

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: P348870

Luminaire Tested: **ARCH-N-PA1-19-730-24VDC-T4W-HSS**

Issue Date: 3/3/2020



**Test Information**

Test Method: LM-79-08  
Report Number: P348870  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-19)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: STREETWORKS  
Catalog Number: ARCH-N-PA1-19-730-24VDC-T4W-HSS  
Description: ARCHEON ROADWAY AND AREA LUMINAIRE  
(1) 70 CRI, 3000K, 370mA LIGHT ENGINE WITH 16 LEDS AND  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 1945 lumens  
Efficiency: N/A  
Efficacy: 102.4 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 0.75' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B0 - U0 - G1

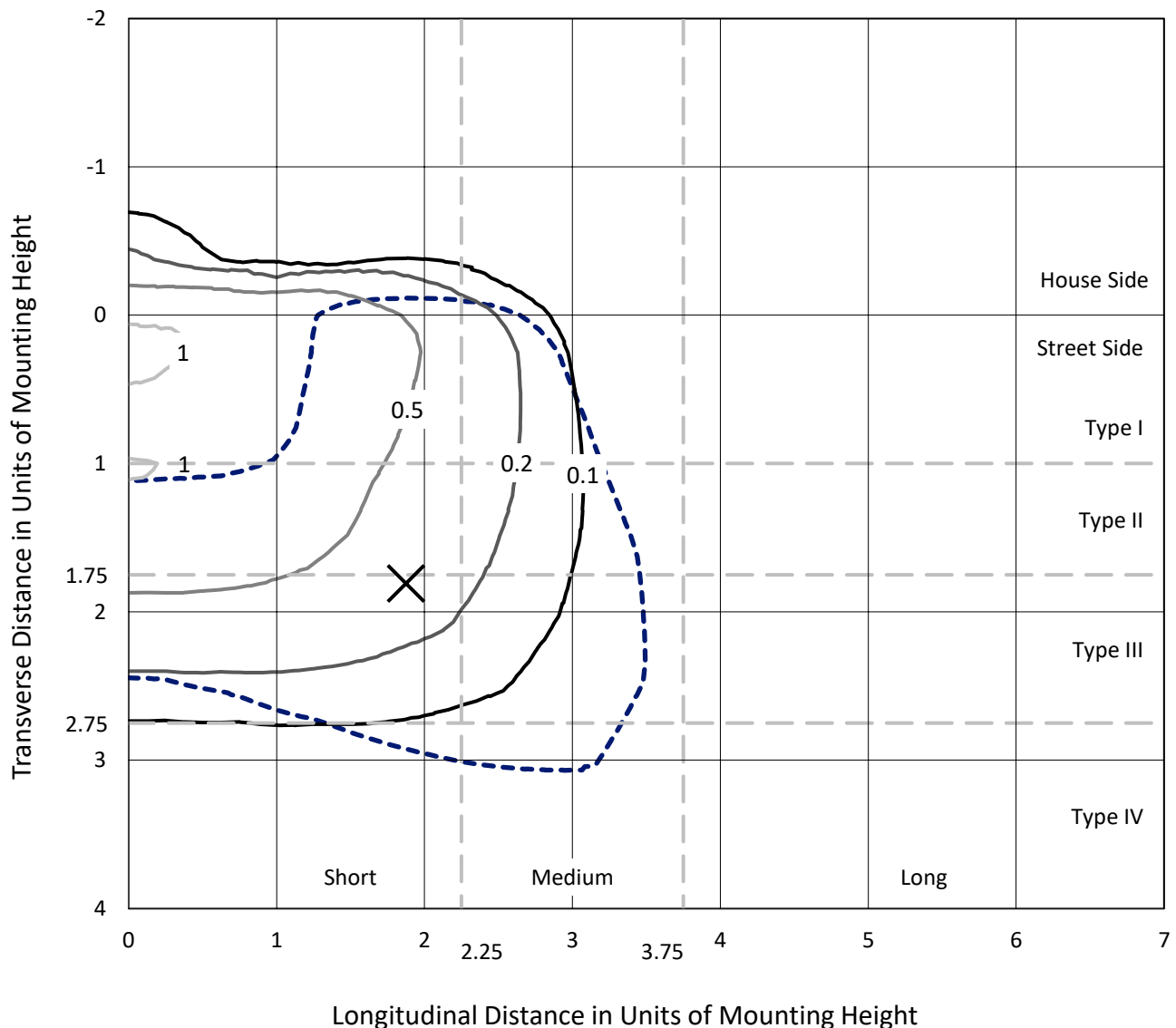
Input Watts (W): 19  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 25 FT

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## Iso-Footcandle Lines of Horizontal Illumination

× Max cd  
 - - - 1/2 Max cd

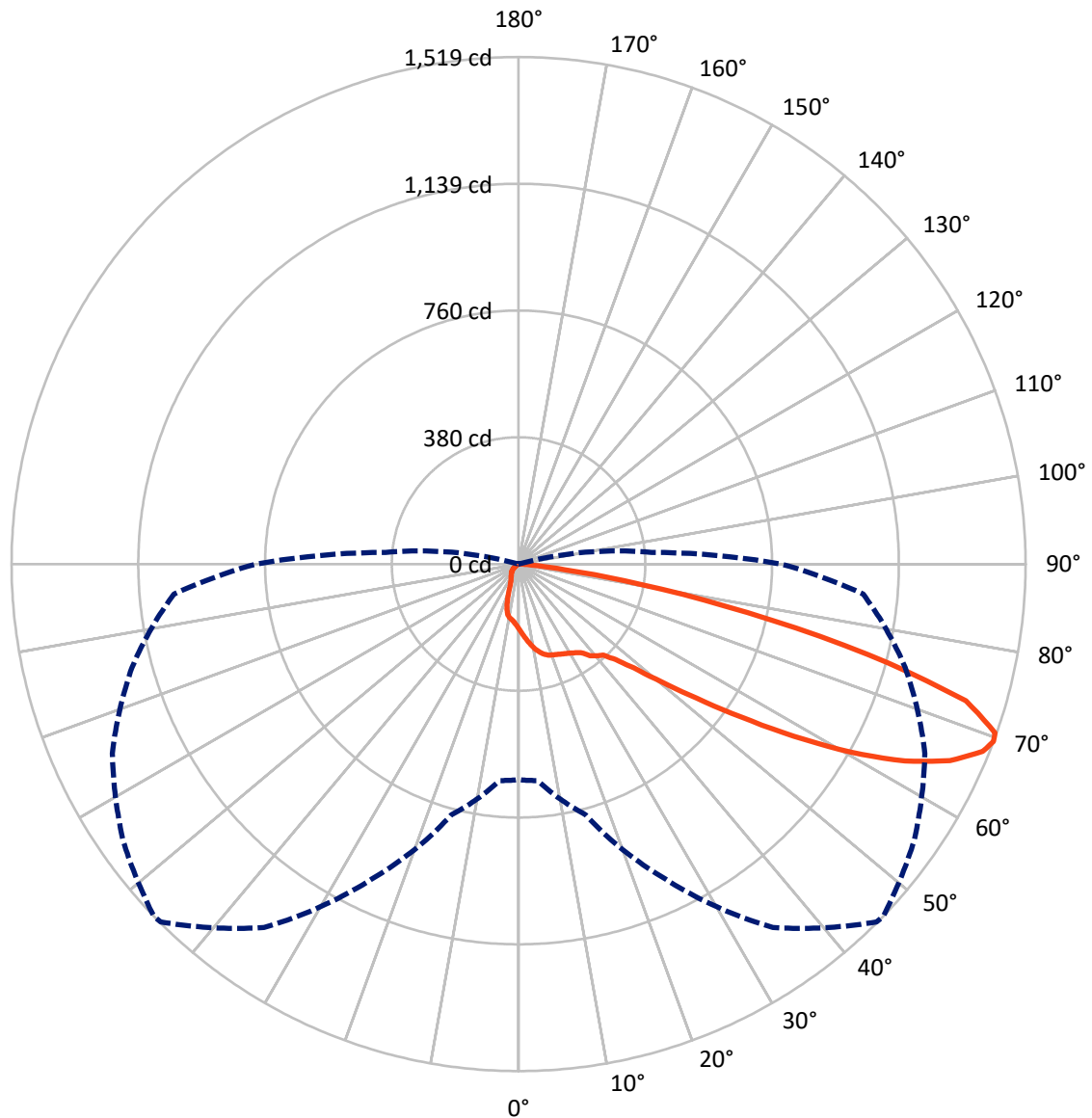


Based on 15 foot mounting height. Maximum calculated value = 1.3 fc  
 Type IV - Short - N/A

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## Luminous Intensity Polar Plot



— Vertical Plane Through 46-Deg Lateral      - - - Horizontal Cone Through 69-Deg Vertical

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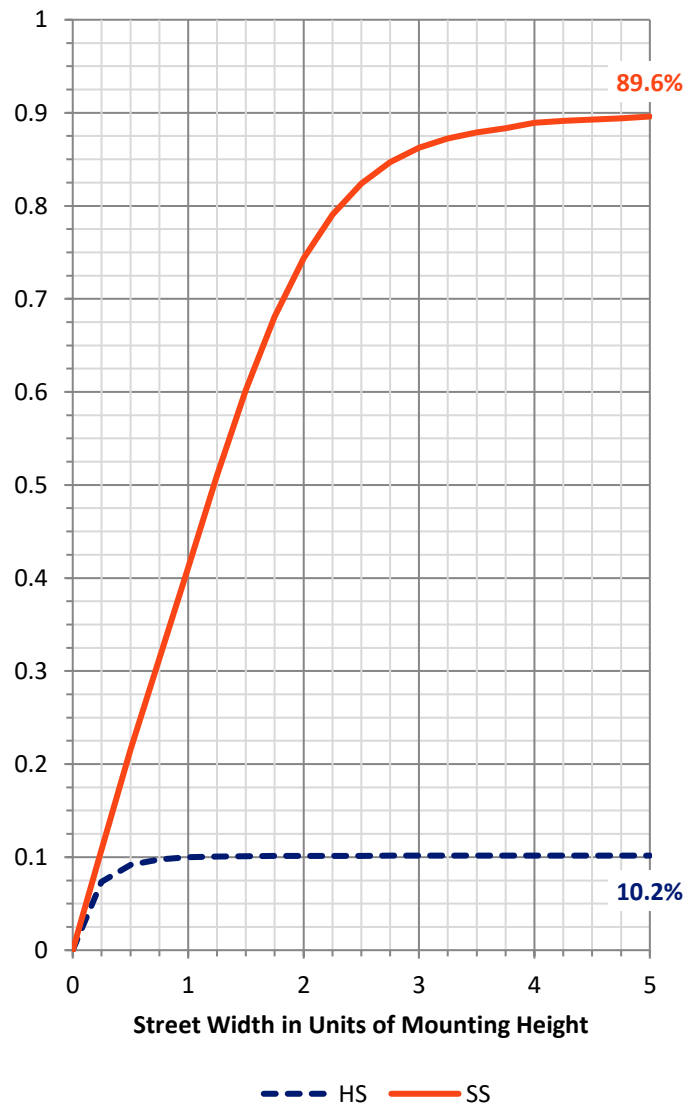
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 199.6    | 0.0    | 199.6  |
|                    | % Fixture | 10.3     | 0.0    | 10.3   |
| <b>Street Side</b> | Lumens    | 1745.4   | 0.0    | 1745.4 |
|                    | % Fixture | 89.7     | 0.0    | 89.7   |
| <b>Total</b>       | Lumens    | 1945.0   | 0.0    | 1945.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 19.4   | 1.0       |
| 10°-20°   | 58.8   | 3.0       |
| 20°-30°   | 92.5   | 4.8       |
| 30°-40°   | 132.7  | 6.8       |
| 40°-50°   | 229.4  | 11.8      |
| 50°-60°   | 453.2  | 23.3      |
| 60°-70°   | 633.3  | 32.6      |
| 70°-80°   | 306.0  | 15.7      |
| 80°-90°   | 19.7   | 1.0       |
| 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°    | 1945.0 | 100.0     |
| 0°-180°   | 1945.0 | 100.0     |



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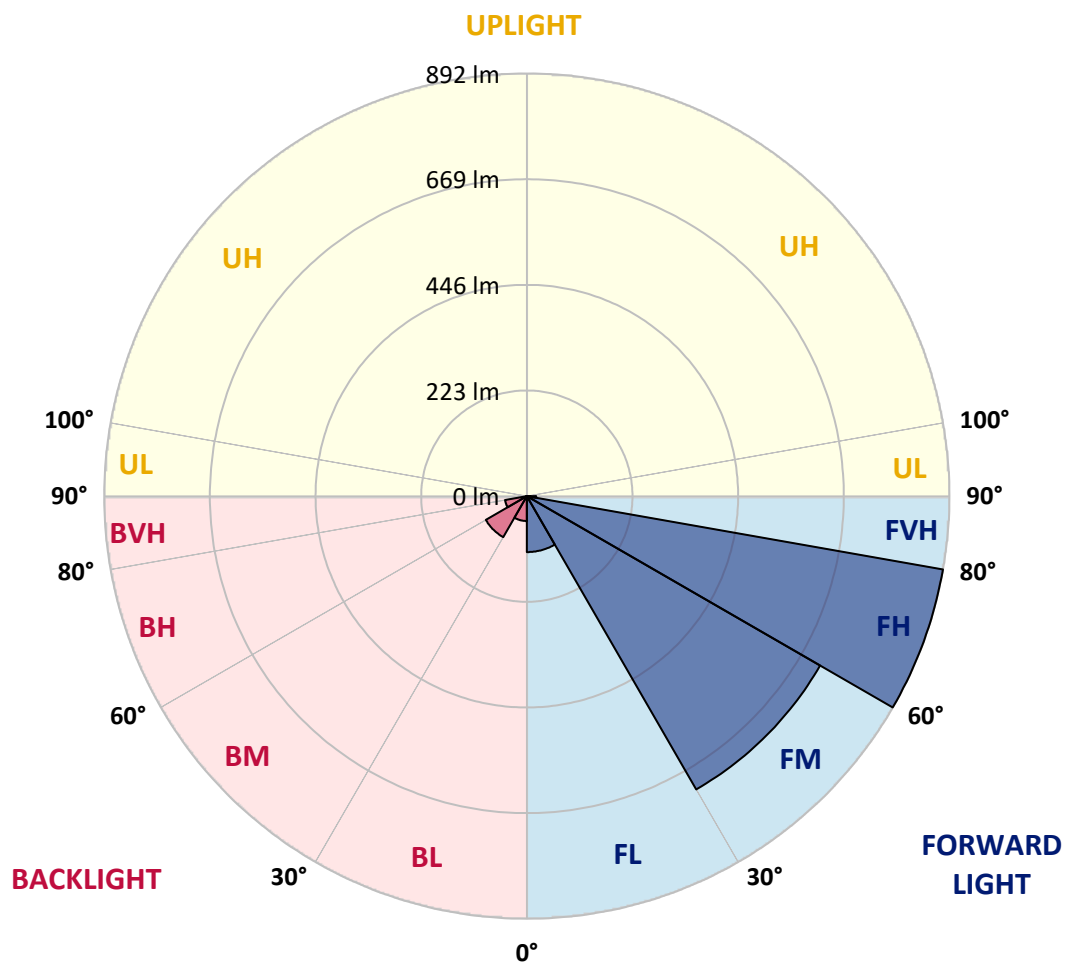
CATALOG NUMBER: ARCH-N-PA1-19-730-24VDC-T4W-HSS

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 118.2  | 6.1       |                         |      |         |
| FM   | (30°-60°)   | 715.2  | 36.8      |                         |      |         |
| FH   | (60°-80°)   | 892.5  | 45.9      |                         |      | G1/1800 |
| FVH  | (80°-90°)   | 19.5   | 1.0       |                         |      | G1/100  |
| BL   | (0°-30°)    | 52.6   | 2.7       | B0/110                  |      |         |
| BM   | (30°-60°)   | 100.0  | 5.1       | B0/220                  |      |         |
| BH   | (60°-80°)   | 46.8   | 2.4       | B0/110                  |      | G0/110  |
| BVH  | (80°-90°)   | 0.2    | 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 IV Short



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CATALOG NUMBER: ARCH-N-PA1-19-730-24VDC-T4W-HSS

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 46°    | 55°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 194.9  | 194.9  | 194.9  | 194.9  | 194.9  | 194.9  | 194.9  | 194.9  | 194.9  | 194.9  | 194.9  |
| 2.5°  | 216.5  | 216.2  | 214.9  | 214.4  | 211.3  | 209.5  | 208.7  | 206.5  | 203.2  | 199.9  | 196.2  |
| 5°    | 241.1  | 241.0  | 238.7  | 236.4  | 230.5  | 225.1  | 224.1  | 218.8  | 211.4  | 204.5  | 197.5  |
| 7.5°  | 266.3  | 265.1  | 262.7  | 258.4  | 249.9  | 241.1  | 240.3  | 232.8  | 222.3  | 212.3  | 202.4  |
| 10°   | 287.6  | 286.9  | 283.8  | 277.1  | 267.2  | 257.3  | 256.3  | 247.0  | 235.2  | 222.9  | 210.2  |
| 12.5° | 304.2  | 303.7  | 299.6  | 291.3  | 280.7  | 270.4  | 269.0  | 260.8  | 248.1  | 234.4  | 219.4  |
| 15°   | 314.3  | 314.1  | 309.1  | 300.2  | 289.8  | 280.9  | 279.7  | 272.5  | 260.7  | 246.3  | 229.4  |
| 17.5° | 316.7  | 316.8  | 311.6  | 302.7  | 294.1  | 287.7  | 286.8  | 281.3  | 271.5  | 257.2  | 239.5  |
| 20°   | 311.4  | 312.5  | 307.9  | 300.1  | 294.8  | 291.5  | 290.7  | 287.4  | 279.1  | 265.6  | 247.5  |
| 22.5° | 303.9  | 304.5  | 301.3  | 296.1  | 293.9  | 294.6  | 294.2  | 292.4  | 285.3  | 272.9  | 255.4  |
| 25°   | 299.4  | 299.4  | 297.5  | 293.1  | 294.6  | 298.5  | 298.6  | 298.2  | 292.6  | 281.9  | 265.1  |
| 27.5° | 299.2  | 298.7  | 296.5  | 293.2  | 297.2  | 303.2  | 303.6  | 306.0  | 302.6  | 292.7  | 277.1  |
| 30°   | 306.5  | 305.9  | 301.2  | 296.9  | 302.0  | 308.5  | 309.4  | 314.8  | 313.1  | 304.5  | 290.5  |
| 32.5° | 323.6  | 321.3  | 311.0  | 303.9  | 307.8  | 315.5  | 316.7  | 325.3  | 328.0  | 319.0  | 303.5  |
| 35°   | 346.9  | 339.7  | 324.8  | 317.3  | 317.6  | 325.7  | 326.8  | 339.4  | 347.5  | 332.3  | 313.5  |
| 37.5° | 379.1  | 375.5  | 351.4  | 331.1  | 332.8  | 345.1  | 348.3  | 361.9  | 359.7  | 339.6  | 324.9  |
| 40°   | 449.7  | 444.1  | 418.4  | 370.0  | 347.3  | 360.8  | 361.8  | 369.1  | 369.2  | 356.1  | 348.6  |
| 42.5° | 545.8  | 543.5  | 516.4  | 440.5  | 375.8  | 371.3  | 373.1  | 385.4  | 399.2  | 390.9  | 390.6  |
| 45°   | 652.2  | 651.0  | 622.3  | 534.0  | 433.5  | 405.6  | 407.9  | 424.4  | 450.8  | 452.6  | 464.2  |
| 47.5° | 737.9  | 737.3  | 720.8  | 638.4  | 521.9  | 463.9  | 464.6  | 482.1  | 528.5  | 551.4  | 569.9  |
| 50°   | 815.9  | 818.6  | 805.5  | 751.4  | 642.3  | 555.2  | 553.5  | 565.1  | 639.5  | 677.0  | 700.0  |
| 52.5° | 924.4  | 928.2  | 891.6  | 856.9  | 768.6  | 668.5  | 667.1  | 679.3  | 773.1  | 801.1  | 805.2  |
| 55°   | 1020.3 | 1013.9 | 985.0  | 975.0  | 922.6  | 808.3  | 808.0  | 818.7  | 902.2  | 914.1  | 921.7  |
| 57.5° | 1062.6 | 1060.1 | 1074.1 | 1097.1 | 1083.9 | 973.7  | 972.9  | 964.7  | 1017.7 | 1019.0 | 1042.3 |
| 60°   | 1089.3 | 1092.3 | 1135.1 | 1206.0 | 1238.7 | 1151.6 | 1146.3 | 1096.2 | 1128.1 | 1125.2 | 1150.1 |
| 62.5° | 1069.3 | 1075.2 | 1152.1 | 1270.2 | 1354.5 | 1306.9 | 1299.4 | 1216.8 | 1222.4 | 1212.6 | 1235.8 |
| 65°   | 962.7  | 971.9  | 1098.1 | 1258.1 | 1412.0 | 1428.3 | 1420.7 | 1323.2 | 1297.2 | 1281.2 | 1268.3 |
| 67.5° | 781.7  | 787.2  | 918.9  | 1152.6 | 1386.1 | 1500.7 | 1499.1 | 1416.5 | 1353.8 | 1269.6 | 1169.8 |
| 69°   | 646.0  | 651.4  | 778.2  | 1041.5 | 1329.1 | 1516.2 | 1519.2 | 1446.4 | 1343.0 | 1199.2 | 1036.5 |
| 70°   | 547.2  | 552.9  | 671.0  | 946.3  | 1262.9 | 1509.0 | 1514.4 | 1443.6 | 1312.2 | 1117.7 | 919.5  |
| 72.5° | 287.0  | 291.9  | 413.1  | 651.9  | 1029.6 | 1385.6 | 1401.9 | 1321.6 | 1112.3 | 811.7  | 543.7  |
| 75°   | 90.2   | 93.0   | 161.3  | 340.8  | 704.9  | 1077.4 | 1081.1 | 1036.7 | 789.8  | 446.5  | 226.4  |
| 77.5° | 34.4   | 33.6   | 53.7   | 125.6  | 356.4  | 678.4  | 701.3  | 647.8  | 414.5  | 157.9  | 52.3   |
| 80°   | 18.5   | 18.6   | 27.9   | 52.0   | 152.5  | 348.6  | 368.0  | 314.0  | 147.3  | 49.2   | 12.0   |
| 82.5° | 8.0    | 8.4    | 15.7   | 27.5   | 70.0   | 128.6  | 138.3  | 115.1  | 56.3   | 33.1   | 4.5    |
| 85°   | 1.7    | 1.9    | 7.6    | 15.0   | 28.5   | 36.1   | 37.8   | 37.3   | 35.8   | 25.7   | 1.7    |
| 87.5° | 0.0    | 0.0    | 3.4    | 5.4    | 7.2    | 8.2    | 7.2    | 9.4    | 19.8   | 17.3   | 0.9    |
| 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-PA1-19-730-24VDC-T4W-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°   | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 194.9  | 194.9 | 194.9 | 194.9 | 194.9 | 194.9 | 194.9 | 194.9 | 194.9 | 194.9 | 194.9 |
| 2.5°  | 195.1  | 193.4 | 190.6 | 187.5 | 185.3 | 183.0 | 181.2 | 180.4 | 179.5 | 178.8 | 179.7 |
| 5°    | 194.7  | 191.5 | 186.0 | 180.7 | 176.9 | 173.8 | 171.3 | 170.3 | 169.3 | 168.5 | 168.4 |
| 7.5°  | 197.9  | 193.4 | 185.0 | 177.3 | 171.4 | 167.2 | 163.7 | 162.2 | 161.0 | 160.5 | 160.0 |
| 10°   | 204.0  | 198.3 | 187.0 | 176.9 | 169.3 | 162.1 | 154.7 | 148.9 | 145.2 | 143.4 | 142.8 |
| 12.5° | 211.9  | 204.7 | 190.9 | 178.8 | 167.7 | 154.0 | 138.2 | 124.5 | 115.6 | 112.7 | 111.0 |
| 15°   | 221.2  | 212.3 | 195.9 | 181.3 | 162.1 | 137.1 | 110.2 | 92.3  | 84.1  | 82.4  | 80.6  |
| 17.5° | 230.2  | 220.3 | 201.9 | 181.7 | 149.6 | 109.5 | 80.7  | 68.6  | 65.4  | 66.5  | 66.8  |
| 20°   | 238.0  | 228.3 | 207.8 | 177.7 | 127.1 | 82.2  | 62.5  | 59.5  | 60.6  | 62.7  | 63.1  |
| 22.5° | 246.0  | 235.9 | 213.3 | 167.2 | 98.3  | 62.4  | 56.3  | 57.0  | 58.2  | 60.3  | 60.6  |
| 25°   | 255.6  | 245.2 | 218.4 | 147.7 | 73.8  | 53.1  | 53.4  | 54.5  | 55.7  | 57.6  | 57.8  |
| 27.5° | 266.7  | 257.0 | 221.8 | 122.5 | 54.7  | 48.8  | 50.0  | 51.6  | 52.8  | 54.6  | 55.0  |
| 30°   | 281.5  | 272.5 | 222.9 | 96.3  | 45.9  | 45.0  | 45.5  | 47.5  | 49.2  | 50.9  | 51.2  |
| 32.5° | 295.4  | 287.8 | 219.2 | 72.7  | 42.5  | 41.4  | 41.4  | 42.6  | 44.6  | 46.1  | 46.5  |
| 35°   | 308.1  | 303.2 | 207.6 | 53.2  | 39.9  | 38.1  | 37.2  | 37.2  | 38.5  | 39.8  | 40.1  |
| 37.5° | 325.0  | 324.8 | 188.7 | 42.4  | 37.5  | 35.4  | 33.5  | 32.0  | 31.6  | 31.8  | 32.0  |
| 40°   | 353.9  | 354.2 | 164.1 | 38.0  | 35.4  | 32.6  | 29.6  | 27.0  | 24.5  | 23.7  | 23.6  |
| 42.5° | 399.1  | 395.0 | 138.3 | 35.9  | 33.6  | 29.6  | 25.3  | 21.7  | 17.9  | 16.7  | 16.6  |
| 45°   | 470.7  | 446.4 | 110.9 | 34.0  | 31.6  | 26.4  | 20.9  | 16.1  | 12.9  | 12.0  | 12.0  |
| 47.5° | 575.2  | 514.0 | 85.9  | 31.9  | 29.1  | 22.6  | 15.8  | 11.6  | 9.5   | 9.0   | 9.1   |
| 50°   | 683.1  | 580.2 | 65.8  | 29.3  | 26.0  | 18.7  | 11.7  | 8.4   | 7.2   | 7.2   | 7.3   |
| 52.5° | 778.9  | 628.7 | 51.3  | 26.4  | 22.2  | 14.7  | 8.8   | 6.6   | 6.0   | 5.9   | 6.0   |
| 55°   | 868.5  | 660.0 | 39.3  | 23.2  | 17.6  | 10.9  | 6.7   | 5.4   | 5.0   | 4.8   | 4.7   |
| 57.5° | 955.0  | 675.5 | 29.5  | 18.7  | 12.8  | 7.9   | 5.4   | 4.6   | 4.2   | 3.9   | 3.8   |
| 60°   | 1012.5 | 662.9 | 20.2  | 13.8  | 8.8   | 5.7   | 4.5   | 3.9   | 3.5   | 3.2   | 3.1   |
| 62.5° | 1045.0 | 628.5 | 13.0  | 9.9   | 6.3   | 4.3   | 3.6   | 3.3   | 2.6   | 2.4   | 2.4   |
| 65°   | 1031.9 | 571.8 | 9.1   | 7.1   | 4.6   | 3.2   | 2.6   | 2.6   | 1.9   | 1.6   | 1.5   |
| 67.5° | 914.4  | 483.1 | 6.9   | 5.3   | 3.3   | 2.4   | 2.0   | 2.3   | 1.2   | 0.7   | 0.7   |
| 69°   | 786.7  | 400.3 | 5.9   | 4.4   | 2.7   | 1.9   | 1.7   | 2.1   | 0.8   | 0.5   | 0.5   |
| 70°   | 683.8  | 345.4 | 5.4   | 3.8   | 2.3   | 1.6   | 1.6   | 2.0   | 0.8   | 0.5   | 0.4   |
| 72.5° | 409.1  | 192.6 | 4.1   | 2.7   | 1.5   | 1.3   | 1.3   | 2.3   | 0.8   | 0.5   | 0.4   |
| 75°   | 165.3  | 67.8  | 3.0   | 1.9   | 1.1   | 1.1   | 1.6   | 2.9   | 0.7   | 0.4   | 0.3   |
| 77.5° | 37.5   | 14.9  | 1.7   | 1.2   | 0.7   | 1.1   | 1.8   | 2.3   | 0.5   | 0.2   | 0.0   |
| 80°   | 9.1    | 3.6   | 1.1   | 0.7   | 0.5   | 0.8   | 1.4   | 1.3   | 0.1   | 0.0   | 0.0   |
| 82.5° | 3.0    | 1.3   | 0.5   | 0.4   | 0.1   | 0.3   | 0.6   | 0.4   | 0.0   | 0.0   | 0.0   |
| 85°   | 1.3    | 0.7   | 0.2   | 0.1   | 0.0   | 0.0   | 0.1   | 0.0   | 0.0   | 0.0   | 0.0   |
| 87.5° | 0.8    | 0.3   | 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: SP1-2101-121-6

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

REPORT NUMBER: SP1-2101-121-6

### Photopic Flux vs. Wavelength



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| 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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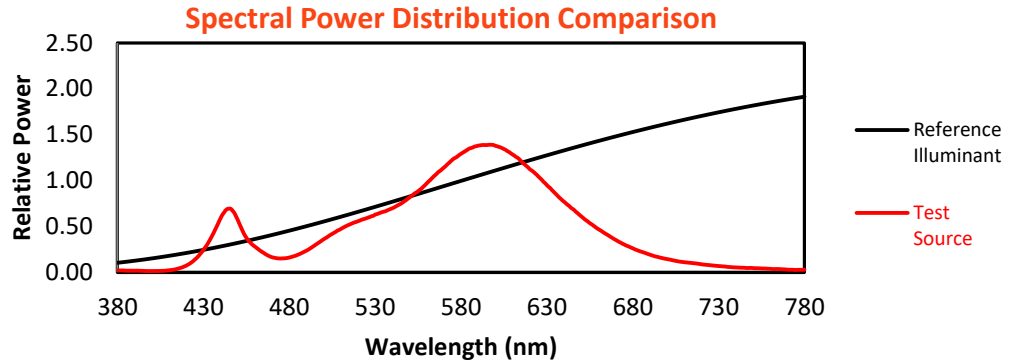
### Melanopic Flux vs. Wavelength


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

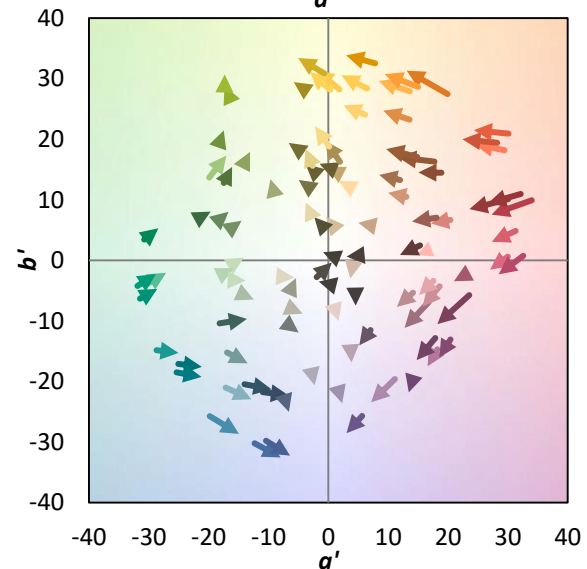
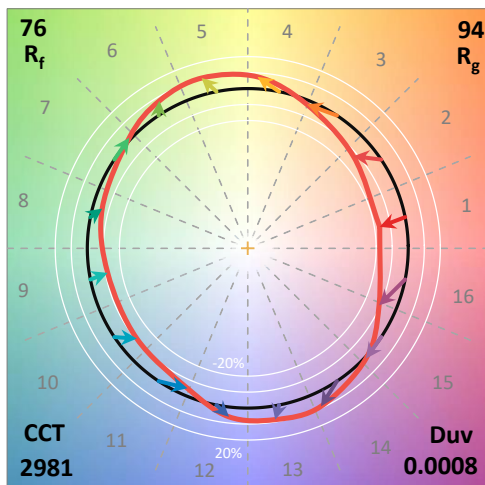
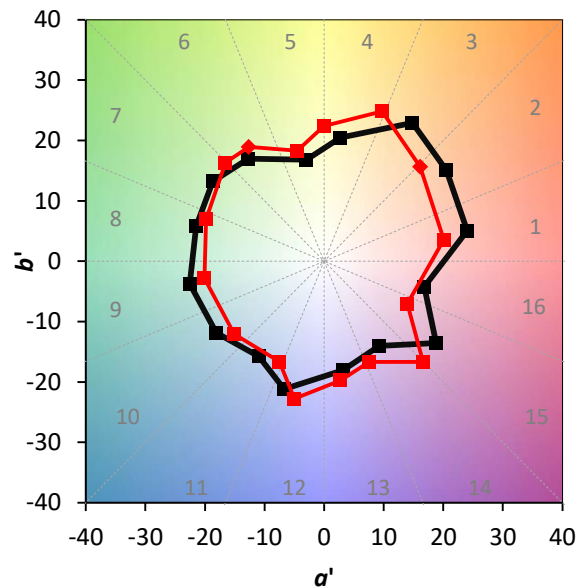
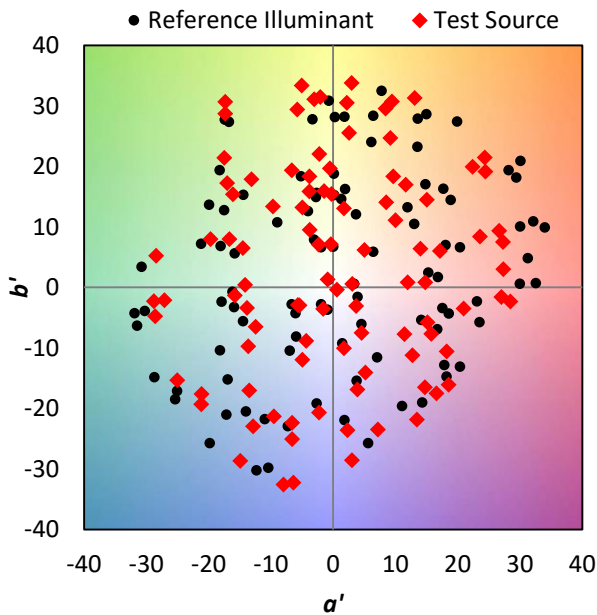
| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 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  $R_a = 72.3$   
 $R_g = -36.9$



### 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)