

Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269



Scaled data based on original data using  
LM-79-2019 Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Test Report Prepared for  
Cooper Lighting Solutions

Brand: METALUX

Report Number: P1311251

Luminaire Tested: 4PWW-4080C5-830-MEDIUMHIGH

Issue Date: 02/11/2026

**Test Information**

Test Method: LM-79-2019  
Report Number: P1311251  
Test Lab: INNOVATION CENTER(P3)  
Issue Date: 02/11/2026  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: METALUX  
Catalog Number: 4PWW-4080C5-830-MEDIUMHIGH  
Description: METALUX 14.75 INCH PROWRAP 80CRI 3000K FIXTURE MEDIUM-HIGH OUTPUT  
Light Source: 3000K CCT, 80+ CRI LEDS  
Ballast/Driver: -

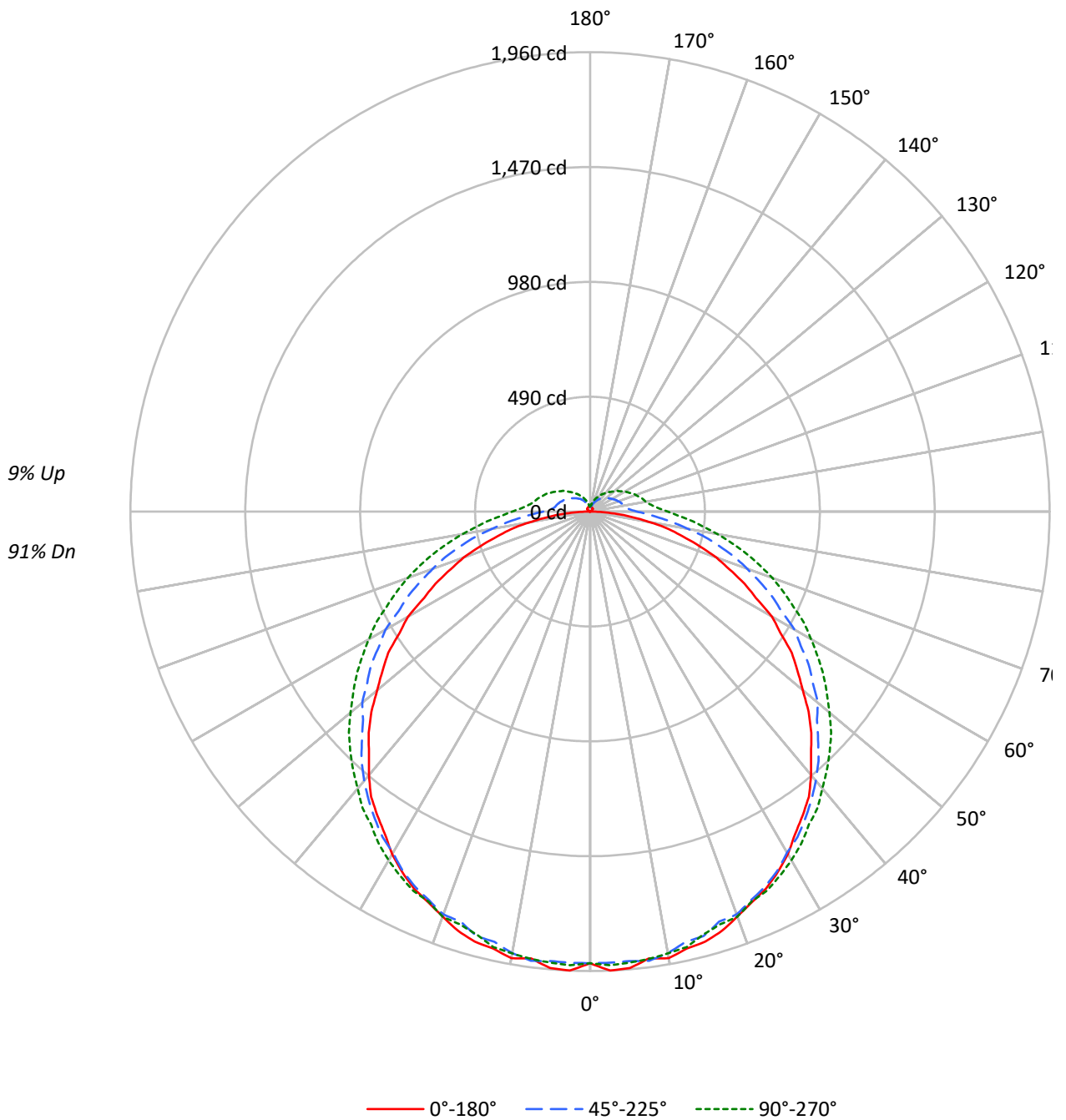
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 6985.9 lumens  
Efficiency: N/A  
Efficacy: 127.2 lumens/watt  
Spacing Criteria (0/90/45): 1.29 / 1.32 / 1.42  
Luminous Opening: Rectangular w/ Sides (W: 1.23' x L: 3.76' x H: 0.19')  
CIE Type: Direct

Input Watts (W): 54.9  
Input Voltage (V): 120  
Input Current (A<sub>in</sub>): 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: 28.75 FT

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### Luminous Intensity Polar Plot





TEST NUMBER: P1311251  
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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 |
| RCR |     |     |     |     |     |     |     |     |     |     |     |     |     |     |    |    |    |
| 0   | 117 | 117 | 117 | 117 | 113 | 113 | 113 | 113 | 106 | 106 | 106 | 100 | 100 | 100 | 94 | 94 | 94 |
| 1   | 105 | 100 | 95  | 91  | 101 | 97  | 92  | 88  | 91  | 87  | 84  | 85  | 82  | 80  | 80 | 78 | 76 |
| 2   | 95  | 86  | 79  | 72  | 91  | 83  | 77  | 71  | 78  | 73  | 68  | 74  | 69  | 65  | 69 | 66 | 62 |
| 3   | 86  | 75  | 66  | 59  | 83  | 73  | 65  | 58  | 68  | 62  | 56  | 64  | 59  | 54  | 61 | 56 | 52 |
| 4   | 79  | 66  | 57  | 50  | 76  | 64  | 56  | 49  | 60  | 53  | 47  | 57  | 51  | 46  | 54 | 49 | 44 |
| 5   | 72  | 59  | 49  | 43  | 69  | 57  | 48  | 42  | 54  | 46  | 41  | 51  | 44  | 39  | 48 | 43 | 38 |
| 6   | 66  | 53  | 44  | 37  | 64  | 51  | 43  | 36  | 49  | 41  | 35  | 46  | 39  | 34  | 44 | 38 | 33 |
| 7   | 62  | 48  | 39  | 32  | 59  | 46  | 38  | 32  | 44  | 37  | 31  | 42  | 35  | 30  | 40 | 34 | 29 |
| 8   | 57  | 43  | 35  | 29  | 55  | 42  | 34  | 28  | 40  | 33  | 28  | 38  | 32  | 27  | 36 | 31 | 26 |
| 9   | 53  | 40  | 31  | 26  | 51  | 39  | 31  | 25  | 37  | 30  | 25  | 35  | 29  | 24  | 34 | 28 | 24 |
| 10  | 50  | 37  | 29  | 23  | 48  | 36  | 28  | 23  | 34  | 27  | 22  | 33  | 26  | 22  | 31 | 26 | 21 |

10°

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 4483 | 4483 | 4483 |
| 5°  | 4546 | 4440 | 4453 |
| 10° | 4532 | 4409 | 4404 |
| 15° | 4516 | 4349 | 4323 |
| 20° | 4471 | 4305 | 4315 |
| 25° | 4454 | 4251 | 4279 |
| 30° | 4407 | 4171 | 4243 |
| 35° | 4342 | 4131 | 4181 |
| 40° | 4276 | 4063 | 4151 |
| 45° | 4184 | 3960 | 4129 |
| 50° | 4047 | 3922 | 4084 |
| 55° | 3980 | 3837 | 4051 |
| 60° | 3841 | 3758 | 4011 |
| 65° | 3616 | 3618 | 3967 |
| 70° | 3432 | 3484 | 3966 |
| 75° | 3104 | 3357 | 3949 |
| 80° | 2713 | 3149 | 3961 |
| 85° | 1978 | 2998 | 4197 |

0°

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°  
 Vertical Angle: 90°  
 Luminance: 5067 cd/sqm



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**ZONAL LUMENS:**

|    | Zone      | Lumens | % Fixture |
|----|-----------|--------|-----------|
| 20 | 0°-10°    | 183.6  | 2.6       |
| 0  | 10°-20°   | 529.2  | 7.6       |
|    | 20°-30°   | 814.4  | 11.7      |
| 91 | 30°-40°   | 1002.7 | 14.4      |
| 73 | 40°-50°   | 1068.7 | 15.3      |
| 59 | 50°-60°   | 1009.6 | 14.5      |
| 49 | 60°-70°   | 840.0  | 12.0      |
| 42 | 70°-80°   | 594.8  | 8.5       |
| 36 | 80°-90°   | 318.6  | 4.6       |
| 31 | 90°-100°  | 168.6  | 2.4       |
| 27 | 100°-110° | 136.1  | 1.9       |
| 24 | 110°-120° | 109.9  | 1.6       |
| 22 | 120°-130° | 82.9   | 1.2       |
| 20 | 130°-140° | 58.2   | 0.8       |
|    | 140°-150° | 37.1   | 0.5       |
|    | 150°-160° | 20.4   | 0.3       |
|    | 160°-170° | 8.8    | 0.1       |
|    | 170°-180° | 2.2    | 0.0       |
|    | 0°-30°    | 1527.3 | 21.9      |
|    | 0°-40°    | 2530.0 | 36.2      |
|    | 0°-60°    | 4608.3 | 66.0      |
|    | 0°-90°    | 6361.8 | 91.1      |
|    | 90°-120°  | 414.6  | 5.9       |
|    | 90°-150°  | 592.7  | 8.5       |
|    | 90°-180°  | 624.0  | 8.9       |
|    | 0°-180°   | 6985.9 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  |
|------|------|-------|------|-------|------|
| 0°   | 1926 | 1926  | 1926 | 1926  | 1926 |
| 5°   | 1954 | 1924  | 1924 | 1942  | 1932 |
| 15°  | 1899 | 1859  | 1874 | 1876  | 1868 |
| 25°  | 1775 | 1732  | 1766 | 1776  | 1785 |
| 35°  | 1582 | 1560  | 1600 | 1635  | 1629 |
| 45°  | 1335 | 1337  | 1375 | 1445  | 1446 |
| 55°  | 1051 | 1047  | 1139 | 1205  | 1216 |
| 65°  | 727  | 765   | 858  | 927   | 956  |
| 75°  | 409  | 474   | 573  | 656   | 689  |
| 85°  | 116  | 184   | 296  | 393   | 431  |
| 90°  | 2    | 83    | 200  | 295   | 332  |
| 95°  | 1    | 65    | 159  | 242   | 272  |
| 105° | 3    | 60    | 138  | 202   | 226  |
| 115° | 7    | 54    | 119  | 170   | 188  |
| 125° | 12   | 50    | 99   | 138   | 152  |
| 135° | 16   | 43    | 80   | 108   | 118  |
| 145° | 18   | 35    | 63   | 83    | 91   |
| 155° | 20   | 27    | 45   | 60    | 65   |
| 165° | 22   | 23    | 28   | 40    | 40   |
| 175° | 23   | 22    | 22   | 21    | 24   |
| 180° | 22   | 22    | 22   | 22    | 22   |

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CATALOG NUMBER: 4PWW-4080C5-830-MEDIUMHIGH

**CANDELA DISTRIBUTION (FULL):**

| Flux |        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|------|--------|--------|--------|--------|--------|--------|
|      | 0°     | 1926.2 | 1926.2 | 1926.2 | 1926.2 | 1926.2 |
| 185  | 2.5°   | 1959.5 | 1928.0 | 1926.2 | 1943.3 | 1937.0 |
| 535  | 5°     | 1954.1 | 1924.4 | 1924.4 | 1941.5 | 1931.6 |
| 817  | 7.5°   | 1922.6 | 1927.1 | 1932.5 | 1912.7 | 1924.4 |
| 990  | 10°    | 1934.3 | 1882.9 | 1912.7 | 1902.7 | 1913.6 |
| 1027 | 12.5°  | 1909.0 | 1888.3 | 1880.2 | 1894.6 | 1902.7 |
| 933  | 15°    | 1899.1 | 1859.4 | 1873.9 | 1875.7 | 1867.6 |
| 718  | 17.5°  | 1874.8 | 1846.8 | 1833.3 | 1848.6 | 1845.9 |
| 438  | 20°    | 1837.8 | 1830.6 | 1828.8 | 1846.8 | 1838.7 |
| 125  | 22.5°  | 1803.5 | 1786.4 | 1794.5 | 1815.3 | 1799.9 |
| 8    | 25°    | 1774.7 | 1732.3 | 1765.7 | 1775.6 | 1784.6 |
| 1    | 27.5°  | 1734.1 | 1700.7 | 1728.7 | 1742.2 | 1752.1 |
| 3    | 30°    | 1687.2 | 1675.5 | 1680.0 | 1706.1 | 1717.9 |
| 7    | 32.5°  | 1628.6 | 1628.6 | 1646.6 | 1676.4 | 1678.2 |
| 10   | 35°    | 1581.7 | 1560.1 | 1599.7 | 1634.9 | 1628.6 |
| 12   | 37.5°  | 1533.0 | 1514.1 | 1551.0 | 1588.9 | 1594.3 |
| 11   | 40°    | 1466.3 | 1455.5 | 1497.8 | 1531.2 | 1541.1 |
| 9    | 42.5°  | 1395.0 | 1401.3 | 1442.8 | 1499.6 | 1495.1 |
| 6    | 45°    | 1334.6 | 1337.3 | 1375.2 | 1444.6 | 1445.5 |
| 2    | 47.5°  | 1264.3 | 1266.1 | 1313.0 | 1378.8 | 1395.0 |
|      | 50°    | 1184.0 | 1191.2 | 1267.9 | 1313.9 | 1332.8 |
|      | 52.5°  | 1115.5 | 1131.7 | 1197.5 | 1251.7 | 1273.3 |
|      | 55°    | 1050.6 | 1047.0 | 1138.9 | 1204.8 | 1215.6 |
|      | 57.5°  | 963.1  | 990.1  | 1065.0 | 1132.6 | 1151.6 |
|      | 60°    | 896.4  | 911.7  | 1007.3 | 1059.6 | 1089.3 |
|      | 62.5°  | 797.2  | 840.4  | 919.8  | 1010.9 | 1028.9 |
|      | 65°    | 726.8  | 764.7  | 858.5  | 927.0  | 955.9  |
|      | 67.5°  | 643.0  | 691.7  | 783.6  | 856.7  | 891.8  |
|      | 70°    | 573.5  | 615.9  | 713.3  | 789.0  | 826.9  |
|      | 72.5°  | 490.6  | 543.8  | 647.5  | 724.1  | 757.5  |
|      | 75°    | 409.4  | 474.3  | 572.6  | 656.5  | 689.0  |
|      | 77.5°  | 344.5  | 400.4  | 504.1  | 587.1  | 619.5  |
|      | 80°    | 259.7  | 325.5  | 425.6  | 519.4  | 551.0  |
|      | 82.5°  | 186.7  | 253.4  | 358.9  | 450.9  | 486.1  |
|      | 85°    | 116.3  | 184.0  | 295.8  | 393.2  | 431.0  |
|      | 87.5°  | 53.2   | 124.4  | 241.7  | 341.8  | 372.4  |
|      | 90°    | 1.8    | 83.0   | 200.2  | 294.9  | 331.9  |
|      | 92.5°  | 0.9    | 68.5   | 174.0  | 262.4  | 296.7  |
|      | 95°    | 0.9    | 64.9   | 158.7  | 241.7  | 272.3  |
|      | 97.5°  | 1.8    | 63.1   | 150.6  | 227.2  | 254.3  |
|      | 100°   | 1.8    | 62.2   | 147.0  | 219.1  | 241.7  |
|      | 102.5° | 2.7    | 61.3   | 142.5  | 208.3  | 234.5  |
|      | 105°   | 2.7    | 60.4   | 138.0  | 202.0  | 226.3  |
|      | 107.5° | 3.6    | 58.6   | 134.4  | 193.9  | 215.5  |
|      | 110°   | 4.5    | 57.7   | 128.1  | 187.6  | 208.3  |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°   | 22.5° | 45°   | 67.5° | 90°   |
|--------|------|-------|-------|-------|-------|
| 112.5° | 6.3  | 55.9  | 124.4 | 178.6 | 200.2 |
| 115°   | 7.2  | 54.1  | 119.0 | 170.4 | 188.5 |
| 117.5° | 8.1  | 53.2  | 113.6 | 164.1 | 179.5 |
| 120°   | 9.0  | 52.3  | 108.2 | 153.3 | 170.4 |
| 122.5° | 9.9  | 51.4  | 103.7 | 146.1 | 160.5 |
| 125°   | 11.7 | 49.6  | 99.2  | 138.0 | 151.5 |
| 127.5° | 12.6 | 47.8  | 93.8  | 130.8 | 146.1 |
| 130°   | 14.4 | 46.0  | 89.3  | 123.5 | 134.4 |
| 132.5° | 14.4 | 45.1  | 84.8  | 116.3 | 126.2 |
| 135°   | 16.2 | 43.3  | 80.3  | 108.2 | 118.1 |
| 137.5° | 16.2 | 41.5  | 75.7  | 101.9 | 110.9 |
| 140°   | 17.1 | 39.7  | 71.2  | 94.7  | 104.6 |
| 142.5° | 17.1 | 37.0  | 68.5  | 89.3  | 96.5  |
| 145°   | 18.0 | 35.2  | 63.1  | 83.0  | 91.1  |
| 147.5° | 18.0 | 32.5  | 59.5  | 75.7  | 82.1  |
| 150°   | 18.0 | 30.7  | 54.1  | 71.2  | 75.7  |
| 152.5° | 18.9 | 28.9  | 49.6  | 65.8  | 69.4  |
| 155°   | 19.8 | 27.1  | 45.1  | 60.4  | 64.9  |
| 157.5° | 20.7 | 26.2  | 40.6  | 54.1  | 57.7  |
| 160°   | 20.7 | 24.3  | 36.1  | 48.7  | 52.3  |
| 162.5° | 21.6 | 23.4  | 32.5  | 44.2  | 46.0  |
| 165°   | 21.6 | 23.4  | 28.0  | 39.7  | 39.7  |
| 167.5° | 22.5 | 22.5  | 25.2  | 32.5  | 35.2  |
| 170°   | 22.5 | 23.4  | 23.4  | 27.1  | 29.8  |
| 172.5° | 22.5 | 22.5  | 21.6  | 23.4  | 25.2  |
| 175°   | 23.4 | 22.5  | 21.6  | 20.7  | 24.3  |
| 177.5° | 23.4 | 22.5  | 20.7  | 18.9  | 23.4  |
| 180°   | 21.6 | 21.6  | 21.6  | 21.6  | 21.6  |

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

Report Prepared for

Cooper Lighting Solutions

Metalux

Report Number: SP3-2511-615-16

Test Date: 01/15/2026

Luminaire Tested: PW-L-8K-830-2nd

Data in this report applies to families of products including PW-L-8K\*

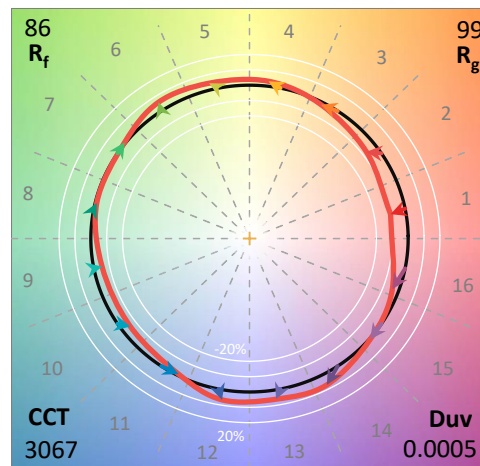
**Test Information**

Test Method: LM-79-2019  
 Report Number: SP3-2511-615-16  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP3 - 3M SPHERE  
 Measurement Geometry: 4π  
 Issue Date: 01/20/2026  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: Metalux  
 Catalog Number: **PW-L-8K-830-2nd**  
 Description: 14.75" Wrap 5 CCT 5 lumen select @8000lms (switch) @3000K 2nd Round

**Spectral Parameters**

CCT (K): 3067  
 CIE u': 0.2481  
 CIE v': 0.5207  
 Duv: 0.0005  
 CIE x: 0.4329  
 CIE y: 0.4038  
 CIE z: 0.1633  
 Peak Wavelength (nm): 607  
 Dominant Wavelength (nm): 582  
 Purity: 51.1535  
 Rf: 85.6  
 Rg: 98.9

|           |      |      |      |
|-----------|------|------|------|
| CRI (Ra): | 84.8 |      |      |
| R1:       | 83.9 | R9:  | 16.5 |
| R2:       | 90.3 | R10: | 77.7 |
| R3:       | 96.3 | R11: | 86.2 |
| R4:       | 85.4 | R12: | 71.0 |
| R5:       | 83.8 | R13: | 85.3 |
| R6:       | 88.5 | R14: | 97.7 |
| R7:       | 85.8 | R15: | 76.4 |
| R8:       | 64.6 |      |      |



**Test Conditions**

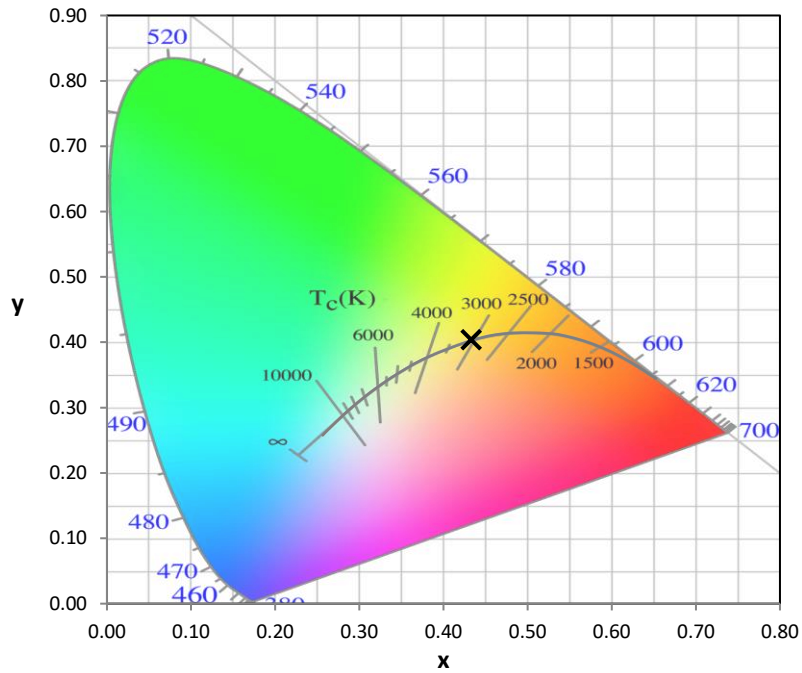
Stabilization Time: 27M  
 Operation Time: 1H 27M  
 Sphere Temperature (°C): 25.0

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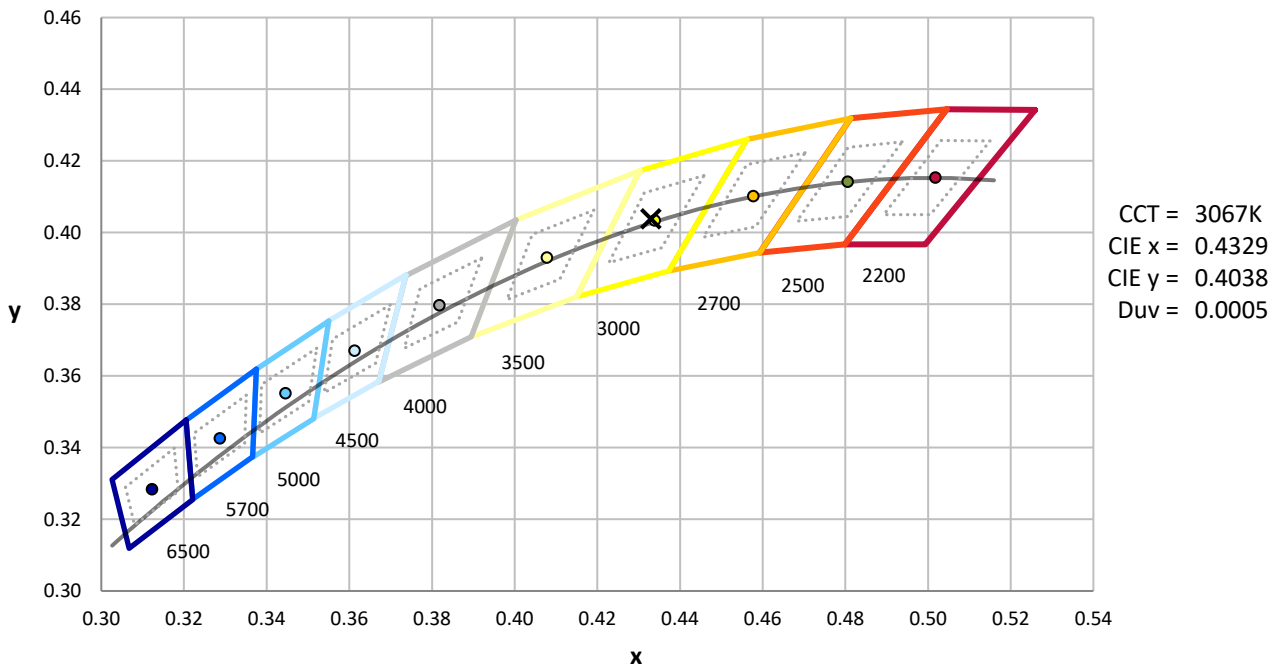
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | 3M SPHERE IN02505     | 1/10/2026        | 7/10/2026            |
| Power Meter                    | XITRON INXT2011006    | 10/21/2025       | 10/21/2026           |
| AC Power Source                | CHROMA 61604 IN6064A  | 10/20/2025       | 10/20/2026           |
| DC Power Source                | EYSIGHT N5770A IN0534 | 10/20/2025       | 10/20/2026           |
| Sphere Thermometer             | TANDD IN4036E         | 10/21/2025       | 10/21/2026           |
|                                |                       |                  |                      |

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**CIE 1931 Chromaticity Diagram**



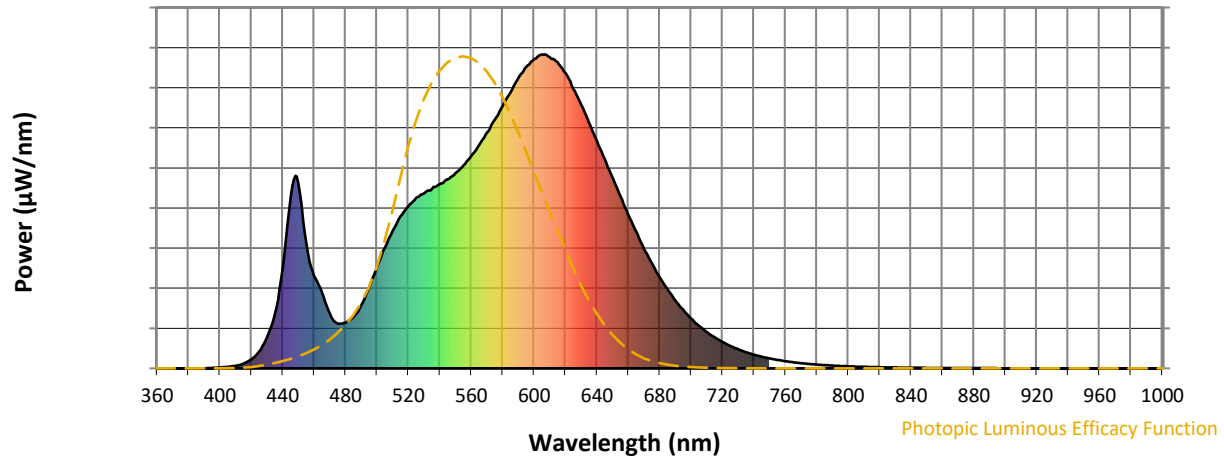
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 3000K 4-step quadrangle

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**Photopic Flux vs. Wavelength**

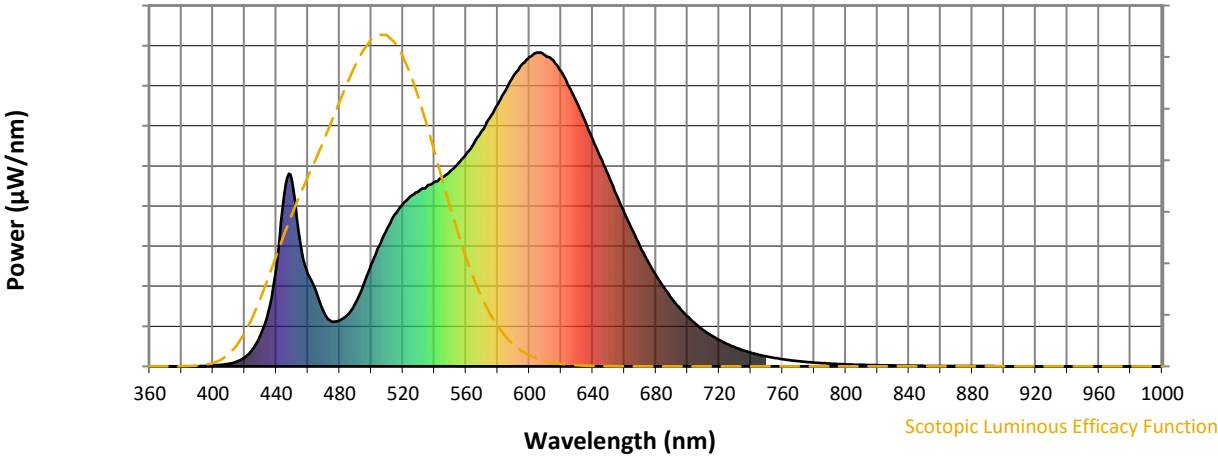


**Photopic Lumens: NR**

| 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    | 201                      | NR            | 620    | 940                      | NR            | 750    | 31                       | NR            | 880    | 1                        | NR            |
| 365    | 0                        | NR            | 495    | 257                      | NR            | 625    | 891                      | NR            | 755    | 27                       | NR            | 885    | 1                        | NR            |
| 370    | 0                        | NR            | 500    | 324                      | NR            | 630    | 840                      | NR            | 760    | 23                       | NR            | 890    | 1                        | NR            |
| 375    | 0                        | NR            | 505    | 383                      | NR            | 635    | 783                      | NR            | 765    | 19                       | NR            | 895    | 1                        | NR            |
| 380    | 0                        | NR            | 510    | 438                      | NR            | 640    | 725                      | NR            | 770    | 17                       | NR            | 900    | 0                        | NR            |
| 385    | 0                        | NR            | 515    | 484                      | NR            | 645    | 666                      | NR            | 775    | 14                       | NR            | 905    | 0                        | NR            |
| 390    | 0                        | NR            | 520    | 517                      | NR            | 650    | 607                      | NR            | 780    | 12                       | NR            | 910    | 0                        | NR            |
| 395    | 1                        | NR            | 525    | 543                      | NR            | 655    | 548                      | NR            | 785    | 10                       | NR            | 915    | 0                        | NR            |
| 400    | 3                        | NR            | 530    | 557                      | NR            | 660    | 489                      | NR            | 790    | 9                        | NR            | 920    | 0                        | NR            |
| 405    | 5                        | NR            | 535    | 572                      | NR            | 665    | 435                      | NR            | 795    | 8                        | NR            | 925    | 0                        | NR            |
| 410    | 8                        | NR            | 540    | 587                      | NR            | 670    | 381                      | NR            | 800    | 6                        | NR            | 930    | 0                        | NR            |
| 415    | 15                       | NR            | 545    | 602                      | NR            | 675    | 334                      | NR            | 805    | 6                        | NR            | 935    | 0                        | NR            |
| 420    | 29                       | NR            | 550    | 622                      | NR            | 680    | 290                      | NR            | 810    | 5                        | NR            | 940    | 0                        | NR            |
| 425    | 54                       | NR            | 555    | 646                      | NR            | 685    | 252                      | NR            | 815    | 4                        | NR            | 945    | 0                        | NR            |
| 430    | 99                       | NR            | 560    | 676                      | NR            | 690    | 216                      | NR            | 820    | 4                        | NR            | 950    | 0                        | NR            |
| 435    | 174                      | NR            | 565    | 712                      | NR            | 695    | 186                      | NR            | 825    | 3                        | NR            | 955    | 0                        | NR            |
| 440    | 317                      | NR            | 570    | 750                      | NR            | 700    | 159                      | NR            | 830    | 3                        | NR            | 960    | 0                        | NR            |
| 445    | 545                      | NR            | 575    | 792                      | NR            | 705    | 135                      | NR            | 835    | 2                        | NR            | 965    | 0                        | NR            |
| 450    | 589                      | NR            | 580    | 835                      | NR            | 710    | 116                      | NR            | 840    | 2                        | NR            | 970    | 0                        | NR            |
| 455    | 398                      | NR            | 585    | 879                      | NR            | 715    | 98                       | NR            | 845    | 2                        | NR            | 975    | 0                        | NR            |
| 460    | 295                      | NR            | 590    | 925                      | NR            | 720    | 84                       | NR            | 850    | 2                        | NR            | 980    | 0                        | NR            |
| 465    | 242                      | NR            | 595    | 960                      | NR            | 725    | 71                       | NR            | 855    | 1                        | NR            | 985    | 0                        | NR            |
| 470    | 173                      | NR            | 600    | 985                      | NR            | 730    | 61                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 142                      | NR            | 605    | 1000                     | NR            | 735    | 51                       | NR            | 865    | 1                        | NR            | 995    | 0                        | NR            |
| 480    | 146                      | NR            | 610    | 991                      | NR            | 740    | 44                       | NR            | 870    | 1                        | NR            | 1000   | 0                        | NR            |
| 485    | 163                      | NR            | 615    | 975                      | NR            | 745    | 37                       | NR            | 875    | 1                        | NR            |        |                          |               |

REPORT NUMBER: SP3-2511-615-16

Scotopic Flux vs. Wavelength



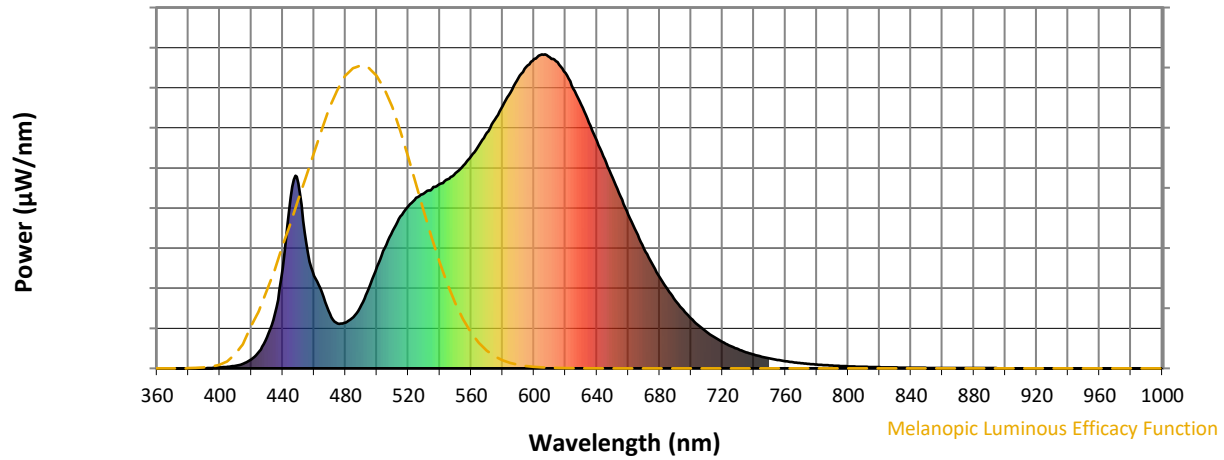
Scotopic Lumens: NR

S/P: 1.36

| 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    | 201                      | NR            | 620    | 940                      | NR            | 750    | 31                       | NR            | 880    | 1                        | NR            |
| 365    | 0                        | NR            | 495    | 257                      | NR            | 625    | 891                      | NR            | 755    | 27                       | NR            | 885    | 1                        | NR            |
| 370    | 0                        | NR            | 500    | 324                      | NR            | 630    | 840                      | NR            | 760    | 23                       | NR            | 890    | 1                        | NR            |
| 375    | 0                        | NR            | 505    | 383                      | NR            | 635    | 783                      | NR            | 765    | 19                       | NR            | 895    | 1                        | NR            |
| 380    | 0                        | NR            | 510    | 438                      | NR            | 640    | 725                      | NR            | 770    | 17                       | NR            | 900    | 0                        | NR            |
| 385    | 0                        | NR            | 515    | 484                      | NR            | 645    | 666                      | NR            | 775    | 14                       | NR            | 905    | 0                        | NR            |
| 390    | 0                        | NR            | 520    | 517                      | NR            | 650    | 607                      | NR            | 780    | 12                       | NR            | 910    | 0                        | NR            |
| 395    | 1                        | NR            | 525    | 543                      | NR            | 655    | 548                      | NR            | 785    | 10                       | NR            | 915    | 0                        | NR            |
| 400    | 3                        | NR            | 530    | 557                      | NR            | 660    | 489                      | NR            | 790    | 9                        | NR            | 920    | 0                        | NR            |
| 405    | 5                        | NR            | 535    | 572                      | NR            | 665    | 435                      | NR            | 795    | 8                        | NR            | 925    | 0                        | NR            |
| 410    | 8                        | NR            | 540    | 587                      | NR            | 670    | 381                      | NR            | 800    | 6                        | NR            | 930    | 0                        | NR            |
| 415    | 15                       | NR            | 545    | 602                      | NR            | 675    | 334                      | NR            | 805    | 6                        | NR            | 935    | 0                        | NR            |
| 420    | 29                       | NR            | 550    | 622                      | NR            | 680    | 290                      | NR            | 810    | 5                        | NR            | 940    | 0                        | NR            |
| 425    | 54                       | NR            | 555    | 646                      | NR            | 685    | 252                      | NR            | 815    | 4                        | NR            | 945    | 0                        | NR            |
| 430    | 99                       | NR            | 560    | 676                      | NR            | 690    | 216                      | NR            | 820    | 4                        | NR            | 950    | 0                        | NR            |
| 435    | 174                      | NR            | 565    | 712                      | NR            | 695    | 186                      | NR            | 825    | 3                        | NR            | 955    | 0                        | NR            |
| 440    | 317                      | NR            | 570    | 750                      | NR            | 700    | 159                      | NR            | 830    | 3                        | NR            | 960    | 0                        | NR            |
| 445    | 545                      | NR            | 575    | 792                      | NR            | 705    | 135                      | NR            | 835    | 2                        | NR            | 965    | 0                        | NR            |
| 450    | 589                      | NR            | 580    | 835                      | NR            | 710    | 116                      | NR            | 840    | 2                        | NR            | 970    | 0                        | NR            |
| 455    | 398                      | NR            | 585    | 879                      | NR            | 715    | 98                       | NR            | 845    | 2                        | NR            | 975    | 0                        | NR            |
| 460    | 295                      | NR            | 590    | 925                      | NR            | 720    | 84                       | NR            | 850    | 2                        | NR            | 980    | 0                        | NR            |
| 465    | 242                      | NR            | 595    | 960                      | NR            | 725    | 71                       | NR            | 855    | 1                        | NR            | 985    | 0                        | NR            |
| 470    | 173                      | NR            | 600    | 985                      | NR            | 730    | 61                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 142                      | NR            | 605    | 1000                     | NR            | 735    | 51                       | NR            | 865    | 1                        | NR            | 995    | 0                        | NR            |
| 480    | 146                      | NR            | 610    | 991                      | NR            | 740    | 44                       | NR            | 870    | 1                        | NR            | 1000   | 0                        | NR            |
| 485    | 163                      | NR            | 615    | 975                      | NR            | 745    | 37                       | NR            | 875    | 1                        | NR            |        |                          |               |

REPORT NUMBER: SP3-2511-615-16

**Melanopic Flux vs. Wavelength**



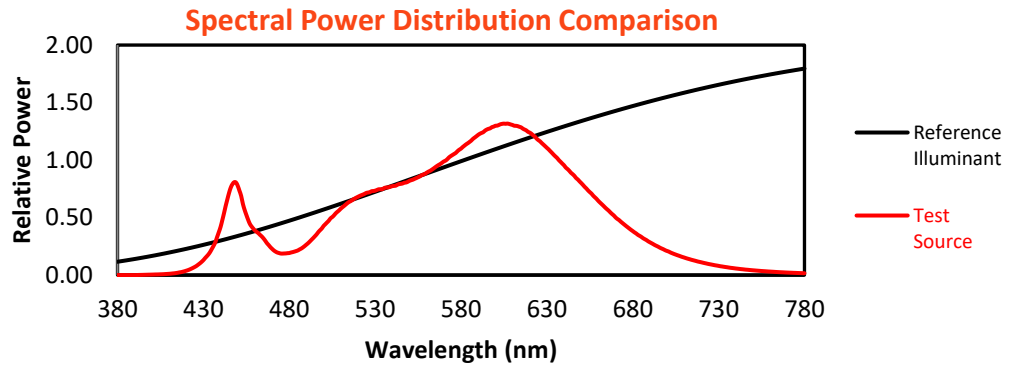
**Melanopic Lumens: NR**

**M/P: 2.58**

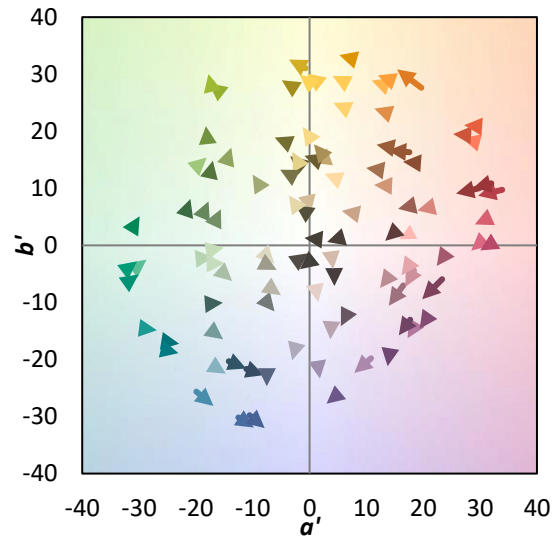
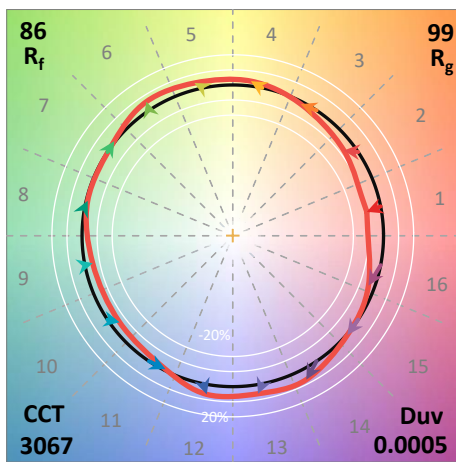
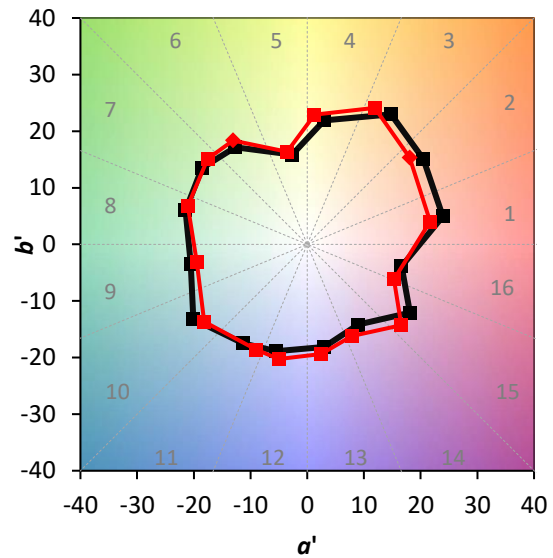
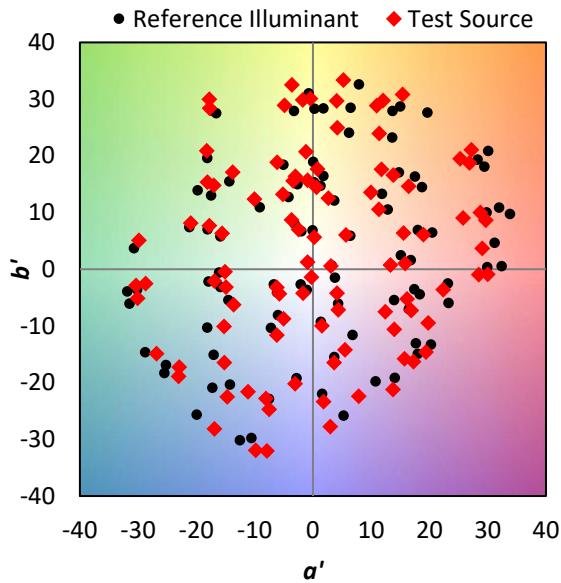
| $\lambda$ (nm) | Power W <sup>^</sup> /nm | Lumens ( $\phi$ /nm) | $\lambda$ (nm) | Power W <sup>^</sup> /nm | Lumens ( $\phi$ /nm) | $\lambda$ (nm) | Power W <sup>^</sup> /nm | Lumens ( $\phi$ /nm) | $\lambda$ (nm) | Power W <sup>^</sup> /nm | Lumens ( $\phi$ /nm) | $\lambda$ (nm) | Power W <sup>^</sup> /nm | Lumens ( $\phi$ /nm) |
|----------------|--------------------------|----------------------|----------------|--------------------------|----------------------|----------------|--------------------------|----------------------|----------------|--------------------------|----------------------|----------------|--------------------------|----------------------|
| 360            | 0                        | NR                   | 490            | 201                      | NR                   | 620            | 940                      | NR                   | 750            | 31                       | NR                   | 880            | 1                        | NR                   |
| 365            | 0                        | NR                   | 495            | 257                      | NR                   | 625            | 891                      | NR                   | 755            | 27                       | NR                   | 885            | 1                        | NR                   |
| 370            | 0                        | NR                   | 500            | 324                      | NR                   | 630            | 840                      | NR                   | 760            | 23                       | NR                   | 890            | 1                        | NR                   |
| 375            | 0                        | NR                   | 505            | 383                      | NR                   | 635            | 783                      | NR                   | 765            | 19                       | NR                   | 895            | 1                        | NR                   |
| 380            | 0                        | NR                   | 510            | 438                      | NR                   | 640            | 725                      | NR                   | 770            | 17                       | NR                   | 900            | 0                        | NR                   |
| 385            | 0                        | NR                   | 515            | 484                      | NR                   | 645            | 666                      | NR                   | 775            | 14                       | NR                   | 905            | 0                        | NR                   |
| 390            | 0                        | NR                   | 520            | 517                      | NR                   | 650            | 607                      | NR                   | 780            | 12                       | NR                   | 910            | 0                        | NR                   |
| 395            | 1                        | NR                   | 525            | 543                      | NR                   | 655            | 548                      | NR                   | 785            | 10                       | NR                   | 915            | 0                        | NR                   |
| 400            | 3                        | NR                   | 530            | 557                      | NR                   | 660            | 489                      | NR                   | 790            | 9                        | NR                   | 920            | 0                        | NR                   |
| 405            | 5                        | NR                   | 535            | 572                      | NR                   | 665            | 435                      | NR                   | 795            | 8                        | NR                   | 925            | 0                        | NR                   |
| 410            | 8                        | NR                   | 540            | 587                      | NR                   | 670            | 381                      | NR                   | 800            | 6                        | NR                   | 930            | 0                        | NR                   |
| 415            | 15                       | NR                   | 545            | 602                      | NR                   | 675            | 334                      | NR                   | 805            | 6                        | NR                   | 935            | 0                        | NR                   |
| 420            | 29                       | NR                   | 550            | 622                      | NR                   | 680            | 290                      | NR                   | 810            | 5                        | NR                   | 940            | 0                        | NR                   |
| 425            | 54                       | NR                   | 555            | 646                      | NR                   | 685            | 252                      | NR                   | 815            | 4                        | NR                   | 945            | 0                        | NR                   |
| 430            | 99                       | NR                   | 560            | 676                      | NR                   | 690            | 216                      | NR                   | 820            | 4                        | NR                   | 950            | 0                        | NR                   |
| 435            | 174                      | NR                   | 565            | 712                      | NR                   | 695            | 186                      | NR                   | 825            | 3                        | NR                   | 955            | 0                        | NR                   |
| 440            | 317                      | NR                   | 570            | 750                      | NR                   | 700            | 159                      | NR                   | 830            | 3                        | NR                   | 960            | 0                        | NR                   |
| 445            | 545                      | NR                   | 575            | 792                      | NR                   | 705            | 135                      | NR                   | 835            | 2                        | NR                   | 965            | 0                        | NR                   |
| 450            | 589                      | NR                   | 580            | 835                      | NR                   | 710            | 116                      | NR                   | 840            | 2                        | NR                   | 970            | 0                        | NR                   |
| 455            | 398                      | NR                   | 585            | 879                      | NR                   | 715            | 98                       | NR                   | 845            | 2                        | NR                   | 975            | 0                        | NR                   |
| 460            | 295                      | NR                   | 590            | 925                      | NR                   | 720            | 84                       | NR                   | 850            | 2                        | NR                   | 980            | 0                        | NR                   |
| 465            | 242                      | NR                   | 595            | 960                      | NR                   | 725            | 71                       | NR                   | 855            | 1                        | NR                   | 985            | 0                        | NR                   |
| 470            | 173                      | NR                   | 600            | 985                      | NR                   | 730            | 61                       | NR                   | 860            | 1                        | NR                   | 990            | 0                        | NR                   |
| 475            | 142                      | NR                   | 605            | 1000                     | NR                   | 735            | 51                       | NR                   | 865            | 1                        | NR                   | 995            | 0                        | NR                   |
| 480            | 146                      | NR                   | 610            | 991                      | NR                   | 740            | 44                       | NR                   | 870            | 1                        | NR                   | 1000           | 0                        | NR                   |
| 485            | 163                      | NR                   | 615            | 975                      | NR                   | 745            | 37                       | NR                   | 875            | 1                        | NR                   |                |                          |                      |

**Summary**

$R_f = 85.6$   
 $R_g = 98.9$   
 $CIE R_a = 84.8$   
 $R_9 = 16.5$

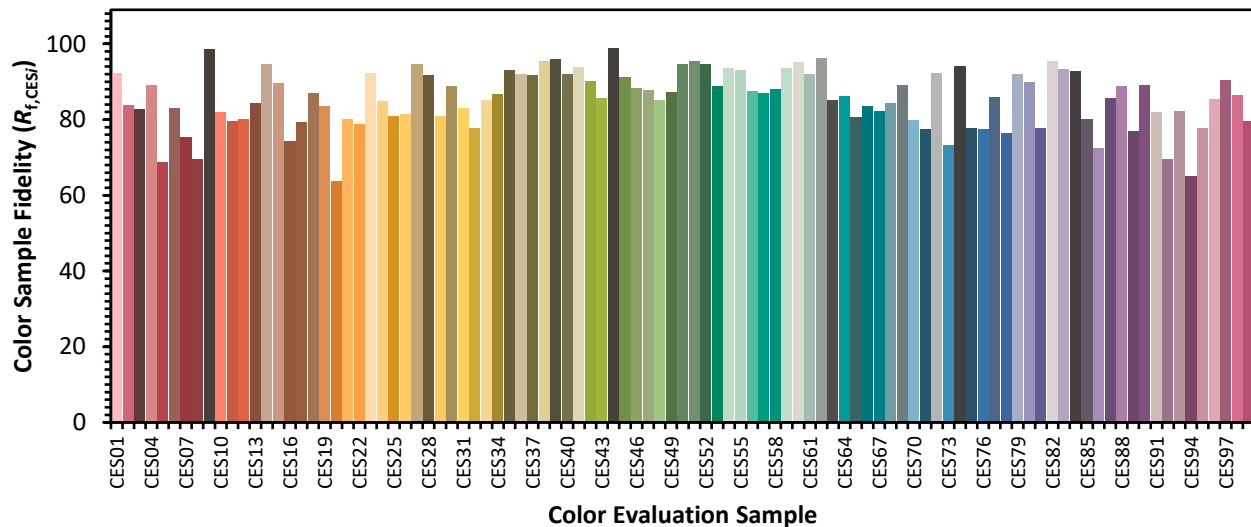


**Color Vector Graphics**

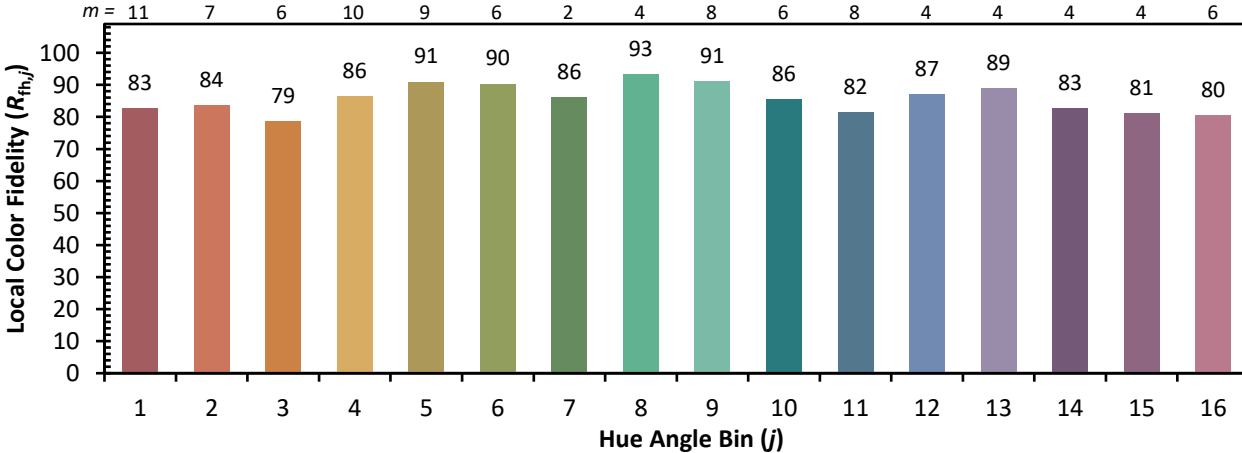
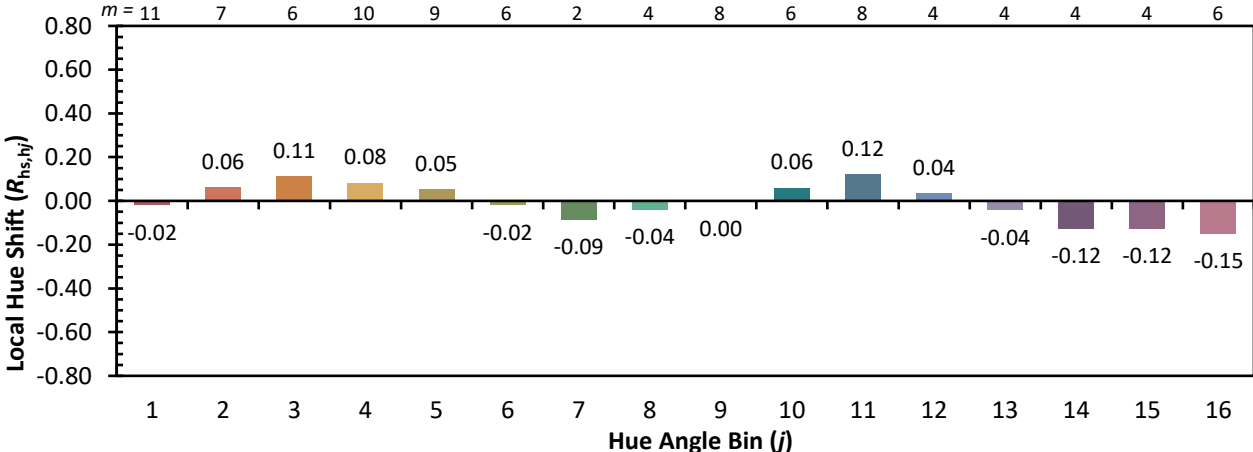
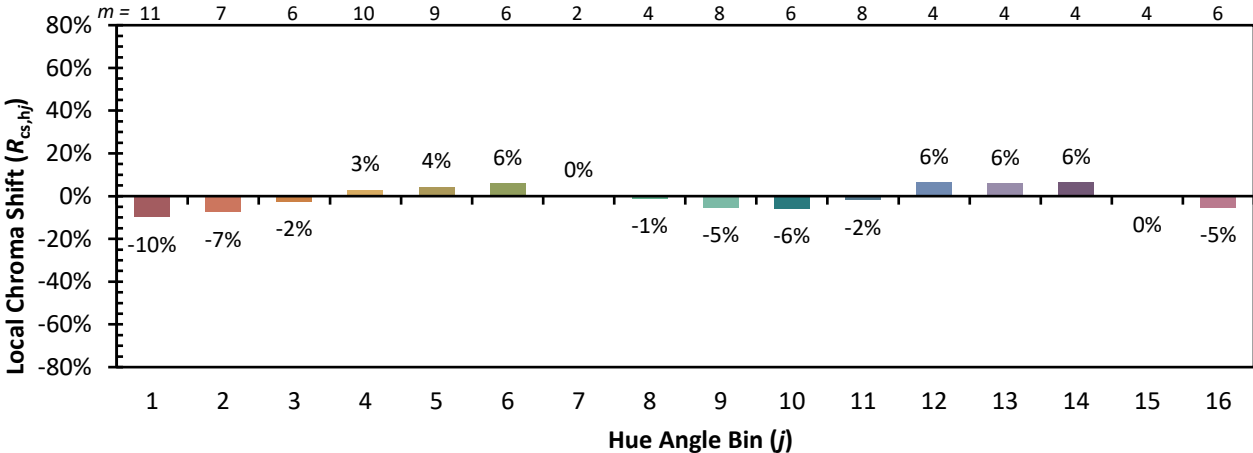


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

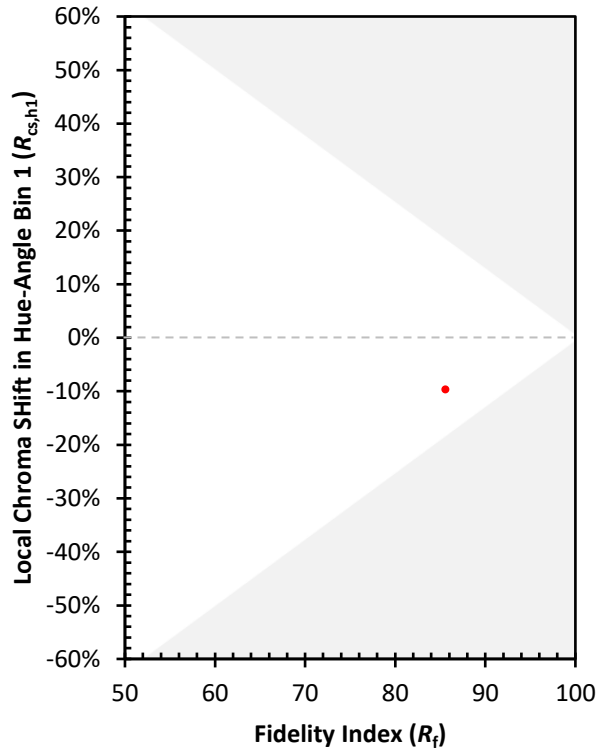
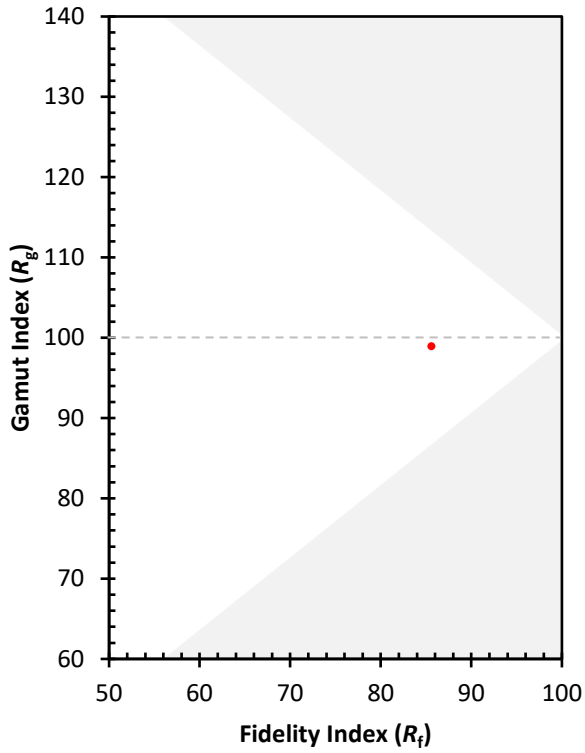
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 82 | CES51 = 95 | CES76 = 77 |
| CES02 = 63 | CES27 = 95 | CES52 = 95 | CES77 = 86 |
| CES03 = 31 | CES28 = 92 | CES53 = 89 | CES78 = 76 |
| CES04 = 70 | CES29 = 81 | CES54 = 93 | CES79 = 92 |
| CES05 = 50 | CES30 = 89 | CES55 = 93 | CES80 = 90 |
| CES06 = 51 | CES31 = 83 | CES56 = 87 | CES81 = 78 |
| CES07 = 42 | CES32 = 78 | CES57 = 87 | CES82 = 95 |
| CES08 = 41 | CES33 = 85 | CES58 = 88 | CES83 = 93 |
| CES09 = 29 | CES34 = 87 | CES59 = 94 | CES84 = 93 |
| CES10 = 76 | CES35 = 93 | CES60 = 95 | CES85 = 80 |
| CES11 = 59 | CES36 = 92 | CES61 = 92 | CES86 = 73 |
| CES12 = 65 | CES37 = 92 | CES62 = 96 | CES87 = 86 |
| CES13 = 44 | CES38 = 96 | CES63 = 85 | CES88 = 89 |
| CES14 = 74 | CES39 = 96 | CES64 = 86 | CES89 = 77 |
| CES15 = 72 | CES40 = 92 | CES65 = 81 | CES90 = 89 |
| CES16 = 48 | CES41 = 94 | CES66 = 84 | CES91 = 82 |
| CES17 = 50 | CES42 = 90 | CES67 = 82 | CES92 = 70 |
| CES18 = 57 | CES43 = 86 | CES68 = 84 | CES93 = 82 |
| CES19 = 72 | CES44 = 99 | CES69 = 89 | CES94 = 65 |
| CES20 = 67 | CES45 = 91 | CES70 = 80 | CES95 = 78 |
| CES21 = 87 | CES46 = 88 | CES71 = 77 | CES96 = 85 |
| CES22 = 79 | CES47 = 88 | CES72 = 92 | CES97 = 90 |
| CES23 = 92 | CES48 = 85 | CES73 = 73 | CES98 = 87 |
| CES24 = 91 | CES49 = 87 | CES74 = 94 | CES99 = 80 |
| CES25 = 72 | CES50 = 95 | CES75 = 78 |            |



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)