

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: INVUE

Report Number: P670775

Luminaire Tested: **CCP-SA1F-722-U-T3**

Issue Date: 04/16/2023



**Test Information**

Test Method: LM-79-08  
Report Number: P670775  
Test Lab: INNOVATION CENTER(G1)  
Issue Date: 04/16/2023  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: INVUE  
Catalog Number: CCP-SA1F-722-U-T3  
Description: INVUE CLEAR CURVE POLE MOUNT LIGHT SQUARE LUMINAIRE @1200mA w/ T3  
distribution lens  
Light Source: (16) 2200K CCT, 70 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

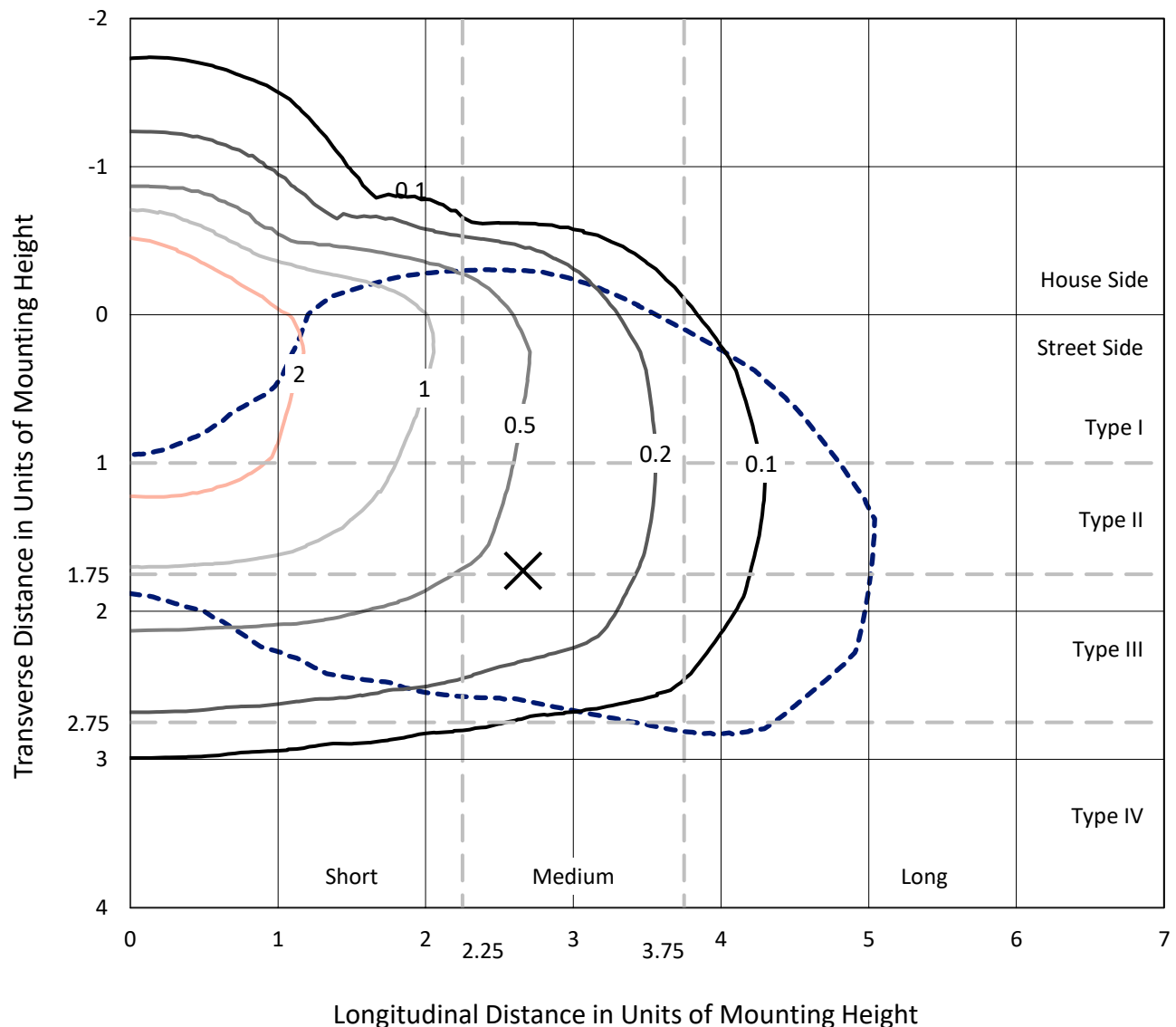
Lumens per Lamp: N/A  
Luminaire Lumens: 5580.2 lumens  
Efficiency: N/A  
Efficacy: 83.3 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 0.5' x H: 0')  
IES Classification: Type III - Medium  
BUG Rating: B1 - U0 - G2

Input Watts (W): 67  
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

REPORT NUMBER: P670775  
 CATALOG NUMBER: CCP-SA1F-722-U-T3

## Iso-Footcandle Lines of Horizontal Illumination

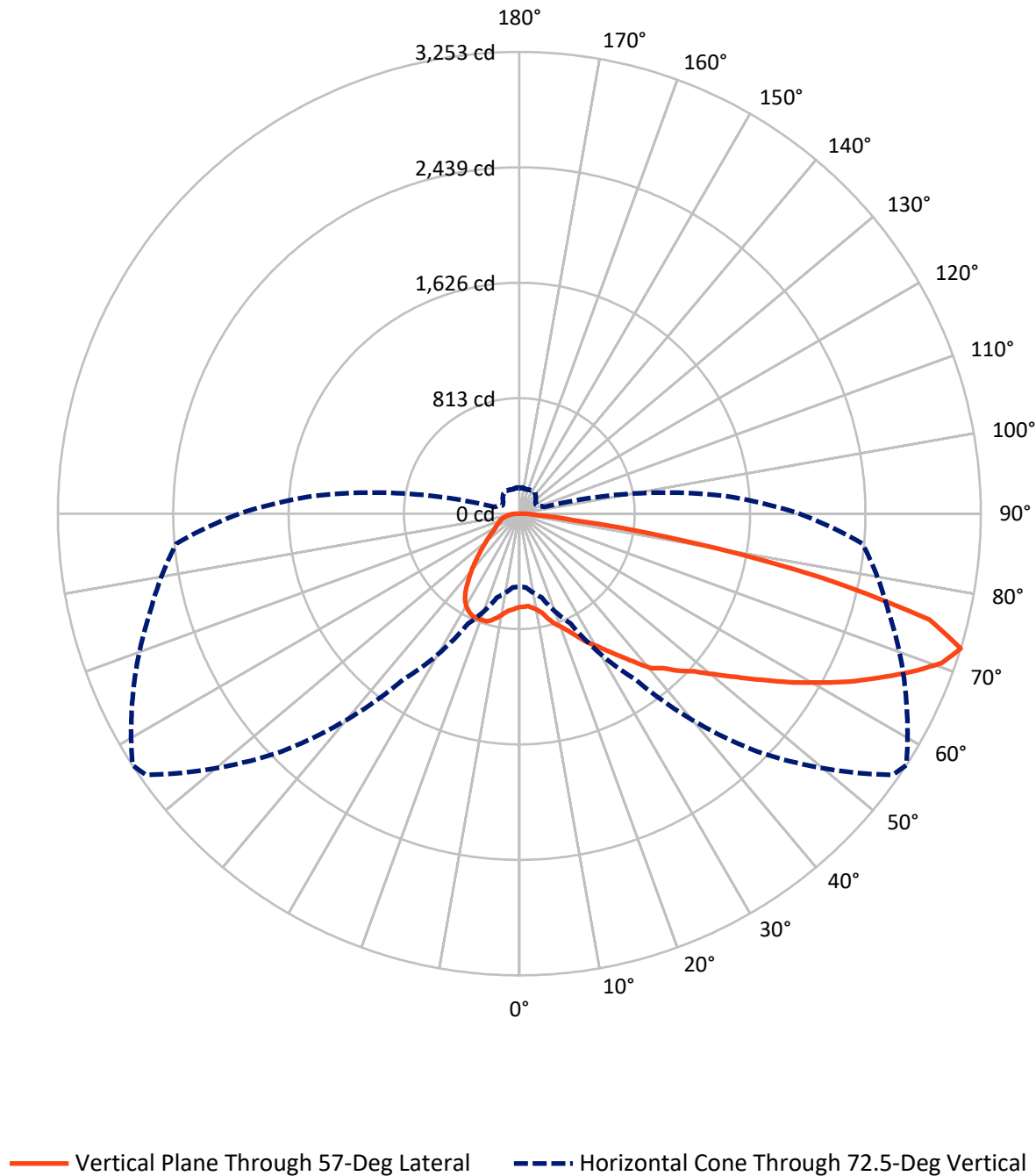
× Max cd  
 - - - 1/2 Max cd



Based on 15 foot mounting height. Maximum calculated value = 3.4 fc  
 Type III - Medium - N/A

REPORT NUMBER: P670775  
CATALOG NUMBER: CCP-SA1F-722-U-T3

## Luminous Intensity Polar Plot



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CATALOG NUMBER: CCP-SA1F-722-U-T3

**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 1303.2   | 0.0    | 1303.2 |
|                    | % Fixture | 23.4     | 0.0    | 23.4   |
| <b>Street Side</b> | Lumens    | 4277.0   | 0.0    | 4277.0 |
|                    | % Fixture | 76.6     | 0.0    | 76.6   |
| <b>Total</b>       | Lumens    | 5580.2   | 0.0    | 5580.2 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 65.4   | 1.2       |
| 10°-20°   | 220.3  | 3.9       |
| 20°-30°   | 402.8  | 7.2       |
| 30°-40°   | 590.9  | 10.6      |
| 40°-50°   | 813.6  | 14.6      |
| 50°-60°   | 1115.7 | 20.0      |
| 60°-70°   | 1344.9 | 24.1      |
| 70°-80°   | 895.9  | 16.1      |
| 80°-90°   | 130.5  | 2.3       |
| 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°    | 5580.2 | 100.0     |
| 0°-180°   | 5580.2 | 100.0     |

**Coefficient of Utilization**



REPORT NUMBER: P670775

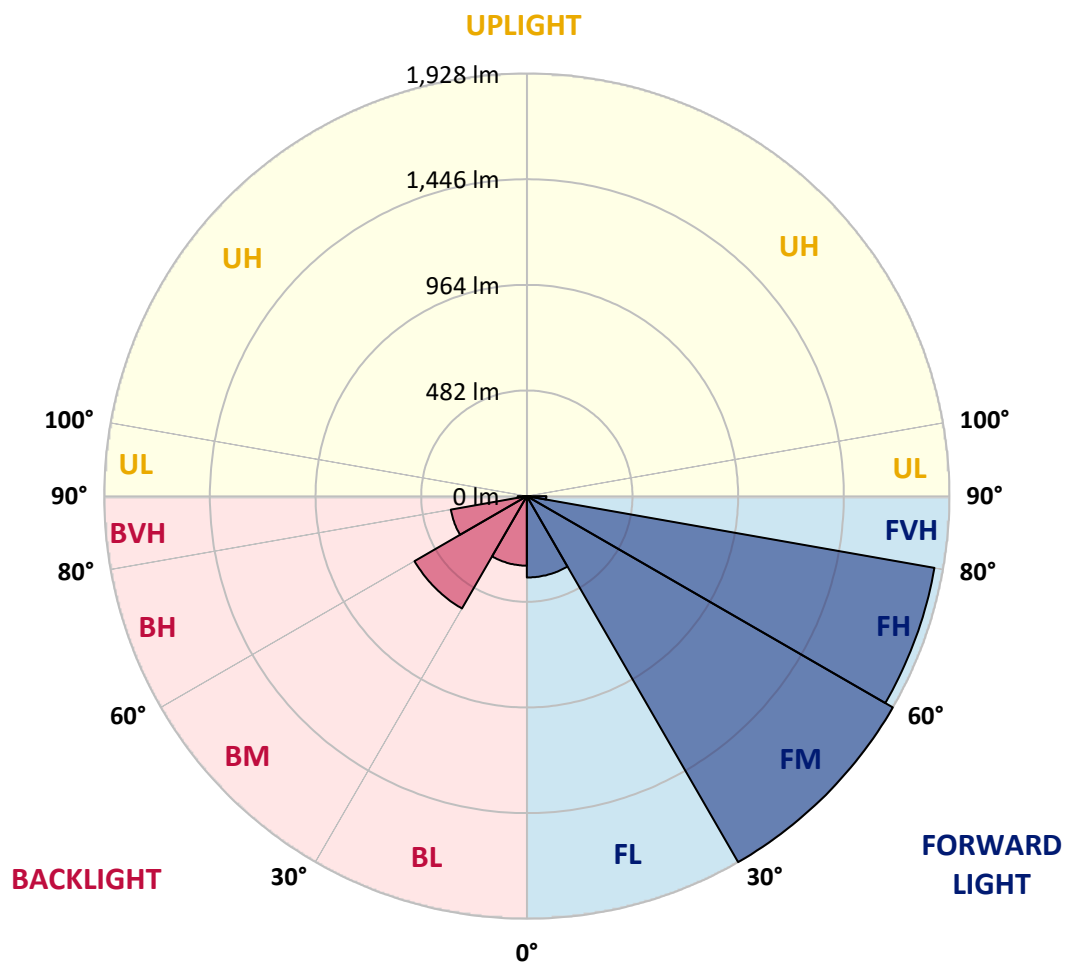
CATALOG NUMBER: CCP-SA1F-722-U-T3

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 371.2  | 6.7       |                         |      |         |
| FM   | (30°-60°)   | 1928.4 | 34.6      |                         |      |         |
| FH   | (60°-80°)   | 1888.5 | 33.8      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 88.9   | 1.6       |                         |      | G1/100  |
| BL   | (0°-30°)    | 317.3  | 5.7       | B1/500                  |      |         |
| BM   | (30°-60°)   | 591.9  | 10.6      | B1/1000                 |      |         |
| BH   | (60°-80°)   | 352.3  | 6.3       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 41.6   | 0.7       |                         |      | G1/100  |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B1-U0-G2**

Type III Medium



REPORT NUMBER: P670775

CATALOG NUMBER: CCP-SA1F-722-U-T3

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 57°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 658.6  | 658.6  | 658.6  | 658.6  | 658.6  | 658.6  | 658.6  | 658.6  | 658.6  | 658.6  | 658.6  |
| 2.5°  | 646.4  | 648.5  | 652.5  | 650.5  | 650.5  | 644.4  | 654.6  | 656.6  | 652.5  | 654.6  | 658.6  |
| 5°    | 646.4  | 650.5  | 656.6  | 652.5  | 654.6  | 652.5  | 648.5  | 654.6  | 654.6  | 656.6  | 662.7  |
| 7.5°  | 681.0  | 679.0  | 679.0  | 672.9  | 670.8  | 668.8  | 670.8  | 670.8  | 666.8  | 668.8  | 668.8  |
| 10°   | 719.6  | 719.6  | 715.6  | 715.6  | 711.5  | 701.3  | 691.2  | 689.1  | 683.0  | 685.1  | 685.1  |
| 12.5° | 760.3  | 764.3  | 768.4  | 756.2  | 752.1  | 735.9  | 729.8  | 717.6  | 717.6  | 713.5  | 711.5  |
| 15°   | 811.1  | 805.0  | 809.1  | 805.0  | 794.8  | 778.6  | 768.4  | 770.4  | 756.2  | 752.1  | 746.0  |
| 17.5° | 855.8  | 857.9  | 851.8  | 847.7  | 829.4  | 817.2  | 819.2  | 817.2  | 798.9  | 792.8  | 782.6  |
| 20°   | 908.7  | 906.6  | 906.6  | 894.4  | 878.2  | 861.9  | 855.8  | 853.8  | 857.9  | 845.7  | 821.3  |
| 22.5° | 963.6  | 955.4  | 955.4  | 945.3  | 922.9  | 912.7  | 908.7  | 900.5  | 904.6  | 894.4  | 857.9  |
| 25°   | 1008.3 | 1008.3 | 1022.5 | 1002.2 | 990.0  | 969.7  | 961.5  | 963.6  | 965.6  | 945.3  | 902.6  |
| 27.5° | 1067.2 | 1057.1 | 1071.3 | 1061.1 | 1055.0 | 1032.7 | 1022.5 | 1028.6 | 1024.5 | 1002.2 | 943.2  |
| 30°   | 1142.4 | 1144.5 | 1136.3 | 1122.1 | 1114.0 | 1097.7 | 1091.6 | 1085.5 | 1091.6 | 1063.2 | 988.0  |
| 32.5° | 1236.0 | 1242.1 | 1221.7 | 1205.5 | 1191.2 | 1175.0 | 1162.8 | 1156.7 | 1162.8 | 1120.1 | 1022.5 |
| 35°   | 1343.7 | 1349.8 | 1333.5 | 1315.2 | 1299.0 | 1258.3 | 1248.2 | 1238.0 | 1215.6 | 1146.5 | 1055.0 |
| 37.5° | 1443.3 | 1435.2 | 1431.1 | 1431.1 | 1400.6 | 1341.7 | 1335.6 | 1329.5 | 1286.8 | 1199.4 | 1099.8 |
| 40°   | 1510.4 | 1520.6 | 1516.5 | 1512.4 | 1508.4 | 1453.5 | 1441.3 | 1431.1 | 1360.0 | 1278.6 | 1162.8 |
| 42.5° | 1585.6 | 1579.5 | 1595.8 | 1601.9 | 1587.6 | 1571.4 | 1522.6 | 1488.0 | 1425.0 | 1360.0 | 1256.3 |
| 45°   | 1675.0 | 1671.0 | 1677.1 | 1699.4 | 1679.1 | 1685.2 | 1603.9 | 1579.5 | 1500.2 | 1461.6 | 1374.2 |
| 47.5° | 1754.3 | 1764.5 | 1795.0 | 1801.1 | 1784.8 | 1813.3 | 1699.4 | 1660.8 | 1610.0 | 1579.5 | 1496.2 |
| 50°   | 1788.9 | 1801.1 | 1870.2 | 1912.9 | 1914.9 | 1959.6 | 1795.0 | 1778.7 | 1709.6 | 1721.8 | 1648.6 |
| 52.5° | 1760.4 | 1799.0 | 1882.4 | 1994.2 | 2063.3 | 2108.0 | 1921.0 | 1912.9 | 1849.9 | 1888.5 | 1815.3 |
| 55°   | 1786.9 | 1823.4 | 1878.3 | 2034.9 | 2209.7 | 2219.8 | 2095.8 | 2065.3 | 2002.3 | 2055.2 | 1988.1 |
| 57.5° | 1799.0 | 1778.7 | 1882.4 | 2079.6 | 2317.4 | 2343.8 | 2262.5 | 2240.2 | 2191.4 | 2242.2 | 2203.6 |
| 60°   | 1703.5 | 1727.9 | 1825.5 | 2067.4 | 2323.5 | 2476.0 | 2449.6 | 2417.0 | 2372.3 | 2419.1 | 2396.7 |
| 62.5° | 1595.8 | 1612.0 | 1717.7 | 1994.2 | 2358.1 | 2571.5 | 2630.5 | 2606.1 | 2543.1 | 2583.7 | 2622.3 |
| 65°   | 1459.6 | 1461.6 | 1579.5 | 1864.1 | 2291.0 | 2626.4 | 2789.0 | 2787.0 | 2742.3 | 2732.1 | 2793.1 |
| 67.5° | 1292.9 | 1309.1 | 1402.6 | 1725.9 | 2199.5 | 2687.4 | 2945.6 | 2976.1 | 2886.6 | 2807.3 | 2829.7 |
| 70°   | 992.0  | 1008.3 | 1097.7 | 1414.8 | 2012.5 | 2669.1 | 3138.7 | 3154.9 | 2980.1 | 2778.9 | 2721.9 |
| 72.5° | 516.3  | 520.4  | 611.9  | 853.8  | 1427.0 | 2370.3 | 3209.8 | 3252.5 | 3004.5 | 2695.5 | 2427.2 |
| 75°   | 170.8  | 170.8  | 209.4  | 325.3  | 672.9  | 1516.5 | 2906.9 | 2984.2 | 2884.6 | 2488.2 | 1986.1 |
| 77.5° | 101.6  | 103.7  | 124.0  | 162.6  | 268.3  | 605.8  | 2049.1 | 2185.3 | 2360.1 | 2116.2 | 1451.4 |
| 80°   | 73.2   | 75.2   | 93.5   | 111.8  | 160.6  | 195.2  | 1028.6 | 1217.7 | 1449.4 | 1362.0 | 774.5  |
| 82.5° | 54.9   | 54.9   | 73.2   | 83.3   | 109.8  | 115.9  | 286.6  | 392.3  | 626.1  | 487.9  | 213.4  |
| 85°   | 56.9   | 56.9   | 56.9   | 59.0   | 75.2   | 67.1   | 119.9  | 128.1  | 183.0  | 160.6  | 59.0   |
| 87.5° | 20.3   | 22.4   | 56.9   | 38.6   | 38.6   | 28.5   | 46.8   | 50.8   | 65.1   | 67.1   | 22.4   |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |



REPORT NUMBER: P670775

CATALOG NUMBER: CCP-SA1F-722-U-T3

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 658.6  | 658.6  | 658.6 | 658.6 | 658.6 | 658.6 | 658.6 | 658.6 | 658.6 | 658.6 | 658.6 |
| 2.5°  | 660.7  | 660.7  | 662.7 | 662.7 | 666.8 | 670.8 | 676.9 | 672.9 | 672.9 | 674.9 | 672.9 |
| 5°    | 658.6  | 660.7  | 666.8 | 676.9 | 681.0 | 683.0 | 695.2 | 695.2 | 695.2 | 699.3 | 699.3 |
| 7.5°  | 666.8  | 670.8  | 681.0 | 691.2 | 693.2 | 699.3 | 715.6 | 719.6 | 729.8 | 733.8 | 735.9 |
| 10°   | 687.1  | 693.2  | 701.3 | 713.5 | 721.7 | 729.8 | 742.0 | 756.2 | 754.2 | 766.4 | 768.4 |
| 12.5° | 717.6  | 715.6  | 729.8 | 742.0 | 750.1 | 762.3 | 766.4 | 766.4 | 766.4 | 766.4 | 770.4 |
| 15°   | 742.0  | 746.0  | 758.2 | 766.4 | 776.5 | 774.5 | 766.4 | 758.2 | 760.3 | 758.2 | 758.2 |
| 17.5° | 778.6  | 778.6  | 788.7 | 790.8 | 794.8 | 774.5 | 762.3 | 762.3 | 768.4 | 768.4 | 764.3 |
| 20°   | 815.2  | 813.1  | 817.2 | 815.2 | 788.7 | 764.3 | 762.3 | 764.3 | 766.4 | 764.3 | 762.3 |
| 22.5° | 849.7  | 845.7  | 839.6 | 831.4 | 784.7 | 762.3 | 758.2 | 748.1 | 737.9 | 737.9 | 731.8 |
| 25°   | 880.2  | 876.1  | 859.9 | 835.5 | 782.6 | 750.1 | 729.8 | 705.4 | 693.2 | 687.1 | 695.2 |
| 27.5° | 908.7  | 900.5  | 878.2 | 835.5 | 764.3 | 717.6 | 679.0 | 648.5 | 638.3 | 630.2 | 638.3 |
| 30°   | 947.3  | 933.1  | 902.6 | 829.4 | 735.9 | 666.8 | 613.9 | 577.3 | 567.2 | 555.0 | 559.0 |
| 32.5° | 981.9  | 949.3  | 922.9 | 811.1 | 699.3 | 609.8 | 548.9 | 512.3 | 494.0 | 483.8 | 491.9 |
| 35°   | 1018.4 | 985.9  | 931.0 | 782.6 | 642.4 | 540.7 | 479.7 | 445.2 | 431.0 | 416.7 | 416.7 |
| 37.5° | 1055.0 | 1036.7 | 943.2 | 729.8 | 573.3 | 475.7 | 420.8 | 394.4 | 370.0 | 343.5 | 343.5 |
| 40°   | 1132.3 | 1107.9 | 957.5 | 668.8 | 504.1 | 412.7 | 374.0 | 339.5 | 315.1 | 278.5 | 276.5 |
| 42.5° | 1213.6 | 1160.7 | 957.5 | 595.6 | 443.2 | 367.9 | 331.4 | 294.8 | 250.0 | 227.7 | 229.7 |
| 45°   | 1317.3 | 1256.3 | 931.0 | 530.6 | 382.2 | 331.4 | 290.7 | 243.9 | 223.6 | 209.4 | 209.4 |
| 47.5° | 1447.4 | 1351.8 | 898.5 | 459.4 | 333.4 | 298.8 | 248.0 | 219.5 | 205.3 | 193.1 | 191.1 |
| 50°   | 1601.9 | 1439.2 | 857.9 | 398.4 | 292.7 | 268.3 | 225.6 | 203.3 | 191.1 | 183.0 | 183.0 |
| 52.5° | 1764.5 | 1567.3 | 829.4 | 343.5 | 260.2 | 227.7 | 209.4 | 195.2 | 185.0 | 178.9 | 176.9 |
| 55°   | 1929.1 | 1695.4 | 809.1 | 284.6 | 229.7 | 209.4 | 205.3 | 193.1 | 189.1 | 183.0 | 178.9 |
| 57.5° | 2114.1 | 1801.1 | 805.0 | 243.9 | 205.3 | 201.2 | 209.4 | 199.2 | 193.1 | 187.0 | 180.9 |
| 60°   | 2313.4 | 1943.4 | 768.4 | 211.4 | 193.1 | 197.2 | 203.3 | 193.1 | 189.1 | 183.0 | 178.9 |
| 62.5° | 2510.5 | 2049.1 | 668.8 | 187.0 | 180.9 | 185.0 | 193.1 | 185.0 | 178.9 | 180.9 | 183.0 |
| 65°   | 2591.8 | 2057.2 | 518.4 | 168.7 | 166.7 | 168.7 | 180.9 | 178.9 | 172.8 | 185.0 | 185.0 |
| 67.5° | 2510.5 | 1984.0 | 365.9 | 152.5 | 152.5 | 162.6 | 183.0 | 187.0 | 180.9 | 197.2 | 195.2 |
| 70°   | 2325.5 | 1803.1 | 248.0 | 142.3 | 146.4 | 172.8 | 189.1 | 185.0 | 176.9 | 197.2 | 193.1 |
| 72.5° | 1973.9 | 1443.3 | 180.9 | 132.1 | 138.2 | 164.7 | 187.0 | 183.0 | 176.9 | 185.0 | 176.9 |
| 75°   | 1481.9 | 1026.6 | 142.3 | 119.9 | 122.0 | 148.4 | 193.1 | 183.0 | 166.7 | 162.6 | 156.5 |
| 77.5° | 990.0  | 634.2  | 109.8 | 105.7 | 105.7 | 130.1 | 185.0 | 170.8 | 150.4 | 144.3 | 142.3 |
| 80°   | 471.6  | 254.1  | 87.4  | 89.4  | 91.5  | 111.8 | 168.7 | 152.5 | 136.2 | 128.1 | 128.1 |
| 82.5° | 150.4  | 95.5   | 73.2  | 73.2  | 73.2  | 91.5  | 140.3 | 128.1 | 117.9 | 111.8 | 101.6 |
| 85°   | 52.9   | 52.9   | 63.0  | 65.1  | 59.0  | 67.1  | 115.9 | 109.8 | 97.6  | 81.3  | 79.3  |
| 87.5° | 20.3   | 30.5   | 42.7  | 50.8  | 36.6  | 46.8  | 83.3  | 77.2  | 71.1  | 52.9  | 50.8  |
| 90°   | 0.0    | 0.0    | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |

LM-79-08: Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

STREETWORKS

Report Number: SP1-2101-121-4

Luminaire Tested: IFLD-S-SA2B-722-U-T3R

Test Date: 03/03/2021

### Test Information

Test Method: LM-79-08  
 Report Number: SP1-2101-121-4  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1  
 Measurement Geometry:  $4\pi$   
 Issue Date: 03/03/2021  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: STREETWORKS  
 Catalog Number: **IFLD-S-SA2B-722-U-T3R**  
 Description: STREETWORKS INF FLOOD

PROGRAMMED @ 800mA.

### Spectral Parameters

|                           |         |           |      |      |       |
|---------------------------|---------|-----------|------|------|-------|
| CCT (K):                  | 2218    | CRI (Ra): | 72.2 |      |       |
| CIE u':                   | 0.2889  | R1:       | 69.1 | R9:  | -16.8 |
| CIE v':                   | 0.5350  | R2:       | 83.2 | R10: | 61.9  |
| Duv:                      | -0.0005 | R3:       | 95.4 | R11: | 60.1  |
| CIE x:                    | 0.5026  | R4:       | 66.4 | R12: | 51.2  |
| CIE y:                    | 0.4136  | R5:       | 66.2 | R13: | 71.3  |
| CIE z:                    | 0.0839  | R6:       | 76.7 | R14: | 97.1  |
| Peak Wavelength (nm):     | 606     | R7:       | 76.7 |      |       |
| Dominant Wavelength (nm): | 587     | R8:       | 43.9 |      |       |
| Purity:                   | 75.3    |           |      |      |       |
| Rf:                       | 70      |           |      |      |       |
| Rg:                       | 99.3    |           |      |      |       |



### Test Conditions

Stabilization Time: 95M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.3/31%  
 Sphere Temperature (°C): 24.8

REPORT NUMBER: SP1-2101-121-4

| 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: SP1-2101-121-4

**CIE 1931 Chromaticity Diagram**



**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 2200K 4-step quadrangle

REPORT NUMBER: SP1-2101-121-4

### 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       | 2623             | 0.0              | 490       | 7941             | 1.1              | 620       | 205150           | 53.4             | 750       | 13431            | 0.0              | 880       | 3867             | 0.0              |
| 365       | 2260             | 0.0              | 495       | 11299            | 2.0              | 625       | 198277           | 43.7             | 755       | 12426            | 0.0              | 885       | 3345             | 0.0              |
| 370       | 2306             | 0.0              | 500       | 16633            | 3.7              | 630       | 187878           | 34.0             | 760       | 11385            | 0.0              | 890       | 2956             | 0.0              |
| 375       | 2437             | 0.0              | 505       | 23672            | 6.6              | 635       | 176836           | 26.6             | 765       | 9797             | 0.0              | 895       | 2272             | 0.0              |
| 380       | 2473             | 0.0              | 510       | 32025            | 11.0             | 640       | 164455           | 19.7             | 770       | 8562             | 0.0              | 900       | 3003             | 0.0              |
| 385       | 2203             | 0.0              | 515       | 41295            | 17.1             | 645       | 154086           | 14.8             | 775       | 7810             | 0.0              | 905       | 2480             | 0.0              |
| 390       | 2262             | 0.0              | 520       | 50628            | 24.6             | 650       | 141592           | 10.3             | 780       | 7052             | 0.0              | 910       | 2068             | 0.0              |
| 395       | 2028             | 0.0              | 525       | 58836            | 31.6             | 655       | 128604           | 7.4              | 785       | 6345             | 0.0              | 915       | 2064             | 0.0              |
| 400       | 1806             | 0.0              | 530       | 67109            | 39.5             | 660       | 116713           | 4.9              | 790       | 5524             | 0.0              | 920       | 2581             | 0.0              |
| 405       | 1945             | 0.0              | 535       | 74404            | 46.1             | 665       | 104993           | 3.3              | 795       | 5788             | 0.0              | 925       | 3137             | 0.0              |
| 410       | 3199             | 0.0              | 540       | 81280            | 53.0             | 670       | 93149            | 2.0              | 800       | 5282             | 0.0              | 930       | 2747             | 0.0              |
| 415       | 5572             | 0.0              | 545       | 88806            | 59.1             | 675       | 82543            | 1.4              | 805       | 4258             | 0.0              | 935       | 2471             | 0.0              |
| 420       | 10322            | 0.0              | 550       | 97367            | 66.2             | 680       | 73089            | 0.8              | 810       | 5156             | 0.0              | 940       | 2339             | 0.0              |
| 425       | 18494            | 0.1              | 555       | 106598           | 72.8             | 685       | 64438            | 0.6              | 815       | 4391             | 0.0              | 945       | 2917             | 0.0              |
| 430       | 28541            | 0.2              | 560       | 117615           | 79.9             | 690       | 56546            | 0.3              | 820       | 4383             | 0.0              | 950       | 1966             | 0.0              |
| 435       | 37453            | 0.4              | 565       | 129103           | 85.8             | 695       | 49328            | 0.2              | 825       | 4881             | 0.0              | 955       | 1580             | 0.0              |
| 440       | 44455            | 0.7              | 570       | 141415           | 92.0             | 700       | 43493            | 0.1              | 830       | 3588             | 0.0              | 960       | 1318             | 0.0              |
| 445       | 45934            | 1.0              | 575       | 155854           | 97.0             | 705       | 38035            | 0.1              | 835       | 3835             | 0.0              | 965       | 1419             | 0.0              |
| 450       | 37926            | 1.0              | 580       | 168613           | 100.2            | 710       | 33716            | 0.0              | 840       | 3014             | 0.0              | 970       | 1917             | 0.0              |
| 455       | 24793            | 0.8              | 585       | 182390           | 101.3            | 715       | 30449            | 0.0              | 845       | 3765             | 0.0              | 975       | 1210             | 0.0              |
| 460       | 15340            | 0.6              | 590       | 194054           | 100.3            | 720       | 27240            | 0.0              | 850       | 2906             | 0.0              | 980       | 3915             | 0.0              |
| 465       | 10883            | 0.6              | 595       | 203639           | 96.5             | 725       | 24231            | 0.0              | 855       | 2947             | 0.0              | 985       | 3180             | 0.0              |
| 470       | 8138             | 0.5              | 600       | 211043           | 91.0             | 730       | 21490            | 0.0              | 860       | 3864             | 0.0              | 990       | 5676             | 0.0              |
| 475       | 6653             | 0.5              | 605       | 214591           | 83.1             | 735       | 18548            | 0.0              | 865       | 3546             | 0.0              | 995       | 4736             | 0.0              |
| 480       | 6220             | 0.6              | 610       | 214337           | 73.6             | 740       | 16963            | 0.0              | 870       | 3253             | 0.0              | 1000      | 5113             | 0.0              |
| 485       | 6613             | 0.8              | 615       | 211915           | 64.0             | 745       | 14922            | 0.0              | 875       | 2450             | 0.0              |           |                  |                  |

REPORT NUMBER: SP1-2101-121-4

### Scotopic Flux vs. Wavelength



Scotopic Lumens: 7290.1

S/P: 0.84

| 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       | 2623             | 0.0              | 490       | 7941             | 12.2             | 620       | 205150           | 2.6              | 750       | 13431            | 0.0              | 880       | 3867             | 0.0              |
| 365       | 2260             | 0.0              | 495       | 11299            | 18.3             | 625       | 198277           | 1.7              | 755       | 12426            | 0.0              | 885       | 3345             | 0.0              |
| 370       | 2306             | 0.0              | 500       | 16633            | 27.8             | 630       | 187878           | 1.1              | 760       | 11385            | 0.0              | 890       | 2956             | 0.0              |
| 375       | 2437             | 0.0              | 505       | 23672            | 40.2             | 635       | 176836           | 0.7              | 765       | 9797             | 0.0              | 895       | 2272             | 0.0              |
| 380       | 2473             | 0.0              | 510       | 32025            | 54.3             | 640       | 164455           | 0.4              | 770       | 8562             | 0.0              | 900       | 3003             | 0.0              |
| 385       | 2203             | 0.0              | 515       | 41295            | 68.4             | 645       | 154086           | 0.3              | 775       | 7810             | 0.0              | 905       | 2480             | 0.0              |
| 390       | 2262             | 0.0              | 520       | 50628            | 80.5             | 650       | 141592           | 0.2              | 780       | 7052             | 0.0              | 910       | 2068             | 0.0              |
| 395       | 2028             | 0.0              | 525       | 58836            | 88.0             | 655       | 128604           | 0.1              | 785       | 6345             | 0.0              | 915       | 2064             | 0.0              |
| 400       | 1806             | 0.0              | 530       | 67109            | 92.5             | 660       | 116713           | 0.1              | 790       | 5524             | 0.0              | 920       | 2581             | 0.0              |
| 405       | 1945             | 0.1              | 535       | 74404            | 92.7             | 665       | 104993           | 0.0              | 795       | 5788             | 0.0              | 925       | 3137             | 0.0              |
| 410       | 3199             | 0.2              | 540       | 81280            | 89.8             | 670       | 93149            | 0.0              | 800       | 5282             | 0.0              | 930       | 2747             | 0.0              |
| 415       | 5572             | 0.6              | 545       | 88806            | 85.1             | 675       | 82543            | 0.0              | 805       | 4258             | 0.0              | 935       | 2471             | 0.0              |
| 420       | 10322            | 1.7              | 550       | 97367            | 79.6             | 680       | 73089            | 0.0              | 810       | 5156             | 0.0              | 940       | 2339             | 0.0              |
| 425       | 18494            | 4.5              | 555       | 106598           | 72.8             | 685       | 64438            | 0.0              | 815       | 4391             | 0.0              | 945       | 2917             | 0.0              |
| 430       | 28541            | 9.7              | 560       | 117615           | 65.7             | 690       | 56546            | 0.0              | 820       | 4383             | 0.0              | 950       | 1966             | 0.0              |
| 435       | 37453            | 16.7             | 565       | 129103           | 57.9             | 695       | 49328            | 0.0              | 825       | 4881             | 0.0              | 955       | 1580             | 0.0              |
| 440       | 44455            | 24.8             | 570       | 141415           | 49.9             | 700       | 43493            | 0.0              | 830       | 3588             | 0.0              | 960       | 1318             | 0.0              |
| 445       | 45934            | 30.8             | 575       | 155854           | 42.4             | 705       | 38035            | 0.0              | 835       | 3835             | 0.0              | 965       | 1419             | 0.0              |
| 450       | 37926            | 29.4             | 580       | 168613           | 34.7             | 710       | 33716            | 0.0              | 840       | 3014             | 0.0              | 970       | 1917             | 0.0              |
| 455       | 24793            | 21.7             | 585       | 182390           | 27.9             | 715       | 30449            | 0.0              | 845       | 3765             | 0.0              | 975       | 1210             | 0.0              |
| 460       | 15340            | 14.8             | 590       | 194054           | 21.6             | 720       | 27240            | 0.0              | 850       | 2906             | 0.0              | 980       | 3915             | 0.0              |
| 465       | 10883            | 11.5             | 595       | 203639           | 16.2             | 725       | 24231            | 0.0              | 855       | 2947             | 0.0              | 985       | 3180             | 0.0              |
| 470       | 8138             | 9.4              | 600       | 211043           | 11.9             | 730       | 21490            | 0.0              | 860       | 3864             | 0.0              | 990       | 5676             | 0.0              |
| 475       | 6653             | 8.3              | 605       | 214591           | 8.4              | 735       | 18548            | 0.0              | 865       | 3546             | 0.0              | 995       | 4736             | 0.0              |
| 480       | 6220             | 8.4              | 610       | 214337           | 5.8              | 740       | 16963            | 0.0              | 870       | 3253             | 0.0              | 1000      | 5113             | 0.0              |
| 485       | 6613             | 9.6              | 615       | 211915           | 3.9              | 745       | 14922            | 0.0              | 875       | 2450             | 0.0              |           |                  |                  |

REPORT NUMBER: SP1-2101-121-4

### Melanopic Flux vs. Wavelength



**Melanopic Lumens: 2276.7**      **M/P: 0.26**

| 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       | 2623             | 0.0              | 490       | 7941             | 6.6              | 620       | 205150           | 0.2              | 750       | 13431            | 0.0              | 880       | 3867             | 0.0              |
| 365       | 2260             | 0.0              | 495       | 11299            | 9.3              | 625       | 198277           | 0.1              | 755       | 12426            | 0.0              | 885       | 3345             | 0.0              |
| 370       | 2306             | 0.0              | 500       | 16633            | 13.4             | 630       | 187878           | 0.1              | 760       | 11385            | 0.0              | 890       | 2956             | 0.0              |
| 375       | 2437             | 0.0              | 505       | 23672            | 18.2             | 635       | 176836           | 0.0              | 765       | 9797             | 0.0              | 895       | 2272             | 0.0              |
| 380       | 2473             | 0.0              | 510       | 32025            | 23.0             | 640       | 164455           | 0.0              | 770       | 8562             | 0.0              | 900       | 3003             | 0.0              |
| 385       | 2203             | 0.0              | 515       | 41295            | 27.0             | 645       | 154086           | 0.0              | 775       | 7810             | 0.0              | 905       | 2480             | 0.0              |
| 390       | 2262             | 0.0              | 520       | 50628            | 29.5             | 650       | 141592           | 0.0              | 780       | 7052             | 0.0              | 910       | 2068             | 0.0              |
| 395       | 2028             | 0.0              | 525       | 58836            | 29.8             | 655       | 128604           | 0.0              | 785       | 6345             | 0.0              | 915       | 2064             | 0.0              |
| 400       | 1806             | 0.0              | 530       | 67109            | 29.0             | 660       | 116713           | 0.0              | 790       | 5524             | 0.0              | 920       | 2581             | 0.0              |
| 405       | 1945             | 0.0              | 535       | 74404            | 26.8             | 665       | 104993           | 0.0              | 795       | 5788             | 0.0              | 925       | 3137             | 0.0              |
| 410       | 3199             | 0.1              | 540       | 81280            | 23.8             | 670       | 93149            | 0.0              | 800       | 5282             | 0.0              | 930       | 2747             | 0.0              |
| 415       | 5572             | 0.4              | 545       | 88806            | 20.6             | 675       | 82543            | 0.0              | 805       | 4258             | 0.0              | 935       | 2471             | 0.0              |
| 420       | 10322            | 1.2              | 550       | 97367            | 17.5             | 680       | 73089            | 0.0              | 810       | 5156             | 0.0              | 940       | 2339             | 0.0              |
| 425       | 18494            | 2.9              | 555       | 106598           | 14.4             | 685       | 64438            | 0.0              | 815       | 4391             | 0.0              | 945       | 2917             | 0.0              |
| 430       | 28541            | 6.0              | 560       | 117615           | 11.6             | 690       | 56546            | 0.0              | 820       | 4383             | 0.0              | 950       | 1966             | 0.0              |
| 435       | 37453            | 10.0             | 565       | 129103           | 9.1              | 695       | 49328            | 0.0              | 825       | 4881             | 0.0              | 955       | 1580             | 0.0              |
| 440       | 44455            | 14.9             | 570       | 141415           | 6.9              | 700       | 43493            | 0.0              | 830       | 3588             | 0.0              | 960       | 1318             | 0.0              |
| 445       | 45934            | 18.1             | 575       | 155854           | 5.2              | 705       | 38035            | 0.0              | 835       | 3835             | 0.0              | 965       | 1419             | 0.0              |
| 450       | 37926            | 17.5             | 580       | 168613           | 3.8              | 710       | 33716            | 0.0              | 840       | 3014             | 0.0              | 970       | 1917             | 0.0              |
| 455       | 24793            | 13.0             | 585       | 182390           | 2.7              | 715       | 30449            | 0.0              | 845       | 3765             | 0.0              | 975       | 1210             | 0.0              |
| 460       | 15340            | 9.0              | 590       | 194054           | 1.9              | 720       | 27240            | 0.0              | 850       | 2906             | 0.0              | 980       | 3915             | 0.0              |
| 465       | 10883            | 7.1              | 595       | 203639           | 1.3              | 725       | 24231            | 0.0              | 855       | 2947             | 0.0              | 985       | 3180             | 0.0              |
| 470       | 8138             | 5.8              | 600       | 211043           | 0.9              | 730       | 21490            | 0.0              | 860       | 3864             | 0.0              | 990       | 5676             | 0.0              |
| 475       | 6653             | 5.1              | 605       | 214591           | 0.6              | 735       | 18548            | 0.0              | 865       | 3546             | 0.0              | 995       | 4736             | 0.0              |
| 480       | 6220             | 5.0              | 610       | 214337           | 0.4              | 740       | 16963            | 0.0              | 870       | 3253             | 0.0              | 1000      | 5113             | 0.0              |
| 485       | 6613             | 5.5              | 615       | 211915           | 0.3              | 745       | 14922            | 0.0              | 875       | 2450             | 0.0              |           |                  |                  |

REPORT NUMBER: SP1-2101-121-4

TM-30-18

### Summary

$R_f = 70$   
 $R_g = 99.3$   
 CIE  $R_a = 72.2$   
 $R_g = -16.8$



### Color Vector Graphics

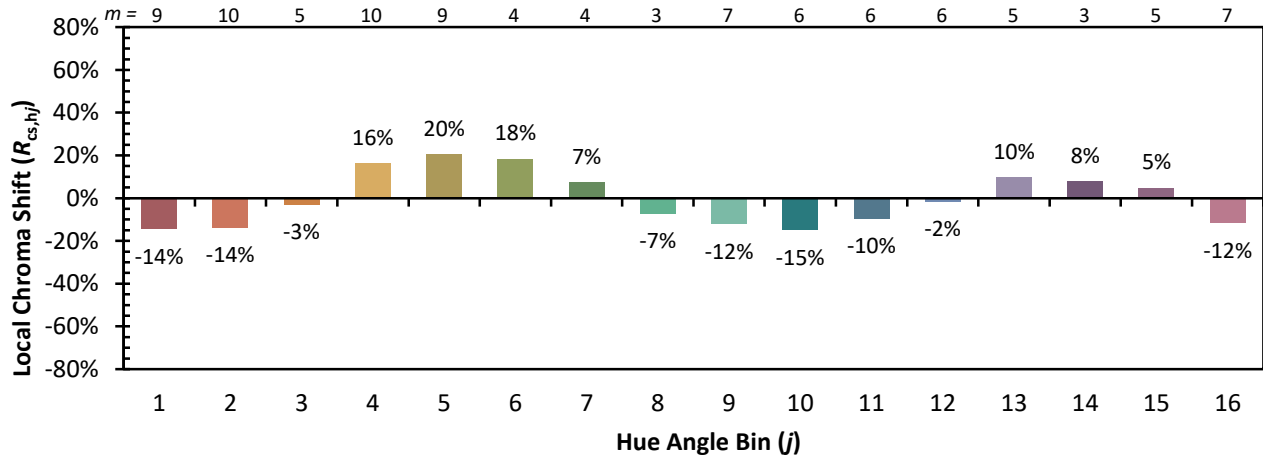


Individual Sample Fidelity Index ( $R_{f,i}$ )

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 87 | CES26 = 57 | CES51 = 74 | CES76 = 57 |
| CES02 = 65 | CES27 = 76 | CES52 = 76 | CES77 = 81 |
| CES03 = 32 | CES28 = 84 | CES53 = 65 | CES78 = 64 |
| CES04 = 72 | CES29 = 46 | CES54 = 78 | CES79 = 85 |
| CES05 = 52 | CES30 = 48 | CES55 = 75 | CES80 = 84 |
| CES06 = 52 | CES31 = 52 | CES56 = 65 | CES81 = 63 |
| CES07 = 44 | CES32 = 51 | CES57 = 62 | CES82 = 92 |
| CES08 = 43 | CES33 = 54 | CES58 = 66 | CES83 = 83 |
| CES09 = 29 | CES34 = 71 | CES59 = 84 | CES84 = 92 |
| CES10 = 79 | CES35 = 86 | CES60 = 90 | CES85 = 81 |
| CES11 = 62 | CES36 = 78 | CES61 = 84 | CES86 = 56 |
| CES12 = 68 | CES37 = 80 | CES62 = 71 | CES87 = 78 |
| CES13 = 45 | CES38 = 54 | CES63 = 68 | CES88 = 72 |
| CES14 = 75 | CES39 = 90 | CES64 = 69 | CES89 = 62 |
| CES15 = 72 | CES40 = 85 | CES65 = 67 | CES90 = 67 |
| CES16 = 49 | CES41 = 75 | CES66 = 64 | CES91 = 90 |
| CES17 = 51 | CES42 = 79 | CES67 = 63 | CES92 = 67 |
| CES18 = 57 | CES43 = 64 | CES68 = 70 | CES93 = 78 |
| CES19 = 74 | CES44 = 98 | CES69 = 80 | CES94 = 52 |
| CES20 = 68 | CES45 = 73 | CES70 = 64 | CES95 = 76 |
| CES21 = 89 | CES46 = 67 | CES71 = 64 | CES96 = 78 |
| CES22 = 81 | CES47 = 61 | CES72 = 87 | CES97 = 77 |
| CES23 = 92 | CES48 = 48 | CES73 = 57 | CES98 = 72 |
| CES24 = 92 | CES49 = 64 | CES74 = 87 | CES99 = 65 |
| CES25 = 74 | CES50 = 74 | CES75 = 66 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)