

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: P348641

Luminaire Tested: **ARCH-N-PA1-30-727-24VDC-T4W**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P348641  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-18)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: STREETWORKS  
Catalog Number: ARCH-N-PA1-30-727-24VDC-T4W  
Description: ARCHEON ROADWAY AND AREA LUMINAIRE  
(1) 70 CRI, 2700K, 560mA LIGHT ENGINE WITH 16 LEDS AND  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 3668 lumens  
Efficiency: N/A  
Efficacy: 131.0 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 0.75' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B1 - U0 - G1

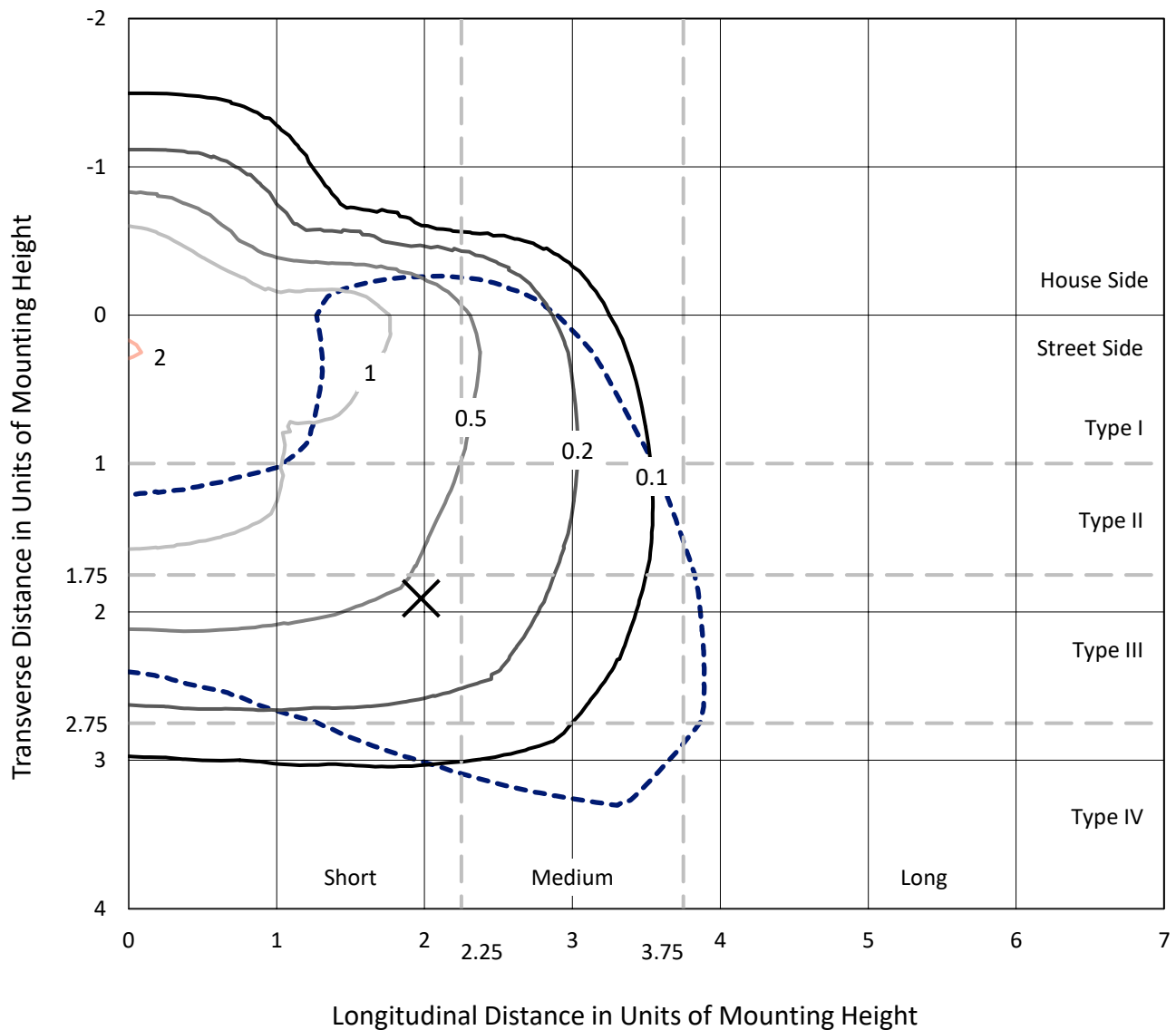
Input Watts (W): 28  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 25 FT

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## Iso-Footcandle Lines of Horizontal Illumination

✕ Max cd  
 - - - 1/2 Max cd

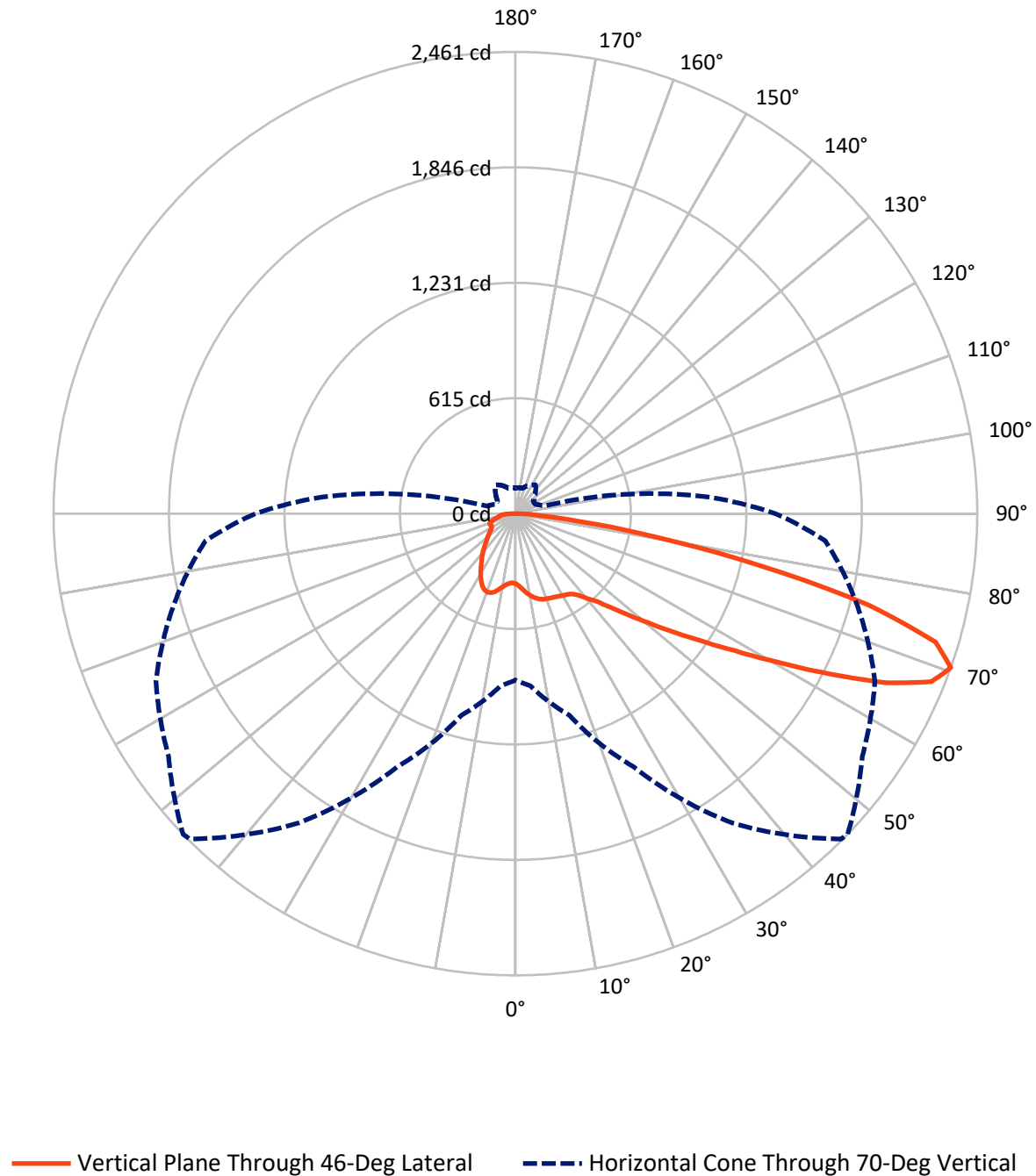


Based on 15 foot mounting height. Maximum calculated value = 2.1 fc  
 Type IV - Short - N/A

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## Luminous Intensity Polar Plot



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**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 840.7    | 0.0    | 840.7  |
|                    | % Fixture | 22.9     | 0.0    | 22.9   |
| <b>Street Side</b> | Lumens    | 2827.3   | 0.0    | 2827.3 |
|                    | % Fixture | 77.1     | 0.0    | 77.1   |
| <b>Total</b>       | Lumens    | 3668.0   | 0.0    | 3668.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 38.1   | 1.0       |
| 10°-20°   | 126.9  | 3.5       |
| 20°-30°   | 211.6  | 5.8       |
| 30°-40°   | 300.3  | 8.2       |
| 40°-50°   | 441.7  | 12.0      |
| 50°-60°   | 748.1  | 20.4      |
| 60°-70°   | 1061.9 | 29.0      |
| 70°-80°   | 645.1  | 17.6      |
| 80°-90°   | 94.1   | 2.6       |
| 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°    | 3668.0 | 100.0     |
| 0°-180°   | 3668.0 | 100.0     |

**Coefficient of Utilization**



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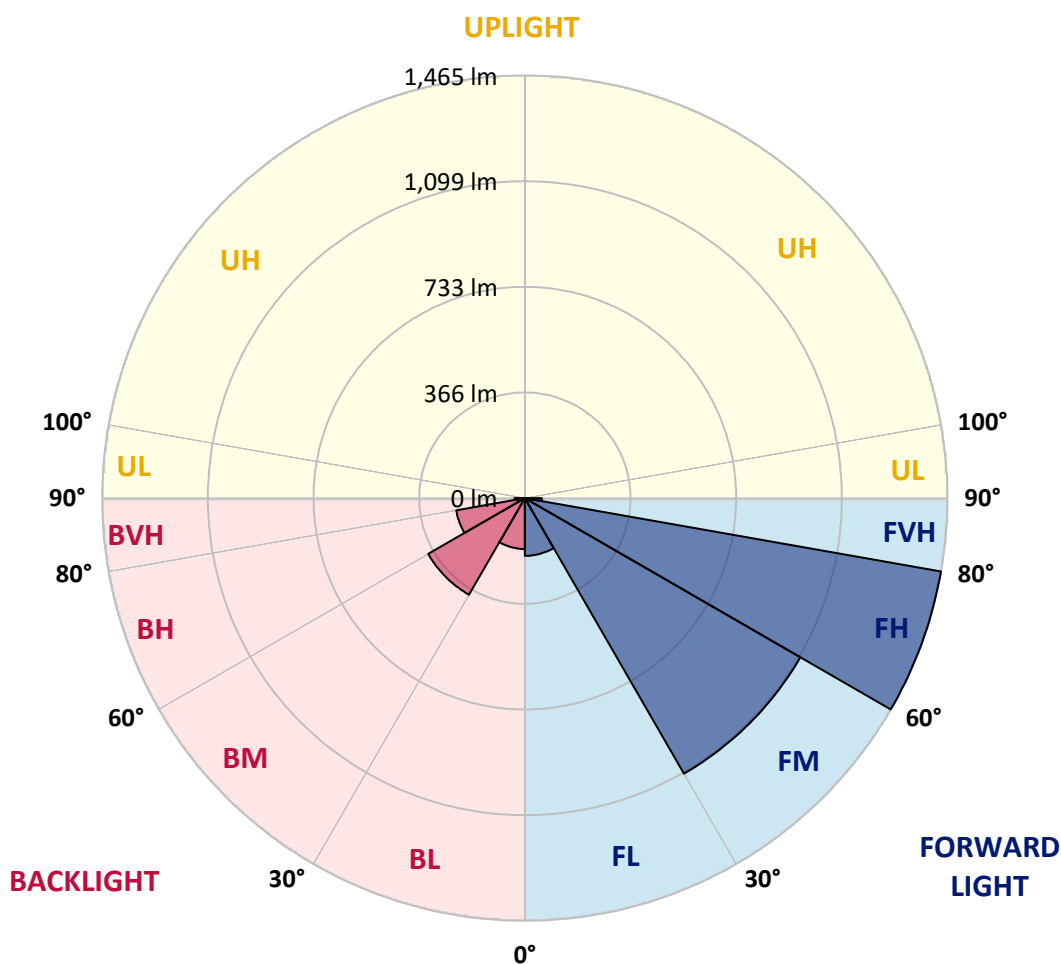
CATALOG NUMBER: ARCH-N-PA1-30-727-24VDC-T4W

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 200.1  | 5.5       |                         |      |         |
| FM   | (30°-60°)   | 1103.2 | 30.1      |                         |      |         |
| FH   | (60°-80°)   | 1465.3 | 39.9      |                         |      | G1/1800 |
| FVH  | (80°-90°)   | 58.6   | 1.6       |                         |      | G1/100  |
| BL   | (0°-30°)    | 176.5  | 4.8       | B1/500                  |      |         |
| BM   | (30°-60°)   | 387.0  | 10.6      | B1/1000                 |      |         |
| BH   | (60°-80°)   | 241.7  | 6.6       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 35.5   | 1.0       |                         |      | 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 IV Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 46°    | 55°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 373.7  | 373.7  | 373.7  | 373.7  | 373.7  | 373.7  | 373.7  | 373.7  | 373.7  | 373.7  | 373.7  |
| 2.5°  | 392.4  | 392.7  | 393.2  | 391.9  | 388.4  | 387.4  | 387.0  | 383.4  | 381.0  | 377.5  | 374.5  |
| 5°    | 423.8  | 424.0  | 423.3  | 419.8  | 412.0  | 406.2  | 405.7  | 397.4  | 389.9  | 381.9  | 375.8  |
| 7.5°  | 456.5  | 456.9  | 454.5  | 447.9  | 437.0  | 426.9  | 426.3  | 415.0  | 403.6  | 391.4  | 382.4  |
| 10°   | 485.5  | 484.0  | 480.1  | 470.9  | 457.9  | 445.6  | 445.1  | 433.3  | 420.1  | 405.5  | 393.4  |
| 12.5° | 504.9  | 503.6  | 498.6  | 487.3  | 473.1  | 461.8  | 460.8  | 449.9  | 437.1  | 421.0  | 406.6  |
| 15°   | 515.5  | 516.4  | 509.6  | 496.8  | 483.0  | 473.5  | 472.6  | 464.8  | 453.4  | 437.2  | 420.6  |
| 17.5° | 516.9  | 517.7  | 511.2  | 498.5  | 487.2  | 480.6  | 480.3  | 475.1  | 466.8  | 451.3  | 434.0  |
| 20°   | 508.9  | 509.4  | 504.0  | 493.6  | 486.2  | 484.2  | 484.0  | 481.8  | 475.6  | 461.8  | 445.0  |
| 22.5° | 497.2  | 497.6  | 493.7  | 486.2  | 483.7  | 486.8  | 487.7  | 486.8  | 482.4  | 469.5  | 453.7  |
| 25°   | 494.3  | 494.1  | 490.1  | 482.4  | 484.5  | 491.2  | 492.3  | 492.7  | 489.7  | 478.4  | 464.7  |
| 27.5° | 508.3  | 507.4  | 499.7  | 487.4  | 488.8  | 496.8  | 498.3  | 502.0  | 500.1  | 490.2  | 477.3  |
| 30°   | 548.6  | 547.1  | 531.4  | 506.5  | 499.7  | 503.9  | 505.8  | 511.5  | 511.9  | 503.6  | 494.0  |
| 32.5° | 616.6  | 614.7  | 586.6  | 542.2  | 518.2  | 511.0  | 512.8  | 521.4  | 526.1  | 519.7  | 509.3  |
| 35°   | 702.6  | 700.4  | 663.5  | 602.8  | 549.1  | 524.7  | 526.0  | 532.9  | 542.2  | 533.1  | 519.3  |
| 37.5° | 792.2  | 787.1  | 751.5  | 674.1  | 598.1  | 554.0  | 554.0  | 554.8  | 559.2  | 540.4  | 531.1  |
| 40°   | 881.3  | 876.2  | 844.1  | 757.9  | 661.7  | 600.0  | 597.1  | 577.7  | 574.2  | 558.0  | 554.8  |
| 42.5° | 964.2  | 962.7  | 943.7  | 852.7  | 736.2  | 645.3  | 641.3  | 608.3  | 609.1  | 599.0  | 599.1  |
| 45°   | 1052.3 | 1052.3 | 1036.9 | 948.4  | 823.1  | 718.1  | 714.1  | 665.6  | 673.1  | 668.4  | 679.6  |
| 47.5° | 1124.2 | 1126.5 | 1124.4 | 1048.0 | 924.1  | 810.7  | 803.4  | 744.9  | 766.0  | 781.9  | 814.4  |
| 50°   | 1197.7 | 1201.2 | 1201.6 | 1157.4 | 1046.3 | 920.6  | 912.3  | 850.2  | 897.3  | 943.0  | 1006.9 |
| 52.5° | 1304.2 | 1312.1 | 1280.6 | 1266.5 | 1195.9 | 1051.2 | 1043.0 | 985.6  | 1064.2 | 1128.4 | 1238.5 |
| 55°   | 1403.0 | 1396.1 | 1373.7 | 1382.4 | 1356.1 | 1199.8 | 1193.6 | 1143.3 | 1250.3 | 1333.6 | 1476.6 |
| 57.5° | 1456.5 | 1456.0 | 1478.6 | 1516.3 | 1528.8 | 1383.1 | 1377.9 | 1329.0 | 1460.0 | 1522.7 | 1700.2 |
| 60°   | 1519.3 | 1520.1 | 1576.1 | 1661.6 | 1713.3 | 1611.3 | 1609.0 | 1571.9 | 1663.8 | 1699.1 | 1875.5 |
| 62.5° | 1528.1 | 1543.9 | 1640.3 | 1787.4 | 1886.1 | 1877.9 | 1882.9 | 1790.7 | 1846.0 | 1840.0 | 2006.4 |
| 65°   | 1427.0 | 1447.8 | 1622.3 | 1825.4 | 2057.8 | 2169.5 | 2174.1 | 2010.7 | 1989.7 | 1960.4 | 2053.3 |
| 67.5° | 1219.9 | 1250.8 | 1440.3 | 1742.7 | 2114.4 | 2385.0 | 2391.6 | 2181.3 | 2109.0 | 2001.2 | 1940.5 |
| 70°   | 887.7  | 922.0  | 1112.8 | 1488.4 | 2013.5 | 2454.0 | 2461.4 | 2256.7 | 2113.5 | 1885.1 | 1656.6 |
| 72.5° | 536.3  | 563.1  | 720.4  | 1095.7 | 1699.4 | 2328.4 | 2341.6 | 2161.1 | 1929.6 | 1596.7 | 1223.3 |
| 75°   | 235.5  | 253.1  | 348.3  | 631.4  | 1216.6 | 1926.5 | 1942.9 | 1849.8 | 1567.8 | 1160.4 | 723.0  |
| 77.5° | 100.3  | 105.3  | 142.9  | 274.3  | 687.8  | 1316.4 | 1339.0 | 1351.6 | 1063.7 | 631.4  | 305.5  |
| 80°   | 62.5   | 64.5   | 80.8   | 124.1  | 321.9  | 739.4  | 763.7  | 795.2  | 528.2  | 232.1  | 106.7  |
| 82.5° | 38.0   | 40.3   | 53.7   | 75.1   | 167.6  | 335.2  | 346.8  | 369.1  | 205.0  | 100.3  | 55.2   |
| 85°   | 22.8   | 24.5   | 32.9   | 47.4   | 95.4   | 131.8  | 131.7  | 145.6  | 96.5   | 64.5   | 29.1   |
| 87.5° | 10.9   | 12.2   | 17.6   | 24.6   | 48.1   | 49.5   | 46.3   | 52.5   | 58.6   | 42.3   | 14.7   |
| 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-N-PA1-30-727-24VDC-T4W

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 373.7  | 373.7  | 373.7 | 373.7 | 373.7 | 373.7 | 373.7 | 373.7 | 373.7 | 373.7 | 373.7 |
| 2.5°  | 373.4  | 372.9  | 371.3 | 370.1 | 369.8 | 369.1 | 368.4 | 368.8 | 369.3 | 369.4 | 369.4 |
| 5°    | 373.3  | 371.9  | 369.8 | 368.9 | 370.1 | 371.6 | 373.4 | 376.0 | 377.5 | 378.6 | 379.3 |
| 7.5°  | 379.3  | 376.7  | 374.3 | 373.8 | 376.1 | 380.1 | 384.4 | 389.6 | 393.3 | 395.8 | 396.3 |
| 10°   | 389.4  | 386.1  | 383.7 | 384.2 | 388.3 | 394.0 | 400.1 | 406.8 | 412.4 | 415.7 | 416.0 |
| 12.5° | 400.9  | 397.8  | 395.5 | 397.7 | 404.3 | 411.4 | 417.6 | 423.5 | 428.6 | 431.9 | 431.9 |
| 15°   | 414.2  | 412.0  | 409.3 | 414.2 | 423.3 | 429.6 | 432.2 | 435.1 | 437.8 | 440.4 | 439.9 |
| 17.5° | 427.0  | 424.9  | 423.5 | 429.3 | 438.7 | 441.6 | 439.9 | 437.7 | 437.7 | 439.1 | 439.3 |
| 20°   | 438.1  | 436.2  | 437.1 | 442.7 | 447.6 | 444.6 | 438.1 | 431.3 | 428.6 | 429.3 | 430.1 |
| 22.5° | 447.8  | 446.9  | 449.5 | 452.2 | 448.6 | 438.1 | 426.0 | 416.9 | 413.5 | 413.2 | 413.5 |
| 25°   | 459.1  | 458.9  | 462.2 | 457.4 | 441.9 | 422.4 | 406.2 | 397.3 | 395.4 | 396.9 | 399.4 |
| 27.5° | 473.1  | 474.5  | 476.1 | 458.7 | 428.1 | 398.7 | 382.2 | 376.1 | 378.0 | 381.6 | 384.0 |
| 30°   | 491.1  | 494.8  | 491.3 | 455.5 | 408.2 | 371.6 | 355.9 | 354.1 | 359.3 | 364.4 | 366.9 |
| 32.5° | 508.5  | 514.4  | 505.9 | 447.4 | 382.6 | 342.8 | 330.6 | 330.1 | 336.4 | 341.4 | 345.0 |
| 35°   | 522.6  | 534.2  | 516.8 | 431.2 | 353.0 | 316.3 | 307.4 | 304.0 | 306.3 | 312.2 | 316.2 |
| 37.5° | 540.9  | 560.4  | 524.3 | 406.5 | 320.9 | 294.5 | 284.1 | 276.3 | 274.3 | 276.7 | 278.7 |
| 40°   | 574.4  | 600.2  | 527.8 | 371.9 | 289.5 | 272.6 | 262.1 | 250.7 | 242.8 | 237.0 | 237.1 |
| 42.5° | 629.1  | 652.0  | 525.6 | 330.0 | 260.5 | 251.3 | 239.4 | 226.2 | 213.4 | 200.3 | 199.3 |
| 45°   | 718.0  | 729.1  | 518.8 | 285.6 | 235.0 | 229.0 | 217.8 | 204.6 | 187.5 | 172.7 | 171.3 |
| 47.5° | 860.2  | 835.8  | 508.3 | 246.8 | 212.5 | 210.0 | 199.7 | 184.5 | 166.5 | 154.5 | 153.5 |
| 50°   | 1054.2 | 989.8  | 503.1 | 215.9 | 192.7 | 193.4 | 185.0 | 169.0 | 151.9 | 143.1 | 142.1 |
| 52.5° | 1286.2 | 1169.2 | 513.0 | 192.1 | 176.7 | 179.4 | 173.1 | 158.0 | 143.7 | 136.8 | 135.8 |
| 55°   | 1526.8 | 1355.0 | 523.7 | 174.7 | 161.7 | 166.8 | 164.7 | 152.3 | 139.3 | 132.9 | 132.1 |
| 57.5° | 1732.8 | 1493.7 | 502.4 | 160.7 | 148.2 | 156.3 | 158.2 | 148.6 | 137.1 | 131.3 | 130.3 |
| 60°   | 1862.5 | 1549.5 | 446.4 | 147.5 | 137.6 | 147.9 | 154.4 | 147.6 | 138.0 | 137.5 | 136.7 |
| 62.5° | 1924.0 | 1544.6 | 362.4 | 137.1 | 130.9 | 144.2 | 157.2 | 153.3 | 148.0 | 152.5 | 152.9 |
| 65°   | 1896.4 | 1470.8 | 269.9 | 130.2 | 126.2 | 145.6 | 165.4 | 163.9 | 150.9 | 155.4 | 156.0 |
| 67.5° | 1714.6 | 1294.7 | 199.8 | 124.1 | 120.9 | 149.5 | 180.5 | 167.5 | 145.2 | 148.5 | 146.5 |
| 70°   | 1385.8 | 1026.4 | 154.1 | 117.4 | 115.5 | 149.0 | 187.3 | 165.3 | 139.1 | 139.8 | 134.4 |
| 72.5° | 955.6  | 699.9  | 125.4 | 111.1 | 107.7 | 135.8 | 182.5 | 160.0 | 133.9 | 128.2 | 121.0 |
| 75°   | 519.7  | 375.7  | 106.6 | 104.6 | 94.0  | 119.3 | 173.7 | 156.3 | 129.3 | 121.6 | 117.6 |
| 77.5° | 204.5  | 155.9  | 92.5  | 95.7  | 82.2  | 105.3 | 163.9 | 149.1 | 122.9 | 112.8 | 110.8 |
| 80°   | 83.5   | 79.6   | 76.7  | 82.7  | 70.7  | 92.1  | 152.1 | 140.7 | 115.2 | 104.7 | 100.7 |
| 82.5° | 47.3   | 49.5   | 59.6  | 65.3  | 57.4  | 84.9  | 146.5 | 133.9 | 106.1 | 93.8  | 89.0  |
| 85°   | 24.2   | 29.0   | 41.5  | 46.8  | 42.2  | 72.2  | 134.9 | 117.2 | 85.1  | 71.8  | 72.2  |
| 87.5° | 11.7   | 16.2   | 26.2  | 29.4  | 27.4  | 52.2  | 100.8 | 85.0  | 66.3  | 52.5  | 50.8  |
| 90°   | 0.0    | 0.0    | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |

Report 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



**Measure Comparisons**



(END OF REPORT)