaire Tested: SA1C-760-U-5WQ

Data in this report applies to families of products SA1C-760-U-5WQ .

### Test Information

Test Method: LM-79-2008  
 Report Number: SP1-1908-441-9-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-760-U-5WQ**  
 Description: MCGRAW EDISON ROADWAY AND AREA LUMINAIRE

\*\*\*THIS IS A REVISION OF SP1-1908-441-4-R3. TO UPDATE THE CATALOG INFORMATION.\*\*\*TESTED IN SITU. ROADWAY AND AREA LUMINAIRE. (1) 70 CRI, 5000K, 1050MA LIGHTSQUARE WITH 16 LEDS AND TYPE V WIDE OPTICS.

### Spectral Parameters

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 5474   | CRI (Ra): | 71.7 |      |       |
| CIE u':                   | 0.2052 | R1:       | 70.6 | R9:  | -27.1 |
| CIE v':                   | 0.4804 | R2:       | 74.6 | R10: | 40.8  |
| Duv:                      | 0.0025 | R3:       | 78.3 | R11: | 74.6  |
| CIE x:                    | 0.3330 | R4:       | 73.8 | R12: | 50.4  |
| CIE y:                    | 0.3466 | R5:       | 72.4 | R13: | 70.0  |
| CIE z:                    | 0.3204 | R6:       | 67.5 | R14: | 87.8  |
| Peak Wavelength (nm):     | 442    | R7:       | 77.5 |      |       |
| Dominant Wavelength (nm): | 554    | R8:       | 58.9 |      |       |
| Purity:                   | 4.1    |           |      |      |       |
| Rf:                       | 72.1   |           |      |      |       |
| Rg:                       | 97.2   |           |      |      |       |



### Test Conditions

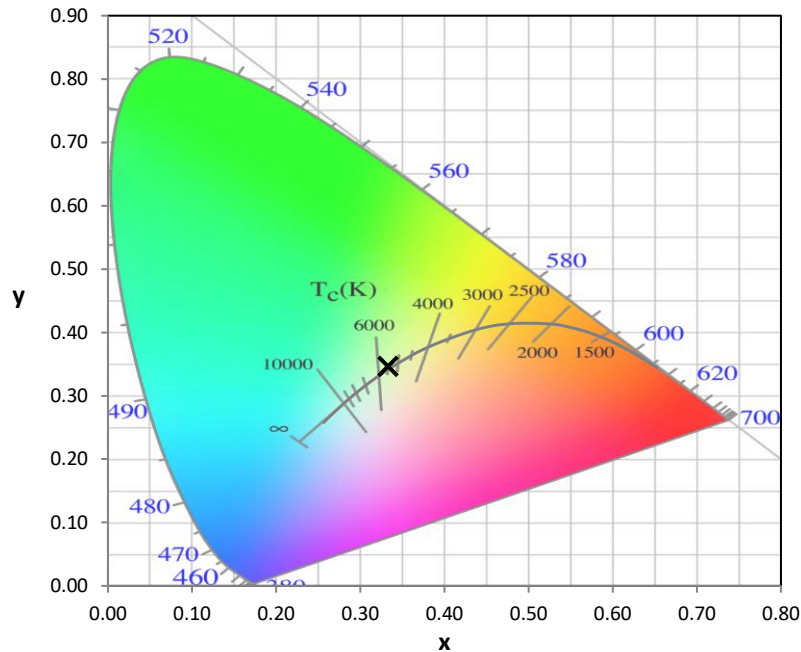
Stabilization Time: 240M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.6/31%  
 Sphere Temperature (°C): 25.9

REPORT NUMBER: SP1-1908-441-9-R4

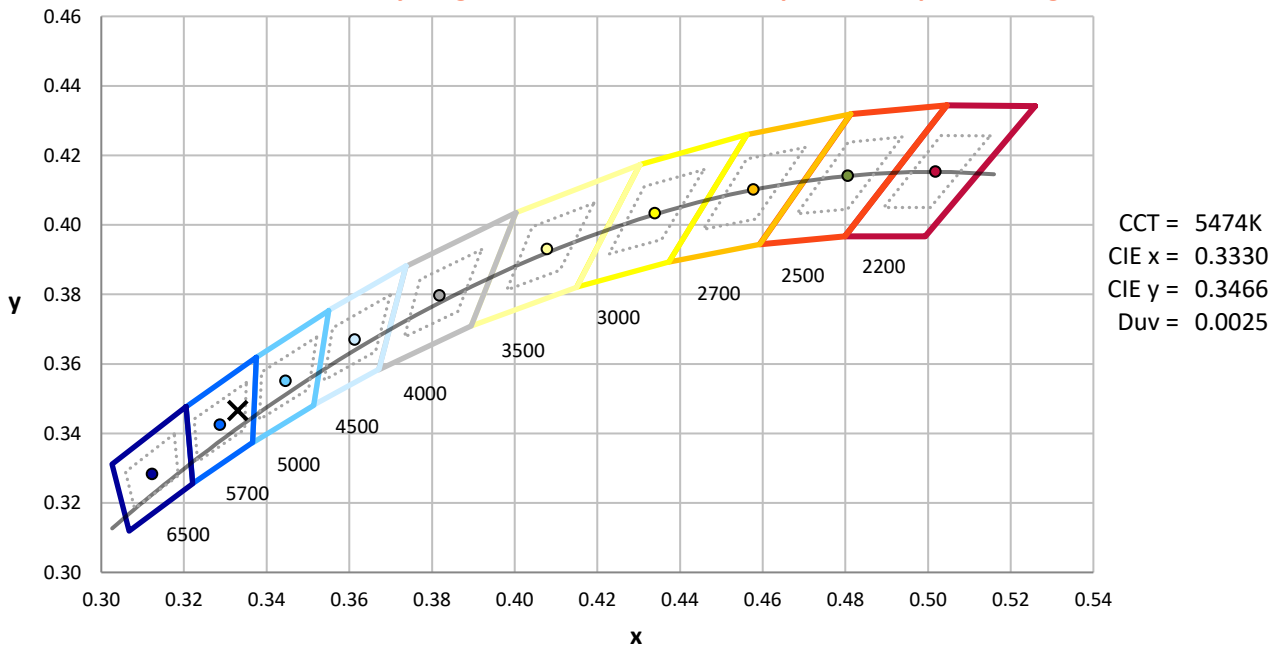
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| 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: SP1-1908-441-9-R4

**CIE 1931 Chromaticity Diagram**



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



Point lies inside the ANSI 5700K 4-step quadrangle

REPORT NUMBER: SP1-1908-441-9-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       | 3540             | NR               | 490       | 33363            | NR               | 620       | 80193            | NR               | 750       | 4663             | NR               | 880       | 4678             | NR               |
| 365       | 2862             | NR               | 495       | 44177            | NR               | 625       | 73091            | NR               | 755       | 4147             | NR               | 885       | 4128             | NR               |
| 370       | 2865             | NR               | 500       | 57019            | NR               | 630       | 66269            | NR               | 760       | 4040             | NR               | 890       | 4504             | NR               |
| 375       | 3254             | NR               | 505       | 70030            | NR               | 635       | 60012            | NR               | 765       | 3474             | NR               | 895       | 4371             | NR               |
| 380       | 3076             | NR               | 510       | 81972            | NR               | 640       | 53914            | NR               | 770       | 3469             | NR               | 900       | 4082             | NR               |
| 385       | 2904             | NR               | 515       | 92590            | NR               | 645       | 48385            | NR               | 775       | 3181             | NR               | 905       | 2982             | NR               |
| 390       | 2689             | NR               | 520       | 100305           | NR               | 650       | 43219            | NR               | 780       | 2969             | NR               | 910       | 4351             | NR               |
| 395       | 2619             | NR               | 525       | 107452           | NR               | 655       | 38562            | NR               | 785       | 3132             | NR               | 915       | 3365             | NR               |
| 400       | 2679             | NR               | 530       | 111373           | NR               | 660       | 34110            | NR               | 790       | 2507             | NR               | 920       | 3430             | NR               |
| 405       | 3515             | NR               | 535       | 114505           | NR               | 665       | 30085            | NR               | 795       | 2968             | NR               | 925       | 4264             | NR               |
| 410       | 6934             | NR               | 540       | 116408           | NR               | 670       | 26205            | NR               | 800       | 2758             | NR               | 930       | 4095             | NR               |
| 415       | 14943            | NR               | 545       | 118700           | NR               | 675       | 22906            | NR               | 805       | 2872             | NR               | 935       | 5048             | NR               |
| 420       | 31939            | NR               | 550       | 119209           | NR               | 680       | 20058            | NR               | 810       | 3094             | NR               | 940       | 4074             | NR               |
| 425       | 64701            | NR               | 555       | 120742           | NR               | 685       | 17413            | NR               | 815       | 3222             | NR               | 945       | 4949             | NR               |
| 430       | 110939           | NR               | 560       | 121594           | NR               | 690       | 15447            | NR               | 820       | 3238             | NR               | 950       | 4387             | NR               |
| 435       | 164597           | NR               | 565       | 121913           | NR               | 695       | 13398            | NR               | 825       | 3524             | NR               | 955       | 4978             | NR               |
| 440       | 207696           | NR               | 570       | 122147           | NR               | 700       | 11777            | NR               | 830       | 2921             | NR               | 960       | 4706             | NR               |
| 445       | 201830           | NR               | 575       | 121605           | NR               | 705       | 10412            | NR               | 835       | 3595             | NR               | 965       | 5083             | NR               |
| 450       | 145410           | NR               | 580       | 120248           | NR               | 710       | 9544             | NR               | 840       | 3016             | NR               | 970       | 4522             | NR               |
| 455       | 89594            | NR               | 585       | 117717           | NR               | 715       | 8940             | NR               | 845       | 4032             | NR               | 975       | 4740             | NR               |
| 460       | 58321            | NR               | 590       | 114359           | NR               | 720       | 7897             | NR               | 850       | 3579             | NR               | 980       | 6122             | NR               |
| 465       | 39318            | NR               | 595       | 109974           | NR               | 725       | 7045             | NR               | 855       | 4571             | NR               | 985       | 6450             | NR               |
| 470       | 27693            | NR               | 600       | 105269           | NR               | 730       | 6483             | NR               | 860       | 4485             | NR               | 990       | 4875             | NR               |
| 475       | 23081            | NR               | 605       | 99453            | NR               | 735       | 5838             | NR               | 865       | 3978             | NR               | 995       | 4764             | NR               |
| 480       | 23002            | NR               | 610       | 92921            | NR               | 740       | 5261             | NR               | 870       | 4298             | NR               | 1000      | 3640             | NR               |
| 485       | 26201            | NR               | 615       | 86989            | NR               | 745       | 4760             | NR               | 875       | 4356             | NR               |           |                  |                  |

REPORT NUMBER: SP1-1908-441-9-R4

Scotopic Flux vs. Wavelength



Scotopic Lumens: 13759.3

S/P: 1.85

| 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       | 3540             | NR               | 490       | 33363            | NR               | 620       | 80193            | NR               | 750       | 4663             | NR               | 880       | 4678             | NR               |
| 365       | 2862             | NR               | 495       | 44177            | NR               | 625       | 73091            | NR               | 755       | 4147             | NR               | 885       | 4128             | NR               |
| 370       | 2865             | NR               | 500       | 57019            | NR               | 630       | 66269            | NR               | 760       | 4040             | NR               | 890       | 4504             | NR               |
| 375       | 3254             | NR               | 505       | 70030            | NR               | 635       | 60012            | NR               | 765       | 3474             | NR               | 895       | 4371             | NR               |
| 380       | 3076             | NR               | 510       | 81972            | NR               | 640       | 53914            | NR               | 770       | 3469             | NR               | 900       | 4082             | NR               |
| 385       | 2904             | NR               | 515       | 92590            | NR               | 645       | 48385            | NR               | 775       | 3181             | NR               | 905       | 2982             | NR               |
| 390       | 2689             | NR               | 520       | 100305           | NR               | 650       | 43219            | NR               | 780       | 2969             | NR               | 910       | 4351             | NR               |
| 395       | 2619             | NR               | 525       | 107452           | NR               | 655       | 38562            | NR               | 785       | 3132             | NR               | 915       | 3365             | NR               |
| 400       | 2679             | NR               | 530       | 111373           | NR               | 660       | 34110            | NR               | 790       | 2507             | NR               | 920       | 3430             | NR               |
| 405       | 3515             | NR               | 535       | 114505           | NR               | 665       | 30085            | NR               | 795       | 2968             | NR               | 925       | 4264             | NR               |
| 410       | 6934             | NR               | 540       | 116408           | NR               | 670       | 26205            | NR               | 800       | 2758             | NR               | 930       | 4095             | NR               |
| 415       | 14943            | NR               | 545       | 118700           | NR               | 675       | 22906            | NR               | 805       | 2872             | NR               | 935       | 5048             | NR               |
| 420       | 31939            | NR               | 550       | 119209           | NR               | 680       | 20058            | NR               | 810       | 3094             | NR               | 940       | 4074             | NR               |
| 425       | 64701            | NR               | 555       | 120742           | NR               | 685       | 17413            | NR               | 815       | 3222             | NR               | 945       | 4949             | NR               |
| 430       | 110939           | NR               | 560       | 121594           | NR               | 690       | 15447            | NR               | 820       | 3238             | NR               | 950       | 4387             | NR               |
| 435       | 164597           | NR               | 565       | 121913           | NR               | 695       | 13398            | NR               | 825       | 3524             | NR               | 955       | 4978             | NR               |
| 440       | 207696           | NR               | 570       | 122147           | NR               | 700       | 11777            | NR               | 830       | 2921             | NR               | 960       | 4706             | NR               |
| 445       | 201830           | NR               | 575       | 121605           | NR               | 705       | 10412            | NR               | 835       | 3595             | NR               | 965       | 5083             | NR               |
| 450       | 145410           | NR               | 580       | 120248           | NR               | 710       | 9544             | NR               | 840       | 3016             | NR               | 970       | 4522             | NR               |
| 455       | 89594            | NR               | 585       | 117717           | NR               | 715       | 8940             | NR               | 845       | 4032             | NR               | 975       | 4740             | NR               |
| 460       | 58321            | NR               | 590       | 114359           | NR               | 720       | 7897             | NR               | 850       | 3579             | NR               | 980       | 6122             | NR               |
| 465       | 39318            | NR               | 595       | 109974           | NR               | 725       | 7045             | NR               | 855       | 4571             | NR               | 985       | 6450             | NR               |
| 470       | 27693            | NR               | 600       | 105269           | NR               | 730       | 6483             | NR               | 860       | 4485             | NR               | 990       | 4875             | NR               |
| 475       | 23081            | NR               | 605       | 99453            | NR               | 735       | 5838             | NR               | 865       | 3978             | NR               | 995       | 4764             | NR               |
| 480       | 23002            | NR               | 610       | 92921            | NR               | 740       | 5261             | NR               | 870       | 4298             | NR               | 1000      | 3640             | NR               |
| 485       | 26201            | NR               | 615       | 86989            | NR               | 745       | 4760             | NR               | 875       | 4356             | NR               |           |                  |                  |

REPORT NUMBER: SP1-1908-441-9-R4

**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 5527.6 M/P: 0.74**

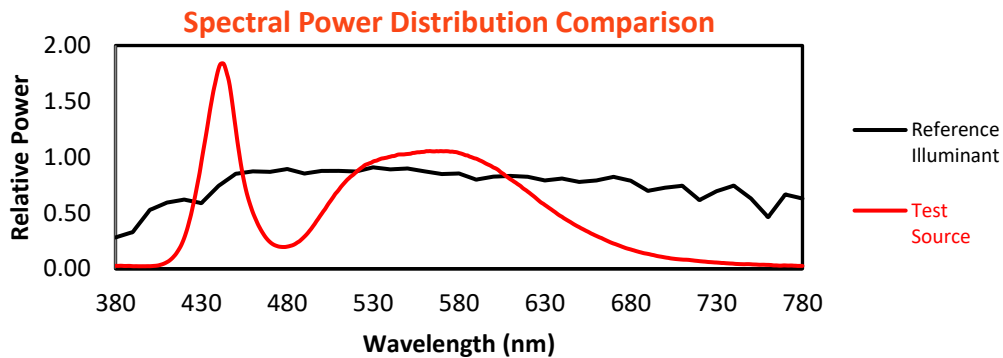
| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 3540             | NR               | 490       | 33363            | NR               | 620       | 80193            | NR               | 750       | 4663             | NR               | 880       | 4678             | NR               |
| 365       | 2862             | NR               | 495       | 44177            | NR               | 625       | 73091            | NR               | 755       | 4147             | NR               | 885       | 4128             | NR               |
| 370       | 2865             | NR               | 500       | 57019            | NR               | 630       | 66269            | NR               | 760       | 4040             | NR               | 890       | 4504             | NR               |
| 375       | 3254             | NR               | 505       | 70030            | NR               | 635       | 60012            | NR               | 765       | 3474             | NR               | 895       | 4371             | NR               |
| 380       | 3076             | NR               | 510       | 81972            | NR               | 640       | 53914            | NR               | 770       | 3469             | NR               | 900       | 4082             | NR               |
| 385       | 2904             | NR               | 515       | 92590            | NR               | 645       | 48385            | NR               | 775       | 3181             | NR               | 905       | 2982             | NR               |
| 390       | 2689             | NR               | 520       | 100305           | NR               | 650       | 43219            | NR               | 780       | 2969             | NR               | 910       | 4351             | NR               |
| 395       | 2619             | NR               | 525       | 107452           | NR               | 655       | 38562            | NR               | 785       | 3132             | NR               | 915       | 3365             | NR               |
| 400       | 2679             | NR               | 530       | 111373           | NR               | 660       | 34110            | NR               | 790       | 2507             | NR               | 920       | 3430             | NR               |
| 405       | 3515             | NR               | 535       | 114505           | NR               | 665       | 30085            | NR               | 795       | 2968             | NR               | 925       | 4264             | NR               |
| 410       | 6934             | NR               | 540       | 116408           | NR               | 670       | 26205            | NR               | 800       | 2758             | NR               | 930       | 4095             | NR               |
| 415       | 14943            | NR               | 545       | 118700           | NR               | 675       | 22906            | NR               | 805       | 2872             | NR               | 935       | 5048             | NR               |
| 420       | 31939            | NR               | 550       | 119209           | NR               | 680       | 20058            | NR               | 810       | 3094             | NR               | 940       | 4074             | NR               |
| 425       | 64701            | NR               | 555       | 120742           | NR               | 685       | 17413            | NR               | 815       | 3222             | NR               | 945       | 4949             | NR               |
| 430       | 110939           | NR               | 560       | 121594           | NR               | 690       | 15447            | NR               | 820       | 3238             | NR               | 950       | 4387             | NR               |
| 435       | 164597           | NR               | 565       | 121913           | NR               | 695       | 13398            | NR               | 825       | 3524             | NR               | 955       | 4978             | NR               |
| 440       | 207696           | NR               | 570       | 122147           | NR               | 700       | 11777            | NR               | 830       | 2921             | NR               | 960       | 4706             | NR               |
| 445       | 201830           | NR               | 575       | 121605           | NR               | 705       | 10412            | NR               | 835       | 3595             | NR               | 965       | 5083             | NR               |
| 450       | 145410           | NR               | 580       | 120248           | NR               | 710       | 9544             | NR               | 840       | 3016             | NR               | 970       | 4522             | NR               |
| 455       | 89594            | NR               | 585       | 117717           | NR               | 715       | 8940             | NR               | 845       | 4032             | NR               | 975       | 4740             | NR               |
| 460       | 58321            | NR               | 590       | 114359           | NR               | 720       | 7897             | NR               | 850       | 3579             | NR               | 980       | 6122             | NR               |
| 465       | 39318            | NR               | 595       | 109974           | NR               | 725       | 7045             | NR               | 855       | 4571             | NR               | 985       | 6450             | NR               |
| 470       | 27693            | NR               | 600       | 105269           | NR               | 730       | 6483             | NR               | 860       | 4485             | NR               | 990       | 4875             | NR               |
| 475       | 23081            | NR               | 605       | 99453            | NR               | 735       | 5838             | NR               | 865       | 3978             | NR               | 995       | 4764             | NR               |
| 480       | 23002            | NR               | 610       | 92921            | NR               | 740       | 5261             | NR               | 870       | 4298             | NR               | 1000      | 3640             | NR               |
| 485       | 26201            | NR               | 615       | 86989            | NR               | 745       | 4760             | NR               | 875       | 4356             | NR               |           |                  |                  |

REPORT NUMBER: SP1-1908-441-9-R4

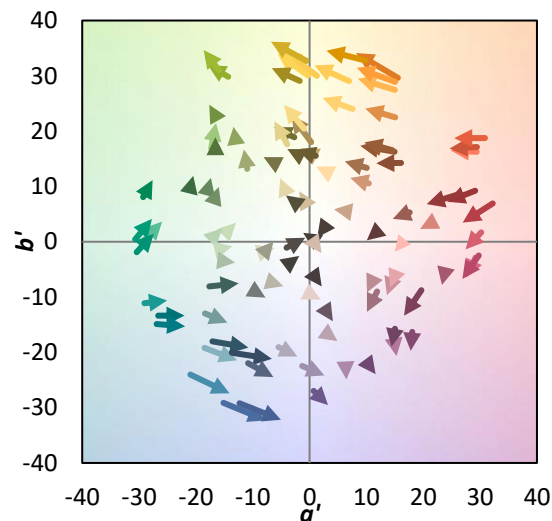
**TM-30-18**

**Summary**

$R_f = 72.1$   
 $R_g = 97.2$   
 CIE  $R_a = 71.7$   
 $R_g = -27.1$



**Color Vector Graphics**

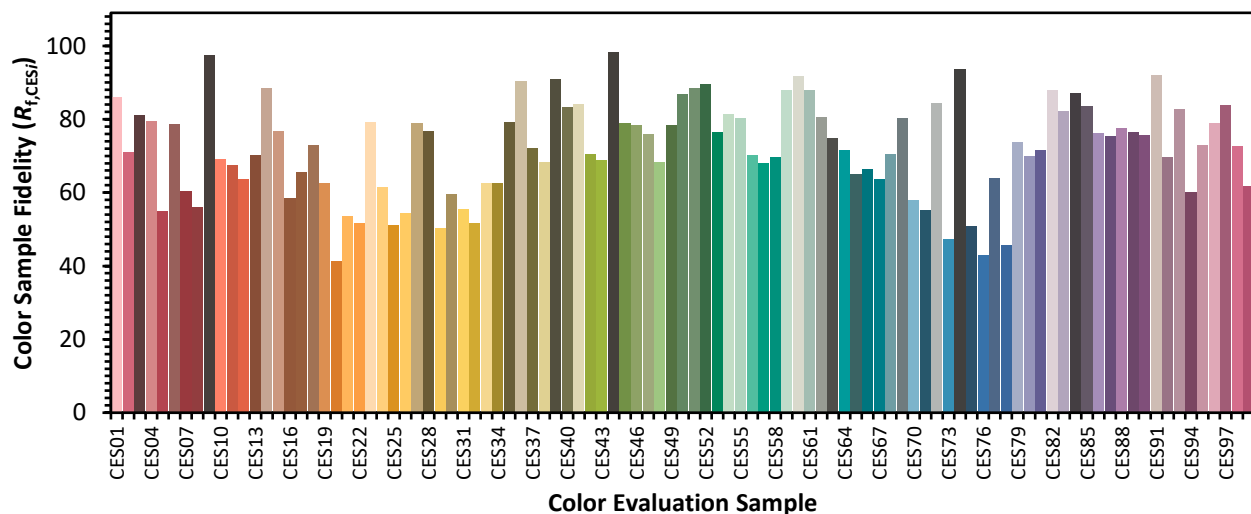


REPORT NUMBER: SP1-1908-441-9-R4

**TM-30-18**

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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 54 | CES51 = 88 | CES76 = 43 |
| CES02 = 59 | CES27 = 79 | CES52 = 90 | CES77 = 64 |
| CES03 = 30 | CES28 = 77 | CES53 = 77 | CES78 = 46 |
| CES04 = 69 | CES29 = 50 | CES54 = 81 | CES79 = 74 |
| CES05 = 46 | CES30 = 59 | CES55 = 80 | CES80 = 70 |
| CES06 = 50 | CES31 = 55 | CES56 = 70 | CES81 = 71 |
| CES07 = 38 | CES32 = 52 | CES57 = 68 | CES82 = 88 |
| CES08 = 38 | CES33 = 63 | CES58 = 70 | CES83 = 82 |
| CES09 = 29 | CES34 = 63 | CES59 = 88 | CES84 = 87 |
| CES10 = 72 | CES35 = 79 | CES60 = 92 | CES85 = 84 |
| CES11 = 55 | CES36 = 90 | CES61 = 88 | CES86 = 76 |
| CES12 = 61 | CES37 = 72 | CES62 = 81 | CES87 = 75 |
| CES13 = 41 | CES38 = 68 | CES63 = 75 | CES88 = 77 |
| CES14 = 74 | CES39 = 91 | CES64 = 72 | CES89 = 76 |
| CES15 = 70 | CES40 = 83 | CES65 = 65 | CES90 = 76 |
| CES16 = 46 | CES41 = 84 | CES66 = 66 | CES91 = 92 |
| CES17 = 48 | CES42 = 70 | CES67 = 64 | CES92 = 70 |
| CES18 = 55 | CES43 = 69 | CES68 = 71 | CES93 = 83 |
| CES19 = 70 | CES44 = 98 | CES69 = 80 | CES94 = 60 |
| CES20 = 64 | CES45 = 79 | CES70 = 58 | CES95 = 73 |
| CES21 = 85 | CES46 = 78 | CES71 = 55 | CES96 = 79 |
| CES22 = 77 | CES47 = 76 | CES72 = 84 | CES97 = 84 |
| CES23 = 91 | CES48 = 68 | CES73 = 47 | CES98 = 73 |
| CES24 = 90 | CES49 = 78 | CES74 = 94 | CES99 = 62 |
| CES25 = 71 | CES50 = 87 | CES75 = 51 |            |



REPORT NUMBER: SP1-1908-441-9-R4

**TM-30-18**

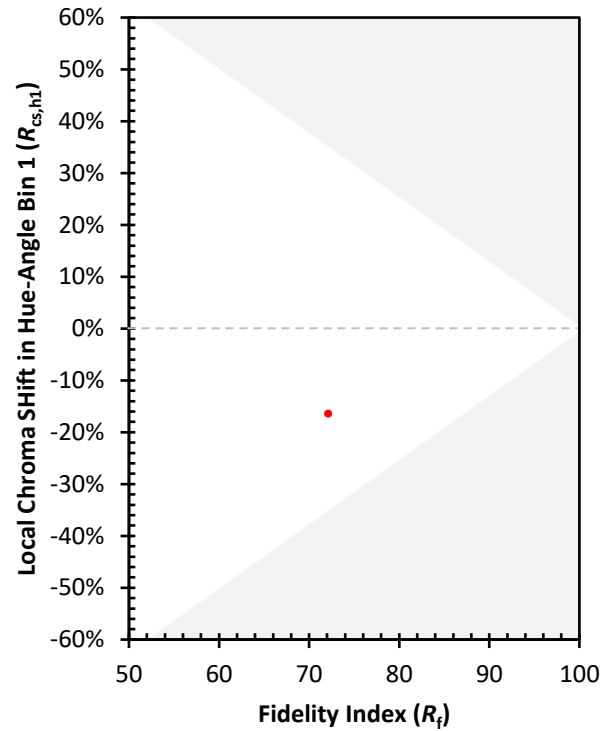
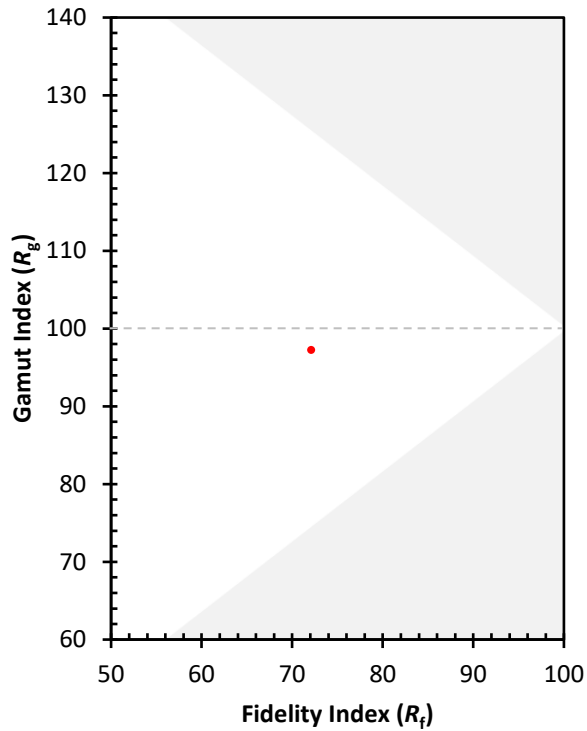
Color Rendition by Hue-Angle Bin



REPORT NUMBER: SP1-1908-441-9-R4

**TM-30-18**

**Measure Comparisons**



(END OF REPORT)