

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: P972281

Luminaire Tested: **GKO-PB2A-740-U-T3**

Issue Date: 02/27/2025



**Test Information**

Test Method: LM-79-08  
Report Number: P972281  
Test Lab: INNOVATION CENTER(G1)  
Issue Date: 02/27/2025  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: MCGRAW-EDISON  
Catalog Number: GKO-PB2A-740-U-T3  
Description: GEKKO WALL PACK 4000LM PACKAGE 70CRI 4000K FIXTURE w/ TYPE III  
DISTRIBUTION OPTIC  
Light Source: (20) 4000K CCT, 70 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 4184.1 lumens  
Efficiency: N/A  
Efficacy: 157.9 lumens/watt  
Luminous Opening: Rectangular (W 0.67' x L: 0.33' x H: 0')  
IES Classification: Type III - Medium  
BUG Rating: B1 - U0 - G1

Input Watts (W): 26.5  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.97  
Total Harmonic Distortion (THDi): 12%  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT

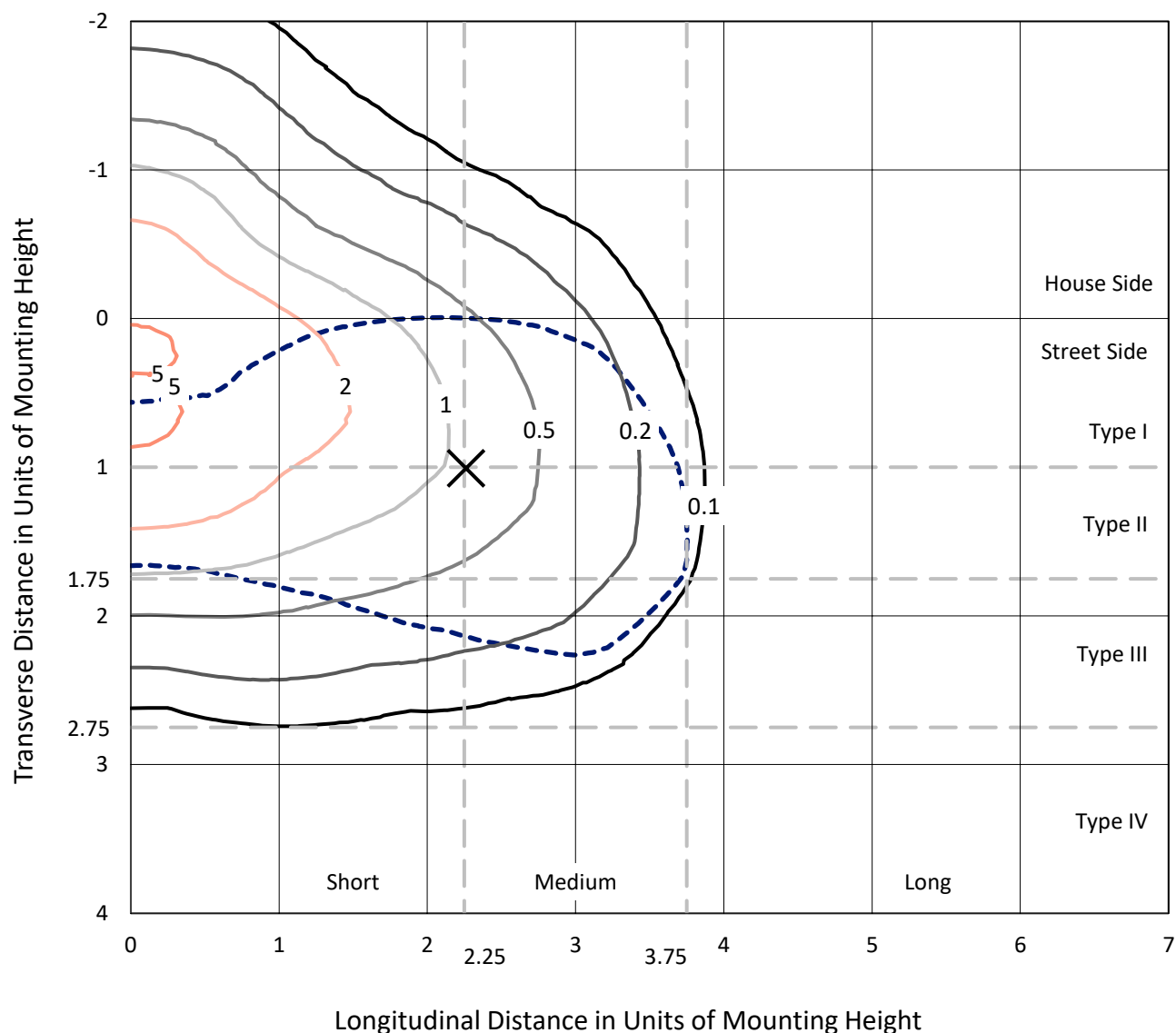
REPORT NUMBER: P972281

CATALOG NUMBER: GKO-PB2A-740-U-T3

## Iso-Footcandle Lines of Horizontal Illumination

× Max cd

--- 1/2 Max cd

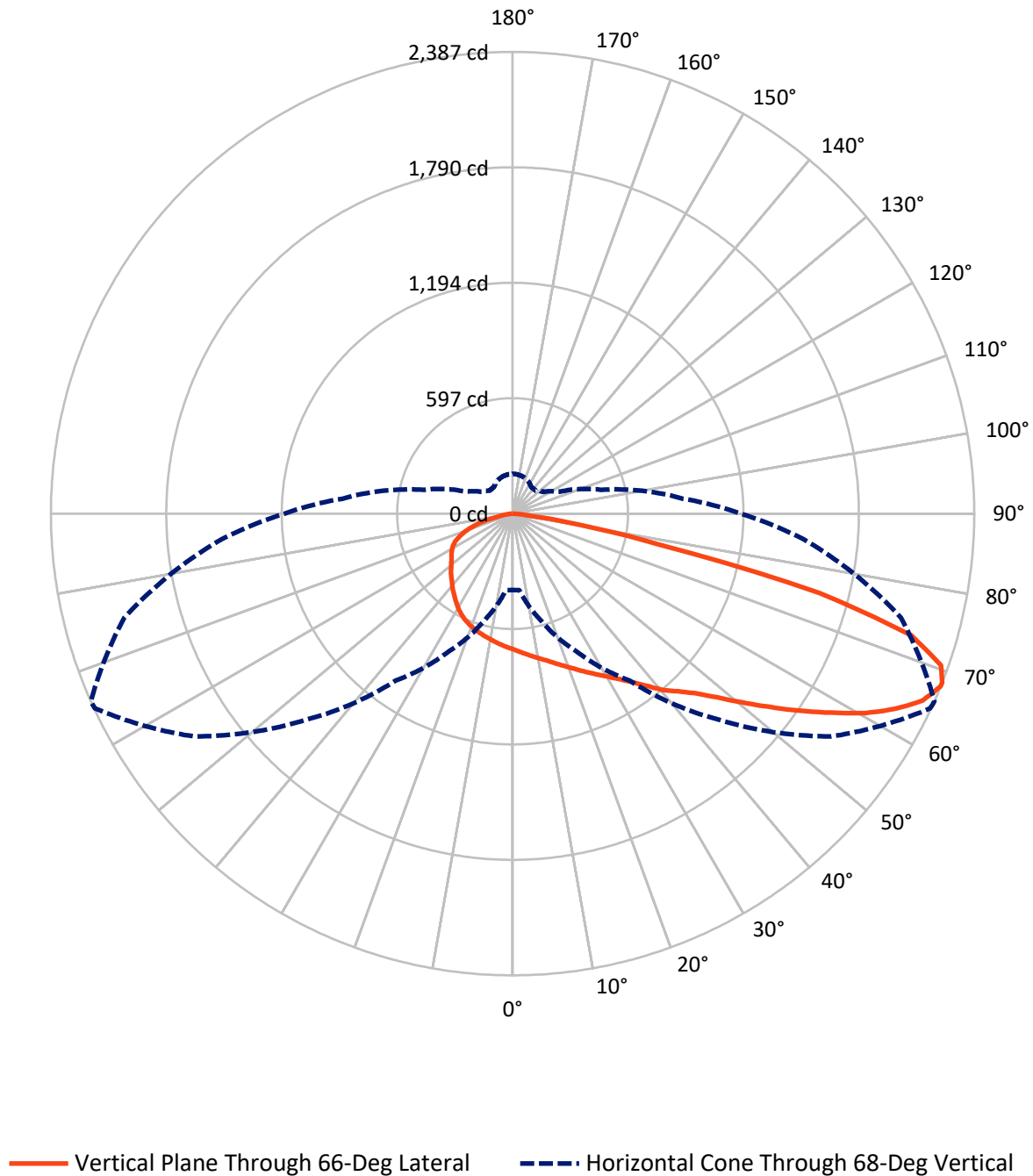


Based on 12 foot mounting height. Maximum calculated value = 5.6 fc

Type III - Medium - N/A

REPORT NUMBER: P972281  
CATALOG NUMBER: GKO-PB2A-740-U-T3

## Luminous Intensity Polar Plot



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CATALOG NUMBER: GKO-PB2A-740-U-T3

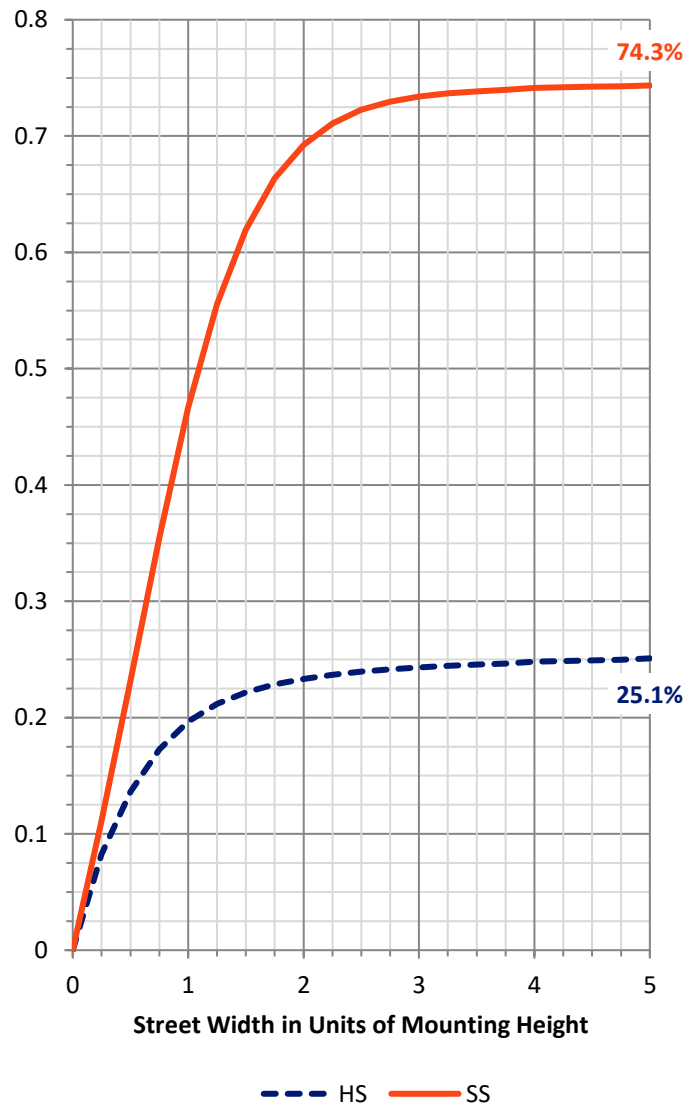
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 1071.2   | 0.0    | 1071.2 |
|                    | % Fixture | 25.6     | 0.0    | 25.6   |
| <b>Street Side</b> | Lumens    | 3112.9   | 0.0    | 3112.9 |
|                    | % Fixture | 74.4     | 0.0    | 74.4   |
| <b>Total</b>       | Lumens    | 4184.1   | 0.0    | 4184.1 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 67.3   | 1.6       |
| 10°-20°   | 202.4  | 4.8       |
| 20°-30°   | 348.7  | 8.3       |
| 30°-40°   | 540.9  | 12.9      |
| 40°-50°   | 741.0  | 17.7      |
| 50°-60°   | 884.0  | 21.1      |
| 60°-70°   | 885.8  | 21.2      |
| 70°-80°   | 468.8  | 11.2      |
| 80°-90°   | 45.2   | 1.1       |
| 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°    | 4184.1 | 100.0     |
| 0°-180°   | 4184.1 | 100.0     |



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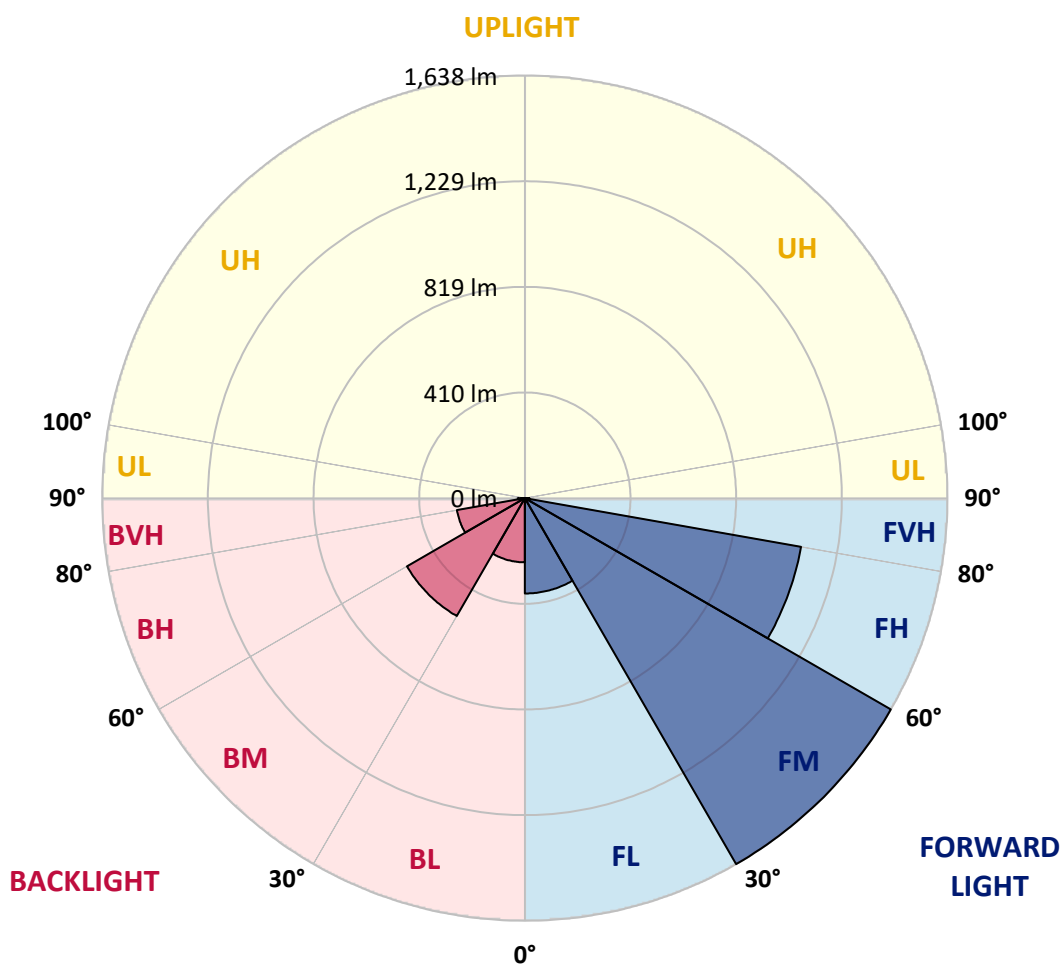
CATALOG NUMBER: GKO-PB2A-740-U-T3

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 369.6  | 8.8       |                         |      |         |
| FM   | (30°-60°)   | 1638.3 | 39.2      |                         |      |         |
| FH   | (60°-80°)   | 1087.3 | 26.0      |                         |      | G1/1800 |
| FVH  | (80°-90°)   | 17.8   | 0.4       |                         |      | G1/100  |
| BL   | (0°-30°)    | 248.8  | 5.9       | B1/500                  |      |         |
| BM   | (30°-60°)   | 527.7  | 12.6      | B1/1000                 |      |         |
| BH   | (60°-80°)   | 267.3  | 6.4       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 27.5   | 0.7       |                         |      | 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 III Medium



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 66°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 701.8  | 701.8  | 701.8  | 701.8  | 701.8  | 701.8  | 701.8  | 701.8  | 701.8  | 701.8  | 701.8  |
| 2.5°  | 731.0  | 731.0  | 729.4  | 728.6  | 727.8  | 722.9  | 719.6  | 715.6  | 715.6  | 709.1  | 703.4  |
| 5°    | 756.2  | 757.0  | 753.7  | 753.7  | 750.5  | 744.0  | 737.5  | 729.4  | 729.4  | 719.6  | 708.3  |
| 7.5°  | 778.1  | 780.6  | 777.3  | 777.3  | 774.1  | 766.7  | 756.2  | 744.8  | 744.8  | 731.0  | 714.8  |
| 10°   | 799.2  | 800.9  | 799.2  | 800.9  | 796.0  | 789.5  | 777.3  | 761.9  | 761.1  | 744.0  | 721.3  |
| 12.5° | 816.3  | 817.9  | 818.7  | 821.2  | 817.1  | 812.2  | 800.9  | 781.4  | 778.9  | 758.6  | 729.4  |
| 15°   | 832.5  | 834.2  | 836.6  | 839.8  | 839.0  | 835.0  | 824.4  | 802.5  | 800.9  | 774.9  | 739.9  |
| 17.5° | 845.5  | 846.3  | 851.2  | 857.7  | 859.3  | 860.2  | 848.8  | 826.0  | 824.4  | 793.5  | 751.3  |
| 20°   | 864.2  | 865.8  | 870.7  | 877.2  | 882.1  | 885.3  | 876.4  | 851.2  | 849.6  | 815.5  | 765.9  |
| 22.5° | 906.4  | 904.0  | 906.4  | 906.4  | 908.9  | 913.8  | 907.3  | 882.1  | 878.8  | 841.5  | 783.8  |
| 25°   | 986.0  | 983.6  | 977.1  | 962.5  | 946.2  | 945.4  | 938.1  | 913.8  | 909.7  | 868.3  | 800.9  |
| 27.5° | 1097.3 | 1091.6 | 1079.5 | 1048.6 | 1009.6 | 984.4  | 973.1  | 947.9  | 943.0  | 895.1  | 817.1  |
| 30°   | 1215.1 | 1221.6 | 1201.3 | 1159.1 | 1087.6 | 1034.0 | 1012.0 | 983.6  | 979.5  | 925.1  | 836.6  |
| 32.5° | 1352.4 | 1353.2 | 1332.9 | 1274.4 | 1181.8 | 1096.5 | 1059.1 | 1024.2 | 1021.0 | 960.1  | 862.6  |
| 35°   | 1432.0 | 1435.2 | 1426.3 | 1371.9 | 1266.3 | 1165.6 | 1116.0 | 1073.8 | 1071.3 | 1003.9 | 895.1  |
| 37.5° | 1514.8 | 1522.1 | 1508.3 | 1448.2 | 1330.4 | 1229.7 | 1179.4 | 1133.1 | 1130.6 | 1054.3 | 935.7  |
| 40°   | 1637.5 | 1634.2 | 1619.6 | 1531.1 | 1390.5 | 1283.3 | 1241.9 | 1205.3 | 1199.7 | 1116.0 | 977.1  |
| 42.5° | 1726.0 | 1734.1 | 1702.4 | 1602.5 | 1456.3 | 1336.9 | 1304.4 | 1263.0 | 1255.7 | 1153.4 | 1001.5 |
| 45°   | 1756.0 | 1748.7 | 1713.8 | 1640.7 | 1542.4 | 1385.7 | 1363.7 | 1332.1 | 1324.7 | 1219.2 | 1049.4 |
| 47.5° | 1762.5 | 1749.5 | 1718.7 | 1663.4 | 1615.5 | 1449.0 | 1436.0 | 1428.7 | 1418.2 | 1302.0 | 1107.1 |
| 50°   | 1722.7 | 1713.8 | 1699.2 | 1671.6 | 1662.6 | 1508.3 | 1514.8 | 1541.6 | 1532.7 | 1391.4 | 1171.2 |
| 52.5° | 1632.6 | 1628.5 | 1641.5 | 1659.4 | 1635.8 | 1559.5 | 1608.2 | 1662.6 | 1659.4 | 1489.6 | 1240.3 |
| 55°   | 1462.8 | 1462.8 | 1535.9 | 1598.5 | 1612.3 | 1592.8 | 1708.9 | 1802.3 | 1798.3 | 1600.1 | 1306.1 |
| 57.5° | 1307.7 | 1310.1 | 1371.0 | 1511.6 | 1570.0 | 1628.5 | 1821.0 | 1948.5 | 1942.0 | 1724.4 | 1375.1 |
| 60°   | 1111.9 | 1111.9 | 1204.5 | 1380.8 | 1509.1 | 1656.1 | 1920.1 | 2089.9 | 2093.9 | 1844.6 | 1443.3 |
| 62.5° | 880.5  | 882.9  | 1011.2 | 1218.3 | 1421.4 | 1661.0 | 1998.9 | 2223.1 | 2222.3 | 1953.4 | 1496.1 |
| 65°   | 649.0  | 649.8  | 824.4  | 1038.0 | 1289.8 | 1626.9 | 2041.9 | 2325.4 | 2330.3 | 2039.5 | 1527.0 |
| 67.5° | 421.5  | 429.7  | 606.7  | 842.3  | 1103.8 | 1530.2 | 2019.2 | 2379.8 | 2385.5 | 2079.3 | 1517.2 |
| 68°   | 394.7  | 396.4  | 574.2  | 788.7  | 1053.5 | 1505.9 | 2008.6 | 2382.3 | 2387.1 | 2078.5 | 1507.5 |
| 70°   | 255.9  | 255.9  | 411.0  | 615.7  | 840.7  | 1354.0 | 1916.9 | 2344.1 | 2349.8 | 2042.8 | 1436.8 |
| 72.5° | 138.1  | 140.5  | 234.7  | 372.8  | 574.2  | 1047.8 | 1730.1 | 2145.1 | 2154.8 | 1847.0 | 1256.5 |
| 75°   | 96.7   | 98.3   | 136.5  | 208.7  | 312.7  | 682.3  | 1352.4 | 1639.1 | 1637.5 | 1276.0 | 787.1  |
| 77.5° | 69.9   | 69.9   | 78.0   | 130.0  | 164.1  | 311.9  | 669.3  | 789.5  | 780.6  | 623.0  | 397.2  |
| 80°   | 45.5   | 45.5   | 48.7   | 68.2   | 78.8   | 95.0   | 204.7  | 341.9  | 348.4  | 303.8  | 198.2  |
| 82.5° | 18.7   | 19.5   | 21.1   | 27.6   | 28.4   | 39.8   | 58.5   | 98.3   | 95.0   | 77.2   | 56.0   |
| 85°   | 2.4    | 2.4    | 3.2    | 4.1    | 4.9    | 8.9    | 8.1    | 8.1    | 8.1    | 9.7    | 8.9    |
| 87.5° | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.8    | 1.6    | 2.4    | 2.4    | 3.2    | 2.4    |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |



REPORT NUMBER: P972281

CATALOG NUMBER: GKO-PB2A-740-U-T3

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°   | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 701.8  | 701.8 | 701.8 | 701.8 | 701.8 | 701.8 | 701.8 | 701.8 | 701.8 | 701.8 | 701.8 |
| 2.5°  | 701.8  | 701.8 | 696.9 | 692.0 | 687.1 | 683.1 | 677.4 | 673.3 | 674.2 | 676.6 | 675.8 |
| 5°    | 705.8  | 701.8 | 692.0 | 681.5 | 673.3 | 666.0 | 655.5 | 649.8 | 649.0 | 650.6 | 649.8 |
| 7.5°  | 708.3  | 701.8 | 687.1 | 670.9 | 657.9 | 648.2 | 633.5 | 627.9 | 625.4 | 626.2 | 626.2 |
| 10°   | 713.1  | 702.6 | 682.3 | 659.5 | 643.3 | 629.5 | 614.0 | 605.9 | 603.5 | 603.5 | 602.7 |
| 12.5° | 718.8  | 704.2 | 677.4 | 649.8 | 628.7 | 612.4 | 594.6 | 585.6 | 583.2 | 583.2 | 582.4 |
| 15°   | 724.5  | 706.6 | 672.5 | 639.2 | 614.9 | 595.4 | 578.3 | 567.7 | 564.5 | 564.5 | 566.1 |
| 17.5° | 731.8  | 709.1 | 667.7 | 629.5 | 600.2 | 578.3 | 560.4 | 549.9 | 545.8 | 548.3 | 549.9 |
| 20°   | 739.1  | 714.0 | 662.8 | 618.9 | 585.6 | 562.9 | 545.0 | 534.4 | 530.4 | 534.4 | 535.3 |
| 22.5° | 749.7  | 718.0 | 657.1 | 606.7 | 571.0 | 545.8 | 529.6 | 519.8 | 517.4 | 521.5 | 524.7 |
| 25°   | 760.2  | 722.9 | 649.8 | 593.7 | 552.3 | 527.9 | 515.0 | 507.6 | 508.5 | 514.1 | 517.4 |
| 27.5° | 771.6  | 726.9 | 642.5 | 577.5 | 532.0 | 509.3 | 499.5 | 497.9 | 501.1 | 507.6 | 511.7 |
| 30°   | 785.4  | 732.6 | 632.7 | 558.8 | 509.3 | 489.0 | 484.9 | 489.8 | 495.5 | 502.0 | 506.0 |
| 32.5° | 803.3  | 739.9 | 623.0 | 537.7 | 485.7 | 467.0 | 473.5 | 484.1 | 490.6 | 497.1 | 501.1 |
| 35°   | 828.5  | 754.6 | 617.3 | 516.6 | 460.5 | 448.4 | 463.0 | 480.0 | 484.9 | 489.0 | 493.8 |
| 37.5° | 857.7  | 774.1 | 614.9 | 497.1 | 437.8 | 432.1 | 452.4 | 472.7 | 474.3 | 476.0 | 480.8 |
| 40°   | 886.1  | 788.7 | 608.4 | 476.0 | 414.2 | 414.2 | 439.4 | 458.9 | 458.1 | 455.7 | 458.9 |
| 42.5° | 897.5  | 787.1 | 589.7 | 455.7 | 395.6 | 396.4 | 419.1 | 437.8 | 432.9 | 432.9 | 437.8 |
| 45°   | 930.0  | 800.0 | 575.9 | 439.4 | 378.5 | 375.3 | 393.1 | 407.7 | 415.9 | 426.4 | 431.3 |
| 47.5° | 971.4  | 817.9 | 565.3 | 420.7 | 362.3 | 351.7 | 361.4 | 385.8 | 399.6 | 411.0 | 415.0 |
| 50°   | 1014.5 | 838.2 | 555.6 | 401.2 | 346.0 | 324.9 | 329.8 | 356.6 | 368.8 | 374.4 | 376.9 |
| 52.5° | 1058.3 | 856.9 | 548.3 | 385.0 | 327.3 | 293.2 | 303.8 | 329.0 | 337.9 | 341.1 | 342.8 |
| 55°   | 1097.3 | 872.3 | 541.8 | 371.2 | 306.2 | 268.0 | 276.2 | 302.1 | 308.6 | 311.9 | 314.3 |
| 57.5° | 1138.7 | 889.4 | 537.7 | 358.2 | 282.7 | 246.1 | 251.8 | 275.3 | 284.3 | 287.5 | 290.0 |
| 60°   | 1175.3 | 905.6 | 534.4 | 344.4 | 260.7 | 226.6 | 229.9 | 252.6 | 262.4 | 264.0 | 266.4 |
| 62.5° | 1199.7 | 916.2 | 529.6 | 327.3 | 240.4 | 207.9 | 208.7 | 230.7 | 241.2 | 242.9 | 244.5 |
| 65°   | 1206.2 | 913.8 | 515.0 | 304.6 | 220.1 | 189.2 | 189.2 | 210.4 | 221.7 | 227.4 | 229.9 |
| 67.5° | 1186.7 | 893.5 | 484.1 | 275.3 | 200.6 | 172.2 | 172.2 | 190.9 | 203.1 | 209.6 | 212.0 |
| 68°   | 1180.2 | 884.5 | 474.3 | 268.0 | 195.7 | 168.1 | 168.1 | 187.6 | 199.0 | 204.7 | 206.3 |
| 70°   | 1124.9 | 840.7 | 429.7 | 240.4 | 180.3 | 155.9 | 155.9 | 173.0 | 185.2 | 185.2 | 184.4 |
| 72.5° | 977.1  | 728.6 | 353.3 | 201.4 | 157.6 | 138.1 | 140.5 | 156.8 | 160.8 | 164.9 | 164.1 |
| 75°   | 605.1  | 436.2 | 237.2 | 159.2 | 132.4 | 121.0 | 125.9 | 140.5 | 143.0 | 151.9 | 149.5 |
| 77.5° | 303.0  | 213.6 | 125.9 | 92.6  | 102.3 | 104.0 | 112.9 | 123.5 | 130.8 | 140.5 | 134.0 |
| 80°   | 149.5  | 104.0 | 73.9  | 57.7  | 60.1  | 76.3  | 98.3  | 106.4 | 119.4 | 125.9 | 120.2 |
| 82.5° | 41.4   | 31.7  | 30.1  | 31.7  | 44.7  | 59.3  | 77.2  | 94.2  | 111.3 | 117.0 | 108.8 |
| 85°   | 7.3    | 5.7   | 4.9   | 15.4  | 30.9  | 43.9  | 62.5  | 83.7  | 99.9  | 95.8  | 90.2  |
| 87.5° | 2.4    | 1.6   | 1.6   | 9.7   | 22.7  | 35.7  | 53.6  | 74.7  | 85.3  | 77.2  | 69.0  |
| 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: SP2-2501-321-1

Test Date: 04/09/2025

Luminaire Tested: GKO-PB1E-740-U-T4W

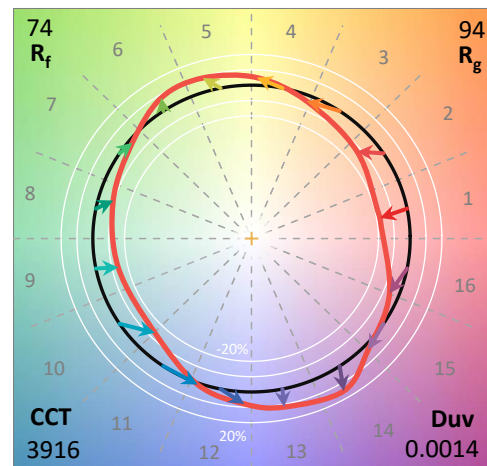
Data in this report applies to families of products including GKO-PB1E-740-U-T4W

### Test Information

Test Method: LM-79-2019  
 Report Number: SP2-2501-321-1  
 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-740-U-T4W**  
 Description: Gekko Wedge Wall Pack Fixture 1 SQ w/ T4W distribution

### Spectral Parameters

|                           |          |           |      |      |       |
|---------------------------|----------|-----------|------|------|-------|
| CCT (K):                  | 3916     | CRI (Ra): | 71.0 |      |       |
| CIE u':                   | 0.2259   | R1:       | 67.4 | R9:  | -37.9 |
| CIE v':                   | 0.5049   | R2:       | 78.3 | R10: | 48.9  |
| Duv:                      | 0.0014   | R3:       | 87.2 | R11: | 64.6  |
| CIE x:                    | 0.3853   | R4:       | 69.5 | R12: | 40.9  |
| CIE y:                    | 0.3827   | R5:       | 67.2 | R13: | 69.2  |
| CIE z:                    | 0.2321   | R6:       | 69.3 | R14: | 92.7  |
| Peak Wavelength (nm):     | 449      | R7:       | 79.9 | R15: | 59.8  |
| Dominant Wavelength (nm): | 578      | R8:       | 48.9 |      |       |
| Purity:                   | 30.46652 |           |      |      |       |
| Rf:                       | 73.5     |           |      |      |       |
| Rg:                       | 93.5     |           |      |      |       |



### Test Conditions

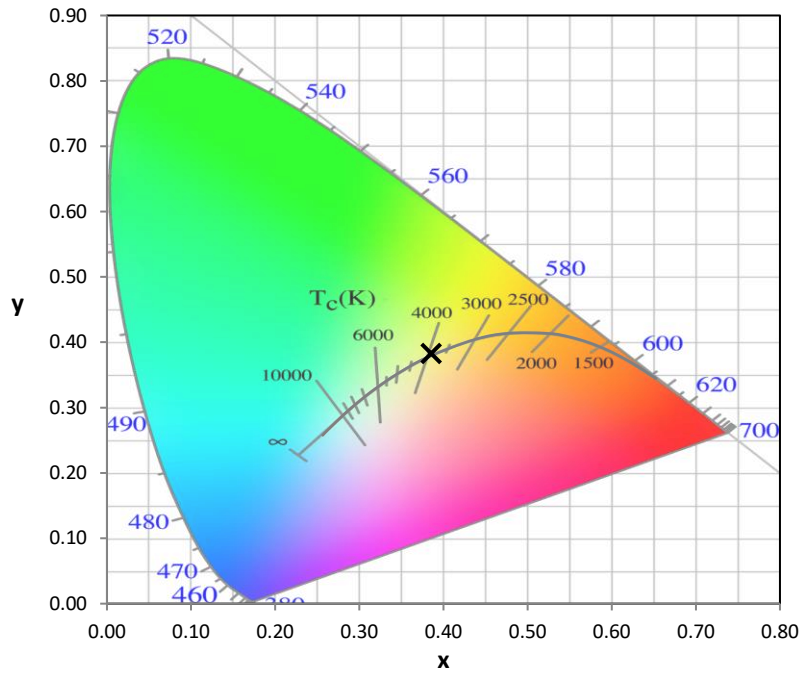
Stabilization Time: 33M  
 Operation Time: 1H 33M  
 Sphere Temperature (°C): 25.0

REPORT NUMBER: SP2-2501-321-1

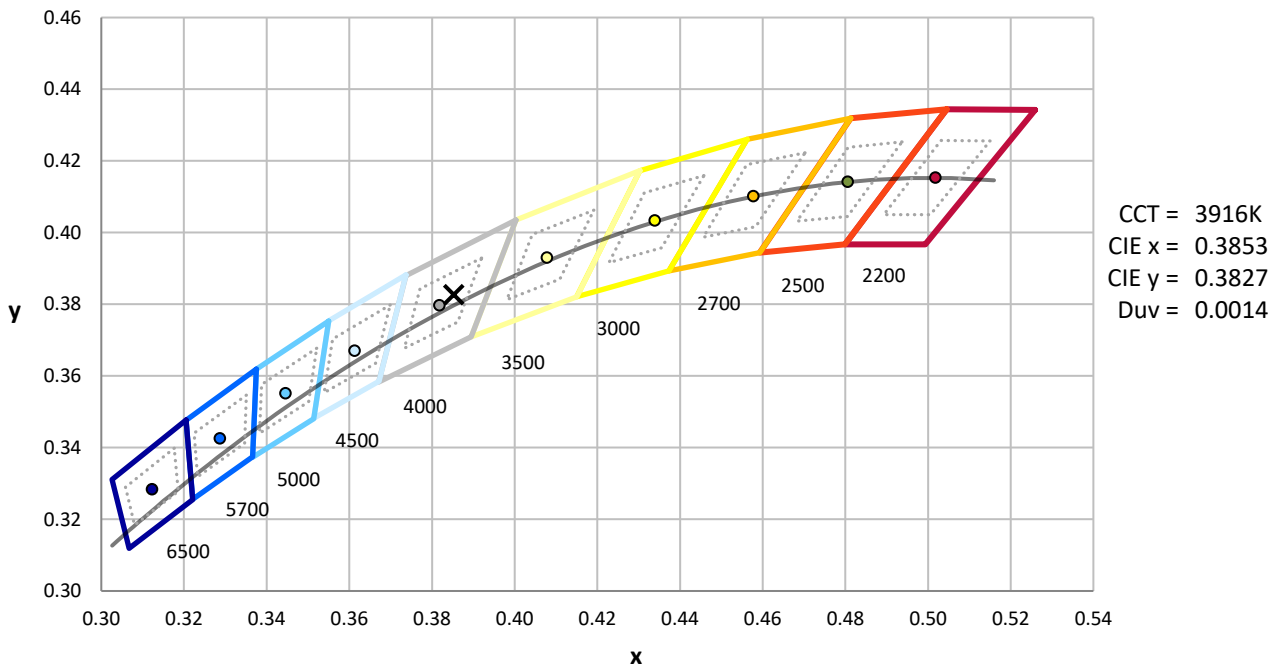
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| 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**



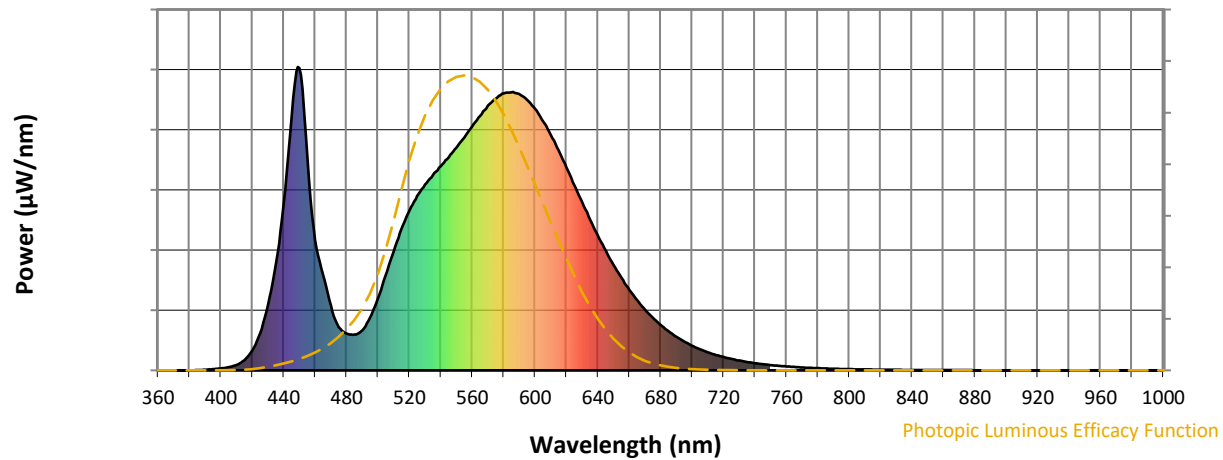
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 4000K 4-step quadrangle

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### Photopic Flux vs. Wavelength

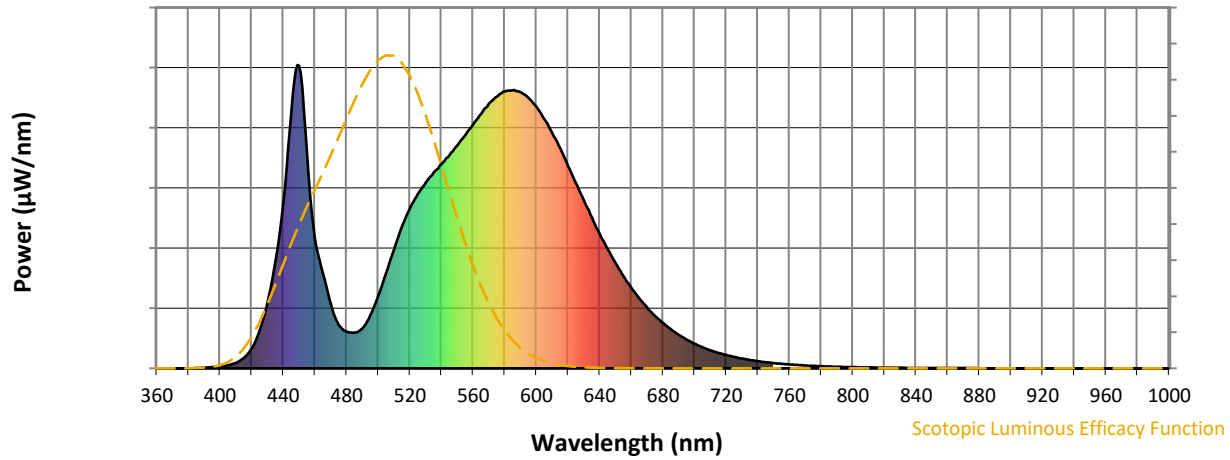


### Photopic Lumens: NR

| λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) |
|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|
| 360    | 0                        | NR            | 490    | 132                      | NR            | 620    | 668                      | NR            | 750    | 17                       | NR            | 880    | 1                        | NR            |
| 365    | 0                        | NR            | 495    | 174                      | NR            | 625    | 611                      | NR            | 755    | 15                       | NR            | 885    | 0                        | NR            |
| 370    | 0                        | NR            | 500    | 238                      | NR            | 630    | 554                      | NR            | 760    | 13                       | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 314                      | NR            | 635    | 498                      | NR            | 765    | 11                       | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 392                      | NR            | 640    | 445                      | NR            | 770    | 10                       | NR            | 900    | 0                        | NR            |
| 385    | 1                        | NR            | 515    | 467                      | NR            | 645    | 394                      | NR            | 775    | 8                        | NR            | 905    | 0                        | NR            |
| 390    | 2                        | NR            | 520    | 526                      | NR            | 650    | 347                      | NR            | 780    | 7                        | NR            | 910    | 0                        | NR            |
| 395    | 4                        | NR            | 525    | 575                      | NR            | 655    | 305                      | NR            | 785    | 6                        | NR            | 915    | 0                        | NR            |
| 400    | 6                        | NR            | 530    | 613                      | NR            | 660    | 266                      | NR            | 790    | 5                        | NR            | 920    | 0                        | NR            |
| 405    | 10                       | NR            | 535    | 644                      | NR            | 665    | 231                      | NR            | 795    | 5                        | NR            | 925    | 0                        | NR            |
| 410    | 18                       | NR            | 540    | 673                      | NR            | 670    | 200                      | NR            | 800    | 4                        | NR            | 930    | 0                        | NR            |
| 415    | 34                       | NR            | 545    | 703                      | NR            | 675    | 174                      | NR            | 805    | 4                        | NR            | 935    | 0                        | NR            |
| 420    | 66                       | NR            | 550    | 734                      | NR            | 680    | 150                      | NR            | 810    | 3                        | NR            | 940    | 0                        | NR            |
| 425    | 124                      | NR            | 555    | 768                      | NR            | 685    | 129                      | NR            | 815    | 3                        | NR            | 945    | 0                        | NR            |
| 430    | 216                      | NR            | 560    | 804                      | NR            | 690    | 111                      | NR            | 820    | 2                        | NR            | 950    | 0                        | NR            |
| 435    | 352                      | NR            | 565    | 838                      | NR            | 695    | 95                       | NR            | 825    | 2                        | NR            | 955    | 0                        | NR            |
| 440    | 548                      | NR            | 570    | 872                      | NR            | 700    | 81                       | NR            | 830    | 2                        | NR            | 960    | 0                        | NR            |
| 445    | 836                      | NR            | 575    | 896                      | NR            | 705    | 69                       | NR            | 835    | 2                        | NR            | 965    | 0                        | NR            |
| 450    | 997                      | NR            | 580    | 913                      | NR            | 710    | 60                       | NR            | 840    | 1                        | NR            | 970    | 0                        | NR            |
| 455    | 705                      | NR            | 585    | 917                      | NR            | 715    | 51                       | NR            | 845    | 1                        | NR            | 975    | 0                        | NR            |
| 460    | 429                      | NR            | 590    | 911                      | NR            | 720    | 44                       | NR            | 850    | 1                        | NR            | 980    | 0                        | NR            |
| 465    | 316                      | NR            | 595    | 891                      | NR            | 725    | 38                       | NR            | 855    | 1                        | NR            | 985    | 0                        | NR            |
| 470    | 213                      | NR            | 600    | 862                      | NR            | 730    | 32                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 143                      | NR            | 605    | 822                      | NR            | 735    | 28                       | NR            | 865    | 1                        | NR            | 995    | 0                        | NR            |
| 480    | 121                      | NR            | 610    | 776                      | NR            | 740    | 24                       | NR            | 870    | 1                        | NR            | 1000   | 0                        | NR            |
| 485    | 118                      | NR            | 615    | 725                      | NR            | 745    | 20                       | NR            | 875    | 1                        | NR            |        |                          |               |

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### Scotopic Flux vs. Wavelength



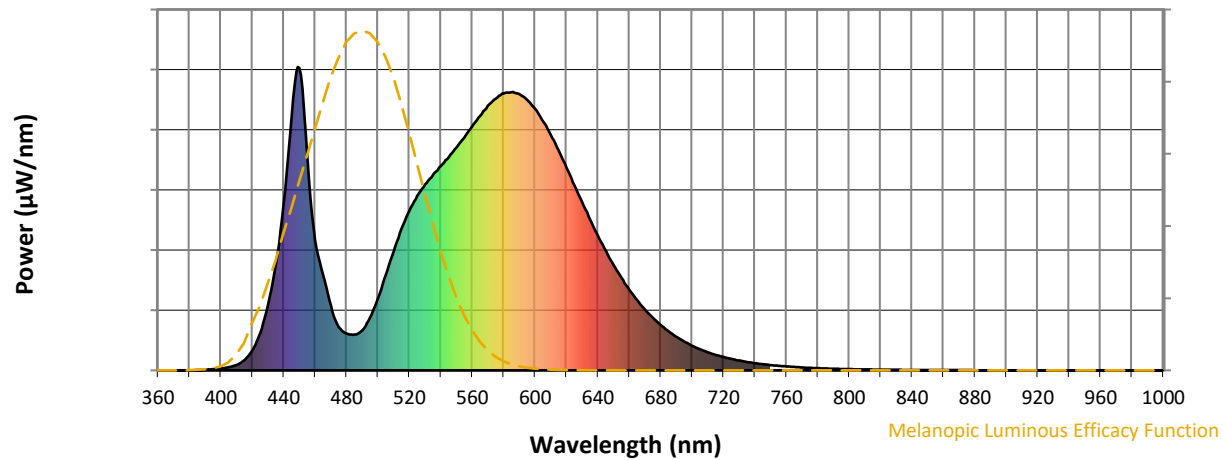
Scotopic Lumens: NR

S/P: 1.49

| $\lambda$<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               | 132                                  | NR                             | 620               | 668                                  | NR                             | 750               | 17                                   | NR                             | 880               | 1                                    | NR                             |
| 365               | 0                                    | NR                             | 495               | 174                                  | NR                             | 625               | 611                                  | NR                             | 755               | 15                                   | NR                             | 885               | 0                                    | NR                             |
| 370               | 0                                    | NR                             | 500               | 238                                  | NR                             | 630               | 554                                  | NR                             | 760               | 13                                   | NR                             | 890               | 0                                    | NR                             |
| 375               | 0                                    | NR                             | 505               | 314                                  | NR                             | 635               | 498                                  | NR                             | 765               | 11                                   | NR                             | 895               | 0                                    | NR                             |
| 380               | 0                                    | NR                             | 510               | 392                                  | NR                             | 640               | 445                                  | NR                             | 770               | 10                                   | NR                             | 900               | 0                                    | NR                             |
| 385               | 1                                    | NR                             | 515               | 467                                  | NR                             | 645               | 394                                  | NR                             | 775               | 8                                    | NR                             | 905               | 0                                    | NR                             |
| 390               | 2                                    | NR                             | 520               | 526                                  | NR                             | 650               | 347                                  | NR                             | 780               | 7                                    | NR                             | 910               | 0                                    | NR                             |
| 395               | 4                                    | NR                             | 525               | 575                                  | NR                             | 655               | 305                                  | NR                             | 785               | 6                                    | NR                             | 915               | 0                                    | NR                             |
| 400               | 6                                    | NR                             | 530               | 613                                  | NR                             | 660               | 266                                  | NR                             | 790               | 5                                    | NR                             | 920               | 0                                    | NR                             |
| 405               | 10                                   | NR                             | 535               | 644                                  | NR                             | 665               | 231                                  | NR                             | 795               | 5                                    | NR                             | 925               | 0                                    | NR                             |
| 410               | 18                                   | NR                             | 540               | 673                                  | NR                             | 670               | 200                                  | NR                             | 800               | 4                                    | NR                             | 930               | 0                                    | NR                             |
| 415               | 34                                   | NR                             | 545               | 703                                  | NR                             | 675               | 174                                  | NR                             | 805               | 4                                    | NR                             | 935               | 0                                    | NR                             |
| 420               | 66                                   | NR                             | 550               | 734                                  | NR                             | 680               | 150                                  | NR                             | 810               | 3                                    | NR                             | 940               | 0                                    | NR                             |
| 425               | 124                                  | NR                             | 555               | 768                                  | NR                             | 685               | 129                                  | NR                             | 815               | 3                                    | NR                             | 945               | 0                                    | NR                             |
| 430               | 216                                  | NR                             | 560               | 804                                  | NR                             | 690               | 111                                  | NR                             | 820               | 2                                    | NR                             | 950               | 0                                    | NR                             |
| 435               | 352                                  | NR                             | 565               | 838                                  | NR                             | 695               | 95                                   | NR                             | 825               | 2                                    | NR                             | 955               | 0                                    | NR                             |
| 440               | 548                                  | NR                             | 570               | 872                                  | NR                             | 700               | 81                                   | NR                             | 830               | 2                                    | NR                             | 960               | 0                                    | NR                             |
| 445               | 836                                  | NR                             | 575               | 896                                  | NR                             | 705               | 69                                   | NR                             | 835               | 2                                    | NR                             | 965               | 0                                    | NR                             |
| 450               | 997                                  | NR                             | 580               | 913                                  | NR                             | 710               | 60                                   | NR                             | 840               | 1                                    | NR                             | 970               | 0                                    | NR                             |
| 455               | 705                                  | NR                             | 585               | 917                                  | NR                             | 715               | 51                                   | NR                             | 845               | 1                                    | NR                             | 975               | 0                                    | NR                             |
| 460               | 429                                  | NR                             | 590               | 911                                  | NR                             | 720               | 44                                   | NR                             | 850               | 1                                    | NR                             | 980               | 0                                    | NR                             |
| 465               | 316                                  | NR                             | 595               | 891                                  | NR                             | 725               | 38                                   | NR                             | 855               | 1                                    | NR                             | 985               | 0                                    | NR                             |
| 470               | 213                                  | NR                             | 600               | 862                                  | NR                             | 730               | 32                                   | NR                             | 860               | 1                                    | NR                             | 990               | 0                                    | NR                             |
| 475               | 143                                  | NR                             | 605               | 822                                  | NR                             | 735               | 28                                   | NR                             | 865               | 1                                    | NR                             | 995               | 0                                    | NR                             |
| 480               | 121                                  | NR                             | 610               | 776                                  | NR                             | 740               | 24                                   | NR                             | 870               | 1                                    | NR                             | 1000              | 0                                    | NR                             |
| 485               | 118                                  | NR                             | 615               | 725                                  | NR                             | 745               | 20                                   | NR                             | 875               | 1                                    | NR                             |                   |                                      |                                |

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### Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 2.88

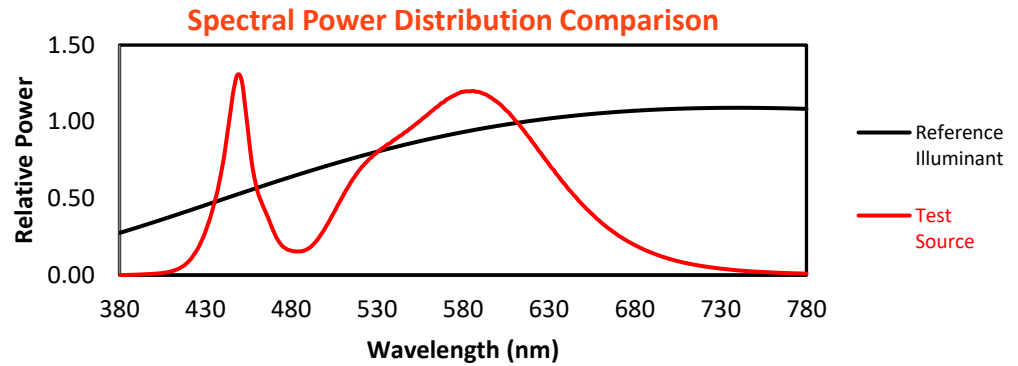
| $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | 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               | 132                                    | NR                             | 620               | 668                                    | NR                             | 750               | 17                                     | NR                             | 880               | 1                                      | NR                             |
| 365               | 0                                      | NR                             | 495               | 174                                    | NR                             | 625               | 611                                    | NR                             | 755               | 15                                     | NR                             | 885               | 0                                      | NR                             |
| 370               | 0                                      | NR                             | 500               | 238                                    | NR                             | 630               | 554                                    | NR                             | 760               | 13                                     | NR                             | 890               | 0                                      | NR                             |
| 375               | 0                                      | NR                             | 505               | 314                                    | NR                             | 635               | 498                                    | NR                             | 765               | 11                                     | NR                             | 895               | 0                                      | NR                             |
| 380               | 0                                      | NR                             | 510               | 392                                    | NR                             | 640               | 445                                    | NR                             | 770               | 10                                     | NR                             | 900               | 0                                      | NR                             |
| 385               | 1                                      | NR                             | 515               | 467                                    | NR                             | 645               | 394                                    | NR                             | 775               | 8                                      | NR                             | 905               | 0                                      | NR                             |
| 390               | 2                                      | NR                             | 520               | 526                                    | NR                             | 650               | 347                                    | NR                             | 780               | 7                                      | NR                             | 910               | 0                                      | NR                             |
| 395               | 4                                      | NR                             | 525               | 575                                    | NR                             | 655               | 305                                    | NR                             | 785               | 6                                      | NR                             | 915               | 0                                      | NR                             |
| 400               | 6                                      | NR                             | 530               | 613                                    | NR                             | 660               | 266                                    | NR                             | 790               | 5                                      | NR                             | 920               | 0                                      | NR                             |
| 405               | 10                                     | NR                             | 535               | 644                                    | NR                             | 665               | 231                                    | NR                             | 795               | 5                                      | NR                             | 925               | 0                                      | NR                             |
| 410               | 18                                     | NR                             | 540               | 673                                    | NR                             | 670               | 200                                    | NR                             | 800               | 4                                      | NR                             | 930               | 0                                      | NR                             |
| 415               | 34                                     | NR                             | 545               | 703                                    | NR                             | 675               | 174                                    | NR                             | 805               | 4                                      | NR                             | 935               | 0                                      | NR                             |
| 420               | 66                                     | NR                             | 550               | 734                                    | NR                             | 680               | 150                                    | NR                             | 810               | 3                                      | NR                             | 940               | 0                                      | NR                             |
| 425               | 124                                    | NR                             | 555               | 768                                    | NR                             | 685               | 129                                    | NR                             | 815               | 3                                      | NR                             | 945               | 0                                      | NR                             |
| 430               | 216                                    | NR                             | 560               | 804                                    | NR                             | 690               | 111                                    | NR                             | 820               | 2                                      | NR                             | 950               | 0                                      | NR                             |
| 435               | 352                                    | NR                             | 565               | 838                                    | NR                             | 695               | 95                                     | NR                             | 825               | 2                                      | NR                             | 955               | 0                                      | NR                             |
| 440               | 548                                    | NR                             | 570               | 872                                    | NR                             | 700               | 81                                     | NR                             | 830               | 2                                      | NR                             | 960               | 0                                      | NR                             |
| 445               | 836                                    | NR                             | 575               | 896                                    | NR                             | 705               | 69                                     | NR                             | 835               | 2                                      | NR                             | 965               | 0                                      | NR                             |
| 450               | 997                                    | NR                             | 580               | 913                                    | NR                             | 710               | 60                                     | NR                             | 840               | 1                                      | NR                             | 970               | 0                                      | NR                             |
| 455               | 705                                    | NR                             | 585               | 917                                    | NR                             | 715               | 51                                     | NR                             | 845               | 1                                      | NR                             | 975               | 0                                      | NR                             |
| 460               | 429                                    | NR                             | 590               | 911                                    | NR                             | 720               | 44                                     | NR                             | 850               | 1                                      | NR                             | 980               | 0                                      | NR                             |
| 465               | 316                                    | NR                             | 595               | 891                                    | NR                             | 725               | 38                                     | NR                             | 855               | 1                                      | NR                             | 985               | 0                                      | NR                             |
| 470               | 213                                    | NR                             | 600               | 862                                    | NR                             | 730               | 32                                     | NR                             | 860               | 1                                      | NR                             | 990               | 0                                      | NR                             |
| 475               | 143                                    | NR                             | 605               | 822                                    | NR                             | 735               | 28                                     | NR                             | 865               | 1                                      | NR                             | 995               | 0                                      | NR                             |
| 480               | 121                                    | NR                             | 610               | 776                                    | NR                             | 740               | 24                                     | NR                             | 870               | 1                                      | NR                             | 1000              | 0                                      | NR                             |
| 485               | 118                                    | NR                             | 615               | 725                                    | NR                             | 745               | 20                                     | NR                             | 875               | 1                                      | NR                             |                   |                                        |                                |

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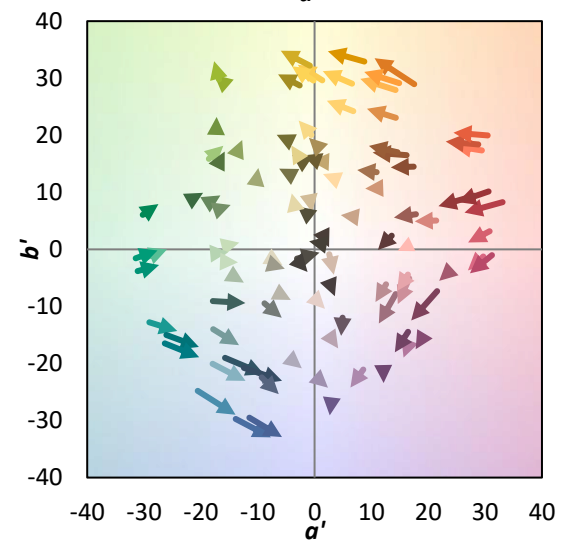
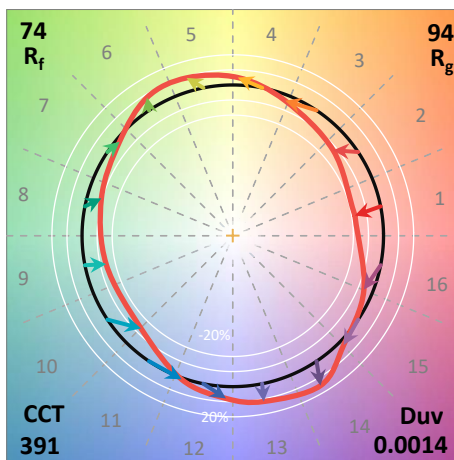
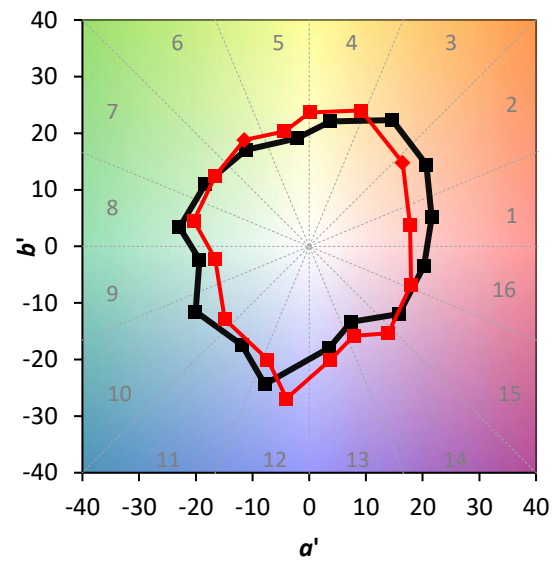
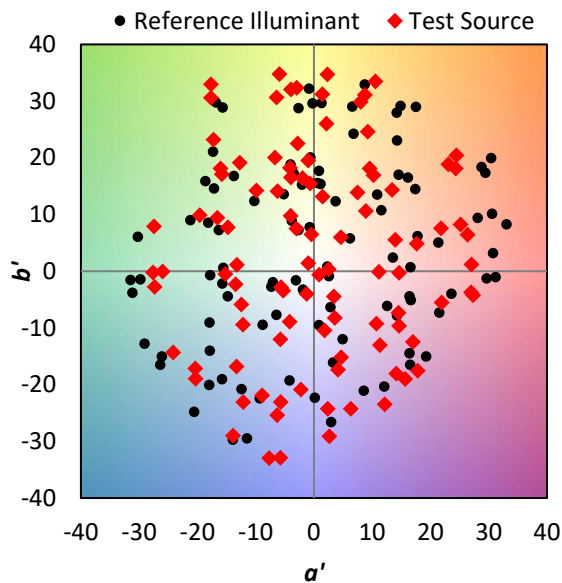
TM-30-18

### Summary

$R_f = 73.5$   
 $R_g = 93.5$   
 CIE  $R_a = 71.0$   
 $R_g = -37.9$



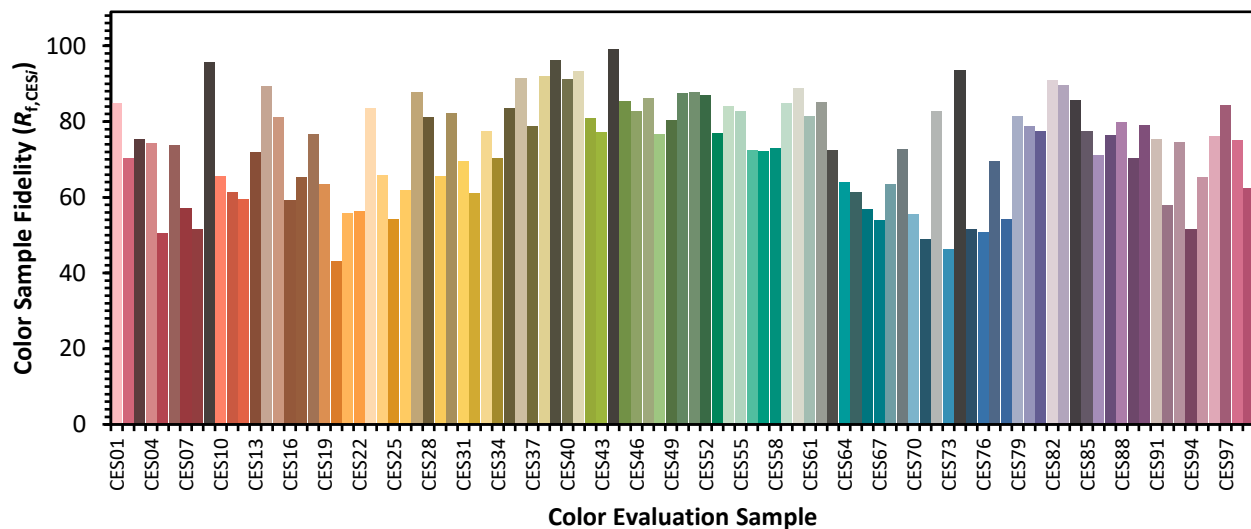
### Color Vector Graphics



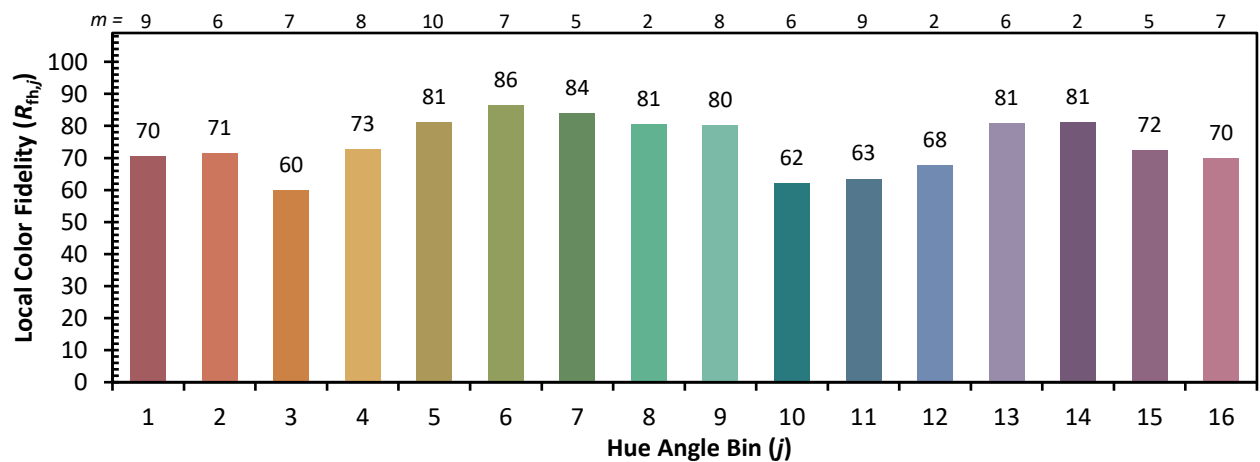
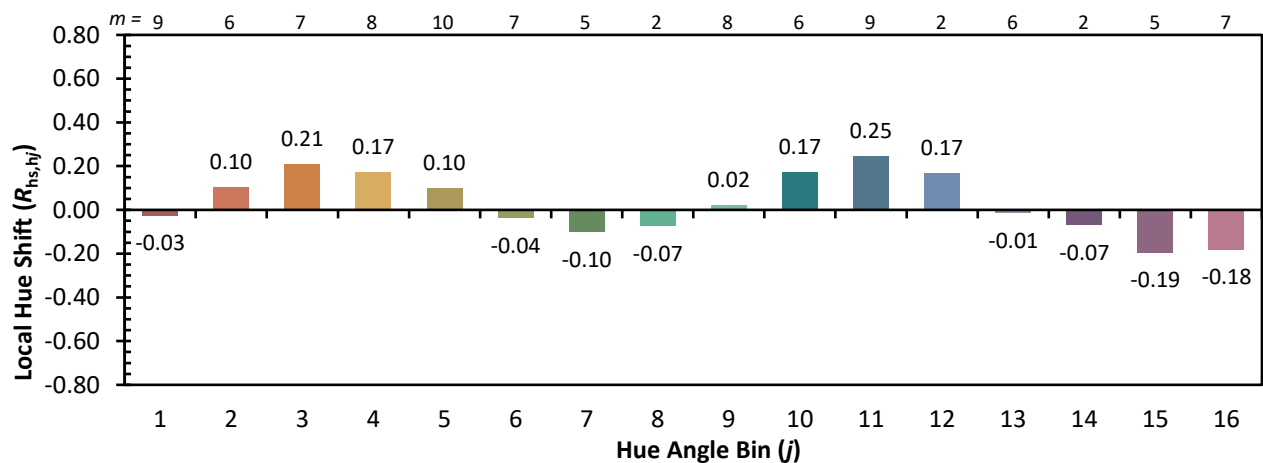
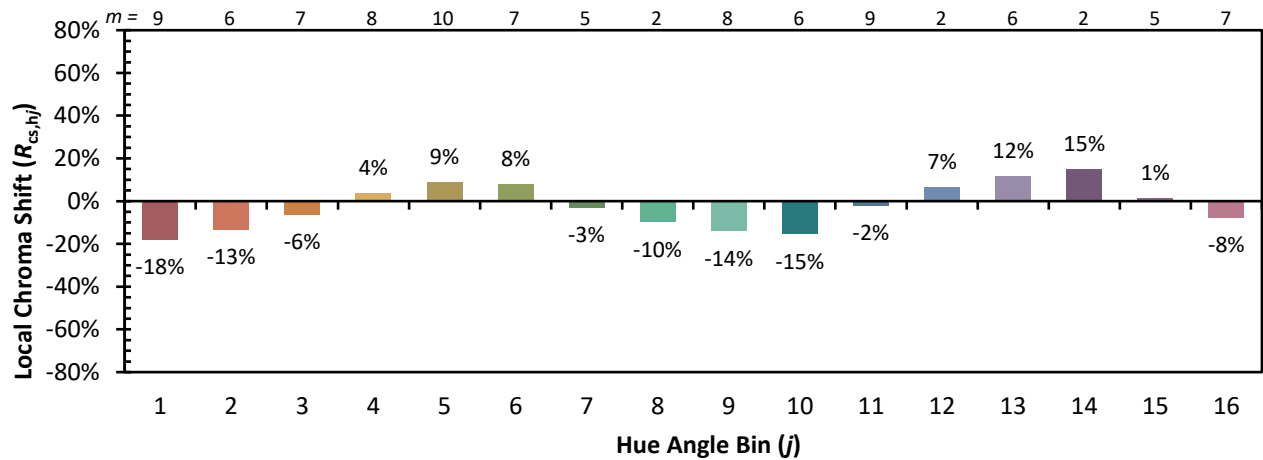


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

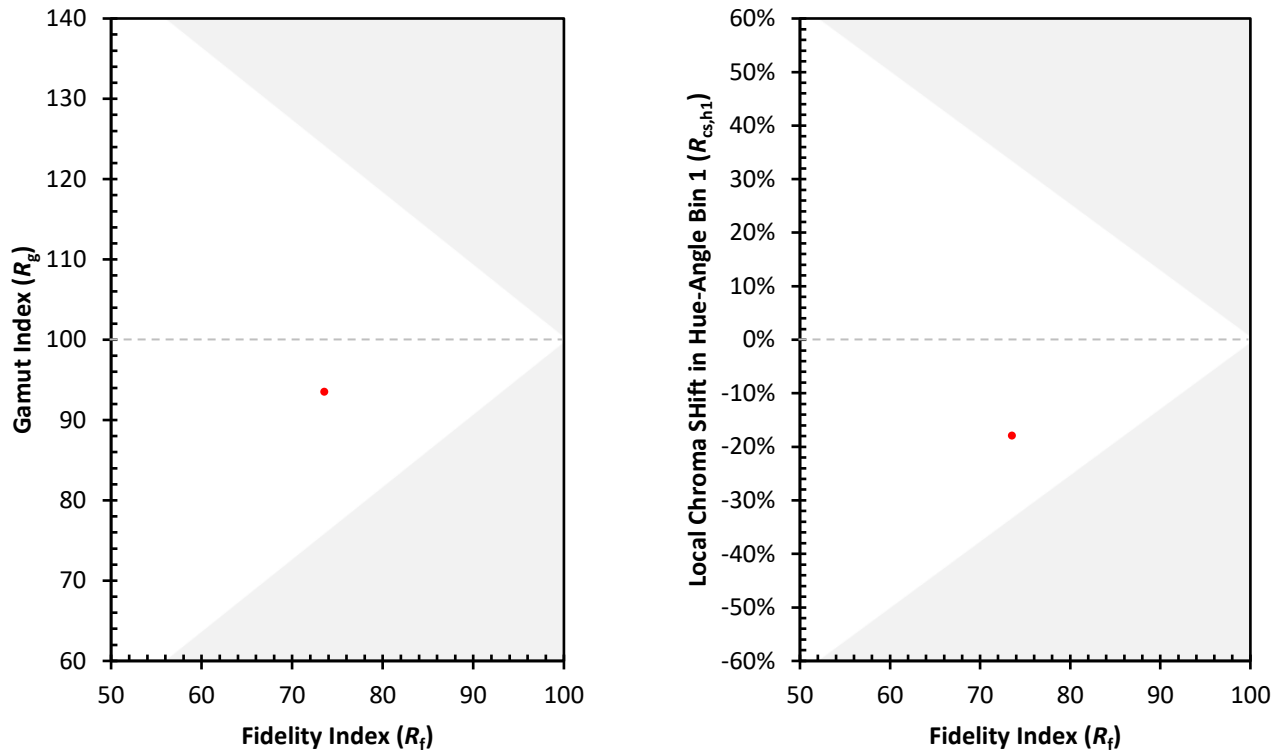
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 62 | CES51 = 88 | CES76 = 51 |
| CES02 = 61 | CES27 = 88 | CES52 = 87 | CES77 = 70 |
| CES03 = 30 | CES28 = 81 | CES53 = 77 | CES78 = 54 |
| CES04 = 70 | CES29 = 66 | CES54 = 84 | CES79 = 81 |
| CES05 = 47 | CES30 = 82 | CES55 = 83 | CES80 = 79 |
| CES06 = 50 | CES31 = 69 | CES56 = 73 | CES81 = 77 |
| CES07 = 40 | CES32 = 61 | CES57 = 72 | CES82 = 91 |
| CES08 = 39 | CES33 = 77 | CES58 = 73 | CES83 = 90 |
| CES09 = 29 | CES34 = 70 | CES59 = 85 | CES84 = 86 |
| CES10 = 74 | CES35 = 84 | CES60 = 89 | CES85 = 77 |
| CES11 = 57 | CES36 = 91 | CES61 = 81 | CES86 = 71 |
| CES12 = 63 | CES37 = 79 | CES62 = 85 | CES87 = 76 |
| CES13 = 42 | CES38 = 92 | CES63 = 72 | CES88 = 80 |
| CES14 = 74 | CES39 = 96 | CES64 = 64 | CES89 = 70 |
| CES15 = 71 | CES40 = 91 | CES65 = 61 | CES90 = 79 |
| CES16 = 46 | CES41 = 93 | CES66 = 57 | CES91 = 75 |
| CES17 = 49 | CES42 = 81 | CES67 = 54 | CES92 = 58 |
| CES18 = 56 | CES43 = 77 | CES68 = 63 | CES93 = 75 |
| CES19 = 72 | CES44 = 99 | CES69 = 73 | CES94 = 52 |
| CES20 = 65 | CES45 = 85 | CES70 = 56 | CES95 = 65 |
| CES21 = 86 | CES46 = 83 | CES71 = 49 | CES96 = 76 |
| CES22 = 78 | CES47 = 86 | CES72 = 83 | CES97 = 84 |
| CES23 = 92 | CES48 = 77 | CES73 = 46 | CES98 = 75 |
| CES24 = 91 | CES49 = 81 | CES74 = 93 | CES99 = 62 |
| CES25 = 72 | CES50 = 87 | CES75 = 52 |            |



### Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)