

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: P972220

Luminaire Tested: **GKO-PB2B-730-U-T4W**

Issue Date: 02/27/2025



**Test Information**

Test Method: LM-79-08  
Report Number: P972220  
Test Lab: INNOVATION CENTER(G1)  
Issue Date: 02/27/2025  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: MCGRAW-EDISON  
Catalog Number: GKO-PB2B-730-U-T4W  
Description: GEKKO WALL PACK 6000LM PACKAGE 70CRI 3000K FIXTURE w/ TYPE IV WIDE DISTRIBUTION OPTIC  
Light Source: (20) 3000K CCT, 70 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 5783.7 lumens  
Efficiency: N/A  
Efficacy: 138.4 lumens/watt  
Luminous Opening: Rectangular (W 0.67' x L: 0.33' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B1 - U0 - G1

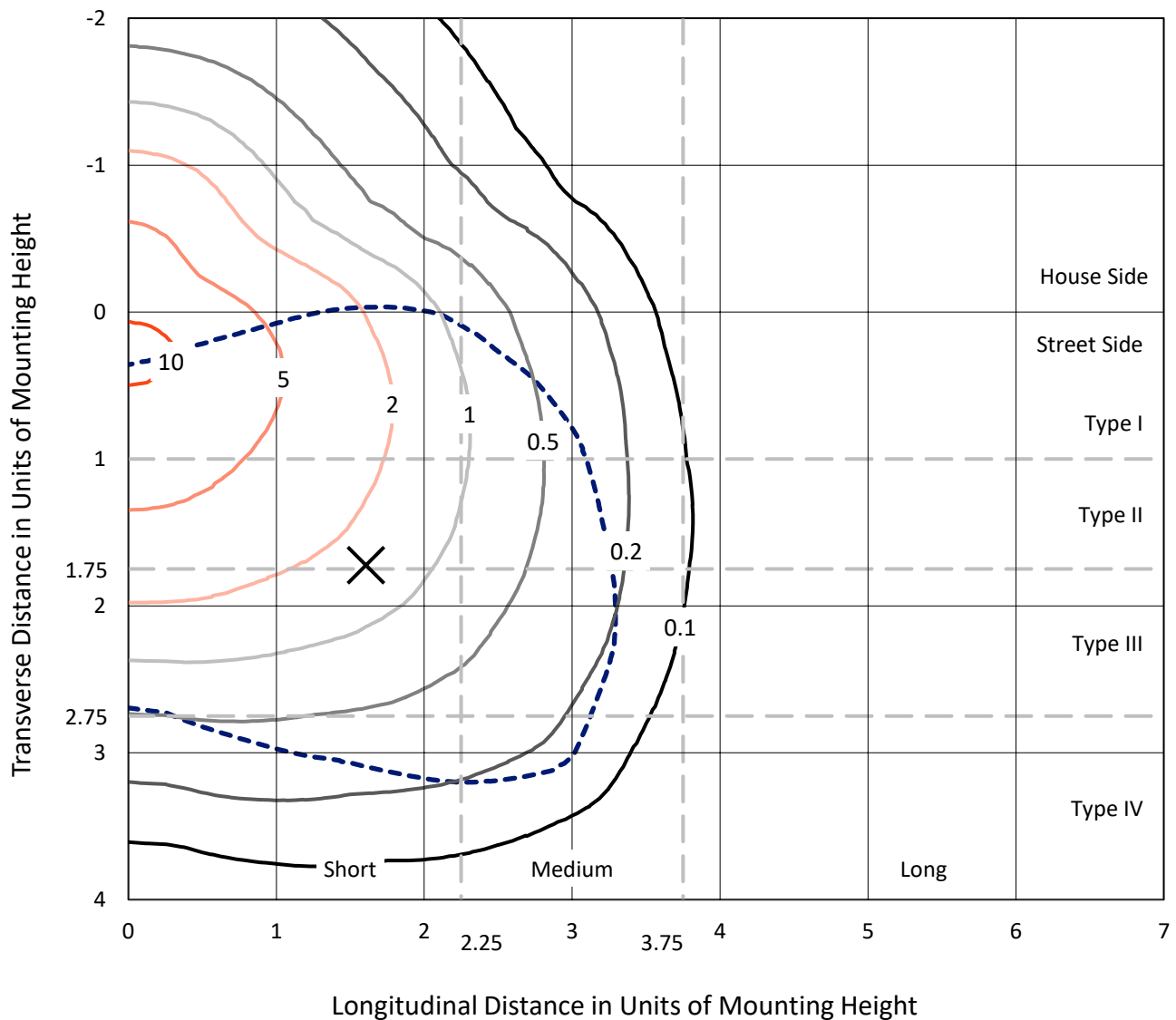
Input Watts (W): 41.8  
Input Voltage (V): 120  
Input Current (A<sub>in</sub>): NR  
Voltage Rise (V): NR  
Power Factor: 0.97  
Total Harmonic Distortion (THDi): 8%  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT

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CATALOG NUMBER: GKO-PB2B-730-U-T4W

## Iso-Footcandle Lines of Horizontal Illumination

× Max cd  
 - - - 1/2 Max cd

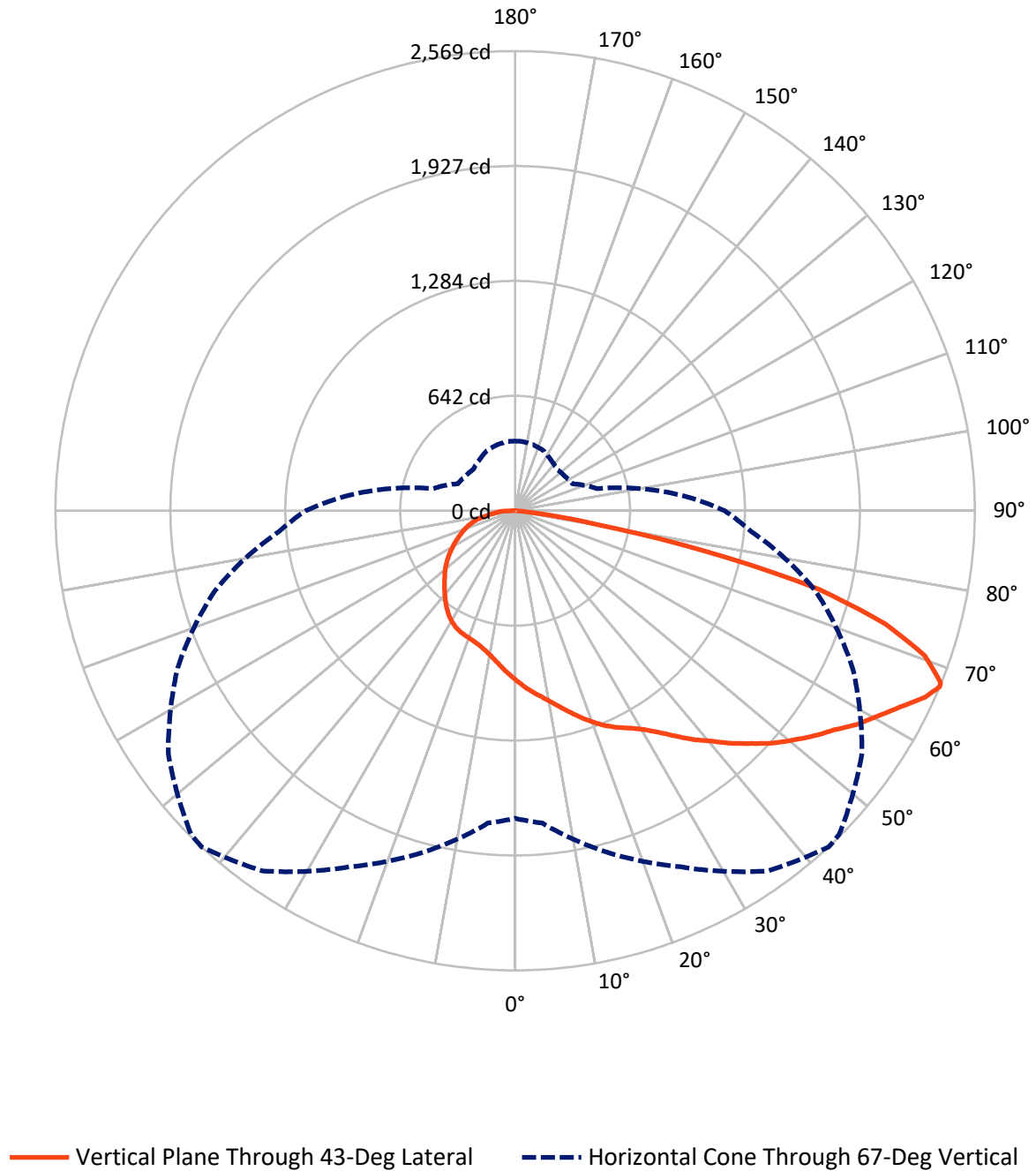


Based on 10 foot mounting height. Maximum calculated value = 11 fc  
 Type IV - Short - N/A

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CATALOG NUMBER: GKO-PB2B-730-U-T4W

## Luminous Intensity Polar Plot



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CATALOG NUMBER: GKO-PB2B-730-U-T4W

**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 1555.6   | 0.0    | 1555.6 |
|                    | % Fixture | 26.9     | 0.0    | 26.9   |
| <b>Street Side</b> | Lumens    | 4228.1   | 0.0    | 4228.1 |
|                    | % Fixture | 73.1     | 0.0    | 73.1   |
| <b>Total</b>       | Lumens    | 5783.7   | 0.0    | 5783.7 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 90.7   | 1.6       |
| 10°-20°   | 278.9  | 4.8       |
| 20°-30°   | 482.9  | 8.3       |
| 30°-40°   | 716.6  | 12.4      |
| 40°-50°   | 973.4  | 16.8      |
| 50°-60°   | 1195.0 | 20.7      |
| 60°-70°   | 1259.4 | 21.8      |
| 70°-80°   | 695.2  | 12.0      |
| 80°-90°   | 91.6   | 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°    | 5783.7 | 100.0     |
| 0°-180°   | 5783.7 | 100.0     |



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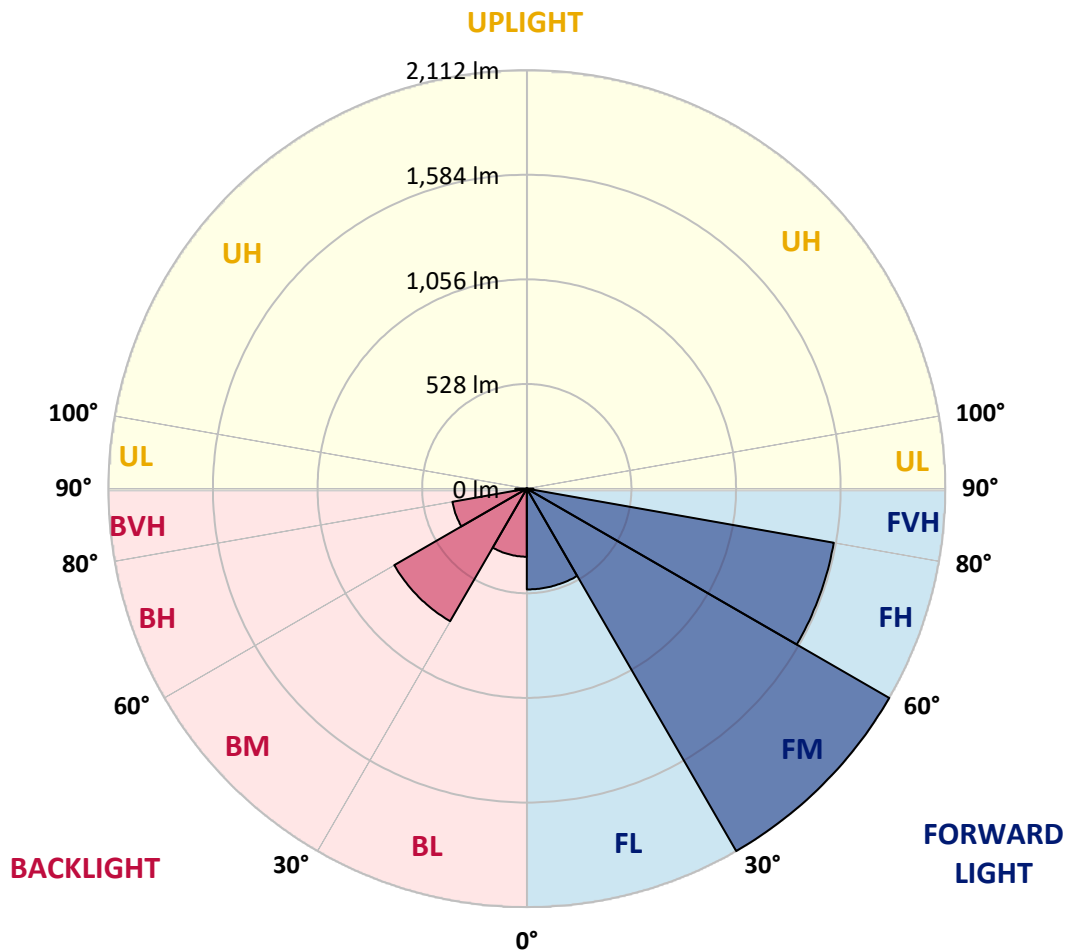
CATALOG NUMBER: GKO-PB2B-730-U-T4W

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 508.8  | 8.8       |                         |      |         |
| FM   | (30°-60°)   | 2112.4 | 36.5      |                         |      |         |
| FH   | (60°-80°)   | 1573.4 | 27.2      |                         |      | G1/1800 |
| FVH  | (80°-90°)   | 33.5   | 0.6       |                         |      | G1/100  |
| BL   | (0°-30°)    | 343.7  | 5.9       | B1/500                  |      |         |
| BM   | (30°-60°)   | 772.6  | 13.4      | B1/1000                 |      |         |
| BH   | (60°-80°)   | 381.2  | 6.6       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 58.1   | 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-G1**

Type IV Short



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 43°    | 45°    | 55°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 949.3  | 949.3  | 949.3  | 949.3  | 949.3  | 949.3  | 949.3  | 949.3  | 949.3  | 949.3  | 949.3  |
| 2.5°  | 993.3  | 995.6  | 993.3  | 991.0  | 986.4  | 984.0  | 981.7  | 975.9  | 969.0  | 958.6  | 950.5  |
| 5°    | 1037.3 | 1037.3 | 1033.8 | 1031.5 | 1024.6 | 1017.6 | 1014.1 | 1000.2 | 985.2  | 967.8  | 951.6  |
| 7.5°  | 1077.8 | 1082.4 | 1076.7 | 1070.9 | 1060.4 | 1048.9 | 1046.6 | 1025.7 | 1004.9 | 981.7  | 957.4  |
| 10°   | 1128.7 | 1132.2 | 1124.1 | 1119.5 | 1099.8 | 1084.8 | 1080.1 | 1054.7 | 1026.9 | 997.9  | 966.7  |
| 12.5° | 1180.8 | 1183.2 | 1177.4 | 1167.0 | 1146.1 | 1127.6 | 1120.6 | 1087.1 | 1051.2 | 1016.5 | 977.1  |
| 15°   | 1226.0 | 1228.3 | 1226.0 | 1214.4 | 1194.7 | 1171.6 | 1162.3 | 1125.3 | 1081.3 | 1036.1 | 989.8  |
| 17.5° | 1259.6 | 1264.2 | 1264.2 | 1258.4 | 1241.0 | 1219.0 | 1213.3 | 1167.0 | 1116.0 | 1059.3 | 1004.9 |
| 20°   | 1288.5 | 1290.8 | 1295.5 | 1292.0 | 1282.7 | 1264.2 | 1256.1 | 1212.1 | 1150.7 | 1085.9 | 1019.9 |
| 22.5° | 1311.7 | 1314.0 | 1322.1 | 1320.9 | 1315.1 | 1305.9 | 1297.8 | 1257.3 | 1191.3 | 1112.5 | 1033.8 |
| 25°   | 1352.2 | 1351.0 | 1355.7 | 1352.2 | 1345.2 | 1341.8 | 1337.1 | 1301.2 | 1231.8 | 1143.8 | 1052.3 |
| 27.5° | 1422.8 | 1420.5 | 1415.9 | 1398.5 | 1381.1 | 1376.5 | 1373.0 | 1347.6 | 1279.2 | 1179.7 | 1073.2 |
| 30°   | 1527.0 | 1529.3 | 1507.3 | 1468.0 | 1433.2 | 1419.3 | 1414.7 | 1397.3 | 1332.5 | 1221.4 | 1096.3 |
| 32.5° | 1650.9 | 1649.7 | 1613.8 | 1558.3 | 1503.8 | 1476.1 | 1466.8 | 1448.3 | 1385.8 | 1263.0 | 1123.0 |
| 35°   | 1740.0 | 1737.7 | 1719.2 | 1669.4 | 1612.7 | 1546.7 | 1529.3 | 1500.4 | 1442.5 | 1310.5 | 1149.6 |
| 37.5° | 1860.4 | 1856.9 | 1821.0 | 1769.0 | 1718.0 | 1623.1 | 1603.4 | 1564.0 | 1496.9 | 1356.8 | 1179.7 |
| 40°   | 1998.2 | 1976.2 | 1917.1 | 1863.9 | 1794.4 | 1693.7 | 1677.5 | 1626.6 | 1559.4 | 1413.5 | 1214.4 |
| 42.5° | 2123.2 | 2090.8 | 2014.4 | 1947.2 | 1860.4 | 1777.1 | 1756.2 | 1696.0 | 1619.6 | 1465.6 | 1250.3 |
| 45°   | 2310.7 | 2232.0 | 2122.0 | 2082.7 | 1932.2 | 1855.8 | 1838.4 | 1764.3 | 1685.6 | 1522.4 | 1286.2 |
| 47.5° | 2287.6 | 2232.0 | 2196.1 | 2191.5 | 2007.4 | 1941.4 | 1916.0 | 1839.6 | 1756.2 | 1582.6 | 1323.2 |
| 50°   | 2332.7 | 2288.8 | 2291.1 | 2234.3 | 2075.7 | 2014.4 | 1995.9 | 1918.3 | 1828.0 | 1641.6 | 1362.6 |
| 52.5° | 2323.5 | 2336.2 | 2329.3 | 2241.3 | 2141.7 | 2090.8 | 2076.9 | 1999.3 | 1896.3 | 1698.3 | 1397.3 |
| 55°   | 2397.6 | 2390.6 | 2375.6 | 2288.8 | 2214.7 | 2162.6 | 2151.0 | 2083.8 | 1965.8 | 1747.0 | 1427.4 |
| 57.5° | 2452.0 | 2416.1 | 2414.9 | 2342.0 | 2295.7 | 2252.9 | 2234.3 | 2170.7 | 2030.6 | 1789.8 | 1450.6 |
| 60°   | 2418.4 | 2375.6 | 2406.8 | 2350.1 | 2345.5 | 2329.3 | 2318.9 | 2247.1 | 2088.5 | 1822.2 | 1459.8 |
| 62.5° | 2239.0 | 2249.4 | 2342.0 | 2338.5 | 2399.9 | 2414.9 | 2403.4 | 2300.3 | 2126.7 | 1833.8 | 1452.9 |
| 65°   | 2001.6 | 2032.9 | 2175.3 | 2296.9 | 2463.6 | 2515.7 | 2504.1 | 2338.5 | 2123.2 | 1807.2 | 1406.6 |
| 67°   | 1719.2 | 1752.7 | 1975.0 | 2196.1 | 2457.8 | 2568.9 | 2560.8 | 2366.3 | 2081.5 | 1738.9 | 1323.2 |
| 67.5° | 1656.7 | 1694.9 | 1917.1 | 2149.8 | 2436.9 | 2564.3 | 2558.5 | 2368.6 | 2067.6 | 1706.4 | 1290.8 |
| 70°   | 1219.0 | 1264.2 | 1577.9 | 1889.4 | 2270.2 | 2430.0 | 2428.8 | 2281.8 | 1924.1 | 1530.5 | 1119.5 |
| 72.5° | 759.4  | 800.0  | 1125.3 | 1473.7 | 1966.9 | 2163.7 | 2155.6 | 1987.8 | 1656.7 | 1249.1 | 883.3  |
| 75°   | 465.4  | 490.9  | 708.5  | 960.9  | 1426.3 | 1751.6 | 1763.2 | 1553.6 | 1129.9 | 742.1  | 499.0  |
| 77.5° | 284.8  | 312.6  | 446.9  | 592.7  | 871.7  | 1089.4 | 1091.7 | 861.3  | 580.0  | 404.0  | 273.2  |
| 80°   | 158.6  | 165.5  | 232.7  | 310.3  | 446.9  | 449.2  | 430.7  | 379.7  | 301.0  | 194.5  | 140.1  |
| 82.5° | 62.5   | 67.1   | 100.7  | 125.0  | 127.3  | 133.1  | 123.9  | 112.3  | 94.9   | 62.5   | 44.0   |
| 85°   | 0.0    | 0.0    | 0.0    | 2.3    | 8.1    | 16.2   | 16.2   | 11.6   | 4.6    | 3.5    | 3.5    |
| 87.5° | 0.0    | 0.0    | 0.0    | 1.2    | 1.2    | 1.2    | 1.2    | 1.2    | 1.2    | 1.2    | 1.2    |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

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CATALOG NUMBER: GKO-PB2B-730-U-T4W

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 949.3  | 949.3  | 949.3 | 949.3 | 949.3 | 949.3 | 949.3 | 949.3 | 949.3 | 949.3 | 949.3 |
| 2.5°  | 948.1  | 947.0  | 938.9 | 929.6 | 922.7 | 916.9 | 911.1 | 904.2 | 904.2 | 906.5 | 905.3 |
| 5°    | 945.8  | 940.0  | 925.0 | 908.8 | 896.1 | 884.5 | 874.1 | 864.8 | 863.6 | 864.8 | 866.0 |
| 7.5°  | 947.0  | 936.6  | 913.4 | 889.1 | 868.3 | 853.2 | 838.2 | 831.2 | 830.1 | 830.1 | 830.1 |
| 10°   | 951.6  | 936.6  | 905.3 | 871.7 | 846.3 | 824.3 | 808.1 | 801.1 | 802.3 | 803.4 | 804.6 |
| 12.5° | 959.7  | 938.9  | 899.5 | 856.7 | 824.3 | 802.3 | 786.1 | 780.3 | 784.9 | 790.7 | 791.9 |
| 15°   | 967.8  | 943.5  | 893.7 | 844.0 | 806.9 | 782.6 | 771.0 | 769.9 | 778.0 | 788.4 | 790.7 |
| 17.5° | 977.1  | 947.0  | 886.8 | 827.7 | 788.4 | 768.7 | 762.9 | 766.4 | 779.1 | 795.3 | 798.8 |
| 20°   | 986.4  | 951.6  | 878.7 | 812.7 | 771.0 | 757.1 | 760.6 | 771.0 | 787.2 | 806.9 | 810.4 |
| 22.5° | 995.6  | 955.1  | 868.3 | 794.2 | 752.5 | 747.9 | 760.6 | 778.0 | 794.2 | 816.2 | 820.8 |
| 25°   | 1006.0 | 959.7  | 855.5 | 771.0 | 734.0 | 737.4 | 759.4 | 780.3 | 797.6 | 820.8 | 826.6 |
| 27.5° | 1022.2 | 966.7  | 842.8 | 750.2 | 713.1 | 724.7 | 753.7 | 779.1 | 797.6 | 819.6 | 826.6 |
| 30°   | 1038.4 | 973.6  | 832.4 | 728.2 | 692.3 | 707.3 | 742.1 | 773.3 | 791.9 | 811.5 | 820.8 |
| 32.5° | 1057.0 | 982.9  | 823.1 | 706.2 | 669.1 | 687.7 | 725.9 | 760.6 | 782.6 | 800.0 | 809.2 |
| 35°   | 1076.7 | 996.8  | 816.2 | 686.5 | 646.0 | 662.2 | 701.6 | 744.4 | 766.4 | 782.6 | 790.7 |
| 37.5° | 1102.1 | 1011.8 | 811.5 | 666.8 | 621.7 | 635.6 | 676.1 | 721.2 | 746.7 | 759.4 | 769.9 |
| 40°   | 1129.9 | 1033.8 | 811.5 | 650.6 | 598.5 | 607.8 | 649.5 | 698.1 | 723.6 | 734.0 | 744.4 |
| 42.5° | 1157.7 | 1055.8 | 810.4 | 634.4 | 574.2 | 581.2 | 622.8 | 672.6 | 696.9 | 705.0 | 713.1 |
| 45°   | 1190.1 | 1081.3 | 809.2 | 615.9 | 547.6 | 554.5 | 597.4 | 647.1 | 670.3 | 677.2 | 684.2 |
| 47.5° | 1224.8 | 1106.8 | 804.6 | 592.7 | 523.3 | 529.1 | 571.9 | 618.2 | 641.4 | 649.5 | 656.4 |
| 50°   | 1256.1 | 1131.1 | 793.0 | 566.1 | 501.3 | 507.1 | 545.3 | 583.5 | 604.3 | 613.6 | 620.5 |
| 52.5° | 1283.9 | 1148.4 | 774.5 | 536.0 | 477.0 | 483.9 | 512.9 | 546.4 | 562.6 | 569.6 | 574.2 |
| 55°   | 1305.9 | 1157.7 | 744.4 | 507.1 | 453.8 | 457.3 | 480.4 | 510.5 | 523.3 | 524.4 | 527.9 |
| 57.5° | 1320.9 | 1156.5 | 703.9 | 473.5 | 430.7 | 431.8 | 448.0 | 474.7 | 483.9 | 482.8 | 485.1 |
| 60°   | 1324.4 | 1141.5 | 655.3 | 442.2 | 407.5 | 404.0 | 420.2 | 438.8 | 444.6 | 449.2 | 455.0 |
| 62.5° | 1310.5 | 1105.6 | 599.7 | 411.0 | 384.4 | 378.6 | 390.1 | 406.3 | 415.6 | 417.9 | 420.2 |
| 65°   | 1259.6 | 1039.6 | 532.5 | 378.6 | 361.2 | 350.8 | 363.5 | 386.7 | 401.7 | 406.3 | 405.2 |
| 67°   | 1170.4 | 947.0  | 474.7 | 354.3 | 338.0 | 328.8 | 347.3 | 371.6 | 382.0 | 389.0 | 389.0 |
| 67.5° | 1141.5 | 913.4  | 455.0 | 346.1 | 332.3 | 324.2 | 341.5 | 364.7 | 378.6 | 386.7 | 386.7 |
| 70°   | 969.0  | 749.0  | 384.4 | 305.6 | 298.7 | 299.8 | 320.7 | 346.1 | 363.5 | 371.6 | 371.6 |
| 72.5° | 738.6  | 580.0  | 312.6 | 266.3 | 264.0 | 272.1 | 298.7 | 321.8 | 343.8 | 357.7 | 356.6 |
| 75°   | 419.1  | 334.6  | 228.1 | 217.6 | 226.9 | 243.1 | 276.7 | 302.2 | 321.8 | 335.7 | 334.6 |
| 77.5° | 244.3  | 201.4  | 157.4 | 149.3 | 176.0 | 213.0 | 247.7 | 280.2 | 294.1 | 298.7 | 295.2 |
| 80°   | 123.9  | 105.3  | 98.4  | 101.9 | 118.1 | 158.6 | 216.5 | 254.7 | 265.1 | 268.6 | 265.1 |
| 82.5° | 39.4   | 35.9   | 39.4  | 52.1  | 78.7  | 125.0 | 174.8 | 230.4 | 243.1 | 243.1 | 242.0 |
| 85°   | 2.3    | 2.3    | 2.3   | 23.2  | 54.4  | 92.6  | 136.6 | 201.4 | 228.1 | 225.7 | 222.3 |
| 87.5° | 1.2    | 1.2    | 1.2   | 15.0  | 42.8  | 77.6  | 120.4 | 182.9 | 217.6 | 201.4 | 189.9 |
| 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: SP2-2501-321-4

Test Date: 04/10/2025

Luminaire Tested: GKO-PB1E-730-U-T4W

Data in this report applies to families of products including GKO-PB1E-730-U-T4W

### Test Information

Test Method: LM-79-2019  
 Report Number: SP2-2501-321-4  
 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-730-U-T4W**  
 Description: Gekko Wedge Wall Pack Fixture 1 SQ w/ T4W distribution

### Spectral Parameters

CCT (K): 3072  
 CIE  $u'$ : 0.2482  
 CIE  $v'$ : 0.5193  
 Duv: -0.0004  
 CIE x: 0.4313  
 CIE y: 0.4010  
 CIE z: 0.1677  
 Peak Wavelength (nm): 593  
 Dominant Wavelength (nm): 582  
 Purity: 49.8225  
 R<sub>f</sub>: 74.7  
 R<sub>g</sub>: 94.2

CRI (Ra): 71.7  
 R1: 68.1  
 R2: 82.1  
 R3: 93.4  
 R4: 67.3  
 R5: 67.2  
 R6: 74.9  
 R7: 77.5  
 R8: 43.4  
 R9: -33.9  
 R10: 58.6  
 R11: 62.0  
 R12: 48.5  
 R13: 70.7  
 R14: 96.4  
 R15: 60.2



### Test Conditions

Stabilization Time: 30M  
 Operation Time: 1H 30M  
 Sphere Temperature (°C): 25.7

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| 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           |

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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 3000K 4-step quadrangle

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### Photopic Flux vs. Wavelength



### Photopic Lumens: NR

| $\lambda$<br>(nm) | Power<br>$\text{W}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) |
|-------------------|-------------------------------|--------------------------------|-------------------|-------------------------------|--------------------------------|-------------------|-------------------------------|--------------------------------|-------------------|-------------------------------|--------------------------------|-------------------|-------------------------------|--------------------------------|
| 360               | 0                             | NR                             | 490               | 114                           | NR                             | 620               | 817                           | NR                             | 750               | 22                            | NR                             | 880               | 1                             | NR                             |
| 365               | 0                             | NR                             | 495               | 141                           | NR                             | 625               | 756                           | NR                             | 755               | 19                            | NR                             | 885               | 1                             | NR                             |
| 370               | 0                             | NR                             | 500               | 189                           | NR                             | 630               | 693                           | NR                             | 760               | 16                            | NR                             | 890               | 0                             | NR                             |
| 375               | 0                             | NR                             | 505               | 247                           | NR                             | 635               | 628                           | NR                             | 765               | 14                            | NR                             | 895               | 0                             | NR                             |
| 380               | 0                             | NR                             | 510               | 307                           | NR                             | 640               | 564                           | NR                             | 770               | 12                            | NR                             | 900               | 0                             | NR                             |
| 385               | 0                             | NR                             | 515               | 366                           | NR                             | 645               | 504                           | NR                             | 775               | 10                            | NR                             | 905               | 0                             | NR                             |
| 390               | 0                             | NR                             | 520               | 415                           | NR                             | 650               | 446                           | NR                             | 780               | 9                             | NR                             | 910               | 0                             | NR                             |
| 395               | 2                             | NR                             | 525               | 455                           | NR                             | 655               | 393                           | NR                             | 785               | 8                             | NR                             | 915               | 0                             | NR                             |
| 400               | 3                             | NR                             | 530               | 491                           | NR                             | 660               | 344                           | NR                             | 790               | 7                             | NR                             | 920               | 0                             | NR                             |
| 405               | 6                             | NR                             | 535               | 523                           | NR                             | 665               | 300                           | NR                             | 795               | 6                             | NR                             | 925               | 0                             | NR                             |
| 410               | 11                            | NR                             | 540               | 556                           | NR                             | 670               | 260                           | NR                             | 800               | 5                             | NR                             | 930               | 0                             | NR                             |
| 415               | 21                            | NR                             | 545               | 591                           | NR                             | 675               | 226                           | NR                             | 805               | 4                             | NR                             | 935               | 0                             | NR                             |
| 420               | 41                            | NR                             | 550               | 632                           | NR                             | 680               | 195                           | NR                             | 810               | 4                             | NR                             | 940               | 0                             | NR                             |
| 425               | 76                            | NR                             | 555               | 679                           | NR                             | 685               | 167                           | NR                             | 815               | 3                             | NR                             | 945               | 0                             | NR                             |
| 430               | 129                           | NR                             | 560               | 732                           | NR                             | 690               | 144                           | NR                             | 820               | 3                             | NR                             | 950               | 0                             | NR                             |
| 435               | 205                           | NR                             | 565               | 787                           | NR                             | 695               | 123                           | NR                             | 825               | 2                             | NR                             | 955               | 0                             | NR                             |
| 440               | 307                           | NR                             | 570               | 847                           | NR                             | 700               | 105                           | NR                             | 830               | 2                             | NR                             | 960               | 0                             | NR                             |
| 445               | 451                           | NR                             | 575               | 900                           | NR                             | 705               | 90                            | NR                             | 835               | 2                             | NR                             | 965               | 0                             | NR                             |
| 450               | 603                           | NR                             | 580               | 944                           | NR                             | 710               | 77                            | NR                             | 840               | 2                             | NR                             | 970               | 0                             | NR                             |
| 455               | 544                           | NR                             | 585               | 977                           | NR                             | 715               | 66                            | NR                             | 845               | 1                             | NR                             | 975               | 0                             | NR                             |
| 460               | 348                           | NR                             | 590               | 997                           | NR                             | 720               | 56                            | NR                             | 850               | 1                             | NR                             | 980               | 0                             | NR                             |
| 465               | 249                           | NR                             | 595               | 998                           | NR                             | 725               | 48                            | NR                             | 855               | 1                             | NR                             | 985               | 0                             | NR                             |
| 470               | 191                           | NR                             | 600               | 986                           | NR                             | 730               | 41                            | NR                             | 860               | 1                             | NR                             | 990               | 0                             | NR                             |
| 475               | 133                           | NR                             | 605               | 960                           | NR                             | 735               | 35                            | NR                             | 865               | 1                             | NR                             | 995               | 0                             | NR                             |
| 480               | 107                           | NR                             | 610               | 921                           | NR                             | 740               | 30                            | NR                             | 870               | 1                             | NR                             | 1000              | 0                             | NR                             |
| 485               | 104                           | NR                             | 615               | 874                           | NR                             | 745               | 26                            | NR                             | 875               | 1                             | NR                             |                   |                               |                                |

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### Scotopic Flux vs. Wavelength



Scotopic Lumens: NR

S/P: 1.24

| 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       | 817                         | NR               | 750       | 22                          | NR               | 880       | 1                           | NR               |
| 365       | 0                           | NR               | 495       | 141                         | NR               | 625       | 756                         | NR               | 755       | 19                          | NR               | 885       | 1                           | NR               |
| 370       | 0                           | NR               | 500       | 189                         | NR               | 630       | 693                         | NR               | 760       | 16                          | NR               | 890       | 0                           | NR               |
| 375       | 0                           | NR               | 505       | 247                         | NR               | 635       | 628                         | NR               | 765       | 14                          | NR               | 895       | 0                           | NR               |
| 380       | 0                           | NR               | 510       | 307                         | NR               | 640       | 564                         | NR               | 770       | 12                          | NR               | 900       | 0                           | NR               |
| 385       | 0                           | NR               | 515       | 366                         | NR               | 645       | 504                         | NR               | 775       | 10                          | NR               | 905       | 0                           | NR               |
| 390       | 0                           | NR               | 520       | 415                         | NR               | 650       | 446                         | NR               | 780       | 9                           | NR               | 910       | 0                           | NR               |
| 395       | 2                           | NR               | 525       | 455                         | NR               | 655       | 393                         | NR               | 785       | 8                           | NR               | 915       | 0                           | NR               |
| 400       | 3                           | NR               | 530       | 491                         | NR               | 660       | 344                         | NR               | 790       | 7                           | NR               | 920       | 0                           | NR               |
| 405       | 6                           | NR               | 535       | 523                         | NR               | 665       | 300                         | NR               | 795       | 6                           | NR               | 925       | 0                           | NR               |
| 410       | 11                          | NR               | 540       | 556                         | NR               | 670       | 260                         | NR               | 800       | 5                           | NR               | 930       | 0                           | NR               |
| 415       | 21                          | NR               | 545       | 591                         | NR               | 675       | 226                         | NR               | 805       | 4                           | NR               | 935       | 0                           | NR               |
| 420       | 41                          | NR               | 550       | 632                         | NR               | 680       | 195                         | NR               | 810       | 4                           | NR               | 940       | 0                           | NR               |
| 425       | 76                          | NR               | 555       | 679                         | NR               | 685       | 167                         | NR               | 815       | 3                           | NR               | 945       | 0                           | NR               |
| 430       | 129                         | NR               | 560       | 732                         | NR               | 690       | 144                         | NR               | 820       | 3                           | NR               | 950       | 0                           | NR               |
| 435       | 205                         | NR               | 565       | 787                         | NR               | 695       | 123                         | NR               | 825       | 2                           | NR               | 955       | 0                           | NR               |
| 440       | 307                         | NR               | 570       | 847                         | NR               | 700       | 105                         | NR               | 830       | 2                           | NR               | 960       | 0                           | NR               |
| 445       | 451                         | NR               | 575       | 900                         | NR               | 705       | 90                          | NR               | 835       | 2                           | NR               | 965       | 0                           | NR               |
| 450       | 603                         | NR               | 580       | 944                         | NR               | 710       | 77                          | NR               | 840       | 2                           | NR               | 970       | 0                           | NR               |
| 455       | 544                         | NR               | 585       | 977                         | NR               | 715       | 66                          | NR               | 845       | 1                           | NR               | 975       | 0                           | NR               |
| 460       | 348                         | NR               | 590       | 997                         | NR               | 720       | 56                          | NR               | 850       | 1                           | NR               | 980       | 0                           | NR               |
| 465       | 249                         | NR               | 595       | 998                         | NR               | 725       | 48                          | NR               | 855       | 1                           | NR               | 985       | 0                           | NR               |
| 470       | 191                         | NR               | 600       | 986                         | NR               | 730       | 41                          | NR               | 860       | 1                           | NR               | 990       | 0                           | NR               |
| 475       | 133                         | NR               | 605       | 960                         | NR               | 735       | 35                          | NR               | 865       | 1                           | NR               | 995       | 0                           | NR               |
| 480       | 107                         | NR               | 610       | 921                         | NR               | 740       | 30                          | NR               | 870       | 1                           | NR               | 1000      | 0                           | NR               |
| 485       | 104                         | NR               | 615       | 874                         | NR               | 745       | 26                          | NR               | 875       | 1                           | NR               |           |                             |                  |

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### Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 2.3

| $\lambda$<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               | 817                                    | NR                             | 750               | 22                                     | NR                             | 880               | 1                                      | NR                             |
| 365               | 0                                      | NR                             | 495               | 141                                    | NR                             | 625               | 756                                    | NR                             | 755               | 19                                     | NR                             | 885               | 1                                      | NR                             |
| 370               | 0                                      | NR                             | 500               | 189                                    | NR                             | 630               | 693                                    | NR                             | 760               | 16                                     | NR                             | 890               | 0                                      | NR                             |
| 375               | 0                                      | NR                             | 505               | 247                                    | NR                             | 635               | 628                                    | NR                             | 765               | 14                                     | NR                             | 895               | 0                                      | NR                             |
| 380               | 0                                      | NR                             | 510               | 307                                    | NR                             | 640               | 564                                    | NR                             | 770               | 12                                     | NR                             | 900               | 0                                      | NR                             |
| 385               | 0                                      | NR                             | 515               | 366                                    | NR                             | 645               | 504                                    | NR                             | 775               | 10                                     | NR                             | 905               | 0                                      | NR                             |
| 390               | 0                                      | NR                             | 520               | 415                                    | NR                             | 650               | 446                                    | NR                             | 780               | 9                                      | NR                             | 910               | 0                                      | NR                             |
| 395               | 2                                      | NR                             | 525               | 455                                    | NR                             | 655               | 393                                    | NR                             | 785               | 8                                      | NR                             | 915               | 0                                      | NR                             |
| 400               | 3                                      | NR                             | 530               | 491                                    | NR                             | 660               | 344                                    | NR                             | 790               | 7                                      | NR                             | 920               | 0                                      | NR                             |
| 405               | 6                                      | NR                             | 535               | 523                                    | NR                             | 665               | 300                                    | NR                             | 795               | 6                                      | NR                             | 925               | 0                                      | NR                             |
| 410               | 11                                     | NR                             | 540               | 556                                    | NR                             | 670               | 260                                    | NR                             | 800               | 5                                      | NR                             | 930               | 0                                      | NR                             |
| 415               | 21                                     | NR                             | 545               | 591                                    | NR                             | 675               | 226                                    | NR                             | 805               | 4                                      | NR                             | 935               | 0                                      | NR                             |
| 420               | 41                                     | NR                             | 550               | 632                                    | NR                             | 680               | 195                                    | NR                             | 810               | 4                                      | NR                             | 940               | 0                                      | NR                             |
| 425               | 76                                     | NR                             | 555               | 679                                    | NR                             | 685               | 167                                    | NR                             | 815               | 3                                      | NR                             | 945               | 0                                      | NR                             |
| 430               | 129                                    | NR                             | 560               | 732                                    | NR                             | 690               | 144                                    | NR                             | 820               | 3                                      | NR                             | 950               | 0                                      | NR                             |
| 435               | 205                                    | NR                             | 565               | 787                                    | NR                             | 695               | 123                                    | NR                             | 825               | 2                                      | NR                             | 955               | 0                                      | NR                             |
| 440               | 307                                    | NR                             | 570               | 847                                    | NR                             | 700               | 105                                    | NR                             | 830               | 2                                      | NR                             | 960               | 0                                      | NR                             |
| 445               | 451                                    | NR                             | 575               | 900                                    | NR                             | 705               | 90                                     | NR                             | 835               | 2                                      | NR                             | 965               | 0                                      | NR                             |
| 450               | 603                                    | NR                             | 580               | 944                                    | NR                             | 710               | 77                                     | NR                             | 840               | 2                                      | NR                             | 970               | 0                                      | NR                             |
| 455               | 544                                    | NR                             | 585               | 977                                    | NR                             | 715               | 66                                     | NR                             | 845               | 1                                      | NR                             | 975               | 0                                      | NR                             |
| 460               | 348                                    | NR                             | 590               | 997                                    | NR                             | 720               | 56                                     | NR                             | 850               | 1                                      | NR                             | 980               | 0                                      | NR                             |
| 465               | 249                                    | NR                             | 595               | 998                                    | NR                             | 725               | 48                                     | NR                             | 855               | 1                                      | NR                             | 985               | 0                                      | NR                             |
| 470               | 191                                    | NR                             | 600               | 986                                    | NR                             | 730               | 41                                     | NR                             | 860               | 1                                      | NR                             | 990               | 0                                      | NR                             |
| 475               | 133                                    | NR                             | 605               | 960                                    | NR                             | 735               | 35                                     | NR                             | 865               | 1                                      | NR                             | 995               | 0                                      | NR                             |
| 480               | 107                                    | NR                             | 610               | 921                                    | NR                             | 740               | 30                                     | NR                             | 870               | 1                                      | NR                             | 1000              | 0                                      | NR                             |
| 485               | 104                                    | NR                             | 615               | 874                                    | NR                             | 745               | 26                                     | NR                             | 875               | 1                                      | NR                             |                   |                                        |                                |

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TM-30-18

### Summary

$R_f = 74.7$   
 $R_g = 94.2$   
 $\text{CIE } R_a = 71.7$   
 $R_g = -33.9$

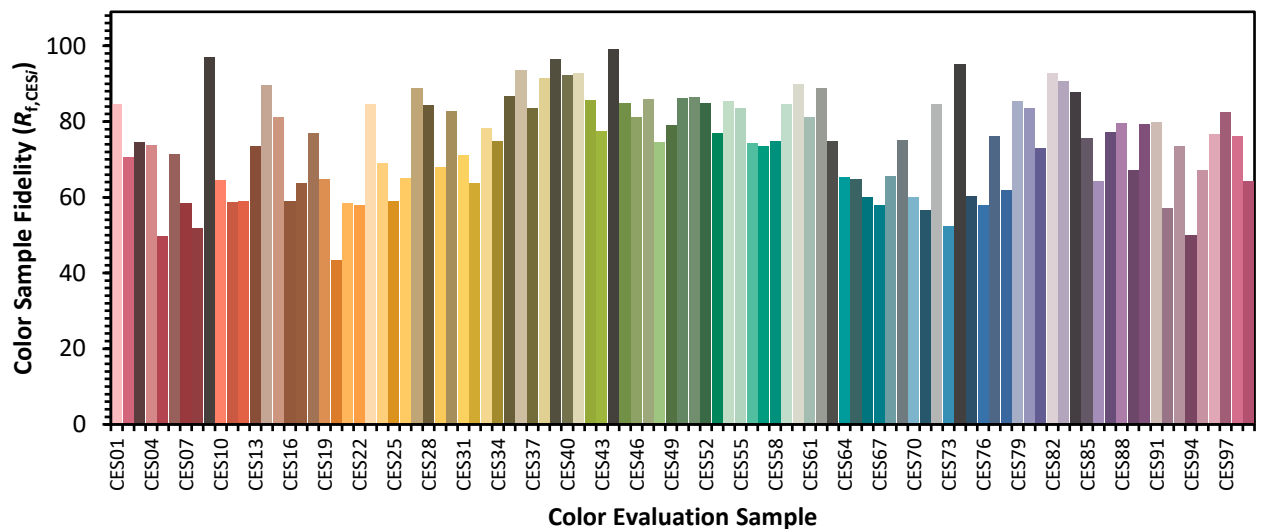


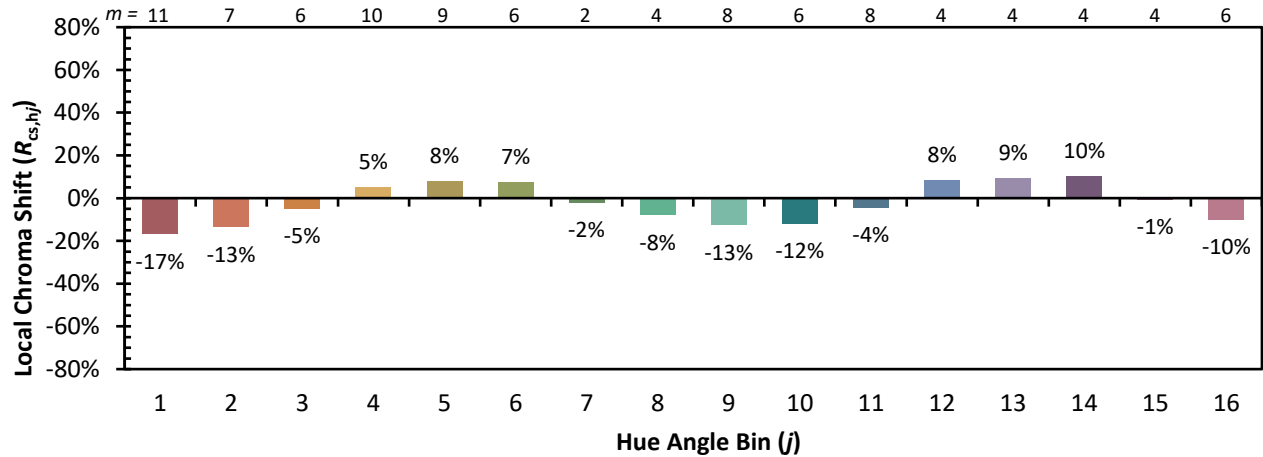
### Color Vector Graphics



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 65 | CES51 = 86 | CES76 = 58 |
| CES02 = 62 | CES27 = 89 | CES52 = 85 | CES77 = 76 |
| CES03 = 31 | CES28 = 84 | CES53 = 77 | CES78 = 62 |
| CES04 = 71 | CES29 = 68 | CES54 = 85 | CES79 = 85 |
| CES05 = 49 | CES30 = 83 | CES55 = 84 | CES80 = 84 |
| CES06 = 51 | CES31 = 71 | CES56 = 74 | CES81 = 73 |
| CES07 = 41 | CES32 = 64 | CES57 = 74 | CES82 = 93 |
| CES08 = 40 | CES33 = 78 | CES58 = 75 | CES83 = 91 |
| CES09 = 29 | CES34 = 75 | CES59 = 85 | CES84 = 88 |
| CES10 = 76 | CES35 = 87 | CES60 = 90 | CES85 = 76 |
| CES11 = 59 | CES36 = 94 | CES61 = 81 | CES86 = 64 |
| CES12 = 65 | CES37 = 84 | CES62 = 89 | CES87 = 77 |
| CES13 = 43 | CES38 = 92 | CES63 = 75 | CES88 = 80 |
| CES14 = 74 | CES39 = 96 | CES64 = 65 | CES89 = 67 |
| CES15 = 71 | CES40 = 92 | CES65 = 65 | CES90 = 79 |
| CES16 = 47 | CES41 = 93 | CES66 = 60 | CES91 = 80 |
| CES17 = 50 | CES42 = 86 | CES67 = 58 | CES92 = 57 |
| CES18 = 56 | CES43 = 78 | CES68 = 66 | CES93 = 74 |
| CES19 = 73 | CES44 = 99 | CES69 = 75 | CES94 = 50 |
| CES20 = 66 | CES45 = 85 | CES70 = 60 | CES95 = 67 |
| CES21 = 87 | CES46 = 81 | CES71 = 57 | CES96 = 77 |
| CES22 = 79 | CES47 = 86 | CES72 = 85 | CES97 = 83 |
| CES23 = 92 | CES48 = 75 | CES73 = 52 | CES98 = 76 |
| CES24 = 91 | CES49 = 79 | CES74 = 95 | CES99 = 64 |
| CES25 = 73 | CES50 = 86 | CES75 = 60 |            |



**Color Rendition by Hue-Angle Bin**


**Measure Comparisons**



(END OF REPORT)