

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: P673852

Luminaire Tested: **CCP-SA1D-750-U-SL3-HSS**

Issue Date: 04/16/2023



**Test Information**

Test Method: LM-79-08  
Report Number: P673852  
Test Lab: INNOVATION CENTER(G1)  
Issue Date: 04/16/2023  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: INVUE  
Catalog Number: CCP-SA1D-750-U-SL3-HSS  
Description: INVUE CLEAR CURVE POLE MOUNT Light Square Luminaire @800mA w/ SL3  
distribution lens and House Side Shield  
Light Source: (16) 5000K CCT, 70 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 4714 lumens  
Efficiency: N/A  
Efficacy: 107.1 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

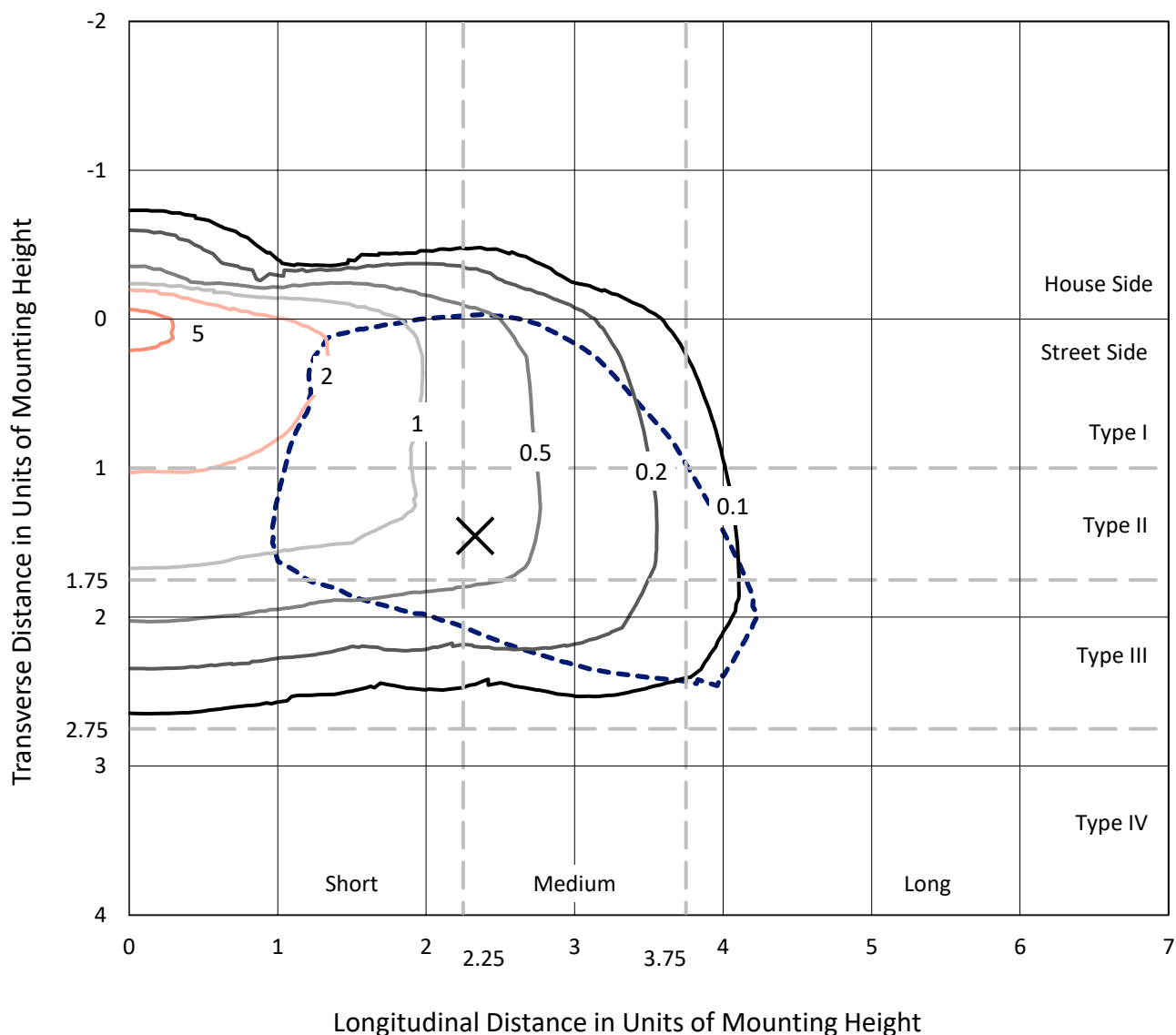
REPORT NUMBER: P673852

CATALOG NUMBER: CCP-SA1D-750-U-SL3-HSS

## Iso-Footcandle Lines of Horizontal Illumination

× Max cd

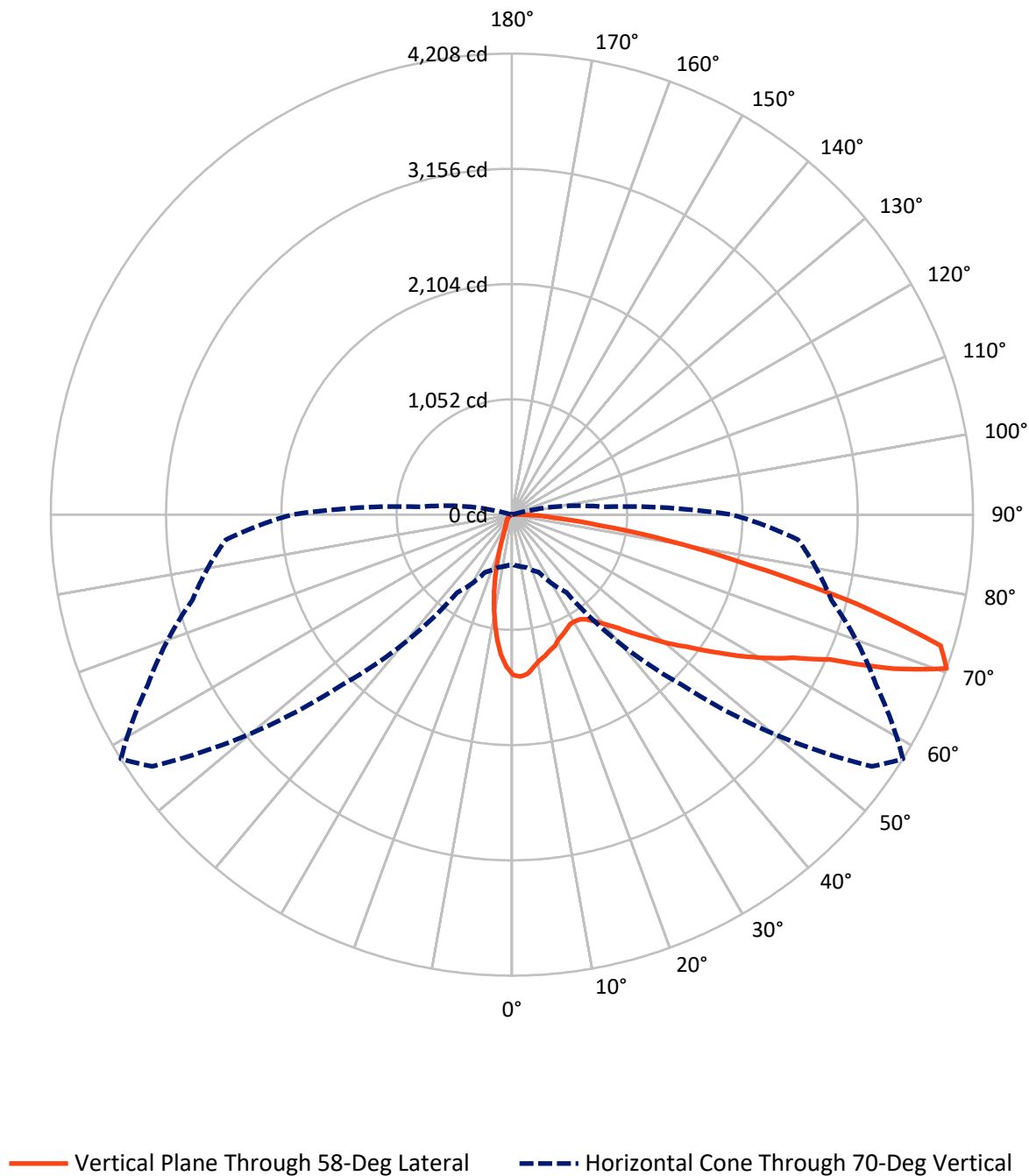
--- 1/2 Max cd



Based on 15 foot mounting height. Maximum calculated value = 6.5 fc  
 Type III - Medium - N/A

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## Luminous Intensity Polar Plot



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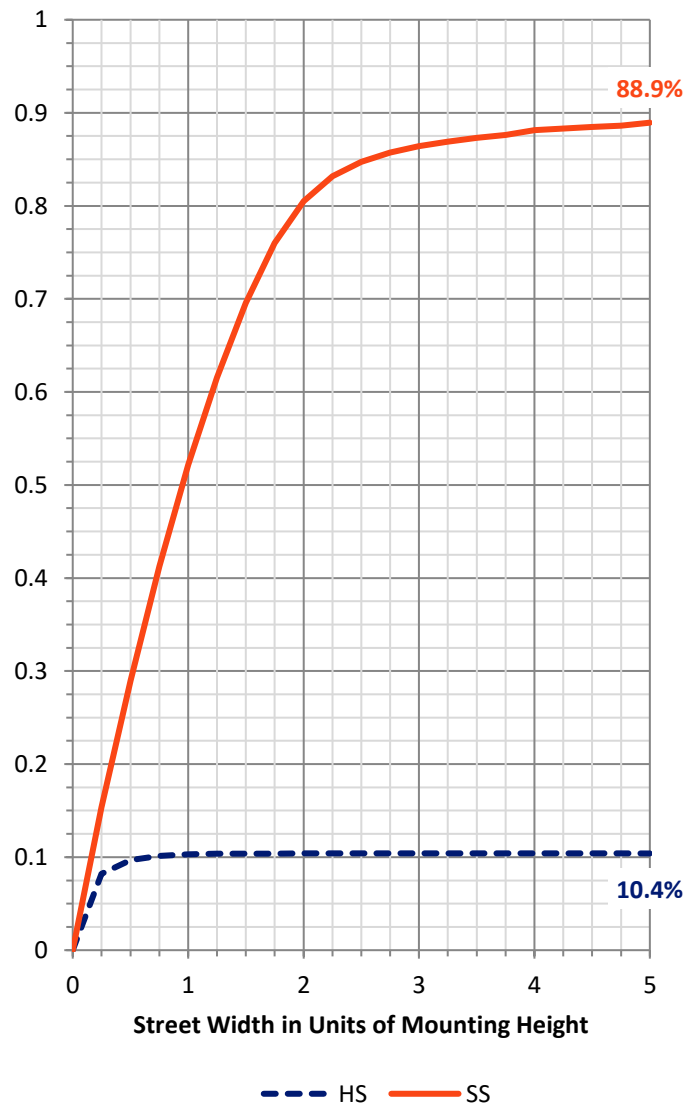
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 493.6    | 0.0    | 493.6  |
|                    | % Fixture | 10.5     | 0.0    | 10.5   |
| <b>Street Side</b> | Lumens    | 4220.4   | 0.0    | 4220.4 |
|                    | % Fixture | 89.5     | 0.0    | 89.5   |
| <b>Total</b>       | Lumens    | 4714.0   | 0.0    | 4714.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 119.4  | 2.5       |
| 10°-20°   | 248.6  | 5.3       |
| 20°-30°   | 332.8  | 7.1       |
| 30°-40°   | 449.9  | 9.5       |
| 40°-50°   | 645.7  | 13.7      |
| 50°-60°   | 951.6  | 20.2      |
| 60°-70°   | 1160.7 | 24.6      |
| 70°-80°   | 708.8  | 15.0      |
| 80°-90°   | 96.3   | 2.0       |
| 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°    | 4714.0 | 100.0     |
| 0°-180°   | 4714.0 | 100.0     |

**Coefficient of Utilization**



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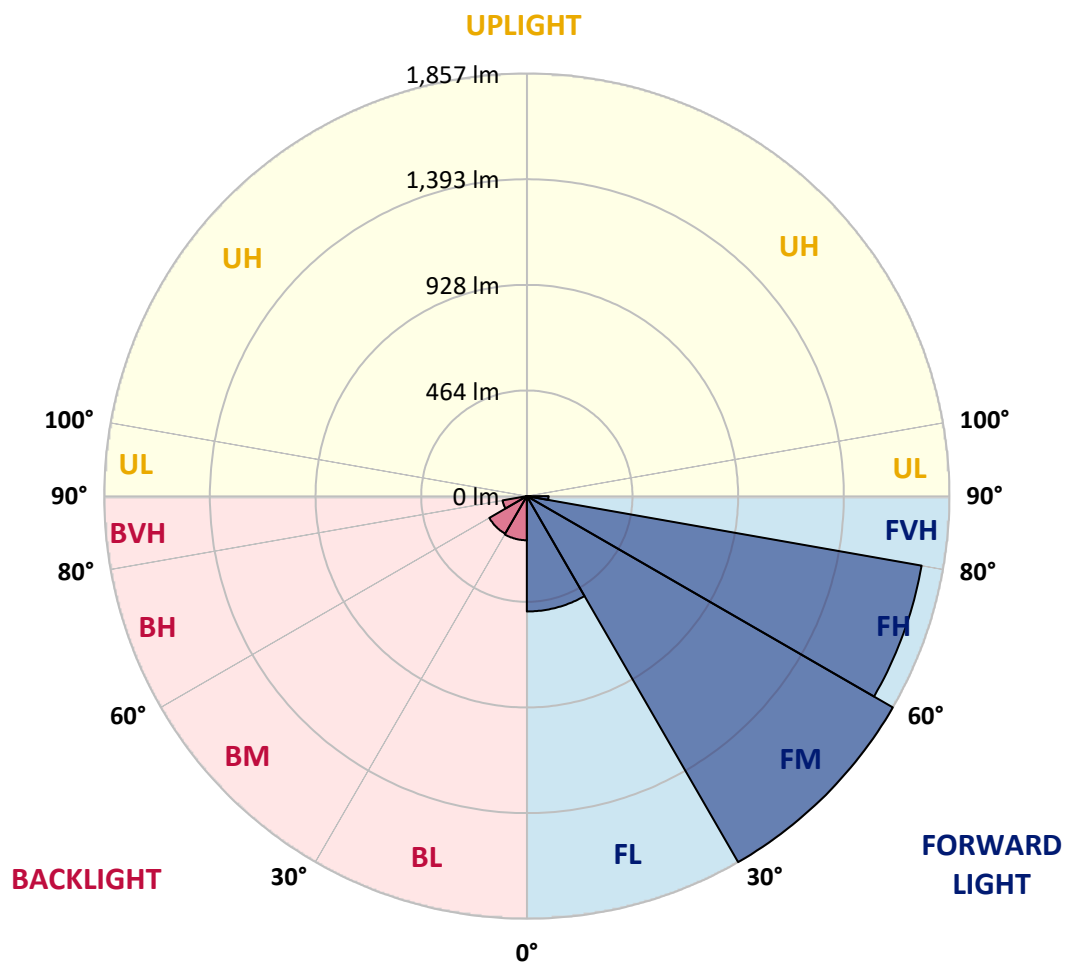
CATALOG NUMBER: CCP-SA1D-750-U-SL3-HSS

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 506.8  | 10.8      |                         |      |         |
| FM   | (30°-60°)   | 1856.8 | 39.4      |                         |      |         |
| FH   | (60°-80°)   | 1761.4 | 37.4      |                         |      | G1/1800 |
| FVH  | (80°-90°)   | 95.4   | 2.0       |                         |      | G1/100  |
| BL   | (0°-30°)    | 194.0  | 4.1       | B1/500                  |      |         |
| BM   | (30°-60°)   | 190.5  | 4.0       | B0/220                  |      |         |
| BH   | (60°-80°)   | 108.2  | 2.3       | B0/110                  |      | G0/110  |
| BVH  | (80°-90°)   | 0.9    | 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°    | 58°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1463.4 | 1463.4 | 1463.4 | 1463.4 | 1463.4 | 1463.4 | 1463.4 | 1463.4 | 1463.4 | 1463.4 | 1463.4 |
| 2.5°  | 1489.9 | 1495.4 | 1482.1 | 1497.6 | 1483.3 | 1489.9 | 1482.1 | 1479.9 | 1481.0 | 1482.1 | 1473.3 |
| 5°    | 1420.3 | 1433.5 | 1439.0 | 1430.2 | 1451.2 | 1447.9 | 1461.1 | 1462.3 | 1456.7 | 1451.2 | 1452.3 |
| 7.5°  | 1328.5 | 1341.8 | 1347.3 | 1352.8 | 1373.8 | 1401.5 | 1419.2 | 1408.1 | 1416.9 | 1436.8 | 1407.0 |
| 10°   | 1262.2 | 1258.9 | 1257.8 | 1268.8 | 1308.6 | 1331.8 | 1361.7 | 1358.4 | 1380.5 | 1399.3 | 1374.9 |
| 12.5° | 1180.4 | 1173.8 | 1193.7 | 1202.5 | 1237.9 | 1278.8 | 1302.0 | 1326.3 | 1348.4 | 1368.3 | 1340.7 |
| 15°   | 1119.6 | 1125.2 | 1132.9 | 1151.7 | 1177.1 | 1231.3 | 1265.5 | 1288.7 | 1328.5 | 1338.5 | 1327.4 |
| 17.5° | 1071.0 | 1075.4 | 1086.5 | 1096.4 | 1128.5 | 1180.4 | 1234.6 | 1262.2 | 1304.2 | 1330.7 | 1296.5 |
| 20°   | 1072.1 | 1058.8 | 1058.8 | 1068.8 | 1086.5 | 1148.4 | 1205.8 | 1214.7 | 1272.2 | 1317.5 | 1294.3 |
| 22.5° | 1073.2 | 1068.8 | 1058.8 | 1057.7 | 1065.5 | 1109.7 | 1168.3 | 1188.2 | 1250.0 | 1303.1 | 1275.5 |
| 25°   | 1088.7 | 1072.1 | 1073.2 | 1057.7 | 1061.0 | 1083.2 | 1129.6 | 1159.4 | 1230.2 | 1310.8 | 1265.5 |
| 27.5° | 1101.9 | 1109.7 | 1094.2 | 1087.6 | 1068.8 | 1067.7 | 1106.4 | 1131.8 | 1220.2 | 1328.5 | 1272.2 |
| 30°   | 1131.8 | 1137.3 | 1137.3 | 1132.9 | 1115.2 | 1089.8 | 1098.6 | 1130.7 | 1200.3 | 1325.2 | 1261.1 |
| 32.5° | 1181.5 | 1171.6 | 1184.8 | 1178.2 | 1155.0 | 1115.2 | 1122.9 | 1139.5 | 1212.5 | 1367.2 | 1278.8 |
| 35°   | 1198.1 | 1205.8 | 1223.5 | 1209.2 | 1201.4 | 1178.2 | 1162.7 | 1174.9 | 1230.2 | 1409.2 | 1305.3 |
| 37.5° | 1248.9 | 1237.9 | 1250.0 | 1282.1 | 1289.8 | 1247.8 | 1218.0 | 1235.7 | 1296.5 | 1458.9 | 1329.6 |
| 40°   | 1253.4 | 1262.2 | 1284.3 | 1347.3 | 1355.0 | 1337.4 | 1313.0 | 1317.5 | 1362.8 | 1523.0 | 1390.4 |
| 42.5° | 1275.5 | 1285.4 | 1330.7 | 1383.8 | 1425.8 | 1429.1 | 1411.4 | 1411.4 | 1450.1 | 1625.8 | 1457.8 |
| 45°   | 1318.6 | 1302.0 | 1360.6 | 1450.1 | 1510.9 | 1523.0 | 1546.3 | 1540.7 | 1571.7 | 1734.1 | 1583.8 |
| 47.5° | 1335.2 | 1340.7 | 1404.8 | 1513.1 | 1582.7 | 1639.1 | 1677.8 | 1678.9 | 1694.4 | 1872.3 | 1747.4 |
| 50°   | 1389.3 | 1388.2 | 1465.6 | 1566.1 | 1668.9 | 1771.7 | 1846.9 | 1846.9 | 1845.8 | 2007.1 | 1887.8 |
| 52.5° | 1461.1 | 1458.9 | 1518.6 | 1638.0 | 1771.7 | 1901.0 | 2000.5 | 2003.8 | 2029.3 | 2172.9 | 2049.1 |
| 55°   | 1578.3 | 1568.4 | 1625.8 | 1714.3 | 1874.5 | 2031.5 | 2203.9 | 2205.0 | 2185.1 | 2291.2 | 2165.2 |
| 57.5° | 1676.7 | 1675.6 | 1723.1 | 1808.2 | 1989.5 | 2199.5 | 2399.5 | 2429.4 | 2366.4 | 2412.8 | 2258.0 |
| 60°   | 1651.3 | 1665.6 | 1764.0 | 1890.0 | 2111.0 | 2409.5 | 2610.6 | 2657.0 | 2556.5 | 2495.7 | 2327.7 |
| 62.5° | 1493.2 | 1526.4 | 1633.6 | 1834.7 | 2213.8 | 2714.5 | 2901.3 | 2880.3 | 2655.9 | 2566.4 | 2412.8 |
| 65°   | 1074.3 | 1107.5 | 1240.1 | 1541.8 | 2094.5 | 2930.0 | 3283.7 | 3188.7 | 2832.8 | 2671.4 | 2526.6 |
| 67.5° | 632.2  | 645.5  | 728.4  | 983.7  | 1566.1 | 2812.9 | 3747.9 | 3755.7 | 3180.9 | 2832.8 | 2723.4 |
| 70°   | 456.5  | 466.4  | 498.5  | 580.3  | 867.6  | 2205.0 | 4006.6 | 4207.7 | 3663.9 | 3018.5 | 2619.5 |
| 72.5° | 350.4  | 350.4  | 404.5  | 483.0  | 552.6  | 1320.8 | 3687.1 | 4090.6 | 3768.9 | 2840.5 | 2111.0 |
| 75°   | 252.0  | 258.6  | 317.2  | 415.6  | 509.5  | 663.2  | 2716.7 | 3246.1 | 3194.2 | 2302.3 | 1474.4 |
| 77.5° | 144.8  | 148.1  | 223.3  | 348.2  | 478.6  | 455.4  | 1678.9 | 2200.6 | 2262.5 | 1441.3 | 638.8  |
| 80°   | 74.1   | 76.3   | 124.9  | 275.2  | 433.3  | 396.8  | 1001.4 | 1449.0 | 1229.0 | 418.9  | 148.1  |
| 82.5° | 36.5   | 36.5   | 56.4   | 175.7  | 368.1  | 351.5  | 589.1  | 800.2  | 435.5  | 96.2   | 61.9   |
| 85°   | 12.2   | 13.3   | 25.4   | 99.5   | 266.4  | 212.2  | 360.3  | 380.2  | 145.9  | 36.5   | 34.3   |
| 87.5° | 3.3    | 4.4    | 6.6    | 36.5   | 116.1  | 139.3  | 214.4  | 243.2  | 59.7   | 14.4   | 16.6   |
| 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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**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1463.4 | 1463.4 | 1463.4 | 1463.4 | 1463.4 | 1463.4 | 1463.4 | 1463.4 | 1463.4 | 1463.4 | 1463.4 |
| 2.5°  | 1440.1 | 1432.4 | 1423.6 | 1401.5 | 1383.8 | 1360.6 | 1345.1 | 1332.9 | 1309.7 | 1314.2 | 1304.2 |
| 5°    | 1425.8 | 1411.4 | 1360.6 | 1311.9 | 1267.7 | 1200.3 | 1153.9 | 1124.0 | 1099.7 | 1075.4 | 1093.1 |
| 7.5°  | 1400.4 | 1366.1 | 1286.5 | 1195.9 | 1101.9 | 1013.5 | 925.1  | 872.0  | 833.4  | 798.0  | 796.9  |
| 10°   | 1357.3 | 1302.0 | 1177.1 | 1058.8 | 914.0  | 798.0  | 685.3  | 596.8  | 539.4  | 497.4  | 496.3  |
| 12.5° | 1308.6 | 1251.2 | 1094.2 | 901.9  | 735.0  | 571.4  | 436.6  | 342.6  | 288.5  | 255.3  | 250.9  |
| 15°   | 1277.7 | 1193.7 | 990.3  | 762.6  | 555.9  | 372.5  | 242.1  | 183.5  | 162.5  | 154.7  | 154.7  |
| 17.5° | 1237.9 | 1141.7 | 887.5  | 617.8  | 385.7  | 215.5  | 156.9  | 141.5  | 140.4  | 138.2  | 135.9  |
| 20°   | 1221.3 | 1101.9 | 795.8  | 492.9  | 244.3  | 152.5  | 134.8  | 131.5  | 131.5  | 129.3  | 127.1  |
| 22.5° | 1177.1 | 1044.5 | 698.5  | 361.4  | 162.5  | 133.7  | 127.1  | 122.7  | 120.5  | 118.3  | 120.5  |
| 25°   | 1157.2 | 1003.6 | 606.8  | 249.8  | 132.6  | 119.4  | 116.1  | 111.6  | 108.3  | 107.2  | 107.2  |
| 27.5° | 1143.9 | 962.7  | 517.3  | 173.5  | 117.2  | 109.4  | 102.8  | 99.5   | 95.1   | 90.6   | 90.6   |
| 30°   | 1134.0 | 930.6  | 431.1  | 128.2  | 105.0  | 97.3   | 91.7   | 84.0   | 78.5   | 74.1   | 74.1   |
| 32.5° | 1120.7 | 893.0  | 344.8  | 109.4  | 95.1   | 87.3   | 77.4   | 70.7   | 63.0   | 59.7   | 59.7   |
| 35°   | 1125.2 | 867.6  | 270.8  | 97.3   | 85.1   | 75.2   | 66.3   | 57.5   | 49.7   | 46.4   | 45.3   |
| 37.5° | 1134.0 | 848.8  | 205.6  | 87.3   | 76.3   | 65.2   | 55.3   | 45.3   | 40.9   | 36.5   | 36.5   |
| 40°   | 1171.6 | 843.3  | 151.4  | 80.7   | 69.6   | 57.5   | 46.4   | 37.6   | 33.2   | 29.8   | 28.7   |
| 42.5° | 1234.6 | 851.0  | 117.2  | 72.9   | 63.0   | 48.6   | 38.7   | 30.9   | 26.5   | 23.2   | 22.1   |
| 45°   | 1315.3 | 880.9  | 96.2   | 68.5   | 55.3   | 40.9   | 30.9   | 25.4   | 19.9   | 17.7   | 17.7   |
| 47.5° | 1432.4 | 927.3  | 84.0   | 63.0   | 48.6   | 34.3   | 26.5   | 19.9   | 15.5   | 13.3   | 13.3   |
| 50°   | 1565.0 | 980.4  | 74.1   | 56.4   | 42.0   | 28.7   | 21.0   | 15.5   | 11.1   | 9.9    | 9.9    |
| 52.5° | 1697.7 | 1047.8 | 68.5   | 51.9   | 36.5   | 23.2   | 16.6   | 11.1   | 7.7    | 6.6    | 6.6    |
| 55°   | 1836.9 | 1107.5 | 61.9   | 48.6   | 29.8   | 18.8   | 12.2   | 6.6    | 4.4    | 3.3    | 3.3    |
| 57.5° | 1934.2 | 1130.7 | 54.2   | 42.0   | 23.2   | 14.4   | 8.8    | 4.4    | 2.2    | 1.1    | 1.1    |
| 60°   | 2003.8 | 1134.0 | 46.4   | 34.3   | 17.7   | 11.1   | 5.5    | 2.2    | 1.1    | 0.0    | 0.0    |
| 62.5° | 2062.4 | 1140.6 | 39.8   | 26.5   | 13.3   | 7.7    | 3.3    | 1.1    | 0.0    | 0.0    | 0.0    |
| 65°   | 2178.5 | 1135.1 | 32.1   | 21.0   | 8.8    | 4.4    | 2.2    | 0.0    | 0.0    | 0.0    | 0.0    |
| 67.5° | 2270.2 | 1079.8 | 25.4   | 14.4   | 5.5    | 2.2    | 1.1    | 0.0    | 0.0    | 0.0    | 0.0    |
| 70°   | 2008.3 | 823.4  | 19.9   | 9.9    | 3.3    | 1.1    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 72.5° | 1577.2 | 549.3  | 13.3   | 5.5    | 2.2    | 1.1    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 75°   | 1034.5 | 273.0  | 9.9    | 3.3    | 1.1    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 77.5° | 402.3  | 71.8   | 6.6    | 2.2    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 80°   | 97.3   | 24.3   | 3.3    | 1.1    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 82.5° | 42.0   | 8.8    | 2.2    | 1.1    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 85°   | 25.4   | 4.4    | 1.1    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 87.5° | 13.3   | 2.2    | 1.1    | 1.1    | 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: SP1-2101-121-8

Luminaire Tested: IFLD-S-SA2E-750-U-T2

Test Date: 03/05/2021

### Test Information

Test Method: LM-79-08  
 Report Number: SP1-2101-121-8  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1  
 Measurement Geometry:  $4\pi$   
 Issue Date: 03/05/2021  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: STREETWORKS  
 Catalog Number: **IFLD-S-SA2E-750-U-T2**  
 Description: STREETWORKS INF FLOOD

PROGRAMMED @ 615mA.

### Spectral Parameters

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 4832   | CRI (Ra): | 71.7 |      |       |
| CIE u':                   | 0.2115 | R1:       | 69.5 | R9:  | -27.7 |
| CIE v':                   | 0.4900 | R2:       | 75.7 | R10: | 42.9  |
| Duv:                      | 0.0025 | R3:       | 80.8 | R11: | 71.2  |
| CIE x:                    | 0.3506 | R4:       | 73.2 | R12: | 44.6  |
| CIE y:                    | 0.3611 | R5:       | 70.3 | R13: | 69.8  |
| CIE z:                    | 0.2884 | R6:       | 67.3 | R14: | 89.2  |
| Peak Wavelength (nm):     | 444    | R7:       | 79.9 |      |       |
| Dominant Wavelength (nm): | 572    | R8:       | 57.2 |      |       |
| Purity:                   | 13.7   |           |      |      |       |
| Rf:                       | 72.3   |           |      |      |       |
| Rg:                       | 96.7   |           |      |      |       |



### Test Conditions

Stabilization Time: 47M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.9/31%  
 Sphere Temperature (°C): 24.4

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| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 1/31/2021        | 7/31/2021            |
| Power Meter                    | IN0071                | 12/1/2020        | 12/1/2021            |
| AC Power Source                | IN0063                | 12/1/2020        | 12/1/2021            |
| DC Power Source                | IN0208                | 12/1/2020        | 12/1/2021            |
| Sphere Thermometer             | IN0085                | 12/1/2020        | 12/1/2021            |
| Room Thermometer               | IN0046                | 12/1/2020        | 12/1/2021            |

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**CIE 1931 Chromaticity Diagram**



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



Point lies inside the ANSI 5000K 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       | 3353             | 0.0              | 490       | 32805            | 4.7              | 620       | 107081           | 27.9             | 750       | 5910             | 0.0              | 880       | 4619             | 0.0              |
| 365       | 2862             | 0.0              | 495       | 44523            | 8.1              | 625       | 98536            | 21.7             | 755       | 5030             | 0.0              | 885       | 4614             | 0.0              |
| 370       | 2810             | 0.0              | 500       | 59272            | 13.1             | 630       | 89745            | 16.2             | 760       | 4853             | 0.0              | 890       | 3959             | 0.0              |
| 375       | 3214             | 0.0              | 505       | 75789            | 21.2             | 635       | 80639            | 12.1             | 765       | 4704             | 0.0              | 895       | 3106             | 0.0              |
| 380       | 3349             | 0.0              | 510       | 91523            | 31.4             | 640       | 72702            | 8.7              | 770       | 3920             | 0.0              | 900       | 4270             | 0.0              |
| 385       | 3025             | 0.0              | 515       | 105611           | 43.7             | 645       | 65679            | 6.3              | 775       | 3859             | 0.0              | 905       | 3918             | 0.0              |
| 390       | 2882             | 0.0              | 520       | 117273           | 56.9             | 650       | 59001            | 4.3              | 780       | 3115             | 0.0              | 910       | 3872             | 0.0              |
| 395       | 2575             | 0.0              | 525       | 125211           | 67.2             | 655       | 52143            | 3.0              | 785       | 3474             | 0.0              | 915       | 3970             | 0.0              |
| 400       | 2553             | 0.0              | 530       | 132145           | 77.8             | 660       | 46377            | 1.9              | 790       | 3401             | 0.0              | 920       | 4123             | 0.0              |
| 405       | 3040             | 0.0              | 535       | 135784           | 84.2             | 665       | 41029            | 1.3              | 795       | 3536             | 0.0              | 925       | 4692             | 0.0              |
| 410       | 5218             | 0.0              | 540       | 138313           | 90.1             | 670       | 35613            | 0.8              | 800       | 3687             | 0.0              | 930       | 4313             | 0.0              |
| 415       | 10898            | 0.0              | 545       | 141311           | 94.1             | 675       | 31345            | 0.5              | 805       | 3213             | 0.0              | 935       | 2374             | 0.0              |
| 420       | 23692            | 0.1              | 550       | 144916           | 98.5             | 680       | 27204            | 0.3              | 810       | 2541             | 0.0              | 940       | 3564             | 0.0              |
| 425       | 50574            | 0.3              | 555       | 147753           | 100.9            | 685       | 23938            | 0.2              | 815       | 3033             | 0.0              | 945       | 3888             | 0.0              |
| 430       | 93101            | 0.7              | 560       | 150201           | 102.1            | 690       | 21157            | 0.1              | 820       | 3270             | 0.0              | 950       | 5143             | 0.0              |
| 435       | 146856           | 1.7              | 565       | 152596           | 101.5            | 695       | 18244            | 0.1              | 825       | 3208             | 0.0              | 955       | 3966             | 0.0              |
| 440       | 206284           | 3.2              | 570       | 153241           | 99.6             | 700       | 16063            | 0.0              | 830       | 2991             | 0.0              | 960       | 4927             | 0.0              |
| 445       | 230963           | 4.8              | 575       | 154079           | 95.9             | 705       | 14433            | 0.0              | 835       | 3477             | 0.0              | 965       | 3279             | 0.0              |
| 450       | 184279           | 4.8              | 580       | 152658           | 90.7             | 710       | 12921            | 0.0              | 840       | 2982             | 0.0              | 970       | 5201             | 0.0              |
| 455       | 112612           | 3.8              | 585       | 151127           | 84.0             | 715       | 11715            | 0.0              | 845       | 3443             | 0.0              | 975       | 3421             | 0.0              |
| 460       | 69904            | 2.9              | 590       | 148249           | 76.6             | 720       | 10565            | 0.0              | 850       | 4753             | 0.0              | 980       | 6148             | 0.0              |
| 465       | 47480            | 2.4              | 595       | 143567           | 68.1             | 725       | 9312             | 0.0              | 855       | 3744             | 0.0              | 985       | 5069             | 0.0              |
| 470       | 32573            | 2.0              | 600       | 138422           | 59.7             | 730       | 8354             | 0.0              | 860       | 4355             | 0.0              | 990       | 8231             | 0.0              |
| 475       | 25178            | 2.0              | 605       | 131783           | 51.0             | 735       | 7425             | 0.0              | 865       | 4984             | 0.0              | 995       | 5852             | 0.0              |
| 480       | 23726            | 2.3              | 610       | 124021           | 42.6             | 740       | 6965             | 0.0              | 870       | 5065             | 0.0              | 1000      | 5471             | 0.0              |
| 485       | 26206            | 3.1              | 615       | 115646           | 34.9             | 745       | 6343             | 0.0              | 875       | 5430             | 0.0              |           |                  |                  |

REPORT NUMBER: SP1-2101-121-8

### Scotopic Flux vs. Wavelength



Scotopic Lumens: 15745.7

S/P: 1.71

| 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       | 3353             | 0.0              | 490       | 32805            | 50.5             | 620       | 107081           | 1.3              | 750       | 5910             | 0.0              | 880       | 4619             | 0.0              |
| 365       | 2862             | 0.0              | 495       | 44523            | 72.0             | 625       | 98536            | 0.8              | 755       | 5030             | 0.0              | 885       | 4614             | 0.0              |
| 370       | 2810             | 0.0              | 500       | 59272            | 99.1             | 630       | 89745            | 0.5              | 760       | 4853             | 0.0              | 890       | 3959             | 0.0              |
| 375       | 3214             | 0.0              | 505       | 75789            | 128.8            | 635       | 80639            | 0.3              | 765       | 4704             | 0.0              | 895       | 3106             | 0.0              |
| 380       | 3349             | 0.0              | 510       | 91523            | 155.1            | 640       | 72702            | 0.2              | 770       | 3920             | 0.0              | 900       | 4270             | 0.0              |
| 385       | 3025             | 0.0              | 515       | 105611           | 175.1            | 645       | 65679            | 0.1              | 775       | 3859             | 0.0              | 905       | 3918             | 0.0              |
| 390       | 2882             | 0.0              | 520       | 117273           | 186.4            | 650       | 59001            | 0.1              | 780       | 3115             | 0.0              | 910       | 3872             | 0.0              |
| 395       | 2575             | 0.0              | 525       | 125211           | 187.3            | 655       | 52143            | 0.0              | 785       | 3474             | 0.0              | 915       | 3970             | 0.0              |
| 400       | 2553             | 0.0              | 530       | 132145           | 182.2            | 660       | 46377            | 0.0              | 790       | 3401             | 0.0              | 920       | 4123             | 0.0              |
| 405       | 3040             | 0.1              | 535       | 135784           | 169.2            | 665       | 41029            | 0.0              | 795       | 3536             | 0.0              | 925       | 4692             | 0.0              |
| 410       | 5218             | 0.3              | 540       | 138313           | 152.8            | 670       | 35613            | 0.0              | 800       | 3687             | 0.0              | 930       | 4313             | 0.0              |
| 415       | 10898            | 1.1              | 545       | 141311           | 135.5            | 675       | 31345            | 0.0              | 805       | 3213             | 0.0              | 935       | 2374             | 0.0              |
| 420       | 23692            | 3.9              | 550       | 144916           | 118.5            | 680       | 27204            | 0.0              | 810       | 2541             | 0.0              | 940       | 3564             | 0.0              |
| 425       | 50574            | 12.4             | 555       | 147753           | 101.0            | 685       | 23938            | 0.0              | 815       | 3033             | 0.0              | 945       | 3888             | 0.0              |
| 430       | 93101            | 31.7             | 560       | 150201           | 84.0             | 690       | 21157            | 0.0              | 820       | 3270             | 0.0              | 950       | 5143             | 0.0              |
| 435       | 146856           | 65.7             | 565       | 152596           | 68.5             | 695       | 18244            | 0.0              | 825       | 3208             | 0.0              | 955       | 3966             | 0.0              |
| 440       | 206284           | 115.3            | 570       | 153241           | 54.1             | 700       | 16063            | 0.0              | 830       | 2991             | 0.0              | 960       | 4927             | 0.0              |
| 445       | 230963           | 154.7            | 575       | 154079           | 42.0             | 705       | 14433            | 0.0              | 835       | 3477             | 0.0              | 965       | 3279             | 0.0              |
| 450       | 184279           | 142.8            | 580       | 152658           | 31.5             | 710       | 12921            | 0.0              | 840       | 2982             | 0.0              | 970       | 5201             | 0.0              |
| 455       | 112612           | 98.4             | 585       | 151127           | 23.1             | 715       | 11715            | 0.0              | 845       | 3443             | 0.0              | 975       | 3421             | 0.0              |
| 460       | 69904            | 67.5             | 590       | 148249           | 16.5             | 720       | 10565            | 0.0              | 850       | 4753             | 0.0              | 980       | 6148             | 0.0              |
| 465       | 47480            | 50.1             | 595       | 143567           | 11.4             | 725       | 9312             | 0.0              | 855       | 3744             | 0.0              | 985       | 5069             | 0.0              |
| 470       | 32573            | 37.5             | 600       | 138422           | 7.8              | 730       | 8354             | 0.0              | 860       | 4355             | 0.0              | 990       | 8231             | 0.0              |
| 475       | 25178            | 31.5             | 605       | 131783           | 5.2              | 735       | 7425             | 0.0              | 865       | 4984             | 0.0              | 995       | 5852             | 0.0              |
| 480       | 23726            | 32.0             | 610       | 124021           | 3.4              | 740       | 6965             | 0.0              | 870       | 5065             | 0.0              | 1000      | 5471             | 0.0              |
| 485       | 26206            | 38.0             | 615       | 115646           | 2.1              | 745       | 6343             | 0.0              | 875       | 5430             | 0.0              |           |                  |                  |

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### Melanopic Flux vs. Wavelength



**Melanopic Lumens: 6193.8**

**M/P: 0.67**

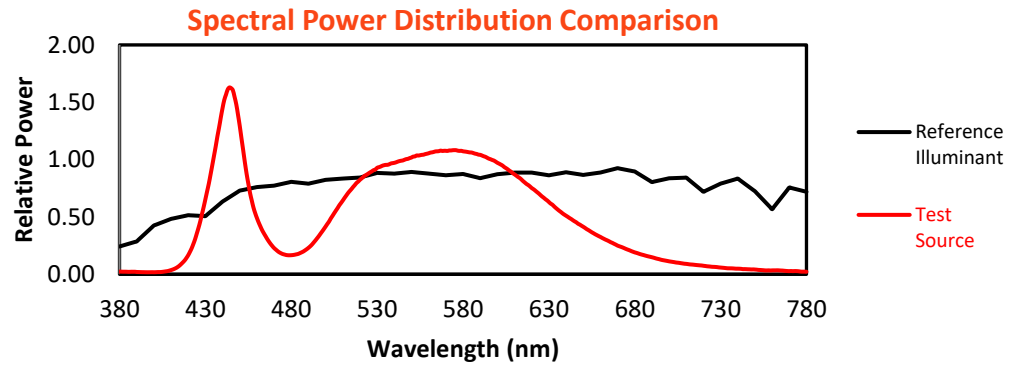
| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 3353             | 0.0              | 490       | 32805            | 27.3             | 620       | 107081           | 0.1              | 750       | 5910             | 0.0              | 880       | 4619             | 0.0              |
| 365       | 2862             | 0.0              | 495       | 44523            | 36.8             | 625       | 98536            | 0.1              | 755       | 5030             | 0.0              | 885       | 4614             | 0.0              |
| 370       | 2810             | 0.0              | 500       | 59272            | 47.6             | 630       | 89745            | 0.0              | 760       | 4853             | 0.0              | 890       | 3959             | 0.0              |
| 375       | 3214             | 0.0              | 505       | 75789            | 58.2             | 635       | 80639            | 0.0              | 765       | 4704             | 0.0              | 895       | 3106             | 0.0              |
| 380       | 3349             | 0.0              | 510       | 91523            | 65.7             | 640       | 72702            | 0.0              | 770       | 3920             | 0.0              | 900       | 4270             | 0.0              |
| 385       | 3025             | 0.0              | 515       | 105611           | 69.0             | 645       | 65679            | 0.0              | 775       | 3859             | 0.0              | 905       | 3918             | 0.0              |
| 390       | 2882             | 0.0              | 520       | 117273           | 68.3             | 650       | 59001            | 0.0              | 780       | 3115             | 0.0              | 910       | 3872             | 0.0              |
| 395       | 2575             | 0.0              | 525       | 125211           | 63.5             | 655       | 52143            | 0.0              | 785       | 3474             | 0.0              | 915       | 3970             | 0.0              |
| 400       | 2553             | 0.0              | 530       | 132145           | 57.1             | 660       | 46377            | 0.0              | 790       | 3401             | 0.0              | 920       | 4123             | 0.0              |
| 405       | 3040             | 0.1              | 535       | 135784           | 48.9             | 665       | 41029            | 0.0              | 795       | 3536             | 0.0              | 925       | 4692             | 0.0              |
| 410       | 5218             | 0.2              | 540       | 138313           | 40.5             | 670       | 35613            | 0.0              | 800       | 3687             | 0.0              | 930       | 4313             | 0.0              |
| 415       | 10898            | 0.7              | 545       | 141311           | 32.8             | 675       | 31345            | 0.0              | 805       | 3213             | 0.0              | 935       | 2374             | 0.0              |
| 420       | 23692            | 2.7              | 550       | 144916           | 26.0             | 680       | 27204            | 0.0              | 810       | 2541             | 0.0              | 940       | 3564             | 0.0              |
| 425       | 50574            | 7.9              | 555       | 147753           | 19.9             | 685       | 23938            | 0.0              | 815       | 3033             | 0.0              | 945       | 3888             | 0.0              |
| 430       | 93101            | 19.7             | 560       | 150201           | 14.8             | 690       | 21157            | 0.0              | 820       | 3270             | 0.0              | 950       | 5143             | 0.0              |
| 435       | 146856           | 39.2             | 565       | 152596           | 10.7             | 695       | 18244            | 0.0              | 825       | 3208             | 0.0              | 955       | 3966             | 0.0              |
| 440       | 206284           | 68.9             | 570       | 153241           | 7.5              | 700       | 16063            | 0.0              | 830       | 2991             | 0.0              | 960       | 4927             | 0.0              |
| 445       | 230963           | 91.1             | 575       | 154079           | 5.1              | 705       | 14433            | 0.0              | 835       | 3477             | 0.0              | 965       | 3279             | 0.0              |
| 450       | 184279           | 84.9             | 580       | 152658           | 3.4              | 710       | 12921            | 0.0              | 840       | 2982             | 0.0              | 970       | 5201             | 0.0              |
| 455       | 112612           | 59.0             | 585       | 151127           | 2.2              | 715       | 11715            | 0.0              | 845       | 3443             | 0.0              | 975       | 3421             | 0.0              |
| 460       | 69904            | 41.2             | 590       | 148249           | 1.5              | 720       | 10565            | 0.0              | 850       | 4753             | 0.0              | 980       | 6148             | 0.0              |
| 465       | 47480            | 31.0             | 595       | 143567           | 0.9              | 725       | 9312             | 0.0              | 855       | 3744             | 0.0              | 985       | 5069             | 0.0              |
| 470       | 32573            | 23.3             | 600       | 138422           | 0.6              | 730       | 8354             | 0.0              | 860       | 4355             | 0.0              | 990       | 8231             | 0.0              |
| 475       | 25178            | 19.2             | 605       | 131783           | 0.4              | 735       | 7425             | 0.0              | 865       | 4984             | 0.0              | 995       | 5852             | 0.0              |
| 480       | 23726            | 19.1             | 610       | 124021           | 0.2              | 740       | 6965             | 0.0              | 870       | 5065             | 0.0              | 1000      | 5471             | 0.0              |
| 485       | 26206            | 21.6             | 615       | 115646           | 0.1              | 745       | 6343             | 0.0              | 875       | 5430             | 0.0              |           |                  |                  |

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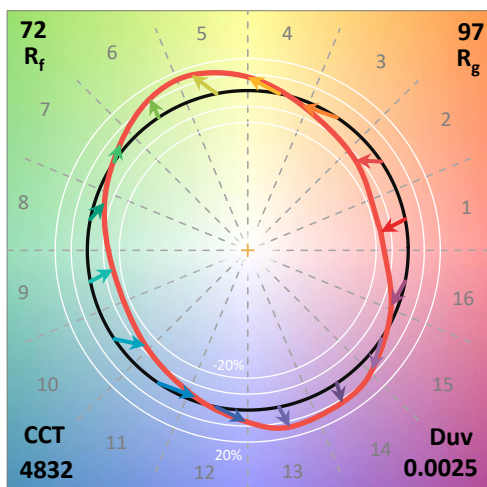
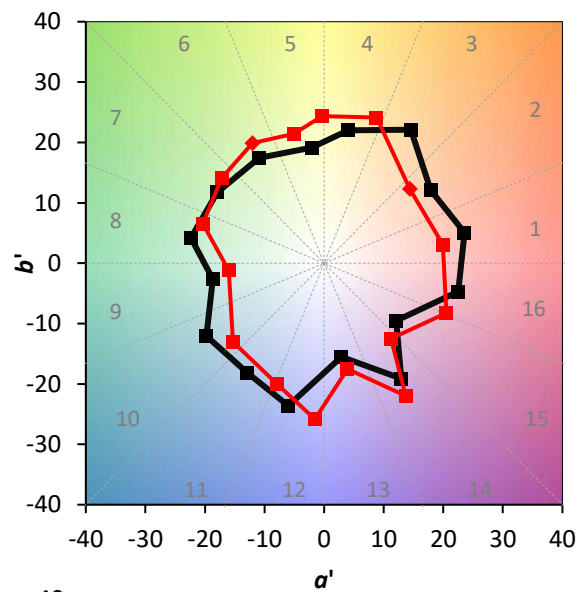
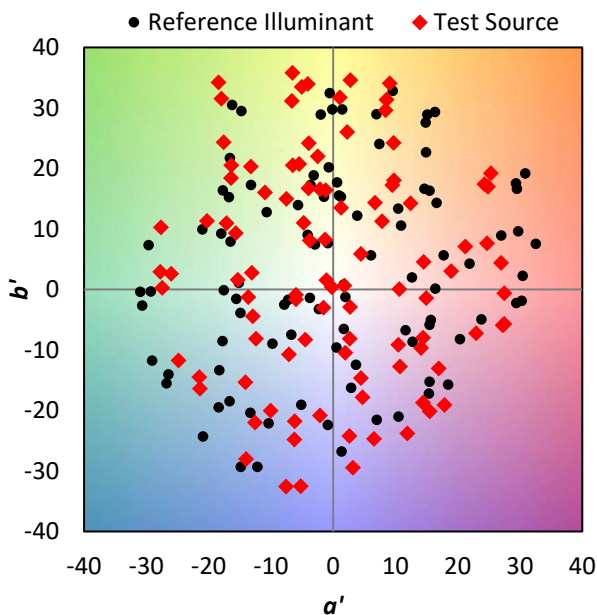
TM-30-18

### Summary

$R_f = 72.3$   
 $R_g = 96.7$   
 $CIE R_a = 71.7$   
 $R_g = -27.7$

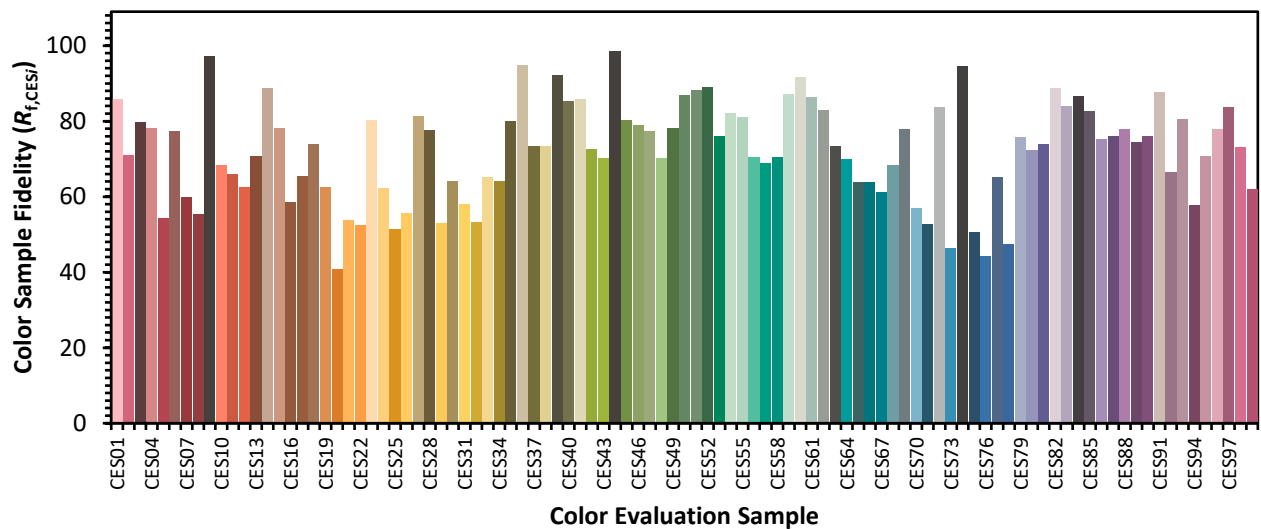


### Color Vector Graphics



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 56 | CES51 = 88 | CES76 = 44 |
| CES02 = 60 | CES27 = 81 | CES52 = 89 | CES77 = 65 |
| CES03 = 30 | CES28 = 78 | CES53 = 76 | CES78 = 47 |
| CES04 = 69 | CES29 = 53 | CES54 = 82 | CES79 = 76 |
| CES05 = 46 | CES30 = 64 | CES55 = 81 | CES80 = 72 |
| CES06 = 50 | CES31 = 58 | CES56 = 70 | CES81 = 74 |
| CES07 = 39 | CES32 = 53 | CES57 = 69 | CES82 = 89 |
| CES08 = 38 | CES33 = 65 | CES58 = 70 | CES83 = 84 |
| CES09 = 29 | CES34 = 64 | CES59 = 87 | CES84 = 87 |
| CES10 = 73 | CES35 = 80 | CES60 = 92 | CES85 = 83 |
| CES11 = 56 | CES36 = 95 | CES61 = 86 | CES86 = 75 |
| CES12 = 62 | CES37 = 73 | CES62 = 83 | CES87 = 76 |
| CES13 = 42 | CES38 = 73 | CES63 = 73 | CES88 = 78 |
| CES14 = 74 | CES39 = 92 | CES64 = 70 | CES89 = 74 |
| CES15 = 70 | CES40 = 85 | CES65 = 64 | CES90 = 76 |
| CES16 = 46 | CES41 = 86 | CES66 = 64 | CES91 = 88 |
| CES17 = 49 | CES42 = 73 | CES67 = 61 | CES92 = 66 |
| CES18 = 55 | CES43 = 70 | CES68 = 68 | CES93 = 81 |
| CES19 = 71 | CES44 = 98 | CES69 = 78 | CES94 = 58 |
| CES20 = 64 | CES45 = 80 | CES70 = 57 | CES95 = 71 |
| CES21 = 85 | CES46 = 79 | CES71 = 53 | CES96 = 78 |
| CES22 = 77 | CES47 = 77 | CES72 = 84 | CES97 = 84 |
| CES23 = 91 | CES48 = 70 | CES73 = 46 | CES98 = 73 |
| CES24 = 90 | CES49 = 78 | CES74 = 95 | CES99 = 62 |
| CES25 = 71 | CES50 = 87 | CES75 = 50 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)