

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: P1217050

Luminaire Tested: 14-ID2-50-CFD2-L950-U

Issue Date: 12/5/2025

**Test Information**

Test Method: LM-79-2019  
Report Number: P1217050  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2508-507-16)  
Test Lab: INNOVATION CENTER  
Issue Date: 12/5/2025  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: CORELITE  
Catalog Number: 14-ID2-50-CFD2-L950-U  
Description: 1X4 IN DEPTH TROFFER WITH 2INCH CUBE DROP LENS  
Light Source: 5000K CCT, 90 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

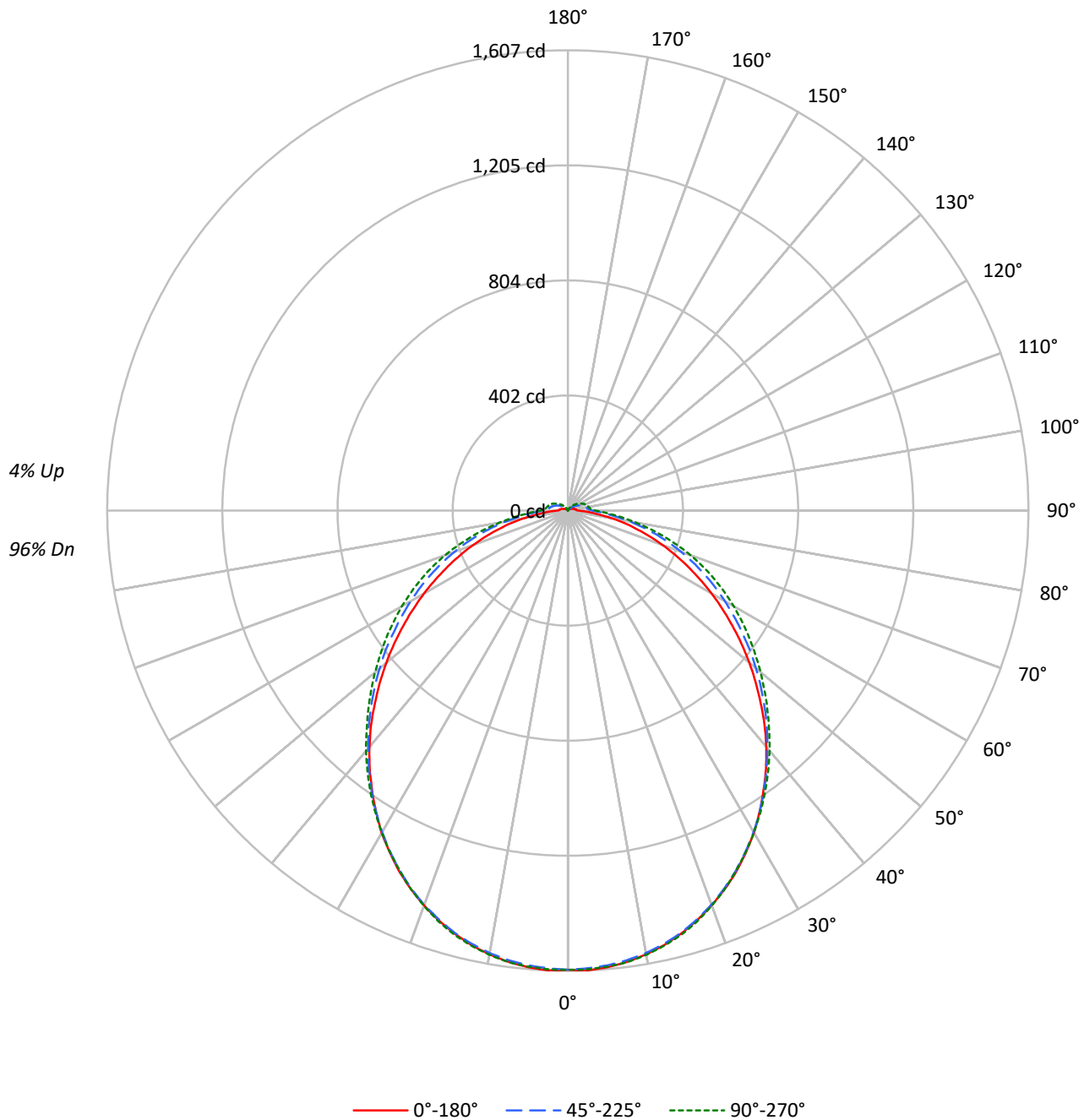
Lumens per Lamp: N/A  
Luminaire Lumens: 4581.6 lumens  
Efficiency: N/A  
Efficacy: 103.9 lumens/watt  
Spacing Criteria (0/90/45): 1.21 / 1.21 / 1.31  
Luminous Opening: Rectangular w/ Sides (W: 1' x L: 4' x H: 0.16')  
CIE Type: Direct

Input Watts (W): 44.1  
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



TEST NUMBER: P1217050  
CATALOG NUMBER: 14-ID2-50-CFD2-L950-U

### Luminous Intensity Polar Plot



TEST NUMBER: P1217050

CATALOG NUMBER: 14-ID2-50-CFD2-L950-U

**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  | 50 | 30 | 10 | 50 | 30 | 0  |
| RCR |     |     |     |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |    |    |
| 0   | 118 | 118 | 118 | 118 | 115 | 115 | 115 | 115 | 109 | 109 | 109 | 103 | 103 | 103 | 98 | 98 | 98 | 98 | 98 | 96 |
| 1   | 107 | 102 | 98  | 94  | 104 | 100 | 95  | 92  | 94  | 91  | 88  | 90  | 87  | 85  | 85 | 83 | 81 | 81 | 81 | 79 |
| 2   | 97  | 89  | 82  | 76  | 94  | 87  | 80  | 75  | 82  | 77  | 72  | 78  | 74  | 70  | 75 | 71 | 68 | 68 | 68 | 66 |
| 3   | 89  | 78  | 70  | 63  | 86  | 76  | 69  | 62  | 73  | 66  | 61  | 69  | 64  | 59  | 66 | 62 | 58 | 58 | 58 | 55 |
| 4   | 81  | 69  | 60  | 54  | 79  | 68  | 59  | 53  | 65  | 57  | 52  | 62  | 56  | 51  | 59 | 54 | 50 | 50 | 50 | 47 |
| 5   | 75  | 62  | 53  | 46  | 72  | 61  | 52  | 46  | 58  | 51  | 45  | 56  | 49  | 44  | 53 | 48 | 43 | 43 | 43 | 41 |
| 6   | 69  | 56  | 47  | 40  | 67  | 55  | 46  | 40  | 52  | 45  | 39  | 50  | 44  | 39  | 48 | 43 | 38 | 38 | 38 | 36 |
| 7   | 64  | 51  | 42  | 36  | 62  | 50  | 41  | 35  | 48  | 40  | 35  | 46  | 39  | 34  | 44 | 38 | 34 | 34 | 34 | 32 |
| 8   | 60  | 46  | 38  | 32  | 58  | 45  | 37  | 32  | 44  | 36  | 31  | 42  | 36  | 31  | 41 | 35 | 30 | 30 | 30 | 28 |
| 9   | 56  | 42  | 34  | 29  | 54  | 42  | 34  | 29  | 40  | 33  | 28  | 39  | 32  | 28  | 38 | 32 | 27 | 27 | 27 | 26 |
| 10  | 52  | 39  | 31  | 26  | 51  | 39  | 31  | 26  | 37  | 30  | 26  | 36  | 30  | 25  | 35 | 29 | 25 | 25 | 25 | 23 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 4314 | 4314 | 4314 |
| 5°  | 4308 | 4252 | 4257 |
| 10° | 4270 | 4182 | 4186 |
| 15° | 4213 | 4097 | 4095 |
| 20° | 4141 | 3989 | 3974 |
| 25° | 4054 | 3864 | 3835 |
| 30° | 3945 | 3723 | 3693 |
| 35° | 3805 | 3566 | 3544 |
| 40° | 3660 | 3402 | 3392 |
| 45° | 3482 | 3237 | 3231 |
| 50° | 3303 | 3070 | 3086 |
| 55° | 3109 | 2896 | 2950 |
| 60° | 2915 | 2734 | 2815 |
| 65° | 2706 | 2565 | 2672 |
| 70° | 2488 | 2379 | 2489 |
| 75° | 2244 | 2157 | 2242 |
| 80° | 1964 | 1879 | 1949 |
| 85° | 1695 | 1608 | 1673 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 3482 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 151.6  | 3.3       |
| 10°-20°   | 430.7  | 9.4       |
| 20°-30°   | 639.5  | 14.0      |
| 30°-40°   | 748.5  | 16.3      |
| 40°-50°   | 751.8  | 16.4      |
| 50°-60°   | 665.9  | 14.5      |
| 60°-70°   | 517.9  | 11.3      |
| 70°-80°   | 328.9  | 7.2       |
| 80°-90°   | 147.0  | 3.2       |
| 90°-100°  | 70.2   | 1.5       |
| 100°-110° | 53.6   | 1.2       |
| 110°-120° | 37.8   | 0.8       |
| 120°-130° | 22.6   | 0.5       |
| 130°-140° | 11.0   | 0.2       |
| 140°-150° | 4.0    | 0.1       |
| 150°-160° | 0.7    | 0.0       |
| 160°-170° | 0.0    | 0.0       |
| 170°-180° | 0.0    | 0.0       |
| 0°-30°    | 1221.8 | 26.7      |
| 0°-40°    | 1970.3 | 43.0      |
| 0°-60°    | 3388.0 | 73.9      |
| 0°-90°    | 4381.7 | 95.6      |
| 90°-120°  | 161.6  | 3.5       |
| 90°-150°  | 199.2  | 4.3       |
| 90°-180°  | 200.0  | 4.4       |
| 0°-180°   | 4581.6 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1603 | 1603  | 1603 | 1603  | 1603 |      |
| 5°   | 1600 | 1599  | 1594 | 1594  | 1598 | 152  |
| 15°  | 1528 | 1529  | 1526 | 1528  | 1533 | 431  |
| 25°  | 1391 | 1392  | 1387 | 1386  | 1388 | 640  |
| 35°  | 1191 | 1200  | 1193 | 1199  | 1200 | 745  |
| 45°  | 952  | 971   | 971  | 986   | 985  | 735  |
| 55°  | 701  | 729   | 742  | 768   | 772  | 627  |
| 65°  | 461  | 495   | 525  | 560   | 564  | 458  |
| 75°  | 248  | 283   | 317  | 346   | 344  | 264  |
| 85°  | 80   | 108   | 136  | 156   | 153  | 81   |
| 90°  | 35   | 60    | 85   | 98    | 96   | 21   |
| 95°  | 30   | 48    | 70   | 79    | 78   | 23   |
| 105° | 22   | 35    | 56   | 67    | 69   | 23   |
| 115° | 14   | 22    | 42   | 53    | 57   | 14   |
| 125° | 9    | 11    | 27   | 37    | 41   | 8    |
| 135° | 5    | 4     | 14   | 22    | 26   | 4    |
| 145° | 3    | 2     | 4    | 10    | 13   | 2    |
| 155° | 2    | 1     | 1    | 2     | 2    | 1    |
| 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°     | 1603.3 | 1603.3 | 1603.3 | 1603.3 | 1603.3 |
| 2.5°   | 1607.0 | 1605.5 | 1599.6 | 1600.3 | 1603.3 |
| 5°     | 1600.3 | 1598.9 | 1593.7 | 1594.4 | 1598.1 |
| 7.5°   | 1589.2 | 1588.5 | 1583.3 | 1584.8 | 1590.0 |
| 10°    | 1573.7 | 1572.9 | 1568.5 | 1570.7 | 1575.2 |
| 12.5°  | 1553.7 | 1552.9 | 1549.2 | 1551.5 | 1555.9 |
| 15°    | 1528.5 | 1529.2 | 1526.3 | 1528.5 | 1532.9 |
| 17.5°  | 1499.6 | 1501.1 | 1496.7 | 1499.6 | 1503.3 |
| 20°    | 1467.0 | 1468.5 | 1464.8 | 1464.8 | 1468.5 |
| 22.5°  | 1430.7 | 1432.2 | 1427.8 | 1427.8 | 1430.7 |
| 25°    | 1390.8 | 1392.2 | 1387.1 | 1386.3 | 1387.8 |
| 27.5°  | 1345.6 | 1349.3 | 1342.6 | 1343.4 | 1344.1 |
| 30°    | 1298.9 | 1302.6 | 1296.0 | 1297.4 | 1298.2 |
| 32.5°  | 1245.6 | 1253.0 | 1245.6 | 1248.6 | 1250.1 |
| 35°    | 1190.8 | 1200.4 | 1193.0 | 1199.0 | 1199.7 |
| 37.5°  | 1135.3 | 1145.6 | 1139.0 | 1147.1 | 1147.9 |
| 40°    | 1076.8 | 1088.6 | 1083.4 | 1093.8 | 1095.3 |
| 42.5°  | 1016.0 | 1030.9 | 1027.9 | 1040.5 | 1039.0 |
| 45°    | 951.6  | 970.9  | 970.9  | 985.7  | 984.9  |
| 47.5°  | 889.4  | 910.9  | 913.8  | 930.9  | 930.9  |
| 50°    | 826.5  | 850.2  | 856.8  | 876.8  | 877.6  |
| 52.5°  | 763.5  | 789.4  | 800.5  | 821.3  | 824.2  |
| 55°    | 700.6  | 728.7  | 742.0  | 768.0  | 772.4  |
| 57.5°  | 639.1  | 667.2  | 687.2  | 713.9  | 719.8  |
| 60°    | 579.1  | 608.7  | 632.4  | 662.8  | 668.0  |
| 62.5°  | 519.1  | 551.0  | 579.9  | 609.5  | 615.4  |
| 65°    | 461.4  | 494.7  | 525.1  | 559.9  | 563.6  |
| 67.5°  | 405.8  | 439.1  | 472.5  | 505.1  | 510.2  |
| 70°    | 351.0  | 385.8  | 419.9  | 454.0  | 455.4  |
| 72.5°  | 298.4  | 333.2  | 368.1  | 399.9  | 399.9  |
| 75°    | 248.1  | 282.9  | 317.0  | 345.8  | 344.4  |
| 77.5°  | 202.9  | 234.0  | 266.6  | 292.5  | 290.3  |
| 80°    | 155.5  | 187.4  | 218.5  | 242.2  | 239.9  |
| 82.5°  | 114.8  | 143.7  | 174.8  | 197.0  | 194.8  |
| 85°    | 80.0   | 108.1  | 136.3  | 155.5  | 153.3  |
| 87.5°  | 52.6   | 80.0   | 105.9  | 122.2  | 120.0  |
| 90°    | 34.8   | 60.0   | 85.2   | 97.8   | 96.3   |
| 92.5°  | 31.1   | 52.6   | 75.5   | 85.9   | 84.4   |
| 95°    | 29.6   | 48.1   | 70.4   | 79.2   | 78.5   |
| 97.5°  | 28.1   | 44.4   | 65.9   | 75.5   | 75.5   |
| 100°   | 25.9   | 41.5   | 62.9   | 72.6   | 73.3   |
| 102.5° | 23.7   | 37.8   | 59.2   | 69.6   | 71.1   |
| 105°   | 21.5   | 34.8   | 56.3   | 66.6   | 68.9   |
| 107.5° | 20.0   | 31.1   | 52.6   | 63.7   | 66.6   |
| 110°   | 17.8   | 28.1   | 48.9   | 60.7   | 63.7   |

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CATALOG NUMBER: 14-ID2-50-CFD2-L950-U

**CANDELA DISTRIBUTION (continued):**

|        | 0°   | 22.5° | 45°  | 67.5° | 90°  |
|--------|------|-------|------|-------|------|
| 112.5° | 15.6 | 24.4  | 45.2 | 57.0  | 60.7 |
| 115°   | 14.1 | 21.5  | 41.5 | 53.3  | 57.0 |
| 117.5° | 12.6 | 18.5  | 37.8 | 49.6  | 52.6 |
| 120°   | 11.1 | 16.3  | 34.1 | 45.9  | 48.9 |
| 122.5° | 9.6  | 13.3  | 30.4 | 41.5  | 45.2 |
| 125°   | 8.9  | 11.1  | 26.7 | 37.0  | 40.7 |
| 127.5° | 7.4  | 8.9   | 23.0 | 33.3  | 37.0 |
| 130°   | 6.7  | 6.7   | 19.3 | 29.6  | 33.3 |
| 132.5° | 5.9  | 5.2   | 16.3 | 25.9  | 28.9 |
| 135°   | 5.2  | 4.4   | 14.1 | 22.2  | 25.9 |
| 137.5° | 4.4  | 3.7   | 11.1 | 19.3  | 22.2 |
| 140°   | 3.7  | 3.0   | 8.9  | 16.3  | 18.5 |
| 142.5° | 3.0  | 2.2   | 6.7  | 13.3  | 15.6 |
| 145°   | 3.0  | 2.2   | 4.4  | 10.4  | 13.3 |
| 147.5° | 2.2  | 1.5   | 2.2  | 8.1   | 10.4 |
| 150°   | 1.5  | 1.5   | 0.7  | 5.9   | 7.4  |
| 152.5° | 1.5  | 0.7   | 0.7  | 3.7   | 5.2  |
| 155°   | 1.5  | 0.7   | 0.7  | 1.5   | 2.2  |
| 157.5° | 0.7  | 0.7   | 0.7  | 0.0   | 0.0  |
| 160°   | 0.7  | 0.7   | 0.7  | 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  |

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CATALOG NUMBER: 14-ID2-50-CFD2-L950-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 | 14.91            | 16.45 | 15.34 | 16.85 | 17.28 | 15.80          | 17.34 | 16.23 | 17.74 | 18.17 |
|                 | 3H   | 16.46            | 17.86 | 16.91 | 18.28 | 18.74 | 17.82          | 19.22 | 18.27 | 19.64 | 20.10 |
|                 | 4H   | 17.01            | 18.33 | 17.48 | 18.77 | 19.25 | 18.65          | 19.96 | 19.11 | 20.40 | 20.88 |
|                 | 6H   | 17.40            | 18.62 | 17.88 | 19.07 | 19.57 | 19.33          | 20.56 | 19.81 | 21.01 | 21.50 |
|                 | 8H   | 17.51            | 18.68 | 18.00 | 19.15 | 19.65 | 19.62          | 20.78 | 20.11 | 21.26 | 21.76 |
|                 | 12H  | 17.58            | 18.70 | 18.08 | 19.17 | 19.70 | 19.87          | 20.99 | 20.37 | 21.46 | 21.99 |
| 4H              | 2H   | 15.60            | 16.92 | 16.07 | 17.36 | 17.84 | 16.31          | 17.63 | 16.78 | 18.06 | 18.54 |
|                 | 3H   | 17.40            | 18.51 | 17.88 | 18.99 | 19.50 | 18.56          | 19.67 | 19.04 | 20.15 | 20.65 |
|                 | 4H   | 18.08            | 19.09 | 18.58 | 19.59 | 20.12 | 19.53          | 20.54 | 20.03 | 21.04 | 21.57 |
|                 | 6H   | 18.59            | 19.48 | 19.11 | 20.00 | 20.55 | 20.38          | 21.26 | 20.90 | 21.78 | 22.34 |
|                 | 8H   | 18.74            | 19.57 | 19.27 | 20.10 | 20.66 | 20.73          | 21.56 | 21.26 | 22.08 | 22.65 |
|                 | 12H  | 18.85            | 19.60 | 19.40 | 20.15 | 20.72 | 21.06          | 21.81 | 21.61 | 22.37 | 22.93 |
| 8H              | 4H   | 18.50            | 19.33 | 19.03 | 19.86 | 20.42 | 19.78          | 20.61 | 20.30 | 21.13 | 21.69 |
|                 | 6H   | 19.15            | 19.85 | 19.71 | 20.41 | 20.98 | 20.76          | 21.46 | 21.32 | 22.02 | 22.60 |
|                 | 8H   | 19.38            | 20.01 | 19.96 | 20.59 | 21.17 | 21.22          | 21.85 | 21.79 | 22.43 | 23.01 |
|                 | 12H  | 19.57            | 20.12 | 20.14 | 20.69 | 21.34 | 21.68          | 22.24 | 22.25 | 22.80 | 23.46 |
| 12H             | 4H   | 18.57            | 19.32 | 19.12 | 19.88 | 20.44 | 19.79          | 20.54 | 20.34 | 21.09 | 21.66 |
|                 | 6H   | 19.27            | 19.89 | 19.84 | 20.47 | 21.06 | 20.80          | 21.43 | 21.38 | 22.01 | 22.59 |
|                 | 8H   | 19.57            | 20.12 | 20.14 | 20.69 | 21.34 | 21.32          | 21.88 | 21.90 | 22.45 | 23.10 |

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

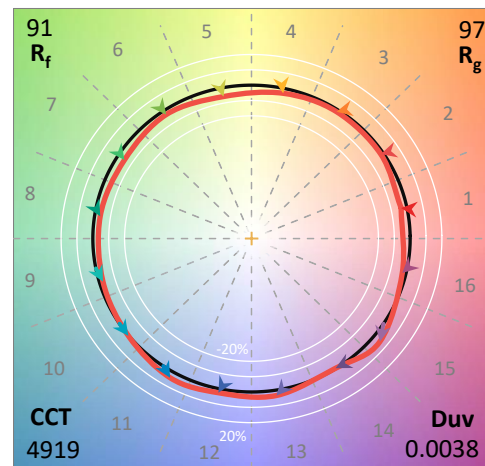
### Test Information

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

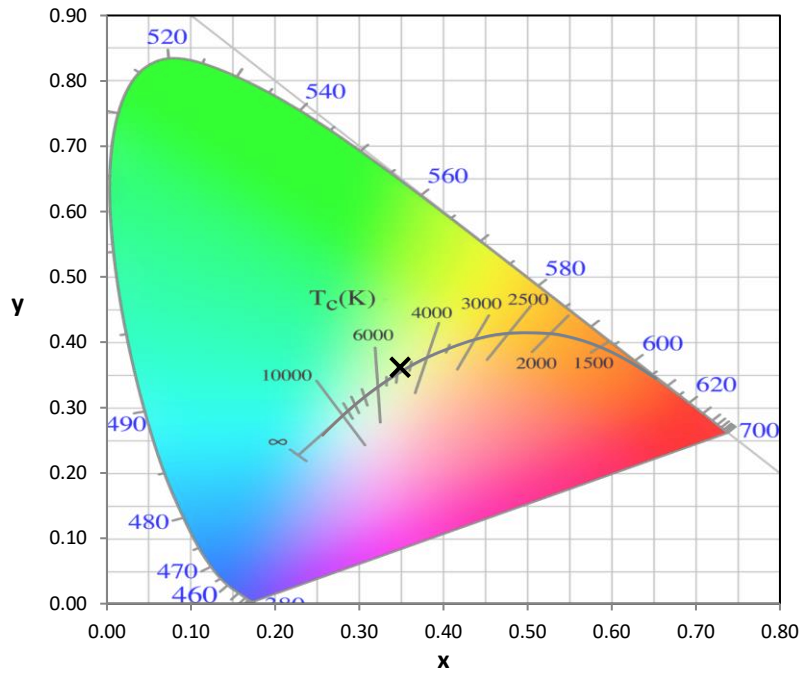
Stabilization Time: M  
 Operation Time: 1H 0M  
 Sphere Temperature (°C): 25.0

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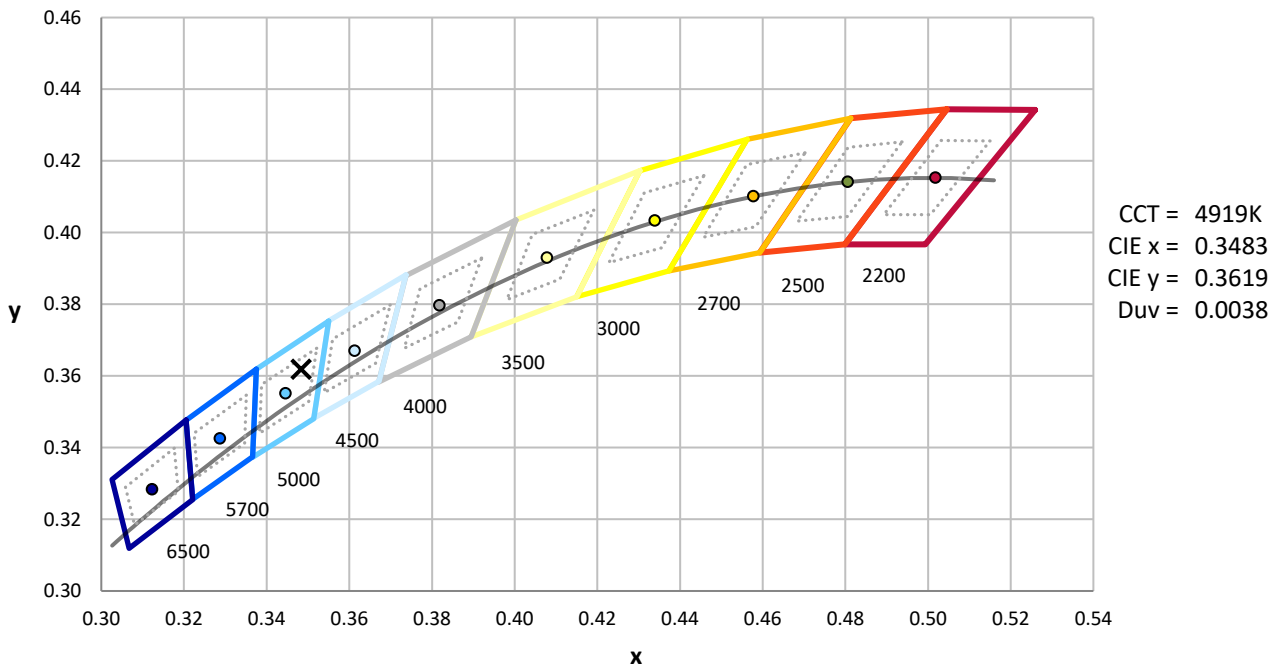
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| 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**



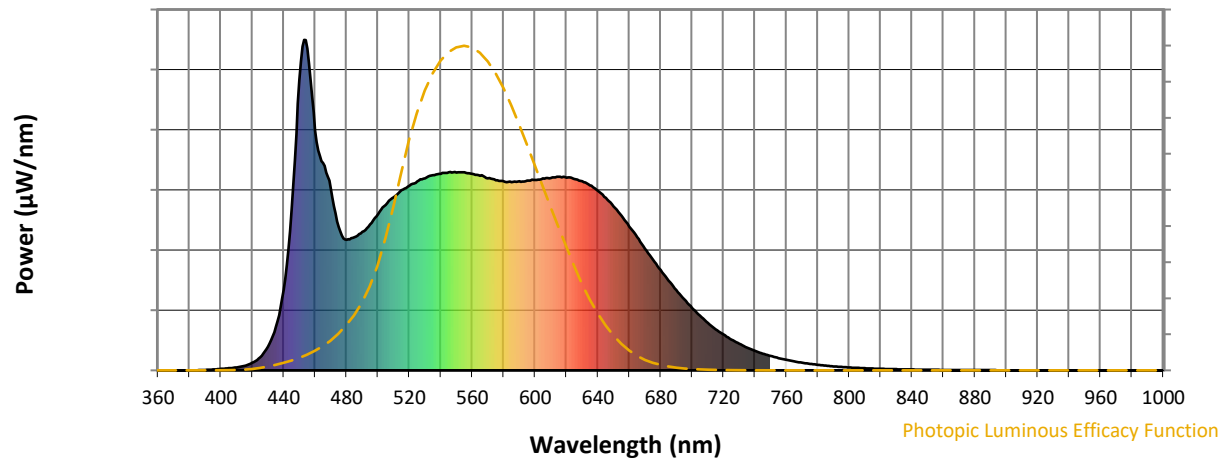
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 5000K 4-step quadrangle

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### Photopic Flux vs. Wavelength

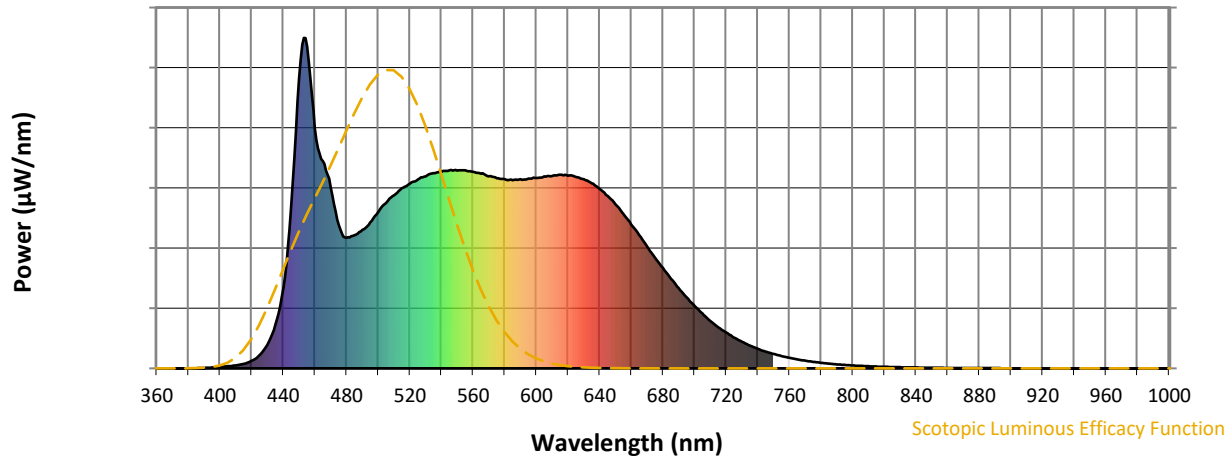


### Photopic Lumens: NR

| $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) |
|-------------------|----------------------------------------|--------------------------------|-------------------|----------------------------------------|--------------------------------|-------------------|----------------------------------------|--------------------------------|-------------------|----------------------------------------|--------------------------------|-------------------|----------------------------------------|--------------------------------|
| 360               | 0                                      | NR                             | 490               | 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



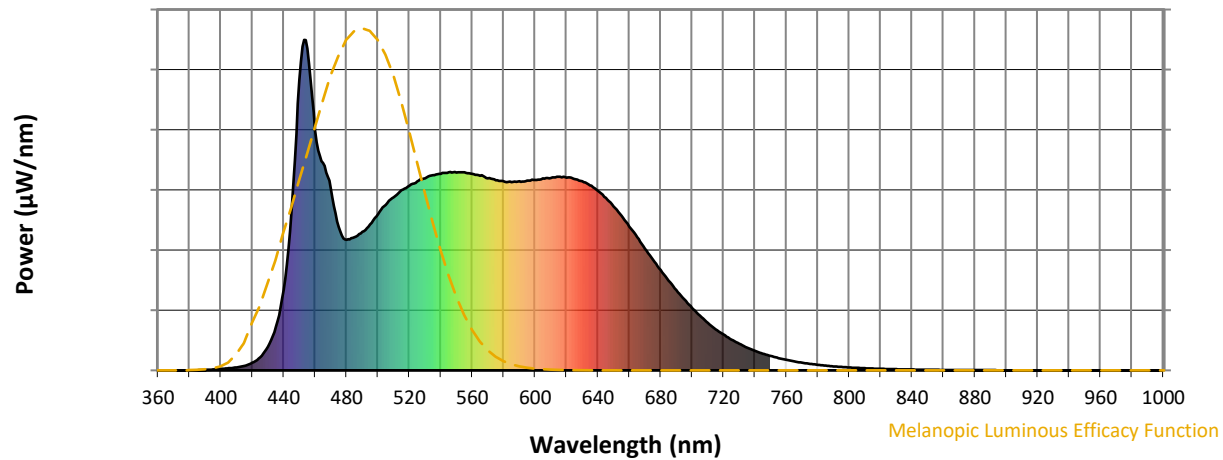
Scotopic Lumens: NR

S/P: 2.09

| λ<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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### Melanopic Flux vs. Wavelength


**Melanopic Lumens: NR**
**M/P: 4.55**

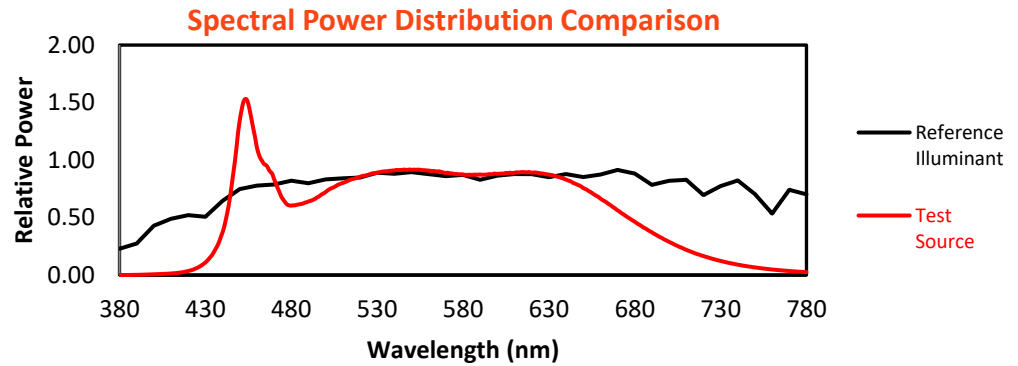
| $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) |
|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|
| 360               | 0                                    | NR                             | 490               | 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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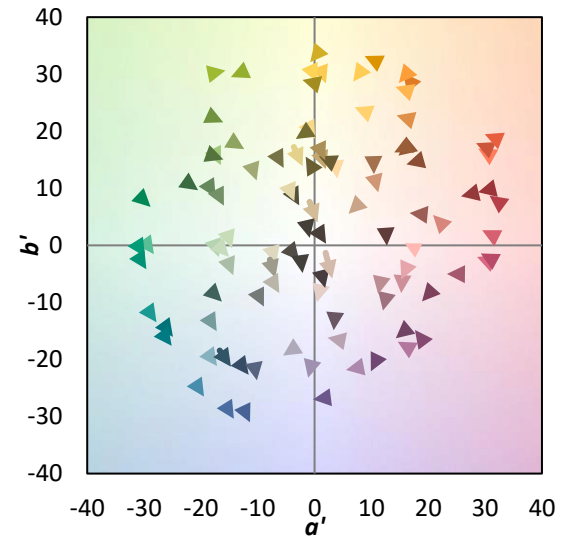
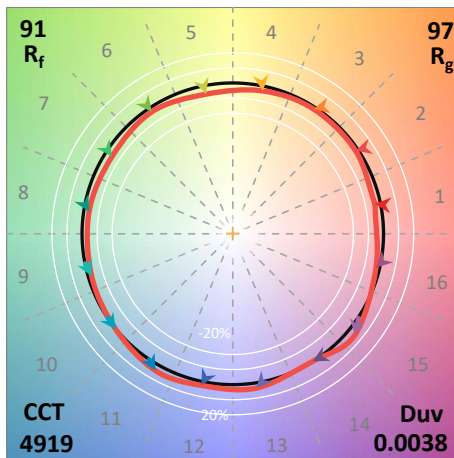
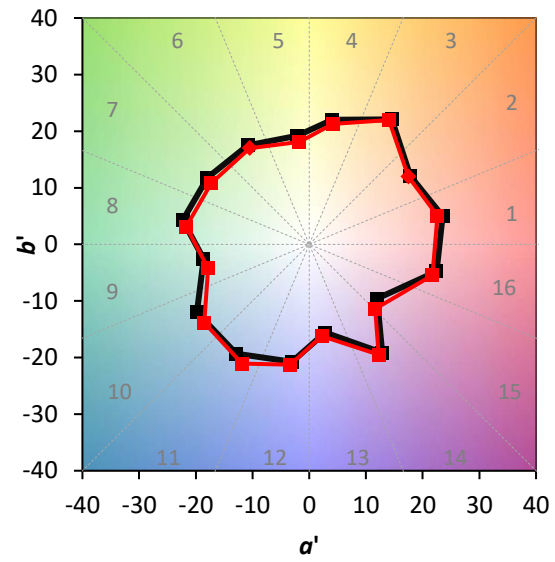
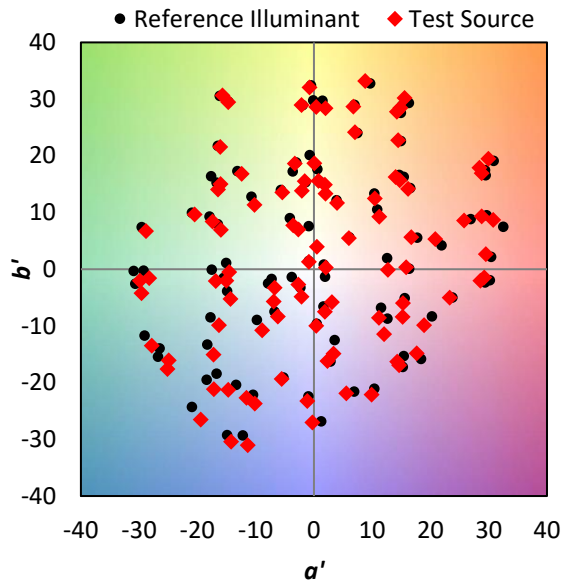
TM-30-18

### Summary

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

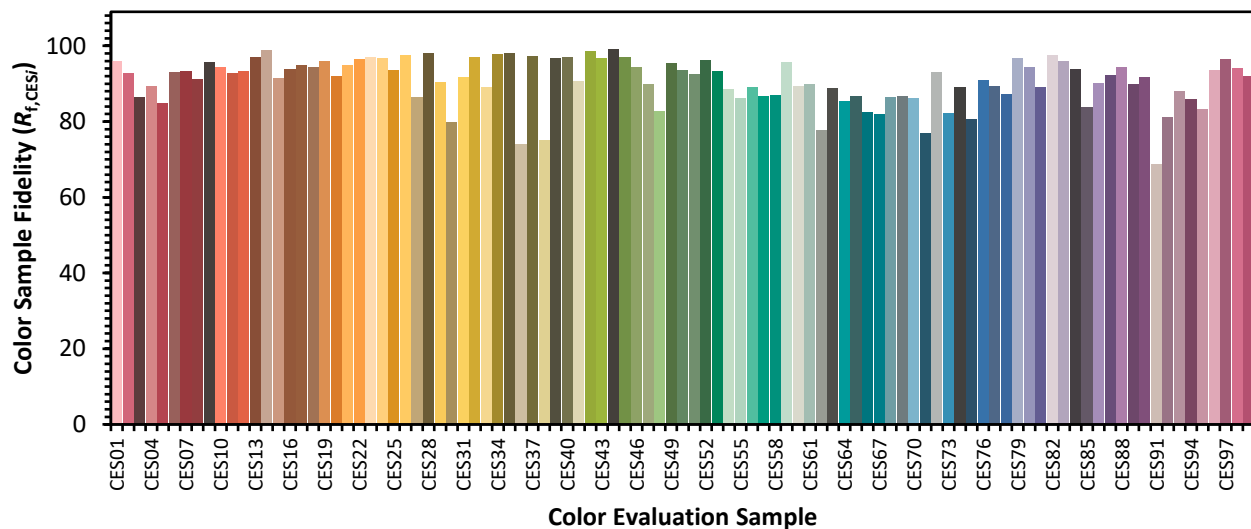


### Color Vector Graphics

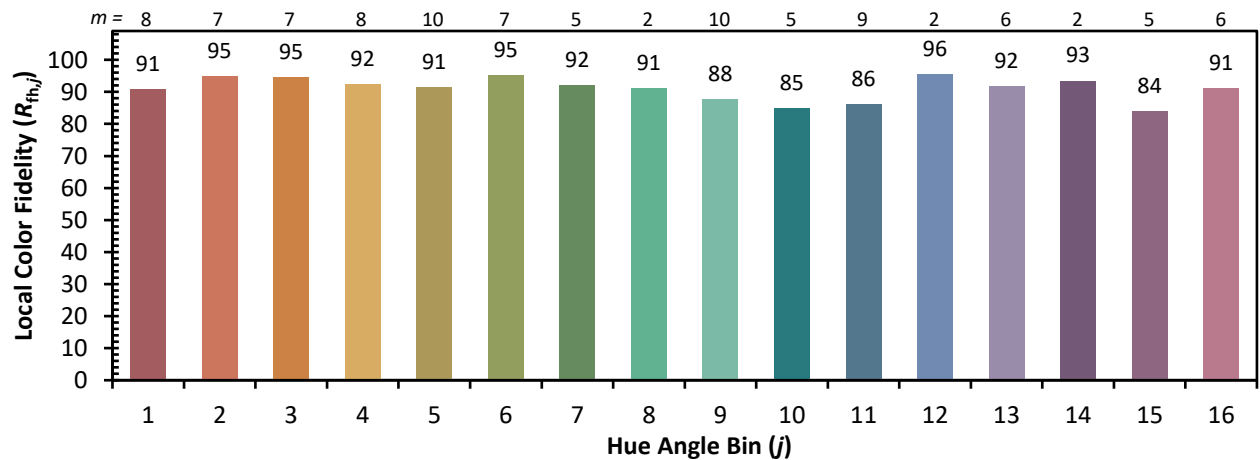
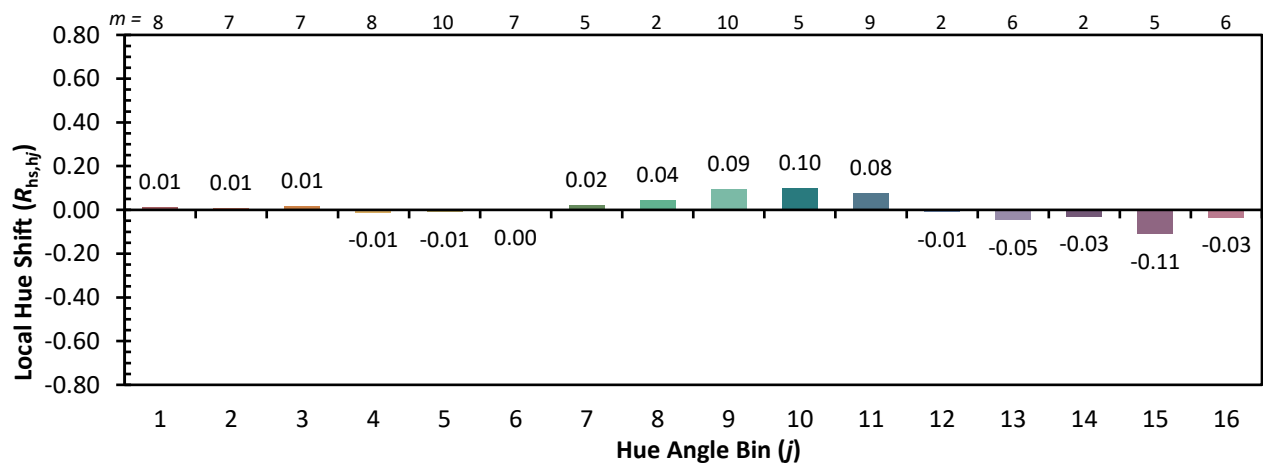
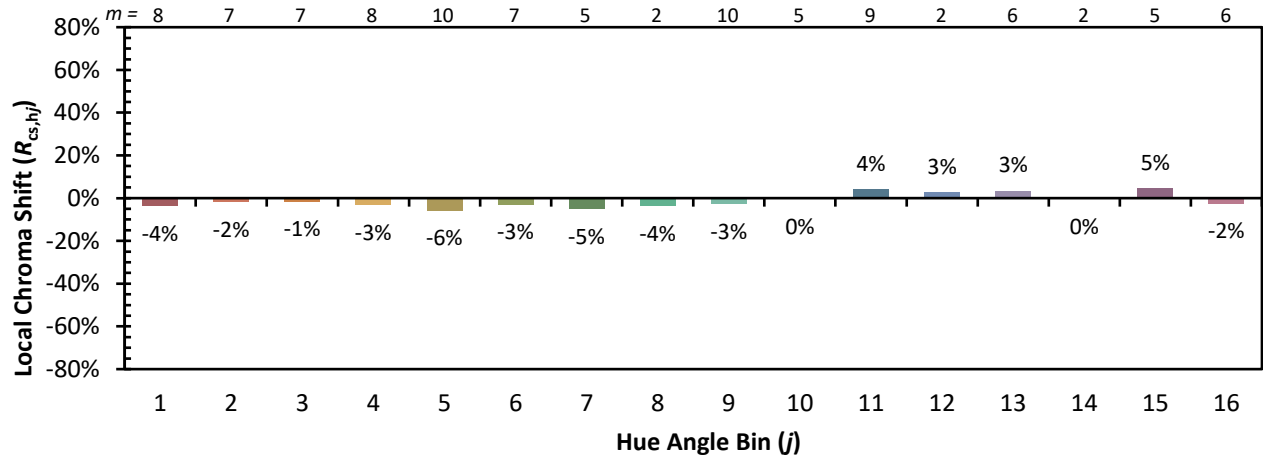


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

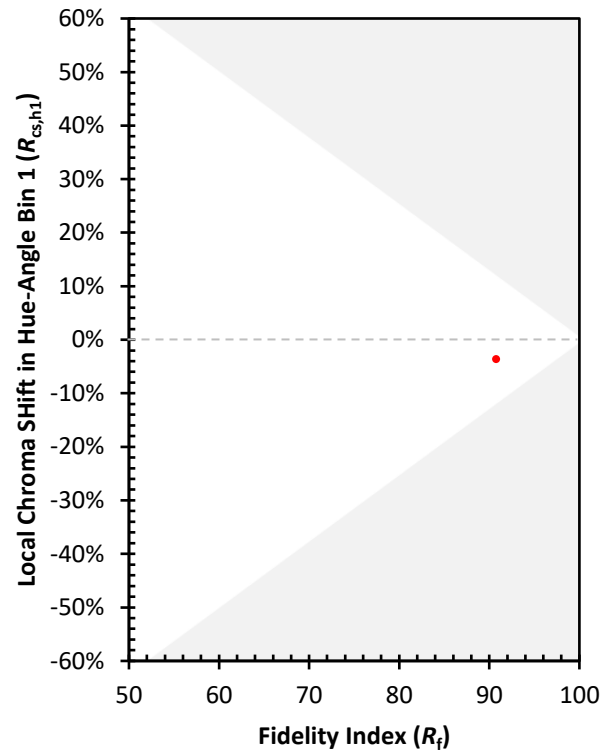
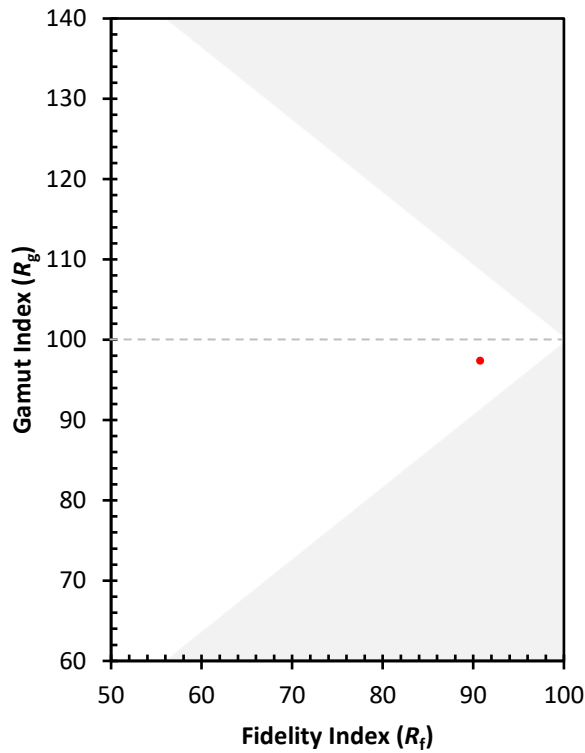
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 98 | CES51 = 93 | CES76 = 91 |
| CES02 = 61 | CES27 = 86 | CES52 = 96 | CES77 = 89 |
| CES03 = 31 | CES28 = 98 | CES53 = 93 | CES78 = 87 |
| CES04 = 68 | CES29 = 90 | CES54 = 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)