

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: P348930

Luminaire Tested: **ARCH-N-PA1-50-730-24VDC-T2U**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P348930  
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-PA1-50-730-24VDC-T2U  
Description: ARCHEON ROADWAY AND AREA LUMINAIRE  
(1) 70 CRI, 3000K, 980mA LIGHT ENGINE WITH 16 LEDS AND  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 6176 lumens  
Efficiency: N/A  
Efficacy: 123.5 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 0.75' x H: 0')  
IES Classification: Type II - Short  
BUG Rating: B2 - U0 - G2

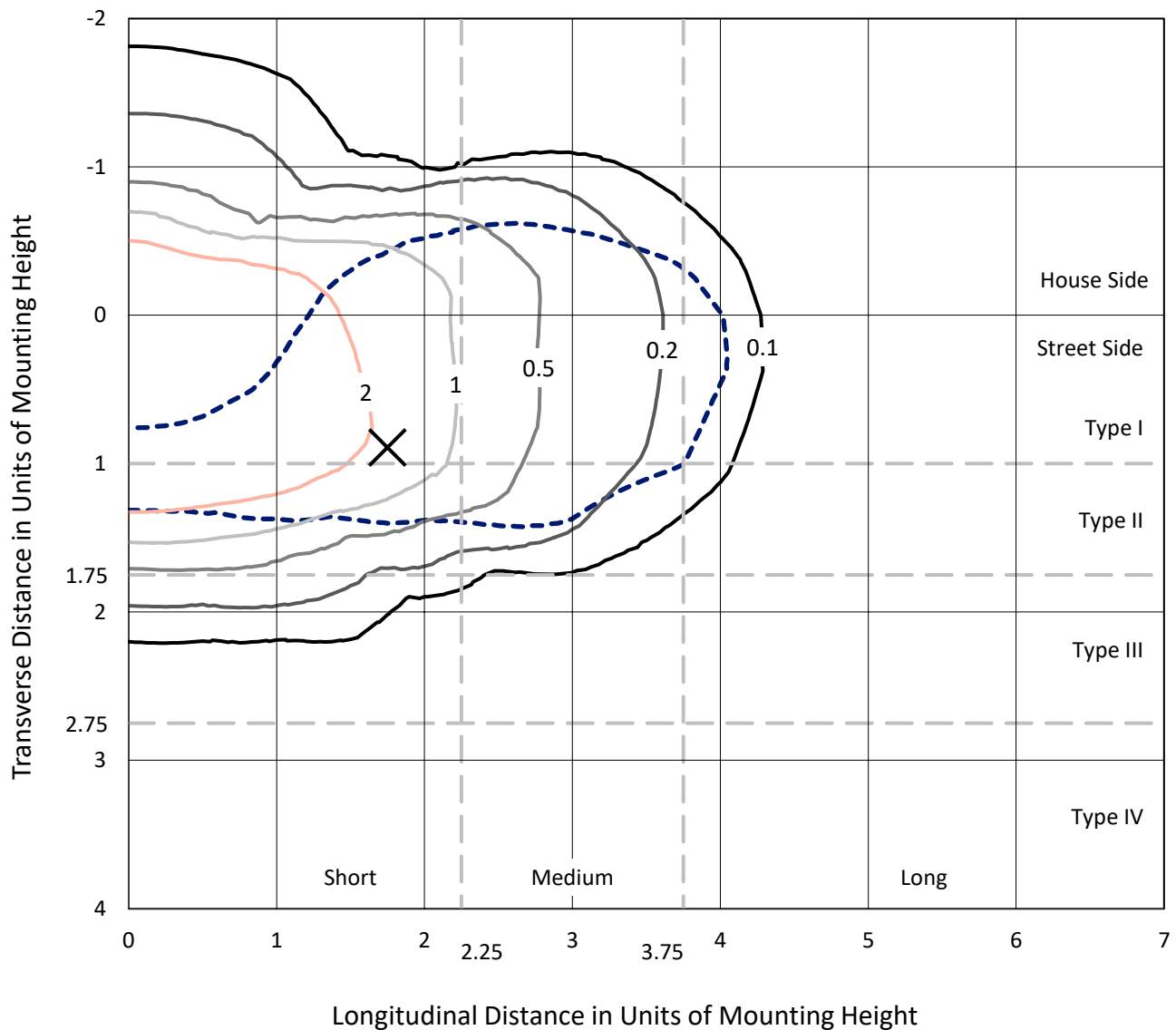
Input Watts (W): 50  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 25 FT

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## Iso-Footcandle Lines of Horizontal Illumination

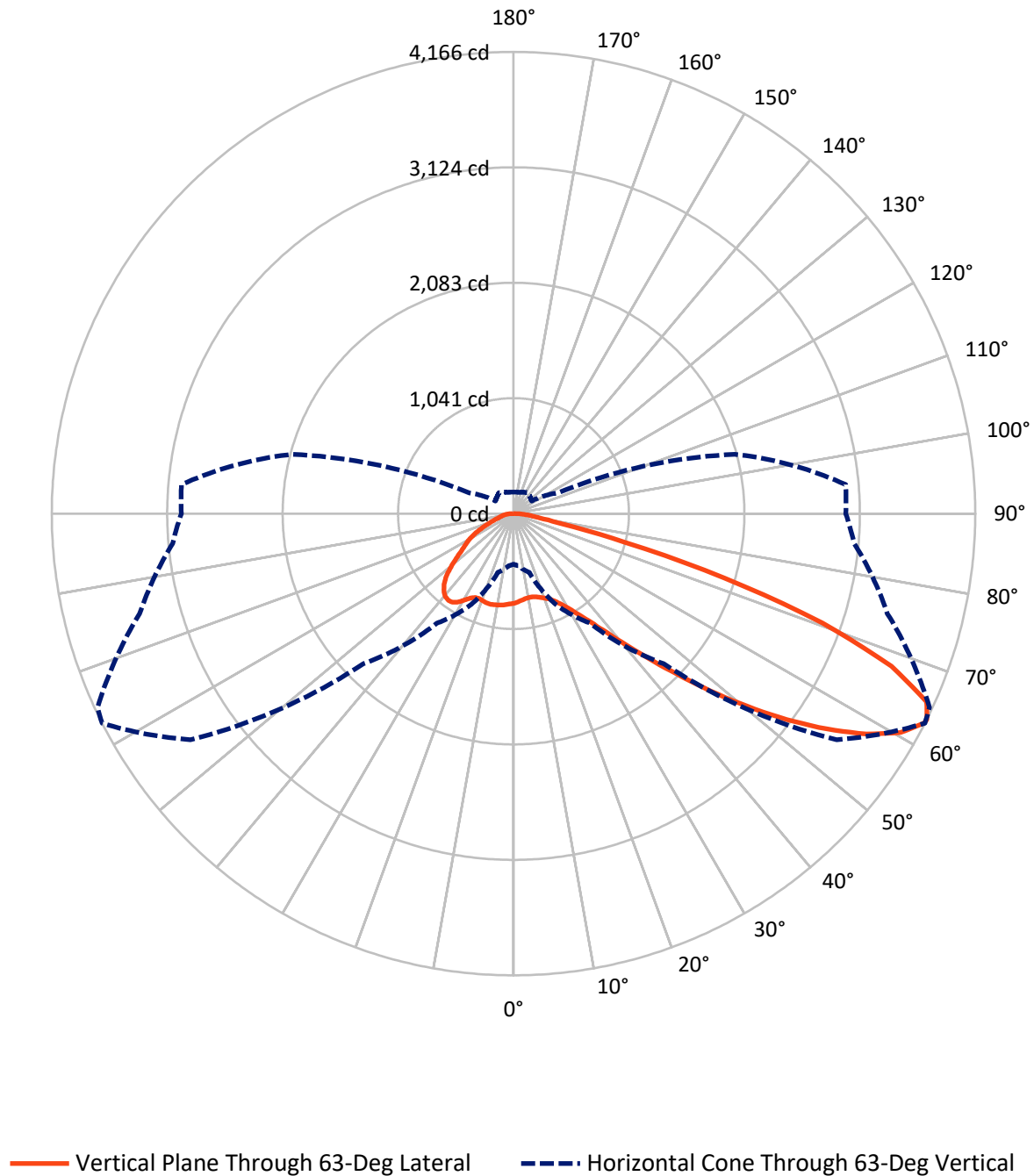
× Max cd  
 - - - 1/2 Max cd



Based on 15 foot mounting height. Maximum calculated value = 4.8 fc  
 Type II - Short - N/A

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## Luminous Intensity Polar Plot



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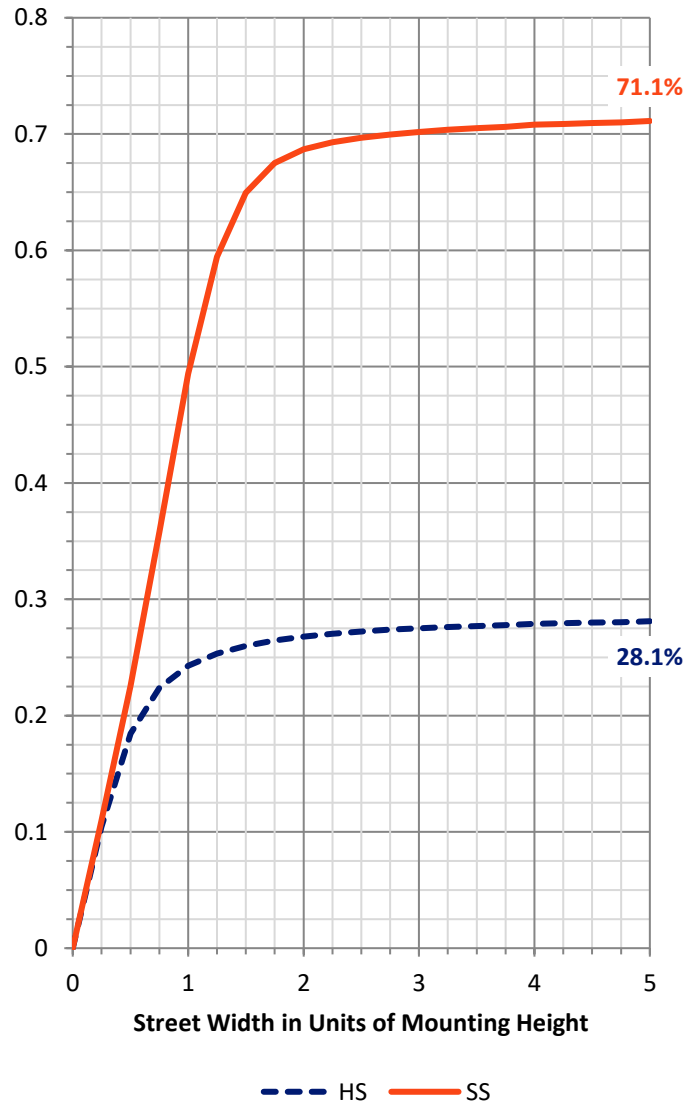
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 1763.2   | 0.0    | 1763.2 |
|                    | % Fixture | 28.5     | 0.0    | 28.5   |
| <b>Street Side</b> | Lumens    | 4412.8   | 0.0    | 4412.8 |
|                    | % Fixture | 71.5     | 0.0    | 71.5   |
| <b>Total</b>       | Lumens    | 6176.0   | 0.0    | 6176.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 76.7   | 1.2       |
| 10°-20°   | 226.4  | 3.7       |
| 20°-30°   | 397.6  | 6.4       |
| 30°-40°   | 670.1  | 10.9      |
| 40°-50°   | 1173.9 | 19.0      |
| 50°-60°   | 1517.3 | 24.6      |
| 60°-70°   | 1313.4 | 21.3      |
| 70°-80°   | 681.8  | 11.0      |
| 80°-90°   | 118.8  | 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°    | 6176.0 | 100.0     |
| 0°-180°   | 6176.0 | 100.0     |



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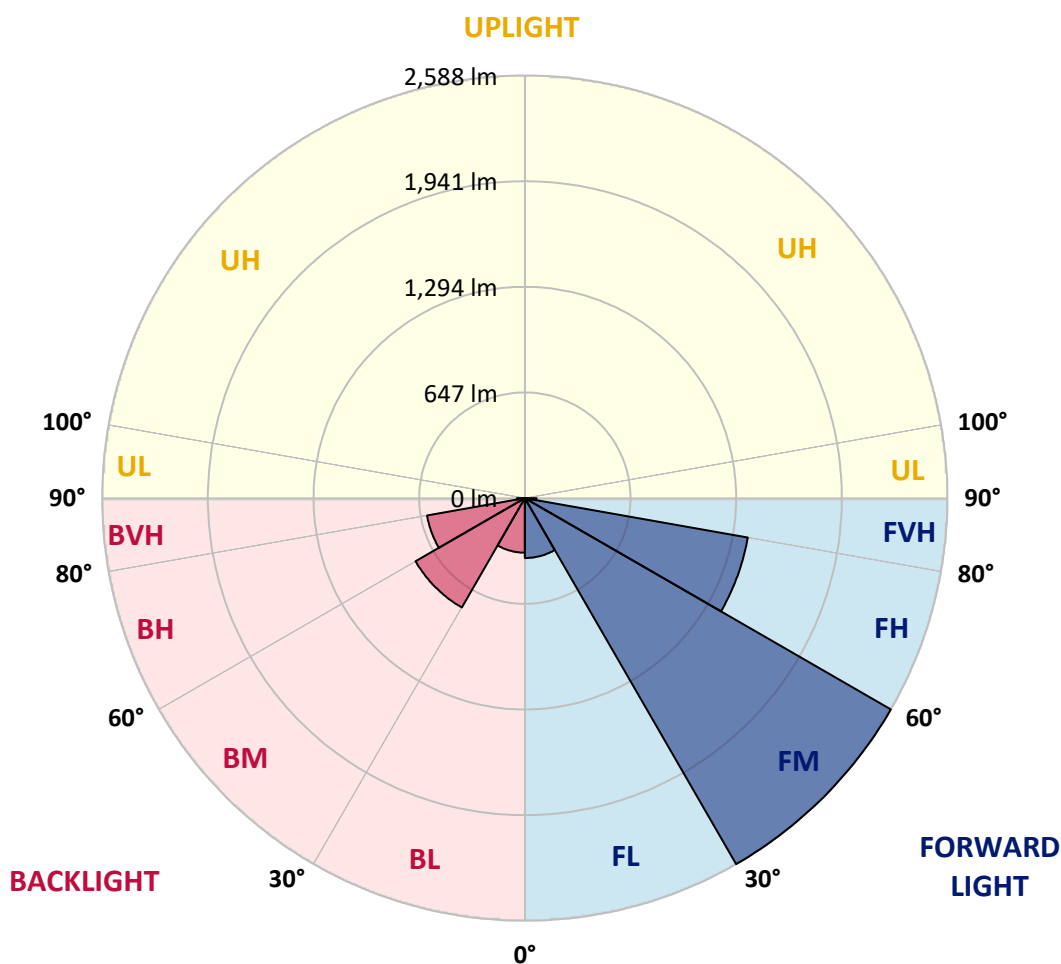
CATALOG NUMBER: ARCH-N-PA1-50-730-24VDC-T2U

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 366.7  | 5.9       |                         |      |         |
| FM   | (30°-60°)   | 2588.5 | 41.9      |                         |      |         |
| FH   | (60°-80°)   | 1386.9 | 22.5      |                         |      | G1/1800 |
| FVH  | (80°-90°)   | 70.8   | 1.1       |                         |      | G1/100  |
| BL   | (0°-30°)    | 334.0  | 5.4       | B1/500                  |      |         |
| BM   | (30°-60°)   | 772.9  | 12.5      | B1/1000                 |      |         |
| BH   | (60°-80°)   | 608.2  | 9.8       | B2/1000                 |      | G2/1000 |
| BVH  | (80°-90°)   | 48.0   | 0.8       |                         |      | G1/100  |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B2-U0-G2**

Type II Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 63°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 808.6  | 808.6  | 808.6  | 808.6  | 808.6  | 808.6  | 808.6  | 808.6  | 808.6  | 808.6  | 808.6  |
| 2.5°  | 789.5  | 787.2  | 791.3  | 793.0  | 792.4  | 795.9  | 795.9  | 796.5  | 796.5  | 799.4  | 802.3  |
| 5°    | 766.4  | 765.3  | 769.3  | 772.2  | 774.5  | 779.7  | 783.2  | 784.9  | 786.7  | 790.7  | 797.6  |
| 7.5°  | 744.5  | 742.7  | 748.5  | 750.8  | 754.3  | 761.8  | 769.9  | 774.5  | 776.8  | 785.5  | 795.3  |
| 10°   | 726.5  | 726.0  | 730.6  | 732.9  | 736.9  | 747.9  | 759.5  | 769.3  | 771.0  | 782.6  | 791.9  |
| 12.5° | 717.9  | 716.7  | 721.9  | 724.8  | 731.7  | 745.0  | 758.3  | 770.5  | 773.4  | 786.7  | 794.7  |
| 15°   | 724.8  | 726.0  | 730.6  | 731.2  | 739.3  | 753.1  | 768.2  | 780.3  | 783.2  | 796.5  | 802.3  |
| 17.5° | 757.8  | 757.2  | 760.1  | 758.9  | 761.8  | 768.7  | 784.9  | 794.7  | 798.2  | 808.0  | 812.7  |
| 20°   | 817.3  | 815.6  | 817.9  | 810.4  | 797.6  | 794.2  | 804.0  | 815.0  | 816.1  | 821.9  | 819.0  |
| 22.5° | 908.0  | 909.8  | 904.6  | 885.5  | 854.9  | 840.4  | 834.1  | 837.5  | 841.6  | 841.0  | 832.3  |
| 25°   | 1026.5 | 1032.3 | 1022.5 | 989.0  | 937.5  | 904.0  | 880.9  | 875.7  | 878.6  | 870.5  | 857.2  |
| 27.5° | 1182.0 | 1186.6 | 1165.2 | 1113.2 | 1043.9 | 994.2  | 947.9  | 930.0  | 930.0  | 912.7  | 888.4  |
| 30°   | 1353.1 | 1356.0 | 1321.9 | 1256.0 | 1175.6 | 1101.7 | 1033.5 | 998.8  | 995.9  | 961.8  | 923.6  |
| 32.5° | 1561.2 | 1553.1 | 1512.6 | 1431.1 | 1330.0 | 1228.2 | 1140.4 | 1087.8 | 1082.0 | 1030.6 | 982.0  |
| 35°   | 1829.9 | 1829.9 | 1746.1 | 1653.1 | 1530.0 | 1400.5 | 1284.9 | 1203.4 | 1197.6 | 1139.2 | 1076.2 |
| 37.5° | 2121.8 | 2120.7 | 2045.0 | 1916.6 | 1769.3 | 1610.9 | 1456.6 | 1354.8 | 1341.5 | 1279.1 | 1208.6 |
| 40°   | 2412.6 | 2402.7 | 2341.5 | 2219.5 | 2062.3 | 1881.4 | 1668.7 | 1550.2 | 1543.8 | 1454.8 | 1366.4 |
| 42.5° | 2625.3 | 2616.0 | 2587.1 | 2505.6 | 2402.2 | 2271.5 | 1944.4 | 1784.3 | 1775.0 | 1662.9 | 1554.8 |
| 45°   | 2742.6 | 2729.3 | 2725.3 | 2726.4 | 2738.0 | 2737.4 | 2284.8 | 2061.1 | 2028.8 | 1898.7 | 1754.8 |
| 47.5° | 2716.0 | 2684.8 | 2726.4 | 2833.3 | 3013.1 | 3131.0 | 2681.3 | 2390.0 | 2329.9 | 2143.8 | 1968.1 |
| 50°   | 2501.6 | 2486.5 | 2575.6 | 2793.5 | 3162.8 | 3439.7 | 3117.7 | 2731.6 | 2646.7 | 2375.6 | 2169.8 |
| 52.5° | 2125.3 | 2154.2 | 2264.0 | 2573.8 | 3135.6 | 3626.4 | 3514.2 | 3086.5 | 2968.6 | 2596.4 | 2344.9 |
| 55°   | 1691.8 | 1728.2 | 1883.1 | 2211.4 | 2884.2 | 3628.7 | 3800.3 | 3430.4 | 3325.2 | 2824.7 | 2524.1 |
| 57.5° | 1231.1 | 1282.6 | 1476.2 | 1777.3 | 2443.2 | 3380.7 | 3941.4 | 3752.4 | 3632.1 | 3049.5 | 2699.3 |
| 60°   | 773.4  | 809.8  | 1020.7 | 1369.9 | 1867.5 | 2833.3 | 3906.1 | 4010.1 | 3910.7 | 3261.6 | 2899.2 |
| 62.5° | 498.2  | 515.6  | 606.9  | 978.0  | 1302.2 | 2077.9 | 3645.4 | 4158.1 | 4115.3 | 3455.3 | 3050.1 |
| 63°   | 456.6  | 471.6  | 549.7  | 904.0  | 1207.4 | 1914.3 | 3557.6 | 4165.6 | 4140.2 | 3491.7 | 3085.4 |
| 65°   | 326.6  | 342.8  | 383.2  | 621.3  | 891.3  | 1284.3 | 3048.4 | 4095.7 | 4124.0 | 3552.4 | 3133.3 |
| 67.5° | 257.8  | 263.0  | 281.5  | 377.4  | 632.3  | 729.4  | 2051.3 | 3677.8 | 3802.1 | 3487.6 | 3062.2 |
| 70°   | 230.6  | 234.7  | 255.5  | 289.6  | 478.6  | 472.8  | 1069.9 | 2957.0 | 3214.2 | 3266.8 | 2883.1 |
| 72.5° | 201.1  | 204.0  | 229.5  | 272.8  | 365.3  | 361.2  | 465.3  | 1988.3 | 2301.0 | 2862.2 | 2635.1 |
| 75°   | 166.5  | 169.4  | 190.7  | 242.2  | 309.2  | 285.5  | 291.3  | 1039.2 | 1319.0 | 2243.8 | 2310.8 |
| 77.5° | 137.0  | 138.7  | 156.6  | 194.8  | 272.2  | 220.2  | 225.4  | 437.0  | 641.0  | 1529.4 | 1824.7 |
| 80°   | 99.4   | 100.0  | 116.8  | 148.0  | 208.1  | 198.8  | 167.6  | 238.1  | 290.7  | 838.1  | 1147.9 |
| 82.5° | 69.4   | 69.9   | 87.3   | 103.5  | 143.3  | 198.3  | 122.0  | 159.5  | 174.6  | 386.1  | 511.0  |
| 85°   | 48.6   | 47.4   | 59.5   | 68.2   | 90.7   | 120.2  | 93.1   | 102.3  | 108.1  | 167.0  | 137.6  |
| 87.5° | 21.4   | 20.8   | 33.5   | 36.4   | 45.7   | 55.5   | 74.0   | 53.8   | 57.2   | 80.9   | 43.3   |
| 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-PA1-50-730-24VDC-T2U

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|--------|--------|--------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 808.6  | 808.6  | 808.6  | 808.6  | 808.6 | 808.6 | 808.6 | 808.6 | 808.6 | 808.6 | 808.6 |
| 2.5°  | 802.8  | 805.2  | 808.6  | 813.8  | 817.9 | 819.6 | 823.1 | 823.6 | 828.8 | 824.2 | 824.8 |
| 5°    | 801.7  | 804.6  | 812.1  | 821.3  | 827.7 | 832.3 | 841.0 | 843.9 | 849.1 | 846.8 | 846.2 |
| 7.5°  | 799.9  | 805.2  | 816.1  | 829.4  | 839.3 | 846.8 | 854.9 | 860.1 | 865.3 | 864.1 | 863.0 |
| 10°   | 797.6  | 804.0  | 819.6  | 832.9  | 846.8 | 854.9 | 860.6 | 861.2 | 863.0 | 861.8 | 858.9 |
| 12.5° | 799.4  | 806.3  | 824.2  | 837.5  | 852.0 | 857.7 | 856.0 | 847.3 | 839.8 | 833.5 | 832.3 |
| 15°   | 805.2  | 813.2  | 830.0  | 842.1  | 853.7 | 850.2 | 839.8 | 820.8 | 806.9 | 798.8 | 799.4 |
| 17.5° | 810.9  | 817.9  | 830.6  | 840.4  | 846.2 | 835.8 | 819.6 | 803.4 | 797.1 | 790.7 | 789.5 |
| 20°   | 816.1  | 817.3  | 825.4  | 834.1  | 833.5 | 825.4 | 810.4 | 790.7 | 778.0 | 767.6 | 768.2 |
| 22.5° | 824.2  | 819.6  | 820.2  | 825.4  | 831.7 | 824.2 | 789.0 | 754.9 | 735.8 | 723.7 | 723.1 |
| 25°   | 842.7  | 832.9  | 823.6  | 826.5  | 850.8 | 802.8 | 743.3 | 698.8 | 682.0 | 671.1 | 672.2 |
| 27.5° | 868.2  | 854.9  | 836.4  | 852.0  | 865.3 | 760.6 | 678.0 | 632.3 | 620.8 | 609.2 | 612.1 |
| 30°   | 895.9  | 876.8  | 854.3  | 906.9  | 849.1 | 693.6 | 597.1 | 555.5 | 545.1 | 534.1 | 536.4 |
| 32.5° | 945.6  | 917.3  | 887.8  | 972.8  | 811.5 | 612.1 | 512.1 | 474.5 | 467.6 | 460.7 | 461.2 |
| 35°   | 1028.3 | 994.7  | 962.9  | 1023.1 | 763.0 | 527.1 | 435.8 | 409.2 | 403.4 | 395.4 | 395.4 |
| 37.5° | 1150.2 | 1097.6 | 1080.9 | 1049.6 | 696.5 | 447.9 | 379.7 | 361.8 | 349.7 | 338.7 | 338.7 |
| 40°   | 1291.8 | 1229.4 | 1216.1 | 1057.7 | 609.8 | 382.1 | 340.4 | 324.8 | 308.7 | 292.5 | 293.6 |
| 42.5° | 1464.1 | 1379.7 | 1349.0 | 1046.8 | 504.6 | 339.9 | 312.7 | 294.8 | 279.2 | 265.3 | 263.0 |
| 45°   | 1658.3 | 1551.3 | 1473.9 | 1015.0 | 409.2 | 313.9 | 294.8 | 273.4 | 253.7 | 241.6 | 239.3 |
| 47.5° | 1856.5 | 1737.5 | 1584.3 | 951.4  | 342.2 | 295.4 | 282.6 | 252.6 | 238.7 | 230.6 | 229.5 |
| 50°   | 2046.1 | 1921.8 | 1675.6 | 851.4  | 303.4 | 282.1 | 264.7 | 242.8 | 231.2 | 224.3 | 223.7 |
| 52.5° | 2214.3 | 2097.0 | 1752.5 | 747.9  | 277.4 | 271.1 | 256.6 | 238.1 | 226.0 | 219.6 | 218.5 |
| 55°   | 2374.4 | 2274.4 | 1828.8 | 655.4  | 254.9 | 252.6 | 252.6 | 233.5 | 220.2 | 214.4 | 213.3 |
| 57.5° | 2550.1 | 2476.1 | 1905.7 | 587.8  | 234.7 | 239.3 | 247.4 | 228.3 | 213.9 | 208.7 | 208.1 |
| 60°   | 2753.0 | 2709.7 | 1986.6 | 528.3  | 216.7 | 224.8 | 239.9 | 221.4 | 206.3 | 202.3 | 201.1 |
| 62.5° | 2960.5 | 2961.7 | 2056.5 | 456.6  | 201.7 | 213.9 | 231.2 | 215.0 | 199.4 | 196.5 | 195.9 |
| 63°   | 2996.9 | 3007.3 | 2066.3 | 441.0  | 198.3 | 211.5 | 228.9 | 212.7 | 197.7 | 194.8 | 194.2 |
| 65°   | 3086.5 | 3132.2 | 2074.4 | 375.1  | 185.5 | 202.9 | 220.2 | 205.2 | 190.2 | 189.6 | 188.4 |
| 67.5° | 3065.1 | 3139.7 | 2024.1 | 294.2  | 171.1 | 190.7 | 208.1 | 194.2 | 180.9 | 180.9 | 178.6 |
| 70°   | 2905.6 | 2954.1 | 1869.8 | 227.2  | 160.1 | 178.0 | 193.6 | 182.6 | 168.8 | 169.9 | 165.3 |
| 72.5° | 2661.1 | 2607.9 | 1538.1 | 177.4  | 146.8 | 163.6 | 176.9 | 167.6 | 155.5 | 154.3 | 149.1 |
| 75°   | 2302.7 | 2127.6 | 1101.7 | 143.3  | 130.6 | 144.5 | 158.4 | 151.4 | 140.5 | 134.1 | 132.9 |
| 77.5° | 1754.8 | 1510.3 | 660.1  | 121.4  | 116.8 | 128.3 | 137.0 | 131.8 | 123.1 | 115.6 | 116.2 |
| 80°   | 1045.0 | 871.0  | 297.7  | 102.9  | 101.1 | 109.8 | 116.8 | 112.7 | 106.9 | 97.7  | 95.4  |
| 82.5° | 423.1  | 337.0  | 133.5  | 83.2   | 85.5  | 91.9  | 98.3  | 94.8  | 90.2  | 87.9  | 74.6  |
| 85°   | 109.8  | 105.8  | 78.0   | 62.4   | 65.9  | 68.8  | 77.5  | 77.5  | 73.4  | 60.1  | 55.5  |
| 87.5° | 31.2   | 41.6   | 43.3   | 39.3   | 44.5  | 45.1  | 53.8  | 53.8  | 54.9  | 37.0  | 33.5  |
| 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

REPORT NUMBER: SP1-2101-121-6

| 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: SP1-2101-121-6

**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

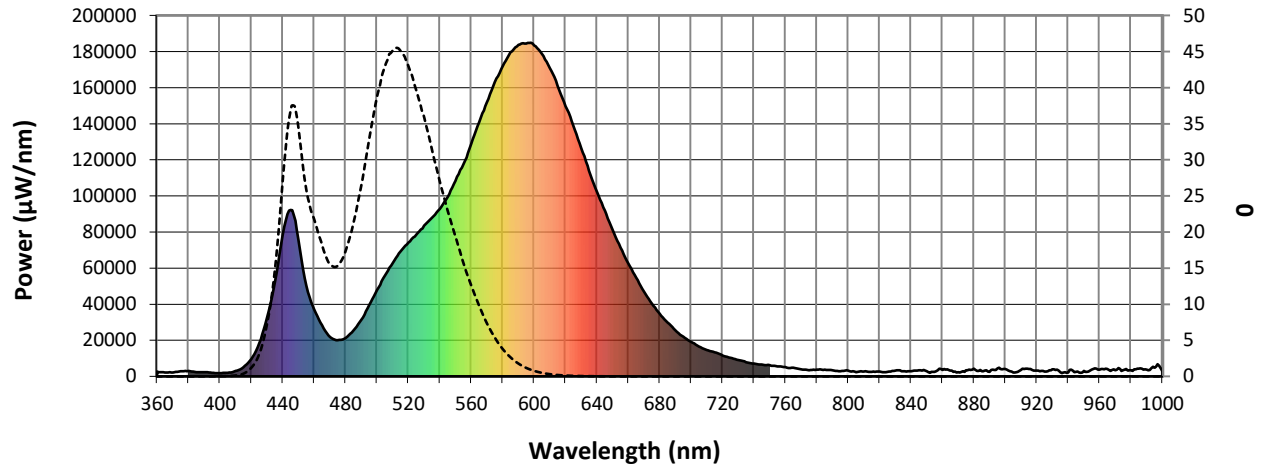


#####

| 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              |           |                  |                  |

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### 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              |           |                  |                  |

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### 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)