

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: P1215076

Luminaire Tested: 22-ID2-20-DBD-L850-U

Issue Date: 12/4/2025

**Test Information**

Test Method: LM-79-2019  
Report Number: P1215076  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-2506-458-17)  
Test Lab: INNOVATION CENTER  
Issue Date: 12/4/2025  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: CORELITE  
Catalog Number: 22-ID2-20-DBD-L850-U  
Description: 2X2 IN DEPTH TROFFER WITH 2INCH DOUBLE BARREL DROP  
Light Source: 5000K CCT, 80 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

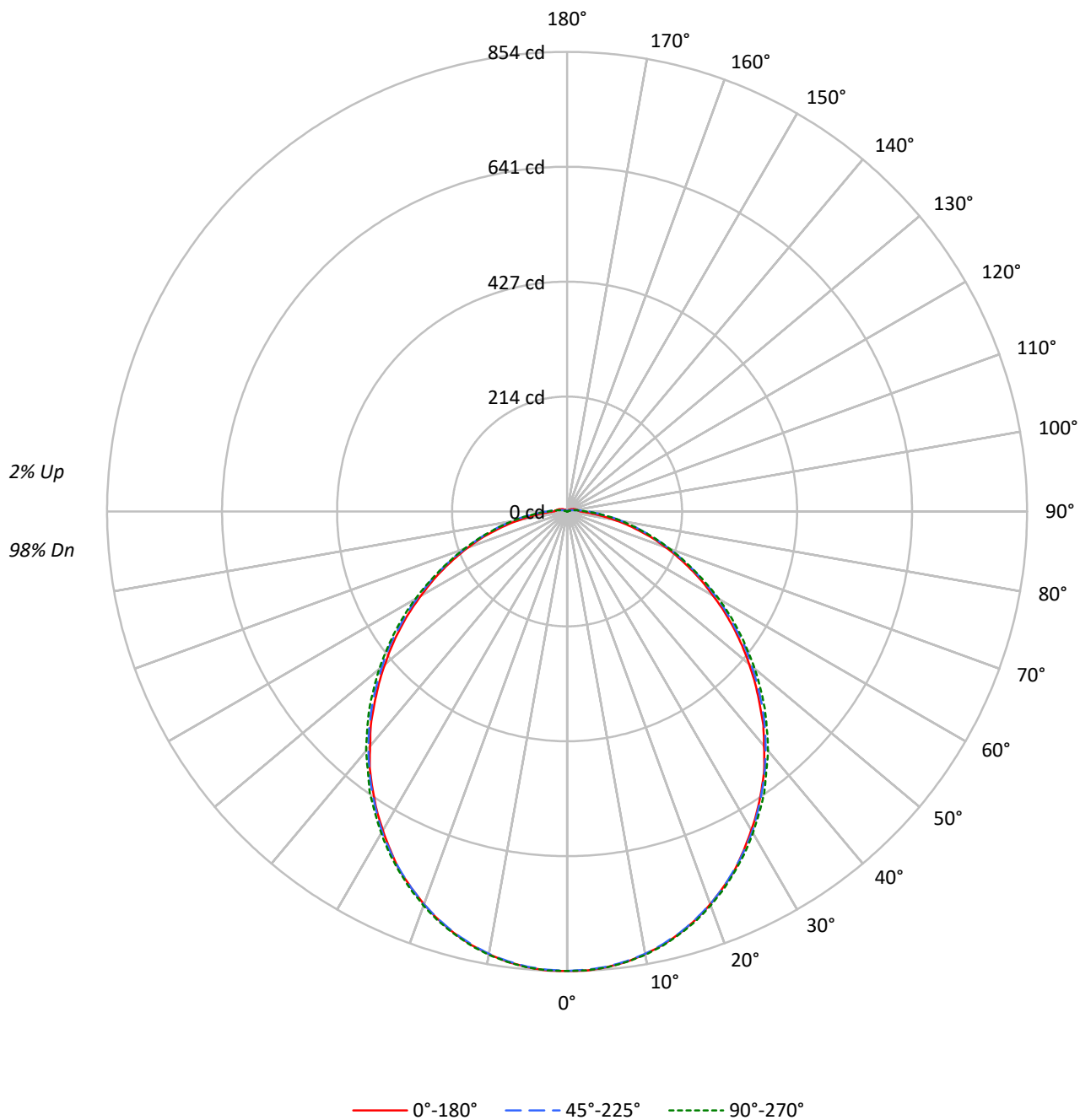
Lumens per Lamp: N/A  
Luminaire Lumens: 2309.4 lumens  
Efficiency: N/A  
Efficacy: 135.8 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.2 / 1.31  
Luminous Opening: Rectangular w/ Sides (W: 2' x L: 2' x H: 0.15')  
CIE Type: Direct

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-DBD-L850-U

### Luminous Intensity Polar Plot



TEST NUMBER: P1215076

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**COEFFICIENT OF UTILIZATION - ZONAL CAVITY METHOD:**

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |    |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|
| RF  | 20  |     |     |     | 20  |     |     |     |     | 20  |     |     |     |     | 20  |     |     |     |     | 20 |
| RC  | 80  |     |     |     | 70  |     |     |     |     | 50  |     |     |     |     | 30  |     |     |     |     | 0  |
| RW  | 70  | 50  | 30  | 10  | 70  | 50  | 30  | 10  | 50  | 30  | 10  | 50  | 30  | 10  | 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  | 84  | 84  | 81 |
| 2   | 98  | 90  | 83  | 77  | 95  | 88  | 82  | 76  | 84  | 79  | 74  | 80  | 76  | 72  | 77  | 74  | 70  | 70  | 70  | 68 |
| 3   | 90  | 79  | 71  | 64  | 87  | 77  | 70  | 64  | 74  | 68  | 62  | 71  | 66  | 61  | 68  | 64  | 60  | 60  | 60  | 57 |
| 4   | 82  | 70  | 62  | 55  | 80  | 69  | 61  | 54  | 66  | 59  | 53  | 63  | 57  | 52  | 61  | 56  | 52  | 52  | 52  | 49 |
| 5   | 76  | 63  | 54  | 47  | 73  | 62  | 53  | 47  | 59  | 52  | 46  | 57  | 51  | 46  | 55  | 49  | 45  | 45  | 45  | 43 |
| 6   | 70  | 57  | 48  | 41  | 68  | 56  | 47  | 41  | 54  | 46  | 41  | 52  | 45  | 40  | 50  | 44  | 40  | 40  | 40  | 38 |
| 7   | 65  | 52  | 43  | 37  | 63  | 51  | 42  | 37  | 49  | 42  | 36  | 47  | 41  | 36  | 46  | 40  | 35  | 35  | 35  | 33 |
| 8   | 61  | 47  | 39  | 33  | 59  | 46  | 38  | 33  | 45  | 38  | 32  | 43  | 37  | 32  | 42  | 36  | 32  | 32  | 32  | 30 |
| 9   | 57  | 43  | 35  | 30  | 55  | 43  | 35  | 29  | 41  | 34  | 29  | 40  | 34  | 29  | 39  | 33  | 29  | 29  | 29  | 27 |
| 10  | 53  | 40  | 32  | 27  | 52  | 39  | 32  | 27  | 38  | 31  | 27  | 37  | 31  | 26  | 36  | 30  | 26  | 26  | 26  | 24 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2298 | 2298 | 2298 |
| 5°  | 2281 | 2272 | 2282 |
| 10° | 2253 | 2239 | 2256 |
| 15° | 2215 | 2195 | 2218 |
| 20° | 2166 | 2141 | 2172 |
| 25° | 2111 | 2079 | 2116 |
| 30° | 2037 | 2012 | 2055 |
| 35° | 1965 | 1932 | 1992 |
| 40° | 1879 | 1850 | 1918 |
| 45° | 1790 | 1762 | 1839 |
| 50° | 1695 | 1666 | 1749 |
| 55° | 1600 | 1563 | 1653 |
| 60° | 1493 | 1457 | 1552 |
| 65° | 1389 | 1347 | 1434 |
| 70° | 1271 | 1226 | 1321 |
| 75° | 1127 | 1111 | 1208 |
| 80° | 957  | 1001 | 1121 |
| 85° | 791  | 899  | 1061 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 45°

Luminance: 1839 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 80.6   | 3.5       |
| 10°-20°   | 228.5  | 9.9       |
| 20°-30°   | 338.6  | 14.7      |
| 30°-40°   | 395.6  | 17.1      |
| 40°-50°   | 395.1  | 17.1      |
| 50°-60°   | 343.7  | 14.9      |
| 60°-70°   | 256.6  | 11.1      |
| 70°-80°   | 156.6  | 6.8       |
| 80°-90°   | 69.0   | 3.0       |
| 90°-100°  | 25.3   | 1.1       |
| 100°-110° | 10.5   | 0.5       |
| 110°-120° | 5.0    | 0.2       |
| 120°-130° | 2.6    | 0.1       |
| 130°-140° | 1.1    | 0.0       |
| 140°-150° | 0.4    | 0.0       |
| 150°-160° | 0.1    | 0.0       |
| 160°-170° | 0.0    | 0.0       |
| 170°-180° | 0.0    | 0.0       |
| 0°-30°    | 647.7  | 28.0      |
| 0°-40°    | 1043.3 | 45.2      |
| 0°-60°    | 1782.2 | 77.2      |
| 0°-90°    | 2264.3 | 98.1      |
| 90°-120°  | 40.8   | 1.8       |
| 90°-150°  | 44.8   | 1.9       |
| 90°-180°  | 45.0   | 1.9       |
| 0°-180°   | 2309.4 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°  | 22.5° | 45° | 67.5° | 90° | Flux |
|------|-----|-------|-----|-------|-----|------|
| 0°   | 854 | 854   | 854 | 854   | 854 |      |
| 5°   | 850 | 849   | 849 | 850   | 850 | 81   |
| 15°  | 811 | 810   | 810 | 811   | 812 | 229  |
| 25°  | 736 | 734   | 735 | 736   | 738 | 338  |
| 35°  | 630 | 630   | 632 | 636   | 638 | 394  |
| 45°  | 506 | 508   | 512 | 516   | 519 | 390  |
| 55°  | 378 | 380   | 384 | 389   | 390 | 338  |
| 65°  | 253 | 256   | 260 | 262   | 261 | 251  |
| 75°  | 139 | 144   | 149 | 151   | 149 | 148  |
| 85°  | 48  | 58    | 64  | 66    | 64  | 48   |
| 90°  | 24  | 33    | 37  | 38    | 35  | 14   |
| 95°  | 21  | 21    | 23  | 24    | 22  | 16   |
| 105° | 15  | 13    | 8   | 6     | 5   | 16   |
| 115° | 10  | 9     | 5   | 1     | 0   | 10   |
| 125° | 6   | 5     | 3   | 0     | 0   | 6    |
| 135° | 3   | 3     | 1   | 0     | 0   | 3    |
| 145° | 1   | 1     | 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   | 0    |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|--------|-------|-------|-------|-------|-------|
| 0°     | 853.8 | 853.8 | 853.8 | 853.8 | 853.8 |
| 2.5°   | 853.8 | 852.9 | 852.3 | 852.9 | 853.5 |
| 5°     | 850.1 | 849.2 | 848.9 | 849.5 | 850.3 |
| 7.5°   | 844.1 | 843.5 | 842.9 | 843.8 | 844.4 |
| 10°    | 835.3 | 834.4 | 834.7 | 835.5 | 836.4 |
| 12.5°  | 824.7 | 823.9 | 823.3 | 824.1 | 825.9 |
| 15°    | 811.0 | 810.2 | 810.2 | 811.0 | 812.2 |
| 17.5°  | 795.1 | 795.1 | 794.2 | 796.0 | 797.4 |
| 20°    | 776.9 | 776.6 | 776.6 | 777.7 | 779.2 |
| 22.5°  | 756.4 | 756.4 | 756.7 | 758.4 | 759.5 |
| 25°    | 735.9 | 734.4 | 734.7 | 736.2 | 737.6 |
| 27.5°  | 710.0 | 710.2 | 711.4 | 712.8 | 715.1 |
| 30°    | 684.0 | 684.9 | 687.2 | 688.3 | 690.0 |
| 32.5°  | 657.8 | 658.4 | 659.5 | 662.7 | 663.8 |
| 35°    | 629.6 | 630.2 | 631.9 | 635.6 | 638.2 |
| 37.5°  | 601.5 | 600.9 | 603.4 | 607.1 | 607.4 |
| 40°    | 568.7 | 571.0 | 573.5 | 577.0 | 580.4 |
| 42.5°  | 539.4 | 540.5 | 543.6 | 546.8 | 549.1 |
| 45°    | 505.5 | 508.3 | 512.0 | 515.7 | 519.4 |
| 47.5°  | 473.9 | 477.3 | 480.1 | 484.7 | 486.7 |
| 50°    | 441.1 | 444.8 | 448.2 | 452.8 | 455.1 |
| 52.5°  | 409.5 | 412.1 | 417.8 | 421.2 | 421.8 |
| 55°    | 377.6 | 379.6 | 383.6 | 388.7 | 390.1 |
| 57.5°  | 345.7 | 348.3 | 352.6 | 357.1 | 357.7 |
| 60°    | 313.5 | 316.7 | 320.4 | 324.1 | 325.8 |
| 62.5°  | 283.1 | 285.9 | 289.6 | 292.8 | 292.5 |
| 65°    | 253.2 | 255.7 | 259.7 | 262.3 | 261.4 |
| 67.5°  | 223.6 | 226.4 | 230.1 | 232.1 | 231.5 |
| 70°    | 194.8 | 197.1 | 201.3 | 203.3 | 202.5 |
| 72.5°  | 168.0 | 171.2 | 174.6 | 176.8 | 175.7 |
| 75°    | 138.7 | 143.8 | 149.2 | 150.6 | 148.7 |
| 77.5°  | 113.3 | 119.0 | 125.6 | 127.3 | 125.3 |
| 80°    | 88.0  | 96.8  | 103.4 | 105.4 | 103.1 |
| 82.5°  | 66.4  | 76.0  | 83.4  | 85.1  | 82.3  |
| 85°    | 47.6  | 58.1  | 64.4  | 65.8  | 63.8  |
| 87.5°  | 33.6  | 43.3  | 48.7  | 49.6  | 46.7  |
| 90°    | 24.5  | 32.7  | 37.0  | 37.6  | 34.7  |
| 92.5°  | 22.5  | 25.9  | 29.3  | 30.2  | 28.5  |
| 95°    | 20.8  | 21.1  | 23.4  | 23.6  | 22.2  |
| 97.5°  | 19.4  | 17.9  | 18.2  | 17.9  | 16.8  |
| 100°   | 17.9  | 16.2  | 14.0  | 13.1  | 12.2  |
| 102.5° | 16.8  | 14.8  | 10.8  | 9.1   | 8.3   |
| 105°   | 15.4  | 13.4  | 8.5   | 5.7   | 5.1   |
| 107.5° | 14.0  | 12.2  | 7.4   | 3.4   | 2.6   |
| 110°   | 12.5  | 10.8  | 6.5   | 1.7   | 0.9   |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°   | 22.5° | 45° | 67.5° | 90° |
|--------|------|-------|-----|-------|-----|
| 112.5° | 11.4 | 9.7   | 6.0 | 1.4   | 0.0 |
| 115°   | 10.0 | 8.8   | 5.1 | 0.9   | 0.0 |
| 117.5° | 8.8  | 7.7   | 4.6 | 0.6   | 0.0 |
| 120°   | 8.0  | 6.8   | 4.0 | 0.3   | 0.0 |
| 122.5° | 7.1  | 6.0   | 3.4 | 0.3   | 0.0 |
| 125°   | 6.0  | 5.1   | 2.8 | 0.3   | 0.0 |
| 127.5° | 5.4  | 4.6   | 2.3 | 0.0   | 0.0 |
| 130°   | 4.6  | 3.7   | 2.0 | 0.0   | 0.0 |
| 132.5° | 4.0  | 3.1   | 1.4 | 0.3   | 0.0 |
| 135°   | 3.1  | 2.6   | 0.9 | 0.3   | 0.0 |
| 137.5° | 2.8  | 2.3   | 0.6 | 0.3   | 0.0 |
| 140°   | 2.3  | 1.7   | 0.6 | 0.3   | 0.0 |
| 142.5° | 1.7  | 1.4   | 0.3 | 0.3   | 0.3 |
| 145°   | 1.1  | 0.9   | 0.3 | 0.3   | 0.3 |
| 147.5° | 0.9  | 0.6   | 0.3 | 0.3   | 0.3 |
| 150°   | 0.6  | 0.6   | 0.3 | 0.3   | 0.3 |
| 152.5° | 0.3  | 0.3   | 0.3 | 0.3   | 0.3 |
| 155°   | 0.3  | 0.3   | 0.3 | 0.3   | 0.3 |
| 157.5° | 0.3  | 0.3   | 0.3 | 0.3   | 0.3 |
| 160°   | 0.3  | 0.3   | 0.3 | 0.3   | 0.3 |
| 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 | 13.23            | 14.81 | 13.63 | 15.17 | 15.53 | 13.42          | 15.00 | 13.81 | 15.35 | 15.72 |
|                 | 3H   | 14.91            | 16.34 | 15.31 | 16.71 | 17.11 | 15.11          | 16.54 | 15.51 | 16.90 | 17.31 |
|                 | 4H   | 15.53            | 16.88 | 15.96 | 17.27 | 17.70 | 15.77          | 17.12 | 16.20 | 17.50 | 17.93 |
|                 | 6H   | 16.00            | 17.25 | 16.44 | 17.66 | 18.10 | 16.31          | 17.57 | 16.76 | 17.97 | 18.41 |
|                 | 8H   | 16.16            | 17.36 | 16.62 | 17.78 | 18.23 | 16.53          | 17.72 | 16.98 | 18.15 | 18.60 |
|                 | 12H  | 16.28            | 17.42 | 16.74 | 17.85 | 18.32 | 16.71          | 17.86 | 17.17 | 18.28 | 18.75 |
| 4H              | 2H   | 13.82            | 15.17 | 14.25 | 15.56 | 15.98 | 13.97          | 15.32 | 14.40 | 15.71 | 16.13 |
|                 | 3H   | 15.71            | 16.85 | 16.15 | 17.29 | 17.73 | 15.88          | 17.02 | 16.32 | 17.45 | 17.90 |
|                 | 4H   | 16.47            | 17.50 | 16.93 | 17.95 | 18.43 | 16.68          | 17.71 | 17.14 | 18.16 | 18.64 |
|                 | 6H   | 17.07            | 17.98 | 17.56 | 18.46 | 18.96 | 17.37          | 18.28 | 17.86 | 18.76 | 19.26 |
|                 | 8H   | 17.29            | 18.13 | 17.78 | 18.61 | 19.12 | 17.65          | 18.50 | 18.14 | 18.98 | 19.49 |
|                 | 12H  | 17.46            | 18.22 | 17.97 | 18.73 | 19.25 | 17.90          | 18.67 | 18.41 | 19.18 | 19.69 |
| 8H              | 4H   | 16.79            | 17.63 | 17.28 | 18.11 | 18.62 | 16.97          | 17.82 | 17.46 | 18.30 | 18.81 |
|                 | 6H   | 17.53            | 18.24 | 18.05 | 18.76 | 19.28 | 17.81          | 18.52 | 18.33 | 19.04 | 19.56 |
|                 | 8H   | 17.83            | 18.47 | 18.37 | 19.01 | 19.54 | 18.19          | 18.82 | 18.72 | 19.36 | 19.89 |
|                 | 12H  | 18.10            | 18.67 | 18.64 | 19.19 | 19.79 | 18.55          | 19.11 | 19.08 | 19.64 | 20.24 |
| 12H             | 4H   | 16.83            | 17.59 | 17.34 | 18.10 | 18.62 | 17.01          | 17.77 | 17.52 | 18.28 | 18.79 |
|                 | 6H   | 17.61            | 18.25 | 18.15 | 18.79 | 19.32 | 17.88          | 18.51 | 18.41 | 19.05 | 19.58 |
|                 | 8H   | 17.98            | 18.55 | 18.52 | 19.07 | 19.67 | 18.32          | 18.89 | 18.86 | 19.41 | 20.01 |



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

Report Prepared for

Cooper Lighting Solutions

Corelite

Report Number: SP1-2506-458-7

Test Date: 08/26/2025

Luminaire Tested: 22ID2-55-CFR1-L850-U

Data in this report applies to families of products including 22ID2-55-CFR1-L850-U

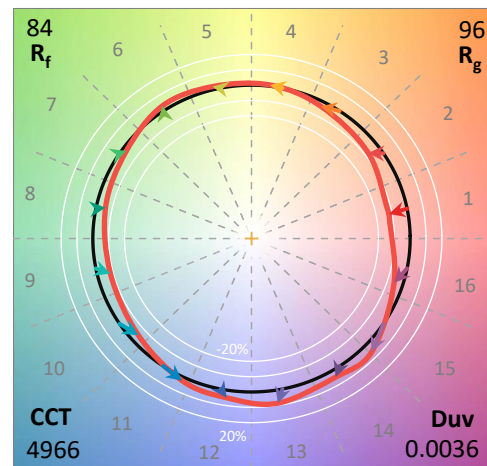
### Test Information

Test Method: LM-79-2019  
 Report Number: SP1-2506-458-7  
 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-L850-U**  
 Description: 2X2 CGTX WITH INDEPTH FRAME AND CFR1 LENS - 5500 LUMEN 5000K 80CRI

### Spectral Parameters

CCT (K): 4966  
 CIE  $u'$ : 0.2093  
 CIE  $v'$ : 0.4890  
 Duv: 0.0036  
 CIE x: 0.3468  
 CIE y: 0.3601  
 CIE z: 0.2931  
 Peak Wavelength (nm): 450  
 Dominant Wavelength (nm): 570  
 Purity: 12.1135  
 R<sub>f</sub>: 84  
 R<sub>g</sub>: 96.2

CRI (Ra): 83.1  
 R1: 81.0  
 R2: 87.8  
 R3: 92.7  
 R4: 82.4  
 R5: 81.0  
 R6: 82.6  
 R7: 88.5  
 R8: 68.6  
 R9: 10.3  
 R10: 70.9  
 R11: 81.3  
 R12: 55.9  
 R13: 82.8  
 R14: 96.1  
 R15: 75.1



### Test Conditions

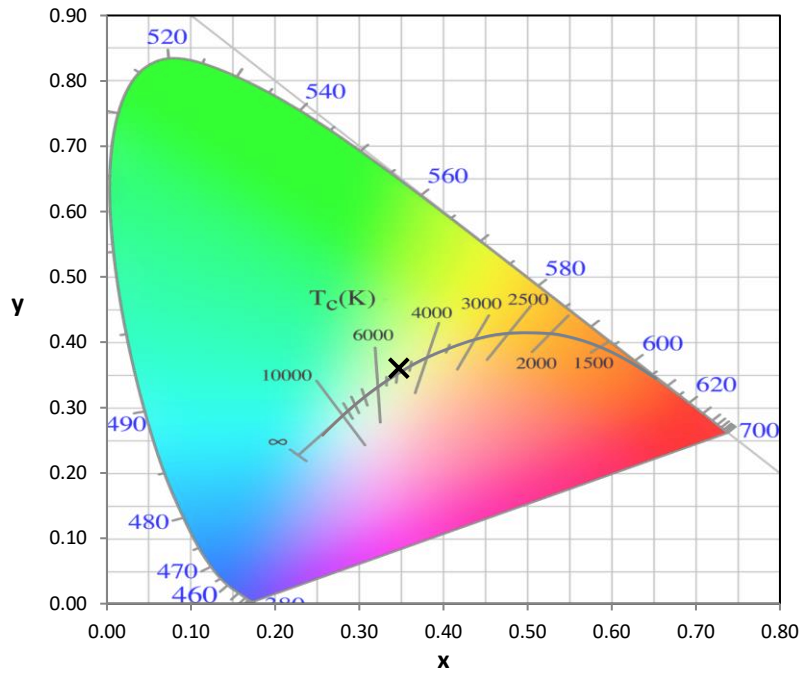
Stabilization Time: 37M  
 Operation Time: 1H 37M  
 Sphere Temperature (°C): 25.2

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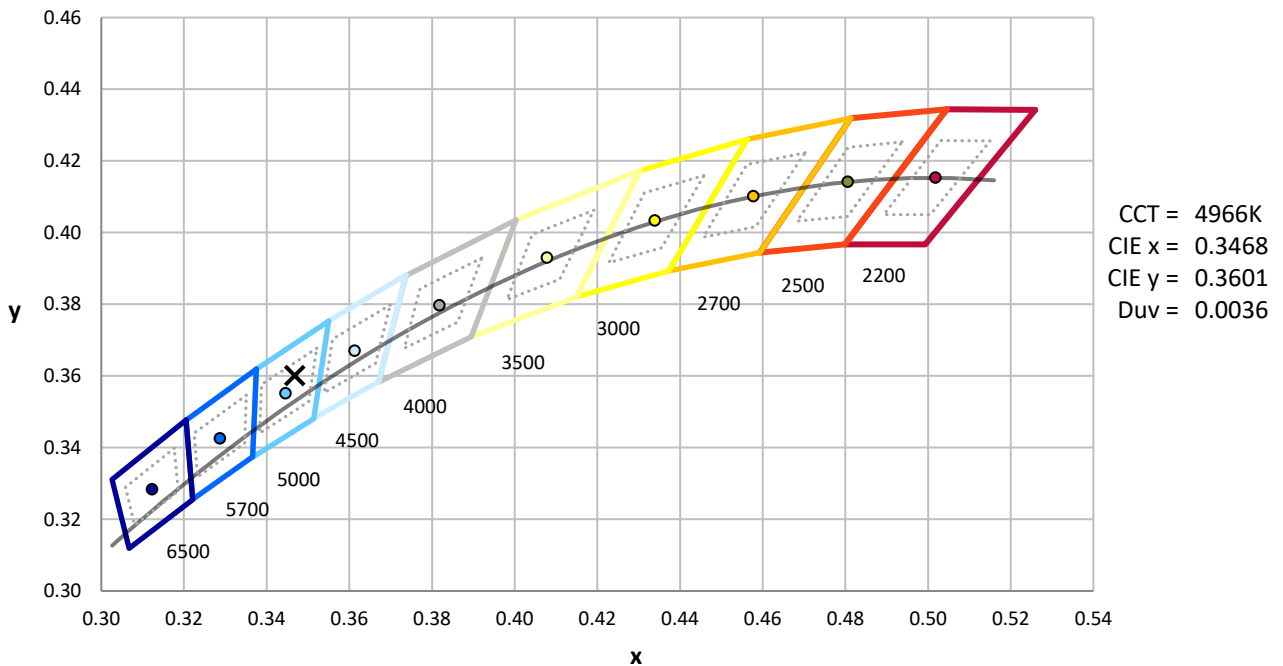
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date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



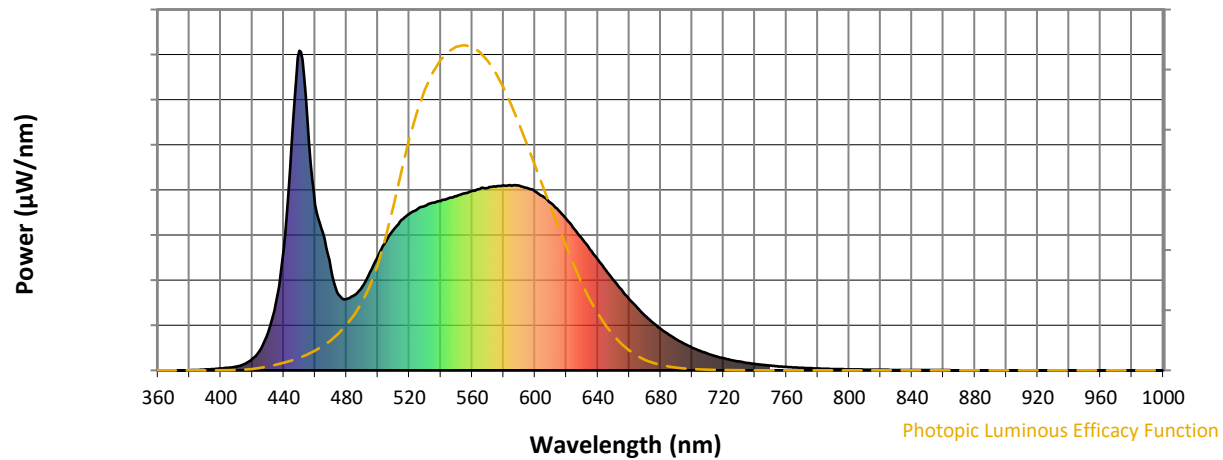
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 5000K 4-step quadrangle

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### Photopic Flux vs. Wavelength

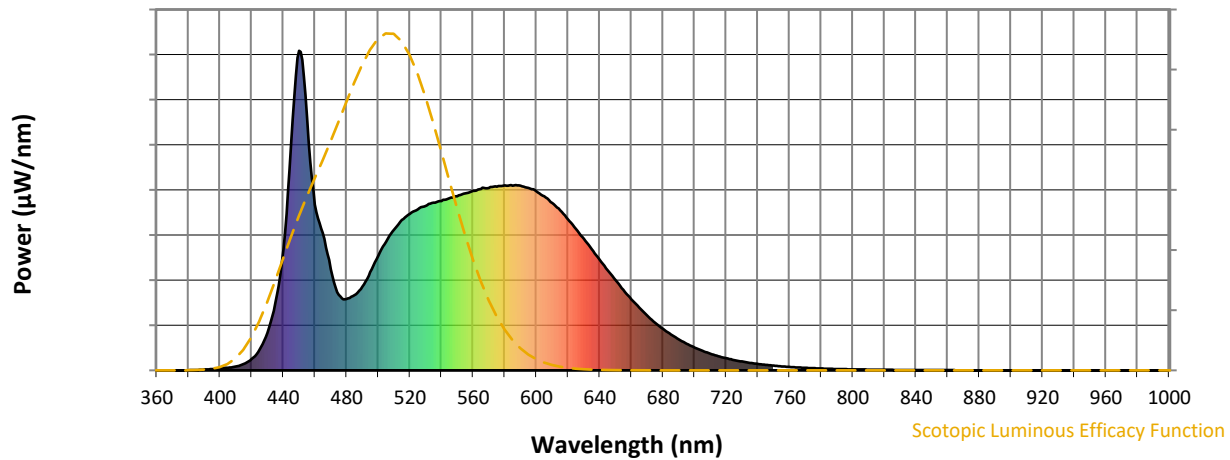


### Photopic Lumens: NR

| λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) |
|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|
| 360    | 0                        | NR            | 490    | 262                      | NR            | 620    | 472                      | NR            | 750    | 15                       | NR            | 880    | 0                        | NR            |
| 365    | 0                        | NR            | 495    | 307                      | NR            | 625    | 443                      | NR            | 755    | 13                       | NR            | 885    | 0                        | NR            |
| 370    | 0                        | NR            | 500    | 358                      | NR            | 630    | 412                      | NR            | 760    | 11                       | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 403                      | NR            | 635    | 379                      | NR            | 765    | 9                        | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 440                      | NR            | 640    | 346                      | NR            | 770    | 8                        | NR            | 900    | 0                        | NR            |
| 385    | 1                        | NR            | 515    | 471                      | NR            | 645    | 313                      | NR            | 775    | 7                        | NR            | 905    | 0                        | NR            |
| 390    | 3                        | NR            | 520    | 490                      | NR            | 650    | 282                      | NR            | 780    | 6                        | NR            | 910    | 0                        | NR            |
| 395    | 4                        | NR            | 525    | 504                      | NR            | 655    | 252                      | NR            | 785    | 5                        | NR            | 915    | 0                        | NR            |
| 400    | 6                        | NR            | 530    | 515                      | NR            | 660    | 223                      | NR            | 790    | 4                        | NR            | 920    | 0                        | NR            |
| 405    | 9                        | NR            | 535    | 524                      | NR            | 665    | 197                      | NR            | 795    | 4                        | NR            | 925    | 0                        | NR            |
| 410    | 12                       | NR            | 540    | 530                      | NR            | 670    | 171                      | NR            | 800    | 3                        | NR            | 930    | 0                        | NR            |
| 415    | 20                       | NR            | 545    | 539                      | NR            | 675    | 149                      | NR            | 805    | 3                        | NR            | 935    | 0                        | NR            |
| 420    | 36                       | NR            | 550    | 545                      | NR            | 680    | 130                      | NR            | 810    | 2                        | NR            | 940    | 0                        | NR            |
| 425    | 64                       | NR            | 555    | 554                      | NR            | 685    | 112                      | NR            | 815    | 2                        | NR            | 945    | 0                        | NR            |
| 430    | 117                      | NR            | 560    | 562                      | NR            | 690    | 97                       | NR            | 820    | 2                        | NR            | 950    | 0                        | NR            |
| 435    | 212                      | NR            | 565    | 567                      | NR            | 695    | 83                       | NR            | 825    | 2                        | NR            | 955    | 0                        | NR            |
| 440    | 378                      | NR            | 570    | 571                      | NR            | 700    | 71                       | NR            | 830    | 1                        | NR            | 960    | 0                        | NR            |
| 445    | 709                      | NR            | 575    | 574                      | NR            | 705    | 61                       | NR            | 835    | 1                        | NR            | 965    | 0                        | NR            |
| 450    | 1000                     | NR            | 580    | 579                      | NR            | 710    | 52                       | NR            | 840    | 1                        | NR            | 970    | 0                        | NR            |
| 455    | 789                      | NR            | 585    | 578                      | NR            | 715    | 44                       | NR            | 845    | 1                        | NR            | 975    | 0                        | NR            |
| 460    | 519                      | NR            | 590    | 578                      | NR            | 720    | 38                       | NR            | 850    | 1                        | NR            | 980    | 0                        | NR            |
| 465    | 429                      | NR            | 595    | 571                      | NR            | 725    | 32                       | NR            | 855    | 1                        | NR            | 985    | 0                        | NR            |
| 470    | 316                      | NR            | 600    | 560                      | NR            | 730    | 28                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 236                      | NR            | 605    | 545                      | NR            | 735    | 24                       | NR            | 865    | 1                        | NR            | 995    | 0                        | NR            |
| 480    | 224                      | NR            | 610    | 524                      | NR            | 740    | 20                       | NR            | 870    | 0                        | NR            | 1000   | 0                        | NR            |
| 485    | 235                      | NR            | 615    | 501                      | NR            | 745    | 17                       | NR            | 875    | 0                        | NR            |        |                          |               |

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### Scotopic Flux vs. Wavelength



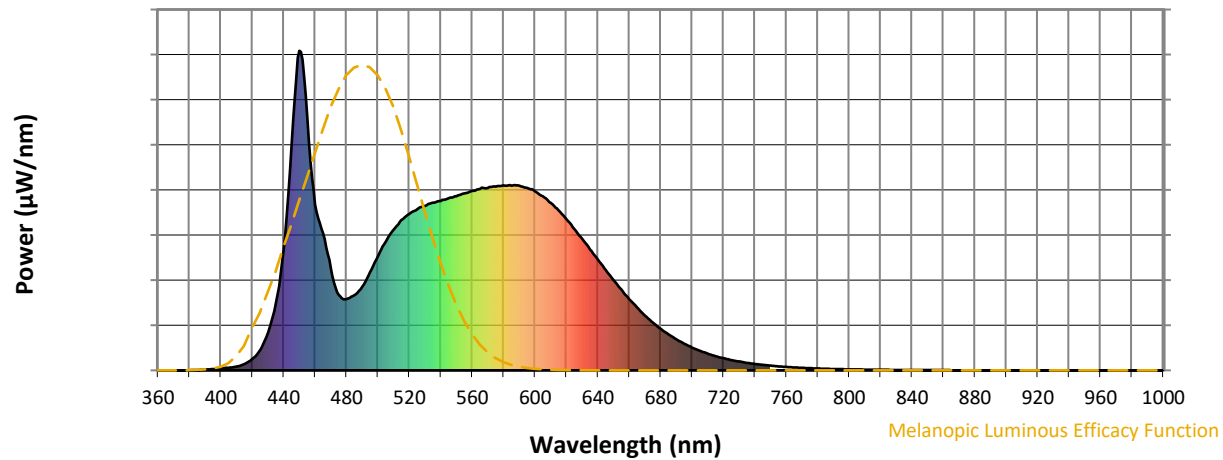
Scotopic Lumens: NR

S/P: 1.94

| $\lambda$<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               | 262                                  | NR                             | 620               | 472                                  | NR                             | 750               | 15                                   | NR                             | 880               | 0                                    | NR                             |
| 365               | 0                                    | NR                             | 495               | 307                                  | NR                             | 625               | 443                                  | NR                             | 755               | 13                                   | NR                             | 885               | 0                                    | NR                             |
| 370               | 0                                    | NR                             | 500               | 358                                  | NR                             | 630               | 412                                  | NR                             | 760               | 11                                   | NR                             | 890               | 0                                    | NR                             |
| 375               | 0                                    | NR                             | 505               | 403                                  | NR                             | 635               | 379                                  | NR                             | 765               | 9                                    | NR                             | 895               | 0                                    | NR                             |
| 380               | 0                                    | NR                             | 510               | 440                                  | NR                             | 640               | 346                                  | NR                             | 770               | 8                                    | NR                             | 900               | 0                                    | NR                             |
| 385               | 1                                    | NR                             | 515               | 471                                  | NR                             | 645               | 313                                  | NR                             | 775               | 7                                    | NR                             | 905               | 0                                    | NR                             |
| 390               | 3                                    | NR                             | 520               | 490                                  | NR                             | 650               | 282                                  | NR                             | 780               | 6                                    | NR                             | 910               | 0                                    | NR                             |
| 395               | 4                                    | NR                             | 525               | 504                                  | NR                             | 655               | 252                                  | NR                             | 785               | 5                                    | NR                             | 915               | 0                                    | NR                             |
| 400               | 6                                    | NR                             | 530               | 515                                  | NR                             | 660               | 223                                  | NR                             | 790               | 4                                    | NR                             | 920               | 0                                    | NR                             |
| 405               | 9                                    | NR                             | 535               | 524                                  | NR                             | 665               | 197                                  | NR                             | 795               | 4                                    | NR                             | 925               | 0                                    | NR                             |
| 410               | 12                                   | NR                             | 540               | 530                                  | NR                             | 670               | 171                                  | NR                             | 800               | 3                                    | NR                             | 930               | 0                                    | NR                             |
| 415               | 20                                   | NR                             | 545               | 539                                  | NR                             | 675               | 149                                  | NR                             | 805               | 3                                    | NR                             | 935               | 0                                    | NR                             |
| 420               | 36                                   | NR                             | 550               | 545                                  | NR                             | 680               | 130                                  | NR                             | 810               | 2                                    | NR                             | 940               | 0                                    | NR                             |
| 425               | 64                                   | NR                             | 555               | 554                                  | NR                             | 685               | 112                                  | NR                             | 815               | 2                                    | NR                             | 945               | 0                                    | NR                             |
| 430               | 117                                  | NR                             | 560               | 562                                  | NR                             | 690               | 97                                   | NR                             | 820               | 2                                    | NR                             | 950               | 0                                    | NR                             |
| 435               | 212                                  | NR                             | 565               | 567                                  | NR                             | 695               | 83                                   | NR                             | 825               | 2                                    | NR                             | 955               | 0                                    | NR                             |
| 440               | 378                                  | NR                             | 570               | 571                                  | NR                             | 700               | 71                                   | NR                             | 830               | 1                                    | NR                             | 960               | 0                                    | NR                             |
| 445               | 709                                  | NR                             | 575               | 574                                  | NR                             | 705               | 61                                   | NR                             | 835               | 1                                    | NR                             | 965               | 0                                    | NR                             |
| 450               | 1000                                 | NR                             | 580               | 579                                  | NR                             | 710               | 52                                   | NR                             | 840               | 1                                    | NR                             | 970               | 0                                    | NR                             |
| 455               | 789                                  | NR                             | 585               | 578                                  | NR                             | 715               | 44                                   | NR                             | 845               | 1                                    | NR                             | 975               | 0                                    | NR                             |
| 460               | 519                                  | NR                             | 590               | 578                                  | NR                             | 720               | 38                                   | NR                             | 850               | 1                                    | NR                             | 980               | 0                                    | NR                             |
| 465               | 429                                  | NR                             | 595               | 571                                  | NR                             | 725               | 32                                   | NR                             | 855               | 1                                    | NR                             | 985               | 0                                    | NR                             |
| 470               | 316                                  | NR                             | 600               | 560                                  | NR                             | 730               | 28                                   | NR                             | 860               | 1                                    | NR                             | 990               | 0                                    | NR                             |
| 475               | 236                                  | NR                             | 605               | 545                                  | NR                             | 735               | 24                                   | NR                             | 865               | 1                                    | NR                             | 995               | 0                                    | NR                             |
| 480               | 224                                  | NR                             | 610               | 524                                  | NR                             | 740               | 20                                   | NR                             | 870               | 0                                    | NR                             | 1000              | 0                                    | NR                             |
| 485               | 235                                  | NR                             | 615               | 501                                  | NR                             | 745               | 17                                   | NR                             | 875               | 0                                    | NR                             |                   |                                      |                                |

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### Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 4.11

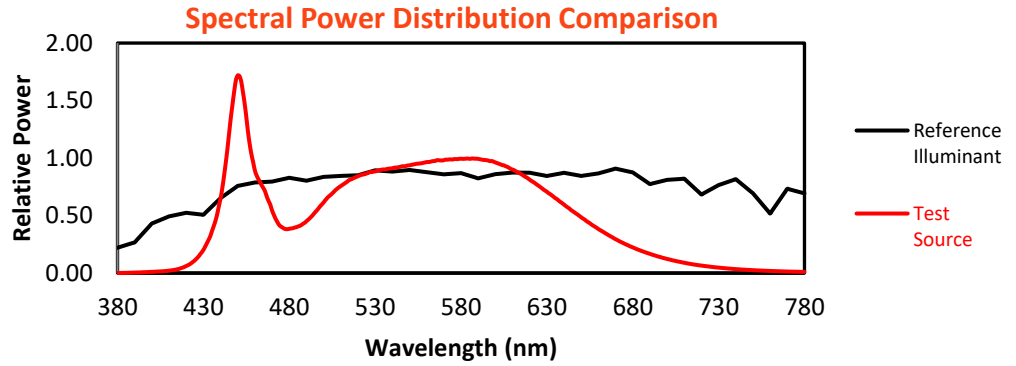
| $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | 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               | 262                                    | NR                             | 620               | 472                                    | NR                             | 750               | 15                                     | NR                             | 880               | 0                                      | NR                             |
| 365               | 0                                      | NR                             | 495               | 307                                    | NR                             | 625               | 443                                    | NR                             | 755               | 13                                     | NR                             | 885               | 0                                      | NR                             |
| 370               | 0                                      | NR                             | 500               | 358                                    | NR                             | 630               | 412                                    | NR                             | 760               | 11                                     | NR                             | 890               | 0                                      | NR                             |
| 375               | 0                                      | NR                             | 505               | 403                                    | NR                             | 635               | 379                                    | NR                             | 765               | 9                                      | NR                             | 895               | 0                                      | NR                             |
| 380               | 0                                      | NR                             | 510               | 440                                    | NR                             | 640               | 346                                    | NR                             | 770               | 8                                      | NR                             | 900               | 0                                      | NR                             |
| 385               | 1                                      | NR                             | 515               | 471                                    | NR                             | 645               | 313                                    | NR                             | 775               | 7                                      | NR                             | 905               | 0                                      | NR                             |
| 390               | 3                                      | NR                             | 520               | 490                                    | NR                             | 650               | 282                                    | NR                             | 780               | 6                                      | NR                             | 910               | 0                                      | NR                             |
| 395               | 4                                      | NR                             | 525               | 504                                    | NR                             | 655               | 252                                    | NR                             | 785               | 5                                      | NR                             | 915               | 0                                      | NR                             |
| 400               | 6                                      | NR                             | 530               | 515                                    | NR                             | 660               | 223                                    | NR                             | 790               | 4                                      | NR                             | 920               | 0                                      | NR                             |
| 405               | 9                                      | NR                             | 535               | 524                                    | NR                             | 665               | 197                                    | NR                             | 795               | 4                                      | NR                             | 925               | 0                                      | NR                             |
| 410               | 12                                     | NR                             | 540               | 530                                    | NR                             | 670               | 171                                    | NR                             | 800               | 3                                      | NR                             | 930               | 0                                      | NR                             |
| 415               | 20                                     | NR                             | 545               | 539                                    | NR                             | 675               | 149                                    | NR                             | 805               | 3                                      | NR                             | 935               | 0                                      | NR                             |
| 420               | 36                                     | NR                             | 550               | 545                                    | NR                             | 680               | 130                                    | NR                             | 810               | 2                                      | NR                             | 940               | 0                                      | NR                             |
| 425               | 64                                     | NR                             | 555               | 554                                    | NR                             | 685               | 112                                    | NR                             | 815               | 2                                      | NR                             | 945               | 0                                      | NR                             |
| 430               | 117                                    | NR                             | 560               | 562                                    | NR                             | 690               | 97                                     | NR                             | 820               | 2                                      | NR                             | 950               | 0                                      | NR                             |
| 435               | 212                                    | NR                             | 565               | 567                                    | NR                             | 695               | 83                                     | NR                             | 825               | 2                                      | NR                             | 955               | 0                                      | NR                             |
| 440               | 378                                    | NR                             | 570               | 571                                    | NR                             | 700               | 71                                     | NR                             | 830               | 1                                      | NR                             | 960               | 0                                      | NR                             |
| 445               | 709                                    | NR                             | 575               | 574                                    | NR                             | 705               | 61                                     | NR                             | 835               | 1                                      | NR                             | 965               | 0                                      | NR                             |
| 450               | 1000                                   | NR                             | 580               | 579                                    | NR                             | 710               | 52                                     | NR                             | 840               | 1                                      | NR                             | 970               | 0                                      | NR                             |
| 455               | 789                                    | NR                             | 585               | 578                                    | NR                             | 715               | 44                                     | NR                             | 845               | 1                                      | NR                             | 975               | 0                                      | NR                             |
| 460               | 519                                    | NR                             | 590               | 578                                    | NR                             | 720               | 38                                     | NR                             | 850               | 1                                      | NR                             | 980               | 0                                      | NR                             |
| 465               | 429                                    | NR                             | 595               | 571                                    | NR                             | 725               | 32                                     | NR                             | 855               | 1                                      | NR                             | 985               | 0                                      | NR                             |
| 470               | 316                                    | NR                             | 600               | 560                                    | NR                             | 730               | 28                                     | NR                             | 860               | 1                                      | NR                             | 990               | 0                                      | NR                             |
| 475               | 236                                    | NR                             | 605               | 545                                    | NR                             | 735               | 24                                     | NR                             | 865               | 1                                      | NR                             | 995               | 0                                      | NR                             |
| 480               | 224                                    | NR                             | 610               | 524                                    | NR                             | 740               | 20                                     | NR                             | 870               | 0                                      | NR                             | 1000              | 0                                      | NR                             |
| 485               | 235                                    | NR                             | 615               | 501                                    | NR                             | 745               | 17                                     | NR                             | 875               | 0                                      | NR                             |                   |                                        |                                |

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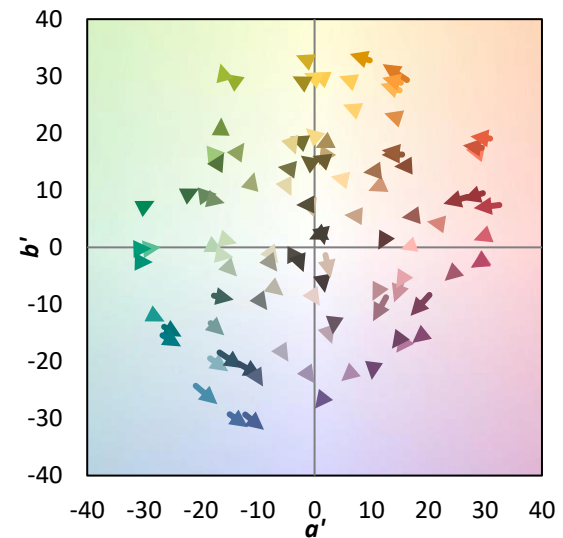
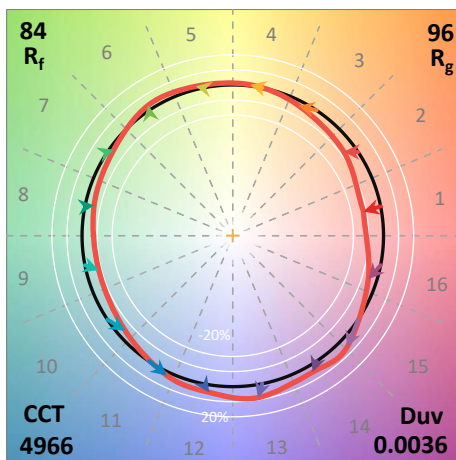
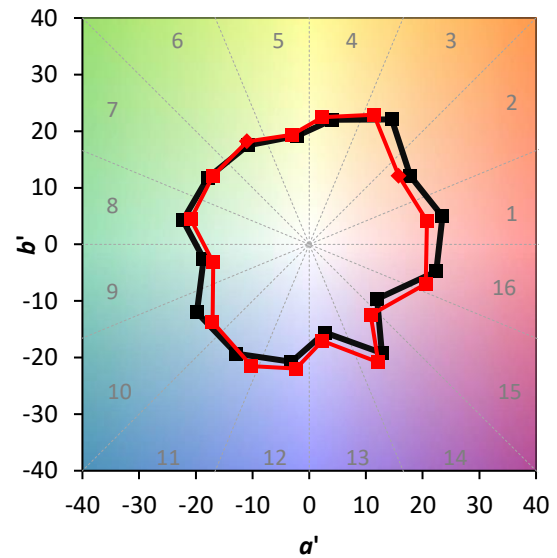
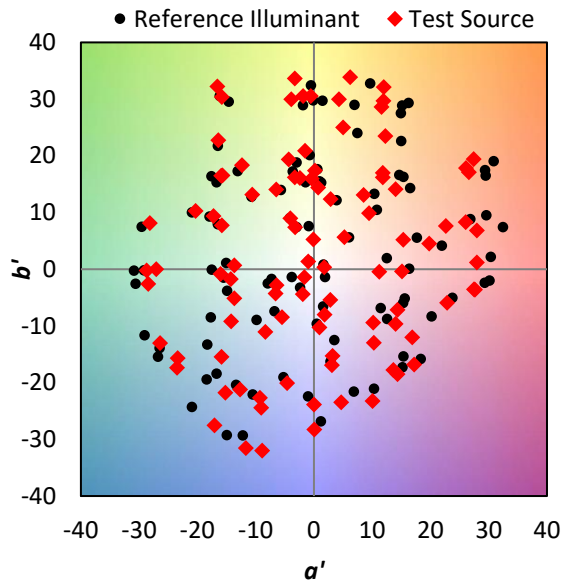
TM-30-18

### Summary

$R_f = 84$   
 $R_g = 96.2$   
 $CIE R_a = 83.1$   
 $R_9 = 10.3$



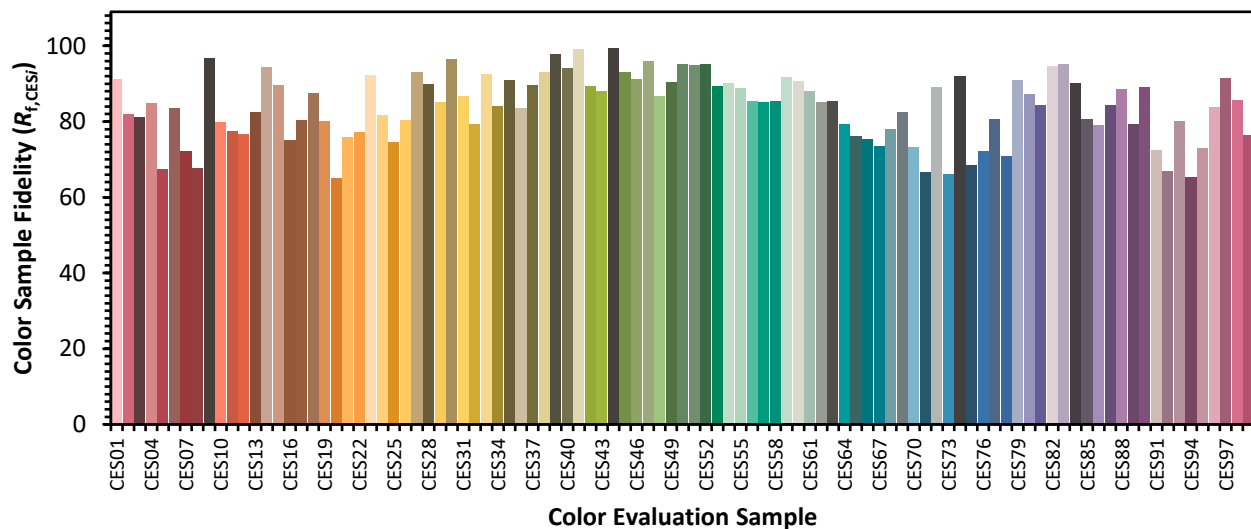
### Color Vector Graphics



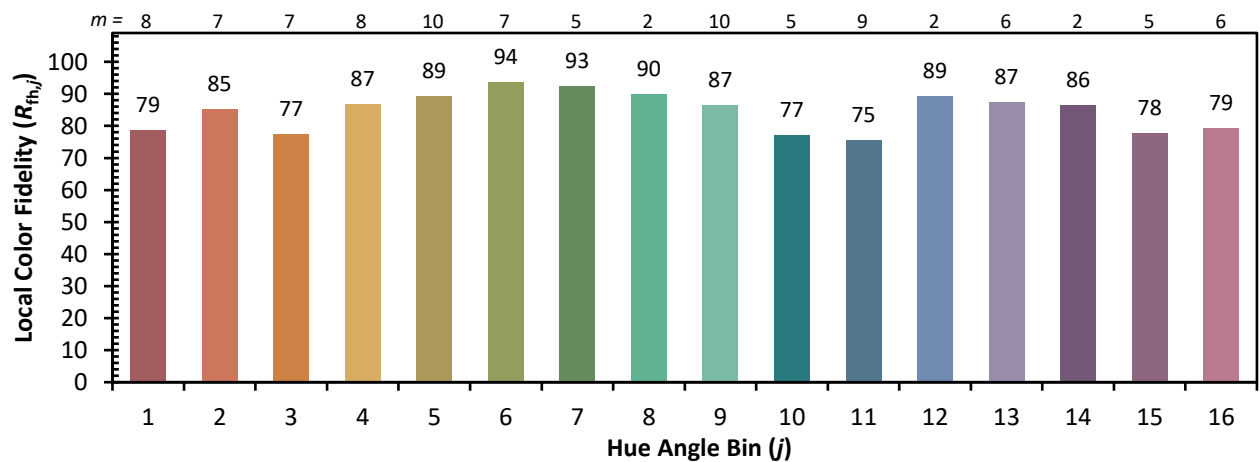
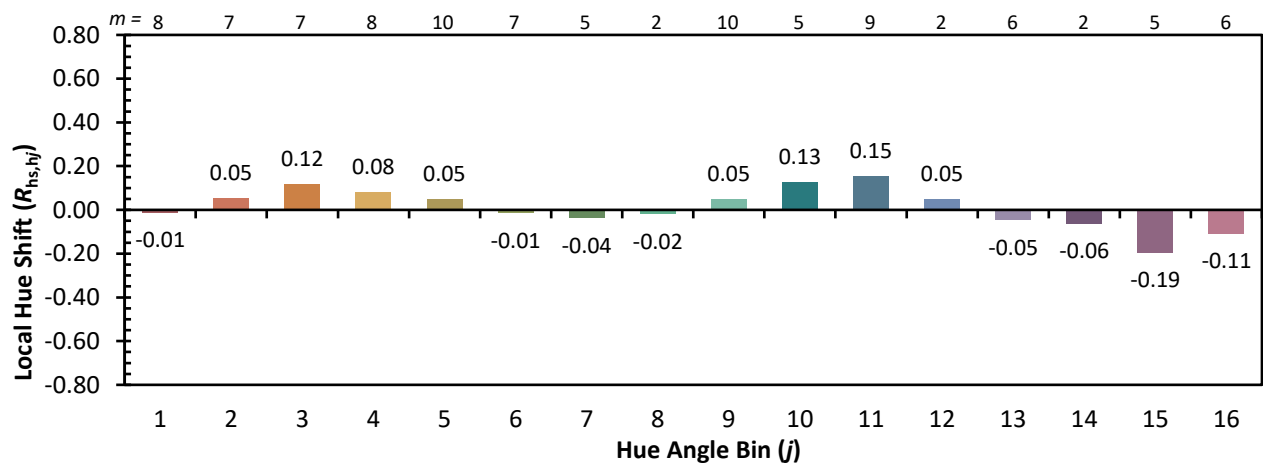
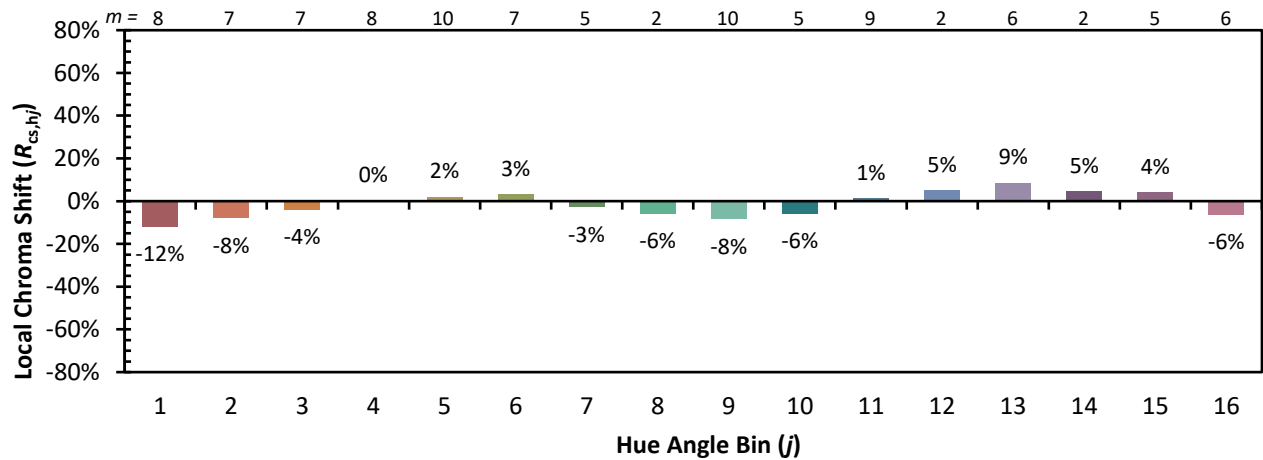


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

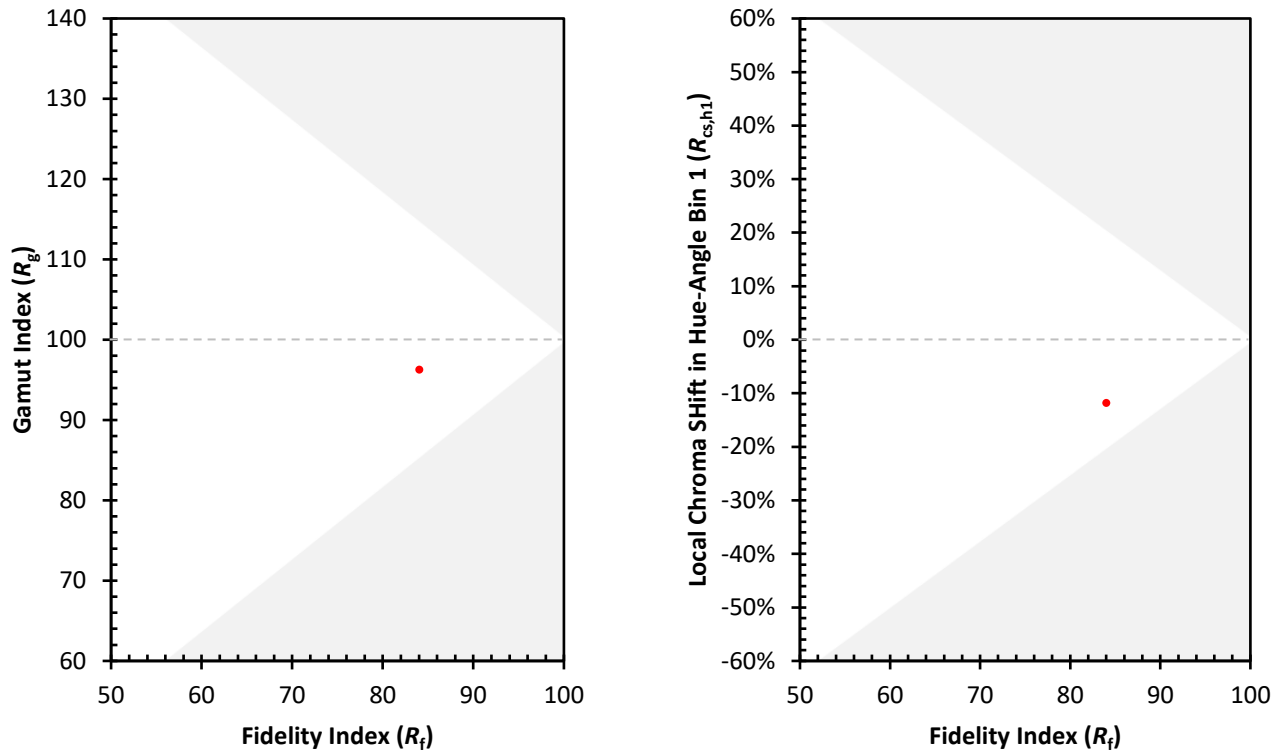
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 80 | CES51 = 95 | CES76 = 72 |
| CES02 = 60 | CES27 = 93 | CES52 = 95 | CES77 = 81 |
| CES03 = 30 | CES28 = 90 | CES53 = 89 | CES78 = 71 |
| CES04 = 69 | CES29 = 85 | CES54 = 90 | CES79 = 91 |
| CES05 = 47 | CES30 = 97 | CES55 = 89 | CES80 = 87 |
| CES06 = 50 | CES31 = 87 | CES56 = 86 | CES81 = 84 |
| CES07 = 40 | CES32 = 79 | CES57 = 85 | CES82 = 95 |
| CES08 = 39 | CES33 = 92 | CES58 = 85 | CES83 = 95 |
| CES09 = 29 | CES34 = 84 | CES59 = 92 | CES84 = 90 |
| CES10 = 73 | CES35 = 91 | CES60 = 91 | CES85 = 81 |
| CES11 = 56 | CES36 = 83 | CES61 = 88 | CES86 = 79 |
| CES12 = 62 | CES37 = 90 | CES62 = 85 | CES87 = 84 |
| CES13 = 42 | CES38 = 93 | CES63 = 85 | CES88 = 89 |
| CES14 = 74 | CES39 = 98 | CES64 = 79 | CES89 = 79 |
| CES15 = 71 | CES40 = 94 | CES65 = 76 | CES90 = 89 |
| CES16 = 46 | CES41 = 99 | CES66 = 75 | CES91 = 72 |
| CES17 = 48 | CES42 = 89 | CES67 = 73 | CES92 = 67 |
| CES18 = 55 | CES43 = 88 | CES68 = 78 | CES93 = 80 |
| CES19 = 70 | CES44 = 99 | CES69 = 82 | CES94 = 65 |
| CES20 = 64 | CES45 = 93 | CES70 = 73 | CES95 = 73 |
| CES21 = 85 | CES46 = 91 | CES71 = 67 | CES96 = 84 |
| CES22 = 77 | CES47 = 96 | CES72 = 89 | CES97 = 92 |
| CES23 = 91 | CES48 = 87 | CES73 = 66 | CES98 = 86 |
| CES24 = 90 | CES49 = 90 | CES74 = 92 | CES99 = 77 |
| CES25 = 71 | CES50 = 95 | CES75 = 68 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)