

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: P800476

Luminaire Tested: **ARCH-S-PA2-30-735-24VDC-T2U**

Issue Date: 10/13/2021



**Test Information**

Test Method: LM-79-08  
Report Number: P800476  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-2108-332-15)  
Test Lab: INNOVATION CENTER  
Issue Date: 10/13/2021  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: STREETWORKS  
Catalog Number: ARCH-S-PA2-30-735-24VDC-T2U  
Description: ARCHEON ROADWAY AND AREA LUMINAIRE  
(2) 70 CRI, 3500K, 320mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE II U OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

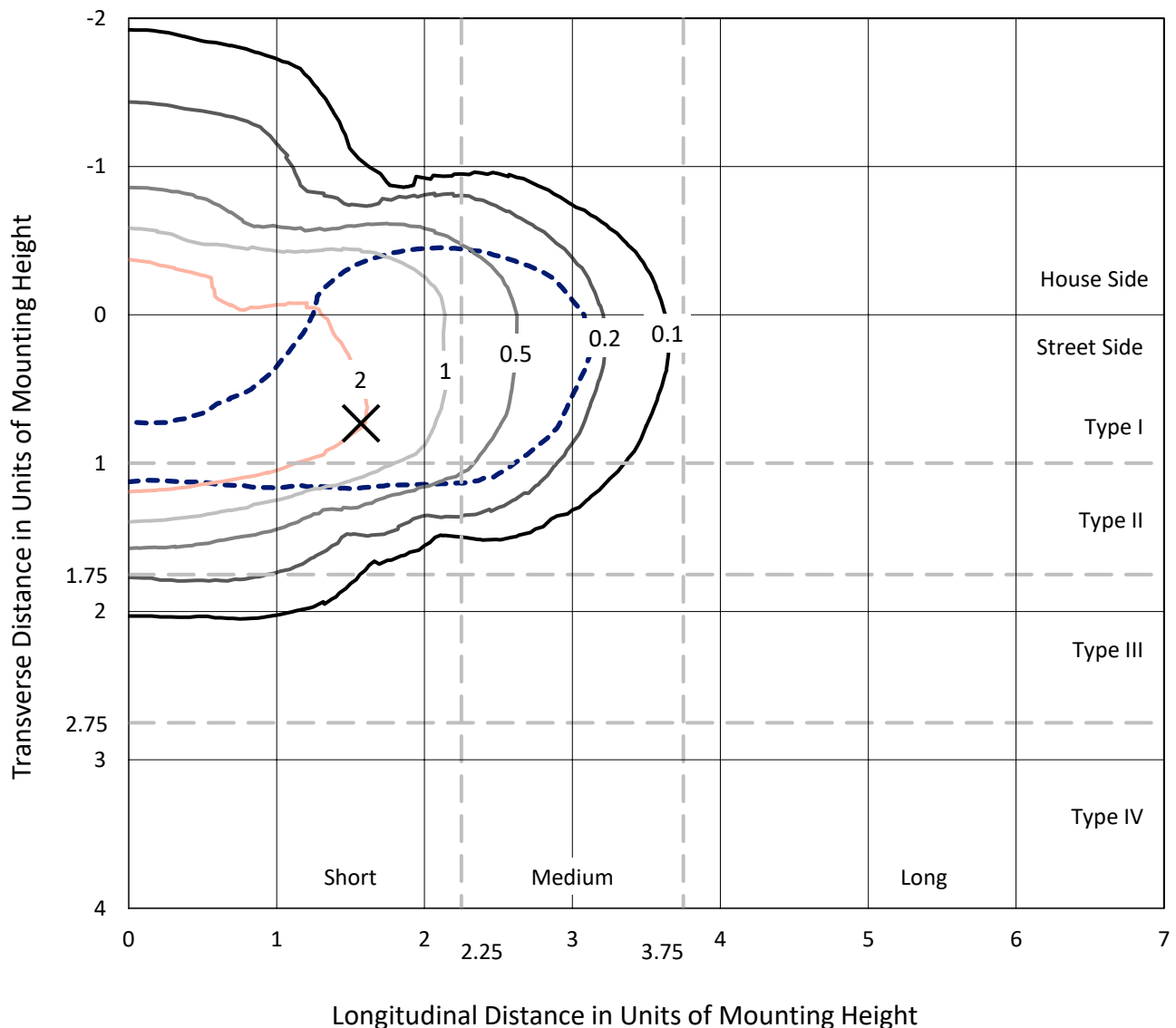
Lumens per Lamp: N/A  
Luminaire Lumens: 4828 lumens  
Efficiency: N/A  
Efficacy: 160.9 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 1' x H: 0')  
IES Classification: Type II - Short  
BUG Rating: B1 - U0 - G1

Input Watts (W): 30  
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

REPORT NUMBER: P800476  
 CATALOG NUMBER: ARCH-S-PA2-30-735-24VDC-T2U

## Iso-Footcandle Lines of Horizontal Illumination

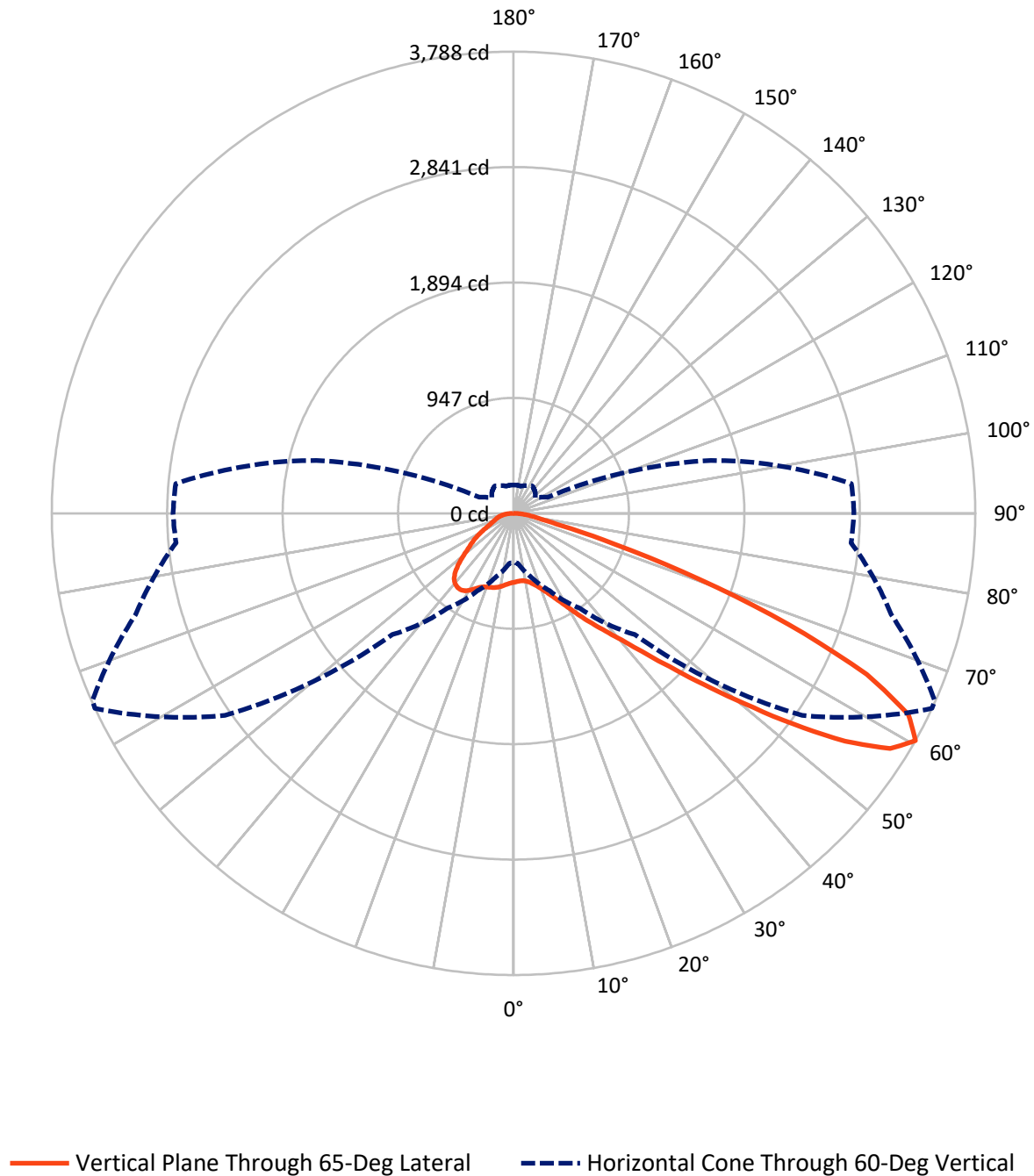
✕ Max cd  
 - - - 1/2 Max cd



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

REPORT NUMBER: P800476  
CATALOG NUMBER: ARCH-S-PA2-30-735-24VDC-T2U

## Luminous Intensity Polar Plot



REPORT NUMBER: P800476

CATALOG NUMBER: ARCH-S-PA2-30-735-24VDC-T2U

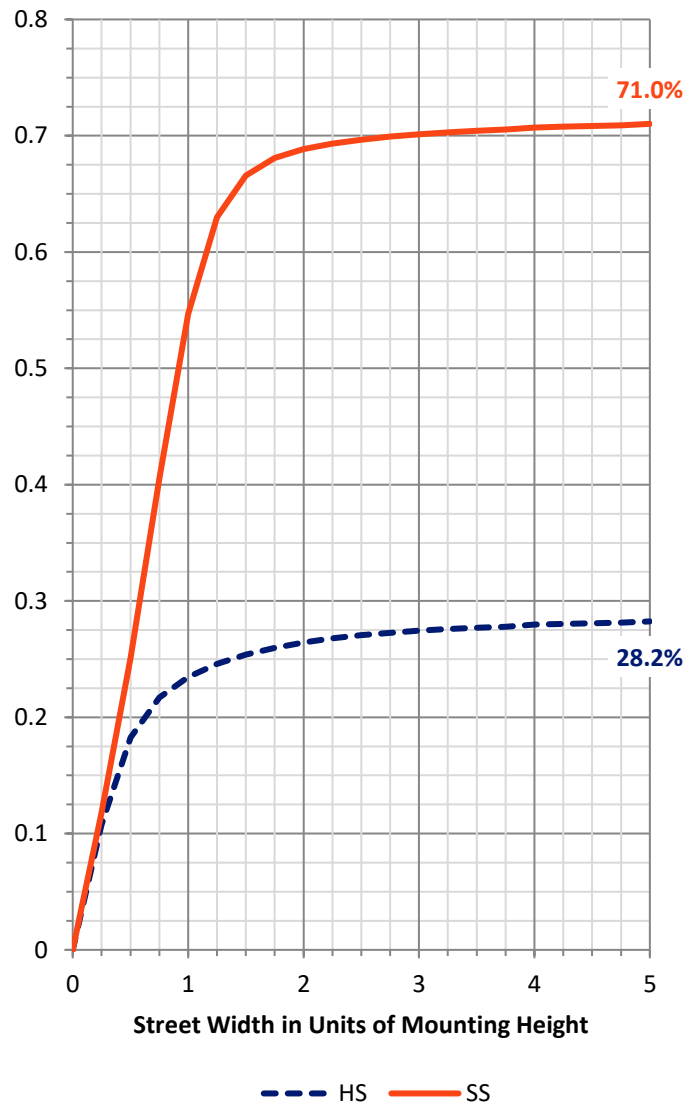
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 1382.1   | 0.0    | 1382.1 |
|                    | % Fixture | 28.6     | 0.0    | 28.6   |
| <b>Street Side</b> | Lumens    | 3445.9   | 0.0    | 3445.9 |
|                    | % Fixture | 71.4     | 0.0    | 71.4   |
| <b>Total</b>       | Lumens    | 4828.0   | 0.0    | 4828.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 54.7   | 1.1       |
| 10°-20°   | 176.1  | 3.6       |
| 20°-30°   | 337.7  | 7.0       |
| 30°-40°   | 586.4  | 12.1      |
| 40°-50°   | 994.6  | 20.6      |
| 50°-60°   | 1238.5 | 25.7      |
| 60°-70°   | 998.0  | 20.7      |
| 70°-80°   | 377.9  | 7.8       |
| 80°-90°   | 64.1   | 1.3       |
| 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°    | 4828.0 | 100.0     |
| 0°-180°   | 4828.0 | 100.0     |



REPORT NUMBER: P800476

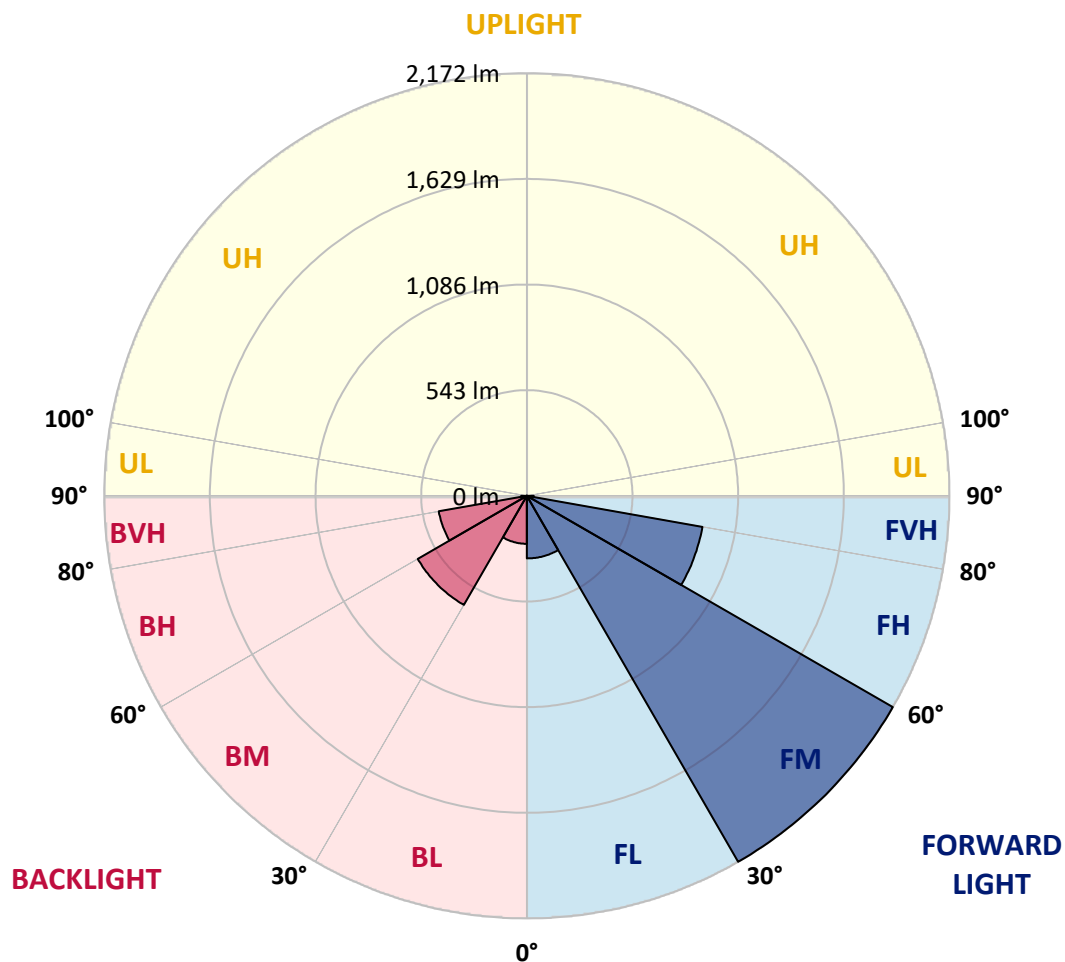
CATALOG NUMBER: ARCH-S-PA2-30-735-24VDC-T2U

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 321.9  | 6.7       |                         |      |         |
| FM   | (30°-60°)   | 2172.1 | 45.0      |                         |      |         |
| FH   | (60°-80°)   | 916.3  | 19.0      |                         |      | G1/1800 |
| FVH  | (80°-90°)   | 35.6   | 0.7       |                         |      | G1/100  |
| BL   | (0°-30°)    | 246.7  | 5.1       | B1/500                  |      |         |
| BM   | (30°-60°)   | 647.4  | 13.4      | B1/1000                 |      |         |
| BH   | (60°-80°)   | 459.5  | 9.5       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 28.5   | 0.6       |                         |      | G1/100  |
| 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



REPORT NUMBER: P800476

CATALOG NUMBER: ARCH-S-PA2-30-735-24VDC-T2U

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 66°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 566.5  | 566.5  | 566.5  | 566.5  | 566.5  | 566.5  | 566.5  | 566.5  | 566.5  | 566.5  | 566.5  |
| 2.5°  | 553.2  | 553.2  | 553.2  | 554.6  | 555.9  | 557.2  | 559.9  | 559.9  | 559.9  | 561.2  | 563.8  |
| 5°    | 542.6  | 541.3  | 542.6  | 544.0  | 546.6  | 549.3  | 554.6  | 557.2  | 557.2  | 562.5  | 567.8  |
| 7.5°  | 544.0  | 541.3  | 541.3  | 542.6  | 545.3  | 547.9  | 553.2  | 557.2  | 558.5  | 565.1  | 574.4  |
| 10°   | 557.2  | 553.2  | 553.2  | 554.6  | 554.6  | 557.2  | 561.2  | 566.5  | 567.8  | 574.4  | 583.7  |
| 12.5° | 585.0  | 581.0  | 579.7  | 575.7  | 571.8  | 574.4  | 578.4  | 579.7  | 581.0  | 585.0  | 594.3  |
| 15°   | 643.2  | 636.6  | 626.0  | 618.1  | 607.5  | 600.9  | 599.6  | 600.9  | 600.9  | 602.2  | 607.5  |
| 17.5° | 726.6  | 718.7  | 702.8  | 685.6  | 660.4  | 639.3  | 632.6  | 627.4  | 627.4  | 623.4  | 623.4  |
| 20°   | 828.5  | 816.6  | 798.1  | 772.9  | 735.9  | 697.5  | 675.0  | 663.1  | 659.1  | 652.5  | 643.2  |
| 22.5° | 946.3  | 938.4  | 914.6  | 876.2  | 820.6  | 769.0  | 731.9  | 705.4  | 705.4  | 689.6  | 669.7  |
| 25°   | 1085.3 | 1070.7 | 1042.9 | 997.9  | 922.5  | 848.4  | 798.1  | 759.7  | 755.7  | 730.6  | 698.8  |
| 27.5° | 1220.3 | 1211.0 | 1176.6 | 1117.1 | 1027.1 | 941.0  | 870.9  | 825.9  | 819.3  | 779.6  | 730.6  |
| 30°   | 1384.4 | 1373.8 | 1322.2 | 1238.8 | 1142.2 | 1044.3 | 962.2  | 904.0  | 897.4  | 843.1  | 774.3  |
| 32.5° | 1588.2 | 1552.5 | 1489.0 | 1393.7 | 1269.3 | 1159.4 | 1065.4 | 1003.2 | 995.3  | 933.1  | 851.0  |
| 35°   | 1835.7 | 1805.3 | 1695.4 | 1594.9 | 1446.6 | 1302.4 | 1189.9 | 1107.8 | 1097.2 | 1023.1 | 919.9  |
| 37.5° | 2010.4 | 1995.9 | 1920.4 | 1841.0 | 1671.6 | 1477.1 | 1339.4 | 1225.6 | 1215.0 | 1117.1 | 983.4  |
| 40°   | 2120.3 | 2105.7 | 2084.6 | 2062.1 | 1968.1 | 1748.4 | 1519.4 | 1364.6 | 1347.4 | 1254.7 | 1110.4 |
| 42.5° | 2177.2 | 2165.3 | 2169.3 | 2214.3 | 2240.7 | 2206.3 | 1776.2 | 1549.9 | 1537.9 | 1425.4 | 1265.3 |
| 45°   | 2144.1 | 2136.2 | 2174.6 | 2293.7 | 2423.4 | 2677.5 | 2105.7 | 1793.4 | 1761.6 | 1627.9 | 1453.2 |
| 47.5° | 1985.3 | 1961.5 | 2051.5 | 2254.0 | 2531.9 | 2902.5 | 2502.8 | 2093.8 | 2059.4 | 1867.5 | 1643.8 |
| 50°   | 1658.4 | 1651.8 | 1774.8 | 2031.6 | 2489.6 | 2991.2 | 2927.6 | 2448.5 | 2423.4 | 2125.6 | 1855.6 |
| 52.5° | 1354.0 | 1351.3 | 1446.6 | 1682.2 | 2219.6 | 2929.0 | 3236.0 | 2870.7 | 2795.3 | 2385.0 | 2085.9 |
| 55°   | 1050.9 | 1049.6 | 1134.3 | 1310.3 | 1770.9 | 2636.5 | 3381.6 | 3300.9 | 3245.3 | 2668.2 | 2322.8 |
| 57.5° | 718.7  | 709.4  | 819.3  | 952.9  | 1330.1 | 2088.5 | 3286.3 | 3641.0 | 3606.6 | 2968.7 | 2574.3 |
| 60°   | 399.7  | 412.9  | 534.7  | 700.1  | 951.6  | 1406.9 | 2889.3 | 3787.9 | 3782.6 | 3208.2 | 2779.4 |
| 62.5° | 283.2  | 288.5  | 340.1  | 497.6  | 626.0  | 806.0  | 2228.8 | 3635.7 | 3678.1 | 3340.6 | 2895.9 |
| 65°   | 235.6  | 238.2  | 263.4  | 367.9  | 457.9  | 465.9  | 1389.7 | 3184.4 | 3240.0 | 3299.6 | 2921.0 |
| 67.5° | 222.4  | 223.7  | 236.9  | 271.3  | 358.7  | 337.5  | 620.7  | 2431.3 | 2549.1 | 2968.7 | 2756.9 |
| 70°   | 202.5  | 203.8  | 223.7  | 239.6  | 289.9  | 266.0  | 319.0  | 1614.7 | 1773.5 | 2346.6 | 2377.1 |
| 72.5° | 173.4  | 177.4  | 193.2  | 225.0  | 235.6  | 221.0  | 246.2  | 862.9  | 1020.4 | 1569.7 | 1835.7 |
| 75°   | 149.6  | 152.2  | 164.1  | 190.6  | 221.0  | 176.0  | 209.1  | 393.1  | 460.6  | 921.2  | 1162.1 |
| 77.5° | 120.4  | 121.8  | 139.0  | 156.2  | 185.3  | 142.9  | 162.8  | 235.6  | 247.5  | 450.0  | 525.4  |
| 80°   | 91.3   | 91.3   | 103.2  | 124.4  | 137.6  | 137.6  | 119.1  | 164.1  | 170.7  | 214.4  | 207.8  |
| 82.5° | 70.1   | 68.8   | 78.1   | 87.4   | 99.3   | 115.1  | 90.0   | 108.5  | 111.2  | 129.7  | 111.2  |
| 85°   | 46.3   | 46.3   | 51.6   | 59.6   | 66.2   | 63.5   | 70.1   | 63.5   | 66.2   | 80.7   | 60.9   |
| 87.5° | 19.9   | 19.9   | 27.8   | 26.5   | 29.1   | 30.4   | 34.4   | 30.4   | 30.4   | 37.1   | 27.8   |
| 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: P800476

CATALOG NUMBER: ARCH-S-PA2-30-735-24VDC-T2U

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 566.5  | 566.5  | 566.5  | 566.5 | 566.5 | 566.5 | 566.5 | 566.5 | 566.5 | 566.5 | 566.5 |
| 2.5°  | 565.1  | 566.5  | 569.1  | 570.4 | 574.4 | 575.7 | 575.7 | 578.4 | 578.4 | 581.0 | 581.0 |
| 5°    | 569.1  | 573.1  | 577.1  | 581.0 | 585.0 | 586.3 | 589.0 | 590.3 | 590.3 | 592.9 | 591.6 |
| 7.5°  | 577.1  | 581.0  | 589.0  | 592.9 | 598.2 | 600.9 | 599.6 | 600.9 | 599.6 | 600.9 | 600.9 |
| 10°   | 587.6  | 592.9  | 602.2  | 607.5 | 611.5 | 612.8 | 608.8 | 604.9 | 599.6 | 599.6 | 599.6 |
| 12.5° | 599.6  | 603.5  | 615.4  | 619.4 | 622.1 | 618.1 | 607.5 | 599.6 | 595.6 | 596.9 | 595.6 |
| 15°   | 611.5  | 615.4  | 624.7  | 628.7 | 628.7 | 616.8 | 607.5 | 604.9 | 603.5 | 604.9 | 604.9 |
| 17.5° | 623.4  | 627.4  | 635.3  | 635.3 | 631.3 | 622.1 | 612.8 | 603.5 | 596.9 | 592.9 | 592.9 |
| 20°   | 639.3  | 639.3  | 641.9  | 641.9 | 640.6 | 626.0 | 603.5 | 581.0 | 567.8 | 559.9 | 558.5 |
| 22.5° | 660.4  | 655.1  | 649.9  | 649.9 | 655.1 | 616.8 | 573.1 | 538.7 | 517.5 | 514.9 | 509.6 |
| 25°   | 682.9  | 671.0  | 657.8  | 667.1 | 657.8 | 592.9 | 530.7 | 484.4 | 459.3 | 450.0 | 452.6 |
| 27.5° | 706.8  | 688.2  | 668.4  | 694.9 | 644.6 | 546.6 | 471.2 | 419.6 | 395.7 | 389.1 | 389.1 |
| 30°   | 739.9  | 712.1  | 682.9  | 724.0 | 619.4 | 493.7 | 401.0 | 364.0 | 350.7 | 345.4 | 344.1 |
| 32.5° | 803.4  | 761.0  | 718.7  | 750.4 | 591.6 | 424.9 | 353.4 | 330.9 | 315.0 | 309.7 | 313.7 |
| 35°   | 860.3  | 800.7  | 772.9  | 762.4 | 547.9 | 369.3 | 324.3 | 304.4 | 291.2 | 284.6 | 284.6 |
| 37.5° | 911.9  | 855.0  | 833.8  | 762.4 | 491.0 | 334.9 | 305.7 | 289.9 | 272.6 | 267.4 | 267.4 |
| 40°   | 1024.4 | 949.0  | 911.9  | 751.8 | 420.9 | 317.6 | 296.5 | 277.9 | 263.4 | 258.1 | 256.8 |
| 42.5° | 1179.3 | 1077.4 | 992.6  | 727.9 | 361.3 | 309.7 | 291.2 | 270.0 | 258.1 | 254.1 | 252.8 |
| 45°   | 1343.4 | 1253.4 | 1069.4 | 685.6 | 322.9 | 301.8 | 289.9 | 267.4 | 252.8 | 248.8 | 247.5 |
| 47.5° | 1541.9 | 1449.3 | 1158.1 | 620.7 | 296.5 | 296.5 | 288.5 | 263.4 | 250.1 | 246.2 | 246.2 |
| 50°   | 1761.6 | 1684.8 | 1270.6 | 546.6 | 276.6 | 292.5 | 285.9 | 263.4 | 248.8 | 244.9 | 243.5 |
| 52.5° | 1986.6 | 1950.9 | 1388.4 | 473.8 | 256.8 | 287.2 | 284.6 | 263.4 | 246.2 | 242.2 | 242.2 |
| 55°   | 2272.5 | 2243.4 | 1524.7 | 419.6 | 240.9 | 276.6 | 284.6 | 260.7 | 242.2 | 239.6 | 239.6 |
| 57.5° | 2553.1 | 2542.5 | 1630.6 | 371.9 | 229.0 | 263.4 | 280.6 | 256.8 | 238.2 | 236.9 | 236.9 |
| 60°   | 2792.6 | 2782.1 | 1675.6 | 312.4 | 217.1 | 250.1 | 272.6 | 250.1 | 231.6 | 232.9 | 232.9 |
| 62.5° | 2940.9 | 2880.0 | 1642.5 | 258.1 | 205.1 | 238.2 | 263.4 | 242.2 | 225.0 | 229.0 | 227.6 |
| 65°   | 2967.3 | 2825.7 | 1514.1 | 215.7 | 191.9 | 225.0 | 252.8 | 232.9 | 215.7 | 225.0 | 223.7 |
| 67.5° | 2772.8 | 2537.2 | 1273.2 | 187.9 | 178.7 | 210.4 | 240.9 | 219.7 | 205.1 | 218.4 | 214.4 |
| 70°   | 2351.9 | 2060.7 | 942.4  | 166.8 | 165.4 | 193.2 | 225.0 | 203.8 | 190.6 | 197.2 | 191.9 |
| 72.5° | 1751.0 | 1487.6 | 610.1  | 150.9 | 150.9 | 173.4 | 202.5 | 184.0 | 170.7 | 172.1 | 166.8 |
| 75°   | 1091.9 | 914.6  | 346.8  | 136.3 | 136.3 | 153.5 | 180.0 | 161.5 | 152.2 | 146.9 | 153.5 |
| 77.5° | 496.3  | 402.4  | 182.6  | 121.8 | 123.1 | 131.0 | 154.9 | 137.6 | 127.1 | 119.1 | 123.1 |
| 80°   | 184.0  | 164.1  | 119.1  | 104.6 | 107.2 | 108.5 | 124.4 | 109.9 | 100.6 | 95.3  | 92.6  |
| 82.5° | 95.3   | 88.7   | 80.7   | 83.4  | 87.4  | 83.4  | 96.6  | 82.1  | 71.5  | 67.5  | 56.9  |
| 85°   | 47.6   | 46.3   | 49.0   | 55.6  | 60.9  | 51.6  | 58.2  | 52.9  | 43.7  | 31.8  | 31.8  |
| 87.5° | 18.5   | 19.9   | 18.5   | 25.1  | 27.8  | 23.8  | 26.5  | 18.5  | 13.2  | 6.6   | 5.3   |
| 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: SP1-2101-121-7

Luminaire Tested: IFLD-S-SA2A-735-U-T2

Test Date: 03/04/2021

### Test Information

Test Method: LM-79-08  
 Report Number: SP1-2101-121-7  
 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-SA2A-735-U-T2**  
 Description: STREETWORKS INF FLOOD

PROGRAMMED @ 615mA.

### Spectral Parameters

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 3388   | CRI (Ra): | 73.1 |      |       |
| CIE u':                   | 0.2371 | R1:       | 68.9 | R9:  | -34.6 |
| CIE v':                   | 0.5177 | R2:       | 81.1 | R10: | 57.8  |
| Duv:                      | 0.0032 | R3:       | 93.1 | R11: | 68.6  |
| CIE x:                    | 0.4153 | R4:       | 71.6 | R12: | 53.9  |
| CIE y:                    | 0.4030 | R5:       | 69.4 | R13: | 70.9  |
| CIE z:                    | 0.1817 | R6:       | 75.0 | R14: | 96.2  |
| Peak Wavelength (nm):     | 590    | R7:       | 79.5 |      |       |
| Dominant Wavelength (nm): | 580    | R8:       | 46.4 |      |       |
| Purity:                   | 45.7   |           |      |      |       |
| Rf:                       | 76.9   |           |      |      |       |
| Rg:                       | 94.4   |           |      |      |       |



### Test Conditions

Stabilization Time: 81M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.0/30%  
 Sphere Temperature (°C): 24.1

REPORT NUMBER: SP1-2101-121-7

| 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: SP1-2101-121-7

**CIE 1931 Chromaticity Diagram**



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



Point lies inside the ANSI 3500K 4-step quadrangle

REPORT NUMBER: SP1-2101-121-7

### 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       | 2672             | 0.0              | 490       | 34553            | 4.9              | 620       | 136720           | 35.6             | 750       | 5870             | 0.0              | 880       | 4216             | 0.0              |
| 365       | 2252             | 0.0              | 495       | 44336            | 8.0              | 625       | 126308           | 27.9             | 755       | 5421             | 0.0              | 885       | 4132             | 0.0              |
| 370       | 2217             | 0.0              | 500       | 54643            | 12.1             | 630       | 114625           | 20.7             | 760       | 5097             | 0.0              | 890       | 3992             | 0.0              |
| 375       | 2697             | 0.0              | 505       | 64676            | 18.1             | 635       | 103216           | 15.5             | 765       | 4626             | 0.0              | 895       | 3214             | 0.0              |
| 380       | 3039             | 0.0              | 510       | 73825            | 25.4             | 640       | 92605            | 11.1             | 770       | 3782             | 0.0              | 900       | 2580             | 0.0              |
| 385       | 2655             | 0.0              | 515       | 81872            | 33.9             | 645       | 83234            | 8.0              | 775       | 3506             | 0.0              | 905       | 1776             | 0.0              |
| 390       | 2357             | 0.0              | 520       | 88574            | 43.0             | 650       | 73263            | 5.4              | 780       | 3507             | 0.0              | 910       | 3995             | 0.0              |
| 395       | 2186             | 0.0              | 525       | 93289            | 50.1             | 655       | 64627            | 3.7              | 785       | 3267             | 0.0              | 915       | 4288             | 0.0              |
| 400       | 2015             | 0.0              | 530       | 98393            | 57.9             | 660       | 56614            | 2.4              | 790       | 2849             | 0.0              | 920       | 2446             | 0.0              |
| 405       | 2234             | 0.0              | 535       | 103269           | 64.0             | 665       | 49537            | 1.6              | 795       | 3037             | 0.0              | 925       | 3009             | 0.0              |
| 410       | 3412             | 0.0              | 540       | 107316           | 69.9             | 670       | 42866            | 0.9              | 800       | 2716             | 0.0              | 930       | 3026             | 0.0              |
| 415       | 6135             | 0.0              | 545       | 113101           | 75.3             | 675       | 36708            | 0.6              | 805       | 2648             | 0.0              | 935       | 4734             | 0.0              |
| 420       | 12146            | 0.0              | 550       | 120690           | 82.0             | 680       | 31814            | 0.4              | 810       | 3187             | 0.0              | 940       | 3719             | 0.0              |
| 425       | 23983            | 0.1              | 555       | 128583           | 87.8             | 685       | 27485            | 0.2              | 815       | 2931             | 0.0              | 945       | 1480             | 0.0              |
| 430       | 42142            | 0.3              | 560       | 137796           | 93.6             | 690       | 23698            | 0.1              | 820       | 2717             | 0.0              | 950       | 3450             | 0.0              |
| 435       | 68228            | 0.8              | 565       | 146577           | 97.5             | 695       | 20309            | 0.1              | 825       | 2236             | 0.0              | 955       | 5051             | 0.0              |
| 440       | 99323            | 1.6              | 570       | 154581           | 100.5            | 700       | 17890            | 0.1              | 830       | 2628             | 0.0              | 960       | 3176             | 0.0              |
| 445       | 115584           | 2.4              | 575       | 162633           | 101.2            | 705       | 15500            | 0.0              | 835       | 3140             | 0.0              | 965       | 5178             | 0.0              |
| 450       | 94997            | 2.5              | 580       | 168101           | 99.9             | 710       | 13699            | 0.0              | 840       | 3675             | 0.0              | 970       | 6385             | 0.0              |
| 455       | 61433            | 2.1              | 585       | 173145           | 96.2             | 715       | 12398            | 0.0              | 845       | 3283             | 0.0              | 975       | 3810             | 0.0              |
| 460       | 43373            | 1.8              | 590       | 174675           | 90.3             | 720       | 11147            | 0.0              | 850       | 3055             | 0.0              | 980       | 4322             | 0.0              |
| 465       | 32472            | 1.7              | 595       | 173724           | 82.3             | 725       | 9761             | 0.0              | 855       | 2932             | 0.0              | 985       | 4200             | 0.0              |
| 470       | 24257            | 1.5              | 600       | 171241           | 73.8             | 730       | 8651             | 0.0              | 860       | 3382             | 0.0              | 990       | 4661             | 0.0              |
| 475       | 21690            | 1.7              | 605       | 165134           | 64.0             | 735       | 7730             | 0.0              | 865       | 2605             | 0.0              | 995       | 6746             | 0.0              |
| 480       | 23173            | 2.2              | 610       | 156652           | 53.8             | 740       | 6847             | 0.0              | 870       | 3325             | 0.0              | 1000      | 4150             | 0.0              |
| 485       | 27564            | 3.3              | 615       | 147879           | 44.6             | 745       | 6124             | 0.0              | 875       | 3325             | 0.0              |           |                  |                  |

REPORT NUMBER: SP1-2101-121-7

### Scotopic Flux vs. Wavelength



Scotopic Lumens: 12126

S/P: 1.36

| 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       | 2672             | 0.0              | 490       | 34553            | 53.2             | 620       | 136720           | 1.7              | 750       | 5870             | 0.0              | 880       | 4216             | 0.0              |
| 365       | 2252             | 0.0              | 495       | 44336            | 71.7             | 625       | 126308           | 1.1              | 755       | 5421             | 0.0              | 885       | 4132             | 0.0              |
| 370       | 2217             | 0.0              | 500       | 54643            | 91.4             | 630       | 114625           | 0.6              | 760       | 5097             | 0.0              | 890       | 3992             | 0.0              |
| 375       | 2697             | 0.0              | 505       | 64676            | 110.0            | 635       | 103216           | 0.4              | 765       | 4626             | 0.0              | 895       | 3214             | 0.0              |
| 380       | 3039             | 0.0              | 510       | 73825            | 125.1            | 640       | 92605            | 0.2              | 770       | 3782             | 0.0              | 900       | 2580             | 0.0              |
| 385       | 2655             | 0.0              | 515       | 81872            | 135.7            | 645       | 83234            | 0.1              | 775       | 3506             | 0.0              | 905       | 1776             | 0.0              |
| 390       | 2357             | 0.0              | 520       | 88574            | 140.8            | 650       | 73263            | 0.1              | 780       | 3507             | 0.0              | 910       | 3995             | 0.0              |
| 395       | 2186             | 0.0              | 525       | 93289            | 139.6            | 655       | 64627            | 0.1              | 785       | 3267             | 0.0              | 915       | 4288             | 0.0              |
| 400       | 2015             | 0.0              | 530       | 98393            | 135.7            | 660       | 56614            | 0.0              | 790       | 2849             | 0.0              | 920       | 2446             | 0.0              |
| 405       | 2234             | 0.1              | 535       | 103269           | 128.7            | 665       | 49537            | 0.0              | 795       | 3037             | 0.0              | 925       | 3009             | 0.0              |
| 410       | 3412             | 0.2              | 540       | 107316           | 118.6            | 670       | 42866            | 0.0              | 800       | 2716             | 0.0              | 930       | 3026             | 0.0              |
| 415       | 6135             | 0.6              | 545       | 113101           | 108.4            | 675       | 36708            | 0.0              | 805       | 2648             | 0.0              | 935       | 4734             | 0.0              |
| 420       | 12146            | 2.0              | 550       | 120690           | 98.7             | 680       | 31814            | 0.0              | 810       | 3187             | 0.0              | 940       | 3719             | 0.0              |
| 425       | 23983            | 5.9              | 555       | 128583           | 87.9             | 685       | 27485            | 0.0              | 815       | 2931             | 0.0              | 945       | 1480             | 0.0              |
| 430       | 42142            | 14.3             | 560       | 137796           | 77.0             | 690       | 23698            | 0.0              | 820       | 2717             | 0.0              | 950       | 3450             | 0.0              |
| 435       | 68228            | 30.5             | 565       | 146577           | 65.8             | 695       | 20309            | 0.0              | 825       | 2236             | 0.0              | 955       | 5051             | 0.0              |
| 440       | 99323            | 55.5             | 570       | 154581           | 54.6             | 700       | 17890            | 0.0              | 830       | 2628             | 0.0              | 960       | 3176             | 0.0              |
| 445       | 115584           | 77.4             | 575       | 162633           | 44.3             | 705       | 15500            | 0.0              | 835       | 3140             | 0.0              | 965       | 5178             | 0.0              |
| 450       | 94997            | 73.6             | 580       | 168101           | 34.6             | 710       | 13699            | 0.0              | 840       | 3675             | 0.0              | 970       | 6385             | 0.0              |
| 455       | 61433            | 53.7             | 585       | 173145           | 26.5             | 715       | 12398            | 0.0              | 845       | 3283             | 0.0              | 975       | 3810             | 0.0              |
| 460       | 43373            | 41.9             | 590       | 174675           | 19.5             | 720       | 11147            | 0.0              | 850       | 3055             | 0.0              | 980       | 4322             | 0.0              |
| 465       | 32472            | 34.3             | 595       | 173724           | 13.9             | 725       | 9761             | 0.0              | 855       | 2932             | 0.0              | 985       | 4200             | 0.0              |
| 470       | 24257            | 27.9             | 600       | 171241           | 9.7              | 730       | 8651             | 0.0              | 860       | 3382             | 0.0              | 990       | 4661             | 0.0              |
| 475       | 21690            | 27.1             | 605       | 165134           | 6.5              | 735       | 7730             | 0.0              | 865       | 2605             | 0.0              | 995       | 6746             | 0.0              |
| 480       | 23173            | 31.3             | 610       | 156652           | 4.2              | 740       | 6847             | 0.0              | 870       | 3325             | 0.0              | 1000      | 4150             | 0.0              |
| 485       | 27564            | 40.0             | 615       | 147879           | 2.7              | 745       | 6124             | 0.0              | 875       | 3325             | 0.0              |           |                  |                  |

REPORT NUMBER: SP1-2101-121-7

### Melanopic Flux vs. Wavelength



**Melanopic Lumens: 4490.7**

**M/P: 0.5**

| 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       | 2672             | 0.0              | 490       | 34553            | 28.8             | 620       | 136720           | 0.1              | 750       | 5870             | 0.0              | 880       | 4216             | 0.0              |
| 365       | 2252             | 0.0              | 495       | 44336            | 36.6             | 625       | 126308           | 0.1              | 755       | 5421             | 0.0              | 885       | 4132             | 0.0              |
| 370       | 2217             | 0.0              | 500       | 54643            | 43.9             | 630       | 114625           | 0.0              | 760       | 5097             | 0.0              | 890       | 3992             | 0.0              |
| 375       | 2697             | 0.0              | 505       | 64676            | 49.6             | 635       | 103216           | 0.0              | 765       | 4626             | 0.0              | 895       | 3214             | 0.0              |
| 380       | 3039             | 0.0              | 510       | 73825            | 53.0             | 640       | 92605            | 0.0              | 770       | 3782             | 0.0              | 900       | 2580             | 0.0              |
| 385       | 2655             | 0.0              | 515       | 81872            | 53.5             | 645       | 83234            | 0.0              | 775       | 3506             | 0.0              | 905       | 1776             | 0.0              |
| 390       | 2357             | 0.0              | 520       | 88574            | 51.6             | 650       | 73263            | 0.0              | 780       | 3507             | 0.0              | 910       | 3995             | 0.0              |
| 395       | 2186             | 0.0              | 525       | 93289            | 47.3             | 655       | 64627            | 0.0              | 785       | 3267             | 0.0              | 915       | 4288             | 0.0              |
| 400       | 2015             | 0.0              | 530       | 98393            | 42.5             | 660       | 56614            | 0.0              | 790       | 2849             | 0.0              | 920       | 2446             | 0.0              |
| 405       | 2234             | 0.0              | 535       | 103269           | 37.2             | 665       | 49537            | 0.0              | 795       | 3037             | 0.0              | 925       | 3009             | 0.0              |
| 410       | 3412             | 0.1              | 540       | 107316           | 31.4             | 670       | 42866            | 0.0              | 800       | 2716             | 0.0              | 930       | 3026             | 0.0              |
| 415       | 6135             | 0.4              | 545       | 113101           | 26.3             | 675       | 36708            | 0.0              | 805       | 2648             | 0.0              | 935       | 4734             | 0.0              |
| 420       | 12146            | 1.4              | 550       | 120690           | 21.7             | 680       | 31814            | 0.0              | 810       | 3187             | 0.0              | 940       | 3719             | 0.0              |
| 425       | 23983            | 3.7              | 555       | 128583           | 17.3             | 685       | 27485            | 0.0              | 815       | 2931             | 0.0              | 945       | 1480             | 0.0              |
| 430       | 42142            | 8.9              | 560       | 137796           | 13.6             | 690       | 23698            | 0.0              | 820       | 2717             | 0.0              | 950       | 3450             | 0.0              |
| 435       | 68228            | 18.2             | 565       | 146577           | 10.3             | 695       | 20309            | 0.0              | 825       | 2236             | 0.0              | 955       | 5051             | 0.0              |
| 440       | 99323            | 33.2             | 570       | 154581           | 7.6              | 700       | 17890            | 0.0              | 830       | 2628             | 0.0              | 960       | 3176             | 0.0              |
| 445       | 115584           | 45.6             | 575       | 162633           | 5.4              | 705       | 15500            | 0.0              | 835       | 3140             | 0.0              | 965       | 5178             | 0.0              |
| 450       | 94997            | 43.8             | 580       | 168101           | 3.8              | 710       | 13699            | 0.0              | 840       | 3675             | 0.0              | 970       | 6385             | 0.0              |
| 455       | 61433            | 32.2             | 585       | 173145           | 2.6              | 715       | 12398            | 0.0              | 845       | 3283             | 0.0              | 975       | 3810             | 0.0              |
| 460       | 43373            | 25.6             | 590       | 174675           | 1.7              | 720       | 11147            | 0.0              | 850       | 3055             | 0.0              | 980       | 4322             | 0.0              |
| 465       | 32472            | 21.2             | 595       | 173724           | 1.1              | 725       | 9761             | 0.0              | 855       | 2932             | 0.0              | 985       | 4200             | 0.0              |
| 470       | 24257            | 17.4             | 600       | 171241           | 0.7              | 730       | 8651             | 0.0              | 860       | 3382             | 0.0              | 990       | 4661             | 0.0              |
| 475       | 21690            | 16.6             | 605       | 165134           | 0.5              | 735       | 7730             | 0.0              | 865       | 2605             | 0.0              | 995       | 6746             | 0.0              |
| 480       | 23173            | 18.6             | 610       | 156652           | 0.3              | 740       | 6847             | 0.0              | 870       | 3325             | 0.0              | 1000      | 4150             | 0.0              |
| 485       | 27564            | 22.7             | 615       | 147879           | 0.2              | 745       | 6124             | 0.0              | 875       | 3325             | 0.0              |           |                  |                  |

REPORT NUMBER: SP1-2101-121-7

TM-30-18

### Summary

$R_f = 76.9$   
 $R_g = 94.4$   
 CIE  $R_a = 73.1$   
 $R_g = -34.6$

### Spectral Power Distribution Comparison



### Color Vector Graphics



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 68 | CES51 = 90 | CES76 = 63 |
| CES02 = 62 | CES27 = 88 | CES52 = 89 | CES77 = 80 |
| CES03 = 31 | CES28 = 87 | CES53 = 80 | CES78 = 65 |
| CES04 = 70 | CES29 = 67 | CES54 = 84 | CES79 = 87 |
| CES05 = 48 | CES30 = 74 | CES55 = 84 | CES80 = 86 |
| CES06 = 51 | CES31 = 71 | CES56 = 75 | CES81 = 75 |
| CES07 = 40 | CES32 = 67 | CES57 = 74 | CES82 = 94 |
| CES08 = 39 | CES33 = 74 | CES58 = 76 | CES83 = 91 |
| CES09 = 29 | CES34 = 78 | CES59 = 87 | CES84 = 89 |
| CES10 = 75 | CES35 = 89 | CES60 = 93 | CES85 = 80 |
| CES11 = 58 | CES36 = 98 | CES61 = 86 | CES86 = 66 |
| CES12 = 64 | CES37 = 86 | CES62 = 89 | CES87 = 79 |
| CES13 = 43 | CES38 = 82 | CES63 = 77 | CES88 = 79 |
| CES14 = 74 | CES39 = 95 | CES64 = 74 | CES89 = 70 |
| CES15 = 71 | CES40 = 91 | CES65 = 68 | CES90 = 77 |
| CES16 = 47 | CES41 = 89 | CES66 = 71 | CES91 = 88 |
| CES17 = 50 | CES42 = 88 | CES67 = 69 | CES92 = 60 |
| CES18 = 56 | CES43 = 82 | CES68 = 74 | CES93 = 77 |
| CES19 = 72 | CES44 = 99 | CES69 = 82 | CES94 = 52 |
| CES20 = 65 | CES45 = 87 | CES70 = 67 | CES95 = 69 |
| CES21 = 86 | CES46 = 82 | CES71 = 66 | CES96 = 78 |
| CES22 = 79 | CES47 = 82 | CES72 = 88 | CES97 = 85 |
| CES23 = 92 | CES48 = 72 | CES73 = 59 | CES98 = 76 |
| CES24 = 91 | CES49 = 82 | CES74 = 97 | CES99 = 63 |
| CES25 = 72 | CES50 = 88 | CES75 = 66 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)