

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: P972209

Luminaire Tested: **GKO-PB2C-727-U-T4W**

Issue Date: 02/27/2025

**Test Information**

Test Method: LM-79-08  
Report Number: P972209  
Test Lab: INNOVATION CENTER(G1)  
Issue Date: 02/27/2025  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: MCGRAW-EDISON  
Catalog Number: GKO-PB2C-727-U-T4W  
Description: GEKKO WALL PACK 8000LM PACKAGE 70CRI 2700K FIXTURE w/ TYPE IV WIDE DISTRIBUTION OPTIC  
Light Source: (20) 2700K CCT, 70 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 7390.2 lumens  
Efficiency: N/A  
Efficacy: 127.0 lumens/watt  
Luminous Opening: Rectangular (W 0.67' x L: 0.33' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B1 - U0 - G2

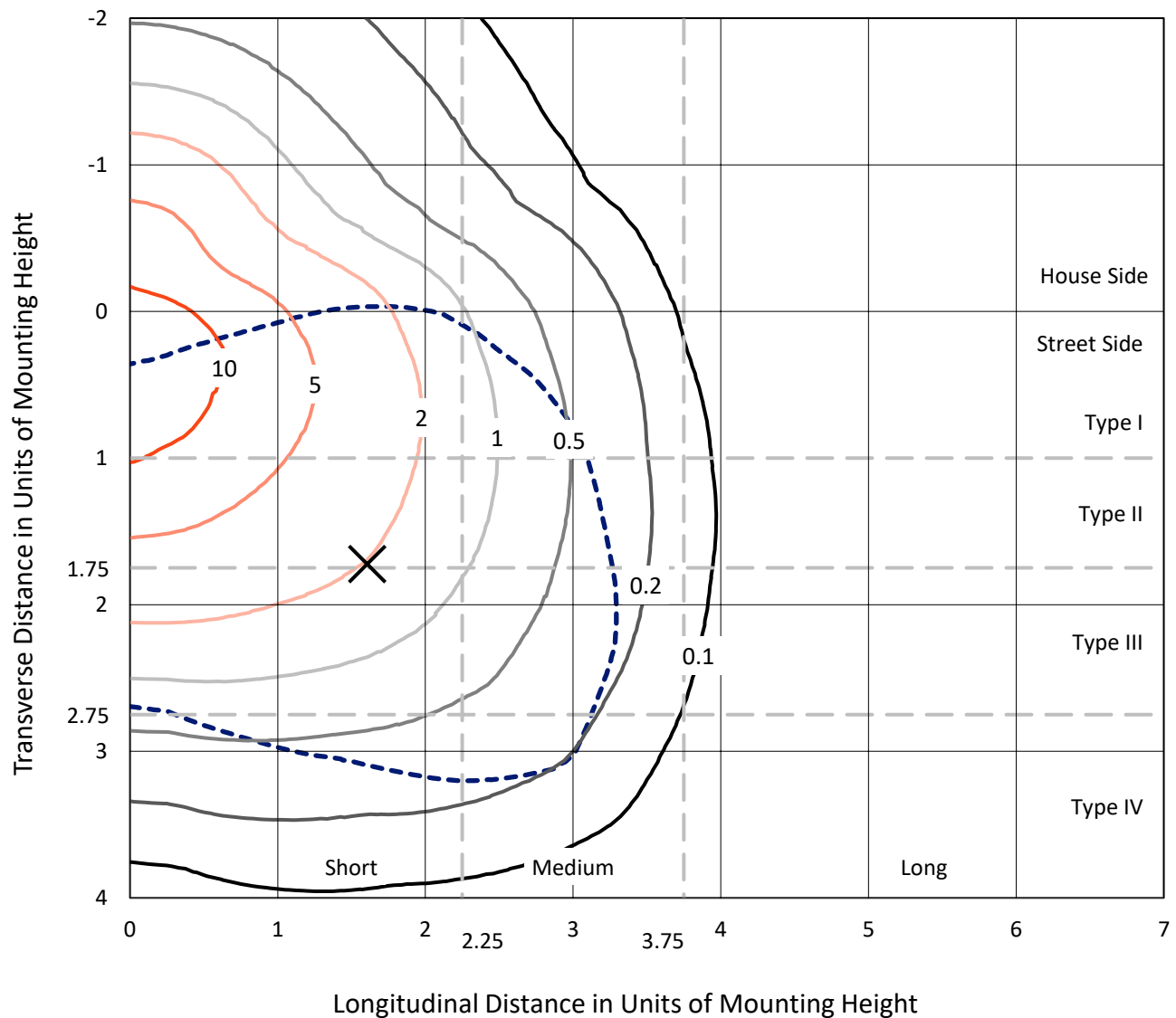
Input Watts (W): 58.2  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.97  
Total Harmonic Distortion (THDi): 5%  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT

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CATALOG NUMBER: GKO-PB2C-727-U-T4W

## Iso-Footcandle Lines of Horizontal Illumination

× Max cd  
 - - - 1/2 Max cd

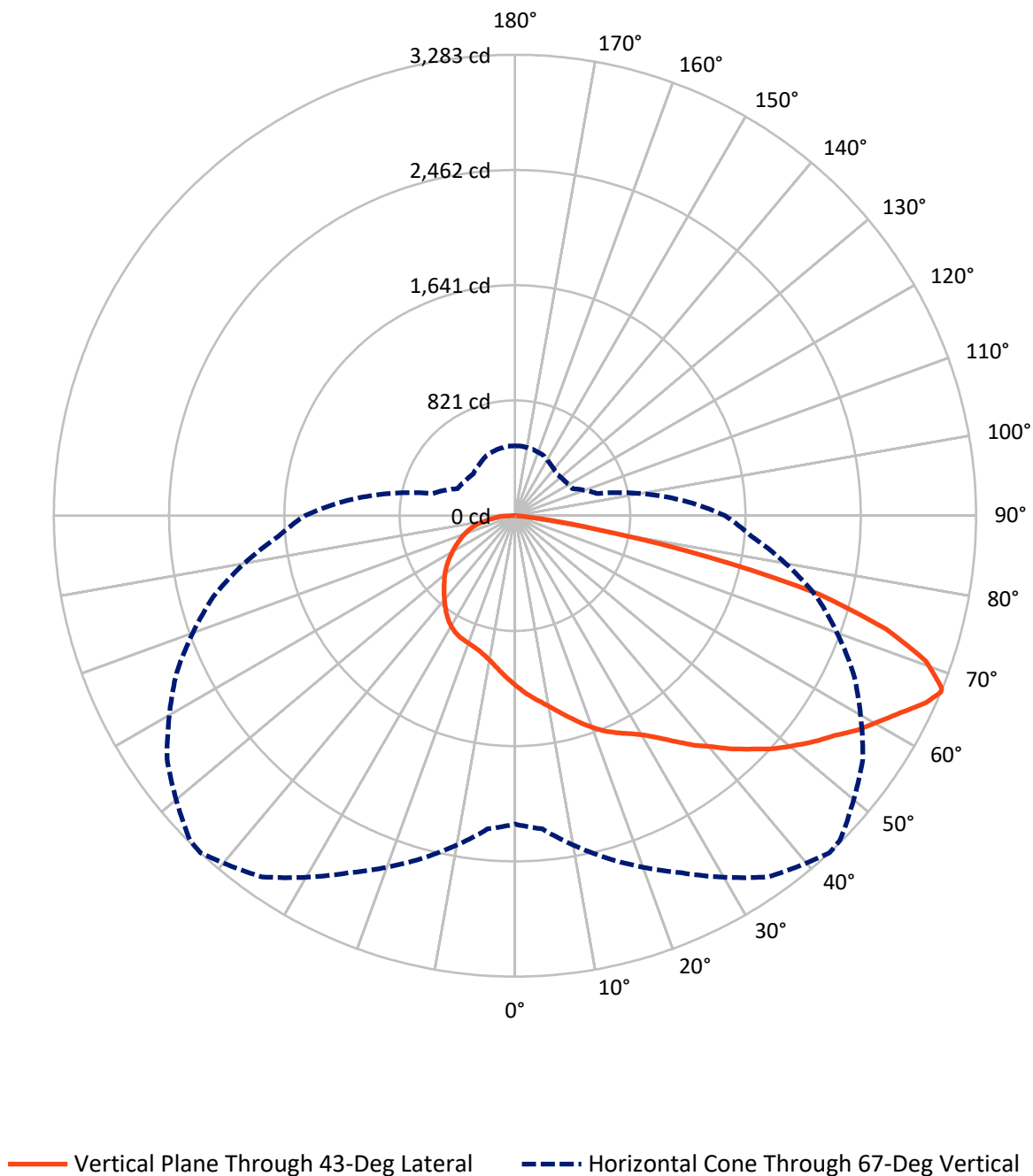


Based on 10 foot mounting height. Maximum calculated value = 14.1 fc  
 Type IV - Short - N/A

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CATALOG NUMBER: GKO-PB2C-727-U-T4W

## Luminous Intensity Polar Plot



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CATALOG NUMBER: GKO-PB2C-727-U-T4W

**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 1987.7   | 0.0    | 1987.7 |
|                    | % Fixture | 26.9     | 0.0    | 26.9   |
| <b>Street Side</b> | Lumens    | 5402.5   | 0.0    | 5402.5 |
|                    | % Fixture | 73.1     | 0.0    | 73.1   |
| <b>Total</b>       | Lumens    | 7390.2   | 0.0    | 7390.2 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 115.9  | 1.6       |
| 10°-20°   | 356.4  | 4.8       |
| 20°-30°   | 617.0  | 8.3       |
| 30°-40°   | 915.6  | 12.4      |
| 40°-50°   | 1243.8 | 16.8      |
| 50°-60°   | 1526.9 | 20.7      |
| 60°-70°   | 1609.3 | 21.8      |
| 70°-80°   | 888.3  | 12.0      |
| 80°-90°   | 117.0  | 1.6       |
| 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°    | 7390.2 | 100.0     |
| 0°-180°   | 7390.2 | 100.0     |



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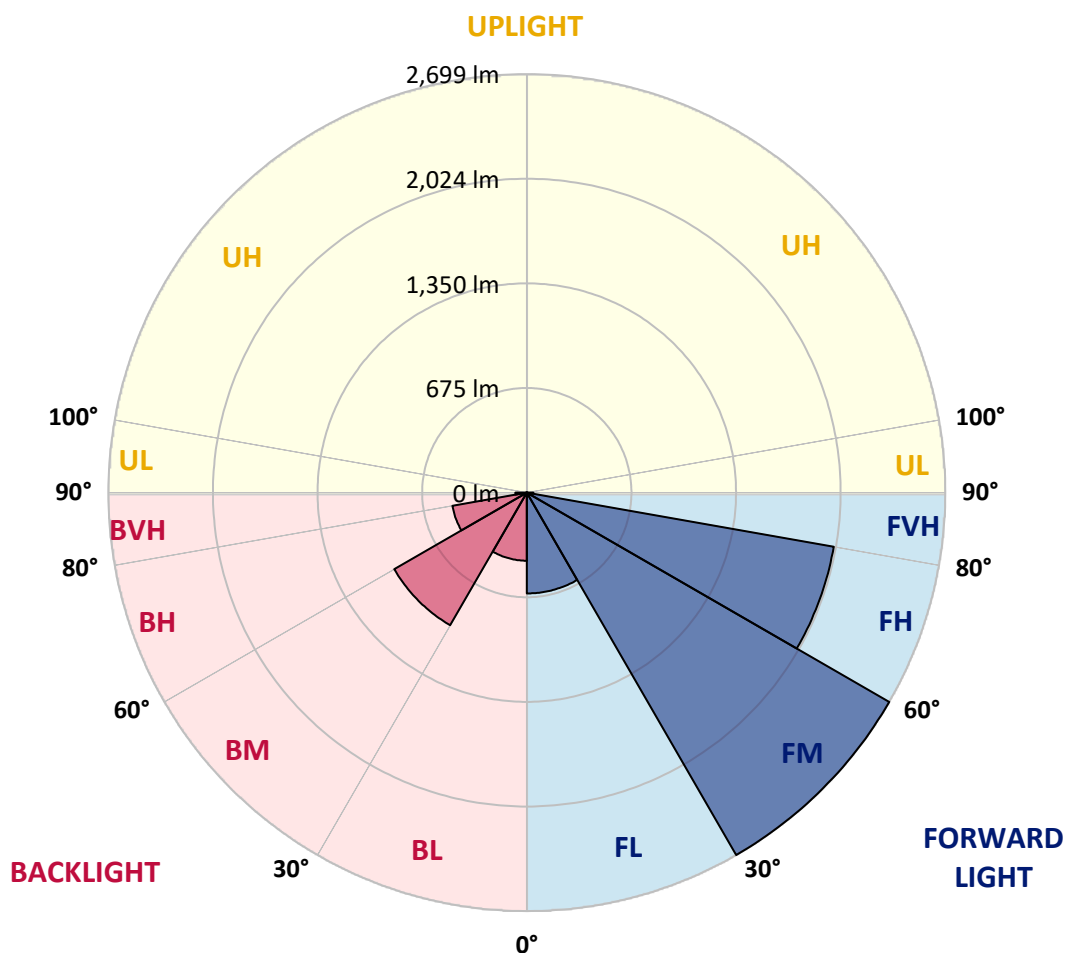
CATALOG NUMBER: GKO-PB2C-727-U-T4W

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 650.1  | 8.8       |                         |      |         |
| FM   | (30°-60°)   | 2699.1 | 36.5      |                         |      |         |
| FH   | (60°-80°)   | 2010.5 | 27.2      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 42.8   | 0.6       |                         |      | G1/100  |
| BL   | (0°-30°)    | 439.1  | 5.9       | B1/500                  |      |         |
| BM   | (30°-60°)   | 987.2  | 13.4      | B1/1000                 |      |         |
| BH   | (60°-80°)   | 487.1  | 6.6       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 74.3   | 1.0       |                         |      | 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°    | 43°    | 45°    | 55°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1213.0 | 1213.0 | 1213.0 | 1213.0 | 1213.0 | 1213.0 | 1213.0 | 1213.0 | 1213.0 | 1213.0 | 1213.0 |
| 2.5°  | 1269.2 | 1272.2 | 1269.2 | 1266.2 | 1260.3 | 1257.4 | 1254.4 | 1247.0 | 1238.1 | 1224.8 | 1214.5 |
| 5°    | 1325.4 | 1325.4 | 1321.0 | 1318.0 | 1309.1 | 1300.3 | 1295.8 | 1278.1 | 1258.8 | 1236.7 | 1215.9 |
| 7.5°  | 1377.2 | 1383.1 | 1375.7 | 1368.3 | 1355.0 | 1340.2 | 1337.2 | 1310.6 | 1284.0 | 1254.4 | 1223.3 |
| 10°   | 1442.3 | 1446.7 | 1436.4 | 1430.4 | 1405.3 | 1386.1 | 1380.1 | 1347.6 | 1312.1 | 1275.1 | 1235.2 |
| 12.5° | 1508.8 | 1511.8 | 1504.4 | 1491.1 | 1464.5 | 1440.8 | 1431.9 | 1389.0 | 1343.2 | 1298.8 | 1248.5 |
| 15°   | 1566.5 | 1569.5 | 1566.5 | 1551.7 | 1526.6 | 1497.0 | 1485.2 | 1437.8 | 1381.6 | 1323.9 | 1264.8 |
| 17.5° | 1609.4 | 1615.3 | 1615.3 | 1608.0 | 1585.8 | 1557.7 | 1550.3 | 1491.1 | 1426.0 | 1353.5 | 1284.0 |
| 20°   | 1646.4 | 1649.4 | 1655.3 | 1650.8 | 1639.0 | 1615.3 | 1605.0 | 1548.8 | 1470.4 | 1387.5 | 1303.2 |
| 22.5° | 1676.0 | 1679.0 | 1689.3 | 1687.8 | 1680.4 | 1668.6 | 1658.2 | 1606.5 | 1522.2 | 1421.6 | 1321.0 |
| 25°   | 1727.8 | 1726.3 | 1732.2 | 1727.8 | 1718.9 | 1714.5 | 1708.5 | 1662.7 | 1573.9 | 1461.5 | 1344.6 |
| 27.5° | 1818.0 | 1815.0 | 1809.1 | 1786.9 | 1764.8 | 1758.8 | 1754.4 | 1721.9 | 1634.6 | 1507.4 | 1371.3 |
| 30°   | 1951.1 | 1954.1 | 1926.0 | 1875.7 | 1831.3 | 1813.6 | 1807.7 | 1785.5 | 1702.6 | 1560.6 | 1400.9 |
| 32.5° | 2109.4 | 2107.9 | 2062.1 | 1991.1 | 1921.6 | 1886.1 | 1874.2 | 1850.5 | 1770.7 | 1613.9 | 1434.9 |
| 35°   | 2223.3 | 2220.4 | 2196.7 | 2133.1 | 2060.6 | 1976.3 | 1954.1 | 1917.1 | 1843.2 | 1674.5 | 1468.9 |
| 37.5° | 2377.2 | 2372.7 | 2326.9 | 2260.3 | 2195.2 | 2073.9 | 2048.8 | 1998.5 | 1912.7 | 1733.7 | 1507.4 |
| 40°   | 2553.2 | 2525.1 | 2449.6 | 2381.6 | 2292.8 | 2164.2 | 2143.4 | 2078.4 | 1992.6 | 1806.2 | 1551.7 |
| 42.5° | 2713.0 | 2671.5 | 2573.9 | 2488.1 | 2377.2 | 2270.7 | 2244.0 | 2167.1 | 2069.5 | 1872.7 | 1597.6 |
| 45°   | 2952.6 | 2852.0 | 2711.5 | 2661.2 | 2468.9 | 2371.2 | 2349.1 | 2254.4 | 2153.8 | 1945.2 | 1643.5 |
| 47.5° | 2923.0 | 2852.0 | 2806.1 | 2800.2 | 2565.0 | 2480.7 | 2448.2 | 2350.5 | 2244.0 | 2022.1 | 1690.8 |
| 50°   | 2980.7 | 2924.5 | 2927.4 | 2855.0 | 2652.3 | 2573.9 | 2550.2 | 2451.1 | 2335.7 | 2097.6 | 1741.1 |
| 52.5° | 2968.9 | 2985.1 | 2976.3 | 2863.8 | 2736.6 | 2671.5 | 2653.8 | 2554.7 | 2423.0 | 2170.1 | 1785.5 |
| 55°   | 3063.5 | 3054.7 | 3035.4 | 2924.5 | 2829.8 | 2763.2 | 2748.5 | 2662.7 | 2511.8 | 2232.2 | 1823.9 |
| 57.5° | 3133.1 | 3087.2 | 3085.7 | 2992.5 | 2933.4 | 2878.6 | 2855.0 | 2773.6 | 2594.6 | 2286.9 | 1853.5 |
| 60°   | 3090.2 | 3035.4 | 3075.4 | 3002.9 | 2997.0 | 2976.3 | 2962.9 | 2871.2 | 2668.6 | 2328.3 | 1865.3 |
| 62.5° | 2860.9 | 2874.2 | 2992.5 | 2988.1 | 3066.5 | 3085.7 | 3070.9 | 2939.3 | 2717.4 | 2343.1 | 1856.5 |
| 65°   | 2557.6 | 2597.6 | 2779.5 | 2934.8 | 3147.9 | 3214.4 | 3199.6 | 2988.1 | 2713.0 | 2309.1 | 1797.3 |
| 67°   | 2196.7 | 2239.6 | 2523.6 | 2806.1 | 3140.5 | 3282.5 | 3272.1 | 3023.6 | 2659.7 | 2221.8 | 1690.8 |
| 67.5° | 2116.8 | 2165.6 | 2449.6 | 2747.0 | 3113.8 | 3276.6 | 3269.2 | 3026.6 | 2642.0 | 2180.4 | 1649.4 |
| 70°   | 1557.7 | 1615.3 | 2016.2 | 2414.1 | 2900.8 | 3105.0 | 3103.5 | 2915.6 | 2458.5 | 1955.6 | 1430.4 |
| 72.5° | 970.4  | 1022.2 | 1437.8 | 1883.1 | 2513.3 | 2764.7 | 2754.4 | 2539.9 | 2116.8 | 1596.1 | 1128.7 |
| 75°   | 594.7  | 627.2  | 905.3  | 1227.8 | 1822.4 | 2238.1 | 2252.9 | 1985.2 | 1443.8 | 948.2  | 637.6  |
| 77.5° | 363.9  | 399.4  | 571.0  | 757.4  | 1113.9 | 1392.0 | 1394.9 | 1100.6 | 741.1  | 516.3  | 349.1  |
| 80°   | 202.7  | 211.5  | 297.3  | 396.4  | 571.0  | 574.0  | 550.3  | 485.2  | 384.6  | 248.5  | 179.0  |
| 82.5° | 79.9   | 85.8   | 128.7  | 159.8  | 162.7  | 170.1  | 158.3  | 143.5  | 121.3  | 79.9   | 56.2   |
| 85°   | 0.0    | 0.0    | 0.0    | 3.0    | 10.4   | 20.7   | 20.7   | 14.8   | 5.9    | 4.4    | 4.4    |
| 87.5° | 0.0    | 0.0    | 0.0    | 1.5    | 1.5    | 1.5    | 1.5    | 1.5    | 1.5    | 1.5    | 1.5    |
| 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: GKO-PB2C-727-U-T4W

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1213.0 | 1213.0 | 1213.0 | 1213.0 | 1213.0 | 1213.0 | 1213.0 | 1213.0 | 1213.0 | 1213.0 | 1213.0 |
| 2.5°  | 1211.5 | 1210.0 | 1199.7 | 1187.8 | 1179.0 | 1171.6 | 1164.2 | 1155.3 | 1155.3 | 1158.3 | 1156.8 |
| 5°    | 1208.6 | 1201.2 | 1181.9 | 1161.2 | 1144.9 | 1130.2 | 1116.8 | 1105.0 | 1103.5 | 1105.0 | 1106.5 |
| 7.5°  | 1210.0 | 1196.7 | 1167.1 | 1136.1 | 1109.4 | 1090.2 | 1071.0 | 1062.1 | 1060.6 | 1060.6 | 1060.6 |
| 10°   | 1215.9 | 1196.7 | 1156.8 | 1113.9 | 1081.3 | 1053.2 | 1032.5 | 1023.6 | 1025.1 | 1026.6 | 1028.1 |
| 12.5° | 1226.3 | 1199.7 | 1149.4 | 1094.6 | 1053.2 | 1025.1 | 1004.4 | 997.0  | 1002.9 | 1010.3 | 1011.8 |
| 15°   | 1236.7 | 1205.6 | 1142.0 | 1078.4 | 1031.0 | 1000.0 | 985.2  | 983.7  | 994.1  | 1007.4 | 1010.3 |
| 17.5° | 1248.5 | 1210.0 | 1133.1 | 1057.7 | 1007.4 | 982.2  | 974.8  | 979.3  | 995.5  | 1016.2 | 1020.7 |
| 20°   | 1260.3 | 1215.9 | 1122.8 | 1038.4 | 985.2  | 967.4  | 971.9  | 985.2  | 1005.9 | 1031.0 | 1035.5 |
| 22.5° | 1272.2 | 1220.4 | 1109.4 | 1014.8 | 961.5  | 955.6  | 971.9  | 994.1  | 1014.8 | 1042.9 | 1048.8 |
| 25°   | 1285.5 | 1226.3 | 1093.2 | 985.2  | 937.8  | 942.3  | 970.4  | 997.0  | 1019.2 | 1048.8 | 1056.2 |
| 27.5° | 1306.2 | 1235.2 | 1076.9 | 958.6  | 911.2  | 926.0  | 963.0  | 995.5  | 1019.2 | 1047.3 | 1056.2 |
| 30°   | 1326.9 | 1244.1 | 1063.6 | 930.5  | 884.6  | 903.8  | 948.2  | 988.1  | 1011.8 | 1037.0 | 1048.8 |
| 32.5° | 1350.6 | 1255.9 | 1051.8 | 902.3  | 855.0  | 878.7  | 927.5  | 971.9  | 1000.0 | 1022.2 | 1034.0 |
| 35°   | 1375.7 | 1273.6 | 1042.9 | 877.2  | 825.4  | 846.1  | 896.4  | 951.2  | 979.3  | 1000.0 | 1010.3 |
| 37.5° | 1408.3 | 1292.9 | 1037.0 | 852.1  | 794.4  | 812.1  | 863.9  | 921.6  | 954.1  | 970.4  | 983.7  |
| 40°   | 1443.8 | 1321.0 | 1037.0 | 831.3  | 764.8  | 776.6  | 829.9  | 892.0  | 924.5  | 937.8  | 951.2  |
| 42.5° | 1479.3 | 1349.1 | 1035.5 | 810.6  | 733.7  | 742.6  | 795.8  | 859.4  | 890.5  | 900.9  | 911.2  |
| 45°   | 1520.7 | 1381.6 | 1034.0 | 787.0  | 699.7  | 708.6  | 763.3  | 826.9  | 856.5  | 865.4  | 874.2  |
| 47.5° | 1565.1 | 1414.2 | 1028.1 | 757.4  | 668.6  | 676.0  | 730.8  | 789.9  | 819.5  | 829.9  | 838.7  |
| 50°   | 1605.0 | 1445.2 | 1013.3 | 723.4  | 640.5  | 647.9  | 696.7  | 745.5  | 772.2  | 784.0  | 792.9  |
| 52.5° | 1640.5 | 1467.4 | 989.6  | 684.9  | 609.5  | 618.3  | 655.3  | 698.2  | 718.9  | 727.8  | 733.7  |
| 55°   | 1668.6 | 1479.3 | 951.2  | 647.9  | 579.9  | 584.3  | 613.9  | 652.4  | 668.6  | 670.1  | 674.5  |
| 57.5° | 1687.8 | 1477.8 | 899.4  | 605.0  | 550.3  | 551.8  | 572.5  | 606.5  | 618.3  | 616.8  | 619.8  |
| 60°   | 1692.3 | 1458.5 | 837.3  | 565.1  | 520.7  | 516.3  | 537.0  | 560.6  | 568.0  | 574.0  | 581.3  |
| 62.5° | 1674.5 | 1412.7 | 766.3  | 525.1  | 491.1  | 483.7  | 498.5  | 519.2  | 531.1  | 534.0  | 537.0  |
| 65°   | 1609.4 | 1328.4 | 680.5  | 483.7  | 461.5  | 448.2  | 464.5  | 494.1  | 513.3  | 519.2  | 517.7  |
| 67°   | 1495.5 | 1210.0 | 606.5  | 452.7  | 431.9  | 420.1  | 443.8  | 474.8  | 488.2  | 497.0  | 497.0  |
| 67.5° | 1458.5 | 1167.1 | 581.3  | 442.3  | 424.5  | 414.2  | 436.4  | 466.0  | 483.7  | 494.1  | 494.1  |
| 70°   | 1238.1 | 957.1  | 491.1  | 390.5  | 381.6  | 383.1  | 409.8  | 442.3  | 464.5  | 474.8  | 474.8  |
| 72.5° | 943.8  | 741.1  | 399.4  | 340.2  | 337.3  | 347.6  | 381.6  | 411.2  | 439.3  | 457.1  | 455.6  |
| 75°   | 535.5  | 427.5  | 291.4  | 278.1  | 289.9  | 310.6  | 353.5  | 386.1  | 411.2  | 429.0  | 427.5  |
| 77.5° | 312.1  | 257.4  | 201.2  | 190.8  | 224.8  | 272.2  | 316.6  | 358.0  | 375.7  | 381.6  | 377.2  |
| 80°   | 158.3  | 134.6  | 125.7  | 130.2  | 150.9  | 202.7  | 276.6  | 325.4  | 338.7  | 343.2  | 338.7  |
| 82.5° | 50.3   | 45.9   | 50.3   | 66.6   | 100.6  | 159.8  | 223.4  | 294.4  | 310.6  | 310.6  | 309.2  |
| 85°   | 3.0    | 3.0    | 3.0    | 29.6   | 69.5   | 118.3  | 174.6  | 257.4  | 291.4  | 288.5  | 284.0  |
| 87.5° | 1.5    | 1.5    | 1.5    | 19.2   | 54.7   | 99.1   | 153.8  | 233.7  | 278.1  | 257.4  | 242.6  |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

LM-79-2019: Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Report Prepared for

Cooper Lighting Solutions

McGraw-Edison

Report Number: SP2-2501-321-3

Test Date: 04/09/2025

Luminaire Tested: GKO-PB1E-727-U-T4W

Data in this report applies to families of products including GKO-PB1E-727-U-T4W

### Test Information

Test Method: LM-79-2019  
 Report Number: SP2-2501-321-3  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP2 - 165CM SPHERE  
 Measurement Geometry:  $4\pi$   
 Issue Date: 04/10/2025  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: McGraw-Edison  
 Catalog Number: **GKO-PB1E-727-U-T4W**  
 Description: Gekko Wedge Wall Pack Fixture 1 SQ w/ T4W distribution

### Spectral Parameters

CCT (K): 2769  
 CIE  $u'$ : 0.2596  
 CIE  $v'$ : 0.5253  
 Duv: -0.0005  
 CIE x: 0.4535  
 CIE y: 0.4078  
 CIE z: 0.1387  
 Peak Wavelength (nm): 597  
 Dominant Wavelength (nm): 584  
 Purity: 58.54014  
 R<sub>f</sub>: 75.7  
 R<sub>g</sub>: 93.2

CRI (Ra): 71.7  
 R1: 68.0  
 R2: 84.0  
 R3: 94.6  
 R4: 65.9  
 R5: 67.3  
 R6: 78.7  
 R7: 75.2  
 R8: 39.8  
 R9: -34.5  
 R10: 64.3  
 R11: 60.9  
 R12: 54.4  
 R13: 71.2  
 R14: 97.6  
 R15: 59.5



### Test Conditions

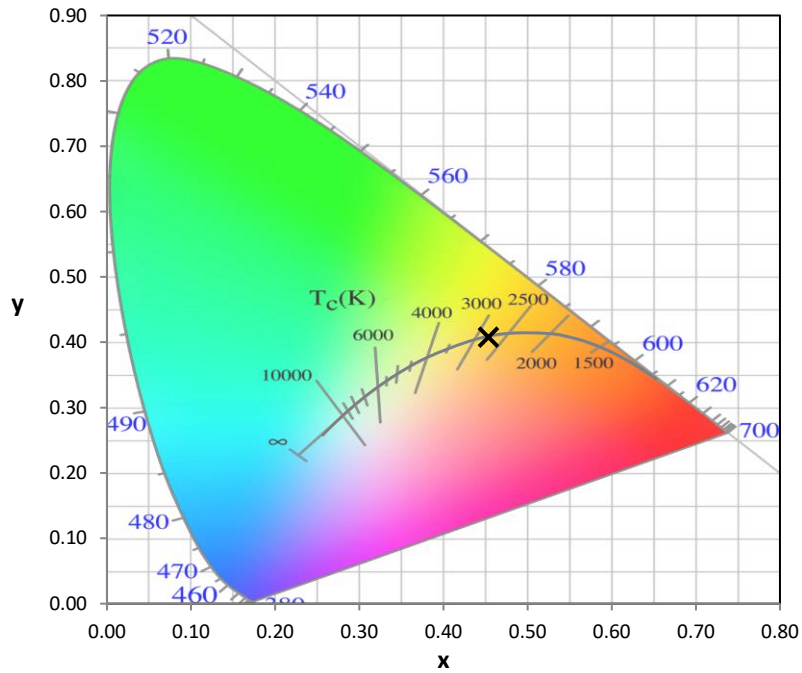
Stabilization Time: 36M  
 Operation Time: 1H 36M  
 Sphere Temperature (°C): 25.0

REPORT NUMBER: SP2-2501-321-3

| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN2187                | 1/6/2025         | 7/6/2025             |
| Power Meter                    | INXT2011002           | 1/21/2025        | 1/21/2026            |
| AC Power Source                | IN0458                | 10/22/2024       | 10/22/2025           |
| DC Power Source                | IN0212                | 10/22/2024       | 10/22/2025           |
| Sphere Thermometer             | IN4036B               | 10/22/2024       | 10/22/2025           |
| Room Thermometer               | IN0046                | 10/22/2024       | 10/22/2025           |

REPORT NUMBER: SP2-2501-321-3

**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

REPORT NUMBER: SP2-2501-321-3

### Photopic Flux vs. Wavelength

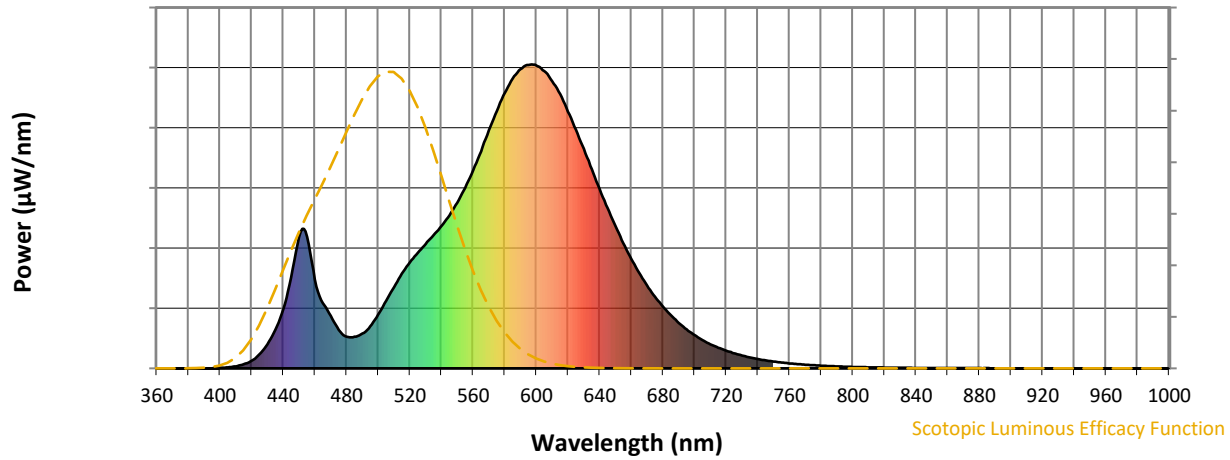


### Photopic Lumens: NR

| $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) |
|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|
| 360               | 0                                    | NR                             | 490               | 114                                  | NR                             | 620               | 844                                  | NR                             | 750               | 22                                   | NR                             | 880               | 1                                    | NR                             |
| 365               | 0                                    | NR                             | 495               | 138                                  | NR                             | 625               | 785                                  | NR                             | 755               | 19                                   | NR                             | 885               | 1                                    | NR                             |
| 370               | 0                                    | NR                             | 500               | 176                                  | NR                             | 630               | 722                                  | NR                             | 760               | 16                                   | NR                             | 890               | 1                                    | NR                             |
| 375               | 0                                    | NR                             | 505               | 222                                  | NR                             | 635               | 655                                  | NR                             | 765               | 14                                   | NR                             | 895               | 0                                    | NR                             |
| 380               | 0                                    | NR                             | 510               | 268                                  | NR                             | 640               | 591                                  | NR                             | 770               | 12                                   | NR                             | 900               | 0                                    | NR                             |
| 385               | 0                                    | NR                             | 515               | 311                                  | NR                             | 645               | 527                                  | NR                             | 775               | 10                                   | NR                             | 905               | 0                                    | NR                             |
| 390               | 0                                    | NR                             | 520               | 348                                  | NR                             | 650               | 467                                  | NR                             | 780               | 9                                    | NR                             | 910               | 0                                    | NR                             |
| 395               | 0                                    | NR                             | 525               | 381                                  | NR                             | 655               | 412                                  | NR                             | 785               | 8                                    | NR                             | 915               | 0                                    | NR                             |
| 400               | 2                                    | NR                             | 530               | 410                                  | NR                             | 660               | 360                                  | NR                             | 790               | 7                                    | NR                             | 920               | 0                                    | NR                             |
| 405               | 4                                    | NR                             | 535               | 438                                  | NR                             | 665               | 314                                  | NR                             | 795               | 6                                    | NR                             | 925               | 0                                    | NR                             |
| 410               | 7                                    | NR                             | 540               | 469                                  | NR                             | 670               | 272                                  | NR                             | 800               | 5                                    | NR                             | 930               | 0                                    | NR                             |
| 415               | 13                                   | NR                             | 545               | 503                                  | NR                             | 675               | 236                                  | NR                             | 805               | 4                                    | NR                             | 935               | 0                                    | NR                             |
| 420               | 25                                   | NR                             | 550               | 544                                  | NR                             | 680               | 203                                  | NR                             | 810               | 4                                    | NR                             | 940               | 0                                    | NR                             |
| 425               | 46                                   | NR                             | 555               | 594                                  | NR                             | 685               | 175                                  | NR                             | 815               | 3                                    | NR                             | 945               | 0                                    | NR                             |
| 430               | 79                                   | NR                             | 560               | 652                                  | NR                             | 690               | 149                                  | NR                             | 820               | 3                                    | NR                             | 950               | 0                                    | NR                             |
| 435               | 128                                  | NR                             | 565               | 714                                  | NR                             | 695               | 128                                  | NR                             | 825               | 2                                    | NR                             | 955               | 0                                    | NR                             |
| 440               | 196                                  | NR                             | 570               | 783                                  | NR                             | 700               | 109                                  | NR                             | 830               | 2                                    | NR                             | 960               | 0                                    | NR                             |
| 445               | 299                                  | NR                             | 575               | 847                                  | NR                             | 705               | 93                                   | NR                             | 835               | 2                                    | NR                             | 965               | 0                                    | NR                             |
| 450               | 433                                  | NR                             | 580               | 906                                  | NR                             | 710               | 80                                   | NR                             | 840               | 2                                    | NR                             | 970               | 0                                    | NR                             |
| 455               | 433                                  | NR                             | 585               | 953                                  | NR                             | 715               | 68                                   | NR                             | 845               | 1                                    | NR                             | 975               | 0                                    | NR                             |
| 460               | 293                                  | NR                             | 590               | 985                                  | NR                             | 720               | 58                                   | NR                             | 850               | 1                                    | NR                             | 980               | 0                                    | NR                             |
| 465               | 215                                  | NR                             | 595               | 998                                  | NR                             | 725               | 50                                   | NR                             | 855               | 1                                    | NR                             | 985               | 0                                    | NR                             |
| 470               | 173                                  | NR                             | 600               | 997                                  | NR                             | 730               | 42                                   | NR                             | 860               | 1                                    | NR                             | 990               | 0                                    | NR                             |
| 475               | 127                                  | NR                             | 605               | 978                                  | NR                             | 735               | 36                                   | NR                             | 865               | 1                                    | NR                             | 995               | 0                                    | NR                             |
| 480               | 104                                  | NR                             | 610               | 945                                  | NR                             | 740               | 30                                   | NR                             | 870               | 1                                    | NR                             | 1000              | 0                                    | NR                             |
| 485               | 104                                  | NR                             | 615               | 902                                  | NR                             | 745               | 26                                   | NR                             | 875               | 1                                    | NR                             |                   |                                      |                                |

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### Scotopic Flux vs. Wavelength



Scotopic Lumens: NR

S/P: 1.14

| λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(Φ/nm) |
|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|
| 360       | 0                           | NR               | 490       | 114                         | NR               | 620       | 844                         | NR               | 750       | 22                          | NR               | 880       | 1                           | NR               |
| 365       | 0                           | NR               | 495       | 138                         | NR               | 625       | 785                         | NR               | 755       | 19                          | NR               | 885       | 1                           | NR               |
| 370       | 0                           | NR               | 500       | 176                         | NR               | 630       | 722                         | NR               | 760       | 16                          | NR               | 890       | 1                           | NR               |
| 375       | 0                           | NR               | 505       | 222                         | NR               | 635       | 655                         | NR               | 765       | 14                          | NR               | 895       | 0                           | NR               |
| 380       | 0                           | NR               | 510       | 268                         | NR               | 640       | 591                         | NR               | 770       | 12                          | NR               | 900       | 0                           | NR               |
| 385       | 0                           | NR               | 515       | 311                         | NR               | 645       | 527                         | NR               | 775       | 10                          | NR               | 905       | 0                           | NR               |
| 390       | 0                           | NR               | 520       | 348                         | NR               | 650       | 467                         | NR               | 780       | 9                           | NR               | 910       | 0                           | NR               |
| 395       | 0                           | NR               | 525       | 381                         | NR               | 655       | 412                         | NR               | 785       | 8                           | NR               | 915       | 0                           | NR               |
| 400       | 2                           | NR               | 530       | 410                         | NR               | 660       | 360                         | NR               | 790       | 7                           | NR               | 920       | 0                           | NR               |
| 405       | 4                           | NR               | 535       | 438                         | NR               | 665       | 314                         | NR               | 795       | 6                           | NR               | 925       | 0                           | NR               |
| 410       | 7                           | NR               | 540       | 469                         | NR               | 670       | 272                         | NR               | 800       | 5                           | NR               | 930       | 0                           | NR               |
| 415       | 13                          | NR               | 545       | 503                         | NR               | 675       | 236                         | NR               | 805       | 4                           | NR               | 935       | 0                           | NR               |
| 420       | 25                          | NR               | 550       | 544                         | NR               | 680       | 203                         | NR               | 810       | 4                           | NR               | 940       | 0                           | NR               |
| 425       | 46                          | NR               | 555       | 594                         | NR               | 685       | 175                         | NR               | 815       | 3                           | NR               | 945       | 0                           | NR               |
| 430       | 79                          | NR               | 560       | 652                         | NR               | 690       | 149                         | NR               | 820       | 3                           | NR               | 950       | 0                           | NR               |
| 435       | 128                         | NR               | 565       | 714                         | NR               | 695       | 128                         | NR               | 825       | 2                           | NR               | 955       | 0                           | NR               |
| 440       | 196                         | NR               | 570       | 783                         | NR               | 700       | 109                         | NR               | 830       | 2                           | NR               | 960       | 0                           | NR               |
| 445       | 299                         | NR               | 575       | 847                         | NR               | 705       | 93                          | NR               | 835       | 2                           | NR               | 965       | 0                           | NR               |
| 450       | 433                         | NR               | 580       | 906                         | NR               | 710       | 80                          | NR               | 840       | 2                           | NR               | 970       | 0                           | NR               |
| 455       | 433                         | NR               | 585       | 953                         | NR               | 715       | 68                          | NR               | 845       | 1                           | NR               | 975       | 0                           | NR               |
| 460       | 293                         | NR               | 590       | 985                         | NR               | 720       | 58                          | NR               | 850       | 1                           | NR               | 980       | 0                           | NR               |
| 465       | 215                         | NR               | 595       | 998                         | NR               | 725       | 50                          | NR               | 855       | 1                           | NR               | 985       | 0                           | NR               |
| 470       | 173                         | NR               | 600       | 997                         | NR               | 730       | 42                          | NR               | 860       | 1                           | NR               | 990       | 0                           | NR               |
| 475       | 127                         | NR               | 605       | 978                         | NR               | 735       | 36                          | NR               | 865       | 1                           | NR               | 995       | 0                           | NR               |
| 480       | 104                         | NR               | 610       | 945                         | NR               | 740       | 30                          | NR               | 870       | 1                           | NR               | 1000      | 0                           | NR               |
| 485       | 104                         | NR               | 615       | 902                         | NR               | 745       | 26                          | NR               | 875       | 1                           | NR               |           |                             |                  |

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### Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 2.08

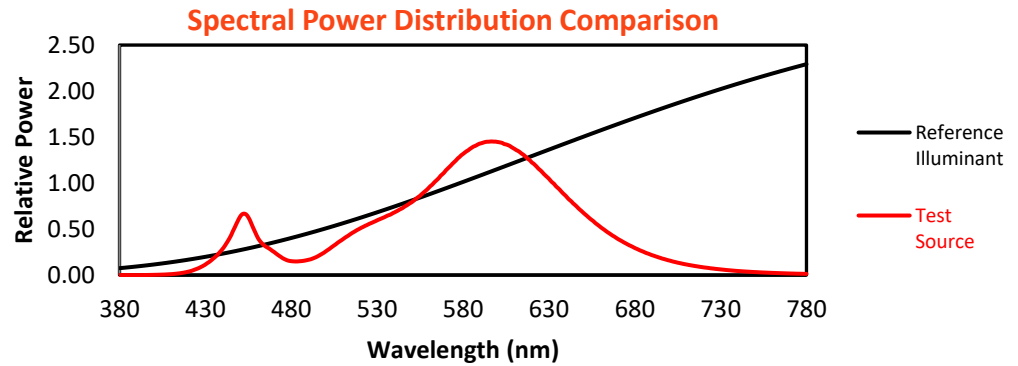
| λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) |
|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|
| 360       | 0                           | NR               | 490       | 114                         | NR               | 620       | 844                         | NR               | 750       | 22                          | NR               | 880       | 1                           | NR               |
| 365       | 0                           | NR               | 495       | 138                         | NR               | 625       | 785                         | NR               | 755       | 19                          | NR               | 885       | 1                           | NR               |
| 370       | 0                           | NR               | 500       | 176                         | NR               | 630       | 722                         | NR               | 760       | 16                          | NR               | 890       | 1                           | NR               |
| 375       | 0                           | NR               | 505       | 222                         | NR               | 635       | 655                         | NR               | 765       | 14                          | NR               | 895       | 0                           | NR               |
| 380       | 0                           | NR               | 510       | 268                         | NR               | 640       | 591                         | NR               | 770       | 12                          | NR               | 900       | 0                           | NR               |
| 385       | 0                           | NR               | 515       | 311                         | NR               | 645       | 527                         | NR               | 775       | 10                          | NR               | 905       | 0                           | NR               |
| 390       | 0                           | NR               | 520       | 348                         | NR               | 650       | 467                         | NR               | 780       | 9                           | NR               | 910       | 0                           | NR               |
| 395       | 0                           | NR               | 525       | 381                         | NR               | 655       | 412                         | NR               | 785       | 8                           | NR               | 915       | 0                           | NR               |
| 400       | 2                           | NR               | 530       | 410                         | NR               | 660       | 360                         | NR               | 790       | 7                           | NR               | 920       | 0                           | NR               |
| 405       | 4                           | NR               | 535       | 438                         | NR               | 665       | 314                         | NR               | 795       | 6                           | NR               | 925       | 0                           | NR               |
| 410       | 7                           | NR               | 540       | 469                         | NR               | 670       | 272                         | NR               | 800       | 5                           | NR               | 930       | 0                           | NR               |
| 415       | 13                          | NR               | 545       | 503                         | NR               | 675       | 236                         | NR               | 805       | 4                           | NR               | 935       | 0                           | NR               |
| 420       | 25                          | NR               | 550       | 544                         | NR               | 680       | 203                         | NR               | 810       | 4                           | NR               | 940       | 0                           | NR               |
| 425       | 46                          | NR               | 555       | 594                         | NR               | 685       | 175                         | NR               | 815       | 3                           | NR               | 945       | 0                           | NR               |
| 430       | 79                          | NR               | 560       | 652                         | NR               | 690       | 149                         | NR               | 820       | 3                           | NR               | 950       | 0                           | NR               |
| 435       | 128                         | NR               | 565       | 714                         | NR               | 695       | 128                         | NR               | 825       | 2                           | NR               | 955       | 0                           | NR               |
| 440       | 196                         | NR               | 570       | 783                         | NR               | 700       | 109                         | NR               | 830       | 2                           | NR               | 960       | 0                           | NR               |
| 445       | 299                         | NR               | 575       | 847                         | NR               | 705       | 93                          | NR               | 835       | 2                           | NR               | 965       | 0                           | NR               |
| 450       | 433                         | NR               | 580       | 906                         | NR               | 710       | 80                          | NR               | 840       | 2                           | NR               | 970       | 0                           | NR               |
| 455       | 433                         | NR               | 585       | 953                         | NR               | 715       | 68                          | NR               | 845       | 1                           | NR               | 975       | 0                           | NR               |
| 460       | 293                         | NR               | 590       | 985                         | NR               | 720       | 58                          | NR               | 850       | 1                           | NR               | 980       | 0                           | NR               |
| 465       | 215                         | NR               | 595       | 998                         | NR               | 725       | 50                          | NR               | 855       | 1                           | NR               | 985       | 0                           | NR               |
| 470       | 173                         | NR               | 600       | 997                         | NR               | 730       | 42                          | NR               | 860       | 1                           | NR               | 990       | 0                           | NR               |
| 475       | 127                         | NR               | 605       | 978                         | NR               | 735       | 36                          | NR               | 865       | 1                           | NR               | 995       | 0                           | NR               |
| 480       | 104                         | NR               | 610       | 945                         | NR               | 740       | 30                          | NR               | 870       | 1                           | NR               | 1000      | 0                           | NR               |
| 485       | 104                         | NR               | 615       | 902                         | NR               | 745       | 26                          | NR               | 875       | 1                           | NR               |           |                             |                  |

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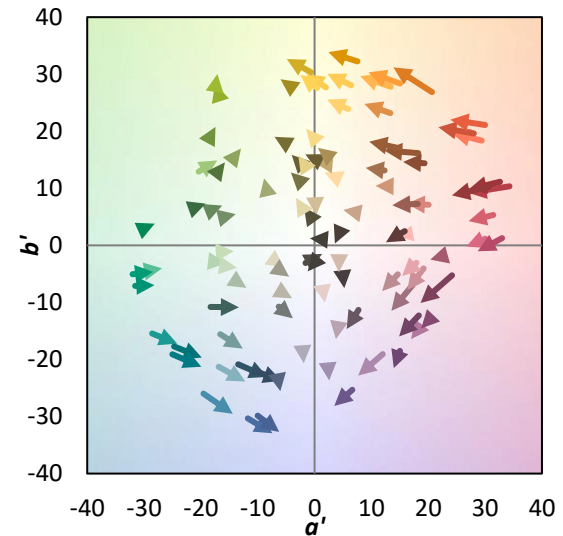
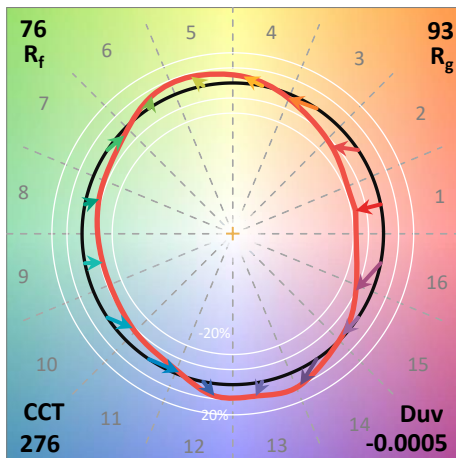
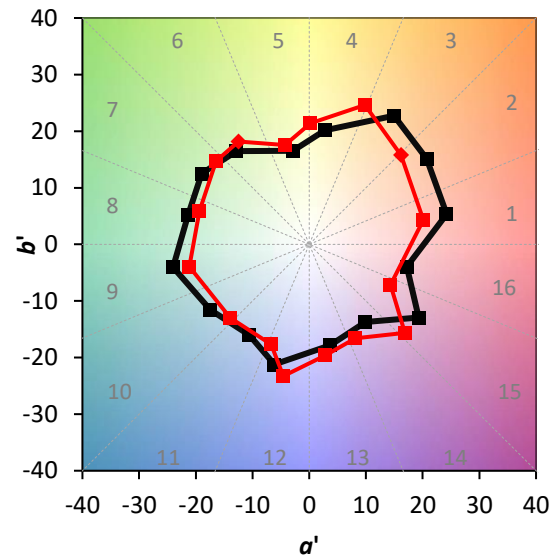
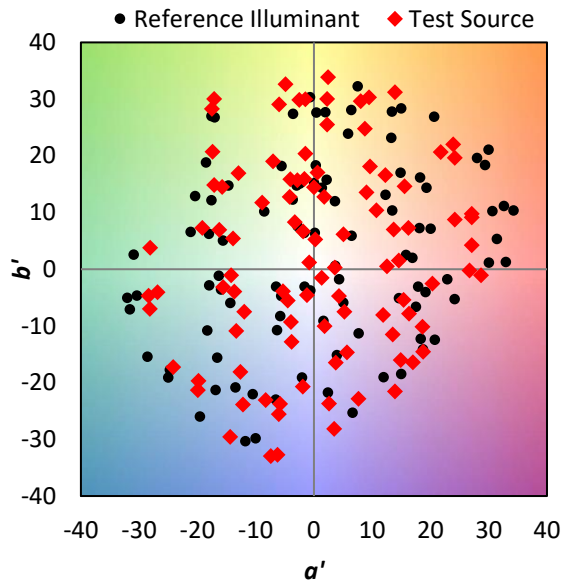
TM-30-18

### Summary

$R_f = 75.7$   
 $R_g = 93.2$   
 $CIE R_a = 71.7$   
 $R_g = -34.5$

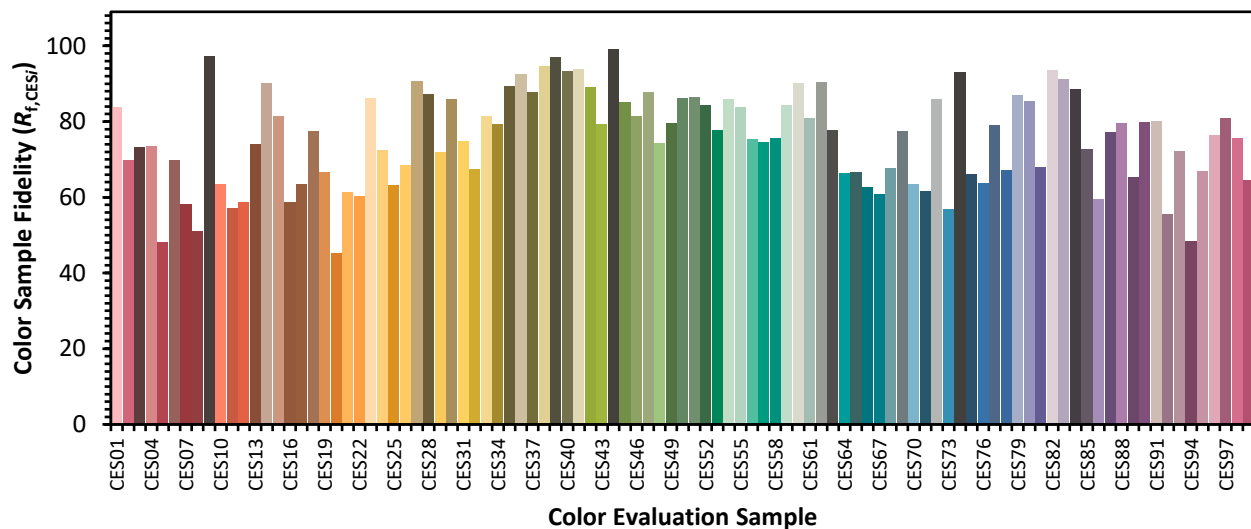


### Color Vector Graphics

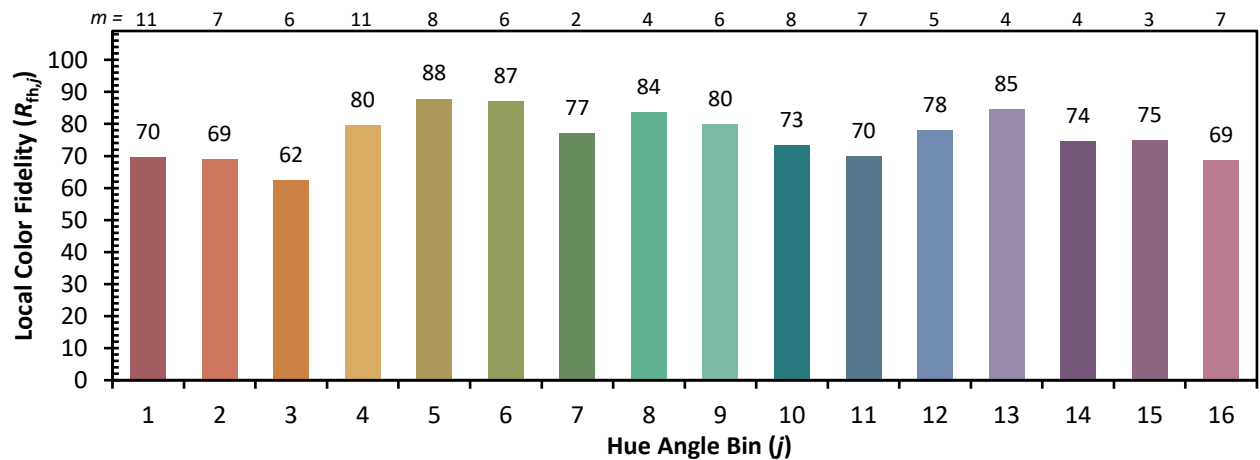


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

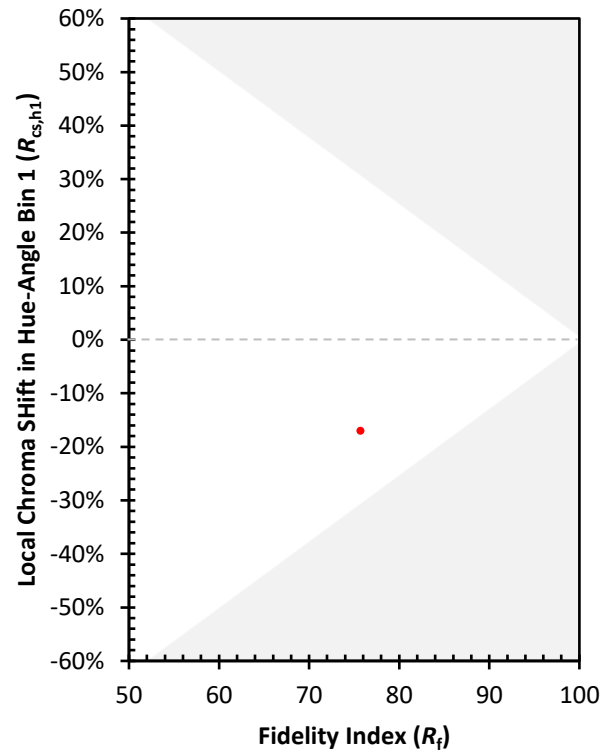
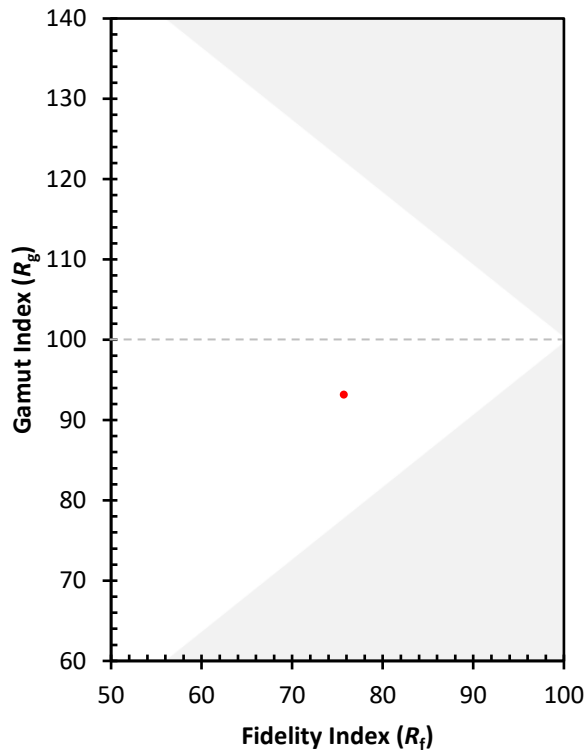
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 68 | CES51 = 87 | CES76 = 64 |
| CES02 = 63 | CES27 = 91 | CES52 = 84 | CES77 = 79 |
| CES03 = 31 | CES28 = 87 | CES53 = 78 | CES78 = 67 |
| CES04 = 71 | CES29 = 72 | CES54 = 86 | CES79 = 87 |
| CES05 = 50 | CES30 = 86 | CES55 = 84 | CES80 = 85 |
| CES06 = 52 | CES31 = 75 | CES56 = 75 | CES81 = 68 |
| CES07 = 42 | CES32 = 67 | CES57 = 74 | CES82 = 94 |
| CES08 = 41 | CES33 = 81 | CES58 = 76 | CES83 = 91 |
| CES09 = 29 | CES34 = 79 | CES59 = 84 | CES84 = 89 |
| CES10 = 77 | CES35 = 89 | CES60 = 90 | CES85 = 73 |
| CES11 = 60 | CES36 = 92 | CES61 = 81 | CES86 = 59 |
| CES12 = 66 | CES37 = 88 | CES62 = 90 | CES87 = 77 |
| CES13 = 43 | CES38 = 95 | CES63 = 78 | CES88 = 79 |
| CES14 = 74 | CES39 = 97 | CES64 = 66 | CES89 = 65 |
| CES15 = 72 | CES40 = 93 | CES65 = 67 | CES90 = 80 |
| CES16 = 48 | CES41 = 94 | CES66 = 63 | CES91 = 80 |
| CES17 = 50 | CES42 = 89 | CES67 = 61 | CES92 = 55 |
| CES18 = 57 | CES43 = 79 | CES68 = 68 | CES93 = 72 |
| CES19 = 73 | CES44 = 99 | CES69 = 77 | CES94 = 48 |
| CES20 = 67 | CES45 = 85 | CES70 = 63 | CES95 = 67 |
| CES21 = 87 | CES46 = 81 | CES71 = 62 | CES96 = 76 |
| CES22 = 80 | CES47 = 88 | CES72 = 86 | CES97 = 81 |
| CES23 = 92 | CES48 = 74 | CES73 = 57 | CES98 = 76 |
| CES24 = 91 | CES49 = 80 | CES74 = 93 | CES99 = 64 |
| CES25 = 73 | CES50 = 86 | CES75 = 66 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)