

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: P800700

Luminaire Tested: **ARCH-M-PA2-50-727-24VDC-T2U-HSS**

Issue Date: 5/19/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P800700  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1910-568-16)  
Test Lab: INNOVATION CENTER  
Issue Date: 5/19/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: STREETWORKS  
Catalog Number: ARCH-M-PA2-50-727-24VDC-T2U-HSS  
Description: ARCHEON-M ROADWAY AND AREA LUMINAIRE  
(2) 70 CRI, 2700K, 305mA LIGHT ENGINES WITH 16 LEDS AND TYPE II U OPTICS  
WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 4664 lumens  
Efficiency: N/A  
Efficacy: 101.4 lumens/watt  
Luminous Opening: Rectangular (W 0.75' x L: 1' x H: 0')  
IES Classification: Type II - Short  
BUG Rating: B1 - U0 - G1

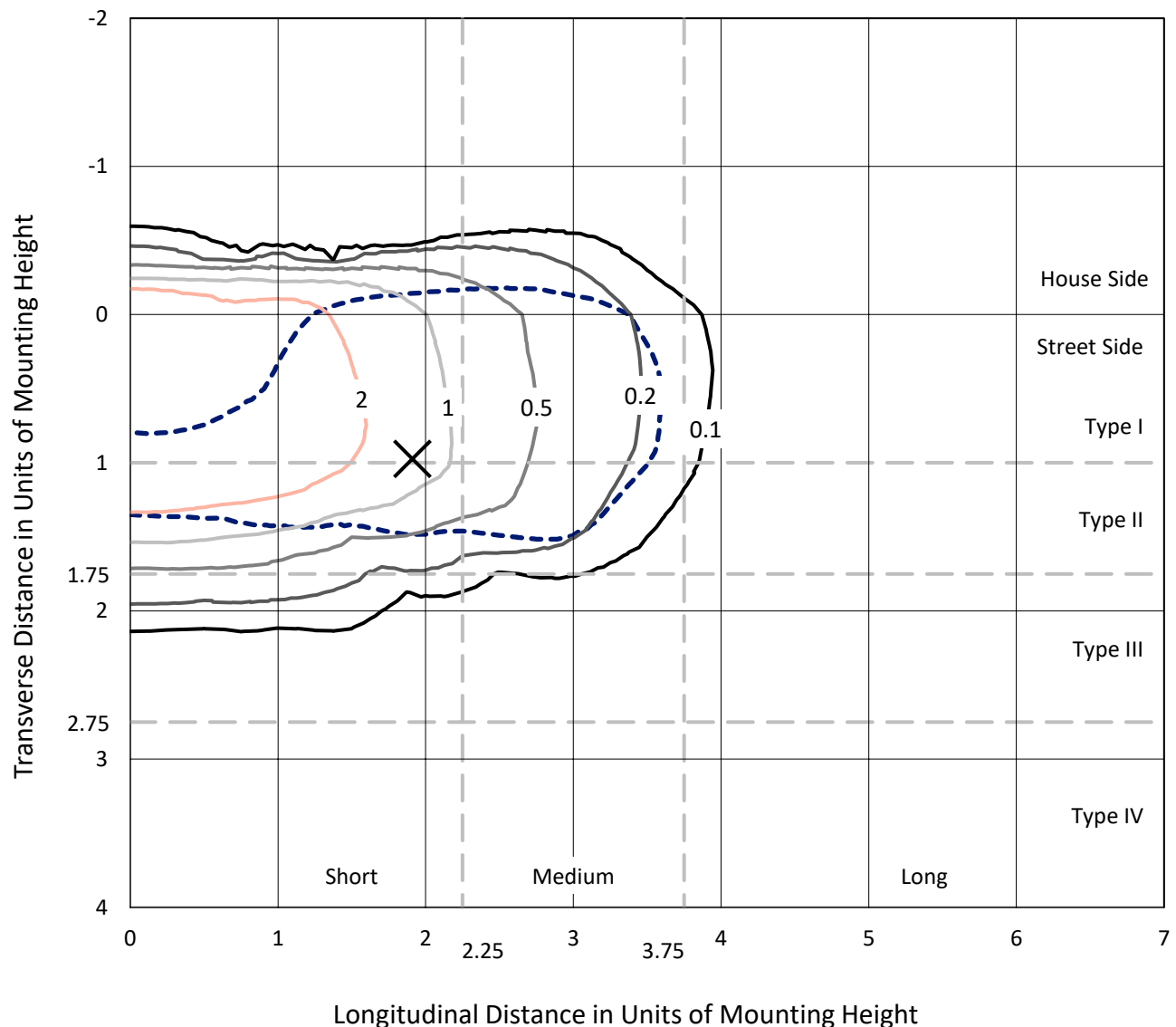
Input Watts (W): 46  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 25 FT

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## Iso-Footcandle Lines of Horizontal Illumination

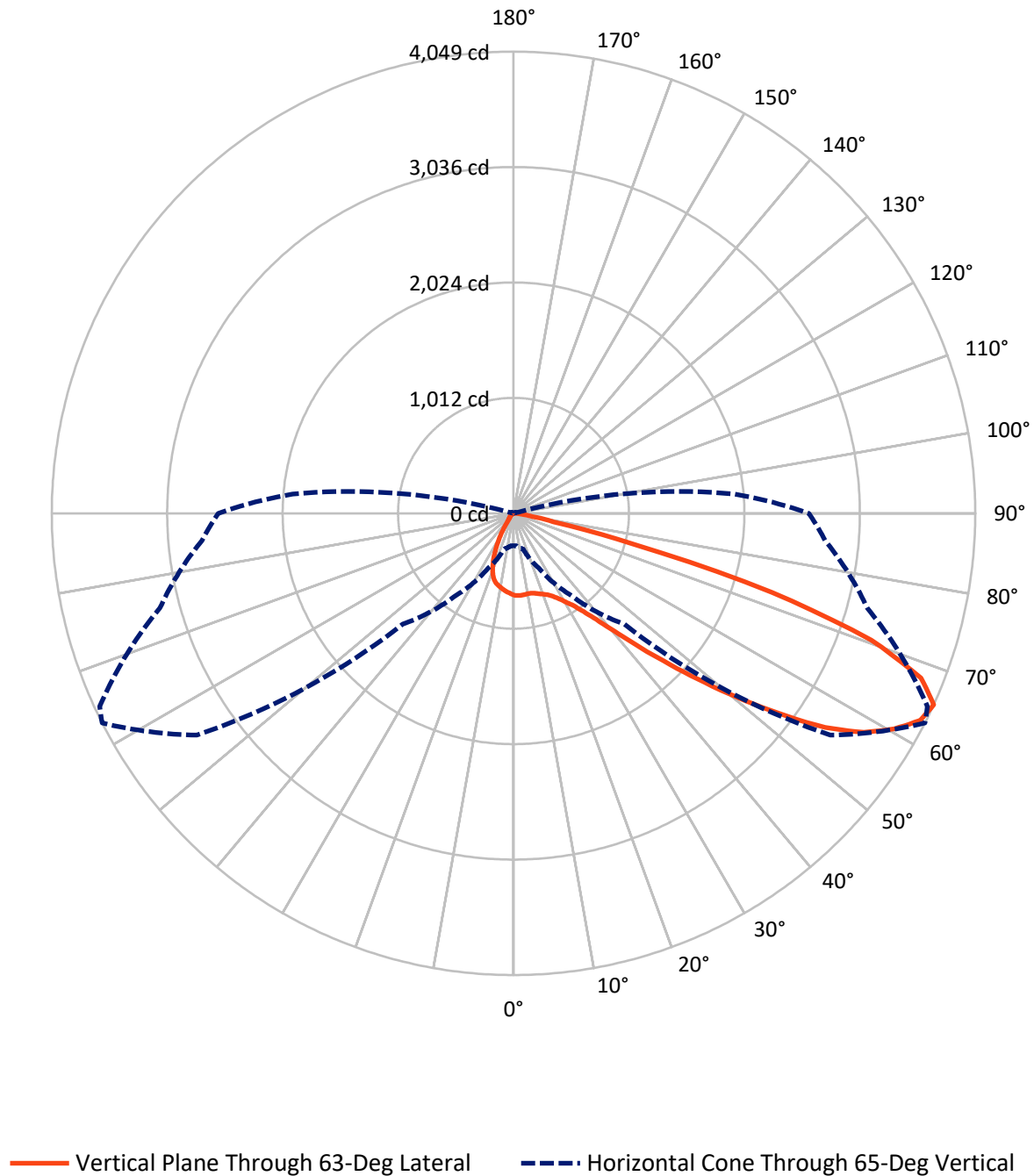
✕ Max cd  
 - - - 1/2 Max cd



Based on 15 foot mounting height. Maximum calculated value = 4.5 fc  
 Type II - Short - N/A

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## Luminous Intensity Polar Plot



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**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 600.3    | 0.0    | 600.3  |
|                    | % Fixture | 12.9     | 0.0    | 12.9   |
| <b>Street Side</b> | Lumens    | 4063.8   | 0.0    | 4063.8 |
|                    | % Fixture | 87.1     | 0.0    | 87.1   |
| <b>Total</b>       | Lumens    | 4664.0   | 0.0    | 4664.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 65.6   | 1.4       |
| 10°-20°   | 161.7  | 3.5       |
| 20°-30°   | 239.7  | 5.1       |
| 30°-40°   | 445.1  | 9.5       |
| 40°-50°   | 942.9  | 20.2      |
| 50°-60°   | 1303.8 | 28.0      |
| 60°-70°   | 1043.7 | 22.4      |
| 70°-80°   | 433.6  | 9.3       |
| 80°-90°   | 27.8   | 0.6       |
| 90°-100°  | 0.0    | 0.0       |
| 100°-110° | 0.0    | 0.0       |
| 110°-120° | 0.0    | 0.0       |
| 120°-130° | 0.0    | 0.0       |
| 130°-140° | 0.0    | 0.0       |
| 140°-150° | 0.0    | 0.0       |
| 150°-160° | 0.0    | 0.0       |
| 160°-170° | 0.0    | 0.0       |
| 170°-180° | 0.0    | 0.0       |
| 0°-90°    | 4664.0 | 100.0     |
| 0°-180°   | 4664.0 | 100.0     |

**Coefficient of Utilization**



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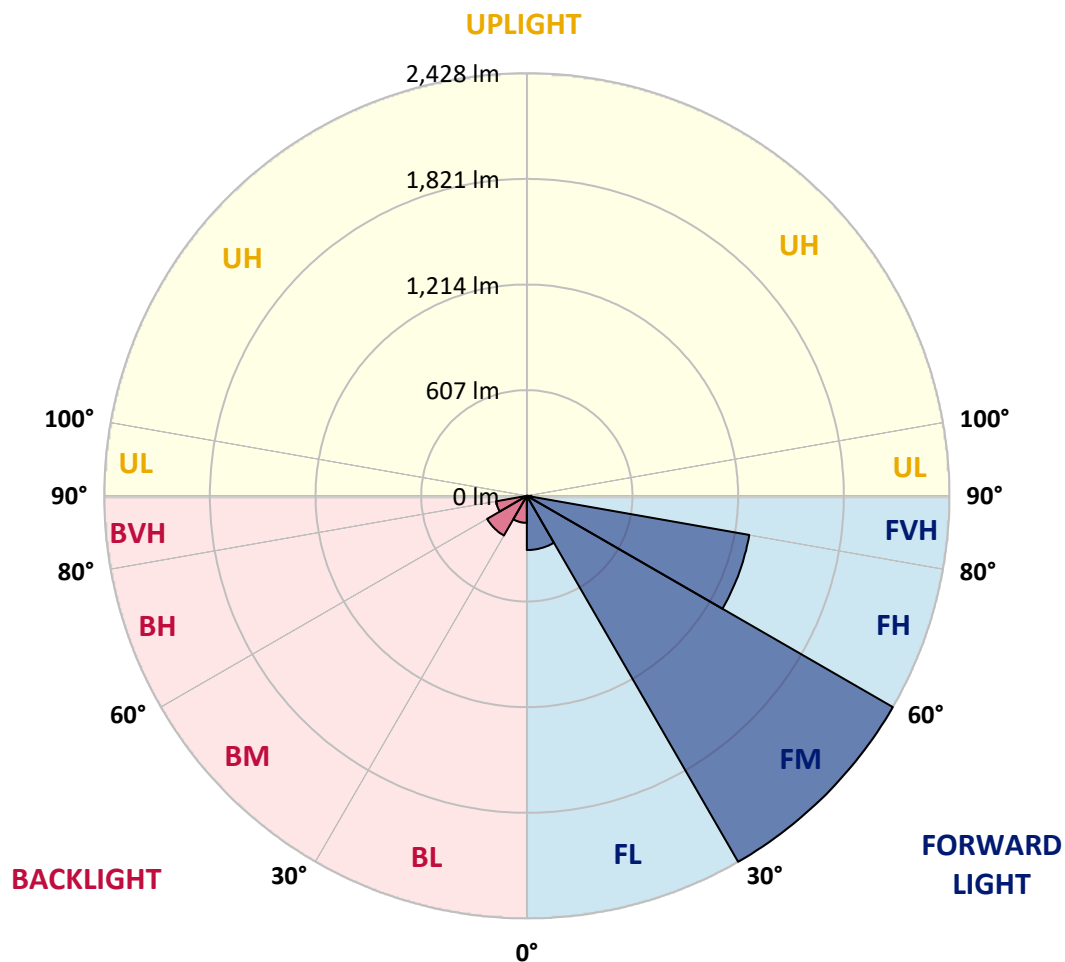
CATALOG NUMBER: ARCH-M-PA2-50-727-24VDC-T2U-HSS

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 311.4  | 6.7       |                         |      |         |
| FM   | (30°-60°)   | 2428.1 | 52.1      |                         |      |         |
| FH   | (60°-80°)   | 1297.6 | 27.8      |                         |      | G1/1800 |
| FVH  | (80°-90°)   | 26.6   | 0.6       |                         |      | G1/100  |
| BL   | (0°-30°)    | 155.6  | 3.3       | B1/500                  |      |         |
| BM   | (30°-60°)   | 263.7  | 5.7       | B1/1000                 |      |         |
| BH   | (60°-80°)   | 179.7  | 3.9       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 1.3    | 0.0       |                         |      | G0/10   |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B1-U0-G1**

Type II Short



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CATALOG NUMBER: ARCH-M-PA2-50-727-24VDC-T2U-HSS

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 63°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 718.5  | 718.5  | 718.5  | 718.5  | 718.5  | 718.5  | 718.5  | 718.5  | 718.5  | 718.5  | 718.5  |
| 2.5°  | 730.8  | 729.1  | 727.3  | 726.4  | 726.4  | 725.5  | 722.0  | 721.1  | 719.4  | 717.6  | 715.9  |
| 5°    | 723.8  | 721.1  | 720.3  | 721.1  | 722.0  | 723.8  | 722.0  | 722.0  | 720.3  | 718.5  | 715.0  |
| 7.5°  | 706.2  | 704.4  | 705.3  | 707.9  | 708.8  | 715.0  | 715.9  | 718.5  | 718.5  | 716.7  | 714.1  |
| 10°   | 685.0  | 684.2  | 684.2  | 688.6  | 693.0  | 701.8  | 707.9  | 715.0  | 715.9  | 715.9  | 711.4  |
| 12.5° | 669.2  | 668.3  | 670.9  | 676.2  | 685.0  | 696.5  | 707.0  | 717.6  | 719.4  | 720.3  | 713.2  |
| 15°   | 659.5  | 659.5  | 663.0  | 673.6  | 685.9  | 701.8  | 714.1  | 728.2  | 729.9  | 729.1  | 719.4  |
| 17.5° | 650.7  | 651.6  | 658.6  | 676.2  | 690.3  | 711.4  | 726.4  | 742.3  | 743.1  | 742.3  | 726.4  |
| 20°   | 647.2  | 648.9  | 659.5  | 682.4  | 698.2  | 722.0  | 741.4  | 757.2  | 758.1  | 754.6  | 733.5  |
| 22.5° | 656.9  | 657.7  | 670.9  | 695.6  | 710.6  | 737.0  | 761.6  | 776.6  | 777.5  | 772.2  | 744.0  |
| 25°   | 690.3  | 690.3  | 701.8  | 722.9  | 736.1  | 762.5  | 788.9  | 806.5  | 806.5  | 800.4  | 767.8  |
| 27.5° | 768.7  | 761.6  | 759.0  | 765.2  | 769.6  | 797.7  | 825.9  | 847.9  | 847.0  | 838.2  | 798.6  |
| 30°   | 920.1  | 902.5  | 874.3  | 842.6  | 826.8  | 846.2  | 872.6  | 900.8  | 899.9  | 885.8  | 836.5  |
| 32.5° | 1174.6 | 1149.1 | 1082.1 | 998.5  | 930.7  | 908.7  | 933.3  | 964.2  | 965.0  | 948.3  | 897.2  |
| 35°   | 1531.2 | 1490.7 | 1370.9 | 1254.7 | 1099.8 | 1016.1 | 1023.1 | 1056.6 | 1067.2 | 1058.4 | 999.4  |
| 37.5° | 1874.6 | 1837.6 | 1723.1 | 1562.0 | 1351.6 | 1180.8 | 1150.8 | 1179.9 | 1192.2 | 1192.2 | 1129.7 |
| 40°   | 2220.6 | 2177.5 | 2076.2 | 1914.2 | 1692.3 | 1437.9 | 1330.4 | 1354.2 | 1367.4 | 1370.1 | 1288.2 |
| 42.5° | 2498.0 | 2469.8 | 2392.3 | 2266.4 | 2058.6 | 1888.7 | 1589.3 | 1576.1 | 1588.4 | 1578.7 | 1472.2 |
| 45°   | 2689.9 | 2667.9 | 2614.2 | 2566.7 | 2465.4 | 2380.0 | 1935.3 | 1846.4 | 1854.3 | 1820.9 | 1679.1 |
| 47.5° | 2729.6 | 2704.9 | 2693.5 | 2759.5 | 2831.7 | 2852.8 | 2360.6 | 2167.8 | 2159.9 | 2085.9 | 1894.0 |
| 50°   | 2557.0 | 2559.6 | 2601.9 | 2790.3 | 3091.5 | 3281.6 | 2853.7 | 2530.6 | 2501.5 | 2336.9 | 2093.8 |
| 52.5° | 2184.5 | 2226.8 | 2333.3 | 2638.9 | 3170.7 | 3593.3 | 3346.8 | 2915.4 | 2870.4 | 2580.8 | 2243.5 |
| 55°   | 1709.1 | 1763.7 | 1938.9 | 2290.2 | 3005.2 | 3732.5 | 3762.4 | 3315.1 | 3213.0 | 2763.9 | 2359.8 |
| 57.5° | 1270.6 | 1287.3 | 1491.6 | 1812.1 | 2613.3 | 3596.0 | 3975.5 | 3623.3 | 3492.1 | 2910.1 | 2475.1 |
| 60°   | 791.6  | 802.1  | 1017.9 | 1379.8 | 1979.4 | 3091.5 | 3975.5 | 3835.5 | 3710.4 | 3041.3 | 2580.8 |
| 62.5° | 492.2  | 495.7  | 576.7  | 945.7  | 1345.4 | 2292.8 | 3810.8 | 4000.1 | 3899.8 | 3135.5 | 2671.5 |
| 65°   | 283.5  | 287.0  | 324.9  | 534.5  | 875.2  | 1372.7 | 3389.9 | 4048.6 | 4003.7 | 3210.3 | 2741.9 |
| 67.5° | 206.9  | 208.7  | 223.6  | 300.3  | 572.3  | 705.3  | 2546.4 | 3854.0 | 3910.3 | 3247.3 | 2740.1 |
| 70°   | 179.6  | 182.3  | 201.6  | 234.2  | 413.0  | 433.2  | 1296.1 | 3328.3 | 3485.9 | 3194.5 | 2658.2 |
| 72.5° | 138.2  | 141.8  | 170.8  | 220.1  | 302.9  | 311.7  | 469.3  | 2368.6 | 2607.2 | 2864.3 | 2433.7 |
| 75°   | 95.1   | 98.6   | 127.7  | 181.4  | 250.1  | 233.3  | 258.0  | 1090.1 | 1375.3 | 1921.3 | 1852.6 |
| 77.5° | 60.8   | 61.6   | 80.1   | 132.1  | 215.7  | 165.5  | 177.0  | 355.7  | 499.2  | 869.1  | 874.3  |
| 80°   | 40.5   | 41.4   | 49.3   | 85.4   | 147.9  | 153.2  | 109.2  | 164.7  | 180.5  | 253.6  | 176.1  |
| 82.5° | 24.7   | 24.7   | 33.5   | 53.7   | 89.8   | 126.8  | 71.3   | 86.3   | 92.5   | 97.7   | 45.8   |
| 85°   | 9.7    | 9.7    | 20.3   | 35.2   | 56.4   | 59.0   | 44.9   | 50.2   | 52.8   | 57.2   | 21.1   |
| 87.5° | 2.6    | 2.6    | 11.4   | 19.4   | 24.7   | 27.3   | 27.3   | 24.7   | 26.4   | 32.6   | 10.6   |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

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CATALOG NUMBER: ARCH-M-PA2-50-727-24VDC-T2U-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 718.5  | 718.5  | 718.5 | 718.5 | 718.5 | 718.5 | 718.5 | 718.5 | 718.5 | 718.5 | 718.5 |
| 2.5°  | 715.0  | 712.3  | 708.8 | 705.3 | 701.8 | 699.1 | 696.5 | 696.5 | 694.7 | 692.1 | 690.3 |
| 5°    | 713.2  | 708.8  | 700.9 | 694.7 | 685.0 | 678.0 | 672.7 | 668.3 | 665.7 | 659.5 | 658.6 |
| 7.5°  | 710.6  | 705.3  | 693.8 | 681.5 | 665.7 | 653.3 | 641.0 | 632.2 | 623.4 | 616.4 | 614.6 |
| 10°   | 706.2  | 700.0  | 683.3 | 665.7 | 643.6 | 620.8 | 591.7 | 558.2 | 527.4 | 509.8 | 504.5 |
| 12.5° | 706.2  | 698.2  | 676.2 | 652.5 | 620.8 | 564.4 | 490.4 | 416.5 | 359.2 | 333.7 | 326.7 |
| 15°   | 710.6  | 700.0  | 670.9 | 638.4 | 579.4 | 464.9 | 345.2 | 247.4 | 184.9 | 165.5 | 161.1 |
| 17.5° | 715.0  | 700.0  | 663.0 | 619.0 | 503.6 | 337.2 | 196.4 | 130.3 | 110.1 | 105.7 | 105.7 |
| 20°   | 716.7  | 698.2  | 652.5 | 582.9 | 402.4 | 209.6 | 117.1 | 97.7  | 89.8  | 87.2  | 87.2  |
| 22.5° | 723.8  | 699.1  | 644.5 | 530.9 | 292.3 | 123.3 | 92.5  | 81.9  | 74.0  | 71.3  | 71.3  |
| 25°   | 741.4  | 709.7  | 646.3 | 464.9 | 187.5 | 93.3  | 78.4  | 67.8  | 59.9  | 56.4  | 56.4  |
| 27.5° | 769.6  | 733.5  | 656.0 | 388.3 | 118.0 | 80.1  | 66.0  | 54.6  | 48.4  | 44.9  | 44.9  |
| 30°   | 801.3  | 759.9  | 660.4 | 300.3 | 88.1  | 67.8  | 53.7  | 43.1  | 38.7  | 36.1  | 35.2  |
| 32.5° | 856.7  | 805.7  | 656.9 | 206.0 | 72.2  | 57.2  | 43.1  | 34.3  | 30.8  | 29.9  | 29.9  |
| 35°   | 945.7  | 885.8  | 649.8 | 129.4 | 59.9  | 45.8  | 34.3  | 28.2  | 25.5  | 24.7  | 23.8  |
| 37.5° | 1066.3 | 1002.9 | 628.7 | 85.4  | 49.3  | 36.1  | 28.2  | 23.8  | 21.1  | 20.3  | 20.3  |
| 40°   | 1213.3 | 1136.7 | 588.2 | 65.2  | 42.3  | 29.1  | 23.8  | 20.3  | 18.5  | 17.6  | 17.6  |
| 42.5° | 1381.5 | 1285.5 | 523.9 | 56.4  | 35.2  | 24.7  | 20.3  | 16.7  | 15.8  | 15.0  | 15.0  |
| 45°   | 1565.5 | 1441.4 | 435.0 | 50.2  | 29.9  | 20.3  | 16.7  | 15.0  | 13.2  | 13.2  | 12.3  |
| 47.5° | 1761.0 | 1598.1 | 334.6 | 44.0  | 25.5  | 17.6  | 15.0  | 12.3  | 11.4  | 10.6  | 10.6  |
| 50°   | 1949.4 | 1738.1 | 235.1 | 37.9  | 21.1  | 15.0  | 12.3  | 10.6  | 9.7   | 8.8   | 8.8   |
| 52.5° | 2082.4 | 1822.6 | 166.4 | 32.6  | 17.6  | 13.2  | 9.7   | 7.9   | 7.0   | 7.0   | 7.0   |
| 55°   | 2188.9 | 1875.5 | 116.2 | 27.3  | 15.0  | 11.4  | 7.9   | 6.2   | 6.2   | 5.3   | 5.3   |
| 57.5° | 2289.3 | 1909.8 | 85.4  | 22.9  | 12.3  | 8.8   | 6.2   | 4.4   | 4.4   | 3.5   | 3.5   |
| 60°   | 2393.2 | 1928.3 | 65.2  | 18.5  | 10.6  | 7.0   | 4.4   | 3.5   | 2.6   | 2.6   | 2.6   |
| 62.5° | 2498.0 | 1939.8 | 50.2  | 15.0  | 8.8   | 5.3   | 3.5   | 2.6   | 1.8   | 0.9   | 0.9   |
| 65°   | 2589.6 | 1943.3 | 38.7  | 11.4  | 7.0   | 3.5   | 2.6   | 0.9   | 0.0   | 0.0   | 0.0   |
| 67.5° | 2616.9 | 1902.8 | 29.9  | 8.8   | 5.3   | 2.6   | 1.8   | 0.0   | 0.0   | 0.0   | 0.0   |
| 70°   | 2542.9 | 1795.3 | 22.9  | 7.0   | 4.4   | 1.8   | 0.9   | 0.0   | 0.0   | 0.0   | 0.0   |
| 72.5° | 2256.7 | 1505.7 | 17.6  | 4.4   | 3.5   | 1.8   | 0.9   | 0.0   | 0.0   | 0.0   | 0.0   |
| 75°   | 1614.8 | 803.0  | 12.3  | 3.5   | 2.6   | 0.9   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 77.5° | 743.1  | 310.8  | 8.8   | 2.6   | 1.8   | 0.9   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 80°   | 145.3  | 77.5   | 3.5   | 1.8   | 0.9   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 82.5° | 33.5   | 13.2   | 1.8   | 1.8   | 0.9   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 85°   | 11.4   | 4.4    | 0.9   | 0.9   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 87.5° | 4.4    | 1.8    | 0.9   | 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   |

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

REPORT NUMBER: SP1-2101-121-5

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

REPORT NUMBER: SP1-2101-121-5

**CIE 1931 Chromaticity Diagram**



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



CCT = 2805K  
 CIE  $x$  = 0.4477  
 CIE  $y$  = 0.4017  
 Duv = -0.0022

Point lies inside the ANSI 2700K 4-step quadrangle

REPORT NUMBER: SP1-2101-121-5

### 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              |           |                  |                  |

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### 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



**Measure Comparisons**



(END OF REPORT)