

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: CORELITE

Report Number: P1216187

Luminaire Tested: 24-ID2-60-CNV-L840-U

Issue Date: 12/5/2025

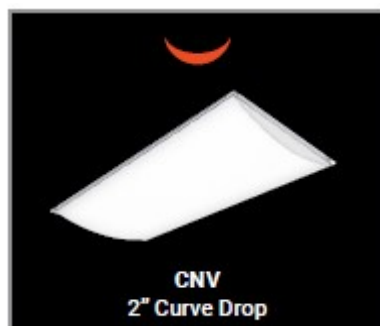
**Test Information**

Test Method: LM-79-2019  
Report Number: P1216187  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-2508-510-5)  
Test Lab: INNOVATION CENTER  
Issue Date: 12/5/2025  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: CORELITE  
Catalog Number: 24-ID2-60-CNV-L840-U  
Description: 2X4 IN DEPTH TROFFER WITH 2INCH CURVE DROP  
Light Source: 4000K CCT, 80 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

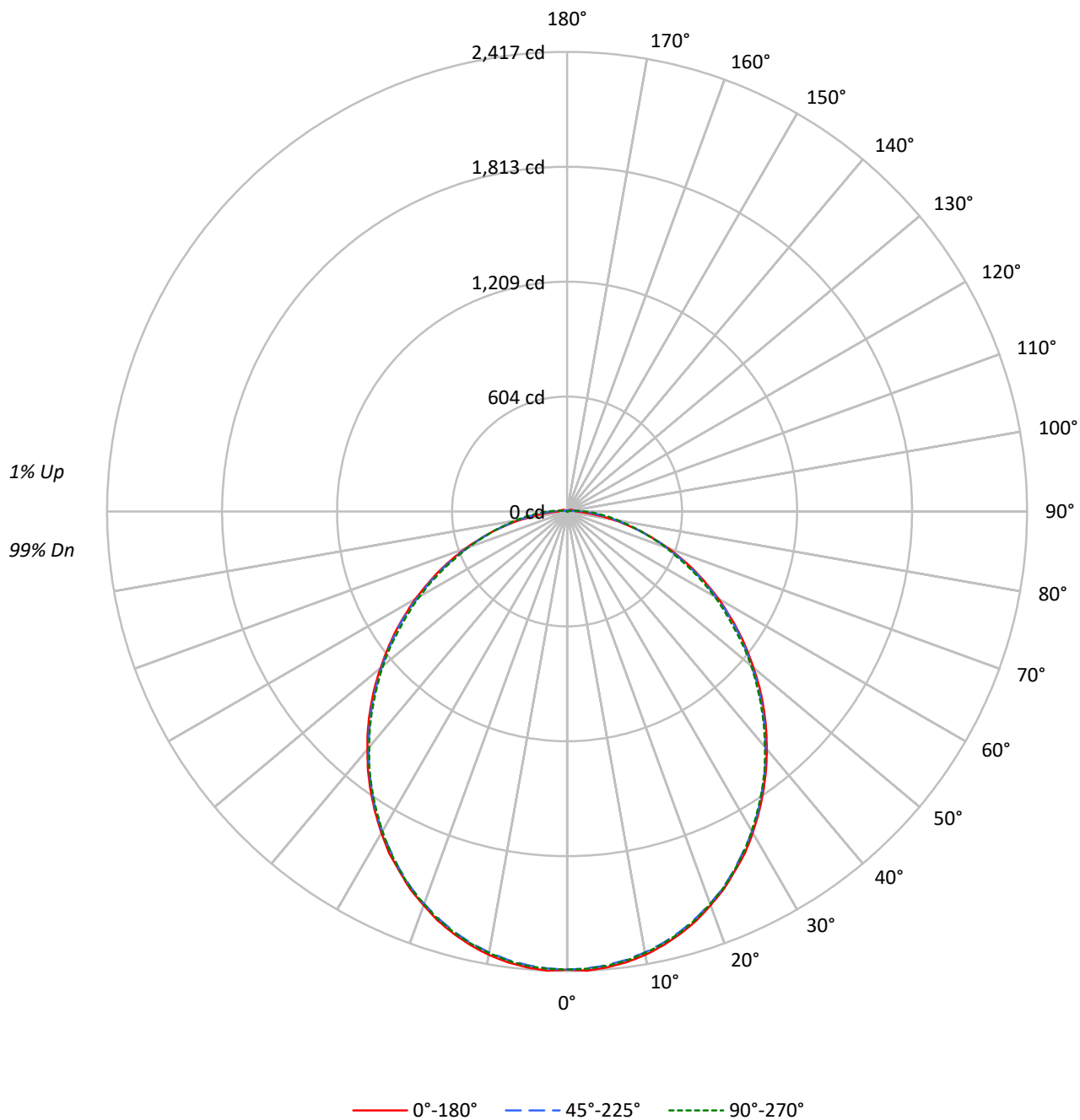
Lumens per Lamp: N/A  
Luminaire Lumens: 6434.4 lumens  
Efficiency: N/A  
Efficacy: 124.0 lumens/watt  
Spacing Criteria (0/90/45): 1.21 / 1.2 / 1.31  
Luminous Opening: Rectangular w/ Sides (W: 2' x L: 4' x H: 0.16')  
CIE Type: Direct

Input Watts (W): 51.9  
Input Voltage (V): 120  
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: 24 FT



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CATALOG NUMBER: 24-ID2-60-CNV-L840-U

### Luminous Intensity Polar Plot



TEST NUMBER: P1216187

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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  |
| RCR |     |     |     |     |     |     |     |     |     |     |     |  |     |     |     |  |     |
| 0   | 119 | 119 | 119 | 119 | 116 | 116 | 116 | 116 | 110 | 110 | 110 |  | 106 | 106 | 106 |  | 101 |
| 1   | 108 | 104 | 99  | 95  | 105 | 101 | 97  | 94  | 97  | 93  | 90  |  | 93  | 90  | 87  |  | 89  |
| 2   | 99  | 90  | 84  | 78  | 96  | 88  | 82  | 77  | 85  | 79  | 75  |  | 81  | 77  | 73  |  | 78  |
| 3   | 90  | 80  | 71  | 65  | 87  | 78  | 70  | 64  | 75  | 68  | 63  |  | 72  | 66  | 62  |  | 69  |
| 4   | 83  | 71  | 62  | 55  | 80  | 69  | 61  | 55  | 67  | 60  | 54  |  | 64  | 58  | 53  |  | 62  |
| 5   | 76  | 63  | 54  | 48  | 74  | 62  | 54  | 47  | 60  | 52  | 47  |  | 58  | 51  | 46  |  | 56  |
| 6   | 70  | 57  | 48  | 42  | 68  | 56  | 48  | 42  | 54  | 47  | 41  |  | 52  | 46  | 41  |  | 51  |
| 7   | 65  | 52  | 43  | 37  | 63  | 51  | 43  | 37  | 49  | 42  | 36  |  | 48  | 41  | 36  |  | 46  |
| 8   | 61  | 47  | 39  | 33  | 59  | 47  | 39  | 33  | 45  | 38  | 33  |  | 44  | 37  | 32  |  | 43  |
| 9   | 57  | 44  | 35  | 30  | 55  | 43  | 35  | 30  | 42  | 35  | 30  |  | 40  | 34  | 29  |  | 39  |
| 10  | 53  | 40  | 32  | 27  | 52  | 40  | 32  | 27  | 39  | 32  | 27  |  | 38  | 31  | 27  |  | 37  |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3242 | 3242 | 3242 |
| 5°  | 3239 | 3211 | 3217 |
| 10° | 3212 | 3170 | 3177 |
| 15° | 3170 | 3117 | 3126 |
| 20° | 3110 | 3050 | 3057 |
| 25° | 3039 | 2968 | 2978 |
| 30° | 2963 | 2878 | 2882 |
| 35° | 2873 | 2771 | 2779 |
| 40° | 2773 | 2659 | 2661 |
| 45° | 2671 | 2544 | 2540 |
| 50° | 2554 | 2412 | 2412 |
| 55° | 2439 | 2281 | 2258 |
| 60° | 2313 | 2130 | 2114 |
| 65° | 2173 | 1965 | 1942 |
| 70° | 2004 | 1770 | 1778 |
| 75° | 1803 | 1567 | 1596 |
| 80° | 1526 | 1357 | 1463 |
| 85° | 1225 | 1196 | 1402 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2671 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 227.6  | 3.5       |
| 10°-20°   | 645.7  | 10.0      |
| 20°-30°   | 957.8  | 14.9      |
| 30°-40°   | 1119.1 | 17.4      |
| 40°-50°   | 1118.6 | 17.4      |
| 50°-60°   | 973.9  | 15.1      |
| 60°-70°   | 722.0  | 11.2      |
| 70°-80°   | 424.0  | 6.6       |
| 80°-90°   | 170.2  | 2.6       |
| 90°-100°  | 44.5   | 0.7       |
| 100°-110° | 14.5   | 0.2       |
| 110°-120° | 8.4    | 0.1       |
| 120°-130° | 4.6    | 0.1       |
| 130°-140° | 2.3    | 0.0       |
| 140°-150° | 1.1    | 0.0       |
| 150°-160° | 0.1    | 0.0       |
| 160°-170° | 0.0    | 0.0       |
| 170°-180° | 0.0    | 0.0       |
| 0°-30°    | 1831.1 | 28.5      |
| 0°-40°    | 2950.2 | 45.9      |
| 0°-60°    | 5042.7 | 78.4      |
| 0°-90°    | 6358.9 | 98.8      |
| 90°-120°  | 67.4   | 1.0       |
| 90°-150°  | 75.4   | 1.2       |
| 90°-180°  | 76.0   | 1.2       |
| 0°-180°   | 6434.4 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2409 | 2409  | 2409 | 2409  | 2409 |      |
| 5°   | 2407 | 2400  | 2395 | 2392  | 2399 | 228  |
| 15°  | 2300 | 2292  | 2288 | 2288  | 2292 | 648  |
| 25°  | 2086 | 2082  | 2078 | 2077  | 2081 | 961  |
| 35°  | 1798 | 1794  | 1787 | 1786  | 1786 | 1124 |
| 45°  | 1460 | 1457  | 1450 | 1445  | 1442 | 1126 |
| 55°  | 1099 | 1097  | 1090 | 1086  | 1073 | 982  |
| 65°  | 741  | 735   | 730  | 719   | 715  | 733  |
| 75°  | 399  | 395   | 397  | 400   | 399  | 422  |
| 85°  | 116  | 131   | 153  | 170   | 174  | 121  |
| 90°  | 47   | 60    | 78   | 92    | 95   | 29   |
| 95°  | 40   | 34    | 34   | 40    | 42   | 31   |
| 105° | 27   | 23    | 13   | 4     | 0    | 29   |
| 115° | 18   | 15    | 8    | 2     | 0    | 18   |
| 125° | 12   | 9     | 5    | 1     | 0    | 10   |
| 135° | 6    | 5     | 3    | 1     | 0    | 5    |
| 145° | 4    | 3     | 1    | 1     | 1    | 2    |
| 155° | 0    | 0     | 0    | 0     | 0    | 0    |
| 165° | 0    | 0     | 0    | 0     | 0    | 0    |
| 175° | 0    | 0     | 0    | 0     | 0    | 0    |
| 180° | 0    | 0     | 0    | 0     | 0    | 0    |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2409.3 | 2409.3 | 2409.3 | 2409.3 | 2409.3 |
| 2.5°   | 2417.2 | 2408.4 | 2404.8 | 2402.2 | 2406.6 |
| 5°     | 2406.6 | 2399.5 | 2395.1 | 2392.5 | 2398.7 |
| 7.5°   | 2390.7 | 2382.8 | 2378.4 | 2376.6 | 2381.9 |
| 10°    | 2367.8 | 2358.1 | 2354.6 | 2352.8 | 2358.1 |
| 12.5°  | 2336.9 | 2329.0 | 2325.4 | 2323.7 | 2329.0 |
| 15°    | 2299.9 | 2291.9 | 2288.4 | 2287.5 | 2291.9 |
| 17.5°  | 2256.6 | 2248.7 | 2244.3 | 2244.3 | 2249.6 |
| 20°    | 2203.7 | 2198.4 | 2195.8 | 2194.9 | 2197.5 |
| 22.5°  | 2150.8 | 2142.8 | 2141.9 | 2138.4 | 2144.6 |
| 25°    | 2085.5 | 2082.0 | 2078.4 | 2076.7 | 2081.1 |
| 27.5°  | 2024.6 | 2014.9 | 2010.5 | 2011.4 | 2014.0 |
| 30°    | 1951.4 | 1945.2 | 1943.5 | 1939.0 | 1940.8 |
| 32.5°  | 1875.5 | 1871.1 | 1869.4 | 1864.1 | 1864.1 |
| 35°    | 1797.9 | 1793.5 | 1787.3 | 1786.4 | 1786.4 |
| 37.5°  | 1717.6 | 1713.2 | 1707.9 | 1703.5 | 1705.3 |
| 40°    | 1632.0 | 1627.6 | 1621.5 | 1620.6 | 1617.0 |
| 42.5°  | 1548.2 | 1543.8 | 1536.8 | 1535.9 | 1532.4 |
| 45°    | 1460.0 | 1457.4 | 1450.3 | 1445.0 | 1441.5 |
| 47.5°  | 1371.8 | 1367.4 | 1359.4 | 1354.2 | 1351.5 |
| 50°    | 1278.3 | 1273.9 | 1268.6 | 1263.3 | 1262.4 |
| 52.5°  | 1188.3 | 1187.4 | 1179.5 | 1175.1 | 1170.7 |
| 55°    | 1099.2 | 1096.6 | 1090.4 | 1086.0 | 1072.7 |
| 57.5°  | 1006.6 | 1004.8 | 1001.3 | 991.6  | 983.6  |
| 60°    | 919.2  | 913.9  | 907.8  | 896.3  | 894.5  |
| 62.5°  | 826.6  | 826.6  | 816.9  | 808.1  | 804.6  |
| 65°    | 741.0  | 734.9  | 729.6  | 719.0  | 714.6  |
| 67.5°  | 651.9  | 651.1  | 641.3  | 635.2  | 627.2  |
| 70°    | 565.5  | 562.8  | 554.9  | 553.1  | 551.4  |
| 72.5°  | 479.0  | 478.1  | 476.4  | 474.6  | 470.2  |
| 75°    | 398.7  | 395.2  | 397.0  | 399.6  | 398.7  |
| 77.5°  | 317.6  | 322.0  | 323.8  | 331.7  | 332.6  |
| 80°    | 241.7  | 248.8  | 259.4  | 271.7  | 274.4  |
| 82.5°  | 172.9  | 182.6  | 202.9  | 218.8  | 222.3  |
| 85°    | 115.6  | 130.6  | 152.6  | 170.3  | 173.8  |
| 87.5°  | 71.5   | 88.2   | 112.0  | 128.8  | 131.4  |
| 90°    | 46.8   | 60.0   | 77.6   | 91.7   | 95.3   |
| 92.5°  | 43.2   | 42.3   | 52.0   | 62.6   | 66.2   |
| 95°    | 39.7   | 33.5   | 33.5   | 39.7   | 42.3   |
| 97.5°  | 37.1   | 30.9   | 21.2   | 22.1   | 22.9   |
| 100°   | 33.5   | 28.2   | 15.9   | 9.7    | 9.7    |
| 102.5° | 30.9   | 25.6   | 14.1   | 3.5    | 0.9    |
| 105°   | 27.3   | 22.9   | 13.2   | 3.5    | 0.0    |
| 107.5° | 24.7   | 21.2   | 11.5   | 2.6    | 0.0    |
| 110°   | 22.1   | 18.5   | 10.6   | 2.6    | 0.0    |

TEST NUMBER: P1216187

CATALOG NUMBER: 24-ID2-60-CNV-L840-U

**CANDELA DISTRIBUTION (continued):**

|        | 0°   | 22.5° | 45° | 67.5° | 90° |
|--------|------|-------|-----|-------|-----|
| 112.5° | 20.3 | 16.8  | 9.7 | 1.8   | 0.0 |
| 115°   | 17.6 | 15.0  | 7.9 | 1.8   | 0.0 |
| 117.5° | 15.9 | 13.2  | 7.1 | 0.9   | 0.0 |
| 120°   | 14.1 | 11.5  | 6.2 | 0.9   | 0.0 |
| 122.5° | 12.4 | 10.6  | 5.3 | 0.9   | 0.0 |
| 125°   | 11.5 | 8.8   | 5.3 | 0.9   | 0.0 |
| 127.5° | 9.7  | 7.9   | 4.4 | 0.0   | 0.0 |
| 130°   | 8.8  | 7.1   | 3.5 | 0.0   | 0.0 |
| 132.5° | 7.9  | 6.2   | 2.6 | 0.9   | 0.0 |
| 135°   | 6.2  | 5.3   | 2.6 | 0.9   | 0.0 |
| 137.5° | 5.3  | 4.4   | 1.8 | 0.9   | 0.9 |
| 140°   | 4.4  | 3.5   | 1.8 | 0.9   | 0.9 |
| 142.5° | 4.4  | 3.5   | 1.8 | 0.9   | 0.9 |
| 145°   | 3.5  | 2.6   | 0.9 | 0.9   | 0.9 |
| 147.5° | 2.6  | 1.8   | 0.9 | 0.9   | 0.9 |
| 150°   | 1.8  | 1.8   | 0.9 | 0.9   | 0.9 |
| 152.5° | 0.0  | 0.0   | 0.0 | 0.0   | 0.0 |
| 155°   | 0.0  | 0.0   | 0.0 | 0.0   | 0.0 |
| 157.5° | 0.0  | 0.0   | 0.0 | 0.0   | 0.0 |
| 160°   | 0.0  | 0.0   | 0.0 | 0.0   | 0.0 |
| 162.5° | 0.0  | 0.0   | 0.0 | 0.0   | 0.0 |
| 165°   | 0.0  | 0.0   | 0.0 | 0.0   | 0.0 |
| 167.5° | 0.0  | 0.0   | 0.0 | 0.0   | 0.0 |
| 170°   | 0.0  | 0.0   | 0.0 | 0.0   | 0.0 |
| 172.5° | 0.0  | 0.0   | 0.0 | 0.0   | 0.0 |
| 175°   | 0.0  | 0.0   | 0.0 | 0.0   | 0.0 |
| 177.5° | 0.0  | 0.0   | 0.0 | 0.0   | 0.0 |
| 180°   | 0.0  | 0.0   | 0.0 | 0.0   | 0.0 |

TEST NUMBER: P1216187

CATALOG NUMBER: 24-ID2-60-CNV-L840-U

**CIE UGR TABLE:**

| Reflectances:   |      |                  |       |       |       |       |                |       |       |       |       |
|-----------------|------|------------------|-------|-------|-------|-------|----------------|-------|-------|-------|-------|
| Ceiling         |      | 0.7              | 0.7   | 0.5   | 0.5   | 0.3   | 0.7            | 0.7   | 0.5   | 0.5   | 0.3   |
| Wall            |      | 0.5              | 0.3   | 0.5   | 0.3   | 0.3   | 0.5            | 0.3   | 0.5   | 0.3   | 0.3   |
| Reference plane |      | 0.2              | 0.2   | 0.2   | 0.2   | 0.2   | 0.2            | 0.2   | 0.2   | 0.2   | 0.2   |
| Room dimensions |      | Viewed crosswise |       |       |       |       | Viewed endwise |       |       |       |       |
| X=2H            | Y=2H | 14.70            | 16.30 | 15.09 | 16.64 | 16.98 | 14.72          | 16.31 | 15.10 | 16.65 | 17.00 |
|                 | 3H   | 16.37            | 17.81 | 16.77 | 18.16 | 18.55 | 16.40          | 17.84 | 16.79 | 18.19 | 18.58 |
|                 | 4H   | 16.97            | 18.33 | 17.39 | 18.70 | 19.11 | 17.05          | 18.41 | 17.47 | 18.78 | 19.19 |
|                 | 6H   | 17.39            | 18.65 | 17.82 | 19.04 | 19.46 | 17.59          | 18.85 | 18.02 | 19.24 | 19.66 |
|                 | 8H   | 17.51            | 18.72 | 17.96 | 19.13 | 19.56 | 17.82          | 19.03 | 18.26 | 19.44 | 19.87 |
|                 | 12H  | 17.60            | 18.75 | 18.04 | 19.16 | 19.61 | 18.03          | 19.18 | 18.48 | 19.59 | 20.05 |
| 4H              | 2H   | 15.27            | 16.63 | 15.69 | 17.01 | 17.41 | 15.29          | 16.65 | 15.71 | 17.02 | 17.42 |
|                 | 3H   | 17.15            | 18.29 | 17.58 | 18.72 | 19.14 | 17.18          | 18.32 | 17.61 | 18.74 | 19.17 |
|                 | 4H   | 17.87            | 18.91 | 18.32 | 19.34 | 19.81 | 17.96          | 18.99 | 18.41 | 19.43 | 19.89 |
|                 | 6H   | 18.41            | 19.32 | 18.89 | 19.78 | 20.27 | 18.64          | 19.55 | 19.11 | 20.01 | 20.49 |
|                 | 8H   | 18.58            | 19.43 | 19.06 | 19.90 | 20.39 | 18.93          | 19.78 | 19.41 | 20.25 | 20.74 |
|                 | 12H  | 18.71            | 19.47 | 19.21 | 19.97 | 20.46 | 19.21          | 19.98 | 19.71 | 20.47 | 20.97 |
| 8H              | 4H   | 18.15            | 19.00 | 18.63 | 19.47 | 19.96 | 18.23          | 19.08 | 18.71 | 19.55 | 20.04 |
|                 | 6H   | 18.81            | 19.52 | 19.32 | 20.03 | 20.53 | 19.04          | 19.75 | 19.56 | 20.26 | 20.77 |
|                 | 8H   | 19.05            | 19.69 | 19.58 | 20.22 | 20.73 | 19.43          | 20.07 | 19.96 | 20.59 | 21.11 |
|                 | 12H  | 19.25            | 19.81 | 19.77 | 20.32 | 20.91 | 19.82          | 20.39 | 20.35 | 20.90 | 21.49 |
| 12H             | 4H   | 18.19            | 18.95 | 18.69 | 19.45 | 19.95 | 18.26          | 19.02 | 18.76 | 19.52 | 20.02 |
|                 | 6H   | 18.88            | 19.51 | 19.40 | 20.04 | 20.55 | 19.10          | 19.73 | 19.62 | 20.26 | 20.77 |
|                 | 8H   | 19.17            | 19.74 | 19.70 | 20.25 | 20.84 | 19.54          | 20.11 | 20.07 | 20.62 | 21.21 |



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

Report Prepared for

Cooper Lighting Solutions

Corelite

Report Number: SP1-2506-458-5

Test Date: 08/26/2025

Luminaire Tested: 22ID2-55-CFR1-L840-U

Data in this report applies to families of products including 22ID2-55-CFR1-L840-U

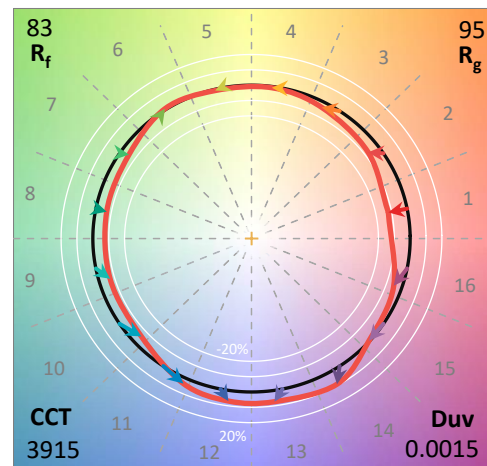
### Test Information

Test Method: LM-79-2019  
 Report Number: SP1-2506-458-5  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry:  $4\pi$   
 Issue Date: 08/27/2025  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: Corelite  
 Catalog Number: **22ID2-55-CFR1-L840-U**  
 Description: 2X2 CGTX WITH INDEPTH FRAME AND CFR1 LENS - 5500 LUMEN 4000K 80CRI

### Spectral Parameters

CCT (K): 3915  
 CIE  $u'$ : 0.2259  
 CIE  $v'$ : 0.5051  
 Duv: 0.0015  
 CIE x: 0.3854  
 CIE y: 0.3830  
 CIE z: 0.2316  
 Peak Wavelength (nm): 453  
 Dominant Wavelength (nm): 578  
 Purity: 30.6207  
 R<sub>f</sub>: 83.2  
 R<sub>g</sub>: 94.6

CRI (Ra): 82.3  
 R1: 80.6  
 R2: 88.9  
 R3: 94.6  
 R4: 80.5  
 R5: 80.0  
 R6: 84.0  
 R7: 86.1  
 R8: 64.0  
 R9: 7.6  
 R10: 72.9  
 R11: 78.7  
 R12: 57.3  
 R13: 82.7  
 R14: 97.1  
 R15: 74.3



### Test Conditions

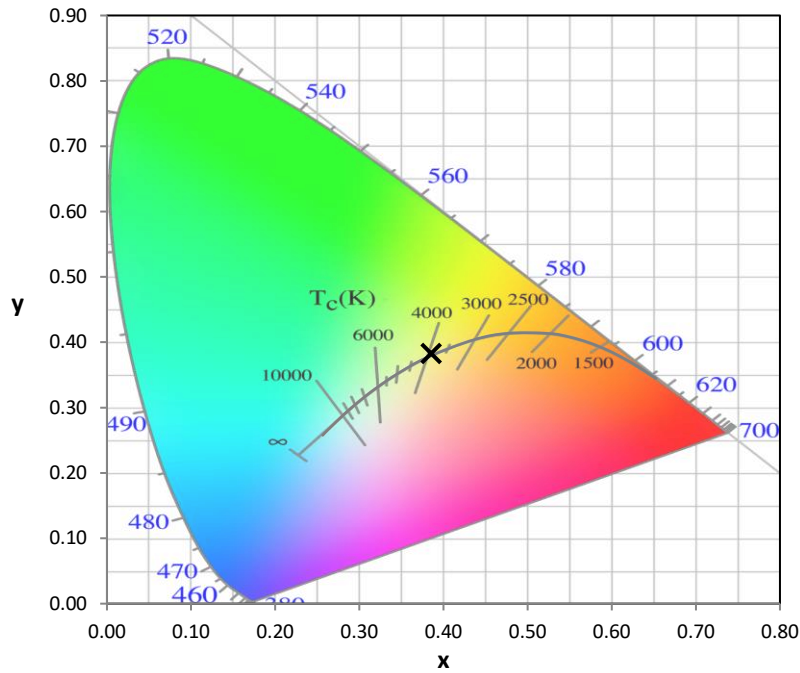
Stabilization Time: 34M  
 Operation Time: 1H 34M  
 Sphere Temperature (°C): 25.2

REPORT NUMBER: SP1-2506-458-5

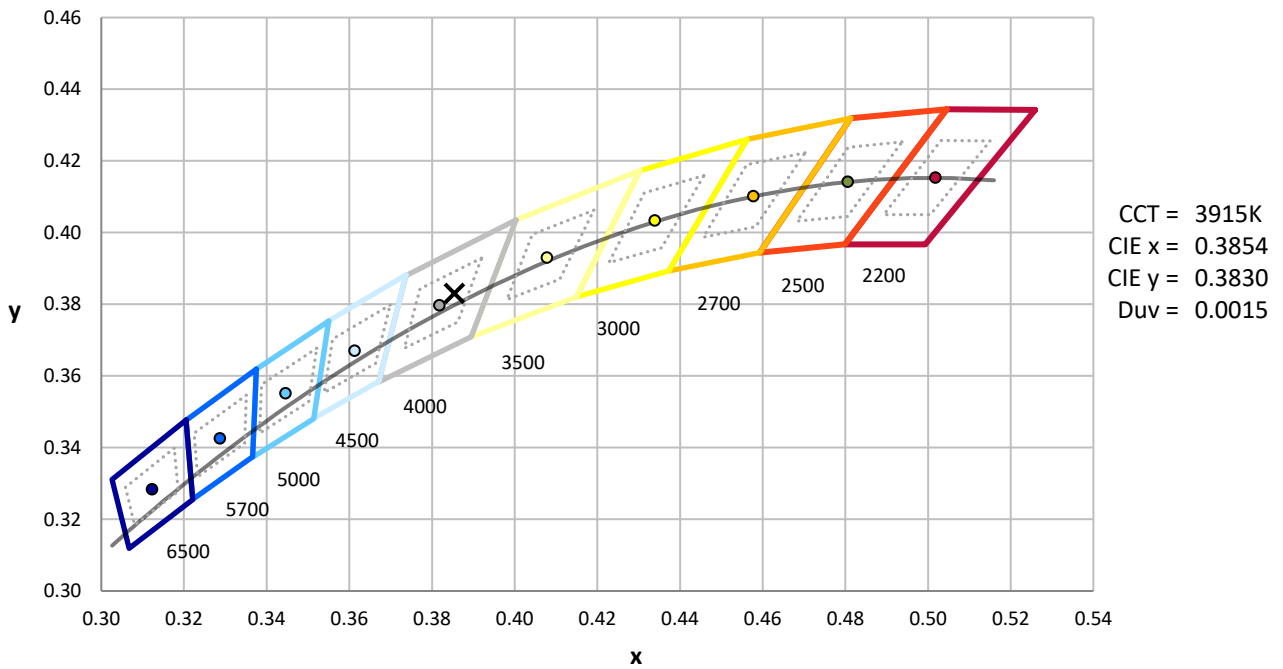
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | 76INCH SPHERE IN0058  | 6/16/2025        | 12/16/2025           |
| Power Meter                    | XITRON INXT2011004    | 1/21/2025        | 1/21/2026            |
| AC Power Source                | CHROMA 61603 IN0063   | 10/22/2024       | 10/22/2025           |
| DC Power Source                | AGILENT E3634A IN0208 | 10/22/2024       | 10/22/2025           |
| Sphere Thermometer             | ONSET IN0085          | 10/22/2024       | 10/22/2025           |
| Room Thermometer               | ONSET IN0046          | 10/22/2024       | 10/22/2025           |

REPORT NUMBER: SP1-2506-458-5

**CIE 1931 Chromaticity Diagram**



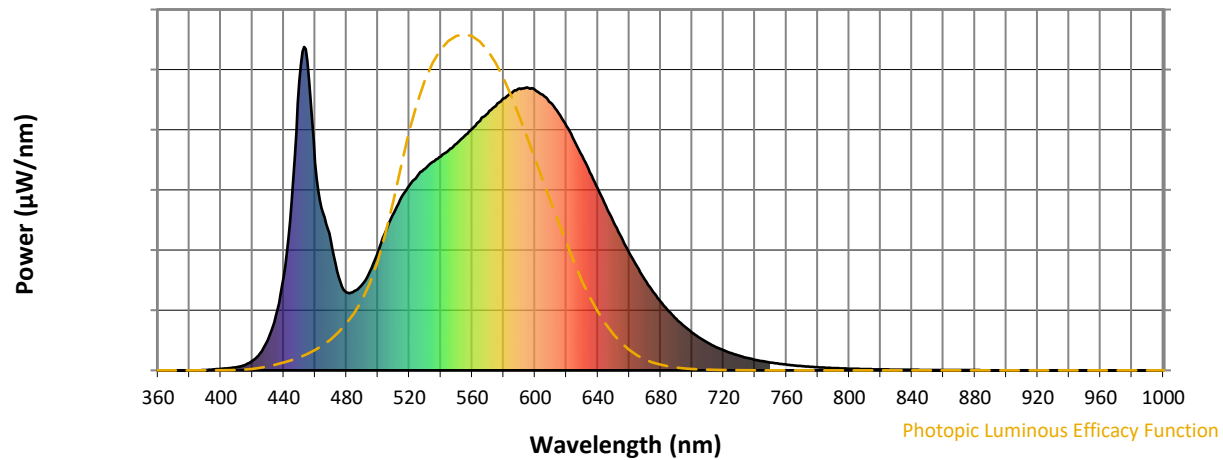
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 4000K 4-step quadrangle

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### Photopic Flux vs. Wavelength

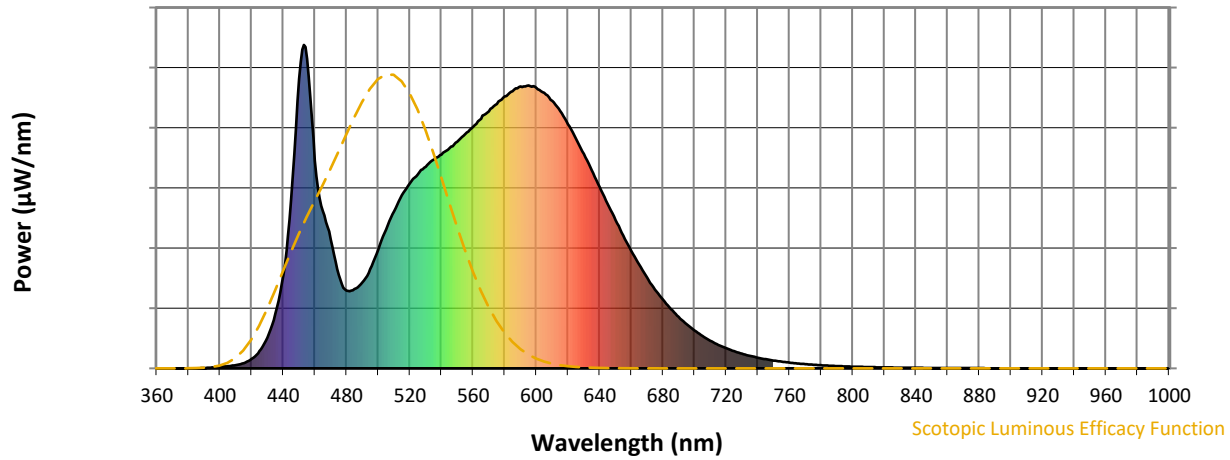


### Photopic Lumens: NR

| λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) |
|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|
| 360       | 0                           | NR               | 490       | 266                         | NR               | 620       | 755                         | NR               | 750       | 24                          | NR               | 880       | 1                           | NR               |
| 365       | 0                           | NR               | 495       | 307                         | NR               | 625       | 710                         | NR               | 755       | 21                          | NR               | 885       | 0                           | NR               |
| 370       | 0                           | NR               | 500       | 366                         | NR               | 630       | 663                         | NR               | 760       | 18                          | NR               | 890       | 0                           | NR               |
| 375       | 0                           | NR               | 505       | 430                         | NR               | 635       | 612                         | NR               | 765       | 15                          | NR               | 895       | 0                           | NR               |
| 380       | 0                           | NR               | 510       | 486                         | NR               | 640       | 561                         | NR               | 770       | 13                          | NR               | 900       | 0                           | NR               |
| 385       | 0                           | NR               | 515       | 536                         | NR               | 645       | 509                         | NR               | 775       | 11                          | NR               | 905       | 0                           | NR               |
| 390       | 1                           | NR               | 520       | 571                         | NR               | 650       | 458                         | NR               | 780       | 10                          | NR               | 910       | 0                           | NR               |
| 395       | 3                           | NR               | 525       | 600                         | NR               | 655       | 410                         | NR               | 785       | 8                           | NR               | 915       | 0                           | NR               |
| 400       | 5                           | NR               | 530       | 624                         | NR               | 660       | 363                         | NR               | 790       | 7                           | NR               | 920       | 0                           | NR               |
| 405       | 7                           | NR               | 535       | 645                         | NR               | 665       | 321                         | NR               | 795       | 6                           | NR               | 925       | 0                           | NR               |
| 410       | 10                          | NR               | 540       | 661                         | NR               | 670       | 280                         | NR               | 800       | 5                           | NR               | 930       | 0                           | NR               |
| 415       | 16                          | NR               | 545       | 681                         | NR               | 675       | 244                         | NR               | 805       | 5                           | NR               | 935       | 0                           | NR               |
| 420       | 30                          | NR               | 550       | 701                         | NR               | 680       | 213                         | NR               | 810       | 4                           | NR               | 940       | 0                           | NR               |
| 425       | 53                          | NR               | 555       | 724                         | NR               | 685       | 183                         | NR               | 815       | 3                           | NR               | 945       | 0                           | NR               |
| 430       | 95                          | NR               | 560       | 747                         | NR               | 690       | 159                         | NR               | 820       | 3                           | NR               | 950       | 0                           | NR               |
| 435       | 170                         | NR               | 565       | 772                         | NR               | 695       | 136                         | NR               | 825       | 3                           | NR               | 955       | 0                           | NR               |
| 440       | 289                         | NR               | 570       | 795                         | NR               | 700       | 117                         | NR               | 830       | 2                           | NR               | 960       | 0                           | NR               |
| 445       | 522                         | NR               | 575       | 817                         | NR               | 705       | 100                         | NR               | 835       | 2                           | NR               | 965       | 0                           | NR               |
| 450       | 895                         | NR               | 580       | 841                         | NR               | 710       | 85                          | NR               | 840       | 2                           | NR               | 970       | 0                           | NR               |
| 455       | 957                         | NR               | 585       | 857                         | NR               | 715       | 72                          | NR               | 845       | 1                           | NR               | 975       | 0                           | NR               |
| 460       | 642                         | NR               | 590       | 871                         | NR               | 720       | 62                          | NR               | 850       | 1                           | NR               | 980       | 0                           | NR               |
| 465       | 487                         | NR               | 595       | 875                         | NR               | 725       | 53                          | NR               | 855       | 1                           | NR               | 985       | 0                           | NR               |
| 470       | 397                         | NR               | 600       | 866                         | NR               | 730       | 45                          | NR               | 860       | 1                           | NR               | 990       | 0                           | NR               |
| 475       | 289                         | NR               | 605       | 852                         | NR               | 735       | 39                          | NR               | 865       | 1                           | NR               | 995       | 0                           | NR               |
| 480       | 241                         | NR               | 610       | 827                         | NR               | 740       | 33                          | NR               | 870       | 1                           | NR               | 1000      | 0                           | NR               |
| 485       | 245                         | NR               | 615       | 796                         | NR               | 745       | 28                          | NR               | 875       | 1                           | NR               |           |                             |                  |

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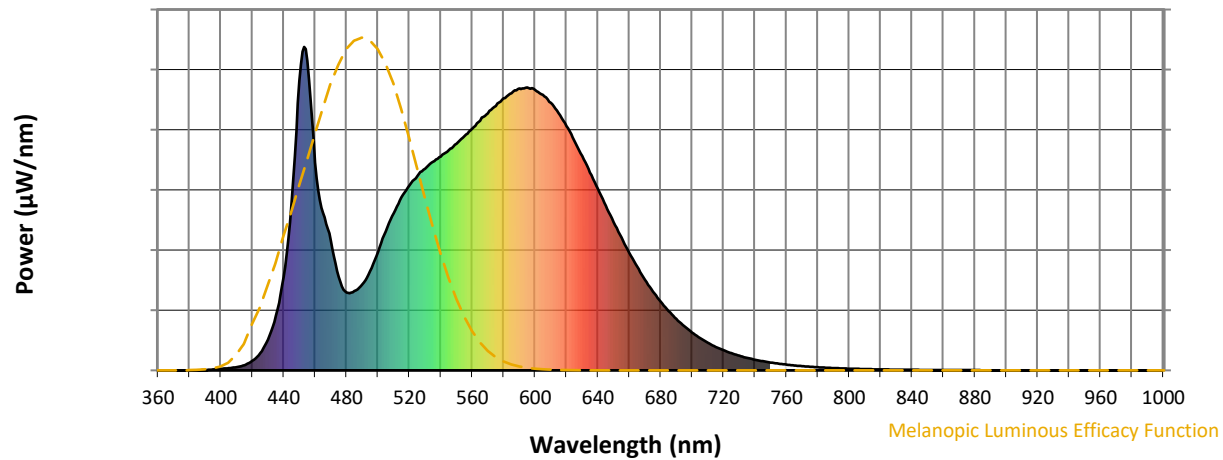
### Scotopic Flux vs. Wavelength


**Scotopic Lumens: NR**
**S/P: 1.65**

| 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    | 266                      | NR            | 620    | 755                      | NR            | 750    | 24                       | NR            | 880    | 1                        | NR            |
| 365    | 0                        | NR            | 495    | 307                      | NR            | 625    | 710                      | NR            | 755    | 21                       | NR            | 885    | 0                        | NR            |
| 370    | 0                        | NR            | 500    | 366                      | NR            | 630    | 663                      | NR            | 760    | 18                       | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 430                      | NR            | 635    | 612                      | NR            | 765    | 15                       | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 486                      | NR            | 640    | 561                      | NR            | 770    | 13                       | NR            | 900    | 0                        | NR            |
| 385    | 0                        | NR            | 515    | 536                      | NR            | 645    | 509                      | NR            | 775    | 11                       | NR            | 905    | 0                        | NR            |
| 390    | 1                        | NR            | 520    | 571                      | NR            | 650    | 458                      | NR            | 780    | 10                       | NR            | 910    | 0                        | NR            |
| 395    | 3                        | NR            | 525    | 600                      | NR            | 655    | 410                      | NR            | 785    | 8                        | NR            | 915    | 0                        | NR            |
| 400    | 5                        | NR            | 530    | 624                      | NR            | 660    | 363                      | NR            | 790    | 7                        | NR            | 920    | 0                        | NR            |
| 405    | 7                        | NR            | 535    | 645                      | NR            | 665    | 321                      | NR            | 795    | 6                        | NR            | 925    | 0                        | NR            |
| 410    | 10                       | NR            | 540    | 661                      | NR            | 670    | 280                      | NR            | 800    | 5                        | NR            | 930    | 0                        | NR            |
| 415    | 16                       | NR            | 545    | 681                      | NR            | 675    | 244                      | NR            | 805    | 5                        | NR            | 935    | 0                        | NR            |
| 420    | 30                       | NR            | 550    | 701                      | NR            | 680    | 213                      | NR            | 810    | 4                        | NR            | 940    | 0                        | NR            |
| 425    | 53                       | NR            | 555    | 724                      | NR            | 685    | 183                      | NR            | 815    | 3                        | NR            | 945    | 0                        | NR            |
| 430    | 95                       | NR            | 560    | 747                      | NR            | 690    | 159                      | NR            | 820    | 3                        | NR            | 950    | 0                        | NR            |
| 435    | 170                      | NR            | 565    | 772                      | NR            | 695    | 136                      | NR            | 825    | 3                        | NR            | 955    | 0                        | NR            |
| 440    | 289                      | NR            | 570    | 795                      | NR            | 700    | 117                      | NR            | 830    | 2                        | NR            | 960    | 0                        | NR            |
| 445    | 522                      | NR            | 575    | 817                      | NR            | 705    | 100                      | NR            | 835    | 2                        | NR            | 965    | 0                        | NR            |
| 450    | 895                      | NR            | 580    | 841                      | NR            | 710    | 85                       | NR            | 840    | 2                        | NR            | 970    | 0                        | NR            |
| 455    | 957                      | NR            | 585    | 857                      | NR            | 715    | 72                       | NR            | 845    | 1                        | NR            | 975    | 0                        | NR            |
| 460    | 642                      | NR            | 590    | 871                      | NR            | 720    | 62                       | NR            | 850    | 1                        | NR            | 980    | 0                        | NR            |
| 465    | 487                      | NR            | 595    | 875                      | NR            | 725    | 53                       | NR            | 855    | 1                        | NR            | 985    | 0                        | NR            |
| 470    | 397                      | NR            | 600    | 866                      | NR            | 730    | 45                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 289                      | NR            | 605    | 852                      | NR            | 735    | 39                       | NR            | 865    | 1                        | NR            | 995    | 0                        | NR            |
| 480    | 241                      | NR            | 610    | 827                      | NR            | 740    | 33                       | NR            | 870    | 1                        | NR            | 1000   | 0                        | NR            |
| 485    | 245                      | NR            | 615    | 796                      | NR            | 745    | 28                       | NR            | 875    | 1                        | NR            |        |                          |               |

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### Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 3.36

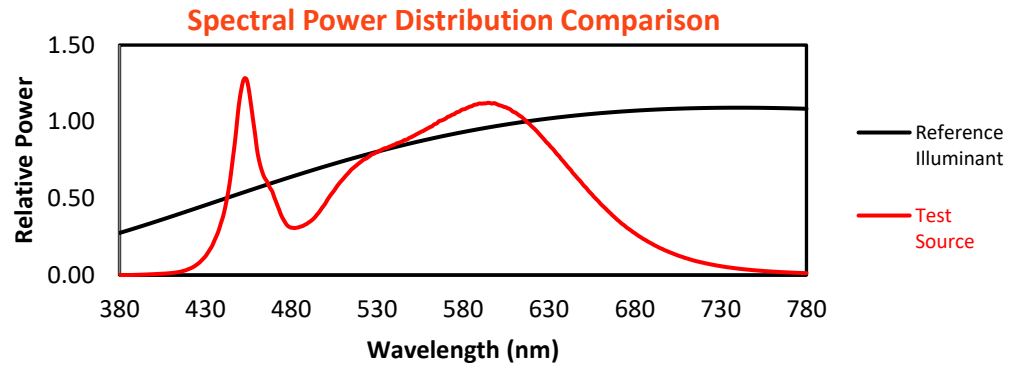
| λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) |
|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|
| 360       | 0                           | NR               | 490       | 266                         | NR               | 620       | 755                         | NR               | 750       | 24                          | NR               | 880       | 1                           | NR               |
| 365       | 0                           | NR               | 495       | 307                         | NR               | 625       | 710                         | NR               | 755       | 21                          | NR               | 885       | 0                           | NR               |
| 370       | 0                           | NR               | 500       | 366                         | NR               | 630       | 663                         | NR               | 760       | 18                          | NR               | 890       | 0                           | NR               |
| 375       | 0                           | NR               | 505       | 430                         | NR               | 635       | 612                         | NR               | 765       | 15                          | NR               | 895       | 0                           | NR               |
| 380       | 0                           | NR               | 510       | 486                         | NR               | 640       | 561                         | NR               | 770       | 13                          | NR               | 900       | 0                           | NR               |
| 385       | 0                           | NR               | 515       | 536                         | NR               | 645       | 509                         | NR               | 775       | 11                          | NR               | 905       | 0                           | NR               |
| 390       | 1                           | NR               | 520       | 571                         | NR               | 650       | 458                         | NR               | 780       | 10                          | NR               | 910       | 0                           | NR               |
| 395       | 3                           | NR               | 525       | 600                         | NR               | 655       | 410                         | NR               | 785       | 8                           | NR               | 915       | 0                           | NR               |
| 400       | 5                           | NR               | 530       | 624                         | NR               | 660       | 363                         | NR               | 790       | 7                           | NR               | 920       | 0                           | NR               |
| 405       | 7                           | NR               | 535       | 645                         | NR               | 665       | 321                         | NR               | 795       | 6                           | NR               | 925       | 0                           | NR               |
| 410       | 10                          | NR               | 540       | 661                         | NR               | 670       | 280                         | NR               | 800       | 5                           | NR               | 930       | 0                           | NR               |
| 415       | 16                          | NR               | 545       | 681                         | NR               | 675       | 244                         | NR               | 805       | 5                           | NR               | 935       | 0                           | NR               |
| 420       | 30                          | NR               | 550       | 701                         | NR               | 680       | 213                         | NR               | 810       | 4                           | NR               | 940       | 0                           | NR               |
| 425       | 53                          | NR               | 555       | 724                         | NR               | 685       | 183                         | NR               | 815       | 3                           | NR               | 945       | 0                           | NR               |
| 430       | 95                          | NR               | 560       | 747                         | NR               | 690       | 159                         | NR               | 820       | 3                           | NR               | 950       | 0                           | NR               |
| 435       | 170                         | NR               | 565       | 772                         | NR               | 695       | 136                         | NR               | 825       | 3                           | NR               | 955       | 0                           | NR               |
| 440       | 289                         | NR               | 570       | 795                         | NR               | 700       | 117                         | NR               | 830       | 2                           | NR               | 960       | 0                           | NR               |
| 445       | 522                         | NR               | 575       | 817                         | NR               | 705       | 100                         | NR               | 835       | 2                           | NR               | 965       | 0                           | NR               |
| 450       | 895                         | NR               | 580       | 841                         | NR               | 710       | 85                          | NR               | 840       | 2                           | NR               | 970       | 0                           | NR               |
| 455       | 957                         | NR               | 585       | 857                         | NR               | 715       | 72                          | NR               | 845       | 1                           | NR               | 975       | 0                           | NR               |
| 460       | 642                         | NR               | 590       | 871                         | NR               | 720       | 62                          | NR               | 850       | 1                           | NR               | 980       | 0                           | NR               |
| 465       | 487                         | NR               | 595       | 875                         | NR               | 725       | 53                          | NR               | 855       | 1                           | NR               | 985       | 0                           | NR               |
| 470       | 397                         | NR               | 600       | 866                         | NR               | 730       | 45                          | NR               | 860       | 1                           | NR               | 990       | 0                           | NR               |
| 475       | 289                         | NR               | 605       | 852                         | NR               | 735       | 39                          | NR               | 865       | 1                           | NR               | 995       | 0                           | NR               |
| 480       | 241                         | NR               | 610       | 827                         | NR               | 740       | 33                          | NR               | 870       | 1                           | NR               | 1000      | 0                           | NR               |
| 485       | 245                         | NR               | 615       | 796                         | NR               | 745       | 28                          | NR               | 875       | 1                           | NR               |           |                             |                  |

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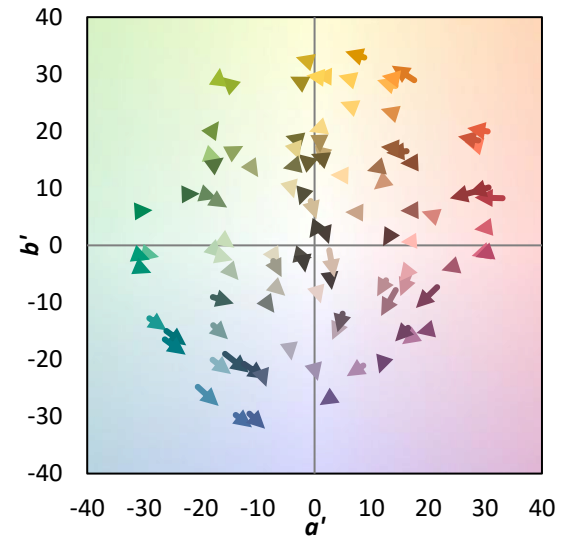
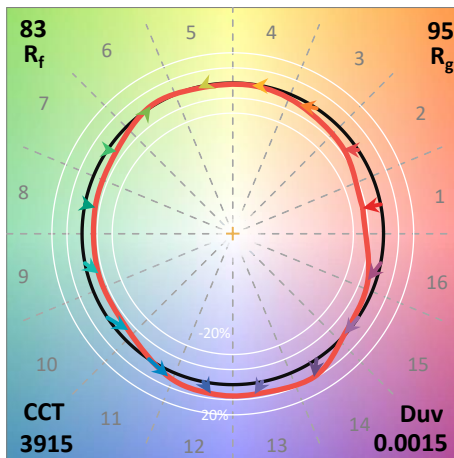
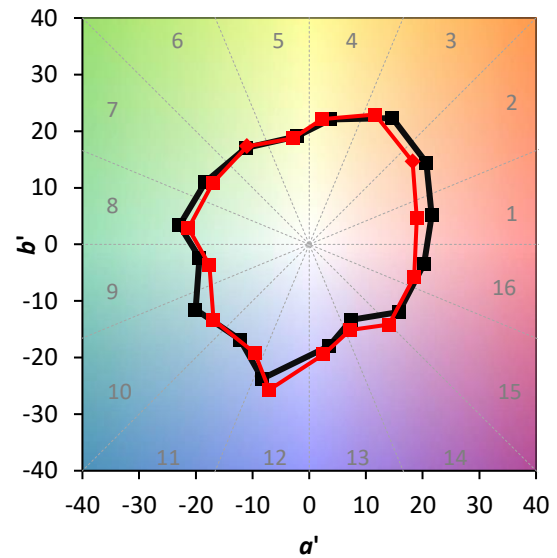
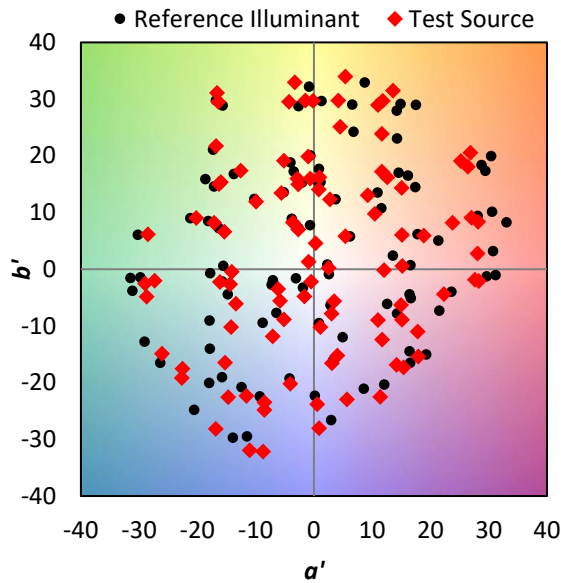
TM-30-18

### Summary

$R_f = 83.2$   
 $R_g = 94.6$   
 $CIE R_a = 82.3$   
 $R_g = 7.6$



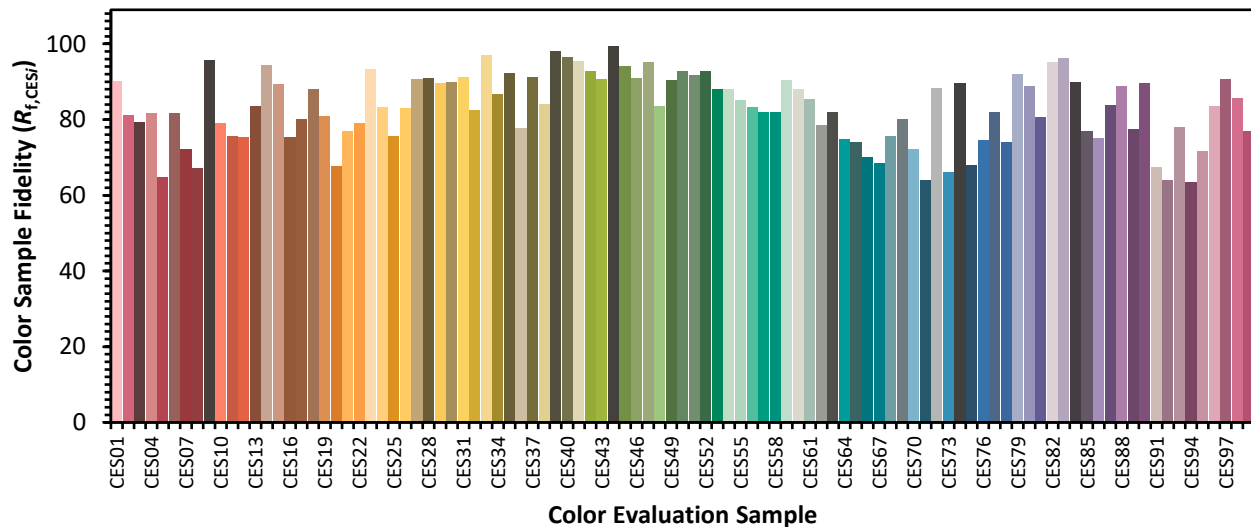
### Color Vector Graphics



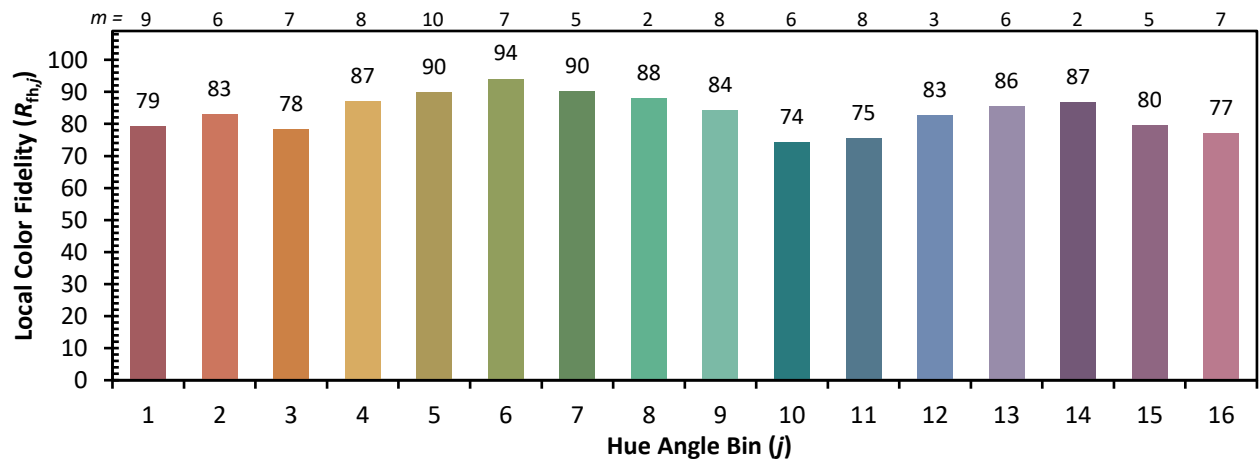
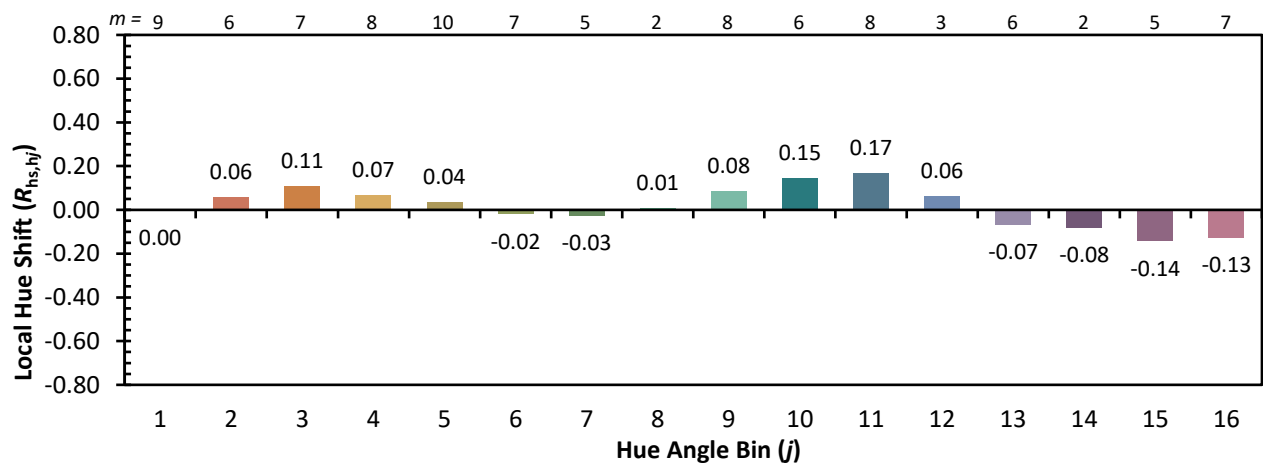
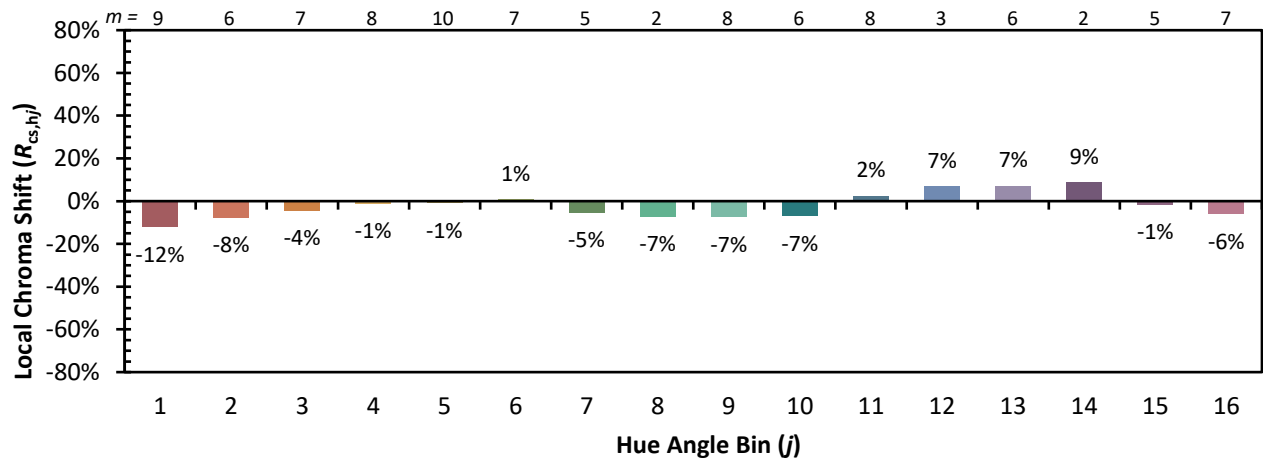


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

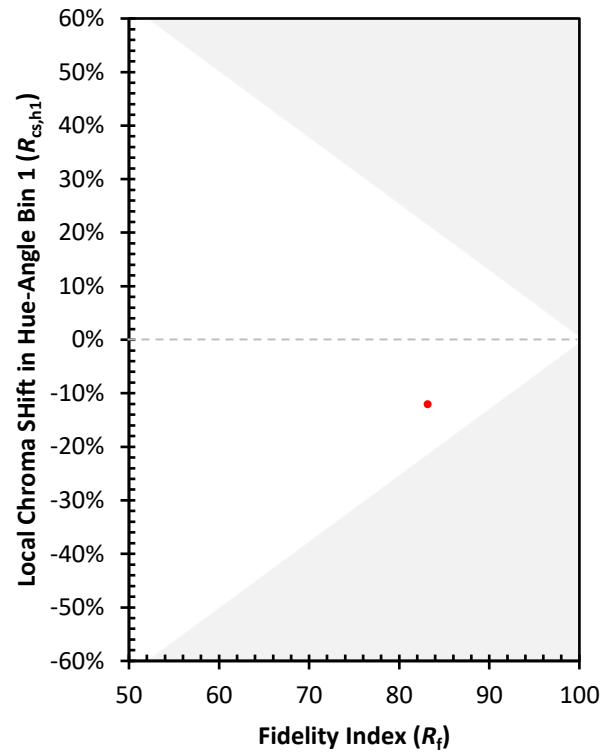
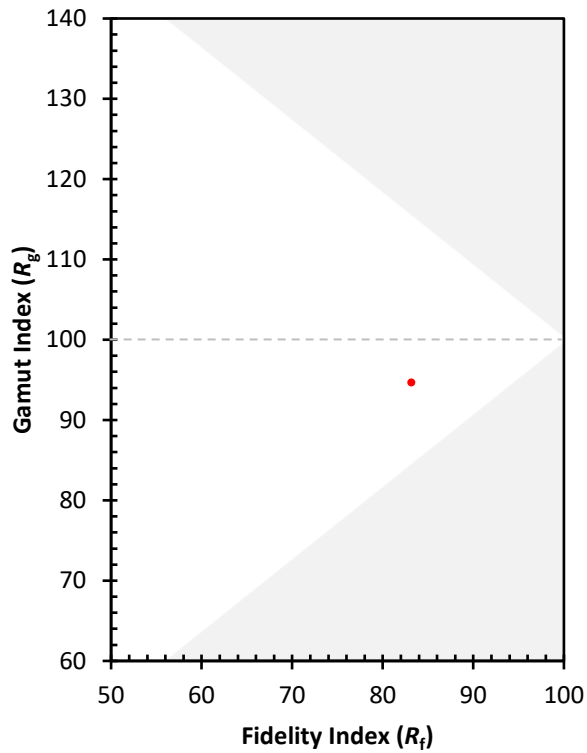
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 83 | CES51 = 92 | CES76 = 75 |
| CES02 = 61 | CES27 = 91 | CES52 = 93 | CES77 = 82 |
| CES03 = 31 | CES28 = 91 | CES53 = 88 | CES78 = 74 |
| CES04 = 70 | CES29 = 90 | CES54 = 88 | CES79 = 92 |
| CES05 = 48 | CES30 = 90 | CES55 = 85 | CES80 = 89 |
| CES06 = 50 | CES31 = 91 | CES56 = 83 | CES81 = 81 |
| CES07 = 41 | CES32 = 83 | CES57 = 82 | CES82 = 95 |
| CES08 = 40 | CES33 = 97 | CES58 = 82 | CES83 = 96 |
| CES09 = 29 | CES34 = 87 | CES59 = 90 | CES84 = 90 |
| CES10 = 74 | CES35 = 92 | CES60 = 88 | CES85 = 77 |
| CES11 = 57 | CES36 = 78 | CES61 = 85 | CES86 = 75 |
| CES12 = 63 | CES37 = 91 | CES62 = 79 | CES87 = 84 |
| CES13 = 42 | CES38 = 84 | CES63 = 82 | CES88 = 89 |
| CES14 = 74 | CES39 = 98 | CES64 = 75 | CES89 = 77 |
| CES15 = 71 | CES40 = 96 | CES65 = 74 | CES90 = 90 |
| CES16 = 47 | CES41 = 95 | CES66 = 70 | CES91 = 67 |
| CES17 = 49 | CES42 = 93 | CES67 = 69 | CES92 = 64 |
| CES18 = 56 | CES43 = 91 | CES68 = 76 | CES93 = 78 |
| CES19 = 71 | CES44 = 99 | CES69 = 80 | CES94 = 63 |
| CES20 = 65 | CES45 = 94 | CES70 = 72 | CES95 = 72 |
| CES21 = 86 | CES46 = 91 | CES71 = 64 | CES96 = 84 |
| CES22 = 78 | CES47 = 95 | CES72 = 88 | CES97 = 91 |
| CES23 = 91 | CES48 = 83 | CES73 = 66 | CES98 = 86 |
| CES24 = 90 | CES49 = 90 | CES74 = 90 | CES99 = 77 |
| CES25 = 71 | CES50 = 93 | CES75 = 68 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)