

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: P1215783

Luminaire Tested: 24-ID2-30-CFD1-L940-U

Issue Date: 12/5/2025

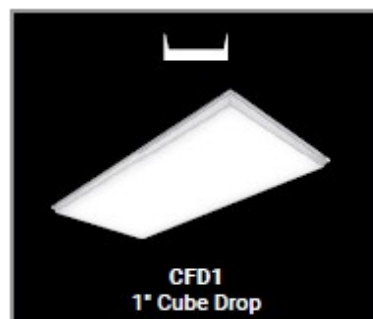
**Test Information**

Test Method: LM-79-2019  
Report Number: P1215783  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-2508-510-8)  
Test Lab: INNOVATION CENTER  
Issue Date: 12/5/2025  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: CORELITE  
Catalog Number: 24-ID2-30-CFD1-L940-U  
Description: 2X4 IN DEPTH TROFFER WITH 1INCH CUBE DROP LENS  
Light Source: 4000K CCT, 90 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

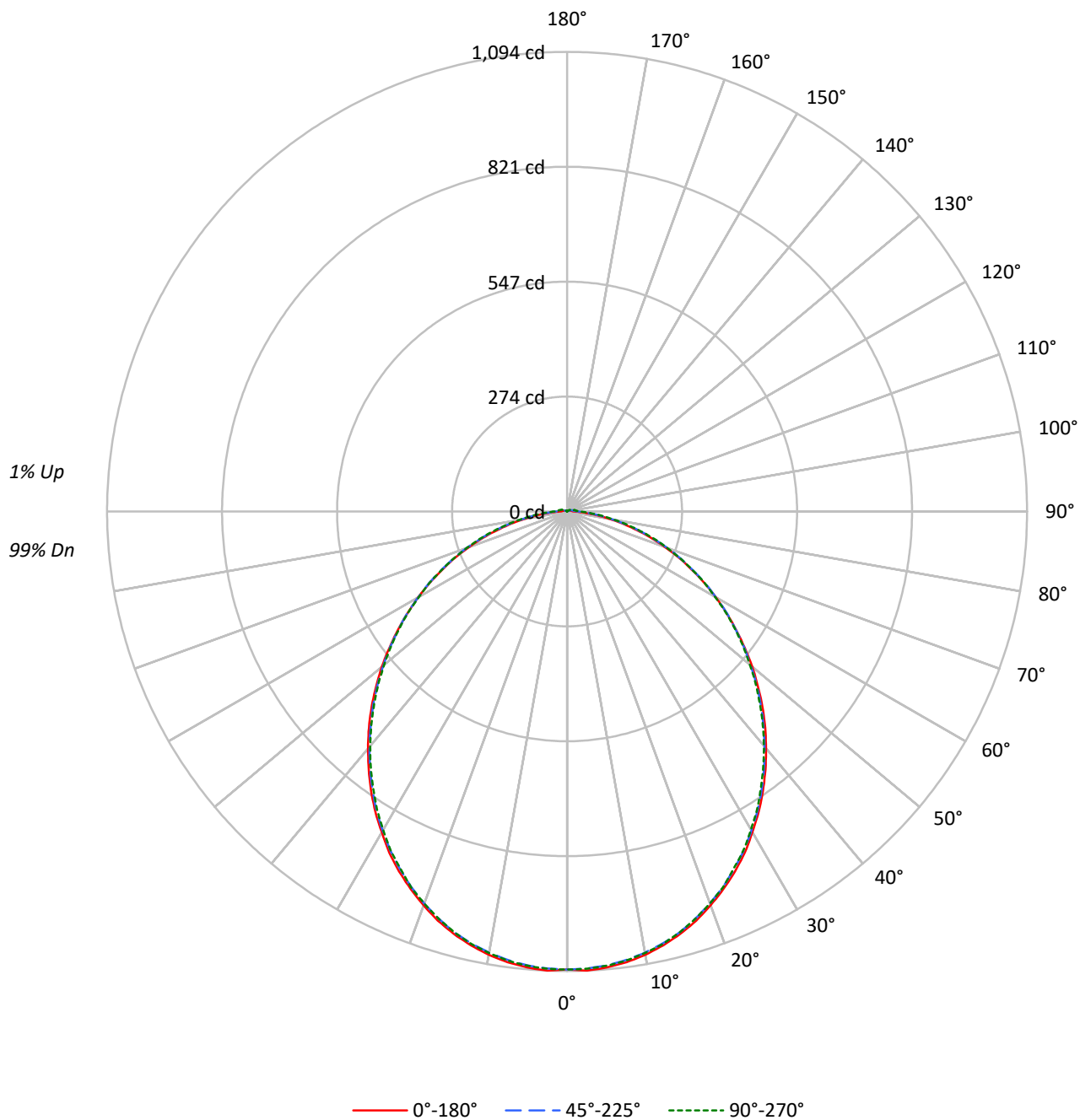
Lumens per Lamp: N/A  
Luminaire Lumens: 2898.5 lumens  
Efficiency: N/A  
Efficacy: 111.1 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.2 / 1.31  
Luminous Opening: Rectangular w/ Sides (W: 2' x L: 4' x H: 0.08')  
CIE Type: Direct

Input Watts (W): 26.1  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



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CATALOG NUMBER: 24-ID2-30-CFD1-L940-U

### Luminous Intensity Polar Plot



TEST NUMBER: P1215783  
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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 | 101 | 101 | 101 | 99 |    |    |
| 1   | 108 | 104 | 99  | 96  | 106 | 101 | 97  | 94  | 97  | 94  | 91  | 93  | 90  | 88  | 89  | 87  | 85  | 83 |    |    |
| 2   | 99  | 91  | 84  | 78  | 96  | 89  | 82  | 77  | 85  | 80  | 75  | 81  | 77  | 73  | 78  | 74  | 71  | 69 |    |    |
| 3   | 90  | 80  | 72  | 65  | 88  | 78  | 71  | 65  | 75  | 68  | 63  | 72  | 66  | 62  | 69  | 65  | 61  | 58 |    |    |
| 4   | 83  | 71  | 62  | 55  | 80  | 69  | 61  | 55  | 67  | 60  | 54  | 64  | 58  | 53  | 62  | 57  | 52  | 50 |    |    |
| 5   | 76  | 63  | 54  | 48  | 74  | 62  | 54  | 48  | 60  | 53  | 47  | 58  | 51  | 46  | 56  | 50  | 46  | 44 |    |    |
| 6   | 70  | 57  | 48  | 42  | 68  | 56  | 48  | 42  | 54  | 47  | 41  | 52  | 46  | 41  | 51  | 45  | 40  | 38 |    |    |
| 7   | 65  | 52  | 43  | 37  | 64  | 51  | 43  | 37  | 49  | 42  | 37  | 48  | 41  | 36  | 46  | 40  | 36  | 34 |    |    |
| 8   | 61  | 47  | 39  | 33  | 59  | 47  | 39  | 33  | 45  | 38  | 33  | 44  | 37  | 33  | 43  | 37  | 32  | 30 |    |    |
| 9   | 57  | 44  | 35  | 30  | 55  | 43  | 35  | 30  | 42  | 35  | 30  | 41  | 34  | 29  | 39  | 34  | 29  | 27 |    |    |
| 10  | 53  | 40  | 32  | 27  | 52  | 40  | 32  | 27  | 39  | 32  | 27  | 38  | 31  | 27  | 37  | 31  | 27  | 25 |    |    |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1467 | 1467 | 1467 |
| 5°  | 1469 | 1459 | 1461 |
| 10° | 1459 | 1446 | 1448 |
| 15° | 1442 | 1428 | 1429 |
| 20° | 1418 | 1400 | 1401 |
| 25° | 1390 | 1368 | 1367 |
| 30° | 1354 | 1330 | 1328 |
| 35° | 1316 | 1288 | 1284 |
| 40° | 1272 | 1239 | 1238 |
| 45° | 1226 | 1191 | 1187 |
| 50° | 1176 | 1136 | 1134 |
| 55° | 1119 | 1082 | 1082 |
| 60° | 1064 | 1023 | 1022 |
| 65° | 997  | 962  | 964  |
| 70° | 924  | 895  | 899  |
| 75° | 832  | 800  | 819  |
| 80° | 716  | 697  | 725  |
| 85° | 584  | 599  | 664  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
 Vertical Angle: 45°  
 Luminance: 1226 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 103.0  | 3.6       |
| 10°-20°   | 292.2  | 10.1      |
| 20°-30°   | 433.0  | 14.9      |
| 30°-40°   | 504.8  | 17.4      |
| 40°-50°   | 503.3  | 17.4      |
| 50°-60°   | 438.1  | 15.1      |
| 60°-70°   | 326.5  | 11.3      |
| 70°-80°   | 189.5  | 6.5       |
| 80°-90°   | 66.1   | 2.3       |
| 90°-100°  | 19.8   | 0.7       |
| 100°-110° | 11.9   | 0.4       |
| 110°-120° | 6.3    | 0.2       |
| 120°-130° | 2.7    | 0.1       |
| 130°-140° | 0.8    | 0.0       |
| 140°-150° | 0.3    | 0.0       |
| 150°-160° | 0.2    | 0.0       |
| 160°-170° | 0.0    | 0.0       |
| 170°-180° | 0.0    | 0.0       |
| 0°-30°    | 828.2  | 28.6      |
| 0°-40°    | 1333.1 | 46.0      |
| 0°-60°    | 2274.4 | 78.5      |
| 0°-90°    | 2856.5 | 98.6      |
| 90°-120°  | 38.0   | 1.3       |
| 90°-150°  | 41.7   | 1.4       |
| 90°-180°  | 42.0   | 1.4       |
| 0°-180°   | 2898.5 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1090 | 1090  | 1090 | 1090  | 1090 |      |
| 5°   | 1090 | 1086  | 1084 | 1083  | 1085 | 103  |
| 15°  | 1041 | 1038  | 1037 | 1034  | 1037 | 293  |
| 25°  | 945  | 942   | 939  | 938   | 938  | 435  |
| 35°  | 812  | 810   | 807  | 804   | 804  | 508  |
| 45°  | 657  | 655   | 652  | 650   | 649  | 507  |
| 55°  | 491  | 492   | 489  | 489   | 487  | 439  |
| 65°  | 326  | 328   | 330  | 330   | 329  | 324  |
| 75°  | 172  | 176   | 178  | 183   | 181  | 183  |
| 85°  | 46   | 52    | 58   | 61    | 63   | 50   |
| 90°  | 16   | 20    | 26   | 30    | 30   | 10   |
| 95°  | 12   | 14    | 18   | 21    | 22   | 9    |
| 105° | 8    | 8     | 11   | 14    | 15   | 8    |
| 115° | 5    | 4     | 6    | 8     | 10   | 5    |
| 125° | 3    | 2     | 2    | 4     | 5    | 2    |
| 135° | 1    | 1     | 0    | 1     | 2    | 1    |
| 145° | 0    | 0     | 0    | 0     | 0    | 0    |
| 155° | 0    | 0     | 0    | 0     | 0    | 0    |
| 165° | 0    | 0     | 0    | 0     | 0    | 0    |
| 175° | 0    | 0     | 0    | 0     | 0    | 0    |
| 180° | 0    | 0     | 0    | 0     | 0    | 0    |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1090.4 | 1090.4 | 1090.4 | 1090.4 | 1090.4 |
| 2.5°   | 1094.0 | 1090.8 | 1088.5 | 1087.7 | 1089.6 |
| 5°     | 1089.6 | 1086.1 | 1084.5 | 1083.3 | 1085.3 |
| 7.5°   | 1082.2 | 1079.4 | 1077.0 | 1075.8 | 1078.2 |
| 10°    | 1071.5 | 1068.0 | 1066.4 | 1065.2 | 1067.6 |
| 12.5°  | 1057.7 | 1054.5 | 1053.0 | 1051.8 | 1054.2 |
| 15°    | 1041.1 | 1037.6 | 1036.8 | 1034.4 | 1036.8 |
| 17.5°  | 1021.4 | 1018.3 | 1015.9 | 1015.1 | 1016.3 |
| 20°    | 997.8  | 995.8  | 993.0  | 992.2  | 993.0  |
| 22.5°  | 972.5  | 970.2  | 967.8  | 966.2  | 968.6  |
| 25°    | 945.3  | 942.5  | 939.4  | 938.2  | 937.8  |
| 27.5°  | 915.7  | 912.2  | 909.8  | 907.4  | 909.0  |
| 30°    | 881.4  | 879.8  | 877.1  | 875.5  | 874.7  |
| 32.5°  | 848.3  | 847.1  | 843.6  | 840.4  | 841.2  |
| 35°    | 812.4  | 810.0  | 807.3  | 804.5  | 803.7  |
| 37.5°  | 774.9  | 772.6  | 769.4  | 767.1  | 766.7  |
| 40°    | 736.3  | 734.7  | 730.8  | 728.4  | 728.4  |
| 42.5°  | 697.6  | 695.7  | 691.3  | 690.1  | 689.0  |
| 45°    | 657.4  | 654.7  | 652.3  | 649.9  | 648.7  |
| 47.5°  | 615.6  | 614.0  | 611.3  | 609.7  | 608.9  |
| 50°    | 575.0  | 573.0  | 570.3  | 569.1  | 567.5  |
| 52.5°  | 532.4  | 532.4  | 530.4  | 529.2  | 527.7  |
| 55°    | 490.6  | 491.8  | 489.0  | 489.4  | 487.4  |
| 57.5°  | 449.2  | 450.4  | 450.8  | 448.0  | 447.6  |
| 60°    | 409.0  | 409.4  | 408.2  | 408.2  | 406.2  |
| 62.5°  | 367.6  | 368.7  | 370.7  | 369.5  | 369.1  |
| 65°    | 326.5  | 328.5  | 329.7  | 330.5  | 328.9  |
| 67.5°  | 288.3  | 290.3  | 292.2  | 291.4  | 291.0  |
| 70°    | 247.7  | 250.0  | 254.0  | 255.6  | 253.6  |
| 72.5°  | 209.8  | 213.0  | 214.9  | 217.3  | 218.1  |
| 75°    | 171.9  | 175.5  | 178.3  | 182.6  | 181.0  |
| 77.5°  | 136.5  | 140.8  | 144.3  | 147.9  | 147.9  |
| 80°    | 102.9  | 107.3  | 111.6  | 115.6  | 114.8  |
| 82.5°  | 72.6   | 77.7   | 82.0   | 86.4   | 87.2   |
| 85°    | 46.5   | 52.1   | 57.6   | 61.1   | 62.7   |
| 87.5°  | 28.0   | 32.3   | 38.3   | 42.2   | 43.8   |
| 90°    | 15.8   | 20.1   | 25.6   | 29.6   | 30.4   |
| 92.5°  | 13.0   | 15.8   | 20.5   | 24.1   | 24.5   |
| 95°    | 11.8   | 14.2   | 18.5   | 20.9   | 21.7   |
| 97.5°  | 10.6   | 12.2   | 16.6   | 19.3   | 20.1   |
| 100°   | 9.9    | 10.6   | 14.6   | 17.4   | 18.1   |
| 102.5° | 8.7    | 9.5    | 13.0   | 15.4   | 16.6   |
| 105°   | 7.9    | 7.9    | 11.4   | 13.8   | 15.0   |
| 107.5° | 7.1    | 6.7    | 9.9    | 12.2   | 13.4   |
| 110°   | 6.3    | 5.5    | 8.7    | 10.6   | 12.2   |

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CATALOG NUMBER: 24-ID2-30-CFD1-L940-U

**CANDELA DISTRIBUTION (continued):**

|        | 0°  | 22.5° | 45° | 67.5° | 90°  |
|--------|-----|-------|-----|-------|------|
| 112.5° | 5.5 | 4.7   | 7.1 | 9.1   | 10.6 |
| 115°   | 4.7 | 3.9   | 5.9 | 7.9   | 9.5  |
| 117.5° | 3.9 | 3.5   | 4.7 | 6.7   | 8.3  |
| 120°   | 3.5 | 2.8   | 3.9 | 5.9   | 7.1  |
| 122.5° | 3.2 | 2.4   | 2.8 | 4.7   | 5.9  |
| 125°   | 2.8 | 2.0   | 2.0 | 3.9   | 5.1  |
| 127.5° | 2.0 | 1.6   | 1.2 | 3.2   | 3.9  |
| 130°   | 2.0 | 1.2   | 0.8 | 2.4   | 3.2  |
| 132.5° | 1.6 | 1.2   | 0.4 | 1.6   | 2.4  |
| 135°   | 1.2 | 0.8   | 0.4 | 1.2   | 1.6  |
| 137.5° | 0.8 | 0.8   | 0.4 | 0.8   | 1.2  |
| 140°   | 0.8 | 0.4   | 0.4 | 0.4   | 0.8  |
| 142.5° | 0.4 | 0.4   | 0.4 | 0.4   | 0.4  |
| 145°   | 0.4 | 0.4   | 0.4 | 0.4   | 0.4  |
| 147.5° | 0.4 | 0.4   | 0.4 | 0.4   | 0.4  |
| 150°   | 0.4 | 0.4   | 0.4 | 0.4   | 0.4  |
| 152.5° | 0.4 | 0.4   | 0.4 | 0.4   | 0.4  |
| 155°   | 0.4 | 0.4   | 0.4 | 0.4   | 0.4  |
| 157.5° | 0.4 | 0.4   | 0.4 | 0.4   | 0.4  |
| 160°   | 0.8 | 0.4   | 0.4 | 0.4   | 0.4  |
| 162.5° | 0.0 | 0.0   | 0.0 | 0.0   | 0.0  |
| 165°   | 0.0 | 0.0   | 0.0 | 0.0   | 0.0  |
| 167.5° | 0.0 | 0.0   | 0.0 | 0.0   | 0.0  |
| 170°   | 0.0 | 0.0   | 0.0 | 0.0   | 0.0  |
| 172.5° | 0.0 | 0.0   | 0.0 | 0.0   | 0.0  |
| 175°   | 0.0 | 0.0   | 0.0 | 0.0   | 0.0  |
| 177.5° | 0.0 | 0.0   | 0.0 | 0.0   | 0.0  |
| 180°   | 0.0 | 0.0   | 0.0 | 0.0   | 0.0  |

TEST NUMBER: P1215783

CATALOG NUMBER: 24-ID2-30-CFD1-L940-U

**CIE UGR TABLE:**

| Reflectances:   |      |                  |       |       |       |       |                |       |       |       |       |
|-----------------|------|------------------|-------|-------|-------|-------|----------------|-------|-------|-------|-------|
| Ceiling         |      | 0.7              | 0.7   | 0.5   | 0.5   | 0.3   | 0.7            | 0.7   | 0.5   | 0.5   | 0.3   |
| Wall            |      | 0.5              | 0.3   | 0.5   | 0.3   | 0.3   | 0.5            | 0.3   | 0.5   | 0.3   | 0.3   |
| Reference plane |      | 0.2              | 0.2   | 0.2   | 0.2   | 0.2   | 0.2            | 0.2   | 0.2   | 0.2   | 0.2   |
| Room dimensions |      | Viewed crosswise |       |       |       |       | Viewed endwise |       |       |       |       |
| X=2H            | Y=2H | 12.11            | 13.69 | 12.50 | 14.04 | 14.39 | 12.14          | 13.72 | 12.53 | 14.07 | 14.42 |
|                 | 3H   | 13.79            | 15.22 | 14.19 | 15.58 | 15.97 | 13.90          | 15.33 | 14.30 | 15.69 | 16.08 |
|                 | 4H   | 14.39            | 15.74 | 14.81 | 16.12 | 16.53 | 14.57          | 15.92 | 14.99 | 16.29 | 16.71 |
|                 | 6H   | 14.82            | 16.07 | 15.25 | 16.46 | 16.89 | 15.09          | 16.34 | 15.52 | 16.73 | 17.16 |
|                 | 8H   | 14.94            | 16.14 | 15.39 | 16.56 | 16.99 | 15.27          | 16.46 | 15.72 | 16.88 | 17.32 |
|                 | 12H  | 15.02            | 16.17 | 15.48 | 16.58 | 17.04 | 15.42          | 16.57 | 15.88 | 16.98 | 17.44 |
| 4H              | 2H   | 12.70            | 14.05 | 13.13 | 14.43 | 14.84 | 12.73          | 14.08 | 13.15 | 14.46 | 14.87 |
|                 | 3H   | 14.60            | 15.74 | 15.04 | 16.16 | 16.60 | 14.71          | 15.84 | 15.14 | 16.26 | 16.70 |
|                 | 4H   | 15.33            | 16.36 | 15.79 | 16.80 | 17.27 | 15.51          | 16.53 | 15.96 | 16.98 | 17.45 |
|                 | 6H   | 15.88            | 16.78 | 16.36 | 17.25 | 17.73 | 16.16          | 17.05 | 16.64 | 17.52 | 18.01 |
|                 | 8H   | 16.05            | 16.89 | 16.54 | 17.36 | 17.86 | 16.40          | 17.24 | 16.88 | 17.71 | 18.21 |
|                 | 12H  | 16.17            | 16.93 | 16.68 | 17.43 | 17.93 | 16.61          | 17.36 | 17.11 | 17.86 | 18.37 |
| 8H              | 4H   | 15.63            | 16.47 | 16.12 | 16.94 | 17.44 | 15.79          | 16.63 | 16.27 | 17.10 | 17.60 |
|                 | 6H   | 16.30            | 17.00 | 16.82 | 17.51 | 18.02 | 16.56          | 17.26 | 17.08 | 17.78 | 18.29 |
|                 | 8H   | 16.54            | 17.17 | 17.07 | 17.70 | 18.22 | 16.88          | 17.51 | 17.42 | 18.04 | 18.56 |
|                 | 12H  | 16.73            | 17.29 | 17.26 | 17.81 | 18.40 | 17.19          | 17.74 | 17.72 | 18.26 | 18.85 |
| 12H             | 4H   | 15.67            | 16.42 | 16.17 | 16.93 | 17.43 | 15.82          | 16.57 | 16.32 | 17.07 | 17.58 |
|                 | 6H   | 16.36            | 16.99 | 16.89 | 17.52 | 18.04 | 16.61          | 17.24 | 17.14 | 17.77 | 18.29 |
|                 | 8H   | 16.66            | 17.22 | 17.19 | 17.73 | 18.32 | 16.99          | 17.55 | 17.52 | 18.06 | 18.66 |

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

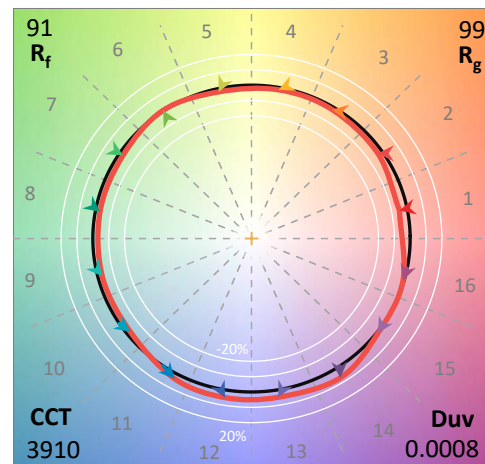
### Test Information

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

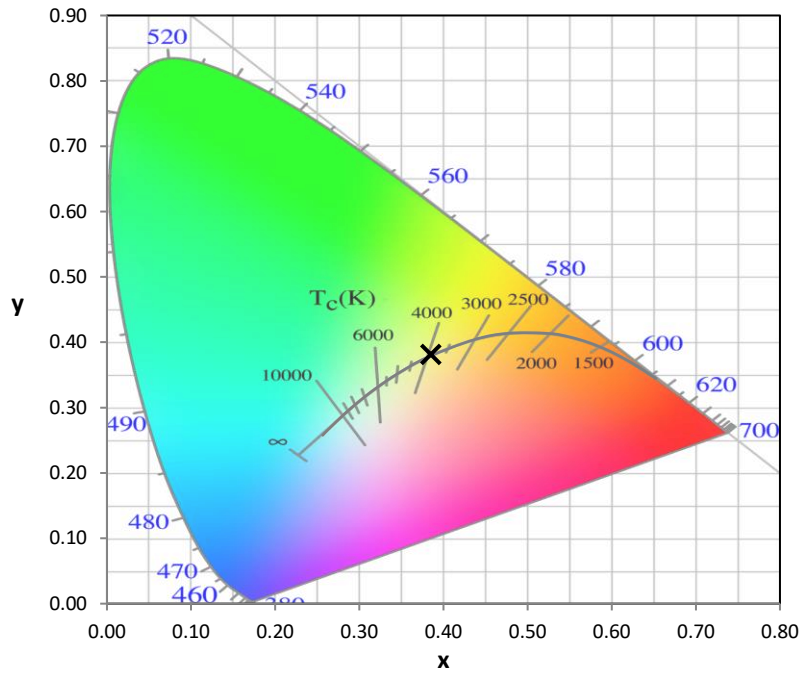
Stabilization Time: 31M  
 Operation Time: 1H 31M  
 Sphere Temperature (°C): 25.2.

REPORT NUMBER: SP1-2506-458-11

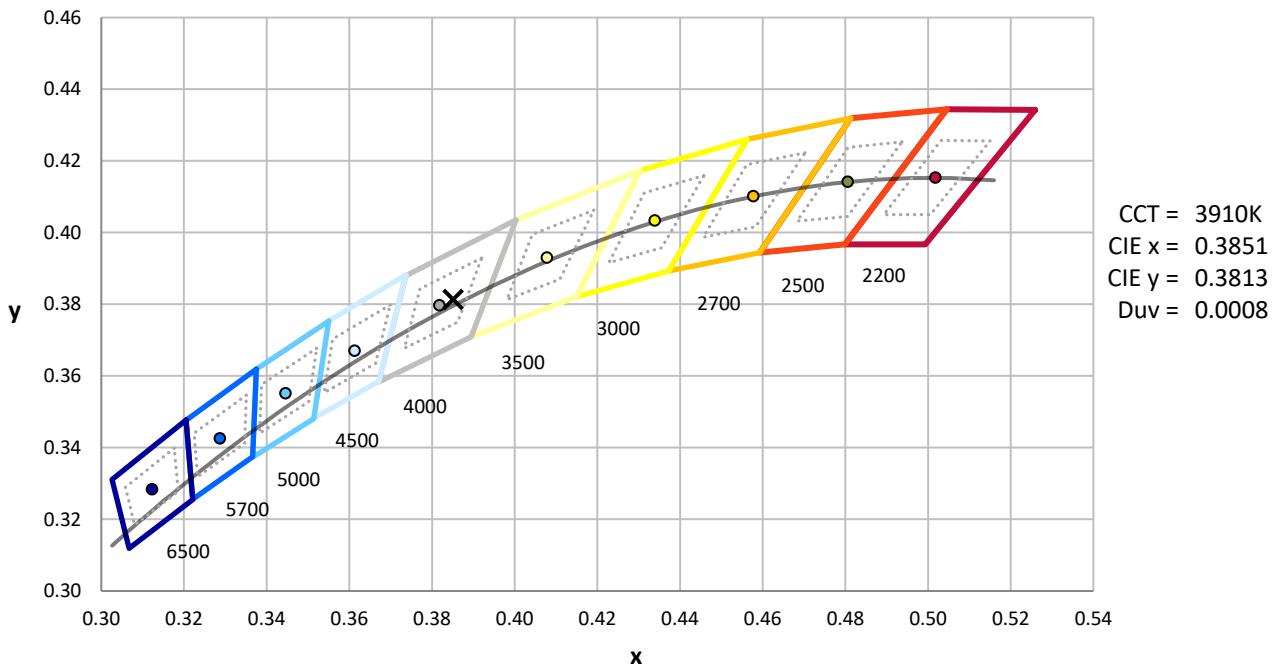
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date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



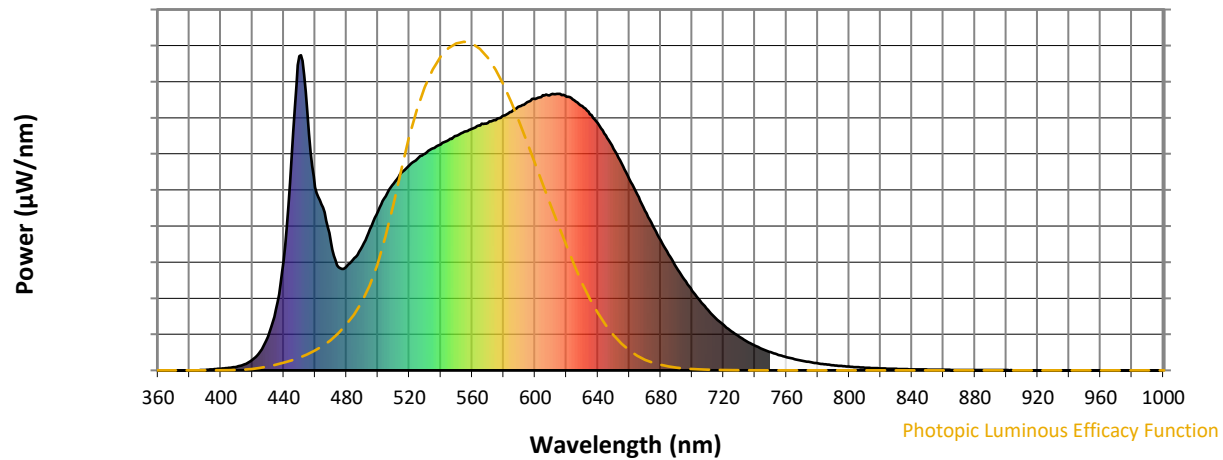
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 4000K 4-step quadrangle

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### Photopic Flux vs. Wavelength

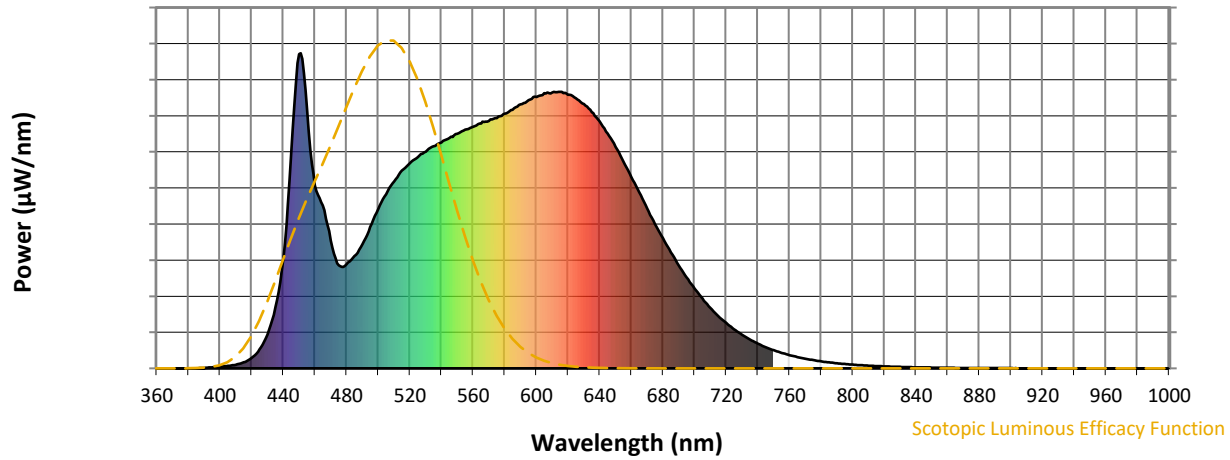


### Photopic Lumens: NR

| 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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### Scotopic Flux vs. Wavelength



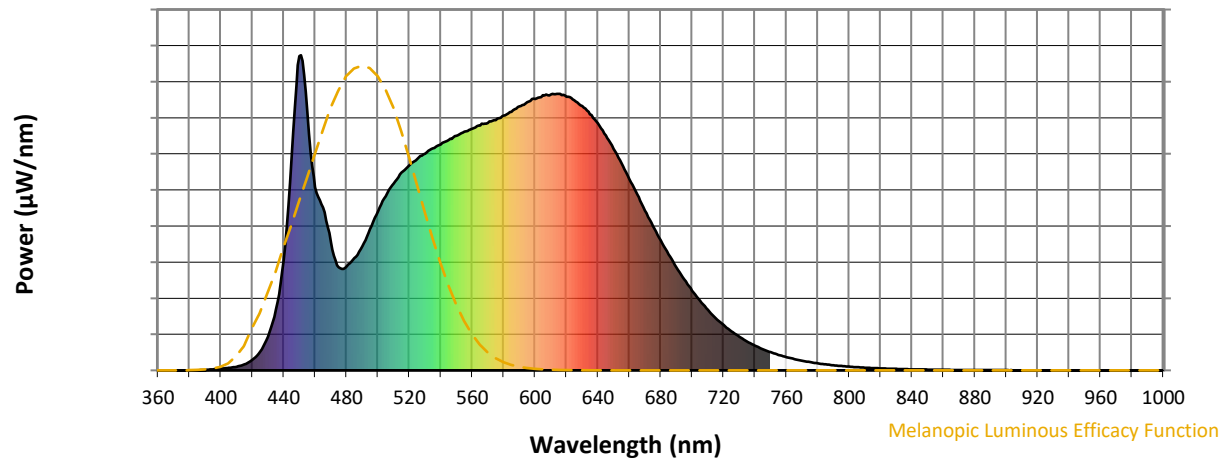
Scotopic Lumens: NR

S/P: 1.75

| 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    | 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**

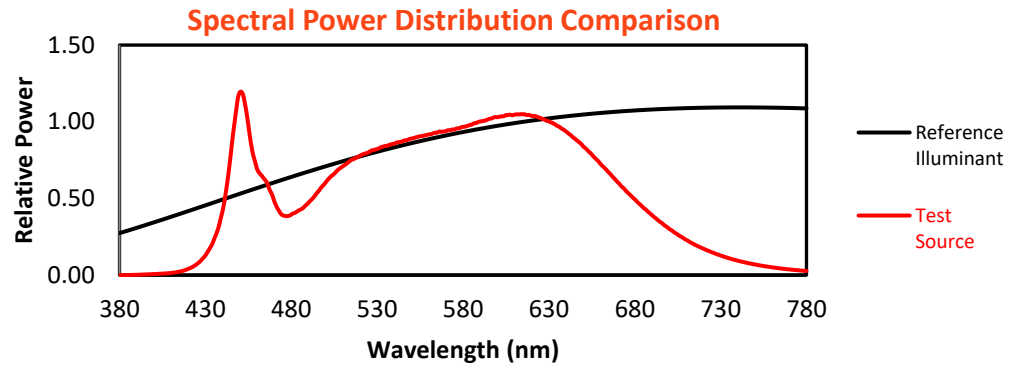
| $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power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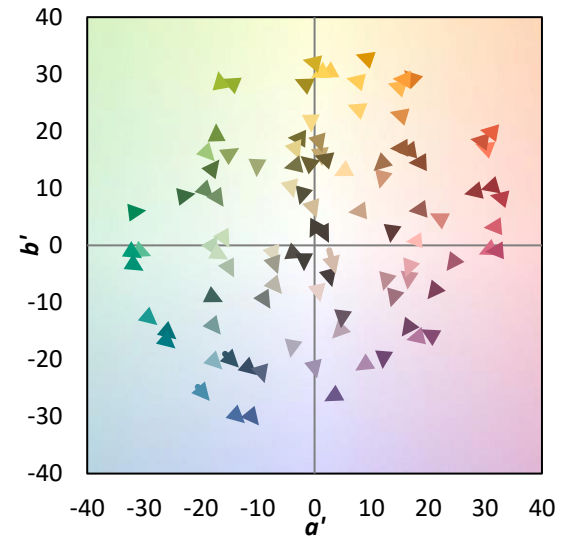
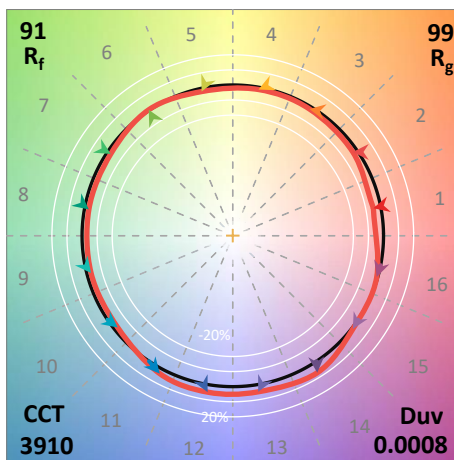
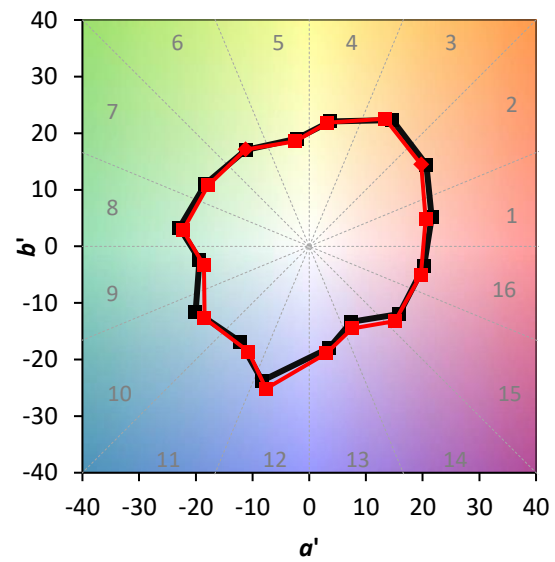
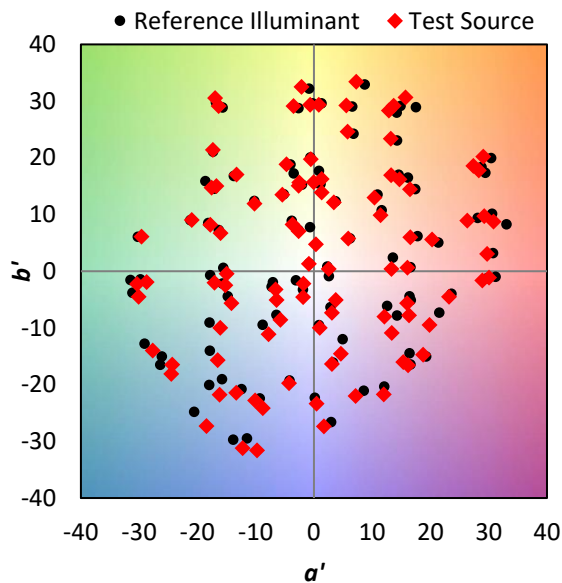
TM-30-18

### Summary

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

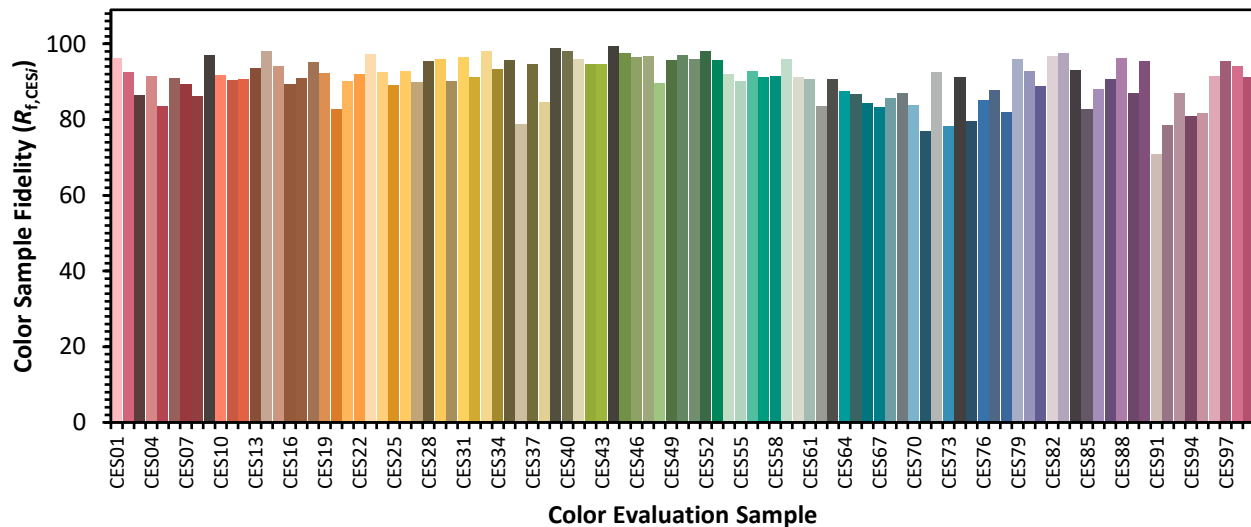


### Color Vector Graphics

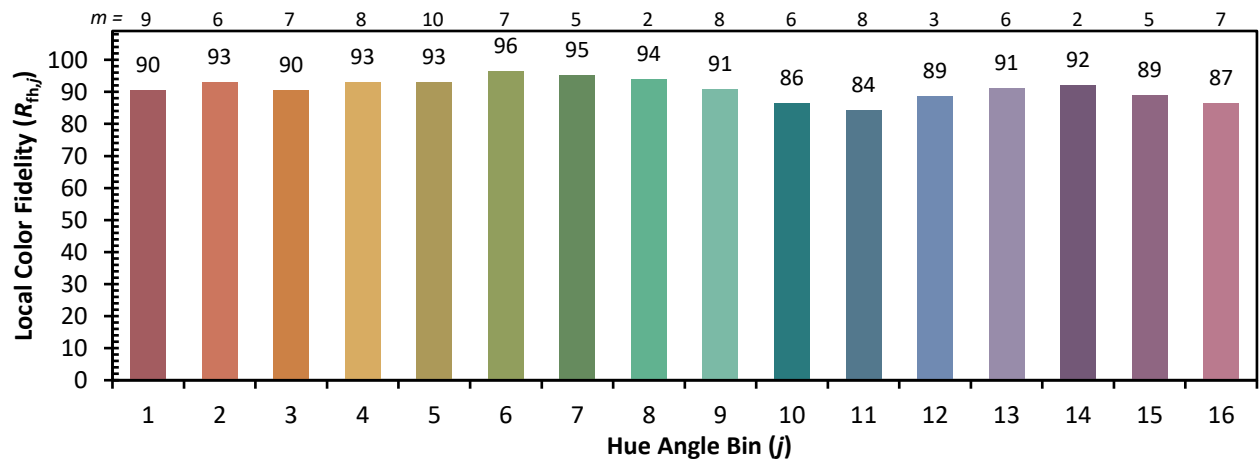
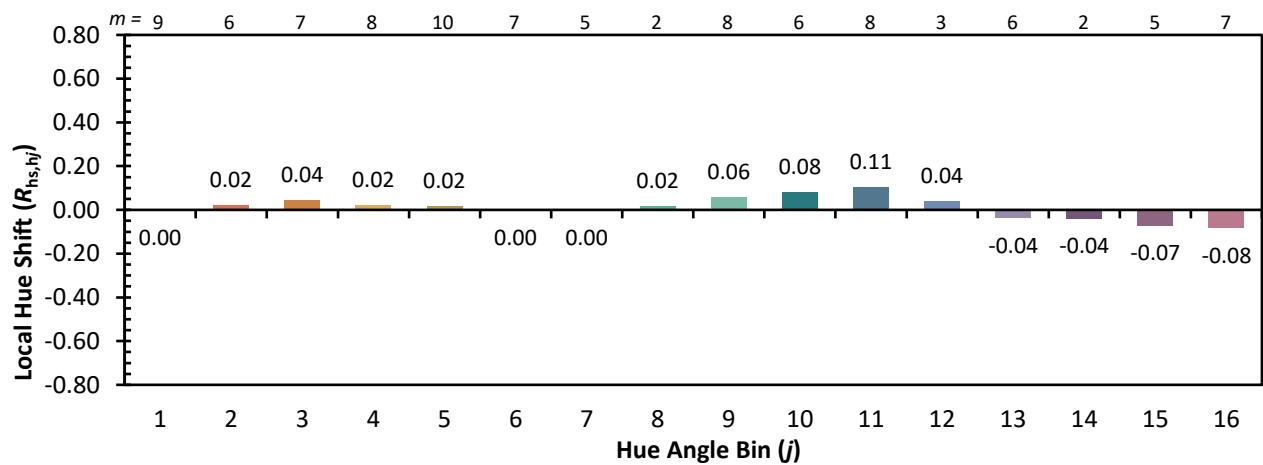
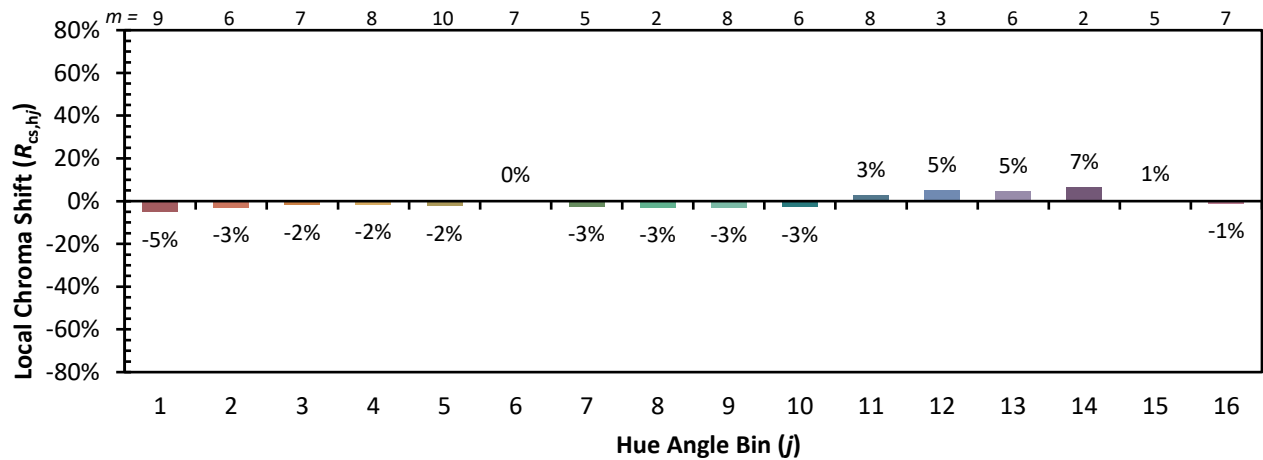


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

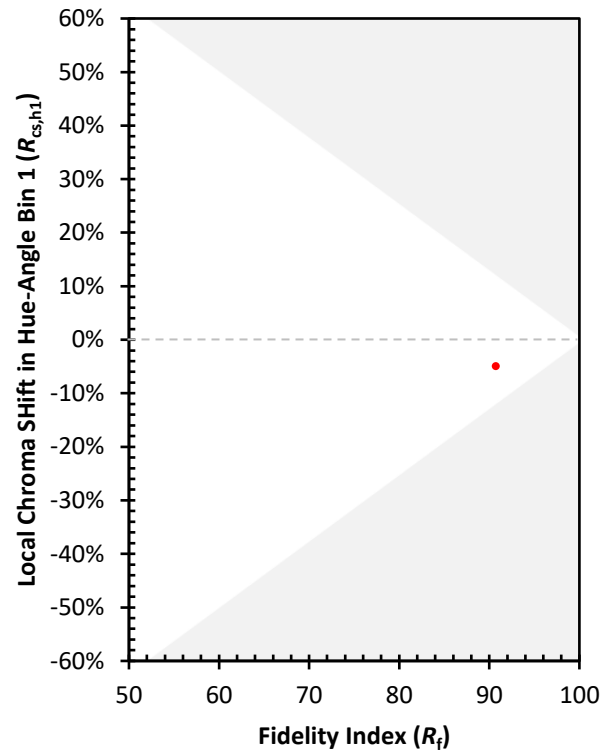
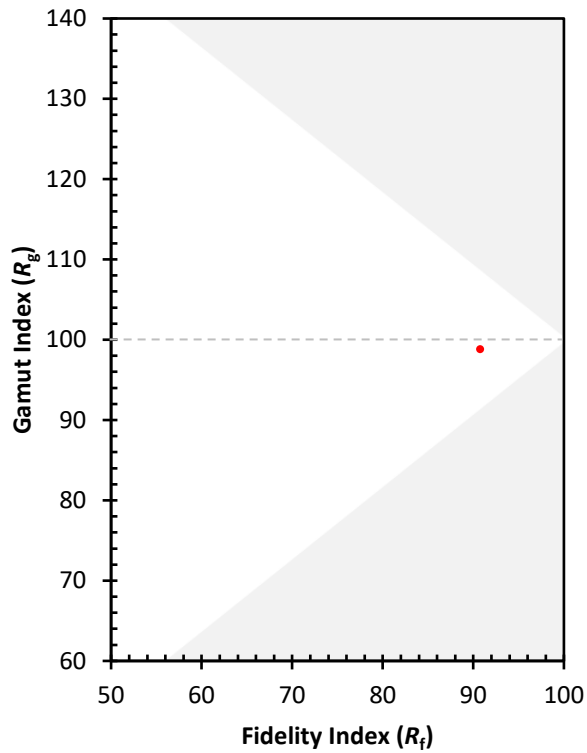
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 93 | CES51 = 96 | CES76 = 85 |
| CES02 = 62 | CES27 = 90 | CES52 = 98 | CES77 = 88 |
| CES03 = 31 | CES28 = 96 | CES53 = 96 | CES78 = 82 |
| CES04 = 69 | CES29 = 96 | CES54 = 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)