

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: P1214768

Luminaire Tested: 22-ID2-45-CFD1-L950-U

Issue Date: 12/4/2025

**Test Information**

Test Method: LM-79-2019  
Report Number: P1214768  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-2506-458-12)  
Test Lab: INNOVATION CENTER  
Issue Date: 12/4/2025  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: CORELITE  
Catalog Number: 22-ID2-45-CFD1-L950-U  
Description: 2X2 IN DEPTH TROFFER WITH 1INCH CUBE DROP LENS  
Light Source: 5000K CCT, 90 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

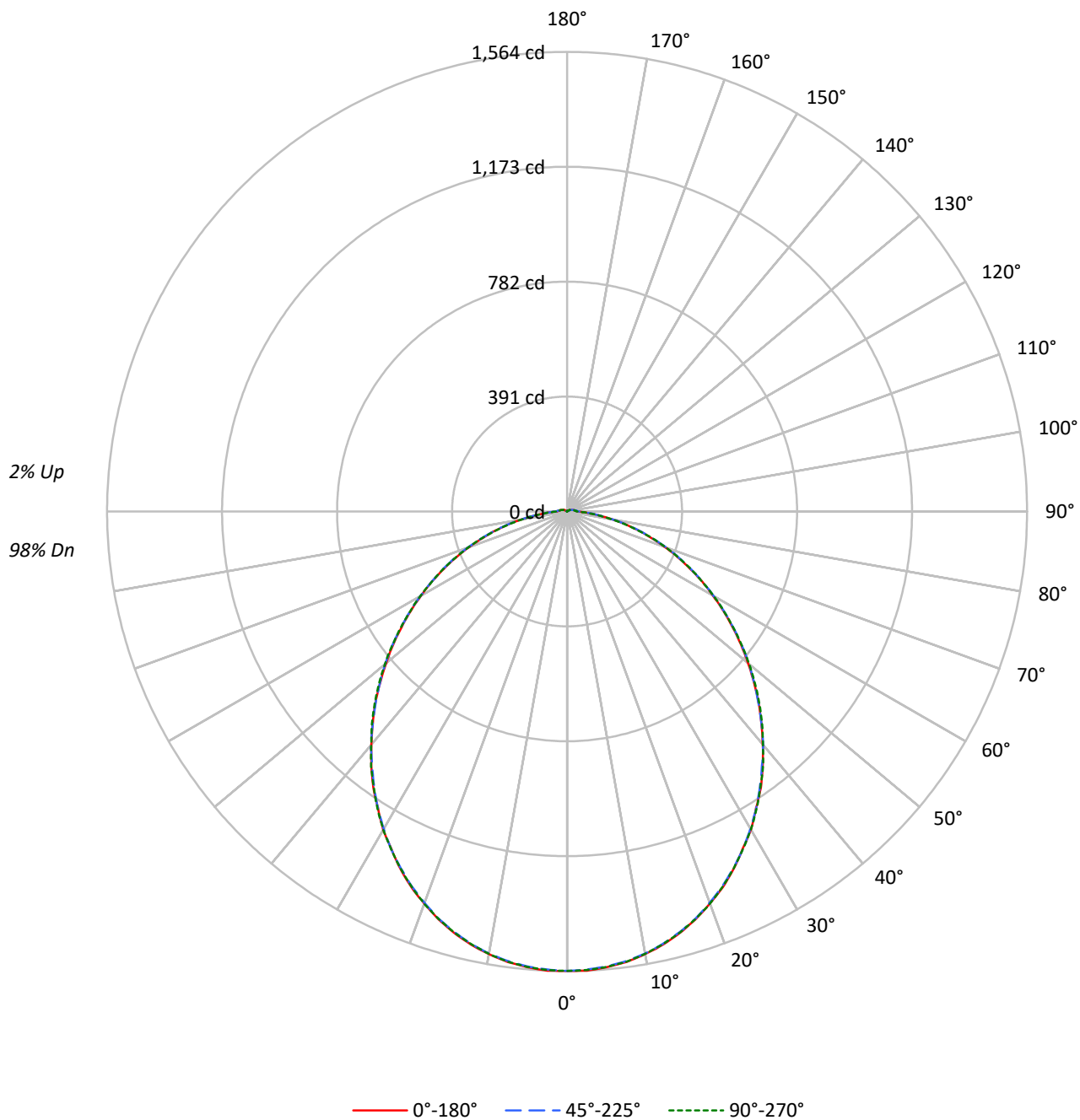
Lumens per Lamp: N/A  
Luminaire Lumens: 4124.1 lumens  
Efficiency: N/A  
Efficacy: 106.0 lumens/watt  
Spacing Criteria (0/90/45): 1.19 / 1.19 / 1.3  
Luminous Opening: Rectangular w/ Sides (W: 2' x L: 2' x H: 0.08')  
CIE Type: Direct

Input Watts (W): 38.9  
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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### Luminous Intensity Polar Plot



TEST NUMBER: P1214768  
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**COEFFICIENT OF UTILIZATION - ZONAL CAVITY METHOD:**

|     |     |     |     |     |     |     |     |     |  |     |     |     |  |  |     |     |     |  |  |    |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|-----|-----|-----|--|--|-----|-----|-----|--|--|----|
| RF  | 20  |     |     |     | 20  |     |     |     |  | 20  |     |     |  |  | 20  |     |     |  |  | 20 |
| RC  | 80  |     |     |     | 70  |     |     |     |  | 50  |     |     |  |  | 30  |     |     |  |  | 0  |
| RW  | 70  | 50  | 30  | 10  | 70  | 50  | 30  | 10  |  | 50  | 30  | 10  |  |  | 50  | 30  | 10  |  |  | 0  |
| RCR |     |     |     |     |     |     |     |     |  |     |     |     |  |  |     |     |     |  |  |    |
| 0   | 119 | 119 | 119 | 119 | 116 | 116 | 116 | 116 |  | 110 | 110 | 110 |  |  | 105 | 105 | 105 |  |  | 98 |
| 1   | 108 | 104 | 99  | 95  | 105 | 101 | 97  | 94  |  | 97  | 93  | 90  |  |  | 92  | 90  | 87  |  |  | 82 |
| 2   | 99  | 91  | 84  | 78  | 96  | 88  | 82  | 77  |  | 85  | 79  | 75  |  |  | 81  | 77  | 73  |  |  | 69 |
| 3   | 90  | 80  | 72  | 65  | 88  | 78  | 71  | 64  |  | 75  | 68  | 63  |  |  | 72  | 66  | 62  |  |  | 58 |
| 4   | 83  | 71  | 62  | 55  | 80  | 69  | 61  | 55  |  | 67  | 60  | 54  |  |  | 64  | 58  | 53  |  |  | 50 |
| 5   | 76  | 63  | 55  | 48  | 74  | 62  | 54  | 48  |  | 60  | 53  | 47  |  |  | 58  | 51  | 46  |  |  | 43 |
| 6   | 70  | 57  | 48  | 42  | 68  | 56  | 48  | 42  |  | 54  | 47  | 41  |  |  | 52  | 46  | 41  |  |  | 38 |
| 7   | 65  | 52  | 43  | 37  | 64  | 51  | 43  | 37  |  | 49  | 42  | 37  |  |  | 48  | 41  | 36  |  |  | 34 |
| 8   | 61  | 48  | 39  | 33  | 59  | 47  | 39  | 33  |  | 45  | 38  | 33  |  |  | 44  | 37  | 33  |  |  | 30 |
| 9   | 57  | 44  | 36  | 30  | 55  | 43  | 35  | 30  |  | 42  | 35  | 30  |  |  | 41  | 34  | 29  |  |  | 27 |
| 10  | 53  | 40  | 33  | 27  | 52  | 40  | 32  | 27  |  | 39  | 32  | 27  |  |  | 38  | 31  | 27  |  |  | 25 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 4207 | 4207 | 4207 |
| 5°  | 4190 | 4177 | 4188 |
| 10° | 4151 | 4133 | 4148 |
| 15° | 4092 | 4066 | 4088 |
| 20° | 4008 | 3977 | 4009 |
| 25° | 3911 | 3872 | 3906 |
| 30° | 3798 | 3752 | 3796 |
| 35° | 3670 | 3614 | 3661 |
| 40° | 3517 | 3479 | 3521 |
| 45° | 3372 | 3313 | 3385 |
| 50° | 3210 | 3165 | 3232 |
| 55° | 3050 | 2997 | 3066 |
| 60° | 2882 | 2822 | 2901 |
| 65° | 2708 | 2643 | 2729 |
| 70° | 2509 | 2442 | 2524 |
| 75° | 2292 | 2193 | 2260 |
| 80° | 1983 | 1873 | 1957 |
| 85° | 1725 | 1594 | 1646 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°  
 Vertical Angle: 45°  
 Luminance: 3385 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 147.6  | 3.6       |
| 10°-20°   | 417.8  | 10.1      |
| 20°-30°   | 616.7  | 15.0      |
| 30°-40°   | 716.1  | 17.4      |
| 40°-50°   | 711.2  | 17.2      |
| 50°-60°   | 617.7  | 15.0      |
| 60°-70°   | 460.7  | 11.2      |
| 70°-80°   | 269.7  | 6.5       |
| 80°-90°   | 96.4   | 2.3       |
| 90°-100°  | 32.9   | 0.8       |
| 100°-110° | 20.4   | 0.5       |
| 110°-120° | 10.8   | 0.3       |
| 120°-130° | 4.6    | 0.1       |
| 130°-140° | 1.3    | 0.0       |
| 140°-150° | 0.2    | 0.0       |
| 150°-160° | 0.0    | 0.0       |
| 160°-170° | 0.0    | 0.0       |
| 170°-180° | 0.0    | 0.0       |
| 0°-30°    | 1182.1 | 28.7      |
| 0°-40°    | 1898.2 | 46.0      |
| 0°-60°    | 3227.1 | 78.2      |
| 0°-90°    | 4053.9 | 98.3      |
| 90°-120°  | 64.1   | 1.6       |
| 90°-150°  | 70.2   | 1.7       |
| 90°-180°  | 70.0   | 1.7       |
| 0°-180°   | 4124.1 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1564 | 1564  | 1564 | 1564  | 1564 |      |
| 5°   | 1557 | 1556  | 1554 | 1554  | 1556 | 148  |
| 15°  | 1485 | 1483  | 1482 | 1482  | 1483 | 418  |
| 25°  | 1342 | 1341  | 1339 | 1340  | 1340 | 617  |
| 35°  | 1148 | 1145  | 1144 | 1145  | 1146 | 717  |
| 45°  | 921  | 922   | 920  | 923   | 925  | 710  |
| 55°  | 687  | 690   | 690  | 691   | 691  | 615  |
| 65°  | 462  | 466   | 465  | 465   | 465  | 458  |
| 75°  | 253  | 255   | 256  | 255   | 250  | 267  |
| 85°  | 81   | 84    | 85   | 82    | 78   | 82   |
| 90°  | 35   | 37    | 38   | 37    | 34   | 21   |
| 95°  | 29   | 30    | 31   | 30    | 28   | 23   |
| 105° | 20   | 19    | 20   | 19    | 19   | 21   |
| 115° | 12   | 10    | 10   | 10    | 12   | 12   |
| 125° | 6    | 5     | 4    | 5     | 6    | 6    |
| 135° | 2    | 2     | 0    | 2     | 3    | 2    |
| 145° | 0    | 0     | 0    | 0     | 0    | 0    |
| 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    |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1563.5 | 1563.5 | 1563.5 | 1563.5 | 1563.5 |
| 2.5°   | 1564.0 | 1561.9 | 1560.4 | 1560.4 | 1561.9 |
| 5°     | 1556.7 | 1555.7 | 1554.1 | 1553.6 | 1555.7 |
| 7.5°   | 1546.4 | 1544.8 | 1543.3 | 1543.3 | 1545.3 |
| 10°    | 1529.8 | 1528.7 | 1527.7 | 1528.2 | 1528.7 |
| 12.5°  | 1510.1 | 1508.0 | 1507.0 | 1507.0 | 1507.5 |
| 15°    | 1484.7 | 1483.1 | 1481.6 | 1482.1 | 1483.1 |
| 17.5°  | 1454.6 | 1454.1 | 1452.6 | 1453.1 | 1453.6 |
| 20°    | 1419.9 | 1418.9 | 1417.3 | 1418.4 | 1420.4 |
| 22.5°  | 1384.2 | 1381.1 | 1380.0 | 1380.5 | 1382.1 |
| 25°    | 1341.7 | 1340.6 | 1338.6 | 1339.6 | 1340.1 |
| 27.5°  | 1294.0 | 1297.6 | 1295.0 | 1294.5 | 1295.5 |
| 30°    | 1250.5 | 1247.4 | 1246.8 | 1246.8 | 1249.9 |
| 32.5°  | 1196.6 | 1196.6 | 1197.1 | 1197.6 | 1199.7 |
| 35°    | 1148.4 | 1144.7 | 1143.7 | 1145.3 | 1145.8 |
| 37.5°  | 1092.9 | 1092.4 | 1088.8 | 1091.9 | 1094.5 |
| 40°    | 1034.9 | 1034.4 | 1037.5 | 1035.4 | 1035.9 |
| 42.5°  | 977.9  | 978.4  | 977.9  | 980.5  | 982.0  |
| 45°    | 921.4  | 921.9  | 919.8  | 922.9  | 925.0  |
| 47.5°  | 861.8  | 863.9  | 862.8  | 863.9  | 867.0  |
| 50°    | 803.2  | 805.8  | 806.9  | 806.9  | 808.9  |
| 52.5°  | 745.7  | 747.8  | 749.3  | 749.9  | 749.3  |
| 55°    | 687.2  | 690.3  | 690.3  | 691.3  | 690.8  |
| 57.5°  | 630.2  | 633.8  | 633.3  | 633.8  | 632.7  |
| 60°    | 572.6  | 575.2  | 575.7  | 576.8  | 576.3  |
| 62.5°  | 518.7  | 519.8  | 520.3  | 520.3  | 518.2  |
| 65°    | 461.7  | 465.9  | 465.4  | 464.8  | 465.4  |
| 67.5°  | 407.8  | 410.4  | 412.5  | 410.9  | 410.4  |
| 70°    | 353.9  | 358.6  | 358.6  | 358.1  | 356.0  |
| 72.5°  | 301.1  | 305.2  | 305.2  | 305.2  | 304.7  |
| 75°    | 253.4  | 255.0  | 255.5  | 255.0  | 249.8  |
| 77.5°  | 203.7  | 205.2  | 207.3  | 206.8  | 202.6  |
| 80°    | 157.0  | 160.1  | 159.6  | 159.1  | 154.9  |
| 82.5°  | 115.0  | 118.7  | 119.7  | 118.2  | 115.0  |
| 85°    | 81.4   | 84.0   | 85.0   | 82.4   | 77.7   |
| 87.5°  | 53.9   | 56.5   | 57.0   | 56.0   | 52.9   |
| 90°    | 34.7   | 37.3   | 38.3   | 37.3   | 33.7   |
| 92.5°  | 31.6   | 33.2   | 34.2   | 33.2   | 30.6   |
| 95°    | 29.0   | 30.1   | 31.1   | 30.1   | 28.5   |
| 97.5°  | 26.4   | 26.9   | 28.0   | 26.9   | 25.9   |
| 100°   | 24.4   | 23.8   | 24.9   | 23.8   | 23.8   |
| 102.5° | 21.8   | 21.2   | 22.3   | 21.2   | 21.8   |
| 105°   | 19.7   | 19.2   | 19.7   | 18.7   | 19.2   |
| 107.5° | 17.6   | 16.6   | 17.1   | 16.1   | 17.6   |
| 110°   | 15.5   | 14.5   | 14.5   | 13.5   | 15.5   |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°   | 22.5° | 45°  | 67.5° | 90°  |
|--------|------|-------|------|-------|------|
| 112.5° | 14.0 | 12.4  | 12.4 | 11.9  | 13.5 |
| 115°   | 11.9 | 10.4  | 10.4 | 9.8   | 11.9 |
| 117.5° | 10.4 | 8.8   | 8.3  | 8.8   | 10.4 |
| 120°   | 8.8  | 7.3   | 6.7  | 7.3   | 8.8  |
| 122.5° | 7.8  | 6.2   | 5.2  | 6.2   | 7.8  |
| 125°   | 6.2  | 5.2   | 3.6  | 5.2   | 6.2  |
| 127.5° | 5.2  | 3.6   | 2.1  | 4.1   | 5.2  |
| 130°   | 4.1  | 3.1   | 1.6  | 3.6   | 4.1  |
| 132.5° | 3.1  | 2.1   | 0.5  | 2.6   | 3.6  |
| 135°   | 2.1  | 1.6   | 0.5  | 1.6   | 2.6  |
| 137.5° | 1.6  | 1.0   | 0.5  | 1.0   | 2.1  |
| 140°   | 1.0  | 0.5   | 0.5  | 0.5   | 1.0  |
| 142.5° | 0.5  | 0.5   | 0.5  | 0.5   | 0.5  |
| 145°   | 0.5  | 0.5   | 0.5  | 0.5   | 0.5  |
| 147.5° | 0.0  | 0.0   | 0.0  | 0.0   | 0.0  |
| 150°   | 0.0  | 0.0   | 0.0  | 0.0   | 0.0  |
| 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: P1214768

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**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 | 15.62            | 17.20 | 16.01 | 17.55 | 17.90 | 15.63          | 17.20 | 16.02 | 17.55 | 17.91 |
|                 | 3H   | 17.33            | 18.75 | 17.73 | 19.12 | 19.52 | 17.34          | 18.77 | 17.75 | 19.13 | 19.53 |
|                 | 4H   | 17.97            | 19.31 | 18.40 | 19.70 | 20.12 | 17.98          | 19.32 | 18.40 | 19.70 | 20.12 |
|                 | 6H   | 18.44            | 19.69 | 18.88 | 20.09 | 20.52 | 18.44          | 19.69 | 18.88 | 20.09 | 20.52 |
|                 | 8H   | 18.60            | 19.79 | 19.05 | 20.21 | 20.65 | 18.60          | 19.79 | 19.05 | 20.21 | 20.65 |
|                 | 12H  | 18.72            | 19.86 | 19.17 | 20.27 | 20.74 | 18.71          | 19.85 | 19.17 | 20.26 | 20.73 |
| 4H              | 2H   | 16.21            | 17.55 | 16.63 | 17.93 | 18.35 | 16.21          | 17.55 | 16.64 | 17.94 | 18.36 |
|                 | 3H   | 18.14            | 19.26 | 18.58 | 19.70 | 20.14 | 18.15          | 19.27 | 18.58 | 19.71 | 20.15 |
|                 | 4H   | 18.91            | 19.93 | 19.37 | 20.37 | 20.85 | 18.91          | 19.93 | 19.37 | 20.38 | 20.85 |
|                 | 6H   | 19.51            | 20.40 | 19.99 | 20.87 | 21.37 | 19.51          | 20.40 | 19.99 | 20.87 | 21.37 |
|                 | 8H   | 19.71            | 20.55 | 20.20 | 21.02 | 21.53 | 19.71          | 20.54 | 20.20 | 21.02 | 21.52 |
|                 | 12H  | 19.88            | 20.63 | 20.38 | 21.14 | 21.64 | 19.87          | 20.62 | 20.37 | 21.12 | 21.63 |
| 8H              | 4H   | 19.20            | 20.03 | 19.68 | 20.51 | 21.01 | 19.20          | 20.04 | 19.69 | 20.51 | 21.02 |
|                 | 6H   | 19.92            | 20.61 | 20.44 | 21.13 | 21.65 | 19.91          | 20.61 | 20.44 | 21.13 | 21.65 |
|                 | 8H   | 20.20            | 20.82 | 20.73 | 21.36 | 21.88 | 20.19          | 20.82 | 20.73 | 21.35 | 21.88 |
|                 | 12H  | 20.45            | 21.00 | 20.98 | 21.52 | 22.12 | 20.43          | 20.99 | 20.97 | 21.51 | 22.11 |
| 12H             | 4H   | 19.23            | 19.98 | 19.73 | 20.48 | 20.99 | 19.23          | 19.98 | 19.74 | 20.49 | 21.00 |
|                 | 6H   | 19.97            | 20.60 | 20.50 | 21.13 | 21.66 | 19.97          | 20.60 | 20.50 | 21.13 | 21.66 |
|                 | 8H   | 20.31            | 20.86 | 20.84 | 21.38 | 21.98 | 20.30          | 20.86 | 20.84 | 21.38 | 21.98 |



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

Report Prepared for

Cooper Lighting Solutions

Corelite

Report Number: SP1-2506-458-13

Test Date: 08/27/2025

Luminaire Tested: 22ID2-55-CFR1-L950-U

Data in this report applies to families of products including 22ID2-55-CFR1-L950-U

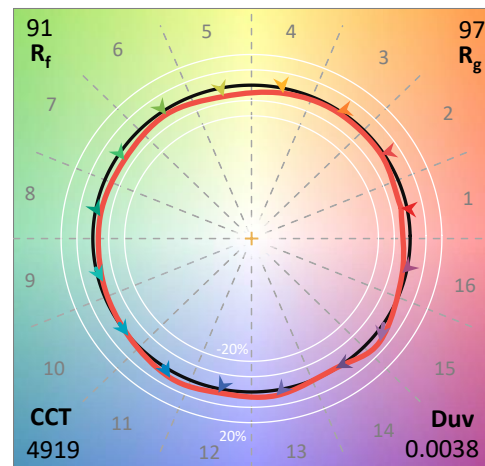
### Test Information

Test Method: LM-79-2019  
 Report Number: SP1-2506-458-13  
 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-L950-U**  
 Description: 2X2 CGTX WITH INDEPTH FRAME AND CFR1 LENS - 5500 LUMEN 5000K 90CRI

### Spectral Parameters

CCT (K): 4919  
 CIE  $u'$ : 0.2096  
 CIE  $v'$ : 0.4901  
 Duv: 0.0038  
 CIE x: 0.3483  
 CIE y: 0.3619  
 CIE z: 0.2898  
 Peak Wavelength (nm): 453  
 Dominant Wavelength (nm): 570  
 Purity: 13.10873  
 R<sub>f</sub>: 90.8  
 R<sub>g</sub>: 97.4

CRI (Ra): 94.0  
 R1: 94.8  
 R2: 97.7  
 R3: 98.4  
 R4: 90.8  
 R5: 92.2  
 R6: 94.3  
 R7: 94.0  
 R8: 90.0  
 R9: 77.7  
 R10: 93.1  
 R11: 92.0  
 R12: 65.9  
 R13: 95.9  
 R14: 99.0  
 R15: 91.4



### Test Conditions

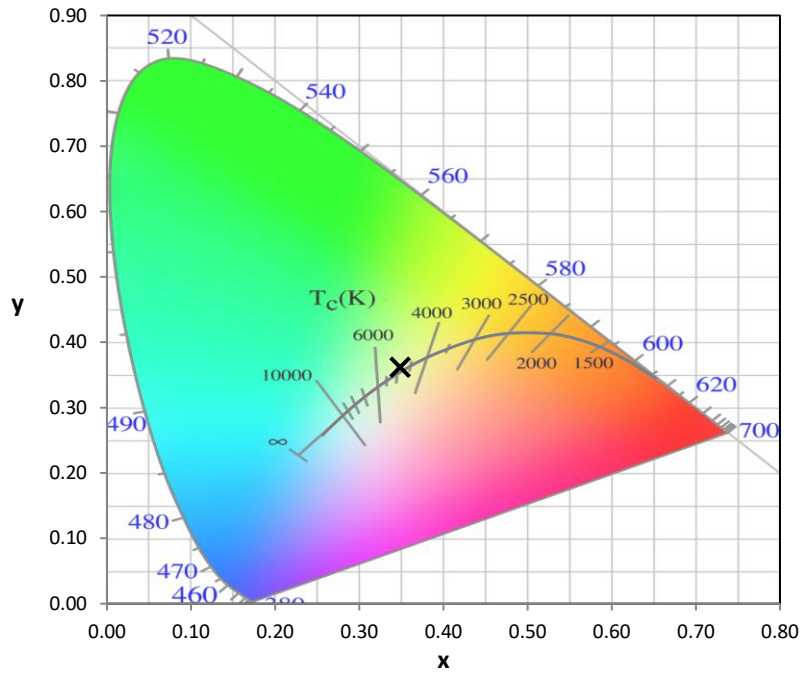
Stabilization Time: M  
 Operation Time: 1H 0M  
 Sphere Temperature (°C): 25.0

REPORT NUMBER: SP1-2506-458-13

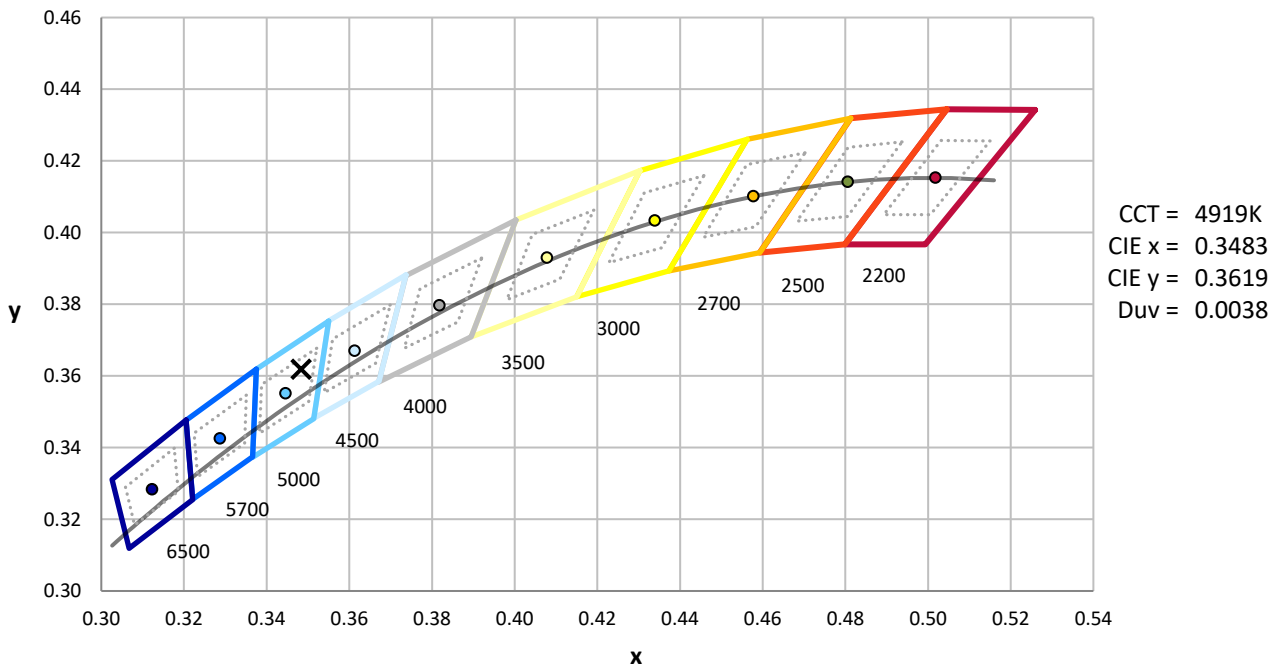
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| 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: SP1-2506-458-13

**CIE 1931 Chromaticity Diagram**



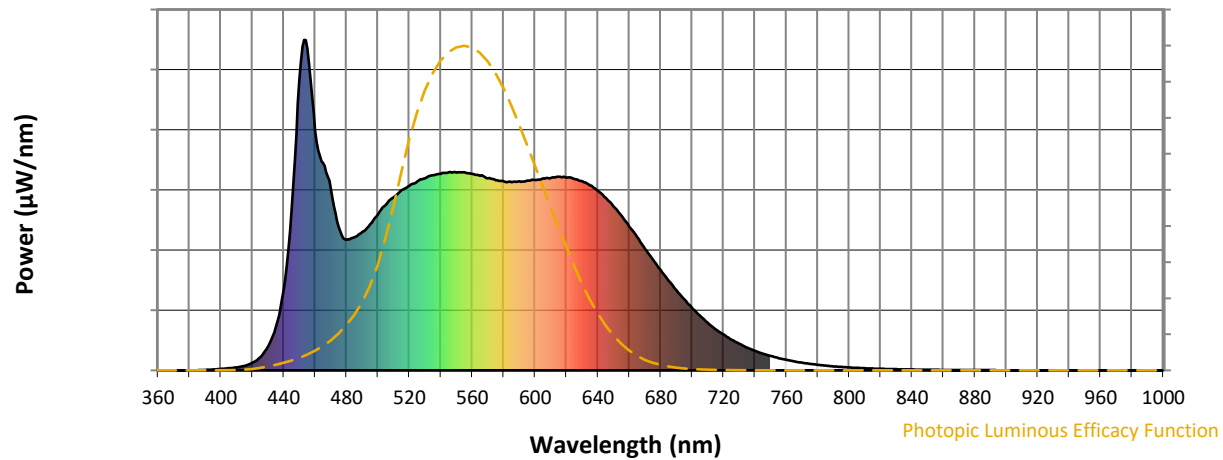
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 5000K 4-step quadrangle

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### Photopic Flux vs. Wavelength

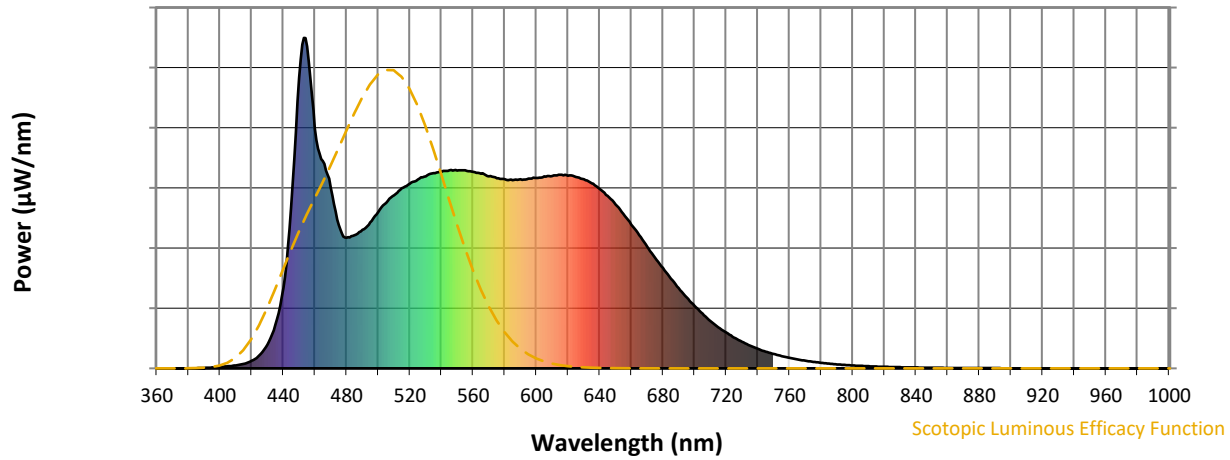


### Photopic Lumens: NR

| λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) |
|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|
| 360       | 0                           | NR               | 490       | 419                         | NR               | 620       | 583                         | NR               | 750       | 44                          | NR               | 880       | 1                           | NR               |
| 365       | 0                           | NR               | 495       | 441                         | NR               | 625       | 580                         | NR               | 755       | 37                          | NR               | 885       | 1                           | NR               |
| 370       | 0                           | NR               | 500       | 472                         | NR               | 630       | 572                         | NR               | 760       | 32                          | NR               | 890       | 1                           | NR               |
| 375       | 0                           | NR               | 505       | 501                         | NR               | 635       | 559                         | NR               | 765       | 27                          | NR               | 895       | 0                           | NR               |
| 380       | 0                           | NR               | 510       | 524                         | NR               | 640       | 543                         | NR               | 770       | 23                          | NR               | 900       | 0                           | NR               |
| 385       | 0                           | NR               | 515       | 545                         | NR               | 645       | 522                         | NR               | 775       | 20                          | NR               | 905       | 0                           | NR               |
| 390       | 1                           | NR               | 520       | 559                         | NR               | 650       | 496                         | NR               | 780       | 17                          | NR               | 910       | 0                           | NR               |
| 395       | 3                           | NR               | 525       | 572                         | NR               | 655       | 468                         | NR               | 785       | 14                          | NR               | 915       | 0                           | NR               |
| 400       | 4                           | NR               | 530       | 581                         | NR               | 660       | 435                         | NR               | 790       | 12                          | NR               | 920       | 0                           | NR               |
| 405       | 7                           | NR               | 535       | 590                         | NR               | 665       | 403                         | NR               | 795       | 10                          | NR               | 925       | 0                           | NR               |
| 410       | 9                           | NR               | 540       | 595                         | NR               | 670       | 368                         | NR               | 800       | 9                           | NR               | 930       | 0                           | NR               |
| 415       | 14                          | NR               | 545       | 599                         | NR               | 675       | 335                         | NR               | 805       | 8                           | NR               | 935       | 0                           | NR               |
| 420       | 23                          | NR               | 550       | 599                         | NR               | 680       | 304                         | NR               | 810       | 6                           | NR               | 940       | 0                           | NR               |
| 425       | 40                          | NR               | 555       | 599                         | NR               | 685       | 271                         | NR               | 815       | 6                           | NR               | 945       | 0                           | NR               |
| 430       | 72                          | NR               | 560       | 595                         | NR               | 690       | 243                         | NR               | 820       | 5                           | NR               | 950       | 0                           | NR               |
| 435       | 132                         | NR               | 565       | 589                         | NR               | 695       | 215                         | NR               | 825       | 4                           | NR               | 955       | 0                           | NR               |
| 440       | 243                         | NR               | 570       | 581                         | NR               | 700       | 189                         | NR               | 830       | 3                           | NR               | 960       | 0                           | NR               |
| 445       | 488                         | NR               | 575       | 575                         | NR               | 705       | 165                         | NR               | 835       | 3                           | NR               | 965       | 0                           | NR               |
| 450       | 879                         | NR               | 580       | 573                         | NR               | 710       | 144                         | NR               | 840       | 3                           | NR               | 970       | 0                           | NR               |
| 455       | 974                         | NR               | 585       | 570                         | NR               | 715       | 124                         | NR               | 845       | 2                           | NR               | 975       | 0                           | NR               |
| 460       | 726                         | NR               | 590       | 572                         | NR               | 720       | 108                         | NR               | 850       | 2                           | NR               | 980       | 0                           | NR               |
| 465       | 627                         | NR               | 595       | 574                         | NR               | 725       | 93                          | NR               | 855       | 2                           | NR               | 985       | 0                           | NR               |
| 470       | 546                         | NR               | 600       | 576                         | NR               | 730       | 80                          | NR               | 860       | 1                           | NR               | 990       | 0                           | NR               |
| 475       | 434                         | NR               | 605       | 581                         | NR               | 735       | 69                          | NR               | 865       | 1                           | NR               | 995       | 0                           | NR               |
| 480       | 395                         | NR               | 610       | 582                         | NR               | 740       | 59                          | NR               | 870       | 1                           | NR               | 1000      | 0                           | NR               |
| 485       | 403                         | NR               | 615       | 586                         | NR               | 745       | 51                          | NR               | 875       | 1                           | NR               |           |                             |                  |

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### Scotopic Flux vs. Wavelength



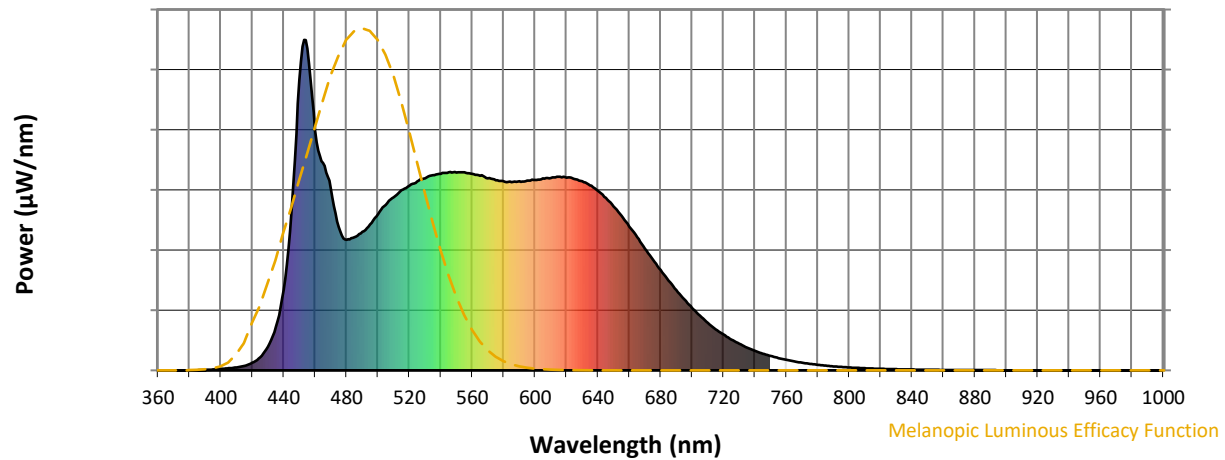
Scotopic Lumens: NR

S/P: 2.09

| 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    | 419                      | NR            | 620    | 583                      | NR            | 750    | 44                       | NR            | 880    | 1                        | NR            |
| 365    | 0                        | NR            | 495    | 441                      | NR            | 625    | 580                      | NR            | 755    | 37                       | NR            | 885    | 1                        | NR            |
| 370    | 0                        | NR            | 500    | 472                      | NR            | 630    | 572                      | NR            | 760    | 32                       | NR            | 890    | 1                        | NR            |
| 375    | 0                        | NR            | 505    | 501                      | NR            | 635    | 559                      | NR            | 765    | 27                       | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 524                      | NR            | 640    | 543                      | NR            | 770    | 23                       | NR            | 900    | 0                        | NR            |
| 385    | 0                        | NR            | 515    | 545                      | NR            | 645    | 522                      | NR            | 775    | 20                       | NR            | 905    | 0                        | NR            |
| 390    | 1                        | NR            | 520    | 559                      | NR            | 650    | 496                      | NR            | 780    | 17                       | NR            | 910    | 0                        | NR            |
| 395    | 3                        | NR            | 525    | 572                      | NR            | 655    | 468                      | NR            | 785    | 14                       | NR            | 915    | 0                        | NR            |
| 400    | 4                        | NR            | 530    | 581                      | NR            | 660    | 435                      | NR            | 790    | 12                       | NR            | 920    | 0                        | NR            |
| 405    | 7                        | NR            | 535    | 590                      | NR            | 665    | 403                      | NR            | 795    | 10                       | NR            | 925    | 0                        | NR            |
| 410    | 9                        | NR            | 540    | 595                      | NR            | 670    | 368                      | NR            | 800    | 9                        | NR            | 930    | 0                        | NR            |
| 415    | 14                       | NR            | 545    | 599                      | NR            | 675    | 335                      | NR            | 805    | 8                        | NR            | 935    | 0                        | NR            |
| 420    | 23                       | NR            | 550    | 599                      | NR            | 680    | 304                      | NR            | 810    | 6                        | NR            | 940    | 0                        | NR            |
| 425    | 40                       | NR            | 555    | 599                      | NR            | 685    | 271                      | NR            | 815    | 6                        | NR            | 945    | 0                        | NR            |
| 430    | 72                       | NR            | 560    | 595                      | NR            | 690    | 243                      | NR            | 820    | 5                        | NR            | 950    | 0                        | NR            |
| 435    | 132                      | NR            | 565    | 589                      | NR            | 695    | 215                      | NR            | 825    | 4                        | NR            | 955    | 0                        | NR            |
| 440    | 243                      | NR            | 570    | 581                      | NR            | 700    | 189                      | NR            | 830    | 3                        | NR            | 960    | 0                        | NR            |
| 445    | 488                      | NR            | 575    | 575                      | NR            | 705    | 165                      | NR            | 835    | 3                        | NR            | 965    | 0                        | NR            |
| 450    | 879                      | NR            | 580    | 573                      | NR            | 710    | 144                      | NR            | 840    | 3                        | NR            | 970    | 0                        | NR            |
| 455    | 974                      | NR            | 585    | 570                      | NR            | 715    | 124                      | NR            | 845    | 2                        | NR            | 975    | 0                        | NR            |
| 460    | 726                      | NR            | 590    | 572                      | NR            | 720    | 108                      | NR            | 850    | 2                        | NR            | 980    | 0                        | NR            |
| 465    | 627                      | NR            | 595    | 574                      | NR            | 725    | 93                       | NR            | 855    | 2                        | NR            | 985    | 0                        | NR            |
| 470    | 546                      | NR            | 600    | 576                      | NR            | 730    | 80                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 434                      | NR            | 605    | 581                      | NR            | 735    | 69                       | NR            | 865    | 1                        | NR            | 995    | 0                        | NR            |
| 480    | 395                      | NR            | 610    | 582                      | NR            | 740    | 59                       | NR            | 870    | 1                        | NR            | 1000   | 0                        | NR            |
| 485    | 403                      | NR            | 615    | 586                      | NR            | 745    | 51                       | NR            | 875    | 1                        | NR            |        |                          |               |

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### Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 4.55

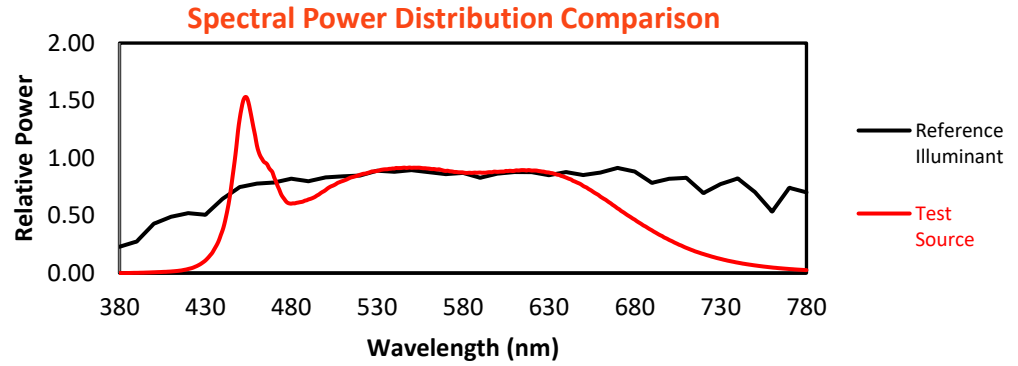
| λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) |
|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|
| 360    | 0                        | NR            | 490    | 419                      | NR            | 620    | 583                      | NR            | 750    | 44                       | NR            | 880    | 1                        | NR            |
| 365    | 0                        | NR            | 495    | 441                      | NR            | 625    | 580                      | NR            | 755    | 37                       | NR            | 885    | 1                        | NR            |
| 370    | 0                        | NR            | 500    | 472                      | NR            | 630    | 572                      | NR            | 760    | 32                       | NR            | 890    | 1                        | NR            |
| 375    | 0                        | NR            | 505    | 501                      | NR            | 635    | 559                      | NR            | 765    | 27                       | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 524                      | NR            | 640    | 543                      | NR            | 770    | 23                       | NR            | 900    | 0                        | NR            |
| 385    | 0                        | NR            | 515    | 545                      | NR            | 645    | 522                      | NR            | 775    | 20                       | NR            | 905    | 0                        | NR            |
| 390    | 1                        | NR            | 520    | 559                      | NR            | 650    | 496                      | NR            | 780    | 17                       | NR            | 910    | 0                        | NR            |
| 395    | 3                        | NR            | 525    | 572                      | NR            | 655    | 468                      | NR            | 785    | 14                       | NR            | 915    | 0                        | NR            |
| 400    | 4                        | NR            | 530    | 581                      | NR            | 660    | 435                      | NR            | 790    | 12                       | NR            | 920    | 0                        | NR            |
| 405    | 7                        | NR            | 535    | 590                      | NR            | 665    | 403                      | NR            | 795    | 10                       | NR            | 925    | 0                        | NR            |
| 410    | 9                        | NR            | 540    | 595                      | NR            | 670    | 368                      | NR            | 800    | 9                        | NR            | 930    | 0                        | NR            |
| 415    | 14                       | NR            | 545    | 599                      | NR            | 675    | 335                      | NR            | 805    | 8                        | NR            | 935    | 0                        | NR            |
| 420    | 23                       | NR            | 550    | 599                      | NR            | 680    | 304                      | NR            | 810    | 6                        | NR            | 940    | 0                        | NR            |
| 425    | 40                       | NR            | 555    | 599                      | NR            | 685    | 271                      | NR            | 815    | 6                        | NR            | 945    | 0                        | NR            |
| 430    | 72                       | NR            | 560    | 595                      | NR            | 690    | 243                      | NR            | 820    | 5                        | NR            | 950    | 0                        | NR            |
| 435    | 132                      | NR            | 565    | 589                      | NR            | 695    | 215                      | NR            | 825    | 4                        | NR            | 955    | 0                        | NR            |
| 440    | 243                      | NR            | 570    | 581                      | NR            | 700    | 189                      | NR            | 830    | 3                        | NR            | 960    | 0                        | NR            |
| 445    | 488                      | NR            | 575    | 575                      | NR            | 705    | 165                      | NR            | 835    | 3                        | NR            | 965    | 0                        | NR            |
| 450    | 879                      | NR            | 580    | 573                      | NR            | 710    | 144                      | NR            | 840    | 3                        | NR            | 970    | 0                        | NR            |
| 455    | 974                      | NR            | 585    | 570                      | NR            | 715    | 124                      | NR            | 845    | 2                        | NR            | 975    | 0                        | NR            |
| 460    | 726                      | NR            | 590    | 572                      | NR            | 720    | 108                      | NR            | 850    | 2                        | NR            | 980    | 0                        | NR            |
| 465    | 627                      | NR            | 595    | 574                      | NR            | 725    | 93                       | NR            | 855    | 2                        | NR            | 985    | 0                        | NR            |
| 470    | 546                      | NR            | 600    | 576                      | NR            | 730    | 80                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 434                      | NR            | 605    | 581                      | NR            | 735    | 69                       | NR            | 865    | 1                        | NR            | 995    | 0                        | NR            |
| 480    | 395                      | NR            | 610    | 582                      | NR            | 740    | 59                       | NR            | 870    | 1                        | NR            | 1000   | 0                        | NR            |
| 485    | 403                      | NR            | 615    | 586                      | NR            | 745    | 51                       | NR            | 875    | 1                        | NR            |        |                          |               |

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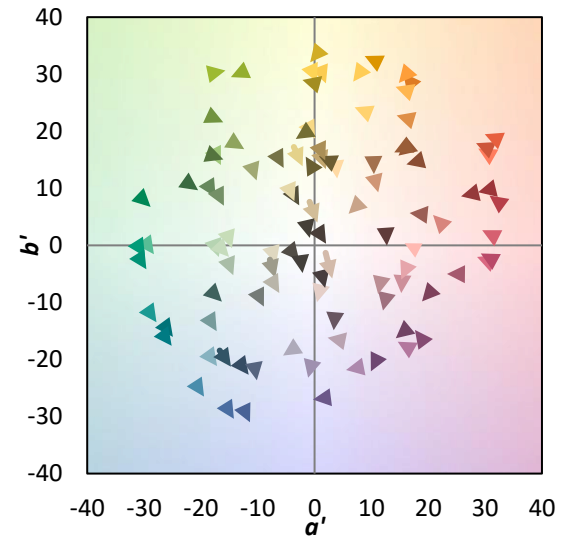
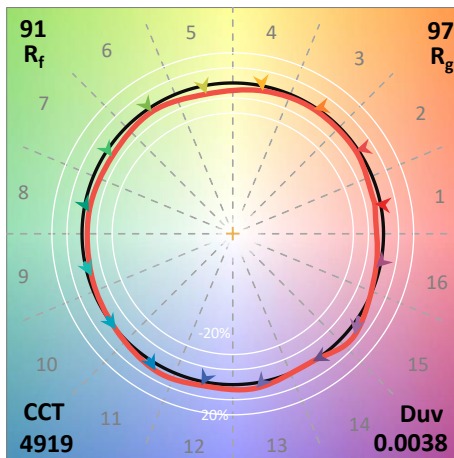
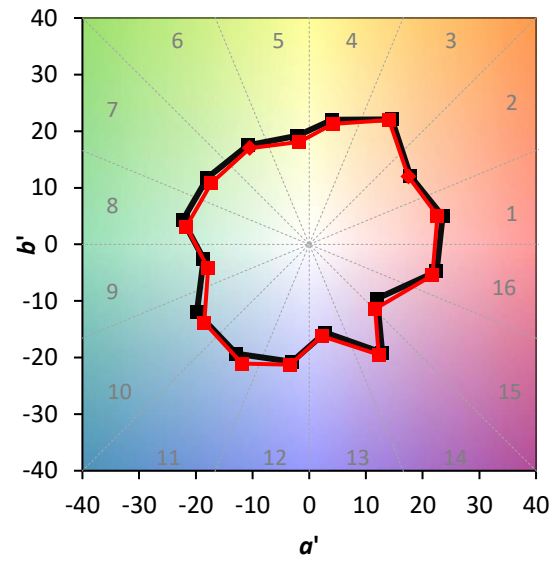
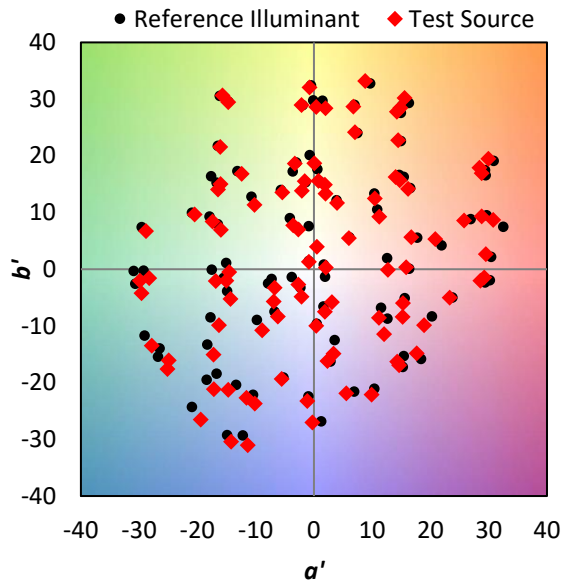
TM-30-18

### Summary

$R_f = 90.8$   
 $R_g = 97.4$   
 $CIE R_a = 94.0$   
 $R_9 = 77.7$



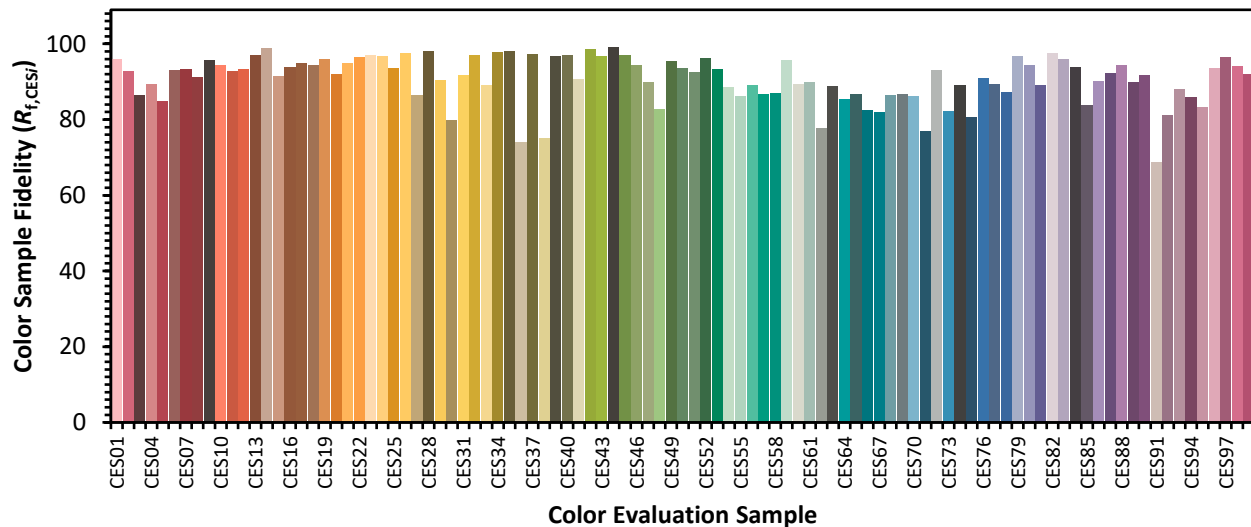
### Color Vector Graphics



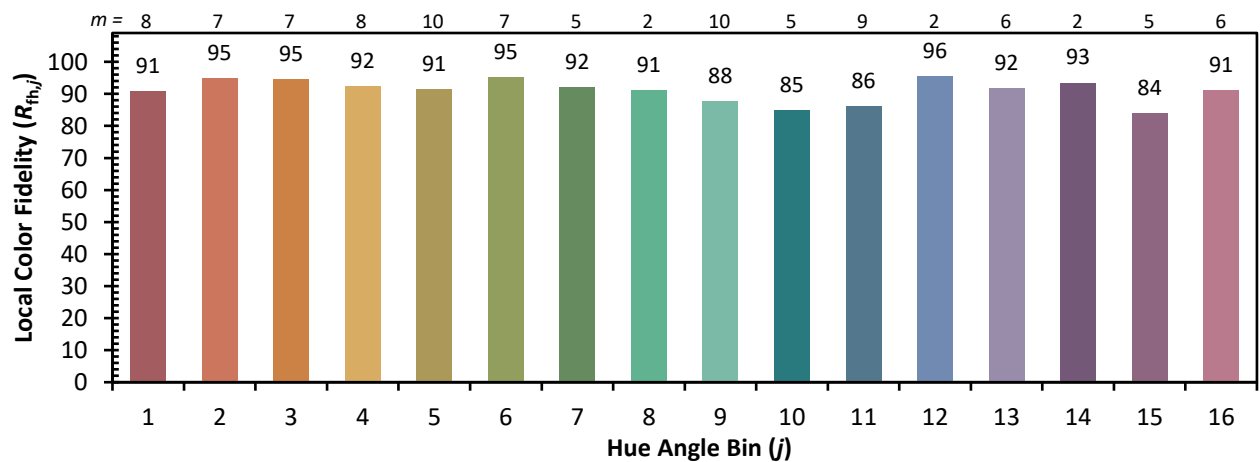
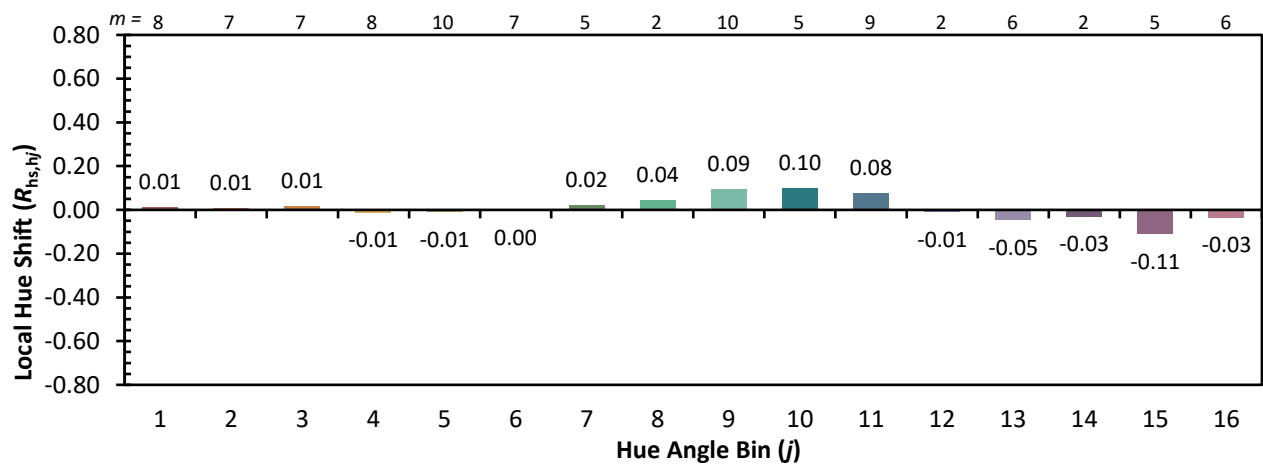
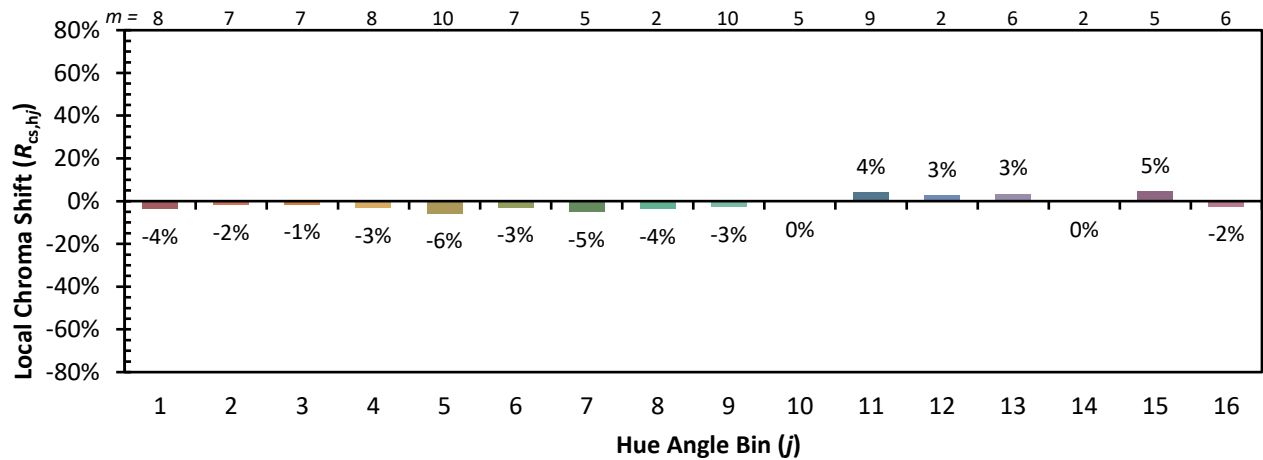


**Individual Sample Fidelity Index ( $R_{fi}$ )**

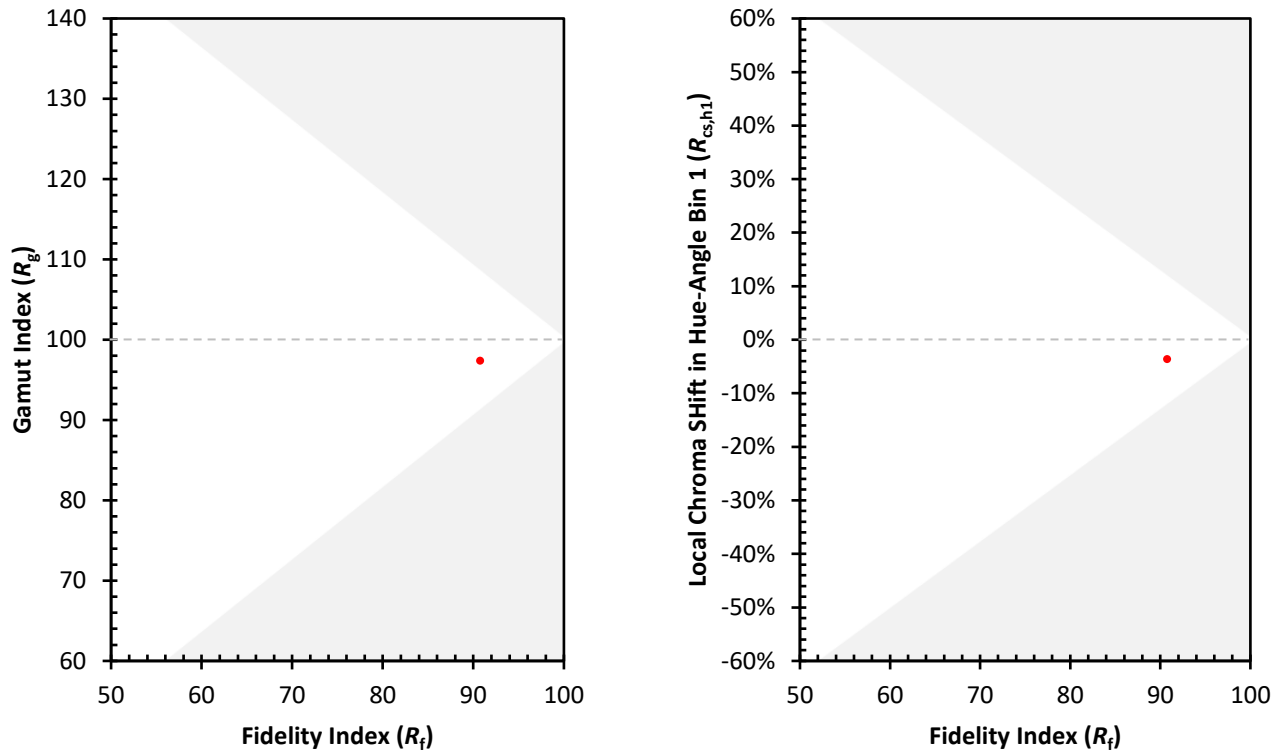
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 98 | CES51 = 93 | CES76 = 91 |
| CES02 = 61 | CES27 = 86 | CES52 = 96 | CES77 = 89 |
| CES03 = 31 | CES28 = 98 | CES53 = 93 | CES78 = 87 |
| CES04 = 68 | CES29 = 90 | CES54 = 89 | CES79 = 97 |
| CES05 = 48 | CES30 = 80 | CES55 = 86 | CES80 = 94 |
| CES06 = 50 | CES31 = 92 | CES56 = 89 | CES81 = 89 |
| CES07 = 41 | CES32 = 97 | CES57 = 87 | CES82 = 97 |
| CES08 = 40 | CES33 = 89 | CES58 = 87 | CES83 = 96 |
| CES09 = 29 | CES34 = 98 | CES59 = 96 | CES84 = 94 |
| CES10 = 73 | CES35 = 98 | CES60 = 89 | CES85 = 84 |
| CES11 = 56 | CES36 = 74 | CES61 = 90 | CES86 = 90 |
| CES12 = 62 | CES37 = 97 | CES62 = 78 | CES87 = 92 |
| CES13 = 42 | CES38 = 75 | CES63 = 89 | CES88 = 95 |
| CES14 = 74 | CES39 = 97 | CES64 = 85 | CES89 = 90 |
| CES15 = 71 | CES40 = 97 | CES65 = 87 | CES90 = 92 |
| CES16 = 47 | CES41 = 91 | CES66 = 82 | CES91 = 69 |
| CES17 = 48 | CES42 = 99 | CES67 = 82 | CES92 = 81 |
| CES18 = 56 | CES43 = 97 | CES68 = 86 | CES93 = 88 |
| CES19 = 70 | CES44 = 99 | CES69 = 87 | CES94 = 86 |
| CES20 = 65 | CES45 = 97 | CES70 = 86 | CES95 = 83 |
| CES21 = 84 | CES46 = 94 | CES71 = 77 | CES96 = 94 |
| CES22 = 77 | CES47 = 90 | CES72 = 93 | CES97 = 97 |
| CES23 = 91 | CES48 = 83 | CES73 = 82 | CES98 = 94 |
| CES24 = 89 | CES49 = 95 | CES74 = 89 | CES99 = 92 |
| CES25 = 70 | CES50 = 94 | CES75 = 81 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)