

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: INVUE

Report Number: P673243

Luminaire Tested: **CCP-SA1D-730-U-T3-HSS**

Issue Date: 04/16/2023

**Test Information**

Test Method: LM-79-08  
Report Number: P673243  
Test Lab: INNOVATION CENTER(G1)  
Issue Date: 04/16/2023  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: INVUE  
Catalog Number: CCP-SA1D-730-U-T3-HSS  
Description: INVUE CLEAR CURVE POLE MOUNT Light Square Luminaire @800mA w/ T3  
distribution lens and House Side Shield  
Light Source: (16) 3000K CCT, 70 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 3658.5 lumens  
Efficiency: N/A  
Efficacy: 83.1 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 0.5' x H: 0')  
IES Classification: Type III - Medium  
BUG Rating: B1 - U0 - G1

Input Watts (W): 44  
Input Voltage (V): 120  
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

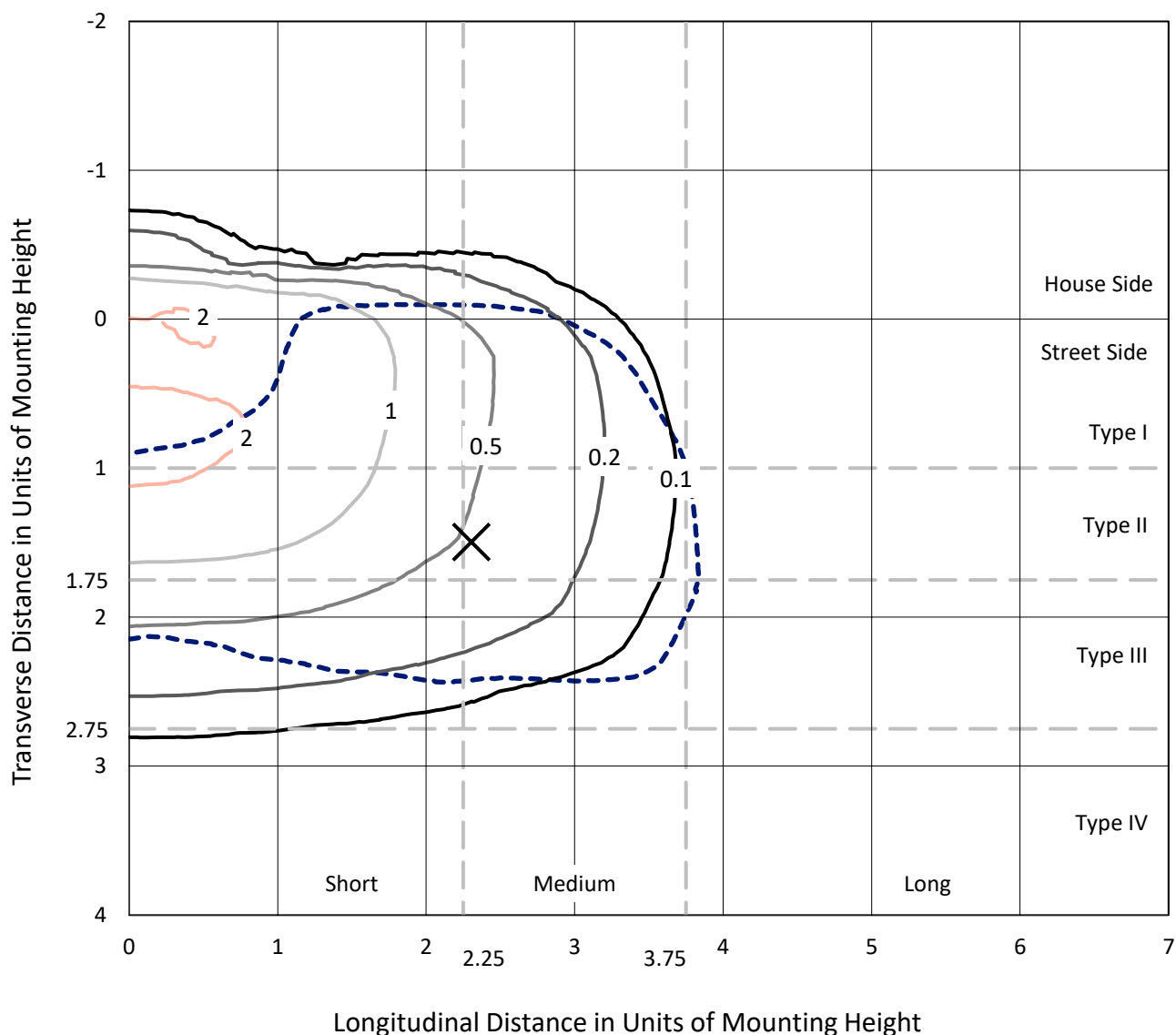
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CATALOG NUMBER: CCP-SA1D-730-U-T3-HSS

## Iso-Footcandle Lines of Horizontal Illumination

✕ Max cd

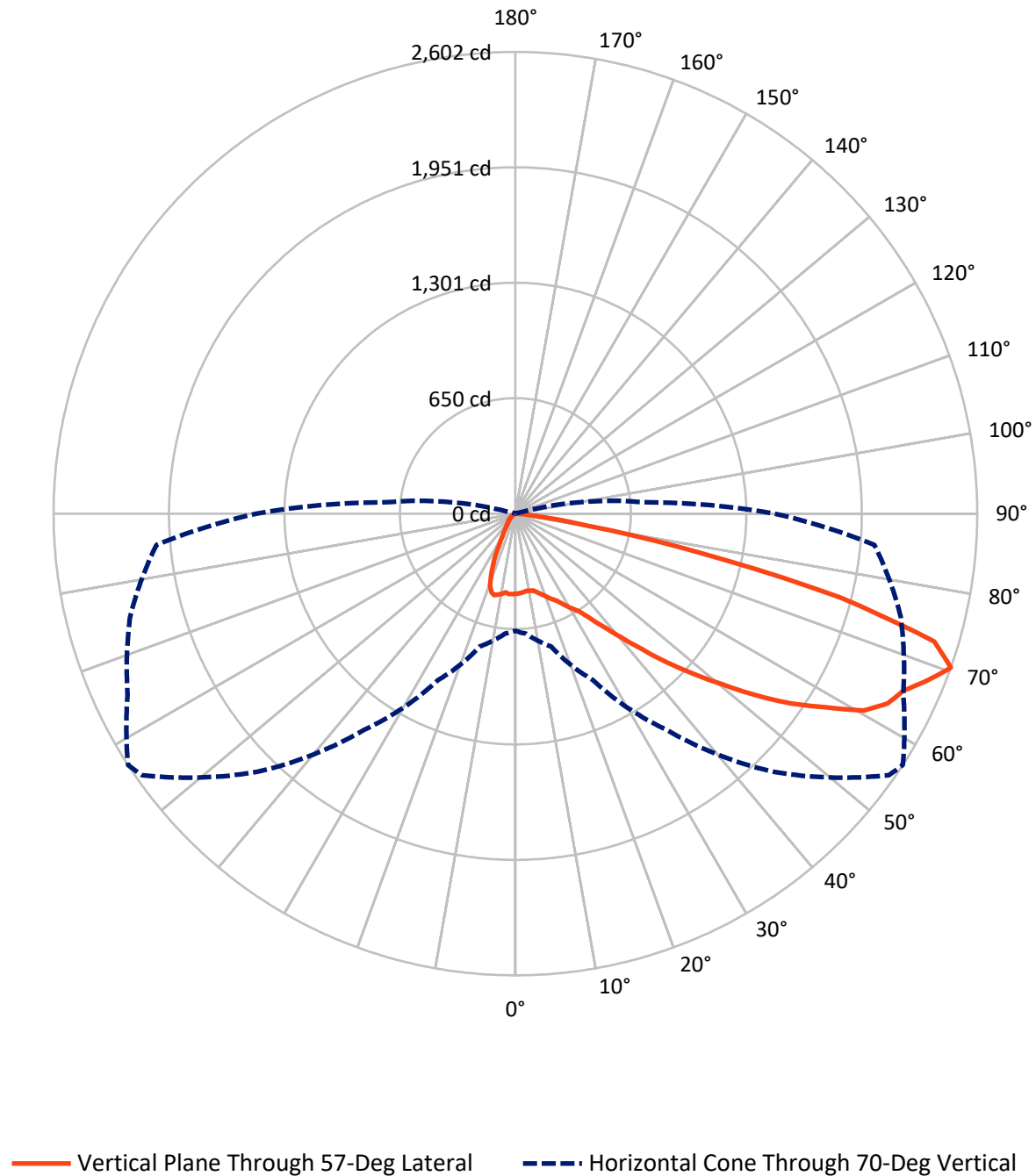
--- 1/2 Max cd



Based on 15 foot mounting height. Maximum calculated value = 2.6 fc  
 Type III - Medium - N/A

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## Luminous Intensity Polar Plot



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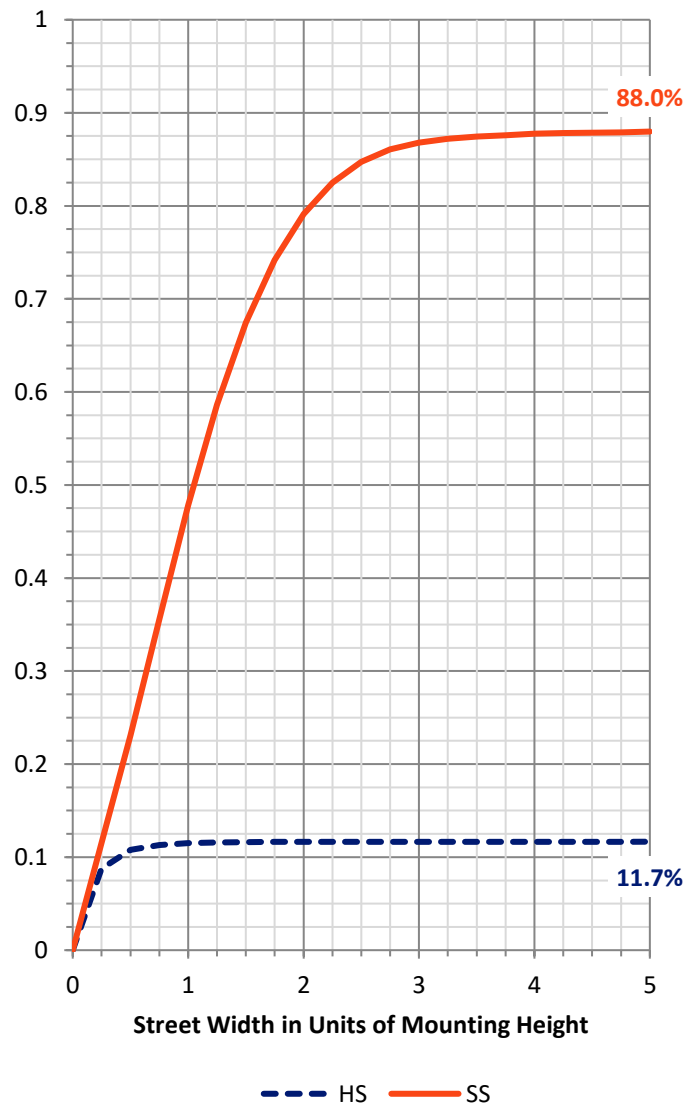
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 431.2    | 0.0    | 431.2  |
|                    | % Fixture | 11.8     | 0.0    | 11.8   |
| <b>Street Side</b> | Lumens    | 3227.3   | 0.0    | 3227.3 |
|                    | % Fixture | 88.2     | 0.0    | 88.2   |
| <b>Total</b>       | Lumens    | 3658.5   | 0.0    | 3658.5 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 42.2   | 1.2       |
| 10°-20°   | 117.9  | 3.2       |
| 20°-30°   | 198.7  | 5.4       |
| 30°-40°   | 340.0  | 9.3       |
| 40°-50°   | 570.9  | 15.6      |
| 50°-60°   | 876.3  | 24.0      |
| 60°-70°   | 1011.8 | 27.7      |
| 70°-80°   | 477.9  | 13.1      |
| 80°-90°   | 22.7   | 0.6       |
| 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°    | 3658.5 | 100.0     |
| 0°-180°   | 3658.5 | 100.0     |

**Coefficient of Utilization**



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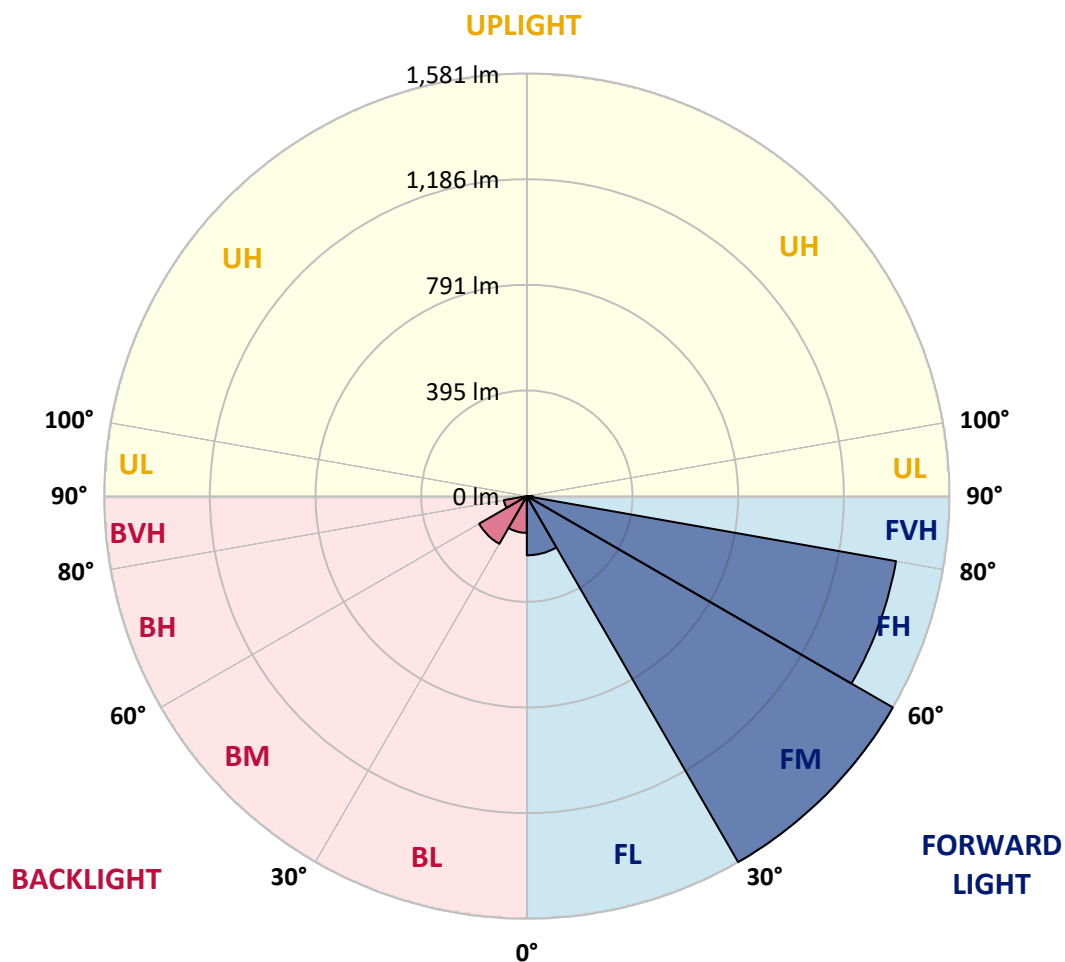
CATALOG NUMBER: CCP-SA1D-730-U-T3-HSS

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 221.3  | 6.0       |                         |      |         |
| FM   | (30°-60°)   | 1581.1 | 43.2      |                         |      |         |
| FH   | (60°-80°)   | 1402.5 | 38.3      |                         |      | G1/1800 |
| FVH  | (80°-90°)   | 22.3   | 0.6       |                         |      | G1/100  |
| BL   | (0°-30°)    | 137.5  | 3.8       | B1/500                  |      |         |
| BM   | (30°-60°)   | 206.1  | 5.6       | B0/220                  |      |         |
| BH   | (60°-80°)   | 87.2   | 2.4       | 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 III Medium





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 57°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 451.4  | 451.4  | 451.4  | 451.4  | 451.4  | 451.4  | 451.4  | 451.4  | 451.4  | 451.4  | 451.4  |
| 2.5°  | 444.9  | 442.1  | 444.9  | 448.6  | 444.9  | 447.7  | 446.7  | 449.5  | 445.8  | 445.8  | 448.6  |
| 5°    | 415.9  | 420.6  | 422.4  | 427.1  | 431.8  | 440.2  | 445.8  | 445.8  | 451.4  | 454.2  | 458.0  |
| 7.5°  | 405.6  | 398.1  | 405.6  | 409.4  | 414.0  | 428.0  | 436.5  | 440.2  | 447.7  | 458.0  | 463.6  |
| 10°   | 390.7  | 396.3  | 396.3  | 408.4  | 415.0  | 423.4  | 438.3  | 441.1  | 458.0  | 468.2  | 473.8  |
| 12.5° | 389.7  | 389.7  | 394.4  | 402.8  | 415.9  | 431.8  | 450.5  | 444.9  | 462.6  | 481.3  | 490.7  |
| 15°   | 392.5  | 399.1  | 399.1  | 410.3  | 420.6  | 443.0  | 458.9  | 459.8  | 485.1  | 503.7  | 512.2  |
| 17.5° | 404.7  | 401.9  | 405.6  | 412.2  | 428.0  | 449.5  | 475.7  | 478.5  | 507.5  | 532.7  | 544.9  |
| 20°   | 429.9  | 434.6  | 429.0  | 425.2  | 431.8  | 459.8  | 493.5  | 499.1  | 531.8  | 556.1  | 568.2  |
| 22.5° | 524.3  | 520.6  | 498.1  | 472.0  | 460.8  | 473.8  | 510.3  | 523.4  | 561.7  | 590.7  | 600.9  |
| 25°   | 630.9  | 624.3  | 598.1  | 558.9  | 507.5  | 501.9  | 543.9  | 543.9  | 599.1  | 630.9  | 628.0  |
| 27.5° | 731.8  | 729.9  | 699.1  | 658.0  | 585.1  | 544.9  | 571.0  | 581.3  | 641.1  | 667.3  | 655.1  |
| 30°   | 834.6  | 836.5  | 808.4  | 758.9  | 682.3  | 614.0  | 609.4  | 617.8  | 672.9  | 714.0  | 688.8  |
| 32.5° | 954.2  | 937.4  | 917.8  | 849.5  | 779.5  | 702.8  | 658.9  | 655.1  | 708.4  | 745.8  | 712.2  |
| 35°   | 1060.8 | 1050.5 | 1029.0 | 967.3  | 886.9  | 795.3  | 733.7  | 724.3  | 753.3  | 802.8  | 766.4  |
| 37.5° | 1154.2 | 1143.9 | 1115.9 | 1074.8 | 1012.2 | 910.3  | 823.4  | 809.4  | 821.5  | 873.8  | 829.9  |
| 40°   | 1234.6 | 1237.4 | 1229.9 | 1189.7 | 1131.8 | 1039.3 | 939.3  | 916.8  | 906.6  | 953.3  | 903.8  |
| 42.5° | 1292.5 | 1319.6 | 1321.5 | 1272.0 | 1225.3 | 1174.8 | 1062.6 | 1044.9 | 1020.6 | 1059.8 | 1025.2 |
| 45°   | 1414.0 | 1399.1 | 1408.4 | 1390.7 | 1339.3 | 1331.8 | 1204.7 | 1194.4 | 1160.8 | 1173.8 | 1137.4 |
| 47.5° | 1509.4 | 1506.6 | 1524.3 | 1495.3 | 1481.3 | 1482.3 | 1366.4 | 1348.6 | 1301.0 | 1325.3 | 1284.1 |
| 50°   | 1564.5 | 1549.6 | 1614.0 | 1636.5 | 1633.7 | 1644.9 | 1529.9 | 1515.0 | 1469.2 | 1504.7 | 1416.8 |
| 52.5° | 1577.6 | 1604.7 | 1665.4 | 1746.8 | 1781.3 | 1804.7 | 1708.4 | 1702.8 | 1653.3 | 1675.7 | 1554.2 |
| 55°   | 1610.3 | 1636.5 | 1672.0 | 1805.6 | 1933.7 | 1939.3 | 1884.1 | 1889.7 | 1845.8 | 1840.2 | 1685.1 |
| 57.5° | 1609.4 | 1603.8 | 1701.9 | 1857.0 | 2034.6 | 2115.0 | 2085.1 | 2058.0 | 2010.3 | 1955.2 | 1769.2 |
| 60°   | 1550.5 | 1547.7 | 1649.6 | 1863.6 | 2089.8 | 2273.9 | 2286.0 | 2254.2 | 2134.6 | 2053.3 | 1868.3 |
| 62.5° | 1433.7 | 1444.9 | 1547.7 | 1807.5 | 2142.1 | 2330.9 | 2375.7 | 2354.2 | 2205.6 | 2118.7 | 1985.1 |
| 65°   | 1300.0 | 1276.7 | 1396.3 | 1667.3 | 2024.3 | 2314.1 | 2411.3 | 2403.8 | 2289.8 | 2189.8 | 2092.6 |
| 67.5° | 1043.0 | 1053.3 | 1144.9 | 1434.6 | 1823.4 | 2252.4 | 2494.4 | 2505.6 | 2357.0 | 2252.4 | 2125.3 |
| 70°   | 660.8  | 679.4  | 774.8  | 1036.5 | 1488.8 | 2058.0 | 2569.2 | 2601.9 | 2410.3 | 2246.8 | 2029.9 |
| 72.5° | 192.5  | 200.0  | 329.9  | 516.8  | 948.6  | 1650.5 | 2449.6 | 2466.4 | 2306.6 | 2039.3 | 1570.1 |
| 75°   | 63.6   | 67.3   | 97.2   | 168.2  | 372.0  | 853.3  | 1809.4 | 1888.8 | 1835.5 | 1478.5 | 898.1  |
| 77.5° | 42.1   | 43.9   | 53.3   | 80.4   | 141.1  | 267.3  | 970.1  | 1055.2 | 1034.6 | 692.5  | 289.7  |
| 80°   | 30.8   | 31.8   | 39.3   | 54.2   | 86.0   | 96.3   | 357.9  | 414.0  | 400.0  | 158.9  | 57.9   |
| 82.5° | 19.6   | 19.6   | 29.0   | 38.3   | 54.2   | 47.7   | 103.7  | 115.0  | 112.2  | 60.7   | 22.4   |
| 85°   | 13.1   | 14.0   | 21.5   | 29.9   | 29.9   | 22.4   | 29.9   | 34.6   | 37.4   | 32.7   | 10.3   |
| 87.5° | 3.7    | 4.7    | 12.1   | 20.6   | 12.1   | 11.2   | 10.3   | 11.2   | 13.1   | 17.8   | 5.6    |
| 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: CCP-SA1D-730-U-T3-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 451.4  | 451.4  | 451.4 | 451.4 | 451.4 | 451.4 | 451.4 | 451.4 | 451.4 | 451.4 | 451.4 |
| 2.5°  | 451.4  | 455.1  | 454.2 | 456.1 | 453.3 | 450.5 | 453.3 | 453.3 | 453.3 | 450.5 | 448.6 |
| 5°    | 455.1  | 453.3  | 455.1 | 451.4 | 455.1 | 451.4 | 449.5 | 443.9 | 443.0 | 443.0 | 446.7 |
| 7.5°  | 460.8  | 462.6  | 454.2 | 454.2 | 445.8 | 447.7 | 443.0 | 443.9 | 442.1 | 439.3 | 437.4 |
| 10°   | 469.2  | 476.6  | 468.2 | 465.4 | 456.1 | 448.6 | 437.4 | 431.8 | 431.8 | 428.0 | 431.8 |
| 12.5° | 492.5  | 489.7  | 485.1 | 475.7 | 464.5 | 449.5 | 422.4 | 395.3 | 372.9 | 356.1 | 364.5 |
| 15°   | 511.2  | 510.3  | 503.7 | 486.0 | 471.0 | 425.2 | 357.0 | 286.9 | 249.5 | 232.7 | 229.9 |
| 17.5° | 540.2  | 537.4  | 526.2 | 502.8 | 453.3 | 352.3 | 244.9 | 186.0 | 149.5 | 141.1 | 138.3 |
| 20°   | 567.3  | 566.4  | 542.1 | 512.2 | 408.4 | 257.0 | 159.8 | 122.4 | 112.2 | 113.1 | 111.2 |
| 22.5° | 596.3  | 591.6  | 562.6 | 500.9 | 325.2 | 171.0 | 114.0 | 109.3 | 105.6 | 104.7 | 106.5 |
| 25°   | 629.0  | 612.2  | 583.2 | 475.7 | 239.3 | 117.8 | 107.5 | 103.7 | 100.0 | 99.1  | 99.1  |
| 27.5° | 642.1  | 630.9  | 592.5 | 415.0 | 151.4 | 102.8 | 100.9 | 96.3  | 91.6  | 88.8  | 87.9  |
| 30°   | 672.0  | 653.3  | 601.9 | 326.2 | 107.5 | 94.4  | 91.6  | 86.0  | 79.4  | 74.8  | 74.8  |
| 32.5° | 701.9  | 679.4  | 602.8 | 228.0 | 89.7  | 85.0  | 80.4  | 72.9  | 64.5  | 59.8  | 60.7  |
| 35°   | 739.3  | 708.4  | 592.5 | 147.7 | 80.4  | 74.8  | 65.4  | 57.0  | 49.5  | 45.8  | 45.8  |
| 37.5° | 802.8  | 773.8  | 550.5 | 97.2  | 72.9  | 63.6  | 54.2  | 44.9  | 38.3  | 35.5  | 35.5  |
| 40°   | 883.2  | 845.8  | 492.5 | 76.6  | 64.5  | 54.2  | 43.0  | 34.6  | 30.8  | 28.0  | 28.0  |
| 42.5° | 979.5  | 932.7  | 406.5 | 68.2  | 57.0  | 44.9  | 33.6  | 27.1  | 23.4  | 23.4  | 22.4  |
| 45°   | 1075.7 | 999.1  | 318.7 | 62.6  | 50.5  | 37.4  | 26.2  | 21.5  | 19.6  | 18.7  | 18.7  |
| 47.5° | 1213.1 | 1079.5 | 228.0 | 57.0  | 43.9  | 29.0  | 21.5  | 17.8  | 15.9  | 15.0  | 15.9  |
| 50°   | 1344.9 | 1155.2 | 161.7 | 51.4  | 36.4  | 23.4  | 17.8  | 15.9  | 14.0  | 13.1  | 13.1  |
| 52.5° | 1460.8 | 1207.5 | 113.1 | 44.9  | 30.8  | 19.6  | 15.9  | 14.0  | 13.1  | 12.1  | 12.1  |
| 55°   | 1524.3 | 1189.7 | 77.6  | 38.3  | 25.2  | 16.8  | 14.0  | 12.1  | 11.2  | 10.3  | 10.3  |
| 57.5° | 1589.7 | 1140.2 | 58.9  | 31.8  | 20.6  | 15.9  | 13.1  | 11.2  | 10.3  | 9.3   | 9.3   |
| 60°   | 1644.9 | 1103.8 | 45.8  | 25.2  | 16.8  | 13.1  | 11.2  | 9.3   | 8.4   | 7.5   | 6.5   |
| 62.5° | 1647.7 | 1030.9 | 33.6  | 18.7  | 13.1  | 11.2  | 9.3   | 7.5   | 4.7   | 3.7   | 2.8   |
| 65°   | 1658.9 | 954.2  | 24.3  | 14.0  | 9.3   | 8.4   | 6.5   | 3.7   | 1.9   | 0.0   | 0.0   |
| 67.5° | 1619.6 | 863.6  | 19.6  | 10.3  | 6.5   | 4.7   | 2.8   | 0.9   | 0.0   | 0.0   | 0.0   |
| 70°   | 1459.8 | 729.0  | 15.0  | 7.5   | 4.7   | 2.8   | 0.9   | 0.0   | 0.0   | 0.0   | 0.0   |
| 72.5° | 1044.9 | 473.8  | 10.3  | 5.6   | 1.9   | 0.9   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 75°   | 557.0  | 201.9  | 7.5   | 3.7   | 0.9   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 77.5° | 174.8  | 51.4   | 4.7   | 1.9   | 0.9   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 80°   | 38.3   | 14.0   | 2.8   | 0.9   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 82.5° | 13.1   | 5.6    | 1.9   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 85°   | 4.7    | 1.9    | 0.9   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 87.5° | 1.9    | 0.9    | 0.9   | 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

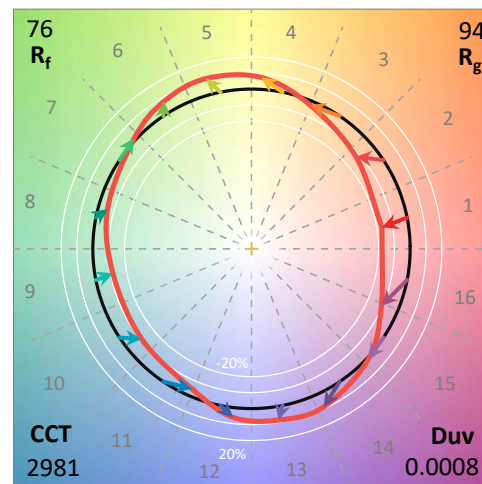
### Test Information

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

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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

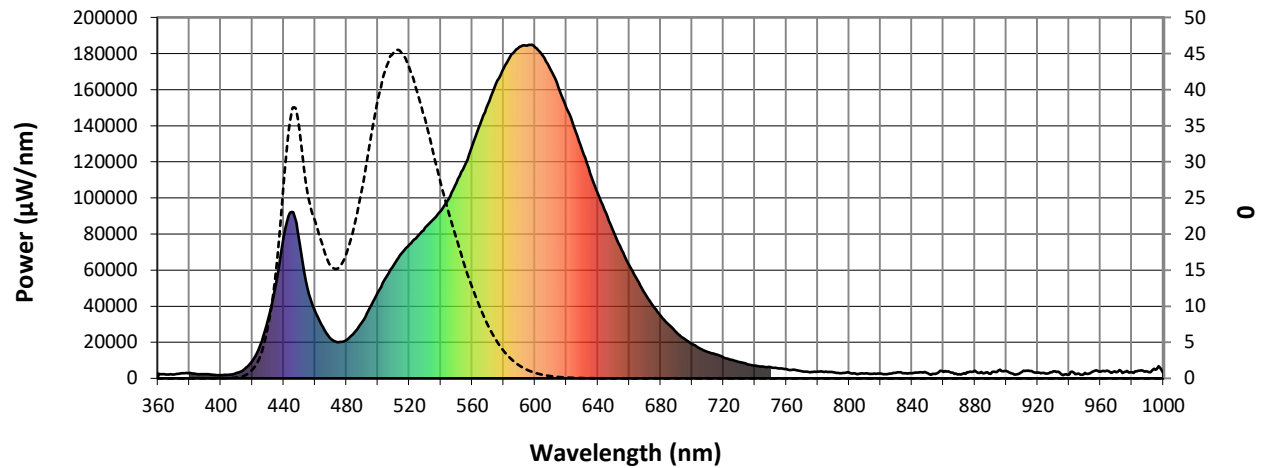


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| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 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              |           |                  |                  |

REPORT NUMBER: SP1-2101-121-6

### Scotopic Flux vs. Wavelength



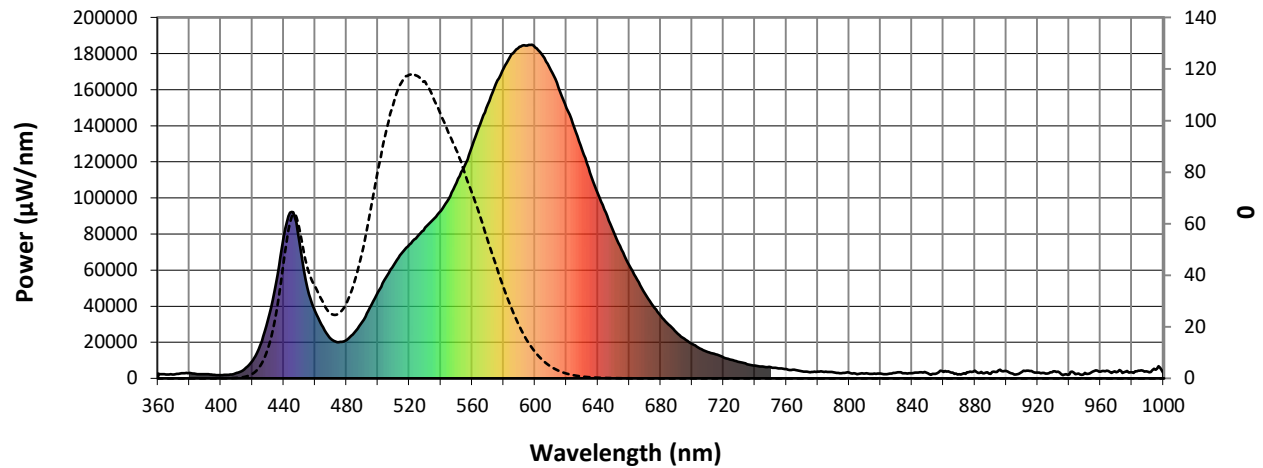
Scotopic Lumens: 10635.1

S/P: 1.22

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 2718             | 0.0              | 490       | 31388            | 48.3             | 620       | 149681           | 1.9              | 750       | 6127             | 0.0              | 880       | 4244             | 0.0              |
| 365       | 2104             | 0.0              | 495       | 39325            | 63.6             | 625       | 139059           | 1.2              | 755       | 5537             | 0.0              | 885       | 2890             | 0.0              |
| 370       | 2172             | 0.0              | 500       | 47816            | 80.0             | 630       | 126485           | 0.7              | 760       | 5066             | 0.0              | 890       | 2506             | 0.0              |
| 375       | 2770             | 0.0              | 505       | 55667            | 94.6             | 635       | 114115           | 0.4              | 765       | 4739             | 0.0              | 895       | 4522             | 0.0              |
| 380       | 2942             | 0.0              | 510       | 62766            | 106.4            | 640       | 102385           | 0.3              | 770       | 3828             | 0.0              | 900       | 4104             | 0.0              |
| 385       | 2372             | 0.0              | 515       | 69117            | 114.6            | 645       | 91895            | 0.2              | 775       | 3411             | 0.0              | 905       | 2090             | 0.0              |
| 390       | 2265             | 0.0              | 520       | 74088            | 117.8            | 650       | 81196            | 0.1              | 780       | 3776             | 0.0              | 910       | 3618             | 0.0              |
| 395       | 2023             | 0.0              | 525       | 78477            | 117.4            | 655       | 71232            | 0.1              | 785       | 3744             | 0.0              | 915       | 4126             | 0.0              |
| 400       | 1804             | 0.0              | 530       | 83585            | 115.2            | 660       | 62529            | 0.0              | 790       | 3446             | 0.0              | 920       | 3214             | 0.0              |
| 405       | 2029             | 0.1              | 535       | 87899            | 109.5            | 665       | 54721            | 0.0              | 795       | 2834             | 0.0              | 925       | 2696             | 0.0              |
| 410       | 2968             | 0.2              | 540       | 92850            | 102.6            | 670       | 47069            | 0.0              | 800       | 3213             | 0.0              | 930       | 3892             | 0.0              |
| 415       | 5120             | 0.5              | 545       | 99487            | 95.4             | 675       | 40348            | 0.0              | 805       | 2357             | 0.0              | 935       | 2376             | 0.0              |
| 420       | 9660             | 1.6              | 550       | 108411           | 88.6             | 680       | 34816            | 0.0              | 810       | 2616             | 0.0              | 940       | 2172             | 0.0              |
| 425       | 18379            | 4.5              | 555       | 117570           | 80.3             | 685       | 29890            | 0.0              | 815       | 2510             | 0.0              | 945       | 2531             | 0.0              |
| 430       | 32455            | 11.0             | 560       | 128783           | 72.0             | 690       | 25584            | 0.0              | 820       | 2684             | 0.0              | 950       | 3041             | 0.0              |
| 435       | 52561            | 23.5             | 565       | 140888           | 63.2             | 695       | 21945            | 0.0              | 825       | 2434             | 0.0              | 955       | 3777             | 0.0              |
| 440       | 78320            | 43.8             | 570       | 151789           | 53.6             | 700       | 19163            | 0.0              | 830       | 3163             | 0.0              | 960       | 3733             | 0.0              |
| 445       | 92278            | 61.8             | 575       | 163210           | 44.4             | 705       | 16563            | 0.0              | 835       | 2905             | 0.0              | 965       | 4082             | 0.0              |
| 450       | 75996            | 58.9             | 580       | 171760           | 35.4             | 710       | 14632            | 0.0              | 840       | 2917             | 0.0              | 970       | 3333             | 0.0              |
| 455       | 50251            | 43.9             | 585       | 179606           | 27.4             | 715       | 13282            | 0.0              | 845       | 3384             | 0.0              | 975       | 3396             | 0.0              |
| 460       | 37320            | 36.0             | 590       | 183682           | 20.5             | 720       | 11587            | 0.0              | 850       | 2926             | 0.0              | 980       | 3415             | 0.0              |
| 465       | 28321            | 29.9             | 595       | 184440           | 14.7             | 725       | 10271            | 0.0              | 855       | 2420             | 0.0              | 985       | 4316             | 0.0              |
| 470       | 21814            | 25.1             | 600       | 183413           | 10.3             | 730       | 9052             | 0.0              | 860       | 3637             | 0.0              | 990       | 3771             | 0.0              |
| 475       | 19996            | 25.0             | 605       | 178745           | 7.0              | 735       | 7872             | 0.0              | 865       | 3162             | 0.0              | 995       | 4745             | 0.0              |
| 480       | 21364            | 28.9             | 610       | 170867           | 4.6              | 740       | 7066             | 0.0              | 870       | 2292             | 0.0              | 1000      | 2768             | 0.0              |
| 485       | 25425            | 36.9             | 615       | 161088           | 3.0              | 745       | 6501             | 0.0              | 875       | 3357             | 0.0              |           |                  |                  |

REPORT NUMBER: SP1-2101-121-6

### Melanopic Flux vs. Wavelength


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

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 2718             | 0.0              | 490       | 31388            | 26.1             | 620       | 149681           | 0.1              | 750       | 6127             | 0.0              | 880       | 4244             | 0.0              |
| 365       | 2104             | 0.0              | 495       | 39325            | 32.5             | 625       | 139059           | 0.1              | 755       | 5537             | 0.0              | 885       | 2890             | 0.0              |
| 370       | 2172             | 0.0              | 500       | 47816            | 38.4             | 630       | 126485           | 0.0              | 760       | 5066             | 0.0              | 890       | 2506             | 0.0              |
| 375       | 2770             | 0.0              | 505       | 55667            | 42.7             | 635       | 114115           | 0.0              | 765       | 4739             | 0.0              | 895       | 4522             | 0.0              |
| 380       | 2942             | 0.0              | 510       | 62766            | 45.1             | 640       | 102385           | 0.0              | 770       | 3828             | 0.0              | 900       | 4104             | 0.0              |
| 385       | 2372             | 0.0              | 515       | 69117            | 45.2             | 645       | 91895            | 0.0              | 775       | 3411             | 0.0              | 905       | 2090             | 0.0              |
| 390       | 2265             | 0.0              | 520       | 74088            | 43.1             | 650       | 81196            | 0.0              | 780       | 3776             | 0.0              | 910       | 3618             | 0.0              |
| 395       | 2023             | 0.0              | 525       | 78477            | 39.8             | 655       | 71232            | 0.0              | 785       | 3744             | 0.0              | 915       | 4126             | 0.0              |
| 400       | 1804             | 0.0              | 530       | 83585            | 36.1             | 660       | 62529            | 0.0              | 790       | 3446             | 0.0              | 920       | 3214             | 0.0              |
| 405       | 2029             | 0.0              | 535       | 87899            | 31.6             | 665       | 54721            | 0.0              | 795       | 2834             | 0.0              | 925       | 2696             | 0.0              |
| 410       | 2968             | 0.1              | 540       | 92850            | 27.2             | 670       | 47069            | 0.0              | 800       | 3213             | 0.0              | 930       | 3892             | 0.0              |
| 415       | 5120             | 0.3              | 545       | 99487            | 23.1             | 675       | 40348            | 0.0              | 805       | 2357             | 0.0              | 935       | 2376             | 0.0              |
| 420       | 9660             | 1.1              | 550       | 108411           | 19.5             | 680       | 34816            | 0.0              | 810       | 2616             | 0.0              | 940       | 2172             | 0.0              |
| 425       | 18379            | 2.9              | 555       | 117570           | 15.9             | 685       | 29890            | 0.0              | 815       | 2510             | 0.0              | 945       | 2531             | 0.0              |
| 430       | 32455            | 6.9              | 560       | 128783           | 12.7             | 690       | 25584            | 0.0              | 820       | 2684             | 0.0              | 950       | 3041             | 0.0              |
| 435       | 52561            | 14.0             | 565       | 140888           | 9.9              | 695       | 21945            | 0.0              | 825       | 2434             | 0.0              | 955       | 3777             | 0.0              |
| 440       | 78320            | 26.2             | 570       | 151789           | 7.4              | 700       | 19163            | 0.0              | 830       | 3163             | 0.0              | 960       | 3733             | 0.0              |
| 445       | 92278            | 36.4             | 575       | 163210           | 5.4              | 705       | 16563            | 0.0              | 835       | 2905             | 0.0              | 965       | 4082             | 0.0              |
| 450       | 75996            | 35.0             | 580       | 171760           | 3.8              | 710       | 14632            | 0.0              | 840       | 2917             | 0.0              | 970       | 3333             | 0.0              |
| 455       | 50251            | 26.3             | 585       | 179606           | 2.7              | 715       | 13282            | 0.0              | 845       | 3384             | 0.0              | 975       | 3396             | 0.0              |
| 460       | 37320            | 22.0             | 590       | 183682           | 1.8              | 720       | 11587            | 0.0              | 850       | 2926             | 0.0              | 980       | 3415             | 0.0              |
| 465       | 28321            | 18.5             | 595       | 184440           | 1.2              | 725       | 10271            | 0.0              | 855       | 2420             | 0.0              | 985       | 4316             | 0.0              |
| 470       | 21814            | 15.6             | 600       | 183413           | 0.8              | 730       | 9052             | 0.0              | 860       | 3637             | 0.0              | 990       | 3771             | 0.0              |
| 475       | 19996            | 15.3             | 605       | 178745           | 0.5              | 735       | 7872             | 0.0              | 865       | 3162             | 0.0              | 995       | 4745             | 0.0              |
| 480       | 21364            | 17.2             | 610       | 170867           | 0.3              | 740       | 7066             | 0.0              | 870       | 2292             | 0.0              | 1000      | 2768             | 0.0              |
| 485       | 25425            | 21.0             | 615       | 161088           | 0.2              | 745       | 6501             | 0.0              | 875       | 3357             | 0.0              |           |                  |                  |

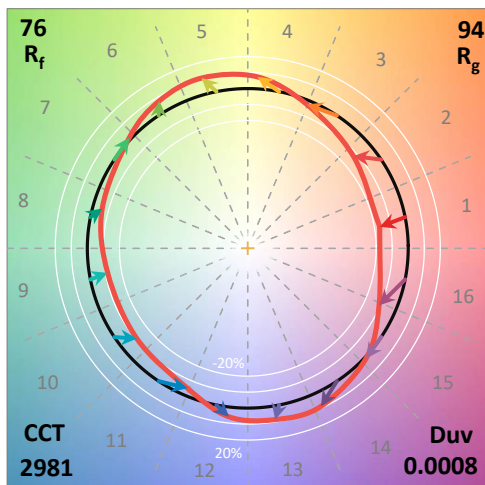
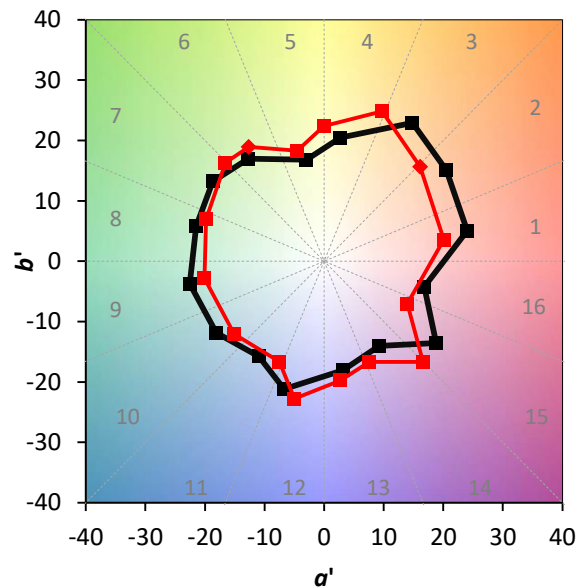
### Summary

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

### Spectral Power Distribution Comparison



### Color Vector Graphics



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

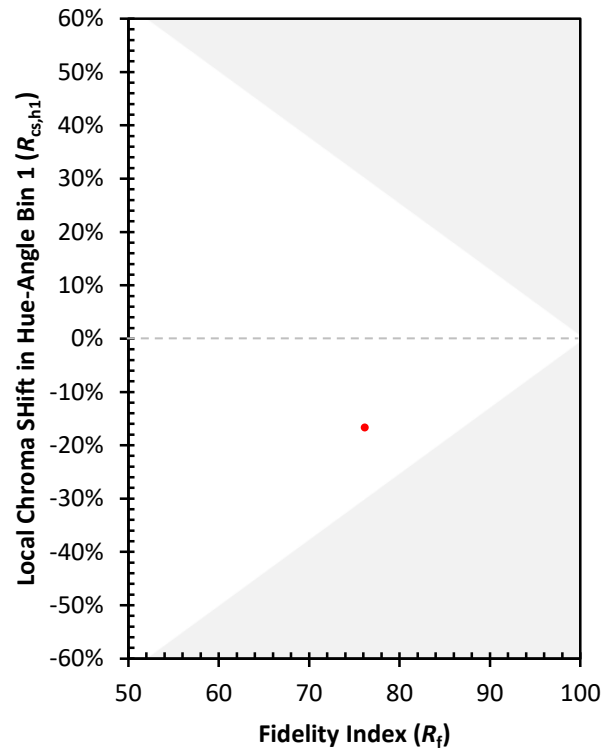
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 67 | CES51 = 88 | CES76 = 64 |
| CES02 = 63 | CES27 = 88 | CES52 = 87 | CES77 = 81 |
| CES03 = 31 | CES28 = 88 | CES53 = 79 | CES78 = 67 |
| CES04 = 71 | CES29 = 66 | CES54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



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)