

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: P348798

Luminaire Tested: **ARCH-N-PA1-60-830-24VDC-T2R-HSS**

Issue Date: 3/3/2020



**Test Information**

Test Method: LM-79-08  
Report Number: P348798  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-9)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: STREETWORKS  
Catalog Number: ARCH-N-PA1-60-830-24VDC-T2R-HSS  
Description: ARCHEON ROADWAY AND AREA LUMINAIRE  
(1) 80 CRI, 3000K, 1160mA LIGHT ENGINE WITH 16 LEDS AND  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 4807 lumens  
Efficiency: N/A  
Efficacy: 81.5 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 0.75' x H: 0')  
IES Classification: Type II - Medium  
BUG Rating: B0 - U0 - G1

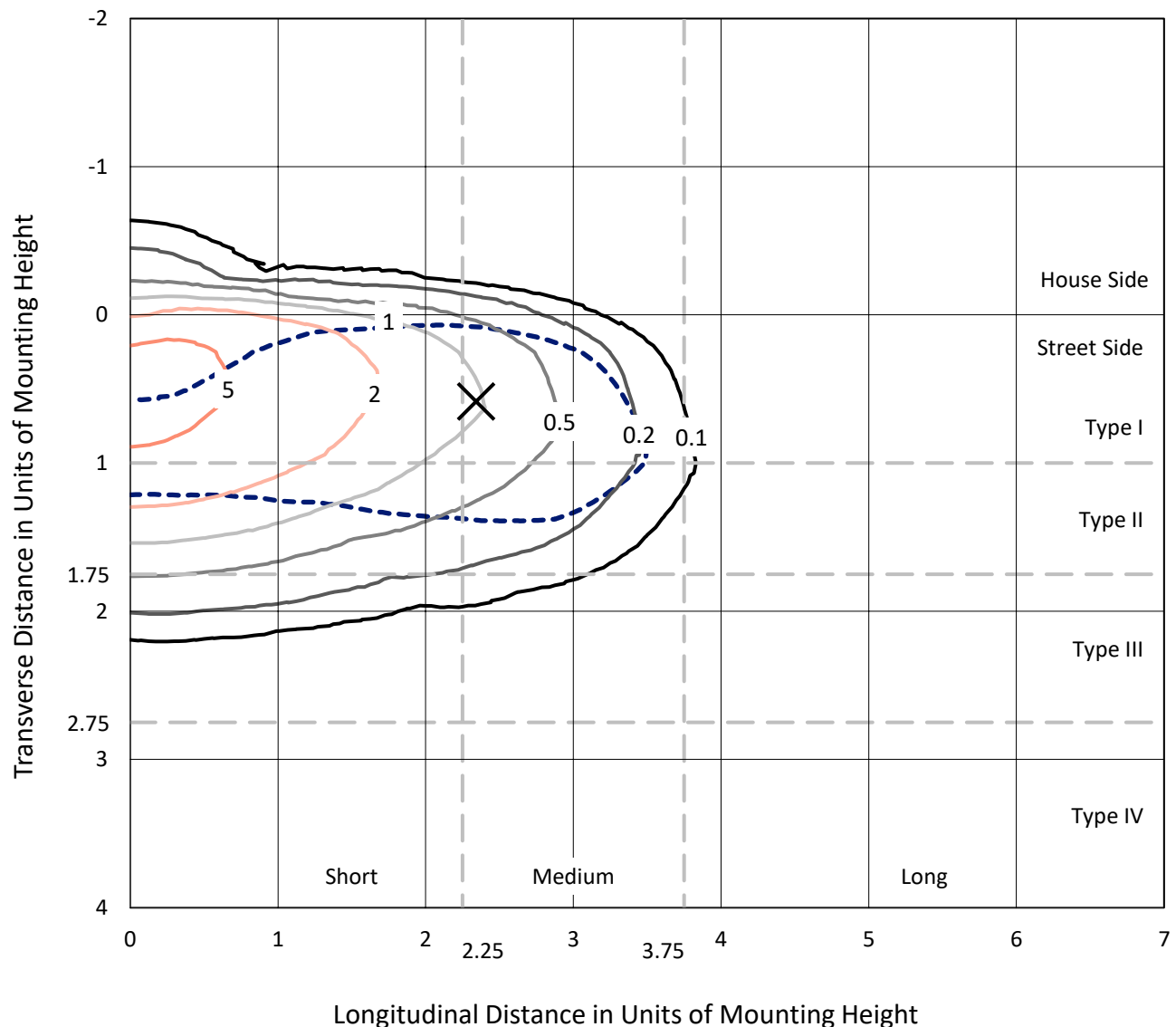
Input Watts (W): 59  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 25 FT

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CATALOG NUMBER: ARCH-N-PA1-60-830-24VDC-T2R-HSS

## Iso-Footcandle Lines of Horizontal Illumination

× Max cd  
- - - 1/2 Max cd

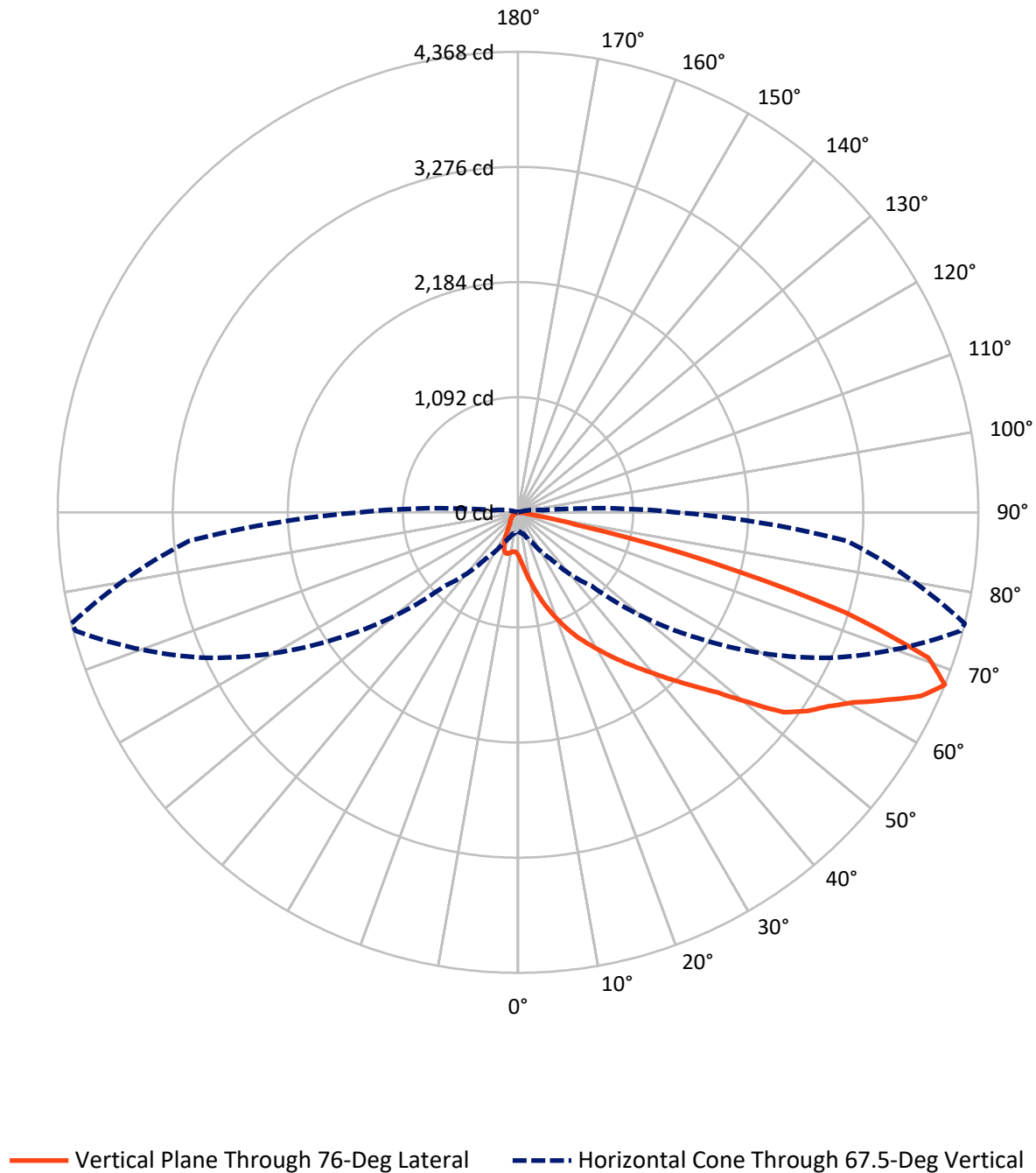


Based on 15 foot mounting height. Maximum calculated value = 6.4 fc  
Type II - Medium - N/A

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## Luminous Intensity Polar Plot



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**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 238.7    | 0.0    | 238.7  |
|                    | % Fixture | 5.0      | 0.0    | 5.0    |
| <b>Street Side</b> | Lumens    | 4568.3   | 0.0    | 4568.3 |
|                    | % Fixture | 95.0     | 0.0    | 95.0   |
| <b>Total</b>       | Lumens    | 4807.0   | 0.0    | 4807.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 50.7   | 1.1       |
| 10°-20°   | 201.0  | 4.2       |
| 20°-30°   | 409.0  | 8.5       |
| 30°-40°   | 709.9  | 14.8      |
| 40°-50°   | 1002.9 | 20.9      |
| 50°-60°   | 1137.4 | 23.7      |
| 60°-70°   | 943.4  | 19.6      |
| 70°-80°   | 341.7  | 7.1       |
| 80°-90°   | 11.1   | 0.2       |
| 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°    | 4807.0 | 100.0     |
| 0°-180°   | 4807.0 | 100.0     |

**Coefficient of Utilization**



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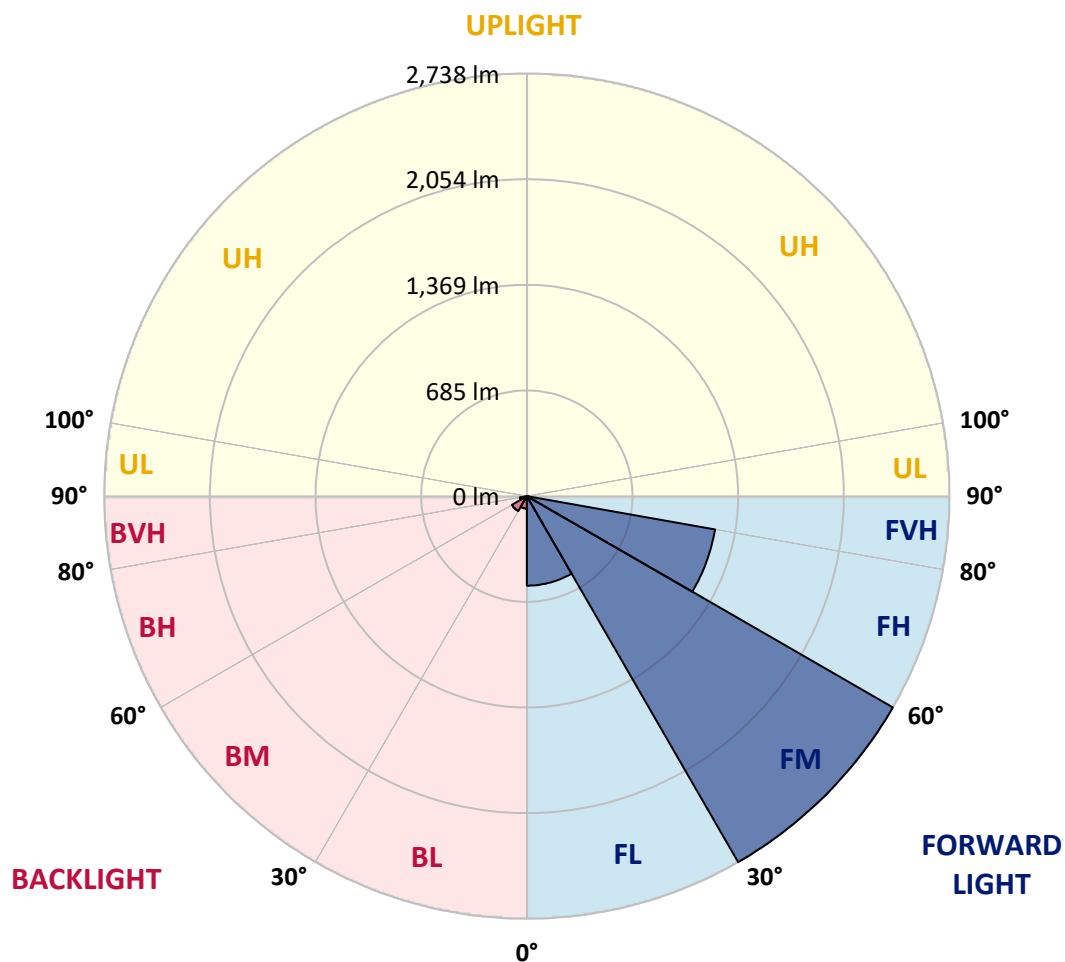
CATALOG NUMBER: ARCH-N-PA1-60-830-24VDC-T2R-HSS

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 580.2  | 12.1      |                         |      |         |
| FM   | (30°-60°)   | 2738.5 | 57.0      |                         |      |         |
| FH   | (60°-80°)   | 1238.9 | 25.8      |                         |      | G1/1800 |
| FVH  | (80°-90°)   | 10.7   | 0.2       |                         |      | G1/100  |
| BL   | (0°-30°)    | 80.5   | 1.7       | B0/110                  |      |         |
| BM   | (30°-60°)   | 111.7  | 2.3       | B0/220                  |      |         |
| BH   | (60°-80°)   | 46.1   | 1.0       | B0/110                  |      | G0/110  |
| BVH  | (80°-90°)   | 0.3    | 0.0       |                         |      | G0/10   |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B0-U0-G1**

Type II Medium



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 75°    | 76°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 407.8  | 407.8  | 407.8  | 407.8  | 407.8  | 407.8  | 407.8  | 407.8  | 407.8  | 407.8  | 407.8  |
| 2.5°  | 608.7  | 595.0  | 598.2  | 589.3  | 573.3  | 540.5  | 512.5  | 485.9  | 455.0  | 453.9  | 428.4  |
| 5°    | 820.8  | 809.2  | 807.8  | 789.8  | 760.8  | 705.0  | 650.6  | 588.7  | 519.6  | 514.6  | 460.4  |
| 7.5°  | 1013.3 | 1004.1 | 1000.7 | 979.4  | 925.3  | 870.9  | 800.2  | 709.2  | 601.1  | 591.9  | 503.6  |
| 10°   | 1161.2 | 1156.8 | 1157.6 | 1142.4 | 1096.1 | 1045.5 | 952.7  | 836.6  | 693.6  | 679.3  | 555.4  |
| 12.5° | 1273.2 | 1274.3 | 1281.9 | 1272.6 | 1246.7 | 1209.2 | 1110.0 | 972.5  | 796.0  | 776.4  | 614.6  |
| 15°   | 1355.6 | 1360.9 | 1374.8 | 1386.3 | 1384.4 | 1352.0 | 1261.0 | 1110.4 | 904.6  | 882.9  | 680.5  |
| 17.5° | 1408.9 | 1414.8 | 1435.0 | 1460.7 | 1484.3 | 1476.7 | 1406.8 | 1243.5 | 1014.6 | 989.5  | 751.1  |
| 20°   | 1455.6 | 1462.6 | 1484.3 | 1518.2 | 1562.2 | 1571.7 | 1525.8 | 1372.7 | 1124.3 | 1093.8 | 824.0  |
| 22.5° | 1557.0 | 1556.7 | 1570.0 | 1589.8 | 1631.7 | 1656.2 | 1627.1 | 1492.5 | 1232.8 | 1201.0 | 898.3  |
| 25°   | 1740.2 | 1733.2 | 1728.6 | 1713.0 | 1722.3 | 1737.5 | 1721.2 | 1604.6 | 1341.9 | 1309.7 | 973.7  |
| 27.5° | 1958.0 | 1962.2 | 1924.7 | 1882.8 | 1850.4 | 1834.8 | 1808.2 | 1708.4 | 1446.8 | 1411.4 | 1047.4 |
| 30°   | 2187.8 | 2189.0 | 2144.8 | 2091.3 | 2019.9 | 1960.7 | 1914.8 | 1807.6 | 1554.6 | 1516.1 | 1119.1 |
| 32.5° | 2395.0 | 2386.8 | 2343.0 | 2270.1 | 2180.0 | 2113.4 | 2018.0 | 1918.4 | 1668.8 | 1631.5 | 1198.7 |
| 35°   | 2559.3 | 2549.6 | 2496.3 | 2430.0 | 2336.5 | 2269.5 | 2154.7 | 2029.0 | 1788.9 | 1752.4 | 1278.5 |
| 37.5° | 2679.4 | 2668.0 | 2613.2 | 2545.0 | 2464.3 | 2425.4 | 2313.3 | 2149.2 | 1919.9 | 1880.7 | 1362.5 |
| 40°   | 2721.1 | 2711.2 | 2676.9 | 2626.9 | 2562.1 | 2553.2 | 2481.6 | 2287.6 | 2062.5 | 2020.8 | 1457.7 |
| 42.5° | 2696.2 | 2686.5 | 2674.3 | 2657.5 | 2630.5 | 2638.9 | 2640.4 | 2445.4 | 2220.8 | 2179.8 | 1562.8 |
| 45°   | 2597.7 | 2589.0 | 2601.7 | 2626.3 | 2659.8 | 2701.5 | 2785.3 | 2614.9 | 2397.8 | 2354.0 | 1684.4 |
| 47.5° | 2452.5 | 2446.2 | 2481.2 | 2542.7 | 2640.6 | 2755.6 | 2917.8 | 2793.1 | 2596.4 | 2555.7 | 1836.0 |
| 50°   | 2246.1 | 2245.1 | 2315.0 | 2427.3 | 2577.9 | 2781.7 | 3054.7 | 2995.7 | 2872.3 | 2829.6 | 2046.9 |
| 52.5° | 1924.7 | 1926.8 | 2064.3 | 2244.0 | 2467.7 | 2764.1 | 3142.8 | 3256.1 | 3193.3 | 3148.9 | 2229.5 |
| 55°   | 1618.7 | 1631.3 | 1728.8 | 1987.9 | 2298.8 | 2698.3 | 3173.1 | 3377.6 | 3370.4 | 3328.3 | 2331.0 |
| 57.5° | 1318.9 | 1341.9 | 1435.8 | 1677.9 | 2052.1 | 2546.9 | 3156.4 | 3430.3 | 3502.3 | 3470.1 | 2465.0 |
| 60°   | 994.2  | 1004.7 | 1113.0 | 1339.2 | 1735.6 | 2270.6 | 3035.8 | 3458.9 | 3682.6 | 3660.3 | 2659.4 |
| 62.5° | 632.5  | 658.8  | 754.9  | 973.1  | 1351.4 | 1886.8 | 2832.3 | 3458.5 | 3908.2 | 3920.4 | 2910.2 |
| 65°   | 333.2  | 364.0  | 414.9  | 603.0  | 928.7  | 1458.2 | 2526.3 | 3426.0 | 4184.9 | 4202.0 | 3106.3 |
| 67.5° | 179.7  | 188.5  | 215.5  | 313.0  | 538.6  | 987.8  | 2076.6 | 3266.0 | 4345.2 | 4367.8 | 3133.7 |
| 70°   | 131.4  | 136.3  | 146.4  | 173.1  | 271.1  | 573.7  | 1515.2 | 2903.1 | 4138.6 | 4130.2 | 2784.3 |
| 72.5° | 100.9  | 108.5  | 116.1  | 126.8  | 155.9  | 306.3  | 943.4  | 2273.3 | 3302.2 | 3246.6 | 2081.2 |
| 75°   | 79.6   | 80.9   | 91.6   | 101.3  | 116.9  | 174.4  | 418.9  | 1324.0 | 2015.5 | 1883.8 | 1079.2 |
| 77.5° | 63.6   | 64.5   | 70.8   | 79.2   | 93.9   | 114.6  | 129.7  | 520.9  | 643.5  | 574.2  | 234.2  |
| 80°   | 37.7   | 39.8   | 52.7   | 61.1   | 77.9   | 72.2   | 47.4   | 113.1  | 100.5  | 91.0   | 39.4   |
| 82.5° | 21.1   | 22.7   | 29.7   | 48.2   | 54.3   | 34.5   | 23.6   | 30.5   | 23.6   | 23.0   | 11.2   |
| 85°   | 0.0    | 1.1    | 19.2   | 29.9   | 22.1   | 7.6    | 9.9    | 10.1   | 7.0    | 6.5    | 4.4    |
| 87.5° | 0.0    | 0.0    | 5.9    | 5.7    | 0.8    | 1.3    | 2.3    | 3.4    | 2.7    | 2.7    | 2.3    |
| 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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**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°   | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 407.8  | 407.8 | 407.8 | 407.8 | 407.8 | 407.8 | 407.8 | 407.8 | 407.8 | 407.8 | 407.8 |
| 2.5°  | 415.8  | 404.4 | 382.9 | 361.9 | 344.2 | 329.6 | 316.6 | 311.3 | 307.1 | 306.5 | 303.1 |
| 5°    | 434.3  | 411.4 | 370.3 | 336.6 | 314.0 | 298.0 | 284.3 | 275.9 | 269.4 | 266.9 | 264.5 |
| 7.5°  | 462.3  | 427.6 | 368.6 | 329.8 | 302.9 | 275.9 | 250.6 | 223.3 | 206.2 | 199.7 | 195.9 |
| 10°   | 496.4  | 449.1 | 374.9 | 327.9 | 280.8 | 223.9 | 182.0 | 147.2 | 133.1 | 128.5 | 127.2 |
| 12.5° | 536.3  | 475.8 | 385.9 | 316.2 | 233.6 | 159.0 | 125.5 | 113.7 | 110.6 | 109.1 | 109.1 |
| 15°   | 582.0  | 505.1 | 393.7 | 282.0 | 172.7 | 120.3 | 108.7 | 103.2 | 99.8  | 97.9  | 98.2  |
| 17.5° | 628.7  | 533.7 | 389.9 | 232.5 | 127.4 | 107.0 | 98.4  | 92.5  | 87.8  | 85.9  | 85.5  |
| 20°   | 675.9  | 560.3 | 368.8 | 173.1 | 107.8 | 97.1  | 87.4  | 80.9  | 76.2  | 74.4  | 73.9  |
| 22.5° | 724.8  | 582.8 | 331.7 | 127.0 | 96.9  | 86.1  | 76.7  | 70.1  | 65.7  | 64.0  | 63.2  |
| 25°   | 772.4  | 601.1 | 279.9 | 102.8 | 86.6  | 75.8  | 66.8  | 60.7  | 56.7  | 55.0  | 54.8  |
| 27.5° | 816.8  | 612.7 | 219.9 | 90.8  | 77.5  | 66.6  | 58.3  | 52.9  | 49.5  | 48.2  | 48.0  |
| 30°   | 856.8  | 613.8 | 162.6 | 81.9  | 69.5  | 58.6  | 51.0  | 46.1  | 43.2  | 41.9  | 41.5  |
| 32.5° | 897.3  | 604.9 | 118.4 | 73.9  | 62.1  | 51.6  | 44.2  | 40.4  | 38.3  | 37.3  | 37.3  |
| 35°   | 935.4  | 584.5 | 92.3  | 67.0  | 55.0  | 44.9  | 39.0  | 36.2  | 35.0  | 33.9  | 33.9  |
| 37.5° | 972.7  | 555.2 | 78.4  | 60.9  | 48.2  | 39.2  | 34.3  | 32.6  | 31.6  | 30.5  | 30.5  |
| 40°   | 1010.6 | 518.4 | 71.2  | 55.2  | 42.8  | 34.8  | 30.5  | 29.1  | 28.0  | 27.2  | 27.0  |
| 42.5° | 1057.1 | 475.8 | 66.6  | 49.9  | 37.9  | 30.8  | 27.0  | 25.3  | 24.4  | 23.6  | 23.2  |
| 45°   | 1111.1 | 439.2 | 62.8  | 44.7  | 33.9  | 27.4  | 23.4  | 21.7  | 20.4  | 19.4  | 19.2  |
| 47.5° | 1188.8 | 412.6 | 57.7  | 39.0  | 30.1  | 23.8  | 20.2  | 18.3  | 16.4  | 15.4  | 15.2  |
| 50°   | 1288.0 | 390.7 | 51.2  | 33.9  | 26.3  | 20.2  | 16.9  | 14.5  | 12.8  | 11.8  | 11.8  |
| 52.5° | 1337.3 | 362.1 | 45.3  | 29.5  | 22.1  | 17.1  | 13.7  | 11.0  | 10.1  | 9.1   | 9.1   |
| 55°   | 1357.1 | 340.2 | 39.4  | 25.1  | 18.3  | 14.1  | 10.7  | 8.4   | 7.8   | 7.2   | 7.0   |
| 57.5° | 1412.7 | 333.8 | 34.3  | 21.3  | 15.2  | 11.2  | 8.2   | 6.3   | 5.9   | 5.1   | 5.1   |
| 60°   | 1502.2 | 337.0 | 29.7  | 18.1  | 12.2  | 8.6   | 6.1   | 4.8   | 4.4   | 3.6   | 3.6   |
| 62.5° | 1598.9 | 333.0 | 25.1  | 15.6  | 9.5   | 6.3   | 4.2   | 3.6   | 3.6   | 2.1   | 1.9   |
| 65°   | 1617.4 | 296.6 | 21.5  | 12.8  | 7.4   | 4.6   | 2.7   | 2.3   | 3.2   | 0.4   | 0.0   |
| 67.5° | 1501.1 | 230.0 | 18.5  | 9.9   | 5.5   | 3.6   | 2.1   | 1.1   | 2.7   | 0.0   | 0.0   |
| 70°   | 1200.4 | 146.2 | 15.0  | 7.2   | 4.2   | 2.9   | 1.7   | 0.4   | 2.1   | 0.0   | 0.0   |
| 72.5° | 848.8  | 84.9  | 11.8  | 5.1   | 3.6   | 2.3   | 1.3   | 0.0   | 1.3   | 0.0   | 0.0   |
| 75°   | 429.3  | 45.3  | 7.4   | 3.8   | 2.7   | 1.7   | 0.8   | 0.0   | 0.2   | 0.0   | 0.0   |
| 77.5° | 92.9   | 21.1  | 4.6   | 2.7   | 1.9   | 1.1   | 0.4   | 0.0   | 0.0   | 0.0   | 0.0   |
| 80°   | 20.2   | 9.3   | 2.9   | 1.7   | 1.1   | 0.6   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 82.5° | 7.4    | 4.8   | 1.5   | 0.8   | 0.4   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 85°   | 4.0    | 2.5   | 0.8   | 0.4   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 87.5° | 2.1    | 0.8   | 0.2   | 0.2   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 90°   | 0.0    | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |

Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

INVUE

Report Number: SP1-2104-224-6

Luminaire Tested: CCW-SA-2A-830-U-SL4

Test Date: 04/27/2021

### Test Information

Test Method: LM-79-08  
 Report Number: SP1-2104-224-6  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1  
 Measurement Geometry:  $4\pi$   
 Issue Date: 04/27/2021  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: INVUE  
 Catalog Number: **CCW-SA-2A-830-U-SL4**  
 Description: INVUE WALL PACK ClearCurve Light Square

### Spectral Parameters

|                           |        |           |      |      |      |
|---------------------------|--------|-----------|------|------|------|
| CCT (K):                  | 2979   | CRI (Ra): | 83.1 |      |      |
| CIE u':                   | 0.2511 | R1:       | 81.3 | R9:  | 7.1  |
| CIE v':                   | 0.5225 | R2:       | 91.2 | R10: | 80.8 |
| Duv:                      | 0.0005 | R3:       | 96.2 | R11: | 82.0 |
| CIE x:                    | 0.4390 | R4:       | 81.7 | R12: | 76.3 |
| CIE y:                    | 0.4060 | R5:       | 82.0 | R13: | 83.6 |
| CIE z:                    | 0.1550 | R6:       | 90.2 | R14: | 98.4 |
| Peak Wavelength (nm):     | 603    | R7:       | 82.8 |      |      |
| Dominant Wavelength (nm): | 582    | R8:       | 58.9 |      |      |
| Purity:                   | 54     |           |      |      |      |
| Rf:                       | 86     |           |      |      |      |
| Rg:                       | 96.1   |           |      |      |      |



### Test Conditions

Stabilization Time: 78M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.0/47%  
 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       | 1540             | 0.0              | 490       | 23715            | 3.4              | 620       | 85792            | 22.3             | 750       | 4198             | 0.0              | 880       | 1529             | 0.0              |
| 365       | 1274             | 0.0              | 495       | 27763            | 5.0              | 625       | 82163            | 18.1             | 755       | 3846             | 0.0              | 885       | 1863             | 0.0              |
| 370       | 1307             | 0.0              | 500       | 32023            | 7.1              | 630       | 76960            | 13.9             | 760       | 3380             | 0.0              | 890       | 2114             | 0.0              |
| 375       | 1612             | 0.0              | 505       | 35605            | 10.0             | 635       | 71512            | 10.7             | 765       | 3174             | 0.0              | 895       | 1695             | 0.0              |
| 380       | 1536             | 0.0              | 510       | 38842            | 13.3             | 640       | 65929            | 7.9              | 770       | 2898             | 0.0              | 900       | 1843             | 0.0              |
| 385       | 1342             | 0.0              | 515       | 41267            | 17.1             | 645       | 60362            | 5.8              | 775       | 2539             | 0.0              | 905       | 1730             | 0.0              |
| 390       | 1278             | 0.0              | 520       | 43140            | 20.9             | 650       | 55010            | 4.0              | 780       | 2473             | 0.0              | 910       | 1325             | 0.0              |
| 395       | 1204             | 0.0              | 525       | 44884            | 24.1             | 655       | 49154            | 2.8              | 785       | 2349             | 0.0              | 915       | 1786             | 0.0              |
| 400       | 1038             | 0.0              | 530       | 46722            | 27.5             | 660       | 44162            | 1.8              | 790       | 1939             | 0.0              | 920       | 2044             | 0.0              |
| 405       | 1061             | 0.0              | 535       | 48254            | 29.9             | 665       | 38916            | 1.2              | 795       | 1859             | 0.0              | 925       | 1947             | 0.0              |
| 410       | 1327             | 0.0              | 540       | 50064            | 32.6             | 670       | 33949            | 0.7              | 800       | 2145             | 0.0              | 930       | 1610             | 0.0              |
| 415       | 1996             | 0.0              | 545       | 52217            | 34.8             | 675       | 29528            | 0.5              | 805       | 1833             | 0.0              | 935       | 2111             | 0.0              |
| 420       | 3268             | 0.0              | 550       | 55198            | 37.5             | 680       | 25626            | 0.3              | 810       | 2023             | 0.0              | 940       | 2657             | 0.0              |
| 425       | 5667             | 0.0              | 555       | 58564            | 40.0             | 685       | 22299            | 0.2              | 815       | 1752             | 0.0              | 945       | 2238             | 0.0              |
| 430       | 9713             | 0.1              | 560       | 62385            | 42.4             | 690       | 19299            | 0.1              | 820       | 1756             | 0.0              | 950       | 2401             | 0.0              |
| 435       | 16063            | 0.2              | 565       | 66522            | 44.2             | 695       | 16488            | 0.1              | 825       | 1713             | 0.0              | 955       | 2656             | 0.0              |
| 440       | 26124            | 0.4              | 570       | 71254            | 46.3             | 700       | 14392            | 0.0              | 830       | 1766             | 0.0              | 960       | 2228             | 0.0              |
| 445       | 38102            | 0.8              | 575       | 75923            | 47.2             | 705       | 12426            | 0.0              | 835       | 1901             | 0.0              | 965       | 2517             | 0.0              |
| 450       | 42175            | 1.1              | 580       | 80516            | 47.8             | 710       | 10953            | 0.0              | 840       | 1722             | 0.0              | 970       | 2476             | 0.0              |
| 455       | 34315            | 1.1              | 585       | 84772            | 47.1             | 715       | 9724             | 0.0              | 845       | 1694             | 0.0              | 975       | 2085             | 0.0              |
| 460       | 26966            | 1.1              | 590       | 88815            | 45.9             | 720       | 8614             | 0.0              | 850       | 1717             | 0.0              | 980       | 1509             | 0.0              |
| 465       | 22504            | 1.2              | 595       | 90846            | 43.1             | 725       | 7544             | 0.0              | 855       | 1853             | 0.0              | 985       | 2241             | 0.0              |
| 470       | 18776            | 1.2              | 600       | 92683            | 39.9             | 730       | 6583             | 0.0              | 860       | 1827             | 0.0              | 990       | 1651             | 0.0              |
| 475       | 16954            | 1.3              | 605       | 93294            | 36.1             | 735       | 5796             | 0.0              | 865       | 1745             | 0.0              | 995       | 1035             | 0.0              |
| 480       | 17815            | 1.7              | 610       | 91814            | 31.5             | 740       | 5170             | 0.0              | 870       | 1690             | 0.0              | 1000      | 2009             | 0.0              |
| 485       | 20300            | 2.4              | 615       | 89370            | 27.0             | 745       | 4593             | 0.0              | 875       | 1834             | 0.0              |           |                  |                  |

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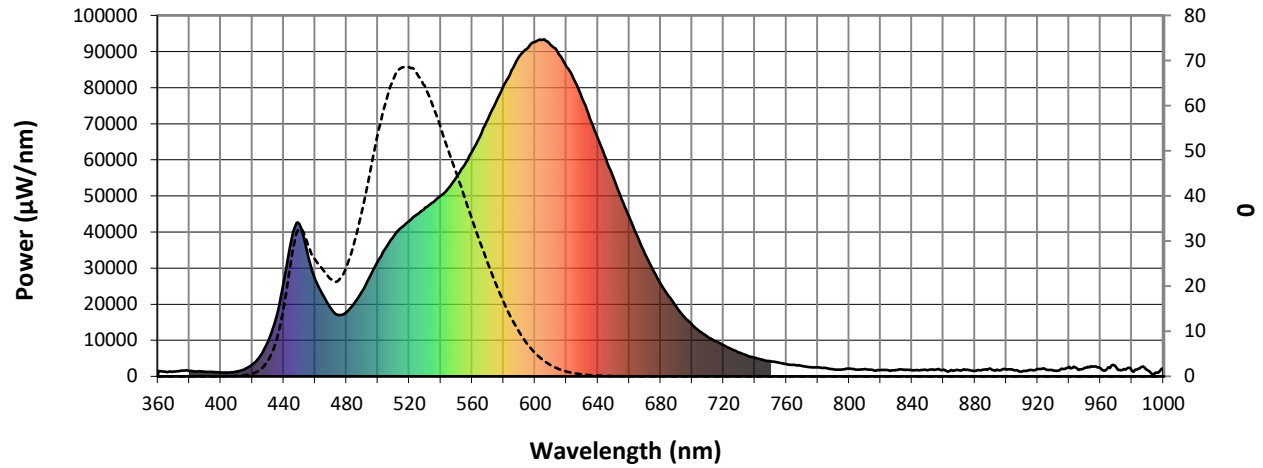
### Scotopic Flux vs. Wavelength


**Scotopic Lumens: 6076.4**
**S/P: 1.34**

| 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       | 1540             | 0.0              | 490       | 23715            | 36.5             | 620       | 85792            | 1.1              | 750       | 4198             | 0.0              | 880       | 1529             | 0.0              |
| 365       | 1274             | 0.0              | 495       | 27763            | 44.9             | 625       | 82163            | 0.7              | 755       | 3846             | 0.0              | 885       | 1863             | 0.0              |
| 370       | 1307             | 0.0              | 500       | 32023            | 53.6             | 630       | 76960            | 0.4              | 760       | 3380             | 0.0              | 890       | 2114             | 0.0              |
| 375       | 1612             | 0.0              | 505       | 35605            | 60.5             | 635       | 71512            | 0.3              | 765       | 3174             | 0.0              | 895       | 1695             | 0.0              |
| 380       | 1536             | 0.0              | 510       | 38842            | 65.8             | 640       | 65929            | 0.2              | 770       | 2898             | 0.0              | 900       | 1843             | 0.0              |
| 385       | 1342             | 0.0              | 515       | 41267            | 68.4             | 645       | 60362            | 0.1              | 775       | 2539             | 0.0              | 905       | 1730             | 0.0              |
| 390       | 1278             | 0.0              | 520       | 43140            | 68.6             | 650       | 55010            | 0.1              | 780       | 2473             | 0.0              | 910       | 1325             | 0.0              |
| 395       | 1204             | 0.0              | 525       | 44884            | 67.1             | 655       | 49154            | 0.0              | 785       | 2349             | 0.0              | 915       | 1786             | 0.0              |
| 400       | 1038             | 0.0              | 530       | 46722            | 64.4             | 660       | 44162            | 0.0              | 790       | 1939             | 0.0              | 920       | 2044             | 0.0              |
| 405       | 1061             | 0.0              | 535       | 48254            | 60.1             | 665       | 38916            | 0.0              | 795       | 1859             | 0.0              | 925       | 1947             | 0.0              |
| 410       | 1327             | 0.1              | 540       | 50064            | 55.3             | 670       | 33949            | 0.0              | 800       | 2145             | 0.0              | 930       | 1610             | 0.0              |
| 415       | 1996             | 0.2              | 545       | 52217            | 50.1             | 675       | 29528            | 0.0              | 805       | 1833             | 0.0              | 935       | 2111             | 0.0              |
| 420       | 3268             | 0.5              | 550       | 55198            | 45.1             | 680       | 25626            | 0.0              | 810       | 2023             | 0.0              | 940       | 2657             | 0.0              |
| 425       | 5667             | 1.4              | 555       | 58564            | 40.0             | 685       | 22299            | 0.0              | 815       | 1752             | 0.0              | 945       | 2238             | 0.0              |
| 430       | 9713             | 3.3              | 560       | 62385            | 34.9             | 690       | 19299            | 0.0              | 820       | 1756             | 0.0              | 950       | 2401             | 0.0              |
| 435       | 16063            | 7.2              | 565       | 66522            | 29.8             | 695       | 16488            | 0.0              | 825       | 1713             | 0.0              | 955       | 2656             | 0.0              |
| 440       | 26124            | 14.6             | 570       | 71254            | 25.1             | 700       | 14392            | 0.0              | 830       | 1766             | 0.0              | 960       | 2228             | 0.0              |
| 445       | 38102            | 25.5             | 575       | 75923            | 20.7             | 705       | 12426            | 0.0              | 835       | 1901             | 0.0              | 965       | 2517             | 0.0              |
| 450       | 42175            | 32.7             | 580       | 80516            | 16.6             | 710       | 10953            | 0.0              | 840       | 1722             | 0.0              | 970       | 2476             | 0.0              |
| 455       | 34315            | 30.0             | 585       | 84772            | 13.0             | 715       | 9724             | 0.0              | 845       | 1694             | 0.0              | 975       | 2085             | 0.0              |
| 460       | 26966            | 26.0             | 590       | 88815            | 9.9              | 720       | 8614             | 0.0              | 850       | 1717             | 0.0              | 980       | 1509             | 0.0              |
| 465       | 22504            | 23.8             | 595       | 90846            | 7.2              | 725       | 7544             | 0.0              | 855       | 1853             | 0.0              | 985       | 2241             | 0.0              |
| 470       | 18776            | 21.6             | 600       | 92683            | 5.2              | 730       | 6583             | 0.0              | 860       | 1827             | 0.0              | 990       | 1651             | 0.0              |
| 475       | 16954            | 21.2             | 605       | 93294            | 3.7              | 735       | 5796             | 0.0              | 865       | 1745             | 0.0              | 995       | 1035             | 0.0              |
| 480       | 17815            | 24.1             | 610       | 91814            | 2.5              | 740       | 5170             | 0.0              | 870       | 1690             | 0.0              | 1000      | 2009             | 0.0              |
| 485       | 20300            | 29.4             | 615       | 89370            | 1.7              | 745       | 4593             | 0.0              | 875       | 1834             | 0.0              |           |                  |                  |

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### Melanopic Flux vs. Wavelength


**Melanopic Lumens: 2300.1**
**M/P: 0.51**

| 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       | 1540             | 0.0              | 490       | 23715            | 19.7             | 620       | 85792            | 0.1              | 750       | 4198             | 0.0              | 880       | 1529             | 0.0              |
| 365       | 1274             | 0.0              | 495       | 27763            | 22.9             | 625       | 82163            | 0.0              | 755       | 3846             | 0.0              | 885       | 1863             | 0.0              |
| 370       | 1307             | 0.0              | 500       | 32023            | 25.7             | 630       | 76960            | 0.0              | 760       | 3380             | 0.0              | 890       | 2114             | 0.0              |
| 375       | 1612             | 0.0              | 505       | 35605            | 27.3             | 635       | 71512            | 0.0              | 765       | 3174             | 0.0              | 895       | 1695             | 0.0              |
| 380       | 1536             | 0.0              | 510       | 38842            | 27.9             | 640       | 65929            | 0.0              | 770       | 2898             | 0.0              | 900       | 1843             | 0.0              |
| 385       | 1342             | 0.0              | 515       | 41267            | 27.0             | 645       | 60362            | 0.0              | 775       | 2539             | 0.0              | 905       | 1730             | 0.0              |
| 390       | 1278             | 0.0              | 520       | 43140            | 25.1             | 650       | 55010            | 0.0              | 780       | 2473             | 0.0              | 910       | 1325             | 0.0              |
| 395       | 1204             | 0.0              | 525       | 44884            | 22.8             | 655       | 49154            | 0.0              | 785       | 2349             | 0.0              | 915       | 1786             | 0.0              |
| 400       | 1038             | 0.0              | 530       | 46722            | 20.2             | 660       | 44162            | 0.0              | 790       | 1939             | 0.0              | 920       | 2044             | 0.0              |
| 405       | 1061             | 0.0              | 535       | 48254            | 17.4             | 665       | 38916            | 0.0              | 795       | 1859             | 0.0              | 925       | 1947             | 0.0              |
| 410       | 1327             | 0.1              | 540       | 50064            | 14.7             | 670       | 33949            | 0.0              | 800       | 2145             | 0.0              | 930       | 1610             | 0.0              |
| 415       | 1996             | 0.1              | 545       | 52217            | 12.1             | 675       | 29528            | 0.0              | 805       | 1833             | 0.0              | 935       | 2111             | 0.0              |
| 420       | 3268             | 0.4              | 550       | 55198            | 9.9              | 680       | 25626            | 0.0              | 810       | 2023             | 0.0              | 940       | 2657             | 0.0              |
| 425       | 5667             | 0.9              | 555       | 58564            | 7.9              | 685       | 22299            | 0.0              | 815       | 1752             | 0.0              | 945       | 2238             | 0.0              |
| 430       | 9713             | 2.1              | 560       | 62385            | 6.2              | 690       | 19299            | 0.0              | 820       | 1756             | 0.0              | 950       | 2401             | 0.0              |
| 435       | 16063            | 4.3              | 565       | 66522            | 4.7              | 695       | 16488            | 0.0              | 825       | 1713             | 0.0              | 955       | 2656             | 0.0              |
| 440       | 26124            | 8.7              | 570       | 71254            | 3.5              | 700       | 14392            | 0.0              | 830       | 1766             | 0.0              | 960       | 2228             | 0.0              |
| 445       | 38102            | 15.0             | 575       | 75923            | 2.5              | 705       | 12426            | 0.0              | 835       | 1901             | 0.0              | 965       | 2517             | 0.0              |
| 450       | 42175            | 19.4             | 580       | 80516            | 1.8              | 710       | 10953            | 0.0              | 840       | 1722             | 0.0              | 970       | 2476             | 0.0              |
| 455       | 34315            | 18.0             | 585       | 84772            | 1.3              | 715       | 9724             | 0.0              | 845       | 1694             | 0.0              | 975       | 2085             | 0.0              |
| 460       | 26966            | 15.9             | 590       | 88815            | 0.9              | 720       | 8614             | 0.0              | 850       | 1717             | 0.0              | 980       | 1509             | 0.0              |
| 465       | 22504            | 14.7             | 595       | 90846            | 0.6              | 725       | 7544             | 0.0              | 855       | 1853             | 0.0              | 985       | 2241             | 0.0              |
| 470       | 18776            | 13.4             | 600       | 92683            | 0.4              | 730       | 6583             | 0.0              | 860       | 1827             | 0.0              | 990       | 1651             | 0.0              |
| 475       | 16954            | 12.9             | 605       | 93294            | 0.3              | 735       | 5796             | 0.0              | 865       | 1745             | 0.0              | 995       | 1035             | 0.0              |
| 480       | 17815            | 14.3             | 610       | 91814            | 0.2              | 740       | 5170             | 0.0              | 870       | 1690             | 0.0              | 1000      | 2009             | 0.0              |
| 485       | 20300            | 16.7             | 615       | 89370            | 0.1              | 745       | 4593             | 0.0              | 875       | 1834             | 0.0              |           |                  |                  |

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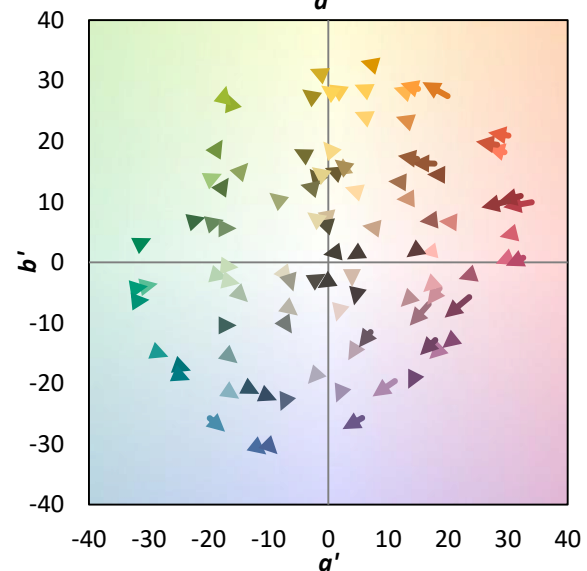
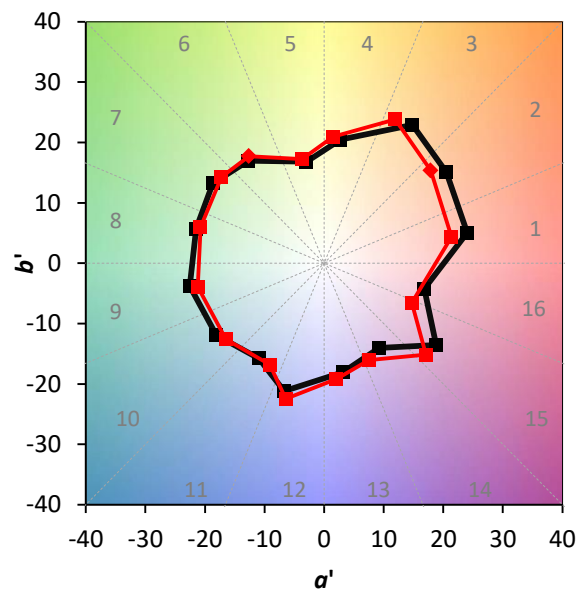
TM-30-18

### Summary

$R_f = 86$   
 $R_g = 96.1$   
 CIE  $R_a = 83.1$   
 $R_9 = 7.1$

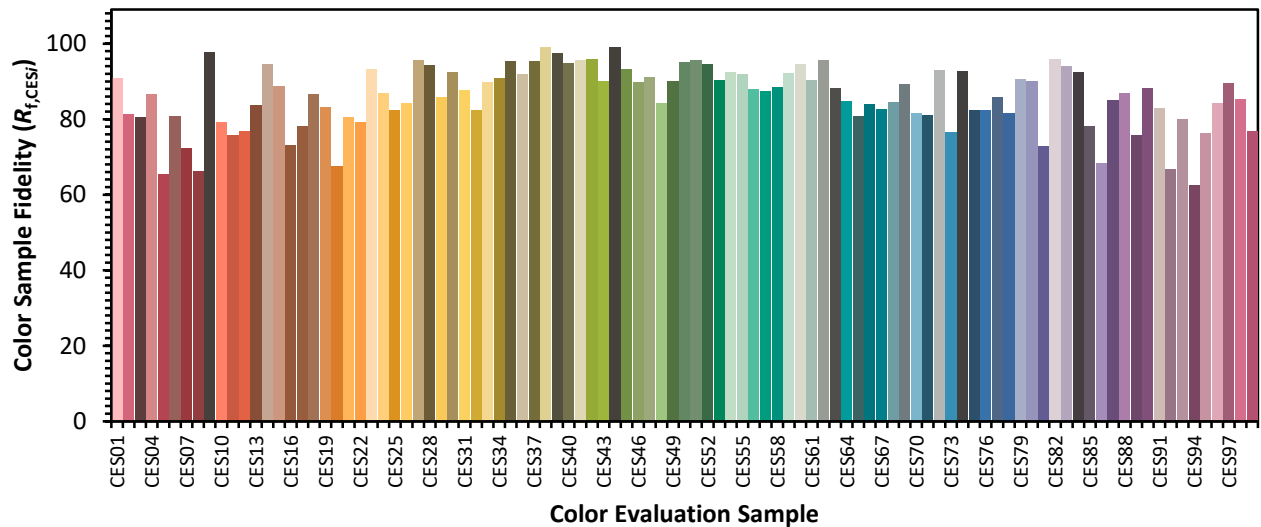


### Color Vector Graphics



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 84 | CES51 = 96 | CES76 = 82 |
| CES02 = 63 | CES27 = 96 | CES52 = 95 | CES77 = 86 |
| CES03 = 31 | CES28 = 94 | CES53 = 90 | CES78 = 82 |
| CES04 = 70 | CES29 = 86 | CES54 = 92 | CES79 = 91 |
| CES05 = 50 | CES30 = 92 | CES55 = 92 | CES80 = 90 |
| CES06 = 51 | CES31 = 88 | CES56 = 88 | CES81 = 73 |
| CES07 = 42 | CES32 = 82 | CES57 = 88 | CES82 = 96 |
| CES08 = 41 | CES33 = 90 | CES58 = 89 | CES83 = 94 |
| CES09 = 29 | CES34 = 91 | CES59 = 92 | CES84 = 92 |
| CES10 = 76 | CES35 = 95 | CES60 = 95 | CES85 = 78 |
| CES11 = 59 | CES36 = 92 | CES61 = 90 | CES86 = 68 |
| CES12 = 65 | CES37 = 95 | CES62 = 96 | CES87 = 85 |
| CES13 = 44 | CES38 = 99 | CES63 = 88 | CES88 = 87 |
| CES14 = 74 | CES39 = 98 | CES64 = 85 | CES89 = 76 |
| CES15 = 72 | CES40 = 95 | CES65 = 81 | CES90 = 88 |
| CES16 = 48 | CES41 = 96 | CES66 = 84 | CES91 = 83 |
| CES17 = 50 | CES42 = 96 | CES67 = 83 | CES92 = 67 |
| CES18 = 57 | CES43 = 90 | CES68 = 84 | CES93 = 80 |
| CES19 = 72 | CES44 = 99 | CES69 = 89 | CES94 = 63 |
| CES20 = 67 | CES45 = 93 | CES70 = 82 | CES95 = 76 |
| CES21 = 87 | CES46 = 90 | CES71 = 81 | CES96 = 84 |
| CES22 = 79 | CES47 = 91 | CES72 = 93 | CES97 = 90 |
| CES23 = 92 | CES48 = 84 | CES73 = 77 | CES98 = 85 |
| CES24 = 91 | CES49 = 90 | CES74 = 93 | CES99 = 77 |
| CES25 = 72 | CES50 = 95 | CES75 = 82 |            |



**Color Rendition by Hue-Angle Bin**


**Measure Comparisons**



(END OF REPORT)