

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



Scaled data based on original data using  
LM-79-08 Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Test Report Prepared for  
Cooper Lighting Solutions  
(formerly Eaton)

Brand: STREETWORKS

Report Number: P348754

Luminaire Tested: **ARCH-N-PA1-40-727-24VDC-T2R-HSS**

Issue Date: 3/3/2020



**Test Information**

Test Method: LM-79-08  
Report Number: P348754  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-9)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: STREETWORKS  
Catalog Number: ARCH-N-PA1-40-727-24VDC-T2R-HSS  
Description: ARCHEON ROADWAY AND AREA LUMINAIRE  
(1) 70 CRI, 2700K, 740mA LIGHT ENGINE WITH 16 LEDS AND  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 3673 lumens  
Efficiency: N/A  
Efficacy: 96.7 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 0.75' x H: 0')  
IES Classification: Type II - Medium  
BUG Rating: B0 - U0 - G1

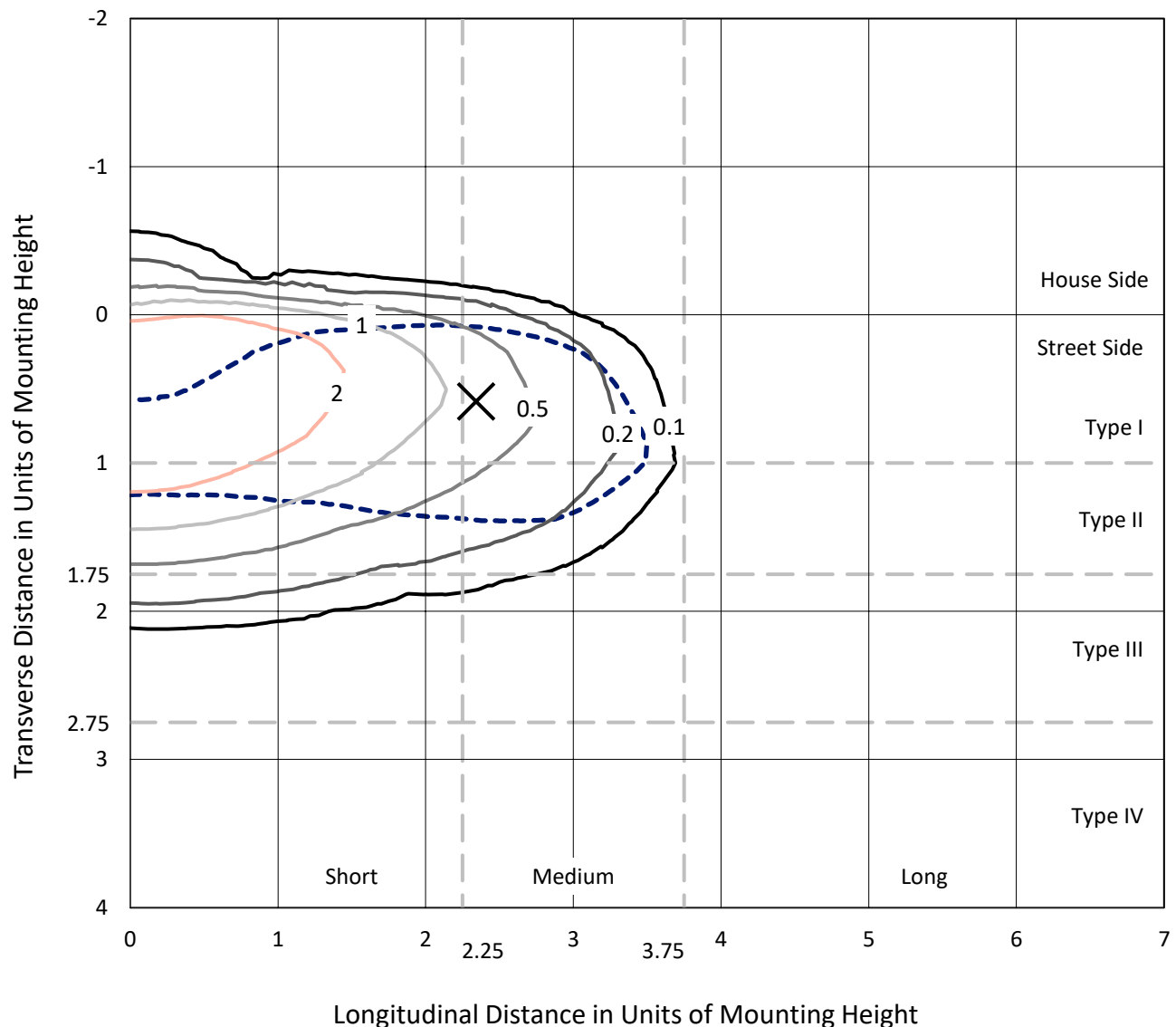
Input Watts (W): 38  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 25 FT

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## Iso-Footcandle Lines of Horizontal Illumination

× Max cd  
 - - - 1/2 Max cd

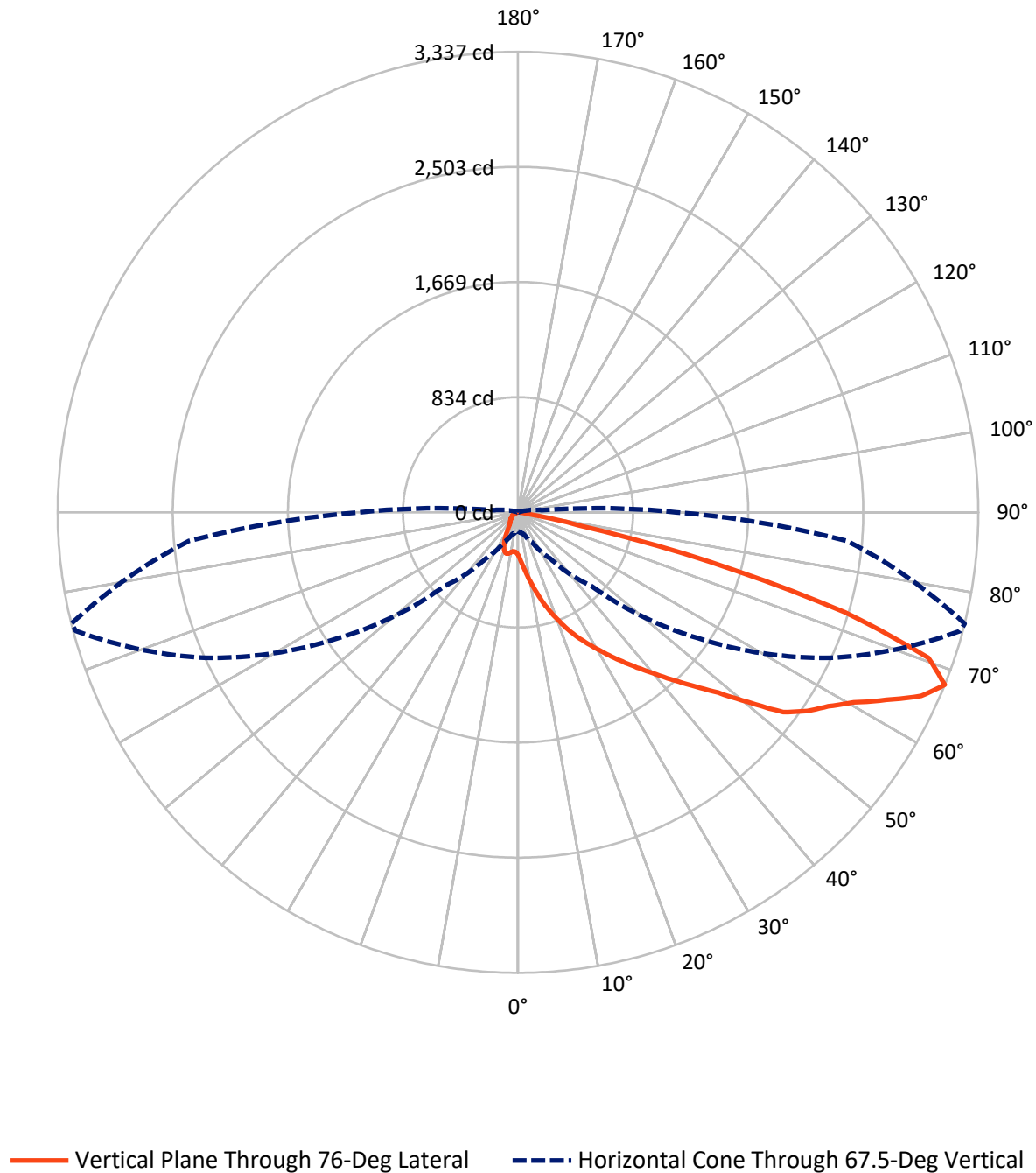


Based on 15 foot mounting height. Maximum calculated value = 4.9 fc  
 Type II - Medium - N/A

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## Luminous Intensity Polar Plot



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**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 182.4    | 0.0    | 182.4  |
|                    | % Fixture | 5.0      | 0.0    | 5.0    |
| <b>Street Side</b> | Lumens    | 3490.6   | 0.0    | 3490.6 |
|                    | % Fixture | 95.0     | 0.0    | 95.0   |
| <b>Total</b>       | Lumens    | 3673.0   | 0.0    | 3673.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 38.7   | 1.1       |
| 10°-20°   | 153.6  | 4.2       |
| 20°-30°   | 312.5  | 8.5       |
| 30°-40°   | 542.4  | 14.8      |
| 40°-50°   | 766.3  | 20.9      |
| 50°-60°   | 869.1  | 23.7      |
| 60°-70°   | 720.8  | 19.6      |
| 70°-80°   | 261.1  | 7.1       |
| 80°-90°   | 8.5    | 0.2       |
| 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°    | 3673.0 | 100.0     |
| 0°-180°   | 3673.0 | 100.0     |

**Coefficient of Utilization**



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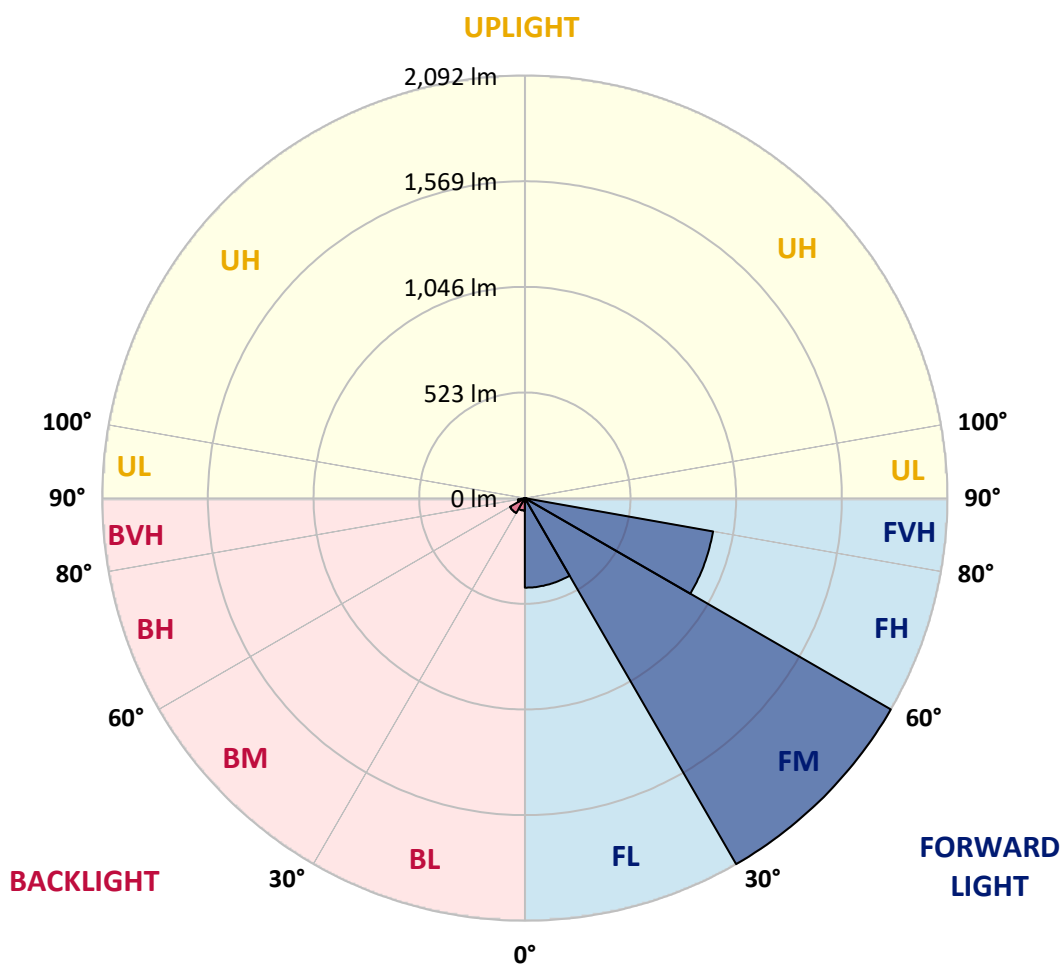
CATALOG NUMBER: ARCH-N-PA1-40-727-24VDC-T2R-HSS

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 443.3  | 12.1      |                         |      |         |
| FM   | (30°-60°)   | 2092.4 | 57.0      |                         |      |         |
| FH   | (60°-80°)   | 946.7  | 25.8      |                         |      | G1/1800 |
| FVH  | (80°-90°)   | 8.2    | 0.2       |                         |      | G0/10   |
| BL   | (0°-30°)    | 61.5   | 1.7       | B0/110                  |      |         |
| BM   | (30°-60°)   | 85.4   | 2.3       | B0/220                  |      |         |
| BH   | (60°-80°)   | 35.2   | 1.0       | B0/110                  |      | G0/110  |
| BVH  | (80°-90°)   | 0.3    | 0.0       |                         |      | G0/10   |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B0-U0-G1**

Type II Medium



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 75°    | 76°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 311.6  | 311.6  | 311.6  | 311.6  | 311.6  | 311.6  | 311.6  | 311.6  | 311.6  | 311.6  | 311.6  |
| 2.5°  | 465.1  | 454.7  | 457.1  | 450.3  | 438.1  | 413.0  | 391.6  | 371.3  | 347.6  | 346.8  | 327.3  |
| 5°    | 627.2  | 618.3  | 617.2  | 603.5  | 581.3  | 538.7  | 497.1  | 449.8  | 397.0  | 393.2  | 351.8  |
| 7.5°  | 774.3  | 767.2  | 764.6  | 748.4  | 707.0  | 665.5  | 611.4  | 541.9  | 459.3  | 452.2  | 384.8  |
| 10°   | 887.3  | 883.9  | 884.5  | 872.9  | 837.5  | 798.9  | 727.9  | 639.2  | 530.0  | 519.0  | 424.4  |
| 12.5° | 972.9  | 973.7  | 979.5  | 972.4  | 952.6  | 923.9  | 848.1  | 743.1  | 608.2  | 593.2  | 469.6  |
| 15°   | 1035.8 | 1039.8 | 1050.4 | 1059.3 | 1057.8 | 1033.1 | 963.5  | 848.5  | 691.2  | 674.7  | 520.0  |
| 17.5° | 1076.5 | 1081.0 | 1096.5 | 1116.1 | 1134.1 | 1128.3 | 1074.9 | 950.2  | 775.2  | 756.1  | 573.9  |
| 20°   | 1112.2 | 1117.6 | 1134.1 | 1160.0 | 1193.7 | 1200.9 | 1165.8 | 1048.8 | 859.1  | 835.8  | 629.6  |
| 22.5° | 1189.7 | 1189.5 | 1199.6 | 1214.8 | 1246.8 | 1265.5 | 1243.2 | 1140.4 | 942.0  | 917.7  | 686.4  |
| 25°   | 1329.7 | 1324.4 | 1320.8 | 1308.9 | 1316.0 | 1327.6 | 1315.2 | 1226.0 | 1025.3 | 1000.7 | 744.0  |
| 27.5° | 1496.1 | 1499.3 | 1470.7 | 1438.6 | 1413.8 | 1401.9 | 1381.7 | 1305.4 | 1105.5 | 1078.4 | 800.3  |
| 30°   | 1671.7 | 1672.6 | 1638.8 | 1598.0 | 1543.4 | 1498.2 | 1463.1 | 1381.2 | 1187.9 | 1158.4 | 855.1  |
| 32.5° | 1830.0 | 1823.8 | 1790.3 | 1734.6 | 1665.7 | 1614.9 | 1542.0 | 1465.8 | 1275.1 | 1246.6 | 915.9  |
| 35°   | 1955.6 | 1948.2 | 1907.4 | 1856.7 | 1785.3 | 1734.1 | 1646.4 | 1550.3 | 1366.8 | 1339.0 | 976.9  |
| 37.5° | 2047.3 | 2038.6 | 1996.8 | 1944.6 | 1883.0 | 1853.2 | 1767.6 | 1642.2 | 1467.0 | 1437.0 | 1041.1 |
| 40°   | 2079.2 | 2071.6 | 2045.4 | 2007.2 | 1957.7 | 1950.9 | 1896.2 | 1748.0 | 1575.9 | 1544.0 | 1113.9 |
| 42.5° | 2060.2 | 2052.8 | 2043.4 | 2030.6 | 2010.0 | 2016.4 | 2017.5 | 1868.5 | 1696.9 | 1665.6 | 1194.2 |
| 45°   | 1984.9 | 1978.3 | 1987.9 | 2006.7 | 2032.3 | 2064.2 | 2128.2 | 1998.1 | 1832.1 | 1798.6 | 1287.0 |
| 47.5° | 1874.0 | 1869.1 | 1895.9 | 1942.8 | 2017.7 | 2105.6 | 2229.5 | 2134.2 | 1983.9 | 1952.8 | 1402.9 |
| 50°   | 1716.2 | 1715.4 | 1768.9 | 1854.7 | 1969.7 | 2125.5 | 2334.1 | 2289.0 | 2194.7 | 2162.0 | 1564.0 |
| 52.5° | 1470.7 | 1472.3 | 1577.4 | 1714.6 | 1885.6 | 2112.0 | 2401.4 | 2487.9 | 2440.0 | 2406.0 | 1703.5 |
| 55°   | 1236.8 | 1246.5 | 1321.0 | 1518.9 | 1756.5 | 2061.8 | 2424.5 | 2580.8 | 2575.3 | 2543.1 | 1781.1 |
| 57.5° | 1007.8 | 1025.3 | 1097.1 | 1282.0 | 1568.0 | 1946.1 | 2411.8 | 2621.0 | 2676.1 | 2651.5 | 1883.5 |
| 60°   | 759.6  | 767.7  | 850.4  | 1023.2 | 1326.1 | 1734.9 | 2319.6 | 2642.9 | 2813.8 | 2796.8 | 2032.0 |
| 62.5° | 483.3  | 503.4  | 576.8  | 743.5  | 1032.6 | 1441.7 | 2164.1 | 2642.6 | 2986.2 | 2995.5 | 2223.7 |
| 65°   | 254.6  | 278.1  | 317.0  | 460.8  | 709.6  | 1114.2 | 1930.3 | 2617.8 | 3197.7 | 3210.7 | 2373.5 |
| 67.5° | 137.3  | 144.0  | 164.6  | 239.2  | 411.5  | 754.8  | 1586.7 | 2495.5 | 3320.2 | 3337.4 | 2394.4 |
| 70°   | 100.4  | 104.1  | 111.9  | 132.3  | 207.1  | 438.4  | 1157.8 | 2218.2 | 3162.3 | 3155.8 | 2127.4 |
| 72.5° | 77.1   | 82.9   | 88.7   | 96.9   | 119.1  | 234.0  | 720.8  | 1737.0 | 2523.2 | 2480.7 | 1590.2 |
| 75°   | 60.8   | 61.8   | 70.0   | 77.4   | 89.3   | 133.3  | 320.1  | 1011.7 | 1540.0 | 1439.4 | 824.6  |
| 77.5° | 48.6   | 49.2   | 54.1   | 60.5   | 71.8   | 87.6   | 99.1   | 398.0  | 491.7  | 438.7  | 179.0  |
| 80°   | 28.8   | 30.4   | 40.2   | 46.7   | 59.5   | 55.2   | 36.2   | 86.4   | 76.8   | 69.5   | 30.1   |
| 82.5° | 16.1   | 17.4   | 22.7   | 36.9   | 41.5   | 26.4   | 18.0   | 23.3   | 18.0   | 17.5   | 8.5    |
| 85°   | 0.0    | 0.8    | 14.6   | 22.9   | 16.9   | 5.8    | 7.6    | 7.7    | 5.3    | 5.0    | 3.4    |
| 87.5° | 0.0    | 0.0    | 4.5    | 4.3    | 0.6    | 1.0    | 1.8    | 2.6    | 2.1    | 2.1    | 1.8    |
| 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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**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°   | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 311.6  | 311.6 | 311.6 | 311.6 | 311.6 | 311.6 | 311.6 | 311.6 | 311.6 | 311.6 | 311.6 |
| 2.5°  | 317.7  | 309.0 | 292.6 | 276.5 | 263.0 | 251.9 | 241.9 | 237.9 | 234.6 | 234.2 | 231.6 |
| 5°    | 331.9  | 314.3 | 282.9 | 257.2 | 240.0 | 227.7 | 217.3 | 210.8 | 205.8 | 203.9 | 202.1 |
| 7.5°  | 353.3  | 326.7 | 281.6 | 252.0 | 231.4 | 210.8 | 191.5 | 170.6 | 157.6 | 152.6 | 149.7 |
| 10°   | 379.3  | 343.1 | 286.5 | 250.6 | 214.5 | 171.1 | 139.1 | 112.5 | 101.7 | 98.2  | 97.2  |
| 12.5° | 409.7  | 363.6 | 294.8 | 241.6 | 178.5 | 121.5 | 95.9  | 86.9  | 84.5  | 83.4  | 83.4  |
| 15°   | 444.7  | 385.9 | 300.8 | 215.5 | 132.0 | 91.9  | 83.0  | 78.9  | 76.3  | 74.8  | 75.0  |
| 17.5° | 480.4  | 407.8 | 297.9 | 177.7 | 97.4  | 81.8  | 75.2  | 70.7  | 67.1  | 65.7  | 65.3  |
| 20°   | 516.5  | 428.1 | 281.8 | 132.3 | 82.4  | 74.2  | 66.8  | 61.8  | 58.3  | 56.8  | 56.5  |
| 22.5° | 553.8  | 445.3 | 253.5 | 97.0  | 74.0  | 65.8  | 58.6  | 53.6  | 50.2  | 48.9  | 48.3  |
| 25°   | 590.2  | 459.3 | 213.9 | 78.5  | 66.1  | 57.9  | 51.0  | 46.4  | 43.3  | 42.0  | 41.8  |
| 27.5° | 624.1  | 468.2 | 168.0 | 69.4  | 59.2  | 50.9  | 44.6  | 40.4  | 37.8  | 36.9  | 36.7  |
| 30°   | 654.7  | 469.0 | 124.2 | 62.6  | 53.1  | 44.7  | 38.9  | 35.2  | 33.0  | 32.0  | 31.7  |
| 32.5° | 685.6  | 462.2 | 90.4  | 56.5  | 47.5  | 39.4  | 33.8  | 30.9  | 29.3  | 28.5  | 28.5  |
| 35°   | 714.7  | 446.6 | 70.5  | 51.2  | 42.0  | 34.3  | 29.8  | 27.7  | 26.7  | 25.9  | 25.9  |
| 37.5° | 743.2  | 424.2 | 59.9  | 46.5  | 36.9  | 29.9  | 26.2  | 24.9  | 24.1  | 23.3  | 23.3  |
| 40°   | 772.2  | 396.1 | 54.4  | 42.2  | 32.7  | 26.6  | 23.3  | 22.2  | 21.4  | 20.8  | 20.6  |
| 42.5° | 807.7  | 363.6 | 50.9  | 38.1  | 29.0  | 23.5  | 20.6  | 19.3  | 18.7  | 18.0  | 17.7  |
| 45°   | 849.0  | 335.6 | 48.0  | 34.1  | 25.9  | 20.9  | 17.9  | 16.6  | 15.6  | 14.8  | 14.6  |
| 47.5° | 908.3  | 315.3 | 44.1  | 29.8  | 23.0  | 18.2  | 15.5  | 14.0  | 12.6  | 11.7  | 11.6  |
| 50°   | 984.1  | 298.5 | 39.1  | 25.9  | 20.1  | 15.5  | 12.9  | 11.1  | 9.8   | 9.0   | 9.0   |
| 52.5° | 1021.8 | 276.7 | 34.6  | 22.5  | 16.9  | 13.0  | 10.5  | 8.4   | 7.7   | 6.9   | 6.9   |
| 55°   | 1036.9 | 259.9 | 30.1  | 19.2  | 14.0  | 10.8  | 8.2   | 6.4   | 6.0   | 5.5   | 5.3   |
| 57.5° | 1079.4 | 255.1 | 26.2  | 16.3  | 11.6  | 8.5   | 6.3   | 4.8   | 4.5   | 3.9   | 3.9   |
| 60°   | 1147.8 | 257.5 | 22.7  | 13.8  | 9.3   | 6.6   | 4.7   | 3.7   | 3.4   | 2.7   | 2.7   |
| 62.5° | 1221.7 | 254.4 | 19.2  | 11.9  | 7.2   | 4.8   | 3.2   | 2.7   | 2.7   | 1.6   | 1.4   |
| 65°   | 1235.8 | 226.6 | 16.4  | 9.8   | 5.6   | 3.5   | 2.1   | 1.8   | 2.4   | 0.3   | 0.0   |
| 67.5° | 1147.0 | 175.7 | 14.2  | 7.6   | 4.2   | 2.7   | 1.6   | 0.8   | 2.1   | 0.0   | 0.0   |
| 70°   | 917.2  | 111.7 | 11.4  | 5.5   | 3.2   | 2.3   | 1.3   | 0.3   | 1.6   | 0.0   | 0.0   |
| 72.5° | 648.6  | 64.9  | 9.0   | 3.9   | 2.7   | 1.8   | 1.0   | 0.0   | 1.0   | 0.0   | 0.0   |
| 75°   | 328.0  | 34.6  | 5.6   | 2.9   | 2.1   | 1.3   | 0.6   | 0.0   | 0.2   | 0.0   | 0.0   |
| 77.5° | 71.0   | 16.1  | 3.5   | 2.1   | 1.4   | 0.8   | 0.3   | 0.0   | 0.0   | 0.0   | 0.0   |
| 80°   | 15.5   | 7.1   | 2.3   | 1.3   | 0.8   | 0.5   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 82.5° | 5.6    | 3.7   | 1.1   | 0.6   | 0.3   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 85°   | 3.1    | 1.9   | 0.6   | 0.3   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 87.5° | 1.6    | 0.6   | 0.2   | 0.2   | 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   |

Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

STREETWORKS

Report Number: SP1-2101-121-5

Luminaire Tested: IFLD-S-SA2E-727-U-T2

Test Date: 03/04/2021

### Test Information

Test Method: LM-79-08  
 Report Number: SP1-2101-121-5  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1  
 Measurement Geometry:  $4\pi$   
 Issue Date: 03/04/2021  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: STREETWORKS  
 Catalog Number: **IFLD-S-SA2E-727-U-T2**  
 Description: STREETWORKS INF FLOOD

PROGRAMMED @ 1500mA.

### Spectral Parameters

|                           |         |           |      |      |       |
|---------------------------|---------|-----------|------|------|-------|
| CCT (K):                  | 2805    | CRI (Ra): | 72.4 |      |       |
| CIE u':                   | 0.2586  | R1:       | 69.8 | R9:  | -15.0 |
| CIE v':                   | 0.5221  | R2:       | 81.3 | R10: | 55.6  |
| Duv:                      | -0.0022 | R3:       | 90.2 | R11: | 61.7  |
| CIE x:                    | 0.4477  | R4:       | 68.5 | R12: | 47.2  |
| CIE y:                    | 0.4017  | R5:       | 67.5 | R13: | 71.4  |
| CIE z:                    | 0.1506  | R6:       | 72.4 | R14: | 93.9  |
| Peak Wavelength (nm):     | 599     | R7:       | 79.4 |      |       |
| Dominant Wavelength (nm): | 584     | R8:       | 49.9 |      |       |
| Purity:                   | 55.3    |           |      |      |       |
| Rf:                       | 71.9    |           |      |      |       |
| Rg:                       | 97.9    |           |      |      |       |



### Test Conditions

Stabilization Time: 60M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.3/31%  
 Sphere Temperature (°C): 24.8

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| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 1/31/2021        | 7/31/2021            |
| Power Meter                    | IN0071                | 12/1/2020        | 12/1/2021            |
| AC Power Source                | IN0063                | 12/1/2020        | 12/1/2021            |
| DC Power Source                | IN0208                | 12/1/2020        | 12/1/2021            |
| Sphere Thermometer             | IN0085                | 12/1/2020        | 12/1/2021            |
| Room Thermometer               | IN0046                | 12/1/2020        | 12/1/2021            |

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**CIE 1931 Chromaticity Diagram**



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



Point lies inside the ANSI 2700K 4-step quadrangle

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### 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       | 4854             | 0.0              | 490       | 23280            | 3.3              | 620       | 266893           | 69.5             | 750       | 19996            | 0.0              | 880       | 6314             | 0.0              |
| 365       | 4049             | 0.0              | 495       | 29582            | 5.4              | 625       | 255096           | 56.3             | 755       | 17900            | 0.0              | 885       | 7853             | 0.0              |
| 370       | 3795             | 0.0              | 500       | 39981            | 8.8              | 630       | 240244           | 43.5             | 760       | 17272            | 0.0              | 890       | 5823             | 0.0              |
| 375       | 4296             | 0.0              | 505       | 54556            | 15.3             | 635       | 223787           | 33.6             | 765       | 14514            | 0.0              | 895       | 7346             | 0.0              |
| 380       | 4496             | 0.0              | 510       | 71364            | 24.5             | 640       | 207566           | 24.8             | 770       | 12643            | 0.0              | 900       | 6920             | 0.0              |
| 385       | 4186             | 0.0              | 515       | 89828            | 37.2             | 645       | 192517           | 18.5             | 775       | 12475            | 0.0              | 905       | 6608             | 0.0              |
| 390       | 3945             | 0.0              | 520       | 108414           | 52.6             | 650       | 177187           | 12.9             | 780       | 11188            | 0.0              | 910       | 6279             | 0.0              |
| 395       | 3780             | 0.0              | 525       | 124929           | 67.1             | 655       | 161553           | 9.3              | 785       | 10229            | 0.0              | 915       | 5131             | 0.0              |
| 400       | 3679             | 0.0              | 530       | 141352           | 83.2             | 660       | 147361           | 6.1              | 790       | 8578             | 0.0              | 920       | 5855             | 0.0              |
| 405       | 4475             | 0.0              | 535       | 154552           | 95.8             | 665       | 132756           | 4.2              | 795       | 9114             | 0.0              | 925       | 5678             | 0.0              |
| 410       | 7499             | 0.0              | 540       | 166297           | 108.4            | 670       | 118534           | 2.6              | 800       | 8597             | 0.0              | 930       | 6661             | 0.0              |
| 415       | 14449            | 0.0              | 545       | 178874           | 119.1            | 675       | 105260           | 1.8              | 805       | 8790             | 0.0              | 935       | 8074             | 0.0              |
| 420       | 26000            | 0.1              | 550       | 193176           | 131.3            | 680       | 93637            | 1.1              | 810       | 7814             | 0.0              | 940       | 7823             | 0.0              |
| 425       | 45491            | 0.2              | 555       | 206008           | 140.7            | 685       | 83217            | 0.7              | 815       | 7533             | 0.0              | 945       | 8364             | 0.0              |
| 430       | 70707            | 0.6              | 560       | 220126           | 149.6            | 690       | 73671            | 0.4              | 820       | 7303             | 0.0              | 950       | 6763             | 0.0              |
| 435       | 98169            | 1.2              | 565       | 234383           | 155.8            | 695       | 64520            | 0.3              | 825       | 6745             | 0.0              | 955       | 4883             | 0.0              |
| 440       | 123846           | 1.9              | 570       | 248161           | 161.4            | 700       | 57442            | 0.2              | 830       | 7209             | 0.0              | 960       | 7488             | 0.0              |
| 445       | 139822           | 2.9              | 575       | 261970           | 163.0            | 705       | 51479            | 0.1              | 835       | 6674             | 0.0              | 965       | 9316             | 0.0              |
| 450       | 131679           | 3.4              | 580       | 272271           | 161.8            | 710       | 45940            | 0.1              | 840       | 6151             | 0.0              | 970       | 6857             | 0.0              |
| 455       | 99242            | 3.3              | 585       | 283822           | 157.7            | 715       | 41575            | 0.0              | 845       | 5371             | 0.0              | 975       | 4388             | 0.0              |
| 460       | 65216            | 2.7              | 590       | 291192           | 150.6            | 720       | 37753            | 0.0              | 850       | 6484             | 0.0              | 980       | 6095             | 0.0              |
| 465       | 44137            | 2.3              | 595       | 294651           | 139.7            | 725       | 33818            | 0.0              | 855       | 6614             | 0.0              | 985       | 7701             | 0.0              |
| 470       | 32002            | 2.0              | 600       | 297168           | 128.1            | 730       | 30414            | 0.0              | 860       | 5959             | 0.0              | 990       | 9045             | 0.0              |
| 475       | 24549            | 1.9              | 605       | 295658           | 114.5            | 735       | 26662            | 0.0              | 865       | 4768             | 0.0              | 995       | 6989             | 0.0              |
| 480       | 20801            | 2.0              | 610       | 287633           | 98.8             | 740       | 23848            | 0.0              | 870       | 5098             | 0.0              | 1000      | 7341             | 0.0              |
| 485       | 20656            | 2.4              | 615       | 279152           | 84.3             | 745       | 21851            | 0.0              | 875       | 5516             | 0.0              |           |                  |                  |

REPORT NUMBER: SP1-2101-121-5

### Scotopic Flux vs. Wavelength



Scotopic Lumens: 15895.6

S/P: 1.11

| 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       | 4854             | 0.0              | 490       | 23280            | 35.8             | 620       | 266893           | 3.3              | 750       | 19996            | 0.0              | 880       | 6314             | 0.0              |
| 365       | 4049             | 0.0              | 495       | 29582            | 47.8             | 625       | 255096           | 2.2              | 755       | 17900            | 0.0              | 885       | 7853             | 0.0              |
| 370       | 3795             | 0.0              | 500       | 39981            | 66.9             | 630       | 240244           | 1.4              | 760       | 17272            | 0.0              | 890       | 5823             | 0.0              |
| 375       | 4296             | 0.0              | 505       | 54556            | 92.7             | 635       | 223787           | 0.9              | 765       | 14514            | 0.0              | 895       | 7346             | 0.0              |
| 380       | 4496             | 0.0              | 510       | 71364            | 121.0            | 640       | 207566           | 0.5              | 770       | 12643            | 0.0              | 900       | 6920             | 0.0              |
| 385       | 4186             | 0.0              | 515       | 89828            | 148.9            | 645       | 192517           | 0.3              | 775       | 12475            | 0.0              | 905       | 6608             | 0.0              |
| 390       | 3945             | 0.0              | 520       | 108414           | 172.3            | 650       | 177187           | 0.2              | 780       | 11188            | 0.0              | 910       | 6279             | 0.0              |
| 395       | 3780             | 0.0              | 525       | 124929           | 186.9            | 655       | 161553           | 0.1              | 785       | 10229            | 0.0              | 915       | 5131             | 0.0              |
| 400       | 3679             | 0.1              | 530       | 141352           | 194.9            | 660       | 147361           | 0.1              | 790       | 8578             | 0.0              | 920       | 5855             | 0.0              |
| 405       | 4475             | 0.1              | 535       | 154552           | 192.6            | 665       | 132756           | 0.0              | 795       | 9114             | 0.0              | 925       | 5678             | 0.0              |
| 410       | 7499             | 0.4              | 540       | 166297           | 183.8            | 670       | 118534           | 0.0              | 800       | 8597             | 0.0              | 930       | 6661             | 0.0              |
| 415       | 14449            | 1.5              | 545       | 178874           | 171.5            | 675       | 105260           | 0.0              | 805       | 8790             | 0.0              | 935       | 8074             | 0.0              |
| 420       | 26000            | 4.3              | 550       | 193176           | 158.0            | 680       | 93637            | 0.0              | 810       | 7814             | 0.0              | 940       | 7823             | 0.0              |
| 425       | 45491            | 11.1             | 555       | 206008           | 140.8            | 685       | 83217            | 0.0              | 815       | 7533             | 0.0              | 945       | 8364             | 0.0              |
| 430       | 70707            | 24.1             | 560       | 220126           | 123.0            | 690       | 73671            | 0.0              | 820       | 7303             | 0.0              | 950       | 6763             | 0.0              |
| 435       | 98169            | 43.9             | 565       | 234383           | 105.2            | 695       | 64520            | 0.0              | 825       | 6745             | 0.0              | 955       | 4883             | 0.0              |
| 440       | 123846           | 69.2             | 570       | 248161           | 87.6             | 700       | 57442            | 0.0              | 830       | 7209             | 0.0              | 960       | 7488             | 0.0              |
| 445       | 139822           | 93.6             | 575       | 261970           | 71.3             | 705       | 51479            | 0.0              | 835       | 6674             | 0.0              | 965       | 9316             | 0.0              |
| 450       | 131679           | 102.1            | 580       | 272271           | 56.1             | 710       | 45940            | 0.0              | 840       | 6151             | 0.0              | 970       | 6857             | 0.0              |
| 455       | 99242            | 86.7             | 585       | 283822           | 43.4             | 715       | 41575            | 0.0              | 845       | 5371             | 0.0              | 975       | 4388             | 0.0              |
| 460       | 65216            | 63.0             | 590       | 291192           | 32.4             | 720       | 37753            | 0.0              | 850       | 6484             | 0.0              | 980       | 6095             | 0.0              |
| 465       | 44137            | 46.6             | 595       | 294651           | 23.5             | 725       | 33818            | 0.0              | 855       | 6614             | 0.0              | 985       | 7701             | 0.0              |
| 470       | 32002            | 36.9             | 600       | 297168           | 16.7             | 730       | 30414            | 0.0              | 860       | 5959             | 0.0              | 990       | 9045             | 0.0              |
| 475       | 24549            | 30.7             | 605       | 295658           | 11.6             | 735       | 26662            | 0.0              | 865       | 4768             | 0.0              | 995       | 6989             | 0.0              |
| 480       | 20801            | 28.1             | 610       | 287633           | 7.8              | 740       | 23848            | 0.0              | 870       | 5098             | 0.0              | 1000      | 7341             | 0.0              |
| 485       | 20656            | 29.9             | 615       | 279152           | 5.2              | 745       | 21851            | 0.0              | 875       | 5516             | 0.0              |           |                  |                  |

REPORT NUMBER: SP1-2101-121-5

### Melanopic Flux vs. Wavelength



**Melanopic Lumens: 5527.7**

**M/P: 0.39**

| 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       | 4854             | 0.0              | 490       | 23280            | 19.4             | 620       | 266893           | 0.2              | 750       | 19996            | 0.0              | 880       | 6314             | 0.0              |
| 365       | 4049             | 0.0              | 495       | 29582            | 24.4             | 625       | 255096           | 0.1              | 755       | 17900            | 0.0              | 885       | 7853             | 0.0              |
| 370       | 3795             | 0.0              | 500       | 39981            | 32.1             | 630       | 240244           | 0.1              | 760       | 17272            | 0.0              | 890       | 5823             | 0.0              |
| 375       | 4296             | 0.0              | 505       | 54556            | 41.9             | 635       | 223787           | 0.1              | 765       | 14514            | 0.0              | 895       | 7346             | 0.0              |
| 380       | 4496             | 0.0              | 510       | 71364            | 51.2             | 640       | 207566           | 0.0              | 770       | 12643            | 0.0              | 900       | 6920             | 0.0              |
| 385       | 4186             | 0.0              | 515       | 89828            | 58.7             | 645       | 192517           | 0.0              | 775       | 12475            | 0.0              | 905       | 6608             | 0.0              |
| 390       | 3945             | 0.0              | 520       | 108414           | 63.1             | 650       | 177187           | 0.0              | 780       | 11188            | 0.0              | 910       | 6279             | 0.0              |
| 395       | 3780             | 0.0              | 525       | 124929           | 63.4             | 655       | 161553           | 0.0              | 785       | 10229            | 0.0              | 915       | 5131             | 0.0              |
| 400       | 3679             | 0.0              | 530       | 141352           | 61.1             | 660       | 147361           | 0.0              | 790       | 8578             | 0.0              | 920       | 5855             | 0.0              |
| 405       | 4475             | 0.1              | 535       | 154552           | 55.6             | 665       | 132756           | 0.0              | 795       | 9114             | 0.0              | 925       | 5678             | 0.0              |
| 410       | 7499             | 0.3              | 540       | 166297           | 48.7             | 670       | 118534           | 0.0              | 800       | 8597             | 0.0              | 930       | 6661             | 0.0              |
| 415       | 14449            | 1.0              | 545       | 178874           | 41.5             | 675       | 105260           | 0.0              | 805       | 8790             | 0.0              | 935       | 8074             | 0.0              |
| 420       | 26000            | 3.0              | 550       | 193176           | 34.7             | 680       | 93637            | 0.0              | 810       | 7814             | 0.0              | 940       | 7823             | 0.0              |
| 425       | 45491            | 7.1              | 555       | 206008           | 27.8             | 685       | 83217            | 0.0              | 815       | 7533             | 0.0              | 945       | 8364             | 0.0              |
| 430       | 70707            | 14.9             | 560       | 220126           | 21.7             | 690       | 73671            | 0.0              | 820       | 7303             | 0.0              | 950       | 6763             | 0.0              |
| 435       | 98169            | 26.2             | 565       | 234383           | 16.5             | 695       | 64520            | 0.0              | 825       | 6745             | 0.0              | 955       | 4883             | 0.0              |
| 440       | 123846           | 41.4             | 570       | 248161           | 12.1             | 700       | 57442            | 0.0              | 830       | 7209             | 0.0              | 960       | 7488             | 0.0              |
| 445       | 139822           | 55.1             | 575       | 261970           | 8.7              | 705       | 51479            | 0.0              | 835       | 6674             | 0.0              | 965       | 9316             | 0.0              |
| 450       | 131679           | 60.7             | 580       | 272271           | 6.1              | 710       | 45940            | 0.0              | 840       | 6151             | 0.0              | 970       | 6857             | 0.0              |
| 455       | 99242            | 52.0             | 585       | 283822           | 4.2              | 715       | 41575            | 0.0              | 845       | 5371             | 0.0              | 975       | 4388             | 0.0              |
| 460       | 65216            | 38.4             | 590       | 291192           | 2.9              | 720       | 37753            | 0.0              | 850       | 6484             | 0.0              | 980       | 6095             | 0.0              |
| 465       | 44137            | 28.8             | 595       | 294651           | 1.9              | 725       | 33818            | 0.0              | 855       | 6614             | 0.0              | 985       | 7701             | 0.0              |
| 470       | 32002            | 22.9             | 600       | 297168           | 1.3              | 730       | 30414            | 0.0              | 860       | 5959             | 0.0              | 990       | 9045             | 0.0              |
| 475       | 24549            | 18.7             | 605       | 295658           | 0.8              | 735       | 26662            | 0.0              | 865       | 4768             | 0.0              | 995       | 6989             | 0.0              |
| 480       | 20801            | 16.7             | 610       | 287633           | 0.5              | 740       | 23848            | 0.0              | 870       | 5098             | 0.0              | 1000      | 7341             | 0.0              |
| 485       | 20656            | 17.0             | 615       | 279152           | 0.3              | 745       | 21851            | 0.0              | 875       | 5516             | 0.0              |           |                  |                  |

### Summary

$R_f = 71.9$   
 $R_g = 97.9$   
 CIE  $R_a = 72.4$   
 $R_g = -15.0$

### Spectral Power Distribution Comparison



### Color Vector Graphics

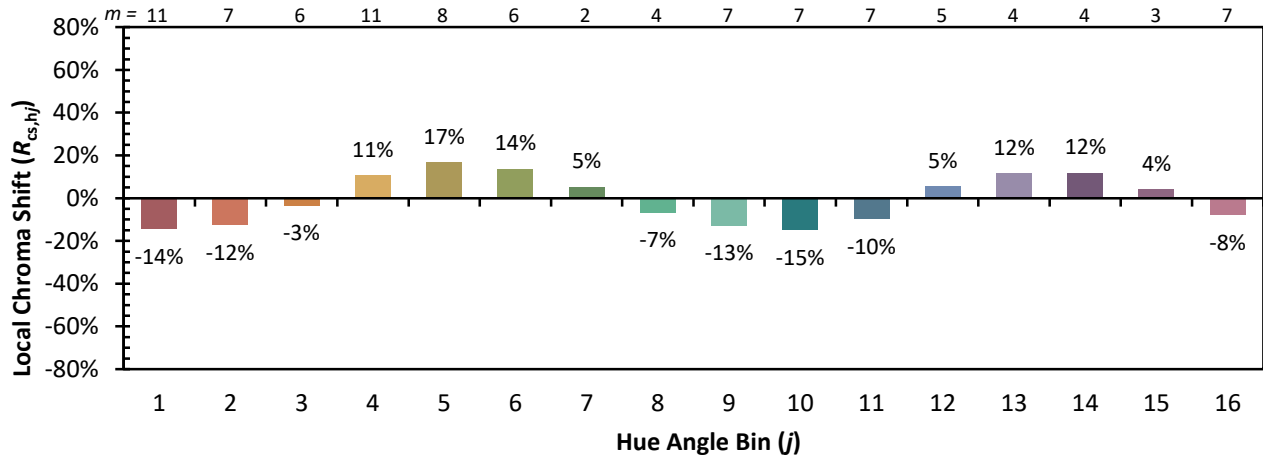


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 56 | CES51 = 80 | CES76 = 50 |
| CES02 = 63 | CES27 = 80 | CES52 = 81 | CES77 = 74 |
| CES03 = 31 | CES28 = 81 | CES53 = 70 | CES78 = 56 |
| CES04 = 71 | CES29 = 51 | CES54 = 82 | CES79 = 81 |
| CES05 = 50 | CES30 = 61 | CES55 = 80 | CES80 = 80 |
| CES06 = 52 | CES31 = 56 | CES56 = 69 | CES81 = 74 |
| CES07 = 42 | CES32 = 52 | CES57 = 67 | CES82 = 91 |
| CES08 = 41 | CES33 = 62 | CES58 = 70 | CES83 = 86 |
| CES09 = 29 | CES34 = 67 | CES59 = 85 | CES84 = 89 |
| CES10 = 76 | CES35 = 83 | CES60 = 91 | CES85 = 83 |
| CES11 = 60 | CES36 = 89 | CES61 = 83 | CES86 = 67 |
| CES12 = 66 | CES37 = 76 | CES62 = 82 | CES87 = 78 |
| CES13 = 43 | CES38 = 68 | CES63 = 71 | CES88 = 76 |
| CES14 = 74 | CES39 = 93 | CES64 = 67 | CES89 = 68 |
| CES15 = 71 | CES40 = 88 | CES65 = 66 | CES90 = 74 |
| CES16 = 48 | CES41 = 82 | CES66 = 61 | CES91 = 96 |
| CES17 = 50 | CES42 = 77 | CES67 = 58 | CES92 = 68 |
| CES18 = 57 | CES43 = 67 | CES68 = 65 | CES93 = 80 |
| CES19 = 73 | CES44 = 99 | CES69 = 75 | CES94 = 57 |
| CES20 = 67 | CES45 = 78 | CES70 = 58 | CES95 = 75 |
| CES21 = 88 | CES46 = 74 | CES71 = 57 | CES96 = 79 |
| CES22 = 80 | CES47 = 71 | CES72 = 85 | CES97 = 81 |
| CES23 = 92 | CES48 = 62 | CES73 = 50 | CES98 = 75 |
| CES24 = 91 | CES49 = 71 | CES74 = 96 | CES99 = 67 |
| CES25 = 73 | CES50 = 80 | CES75 = 59 |            |



Color Rendition by Hue-Angle Bin



REPORT NUMBER: SP1-2101-121-5

**TM-30-18**

**Measure Comparisons**



(END OF REPORT)