

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: P972261

Luminaire Tested: **GKO-PB2A-727-U-T3**

Issue Date: 02/27/2025

**Test Information**

Test Method: LM-79-08  
Report Number: P972261  
Test Lab: INNOVATION CENTER(G1)  
Issue Date: 02/27/2025  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: MCGRAW-EDISON  
Catalog Number: GKO-PB2A-727-U-T3  
Description: GEKKO WALL PACK 4000LM PACKAGE 70CRI 2700K FIXTURE w/ TYPE III  
DISTRIBUTION OPTIC  
Light Source: (20) 2700K CCT, 70 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 3849.4 lumens  
Efficiency: N/A  
Efficacy: 145.3 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

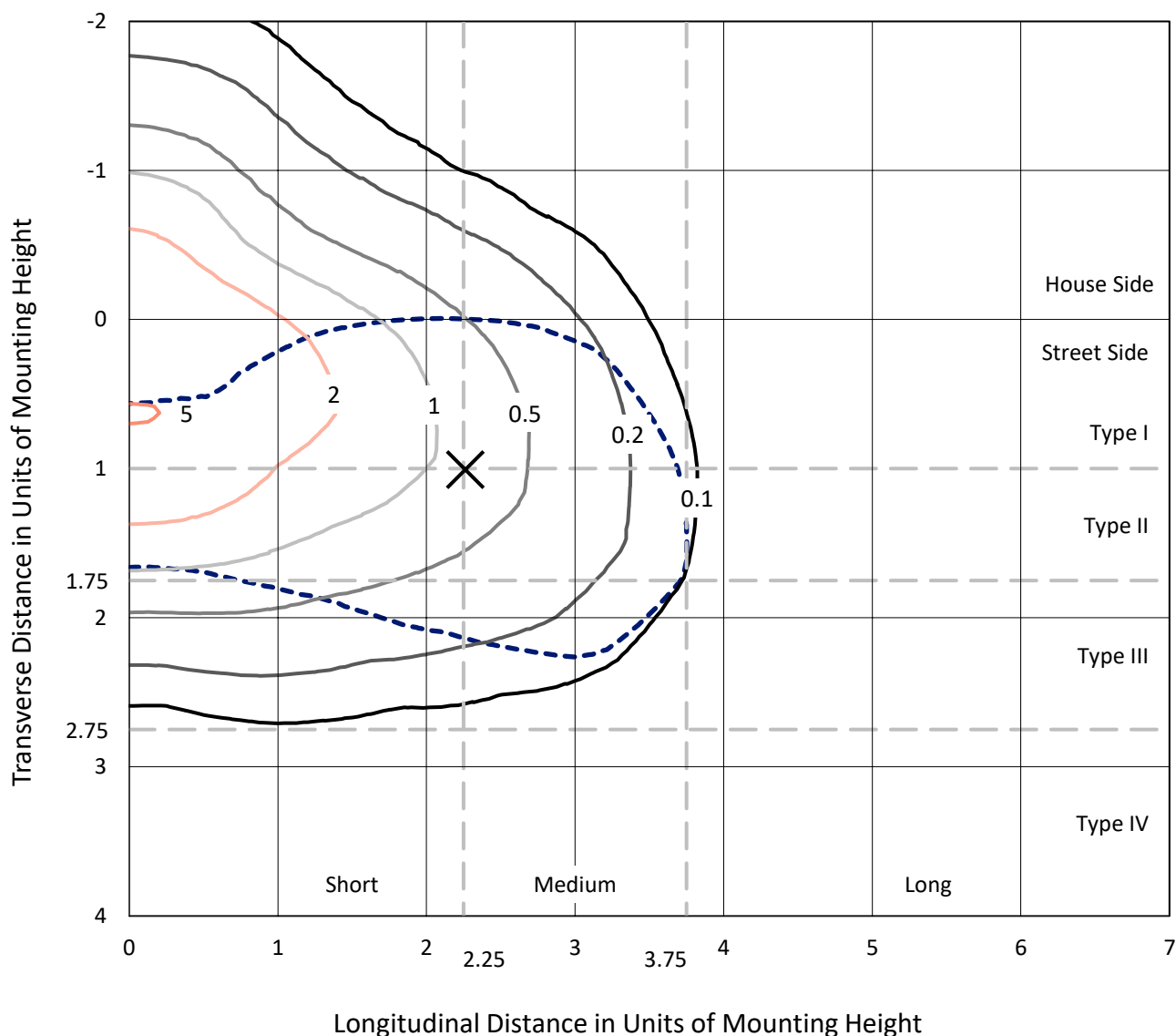
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## Iso-Footcandle Lines of Horizontal Illumination

× Max cd

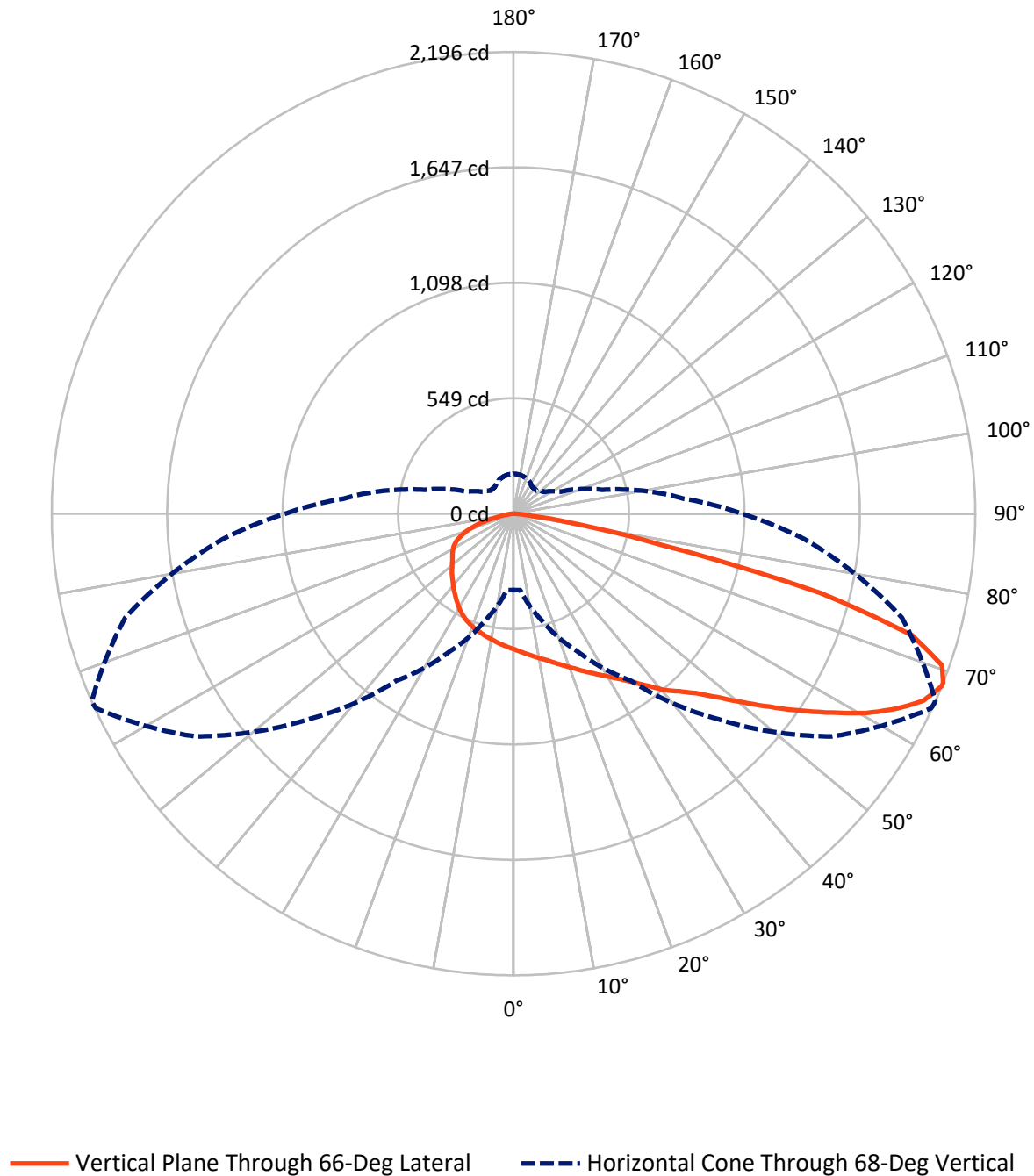
--- 1/2 Max cd



Based on 12 foot mounting height. Maximum calculated value = 5.2 fc  
 Type III - Medium - N/A

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## Luminous Intensity Polar Plot



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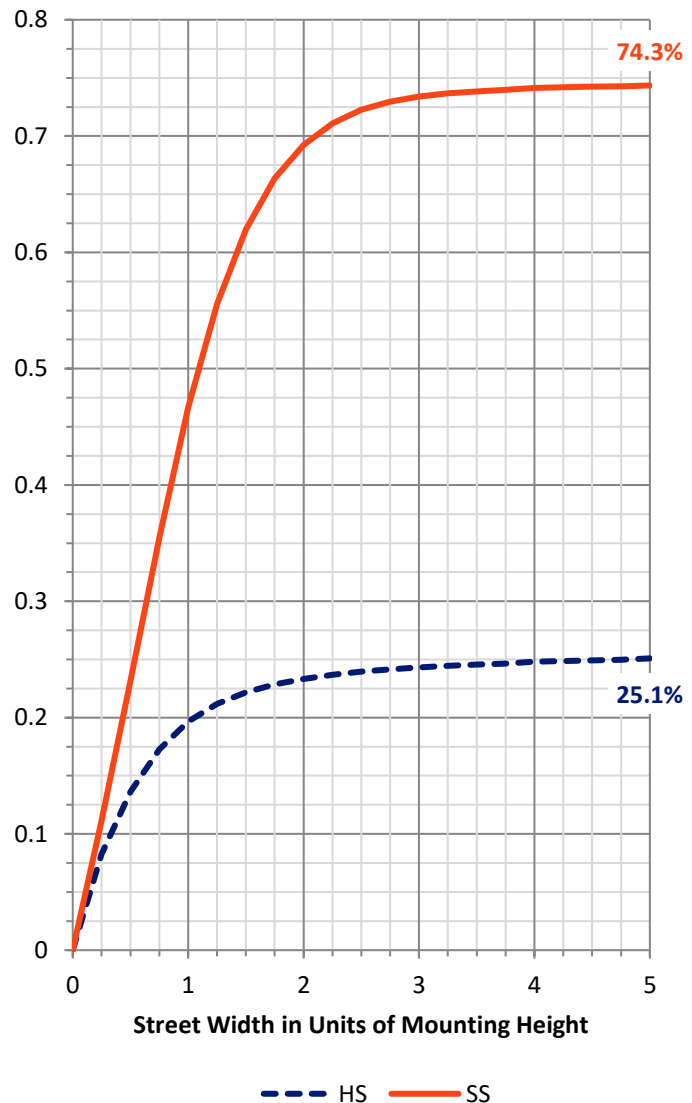
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 985.5    | 0.0    | 985.5  |
|                    | % Fixture | 25.6     | 0.0    | 25.6   |
| <b>Street Side</b> | Lumens    | 2863.9   | 0.0    | 2863.9 |
|                    | % Fixture | 74.4     | 0.0    | 74.4   |
| <b>Total</b>       | Lumens    | 3849.4   | 0.0    | 3849.4 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 61.9   | 1.6       |
| 10°-20°   | 186.2  | 4.8       |
| 20°-30°   | 320.8  | 8.3       |
| 30°-40°   | 497.7  | 12.9      |
| 40°-50°   | 681.8  | 17.7      |
| 50°-60°   | 813.3  | 21.1      |
| 60°-70°   | 814.9  | 21.2      |
| 70°-80°   | 431.2  | 11.2      |
| 80°-90°   | 41.6   | 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°    | 3849.4 | 100.0     |
| 0°-180°   | 3849.4 | 100.0     |



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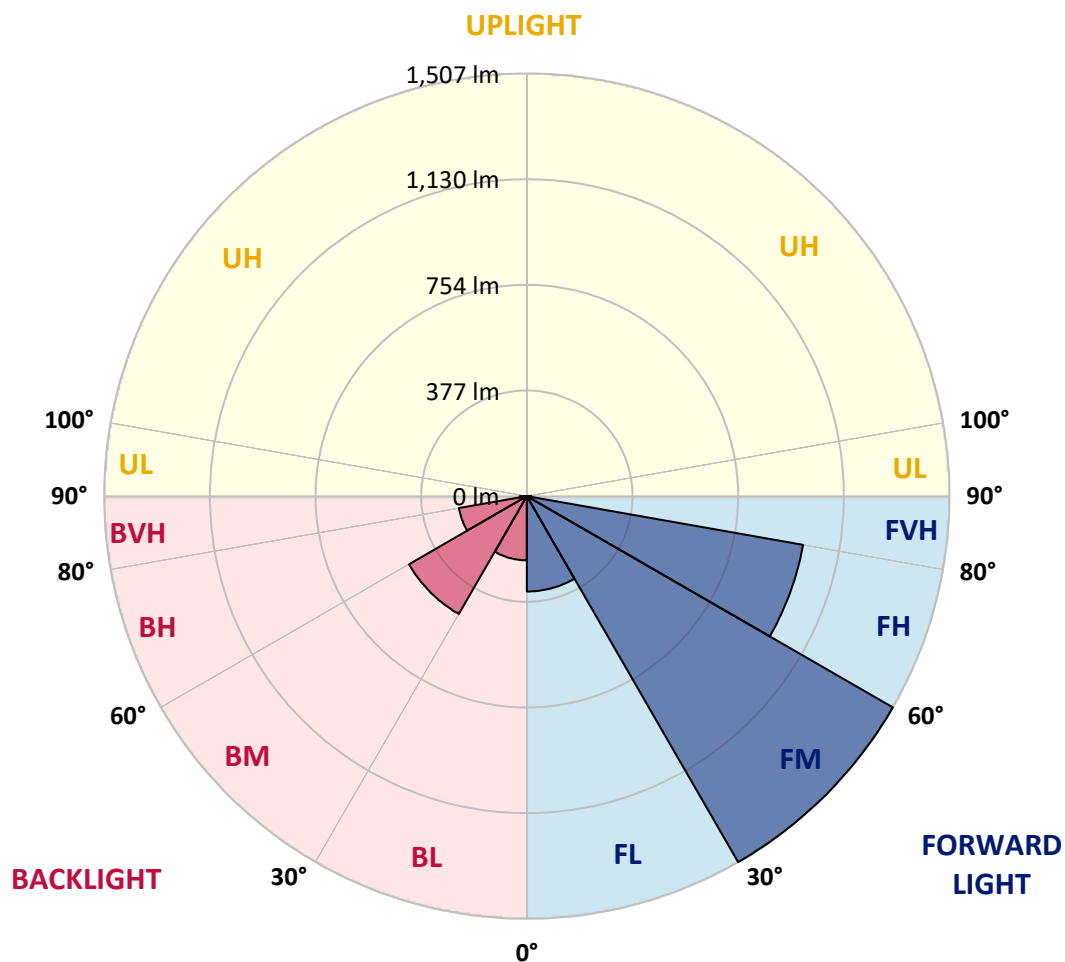
CATALOG NUMBER: GKO-PB2A-727-U-T3

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 340.0  | 8.8       |                         |      |         |
| FM   | (30°-60°)   | 1507.2 | 39.2      |                         |      |         |
| FH   | (60°-80°)   | 1000.3 | 26.0      |                         |      | G1/1800 |
| FVH  | (80°-90°)   | 16.4   | 0.4       |                         |      | G1/100  |
| BL   | (0°-30°)    | 228.9  | 5.9       | B1/500                  |      |         |
| BM   | (30°-60°)   | 485.5  | 12.6      | B1/1000                 |      |         |
| BH   | (60°-80°)   | 245.9  | 6.4       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 25.3   | 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°    | 645.6  | 645.6  | 645.6  | 645.6  | 645.6  | 645.6  | 645.6  | 645.6  | 645.6  | 645.6  | 645.6  |
| 2.5°  | 672.5  | 672.5  | 671.0  | 670.3  | 669.5  | 665.1  | 662.1  | 658.3  | 658.3  | 652.4  | 647.1  |
| 5°    | 695.7  | 696.4  | 693.4  | 693.4  | 690.5  | 684.5  | 678.5  | 671.0  | 671.0  | 662.1  | 651.6  |
| 7.5°  | 715.9  | 718.1  | 715.1  | 715.1  | 712.1  | 705.4  | 695.7  | 685.2  | 685.2  | 672.5  | 657.6  |
| 10°   | 735.3  | 736.8  | 735.3  | 736.8  | 732.3  | 726.3  | 715.1  | 700.9  | 700.2  | 684.5  | 663.6  |
| 12.5° | 751.0  | 752.5  | 753.2  | 755.5  | 751.7  | 747.3  | 736.8  | 718.9  | 716.6  | 697.9  | 671.0  |
| 15°   | 765.9  | 767.4  | 769.7  | 772.7  | 771.9  | 768.2  | 758.5  | 738.3  | 736.8  | 712.9  | 680.7  |
| 17.5° | 777.9  | 778.6  | 783.1  | 789.1  | 790.6  | 791.3  | 780.9  | 760.0  | 758.5  | 730.1  | 691.2  |
| 20°   | 795.1  | 796.6  | 801.1  | 807.0  | 811.5  | 814.5  | 806.3  | 783.1  | 781.6  | 750.2  | 704.7  |
| 22.5° | 833.9  | 831.7  | 833.9  | 833.9  | 836.2  | 840.7  | 834.7  | 811.5  | 808.5  | 774.2  | 721.1  |
| 25°   | 907.2  | 904.9  | 898.9  | 885.5  | 870.5  | 869.8  | 863.1  | 840.7  | 836.9  | 798.8  | 736.8  |
| 27.5° | 1009.5 | 1004.3 | 993.1  | 964.7  | 928.8  | 905.7  | 895.2  | 872.0  | 867.6  | 823.5  | 751.7  |
| 30°   | 1117.9 | 1123.9 | 1105.2 | 1066.3 | 1000.6 | 951.3  | 931.1  | 904.9  | 901.2  | 851.1  | 769.7  |
| 32.5° | 1244.2 | 1244.9 | 1226.2 | 1172.4 | 1087.3 | 1008.8 | 974.4  | 942.3  | 939.3  | 883.3  | 793.6  |
| 35°   | 1317.4 | 1320.4 | 1312.2 | 1262.1 | 1165.0 | 1072.3 | 1026.7 | 987.9  | 985.6  | 923.6  | 823.5  |
| 37.5° | 1393.6 | 1400.3 | 1387.6 | 1332.4 | 1224.0 | 1131.3 | 1085.0 | 1042.4 | 1040.2 | 969.9  | 860.8  |
| 40°   | 1506.5 | 1503.5 | 1490.0 | 1408.6 | 1279.3 | 1180.7 | 1142.5 | 1108.9 | 1103.7 | 1026.7 | 898.9  |
| 42.5° | 1587.9 | 1595.4 | 1566.2 | 1474.3 | 1339.8 | 1230.0 | 1200.1 | 1162.0 | 1155.3 | 1061.1 | 921.4  |
| 45°   | 1615.6 | 1608.8 | 1576.7 | 1509.4 | 1419.0 | 1274.8 | 1254.6 | 1225.5 | 1218.8 | 1121.6 | 965.4  |
| 47.5° | 1621.5 | 1609.6 | 1581.2 | 1530.4 | 1486.3 | 1333.1 | 1321.1 | 1314.4 | 1304.7 | 1197.8 | 1018.5 |
| 50°   | 1584.9 | 1576.7 | 1563.3 | 1537.8 | 1529.6 | 1387.6 | 1393.6 | 1418.3 | 1410.1 | 1280.0 | 1077.5 |
| 52.5° | 1502.0 | 1498.2 | 1510.2 | 1526.6 | 1505.0 | 1434.7 | 1479.6 | 1529.6 | 1526.6 | 1370.5 | 1141.1 |
| 55°   | 1345.8 | 1345.8 | 1413.1 | 1470.6 | 1483.3 | 1465.4 | 1572.2 | 1658.2 | 1654.4 | 1472.1 | 1201.6 |
| 57.5° | 1203.1 | 1205.3 | 1261.4 | 1390.6 | 1444.4 | 1498.2 | 1675.3 | 1792.7 | 1786.7 | 1586.4 | 1265.1 |
| 60°   | 1023.0 | 1023.0 | 1108.2 | 1270.3 | 1388.4 | 1523.6 | 1766.5 | 1922.7 | 1926.4 | 1697.0 | 1327.9 |
| 62.5° | 810.0  | 812.3  | 930.3  | 1120.9 | 1307.7 | 1528.1 | 1839.0 | 2045.2 | 2044.5 | 1797.1 | 1376.4 |
| 65°   | 597.1  | 597.8  | 758.5  | 955.0  | 1186.6 | 1496.7 | 1878.6 | 2139.4 | 2143.9 | 1876.3 | 1404.8 |
| 67.5° | 387.8  | 395.3  | 558.2  | 774.9  | 1015.5 | 1407.8 | 1857.7 | 2189.4 | 2194.7 | 1913.0 | 1395.9 |
| 68°   | 363.2  | 364.7  | 528.3  | 725.6  | 969.2  | 1385.4 | 1848.0 | 2191.7 | 2196.2 | 1912.2 | 1386.9 |
| 70°   | 235.4  | 235.4  | 378.1  | 566.4  | 773.4  | 1245.7 | 1763.5 | 2156.6 | 2161.8 | 1879.3 | 1321.9 |
| 72.5° | 127.0  | 129.3  | 216.0  | 343.0  | 528.3  | 964.0  | 1591.6 | 1973.5 | 1982.5 | 1699.3 | 1156.0 |
| 75°   | 88.9   | 90.4   | 125.5  | 192.0  | 287.7  | 627.7  | 1244.2 | 1508.0 | 1506.5 | 1173.9 | 724.1  |
| 77.5° | 64.3   | 64.3   | 71.7   | 119.6  | 150.9  | 286.9  | 615.7  | 726.3  | 718.1  | 573.1  | 365.4  |
| 80°   | 41.8   | 41.8   | 44.8   | 62.8   | 72.5   | 87.4   | 188.3  | 314.6  | 320.6  | 279.5  | 182.3  |
| 82.5° | 17.2   | 17.9   | 19.4   | 25.4   | 26.2   | 36.6   | 53.8   | 90.4   | 87.4   | 71.0   | 51.6   |
| 85°   | 2.2    | 2.2    | 3.0    | 3.7    | 4.5    | 8.2    | 7.5    | 7.5    | 7.5    | 9.0    | 8.2    |
| 87.5° | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.7    | 1.5    | 2.2    | 2.2    | 3.0    | 2.2    |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

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CATALOG NUMBER: GKO-PB2A-727-U-T3

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°   | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 645.6  | 645.6 | 645.6 | 645.6 | 645.6 | 645.6 | 645.6 | 645.6 | 645.6 | 645.6 | 645.6 |
| 2.5°  | 645.6  | 645.6 | 641.1 | 636.7 | 632.2 | 628.4 | 623.2 | 619.5 | 620.2 | 622.5 | 621.7 |
| 5°    | 649.4  | 645.6 | 636.7 | 626.9 | 619.5 | 612.7 | 603.0 | 597.8 | 597.1 | 598.5 | 597.8 |
| 7.5°  | 651.6  | 645.6 | 632.2 | 617.2 | 605.3 | 596.3 | 582.9 | 577.6 | 575.4 | 576.1 | 576.1 |
| 10°   | 656.1  | 646.4 | 627.7 | 606.8 | 591.8 | 579.1 | 564.9 | 557.4 | 555.2 | 555.2 | 554.5 |
| 12.5° | 661.3  | 647.9 | 623.2 | 597.8 | 578.4 | 563.4 | 547.0 | 538.8 | 536.5 | 536.5 | 535.8 |
| 15°   | 666.5  | 650.1 | 618.7 | 588.1 | 565.7 | 547.7 | 532.0 | 522.3 | 519.3 | 519.3 | 520.8 |
| 17.5° | 673.3  | 652.4 | 614.2 | 579.1 | 552.2 | 532.0 | 515.6 | 505.9 | 502.2 | 504.4 | 505.9 |
| 20°   | 680.0  | 656.8 | 609.8 | 569.4 | 538.8 | 517.8 | 501.4 | 491.7 | 488.0 | 491.7 | 492.4 |
| 22.5° | 689.7  | 660.6 | 604.5 | 558.2 | 525.3 | 502.2 | 487.2 | 478.2 | 476.0 | 479.7 | 482.7 |
| 25°   | 699.4  | 665.1 | 597.8 | 546.2 | 508.1 | 485.7 | 473.8 | 467.0 | 467.8 | 473.0 | 476.0 |
| 27.5° | 709.9  | 668.8 | 591.1 | 531.3 | 489.4 | 468.5 | 459.6 | 458.1 | 461.1 | 467.0 | 470.8 |
| 30°   | 722.6  | 674.0 | 582.1 | 514.1 | 468.5 | 449.8 | 446.1 | 450.6 | 455.8 | 461.8 | 465.5 |
| 32.5° | 739.0  | 680.7 | 573.1 | 494.7 | 446.9 | 429.7 | 435.6 | 445.4 | 451.3 | 457.3 | 461.1 |
| 35°   | 762.2  | 694.2 | 567.9 | 475.3 | 423.7 | 412.5 | 425.9 | 441.6 | 446.1 | 449.8 | 454.3 |
| 37.5° | 789.1  | 712.1 | 565.7 | 457.3 | 402.8 | 397.5 | 416.2 | 434.9 | 436.4 | 437.9 | 442.4 |
| 40°   | 815.3  | 725.6 | 559.7 | 437.9 | 381.1 | 381.1 | 404.3 | 422.2 | 421.5 | 419.2 | 422.2 |
| 42.5° | 825.7  | 724.1 | 542.5 | 419.2 | 363.9 | 364.7 | 385.6 | 402.8 | 398.3 | 398.3 | 402.8 |
| 45°   | 855.6  | 736.0 | 529.8 | 404.3 | 348.2 | 345.2 | 361.7 | 375.1 | 382.6 | 392.3 | 396.8 |
| 47.5° | 893.7  | 752.5 | 520.1 | 387.1 | 333.3 | 323.6 | 332.5 | 354.9 | 367.6 | 378.1 | 381.8 |
| 50°   | 933.3  | 771.2 | 511.1 | 369.1 | 318.3 | 298.9 | 303.4 | 328.0 | 339.3 | 344.5 | 346.7 |
| 52.5° | 973.7  | 788.4 | 504.4 | 354.2 | 301.1 | 269.8 | 279.5 | 302.6 | 310.9 | 313.8 | 315.3 |
| 55°   | 1009.5 | 802.5 | 498.4 | 341.5 | 281.7 | 246.6 | 254.1 | 278.0 | 284.0 | 286.9 | 289.2 |
| 57.5° | 1047.6 | 818.2 | 494.7 | 329.5 | 260.0 | 226.4 | 231.6 | 253.3 | 261.5 | 264.5 | 266.8 |
| 60°   | 1081.3 | 833.2 | 491.7 | 316.8 | 239.9 | 208.5 | 211.5 | 232.4 | 241.4 | 242.9 | 245.1 |
| 62.5° | 1103.7 | 842.9 | 487.2 | 301.1 | 221.2 | 191.3 | 192.0 | 212.2 | 221.9 | 223.4 | 224.9 |
| 65°   | 1109.7 | 840.7 | 473.8 | 280.2 | 202.5 | 174.1 | 174.1 | 193.5 | 204.0 | 209.2 | 211.5 |
| 67.5° | 1091.7 | 822.0 | 445.4 | 253.3 | 184.6 | 158.4 | 158.4 | 175.6 | 186.8 | 192.8 | 195.0 |
| 68°   | 1085.8 | 813.8 | 436.4 | 246.6 | 180.1 | 154.7 | 154.7 | 172.6 | 183.1 | 188.3 | 189.8 |
| 70°   | 1034.9 | 773.4 | 395.3 | 221.2 | 165.9 | 143.5 | 143.5 | 159.2 | 170.4 | 170.4 | 169.6 |
| 72.5° | 898.9  | 670.3 | 325.1 | 185.3 | 145.0 | 127.0 | 129.3 | 144.2 | 148.0 | 151.7 | 150.9 |
| 75°   | 556.7  | 401.3 | 218.2 | 146.5 | 121.8 | 111.3 | 115.8 | 129.3 | 131.5 | 139.7 | 137.5 |
| 77.5° | 278.7  | 196.5 | 115.8 | 85.2  | 94.2  | 95.6  | 103.9 | 113.6 | 120.3 | 129.3 | 123.3 |
| 80°   | 137.5  | 95.6  | 68.0  | 53.1  | 55.3  | 70.2  | 90.4  | 97.9  | 109.8 | 115.8 | 110.6 |
| 82.5° | 38.1   | 29.1  | 27.6  | 29.1  | 41.1  | 54.5  | 71.0  | 86.7  | 102.4 | 107.6 | 100.1 |
| 85°   | 6.7    | 5.2   | 4.5   | 14.2  | 28.4  | 40.4  | 57.5  | 77.0  | 91.9  | 88.2  | 82.9  |
| 87.5° | 2.2    | 1.5   | 1.5   | 9.0   | 20.9  | 32.9  | 49.3  | 68.7  | 78.5  | 71.0  | 63.5  |
| 90°   | 0.0    | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |

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

Report Prepared for

Cooper Lighting Solutions

McGraw-Edison

Report Number: SP2-2501-321-3

Test Date: 04/09/2025

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

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

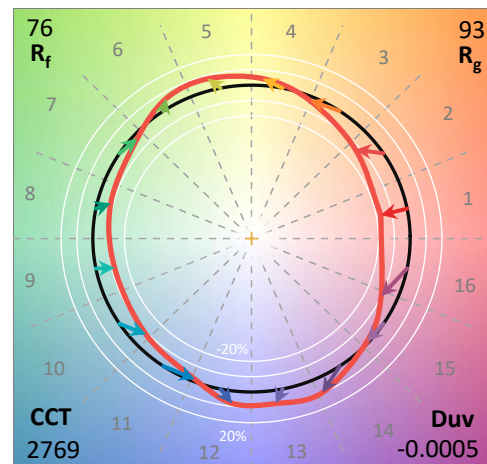
### Test Information

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

### Spectral Parameters

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

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



### Test Conditions

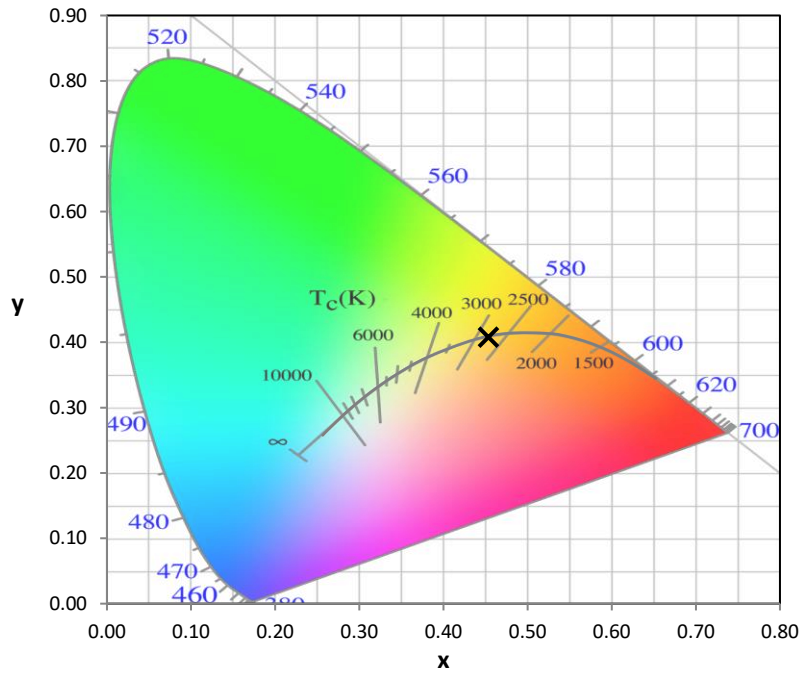
Stabilization Time: 36M  
 Operation Time: 1H 36M  
 Sphere Temperature (°C): 25.0

REPORT NUMBER: SP2-2501-321-3

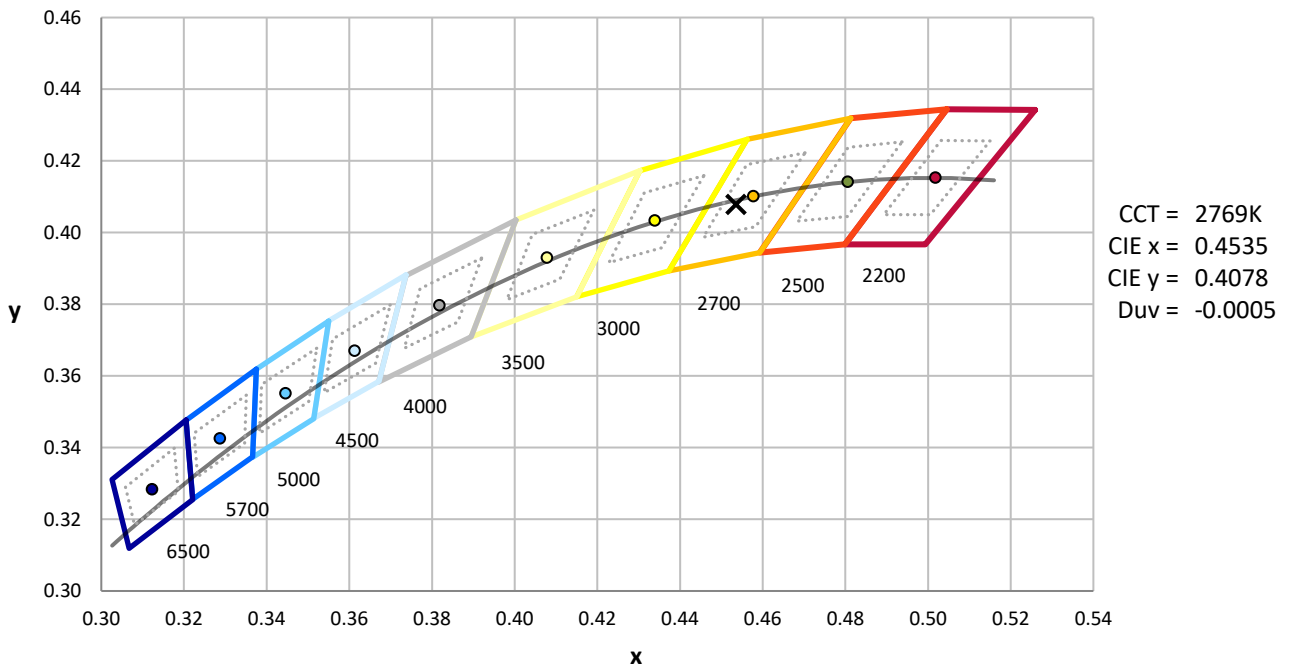
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date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

REPORT NUMBER: SP2-2501-321-3

**CIE 1931 Chromaticity Diagram**

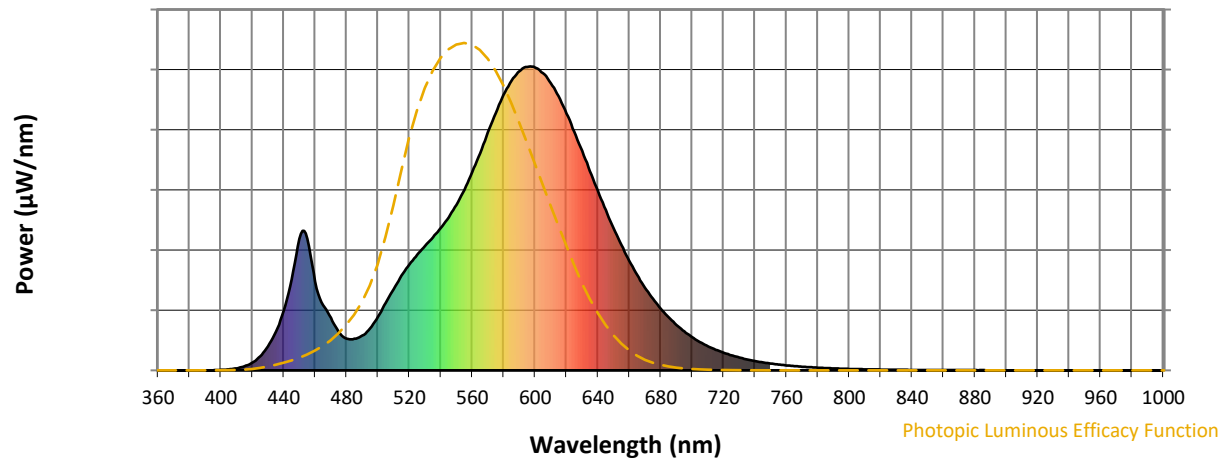


**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 2700K 4-step quadrangle

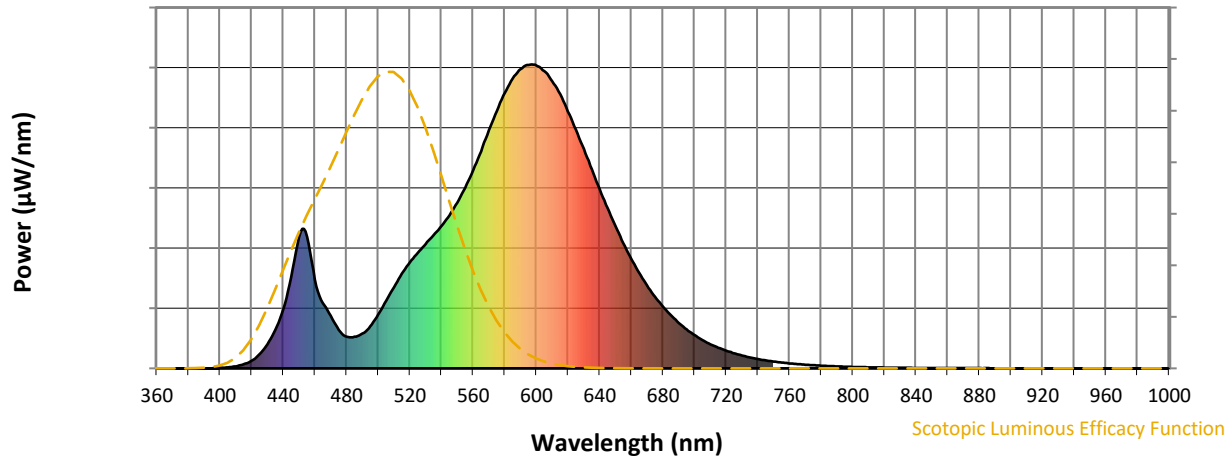
REPORT NUMBER: SP2-2501-321-3

**Photopic Flux vs. Wavelength**

**Photopic Lumens: NR**

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

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### Scotopic Flux vs. Wavelength

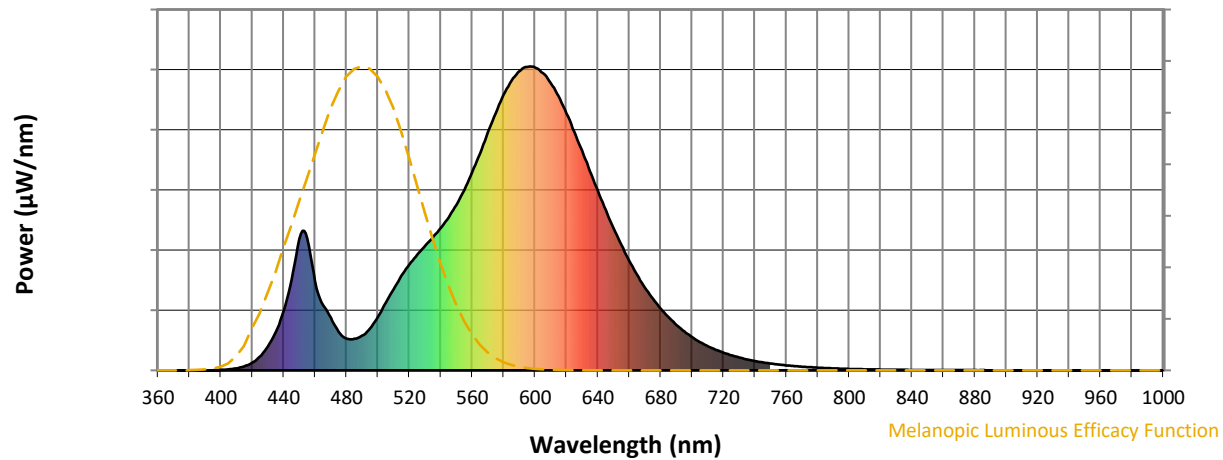


Scotopic Lumens: NR

S/P: 1.14

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

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**Melanopic Flux vs. Wavelength**

**Melanopic Lumens: NR**
**M/P: 2.08**

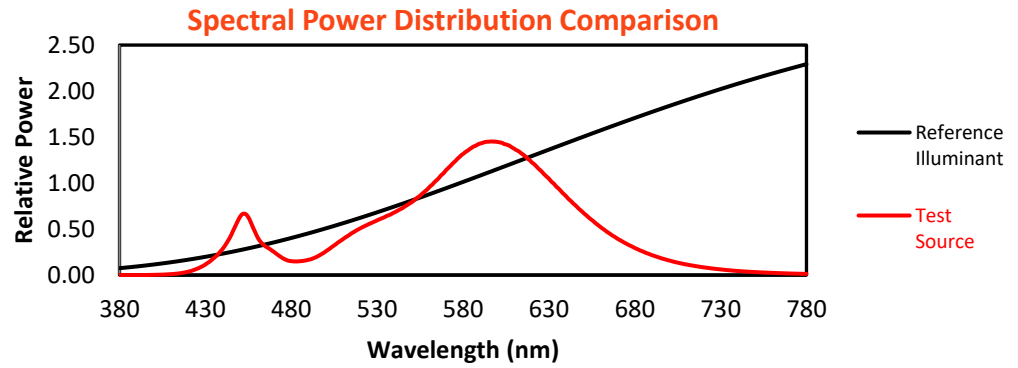
| $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm)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

REPORT NUMBER: SP2-2501-321-3

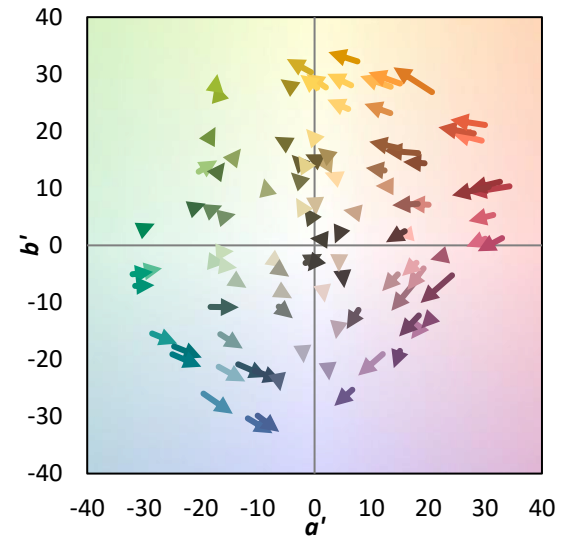
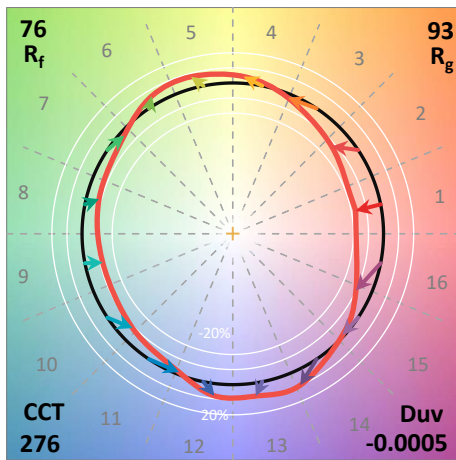
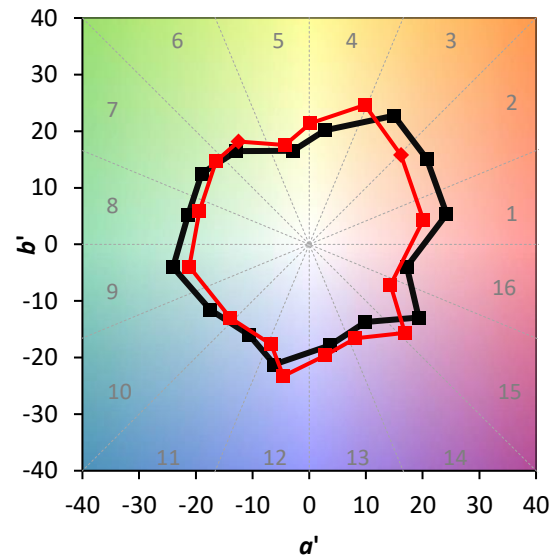
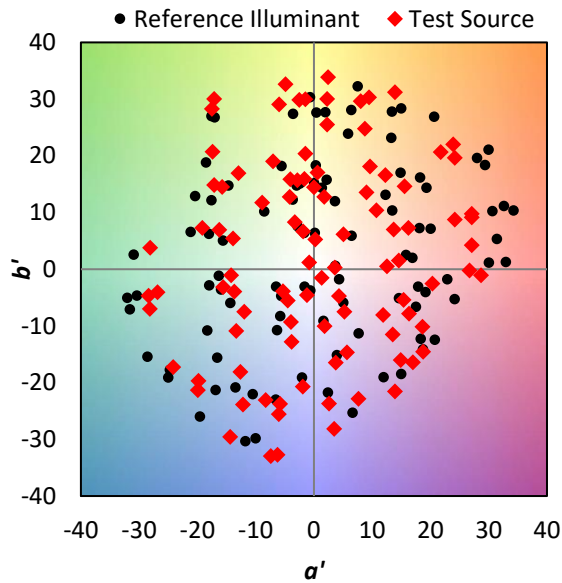
TM-30-18

### Summary

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

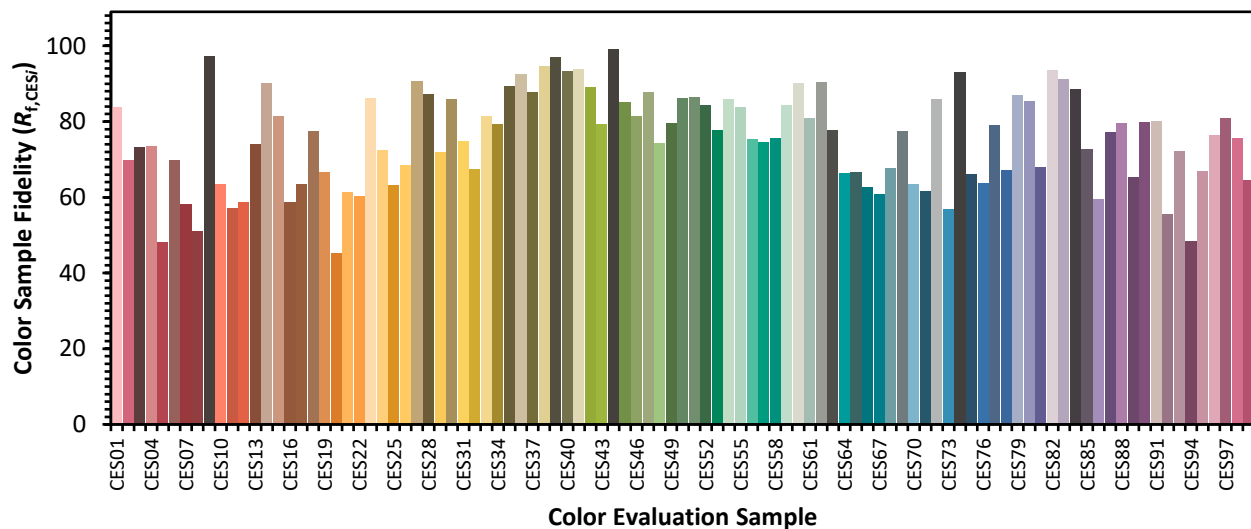


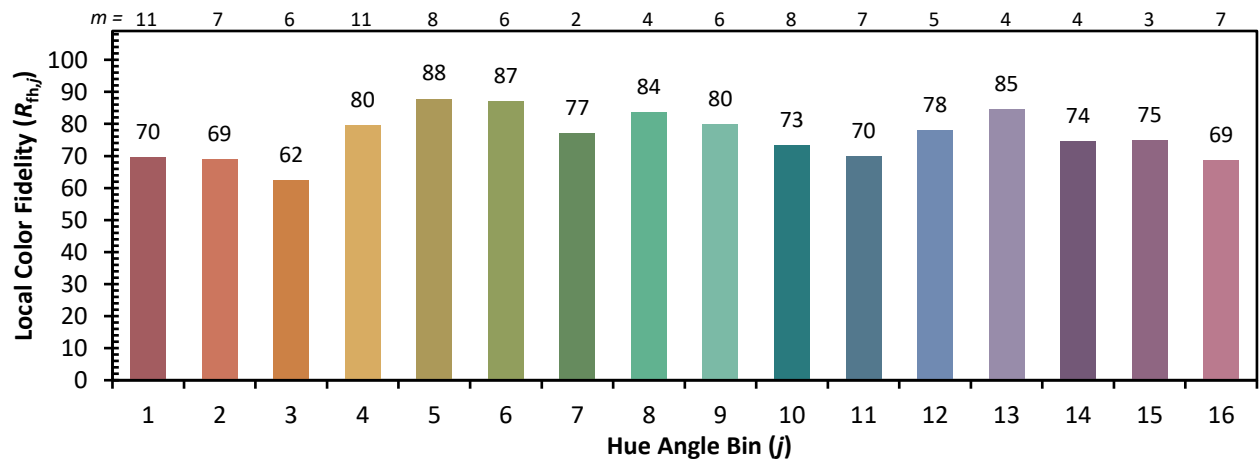
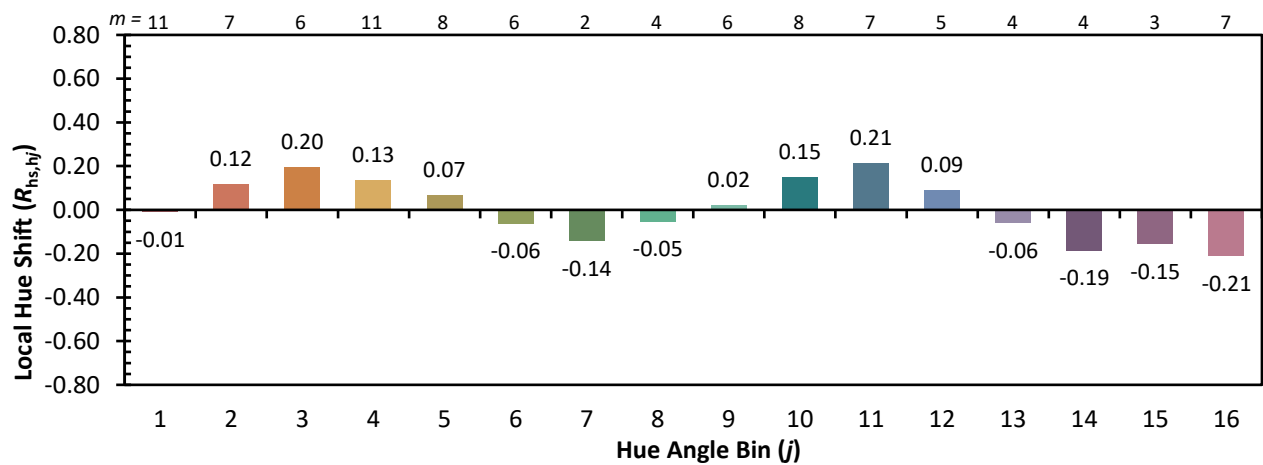
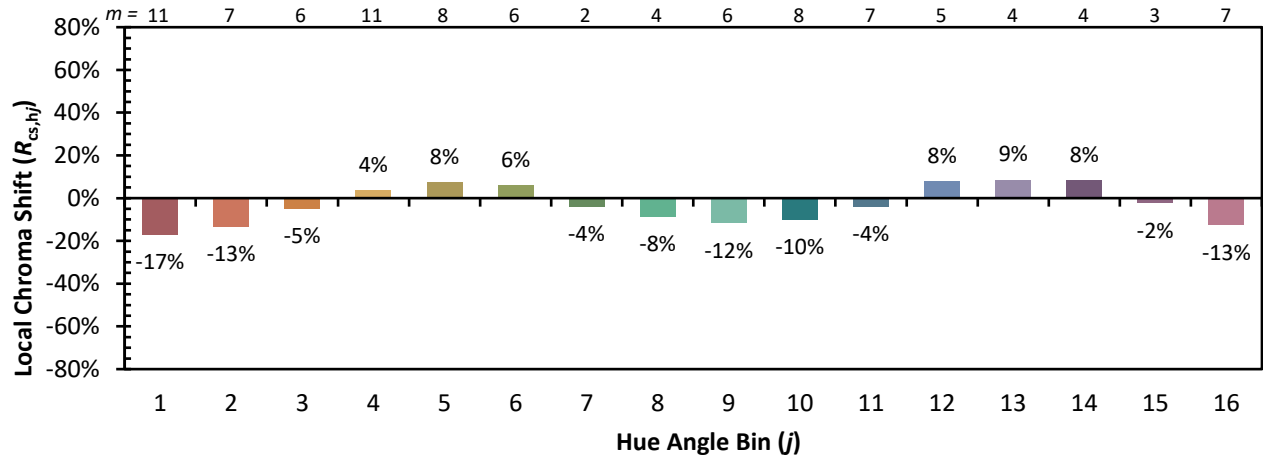
### Color Vector Graphics



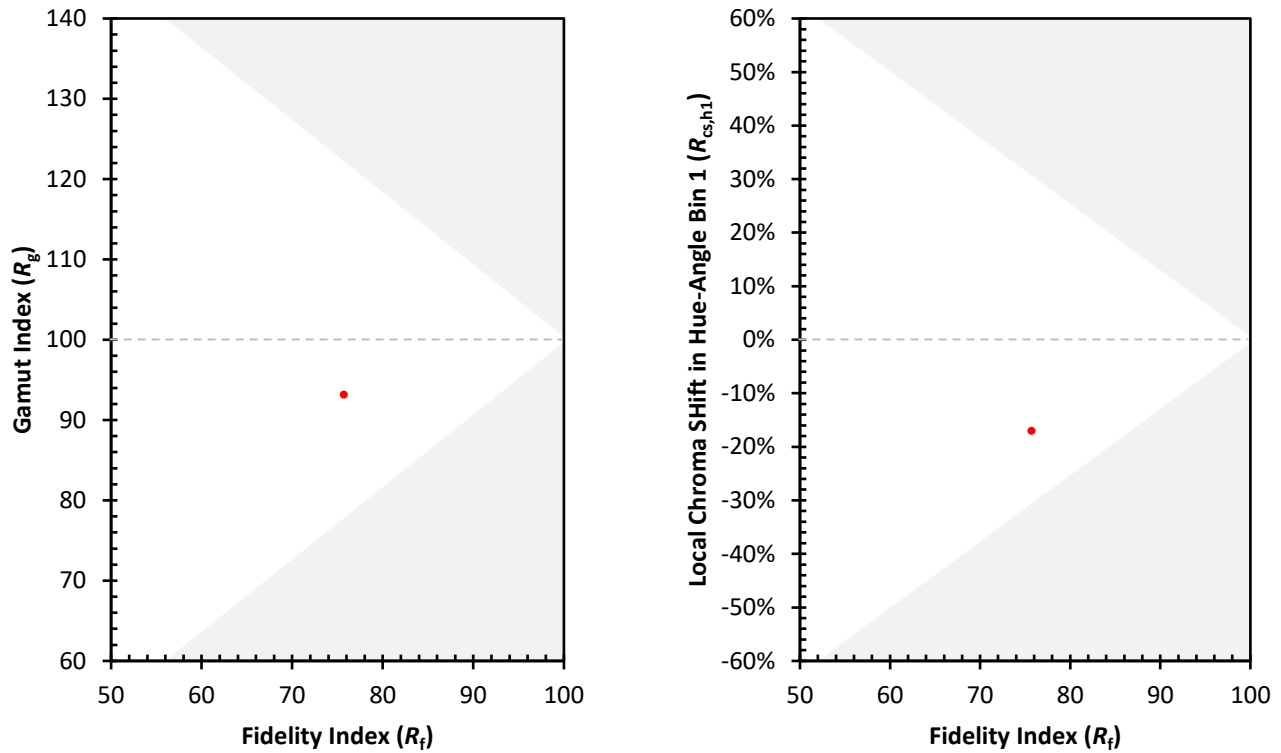
**Individual Sample Fidelity Index ( $R_{f,i}$ )**

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



**Color Rendition by Hue-Angle Bin**


**Measure Comparisons**



(END OF REPORT)