

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: P1214991

Luminaire Tested: 22-ID2-20-CNV-L940-U

Issue Date: 12/4/2025

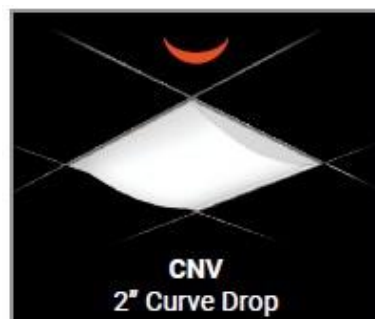
**Test Information**

Test Method: LM-79-2019  
Report Number: P1214991  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-2506-458-15)  
Test Lab: INNOVATION CENTER  
Issue Date: 12/4/2025  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: CORELITE  
Catalog Number: 22-ID2-20-CNV-L940-U  
Description: 2X2 IN DEPTH TROFFER WITH 2INCH CURVE DROP  
Light Source: 4000K CCT, 90 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

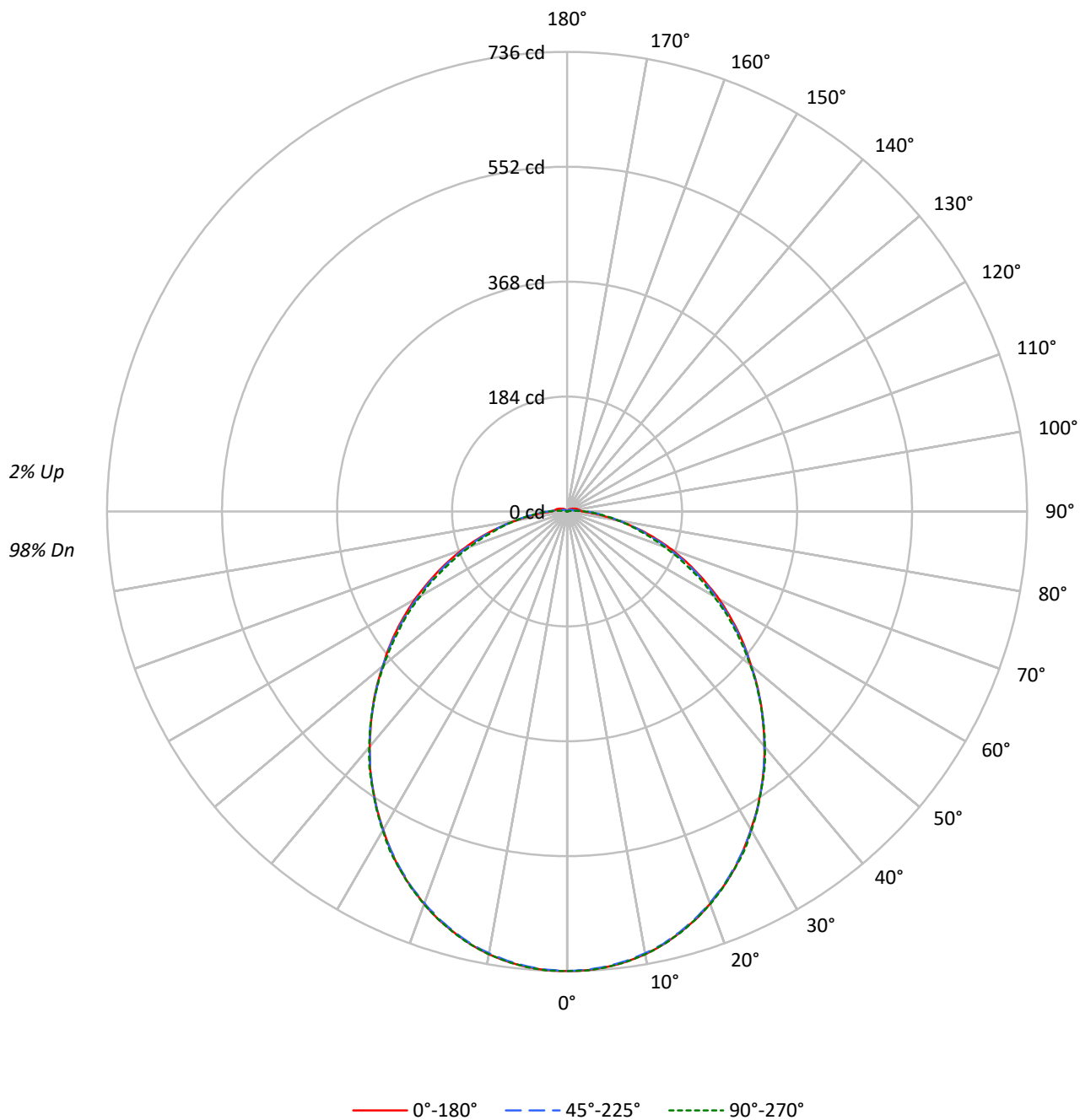
Lumens per Lamp: N/A  
Luminaire Lumens: 1980.8 lumens  
Efficiency: N/A  
Efficacy: 116.5 lumens/watt  
Spacing Criteria (0/90/45): 1.19 / 1.2 / 1.31  
Luminous Opening: Rectangular w/ Sides (W: 2' x L: 2' x H: 0.16')  
CIE Type: Direct

Input Watts (W): 17  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



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CATALOG NUMBER: 22-ID2-20-CNV-L940-U

### Luminous Intensity Polar Plot



TEST NUMBER: P1214991

CATALOG NUMBER: 22-ID2-20-CNV-L940-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   | 119 | 119 | 119 | 119 | 116 | 116 | 116 | 116 | 110 | 110 | 110 | 105 | 105 | 105 | 100 | 100 | 100 | 100 | 100 | 98 |
| 1   | 108 | 103 | 99  | 95  | 105 | 101 | 97  | 93  | 96  | 93  | 90  | 92  | 89  | 87  | 88  | 86  | 84  | 88  | 86  | 82 |
| 2   | 98  | 90  | 83  | 77  | 96  | 88  | 82  | 76  | 84  | 79  | 74  | 81  | 76  | 72  | 77  | 74  | 70  | 77  | 74  | 68 |
| 3   | 90  | 79  | 71  | 65  | 87  | 77  | 70  | 64  | 74  | 68  | 62  | 71  | 66  | 61  | 68  | 64  | 60  | 68  | 64  | 58 |
| 4   | 82  | 70  | 62  | 55  | 80  | 69  | 61  | 54  | 66  | 59  | 53  | 64  | 57  | 52  | 61  | 56  | 52  | 61  | 56  | 49 |
| 5   | 76  | 63  | 54  | 47  | 74  | 62  | 53  | 47  | 59  | 52  | 46  | 57  | 51  | 46  | 55  | 50  | 45  | 55  | 50  | 43 |
| 6   | 70  | 57  | 48  | 42  | 68  | 56  | 47  | 41  | 54  | 46  | 41  | 52  | 45  | 40  | 50  | 44  | 40  | 50  | 44  | 38 |
| 7   | 65  | 52  | 43  | 37  | 63  | 51  | 42  | 37  | 49  | 42  | 36  | 47  | 41  | 36  | 46  | 40  | 35  | 46  | 40  | 33 |
| 8   | 61  | 47  | 39  | 33  | 59  | 46  | 38  | 33  | 45  | 38  | 32  | 43  | 37  | 32  | 42  | 36  | 32  | 42  | 36  | 30 |
| 9   | 57  | 43  | 35  | 30  | 55  | 43  | 35  | 30  | 41  | 34  | 29  | 40  | 34  | 29  | 39  | 33  | 29  | 39  | 33  | 27 |
| 10  | 53  | 40  | 32  | 27  | 52  | 39  | 32  | 27  | 38  | 31  | 27  | 37  | 31  | 26  | 36  | 30  | 26  | 36  | 30  | 24 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1981 | 1981 | 1981 |
| 5°  | 1964 | 1956 | 1965 |
| 10° | 1940 | 1925 | 1941 |
| 15° | 1904 | 1885 | 1906 |
| 20° | 1861 | 1836 | 1863 |
| 25° | 1811 | 1780 | 1811 |
| 30° | 1748 | 1717 | 1752 |
| 35° | 1685 | 1650 | 1687 |
| 40° | 1617 | 1576 | 1622 |
| 45° | 1547 | 1498 | 1544 |
| 50° | 1470 | 1419 | 1462 |
| 55° | 1404 | 1334 | 1376 |
| 60° | 1328 | 1242 | 1278 |
| 65° | 1238 | 1149 | 1178 |
| 70° | 1147 | 1038 | 1069 |
| 75° | 1031 | 918  | 962  |
| 80° | 874  | 800  | 887  |
| 85° | 727  | 708  | 840  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 1547 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 69.5   | 3.5       |
| 10°-20°   | 196.7  | 9.9       |
| 20°-30°   | 290.9  | 14.7      |
| 30°-40°   | 339.0  | 17.1      |
| 40°-50°   | 338.5  | 17.1      |
| 50°-60°   | 295.5  | 14.9      |
| 60°-70°   | 221.5  | 11.2      |
| 70°-80°   | 133.4  | 6.7       |
| 80°-90°   | 57.6   | 2.9       |
| 90°-100°  | 19.0   | 1.0       |
| 100°-110° | 8.8    | 0.4       |
| 110°-120° | 5.4    | 0.3       |
| 120°-130° | 2.9    | 0.1       |
| 130°-140° | 1.4    | 0.1       |
| 140°-150° | 0.5    | 0.0       |
| 150°-160° | 0.1    | 0.0       |
| 160°-170° | 0.0    | 0.0       |
| 170°-180° | 0.0    | 0.0       |
| 0°-30°    | 557.1  | 28.1      |
| 0°-40°    | 896.1  | 45.2      |
| 0°-60°    | 1530.1 | 77.2      |
| 0°-90°    | 1942.6 | 98.1      |
| 90°-120°  | 33.2   | 1.7       |
| 90°-150°  | 38.0   | 1.9       |
| 90°-180°  | 38.0   | 1.9       |
| 0°-180°   | 1980.8 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°  | 22.5° | 45° | 67.5° | 90° | Flux |
|------|-----|-------|-----|-------|-----|------|
| 0°   | 736 | 736   | 736 | 736   | 736 |      |
| 5°   | 732 | 732   | 731 | 732   | 732 | 70   |
| 15°  | 698 | 698   | 697 | 698   | 699 | 197  |
| 25°  | 633 | 631   | 631 | 633   | 633 | 291  |
| 35°  | 542 | 541   | 542 | 543   | 542 | 339  |
| 45°  | 439 | 439   | 438 | 440   | 438 | 338  |
| 55°  | 333 | 332   | 330 | 329   | 327 | 298  |
| 65°  | 228 | 226   | 224 | 220   | 217 | 226  |
| 75°  | 129 | 128   | 126 | 124   | 120 | 136  |
| 85°  | 45  | 48    | 53  | 54    | 52  | 45   |
| 90°  | 24  | 27    | 30  | 30    | 29  | 14   |
| 95°  | 20  | 18    | 16  | 14    | 12  | 16   |
| 105° | 15  | 14    | 8   | 3     | 0   | 16   |
| 115° | 11  | 9     | 6   | 1     | 0   | 11   |
| 125° | 7   | 6     | 3   | 0     | 0   | 6    |
| 135° | 4   | 3     | 2   | 0     | 0   | 3    |
| 145° | 2   | 2     | 0   | 0     | 0   | 1    |
| 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°     | 736.0 | 736.0 | 736.0 | 736.0 | 736.0 |
| 2.5°   | 735.5 | 735.0 | 734.5 | 735.0 | 735.8 |
| 5°     | 732.3 | 731.8 | 731.3 | 732.3 | 732.5 |
| 7.5°   | 727.3 | 726.8 | 726.0 | 726.8 | 727.5 |
| 10°    | 720.1 | 719.3 | 718.6 | 719.3 | 720.3 |
| 12.5°  | 710.6 | 710.3 | 709.4 | 709.9 | 710.6 |
| 15°    | 698.1 | 697.9 | 697.1 | 698.1 | 698.9 |
| 17.5°  | 684.9 | 683.7 | 683.4 | 684.2 | 684.9 |
| 20°    | 668.7 | 668.2 | 667.5 | 668.7 | 669.5 |
| 22.5°  | 651.3 | 651.3 | 650.6 | 651.3 | 652.0 |
| 25°    | 632.6 | 631.4 | 631.1 | 632.9 | 632.6 |
| 27.5°  | 611.2 | 611.7 | 610.9 | 611.4 | 613.4 |
| 30°    | 588.5 | 588.8 | 588.8 | 589.8 | 590.0 |
| 32.5°  | 565.8 | 566.1 | 566.3 | 566.6 | 566.8 |
| 35°    | 541.7 | 541.4 | 541.9 | 542.9 | 542.2 |
| 37.5°  | 517.5 | 516.8 | 517.0 | 517.3 | 519.2 |
| 40°    | 491.3 | 491.1 | 491.3 | 492.8 | 492.6 |
| 42.5°  | 464.7 | 464.7 | 465.9 | 466.4 | 465.7 |
| 45°    | 439.0 | 438.8 | 438.3 | 439.5 | 438.3 |
| 47.5°  | 412.4 | 411.6 | 411.4 | 412.4 | 411.1 |
| 50°    | 384.5 | 385.2 | 384.7 | 384.0 | 382.5 |
| 52.5°  | 359.5 | 358.8 | 357.8 | 356.8 | 354.6 |
| 55°    | 333.4 | 332.1 | 330.4 | 329.1 | 326.9 |
| 57.5°  | 306.7 | 305.2 | 303.5 | 301.2 | 300.2 |
| 60°    | 281.0 | 278.6 | 276.1 | 274.3 | 270.3 |
| 62.5°  | 253.4 | 252.9 | 249.7 | 247.7 | 245.4 |
| 65°    | 227.7 | 226.0 | 224.2 | 220.3 | 216.8 |
| 67.5°  | 202.3 | 201.6 | 197.8 | 194.8 | 191.6 |
| 70°    | 177.9 | 175.4 | 172.9 | 169.9 | 165.7 |
| 72.5°  | 153.2 | 151.7 | 148.7 | 145.5 | 142.3 |
| 75°    | 128.8 | 127.8 | 125.6 | 123.8 | 120.1 |
| 77.5°  | 104.1 | 104.1 | 104.4 | 103.6 | 101.2 |
| 80°    | 82.0  | 83.5  | 84.7  | 85.2  | 83.2  |
| 82.5°  | 62.3  | 63.8  | 68.0  | 69.3  | 66.8  |
| 85°    | 45.1  | 47.6  | 52.6  | 53.8  | 52.1  |
| 87.5°  | 32.1  | 35.9  | 39.9  | 41.4  | 39.6  |
| 90°    | 23.9  | 26.9  | 29.9  | 30.4  | 28.7  |
| 92.5°  | 21.9  | 21.2  | 21.9  | 21.4  | 19.7  |
| 95°    | 20.4  | 18.2  | 16.2  | 14.2  | 12.2  |
| 97.5°  | 19.2  | 16.9  | 12.2  | 8.7   | 7.0   |
| 100°   | 17.9  | 15.7  | 10.2  | 5.0   | 2.7   |
| 102.5° | 16.7  | 14.7  | 9.5   | 3.2   | 0.5   |
| 105°   | 15.4  | 13.5  | 8.5   | 2.7   | 0.2   |
| 107.5° | 14.2  | 12.5  | 7.7   | 2.2   | 0.2   |
| 110°   | 13.0  | 11.5  | 7.0   | 2.0   | 0.2   |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°   | 22.5° | 45° | 67.5° | 90° |
|--------|------|-------|-----|-------|-----|
| 112.5° | 12.0 | 10.5  | 6.2 | 1.5   | 0.0 |
| 115°   | 10.7 | 9.2   | 5.7 | 1.2   | 0.0 |
| 117.5° | 9.7  | 8.5   | 5.0 | 1.0   | 0.0 |
| 120°   | 8.7  | 7.5   | 4.5 | 0.7   | 0.0 |
| 122.5° | 7.7  | 6.7   | 3.7 | 0.5   | 0.0 |
| 125°   | 7.0  | 6.0   | 3.2 | 0.2   | 0.0 |
| 127.5° | 6.0  | 5.2   | 2.7 | 0.2   | 0.0 |
| 130°   | 5.2  | 4.5   | 2.5 | 0.2   | 0.2 |
| 132.5° | 4.7  | 4.0   | 2.0 | 0.2   | 0.2 |
| 135°   | 4.0  | 3.2   | 1.5 | 0.2   | 0.2 |
| 137.5° | 3.5  | 2.7   | 1.2 | 0.2   | 0.2 |
| 140°   | 2.7  | 2.2   | 1.0 | 0.2   | 0.2 |
| 142.5° | 2.2  | 1.7   | 0.7 | 0.2   | 0.2 |
| 145°   | 1.7  | 1.5   | 0.5 | 0.2   | 0.2 |
| 147.5° | 1.2  | 1.0   | 0.2 | 0.2   | 0.2 |
| 150°   | 1.0  | 0.7   | 0.2 | 0.2   | 0.2 |
| 152.5° | 0.7  | 0.5   | 0.2 | 0.2   | 0.2 |
| 155°   | 0.5  | 0.2   | 0.2 | 0.2   | 0.2 |
| 157.5° | 0.2  | 0.2   | 0.2 | 0.2   | 0.2 |
| 160°   | 0.2  | 0.2   | 0.2 | 0.2   | 0.2 |
| 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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**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 | 12.84            | 14.42 | 13.23 | 14.77 | 15.14 | 12.73          | 14.31 | 13.13 | 14.67 | 15.03 |
|                 | 3H   | 14.57            | 16.00 | 14.98 | 16.37 | 16.78 | 14.38          | 15.81 | 14.79 | 16.18 | 16.58 |
|                 | 4H   | 15.23            | 16.58 | 15.66 | 16.97 | 17.39 | 15.00          | 16.35 | 15.43 | 16.73 | 17.16 |
|                 | 6H   | 15.71            | 16.97 | 16.16 | 17.37 | 17.81 | 15.51          | 16.76 | 15.95 | 17.16 | 17.60 |
|                 | 8H   | 15.88            | 17.08 | 16.33 | 17.50 | 17.95 | 15.71          | 16.90 | 16.16 | 17.33 | 17.78 |
|                 | 12H  | 16.01            | 17.15 | 16.47 | 17.57 | 18.05 | 15.88          | 17.03 | 16.34 | 17.45 | 17.92 |
| 4H              | 2H   | 13.40            | 14.75 | 13.83 | 15.14 | 15.56 | 13.32          | 14.66 | 13.74 | 15.05 | 15.48 |
|                 | 3H   | 15.34            | 16.48 | 15.78 | 16.91 | 17.36 | 15.18          | 16.31 | 15.62 | 16.75 | 17.19 |
|                 | 4H   | 16.13            | 17.16 | 16.59 | 17.61 | 18.09 | 15.93          | 16.96 | 16.39 | 17.41 | 17.89 |
|                 | 6H   | 16.74            | 17.64 | 17.23 | 18.12 | 18.62 | 16.57          | 17.48 | 17.06 | 17.95 | 18.45 |
|                 | 8H   | 16.96            | 17.81 | 17.45 | 18.28 | 18.79 | 16.83          | 17.68 | 17.32 | 18.16 | 18.67 |
|                 | 12H  | 17.14            | 17.90 | 17.65 | 18.41 | 18.92 | 17.07          | 17.83 | 17.58 | 18.34 | 18.86 |
| 8H              | 4H   | 16.40            | 17.25 | 16.89 | 17.73 | 18.24 | 16.22          | 17.07 | 16.71 | 17.55 | 18.06 |
|                 | 6H   | 17.14            | 17.85 | 17.66 | 18.37 | 18.89 | 17.01          | 17.71 | 17.53 | 18.24 | 18.76 |
|                 | 8H   | 17.44            | 18.08 | 17.98 | 18.61 | 19.14 | 17.36          | 18.00 | 17.90 | 18.54 | 19.07 |
|                 | 12H  | 17.70            | 18.27 | 18.24 | 18.79 | 19.40 | 17.70          | 18.27 | 18.24 | 18.79 | 19.40 |
| 12H             | 4H   | 16.43            | 17.20 | 16.95 | 17.71 | 18.22 | 16.26          | 17.02 | 16.77 | 17.53 | 18.05 |
|                 | 6H   | 17.20            | 17.84 | 17.74 | 18.38 | 18.91 | 17.07          | 17.71 | 17.61 | 18.25 | 18.78 |
|                 | 8H   | 17.56            | 18.13 | 18.10 | 18.65 | 19.25 | 17.49          | 18.06 | 18.03 | 18.58 | 19.18 |



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

Report Prepared for

Cooper Lighting Solutions

Corelite

Report Number: SP1-2506-458-11

Test Date: 08/26/2025

Luminaire Tested: 22ID2-55-CFR1-L940-U

Data in this report applies to families of products including 22ID2-55-CFR1-L940-U

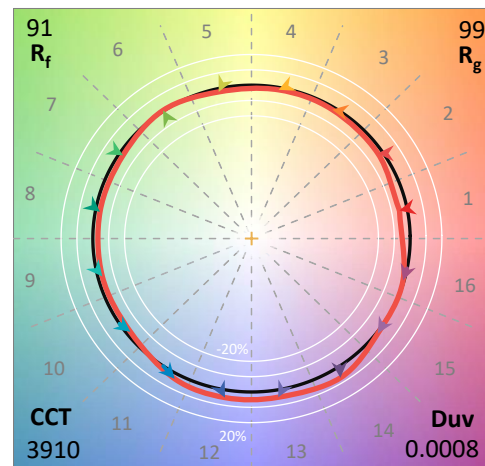
### Test Information

Test Method: LM-79-2019  
 Report Number: SP1-2506-458-11  
 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-L940-U**  
 Description: 2X2 CGTX WITH INDEPTH FRAME AND CFR1 LENS - 5500 LUMEN 4000K 90CRI

### Spectral Parameters

CCT (K): 3910  
 CIE  $u'$ : 0.2263  
 CIE  $v'$ : 0.5043  
 Duv: 0.0008  
 CIE x: 0.3851  
 CIE y: 0.3813  
 CIE z: 0.2336  
 Peak Wavelength (nm): 451  
 Dominant Wavelength (nm): 578  
 Purity: 30.01895  
 R<sub>f</sub>: 90.8  
 R<sub>g</sub>: 98.8

CRI (Ra): 92.4  
 R1: 92.5  
 R2: 94.9  
 R3: 95.8  
 R4: 92.7  
 R5: 91.7  
 R6: 92.1  
 R7: 94.3  
 R8: 85.2  
 R9: 62.0  
 R10: 87.0  
 R11: 92.8  
 R12: 71.7  
 R13: 93.2  
 R14: 97.3  
 R15: 89.6



### Test Conditions

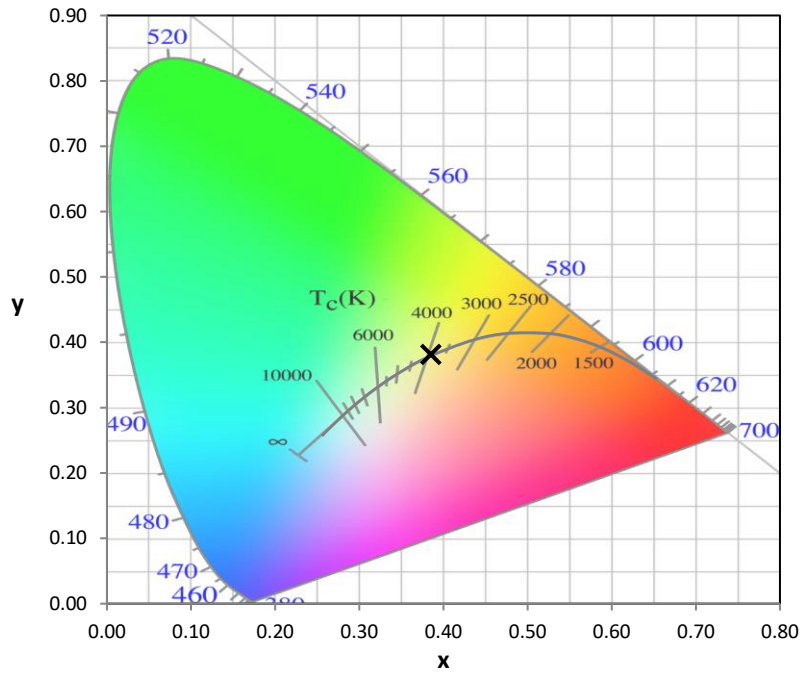
Stabilization Time: 31M  
 Operation Time: 1H 31M  
 Sphere Temperature (°C): 25.2.

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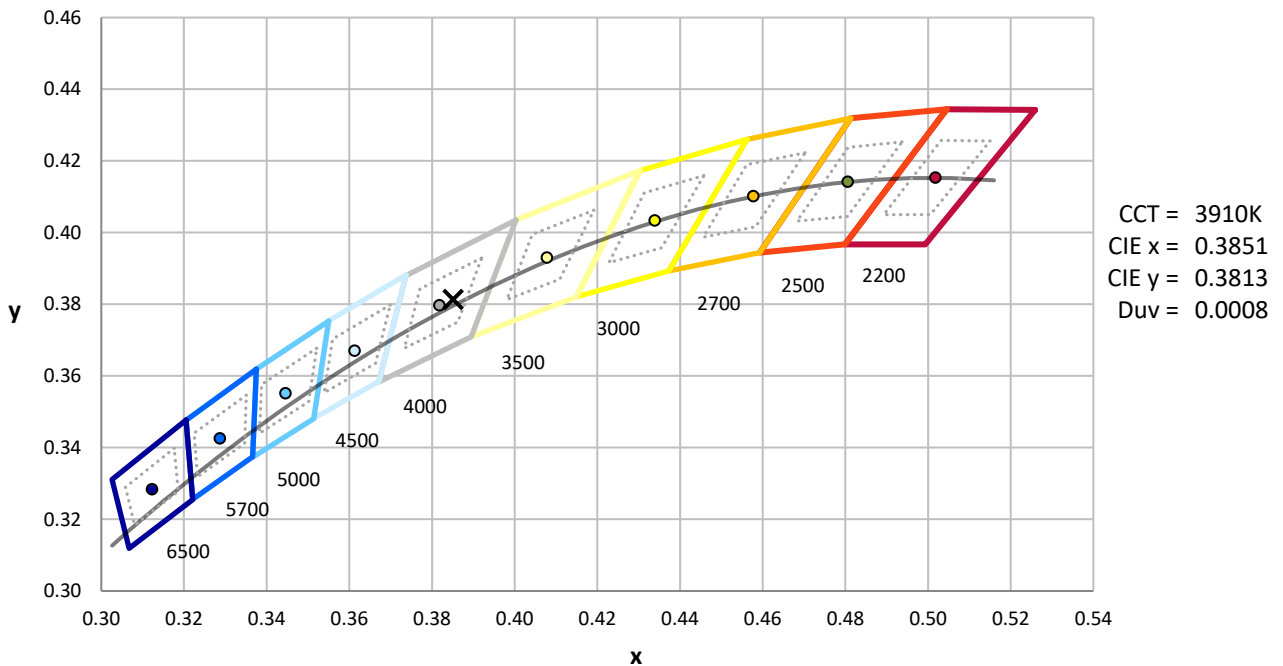
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date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

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**CIE 1931 Chromaticity Diagram**



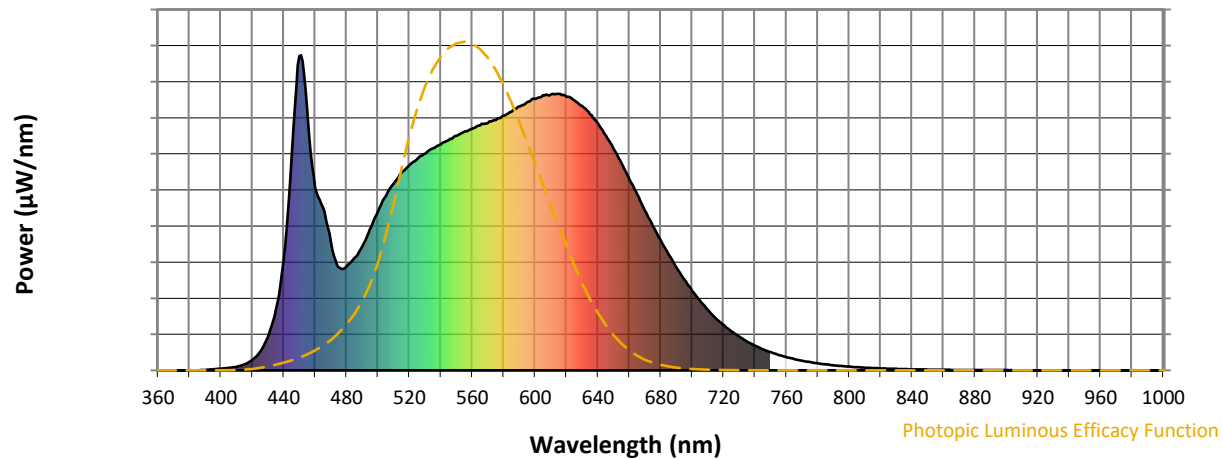
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 4000K 4-step quadrangle

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### Photopic Flux vs. Wavelength

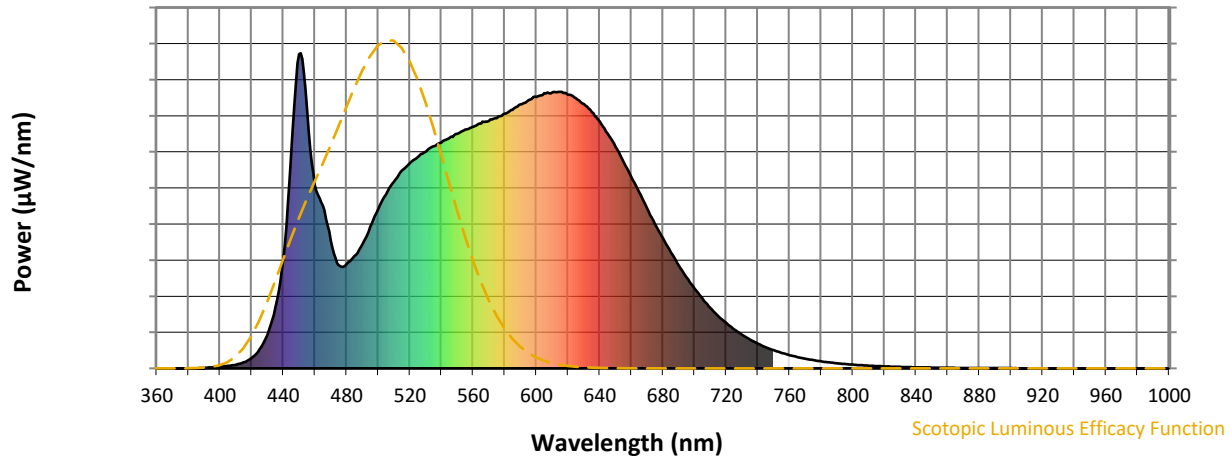


### Photopic Lumens: NR

| $\lambda$<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               | 394                                  | NR                             | 620               | 868                                  | NR                             | 750               | 58                                   | NR                             | 880               | 1                                    | NR                             |
| 365               | 0                                    | NR                             | 495               | 449                                  | NR                             | 625               | 858                                  | NR                             | 755               | 49                                   | NR                             | 885               | 1                                    | NR                             |
| 370               | 0                                    | NR                             | 500               | 505                                  | NR                             | 630               | 839                                  | NR                             | 760               | 42                                   | NR                             | 890               | 1                                    | NR                             |
| 375               | 0                                    | NR                             | 505               | 553                                  | NR                             | 635               | 813                                  | NR                             | 765               | 36                                   | NR                             | 895               | 1                                    | NR                             |
| 380               | 0                                    | NR                             | 510               | 593                                  | NR                             | 640               | 783                                  | NR                             | 770               | 31                                   | NR                             | 900               | 1                                    | NR                             |
| 385               | 0                                    | NR                             | 515               | 628                                  | NR                             | 645               | 746                                  | NR                             | 775               | 26                                   | NR                             | 905               | 1                                    | NR                             |
| 390               | 1                                    | NR                             | 520               | 651                                  | NR                             | 650               | 702                                  | NR                             | 780               | 22                                   | NR                             | 910               | 0                                    | NR                             |
| 395               | 4                                    | NR                             | 525               | 670                                  | NR                             | 655               | 657                                  | NR                             | 785               | 19                                   | NR                             | 915               | 0                                    | NR                             |
| 400               | 5                                    | NR                             | 530               | 687                                  | NR                             | 660               | 607                                  | NR                             | 790               | 16                                   | NR                             | 920               | 0                                    | NR                             |
| 405               | 8                                    | NR                             | 535               | 705                                  | NR                             | 665               | 559                                  | NR                             | 795               | 14                                   | NR                             | 925               | 0                                    | NR                             |
| 410               | 12                                   | NR                             | 540               | 717                                  | NR                             | 670               | 507                                  | NR                             | 800               | 12                                   | NR                             | 930               | 0                                    | NR                             |
| 415               | 19                                   | NR                             | 545               | 731                                  | NR                             | 675               | 458                                  | NR                             | 805               | 10                                   | NR                             | 935               | 0                                    | NR                             |
| 420               | 34                                   | NR                             | 550               | 745                                  | NR                             | 680               | 413                                  | NR                             | 810               | 9                                    | NR                             | 940               | 0                                    | NR                             |
| 425               | 60                                   | NR                             | 555               | 757                                  | NR                             | 685               | 367                                  | NR                             | 815               | 7                                    | NR                             | 945               | 0                                    | NR                             |
| 430               | 107                                  | NR                             | 560               | 767                                  | NR                             | 690               | 328                                  | NR                             | 820               | 6                                    | NR                             | 950               | 0                                    | NR                             |
| 435               | 194                                  | NR                             | 565               | 777                                  | NR                             | 695               | 289                                  | NR                             | 825               | 5                                    | NR                             | 955               | 0                                    | NR                             |
| 440               | 349                                  | NR                             | 570               | 785                                  | NR                             | 700               | 253                                  | NR                             | 830               | 5                                    | NR                             | 960               | 0                                    | NR                             |
| 445               | 678                                  | NR                             | 575               | 794                                  | NR                             | 705               | 221                                  | NR                             | 835               | 4                                    | NR                             | 965               | 0                                    | NR                             |
| 450               | 997                                  | NR                             | 580               | 809                                  | NR                             | 710               | 192                                  | NR                             | 840               | 3                                    | NR                             | 970               | 0                                    | NR                             |
| 455               | 819                                  | NR                             | 585               | 820                                  | NR                             | 715               | 165                                  | NR                             | 845               | 3                                    | NR                             | 975               | 0                                    | NR                             |
| 460               | 581                                  | NR                             | 590               | 838                                  | NR                             | 720               | 144                                  | NR                             | 850               | 2                                    | NR                             | 980               | 0                                    | NR                             |
| 465               | 517                                  | NR                             | 595               | 851                                  | NR                             | 725               | 124                                  | NR                             | 855               | 2                                    | NR                             | 985               | 0                                    | NR                             |
| 470               | 406                                  | NR                             | 600               | 861                                  | NR                             | 730               | 107                                  | NR                             | 860               | 2                                    | NR                             | 990               | 0                                    | NR                             |
| 475               | 327                                  | NR                             | 605               | 873                                  | NR                             | 735               | 91                                   | NR                             | 865               | 2                                    | NR                             | 995               | 0                                    | NR                             |
| 480               | 330                                  | NR                             | 610               | 875                                  | NR                             | 740               | 78                                   | NR                             | 870               | 1                                    | NR                             | 1000              | 0                                    | NR                             |
| 485               | 356                                  | NR                             | 615               | 877                                  | NR                             | 745               | 67                                   | NR                             | 875               | 1                                    | NR                             |                   |                                      |                                |

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### Scotopic Flux vs. Wavelength



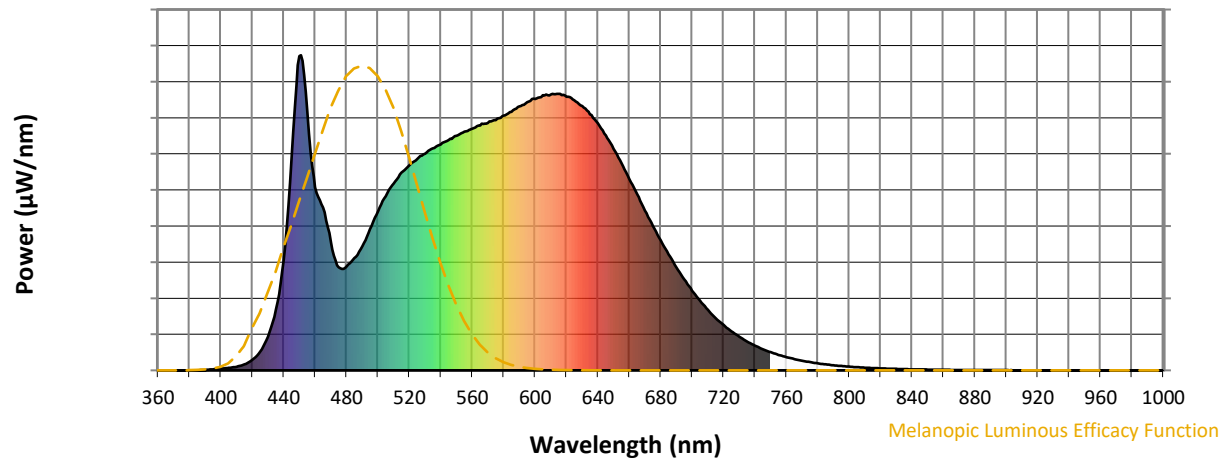
Scotopic Lumens: NR

S/P: 1.75

| $\lambda$<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               | 394                                  | NR                             | 620               | 868                                  | NR                             | 750               | 58                                   | NR                             | 880               | 1                                    | NR                             |
| 365               | 0                                    | NR                             | 495               | 449                                  | NR                             | 625               | 858                                  | NR                             | 755               | 49                                   | NR                             | 885               | 1                                    | NR                             |
| 370               | 0                                    | NR                             | 500               | 505                                  | NR                             | 630               | 839                                  | NR                             | 760               | 42                                   | NR                             | 890               | 1                                    | NR                             |
| 375               | 0                                    | NR                             | 505               | 553                                  | NR                             | 635               | 813                                  | NR                             | 765               | 36                                   | NR                             | 895               | 1                                    | NR                             |
| 380               | 0                                    | NR                             | 510               | 593                                  | NR                             | 640               | 783                                  | NR                             | 770               | 31                                   | NR                             | 900               | 1                                    | NR                             |
| 385               | 0                                    | NR                             | 515               | 628                                  | NR                             | 645               | 746                                  | NR                             | 775               | 26                                   | NR                             | 905               | 1                                    | NR                             |
| 390               | 1                                    | NR                             | 520               | 651                                  | NR                             | 650               | 702                                  | NR                             | 780               | 22                                   | NR                             | 910               | 0                                    | NR                             |
| 395               | 4                                    | NR                             | 525               | 670                                  | NR                             | 655               | 657                                  | NR                             | 785               | 19                                   | NR                             | 915               | 0                                    | NR                             |
| 400               | 5                                    | NR                             | 530               | 687                                  | NR                             | 660               | 607                                  | NR                             | 790               | 16                                   | NR                             | 920               | 0                                    | NR                             |
| 405               | 8                                    | NR                             | 535               | 705                                  | NR                             | 665               | 559                                  | NR                             | 795               | 14                                   | NR                             | 925               | 0                                    | NR                             |
| 410               | 12                                   | NR                             | 540               | 717                                  | NR                             | 670               | 507                                  | NR                             | 800               | 12                                   | NR                             | 930               | 0                                    | NR                             |
| 415               | 19                                   | NR                             | 545               | 731                                  | NR                             | 675               | 458                                  | NR                             | 805               | 10                                   | NR                             | 935               | 0                                    | NR                             |
| 420               | 34                                   | NR                             | 550               | 745                                  | NR                             | 680               | 413                                  | NR                             | 810               | 9                                    | NR                             | 940               | 0                                    | NR                             |
| 425               | 60                                   | NR                             | 555               | 757                                  | NR                             | 685               | 367                                  | NR                             | 815               | 7                                    | NR                             | 945               | 0                                    | NR                             |
| 430               | 107                                  | NR                             | 560               | 767                                  | NR                             | 690               | 328                                  | NR                             | 820               | 6                                    | NR                             | 950               | 0                                    | NR                             |
| 435               | 194                                  | NR                             | 565               | 777                                  | NR                             | 695               | 289                                  | NR                             | 825               | 5                                    | NR                             | 955               | 0                                    | NR                             |
| 440               | 349                                  | NR                             | 570               | 785                                  | NR                             | 700               | 253                                  | NR                             | 830               | 5                                    | NR                             | 960               | 0                                    | NR                             |
| 445               | 678                                  | NR                             | 575               | 794                                  | NR                             | 705               | 221                                  | NR                             | 835               | 4                                    | NR                             | 965               | 0                                    | NR                             |
| 450               | 997                                  | NR                             | 580               | 809                                  | NR                             | 710               | 192                                  | NR                             | 840               | 3                                    | NR                             | 970               | 0                                    | NR                             |
| 455               | 819                                  | NR                             | 585               | 820                                  | NR                             | 715               | 165                                  | NR                             | 845               | 3                                    | NR                             | 975               | 0                                    | NR                             |
| 460               | 581                                  | NR                             | 590               | 838                                  | NR                             | 720               | 144                                  | NR                             | 850               | 2                                    | NR                             | 980               | 0                                    | NR                             |
| 465               | 517                                  | NR                             | 595               | 851                                  | NR                             | 725               | 124                                  | NR                             | 855               | 2                                    | NR                             | 985               | 0                                    | NR                             |
| 470               | 406                                  | NR                             | 600               | 861                                  | NR                             | 730               | 107                                  | NR                             | 860               | 2                                    | NR                             | 990               | 0                                    | NR                             |
| 475               | 327                                  | NR                             | 605               | 873                                  | NR                             | 735               | 91                                   | NR                             | 865               | 2                                    | NR                             | 995               | 0                                    | NR                             |
| 480               | 330                                  | NR                             | 610               | 875                                  | NR                             | 740               | 78                                   | NR                             | 870               | 1                                    | NR                             | 1000              | 0                                    | NR                             |
| 485               | 356                                  | NR                             | 615               | 877                                  | NR                             | 745               | 67                                   | NR                             | 875               | 1                                    | NR                             |                   |                                      |                                |

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### Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 3.61

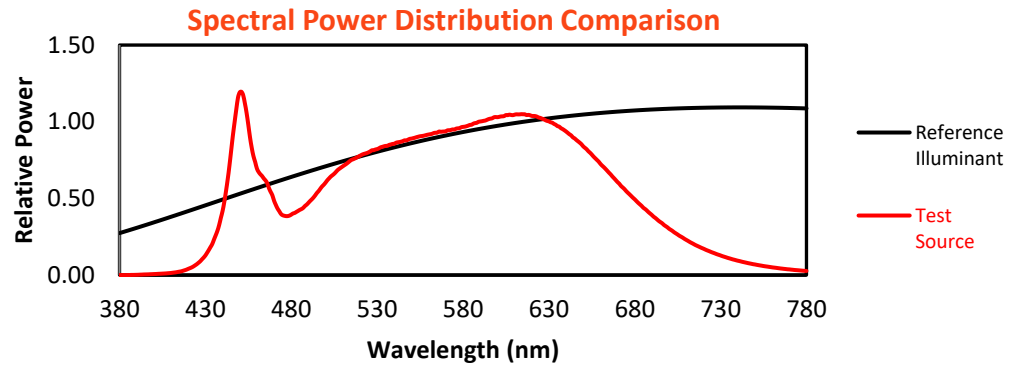
| λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) |
|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|
| 360       | 0                           | NR               | 490       | 394                         | NR               | 620       | 868                         | NR               | 750       | 58                          | NR               | 880       | 1                           | NR               |
| 365       | 0                           | NR               | 495       | 449                         | NR               | 625       | 858                         | NR               | 755       | 49                          | NR               | 885       | 1                           | NR               |
| 370       | 0                           | NR               | 500       | 505                         | NR               | 630       | 839                         | NR               | 760       | 42                          | NR               | 890       | 1                           | NR               |
| 375       | 0                           | NR               | 505       | 553                         | NR               | 635       | 813                         | NR               | 765       | 36                          | NR               | 895       | 1                           | NR               |
| 380       | 0                           | NR               | 510       | 593                         | NR               | 640       | 783                         | NR               | 770       | 31                          | NR               | 900       | 1                           | NR               |
| 385       | 0                           | NR               | 515       | 628                         | NR               | 645       | 746                         | NR               | 775       | 26                          | NR               | 905       | 1                           | NR               |
| 390       | 1                           | NR               | 520       | 651                         | NR               | 650       | 702                         | NR               | 780       | 22                          | NR               | 910       | 0                           | NR               |
| 395       | 4                           | NR               | 525       | 670                         | NR               | 655       | 657                         | NR               | 785       | 19                          | NR               | 915       | 0                           | NR               |
| 400       | 5                           | NR               | 530       | 687                         | NR               | 660       | 607                         | NR               | 790       | 16                          | NR               | 920       | 0                           | NR               |
| 405       | 8                           | NR               | 535       | 705                         | NR               | 665       | 559                         | NR               | 795       | 14                          | NR               | 925       | 0                           | NR               |
| 410       | 12                          | NR               | 540       | 717                         | NR               | 670       | 507                         | NR               | 800       | 12                          | NR               | 930       | 0                           | NR               |
| 415       | 19                          | NR               | 545       | 731                         | NR               | 675       | 458                         | NR               | 805       | 10                          | NR               | 935       | 0                           | NR               |
| 420       | 34                          | NR               | 550       | 745                         | NR               | 680       | 413                         | NR               | 810       | 9                           | NR               | 940       | 0                           | NR               |
| 425       | 60                          | NR               | 555       | 757                         | NR               | 685       | 367                         | NR               | 815       | 7                           | NR               | 945       | 0                           | NR               |
| 430       | 107                         | NR               | 560       | 767                         | NR               | 690       | 328                         | NR               | 820       | 6                           | NR               | 950       | 0                           | NR               |
| 435       | 194                         | NR               | 565       | 777                         | NR               | 695       | 289                         | NR               | 825       | 5                           | NR               | 955       | 0                           | NR               |
| 440       | 349                         | NR               | 570       | 785                         | NR               | 700       | 253                         | NR               | 830       | 5                           | NR               | 960       | 0                           | NR               |
| 445       | 678                         | NR               | 575       | 794                         | NR               | 705       | 221                         | NR               | 835       | 4                           | NR               | 965       | 0                           | NR               |
| 450       | 997                         | NR               | 580       | 809                         | NR               | 710       | 192                         | NR               | 840       | 3                           | NR               | 970       | 0                           | NR               |
| 455       | 819                         | NR               | 585       | 820                         | NR               | 715       | 165                         | NR               | 845       | 3                           | NR               | 975       | 0                           | NR               |
| 460       | 581                         | NR               | 590       | 838                         | NR               | 720       | 144                         | NR               | 850       | 2                           | NR               | 980       | 0                           | NR               |
| 465       | 517                         | NR               | 595       | 851                         | NR               | 725       | 124                         | NR               | 855       | 2                           | NR               | 985       | 0                           | NR               |
| 470       | 406                         | NR               | 600       | 861                         | NR               | 730       | 107                         | NR               | 860       | 2                           | NR               | 990       | 0                           | NR               |
| 475       | 327                         | NR               | 605       | 873                         | NR               | 735       | 91                          | NR               | 865       | 2                           | NR               | 995       | 0                           | NR               |
| 480       | 330                         | NR               | 610       | 875                         | NR               | 740       | 78                          | NR               | 870       | 1                           | NR               | 1000      | 0                           | NR               |
| 485       | 356                         | NR               | 615       | 877                         | NR               | 745       | 67                          | NR               | 875       | 1                           | NR               |           |                             |                  |

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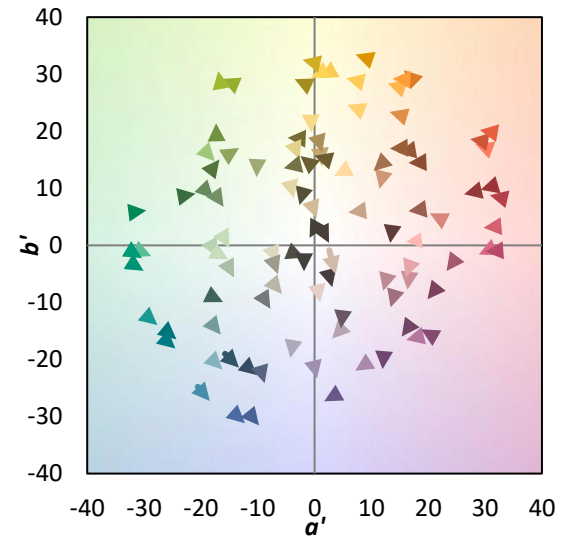
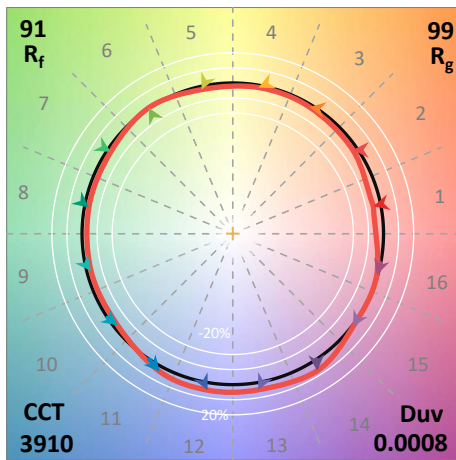
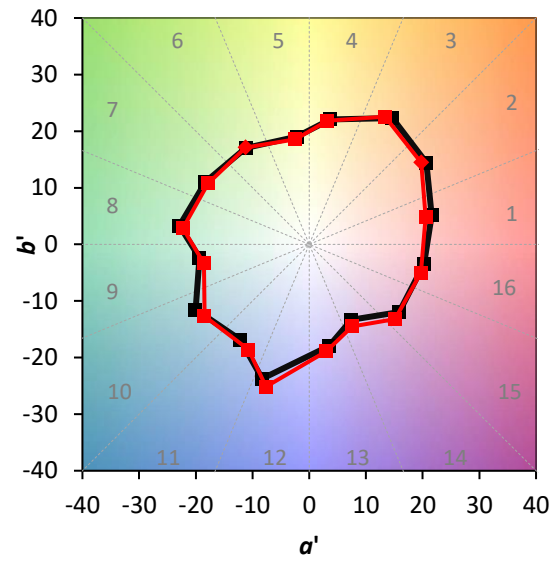
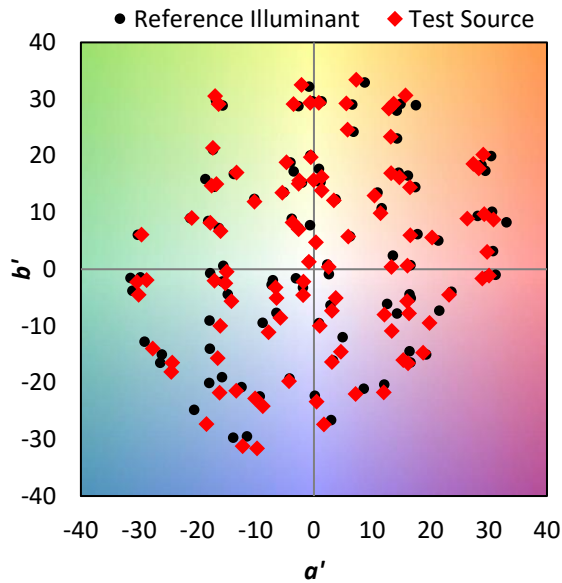
TM-30-18

### Summary

$R_f = 90.8$   
 $R_g = 98.8$   
 $CIE R_a = 92.4$   
 $R_9 = 62.0$



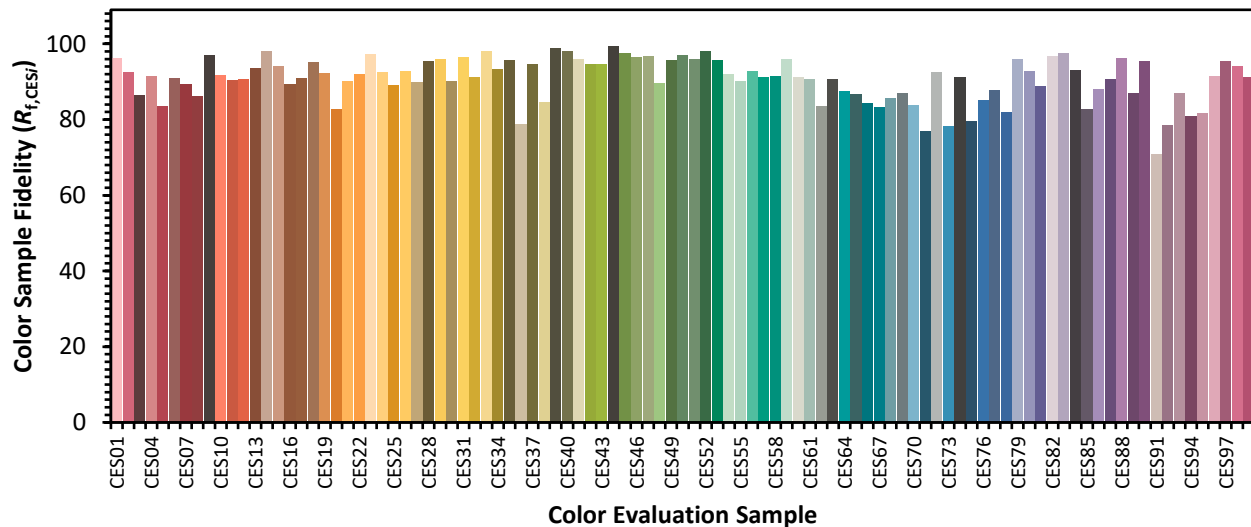
### Color Vector Graphics



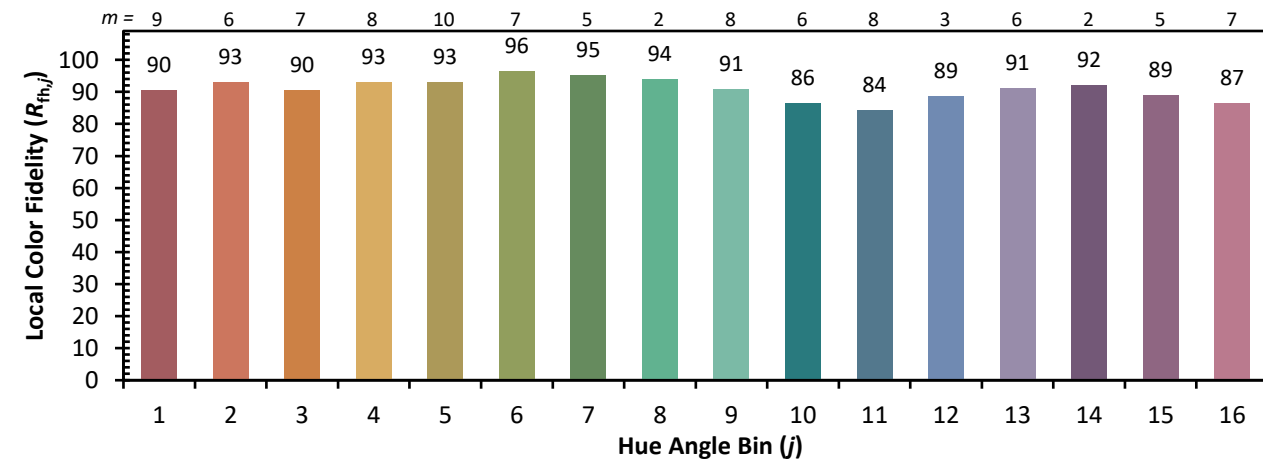
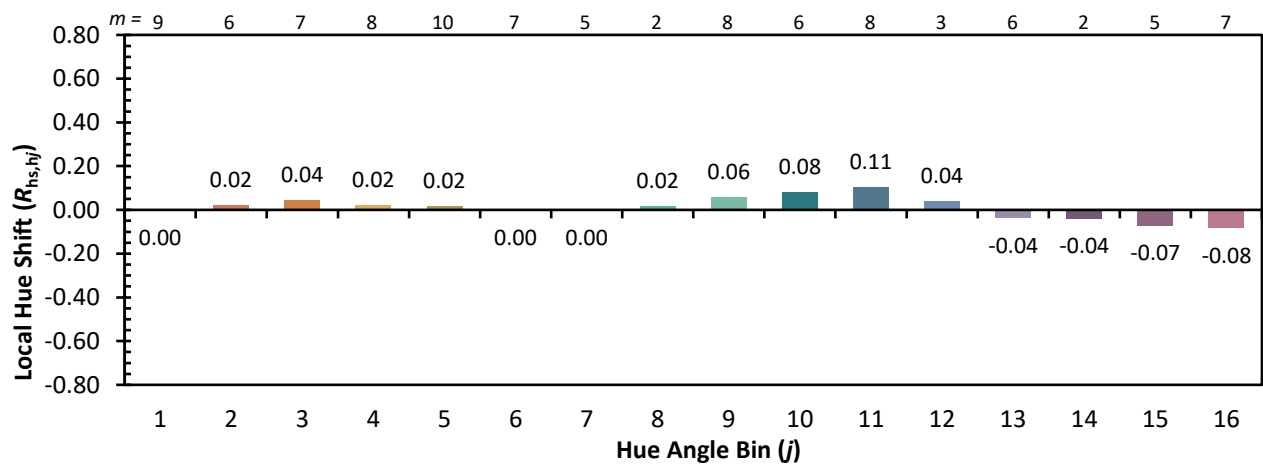
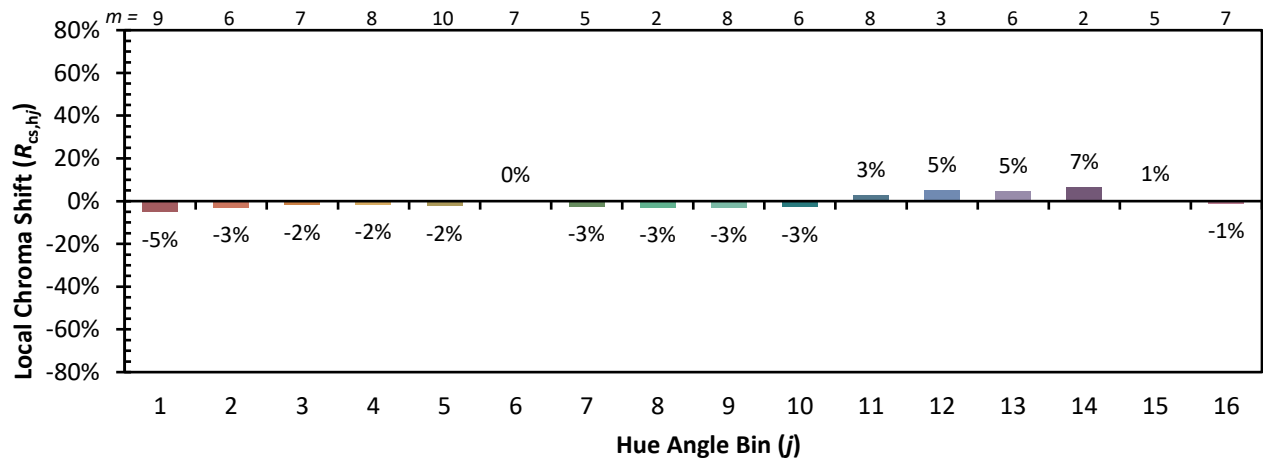


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

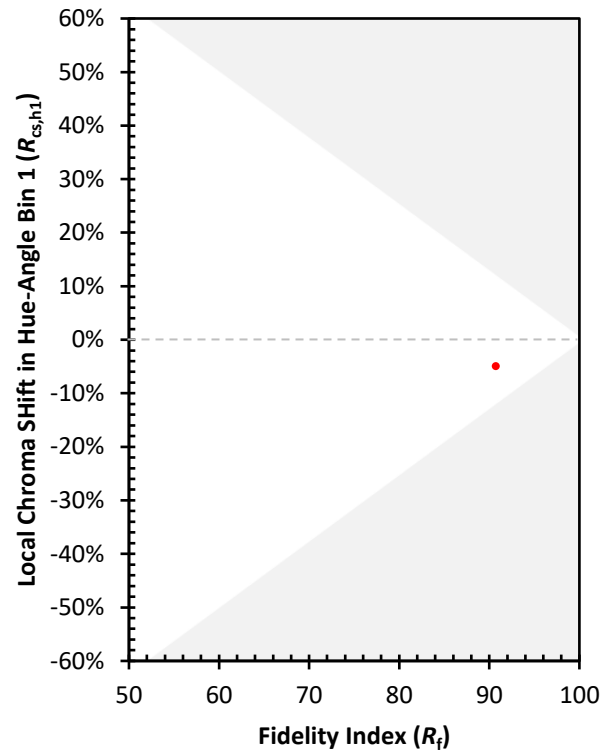
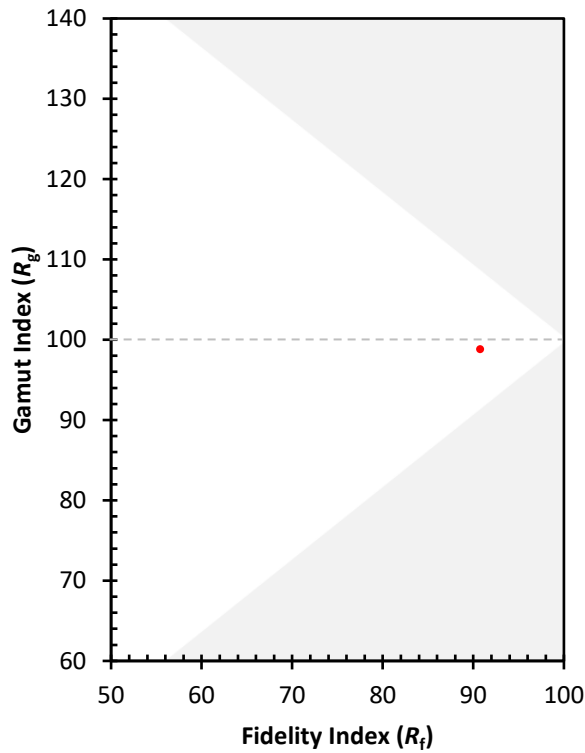
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 93 | CES51 = 96 | CES76 = 85 |
| CES02 = 62 | CES27 = 90 | CES52 = 98 | CES77 = 88 |
| CES03 = 31 | CES28 = 96 | CES53 = 96 | CES78 = 82 |
| CES04 = 69 | CES29 = 96 | CES54 = 92 | CES79 = 96 |
| CES05 = 49 | CES30 = 90 | CES55 = 90 | CES80 = 93 |
| CES06 = 50 | CES31 = 97 | CES56 = 93 | CES81 = 89 |
| CES07 = 42 | CES32 = 91 | CES57 = 91 | CES82 = 97 |
| CES08 = 41 | CES33 = 98 | CES58 = 92 | CES83 = 98 |
| CES09 = 29 | CES34 = 93 | CES59 = 96 | CES84 = 93 |
| CES10 = 74 | CES35 = 96 | CES60 = 91 | CES85 = 83 |
| CES11 = 57 | CES36 = 79 | CES61 = 91 | CES86 = 88 |
| CES12 = 63 | CES37 = 95 | CES62 = 84 | CES87 = 91 |
| CES13 = 43 | CES38 = 85 | CES63 = 91 | CES88 = 96 |
| CES14 = 74 | CES39 = 99 | CES64 = 87 | CES89 = 87 |
| CES15 = 71 | CES40 = 98 | CES65 = 87 | CES90 = 96 |
| CES16 = 47 | CES41 = 96 | CES66 = 84 | CES91 = 71 |
| CES17 = 49 | CES42 = 95 | CES67 = 83 | CES92 = 79 |
| CES18 = 56 | CES43 = 95 | CES68 = 86 | CES93 = 87 |
| CES19 = 71 | CES44 = 99 | CES69 = 87 | CES94 = 81 |
| CES20 = 66 | CES45 = 98 | CES70 = 84 | CES95 = 82 |
| CES21 = 85 | CES46 = 97 | CES71 = 77 | CES96 = 91 |
| CES22 = 78 | CES47 = 97 | CES72 = 93 | CES97 = 96 |
| CES23 = 91 | CES48 = 90 | CES73 = 78 | CES98 = 94 |
| CES24 = 90 | CES49 = 96 | CES74 = 91 | CES99 = 91 |
| CES25 = 71 | CES50 = 97 | CES75 = 80 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)