

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: P437630

Luminaire Tested: **ISC-SA1E-727-U-SL3-HSS**

Issue Date: 12/9/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P437630  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-2011-074-17)  
Test Lab: INNOVATION CENTER  
Issue Date: 12/9/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: MCGRAW-EDISON  
Catalog Number: ISC-SA1E-727-U-SL3-HSS  
Description: IMPACT ELITE LED CYLINDER LUMINAIRE  
(1) 70 CRI, 2700K, 1050mA 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: 5014 lumens  
Efficiency: N/A  
Efficacy: 86.2 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 0.5' x H: 0')  
IES Classification: Type III - Short  
BUG Rating: B1 - U0 - G2

Input Watts (W): 58.2  
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



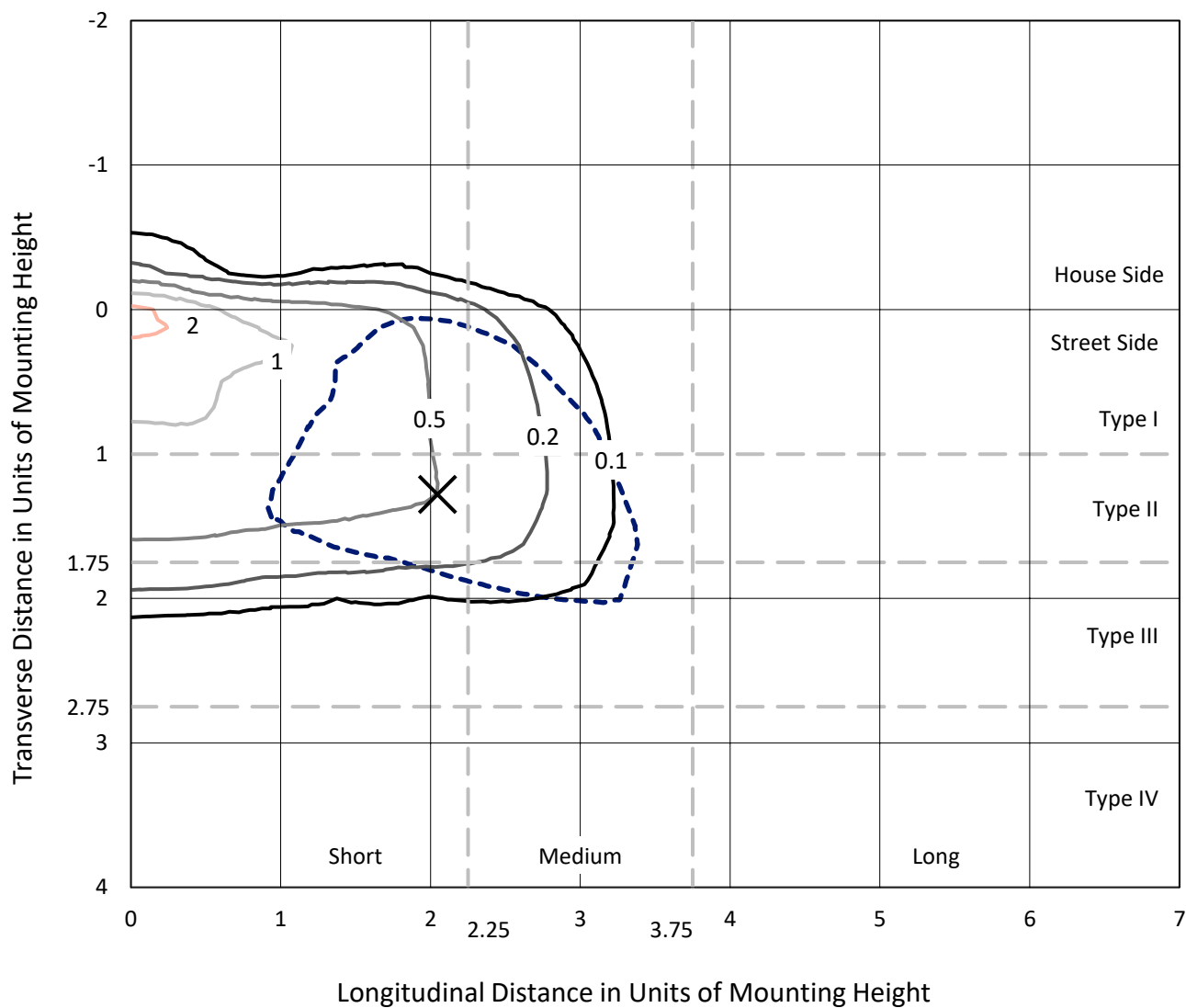
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## Iso-Footcandle Lines of Horizontal Illumination

✕ Max cd

--- 1/2 Max cd

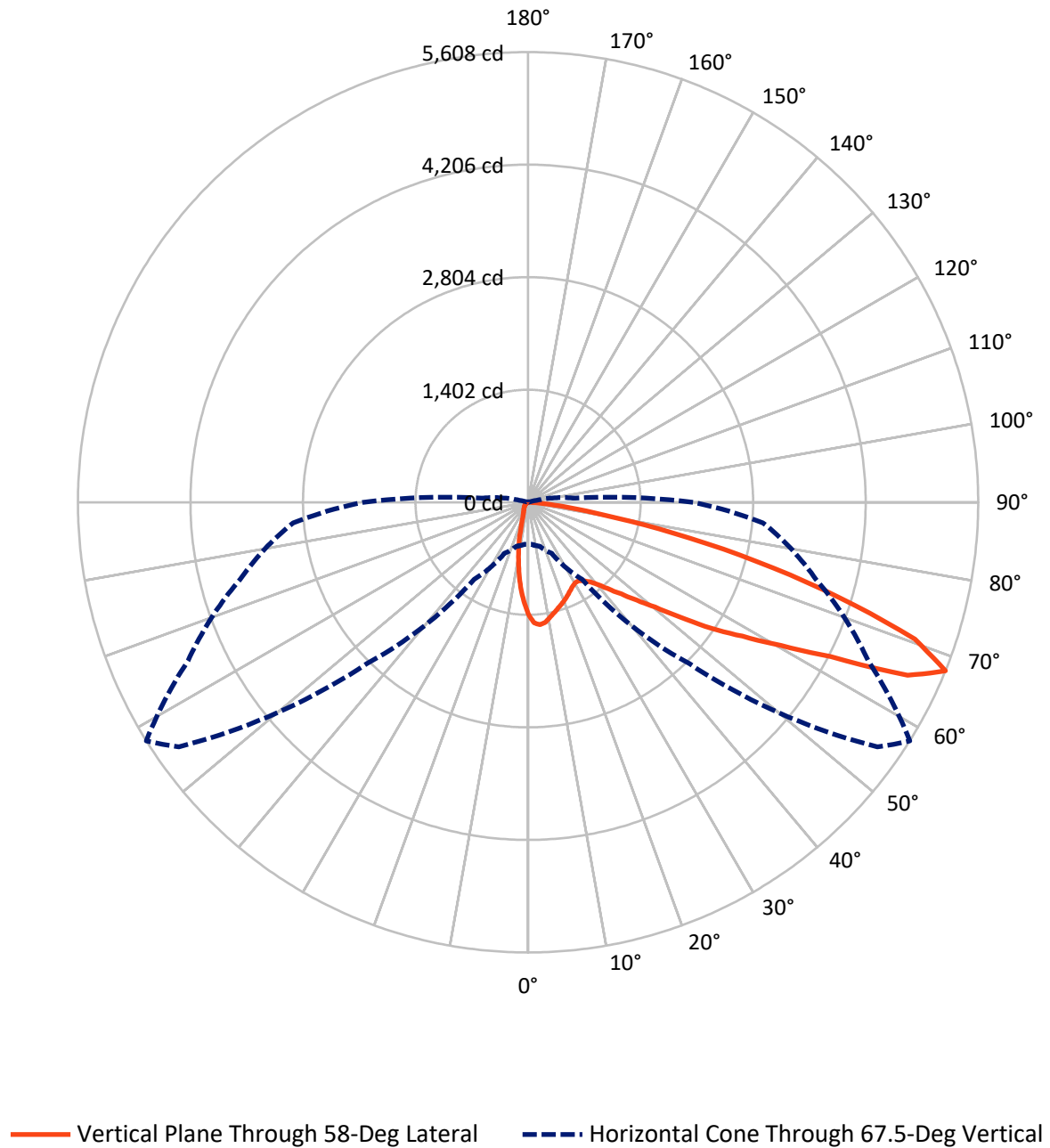


Based on 25 foot mounting height. Maximum calculated value = 2.3 fc  
 Type III - Short - N/A

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## Luminous Intensity Polar Plot



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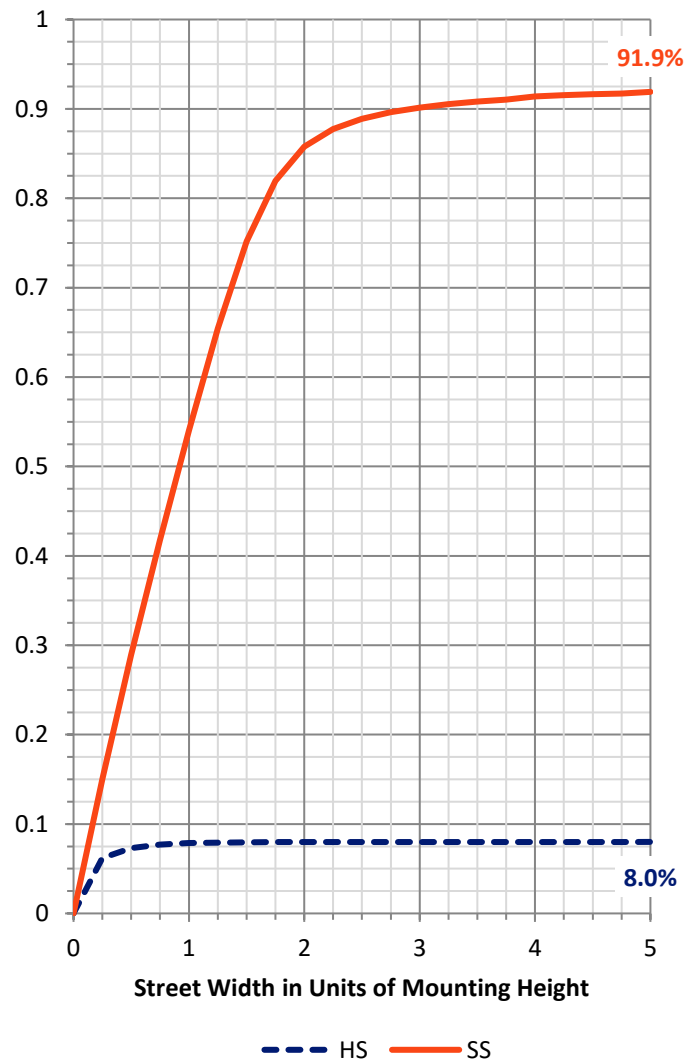
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 404.3    | 0.0    | 404.3  |
|                    | % Fixture | 8.1      | 0.0    | 8.1    |
| <b>Street Side</b> | Lumens    | 4609.8   | 0.0    | 4609.8 |
|                    | % Fixture | 91.9     | 0.0    | 91.9   |
| <b>Total</b>       | Lumens    | 5014.0   | 0.0    | 5014.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 113.0  | 2.3       |
| 10°-20°   | 238.2  | 4.8       |
| 20°-30°   | 322.3  | 6.4       |
| 30°-40°   | 443.3  | 8.8       |
| 40°-50°   | 694.0  | 13.8      |
| 50°-60°   | 1169.1 | 23.3      |
| 60°-70°   | 1387.4 | 27.7      |
| 70°-80°   | 602.5  | 12.0      |
| 80°-90°   | 44.3   | 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°    | 5014.0 | 100.0     |
| 0°-180°   | 5014.0 | 100.0     |

**Coefficient of Utilization**



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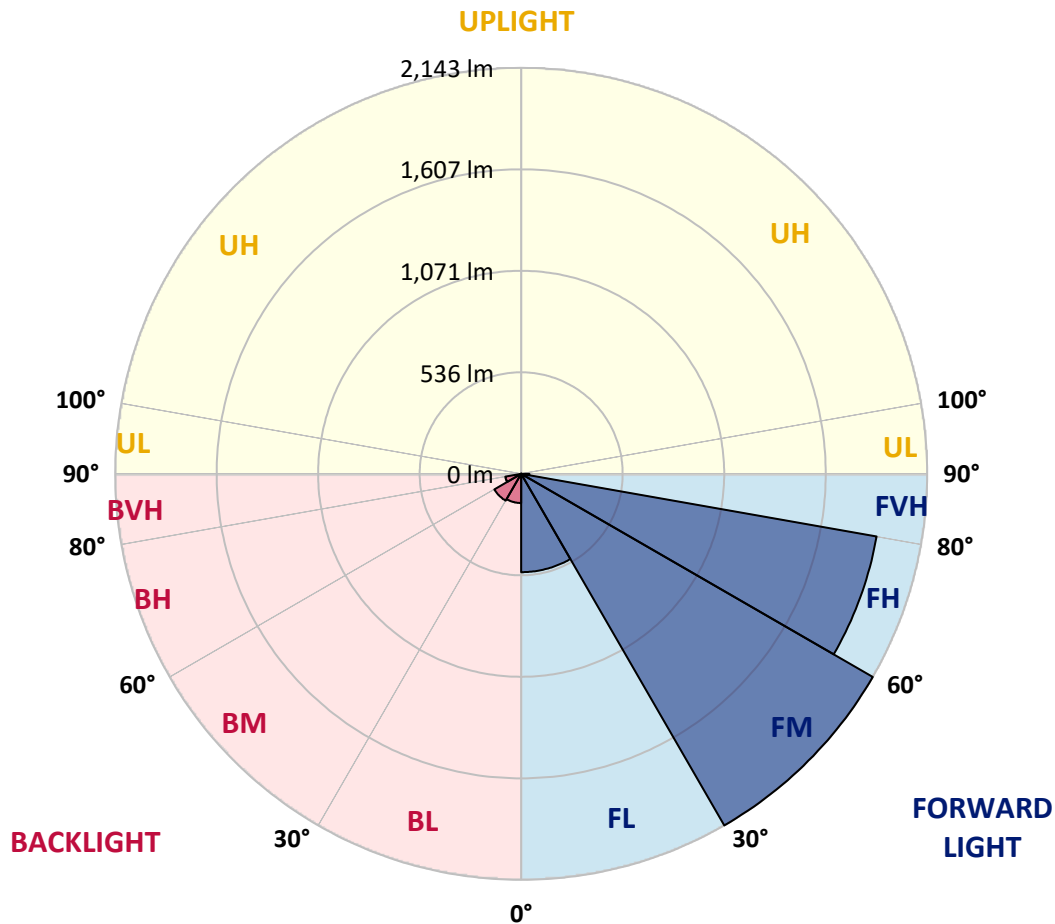
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**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 519.2  | 10.4      |                         |      |         |
| FM   | (30°-60°)   | 2142.8 | 42.7      |                         |      |         |
| FH   | (60°-80°)   | 1904.8 | 38.0      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 42.9   | 0.9       |                         |      | G1/100  |
| BL   | (0°-30°)    | 154.3  | 3.1       | B1/500                  |      |         |
| BM   | (30°-60°)   | 163.5  | 3.3       | B0/220                  |      |         |
| BH   | (60°-80°)   | 85.1   | 1.7       | B0/110                  |      | G0/110  |
| BVH  | (80°-90°)   | 1.4    | 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°    | 58°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1411.7 | 1411.7 | 1411.7 | 1411.7 | 1411.7 | 1411.7 | 1411.7 | 1411.7 | 1411.7 | 1411.7 | 1411.7 |
| 2.5°  | 1575.7 | 1567.1 | 1562.8 | 1560.6 | 1545.5 | 1532.6 | 1506.7 | 1504.5 | 1487.2 | 1454.9 | 1422.5 |
| 5°    | 1541.2 | 1547.7 | 1549.8 | 1556.3 | 1554.2 | 1554.2 | 1536.9 | 1532.6 | 1508.8 | 1463.5 | 1400.9 |
| 7.5°  | 1465.7 | 1463.5 | 1467.8 | 1485.1 | 1493.7 | 1511.0 | 1508.8 | 1513.1 | 1502.3 | 1452.7 | 1364.2 |
| 10°   | 1355.6 | 1359.9 | 1372.8 | 1387.9 | 1411.7 | 1441.9 | 1461.3 | 1465.7 | 1474.3 | 1433.3 | 1329.7 |
| 12.5° | 1254.1 | 1260.6 | 1269.2 | 1299.4 | 1325.3 | 1372.8 | 1409.5 | 1418.2 | 1435.4 | 1413.8 | 1299.4 |
| 15°   | 1169.9 | 1172.1 | 1178.6 | 1206.6 | 1249.8 | 1310.2 | 1364.2 | 1377.2 | 1405.2 | 1396.6 | 1275.7 |
| 17.5° | 1103.0 | 1105.2 | 1113.8 | 1137.6 | 1172.1 | 1243.3 | 1316.7 | 1338.3 | 1379.3 | 1385.8 | 1249.8 |
| 20°   | 1066.3 | 1066.3 | 1066.3 | 1081.4 | 1116.0 | 1182.9 | 1269.2 | 1299.4 | 1357.7 | 1368.5 | 1228.2 |
| 22.5° | 1055.5 | 1055.5 | 1051.2 | 1055.5 | 1077.1 | 1133.2 | 1221.7 | 1258.4 | 1331.8 | 1362.0 | 1202.3 |
| 25°   | 1070.6 | 1064.2 | 1064.2 | 1053.4 | 1055.5 | 1092.2 | 1178.6 | 1219.6 | 1316.7 | 1357.7 | 1189.4 |
| 27.5° | 1098.7 | 1096.5 | 1087.9 | 1079.3 | 1066.3 | 1075.0 | 1141.9 | 1182.9 | 1301.6 | 1364.2 | 1178.6 |
| 30°   | 1131.1 | 1131.1 | 1126.8 | 1122.4 | 1100.9 | 1083.6 | 1124.6 | 1161.3 | 1295.1 | 1375.0 | 1172.1 |
| 32.5° | 1167.8 | 1165.6 | 1176.4 | 1180.7 | 1154.8 | 1122.4 | 1128.9 | 1163.5 | 1299.4 | 1407.4 | 1176.4 |
| 35°   | 1210.9 | 1210.9 | 1230.4 | 1256.3 | 1234.7 | 1185.0 | 1169.9 | 1200.2 | 1321.0 | 1441.9 | 1193.7 |
| 37.5° | 1258.4 | 1260.6 | 1295.1 | 1331.8 | 1316.7 | 1273.5 | 1247.6 | 1258.4 | 1366.4 | 1506.7 | 1232.5 |
| 40°   | 1314.6 | 1314.6 | 1366.4 | 1426.8 | 1426.8 | 1377.2 | 1342.6 | 1351.2 | 1431.1 | 1599.5 | 1301.6 |
| 42.5° | 1375.0 | 1381.5 | 1454.9 | 1528.2 | 1549.8 | 1504.5 | 1467.8 | 1478.6 | 1534.7 | 1720.4 | 1403.1 |
| 45°   | 1461.3 | 1480.8 | 1575.7 | 1647.0 | 1690.1 | 1668.6 | 1621.1 | 1629.7 | 1670.7 | 1895.2 | 1556.3 |
| 47.5° | 1614.6 | 1631.9 | 1713.9 | 1785.1 | 1839.1 | 1849.9 | 1828.3 | 1824.0 | 1841.2 | 2100.3 | 1750.6 |
| 50°   | 1798.1 | 1813.2 | 1869.3 | 1929.7 | 2005.3 | 2070.0 | 2057.1 | 2050.6 | 2057.1 | 2324.8 | 1988.0 |
| 52.5° | 1979.4 | 1972.9 | 2039.8 | 2072.2 | 2178.0 | 2320.4 | 2376.6 | 2376.6 | 2342.0 | 2560.0 | 2221.1 |
| 55°   | 2141.3 | 2169.3 | 2240.6 | 2298.8 | 2387.3 | 2557.9 | 2747.8 | 2771.6 | 2652.8 | 2793.2 | 2415.4 |
| 57.5° | 2121.8 | 2149.9 | 2281.6 | 2465.1 | 2726.2 | 2957.2 | 3142.8 | 3147.2 | 2974.5 | 2972.3 | 2655.0 |
| 60°   | 1895.2 | 1897.4 | 2074.4 | 2352.8 | 2875.2 | 3533.5 | 3641.5 | 3619.9 | 3255.1 | 3222.7 | 2985.3 |
| 62.5° | 1334.0 | 1325.3 | 1554.2 | 1908.2 | 2652.8 | 3848.7 | 4397.0 | 4232.9 | 3721.3 | 3615.6 | 3293.9 |
| 65°   | 777.1  | 772.8  | 861.3  | 1139.7 | 2009.6 | 3626.4 | 5169.7 | 5195.6 | 4334.4 | 3816.3 | 3229.2 |
| 67.5° | 522.4  | 526.7  | 567.7  | 703.7  | 1172.1 | 2845.0 | 5312.2 | 5607.9 | 4675.4 | 3712.7 | 2937.8 |
| 70°   | 384.2  | 384.2  | 416.6  | 518.1  | 695.1  | 1783.0 | 4640.9 | 5113.6 | 4742.3 | 3453.7 | 2458.6 |
| 72.5° | 274.1  | 274.1  | 319.5  | 418.8  | 567.7  | 919.5  | 3449.4 | 4053.7 | 4004.1 | 2866.5 | 1700.9 |
| 75°   | 174.8  | 179.2  | 228.8  | 343.2  | 518.1  | 589.3  | 2339.9 | 2937.8 | 2793.2 | 1603.8 | 725.3  |
| 77.5° | 66.9   | 75.5   | 123.0  | 252.5  | 453.3  | 490.0  | 1334.0 | 1852.0 | 1474.3 | 561.2  | 194.3  |
| 80°   | 23.7   | 23.7   | 41.0   | 129.5  | 319.5  | 403.6  | 697.2  | 919.5  | 479.2  | 136.0  | 73.4   |
| 82.5° | 4.3    | 4.3    | 15.1   | 54.0   | 157.6  | 280.6  | 405.8  | 453.3  | 187.8  | 45.3   | 43.2   |
| 85°   | 0.0    | 0.0    | 2.2    | 10.8   | 36.7   | 28.1   | 161.9  | 153.3  | 58.3   | 19.4   | 28.1   |
| 87.5° | 0.0    | 0.0    | 0.0    | 0.0    | 2.2    | 2.2    | 4.3    | 4.3    | 4.3    | 4.3    | 4.3    |
| 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: ISC-SA1E-727-U-SL3-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1411.7 | 1411.7 | 1411.7 | 1411.7 | 1411.7 | 1411.7 | 1411.7 | 1411.7 | 1411.7 | 1411.7 | 1411.7 |
| 2.5°  | 1396.6 | 1379.3 | 1329.7 | 1295.1 | 1247.6 | 1200.2 | 1169.9 | 1146.2 | 1135.4 | 1120.3 | 1126.8 |
| 5°    | 1362.0 | 1323.2 | 1232.5 | 1150.5 | 1072.8 | 990.8  | 930.3  | 876.4  | 859.1  | 828.9  | 824.6  |
| 7.5°  | 1310.2 | 1256.3 | 1122.4 | 992.9  | 867.7  | 764.1  | 671.3  | 600.1  | 535.3  | 507.3  | 524.5  |
| 10°   | 1260.6 | 1187.2 | 1012.4 | 839.7  | 673.5  | 528.8  | 418.8  | 332.4  | 282.8  | 261.2  | 265.5  |
| 12.5° | 1213.1 | 1120.3 | 898.0  | 692.9  | 490.0  | 325.9  | 237.4  | 192.1  | 177.0  | 174.8  | 170.5  |
| 15°   | 1172.1 | 1057.7 | 796.5  | 537.5  | 325.9  | 205.1  | 168.4  | 157.6  | 155.4  | 155.4  | 155.4  |
| 17.5° | 1126.8 | 992.9  | 686.4  | 395.0  | 213.7  | 159.7  | 148.9  | 146.8  | 144.6  | 144.6  | 144.6  |
| 20°   | 1092.2 | 936.8  | 585.0  | 276.3  | 164.0  | 142.5  | 138.1  | 138.1  | 136.0  | 136.0  | 136.0  |
| 22.5° | 1055.5 | 878.5  | 485.7  | 202.9  | 140.3  | 131.7  | 127.4  | 125.2  | 125.2  | 123.0  | 123.0  |
| 25°   | 1021.0 | 824.6  | 390.7  | 155.4  | 125.2  | 118.7  | 114.4  | 112.2  | 112.2  | 110.1  | 107.9  |
| 27.5° | 999.4  | 781.4  | 306.5  | 131.7  | 112.2  | 107.9  | 103.6  | 99.3   | 95.0   | 92.8   | 92.8   |
| 30°   | 984.3  | 729.6  | 233.1  | 114.4  | 103.6  | 97.1   | 90.7   | 84.2   | 77.7   | 75.5   | 75.5   |
| 32.5° | 962.7  | 688.6  | 179.2  | 103.6  | 92.8   | 86.3   | 77.7   | 71.2   | 64.8   | 60.4   | 60.4   |
| 35°   | 962.7  | 654.0  | 138.1  | 92.8   | 84.2   | 75.5   | 69.1   | 58.3   | 51.8   | 49.6   | 47.5   |
| 37.5° | 977.8  | 615.2  | 114.4  | 86.3   | 77.7   | 69.1   | 60.4   | 49.6   | 43.2   | 41.0   | 41.0   |
| 40°   | 1012.4 | 602.2  | 97.1   | 77.7   | 69.1   | 60.4   | 51.8   | 41.0   | 36.7   | 32.4   | 32.4   |
| 42.5° | 1083.6 | 606.6  | 86.3   | 73.4   | 62.6   | 54.0   | 43.2   | 34.5   | 30.2   | 28.1   | 28.1   |
| 45°   | 1187.2 | 619.5  | 79.9   | 66.9   | 56.1   | 45.3   | 36.7   | 30.2   | 23.7   | 21.6   | 21.6   |
| 47.5° | 1331.8 | 660.5  | 71.2   | 60.4   | 49.6   | 38.9   | 30.2   | 23.7   | 19.4   | 17.3   | 17.3   |
| 50°   | 1504.5 | 731.7  | 66.9   | 54.0   | 45.3   | 32.4   | 23.7   | 17.3   | 13.0   | 13.0   | 13.0   |
| 52.5° | 1707.4 | 803.0  | 60.4   | 49.6   | 38.9   | 28.1   | 19.4   | 13.0   | 10.8   | 8.6    | 8.6    |
| 55°   | 1877.9 | 865.6  | 54.0   | 45.3   | 32.4   | 21.6   | 15.1   | 10.8   | 8.6    | 6.5    | 6.5    |
| 57.5° | 2100.3 | 956.2  | 45.3   | 38.9   | 25.9   | 17.3   | 10.8   | 8.6    | 4.3    | 4.3    | 4.3    |
| 60°   | 2398.1 | 1064.2 | 38.9   | 32.4   | 19.4   | 13.0   | 8.6    | 4.3    | 4.3    | 2.2    | 2.2    |
| 62.5° | 2525.5 | 977.8  | 34.5   | 25.9   | 15.1   | 8.6    | 6.5    | 4.3    | 2.2    | 2.2    | 2.2    |
| 65°   | 2385.2 | 798.7  | 28.1   | 19.4   | 10.8   | 6.5    | 4.3    | 2.2    | 2.2    | 0.0    | 0.0    |
| 67.5° | 2057.1 | 589.3  | 23.7   | 13.0   | 8.6    | 4.3    | 2.2    | 0.0    | 0.0    | 0.0    | 0.0    |
| 70°   | 1677.2 | 436.0  | 17.3   | 8.6    | 4.3    | 4.3    | 2.2    | 0.0    | 0.0    | 0.0    | 0.0    |
| 72.5° | 1161.3 | 263.3  | 13.0   | 6.5    | 4.3    | 2.2    | 2.2    | 0.0    | 0.0    | 0.0    | 0.0    |
| 75°   | 451.1  | 103.6  | 10.8   | 6.5    | 4.3    | 2.2    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 77.5° | 127.4  | 36.7   | 8.6    | 4.3    | 4.3    | 2.2    | 2.2    | 2.2    | 0.0    | 0.0    | 0.0    |
| 80°   | 51.8   | 19.4   | 6.5    | 4.3    | 4.3    | 4.3    | 2.2    | 2.2    | 0.0    | 0.0    | 0.0    |
| 82.5° | 32.4   | 10.8   | 4.3    | 2.2    | 2.2    | 2.2    | 2.2    | 0.0    | 0.0    | 0.0    | 0.0    |
| 85°   | 21.6   | 6.5    | 4.3    | 2.2    | 2.2    | 0.0    | 0.0    | 0.0    | 0.0    | 2.2    | 2.2    |
| 87.5° | 4.3    | 4.3    | 2.2    | 2.2    | 2.2    | 2.2    | 0.0    | 0.0    | 0.0    | 0.0    | 2.2    |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

LM-79-2008: Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Report Prepared for

Cooper Lighting Solutions

McGRAW-EDISON

Report Number: SP1-1908-441-1-R4

Test Date: 08/20/2019

Luminaire Tested: SA1C-727-U-5WQ

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### Test Information

Test Method: LM-79-2008  
 Report Number: SP1-1908-441-1-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-727-U-5WQ**  
 Description: MCGRAW EDISON ROADWAY AND AREA LUMINAIRE

\*\*\*THIS IS A REVISION OF SP1-1908-441-1-R3. TO UPDATE THE CATALOG NUMBER.\*\*\*TESTED IN SITU. (1) 70 CRI, 2700K, 1050MA LIGHTSQUARE WITH 16 LEDS AND TYPE V WIDE OPTICS.

### Spectral Parameters

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 2741   | CRI (Ra): | 71.5 |      |       |
| CIE u':                   | 0.2605 | R1:       | 69.2 | R9:  | -16.1 |
| CIE v':                   | 0.5272 | R2:       | 79.4 | R10: | 51.4  |
| Duv:                      | 0.0005 | R3:       | 87.8 | R11: | 63.1  |
| CIE x:                    | 0.4573 | R4:       | 69.4 | R12: | 42.0  |
| CIE y:                    | 0.4113 | R5:       | 66.4 | R13: | 70.2  |
| CIE z:                    | 0.1313 | R6:       | 69.8 | R14: | 92.4  |
| Peak Wavelength (nm):     | 602    | R7:       | 79.8 |      |       |
| Dominant Wavelength (nm): | 583    | R8:       | 50.1 |      |       |
| Purity:                   | 61.2   |           |      |      |       |
| Rf:                       | 69.9   |           |      |      |       |
| Rg:                       | 98.3   |           |      |      |       |



### Test Conditions

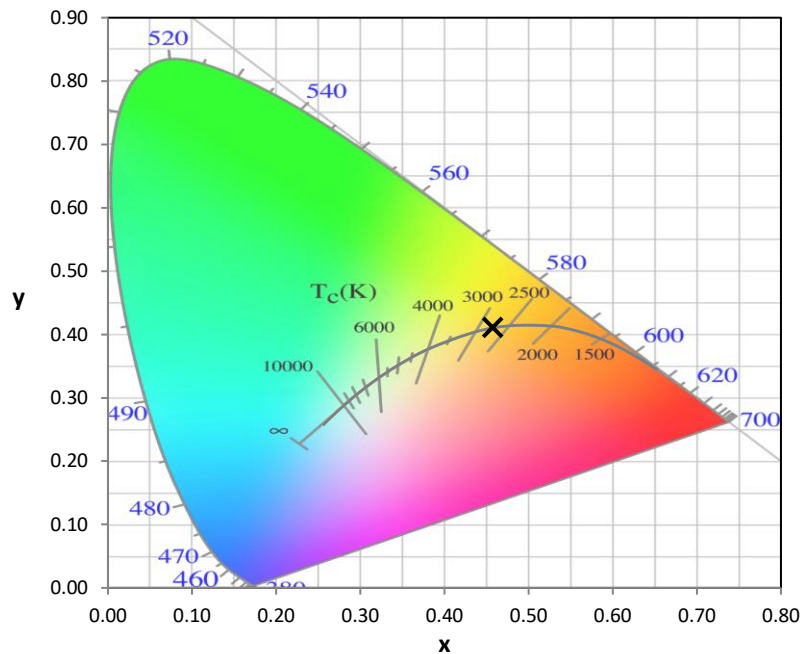
Stabilization Time: 56M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.3./42%  
 Sphere Temperature (°C): 25.7

REPORT NUMBER: SP1-1908-441-1-R4

| 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 2700K 4-step quadrangle

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**Photopic Flux vs. Wavelength**



**Photopic Lumens: 6211.7**

| 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       | 2044             | 0.0              | 490       | 7179             | 1.0              | 620       | 118034           | 30.7             | 750       | 8362             | 0.0              | 880       | 3128             | 0.0              |
| 365       | 2016             | 0.0              | 495       | 10476            | 1.9              | 625       | 111884           | 24.7             | 755       | 7635             | 0.0              | 885       | 3110             | 0.0              |
| 370       | 2020             | 0.0              | 500       | 15549            | 3.4              | 630       | 106119           | 19.2             | 760       | 6582             | 0.0              | 890       | 2632             | 0.0              |
| 375       | 2137             | 0.0              | 505       | 22477            | 6.3              | 635       | 99706            | 15.0             | 765       | 5777             | 0.0              | 895       | 2709             | 0.0              |
| 380       | 2046             | 0.0              | 510       | 30417            | 10.4             | 640       | 92142            | 11.0             | 770       | 5474             | 0.0              | 900       | 2016             | 0.0              |
| 385       | 1925             | 0.0              | 515       | 39274            | 16.3             | 645       | 84987            | 8.2              | 775       | 4977             | 0.0              | 905       | 1748             | 0.0              |
| 390       | 1893             | 0.0              | 520       | 47282            | 22.9             | 650       | 78016            | 5.7              | 780       | 4723             | 0.0              | 910       | 2046             | 0.0              |
| 395       | 1695             | 0.0              | 525       | 55413            | 29.7             | 655       | 71541            | 4.1              | 785       | 4219             | 0.0              | 915       | 1844             | 0.0              |
| 400       | 1633             | 0.0              | 530       | 62377            | 36.7             | 660       | 64863            | 2.7              | 790       | 3969             | 0.0              | 920       | 2734             | 0.0              |
| 405       | 2065             | 0.0              | 535       | 68520            | 42.5             | 665       | 58485            | 1.9              | 795       | 4122             | 0.0              | 925       | 2307             | 0.0              |
| 410       | 3449             | 0.0              | 540       | 73435            | 47.8             | 670       | 51641            | 1.1              | 800       | 2864             | 0.0              | 930       | 2039             | 0.0              |
| 415       | 7117             | 0.0              | 545       | 78677            | 52.4             | 675       | 46030            | 0.8              | 805       | 3151             | 0.0              | 935       | 1784             | 0.0              |
| 420       | 13992            | 0.0              | 550       | 83331            | 56.6             | 680       | 40590            | 0.5              | 810       | 3022             | 0.0              | 940       | 2464             | 0.0              |
| 425       | 25176            | 0.1              | 555       | 89120            | 60.9             | 685       | 35691            | 0.3              | 815       | 3471             | 0.0              | 945       | 2794             | 0.0              |
| 430       | 38151            | 0.3              | 560       | 94613            | 64.3             | 690       | 31631            | 0.2              | 820       | 2749             | 0.0              | 950       | 3090             | 0.0              |
| 435       | 49673            | 0.6              | 565       | 99818            | 66.4             | 695       | 27437            | 0.1              | 825       | 2729             | 0.0              | 955       | 1866             | 0.0              |
| 440       | 57273            | 0.9              | 570       | 106526           | 69.3             | 700       | 24589            | 0.1              | 830       | 2282             | 0.0              | 960       | 3110             | 0.0              |
| 445       | 54802            | 1.1              | 575       | 111610           | 69.4             | 705       | 21832            | 0.0              | 835       | 3140             | 0.0              | 965       | 3880             | 0.0              |
| 450       | 39184            | 1.0              | 580       | 117163           | 69.6             | 710       | 19500            | 0.0              | 840       | 2365             | 0.0              | 970       | 3243             | 0.0              |
| 455       | 22506            | 0.8              | 585       | 122201           | 67.9             | 715       | 17870            | 0.0              | 845       | 3024             | 0.0              | 975       | 2014             | 0.0              |
| 460       | 13692            | 0.6              | 590       | 125662           | 65.0             | 720       | 15924            | 0.0              | 850       | 2510             | 0.0              | 980       | 1688             | 0.0              |
| 465       | 9446             | 0.5              | 595       | 127415           | 60.4             | 725       | 14268            | 0.0              | 855       | 2739             | 0.0              | 985       | 2827             | 0.0              |
| 470       | 6698             | 0.4              | 600       | 129155           | 55.7             | 730       | 12438            | 0.0              | 860       | 3515             | 0.0              | 990       | 4172             | 0.0              |
| 475       | 5328             | 0.4              | 605       | 128057           | 49.6             | 735       | 11255            | 0.0              | 865       | 3600             | 0.0              | 995       | 3177             | 0.0              |
| 480       | 5081             | 0.5              | 610       | 126031           | 43.3             | 740       | 9951             | 0.0              | 870       | 3609             | 0.0              | 1000      | 3241             | 0.0              |
| 485       | 5579             | 0.7              | 615       | 123059           | 37.1             | 745       | 8870             | 0.0              | 875       | 3208             | 0.0              |           |                  |                  |

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Scotopic Flux vs. Wavelength



Scotopic Lumens: 6474.3

S/P: 1.04

| 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       | 2044             | 0.0              | 490       | 7179             | 6.0              | 620       | 118034           | 0.1              | 750       | 8362             | 0.0              | 880       | 3128             | 0.0              |
| 365       | 2016             | 0.0              | 495       | 10476            | 8.6              | 625       | 111884           | 0.1              | 755       | 7635             | 0.0              | 885       | 3110             | 0.0              |
| 370       | 2020             | 0.0              | 500       | 15549            | 12.5             | 630       | 106119           | 0.0              | 760       | 6582             | 0.0              | 890       | 2632             | 0.0              |
| 375       | 2137             | 0.0              | 505       | 22477            | 17.3             | 635       | 99706            | 0.0              | 765       | 5777             | 0.0              | 895       | 2709             | 0.0              |
| 380       | 2046             | 0.0              | 510       | 30417            | 21.8             | 640       | 92142            | 0.0              | 770       | 5474             | 0.0              | 900       | 2016             | 0.0              |
| 385       | 1925             | 0.0              | 515       | 39274            | 25.7             | 645       | 84987            | 0.0              | 775       | 4977             | 0.0              | 905       | 1748             | 0.0              |
| 390       | 1893             | 0.0              | 520       | 47282            | 27.5             | 650       | 78016            | 0.0              | 780       | 4723             | 0.0              | 910       | 2046             | 0.0              |
| 395       | 1695             | 0.0              | 525       | 55413            | 28.1             | 655       | 71541            | 0.0              | 785       | 4219             | 0.0              | 915       | 1844             | 0.0              |
| 400       | 1633             | 0.0              | 530       | 62377            | 27.0             | 660       | 64863            | 0.0              | 790       | 3969             | 0.0              | 920       | 2734             | 0.0              |
| 405       | 2065             | 0.0              | 535       | 68520            | 24.7             | 665       | 58485            | 0.0              | 795       | 4122             | 0.0              | 925       | 2307             | 0.0              |
| 410       | 3449             | 0.1              | 540       | 73435            | 21.5             | 670       | 51641            | 0.0              | 800       | 2864             | 0.0              | 930       | 2039             | 0.0              |
| 415       | 7117             | 0.5              | 545       | 78677            | 18.3             | 675       | 46030            | 0.0              | 805       | 3151             | 0.0              | 935       | 1784             | 0.0              |
| 420       | 13992            | 1.6              | 550       | 83331            | 15.0             | 680       | 40590            | 0.0              | 810       | 3022             | 0.0              | 940       | 2464             | 0.0              |
| 425       | 25176            | 3.9              | 555       | 89120            | 12.0             | 685       | 35691            | 0.0              | 815       | 3471             | 0.0              | 945       | 2794             | 0.0              |
| 430       | 38151            | 8.1              | 560       | 94613            | 9.3              | 690       | 31631            | 0.0              | 820       | 2749             | 0.0              | 950       | 3090             | 0.0              |
| 435       | 49673            | 13.3             | 565       | 99818            | 7.0              | 695       | 27437            | 0.0              | 825       | 2729             | 0.0              | 955       | 1866             | 0.0              |
| 440       | 57273            | 19.1             | 570       | 106526           | 5.2              | 700       | 24589            | 0.0              | 830       | 2282             | 0.0              | 960       | 3110             | 0.0              |
| 445       | 54802            | 21.6             | 575       | 111610           | 3.7              | 705       | 21832            | 0.0              | 835       | 3140             | 0.0              | 965       | 3880             | 0.0              |
| 450       | 39184            | 18.1             | 580       | 117163           | 2.6              | 710       | 19500            | 0.0              | 840       | 2365             | 0.0              | 970       | 3243             | 0.0              |
| 455       | 22506            | 11.8             | 585       | 122201           | 1.8              | 715       | 17870            | 0.0              | 845       | 3024             | 0.0              | 975       | 2014             | 0.0              |
| 460       | 13692            | 8.1              | 590       | 125662           | 1.2              | 720       | 15924            | 0.0              | 850       | 2510             | 0.0              | 980       | 1688             | 0.0              |
| 465       | 9446             | 6.2              | 595       | 127415           | 0.8              | 725       | 14268            | 0.0              | 855       | 2739             | 0.0              | 985       | 2827             | 0.0              |
| 470       | 6698             | 4.8              | 600       | 129155           | 0.5              | 730       | 12438            | 0.0              | 860       | 3515             | 0.0              | 990       | 4172             | 0.0              |
| 475       | 5328             | 4.1              | 605       | 128057           | 0.4              | 735       | 11255            | 0.0              | 865       | 3600             | 0.0              | 995       | 3177             | 0.0              |
| 480       | 5081             | 4.1              | 610       | 126031           | 0.2              | 740       | 9951             | 0.0              | 870       | 3609             | 0.0              | 1000      | 3241             | 0.0              |
| 485       | 5579             | 4.6              | 615       | 123059           | 0.1              | 745       | 8870             | 0.0              | 875       | 3208             | 0.0              |           |                  |                  |

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**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 2145.7 M/P: 0.35**

| 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       | 2044             | 0.0              | 490       | 7179             | 11.1             | 620       | 118034           | 1.5              | 750       | 8362             | 0.0              | 880       | 3128             | 0.0              |
| 365       | 2016             | 0.0              | 495       | 10476            | 16.9             | 625       | 111884           | 0.9              | 755       | 7635             | 0.0              | 885       | 3110             | 0.0              |
| 370       | 2020             | 0.0              | 500       | 15549            | 26.0             | 630       | 106119           | 0.6              | 760       | 6582             | 0.0              | 890       | 2632             | 0.0              |
| 375       | 2137             | 0.0              | 505       | 22477            | 38.2             | 635       | 99706            | 0.4              | 765       | 5777             | 0.0              | 895       | 2709             | 0.0              |
| 380       | 2046             | 0.0              | 510       | 30417            | 51.6             | 640       | 92142            | 0.2              | 770       | 5474             | 0.0              | 900       | 2016             | 0.0              |
| 385       | 1925             | 0.0              | 515       | 39274            | 65.1             | 645       | 84987            | 0.1              | 775       | 4977             | 0.0              | 905       | 1748             | 0.0              |
| 390       | 1893             | 0.0              | 520       | 47282            | 75.2             | 650       | 78016            | 0.1              | 780       | 4723             | 0.0              | 910       | 2046             | 0.0              |
| 395       | 1695             | 0.0              | 525       | 55413            | 82.9             | 655       | 71541            | 0.1              | 785       | 4219             | 0.0              | 915       | 1844             | 0.0              |
| 400       | 1633             | 0.0              | 530       | 62377            | 86.0             | 660       | 64863            | 0.0              | 790       | 3969             | 0.0              | 920       | 2734             | 0.0              |
| 405       | 2065             | 0.1              | 535       | 68520            | 85.4             | 665       | 58485            | 0.0              | 795       | 4122             | 0.0              | 925       | 2307             | 0.0              |
| 410       | 3449             | 0.2              | 540       | 73435            | 81.1             | 670       | 51641            | 0.0              | 800       | 2864             | 0.0              | 930       | 2039             | 0.0              |
| 415       | 7117             | 0.7              | 545       | 78677            | 75.4             | 675       | 46030            | 0.0              | 805       | 3151             | 0.0              | 935       | 1784             | 0.0              |
| 420       | 13992            | 2.3              | 550       | 83331            | 68.1             | 680       | 40590            | 0.0              | 810       | 3022             | 0.0              | 940       | 2464             | 0.0              |
| 425       | 25176            | 6.2              | 555       | 89120            | 60.9             | 685       | 35691            | 0.0              | 815       | 3471             | 0.0              | 945       | 2794             | 0.0              |
| 430       | 38151            | 13.0             | 560       | 94613            | 52.9             | 690       | 31631            | 0.0              | 820       | 2749             | 0.0              | 950       | 3090             | 0.0              |
| 435       | 49673            | 22.2             | 565       | 99818            | 44.8             | 695       | 27437            | 0.0              | 825       | 2729             | 0.0              | 955       | 1866             | 0.0              |
| 440       | 57273            | 32.0             | 570       | 106526           | 37.6             | 700       | 24589            | 0.0              | 830       | 2282             | 0.0              | 960       | 3110             | 0.0              |
| 445       | 54802            | 36.7             | 575       | 111610           | 30.4             | 705       | 21832            | 0.0              | 835       | 3140             | 0.0              | 965       | 3880             | 0.0              |
| 450       | 39184            | 30.4             | 580       | 117163           | 24.1             | 710       | 19500            | 0.0              | 840       | 2365             | 0.0              | 970       | 3243             | 0.0              |
| 455       | 22506            | 19.7             | 585       | 122201           | 18.7             | 715       | 17870            | 0.0              | 845       | 3024             | 0.0              | 975       | 2014             | 0.0              |
| 460       | 13692            | 13.2             | 590       | 125662           | 14.0             | 720       | 15924            | 0.0              | 850       | 2510             | 0.0              | 980       | 1688             | 0.0              |
| 465       | 9446             | 10.0             | 595       | 127415           | 10.2             | 725       | 14268            | 0.0              | 855       | 2739             | 0.0              | 985       | 2827             | 0.0              |
| 470       | 6698             | 7.7              | 600       | 129155           | 7.3              | 730       | 12438            | 0.0              | 860       | 3515             | 0.0              | 990       | 4172             | 0.0              |
| 475       | 5328             | 6.7              | 605       | 128057           | 5.0              | 735       | 11255            | 0.0              | 865       | 3600             | 0.0              | 995       | 3177             | 0.0              |
| 480       | 5081             | 6.9              | 610       | 126031           | 3.4              | 740       | 9951             | 0.0              | 870       | 3609             | 0.0              | 1000      | 3241             | 0.0              |
| 485       | 5579             | 8.1              | 615       | 123059           | 2.3              | 745       | 8870             | 0.0              | 875       | 3208             | 0.0              |           |                  |                  |

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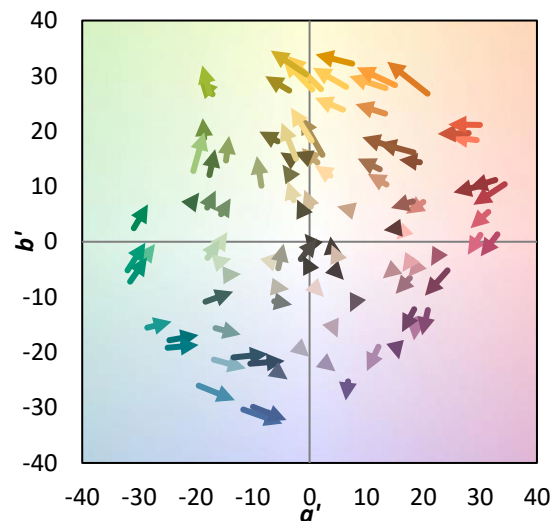
**TM-30-18**

### Summary

$R_f = 69.9$   
 $R_g = 98.3$   
 $CIE R_a = 71.5$   
 $R_g = -16.1$



### Color Vector Graphics



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 54 | CES51 = 77 | CES76 = 48 |
| CES02 = 63 | CES27 = 74 | CES52 = 80 | CES77 = 75 |
| CES03 = 31 | CES28 = 80 | CES53 = 66 | CES78 = 56 |
| CES04 = 71 | CES29 = 44 | CES54 = 77 | CES79 = 81 |
| CES05 = 50 | CES30 = 46 | CES55 = 74 | CES80 = 80 |
| CES06 = 52 | CES31 = 50 | CES56 = 63 | CES81 = 73 |
| CES07 = 42 | CES32 = 49 | CES57 = 60 | CES82 = 91 |
| CES08 = 41 | CES33 = 53 | CES58 = 63 | CES83 = 84 |
| CES09 = 29 | CES34 = 66 | CES59 = 85 | CES84 = 90 |
| CES10 = 77 | CES35 = 82 | CES60 = 89 | CES85 = 87 |
| CES11 = 60 | CES36 = 78 | CES61 = 85 | CES86 = 65 |
| CES12 = 66 | CES37 = 75 | CES62 = 69 | CES87 = 78 |
| CES13 = 43 | CES38 = 53 | CES63 = 68 | CES88 = 73 |
| CES14 = 74 | CES39 = 91 | CES64 = 68 | CES89 = 68 |
| CES15 = 71 | CES40 = 85 | CES65 = 65 | CES90 = 68 |
| CES16 = 48 | CES41 = 76 | CES66 = 62 | CES91 = 91 |
| CES17 = 50 | CES42 = 76 | CES67 = 60 | CES92 = 71 |
| CES18 = 57 | CES43 = 65 | CES68 = 68 | CES93 = 82 |
| CES19 = 73 | CES44 = 98 | CES69 = 77 | CES94 = 57 |
| CES20 = 67 | CES45 = 75 | CES70 = 60 | CES95 = 78 |
| CES21 = 88 | CES46 = 70 | CES71 = 57 | CES96 = 80 |
| CES22 = 80 | CES47 = 63 | CES72 = 86 | CES97 = 79 |
| CES23 = 92 | CES48 = 51 | CES73 = 52 | CES98 = 71 |
| CES24 = 91 | CES49 = 68 | CES74 = 90 | CES99 = 64 |
| CES25 = 73 | CES50 = 77 | CES75 = 58 |            |



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**TM-30-18**

Color Rendition by Hue-Angle Bin



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**TM-30-18**

**Measure Comparisons**



(END OF REPORT)