

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: P800945

Luminaire Tested: **ARCH-M-PA2-40-827-24VDC-T3-HSS**

Issue Date: 5/19/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P800945  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1910-568-14)  
Test Lab: INNOVATION CENTER  
Issue Date: 5/19/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: STREETWORKS  
Catalog Number: ARCH-M-PA2-40-827-24VDC-T3-HSS  
Description: ARCHEON-M ROADWAY AND AREA LUMINAIRE  
(2) 80 CRI, 2700K, 240mA LIGHT ENGINES WITH 16 LEDS AND TYPE III OPTICS  
WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

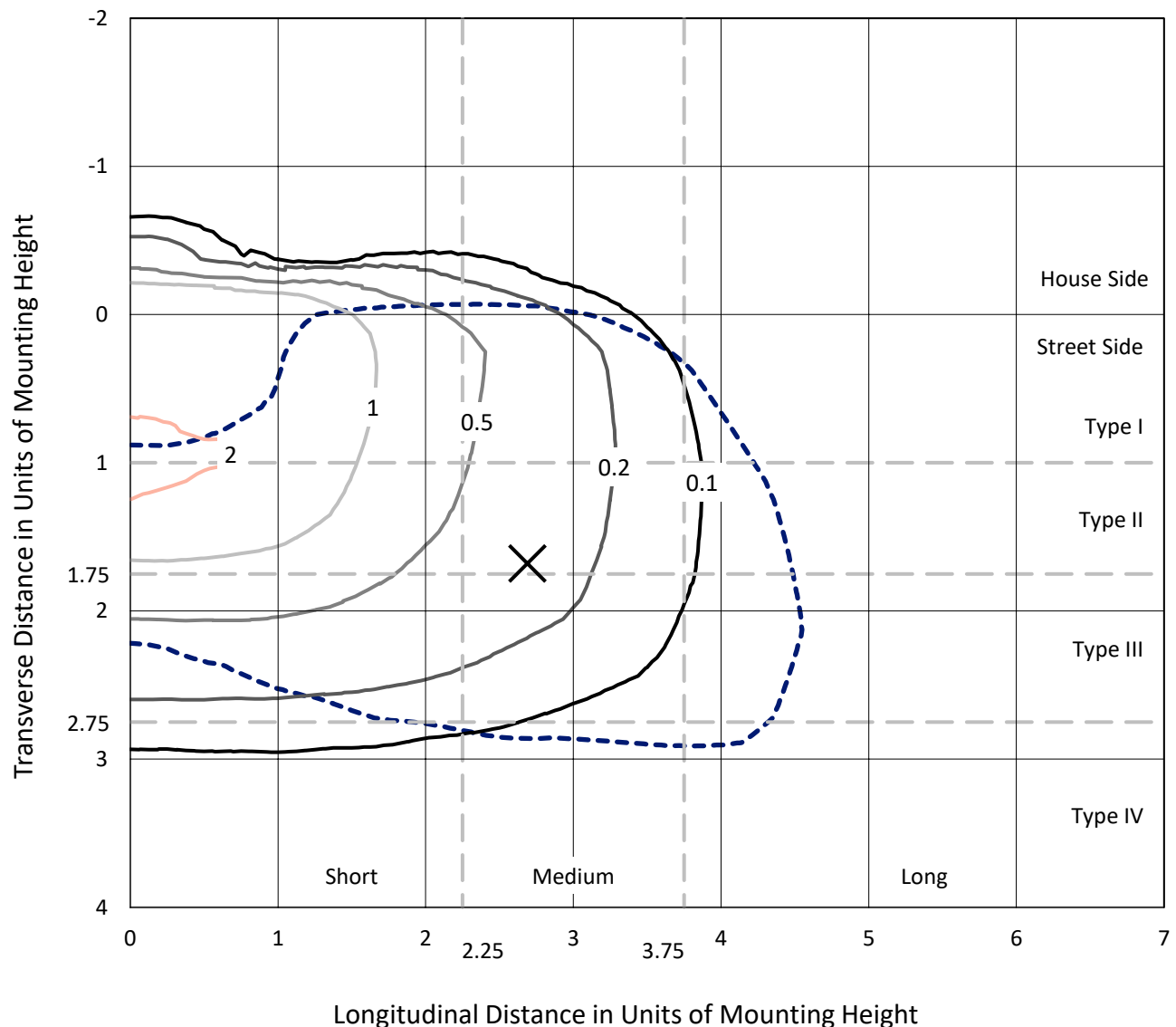
Lumens per Lamp: N/A  
Luminaire Lumens: 3565 lumens  
Efficiency: N/A  
Efficacy: 99.0 lumens/watt  
Luminous Opening: Rectangular (W 0.75' x L: 1' x H: 0')  
IES Classification: Type IV - Medium  
BUG Rating: B1 - U0 - G1

Input Watts (W): 36  
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-M-PA2-40-827-24VDC-T3-HSS

## Iso-Footcandle Lines of Horizontal Illumination

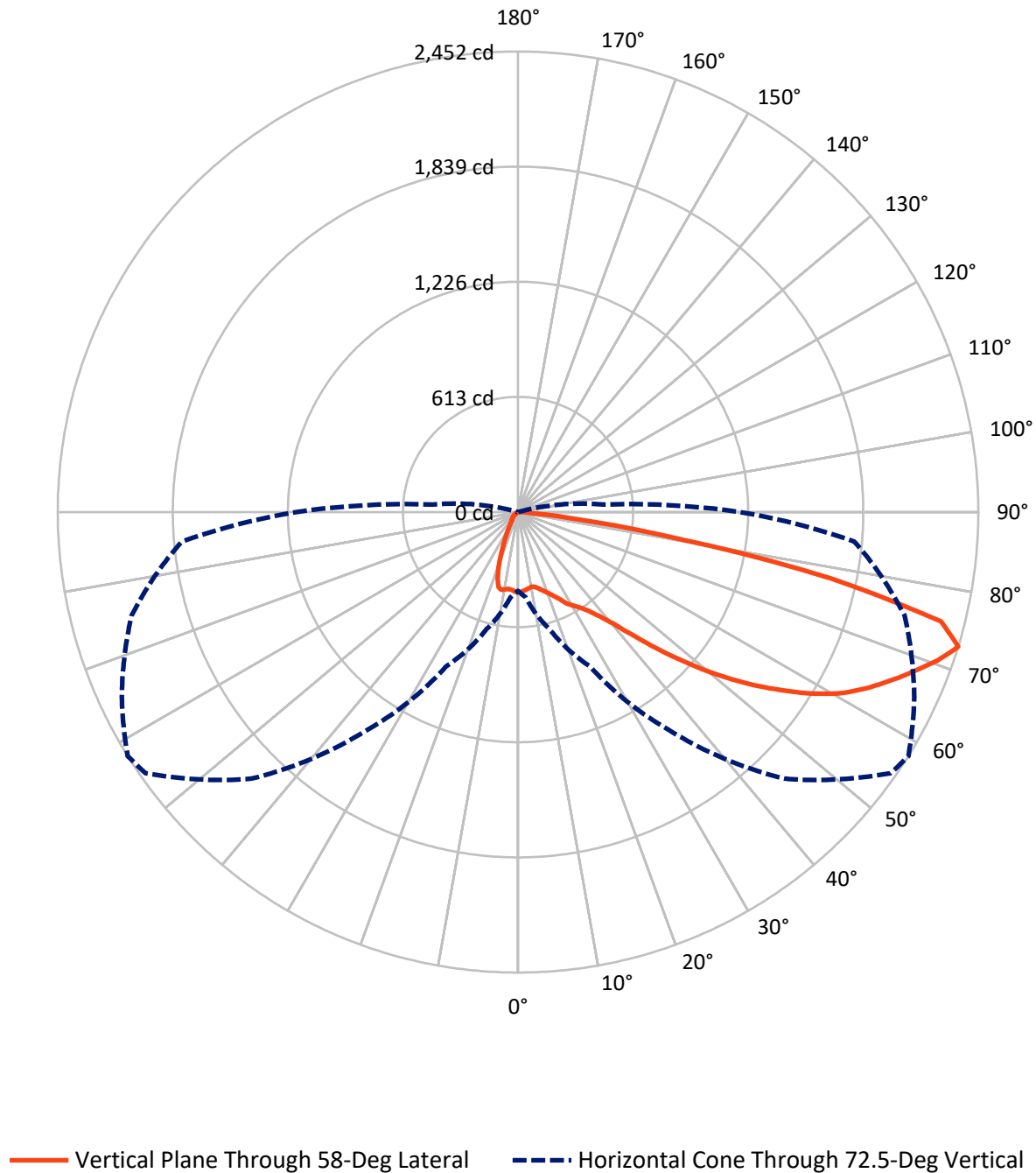
× Max cd  
 - - - 1/2 Max cd



Based on 15 foot mounting height. Maximum calculated value = 2.3 fc  
 Type IV - Medium - N/A

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## Luminous Intensity Polar Plot



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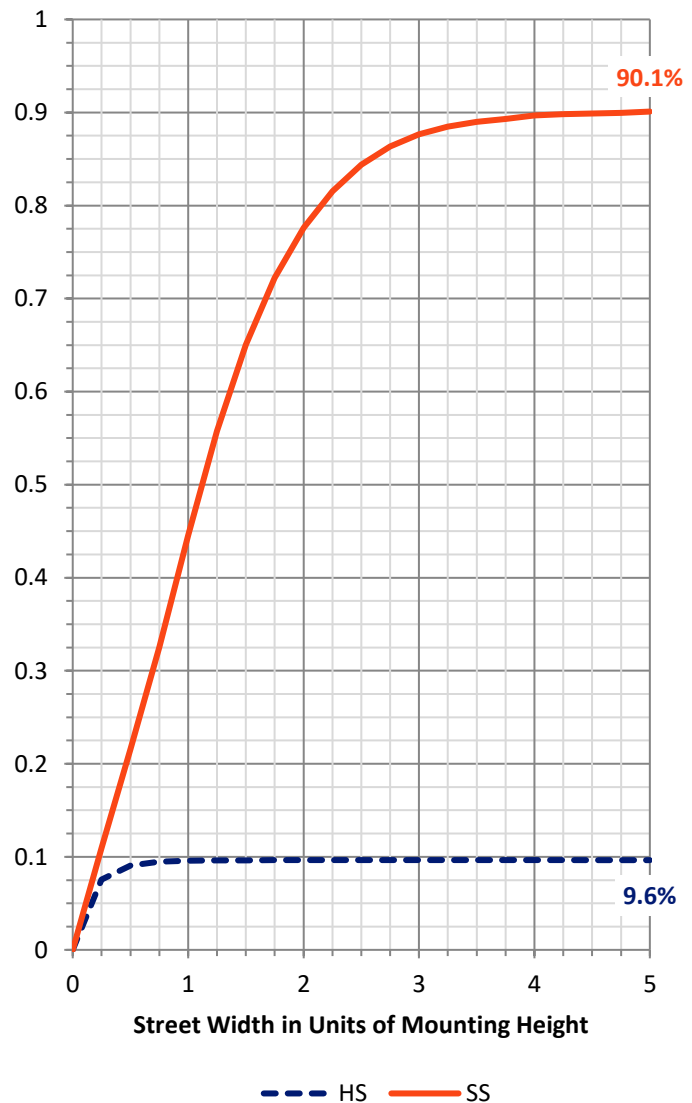
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 346.7    | 0.0    | 346.7  |
|                    | % Fixture | 9.7      | 0.0    | 9.7    |
| <b>Street Side</b> | Lumens    | 3218.3   | 0.0    | 3218.3 |
|                    | % Fixture | 90.3     | 0.0    | 90.3   |
| <b>Total</b>       | Lumens    | 3565.0   | 0.0    | 3565.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 39.3   | 1.1       |
| 10°-20°   | 102.3  | 2.9       |
| 20°-30°   | 160.6  | 4.5       |
| 30°-40°   | 277.0  | 7.8       |
| 40°-50°   | 527.1  | 14.8      |
| 50°-60°   | 834.7  | 23.4      |
| 60°-70°   | 974.0  | 27.3      |
| 70°-80°   | 610.0  | 17.1      |
| 80°-90°   | 40.0   | 1.1       |
| 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°    | 3565.0 | 100.0     |
| 0°-180°   | 3565.0 | 100.0     |

**Coefficient of Utilization**



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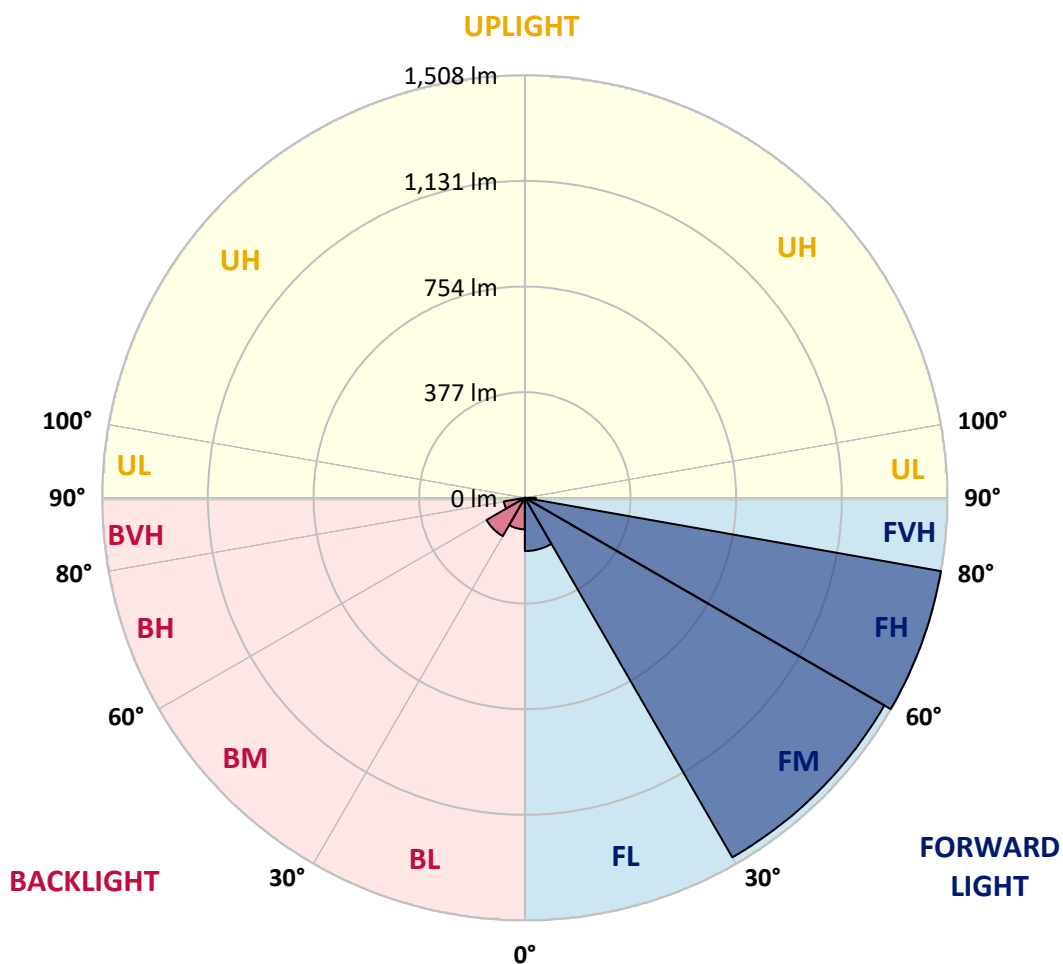
CATALOG NUMBER: ARCH-M-PA2-40-827-24VDC-T3-HSS

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 189.9  | 5.3       |                         |      |         |
| FM   | (30°-60°)   | 1481.1 | 41.5      |                         |      |         |
| FH   | (60°-80°)   | 1507.7 | 42.3      |                         |      | G1/1800 |
| FVH  | (80°-90°)   | 39.7   | 1.1       |                         |      | G1/100  |
| BL   | (0°-30°)    | 112.3  | 3.1       | B1/500                  |      |         |
| BM   | (30°-60°)   | 157.7  | 4.4       | B0/220                  |      |         |
| BH   | (60°-80°)   | 76.3   | 2.1       | B0/110                  |      | G0/110  |
| BVH  | (80°-90°)   | 0.4    | 0.0       |                         |      | G0/10   |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B1-U0-G1**

Type IV Medium





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 58°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 427.8  | 427.8  | 427.8  | 427.8  | 427.8  | 427.8  | 427.8  | 427.8  | 427.8  | 427.8  | 427.8  |
| 2.5°  | 425.9  | 424.0  | 423.3  | 422.7  | 423.3  | 424.0  | 422.0  | 424.0  | 422.7  | 423.3  | 424.6  |
| 5°    | 410.6  | 408.7  | 408.0  | 408.7  | 410.6  | 413.8  | 415.0  | 416.9  | 416.9  | 418.9  | 419.5  |
| 7.5°  | 393.4  | 392.1  | 391.4  | 392.7  | 396.5  | 403.6  | 407.4  | 409.9  | 412.5  | 416.3  | 420.1  |
| 10°   | 383.8  | 383.2  | 382.5  | 384.4  | 388.3  | 394.6  | 399.7  | 403.6  | 413.1  | 424.0  | 431.0  |
| 12.5° | 377.4  | 377.4  | 378.7  | 382.5  | 387.6  | 392.7  | 404.8  | 409.9  | 424.6  | 441.2  | 450.7  |
| 15°   | 372.3  | 372.3  | 374.2  | 381.2  | 388.3  | 400.4  | 418.2  | 424.0  | 441.2  | 461.6  | 474.3  |
| 17.5° | 368.5  | 369.8  | 371.0  | 378.1  | 391.4  | 411.8  | 432.9  | 441.2  | 462.2  | 484.5  | 498.5  |
| 20°   | 369.1  | 370.4  | 371.0  | 378.1  | 397.2  | 425.2  | 452.0  | 461.6  | 485.8  | 509.4  | 523.4  |
| 22.5° | 373.0  | 374.9  | 375.5  | 385.1  | 407.4  | 439.3  | 473.7  | 484.5  | 510.7  | 535.5  | 546.4  |
| 25°   | 388.9  | 390.2  | 386.3  | 394.6  | 422.0  | 460.9  | 501.7  | 513.2  | 539.3  | 562.3  | 571.2  |
| 27.5° | 443.1  | 444.4  | 423.3  | 413.8  | 433.5  | 478.8  | 536.2  | 552.1  | 584.6  | 599.9  | 601.2  |
| 30°   | 560.4  | 561.7  | 520.2  | 475.0  | 460.9  | 494.1  | 555.3  | 577.6  | 619.7  | 636.9  | 629.2  |
| 32.5° | 711.5  | 710.2  | 653.5  | 586.5  | 526.0  | 520.9  | 582.7  | 606.3  | 652.2  | 668.8  | 663.0  |
| 35°   | 863.2  | 865.1  | 816.7  | 715.9  | 629.2  | 571.2  | 617.8  | 645.2  | 700.6  | 724.2  | 714.0  |
| 37.5° | 967.1  | 979.9  | 958.8  | 849.8  | 756.1  | 664.3  | 674.5  | 703.8  | 773.3  | 805.2  | 783.5  |
| 40°   | 1113.8 | 1110.6 | 1059.6 | 979.2  | 896.4  | 802.0  | 766.3  | 780.3  | 860.0  | 902.7  | 868.9  |
| 42.5° | 1310.7 | 1304.4 | 1217.7 | 1139.3 | 1046.8 | 969.7  | 897.0  | 894.4  | 959.5  | 1009.2 | 960.1  |
| 45°   | 1489.3 | 1479.7 | 1420.4 | 1344.5 | 1243.2 | 1154.6 | 1056.4 | 1034.1 | 1079.3 | 1121.4 | 1064.0 |
| 47.5° | 1631.4 | 1615.5 | 1573.4 | 1533.2 | 1508.4 | 1370.7 | 1223.4 | 1189.6 | 1212.6 | 1243.8 | 1162.8 |
| 50°   | 1799.7 | 1755.7 | 1694.5 | 1670.3 | 1722.0 | 1615.5 | 1384.1 | 1351.5 | 1350.3 | 1368.1 | 1264.8 |
| 52.5° | 1876.2 | 1796.5 | 1762.1 | 1782.5 | 1873.7 | 1843.1 | 1557.5 | 1510.9 | 1492.4 | 1494.4 | 1359.8 |
| 55°   | 1783.8 | 1774.9 | 1793.4 | 1857.1 | 1976.3 | 1958.5 | 1723.9 | 1666.5 | 1639.1 | 1604.6 | 1451.0 |
| 57.5° | 1678.6 | 1706.0 | 1779.3 | 1901.1 | 2106.4 | 2079.0 | 1887.7 | 1822.7 | 1772.3 | 1693.3 | 1552.4 |
| 60°   | 1581.7 | 1609.7 | 1730.9 | 1911.3 | 2177.8 | 2195.0 | 2024.1 | 1962.3 | 1887.7 | 1783.8 | 1663.9 |
| 62.5° | 1434.4 | 1456.1 | 1626.3 | 1896.6 | 2146.5 | 2262.6 | 2119.1 | 2072.6 | 2003.1 | 1869.9 | 1792.1 |
| 65°   | 1268.7 | 1282.7 | 1451.0 | 1779.3 | 2085.3 | 2254.9 | 2197.5 | 2171.4 | 2103.8 | 1959.7 | 1918.9 |
| 67.5° | 1087.0 | 1103.6 | 1243.8 | 1568.3 | 1965.5 | 2219.2 | 2271.5 | 2268.9 | 2191.8 | 2059.2 | 2010.7 |
| 70°   | 877.9  | 879.1  | 995.2  | 1300.5 | 1756.4 | 2147.8 | 2363.3 | 2369.0 | 2276.0 | 2133.8 | 2014.6 |
| 72.5° | 420.1  | 454.6  | 645.2  | 907.8  | 1427.4 | 2007.6 | 2423.2 | 2451.9 | 2328.9 | 2131.2 | 1797.2 |
| 75°   | 96.3   | 99.5   | 188.1  | 431.6  | 837.1  | 1540.9 | 2273.4 | 2327.0 | 2200.1 | 1843.1 | 1266.1 |
| 77.5° | 35.1   | 37.0   | 52.9   | 126.2  | 321.9  | 796.3  | 1627.0 | 1705.4 | 1626.3 | 1191.5 | 598.6  |
| 80°   | 23.6   | 23.0   | 27.4   | 56.1   | 147.9  | 225.7  | 832.0  | 878.5  | 802.0  | 406.7  | 143.4  |
| 82.5° | 12.1   | 12.8   | 19.1   | 31.2   | 99.5   | 78.4   | 278.0  | 302.2  | 248.6  | 81.6   | 26.8   |
| 85°   | 5.7    | 5.7    | 10.8   | 19.8   | 42.1   | 27.4   | 61.8   | 74.6   | 66.9   | 35.7   | 8.9    |
| 87.5° | 5.7    | 5.7    | 10.2   | 12.8   | 21.7   | 11.5   | 15.3   | 19.1   | 17.9   | 19.1   | 3.2    |
| 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°    | 427.8  | 427.8 | 427.8 | 427.8 | 427.8 | 427.8 | 427.8 | 427.8 | 427.8 | 427.8 | 427.8 |
| 2.5°  | 424.6  | 424.0 | 423.3 | 424.6 | 424.0 | 425.2 | 425.2 | 426.5 | 426.5 | 425.2 | 424.6 |
| 5°    | 418.9  | 417.6 | 416.3 | 416.3 | 415.7 | 416.9 | 420.8 | 424.0 | 424.6 | 422.7 | 422.0 |
| 7.5°  | 419.5  | 419.5 | 418.2 | 415.7 | 411.2 | 411.2 | 411.2 | 415.0 | 416.9 | 415.7 | 415.0 |
| 10°   | 431.0  | 431.6 | 428.4 | 422.7 | 415.0 | 408.0 | 394.6 | 374.9 | 356.4 | 351.3 | 349.4 |
| 12.5° | 450.7  | 451.4 | 445.0 | 434.8 | 418.9 | 377.4 | 326.4 | 279.2 | 242.9 | 232.7 | 230.8 |
| 15°   | 474.3  | 475.0 | 463.5 | 446.9 | 398.5 | 302.2 | 226.3 | 172.8 | 140.9 | 133.2 | 132.6 |
| 17.5° | 498.5  | 497.3 | 480.1 | 448.2 | 337.9 | 214.2 | 137.7 | 110.3 | 102.0 | 100.1 | 100.7 |
| 20°   | 522.1  | 518.3 | 494.7 | 424.6 | 260.1 | 140.3 | 100.7 | 94.4  | 92.4  | 91.2  | 91.2  |
| 22.5° | 543.8  | 536.2 | 506.8 | 378.1 | 182.3 | 100.7 | 89.9  | 88.6  | 86.1  | 84.2  | 83.5  |
| 25°   | 565.5  | 554.6 | 514.5 | 317.5 | 122.4 | 88.0  | 84.8  | 82.2  | 79.1  | 76.5  | 75.9  |
| 27.5° | 591.6  | 576.3 | 510.7 | 241.0 | 91.8  | 81.6  | 79.1  | 75.2  | 70.8  | 66.9  | 65.7  |
| 30°   | 616.5  | 599.3 | 489.0 | 166.4 | 78.4  | 75.2  | 71.4  | 65.7  | 59.9  | 55.5  | 54.2  |
| 32.5° | 647.7  | 628.0 | 450.1 | 109.0 | 68.2  | 65.7  | 61.8  | 54.8  | 47.2  | 42.1  | 40.8  |
| 35°   | 692.4  | 670.0 | 400.4 | 76.5  | 59.9  | 55.5  | 50.4  | 42.7  | 34.4  | 30.6  | 30.0  |
| 37.5° | 754.8  | 724.9 | 337.9 | 61.8  | 52.9  | 46.5  | 38.9  | 31.2  | 25.5  | 22.3  | 21.7  |
| 40°   | 831.3  | 785.4 | 268.4 | 54.8  | 47.2  | 38.9  | 29.3  | 22.3  | 18.5  | 15.9  | 15.9  |
| 42.5° | 914.2  | 842.2 | 197.6 | 50.4  | 41.4  | 31.9  | 21.7  | 15.9  | 13.4  | 12.1  | 11.5  |
| 45°   | 999.6  | 892.5 | 133.2 | 46.5  | 36.3  | 24.2  | 15.3  | 10.8  | 8.9   | 8.9   | 8.3   |
| 47.5° | 1088.3 | 926.3 | 86.1  | 42.1  | 30.6  | 17.9  | 10.2  | 7.7   | 6.4   | 6.4   | 6.4   |
| 50°   | 1176.2 | 944.2 | 61.2  | 38.3  | 24.9  | 12.1  | 7.7   | 5.7   | 5.1   | 5.1   | 5.1   |
| 52.5° | 1240.0 | 932.7 | 49.1  | 33.2  | 19.1  | 8.9   | 5.7   | 4.5   | 3.8   | 3.8   | 3.8   |
| 55°   | 1295.4 | 912.9 | 42.7  | 28.7  | 14.0  | 6.4   | 4.5   | 3.8   | 3.2   | 3.2   | 3.2   |
| 57.5° | 1352.2 | 887.4 | 38.3  | 24.2  | 10.2  | 4.5   | 3.2   | 2.6   | 2.6   | 2.6   | 2.6   |
| 60°   | 1403.8 | 844.1 | 33.2  | 19.1  | 7.0   | 3.2   | 2.6   | 1.9   | 1.9   | 1.9   | 1.9   |
| 62.5° | 1454.2 | 807.1 | 28.7  | 14.7  | 5.1   | 2.6   | 1.3   | 1.3   | 0.6   | 0.6   | 0.6   |
| 65°   | 1482.9 | 757.4 | 23.0  | 9.6   | 3.2   | 1.9   | 0.6   | 0.6   | 0.0   | 0.0   | 0.0   |
| 67.5° | 1474.0 | 698.1 | 15.9  | 5.7   | 1.9   | 1.3   | 0.6   | 0.0   | 0.0   | 0.0   | 0.0   |
| 70°   | 1412.1 | 618.4 | 9.6   | 3.2   | 1.9   | 1.3   | 0.6   | 0.0   | 0.0   | 0.0   | 0.0   |
| 72.5° | 1182.6 | 457.7 | 5.7   | 2.6   | 1.3   | 0.6   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 75°   | 789.9  | 210.4 | 3.2   | 1.9   | 0.6   | 0.6   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 77.5° | 361.5  | 63.1  | 1.9   | 1.3   | 0.6   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 80°   | 72.7   | 16.6  | 1.3   | 0.6   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 82.5° | 15.3   | 3.2   | 0.6   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 85°   | 3.2    | 1.3   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 87.5° | 1.3    | 0.6   | 0.0   | 0.0   | 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)

STREETWORKS

Report Number: SP1-2101-121-9

Luminaire Tested: IFLD-S-SA2A-827-U-T2

Test Date: 03/05/2021

### Test Information

Test Method: LM-79-08  
 Report Number: SP1-2101-121-9  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1  
 Measurement Geometry:  $4\pi$   
 Issue Date: 03/05/2021  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: STREETWORKS  
 Catalog Number: **IFLD-S-SA2A-827-U-T2**  
 Description: STREETWORKS INF FLOOD

PROGRAMMED @ 615mA.

### Spectral Parameters

|                           |        |           |      |      |      |
|---------------------------|--------|-----------|------|------|------|
| CCT (K):                  | 2709   | CRI (Ra): | 82.1 |      |      |
| CIE u':                   | 0.2620 | R1:       | 80.4 | R9:  | 4.5  |
| CIE v':                   | 0.5273 | R2:       | 91.2 | R10: | 81.3 |
| Duv:                      | 0.0001 | R3:       | 95.2 | R11: | 81.0 |
| CIE x:                    | 0.4591 | R4:       | 80.5 | R12: | 79.0 |
| CIE y:                    | 0.4107 | R5:       | 81.2 | R13: | 82.9 |
| CIE z:                    | 0.1301 | R6:       | 90.9 | R14: | 97.9 |
| Peak Wavelength (nm):     | 606    | R7:       | 81.1 |      |      |
| Dominant Wavelength (nm): | 584    | R8:       | 56.0 |      |      |
| Purity:                   | 61.2   |           |      |      |      |
| Rf:                       | 85.2   |           |      |      |      |
| Rg:                       | 96.4   |           |      |      |      |



### Test Conditions

Stabilization Time: 60M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.9/31%  
 Sphere Temperature (°C): 24.4

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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**



CCT = 2709K  
 CIE  $x$  = 0.4591  
 CIE  $y$  = 0.4107  
 Duv = 0.0001

Point lies inside the ANSI 2700K 4-step quadrangle

REPORT NUMBER: SP1-2101-121-9

### 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       | 2013             | 0.0              | 490       | 33356            | 4.7              | 620       | 150993           | 39.3             | 750       | 7593             | 0.0              | 880       | 2373             | 0.0              |
| 365       | 1908             | 0.0              | 495       | 40031            | 7.3              | 625       | 145077           | 32.0             | 755       | 6765             | 0.0              | 885       | 2481             | 0.0              |
| 370       | 1889             | 0.0              | 500       | 46287            | 10.2             | 630       | 136072           | 24.6             | 760       | 6000             | 0.0              | 890       | 2394             | 0.0              |
| 375       | 2095             | 0.0              | 505       | 51783            | 14.5             | 635       | 126417           | 19.0             | 765       | 5393             | 0.0              | 895       | 2574             | 0.0              |
| 380       | 2228             | 0.0              | 510       | 56588            | 19.4             | 640       | 116412           | 13.9             | 770       | 5030             | 0.0              | 900       | 2048             | 0.0              |
| 385       | 2074             | 0.0              | 515       | 60751            | 25.2             | 645       | 107525           | 10.4             | 775       | 4491             | 0.0              | 905       | 2381             | 0.0              |
| 390       | 1820             | 0.0              | 520       | 63966            | 31.0             | 650       | 97857            | 7.2              | 780       | 3943             | 0.0              | 910       | 2017             | 0.0              |
| 395       | 1728             | 0.0              | 525       | 66683            | 35.8             | 655       | 88582            | 5.1              | 785       | 3682             | 0.0              | 915       | 1904             | 0.0              |
| 400       | 1557             | 0.0              | 530       | 69869            | 41.1             | 660       | 79462            | 3.3              | 790       | 3402             | 0.0              | 920       | 2254             | 0.0              |
| 405       | 1644             | 0.0              | 535       | 72510            | 45.0             | 665       | 70606            | 2.2              | 795       | 3156             | 0.0              | 925       | 1998             | 0.0              |
| 410       | 2044             | 0.0              | 540       | 75299            | 49.1             | 670       | 61774            | 1.4              | 800       | 3062             | 0.0              | 930       | 1776             | 0.0              |
| 415       | 3009             | 0.0              | 545       | 79297            | 52.8             | 675       | 53771            | 0.9              | 805       | 2712             | 0.0              | 935       | 2086             | 0.0              |
| 420       | 4992             | 0.0              | 550       | 84946            | 57.7             | 680       | 46786            | 0.5              | 810       | 2896             | 0.0              | 940       | 1766             | 0.0              |
| 425       | 8631             | 0.0              | 555       | 90790            | 62.0             | 685       | 40747            | 0.4              | 815       | 2605             | 0.0              | 945       | 1738             | 0.0              |
| 430       | 14680            | 0.1              | 560       | 98231            | 66.8             | 690       | 35400            | 0.2              | 820       | 2901             | 0.0              | 950       | 2303             | 0.0              |
| 435       | 23899            | 0.3              | 565       | 105738           | 70.3             | 695       | 30445            | 0.1              | 825       | 2541             | 0.0              | 955       | 2567             | 0.0              |
| 440       | 38159            | 0.6              | 570       | 114034           | 74.1             | 700       | 26278            | 0.1              | 830       | 2014             | 0.0              | 960       | 2492             | 0.0              |
| 445       | 53061            | 1.1              | 575       | 123632           | 76.9             | 705       | 22703            | 0.0              | 835       | 2258             | 0.0              | 965       | 810              | 0.0              |
| 450       | 53893            | 1.4              | 580       | 132443           | 78.7             | 710       | 19853            | 0.0              | 840       | 2203             | 0.0              | 970       | 3201             | 0.0              |
| 455       | 41221            | 1.4              | 585       | 141502           | 78.6             | 715       | 17730            | 0.0              | 845       | 2073             | 0.0              | 975       | 1858             | 0.0              |
| 460       | 32969            | 1.4              | 590       | 148917           | 77.0             | 720       | 15616            | 0.0              | 850       | 2096             | 0.0              | 980       | 1769             | 0.0              |
| 465       | 28048            | 1.4              | 595       | 154326           | 73.2             | 725       | 13986            | 0.0              | 855       | 2751             | 0.0              | 985       | 1043             | 0.0              |
| 470       | 23347            | 1.5              | 600       | 159208           | 68.6             | 730       | 12029            | 0.0              | 860       | 2501             | 0.0              | 990       | 2950             | 0.0              |
| 475       | 22136            | 1.7              | 605       | 161290           | 62.5             | 735       | 10461            | 0.0              | 865       | 2512             | 0.0              | 995       | 1643             | 0.0              |
| 480       | 24192            | 2.3              | 610       | 159549           | 54.8             | 740       | 9230             | 0.0              | 870       | 2913             | 0.0              | 1000      | 292              | 0.0              |
| 485       | 28231            | 3.3              | 615       | 156663           | 47.3             | 745       | 8376             | 0.0              | 875       | 2299             | 0.0              |           |                  |                  |

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### Scotopic Flux vs. Wavelength



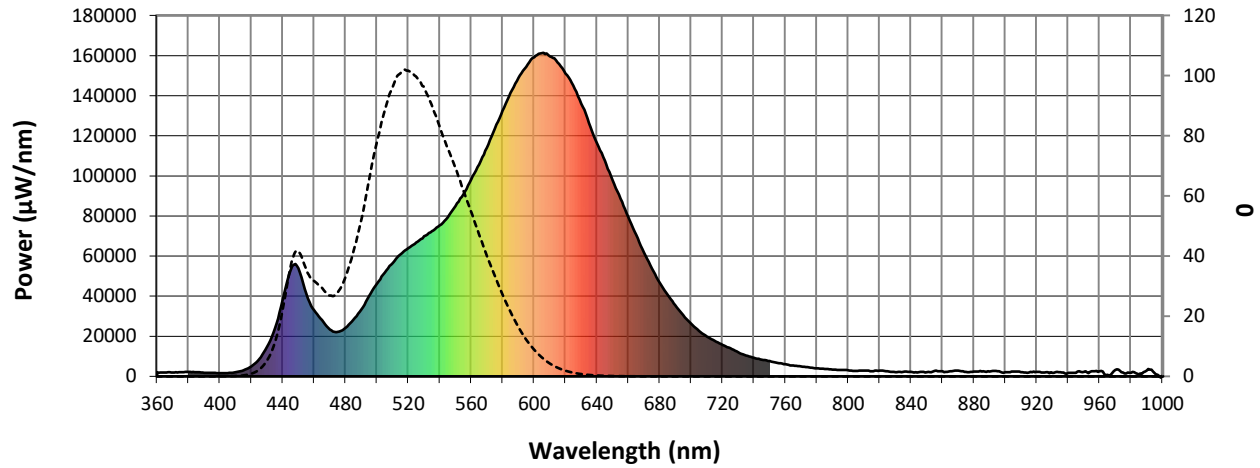
Scotopic Lumens: 8911.3

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       | 2013             | 0.0              | 490       | 33356            | 51.4             | 620       | 150993           | 1.9              | 750       | 7593             | 0.0              | 880       | 2373             | 0.0              |
| 365       | 1908             | 0.0              | 495       | 40031            | 64.7             | 625       | 145077           | 1.2              | 755       | 6765             | 0.0              | 885       | 2481             | 0.0              |
| 370       | 1889             | 0.0              | 500       | 46287            | 77.4             | 630       | 136072           | 0.8              | 760       | 6000             | 0.0              | 890       | 2394             | 0.0              |
| 375       | 2095             | 0.0              | 505       | 51783            | 88.0             | 635       | 126417           | 0.5              | 765       | 5393             | 0.0              | 895       | 2574             | 0.0              |
| 380       | 2228             | 0.0              | 510       | 56588            | 95.9             | 640       | 116412           | 0.3              | 770       | 5030             | 0.0              | 900       | 2048             | 0.0              |
| 385       | 2074             | 0.0              | 515       | 60751            | 100.7            | 645       | 107525           | 0.2              | 775       | 4491             | 0.0              | 905       | 2381             | 0.0              |
| 390       | 1820             | 0.0              | 520       | 63966            | 101.7            | 650       | 97857            | 0.1              | 780       | 3943             | 0.0              | 910       | 2017             | 0.0              |
| 395       | 1728             | 0.0              | 525       | 66683            | 99.8             | 655       | 88582            | 0.1              | 785       | 3682             | 0.0              | 915       | 1904             | 0.0              |
| 400       | 1557             | 0.0              | 530       | 69869            | 96.3             | 660       | 79462            | 0.0              | 790       | 3402             | 0.0              | 920       | 2254             | 0.0              |
| 405       | 1644             | 0.1              | 535       | 72510            | 90.4             | 665       | 70606            | 0.0              | 795       | 3156             | 0.0              | 925       | 1998             | 0.0              |
| 410       | 2044             | 0.1              | 540       | 75299            | 83.2             | 670       | 61774            | 0.0              | 800       | 3062             | 0.0              | 930       | 1776             | 0.0              |
| 415       | 3009             | 0.3              | 545       | 79297            | 76.0             | 675       | 53771            | 0.0              | 805       | 2712             | 0.0              | 935       | 2086             | 0.0              |
| 420       | 4992             | 0.8              | 550       | 84946            | 69.5             | 680       | 46786            | 0.0              | 810       | 2896             | 0.0              | 940       | 1766             | 0.0              |
| 425       | 8631             | 2.1              | 555       | 90790            | 62.0             | 685       | 40747            | 0.0              | 815       | 2605             | 0.0              | 945       | 1738             | 0.0              |
| 430       | 14680            | 5.0              | 560       | 98231            | 54.9             | 690       | 35400            | 0.0              | 820       | 2901             | 0.0              | 950       | 2303             | 0.0              |
| 435       | 23899            | 10.7             | 565       | 105738           | 47.4             | 695       | 30445            | 0.0              | 825       | 2541             | 0.0              | 955       | 2567             | 0.0              |
| 440       | 38159            | 21.3             | 570       | 114034           | 40.2             | 700       | 26278            | 0.0              | 830       | 2014             | 0.0              | 960       | 2492             | 0.0              |
| 445       | 53061            | 35.5             | 575       | 123632           | 33.7             | 705       | 22703            | 0.0              | 835       | 2258             | 0.0              | 965       | 810              | 0.0              |
| 450       | 53893            | 41.8             | 580       | 132443           | 27.3             | 710       | 19853            | 0.0              | 840       | 2203             | 0.0              | 970       | 3201             | 0.0              |
| 455       | 41221            | 36.0             | 585       | 141502           | 21.6             | 715       | 17730            | 0.0              | 845       | 2073             | 0.0              | 975       | 1858             | 0.0              |
| 460       | 32969            | 31.8             | 590       | 148917           | 16.6             | 720       | 15616            | 0.0              | 850       | 2096             | 0.0              | 980       | 1769             | 0.0              |
| 465       | 28048            | 29.6             | 595       | 154326           | 12.3             | 725       | 13986            | 0.0              | 855       | 2751             | 0.0              | 985       | 1043             | 0.0              |
| 470       | 23347            | 26.9             | 600       | 159208           | 9.0              | 730       | 12029            | 0.0              | 860       | 2501             | 0.0              | 990       | 2950             | 0.0              |
| 475       | 22136            | 27.7             | 605       | 161290           | 6.3              | 735       | 10461            | 0.0              | 865       | 2512             | 0.0              | 995       | 1643             | 0.0              |
| 480       | 24192            | 32.7             | 610       | 159549           | 4.3              | 740       | 9230             | 0.0              | 870       | 2913             | 0.0              | 1000      | 292              | 0.0              |
| 485       | 28231            | 40.9             | 615       | 156663           | 2.9              | 745       | 8376             | 0.0              | 875       | 2299             | 0.0              |           |                  |                  |

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### Melanopic Flux vs. Wavelength


**Melanopic Lumens: 3277.6**      **M/P: 0.45**

| 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       | 2013             | 0.0              | 490       | 33356            | 27.8             | 620       | 150993           | 0.1              | 750       | 7593             | 0.0              | 880       | 2373             | 0.0              |
| 365       | 1908             | 0.0              | 495       | 40031            | 33.0             | 625       | 145077           | 0.1              | 755       | 6765             | 0.0              | 885       | 2481             | 0.0              |
| 370       | 1889             | 0.0              | 500       | 46287            | 37.2             | 630       | 136072           | 0.0              | 760       | 6000             | 0.0              | 890       | 2394             | 0.0              |
| 375       | 2095             | 0.0              | 505       | 51783            | 39.7             | 635       | 126417           | 0.0              | 765       | 5393             | 0.0              | 895       | 2574             | 0.0              |
| 380       | 2228             | 0.0              | 510       | 56588            | 40.6             | 640       | 116412           | 0.0              | 770       | 5030             | 0.0              | 900       | 2048             | 0.0              |
| 385       | 2074             | 0.0              | 515       | 60751            | 39.7             | 645       | 107525           | 0.0              | 775       | 4491             | 0.0              | 905       | 2381             | 0.0              |
| 390       | 1820             | 0.0              | 520       | 63966            | 37.2             | 650       | 97857            | 0.0              | 780       | 3943             | 0.0              | 910       | 2017             | 0.0              |
| 395       | 1728             | 0.0              | 525       | 66683            | 33.8             | 655       | 88582            | 0.0              | 785       | 3682             | 0.0              | 915       | 1904             | 0.0              |
| 400       | 1557             | 0.0              | 530       | 69869            | 30.2             | 660       | 79462            | 0.0              | 790       | 3402             | 0.0              | 920       | 2254             | 0.0              |
| 405       | 1644             | 0.0              | 535       | 72510            | 26.1             | 665       | 70606            | 0.0              | 795       | 3156             | 0.0              | 925       | 1998             | 0.0              |
| 410       | 2044             | 0.1              | 540       | 75299            | 22.0             | 670       | 61774            | 0.0              | 800       | 3062             | 0.0              | 930       | 1776             | 0.0              |
| 415       | 3009             | 0.2              | 545       | 79297            | 18.4             | 675       | 53771            | 0.0              | 805       | 2712             | 0.0              | 935       | 2086             | 0.0              |
| 420       | 4992             | 0.6              | 550       | 84946            | 15.2             | 680       | 46786            | 0.0              | 810       | 2896             | 0.0              | 940       | 1766             | 0.0              |
| 425       | 8631             | 1.3              | 555       | 90790            | 12.2             | 685       | 40747            | 0.0              | 815       | 2605             | 0.0              | 945       | 1738             | 0.0              |
| 430       | 14680            | 3.1              | 560       | 98231            | 9.7              | 690       | 35400            | 0.0              | 820       | 2901             | 0.0              | 950       | 2303             | 0.0              |
| 435       | 23899            | 6.4              | 565       | 105738           | 7.4              | 695       | 30445            | 0.0              | 825       | 2541             | 0.0              | 955       | 2567             | 0.0              |
| 440       | 38159            | 12.8             | 570       | 114034           | 5.6              | 700       | 26278            | 0.0              | 830       | 2014             | 0.0              | 960       | 2492             | 0.0              |
| 445       | 53061            | 20.9             | 575       | 123632           | 4.1              | 705       | 22703            | 0.0              | 835       | 2258             | 0.0              | 965       | 810              | 0.0              |
| 450       | 53893            | 24.8             | 580       | 132443           | 3.0              | 710       | 19853            | 0.0              | 840       | 2203             | 0.0              | 970       | 3201             | 0.0              |
| 455       | 41221            | 21.6             | 585       | 141502           | 2.1              | 715       | 17730            | 0.0              | 845       | 2073             | 0.0              | 975       | 1858             | 0.0              |
| 460       | 32969            | 19.4             | 590       | 148917           | 1.5              | 720       | 15616            | 0.0              | 850       | 2096             | 0.0              | 980       | 1769             | 0.0              |
| 465       | 28048            | 18.3             | 595       | 154326           | 1.0              | 725       | 13986            | 0.0              | 855       | 2751             | 0.0              | 985       | 1043             | 0.0              |
| 470       | 23347            | 16.7             | 600       | 159208           | 0.7              | 730       | 12029            | 0.0              | 860       | 2501             | 0.0              | 990       | 2950             | 0.0              |
| 475       | 22136            | 16.9             | 605       | 161290           | 0.4              | 735       | 10461            | 0.0              | 865       | 2512             | 0.0              | 995       | 1643             | 0.0              |
| 480       | 24192            | 19.4             | 610       | 159549           | 0.3              | 740       | 9230             | 0.0              | 870       | 2913             | 0.0              | 1000      | 292              | 0.0              |
| 485       | 28231            | 23.3             | 615       | 156663           | 0.2              | 745       | 8376             | 0.0              | 875       | 2299             | 0.0              |           |                  |                  |

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TM-30-18

### Summary

$R_f = 85.2$   
 $R_g = 96.4$   
 CIE  $R_a = 82.1$   
 $R_9 = 4.5$



### Color Vector Graphics



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 83 | CES51 = 95 | CES76 = 83 |
| CES02 = 64 | CES27 = 95 | CES52 = 94 | CES77 = 85 |
| CES03 = 31 | CES28 = 94 | CES53 = 89 | CES78 = 82 |
| CES04 = 71 | CES29 = 82 | CES54 = 92 | CES79 = 89 |
| CES05 = 50 | CES30 = 87 | CES55 = 92 | CES80 = 89 |
| CES06 = 52 | CES31 = 85 | CES56 = 87 | CES81 = 69 |
| CES07 = 43 | CES32 = 80 | CES57 = 87 | CES82 = 96 |
| CES08 = 42 | CES33 = 86 | CES58 = 88 | CES83 = 93 |
| CES09 = 29 | CES34 = 91 | CES59 = 92 | CES84 = 93 |
| CES10 = 77 | CES35 = 96 | CES60 = 96 | CES85 = 78 |
| CES11 = 60 | CES36 = 96 | CES61 = 91 | CES86 = 65 |
| CES12 = 66 | CES37 = 95 | CES62 = 97 | CES87 = 85 |
| CES13 = 44 | CES38 = 93 | CES63 = 87 | CES88 = 86 |
| CES14 = 74 | CES39 = 97 | CES64 = 86 | CES89 = 74 |
| CES15 = 72 | CES40 = 94 | CES65 = 81 | CES90 = 86 |
| CES16 = 48 | CES41 = 93 | CES66 = 85 | CES91 = 87 |
| CES17 = 50 | CES42 = 95 | CES67 = 84 | CES92 = 67 |
| CES18 = 57 | CES43 = 88 | CES68 = 85 | CES93 = 80 |
| CES19 = 73 | CES44 = 99 | CES69 = 91 | CES94 = 61 |
| CES20 = 67 | CES45 = 92 | CES70 = 82 | CES95 = 77 |
| CES21 = 87 | CES46 = 88 | CES71 = 83 | CES96 = 84 |
| CES22 = 79 | CES47 = 88 | CES72 = 93 | CES97 = 88 |
| CES23 = 92 | CES48 = 81 | CES73 = 78 | CES98 = 84 |
| CES24 = 91 | CES49 = 88 | CES74 = 91 | CES99 = 76 |
| CES25 = 72 | CES50 = 94 | CES75 = 85 |            |



### Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)