

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: P674732

Luminaire Tested: **CCP-SA2C-760-U-T3R-HSS**

Issue Date: 04/16/2023

**Test Information**

Test Method: LM-79-08  
Report Number: P674732  
Test Lab: INNOVATION CENTER(G2)  
Issue Date: 04/16/2023  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: INVUE  
Catalog Number: CCP-SA2C-760-U-T3R-HSS  
Description: INVUE CLEAR CURVE POLE MOUNT Light Square Luminaire @615mA w/ T3R  
distribution lens and House Side Shield  
Light Source: (32) 5700K CCT, 70 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 7335 lumens  
Efficiency: N/A  
Efficacy: 118.1 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 1' x H: 0')  
IES Classification: Type III - Short  
BUG Rating: B1 - U0 - G2

Input Watts (W): 62.1  
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

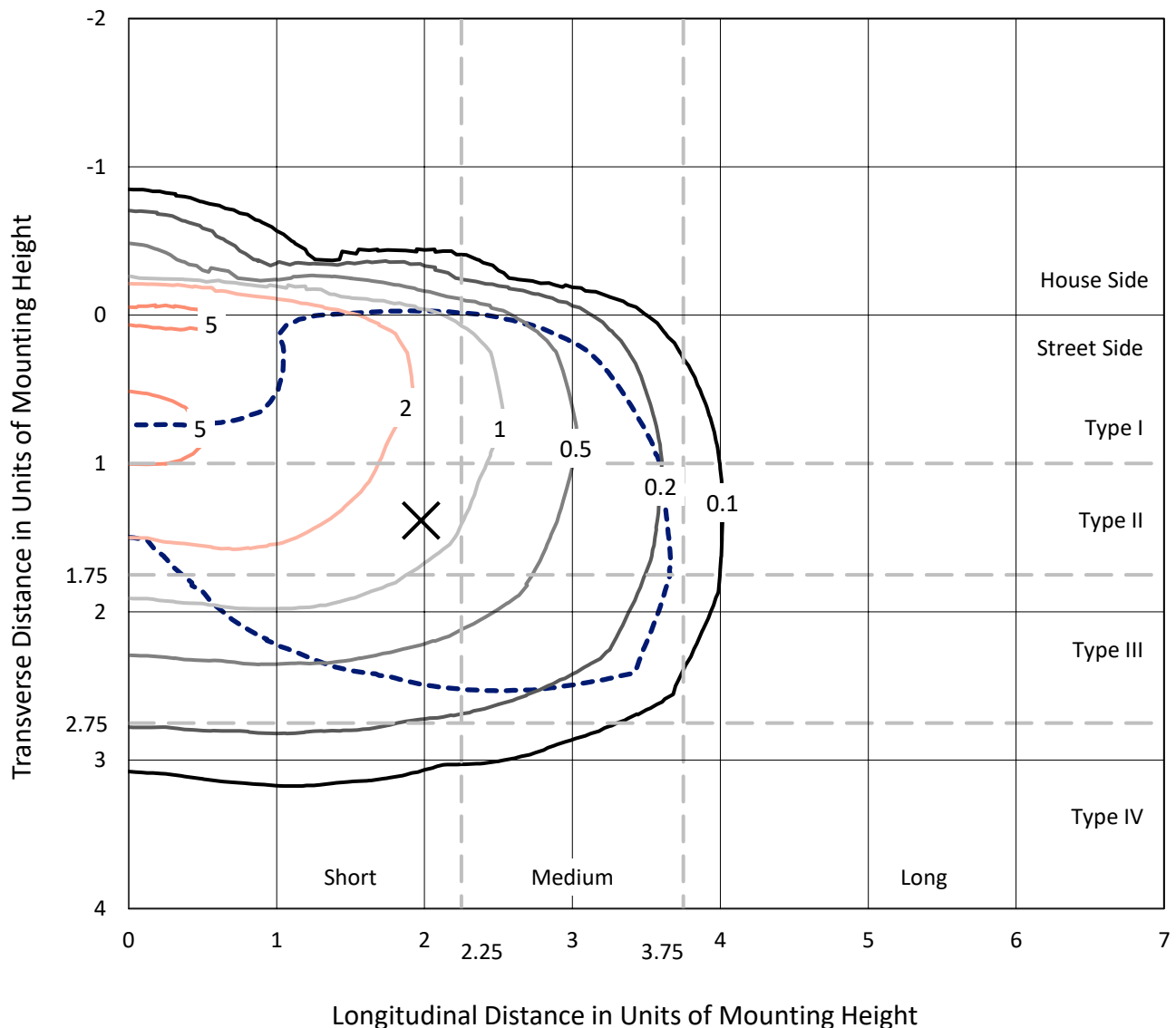
REPORT NUMBER: P674732

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## Iso-Footcandle Lines of Horizontal Illumination

✗ Max cd

--- 1/2 Max cd

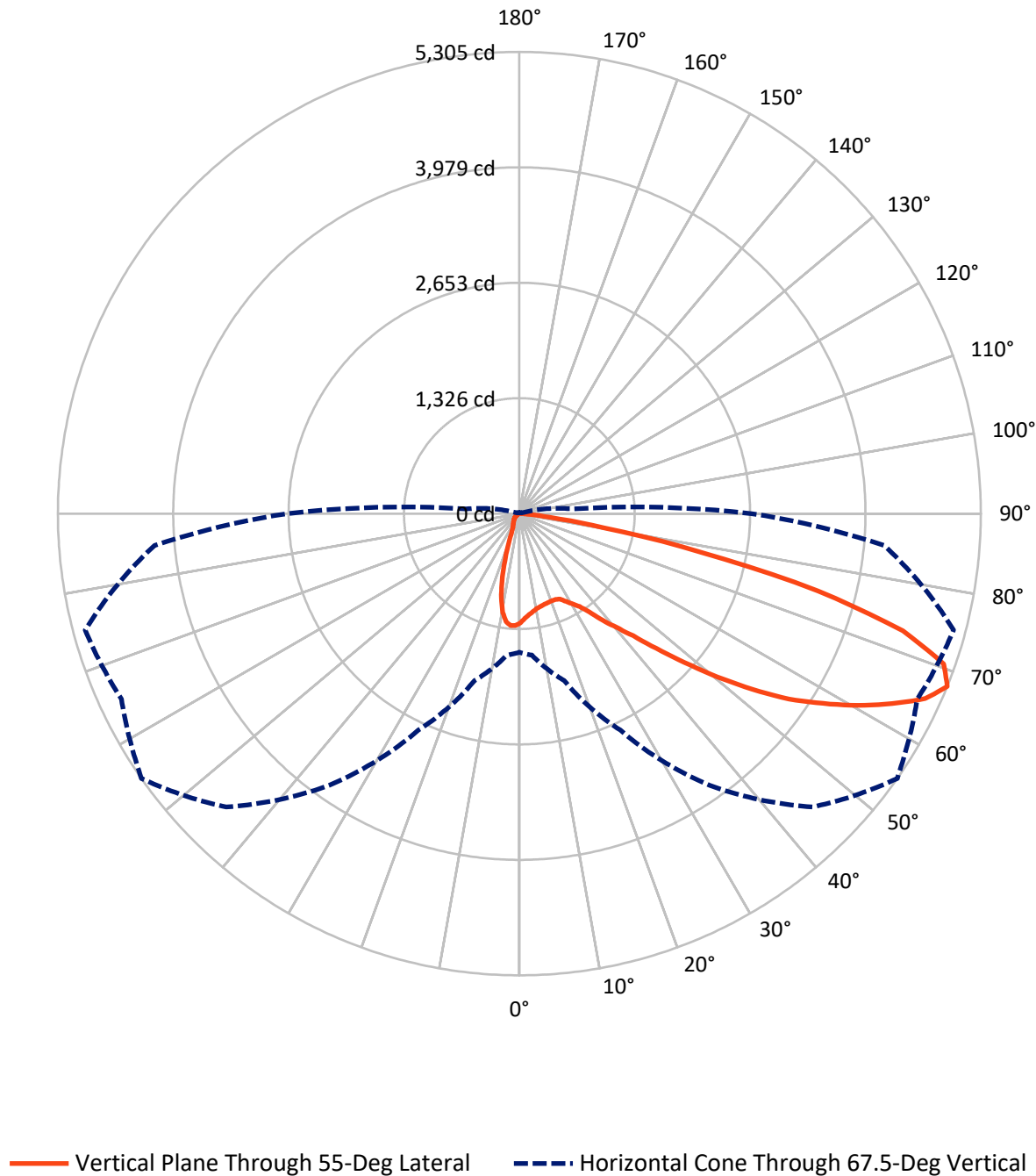


Based on 15 foot mounting height. Maximum calculated value = 6.1 fc

Type III - Short - N/A

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CATALOG NUMBER: CCP-SA2C-760-U-T3R-HSS

## Luminous Intensity Polar Plot



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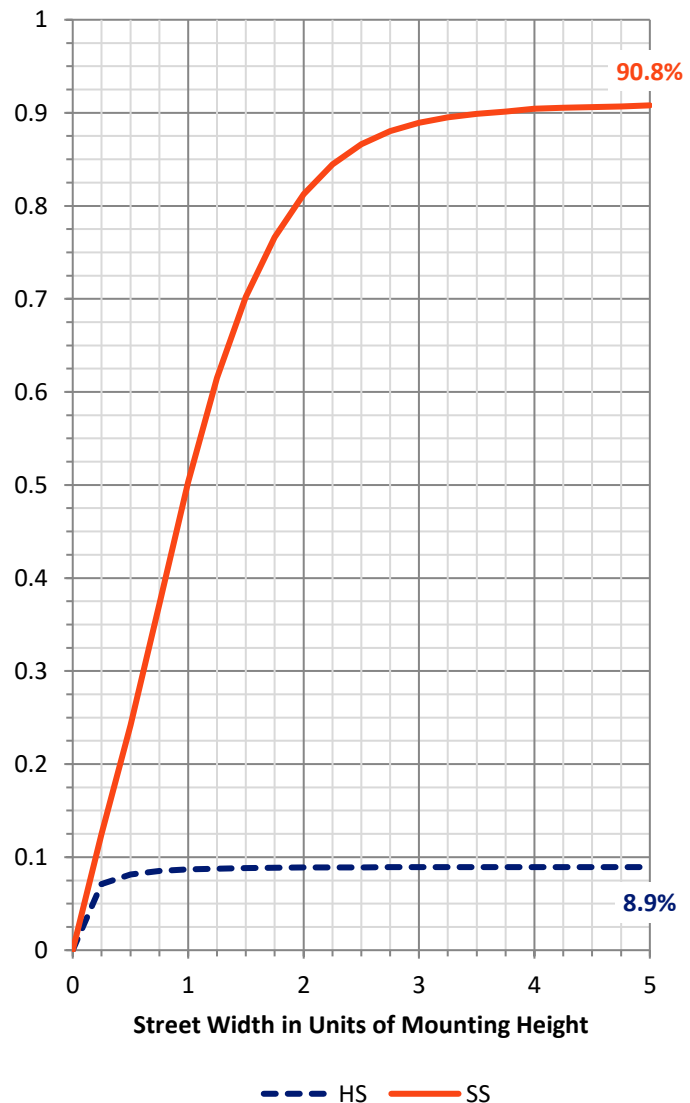
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 658.9    | 0.0    | 658.9  |
|                    | % Fixture | 9.0      | 0.0    | 9.0    |
| <b>Street Side</b> | Lumens    | 6676.0   | 0.0    | 6676.0 |
|                    | % Fixture | 91.0     | 0.0    | 91.0   |
| <b>Total</b>       | Lumens    | 7335.0   | 0.0    | 7335.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 110.3  | 1.5       |
| 10°-20°   | 251.2  | 3.4       |
| 20°-30°   | 403.0  | 5.5       |
| 30°-40°   | 698.9  | 9.5       |
| 40°-50°   | 1165.4 | 15.9      |
| 50°-60°   | 1704.2 | 23.2      |
| 60°-70°   | 1987.1 | 27.1      |
| 70°-80°   | 964.4  | 13.1      |
| 80°-90°   | 50.4   | 0.7       |
| 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°    | 7335.0 | 100.0     |
| 0°-180°   | 7335.0 | 100.0     |



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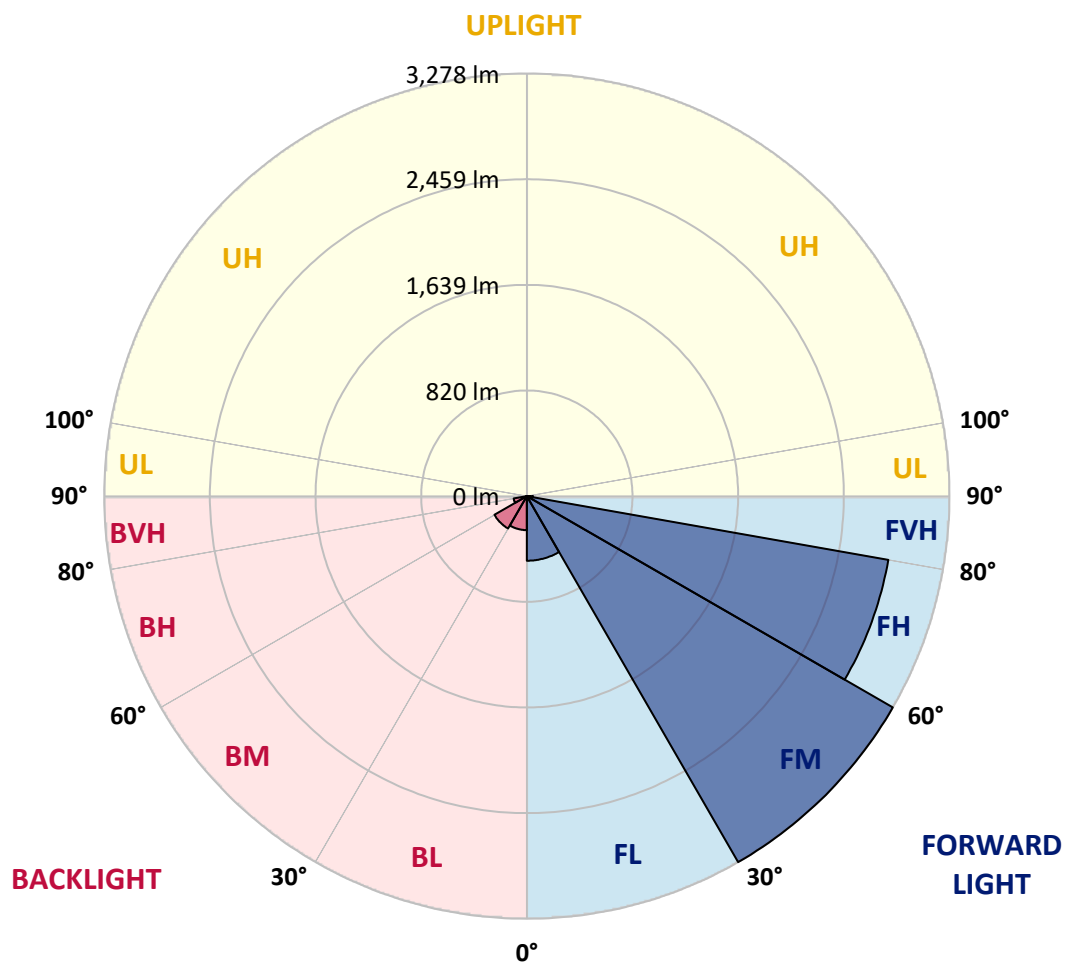
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**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 501.1  | 6.8       |                         |      |         |
| FM   | (30°-60°)   | 3278.5 | 44.7      |                         |      |         |
| FH   | (60°-80°)   | 2847.5 | 38.8      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 48.9   | 0.7       |                         |      | G1/100  |
| BL   | (0°-30°)    | 263.4  | 3.6       | B1/500                  |      |         |
| BM   | (30°-60°)   | 290.1  | 4.0       | B1/1000                 |      |         |
| BH   | (60°-80°)   | 103.9  | 1.4       | B0/110                  |      | G0/110  |
| BVH  | (80°-90°)   | 1.5    | 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-G2**

Type III Short



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 56°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1257.0 | 1257.0 | 1257.0 | 1257.0 | 1257.0 | 1257.0 | 1257.0 | 1257.0 | 1257.0 | 1257.0 | 1257.0 |
| 2.5°  | 1160.4 | 1167.8 | 1177.3 | 1180.6 | 1192.1 | 1208.3 | 1203.6 | 1200.2 | 1218.5 | 1243.5 | 1251.6 |
| 5°    | 1088.1 | 1088.7 | 1103.6 | 1114.4 | 1134.0 | 1149.5 | 1166.4 | 1165.1 | 1198.2 | 1240.8 | 1267.8 |
| 7.5°  | 1017.1 | 1018.4 | 1034.0 | 1050.9 | 1079.3 | 1109.7 | 1135.4 | 1134.0 | 1187.4 | 1244.2 | 1295.5 |
| 10°   | 923.8  | 930.6  | 949.5  | 979.2  | 1023.8 | 1071.8 | 1107.6 | 1111.0 | 1175.2 | 1257.0 | 1333.4 |
| 12.5° | 848.8  | 852.2  | 873.1  | 911.7  | 964.4  | 1027.2 | 1094.1 | 1092.1 | 1177.9 | 1280.7 | 1382.7 |
| 15°   | 817.1  | 815.0  | 827.9  | 856.2  | 916.4  | 995.5  | 1080.6 | 1085.3 | 1187.4 | 1307.7 | 1434.1 |
| 17.5° | 824.5  | 822.5  | 829.2  | 839.4  | 881.9  | 969.1  | 1073.2 | 1081.3 | 1202.3 | 1336.1 | 1482.0 |
| 20°   | 906.9  | 892.7  | 880.6  | 869.8  | 875.8  | 947.5  | 1068.5 | 1077.2 | 1211.0 | 1357.7 | 1532.7 |
| 22.5° | 1065.7 | 1048.2 | 1015.7 | 955.6  | 915.7  | 948.8  | 1069.8 | 1081.3 | 1230.6 | 1392.8 | 1594.2 |
| 25°   | 1324.6 | 1307.7 | 1238.1 | 1115.1 | 1009.7 | 997.5  | 1088.1 | 1100.2 | 1275.9 | 1446.2 | 1659.8 |
| 27.5° | 1667.2 | 1629.4 | 1544.9 | 1368.5 | 1165.1 | 1075.2 | 1142.8 | 1156.3 | 1340.1 | 1487.5 | 1704.4 |
| 30°   | 1951.7 | 1942.9 | 1861.9 | 1645.6 | 1379.3 | 1189.4 | 1204.3 | 1211.7 | 1369.2 | 1512.5 | 1749.0 |
| 32.5° | 2247.1 | 2228.8 | 2154.5 | 1944.3 | 1628.0 | 1352.3 | 1273.2 | 1276.6 | 1407.0 | 1549.6 | 1813.9 |
| 35°   | 2503.9 | 2487.0 | 2424.8 | 2220.7 | 1918.6 | 1571.3 | 1387.4 | 1380.0 | 1485.4 | 1631.4 | 1901.7 |
| 37.5° | 2741.8 | 2739.7 | 2685.0 | 2476.8 | 2179.5 | 1798.3 | 1555.7 | 1549.6 | 1607.7 | 1721.3 | 2020.7 |
| 40°   | 2974.2 | 2968.8 | 2922.2 | 2732.3 | 2436.3 | 2024.7 | 1715.9 | 1700.3 | 1711.8 | 1847.0 | 2177.5 |
| 42.5° | 3116.8 | 3128.3 | 3144.5 | 3024.2 | 2741.1 | 2290.3 | 1918.6 | 1909.2 | 1907.1 | 2043.6 | 2383.6 |
| 45°   | 3193.9 | 3214.1 | 3309.4 | 3298.6 | 3064.1 | 2620.8 | 2207.2 | 2182.9 | 2174.8 | 2314.0 | 2619.4 |
| 47.5° | 3268.9 | 3277.7 | 3433.8 | 3499.3 | 3373.6 | 2965.4 | 2555.9 | 2522.1 | 2489.0 | 2643.8 | 2901.2 |
| 50°   | 3273.6 | 3287.8 | 3481.1 | 3640.6 | 3633.1 | 3304.7 | 2947.2 | 2917.5 | 2879.6 | 3045.2 | 3176.3 |
| 52.5° | 3207.4 | 3235.8 | 3475.0 | 3729.8 | 3794.0 | 3604.1 | 3353.4 | 3329.0 | 3297.9 | 3421.6 | 3408.1 |
| 55°   | 2749.9 | 2797.8 | 3356.1 | 3737.9 | 3906.8 | 3860.9 | 3761.5 | 3727.8 | 3697.3 | 3785.2 | 3635.2 |
| 57.5° | 2532.3 | 2559.3 | 2995.2 | 3731.8 | 4050.8 | 4098.8 | 4115.7 | 4100.1 | 4057.6 | 4167.0 | 3872.4 |
| 60°   | 2401.8 | 2441.0 | 2822.9 | 3664.2 | 4206.2 | 4367.7 | 4473.9 | 4442.8 | 4390.7 | 4541.4 | 4126.5 |
| 62.5° | 2245.7 | 2274.1 | 2651.2 | 3469.6 | 4298.8 | 4641.5 | 4809.7 | 4781.3 | 4673.9 | 4886.8 | 4331.9 |
| 65°   | 1957.8 | 2000.4 | 2378.2 | 3163.5 | 4174.5 | 4842.2 | 5126.0 | 5116.5 | 4930.0 | 5147.6 | 4388.0 |
| 67.5° | 1593.6 | 1632.1 | 1984.2 | 2743.8 | 3810.9 | 4767.2 | 5305.1 | 5275.4 | 5046.3 | 5167.2 | 4210.3 |
| 70°   | 1196.2 | 1217.1 | 1482.7 | 2096.4 | 3122.2 | 4366.4 | 5175.3 | 5169.3 | 4869.9 | 4876.6 | 3664.9 |
| 72.5° | 642.0  | 700.1  | 986.0  | 1403.0 | 2195.7 | 3536.5 | 4612.4 | 4588.1 | 4344.8 | 3994.0 | 2635.7 |
| 75°   | 224.4  | 241.3  | 525.1  | 788.0  | 1192.8 | 2355.9 | 3546.6 | 3489.9 | 3249.3 | 2597.8 | 1436.1 |
| 77.5° | 137.9  | 151.4  | 233.2  | 402.8  | 464.3  | 1022.5 | 2130.8 | 2057.2 | 1901.7 | 1123.2 | 490.6  |
| 80°   | 95.3   | 107.5  | 156.1  | 210.9  | 158.1  | 331.1  | 980.6  | 952.9  | 733.3  | 267.6  | 112.9  |
| 82.5° | 53.4   | 64.2   | 118.3  | 103.4  | 63.5   | 85.8   | 339.9  | 314.9  | 195.3  | 72.3   | 37.8   |
| 85°   | 31.1   | 37.2   | 83.1   | 73.0   | 32.4   | 30.4   | 88.5   | 79.1   | 50.7   | 27.0   | 18.2   |
| 87.5° | 16.2   | 21.0   | 60.8   | 48.7   | 19.6   | 10.8   | 20.3   | 19.6   | 12.8   | 9.5    | 12.2   |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

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**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1257.0 | 1257.0 | 1257.0 | 1257.0 | 1257.0 | 1257.0 | 1257.0 | 1257.0 | 1257.0 | 1257.0 | 1257.0 |
| 2.5°  | 1266.5 | 1263.1 | 1280.7 | 1286.7 | 1285.4 | 1282.7 | 1289.4 | 1280.7 | 1280.0 | 1278.0 | 1275.9 |
| 5°    | 1289.4 | 1294.8 | 1309.0 | 1309.0 | 1290.1 | 1259.0 | 1240.1 | 1214.4 | 1192.8 | 1180.0 | 1177.9 |
| 7.5°  | 1323.9 | 1334.7 | 1344.2 | 1315.1 | 1250.2 | 1173.2 | 1091.4 | 1027.2 | 971.1  | 942.1  | 939.4  |
| 10°   | 1372.6 | 1382.7 | 1375.3 | 1292.1 | 1152.9 | 993.4  | 860.3  | 726.5  | 659.6  | 623.1  | 623.1  |
| 12.5° | 1430.7 | 1438.8 | 1393.5 | 1234.7 | 992.8  | 761.6  | 583.9  | 443.3  | 376.4  | 333.2  | 330.5  |
| 15°   | 1493.5 | 1495.6 | 1390.8 | 1134.7 | 794.8  | 511.6  | 335.2  | 246.0  | 217.6  | 211.5  | 210.2  |
| 17.5° | 1548.3 | 1540.2 | 1362.4 | 986.7  | 572.4  | 304.8  | 212.9  | 192.6  | 187.2  | 187.2  | 187.2  |
| 20°   | 1599.6 | 1572.6 | 1305.7 | 814.3  | 367.0  | 207.5  | 183.1  | 177.7  | 177.7  | 178.4  | 178.4  |
| 22.5° | 1656.4 | 1603.0 | 1224.6 | 623.1  | 235.9  | 177.7  | 171.7  | 169.0  | 168.3  | 170.3  | 169.6  |
| 25°   | 1723.3 | 1632.8 | 1108.3 | 430.5  | 182.5  | 165.6  | 162.9  | 160.2  | 160.2  | 160.2  | 160.2  |
| 27.5° | 1760.5 | 1628.7 | 975.9  | 271.7  | 159.5  | 153.4  | 150.7  | 148.0  | 146.0  | 145.3  | 146.0  |
| 30°   | 1792.9 | 1605.0 | 802.9  | 189.9  | 143.9  | 137.2  | 135.2  | 131.8  | 127.7  | 126.4  | 126.4  |
| 32.5° | 1835.5 | 1585.4 | 621.7  | 152.7  | 130.4  | 123.0  | 116.9  | 111.5  | 104.8  | 102.0  | 101.4  |
| 35°   | 1882.8 | 1549.6 | 455.5  | 134.5  | 118.3  | 108.8  | 99.3   | 90.6   | 81.8   | 79.1   | 78.4   |
| 37.5° | 1941.6 | 1517.2 | 308.8  | 124.3  | 108.1  | 96.6   | 83.8   | 71.6   | 63.5   | 62.2   | 62.2   |
| 40°   | 2021.3 | 1490.2 | 213.6  | 115.6  | 98.7   | 85.2   | 69.6   | 56.8   | 51.4   | 50.0   | 50.0   |
| 42.5° | 2130.1 | 1467.9 | 161.5  | 108.1  | 90.6   | 73.7   | 56.1   | 46.6   | 42.6   | 41.2   | 41.2   |
| 45°   | 2258.6 | 1433.4 | 136.5  | 101.4  | 82.4   | 62.2   | 46.6   | 39.2   | 37.2   | 37.2   | 37.2   |
| 47.5° | 2405.9 | 1390.1 | 124.3  | 94.6   | 73.7   | 50.7   | 39.2   | 35.8   | 35.1   | 35.1   | 35.8   |
| 50°   | 2554.6 | 1338.8 | 115.6  | 86.5   | 63.5   | 43.3   | 35.8   | 33.8   | 33.8   | 34.5   | 34.5   |
| 52.5° | 2655.3 | 1258.4 | 106.8  | 77.7   | 53.4   | 37.8   | 33.8   | 33.1   | 32.4   | 32.4   | 32.4   |
| 55°   | 2753.2 | 1188.1 | 94.6   | 68.3   | 44.6   | 35.1   | 32.4   | 31.8   | 31.8   | 31.1   | 31.1   |
| 57.5° | 2855.3 | 1132.7 | 79.1   | 56.8   | 37.8   | 33.1   | 31.1   | 31.1   | 29.7   | 29.1   | 29.1   |
| 60°   | 2973.6 | 1084.0 | 60.8   | 44.6   | 33.1   | 31.1   | 29.1   | 28.4   | 27.0   | 25.7   | 25.7   |
| 62.5° | 3008.0 | 981.3  | 46.0   | 35.8   | 28.4   | 27.0   | 26.4   | 25.0   | 21.6   | 18.9   | 19.6   |
| 65°   | 2918.1 | 819.8  | 36.5   | 28.4   | 23.0   | 23.0   | 21.0   | 17.6   | 14.2   | 12.2   | 12.2   |
| 67.5° | 2670.1 | 612.3  | 29.7   | 22.3   | 18.2   | 17.6   | 14.9   | 12.8   | 8.8    | 7.4    | 7.4    |
| 70°   | 2200.4 | 404.8  | 24.3   | 17.6   | 14.9   | 12.2   | 10.1   | 9.5    | 6.8    | 5.4    | 5.4    |
| 72.5° | 1542.2 | 219.6  | 20.3   | 14.2   | 10.8   | 8.1    | 6.8    | 6.1    | 4.7    | 4.1    | 3.4    |
| 75°   | 814.3  | 84.5   | 16.2   | 10.8   | 6.8    | 5.4    | 4.1    | 4.1    | 3.4    | 2.7    | 2.7    |
| 77.5° | 279.1  | 35.8   | 11.5   | 6.1    | 4.7    | 3.4    | 2.7    | 2.0    | 2.7    | 2.0    | 2.0    |
| 80°   | 66.2   | 21.0   | 7.4    | 4.1    | 2.7    | 2.0    | 2.0    | 1.4    | 1.4    | 1.4    | 1.4    |
| 82.5° | 29.1   | 12.2   | 4.7    | 2.7    | 2.7    | 2.0    | 1.4    | 0.7    | 0.7    | 0.7    | 0.7    |
| 85°   | 19.6   | 7.4    | 3.4    | 2.7    | 2.0    | 1.4    | 0.7    | 0.7    | 0.0    | 0.0    | 0.0    |
| 87.5° | 15.5   | 4.7    | 2.7    | 2.7    | 2.0    | 1.4    | 0.7    | 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)

INVUE

Report Number: SP1-2012-088-5-R3

Luminaire Tested: CCW-SA1A-760-U-SL2-HSS

Test Date: 01/19/2021

### Test Information

Test Method: LM-79-08  
 Report Number: SP1-2012-088-5-R3  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1  
 Measurement Geometry:  $4\pi$   
 Issue Date: 01/19/2021  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: INVUE  
 Catalog Number: **CCW-SA1A-760-U-SL2-HSS**  
 Description: INVUE WALL PACK

\*\*\*THIS IS A REVISION OF SP1-2012-088-5-R2. TO UPDATE THE CATALOG  
 INFORMATION.\*\*\*TESTED IN SITU. INVUE WALL PACK LIGHT SQUARE T2 OPTICS 1-SQUARE WITH  
 HOUSE SIDE SHIELD

### Spectral Parameters

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 5447   | CRI (Ra): | 71.9 |      |       |
| CIE u':                   | 0.2053 | R1:       | 70.7 | R9:  | -27.5 |
| CIE v':                   | 0.4809 | R2:       | 74.8 | R10: | 41.5  |
| Duv:                      | 0.0027 | R3:       | 78.7 | R11: | 74.9  |
| CIE x:                    | 0.3337 | R4:       | 74.0 | R12: | 49.9  |
| CIE y:                    | 0.3473 | R5:       | 72.5 | R13: | 70.2  |
| CIE z:                    | 0.3190 | R6:       | 67.7 | R14: | 88.1  |
| Peak Wavelength (nm):     | 443    | R7:       | 77.7 |      |       |
| Dominant Wavelength (nm): | 556    | R8:       | 58.8 |      |       |
| Purity:                   | 4.5    |           |      |      |       |
| Rf:                       | 72.3   |           |      |      |       |
| Rg:                       | 97.2   |           |      |      |       |



### Test Conditions

Stabilization Time: 75M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.4/18%  
 Sphere Temperature (°C): 25.3

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| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 7/29/2020        | 1/29/2021            |
| 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 5700K 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       | 828              | 0.0              | 490       | 9471             | 1.3              | 620       | 23317            | 6.1              | 750       | 1157             | 0.0              | 880       | 1136             | 0.0              |
| 365       | 696              | 0.0              | 495       | 12752            | 2.3              | 625       | 21413            | 4.7              | 755       | 1067             | 0.0              | 885       | 773              | 0.0              |
| 370       | 807              | 0.0              | 500       | 16685            | 3.7              | 630       | 19344            | 3.5              | 760       | 1059             | 0.0              | 890       | 872              | 0.0              |
| 375       | 837              | 0.0              | 505       | 20565            | 5.8              | 635       | 17464            | 2.6              | 765       | 1009             | 0.0              | 895       | 891              | 0.0              |
| 380       | 757              | 0.0              | 510       | 24119            | 8.3              | 640       | 15745            | 1.9              | 770       | 774              | 0.0              | 900       | 807              | 0.0              |
| 385       | 706              | 0.0              | 515       | 27181            | 11.3             | 645       | 14060            | 1.4              | 775       | 761              | 0.0              | 905       | 899              | 0.0              |
| 390       | 746              | 0.0              | 520       | 29555            | 14.3             | 650       | 12579            | 0.9              | 780       | 653              | 0.0              | 910       | 506              | 0.0              |
| 395       | 660              | 0.0              | 525       | 31307            | 16.8             | 655       | 11181            | 0.6              | 785       | 704              | 0.0              | 915       | 598              | 0.0              |
| 400       | 671              | 0.0              | 530       | 32558            | 19.2             | 660       | 9847             | 0.4              | 790       | 663              | 0.0              | 920       | 510              | 0.0              |
| 405       | 848              | 0.0              | 535       | 33301            | 20.7             | 665       | 8641             | 0.3              | 795       | 493              | 0.0              | 925       | 874              | 0.0              |
| 410       | 1490             | 0.0              | 540       | 33727            | 22.0             | 670       | 7535             | 0.2              | 800       | 584              | 0.0              | 930       | 549              | 0.0              |
| 415       | 3203             | 0.0              | 545       | 34356            | 22.9             | 675       | 6542             | 0.1              | 805       | 739              | 0.0              | 935       | 720              | 0.0              |
| 420       | 7298             | 0.0              | 550       | 34589            | 23.5             | 680       | 5664             | 0.1              | 810       | 601              | 0.0              | 940       | 754              | 0.0              |
| 425       | 15315            | 0.1              | 555       | 34855            | 23.8             | 685       | 4962             | 0.0              | 815       | 677              | 0.0              | 945       | 931              | 0.0              |
| 430       | 27886            | 0.2              | 560       | 35083            | 23.8             | 690       | 4369             | 0.0              | 820       | 726              | 0.0              | 950       | 811              | 0.0              |
| 435       | 45485            | 0.5              | 565       | 35553            | 23.6             | 695       | 3785             | 0.0              | 825       | 693              | 0.0              | 955       | 955              | 0.0              |
| 440       | 61965            | 1.0              | 570       | 35511            | 23.1             | 700       | 3318             | 0.0              | 830       | 619              | 0.0              | 960       | 1025             | 0.0              |
| 445       | 62721            | 1.3              | 575       | 35515            | 22.1             | 705       | 2962             | 0.0              | 835       | 738              | 0.0              | 965       | 916              | 0.0              |
| 450       | 44754            | 1.2              | 580       | 35114            | 20.9             | 710       | 2689             | 0.0              | 840       | 681              | 0.0              | 970       | 695              | 0.0              |
| 455       | 26152            | 0.9              | 585       | 34546            | 19.2             | 715       | 2476             | 0.0              | 845       | 691              | 0.0              | 975       | 568              | 0.0              |
| 460       | 17101            | 0.7              | 590       | 33522            | 17.3             | 720       | 2192             | 0.0              | 850       | 710              | 0.0              | 980       | 643              | 0.0              |
| 465       | 11400            | 0.6              | 595       | 32326            | 15.3             | 725       | 1939             | 0.0              | 855       | 1025             | 0.0              | 985       | 804              | 0.0              |
| 470       | 7763             | 0.5              | 600       | 30973            | 13.3             | 730       | 1698             | 0.0              | 860       | 889              | 0.0              | 990       | 812              | 0.0              |
| 475       | 6419             | 0.5              | 605       | 29160            | 11.3             | 735       | 1533             | 0.0              | 865       | 885              | 0.0              | 995       | 496              | 0.0              |
| 480       | 6330             | 0.6              | 610       | 27373            | 9.4              | 740       | 1375             | 0.0              | 870       | 905              | 0.0              | 1000      | 659              | 0.0              |
| 485       | 7299             | 0.9              | 615       | 25423            | 7.7              | 745       | 1254             | 0.0              | 875       | 739              | 0.0              |           |                  |                  |

REPORT NUMBER: SP1-2012-088-5-R3

### Scotopic Flux vs. Wavelength



Scotopic Lumens: 1610.2

S/P: 0.74

| 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       | 828              | 0.0              | 490       | 9471             | 14.6             | 620       | 23317            | 0.3              | 750       | 1157             | 0.0              | 880       | 1136             | 0.0              |
| 365       | 696              | 0.0              | 495       | 12752            | 20.6             | 625       | 21413            | 0.2              | 755       | 1067             | 0.0              | 885       | 773              | 0.0              |
| 370       | 807              | 0.0              | 500       | 16685            | 27.9             | 630       | 19344            | 0.1              | 760       | 1059             | 0.0              | 890       | 872              | 0.0              |
| 375       | 837              | 0.0              | 505       | 20565            | 35.0             | 635       | 17464            | 0.1              | 765       | 1009             | 0.0              | 895       | 891              | 0.0              |
| 380       | 757              | 0.0              | 510       | 24119            | 40.9             | 640       | 15745            | 0.0              | 770       | 774              | 0.0              | 900       | 807              | 0.0              |
| 385       | 706              | 0.0              | 515       | 27181            | 45.1             | 645       | 14060            | 0.0              | 775       | 761              | 0.0              | 905       | 899              | 0.0              |
| 390       | 746              | 0.0              | 520       | 29555            | 47.0             | 650       | 12579            | 0.0              | 780       | 653              | 0.0              | 910       | 506              | 0.0              |
| 395       | 660              | 0.0              | 525       | 31307            | 46.8             | 655       | 11181            | 0.0              | 785       | 704              | 0.0              | 915       | 598              | 0.0              |
| 400       | 671              | 0.0              | 530       | 32558            | 44.9             | 660       | 9847             | 0.0              | 790       | 663              | 0.0              | 920       | 510              | 0.0              |
| 405       | 848              | 0.0              | 535       | 33301            | 41.5             | 665       | 8641             | 0.0              | 795       | 493              | 0.0              | 925       | 874              | 0.0              |
| 410       | 1490             | 0.1              | 540       | 33727            | 37.3             | 670       | 7535             | 0.0              | 800       | 584              | 0.0              | 930       | 549              | 0.0              |
| 415       | 3203             | 0.3              | 545       | 34356            | 32.9             | 675       | 6542             | 0.0              | 805       | 739              | 0.0              | 935       | 720              | 0.0              |
| 420       | 7298             | 1.2              | 550       | 34589            | 28.3             | 680       | 5664             | 0.0              | 810       | 601              | 0.0              | 940       | 754              | 0.0              |
| 425       | 15315            | 3.7              | 555       | 34855            | 23.8             | 685       | 4962             | 0.0              | 815       | 677              | 0.0              | 945       | 931              | 0.0              |
| 430       | 27886            | 9.5              | 560       | 35083            | 19.6             | 690       | 4369             | 0.0              | 820       | 726              | 0.0              | 950       | 811              | 0.0              |
| 435       | 45485            | 20.3             | 565       | 35553            | 16.0             | 695       | 3785             | 0.0              | 825       | 693              | 0.0              | 955       | 955              | 0.0              |
| 440       | 61965            | 34.6             | 570       | 35511            | 12.5             | 700       | 3318             | 0.0              | 830       | 619              | 0.0              | 960       | 1025             | 0.0              |
| 445       | 62721            | 42.0             | 575       | 35515            | 9.7              | 705       | 2962             | 0.0              | 835       | 738              | 0.0              | 965       | 916              | 0.0              |
| 450       | 44754            | 34.7             | 580       | 35114            | 7.2              | 710       | 2689             | 0.0              | 840       | 681              | 0.0              | 970       | 695              | 0.0              |
| 455       | 26152            | 22.9             | 585       | 34546            | 5.3              | 715       | 2476             | 0.0              | 845       | 691              | 0.0              | 975       | 568              | 0.0              |
| 460       | 17101            | 16.5             | 590       | 33522            | 3.7              | 720       | 2192             | 0.0              | 850       | 710              | 0.0              | 980       | 643              | 0.0              |
| 465       | 11400            | 12.0             | 595       | 32326            | 2.6              | 725       | 1939             | 0.0              | 855       | 1025             | 0.0              | 985       | 804              | 0.0              |
| 470       | 7763             | 8.9              | 600       | 30973            | 1.7              | 730       | 1698             | 0.0              | 860       | 889              | 0.0              | 990       | 812              | 0.0              |
| 475       | 6419             | 8.0              | 605       | 29160            | 1.1              | 735       | 1533             | 0.0              | 865       | 885              | 0.0              | 995       | 496              | 0.0              |
| 480       | 6330             | 8.5              | 610       | 27373            | 0.7              | 740       | 1375             | 0.0              | 870       | 905              | 0.0              | 1000      | 659              | 0.0              |
| 485       | 7299             | 10.6             | 615       | 25423            | 0.5              | 745       | 1254             | 0.0              | 875       | 739              | 0.0              |           |                  |                  |

REPORT NUMBER: SP1-2012-088-5-R3

### Melanopic Flux vs. Wavelength


**Melanopic Lumens: 4010.3**
**S/P: 1.85**

| 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       | 828              | 0.0              | 490       | 9471             | 7.9              | 620       | 23317            | 0.0              | 750       | 1157             | 0.0              | 880       | 1136             | 0.0              |
| 365       | 696              | 0.0              | 495       | 12752            | 10.5             | 625       | 21413            | 0.0              | 755       | 1067             | 0.0              | 885       | 773              | 0.0              |
| 370       | 807              | 0.0              | 500       | 16685            | 13.4             | 630       | 19344            | 0.0              | 760       | 1059             | 0.0              | 890       | 872              | 0.0              |
| 375       | 837              | 0.0              | 505       | 20565            | 15.8             | 635       | 17464            | 0.0              | 765       | 1009             | 0.0              | 895       | 891              | 0.0              |
| 380       | 757              | 0.0              | 510       | 24119            | 17.3             | 640       | 15745            | 0.0              | 770       | 774              | 0.0              | 900       | 807              | 0.0              |
| 385       | 706              | 0.0              | 515       | 27181            | 17.8             | 645       | 14060            | 0.0              | 775       | 761              | 0.0              | 905       | 899              | 0.0              |
| 390       | 746              | 0.0              | 520       | 29555            | 17.2             | 650       | 12579            | 0.0              | 780       | 653              | 0.0              | 910       | 506              | 0.0              |
| 395       | 660              | 0.0              | 525       | 31307            | 15.9             | 655       | 11181            | 0.0              | 785       | 704              | 0.0              | 915       | 598              | 0.0              |
| 400       | 671              | 0.0              | 530       | 32558            | 14.1             | 660       | 9847             | 0.0              | 790       | 663              | 0.0              | 920       | 510              | 0.0              |
| 405       | 848              | 0.0              | 535       | 33301            | 12.0             | 665       | 8641             | 0.0              | 795       | 493              | 0.0              | 925       | 874              | 0.0              |
| 410       | 1490             | 0.1              | 540       | 33727            | 9.9              | 670       | 7535             | 0.0              | 800       | 584              | 0.0              | 930       | 549              | 0.0              |
| 415       | 3203             | 0.2              | 545       | 34356            | 8.0              | 675       | 6542             | 0.0              | 805       | 739              | 0.0              | 935       | 720              | 0.0              |
| 420       | 7298             | 0.8              | 550       | 34589            | 6.2              | 680       | 5664             | 0.0              | 810       | 601              | 0.0              | 940       | 754              | 0.0              |
| 425       | 15315            | 2.4              | 555       | 34855            | 4.7              | 685       | 4962             | 0.0              | 815       | 677              | 0.0              | 945       | 931              | 0.0              |
| 430       | 27886            | 5.9              | 560       | 35083            | 3.5              | 690       | 4369             | 0.0              | 820       | 726              | 0.0              | 950       | 811              | 0.0              |
| 435       | 45485            | 12.1             | 565       | 35553            | 2.5              | 695       | 3785             | 0.0              | 825       | 693              | 0.0              | 955       | 955              | 0.0              |
| 440       | 61965            | 20.7             | 570       | 35511            | 1.7              | 700       | 3318             | 0.0              | 830       | 619              | 0.0              | 960       | 1025             | 0.0              |
| 445       | 62721            | 24.7             | 575       | 35515            | 1.2              | 705       | 2962             | 0.0              | 835       | 738              | 0.0              | 965       | 916              | 0.0              |
| 450       | 44754            | 20.6             | 580       | 35114            | 0.8              | 710       | 2689             | 0.0              | 840       | 681              | 0.0              | 970       | 695              | 0.0              |
| 455       | 26152            | 13.7             | 585       | 34546            | 0.5              | 715       | 2476             | 0.0              | 845       | 691              | 0.0              | 975       | 568              | 0.0              |
| 460       | 17101            | 10.1             | 590       | 33522            | 0.3              | 720       | 2192             | 0.0              | 850       | 710              | 0.0              | 980       | 643              | 0.0              |
| 465       | 11400            | 7.4              | 595       | 32326            | 0.2              | 725       | 1939             | 0.0              | 855       | 1025             | 0.0              | 985       | 804              | 0.0              |
| 470       | 7763             | 5.6              | 600       | 30973            | 0.1              | 730       | 1698             | 0.0              | 860       | 889              | 0.0              | 990       | 812              | 0.0              |
| 475       | 6419             | 4.9              | 605       | 29160            | 0.1              | 735       | 1533             | 0.0              | 865       | 885              | 0.0              | 995       | 496              | 0.0              |
| 480       | 6330             | 5.1              | 610       | 27373            | 0.0              | 740       | 1375             | 0.0              | 870       | 905              | 0.0              | 1000      | 659              | 0.0              |
| 485       | 7299             | 6.0              | 615       | 25423            | 0.0              | 745       | 1254             | 0.0              | 875       | 739              | 0.0              |           |                  |                  |

### Summary

$R_f = 72.3$   
 $R_g = 97.2$   
 CIE  $R_a = 71.9$   
 $R_g = -27.5$

### Spectral Power Distribution Comparison

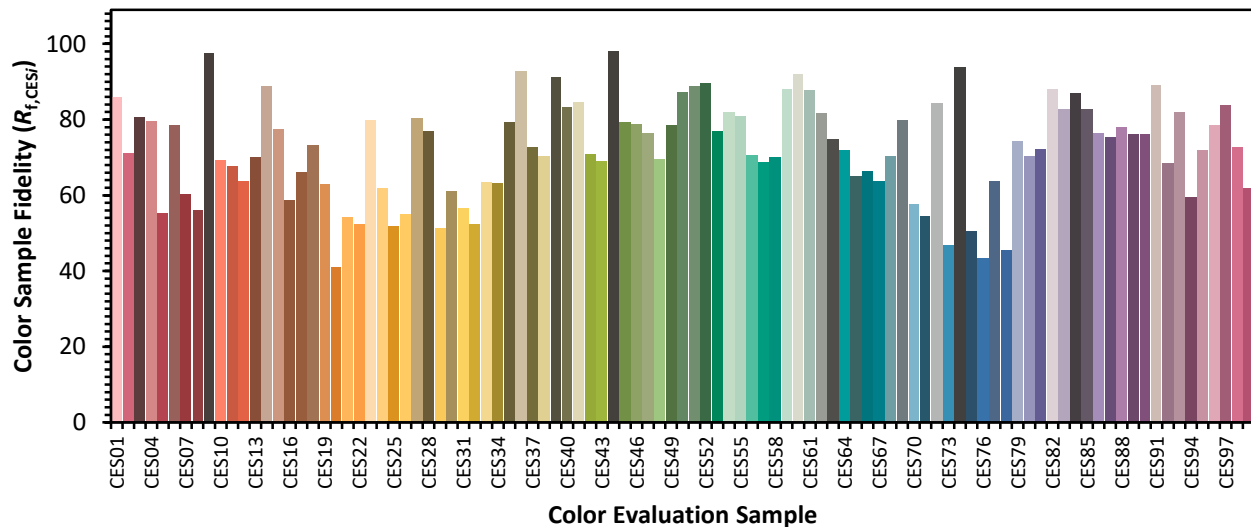


### Color Vector Graphics



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 55 | CES51 = 89 | CES76 = 43 |
| CES02 = 59 | CES27 = 80 | CES52 = 90 | CES77 = 64 |
| CES03 = 30 | CES28 = 77 | CES53 = 77 | CES78 = 46 |
| CES04 = 69 | CES29 = 51 | CES54 = 82 | CES79 = 74 |
| CES05 = 46 | CES30 = 61 | CES55 = 81 | CES80 = 70 |
| CES06 = 50 | CES31 = 56 | CES56 = 71 | CES81 = 72 |
| CES07 = 38 | CES32 = 52 | CES57 = 69 | CES82 = 88 |
| CES08 = 38 | CES33 = 63 | CES58 = 70 | CES83 = 83 |
| CES09 = 29 | CES34 = 63 | CES59 = 88 | CES84 = 87 |
| CES10 = 72 | CES35 = 79 | CES60 = 92 | CES85 = 83 |
| CES11 = 55 | CES36 = 93 | CES61 = 88 | CES86 = 76 |
| CES12 = 61 | CES37 = 73 | CES62 = 82 | CES87 = 75 |
| CES13 = 41 | CES38 = 70 | CES63 = 75 | CES88 = 78 |
| CES14 = 74 | CES39 = 91 | CES64 = 72 | CES89 = 76 |
| CES15 = 70 | CES40 = 83 | CES65 = 65 | CES90 = 76 |
| CES16 = 46 | CES41 = 85 | CES66 = 66 | CES91 = 89 |
| CES17 = 48 | CES42 = 71 | CES67 = 64 | CES92 = 69 |
| CES18 = 55 | CES43 = 69 | CES68 = 70 | CES93 = 82 |
| CES19 = 71 | CES44 = 98 | CES69 = 80 | CES94 = 60 |
| CES20 = 64 | CES45 = 79 | CES70 = 58 | CES95 = 72 |
| CES21 = 85 | CES46 = 79 | CES71 = 54 | CES96 = 79 |
| CES22 = 77 | CES47 = 76 | CES72 = 84 | CES97 = 84 |
| CES23 = 91 | CES48 = 69 | CES73 = 47 | CES98 = 73 |
| CES24 = 90 | CES49 = 79 | CES74 = 94 | CES99 = 62 |
| CES25 = 71 | CES50 = 87 | CES75 = 50 |            |



**Color Rendition by Hue-Angle Bin**


**Measure Comparisons**



(END OF REPORT)