

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: McGRAW-EDISON

Report Number: P438941

Luminaire Tested: **ISW-SA1F-827-U-SL3-HSS**

Issue Date: 12/10/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P438941  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-2011-074-17)  
Test Lab: INNOVATION CENTER  
Issue Date: 12/10/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: ISW-SA1F-827-U-SL3-HSS  
Description: IMPACT ELITE LED WEDGE LUMINAIRE  
(1) 80 CRI, 2700K, 1200mA LIGHTSQUARE WITH 16 LEDS AND TYPE III SPILL  
LIGHT ELIMINATOR OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

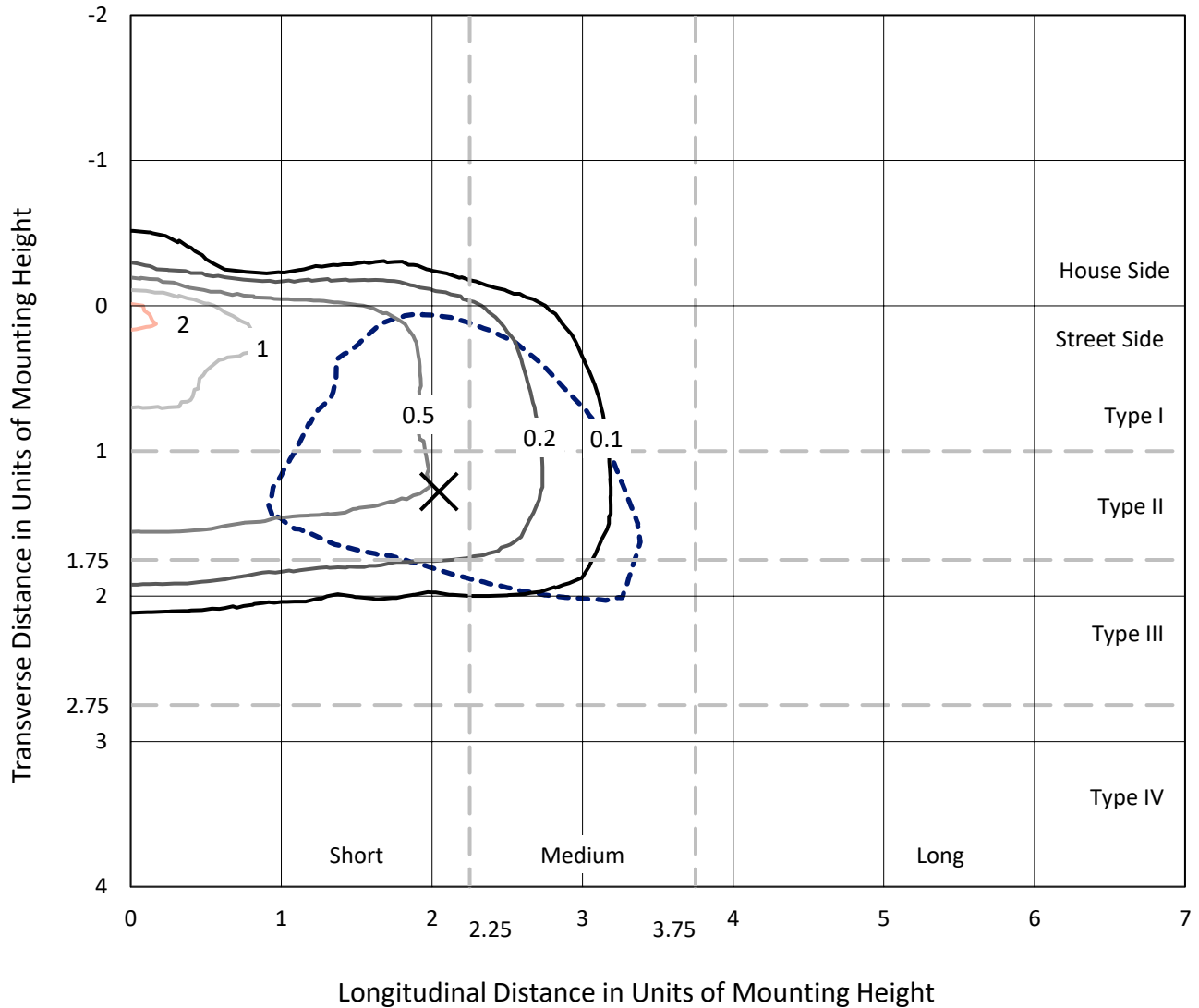
Lumens per Lamp: N/A  
Luminaire Lumens: 4712 lumens  
Efficiency: N/A  
Efficacy: 71.4 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 0.5' x H: 0')  
IES Classification: Type III - Short  
BUG Rating: B1 - U0 - G1  
  
Input Watts (W): 66  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT



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### Iso-Footcandle Lines of Horizontal Illumination

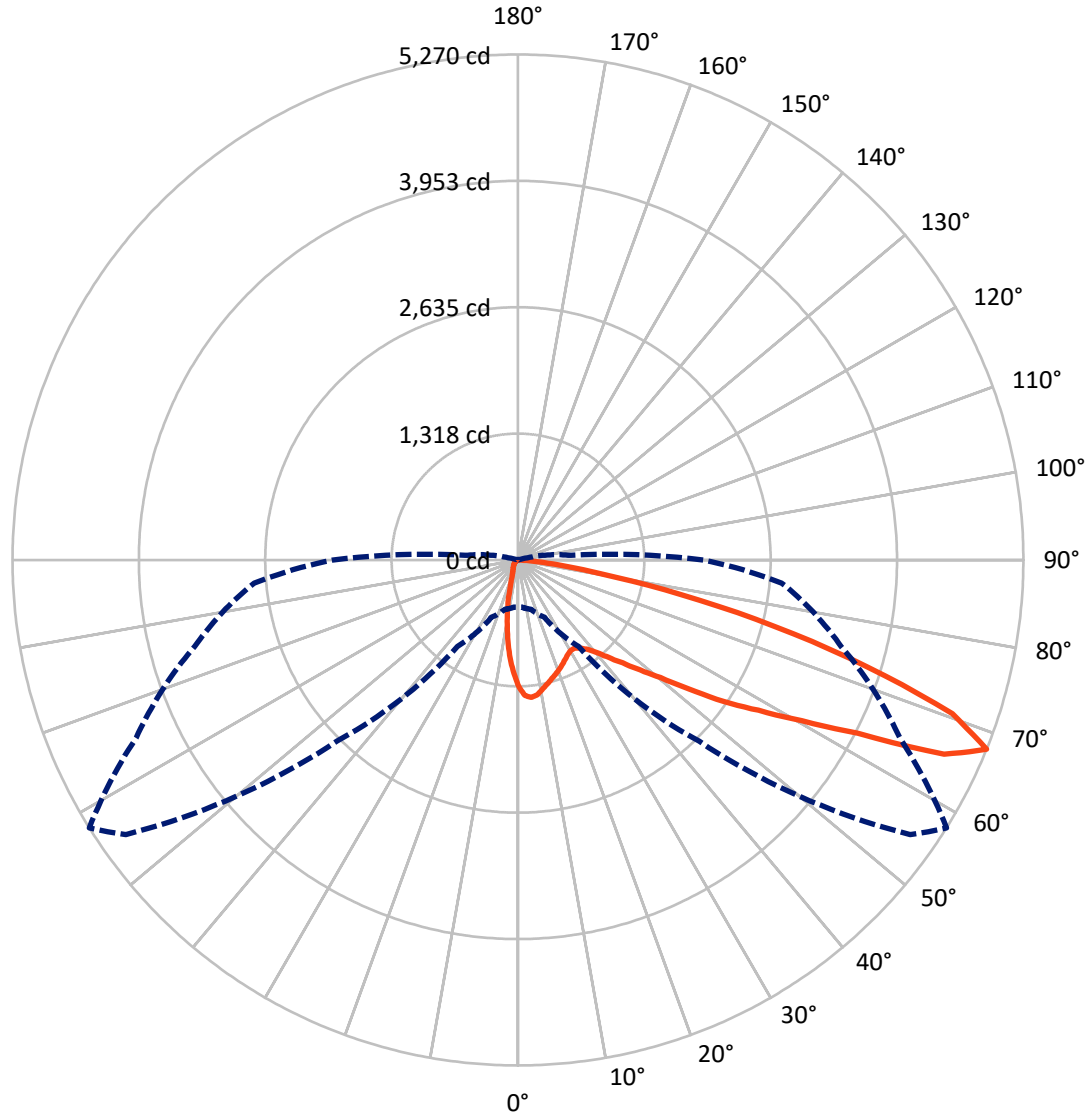
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 2.2 fc  
 Type III - Short - N/A

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### Luminous Intensity Polar Plot



— Vertical Plane Through 58-Deg Lateral    - - - Horizontal Cone Through 67.5-Deg Vertical

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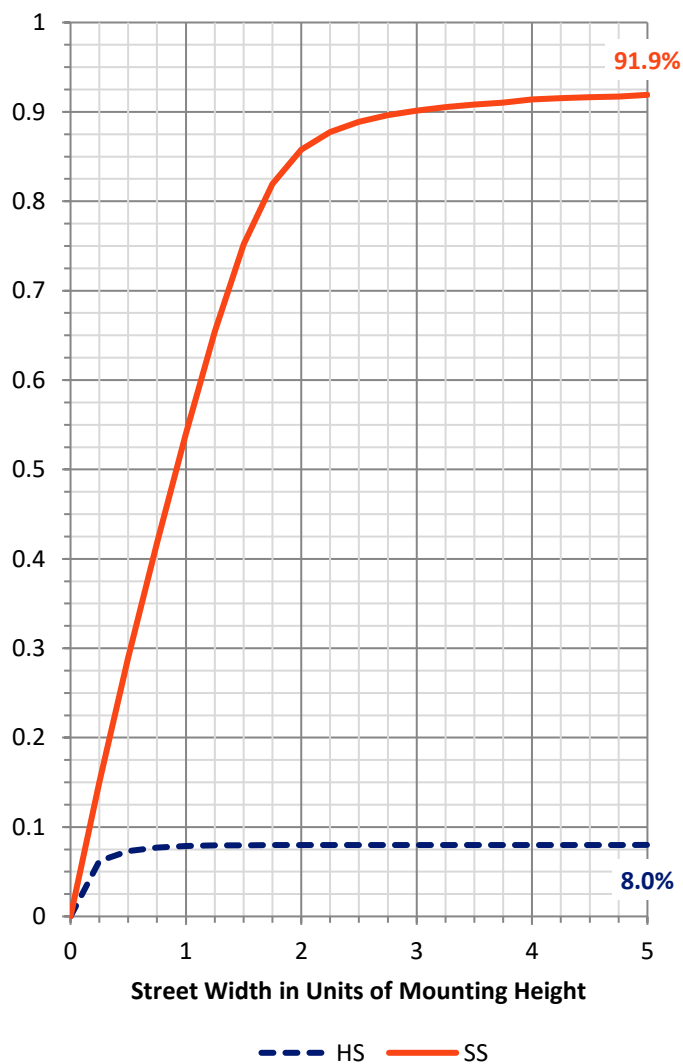
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 379.9    | 0.0    | 379.9  |
|                    | % Fixture | 8.1      | 0.0    | 8.1    |
| <b>Street Side</b> | Lumens    | 4332.1   | 0.0    | 4332.1 |
|                    | % Fixture | 91.9     | 0.0    | 91.9   |
| <b>Total</b>       | Lumens    | 4712.0   | 0.0    | 4712.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 106.2  | 2.3       |
| 10°-20°   | 223.8  | 4.8       |
| 20°-30°   | 302.9  | 6.4       |
| 30°-40°   | 416.6  | 8.8       |
| 40°-50°   | 652.2  | 13.8      |
| 50°-60°   | 1098.7 | 23.3      |
| 60°-70°   | 1303.8 | 27.7      |
| 70°-80°   | 566.2  | 12.0      |
| 80°-90°   | 41.6   | 0.9       |
| 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°    | 4712.0 | 100.0     |
| 0°-180°   | 4712.0 | 100.0     |

**Coefficient of Utilization**



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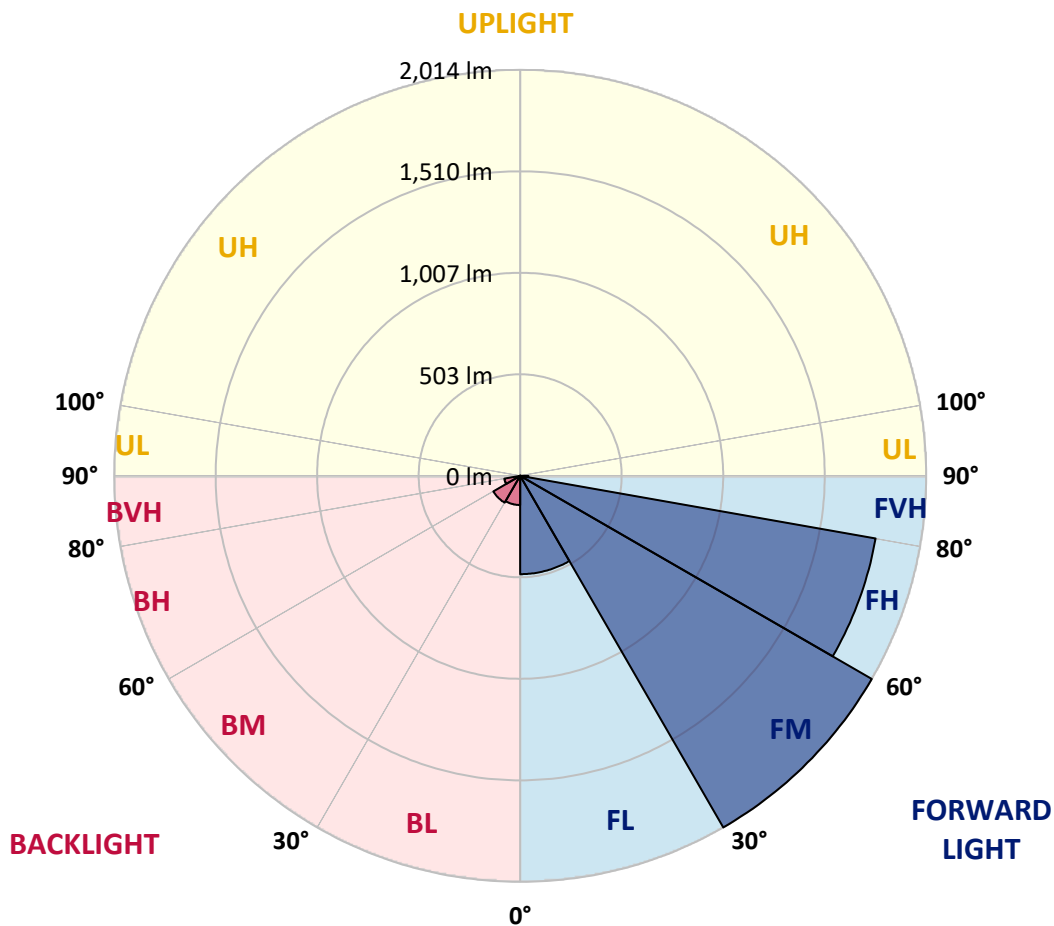
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**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone           | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|----------------|--------|-----------|-------------------------|------|---------|
|                |        |           | B                       | U    | G       |
| FL (0°-30°)    | 487.9  | 10.4      |                         |      |         |
| FM (30°-60°)   | 2013.7 | 42.7      |                         |      |         |
| FH (60°-80°)   | 1790.1 | 38.0      |                         |      | G1/1800 |
| FVH (80°-90°)  | 40.3   | 0.9       |                         |      | G1/100  |
| BL (0°-30°)    | 145.0  | 3.1       | B1/500                  |      |         |
| BM (30°-60°)   | 153.7  | 3.3       | B0/220                  |      |         |
| BH (60°-80°)   | 80.0   | 1.7       | B0/110                  |      | G0/110  |
| BVH (80°-90°)  | 1.3    | 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 Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 58°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1326.7 | 1326.7 | 1326.7 | 1326.7 | 1326.7 | 1326.7 | 1326.7 | 1326.7 | 1326.7 | 1326.7 | 1326.7 |
| 2.5°  | 1480.8 | 1472.7 | 1468.7 | 1466.6 | 1452.4 | 1440.3 | 1415.9 | 1413.9 | 1397.7 | 1367.2 | 1336.8 |
| 5°    | 1448.4 | 1454.5 | 1456.5 | 1462.6 | 1460.5 | 1460.5 | 1444.3 | 1440.3 | 1417.9 | 1375.3 | 1316.5 |
| 7.5°  | 1377.4 | 1375.3 | 1379.4 | 1395.6 | 1403.7 | 1420.0 | 1417.9 | 1422.0 | 1411.9 | 1365.2 | 1282.0 |
| 10°   | 1273.9 | 1278.0 | 1290.1 | 1304.3 | 1326.7 | 1355.1 | 1373.3 | 1377.4 | 1385.5 | 1346.9 | 1249.6 |
| 12.5° | 1178.6 | 1184.7 | 1192.8 | 1221.2 | 1245.5 | 1290.1 | 1324.6 | 1332.7 | 1349.0 | 1328.7 | 1221.2 |
| 15°   | 1099.5 | 1101.5 | 1107.6 | 1133.9 | 1174.5 | 1231.3 | 1282.0 | 1294.2 | 1320.6 | 1312.5 | 1198.9 |
| 17.5° | 1036.6 | 1038.6 | 1046.7 | 1069.0 | 1101.5 | 1168.4 | 1237.4 | 1257.7 | 1296.2 | 1302.3 | 1174.5 |
| 20°   | 1002.1 | 1002.1 | 1002.1 | 1016.3 | 1048.8 | 1111.6 | 1192.8 | 1221.2 | 1275.9 | 1286.1 | 1154.2 |
| 22.5° | 992.0  | 992.0  | 987.9  | 992.0  | 1012.2 | 1065.0 | 1148.1 | 1182.6 | 1251.6 | 1280.0 | 1129.9 |
| 25°   | 1006.2 | 1000.1 | 1000.1 | 989.9  | 992.0  | 1026.4 | 1107.6 | 1146.1 | 1237.4 | 1275.9 | 1117.7 |
| 27.5° | 1032.5 | 1030.5 | 1022.4 | 1014.3 | 1002.1 | 1010.2 | 1073.1 | 1111.6 | 1223.2 | 1282.0 | 1107.6 |
| 30°   | 1063.0 | 1063.0 | 1058.9 | 1054.8 | 1034.6 | 1018.3 | 1056.9 | 1091.3 | 1217.1 | 1292.2 | 1101.5 |
| 32.5° | 1097.4 | 1095.4 | 1105.5 | 1109.6 | 1085.3 | 1054.8 | 1060.9 | 1093.4 | 1221.2 | 1322.6 | 1105.5 |
| 35°   | 1138.0 | 1138.0 | 1156.3 | 1180.6 | 1160.3 | 1113.7 | 1099.5 | 1127.9 | 1241.5 | 1355.1 | 1121.8 |
| 37.5° | 1182.6 | 1184.7 | 1217.1 | 1251.6 | 1237.4 | 1196.8 | 1172.5 | 1182.6 | 1284.1 | 1415.9 | 1158.3 |
| 40°   | 1235.4 | 1235.4 | 1284.1 | 1340.9 | 1340.9 | 1294.2 | 1261.7 | 1269.9 | 1344.9 | 1503.1 | 1223.2 |
| 42.5° | 1292.2 | 1298.3 | 1367.2 | 1436.2 | 1456.5 | 1413.9 | 1379.4 | 1389.5 | 1442.3 | 1616.7 | 1318.5 |
| 45°   | 1373.3 | 1391.6 | 1480.8 | 1547.8 | 1588.3 | 1568.1 | 1523.4 | 1531.5 | 1570.1 | 1781.1 | 1462.6 |
| 47.5° | 1517.3 | 1533.6 | 1610.7 | 1677.6 | 1728.3 | 1738.5 | 1718.2 | 1714.1 | 1730.3 | 1973.8 | 1645.1 |
| 50°   | 1689.8 | 1704.0 | 1756.7 | 1813.5 | 1884.5 | 1945.4 | 1933.2 | 1927.1 | 1933.2 | 2184.7 | 1868.3 |
| 52.5° | 1860.2 | 1854.1 | 1917.0 | 1947.4 | 2046.8 | 2180.7 | 2233.4 | 2233.4 | 2201.0 | 2405.8 | 2087.4 |
| 55°   | 2012.3 | 2038.7 | 2105.6 | 2160.4 | 2243.6 | 2403.8 | 2582.3 | 2604.6 | 2493.1 | 2624.9 | 2269.9 |
| 57.5° | 1994.0 | 2020.4 | 2144.2 | 2316.6 | 2562.0 | 2779.1 | 2953.5 | 2957.6 | 2795.3 | 2793.3 | 2495.1 |
| 60°   | 1781.1 | 1783.1 | 1949.4 | 2211.1 | 2702.0 | 3320.7 | 3422.1 | 3401.8 | 3059.0 | 3028.6 | 2805.5 |
| 62.5° | 1253.6 | 1245.5 | 1460.5 | 1793.2 | 2493.1 | 3616.9 | 4132.1 | 3978.0 | 3497.2 | 3397.8 | 3095.5 |
| 65°   | 730.3  | 726.2  | 809.4  | 1071.1 | 1888.6 | 3407.9 | 4858.3 | 4882.7 | 4073.3 | 3586.4 | 3034.7 |
| 67.5° | 490.9  | 495.0  | 533.5  | 661.3  | 1101.5 | 2673.6 | 4992.2 | 5270.1 | 4393.8 | 3489.1 | 2760.8 |
| 70°   | 361.1  | 361.1  | 391.5  | 486.8  | 653.2  | 1675.6 | 4361.3 | 4805.6 | 4456.7 | 3245.7 | 2310.5 |
| 72.5° | 257.6  | 257.6  | 300.2  | 393.5  | 533.5  | 864.2  | 3241.6 | 3809.6 | 3762.9 | 2693.9 | 1598.5 |
| 75°   | 164.3  | 168.4  | 215.0  | 322.5  | 486.8  | 553.8  | 2198.9 | 2760.8 | 2624.9 | 1507.2 | 681.6  |
| 77.5° | 62.9   | 71.0   | 115.6  | 237.3  | 426.0  | 460.5  | 1253.6 | 1740.5 | 1385.5 | 527.4  | 182.6  |
| 80°   | 22.3   | 22.3   | 38.5   | 121.7  | 300.2  | 379.3  | 655.2  | 864.2  | 450.3  | 127.8  | 69.0   |
| 82.5° | 4.1    | 4.1    | 14.2   | 50.7   | 148.1  | 263.7  | 381.4  | 426.0  | 176.5  | 42.6   | 40.6   |
| 85°   | 0.0    | 0.0    | 2.0    | 10.1   | 34.5   | 26.4   | 152.1  | 144.0  | 54.8   | 18.3   | 26.4   |
| 87.5° | 0.0    | 0.0    | 0.0    | 0.0    | 2.0    | 2.0    | 4.1    | 4.1    | 4.1    | 4.1    | 4.1    |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |



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 CATALOG NUMBER: ISW-SA1F-827-U-SL3-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1326.7 | 1326.7 | 1326.7 | 1326.7 | 1326.7 | 1326.7 | 1326.7 | 1326.7 | 1326.7 | 1326.7 | 1326.7 |
| 2.5°  | 1312.5 | 1296.2 | 1249.6 | 1217.1 | 1172.5 | 1127.9 | 1099.5 | 1077.2 | 1067.0 | 1052.8 | 1058.9 |
| 5°    | 1280.0 | 1243.5 | 1158.3 | 1081.2 | 1008.2 | 931.1  | 874.3  | 823.6  | 807.4  | 779.0  | 774.9  |
| 7.5°  | 1231.3 | 1180.6 | 1054.8 | 933.1  | 815.5  | 718.1  | 630.9  | 563.9  | 503.1  | 476.7  | 492.9  |
| 10°   | 1184.7 | 1115.7 | 951.4  | 789.1  | 632.9  | 497.0  | 393.5  | 312.4  | 265.7  | 245.5  | 249.5  |
| 12.5° | 1140.0 | 1052.8 | 843.9  | 651.2  | 460.5  | 306.3  | 223.1  | 180.5  | 166.3  | 164.3  | 160.3  |
| 15°   | 1101.5 | 994.0  | 748.5  | 505.1  | 306.3  | 192.7  | 158.2  | 148.1  | 146.1  | 146.1  | 146.1  |
| 17.5° | 1058.9 | 933.1  | 645.1  | 371.2  | 200.8  | 150.1  | 140.0  | 137.9  | 135.9  | 135.9  | 135.9  |
| 20°   | 1026.4 | 880.4  | 549.7  | 259.7  | 154.2  | 133.9  | 129.8  | 129.8  | 127.8  | 127.8  | 127.8  |
| 22.5° | 992.0  | 825.6  | 456.4  | 190.7  | 131.9  | 123.7  | 119.7  | 117.7  | 117.7  | 115.6  | 115.6  |
| 25°   | 959.5  | 774.9  | 367.2  | 146.1  | 117.7  | 111.6  | 107.5  | 105.5  | 105.5  | 103.5  | 101.4  |
| 27.5° | 939.2  | 734.3  | 288.1  | 123.7  | 105.5  | 101.4  | 97.4   | 93.3   | 89.3   | 87.2   | 87.2   |
| 30°   | 925.0  | 685.6  | 219.1  | 107.5  | 97.4   | 91.3   | 85.2   | 79.1   | 73.0   | 71.0   | 71.0   |
| 32.5° | 904.7  | 647.1  | 168.4  | 97.4   | 87.2   | 81.1   | 73.0   | 66.9   | 60.9   | 56.8   | 56.8   |
| 35°   | 904.7  | 614.6  | 129.8  | 87.2   | 79.1   | 71.0   | 64.9   | 54.8   | 48.7   | 46.7   | 44.6   |
| 37.5° | 918.9  | 578.1  | 107.5  | 81.1   | 73.0   | 64.9   | 56.8   | 46.7   | 40.6   | 38.5   | 38.5   |
| 40°   | 951.4  | 566.0  | 91.3   | 73.0   | 64.9   | 56.8   | 48.7   | 38.5   | 34.5   | 30.4   | 30.4   |
| 42.5° | 1018.3 | 570.0  | 81.1   | 69.0   | 58.8   | 50.7   | 40.6   | 32.5   | 28.4   | 26.4   | 26.4   |
| 45°   | 1115.7 | 582.2  | 75.1   | 62.9   | 52.7   | 42.6   | 34.5   | 28.4   | 22.3   | 20.3   | 20.3   |
| 47.5° | 1251.6 | 620.7  | 66.9   | 56.8   | 46.7   | 36.5   | 28.4   | 22.3   | 18.3   | 16.2   | 16.2   |
| 50°   | 1413.9 | 687.7  | 62.9   | 50.7   | 42.6   | 30.4   | 22.3   | 16.2   | 12.2   | 12.2   | 12.2   |
| 52.5° | 1604.6 | 754.6  | 56.8   | 46.7   | 36.5   | 26.4   | 18.3   | 12.2   | 10.1   | 8.1    | 8.1    |
| 55°   | 1764.8 | 813.4  | 50.7   | 42.6   | 30.4   | 20.3   | 14.2   | 10.1   | 8.1    | 6.1    | 6.1    |
| 57.5° | 1973.8 | 898.6  | 42.6   | 36.5   | 24.3   | 16.2   | 10.1   | 8.1    | 4.1    | 4.1    | 4.1    |
| 60°   | 2253.7 | 1000.1 | 36.5   | 30.4   | 18.3   | 12.2   | 8.1    | 4.1    | 4.1    | 2.0    | 2.0    |
| 62.5° | 2373.4 | 918.9  | 32.5   | 24.3   | 14.2   | 8.1    | 6.1    | 4.1    | 2.0    | 2.0    | 2.0    |
| 65°   | 2241.5 | 750.6  | 26.4   | 18.3   | 10.1   | 6.1    | 4.1    | 2.0    | 2.0    | 0.0    | 0.0    |
| 67.5° | 1933.2 | 553.8  | 22.3   | 12.2   | 8.1    | 4.1    | 2.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 70°   | 1576.2 | 409.8  | 16.2   | 8.1    | 4.1    | 4.1    | 2.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 72.5° | 1091.3 | 247.5  | 12.2   | 6.1    | 4.1    | 2.0    | 2.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 75°   | 424.0  | 97.4   | 10.1   | 6.1    | 4.1    | 2.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 77.5° | 119.7  | 34.5   | 8.1    | 4.1    | 4.1    | 2.0    | 2.0    | 2.0    | 0.0    | 0.0    | 0.0    |
| 80°   | 48.7   | 18.3   | 6.1    | 4.1    | 4.1    | 4.1    | 2.0    | 2.0    | 0.0    | 0.0    | 0.0    |
| 82.5° | 30.4   | 10.1   | 4.1    | 2.0    | 2.0    | 2.0    | 2.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 85°   | 20.3   | 6.1    | 4.1    | 2.0    | 2.0    | 0.0    | 0.0    | 0.0    | 0.0    | 2.0    | 2.0    |
| 87.5° | 4.1    | 4.1    | 2.0    | 2.0    | 2.0    | 2.0    | 0.0    | 0.0    | 0.0    | 0.0    | 2.0    |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |



Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269



**Test Information**

Test Method: LM-79-2019  
 Report Number: SP1-2407-157-9  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry: 4π  
 Issue Date: 10/03/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: Invue  
 Catalog Number: **EMM2-HTN-SA1A-827-U-5WQ**  
 Description: Epic Modern Light Square 40W 5WQ Optic

**Spectral Parameters**

CCT (K): 2764  
 CIE u': 0.2591  
 CIE v': 0.5290  
 Duv: 0.0020  
 CIE x: 0.4581  
 CIE y: 0.4156  
 CIE z: 0.1263  
 Peak Wavelength (nm): 603  
 Dominant Wavelength (nm): 583  
 Purity: 62.2537  
 Rf: 84.7  
 Rg: 94.6

|           |      |      |      |
|-----------|------|------|------|
| CRI (Ra): | 80.9 |      |      |
| R1:       | 78.8 | R9:  | -1.5 |
| R2:       | 89.9 | R10: | 77.9 |
| R3:       | 96.2 | R11: | 78.9 |
| R4:       | 79.1 | R12: | 71.6 |
| R5:       | 79.1 | R13: | 81.2 |
| R6:       | 88.8 | R14: | 98.5 |
| R7:       | 81.3 | R15: | 69.9 |
| R8:       | 54.3 |      |      |



**Test Conditions**

Stabilization Time: 81M  
 Operation Time: 2H 21M  
 Sphere Temperature (°C): 25.2

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| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 6/18/2024        | 12/18/2024           |
| Power Meter                    | INXT2011004           | 2/8/2024         | 2/8/2025             |
| AC Power Source                | IN0063                | 10/24/2023       | 10/24/2024           |
| DC Power Source                | IN0208                | 10/24/2023       | 10/24/2024           |
| Sphere Thermometer             | IN0085                | 10/24/2023       | 10/24/2024           |
| Room Thermometer               | IN0046                | 10/24/2023       | 10/24/2024           |

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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 2700K 4-step quadrangle

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**Photopic Flux vs. Wavelength**



**Photopic Lumens: 4337.9**

| λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) |
|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|
| 360    | 0             | 0.0           | 490    | 18018         | 2.6           | 620    | 87426         | 22.8          | 750    | 2680          | 0.0           | 880    | 58            | 0.0           |
| 365    | 0             | 0.0           | 495    | 22295         | 3.9           | 625    | 83013         | 18.2          | 755    | 2287          | 0.0           | 885    | 46            | 0.0           |
| 370    | 0             | 0.0           | 500    | 26478         | 5.8           | 630    | 78077         | 14.1          | 760    | 1944          | 0.0           | 890    | 45            | 0.0           |
| 375    | 0             | 0.0           | 505    | 30524         | 8.5           | 635    | 72080         | 10.7          | 765    | 1653          | 0.0           | 895    | 41            | 0.0           |
| 380    | 0             | 0.0           | 510    | 33611         | 11.5          | 640    | 66249         | 7.9           | 770    | 1413          | 0.0           | 900    | 38            | 0.0           |
| 385    | 0             | 0.0           | 515    | 36490         | 15.2          | 645    | 59973         | 5.7           | 775    | 1198          | 0.0           | 905    | 33            | 0.0           |
| 390    | 0             | 0.0           | 520    | 38610         | 18.7          | 650    | 53972         | 3.9           | 780    | 1025          | 0.0           | 910    | 30            | 0.0           |
| 395    | 0             | 0.0           | 525    | 40511         | 21.9          | 655    | 48369         | 2.7           | 785    | 874           | 0.0           | 915    | 23            | 0.0           |
| 400    | 48            | 0.0           | 530    | 42223         | 24.9          | 660    | 42641         | 1.8           | 790    | 747           | 0.0           | 920    | 24            | 0.0           |
| 405    | 201           | 0.0           | 535    | 44137         | 27.6          | 665    | 37602         | 1.1           | 795    | 639           | 0.0           | 925    | 22            | 0.0           |
| 410    | 457           | 0.0           | 540    | 46032         | 30.0          | 670    | 32798         | 0.7           | 800    | 547           | 0.0           | 930    | 22            | 0.0           |
| 415    | 925           | 0.0           | 545    | 48553         | 32.5          | 675    | 28558         | 0.5           | 805    | 473           | 0.0           | 935    | 17            | 0.0           |
| 420    | 1816          | 0.0           | 550    | 51408         | 34.9          | 680    | 24782         | 0.3           | 810    | 401           | 0.0           | 940    | 13            | 0.0           |
| 425    | 3217          | 0.0           | 555    | 54711         | 37.4          | 685    | 21386         | 0.2           | 815    | 351           | 0.0           | 945    | 6             | 0.0           |
| 430    | 5520          | 0.0           | 560    | 58847         | 40.0          | 690    | 18413         | 0.1           | 820    | 307           | 0.0           | 950    | 10            | 0.0           |
| 435    | 9225          | 0.1           | 565    | 63386         | 42.4          | 695    | 15721         | 0.1           | 825    | 261           | 0.0           | 955    | 11            | 0.0           |
| 440    | 15522         | 0.2           | 570    | 68196         | 44.3          | 700    | 13432         | 0.0           | 830    | 228           | 0.0           | 960    | 8             | 0.0           |
| 445    | 27642         | 0.6           | 575    | 73613         | 46.0          | 705    | 11513         | 0.0           | 835    | 193           | 0.0           | 965    | 12            | 0.0           |
| 450    | 36602         | 0.9           | 580    | 79207         | 47.1          | 710    | 9780          | 0.0           | 840    | 174           | 0.0           | 970    | 3             | 0.0           |
| 455    | 28292         | 0.9           | 585    | 84248         | 47.0          | 715    | 8356          | 0.0           | 845    | 151           | 0.0           | 975    | 8             | 0.0           |
| 460    | 21166         | 0.9           | 590    | 88397         | 45.7          | 720    | 7161          | 0.0           | 850    | 123           | 0.0           | 980    | 2             | 0.0           |
| 465    | 19092         | 1.0           | 595    | 91428         | 43.4          | 725    | 6067          | 0.0           | 855    | 106           | 0.0           | 985    | 13            | 0.0           |
| 470    | 14951         | 0.9           | 600    | 93452         | 40.3          | 730    | 5164          | 0.0           | 860    | 95            | 0.0           | 990    | 16            | 0.0           |
| 475    | 12606         | 1.0           | 605    | 93959         | 36.4          | 735    | 4393          | 0.0           | 865    | 82            | 0.0           | 995    | 20            | 0.0           |
| 480    | 13323         | 1.3           | 610    | 93079         | 32.0          | 740    | 3694          | 0.0           | 870    | 77            | 0.0           | 1000   | 0             | 0.0           |
| 485    | 15164         | 1.8           | 615    | 90707         | 27.3          | 745    | 3157          | 0.0           | 875    | 65            | 0.0           |        |               |               |

REPORT NUMBER: SP1-2407-157-9

**Scotopic Flux vs. Wavelength**



**Scotopic Lumens: 5286.7**

**S/P: 1.22**

| $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) |
|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|
| 360               | 0                                    | 0.0                            | 490               | 18018                                | 75.9                           | 620               | 87426                                | 0.4                            | 750               | 2680                                 | 0.0                            | 880               | 58                                   | 0.0                            |
| 365               | 0                                    | 0.0                            | 495               | 22295                                | 93.2                           | 625               | 83013                                | 0.2                            | 755               | 2287                                 | 0.0                            | 885               | 46                                   | 0.0                            |
| 370               | 0                                    | 0.0                            | 500               | 26478                                | 107.8                          | 630               | 78077                                | 0.1                            | 760               | 1944                                 | 0.0                            | 890               | 45                                   | 0.0                            |
| 375               | 0                                    | 0.0                            | 505               | 30524                                | 118.7                          | 635               | 72080                                | 0.1                            | 765               | 1653                                 | 0.0                            | 895               | 41                                   | 0.0                            |
| 380               | 0                                    | 0.0                            | 510               | 33611                                | 122.2                          | 640               | 66249                                | 0.1                            | 770               | 1413                                 | 0.0                            | 900               | 38                                   | 0.0                            |
| 385               | 0                                    | 0.0                            | 515               | 36490                                | 120.8                          | 645               | 59973                                | 0.0                            | 775               | 1198                                 | 0.0                            | 905               | 33                                   | 0.0                            |
| 390               | 0                                    | 0.0                            | 520               | 38610                                | 113.9                          | 650               | 53972                                | 0.0                            | 780               | 1025                                 | 0.0                            | 910               | 30                                   | 0.0                            |
| 395               | 0                                    | 0.0                            | 525               | 40511                                | 104.1                          | 655               | 48369                                | 0.0                            | 785               | 874                                  | 0.0                            | 915               | 23                                   | 0.0                            |
| 400               | 48                                   | 0.0                            | 530               | 42223                                | 92.4                           | 660               | 42641                                | 0.0                            | 790               | 747                                  | 0.0                            | 920               | 24                                   | 0.0                            |
| 405               | 201                                  | 0.0                            | 535               | 44137                                | 80.5                           | 665               | 37602                                | 0.0                            | 795               | 639                                  | 0.0                            | 925               | 22                                   | 0.0                            |
| 410               | 457                                  | 0.1                            | 540               | 46032                                | 68.2                           | 670               | 32798                                | 0.0                            | 800               | 547                                  | 0.0                            | 930               | 22                                   | 0.0                            |
| 415               | 925                                  | 0.3                            | 545               | 48553                                | 57.1                           | 675               | 28558                                | 0.0                            | 805               | 473                                  | 0.0                            | 935               | 17                                   | 0.0                            |
| 420               | 1816                                 | 1.1                            | 550               | 51408                                | 46.7                           | 680               | 24782                                | 0.0                            | 810               | 401                                  | 0.0                            | 940               | 13                                   | 0.0                            |
| 425               | 3217                                 | 2.5                            | 555               | 54711                                | 37.4                           | 685               | 21386                                | 0.0                            | 815               | 351                                  | 0.0                            | 945               | 6                                    | 0.0                            |
| 430               | 5520                                 | 5.9                            | 560               | 58847                                | 29.4                           | 690               | 18413                                | 0.0                            | 820               | 307                                  | 0.0                            | 950               | 10                                   | 0.0                            |
| 435               | 9225                                 | 12.5                           | 565               | 63386                                | 22.5                           | 695               | 15721                                | 0.0                            | 825               | 261                                  | 0.0                            | 955               | 11                                   | 0.0                            |
| 440               | 15522                                | 26.3                           | 570               | 68196                                | 16.9                           | 700               | 13432                                | 0.0                            | 830               | 228                                  | 0.0                            | 960               | 8                                    | 0.0                            |
| 445               | 27642                                | 55.2                           | 575               | 73613                                | 12.4                           | 705               | 11513                                | 0.0                            | 835               | 193                                  | 0.0                            | 965               | 12                                   | 0.0                            |
| 450               | 36602                                | 85.4                           | 580               | 79207                                | 9.0                            | 710               | 9780                                 | 0.0                            | 840               | 174                                  | 0.0                            | 970               | 3                                    | 0.0                            |
| 455               | 28292                                | 75.1                           | 585               | 84248                                | 6.3                            | 715               | 8356                                 | 0.0                            | 845               | 151                                  | 0.0                            | 975               | 8                                    | 0.0                            |
| 460               | 21166                                | 63.2                           | 590               | 88397                                | 4.4                            | 720               | 7161                                 | 0.0                            | 850               | 123                                  | 0.0                            | 980               | 2                                    | 0.0                            |
| 465               | 19092                                | 63.2                           | 595               | 91428                                | 3.0                            | 725               | 6067                                 | 0.0                            | 855               | 106                                  | 0.0                            | 985               | 13                                   | 0.0                            |
| 470               | 14951                                | 54.2                           | 600               | 93452                                | 2.0                            | 730               | 5164                                 | 0.0                            | 860               | 95                                   | 0.0                            | 990               | 16                                   | 0.0                            |
| 475               | 12606                                | 48.8                           | 605               | 93959                                | 1.3                            | 735               | 4393                                 | 0.0                            | 865               | 82                                   | 0.0                            | 995               | 20                                   | 0.0                            |
| 480               | 13323                                | 54.2                           | 610               | 93079                                | 0.9                            | 740               | 3694                                 | 0.0                            | 870               | 77                                   | 0.0                            | 1000              | 0                                    | 0.0                            |
| 485               | 15164                                | 63.3                           | 615               | 90707                                | 0.5                            | 745               | 3157                                 | 0.0                            | 875               | 65                                   | 0.0                            |                   |                                      |                                |

REPORT NUMBER: SP1-2407-157-9

**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 9797**

**M/P: 2.26**

| $\lambda$<br>(nm) | Power<br>( $\mu$ W/nm) | Lumens<br>( $\phi$ /nm) | $\lambda$<br>(nm) | Power<br>( $\mu$ W/nm) | Lumens<br>( $\phi$ /nm) | $\lambda$<br>(nm) | Power<br>( $\mu$ W/nm) | Lumens<br>( $\phi$ /nm) | $\lambda$<br>(nm) | Power<br>( $\mu$ W/nm) | Lumens<br>( $\phi$ /nm) | $\lambda$<br>(nm) | Power<br>( $\mu$ W/nm) | Lumens<br>( $\phi$ /nm) |
|-------------------|------------------------|-------------------------|-------------------|------------------------|-------------------------|-------------------|------------------------|-------------------------|-------------------|------------------------|-------------------------|-------------------|------------------------|-------------------------|
| 360               | 0                      | 0.0                     | 490               | 18018                  | 27.7                    | 620               | 87426                  | 1.1                     | 750               | 2680                   | 0.0                     | 880               | 58                     | 0.0                     |
| 365               | 0                      | 0.0                     | 495               | 22295                  | 36.0                    | 625               | 83013                  | 0.7                     | 755               | 2287                   | 0.0                     | 885               | 46                     | 0.0                     |
| 370               | 0                      | 0.0                     | 500               | 26478                  | 44.2                    | 630               | 78077                  | 0.4                     | 760               | 1944                   | 0.0                     | 890               | 45                     | 0.0                     |
| 375               | 0                      | 0.0                     | 505               | 30524                  | 51.8                    | 635               | 72080                  | 0.3                     | 765               | 1653                   | 0.0                     | 895               | 41                     | 0.0                     |
| 380               | 0                      | 0.0                     | 510               | 33611                  | 57.0                    | 640               | 66249                  | 0.2                     | 770               | 1413                   | 0.0                     | 900               | 38                     | 0.0                     |
| 385               | 0                      | 0.0                     | 515               | 36490                  | 60.5                    | 645               | 59973                  | 0.1                     | 775               | 1198                   | 0.0                     | 905               | 33                     | 0.0                     |
| 390               | 0                      | 0.0                     | 520               | 38610                  | 61.4                    | 650               | 53972                  | 0.1                     | 780               | 1025                   | 0.0                     | 910               | 30                     | 0.0                     |
| 395               | 0                      | 0.0                     | 525               | 40511                  | 60.6                    | 655               | 48369                  | 0.0                     | 785               | 874                    | 0.0                     | 915               | 23                     | 0.0                     |
| 400               | 48                     | 0.0                     | 530               | 42223                  | 58.2                    | 660               | 42641                  | 0.0                     | 790               | 747                    | 0.0                     | 920               | 24                     | 0.0                     |
| 405               | 201                    | 0.0                     | 535               | 44137                  | 55.0                    | 665               | 37602                  | 0.0                     | 795               | 639                    | 0.0                     | 925               | 22                     | 0.0                     |
| 410               | 457                    | 0.0                     | 540               | 46032                  | 50.9                    | 670               | 32798                  | 0.0                     | 800               | 547                    | 0.0                     | 930               | 22                     | 0.0                     |
| 415               | 925                    | 0.1                     | 545               | 48553                  | 46.6                    | 675               | 28558                  | 0.0                     | 805               | 473                    | 0.0                     | 935               | 17                     | 0.0                     |
| 420               | 1816                   | 0.3                     | 550               | 51408                  | 42.0                    | 680               | 24782                  | 0.0                     | 810               | 401                    | 0.0                     | 940               | 13                     | 0.0                     |
| 425               | 3217                   | 0.8                     | 555               | 54711                  | 37.4                    | 685               | 21386                  | 0.0                     | 815               | 351                    | 0.0                     | 945               | 6                      | 0.0                     |
| 430               | 5520                   | 1.9                     | 560               | 58847                  | 32.9                    | 690               | 18413                  | 0.0                     | 820               | 307                    | 0.0                     | 950               | 10                     | 0.0                     |
| 435               | 9225                   | 4.1                     | 565               | 63386                  | 28.4                    | 695               | 15721                  | 0.0                     | 825               | 261                    | 0.0                     | 955               | 11                     | 0.0                     |
| 440               | 15522                  | 8.7                     | 570               | 68196                  | 24.1                    | 700               | 13432                  | 0.0                     | 830               | 228                    | 0.0                     | 960               | 8                      | 0.0                     |
| 445               | 27642                  | 18.5                    | 575               | 73613                  | 20.0                    | 705               | 11513                  | 0.0                     | 835               | 193                    | 0.0                     | 965               | 12                     | 0.0                     |
| 450               | 36602                  | 28.3                    | 580               | 79207                  | 16.3                    | 710               | 9780                   | 0.0                     | 840               | 174                    | 0.0                     | 970               | 3                      | 0.0                     |
| 455               | 28292                  | 24.7                    | 585               | 84248                  | 12.9                    | 715               | 8356                   | 0.0                     | 845               | 151                    | 0.0                     | 975               | 8                      | 0.0                     |
| 460               | 21166                  | 20.4                    | 590               | 88397                  | 9.8                     | 720               | 7161                   | 0.0                     | 850               | 123                    | 0.0                     | 980               | 2                      | 0.0                     |
| 465               | 19092                  | 20.1                    | 595               | 91428                  | 7.3                     | 725               | 6067                   | 0.0                     | 855               | 106                    | 0.0                     | 985               | 13                     | 0.0                     |
| 470               | 14951                  | 17.2                    | 600               | 93452                  | 5.3                     | 730               | 5164                   | 0.0                     | 860               | 95                     | 0.0                     | 990               | 16                     | 0.0                     |
| 475               | 12606                  | 15.7                    | 605               | 93959                  | 3.7                     | 735               | 4393                   | 0.0                     | 865               | 82                     | 0.0                     | 995               | 20                     | 0.0                     |
| 480               | 13323                  | 18.0                    | 610               | 93079                  | 2.5                     | 740               | 3694                   | 0.0                     | 870               | 77                     | 0.0                     | 1000              | 0                      | 0.0                     |
| 485               | 15164                  | 21.9                    | 615               | 90707                  | 1.7                     | 745               | 3157                   | 0.0                     | 875               | 65                     | 0.0                     |                   |                        |                         |

**Summary**

$R_f = 84.7$   
 $R_g = 94.6$   
 $CIE R_a = 80.9$   
 $R_g = -1.5$



**Color Vector Graphics**





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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 84 | CES51 = 95 | CES76 = 81 |
| CES02 = 63 | CES27 = 95 | CES52 = 94 | CES77 = 84 |
| CES03 = 31 | CES28 = 94 | CES53 = 89 | CES78 = 81 |
| CES04 = 71 | CES29 = 87 | CES54 = 91 | CES79 = 89 |
| CES05 = 50 | CES30 = 94 | CES55 = 90 | CES80 = 89 |
| CES06 = 52 | CES31 = 89 | CES56 = 86 | CES81 = 69 |
| CES07 = 43 | CES32 = 82 | CES57 = 85 | CES82 = 96 |
| CES08 = 41 | CES33 = 91 | CES58 = 86 | CES83 = 93 |
| CES09 = 29 | CES34 = 92 | CES59 = 91 | CES84 = 92 |
| CES10 = 77 | CES35 = 96 | CES60 = 94 | CES85 = 76 |
| CES11 = 60 | CES36 = 90 | CES61 = 89 | CES86 = 65 |
| CES12 = 66 | CES37 = 96 | CES62 = 94 | CES87 = 84 |
| CES13 = 44 | CES38 = 98 | CES63 = 87 | CES88 = 86 |
| CES14 = 74 | CES39 = 98 | CES64 = 82 | CES89 = 73 |
| CES15 = 72 | CES40 = 95 | CES65 = 78 | CES90 = 88 |
| CES16 = 48 | CES41 = 96 | CES66 = 81 | CES91 = 82 |
| CES17 = 50 | CES42 = 97 | CES67 = 80 | CES92 = 64 |
| CES18 = 57 | CES43 = 91 | CES68 = 83 | CES93 = 78 |
| CES19 = 73 | CES44 = 99 | CES69 = 88 | CES94 = 59 |
| CES20 = 67 | CES45 = 93 | CES70 = 80 | CES95 = 74 |
| CES21 = 87 | CES46 = 89 | CES71 = 79 | CES96 = 83 |
| CES22 = 79 | CES47 = 92 | CES72 = 92 | CES97 = 88 |
| CES23 = 92 | CES48 = 83 | CES73 = 75 | CES98 = 83 |
| CES24 = 91 | CES49 = 90 | CES74 = 91 | CES99 = 74 |
| CES25 = 72 | CES50 = 94 | CES75 = 81 |            |



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)