

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: P438925

Luminaire Tested: **ISW-SA1F-760-U-SL4**

Issue Date: 12/10/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P438925  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-2011-074-18)  
Test Lab: INNOVATION CENTER  
Issue Date: 12/10/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: ISW-SA1F-760-U-SL4  
Description: IMPACT ELITE LED WEDGE LUMINAIRE  
(1) 70 CRI, 5700K, 1200mA LIGHTSQUARE WITH 16 LEDS AND TYPE IV SPILL  
LIGHT ELIMINATOR OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 7534 lumens  
Efficiency: N/A  
Efficacy: 114.2 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 0.5' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B1 - U0 - G2

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



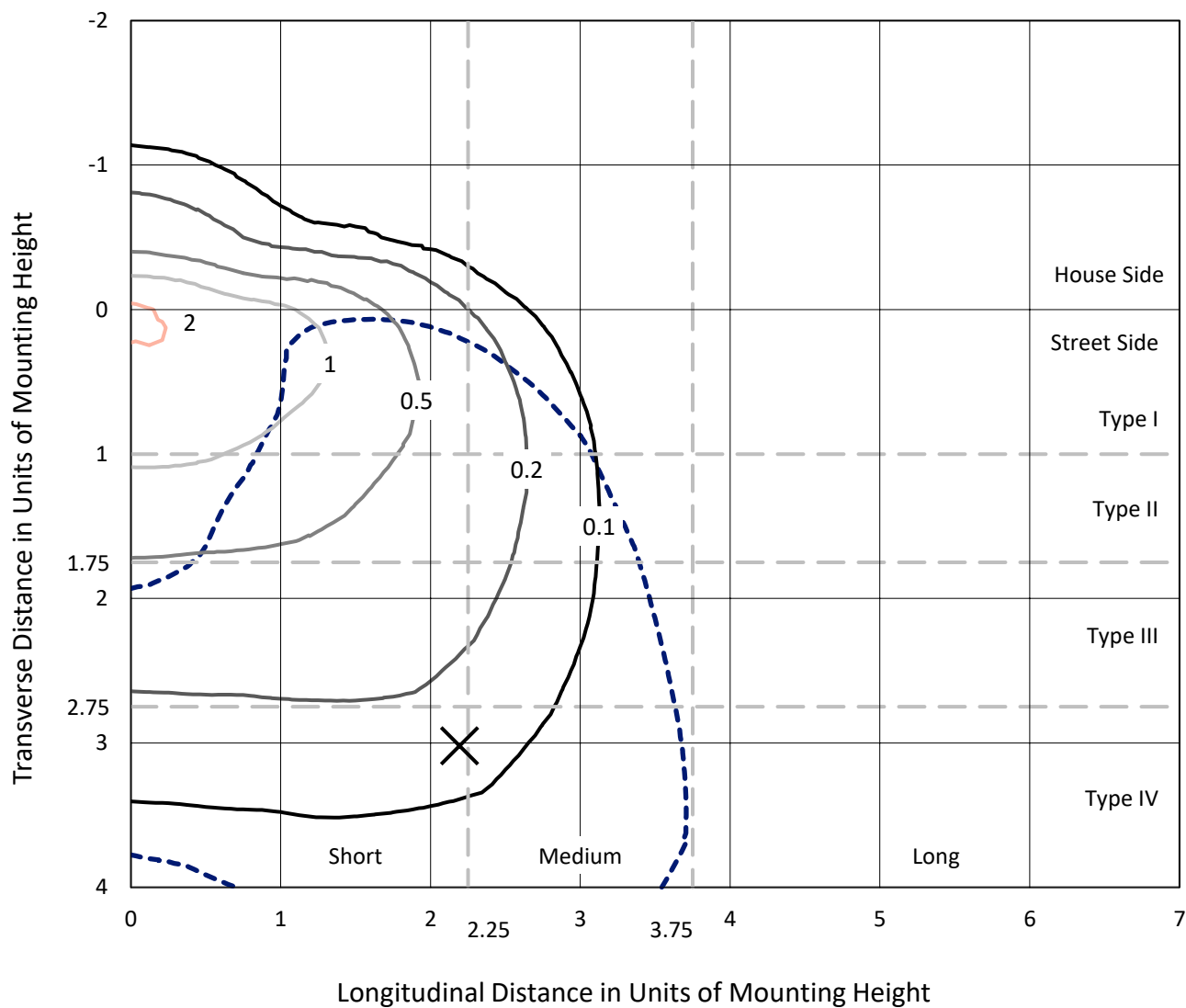
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CATALOG NUMBER: ISW-SA1F-760-U-SL4

## Iso-Footcandle Lines of Horizontal Illumination

✕ Max cd

--- 1/2 Max cd

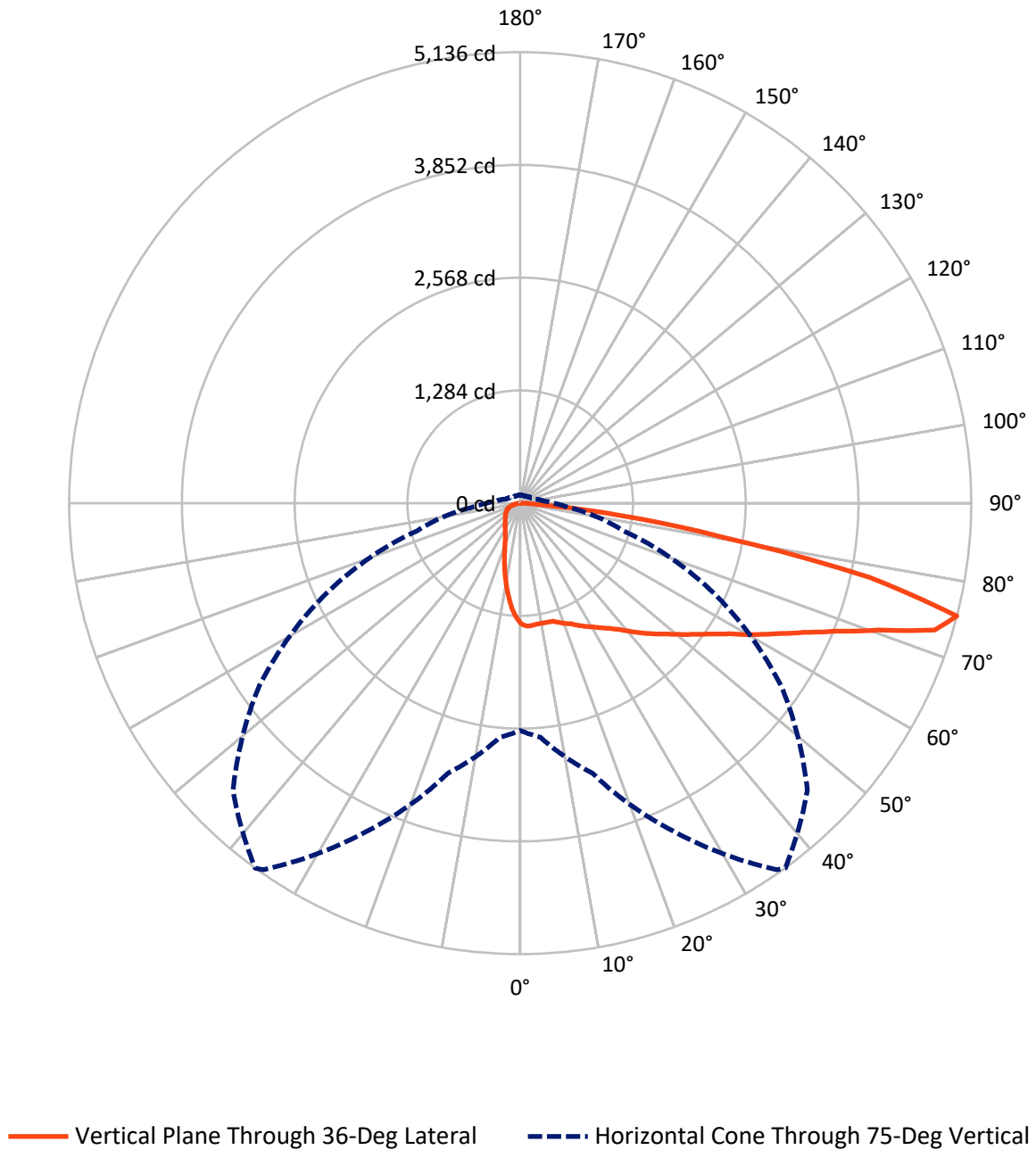


Based on 25 foot mounting height. Maximum calculated value = 2.2 fc

Type IV - Short - N/A

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CATALOG NUMBER: ISW-SA1F-760-U-SL4

## Luminous Intensity Polar Plot



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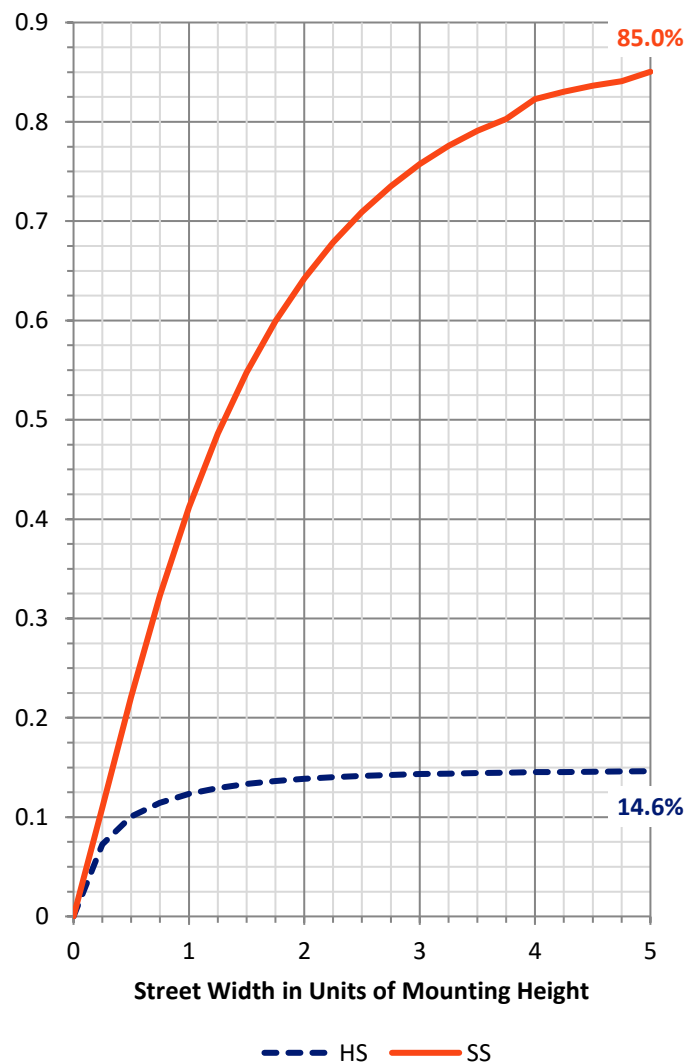
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 1111.9   | 0.0    | 1111.9 |
|                    | % Fixture | 14.8     | 0.0    | 14.8   |
| <b>Street Side</b> | Lumens    | 6422.1   | 0.0    | 6422.1 |
|                    | % Fixture | 85.2     | 0.0    | 85.2   |
| <b>Total</b>       | Lumens    | 7534.0   | 0.0    | 7534.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 121.2  | 1.6       |
| 10°-20°   | 313.5  | 4.2       |
| 20°-30°   | 484.8  | 6.4       |
| 30°-40°   | 702.1  | 9.3       |
| 40°-50°   | 1015.5 | 13.5      |
| 50°-60°   | 1408.6 | 18.7      |
| 60°-70°   | 1778.6 | 23.6      |
| 70°-80°   | 1527.7 | 20.3      |
| 80°-90°   | 182.0  | 2.4       |
| 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°    | 7534.0 | 100.0     |
| 0°-180°   | 7534.0 | 100.0     |

**Coefficient of Utilization**



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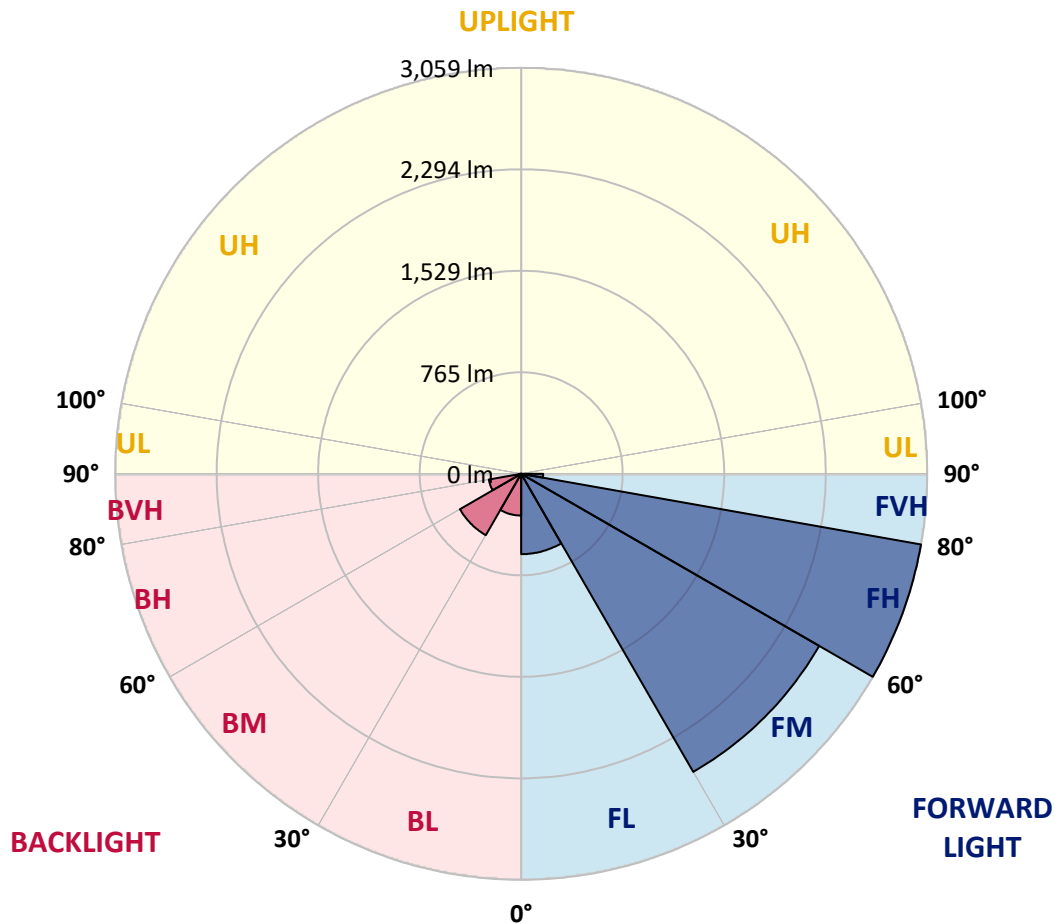
CATALOG NUMBER: ISW-SA1F-760-U-SL4

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 605.0  | 8.0       |                         |      |         |
| FM   | (30°-60°)   | 2593.1 | 34.4      |                         |      |         |
| FH   | (60°-80°)   | 3058.8 | 40.6      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 165.2  | 2.2       |                         |      | G2/225  |
| BL   | (0°-30°)    | 314.4  | 4.2       | B1/500                  |      |         |
| BM   | (30°-60°)   | 533.1  | 7.1       | B1/1000                 |      |         |
| BH   | (60°-80°)   | 247.5  | 3.3       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 16.8   | 0.2       |                         |      | G1/100  |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

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

Type IV Short



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 36°    | 45°    | 55°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1374.5 | 1374.5 | 1374.5 | 1374.5 | 1374.5 | 1374.5 | 1374.5 | 1374.5 | 1374.5 | 1374.5 | 1374.5 |
| 2.5°  | 1413.9 | 1413.9 | 1413.9 | 1411.1 | 1405.5 | 1402.6 | 1397.0 | 1391.4 | 1388.6 | 1377.4 | 1374.5 |
| 5°    | 1413.9 | 1416.7 | 1413.9 | 1411.1 | 1405.5 | 1399.8 | 1394.2 | 1383.0 | 1374.5 | 1360.5 | 1346.4 |
| 7.5°  | 1399.8 | 1402.6 | 1402.6 | 1399.8 | 1394.2 | 1391.4 | 1385.8 | 1371.7 | 1360.5 | 1340.8 | 1318.3 |
| 10°   | 1377.4 | 1383.0 | 1383.0 | 1385.8 | 1388.6 | 1388.6 | 1383.0 | 1371.7 | 1354.9 | 1332.4 | 1295.8 |
| 12.5° | 1349.2 | 1363.3 | 1371.7 | 1380.2 | 1391.4 | 1391.4 | 1394.2 | 1377.4 | 1363.3 | 1332.4 | 1295.8 |
| 15°   | 1340.8 | 1349.2 | 1366.1 | 1391.4 | 1402.6 | 1394.2 | 1405.5 | 1397.0 | 1380.2 | 1349.2 | 1304.3 |
| 17.5° | 1338.0 | 1346.4 | 1374.5 | 1405.5 | 1422.3 | 1427.9 | 1427.9 | 1416.7 | 1397.0 | 1366.1 | 1309.9 |
| 20°   | 1349.2 | 1360.5 | 1397.0 | 1436.4 | 1461.7 | 1461.7 | 1458.9 | 1444.8 | 1419.5 | 1383.0 | 1321.1 |
| 22.5° | 1385.8 | 1388.6 | 1430.8 | 1478.5 | 1498.2 | 1492.6 | 1498.2 | 1472.9 | 1444.8 | 1408.3 | 1335.2 |
| 25°   | 1433.6 | 1439.2 | 1472.9 | 1529.1 | 1540.4 | 1543.2 | 1534.8 | 1506.7 | 1475.7 | 1439.2 | 1352.1 |
| 27.5° | 1498.2 | 1506.7 | 1532.0 | 1585.4 | 1593.8 | 1588.2 | 1576.9 | 1543.2 | 1512.3 | 1478.5 | 1385.8 |
| 30°   | 1574.1 | 1579.7 | 1610.7 | 1633.1 | 1641.6 | 1636.0 | 1627.5 | 1591.0 | 1565.7 | 1534.8 | 1436.4 |
| 32.5° | 1647.2 | 1650.0 | 1683.7 | 1706.2 | 1692.2 | 1692.2 | 1680.9 | 1644.4 | 1624.7 | 1619.1 | 1501.0 |
| 35°   | 1723.1 | 1728.7 | 1759.6 | 1770.9 | 1748.4 | 1751.2 | 1748.4 | 1717.5 | 1723.1 | 1734.3 | 1599.4 |
| 37.5° | 1793.4 | 1801.8 | 1838.3 | 1841.2 | 1832.7 | 1824.3 | 1832.7 | 1815.9 | 1827.1 | 1872.1 | 1714.7 |
| 40°   | 1855.2 | 1866.5 | 1911.4 | 1919.9 | 1917.0 | 1917.0 | 1922.7 | 1919.9 | 1962.0 | 2035.1 | 1855.2 |
| 42.5° | 1905.8 | 1919.9 | 1973.3 | 1995.8 | 2012.6 | 2021.1 | 2040.7 | 2046.4 | 2108.2 | 2226.2 | 2018.2 |
| 45°   | 1956.4 | 1970.5 | 2043.5 | 2080.1 | 2119.4 | 2122.2 | 2161.6 | 2181.3 | 2296.5 | 2403.3 | 2195.3 |
| 47.5° | 2015.4 | 2032.3 | 2099.8 | 2172.8 | 2217.8 | 2226.2 | 2299.3 | 2338.7 | 2479.2 | 2617.0 | 2361.2 |
| 50°   | 2096.9 | 2102.6 | 2156.0 | 2279.7 | 2335.9 | 2349.9 | 2431.4 | 2513.0 | 2667.6 | 2805.3 | 2507.3 |
| 52.5° | 2198.1 | 2192.5 | 2217.8 | 2375.2 | 2462.4 | 2482.0 | 2614.2 | 2695.7 | 2881.2 | 3007.7 | 2622.6 |
| 55°   | 2282.5 | 2276.8 | 2313.4 | 2484.9 | 2622.6 | 2628.2 | 2785.6 | 2864.3 | 3078.0 | 3156.7 | 2721.0 |
| 57.5° | 2380.8 | 2369.6 | 2406.1 | 2617.0 | 2805.3 | 2808.1 | 2990.8 | 3080.8 | 3255.0 | 3288.8 | 2785.6 |
| 60°   | 2462.4 | 2462.4 | 2510.2 | 2746.3 | 3007.7 | 3038.6 | 3204.4 | 3274.7 | 3426.5 | 3384.3 | 2816.5 |
| 62.5° | 2538.3 | 2552.3 | 2619.8 | 2917.7 | 3246.6 | 3271.9 | 3440.6 | 3468.7 | 3603.6 | 3457.4 | 2782.8 |
| 65°   | 2628.2 | 2650.7 | 2780.0 | 3122.9 | 3530.5 | 3547.4 | 3687.9 | 3727.3 | 3780.7 | 3454.6 | 2636.6 |
| 67.5° | 2723.8 | 2760.3 | 2931.8 | 3353.4 | 3842.5 | 3887.5 | 4039.3 | 3999.9 | 3898.7 | 3345.0 | 2330.3 |
| 70°   | 2853.1 | 2898.1 | 3142.6 | 3659.8 | 4269.8 | 4326.0 | 4525.6 | 4283.8 | 3836.9 | 2954.3 | 1888.9 |
| 72.5° | 2951.5 | 3010.5 | 3345.0 | 4056.2 | 4848.8 | 4936.0 | 4888.2 | 4289.5 | 3440.6 | 2355.6 | 1264.9 |
| 75°   | 2588.9 | 2678.8 | 3184.8 | 4120.8 | 5096.2 | 5135.6 | 4624.0 | 3626.1 | 2437.1 | 1217.1 | 545.3  |
| 77.5° | 1891.7 | 1886.1 | 2327.4 | 3201.6 | 4177.0 | 4073.0 | 3508.0 | 2358.4 | 1158.1 | 441.3  | 275.5  |
| 80°   | 950.1  | 913.5  | 1259.3 | 1706.2 | 2254.4 | 2324.6 | 2074.5 | 1225.6 | 458.2  | 236.1  | 165.8  |
| 82.5° | 351.4  | 359.8  | 461.0  | 697.1  | 1132.8 | 1149.7 | 837.7  | 520.0  | 250.2  | 123.7  | 87.1   |
| 85°   | 134.9  | 140.5  | 151.8  | 151.8  | 210.8  | 233.3  | 216.4  | 208.0  | 84.3   | 42.2   | 47.8   |
| 87.5° | 0.0    | 0.0    | 0.0    | 0.0    | 2.8    | 2.8    | 2.8    | 2.8    | 2.8    | 2.8    | 2.8    |
| 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-760-U-SL4

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1374.5 | 1374.5 | 1374.5 | 1374.5 | 1374.5 | 1374.5 | 1374.5 | 1374.5 | 1374.5 | 1374.5 | 1374.5 |
| 2.5°  | 1366.1 | 1360.5 | 1349.2 | 1329.6 | 1318.3 | 1309.9 | 1298.6 | 1287.4 | 1284.6 | 1281.8 | 1295.8 |
| 5°    | 1332.4 | 1323.9 | 1295.8 | 1270.5 | 1242.4 | 1219.9 | 1197.5 | 1177.8 | 1166.5 | 1163.7 | 1169.3 |
| 7.5°  | 1298.6 | 1287.4 | 1245.2 | 1194.6 | 1146.9 | 1107.5 | 1068.1 | 1048.5 | 1017.6 | 1017.6 | 1020.4 |
| 10°   | 1279.0 | 1259.3 | 1200.3 | 1124.4 | 1062.5 | 992.3  | 944.5  | 896.7  | 877.0  | 863.0  | 857.3  |
| 12.5° | 1267.7 | 1236.8 | 1158.1 | 1073.8 | 978.2  | 885.4  | 820.8  | 761.8  | 730.8  | 708.4  | 708.4  |
| 15°   | 1270.5 | 1236.8 | 1130.0 | 1020.4 | 896.7  | 784.2  | 702.7  | 638.1  | 598.7  | 576.2  | 570.6  |
| 17.5° | 1267.7 | 1225.6 | 1096.3 | 952.9  | 815.2  | 697.1  | 598.7  | 531.3  | 491.9  | 477.9  | 475.0  |
| 20°   | 1273.3 | 1217.1 | 1056.9 | 891.1  | 736.5  | 610.0  | 508.8  | 446.9  | 424.4  | 413.2  | 410.4  |
| 22.5° | 1276.2 | 1200.3 | 1017.6 | 823.6  | 652.1  | 528.5  | 444.1  | 402.0  | 385.1  | 376.7  | 373.9  |
| 25°   | 1281.8 | 1197.5 | 972.6  | 761.8  | 581.9  | 466.6  | 402.0  | 365.4  | 357.0  | 351.4  | 351.4  |
| 27.5° | 1304.3 | 1197.5 | 933.2  | 683.1  | 508.8  | 416.0  | 365.4  | 342.9  | 337.3  | 334.5  | 334.5  |
| 30°   | 1332.4 | 1203.1 | 896.7  | 618.4  | 452.6  | 376.7  | 340.1  | 323.3  | 320.4  | 317.6  | 317.6  |
| 32.5° | 1380.2 | 1222.8 | 854.5  | 556.6  | 404.8  | 348.6  | 320.4  | 306.4  | 300.8  | 300.8  | 300.8  |
| 35°   | 1444.8 | 1256.5 | 812.4  | 500.3  | 365.4  | 320.4  | 300.8  | 286.7  | 283.9  | 286.7  | 286.7  |
| 37.5° | 1537.6 | 1295.8 | 775.8  | 449.7  | 334.5  | 298.0  | 281.1  | 272.7  | 269.8  | 269.8  | 272.7  |
| 40°   | 1652.8 | 1366.1 | 739.3  | 410.4  | 312.0  | 278.3  | 267.0  | 258.6  | 255.8  | 258.6  | 258.6  |
| 42.5° | 1779.3 | 1442.0 | 708.4  | 371.0  | 289.5  | 264.2  | 250.2  | 244.6  | 241.7  | 244.6  | 247.4  |
| 45°   | 1919.9 | 1520.7 | 683.1  | 342.9  | 272.7  | 250.2  | 238.9  | 236.1  | 233.3  | 233.3  | 236.1  |
| 47.5° | 2037.9 | 1605.0 | 663.4  | 323.3  | 258.6  | 238.9  | 230.5  | 224.9  | 222.1  | 219.3  | 222.1  |
| 50°   | 2147.5 | 1669.7 | 657.8  | 312.0  | 250.2  | 227.7  | 219.3  | 213.6  | 210.8  | 208.0  | 210.8  |
| 52.5° | 2229.1 | 1703.4 | 657.8  | 303.6  | 241.7  | 219.3  | 210.8  | 205.2  | 202.4  | 196.8  | 199.6  |
| 55°   | 2285.3 | 1720.3 | 649.3  | 298.0  | 233.3  | 210.8  | 199.6  | 196.8  | 194.0  | 188.3  | 188.3  |
| 57.5° | 2319.0 | 1717.5 | 618.4  | 295.1  | 230.5  | 199.6  | 191.1  | 188.3  | 185.5  | 179.9  | 179.9  |
| 60°   | 2313.4 | 1664.1 | 562.2  | 283.9  | 224.9  | 191.1  | 179.9  | 179.9  | 179.9  | 174.3  | 174.3  |
| 62.5° | 2231.9 | 1515.1 | 469.4  | 267.0  | 219.3  | 182.7  | 168.7  | 174.3  | 177.1  | 171.5  | 171.5  |
| 65°   | 2012.6 | 1287.4 | 387.9  | 244.6  | 205.2  | 174.3  | 160.2  | 168.7  | 174.3  | 171.5  | 168.7  |
| 67.5° | 1695.0 | 1020.4 | 320.4  | 222.1  | 191.1  | 163.0  | 149.0  | 160.2  | 163.0  | 163.0  | 163.0  |
| 70°   | 1309.9 | 733.7  | 264.2  | 194.0  | 171.5  | 146.2  | 134.9  | 140.5  | 143.4  | 143.4  | 146.2  |
| 72.5° | 775.8  | 438.5  | 216.4  | 165.8  | 146.2  | 126.5  | 118.1  | 120.9  | 118.1  | 118.1  | 118.1  |
| 75°   | 382.3  | 272.7  | 174.3  | 140.5  | 123.7  | 106.8  | 98.4   | 92.8   | 92.8   | 92.8   | 89.9   |
| 77.5° | 233.3  | 202.4  | 143.4  | 112.4  | 98.4   | 81.5   | 75.9   | 70.3   | 70.3   | 70.3   | 70.3   |
| 80°   | 165.8  | 157.4  | 109.6  | 84.3   | 67.5   | 59.0   | 56.2   | 53.4   | 53.4   | 50.6   | 50.6   |
| 82.5° | 104.0  | 118.1  | 81.5   | 56.2   | 45.0   | 42.2   | 39.4   | 36.5   | 33.7   | 30.9   | 30.9   |
| 85°   | 59.0   | 75.9   | 47.8   | 30.9   | 25.3   | 19.7   | 16.9   | 16.9   | 14.1   | 14.1   | 11.2   |
| 87.5° | 2.8    | 5.6    | 5.6    | 5.6    | 5.6    | 2.8    | 2.8    | 2.8    | 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    |

Signify Classified - Internal  
Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269



### Test Information

Test Method: LM-79-2008  
 Report Number: SP1-1908-441-9-R4  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry:  $4\pi$   
 Issue Date: 10/28/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: MCGRAW-EDISON  
 Catalog Number: **SA1C-760-U-5WQ**  
 Description: MCGRAW EDISON ROADWAY AND AREA LUMINAIRE

\*\*\*THIS IS A REVISION OF SP1-1908-441-4-R3. TO UPDATE THE CATALOG INFORMATION.\*\*\*TESTED IN SITU. ROADWAY AND AREA LUMINAIRE. (1) 70 CRI, 5000K, 1050MA LIGHTSQUARE WITH 16 LEDS AND TYPE V WIDE OPTICS.

### Spectral Parameters

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 5474   | CRI (Ra): | 71.7 |      |       |
| CIE u':                   | 0.2052 | R1:       | 70.6 | R9:  | -27.1 |
| CIE v':                   | 0.4804 | R2:       | 74.6 | R10: | 40.8  |
| Duv:                      | 0.0025 | R3:       | 78.3 | R11: | 74.6  |
| CIE x:                    | 0.3330 | R4:       | 73.8 | R12: | 50.4  |
| CIE y:                    | 0.3466 | R5:       | 72.4 | R13: | 70.0  |
| CIE z:                    | 0.3204 | R6:       | 67.5 | R14: | 87.8  |
| Peak Wavelength (nm):     | 442    | R7:       | 77.5 |      |       |
| Dominant Wavelength (nm): | 554    | R8:       | 58.9 |      |       |
| Purity:                   | 4.1    |           |      |      |       |
| Rf:                       | 72.1   |           |      |      |       |
| Rg:                       | 97.2   |           |      |      |       |



### Test Conditions

Stabilization Time: 240M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.6/31%  
 Sphere Temperature (°C): 25.9

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| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 6/28/2019        | 12/28/2019           |
| Power Meter                    | IN0071                | 12/5/2018        | 12/5/2019            |
| AC Power Source                | IN0063                | 12/5/2018        | 12/5/2019            |
| DC Power Source                | IN0208                | 12/5/2018        | 12/5/2019            |
| Sphere Thermometer             | IN0085                | 12/5/2018        | 12/5/2019            |
| Room Thermometer               | IN0046                | 12/5/2018        | 12/5/2019            |

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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       | 3540             | NR               | 490       | 33363            | NR               | 620       | 80193            | NR               | 750       | 4663             | NR               | 880       | 4678             | NR               |
| 365       | 2862             | NR               | 495       | 44177            | NR               | 625       | 73091            | NR               | 755       | 4147             | NR               | 885       | 4128             | NR               |
| 370       | 2865             | NR               | 500       | 57019            | NR               | 630       | 66269            | NR               | 760       | 4040             | NR               | 890       | 4504             | NR               |
| 375       | 3254             | NR               | 505       | 70030            | NR               | 635       | 60012            | NR               | 765       | 3474             | NR               | 895       | 4371             | NR               |
| 380       | 3076             | NR               | 510       | 81972            | NR               | 640       | 53914            | NR               | 770       | 3469             | NR               | 900       | 4082             | NR               |
| 385       | 2904             | NR               | 515       | 92590            | NR               | 645       | 48385            | NR               | 775       | 3181             | NR               | 905       | 2982             | NR               |
| 390       | 2689             | NR               | 520       | 100305           | NR               | 650       | 43219            | NR               | 780       | 2969             | NR               | 910       | 4351             | NR               |
| 395       | 2619             | NR               | 525       | 107452           | NR               | 655       | 38562            | NR               | 785       | 3132             | NR               | 915       | 3365             | NR               |
| 400       | 2679             | NR               | 530       | 111373           | NR               | 660       | 34110            | NR               | 790       | 2507             | NR               | 920       | 3430             | NR               |
| 405       | 3515             | NR               | 535       | 114505           | NR               | 665       | 30085            | NR               | 795       | 2968             | NR               | 925       | 4264             | NR               |
| 410       | 6934             | NR               | 540       | 116408           | NR               | 670       | 26205            | NR               | 800       | 2758             | NR               | 930       | 4095             | NR               |
| 415       | 14943            | NR               | 545       | 118700           | NR               | 675       | 22906            | NR               | 805       | 2872             | NR               | 935       | 5048             | NR               |
| 420       | 31939            | NR               | 550       | 119209           | NR               | 680       | 20058            | NR               | 810       | 3094             | NR               | 940       | 4074             | NR               |
| 425       | 64701            | NR               | 555       | 120742           | NR               | 685       | 17413            | NR               | 815       | 3222             | NR               | 945       | 4949             | NR               |
| 430       | 110939           | NR               | 560       | 121594           | NR               | 690       | 15447            | NR               | 820       | 3238             | NR               | 950       | 4387             | NR               |
| 435       | 164597           | NR               | 565       | 121913           | NR               | 695       | 13398            | NR               | 825       | 3524             | NR               | 955       | 4978             | NR               |
| 440       | 207696           | NR               | 570       | 122147           | NR               | 700       | 11777            | NR               | 830       | 2921             | NR               | 960       | 4706             | NR               |
| 445       | 201830           | NR               | 575       | 121605           | NR               | 705       | 10412            | NR               | 835       | 3595             | NR               | 965       | 5083             | NR               |
| 450       | 145410           | NR               | 580       | 120248           | NR               | 710       | 9544             | NR               | 840       | 3016             | NR               | 970       | 4522             | NR               |
| 455       | 89594            | NR               | 585       | 117717           | NR               | 715       | 8940             | NR               | 845       | 4032             | NR               | 975       | 4740             | NR               |
| 460       | 58321            | NR               | 590       | 114359           | NR               | 720       | 7897             | NR               | 850       | 3579             | NR               | 980       | 6122             | NR               |
| 465       | 39318            | NR               | 595       | 109974           | NR               | 725       | 7045             | NR               | 855       | 4571             | NR               | 985       | 6450             | NR               |
| 470       | 27693            | NR               | 600       | 105269           | NR               | 730       | 6483             | NR               | 860       | 4485             | NR               | 990       | 4875             | NR               |
| 475       | 23081            | NR               | 605       | 99453            | NR               | 735       | 5838             | NR               | 865       | 3978             | NR               | 995       | 4764             | NR               |
| 480       | 23002            | NR               | 610       | 92921            | NR               | 740       | 5261             | NR               | 870       | 4298             | NR               | 1000      | 3640             | NR               |
| 485       | 26201            | NR               | 615       | 86989            | NR               | 745       | 4760             | NR               | 875       | 4356             | NR               |           |                  |                  |

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Scotopic Flux vs. Wavelength



Scotopic Lumens: 13759.3

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       | 3540             | NR               | 490       | 33363            | NR               | 620       | 80193            | NR               | 750       | 4663             | NR               | 880       | 4678             | NR               |
| 365       | 2862             | NR               | 495       | 44177            | NR               | 625       | 73091            | NR               | 755       | 4147             | NR               | 885       | 4128             | NR               |
| 370       | 2865             | NR               | 500       | 57019            | NR               | 630       | 66269            | NR               | 760       | 4040             | NR               | 890       | 4504             | NR               |
| 375       | 3254             | NR               | 505       | 70030            | NR               | 635       | 60012            | NR               | 765       | 3474             | NR               | 895       | 4371             | NR               |
| 380       | 3076             | NR               | 510       | 81972            | NR               | 640       | 53914            | NR               | 770       | 3469             | NR               | 900       | 4082             | NR               |
| 385       | 2904             | NR               | 515       | 92590            | NR               | 645       | 48385            | NR               | 775       | 3181             | NR               | 905       | 2982             | NR               |
| 390       | 2689             | NR               | 520       | 100305           | NR               | 650       | 43219            | NR               | 780       | 2969             | NR               | 910       | 4351             | NR               |
| 395       | 2619             | NR               | 525       | 107452           | NR               | 655       | 38562            | NR               | 785       | 3132             | NR               | 915       | 3365             | NR               |
| 400       | 2679             | NR               | 530       | 111373           | NR               | 660       | 34110            | NR               | 790       | 2507             | NR               | 920       | 3430             | NR               |
| 405       | 3515             | NR               | 535       | 114505           | NR               | 665       | 30085            | NR               | 795       | 2968             | NR               | 925       | 4264             | NR               |
| 410       | 6934             | NR               | 540       | 116408           | NR               | 670       | 26205            | NR               | 800       | 2758             | NR               | 930       | 4095             | NR               |
| 415       | 14943            | NR               | 545       | 118700           | NR               | 675       | 22906            | NR               | 805       | 2872             | NR               | 935       | 5048             | NR               |
| 420       | 31939            | NR               | 550       | 119209           | NR               | 680       | 20058            | NR               | 810       | 3094             | NR               | 940       | 4074             | NR               |
| 425       | 64701            | NR               | 555       | 120742           | NR               | 685       | 17413            | NR               | 815       | 3222             | NR               | 945       | 4949             | NR               |
| 430       | 110939           | NR               | 560       | 121594           | NR               | 690       | 15447            | NR               | 820       | 3238             | NR               | 950       | 4387             | NR               |
| 435       | 164597           | NR               | 565       | 121913           | NR               | 695       | 13398            | NR               | 825       | 3524             | NR               | 955       | 4978             | NR               |
| 440       | 207696           | NR               | 570       | 122147           | NR               | 700       | 11777            | NR               | 830       | 2921             | NR               | 960       | 4706             | NR               |
| 445       | 201830           | NR               | 575       | 121605           | NR               | 705       | 10412            | NR               | 835       | 3595             | NR               | 965       | 5083             | NR               |
| 450       | 145410           | NR               | 580       | 120248           | NR               | 710       | 9544             | NR               | 840       | 3016             | NR               | 970       | 4522             | NR               |
| 455       | 89594            | NR               | 585       | 117717           | NR               | 715       | 8940             | NR               | 845       | 4032             | NR               | 975       | 4740             | NR               |
| 460       | 58321            | NR               | 590       | 114359           | NR               | 720       | 7897             | NR               | 850       | 3579             | NR               | 980       | 6122             | NR               |
| 465       | 39318            | NR               | 595       | 109974           | NR               | 725       | 7045             | NR               | 855       | 4571             | NR               | 985       | 6450             | NR               |
| 470       | 27693            | NR               | 600       | 105269           | NR               | 730       | 6483             | NR               | 860       | 4485             | NR               | 990       | 4875             | NR               |
| 475       | 23081            | NR               | 605       | 99453            | NR               | 735       | 5838             | NR               | 865       | 3978             | NR               | 995       | 4764             | NR               |
| 480       | 23002            | NR               | 610       | 92921            | NR               | 740       | 5261             | NR               | 870       | 4298             | NR               | 1000      | 3640             | NR               |
| 485       | 26201            | NR               | 615       | 86989            | NR               | 745       | 4760             | NR               | 875       | 4356             | NR               |           |                  |                  |

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**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 5527.6 M/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       | 3540             | NR               | 490       | 33363            | NR               | 620       | 80193            | NR               | 750       | 4663             | NR               | 880       | 4678             | NR               |
| 365       | 2862             | NR               | 495       | 44177            | NR               | 625       | 73091            | NR               | 755       | 4147             | NR               | 885       | 4128             | NR               |
| 370       | 2865             | NR               | 500       | 57019            | NR               | 630       | 66269            | NR               | 760       | 4040             | NR               | 890       | 4504             | NR               |
| 375       | 3254             | NR               | 505       | 70030            | NR               | 635       | 60012            | NR               | 765       | 3474             | NR               | 895       | 4371             | NR               |
| 380       | 3076             | NR               | 510       | 81972            | NR               | 640       | 53914            | NR               | 770       | 3469             | NR               | 900       | 4082             | NR               |
| 385       | 2904             | NR               | 515       | 92590            | NR               | 645       | 48385            | NR               | 775       | 3181             | NR               | 905       | 2982             | NR               |
| 390       | 2689             | NR               | 520       | 100305           | NR               | 650       | 43219            | NR               | 780       | 2969             | NR               | 910       | 4351             | NR               |
| 395       | 2619             | NR               | 525       | 107452           | NR               | 655       | 38562            | NR               | 785       | 3132             | NR               | 915       | 3365             | NR               |
| 400       | 2679             | NR               | 530       | 111373           | NR               | 660       | 34110            | NR               | 790       | 2507             | NR               | 920       | 3430             | NR               |
| 405       | 3515             | NR               | 535       | 114505           | NR               | 665       | 30085            | NR               | 795       | 2968             | NR               | 925       | 4264             | NR               |
| 410       | 6934             | NR               | 540       | 116408           | NR               | 670       | 26205            | NR               | 800       | 2758             | NR               | 930       | 4095             | NR               |
| 415       | 14943            | NR               | 545       | 118700           | NR               | 675       | 22906            | NR               | 805       | 2872             | NR               | 935       | 5048             | NR               |
| 420       | 31939            | NR               | 550       | 119209           | NR               | 680       | 20058            | NR               | 810       | 3094             | NR               | 940       | 4074             | NR               |
| 425       | 64701            | NR               | 555       | 120742           | NR               | 685       | 17413            | NR               | 815       | 3222             | NR               | 945       | 4949             | NR               |
| 430       | 110939           | NR               | 560       | 121594           | NR               | 690       | 15447            | NR               | 820       | 3238             | NR               | 950       | 4387             | NR               |
| 435       | 164597           | NR               | 565       | 121913           | NR               | 695       | 13398            | NR               | 825       | 3524             | NR               | 955       | 4978             | NR               |
| 440       | 207696           | NR               | 570       | 122147           | NR               | 700       | 11777            | NR               | 830       | 2921             | NR               | 960       | 4706             | NR               |
| 445       | 201830           | NR               | 575       | 121605           | NR               | 705       | 10412            | NR               | 835       | 3595             | NR               | 965       | 5083             | NR               |
| 450       | 145410           | NR               | 580       | 120248           | NR               | 710       | 9544             | NR               | 840       | 3016             | NR               | 970       | 4522             | NR               |
| 455       | 89594            | NR               | 585       | 117717           | NR               | 715       | 8940             | NR               | 845       | 4032             | NR               | 975       | 4740             | NR               |
| 460       | 58321            | NR               | 590       | 114359           | NR               | 720       | 7897             | NR               | 850       | 3579             | NR               | 980       | 6122             | NR               |
| 465       | 39318            | NR               | 595       | 109974           | NR               | 725       | 7045             | NR               | 855       | 4571             | NR               | 985       | 6450             | NR               |
| 470       | 27693            | NR               | 600       | 105269           | NR               | 730       | 6483             | NR               | 860       | 4485             | NR               | 990       | 4875             | NR               |
| 475       | 23081            | NR               | 605       | 99453            | NR               | 735       | 5838             | NR               | 865       | 3978             | NR               | 995       | 4764             | NR               |
| 480       | 23002            | NR               | 610       | 92921            | NR               | 740       | 5261             | NR               | 870       | 4298             | NR               | 1000      | 3640             | NR               |
| 485       | 26201            | NR               | 615       | 86989            | NR               | 745       | 4760             | NR               | 875       | 4356             | NR               |           |                  |                  |

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**TM-30-18**

**Summary**

$R_f = 72.1$   
 $R_g = 97.2$   
 CIE  $R_a = 71.7$   
 $R_g = -27.1$



**Color Vector Graphics**



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 54 | CES51 = 88 | CES76 = 43 |
| CES02 = 59 | CES27 = 79 | CES52 = 90 | CES77 = 64 |
| CES03 = 30 | CES28 = 77 | CES53 = 77 | CES78 = 46 |
| CES04 = 69 | CES29 = 50 | CES54 = 81 | CES79 = 74 |
| CES05 = 46 | CES30 = 59 | CES55 = 80 | CES80 = 70 |
| CES06 = 50 | CES31 = 55 | CES56 = 70 | CES81 = 71 |
| CES07 = 38 | CES32 = 52 | CES57 = 68 | CES82 = 88 |
| CES08 = 38 | CES33 = 63 | CES58 = 70 | CES83 = 82 |
| CES09 = 29 | CES34 = 63 | CES59 = 88 | CES84 = 87 |
| CES10 = 72 | CES35 = 79 | CES60 = 92 | CES85 = 84 |
| CES11 = 55 | CES36 = 90 | CES61 = 88 | CES86 = 76 |
| CES12 = 61 | CES37 = 72 | CES62 = 81 | CES87 = 75 |
| CES13 = 41 | CES38 = 68 | CES63 = 75 | CES88 = 77 |
| CES14 = 74 | CES39 = 91 | CES64 = 72 | CES89 = 76 |
| CES15 = 70 | CES40 = 83 | CES65 = 65 | CES90 = 76 |
| CES16 = 46 | CES41 = 84 | CES66 = 66 | CES91 = 92 |
| CES17 = 48 | CES42 = 70 | CES67 = 64 | CES92 = 70 |
| CES18 = 55 | CES43 = 69 | CES68 = 71 | CES93 = 83 |
| CES19 = 70 | CES44 = 98 | CES69 = 80 | CES94 = 60 |
| CES20 = 64 | CES45 = 79 | CES70 = 58 | CES95 = 73 |
| CES21 = 85 | CES46 = 78 | CES71 = 55 | CES96 = 79 |
| CES22 = 77 | CES47 = 76 | CES72 = 84 | CES97 = 84 |
| CES23 = 91 | CES48 = 68 | CES73 = 47 | CES98 = 73 |
| CES24 = 90 | CES49 = 78 | CES74 = 94 | CES99 = 62 |
| CES25 = 71 | CES50 = 87 | CES75 = 51 |            |



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Color Rendition by Hue-Angle Bin



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**Measure Comparisons**



(END OF REPORT)