

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: FAIL-SAFE

Report Number: P735571

Luminaire Tested: **4APN6-19-B2750-W2D-4000K**

Issue Date: 1/5/2024



**Test Information**

Test Method: LM-79-08  
Report Number: P735571  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (P709119)  
Test Lab: INNOVATION CENTER(G2)  
Issue Date: 1/5/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: FAIL-SAFE  
Catalog Number: 4APN6-19-B2750-W2D-4000K  
Description: 4FT 1900 AMBIENT LUMEN OUTPUT APN WITH BIO UP LEDS AT 4000K CCT

Light Source: -  
Ballast/Driver: -

**Summary**

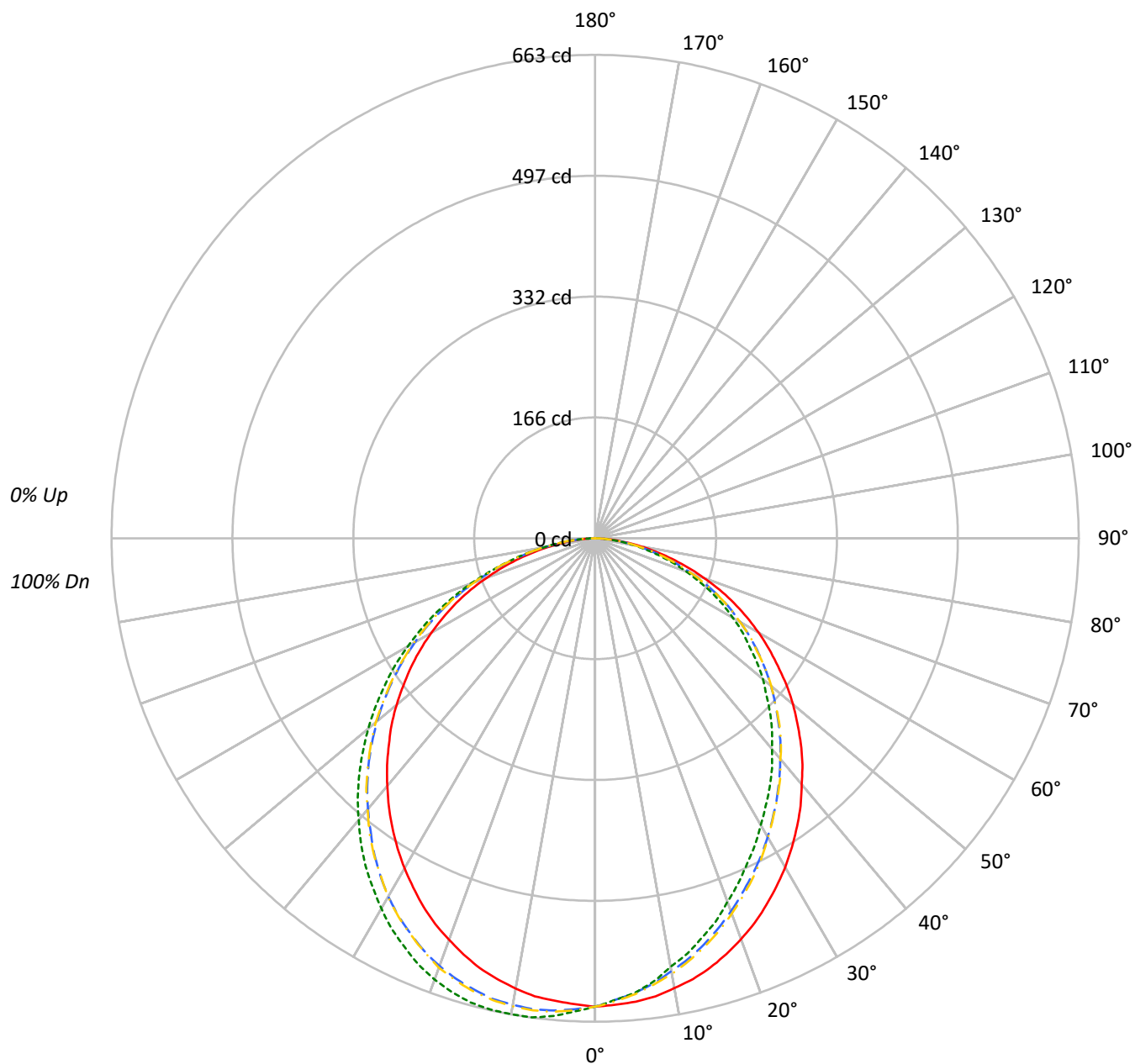
Lumens per Lamp: N/A  
Luminaire Lumens: 1723.0 lumens  
Efficiency: N/A  
Efficacy: 90.7 lumens/watt  
Spacing Criteria (0/90/45): 1.21 / 1.21 / 1.33  
Luminous Opening: Rectangular (W 0.29' x L: 4' x H: 0')  
CIE Type: Direct

Input Watts (W): 19  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 25 FT

TEST NUMBER: P735571

CATALOG NUMBER: 4APN6-19-B2750-W2D-4000K

### Luminous Intensity Polar Plot





TEST NUMBER: P735571

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**COEFFICIENT OF UTILIZATION - ZONAL CAVITY METHOD:**

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |    |    |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|
| RF  | 20  |     |     |     | 20  |     |     |     |     | 20  |     |     |     |     | 20  |     |     |     |    | 20 |
| RC  | 80  |     |     |     | 70  |     |     |     |     | 50  |     |     |     |     | 30  |     |     |     |    | 10 |
| RW  | 70  | 50  | 30  | 10  | 70  | 50  | 30  | 10  | 50  | 30  | 10  | 50  | 30  | 10  | 50  | 30  | 10  | 50  | 30 | 10 |
| RCR |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |    |    |
| 0   | 119 | 119 | 119 | 119 | 116 | 116 | 116 | 116 | 111 | 111 | 111 | 106 | 106 | 106 | 102 | 102 | 102 | 100 |    |    |
| 1   | 109 | 104 | 100 | 96  | 106 | 102 | 98  | 95  | 98  | 94  | 92  | 94  | 91  | 89  | 90  | 88  | 86  | 84  |    |    |
| 2   | 99  | 91  | 84  | 78  | 96  | 89  | 83  | 77  | 85  | 80  | 76  | 82  | 78  | 74  | 79  | 76  | 72  | 70  |    |    |
| 3   | 90  | 80  | 72  | 65  | 88  | 78  | 71  | 65  | 75  | 69  | 64  | 73  | 67  | 62  | 70  | 65  | 61  | 59  |    |    |
| 4   | 83  | 71  | 62  | 55  | 81  | 70  | 61  | 55  | 67  | 60  | 54  | 65  | 59  | 54  | 63  | 57  | 53  | 51  |    |    |
| 5   | 76  | 63  | 54  | 48  | 74  | 62  | 54  | 48  | 60  | 53  | 47  | 58  | 52  | 47  | 56  | 51  | 46  | 44  |    |    |
| 6   | 70  | 57  | 48  | 42  | 68  | 56  | 48  | 42  | 54  | 47  | 41  | 53  | 46  | 41  | 51  | 45  | 41  | 38  |    |    |
| 7   | 65  | 52  | 43  | 37  | 64  | 51  | 43  | 37  | 49  | 42  | 37  | 48  | 41  | 36  | 47  | 41  | 36  | 34  |    |    |
| 8   | 61  | 47  | 39  | 33  | 59  | 47  | 39  | 33  | 45  | 38  | 33  | 44  | 37  | 33  | 43  | 37  | 32  | 30  |    |    |
| 9   | 57  | 43  | 35  | 30  | 55  | 43  | 35  | 30  | 42  | 35  | 30  | 41  | 34  | 29  | 40  | 34  | 29  | 27  |    |    |
| 10  | 53  | 40  | 32  | 27  | 52  | 40  | 32  | 27  | 39  | 32  | 27  | 38  | 31  | 27  | 37  | 31  | 27  | 25  |    |    |

**AVERAGE LUMINANCE (cd/sqm):**

|     | 0°   | 90°  | 180° | 270° |
|-----|------|------|------|------|
| 0°  | 5927 | 5927 | 5927 | 5927 |
| 5°  | 5910 | 5795 | 5896 | 6091 |
| 10° | 5868 | 5590 | 5876 | 6209 |
| 15° | 5824 | 5415 | 5831 | 6296 |
| 20° | 5745 | 5210 | 5752 | 6322 |
| 25° | 5652 | 5016 | 5674 | 6296 |
| 30° | 5550 | 4839 | 5566 | 6247 |
| 35° | 5434 | 4698 | 5459 | 6180 |
| 40° | 5304 | 4543 | 5339 | 6074 |
| 45° | 5206 | 4428 | 5215 | 5964 |
| 50° | 5081 | 4307 | 5100 | 5830 |
| 55° | 4921 | 4150 | 4956 | 5670 |
| 60° | 4774 | 4023 | 4788 | 5471 |
| 65° | 4585 | 3855 | 4585 | 5235 |
| 70° | 4273 | 3569 | 4254 | 4880 |
| 75° | 3886 | 3237 | 3832 | 4381 |
| 80° | 3358 | 2779 | 3246 | 3746 |
| 85° | 2615 | 2075 | 2467 | 3080 |



TEST NUMBER: P735571

CATALOG NUMBER: 4APN6-19-B2750-W2D-4000K

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 60.7   | 3.5       |
| 10°-20°   | 172.3  | 10.0      |
| 20°-30°   | 256.1  | 14.9      |
| 30°-40°   | 301.9  | 17.5      |
| 40°-50°   | 307.4  | 17.8      |
| 50°-60°   | 273.8  | 15.9      |
| 60°-70°   | 206.3  | 12.0      |
| 70°-80°   | 114.7  | 6.7       |
| 80°-90°   | 29.8   | 1.7       |
| 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°-30°    | 489.1  | 28.4      |
| 0°-40°    | 791.0  | 45.9      |
| 0°-60°    | 1372.2 | 79.6      |
| 0°-90°    | 1723.0 | 100.0     |
| 90°-120°  | 0.0    | 0.0       |
| 90°-150°  | 0.0    | 0.0       |
| 90°-180°  | 0.0    | 0.0       |
| 0°-180°   | 1723.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|     | 0°  | 90° | 180° | 270° | 360° | Flux |
|-----|-----|-----|------|------|------|------|
| 0°  | 642 | 642 | 642  | 642  | 642  |      |
| 5°  | 638 | 626 | 637  | 658  | 638  | 61   |
| 15° | 610 | 567 | 610  | 659  | 610  | 172  |
| 25° | 555 | 493 | 557  | 618  | 555  | 256  |
| 35° | 482 | 417 | 485  | 549  | 482  | 302  |
| 45° | 399 | 339 | 400  | 457  | 399  | 307  |
| 55° | 306 | 258 | 308  | 352  | 306  | 274  |
| 65° | 210 | 177 | 210  | 240  | 210  | 207  |
| 75° | 109 | 91  | 108  | 123  | 109  | 116  |
| 85° | 25  | 20  | 23   | 29   | 25   | 30   |
| 90° | 0   | 0   | 0    | 0    | 0    |      |



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°    | 10°   | 20°   | 30°   | 40°   | 50°   | 60°   | 70°   | 80°   | 90°   | 100°  |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 642.4 | 642.4 | 642.4 | 642.4 | 642.4 | 642.4 | 642.4 | 642.4 | 642.4 | 642.4 | 642.4 |
| 2.5°  | 640.3 | 640.3 | 641.0 | 638.1 | 634.5 | 633.0 | 632.3 | 631.5 | 633.0 | 633.7 | 633.0 |
| 5°    | 638.1 | 636.6 | 635.2 | 631.5 | 627.2 | 624.3 | 622.8 | 622.1 | 623.6 | 625.7 | 623.6 |
| 7.5°  | 633.7 | 630.8 | 627.9 | 622.8 | 617.8 | 613.4 | 611.2 | 609.7 | 611.2 | 613.4 | 611.9 |
| 10°   | 626.4 | 622.8 | 618.5 | 612.7 | 605.4 | 600.3 | 598.1 | 596.0 | 596.7 | 596.7 | 596.7 |
| 12.5° | 619.2 | 614.1 | 609.0 | 601.8 | 593.7 | 587.9 | 584.3 | 581.4 | 582.8 | 583.6 | 583.6 |
| 15°   | 609.7 | 603.2 | 596.0 | 587.9 | 580.0 | 573.4 | 569.1 | 566.1 | 566.9 | 566.9 | 567.6 |
| 17.5° | 598.1 | 590.9 | 583.6 | 574.2 | 564.6 | 557.4 | 552.4 | 548.7 | 550.1 | 550.9 | 551.6 |
| 20°   | 585.1 | 577.0 | 569.1 | 558.8 | 548.7 | 540.7 | 535.6 | 531.2 | 530.6 | 530.6 | 531.2 |
| 22.5° | 571.2 | 562.5 | 553.1 | 542.1 | 531.2 | 522.5 | 517.4 | 513.1 | 512.4 | 512.4 | 513.1 |
| 25°   | 555.2 | 545.8 | 536.4 | 525.5 | 513.8 | 505.1 | 498.5 | 494.2 | 493.4 | 492.7 | 494.2 |
| 27.5° | 538.5 | 529.1 | 519.7 | 508.8 | 496.4 | 487.6 | 481.1 | 476.7 | 475.3 | 474.6 | 476.0 |
| 30°   | 521.0 | 510.1 | 500.0 | 488.3 | 477.4 | 468.8 | 462.2 | 457.1 | 455.7 | 454.2 | 455.7 |
| 32.5° | 502.2 | 491.3 | 480.4 | 468.8 | 457.9 | 449.1 | 442.6 | 437.5 | 436.1 | 435.3 | 436.8 |
| 35°   | 482.5 | 471.6 | 461.5 | 449.8 | 438.9 | 430.3 | 423.7 | 419.4 | 417.9 | 417.1 | 417.9 |
| 37.5° | 462.9 | 452.1 | 441.9 | 430.3 | 419.4 | 410.6 | 404.1 | 399.7 | 399.0 | 398.3 | 399.0 |
| 40°   | 440.4 | 431.0 | 420.8 | 409.9 | 399.0 | 390.3 | 385.2 | 380.1 | 378.6 | 377.2 | 379.4 |
| 42.5° | 420.8 | 411.3 | 401.2 | 391.0 | 380.1 | 371.4 | 365.6 | 361.2 | 359.8 | 359.0 | 359.8 |
| 45°   | 399.0 | 388.8 | 378.6 | 369.2 | 359.0 | 351.0 | 345.2 | 340.8 | 340.1 | 339.4 | 340.1 |
| 47.5° | 375.8 | 367.0 | 358.3 | 348.9 | 338.6 | 330.7 | 325.6 | 321.3 | 319.8 | 318.3 | 319.8 |
| 50°   | 354.0 | 345.2 | 336.5 | 327.7 | 318.3 | 311.0 | 305.9 | 301.6 | 300.8 | 300.1 | 300.8 |
| 52.5° | 330.7 | 322.0 | 314.0 | 305.3 | 297.2 | 289.9 | 284.9 | 281.3 | 280.5 | 279.8 | 280.5 |
| 55°   | 305.9 | 298.7 | 291.4 | 284.1 | 276.2 | 269.6 | 265.3 | 260.9 | 259.5 | 258.0 | 259.5 |
| 57.5° | 282.7 | 276.2 | 268.9 | 261.6 | 254.4 | 248.6 | 244.2 | 240.5 | 239.8 | 239.1 | 239.8 |
| 60°   | 258.7 | 252.9 | 246.3 | 239.8 | 232.6 | 226.8 | 223.1 | 220.2 | 218.7 | 218.0 | 218.7 |
| 62.5° | 234.7 | 228.9 | 223.8 | 217.3 | 210.8 | 206.4 | 202.7 | 199.9 | 198.4 | 197.7 | 198.4 |
| 65°   | 210.0 | 205.0 | 199.9 | 194.1 | 189.0 | 184.6 | 180.9 | 178.1 | 177.3 | 176.6 | 176.6 |
| 67.5° | 184.6 | 180.2 | 175.9 | 170.8 | 165.0 | 160.6 | 157.0 | 154.8 | 154.1 | 153.3 | 154.1 |
| 70°   | 158.4 | 154.8 | 150.5 | 146.0 | 141.7 | 138.1 | 135.9 | 133.8 | 133.0 | 132.3 | 132.3 |
| 72.5° | 133.8 | 130.8 | 127.2 | 123.6 | 119.9 | 116.3 | 114.1 | 112.7 | 112.0 | 111.2 | 111.2 |
| 75°   | 109.0 | 106.1 | 103.9 | 101.1 | 97.4  | 95.2  | 93.0  | 91.5  | 90.8  | 90.8  | 90.8  |
| 77.5° | 85.7  | 83.6  | 81.4  | 78.5  | 76.3  | 74.1  | 72.7  | 72.0  | 71.2  | 71.2  | 71.2  |
| 80°   | 63.2  | 61.8  | 60.3  | 58.8  | 56.7  | 54.5  | 53.8  | 53.0  | 52.3  | 52.3  | 52.3  |
| 82.5° | 42.9  | 42.1  | 40.7  | 39.3  | 37.8  | 37.0  | 36.3  | 35.6  | 35.6  | 35.6  | 35.6  |
| 85°   | 24.7  | 24.0  | 23.3  | 22.5  | 21.8  | 21.8  | 21.1  | 20.3  | 19.6  | 19.6  | 19.6  |
| 87.5° | 10.2  | 10.2  | 10.2  | 9.4   | 8.7   | 8.7   | 8.7   | 8.7   | 8.7   | 8.7   | 8.7   |
| 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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**CANDELA DISTRIBUTION (continued):**

|       | 110°  | 120°  | 130°  | 140°  | 150°  | 160°  | 170°  | 180°  | 190°  | 200°  | 210°  |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 642.4 | 642.4 | 642.4 | 642.4 | 642.4 | 642.4 | 642.4 | 642.4 | 642.4 | 642.4 | 642.4 |
| 2.5°  | 631.5 | 633.0 | 634.5 | 636.6 | 638.8 | 641.0 | 640.3 | 639.6 | 642.4 | 646.1 | 646.8 |
| 5°    | 622.1 | 623.6 | 625.7 | 629.4 | 633.0 | 635.9 | 636.6 | 636.6 | 642.4 | 647.5 | 649.0 |
| 7.5°  | 610.5 | 612.7 | 615.5 | 619.2 | 624.3 | 628.7 | 630.8 | 633.7 | 639.6 | 646.1 | 649.0 |
| 10°   | 596.0 | 599.6 | 603.9 | 609.0 | 614.1 | 619.2 | 623.6 | 627.2 | 634.5 | 641.7 | 646.1 |
| 12.5° | 582.8 | 586.4 | 590.9 | 596.7 | 603.2 | 609.7 | 614.1 | 619.2 | 627.9 | 636.6 | 641.7 |
| 15°   | 568.3 | 571.9 | 577.0 | 582.8 | 590.1 | 597.4 | 603.9 | 610.5 | 619.2 | 628.7 | 634.5 |
| 17.5° | 552.4 | 556.0 | 561.0 | 568.3 | 576.3 | 584.3 | 591.6 | 598.8 | 609.0 | 619.2 | 625.7 |
| 20°   | 532.7 | 537.8 | 544.3 | 551.6 | 561.0 | 570.5 | 577.8 | 585.8 | 596.7 | 607.6 | 614.8 |
| 22.5° | 513.8 | 518.9 | 526.1 | 534.9 | 545.1 | 555.2 | 564.0 | 572.7 | 584.3 | 595.2 | 603.2 |
| 25°   | 495.6 | 501.5 | 508.8 | 517.4 | 526.9 | 537.0 | 547.3 | 557.4 | 569.1 | 580.7 | 588.7 |
| 27.5° | 477.4 | 482.5 | 489.8 | 498.5 | 509.4 | 519.7 | 529.8 | 540.0 | 552.4 | 564.6 | 573.4 |
| 30°   | 457.1 | 462.9 | 469.5 | 478.2 | 489.8 | 501.5 | 511.6 | 522.5 | 534.9 | 547.3 | 556.0 |
| 32.5° | 438.2 | 443.3 | 449.8 | 458.6 | 470.2 | 481.8 | 492.7 | 504.3 | 516.0 | 528.3 | 537.0 |
| 35°   | 419.4 | 424.4 | 431.0 | 439.7 | 451.3 | 462.9 | 473.8 | 484.7 | 496.4 | 508.0 | 516.7 |
| 37.5° | 400.4 | 405.5 | 412.1 | 420.8 | 431.7 | 443.3 | 453.5 | 464.4 | 476.0 | 487.6 | 495.6 |
| 40°   | 380.8 | 385.9 | 391.0 | 399.7 | 410.6 | 422.2 | 432.4 | 443.3 | 454.9 | 466.5 | 474.6 |
| 42.5° | 361.2 | 366.2 | 372.8 | 381.6 | 391.7 | 401.9 | 412.1 | 422.2 | 433.1 | 444.0 | 452.1 |
| 45°   | 341.6 | 345.9 | 352.5 | 360.5 | 370.7 | 380.1 | 390.3 | 399.7 | 410.6 | 420.8 | 428.8 |
| 47.5° | 321.3 | 325.6 | 330.7 | 338.6 | 348.9 | 359.0 | 369.2 | 378.6 | 388.1 | 398.3 | 405.5 |
| 50°   | 301.6 | 305.9 | 311.7 | 319.0 | 328.5 | 338.0 | 346.7 | 355.3 | 364.9 | 374.3 | 380.8 |
| 52.5° | 281.3 | 285.6 | 290.7 | 298.0 | 305.9 | 314.7 | 322.6 | 331.4 | 340.1 | 348.9 | 355.3 |
| 55°   | 260.9 | 263.8 | 268.1 | 274.7 | 283.4 | 292.2 | 300.1 | 308.1 | 316.2 | 323.4 | 329.9 |
| 57.5° | 240.5 | 244.2 | 249.3 | 255.1 | 262.3 | 269.6 | 276.9 | 284.1 | 291.4 | 298.7 | 304.5 |
| 60°   | 220.2 | 223.1 | 226.8 | 231.8 | 239.1 | 245.6 | 252.9 | 259.5 | 266.0 | 272.5 | 277.7 |
| 62.5° | 199.1 | 202.0 | 205.7 | 210.8 | 216.6 | 222.4 | 228.9 | 234.7 | 240.5 | 246.3 | 251.4 |
| 65°   | 177.3 | 180.2 | 183.9 | 188.2 | 193.3 | 198.4 | 204.2 | 210.0 | 214.4 | 218.7 | 223.8 |
| 67.5° | 154.8 | 157.7 | 161.4 | 165.0 | 169.3 | 174.4 | 179.5 | 184.6 | 189.0 | 193.3 | 196.9 |
| 70°   | 133.0 | 135.1 | 138.8 | 141.7 | 145.4 | 149.0 | 153.3 | 157.7 | 160.6 | 164.2 | 168.6 |
| 72.5° | 112.0 | 114.1 | 117.0 | 119.9 | 122.1 | 125.0 | 129.4 | 133.0 | 136.6 | 141.0 | 143.2 |
| 75°   | 91.5  | 93.0  | 95.2  | 97.4  | 99.6  | 101.8 | 104.7 | 107.5 | 110.5 | 112.7 | 115.6 |
| 77.5° | 71.2  | 72.7  | 74.8  | 76.3  | 77.8  | 79.3  | 81.4  | 83.6  | 85.7  | 87.2  | 90.2  |
| 80°   | 52.3  | 53.8  | 55.2  | 56.7  | 58.1  | 59.6  | 60.3  | 61.1  | 63.9  | 66.1  | 67.6  |
| 82.5° | 35.6  | 36.3  | 37.0  | 38.5  | 39.3  | 40.0  | 40.7  | 40.7  | 42.1  | 43.6  | 45.8  |
| 85°   | 20.3  | 21.1  | 21.8  | 21.8  | 21.8  | 21.8  | 22.5  | 23.3  | 24.0  | 25.4  | 26.9  |
| 87.5° | 8.0   | 8.0   | 8.7   | 8.7   | 8.7   | 8.7   | 8.7   | 8.7   | 9.4   | 10.9  | 11.6  |
| 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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**CANDELA DISTRIBUTION (continued):**

|       | 220°  | 230°  | 240°  | 250°  | 260°  | 270°  | 280°  | 290°  | 300°  | 310°  | 320°  |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 642.4 | 642.4 | 642.4 | 642.4 | 642.4 | 642.4 | 642.4 | 642.4 | 642.4 | 642.4 | 642.4 |
| 2.5°  | 646.1 | 646.8 | 648.2 | 649.0 | 649.7 | 649.7 | 650.5 | 651.2 | 649.7 | 648.2 | 647.5 |
| 5°    | 649.7 | 650.5 | 652.6 | 654.8 | 656.3 | 657.7 | 657.0 | 656.3 | 654.8 | 652.6 | 651.2 |
| 7.5°  | 650.5 | 652.6 | 654.8 | 657.7 | 659.9 | 662.8 | 661.4 | 659.9 | 657.0 | 654.1 | 651.9 |
| 10°   | 648.2 | 651.2 | 654.8 | 658.4 | 660.6 | 662.8 | 661.4 | 659.9 | 657.0 | 653.3 | 650.5 |
| 12.5° | 645.4 | 649.0 | 653.3 | 657.0 | 659.1 | 662.1 | 659.9 | 657.7 | 654.1 | 650.5 | 646.8 |
| 15°   | 638.8 | 643.2 | 648.2 | 652.6 | 656.3 | 659.1 | 657.0 | 655.5 | 651.2 | 646.1 | 641.0 |
| 17.5° | 630.8 | 636.6 | 641.7 | 646.8 | 649.7 | 652.6 | 651.2 | 649.7 | 644.6 | 638.8 | 633.0 |
| 20°   | 621.4 | 627.2 | 632.3 | 637.3 | 641.0 | 643.9 | 641.7 | 639.6 | 634.5 | 629.4 | 623.6 |
| 22.5° | 609.7 | 615.5 | 621.4 | 626.4 | 630.1 | 633.0 | 630.1 | 626.4 | 621.4 | 616.3 | 610.5 |
| 25°   | 595.2 | 601.8 | 608.3 | 613.4 | 615.5 | 618.5 | 615.5 | 612.7 | 607.6 | 602.5 | 596.0 |
| 27.5° | 580.7 | 587.2 | 593.7 | 598.8 | 601.0 | 603.9 | 601.0 | 598.1 | 593.0 | 587.9 | 581.4 |
| 30°   | 564.0 | 570.5 | 577.0 | 582.1 | 584.3 | 586.4 | 583.6 | 580.7 | 576.3 | 571.2 | 564.6 |
| 32.5° | 545.1 | 551.6 | 556.7 | 561.8 | 564.6 | 567.6 | 564.6 | 562.5 | 557.4 | 550.9 | 544.3 |
| 35°   | 524.7 | 531.2 | 537.8 | 542.8 | 545.8 | 548.7 | 545.1 | 541.5 | 537.0 | 531.9 | 526.1 |
| 37.5° | 502.2 | 509.4 | 516.7 | 522.5 | 524.7 | 527.6 | 524.7 | 521.0 | 516.7 | 511.6 | 505.1 |
| 40°   | 481.1 | 487.6 | 494.2 | 500.0 | 502.2 | 504.3 | 501.5 | 498.5 | 493.4 | 488.3 | 481.8 |
| 42.5° | 459.3 | 465.8 | 471.6 | 476.7 | 478.9 | 481.8 | 478.9 | 475.3 | 471.6 | 467.3 | 461.5 |
| 45°   | 436.1 | 442.6 | 447.7 | 452.8 | 454.9 | 457.1 | 454.2 | 450.6 | 447.0 | 443.3 | 437.5 |
| 47.5° | 412.1 | 417.9 | 423.0 | 428.0 | 429.5 | 431.7 | 428.8 | 426.6 | 423.0 | 419.4 | 414.3 |
| 50°   | 387.4 | 393.2 | 398.3 | 402.6 | 404.1 | 406.2 | 403.4 | 400.4 | 397.6 | 394.6 | 390.3 |
| 52.5° | 361.9 | 367.0 | 372.1 | 376.5 | 377.9 | 379.4 | 376.5 | 373.5 | 370.7 | 367.7 | 363.4 |
| 55°   | 335.8 | 340.8 | 345.9 | 349.6 | 351.0 | 352.5 | 349.6 | 347.4 | 344.4 | 342.3 | 338.0 |
| 57.5° | 309.6 | 314.7 | 319.0 | 322.6 | 324.1 | 325.6 | 322.6 | 319.8 | 317.6 | 315.4 | 311.7 |
| 60°   | 282.7 | 287.8 | 291.4 | 294.3 | 295.8 | 296.5 | 293.6 | 291.4 | 289.9 | 288.6 | 284.9 |
| 62.5° | 256.5 | 260.2 | 263.8 | 266.0 | 267.4 | 268.1 | 266.0 | 264.5 | 263.1 | 261.6 | 258.7 |
| 65°   | 228.9 | 233.3 | 236.2 | 238.4 | 239.1 | 239.8 | 237.7 | 236.2 | 234.7 | 233.3 | 231.1 |
| 67.5° | 201.3 | 205.0 | 207.1 | 209.3 | 210.0 | 210.0 | 210.0 | 209.3 | 207.8 | 205.7 | 203.5 |
| 70°   | 173.7 | 176.6 | 178.8 | 180.2 | 180.9 | 180.9 | 179.5 | 178.1 | 178.1 | 177.3 | 175.9 |
| 72.5° | 145.4 | 147.5 | 149.0 | 150.5 | 150.5 | 150.5 | 150.5 | 151.2 | 150.5 | 149.0 | 146.8 |
| 75°   | 118.4 | 120.6 | 122.1 | 122.9 | 122.9 | 122.9 | 122.9 | 123.6 | 122.9 | 122.1 | 120.6 |
| 77.5° | 93.0  | 94.5  | 95.2  | 96.0  | 96.0  | 96.0  | 96.6  | 97.4  | 96.6  | 96.0  | 95.2  |
| 80°   | 69.0  | 69.7  | 70.5  | 71.2  | 70.5  | 70.5  | 71.2  | 72.7  | 72.0  | 71.2  | 70.5  |
| 82.5° | 47.2  | 47.9  | 48.7  | 48.7  | 49.4  | 50.2  | 50.2  | 50.2  | 50.2  | 49.4  | 48.7  |
| 85°   | 28.4  | 29.1  | 29.1  | 29.1  | 29.1  | 29.1  | 29.8  | 30.5  | 30.5  | 29.8  | 29.8  |
| 87.5° | 13.1  | 13.8  | 13.1  | 12.4  | 11.6  | 11.6  | 13.1  | 14.5  | 14.5  | 13.8  | 13.8  |
| 90°   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |



TEST NUMBER: P735571

CATALOG NUMBER: 4APN6-19-B2750-W2D-4000K

**CANDELA DISTRIBUTION (continued):**

|       | 330°  | 340°  | 350°  | 360°  |
|-------|-------|-------|-------|-------|
| 0°    | 642.4 | 642.4 | 642.4 | 642.4 |
| 2.5°  | 648.2 | 647.5 | 643.9 | 640.3 |
| 5°    | 650.5 | 648.2 | 643.2 | 638.1 |
| 7.5°  | 650.5 | 647.5 | 640.3 | 633.7 |
| 10°   | 646.8 | 642.4 | 634.5 | 626.4 |
| 12.5° | 642.4 | 637.3 | 627.9 | 619.2 |
| 15°   | 635.9 | 630.1 | 619.9 | 609.7 |
| 17.5° | 626.4 | 619.2 | 609.0 | 598.1 |
| 20°   | 617.0 | 609.0 | 596.7 | 585.1 |
| 22.5° | 603.9 | 596.7 | 583.6 | 571.2 |
| 25°   | 589.4 | 581.4 | 568.3 | 555.2 |
| 27.5° | 574.2 | 564.6 | 551.6 | 538.5 |
| 30°   | 556.7 | 547.3 | 534.2 | 521.0 |
| 32.5° | 537.8 | 529.1 | 516.0 | 502.2 |
| 35°   | 518.9 | 509.4 | 496.4 | 482.5 |
| 37.5° | 497.9 | 489.1 | 476.0 | 462.9 |
| 40°   | 475.3 | 466.5 | 453.5 | 440.4 |
| 42.5° | 454.2 | 446.2 | 433.1 | 420.8 |
| 45°   | 431.0 | 423.0 | 410.6 | 399.0 |
| 47.5° | 407.0 | 399.0 | 387.4 | 375.8 |
| 50°   | 383.7 | 375.8 | 364.9 | 354.0 |
| 52.5° | 357.6 | 351.0 | 340.8 | 330.7 |
| 55°   | 332.2 | 325.6 | 315.4 | 305.9 |
| 57.5° | 306.7 | 300.8 | 291.4 | 282.7 |
| 60°   | 279.8 | 274.0 | 266.7 | 258.7 |
| 62.5° | 254.4 | 249.3 | 242.0 | 234.7 |
| 65°   | 227.5 | 223.1 | 216.6 | 210.0 |
| 67.5° | 199.9 | 196.2 | 190.4 | 184.6 |
| 70°   | 172.3 | 167.9 | 163.5 | 158.4 |
| 72.5° | 144.7 | 142.4 | 138.1 | 133.8 |
| 75°   | 118.4 | 116.3 | 112.7 | 109.0 |
| 77.5° | 93.8  | 91.5  | 88.7  | 85.7  |
| 80°   | 69.0  | 67.6  | 65.4  | 63.2  |
| 82.5° | 47.9  | 46.5  | 45.1  | 42.9  |
| 85°   | 29.1  | 27.6  | 26.1  | 24.7  |
| 87.5° | 13.1  | 12.4  | 10.9  | 10.2  |
| 90°   | 0.0   | 0.0   | 0.0   | 0.0   |



Report Generated By 670246072 / DESKTOP-50001EG





— 0°-180°    - - 45°-225°    - - - - 90°-270°    - · - 135°-315°













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

Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

METALUX

Report Number: SP1-2210-795-4

Test Date: 10/06/2022

Luminaire Tested: 9WP217084MDER4AM-4000K-315MA

Data in this report applies to families of products including 9WP217084MDER4AM-4000K.

### Test Information

Test Method: LM-79-2019  
 Report Number: SP1-2210-795-4  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry:  $4\pi$   
 Issue Date: 10/06/2022  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: METALUX  
 Catalog Number: **9WP217084MDER4AM-4000K-315MA**  
 Description: METALUX

TUNABLE BOARD, 4000K-315MA, PROGRAMMED @ 5.0Vdc.

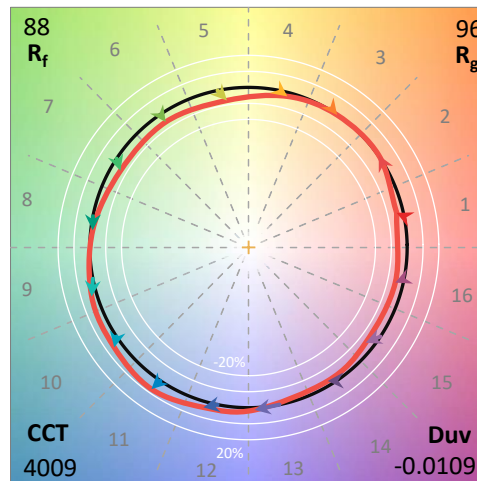
### Spectral Parameters

CCT (K): 4009  
 CIE  $u'$ : 0.2311  
 CIE  $v'$ : 0.4879  
 Duv: -0.0109  
 CIE x: 0.3728  
 CIE y: 0.3498  
 CIE z: 0.2775  
 Peak Wavelength (nm): 632  
 Dominant Wavelength (nm): 588  
 Purity: 17.1

CRI (Ra): 87.8

|          |           |
|----------|-----------|
| R1: 94.2 | R9: 79.5  |
| R2: 88.6 | R10: 77.2 |
| R3: 84.5 | R11: 92.9 |
| R4: 91.1 | R12: 72.5 |
| R5: 92.1 | R13: 92.1 |
| R6: 82.3 | R14: 92.6 |
| R7: 84.3 |           |
| R8: 84.9 |           |

Rf: 88  
 Rg: 96.2



### Test Conditions

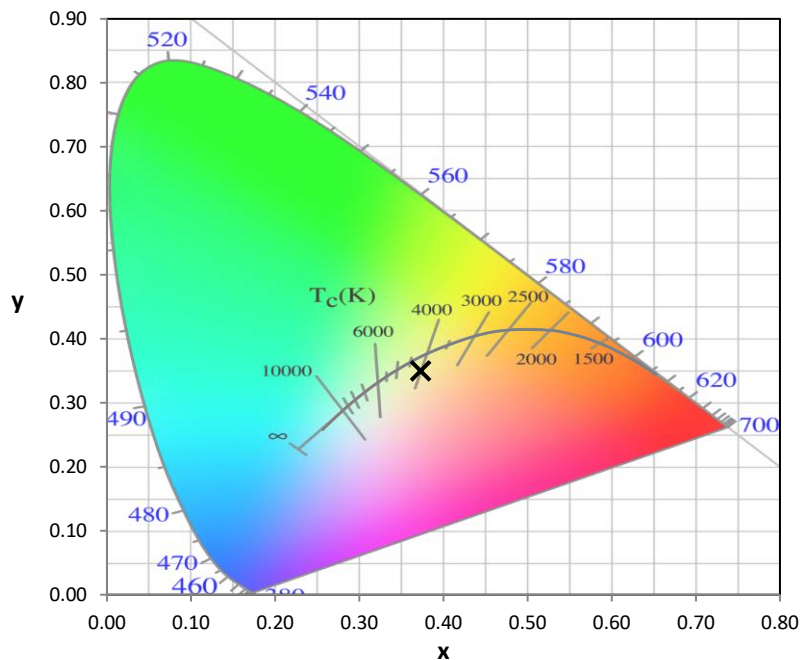
Stabilization Time: 44M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.0/38%  
 Sphere Temperature (°C): 24.4

REPORT NUMBER: SP1-2210-795-4

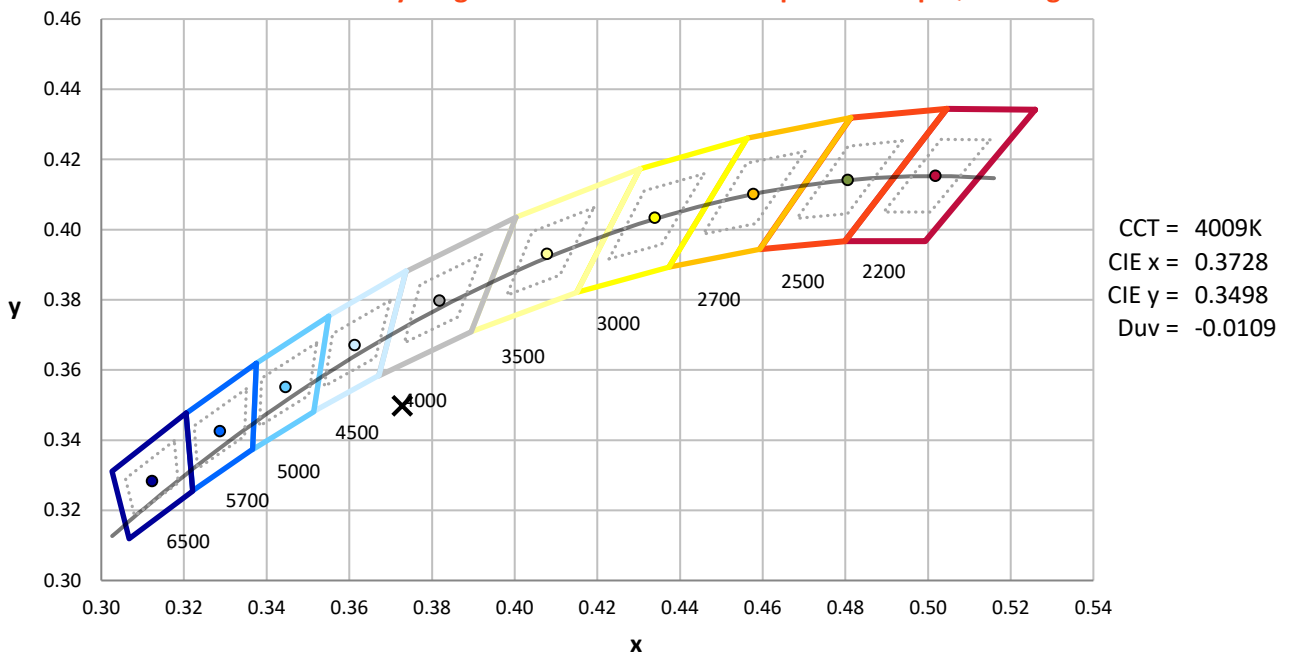
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | 76INCH SPHERE IN0058  | 8/8/2022         | 2/8/2023             |
| Power Meter                    | XITRON 2801 IN0071    | 11/29/2021       | 11/29/2022           |
| AC Power Source                | CHROMA 61603 IN0063   | 11/29/2021       | 11/29/2022           |
| DC Power Source                | AGILENT E3634A IN0208 | 11/29/2021       | 11/29/2022           |
| Sphere Thermometer             | ONSET IN0085          | 11/29/2021       | 11/29/2022           |
| Room Thermometer               | ONSET IN0046          | 11/29/2021       | 11/29/2022           |

REPORT NUMBER: SP1-2210-795-4

**CIE 1931 Chromaticity Diagram**



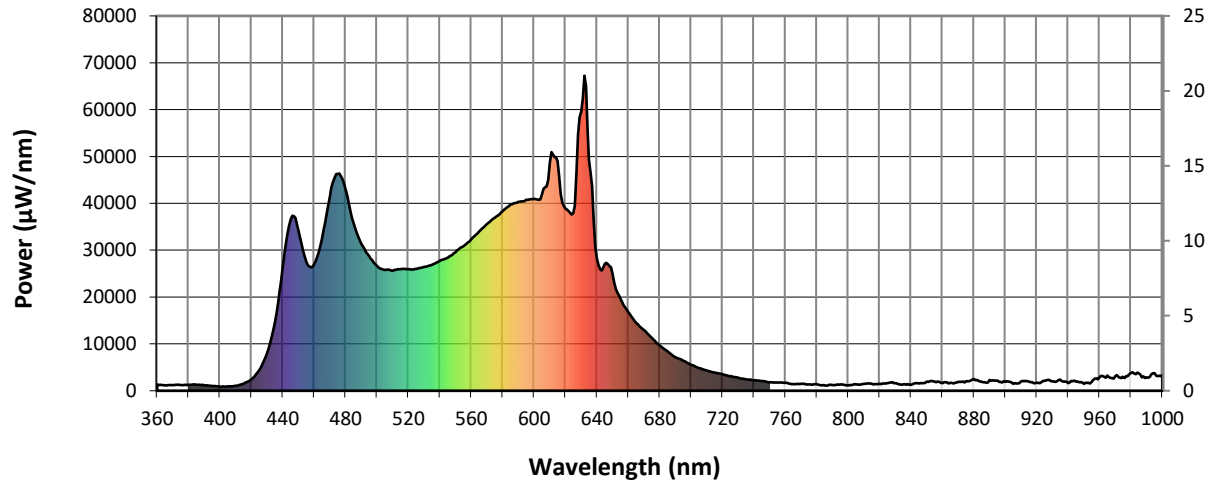
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies outside the range

REPORT NUMBER: SP1-2210-795-4

**Photopic Flux vs. Wavelength**

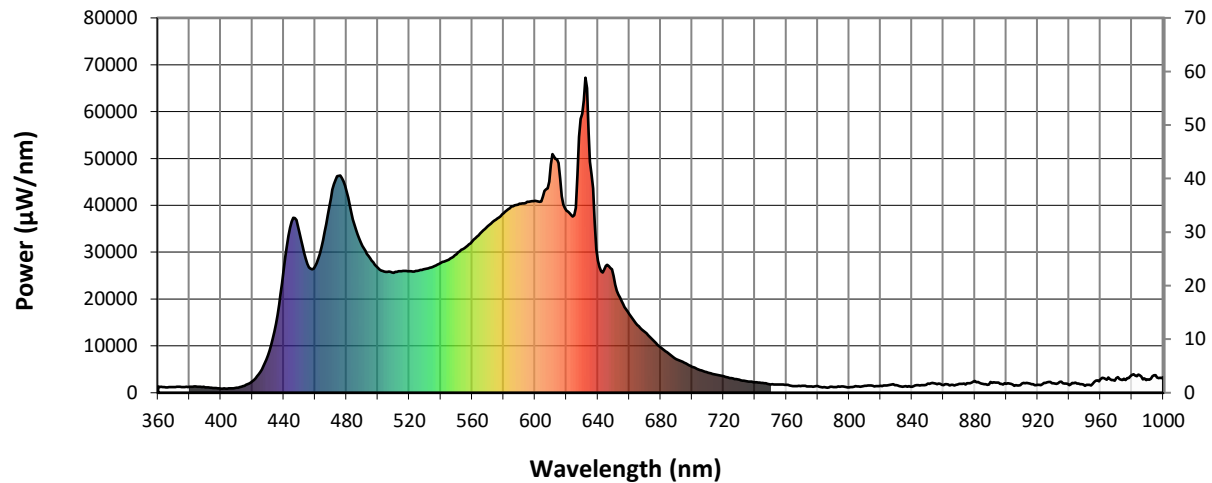


#####

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 1347             | NR               | 490       | 31353            | NR               | 620       | 38840            | NR               | 750       | 1762             | NR               | 880       | 2493             | NR               |
| 365       | 1168             | NR               | 495       | 28718            | NR               | 625       | 37861            | NR               | 755       | 1752             | NR               | 885       | 1913             | NR               |
| 370       | 1204             | NR               | 500       | 26605            | NR               | 630       | 59547            | NR               | 760       | 1690             | NR               | 890       | 2275             | NR               |
| 375       | 1232             | NR               | 505       | 25784            | NR               | 635       | 49312            | NR               | 765       | 1395             | NR               | 895       | 2173             | NR               |
| 380       | 1249             | NR               | 510       | 25614            | NR               | 640       | 28168            | NR               | 770       | 1452             | NR               | 900       | 1923             | NR               |
| 385       | 1285             | NR               | 515       | 25941            | NR               | 645       | 27115            | NR               | 775       | 1370             | NR               | 905       | 1511             | NR               |
| 390       | 1154             | NR               | 520       | 25900            | NR               | 650       | 24916            | NR               | 780       | 1429             | NR               | 910       | 1971             | NR               |
| 395       | 1036             | NR               | 525       | 26015            | NR               | 655       | 19572            | NR               | 785       | 1112             | NR               | 915       | 1957             | NR               |
| 400       | 873              | NR               | 530       | 26424            | NR               | 660       | 16766            | NR               | 790       | 1222             | NR               | 920       | 1699             | NR               |
| 405       | 908              | NR               | 535       | 26869            | NR               | 665       | 14487            | NR               | 795       | 1347             | NR               | 925       | 2123             | NR               |
| 410       | 1056             | NR               | 540       | 27684            | NR               | 670       | 12943            | NR               | 800       | 1132             | NR               | 930       | 2029             | NR               |
| 415       | 1492             | NR               | 545       | 28407            | NR               | 675       | 11228            | NR               | 805       | 1360             | NR               | 935       | 2371             | NR               |
| 420       | 2426             | NR               | 550       | 29571            | NR               | 680       | 9665             | NR               | 810       | 1451             | NR               | 940       | 1649             | NR               |
| 425       | 4409             | NR               | 555       | 30862            | NR               | 685       | 8389             | NR               | 815       | 1507             | NR               | 945       | 1984             | NR               |
| 430       | 7984             | NR               | 560       | 32297            | NR               | 690       | 7170             | NR               | 820       | 1466             | NR               | 950       | 1495             | NR               |
| 435       | 14687            | NR               | 565       | 33979            | NR               | 695       | 6398             | NR               | 825       | 1609             | NR               | 955       | 1862             | NR               |
| 440       | 26286            | NR               | 570       | 35579            | NR               | 700       | 5544             | NR               | 830       | 1642             | NR               | 960       | 2951             | NR               |
| 445       | 36513            | NR               | 575       | 36922            | NR               | 705       | 4845             | NR               | 835       | 1363             | NR               | 965       | 3240             | NR               |
| 450       | 34274            | NR               | 580       | 38319            | NR               | 710       | 4309             | NR               | 840       | 1294             | NR               | 970       | 3119             | NR               |
| 455       | 27519            | NR               | 585       | 39771            | NR               | 715       | 3879             | NR               | 845       | 1584             | NR               | 975       | 3020             | NR               |
| 460       | 26986            | NR               | 590       | 40329            | NR               | 720       | 3504             | NR               | 850       | 1930             | NR               | 980       | 3800             | NR               |
| 465       | 32511            | NR               | 595       | 40738            | NR               | 725       | 3094             | NR               | 855       | 1952             | NR               | 985       | 3748             | NR               |
| 470       | 41588            | NR               | 600       | 40944            | NR               | 730       | 2758             | NR               | 860       | 1631             | NR               | 990       | 2878             | NR               |
| 475       | 46297            | NR               | 605       | 41826            | NR               | 735       | 2441             | NR               | 865       | 1714             | NR               | 995       | 3708             | NR               |
| 480       | 42885            | NR               | 610       | 48714            | NR               | 740       | 2221             | NR               | 870       | 1878             | NR               | 1000      | 3359             | NR               |
| 485       | 35895            | NR               | 615       | 48984            | NR               | 745       | 2091             | NR               | 875       | 2024             | NR               |           |                  |                  |

REPORT NUMBER: SP1-2210-795-4

**Scotopic Flux vs. Wavelength**



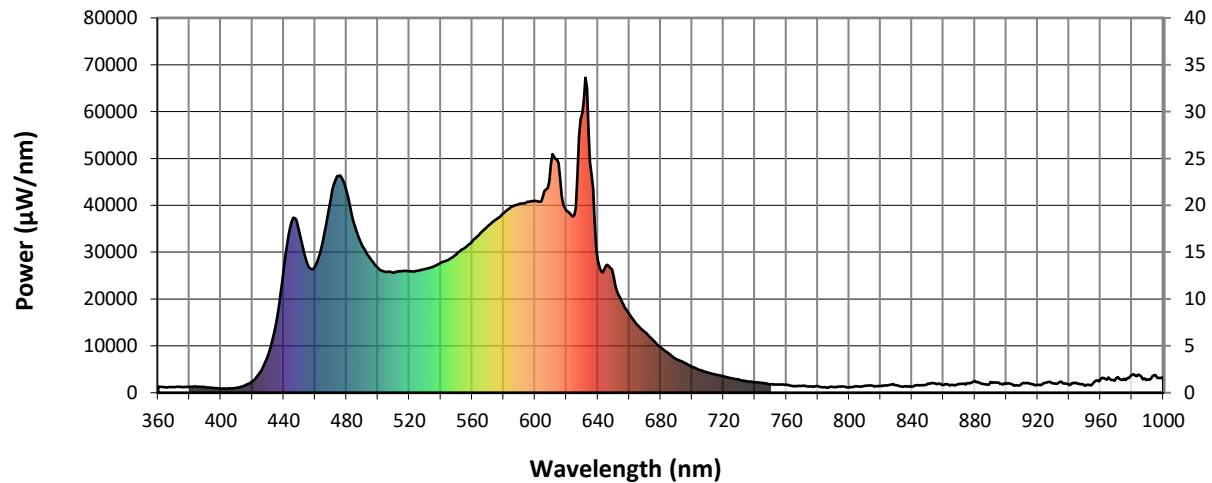
**Scotopic Lumens: 4927.4**

**S/P: 2.02**

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 1347             | NR               | 490       | 31353            | NR               | 620       | 38840            | NR               | 750       | 1762             | NR               | 880       | 2493             | NR               |
| 365       | 1168             | NR               | 495       | 28718            | NR               | 625       | 37861            | NR               | 755       | 1752             | NR               | 885       | 1913             | NR               |
| 370       | 1204             | NR               | 500       | 26605            | NR               | 630       | 59547            | NR               | 760       | 1690             | NR               | 890       | 2275             | NR               |
| 375       | 1232             | NR               | 505       | 25784            | NR               | 635       | 49312            | NR               | 765       | 1395             | NR               | 895       | 2173             | NR               |
| 380       | 1249             | NR               | 510       | 25614            | NR               | 640       | 28168            | NR               | 770       | 1452             | NR               | 900       | 1923             | NR               |
| 385       | 1285             | NR               | 515       | 25941            | NR               | 645       | 27115            | NR               | 775       | 1370             | NR               | 905       | 1511             | NR               |
| 390       | 1154             | NR               | 520       | 25900            | NR               | 650       | 24916            | NR               | 780       | 1429             | NR               | 910       | 1971             | NR               |
| 395       | 1036             | NR               | 525       | 26015            | NR               | 655       | 19572            | NR               | 785       | 1112             | NR               | 915       | 1957             | NR               |
| 400       | 873              | NR               | 530       | 26424            | NR               | 660       | 16766            | NR               | 790       | 1222             | NR               | 920       | 1699             | NR               |
| 405       | 908              | NR               | 535       | 26869            | NR               | 665       | 14487            | NR               | 795       | 1347             | NR               | 925       | 2123             | NR               |
| 410       | 1056             | NR               | 540       | 27684            | NR               | 670       | 12943            | NR               | 800       | 1132             | NR               | 930       | 2029             | NR               |
| 415       | 1492             | NR               | 545       | 28407            | NR               | 675       | 11228            | NR               | 805       | 1360             | NR               | 935       | 2371             | NR               |
| 420       | 2426             | NR               | 550       | 29571            | NR               | 680       | 9665             | NR               | 810       | 1451             | NR               | 940       | 1649             | NR               |
| 425       | 4409             | NR               | 555       | 30862            | NR               | 685       | 8389             | NR               | 815       | 1507             | NR               | 945       | 1984             | NR               |
| 430       | 7984             | NR               | 560       | 32297            | NR               | 690       | 7170             | NR               | 820       | 1466             | NR               | 950       | 1495             | NR               |
| 435       | 14687            | NR               | 565       | 33979            | NR               | 695       | 6398             | NR               | 825       | 1609             | NR               | 955       | 1862             | NR               |
| 440       | 26286            | NR               | 570       | 35579            | NR               | 700       | 5544             | NR               | 830       | 1642             | NR               | 960       | 2951             | NR               |
| 445       | 36513            | NR               | 575       | 36922            | NR               | 705       | 4845             | NR               | 835       | 1363             | NR               | 965       | 3240             | NR               |
| 450       | 34274            | NR               | 580       | 38319            | NR               | 710       | 4309             | NR               | 840       | 1294             | NR               | 970       | 3119             | NR               |
| 455       | 27519            | NR               | 585       | 39771            | NR               | 715       | 3879             | NR               | 845       | 1584             | NR               | 975       | 3020             | NR               |
| 460       | 26986            | NR               | 590       | 40329            | NR               | 720       | 3504             | NR               | 850       | 1930             | NR               | 980       | 3800             | NR               |
| 465       | 32511            | NR               | 595       | 40738            | NR               | 725       | 3094             | NR               | 855       | 1952             | NR               | 985       | 3748             | NR               |
| 470       | 41588            | NR               | 600       | 40944            | NR               | 730       | 2758             | NR               | 860       | 1631             | NR               | 990       | 2878             | NR               |
| 475       | 46297            | NR               | 605       | 41826            | NR               | 735       | 2441             | NR               | 865       | 1714             | NR               | 995       | 3708             | NR               |
| 480       | 42885            | NR               | 610       | 48714            | NR               | 740       | 2221             | NR               | 870       | 1878             | NR               | 1000      | 3359             | NR               |
| 485       | 35895            | NR               | 615       | 48984            | NR               | 745       | 2091             | NR               | 875       | 2024             | NR               |           |                  |                  |

REPORT NUMBER: SP1-2210-795-4

**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 2189.1**

**S/P: 0.9**

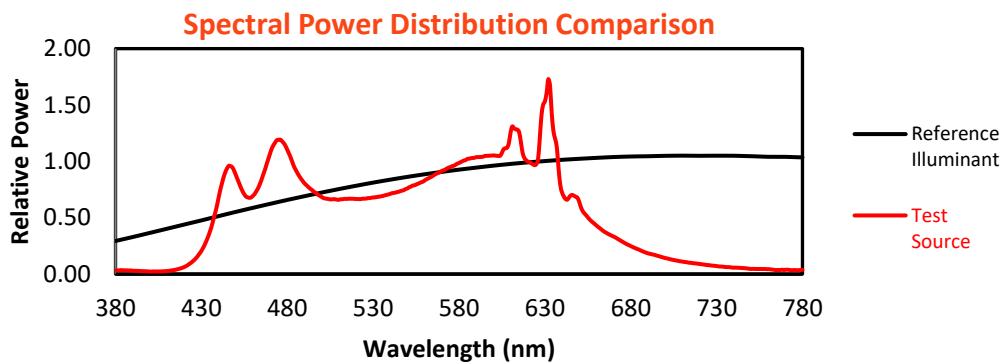
| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 1347             | NR               | 490       | 31353            | NR               | 620       | 38840            | NR               | 750       | 1762             | NR               | 880       | 2493             | NR               |
| 365       | 1168             | NR               | 495       | 28718            | NR               | 625       | 37861            | NR               | 755       | 1752             | NR               | 885       | 1913             | NR               |
| 370       | 1204             | NR               | 500       | 26605            | NR               | 630       | 59547            | NR               | 760       | 1690             | NR               | 890       | 2275             | NR               |
| 375       | 1232             | NR               | 505       | 25784            | NR               | 635       | 49312            | NR               | 765       | 1395             | NR               | 895       | 2173             | NR               |
| 380       | 1249             | NR               | 510       | 25614            | NR               | 640       | 28168            | NR               | 770       | 1452             | NR               | 900       | 1923             | NR               |
| 385       | 1285             | NR               | 515       | 25941            | NR               | 645       | 27115            | NR               | 775       | 1370             | NR               | 905       | 1511             | NR               |
| 390       | 1154             | NR               | 520       | 25900            | NR               | 650       | 24916            | NR               | 780       | 1429             | NR               | 910       | 1971             | NR               |
| 395       | 1036             | NR               | 525       | 26015            | NR               | 655       | 19572            | NR               | 785       | 1112             | NR               | 915       | 1957             | NR               |
| 400       | 873              | NR               | 530       | 26424            | NR               | 660       | 16766            | NR               | 790       | 1222             | NR               | 920       | 1699             | NR               |
| 405       | 908              | NR               | 535       | 26869            | NR               | 665       | 14487            | NR               | 795       | 1347             | NR               | 925       | 2123             | NR               |
| 410       | 1056             | NR               | 540       | 27684            | NR               | 670       | 12943            | NR               | 800       | 1132             | NR               | 930       | 2029             | NR               |
| 415       | 1492             | NR               | 545       | 28407            | NR               | 675       | 11228            | NR               | 805       | 1360             | NR               | 935       | 2371             | NR               |
| 420       | 2426             | NR               | 550       | 29571            | NR               | 680       | 9665             | NR               | 810       | 1451             | NR               | 940       | 1649             | NR               |
| 425       | 4409             | NR               | 555       | 30862            | NR               | 685       | 8389             | NR               | 815       | 1507             | NR               | 945       | 1984             | NR               |
| 430       | 7984             | NR               | 560       | 32297            | NR               | 690       | 7170             | NR               | 820       | 1466             | NR               | 950       | 1495             | NR               |
| 435       | 14687            | NR               | 565       | 33979            | NR               | 695       | 6398             | NR               | 825       | 1609             | NR               | 955       | 1862             | NR               |
| 440       | 26286            | NR               | 570       | 35579            | NR               | 700       | 5544             | NR               | 830       | 1642             | NR               | 960       | 2951             | NR               |
| 445       | 36513            | NR               | 575       | 36922            | NR               | 705       | 4845             | NR               | 835       | 1363             | NR               | 965       | 3240             | NR               |
| 450       | 34274            | NR               | 580       | 38319            | NR               | 710       | 4309             | NR               | 840       | 1294             | NR               | 970       | 3119             | NR               |
| 455       | 27519            | NR               | 585       | 39771            | NR               | 715       | 3879             | NR               | 845       | 1584             | NR               | 975       | 3020             | NR               |
| 460       | 26986            | NR               | 590       | 40329            | NR               | 720       | 3504             | NR               | 850       | 1930             | NR               | 980       | 3800             | NR               |
| 465       | 32511            | NR               | 595       | 40738            | NR               | 725       | 3094             | NR               | 855       | 1952             | NR               | 985       | 3748             | NR               |
| 470       | 41588            | NR               | 600       | 40944            | NR               | 730       | 2758             | NR               | 860       | 1631             | NR               | 990       | 2878             | NR               |
| 475       | 46297            | NR               | 605       | 41826            | NR               | 735       | 2441             | NR               | 865       | 1714             | NR               | 995       | 3708             | NR               |
| 480       | 42885            | NR               | 610       | 48714            | NR               | 740       | 2221             | NR               | 870       | 1878             | NR               | 1000      | 3359             | NR               |
| 485       | 35895            | NR               | 615       | 48984            | NR               | 745       | 2091             | NR               | 875       | 2024             | NR               |           |                  |                  |

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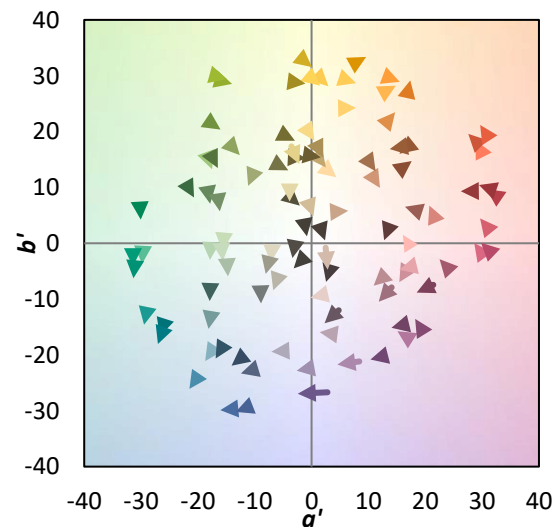
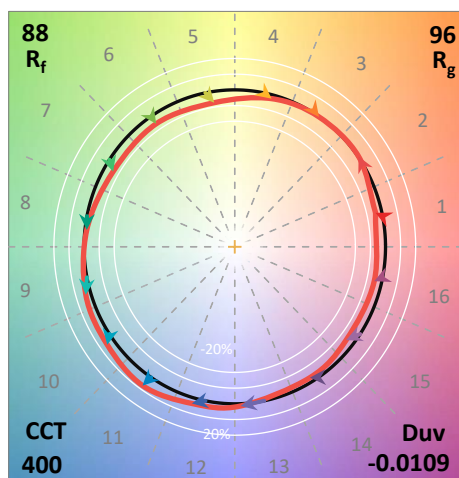
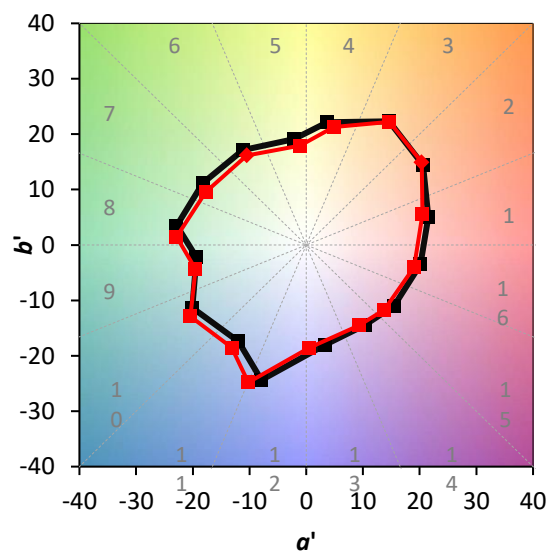
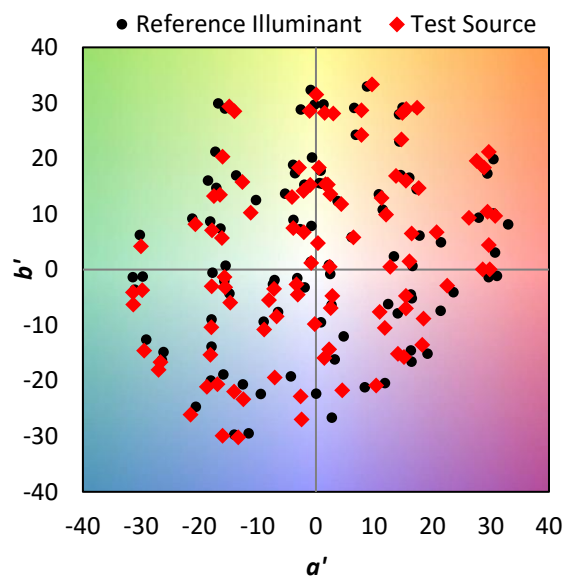
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### Summary

$R_f = 88$   
 $R_g = 96.2$   
 CIE  $R_a = 87.8$   
 $R_g = 79.5$



### Color Vector Graphics

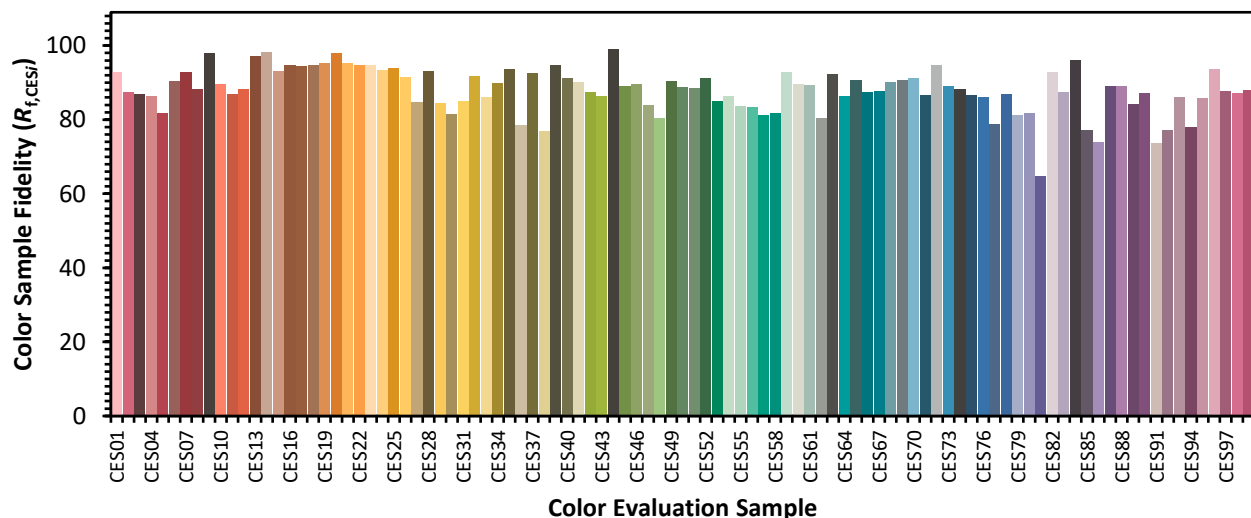


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**Individual Sample Fidelity Index ( $R_{f,i}$ )**

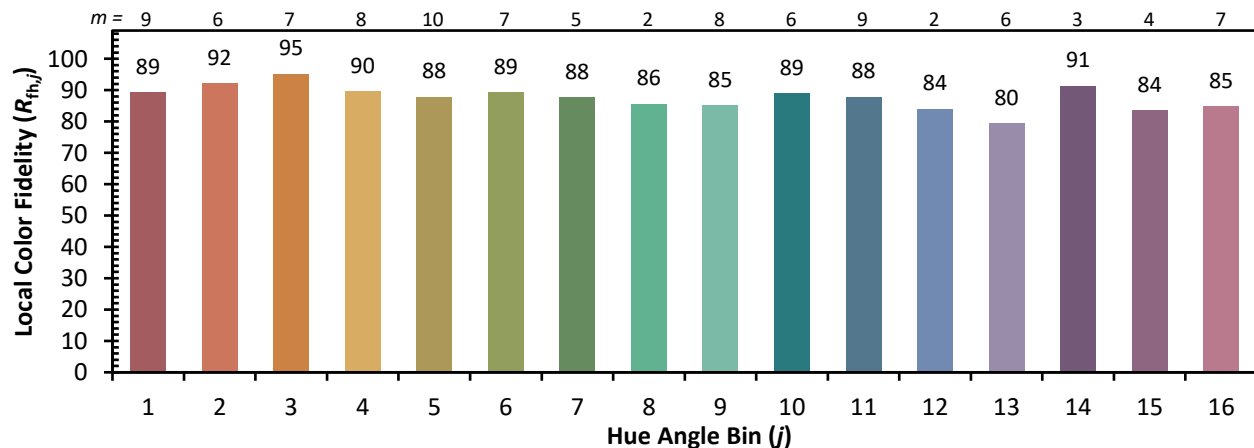
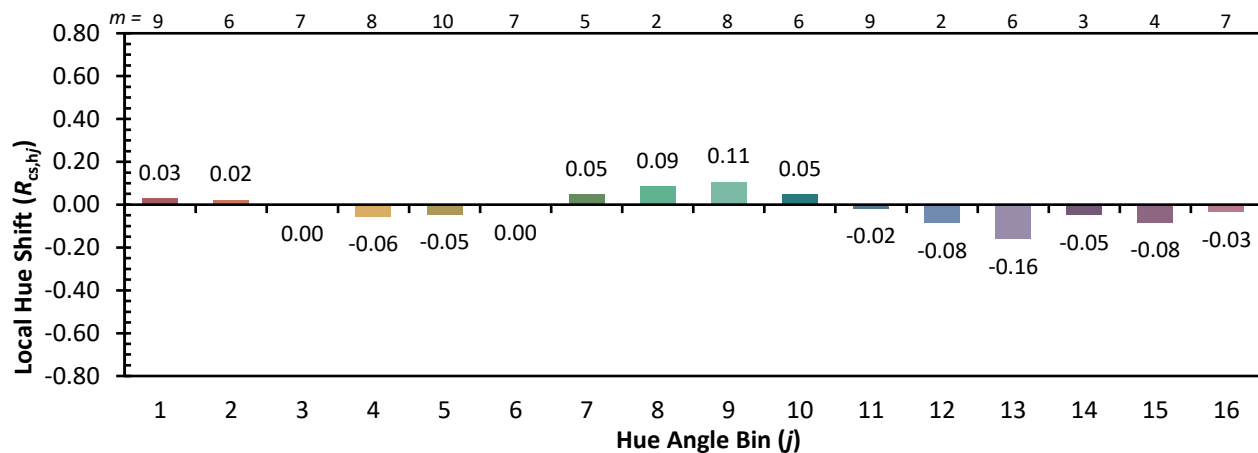
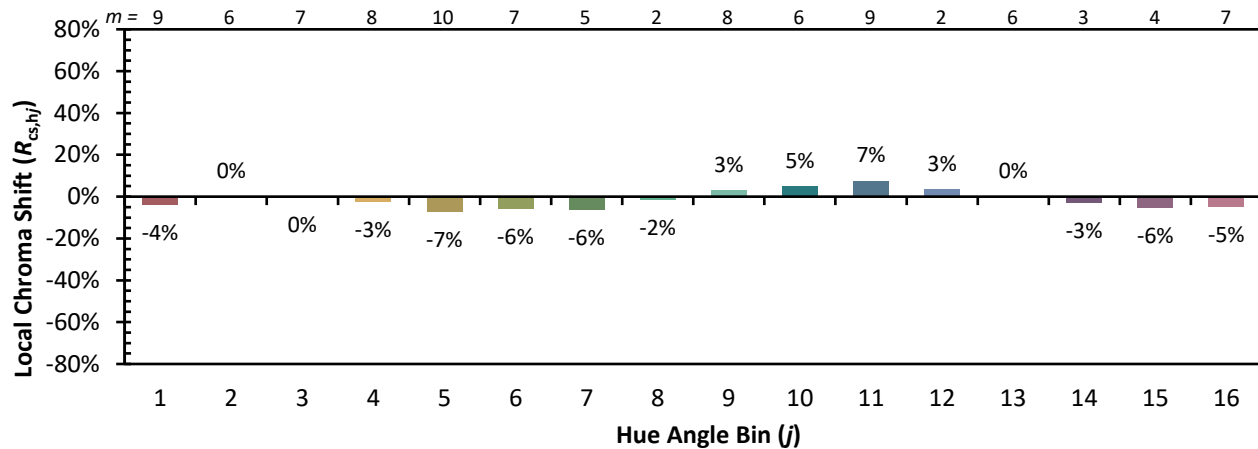
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 91 | CES51 = 88 | CES76 = 86 |
| CES02 = 62 | CES27 = 85 | CES52 = 91 | CES77 = 79 |
| CES03 = 31 | CES28 = 93 | CES53 = 85 | CES78 = 87 |
| CES04 = 70 | CES29 = 84 | CES54 = 86 | CES79 = 81 |
| CES05 = 49 | CES30 = 81 | CES55 = 84 | CES80 = 82 |
| CES06 = 51 | CES31 = 85 | CES56 = 83 | CES81 = 65 |
| CES07 = 42 | CES32 = 92 | CES57 = 81 | CES82 = 93 |
| CES08 = 41 | CES33 = 86 | CES58 = 82 | CES83 = 87 |
| CES09 = 29 | CES34 = 90 | CES59 = 93 | CES84 = 96 |
| CES10 = 75 | CES35 = 94 | CES60 = 90 | CES85 = 77 |
| CES11 = 58 | CES36 = 78 | CES61 = 89 | CES86 = 74 |
| CES12 = 64 | CES37 = 92 | CES62 = 80 | CES87 = 89 |
| CES13 = 43 | CES38 = 77 | CES63 = 92 | CES88 = 89 |
| CES14 = 74 | CES39 = 95 | CES64 = 86 | CES89 = 84 |
| CES15 = 71 | CES40 = 91 | CES65 = 91 | CES90 = 87 |
| CES16 = 47 | CES41 = 90 | CES66 = 87 | CES91 = 74 |
| CES17 = 49 | CES42 = 87 | CES67 = 88 | CES92 = 77 |
| CES18 = 56 | CES43 = 86 | CES68 = 90 | CES93 = 86 |
| CES19 = 71 | CES44 = 99 | CES69 = 91 | CES94 = 78 |
| CES20 = 66 | CES45 = 89 | CES70 = 91 | CES95 = 86 |
| CES21 = 85 | CES46 = 90 | CES71 = 86 | CES96 = 94 |
| CES22 = 78 | CES47 = 84 | CES72 = 95 | CES97 = 88 |
| CES23 = 91 | CES48 = 80 | CES73 = 89 | CES98 = 87 |
| CES24 = 90 | CES49 = 90 | CES74 = 88 | CES99 = 88 |
| CES25 = 71 | CES50 = 89 | CES75 = 86 |            |



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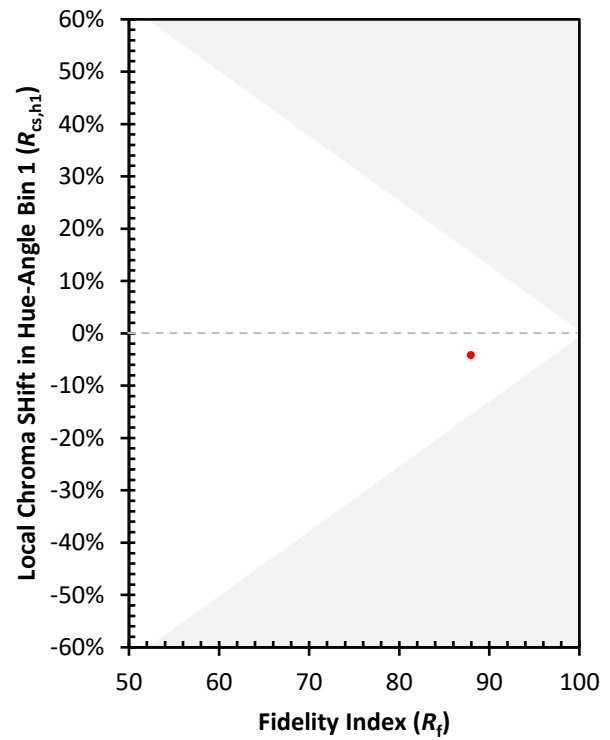
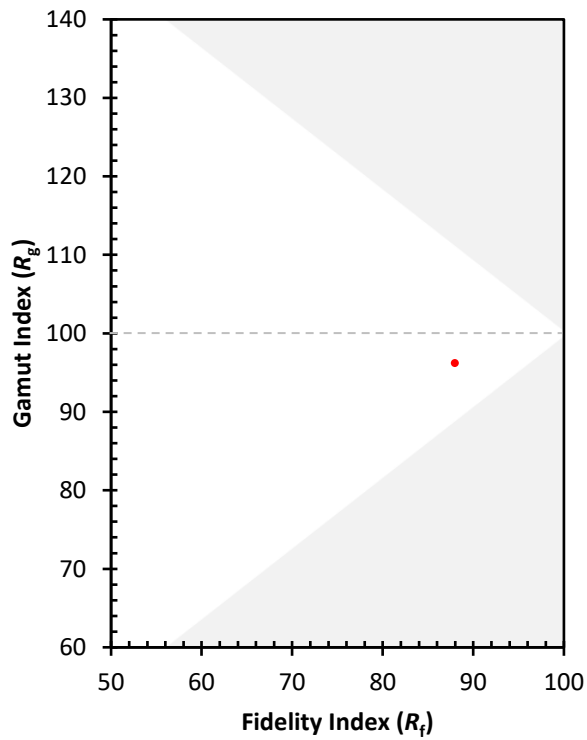
**Color Rendition by Hue-Angle Bin**



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**Measure Comparisons**



(END OF REPORT)