

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: P348928

Luminaire Tested: **ARCH-N-PA1-30-730-24VDC-T2U**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P348928  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1908-474-1)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: STREETWORKS  
Catalog Number: ARCH-N-PA1-30-730-24VDC-T2U  
Description: ARCHEON ROADWAY AND AREA LUMINAIRE  
(1) 70 CRI, 3000K, 560mA LIGHT ENGINE WITH 16 LEDS AND  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 3993 lumens  
Efficiency: N/A  
Efficacy: 142.6 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 0.75' x H: 0')  
IES Classification: Type II - 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

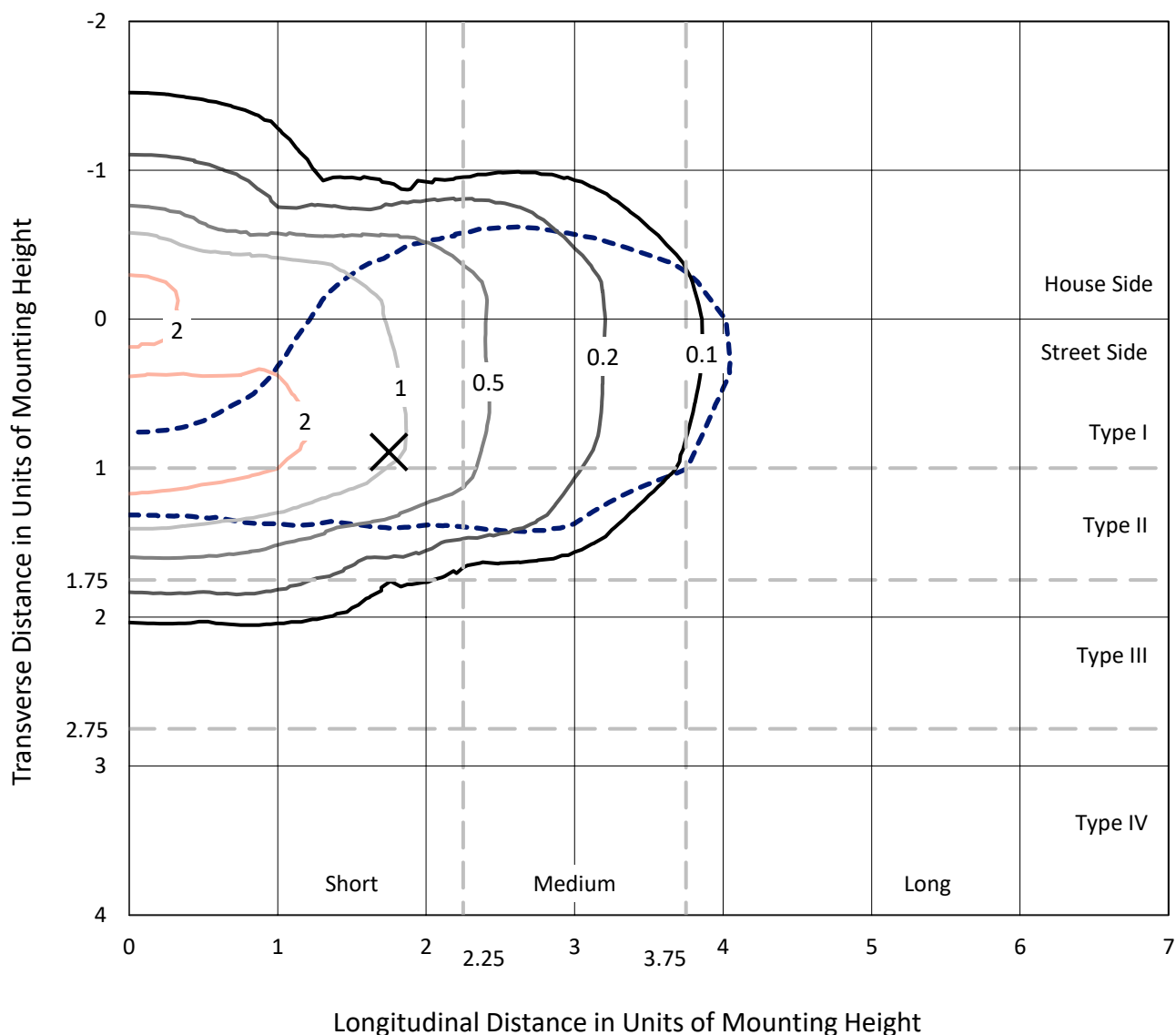
REPORT NUMBER: P348928

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## Iso-Footcandle Lines of Horizontal Illumination

× Max cd

--- 1/2 Max cd

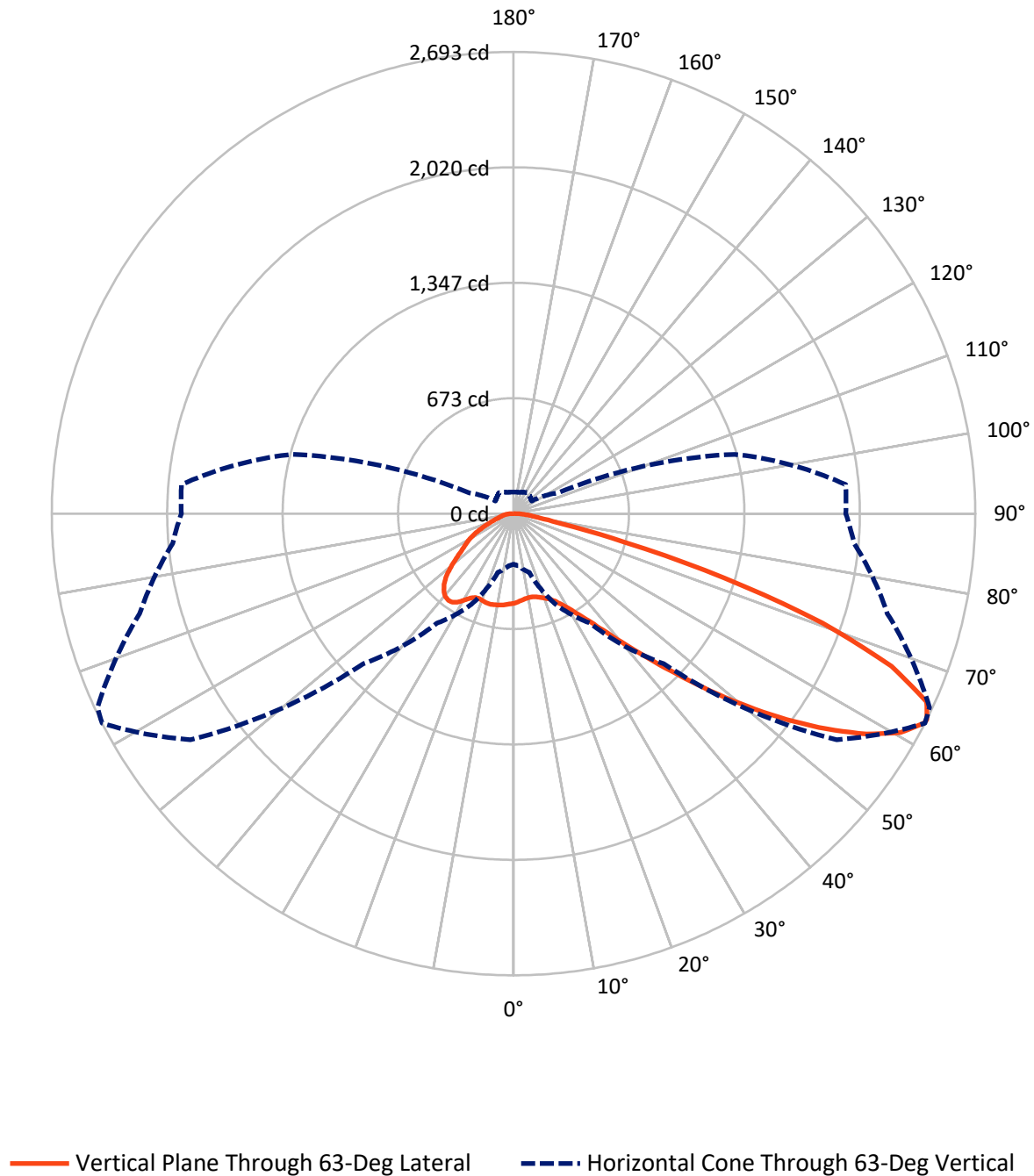


Based on 15 foot mounting height. Maximum calculated value = 3.1 fc

Type II - Short - N/A

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## Luminous Intensity Polar Plot



REPORT NUMBER: P348928

CATALOG NUMBER: ARCH-N-PA1-30-730-24VDC-T2U

**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 1140.0   | 0.0    | 1140.0 |
|                    | % Fixture | 28.5     | 0.0    | 28.5   |
| <b>Street Side</b> | Lumens    | 2853.0   | 0.0    | 2853.0 |
|                    | % Fixture | 71.5     | 0.0    | 71.5   |
| <b>Total</b>       | Lumens    | 3993.0   | 0.0    | 3993.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 49.6   | 1.2       |
| 10°-20°   | 146.4  | 3.7       |
| 20°-30°   | 257.0  | 6.4       |
| 30°-40°   | 433.3  | 10.9      |
| 40°-50°   | 759.0  | 19.0      |
| 50°-60°   | 981.0  | 24.6      |
| 60°-70°   | 849.1  | 21.3      |
| 70°-80°   | 440.8  | 11.0      |
| 80°-90°   | 76.8   | 1.9       |
| 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°    | 3993.0 | 100.0     |
| 0°-180°   | 3993.0 | 100.0     |



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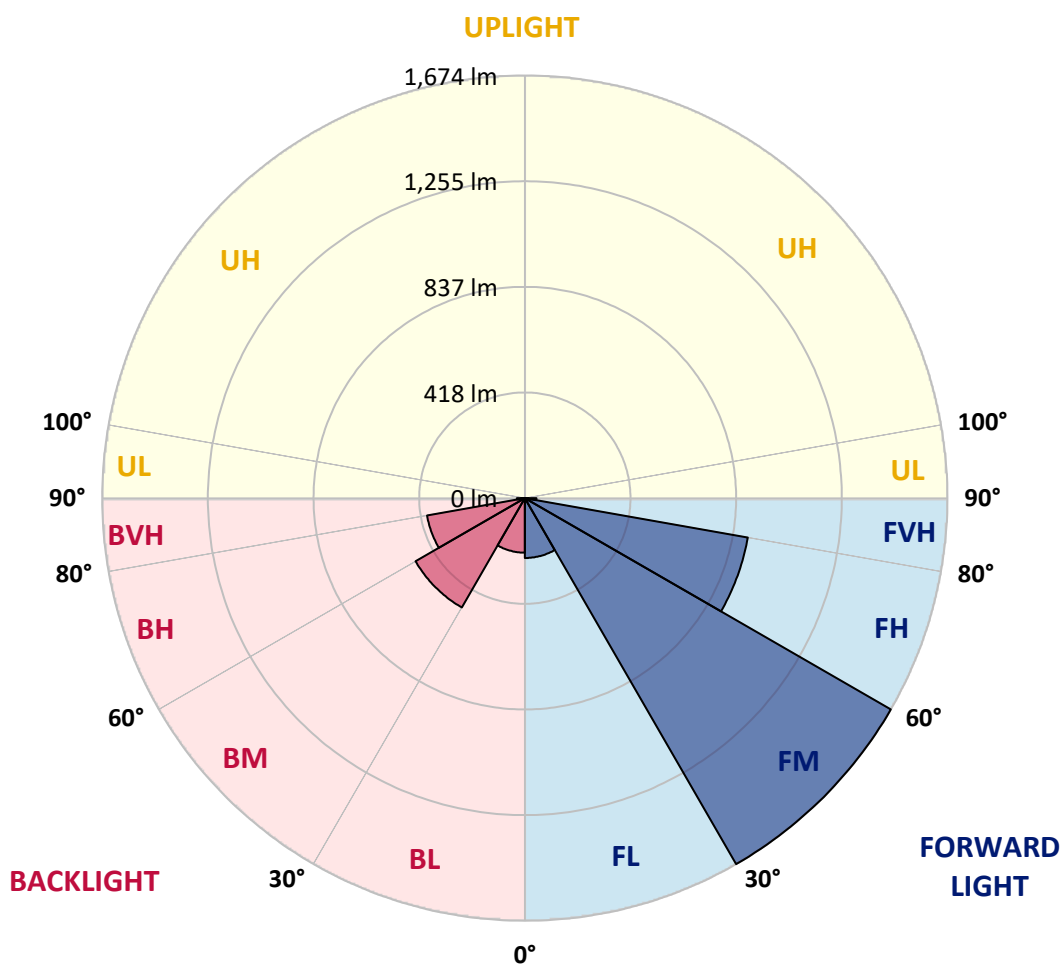
CATALOG NUMBER: ARCH-N-PA1-30-730-24VDC-T2U

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 237.1  | 5.9       |                         |      |         |
| FM   | (30°-60°)   | 1673.5 | 41.9      |                         |      |         |
| FH   | (60°-80°)   | 896.7  | 22.5      |                         |      | G1/1800 |
| FVH  | (80°-90°)   | 45.7   | 1.1       |                         |      | G1/100  |
| BL   | (0°-30°)    | 215.9  | 5.4       | B1/500                  |      |         |
| BM   | (30°-60°)   | 499.7  | 12.5      | B1/1000                 |      |         |
| BH   | (60°-80°)   | 393.2  | 9.8       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 31.1   | 0.8       |                         |      | 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



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CATALOG NUMBER: ARCH-N-PA1-30-730-24VDC-T2U

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 63°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 522.8  | 522.8  | 522.8  | 522.8  | 522.8  | 522.8  | 522.8  | 522.8  | 522.8  | 522.8  | 522.8  |
| 2.5°  | 510.5  | 509.0  | 511.6  | 512.7  | 512.3  | 514.6  | 514.6  | 515.0  | 515.0  | 516.8  | 518.7  |
| 5°    | 495.5  | 494.8  | 497.4  | 499.3  | 500.8  | 504.1  | 506.4  | 507.5  | 508.6  | 511.2  | 515.7  |
| 7.5°  | 481.3  | 480.2  | 483.9  | 485.4  | 487.7  | 492.5  | 497.8  | 500.8  | 502.2  | 507.9  | 514.2  |
| 10°   | 469.7  | 469.4  | 472.4  | 473.8  | 476.5  | 483.6  | 491.0  | 497.4  | 498.5  | 506.0  | 512.0  |
| 12.5° | 464.1  | 463.4  | 466.7  | 468.6  | 473.1  | 481.7  | 490.3  | 498.1  | 500.0  | 508.6  | 513.8  |
| 15°   | 468.6  | 469.4  | 472.4  | 472.7  | 478.0  | 486.9  | 496.6  | 504.5  | 506.4  | 515.0  | 518.7  |
| 17.5° | 489.9  | 489.5  | 491.4  | 490.7  | 492.5  | 497.0  | 507.5  | 513.8  | 516.1  | 522.4  | 525.4  |
| 20°   | 528.4  | 527.3  | 528.8  | 523.9  | 515.7  | 513.5  | 519.8  | 526.9  | 527.7  | 531.4  | 529.5  |
| 22.5° | 587.1  | 588.2  | 584.8  | 572.5  | 552.7  | 543.4  | 539.2  | 541.5  | 544.1  | 543.7  | 538.1  |
| 25°   | 663.7  | 667.4  | 661.1  | 639.4  | 606.1  | 584.5  | 569.5  | 566.1  | 568.0  | 562.8  | 554.2  |
| 27.5° | 764.2  | 767.2  | 753.4  | 719.7  | 674.9  | 642.8  | 612.9  | 601.3  | 601.3  | 590.1  | 574.4  |
| 30°   | 874.8  | 876.7  | 854.6  | 812.0  | 760.1  | 712.3  | 668.2  | 645.7  | 643.9  | 621.8  | 597.2  |
| 32.5° | 1009.4 | 1004.1 | 978.0  | 925.3  | 859.9  | 794.1  | 737.3  | 703.3  | 699.6  | 666.3  | 634.9  |
| 35°   | 1183.1 | 1183.1 | 1128.9 | 1068.8 | 989.2  | 905.5  | 830.7  | 778.0  | 774.3  | 736.6  | 695.8  |
| 37.5° | 1371.8 | 1371.1 | 1322.1 | 1239.2 | 1143.9 | 1041.5 | 941.7  | 875.9  | 867.3  | 827.0  | 781.4  |
| 40°   | 1559.8 | 1553.5 | 1513.8 | 1435.0 | 1333.3 | 1216.4 | 1078.9 | 1002.3 | 998.1  | 940.6  | 883.4  |
| 42.5° | 1697.3 | 1691.3 | 1672.7 | 1620.0 | 1553.1 | 1468.6 | 1257.1 | 1153.6 | 1147.6 | 1075.1 | 1005.2 |
| 45°   | 1773.2 | 1764.6 | 1762.0 | 1762.7 | 1770.2 | 1769.8 | 1477.2 | 1332.6 | 1311.7 | 1227.6 | 1134.5 |
| 47.5° | 1756.0 | 1735.8 | 1762.7 | 1831.9 | 1948.1 | 2024.3 | 1733.6 | 1545.2 | 1506.4 | 1386.0 | 1272.4 |
| 50°   | 1617.4 | 1607.6 | 1665.2 | 1806.1 | 2044.9 | 2223.9 | 2015.7 | 1766.1 | 1711.2 | 1535.9 | 1402.9 |
| 52.5° | 1374.1 | 1392.8 | 1463.8 | 1664.1 | 2027.3 | 2344.6 | 2272.1 | 1995.5 | 1919.3 | 1678.6 | 1516.1 |
| 55°   | 1093.8 | 1117.4 | 1217.5 | 1429.8 | 1864.7 | 2346.1 | 2457.1 | 2217.9 | 2149.9 | 1826.3 | 1631.9 |
| 57.5° | 796.0  | 829.2  | 954.4  | 1149.1 | 1579.6 | 2185.7 | 2548.2 | 2426.0 | 2348.3 | 1971.6 | 1745.2 |
| 60°   | 500.0  | 523.5  | 659.9  | 885.7  | 1207.4 | 1831.9 | 2525.4 | 2592.7 | 2528.4 | 2108.8 | 1874.5 |
| 62.5° | 322.1  | 333.3  | 392.4  | 632.3  | 841.9  | 1343.4 | 2356.9 | 2688.4 | 2660.7 | 2234.0 | 1972.0 |
| 63°   | 295.2  | 304.9  | 355.4  | 584.5  | 780.7  | 1237.7 | 2300.1 | 2693.2 | 2676.8 | 2257.5 | 1994.8 |
| 65°   | 211.1  | 221.6  | 247.8  | 401.7  | 576.2  | 830.4  | 1970.9 | 2648.0 | 2666.3 | 2296.7 | 2025.8 |
| 67.5° | 166.7  | 170.0  | 182.0  | 244.0  | 408.8  | 471.6  | 1326.2 | 2377.8 | 2458.2 | 2254.9 | 1979.8 |
| 70°   | 149.1  | 151.7  | 165.2  | 187.2  | 309.4  | 305.7  | 691.7  | 1911.8 | 2078.1 | 2112.1 | 1864.0 |
| 72.5° | 130.0  | 131.9  | 148.4  | 176.4  | 236.2  | 233.6  | 300.8  | 1285.5 | 1487.7 | 1850.5 | 1703.7 |
| 75°   | 107.6  | 109.5  | 123.3  | 156.6  | 199.9  | 184.6  | 188.3  | 671.9  | 852.8  | 1450.7 | 1494.0 |
| 77.5° | 88.6   | 89.7   | 101.3  | 125.9  | 176.0  | 142.4  | 145.7  | 282.5  | 414.4  | 988.8  | 1179.8 |
| 80°   | 64.3   | 64.6   | 75.5   | 95.7   | 134.5  | 128.6  | 108.4  | 154.0  | 188.0  | 541.9  | 742.2  |
| 82.5° | 44.8   | 45.2   | 56.4   | 66.9   | 92.7   | 128.2  | 78.8   | 103.1  | 112.9  | 249.6  | 330.3  |
| 85°   | 31.4   | 30.6   | 38.5   | 44.1   | 58.7   | 77.7   | 60.2   | 66.1   | 69.9   | 108.0  | 88.9   |
| 87.5° | 13.8   | 13.5   | 21.7   | 23.5   | 29.5   | 35.9   | 47.8   | 34.8   | 37.0   | 52.3   | 28.0   |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

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**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 522.8  | 522.8  | 522.8  | 522.8 | 522.8 | 522.8 | 522.8 | 522.8 | 522.8 | 522.8 | 522.8 |
| 2.5°  | 519.1  | 520.6  | 522.8  | 526.2 | 528.8 | 529.9 | 532.1 | 532.5 | 535.9 | 532.9 | 533.3 |
| 5°    | 518.3  | 520.2  | 525.0  | 531.0 | 535.1 | 538.1 | 543.7 | 545.6 | 549.0 | 547.5 | 547.1 |
| 7.5°  | 517.2  | 520.6  | 527.7  | 536.3 | 542.6 | 547.5 | 552.7 | 556.1 | 559.4 | 558.7 | 557.9 |
| 10°   | 515.7  | 519.8  | 529.9  | 538.5 | 547.5 | 552.7 | 556.4 | 556.8 | 557.9 | 557.2 | 555.3 |
| 12.5° | 516.8  | 521.3  | 532.9  | 541.5 | 550.8 | 554.6 | 553.4 | 547.8 | 543.0 | 538.9 | 538.1 |
| 15°   | 520.6  | 525.8  | 536.6  | 544.5 | 551.9 | 549.7 | 543.0 | 530.6 | 521.7 | 516.4 | 516.8 |
| 17.5° | 524.3  | 528.8  | 537.0  | 543.4 | 547.1 | 540.4 | 529.9 | 519.4 | 515.3 | 511.2 | 510.5 |
| 20°   | 527.7  | 528.4  | 533.6  | 539.2 | 538.9 | 533.6 | 523.9 | 511.2 | 503.0 | 496.3 | 496.6 |
| 22.5° | 532.9  | 529.9  | 530.3  | 533.6 | 537.7 | 532.9 | 510.1 | 488.0 | 475.7 | 467.9 | 467.5 |
| 25°   | 544.8  | 538.5  | 532.5  | 534.4 | 550.1 | 519.1 | 480.6 | 451.8 | 441.0 | 433.9 | 434.6 |
| 27.5° | 561.3  | 552.7  | 540.7  | 550.8 | 559.4 | 491.8 | 438.3 | 408.8 | 401.3 | 393.9 | 395.7 |
| 30°   | 579.2  | 566.9  | 552.3  | 586.3 | 549.0 | 448.4 | 386.0 | 359.1 | 352.4 | 345.3 | 346.8 |
| 32.5° | 611.4  | 593.1  | 574.0  | 628.9 | 524.7 | 395.7 | 331.1 | 306.8 | 302.3 | 297.8 | 298.2 |
| 35°   | 664.8  | 643.1  | 622.6  | 661.4 | 493.3 | 340.8 | 281.8 | 264.6 | 260.8 | 255.6 | 255.6 |
| 37.5° | 743.7  | 709.6  | 698.8  | 678.6 | 450.3 | 289.6 | 245.5 | 233.9 | 226.1 | 219.0 | 219.0 |
| 40°   | 835.2  | 794.9  | 786.3  | 683.9 | 394.2 | 247.0 | 220.1 | 210.0 | 199.6 | 189.1 | 189.8 |
| 42.5° | 946.6  | 892.0  | 872.2  | 676.8 | 326.2 | 219.7 | 202.2 | 190.6 | 180.5 | 171.5 | 170.0 |
| 45°   | 1072.1 | 1003.0 | 952.9  | 656.2 | 264.6 | 202.9 | 190.6 | 176.8 | 164.1 | 156.2 | 154.7 |
| 47.5° | 1200.3 | 1123.3 | 1024.3 | 615.1 | 221.2 | 191.0 | 182.7 | 163.3 | 154.3 | 149.1 | 148.4 |
| 50°   | 1322.9 | 1242.5 | 1083.3 | 550.5 | 196.2 | 182.4 | 171.2 | 157.0 | 149.5 | 145.0 | 144.6 |
| 52.5° | 1431.6 | 1355.8 | 1133.0 | 483.6 | 179.4 | 175.3 | 165.9 | 154.0 | 146.1 | 142.0 | 141.3 |
| 55°   | 1535.1 | 1470.5 | 1182.4 | 423.8 | 164.8 | 163.3 | 163.3 | 151.0 | 142.4 | 138.6 | 137.9 |
| 57.5° | 1648.7 | 1600.9 | 1232.1 | 380.0 | 151.7 | 154.7 | 159.9 | 147.6 | 138.3 | 134.9 | 134.5 |
| 60°   | 1779.9 | 1751.9 | 1284.4 | 341.6 | 140.1 | 145.4 | 155.1 | 143.1 | 133.4 | 130.8 | 130.0 |
| 62.5° | 1914.1 | 1914.8 | 1329.6 | 295.2 | 130.4 | 138.3 | 149.5 | 139.0 | 128.9 | 127.1 | 126.7 |
| 63°   | 1937.6 | 1944.3 | 1336.0 | 285.1 | 128.2 | 136.8 | 148.0 | 137.5 | 127.8 | 125.9 | 125.6 |
| 65°   | 1995.5 | 2025.1 | 1341.2 | 242.5 | 120.0 | 131.2 | 142.4 | 132.7 | 122.9 | 122.6 | 121.8 |
| 67.5° | 1981.7 | 2029.9 | 1308.7 | 190.2 | 110.6 | 123.3 | 134.5 | 125.6 | 117.0 | 117.0 | 115.5 |
| 70°   | 1878.6 | 1910.0 | 1208.9 | 146.9 | 103.5 | 115.1 | 125.2 | 118.1 | 109.1 | 109.9 | 106.9 |
| 72.5° | 1720.5 | 1686.1 | 994.4  | 114.7 | 94.9  | 105.8 | 114.4 | 108.4 | 100.5 | 99.8  | 96.4  |
| 75°   | 1488.8 | 1375.6 | 712.3  | 92.7  | 84.5  | 93.4  | 102.4 | 97.9  | 90.8  | 86.7  | 86.0  |
| 77.5° | 1134.5 | 976.5  | 426.8  | 78.5  | 75.5  | 83.0  | 88.6  | 85.2  | 79.6  | 74.7  | 75.1  |
| 80°   | 675.6  | 563.2  | 192.5  | 66.5  | 65.4  | 71.0  | 75.5  | 72.9  | 69.1  | 63.2  | 61.7  |
| 82.5° | 273.5  | 217.9  | 86.3   | 53.8  | 55.3  | 59.4  | 63.5  | 61.3  | 58.3  | 56.8  | 48.2  |
| 85°   | 71.0   | 68.4   | 50.4   | 40.4  | 42.6  | 44.5  | 50.1  | 50.1  | 47.5  | 38.9  | 35.9  |
| 87.5° | 20.2   | 26.9   | 28.0   | 25.4  | 28.8  | 29.1  | 34.8  | 34.8  | 35.5  | 23.9  | 21.7  |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |

Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

STREETWORKS

Report Number: SP1-2101-121-6

Luminaire Tested: IFLD-S-SA2E-730-U-T2

Test Date: 03/04/2021

### Test Information

Test Method: LM-79-08  
 Report Number: SP1-2101-121-6  
 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-730-U-T2**  
 Description: STREETWORKS INF FLOOD

PROGRAMMED @ 615mA.

### Spectral Parameters

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 2981   | CRI (Ra): | 72.3 |      |       |
| CIE u':                   | 0.2509 | R1:       | 68.0 | R9:  | -36.9 |
| CIE v':                   | 0.5228 | R2:       | 82.9 | R10: | 62.7  |
| Duv:                      | 0.0008 | R3:       | 95.0 | R11: | 65.3  |
| CIE x:                    | 0.4393 | R4:       | 68.7 | R12: | 58.3  |
| CIE y:                    | 0.4068 | R5:       | 68.4 | R13: | 70.8  |
| CIE z:                    | 0.1540 | R6:       | 77.8 | R14: | 97.4  |
| Peak Wavelength (nm):     | 598    | R7:       | 76.5 |      |       |
| Dominant Wavelength (nm): | 582    | R8:       | 41.3 |      |       |
| Purity:                   | 54.3   |           |      |      |       |
| Rf:                       | 76.2   |           |      |      |       |
| Rg:                       | 94.1   |           |      |      |       |



### Test Conditions

Stabilization Time: 64M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.0/30%  
 Sphere Temperature (°C): 24.1

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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**



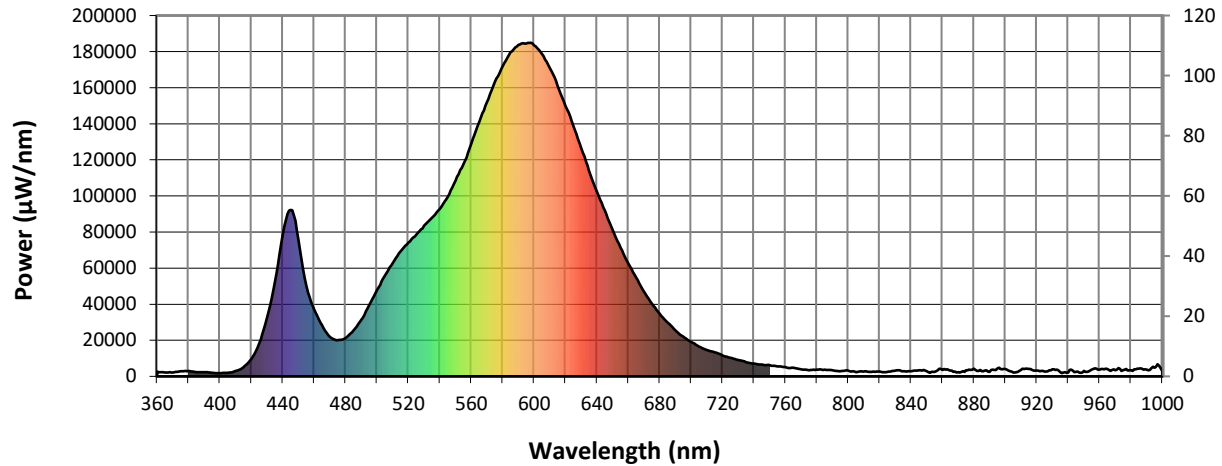
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 3000K 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       | 2718             | 0.0              | 490       | 31388            | 4.5              | 620       | 149681           | 39.0             | 750       | 6127             | 0.0              | 880       | 4244             | 0.0              |
| 365       | 2104             | 0.0              | 495       | 39325            | 7.1              | 625       | 139059           | 30.7             | 755       | 5537             | 0.0              | 885       | 2890             | 0.0              |
| 370       | 2172             | 0.0              | 500       | 47816            | 10.5             | 630       | 126485           | 22.9             | 760       | 5066             | 0.0              | 890       | 2506             | 0.0              |
| 375       | 2770             | 0.0              | 505       | 55667            | 15.6             | 635       | 114115           | 17.1             | 765       | 4739             | 0.0              | 895       | 4522             | 0.0              |
| 380       | 2942             | 0.0              | 510       | 62766            | 21.6             | 640       | 102385           | 12.2             | 770       | 3828             | 0.0              | 900       | 4104             | 0.0              |
| 385       | 2372             | 0.0              | 515       | 69117            | 28.6             | 645       | 91895            | 8.8              | 775       | 3411             | 0.0              | 905       | 2090             | 0.0              |
| 390       | 2265             | 0.0              | 520       | 74088            | 35.9             | 650       | 81196            | 5.9              | 780       | 3776             | 0.0              | 910       | 3618             | 0.0              |
| 395       | 2023             | 0.0              | 525       | 78477            | 42.1             | 655       | 71232            | 4.1              | 785       | 3744             | 0.0              | 915       | 4126             | 0.0              |
| 400       | 1804             | 0.0              | 530       | 83585            | 49.2             | 660       | 62529            | 2.6              | 790       | 3446             | 0.0              | 920       | 3214             | 0.0              |
| 405       | 2029             | 0.0              | 535       | 87899            | 54.5             | 665       | 54721            | 1.7              | 795       | 2834             | 0.0              | 925       | 2696             | 0.0              |
| 410       | 2968             | 0.0              | 540       | 92850            | 60.5             | 670       | 47069            | 1.0              | 800       | 3213             | 0.0              | 930       | 3892             | 0.0              |
| 415       | 5120             | 0.0              | 545       | 99487            | 66.2             | 675       | 40348            | 0.7              | 805       | 2357             | 0.0              | 935       | 2376             | 0.0              |
| 420       | 9660             | 0.0              | 550       | 108411           | 73.7             | 680       | 34816            | 0.4              | 810       | 2616             | 0.0              | 940       | 2172             | 0.0              |
| 425       | 18379            | 0.1              | 555       | 117570           | 80.3             | 685       | 29890            | 0.3              | 815       | 2510             | 0.0              | 945       | 2531             | 0.0              |
| 430       | 32455            | 0.3              | 560       | 128783           | 87.5             | 690       | 25584            | 0.1              | 820       | 2684             | 0.0              | 950       | 3041             | 0.0              |
| 435       | 52561            | 0.6              | 565       | 140888           | 93.7             | 695       | 21945            | 0.1              | 825       | 2434             | 0.0              | 955       | 3777             | 0.0              |
| 440       | 78320            | 1.2              | 570       | 151789           | 98.7             | 700       | 19163            | 0.1              | 830       | 3163             | 0.0              | 960       | 3733             | 0.0              |
| 445       | 92278            | 1.9              | 575       | 163210           | 101.6            | 705       | 16563            | 0.0              | 835       | 2905             | 0.0              | 965       | 4082             | 0.0              |
| 450       | 75996            | 2.0              | 580       | 171760           | 102.1            | 710       | 14632            | 0.0              | 840       | 2917             | 0.0              | 970       | 3333             | 0.0              |
| 455       | 50251            | 1.7              | 585       | 179606           | 99.8             | 715       | 13282            | 0.0              | 845       | 3384             | 0.0              | 975       | 3396             | 0.0              |
| 460       | 37320            | 1.5              | 590       | 183682           | 95.0             | 720       | 11587            | 0.0              | 850       | 2926             | 0.0              | 980       | 3415             | 0.0              |
| 465       | 28321            | 1.5              | 595       | 184440           | 87.4             | 725       | 10271            | 0.0              | 855       | 2420             | 0.0              | 985       | 4316             | 0.0              |
| 470       | 21814            | 1.4              | 600       | 183413           | 79.0             | 730       | 9052             | 0.0              | 860       | 3637             | 0.0              | 990       | 3771             | 0.0              |
| 475       | 19996            | 1.6              | 605       | 178745           | 69.2             | 735       | 7872             | 0.0              | 865       | 3162             | 0.0              | 995       | 4745             | 0.0              |
| 480       | 21364            | 2.0              | 610       | 170867           | 58.7             | 740       | 7066             | 0.0              | 870       | 2292             | 0.0              | 1000      | 2768             | 0.0              |
| 485       | 25425            | 3.0              | 615       | 161088           | 48.6             | 745       | 6501             | 0.0              | 875       | 3357             | 0.0              |           |                  |                  |

REPORT NUMBER: SP1-2101-121-6

### Scotopic Flux vs. Wavelength



Scotopic Lumens: 10635.1

S/P: 1.22

| 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       | 2718             | 0.0              | 490       | 31388            | 48.3             | 620       | 149681           | 1.9              | 750       | 6127             | 0.0              | 880       | 4244             | 0.0              |
| 365       | 2104             | 0.0              | 495       | 39325            | 63.6             | 625       | 139059           | 1.2              | 755       | 5537             | 0.0              | 885       | 2890             | 0.0              |
| 370       | 2172             | 0.0              | 500       | 47816            | 80.0             | 630       | 126485           | 0.7              | 760       | 5066             | 0.0              | 890       | 2506             | 0.0              |
| 375       | 2770             | 0.0              | 505       | 55667            | 94.6             | 635       | 114115           | 0.4              | 765       | 4739             | 0.0              | 895       | 4522             | 0.0              |
| 380       | 2942             | 0.0              | 510       | 62766            | 106.4            | 640       | 102385           | 0.3              | 770       | 3828             | 0.0              | 900       | 4104             | 0.0              |
| 385       | 2372             | 0.0              | 515       | 69117            | 114.6            | 645       | 91895            | 0.2              | 775       | 3411             | 0.0              | 905       | 2090             | 0.0              |
| 390       | 2265             | 0.0              | 520       | 74088            | 117.8            | 650       | 81196            | 0.1              | 780       | 3776             | 0.0              | 910       | 3618             | 0.0              |
| 395       | 2023             | 0.0              | 525       | 78477            | 117.4            | 655       | 71232            | 0.1              | 785       | 3744             | 0.0              | 915       | 4126             | 0.0              |
| 400       | 1804             | 0.0              | 530       | 83585            | 115.2            | 660       | 62529            | 0.0              | 790       | 3446             | 0.0              | 920       | 3214             | 0.0              |
| 405       | 2029             | 0.1              | 535       | 87899            | 109.5            | 665       | 54721            | 0.0              | 795       | 2834             | 0.0              | 925       | 2696             | 0.0              |
| 410       | 2968             | 0.2              | 540       | 92850            | 102.6            | 670       | 47069            | 0.0              | 800       | 3213             | 0.0              | 930       | 3892             | 0.0              |
| 415       | 5120             | 0.5              | 545       | 99487            | 95.4             | 675       | 40348            | 0.0              | 805       | 2357             | 0.0              | 935       | 2376             | 0.0              |
| 420       | 9660             | 1.6              | 550       | 108411           | 88.6             | 680       | 34816            | 0.0              | 810       | 2616             | 0.0              | 940       | 2172             | 0.0              |
| 425       | 18379            | 4.5              | 555       | 117570           | 80.3             | 685       | 29890            | 0.0              | 815       | 2510             | 0.0              | 945       | 2531             | 0.0              |
| 430       | 32455            | 11.0             | 560       | 128783           | 72.0             | 690       | 25584            | 0.0              | 820       | 2684             | 0.0              | 950       | 3041             | 0.0              |
| 435       | 52561            | 23.5             | 565       | 140888           | 63.2             | 695       | 21945            | 0.0              | 825       | 2434             | 0.0              | 955       | 3777             | 0.0              |
| 440       | 78320            | 43.8             | 570       | 151789           | 53.6             | 700       | 19163            | 0.0              | 830       | 3163             | 0.0              | 960       | 3733             | 0.0              |
| 445       | 92278            | 61.8             | 575       | 163210           | 44.4             | 705       | 16563            | 0.0              | 835       | 2905             | 0.0              | 965       | 4082             | 0.0              |
| 450       | 75996            | 58.9             | 580       | 171760           | 35.4             | 710       | 14632            | 0.0              | 840       | 2917             | 0.0              | 970       | 3333             | 0.0              |
| 455       | 50251            | 43.9             | 585       | 179606           | 27.4             | 715       | 13282            | 0.0              | 845       | 3384             | 0.0              | 975       | 3396             | 0.0              |
| 460       | 37320            | 36.0             | 590       | 183682           | 20.5             | 720       | 11587            | 0.0              | 850       | 2926             | 0.0              | 980       | 3415             | 0.0              |
| 465       | 28321            | 29.9             | 595       | 184440           | 14.7             | 725       | 10271            | 0.0              | 855       | 2420             | 0.0              | 985       | 4316             | 0.0              |
| 470       | 21814            | 25.1             | 600       | 183413           | 10.3             | 730       | 9052             | 0.0              | 860       | 3637             | 0.0              | 990       | 3771             | 0.0              |
| 475       | 19996            | 25.0             | 605       | 178745           | 7.0              | 735       | 7872             | 0.0              | 865       | 3162             | 0.0              | 995       | 4745             | 0.0              |
| 480       | 21364            | 28.9             | 610       | 170867           | 4.6              | 740       | 7066             | 0.0              | 870       | 2292             | 0.0              | 1000      | 2768             | 0.0              |
| 485       | 25425            | 36.9             | 615       | 161088           | 3.0              | 745       | 6501             | 0.0              | 875       | 3357             | 0.0              |           |                  |                  |

REPORT NUMBER: SP1-2101-121-6

### Melanopic Flux vs. Wavelength


**Melanopic Lumens: 3860**
**M/P: 0.44**

| 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       | 2718             | 0.0              | 490       | 31388            | 26.1             | 620       | 149681           | 0.1              | 750       | 6127             | 0.0              | 880       | 4244             | 0.0              |
| 365       | 2104             | 0.0              | 495       | 39325            | 32.5             | 625       | 139059           | 0.1              | 755       | 5537             | 0.0              | 885       | 2890             | 0.0              |
| 370       | 2172             | 0.0              | 500       | 47816            | 38.4             | 630       | 126485           | 0.0              | 760       | 5066             | 0.0              | 890       | 2506             | 0.0              |
| 375       | 2770             | 0.0              | 505       | 55667            | 42.7             | 635       | 114115           | 0.0              | 765       | 4739             | 0.0              | 895       | 4522             | 0.0              |
| 380       | 2942             | 0.0              | 510       | 62766            | 45.1             | 640       | 102385           | 0.0              | 770       | 3828             | 0.0              | 900       | 4104             | 0.0              |
| 385       | 2372             | 0.0              | 515       | 69117            | 45.2             | 645       | 91895            | 0.0              | 775       | 3411             | 0.0              | 905       | 2090             | 0.0              |
| 390       | 2265             | 0.0              | 520       | 74088            | 43.1             | 650       | 81196            | 0.0              | 780       | 3776             | 0.0              | 910       | 3618             | 0.0              |
| 395       | 2023             | 0.0              | 525       | 78477            | 39.8             | 655       | 71232            | 0.0              | 785       | 3744             | 0.0              | 915       | 4126             | 0.0              |
| 400       | 1804             | 0.0              | 530       | 83585            | 36.1             | 660       | 62529            | 0.0              | 790       | 3446             | 0.0              | 920       | 3214             | 0.0              |
| 405       | 2029             | 0.0              | 535       | 87899            | 31.6             | 665       | 54721            | 0.0              | 795       | 2834             | 0.0              | 925       | 2696             | 0.0              |
| 410       | 2968             | 0.1              | 540       | 92850            | 27.2             | 670       | 47069            | 0.0              | 800       | 3213             | 0.0              | 930       | 3892             | 0.0              |
| 415       | 5120             | 0.3              | 545       | 99487            | 23.1             | 675       | 40348            | 0.0              | 805       | 2357             | 0.0              | 935       | 2376             | 0.0              |
| 420       | 9660             | 1.1              | 550       | 108411           | 19.5             | 680       | 34816            | 0.0              | 810       | 2616             | 0.0              | 940       | 2172             | 0.0              |
| 425       | 18379            | 2.9              | 555       | 117570           | 15.9             | 685       | 29890            | 0.0              | 815       | 2510             | 0.0              | 945       | 2531             | 0.0              |
| 430       | 32455            | 6.9              | 560       | 128783           | 12.7             | 690       | 25584            | 0.0              | 820       | 2684             | 0.0              | 950       | 3041             | 0.0              |
| 435       | 52561            | 14.0             | 565       | 140888           | 9.9              | 695       | 21945            | 0.0              | 825       | 2434             | 0.0              | 955       | 3777             | 0.0              |
| 440       | 78320            | 26.2             | 570       | 151789           | 7.4              | 700       | 19163            | 0.0              | 830       | 3163             | 0.0              | 960       | 3733             | 0.0              |
| 445       | 92278            | 36.4             | 575       | 163210           | 5.4              | 705       | 16563            | 0.0              | 835       | 2905             | 0.0              | 965       | 4082             | 0.0              |
| 450       | 75996            | 35.0             | 580       | 171760           | 3.8              | 710       | 14632            | 0.0              | 840       | 2917             | 0.0              | 970       | 3333             | 0.0              |
| 455       | 50251            | 26.3             | 585       | 179606           | 2.7              | 715       | 13282            | 0.0              | 845       | 3384             | 0.0              | 975       | 3396             | 0.0              |
| 460       | 37320            | 22.0             | 590       | 183682           | 1.8              | 720       | 11587            | 0.0              | 850       | 2926             | 0.0              | 980       | 3415             | 0.0              |
| 465       | 28321            | 18.5             | 595       | 184440           | 1.2              | 725       | 10271            | 0.0              | 855       | 2420             | 0.0              | 985       | 4316             | 0.0              |
| 470       | 21814            | 15.6             | 600       | 183413           | 0.8              | 730       | 9052             | 0.0              | 860       | 3637             | 0.0              | 990       | 3771             | 0.0              |
| 475       | 19996            | 15.3             | 605       | 178745           | 0.5              | 735       | 7872             | 0.0              | 865       | 3162             | 0.0              | 995       | 4745             | 0.0              |
| 480       | 21364            | 17.2             | 610       | 170867           | 0.3              | 740       | 7066             | 0.0              | 870       | 2292             | 0.0              | 1000      | 2768             | 0.0              |
| 485       | 25425            | 21.0             | 615       | 161088           | 0.2              | 745       | 6501             | 0.0              | 875       | 3357             | 0.0              |           |                  |                  |

### Summary

$R_f = 76.2$   
 $R_g = 94.1$   
 CIE  $R_a = 72.3$   
 $R_g = -36.9$

### Spectral Power Distribution Comparison



### Color Vector Graphics



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 67 | CES51 = 88 | CES76 = 64 |
| CES02 = 63 | CES27 = 88 | CES52 = 87 | CES77 = 81 |
| CES03 = 31 | CES28 = 88 | CES53 = 79 | CES78 = 67 |
| CES04 = 71 | CES29 = 66 | CES54 = 84 | CES79 = 87 |
| CES05 = 49 | CES30 = 72 | CES55 = 84 | CES80 = 87 |
| CES06 = 51 | CES31 = 70 | CES56 = 75 | CES81 = 71 |
| CES07 = 41 | CES32 = 66 | CES57 = 74 | CES82 = 94 |
| CES08 = 40 | CES33 = 73 | CES58 = 77 | CES83 = 90 |
| CES09 = 29 | CES34 = 80 | CES59 = 86 | CES84 = 90 |
| CES10 = 76 | CES35 = 90 | CES60 = 93 | CES85 = 78 |
| CES11 = 59 | CES36 = 96 | CES61 = 85 | CES86 = 61 |
| CES12 = 65 | CES37 = 88 | CES62 = 90 | CES87 = 79 |
| CES13 = 43 | CES38 = 80 | CES63 = 77 | CES88 = 77 |
| CES14 = 74 | CES39 = 95 | CES64 = 73 | CES89 = 67 |
| CES15 = 71 | CES40 = 91 | CES65 = 69 | CES90 = 76 |
| CES16 = 47 | CES41 = 88 | CES66 = 71 | CES91 = 90 |
| CES17 = 50 | CES42 = 89 | CES67 = 69 | CES92 = 59 |
| CES18 = 56 | CES43 = 80 | CES68 = 73 | CES93 = 75 |
| CES19 = 73 | CES44 = 99 | CES69 = 82 | CES94 = 50 |
| CES20 = 66 | CES45 = 85 | CES70 = 68 | CES95 = 69 |
| CES21 = 87 | CES46 = 80 | CES71 = 68 | CES96 = 77 |
| CES22 = 79 | CES47 = 81 | CES72 = 88 | CES97 = 83 |
| CES23 = 92 | CES48 = 69 | CES73 = 61 | CES98 = 75 |
| CES24 = 91 | CES49 = 80 | CES74 = 95 | CES99 = 63 |
| CES25 = 73 | CES50 = 87 | CES75 = 70 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**


(END OF REPORT)