

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: P1214847

Luminaire Tested: 22-ID2-40-CFD2-L940-U

Issue Date: 12/4/2025

**Test Information**

Test Method: LM-79-2019  
Report Number: P1214847  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-2506-458-13)  
Test Lab: INNOVATION CENTER  
Issue Date: 12/4/2025  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: CORELITE  
Catalog Number: 22-ID2-40-CFD2-L940-U  
Description: 2X2 IN DEPTH TROFFER WITH 2INCH CUBE DROP LENS  
Light Source: 4000K CCT, 90 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

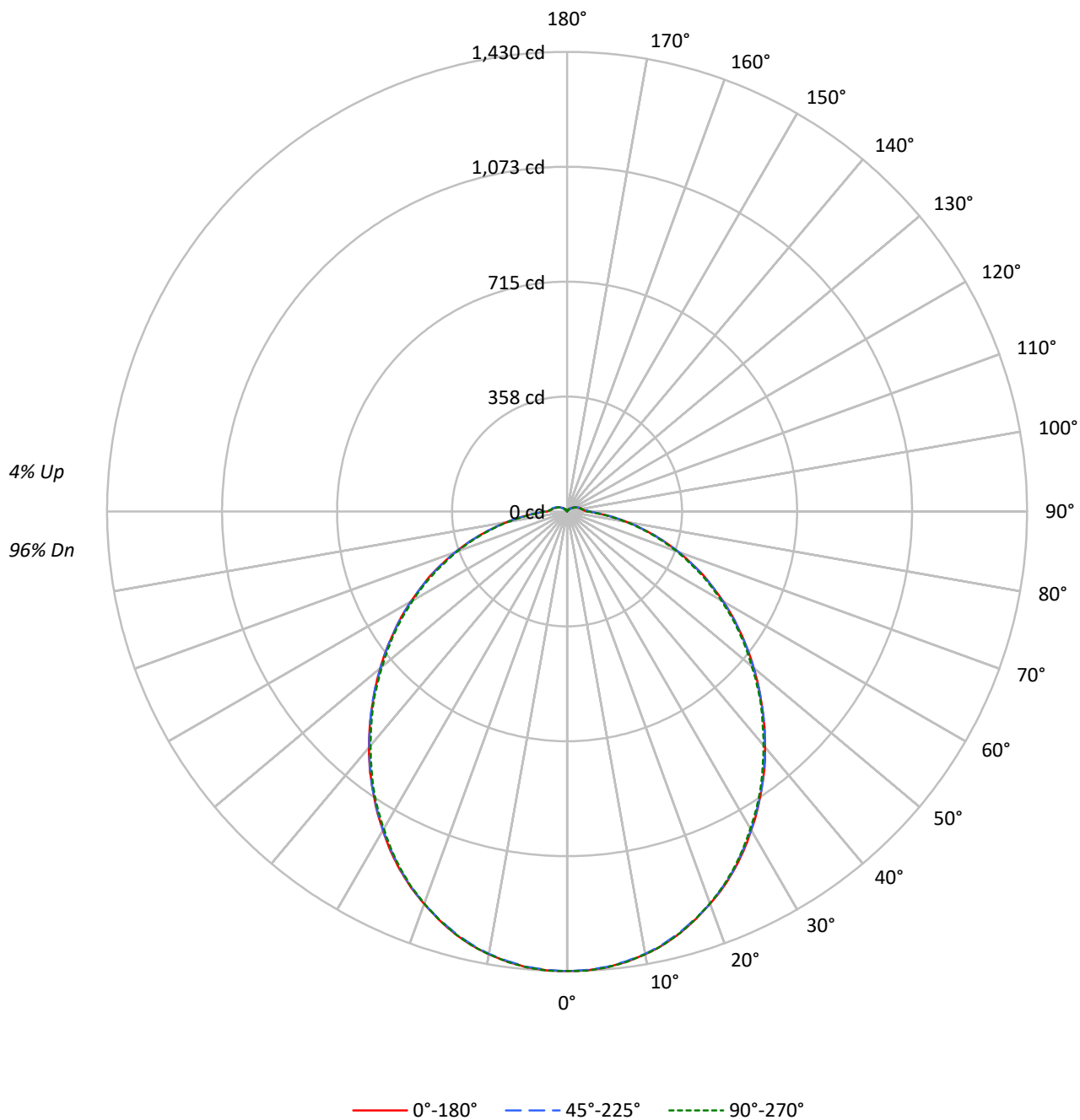
Lumens per Lamp: N/A  
Luminaire Lumens: 4037.0 lumens  
Efficiency: N/A  
Efficacy: 114.7 lumens/watt  
Spacing Criteria (0/90/45): 1.19 / 1.19 / 1.31  
Luminous Opening: Rectangular w/ Sides (W: 2' x L: 2' x H: 0.16')  
CIE Type: Direct

Input Watts (W): 35.2  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



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### Luminous Intensity Polar Plot



TEST NUMBER: P1214847

CATALOG NUMBER: 22-ID2-40-CFD2-L940-U

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

|     |     |     |     |     |     |     |     |     |     |     |     |  |     |     |     |  |    |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|-----|-----|-----|--|----|
| RF  | 20  |     |     |     | 20  |     |     |     | 20  |     |     |  | 20  |     |     |  | 20 |
| RC  | 80  |     |     |     | 70  |     |     |     | 50  |     |     |  | 30  |     |     |  | 0  |
| RW  | 70  | 50  | 30  | 10  | 70  | 50  | 30  | 10  | 50  | 30  | 10  |  | 50  | 30  | 10  |  | 0  |
| RCR |     |     |     |     |     |     |     |     |     |     |     |  |     |     |     |  |    |
| 0   | 118 | 118 | 118 | 118 | 115 | 115 | 115 | 115 | 109 | 109 | 109 |  | 103 | 103 | 103 |  | 98 |
| 1   | 107 | 102 | 98  | 94  | 104 | 100 | 95  | 92  | 95  | 91  | 88  |  | 90  | 87  | 85  |  | 86 |
| 2   | 97  | 89  | 82  | 76  | 94  | 87  | 80  | 75  | 83  | 77  | 73  |  | 79  | 74  | 70  |  | 75 |
| 3   | 89  | 78  | 70  | 63  | 86  | 76  | 69  | 62  | 73  | 66  | 61  |  | 69  | 64  | 59  |  | 66 |
| 4   | 81  | 69  | 60  | 54  | 79  | 68  | 59  | 53  | 65  | 58  | 52  |  | 62  | 56  | 51  |  | 59 |
| 5   | 75  | 62  | 53  | 46  | 72  | 61  | 52  | 46  | 58  | 51  | 45  |  | 56  | 49  | 44  |  | 53 |
| 6   | 69  | 56  | 47  | 40  | 67  | 55  | 46  | 40  | 52  | 45  | 39  |  | 50  | 44  | 39  |  | 48 |
| 7   | 64  | 51  | 42  | 36  | 62  | 50  | 41  | 36  | 48  | 40  | 35  |  | 46  | 39  | 34  |  | 44 |
| 8   | 60  | 46  | 38  | 32  | 58  | 45  | 37  | 32  | 44  | 37  | 31  |  | 42  | 36  | 31  |  | 41 |
| 9   | 56  | 43  | 34  | 29  | 54  | 42  | 34  | 29  | 40  | 33  | 28  |  | 39  | 33  | 28  |  | 38 |
| 10  | 52  | 39  | 31  | 26  | 51  | 39  | 31  | 26  | 37  | 30  | 26  |  | 36  | 30  | 25  |  | 35 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3849 | 3849 | 3849 |
| 5°  | 3819 | 3804 | 3819 |
| 10° | 3771 | 3745 | 3771 |
| 15° | 3704 | 3664 | 3703 |
| 20° | 3616 | 3573 | 3612 |
| 25° | 3520 | 3463 | 3509 |
| 30° | 3402 | 3338 | 3384 |
| 35° | 3278 | 3209 | 3264 |
| 40° | 3153 | 3068 | 3128 |
| 45° | 3019 | 2934 | 3004 |
| 50° | 2897 | 2790 | 2864 |
| 55° | 2772 | 2657 | 2747 |
| 60° | 2651 | 2518 | 2614 |
| 65° | 2533 | 2378 | 2478 |
| 70° | 2377 | 2215 | 2338 |
| 75° | 2206 | 2018 | 2162 |
| 80° | 2009 | 1784 | 1972 |
| 85° | 1837 | 1594 | 1781 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 3019 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 135.0  | 3.3       |
| 10°-20°   | 382.3  | 9.5       |
| 20°-30°   | 564.8  | 14.0      |
| 30°-40°   | 658.3  | 16.3      |
| 40°-50°   | 661.3  | 16.4      |
| 50°-60°   | 588.8  | 14.6      |
| 60°-70°   | 458.9  | 11.4      |
| 70°-80°   | 292.6  | 7.2       |
| 80°-90°   | 131.6  | 3.3       |
| 90°-100°  | 61.0   | 1.5       |
| 100°-110° | 44.1   | 1.1       |
| 110°-120° | 29.4   | 0.7       |
| 120°-130° | 17.0   | 0.4       |
| 130°-140° | 8.3    | 0.2       |
| 140°-150° | 3.0    | 0.1       |
| 150°-160° | 0.5    | 0.0       |
| 160°-170° | 0.0    | 0.0       |
| 170°-180° | 0.0    | 0.0       |
| 0°-30°    | 1082.1 | 26.8      |
| 0°-40°    | 1740.4 | 43.1      |
| 0°-60°    | 2990.5 | 74.1      |
| 0°-90°    | 3873.6 | 96.0      |
| 90°-120°  | 134.5  | 3.3       |
| 90°-150°  | 162.8  | 4.0       |
| 90°-180°  | 163.0  | 4.0       |
| 0°-180°   | 4037.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1430 | 1430  | 1430 | 1430  | 1430 |      |
| 5°   | 1424 | 1422  | 1422 | 1423  | 1424 | 135  |
| 15°  | 1358 | 1357  | 1355 | 1356  | 1358 | 383  |
| 25°  | 1230 | 1228  | 1228 | 1225  | 1226 | 566  |
| 35°  | 1054 | 1055  | 1054 | 1049  | 1049 | 660  |
| 45°  | 857  | 861   | 858  | 855   | 852  | 662  |
| 55°  | 658  | 661   | 658  | 655   | 652  | 590  |
| 65°  | 466  | 468   | 464  | 462   | 456  | 460  |
| 75°  | 276  | 280   | 276  | 275   | 270  | 292  |
| 85°  | 114  | 118   | 118  | 117   | 110  | 109  |
| 90°  | 62   | 67    | 69   | 68    | 63   | 36   |
| 95°  | 52   | 56    | 57   | 56    | 52   | 41   |
| 105° | 41   | 41    | 43   | 42    | 40   | 43   |
| 115° | 30   | 29    | 30   | 29    | 29   | 30   |
| 125° | 20   | 18    | 19   | 18    | 19   | 18   |
| 135° | 12   | 10    | 10   | 10    | 12   | 9    |
| 145° | 6    | 5     | 3    | 4     | 6    | 4    |
| 155° | 2    | 1     | 0    | 1     | 2    | 1    |
| 165° | 0    | 0     | 0    | 0     | 0    | 0    |
| 175° | 0    | 0     | 0    | 0     | 0    | 0    |
| 180° | 0    | 0     | 0    | 0     | 0    |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1430.2 | 1430.2 | 1430.2 | 1430.2 | 1430.2 |
| 2.5°   | 1429.2 | 1428.2 | 1427.7 | 1428.7 | 1430.2 |
| 5°     | 1423.8 | 1422.3 | 1422.3 | 1422.8 | 1423.8 |
| 7.5°   | 1413.3 | 1412.3 | 1411.3 | 1412.8 | 1413.8 |
| 10°    | 1399.4 | 1398.4 | 1397.9 | 1398.4 | 1399.4 |
| 12.5°  | 1381.5 | 1379.0 | 1379.0 | 1380.0 | 1381.5 |
| 15°    | 1358.1 | 1357.1 | 1355.1 | 1356.1 | 1357.6 |
| 17.5°  | 1329.8 | 1330.8 | 1328.3 | 1328.8 | 1329.3 |
| 20°    | 1299.4 | 1298.9 | 1298.9 | 1298.4 | 1297.9 |
| 22.5°  | 1267.1 | 1265.1 | 1264.6 | 1262.6 | 1264.1 |
| 25°    | 1229.8 | 1228.3 | 1227.8 | 1225.3 | 1225.8 |
| 27.5°  | 1189.5 | 1187.5 | 1186.1 | 1185.1 | 1184.1 |
| 30°    | 1145.3 | 1145.3 | 1144.3 | 1142.3 | 1139.3 |
| 32.5°  | 1101.5 | 1101.0 | 1099.5 | 1097.0 | 1096.0 |
| 35°    | 1053.8 | 1054.8 | 1054.3 | 1049.3 | 1049.3 |
| 37.5°  | 1008.0 | 1008.0 | 1006.0 | 1003.0 | 999.1  |
| 40°    | 957.8  | 958.8  | 956.3  | 952.8  | 950.3  |
| 42.5°  | 908.1  | 909.1  | 907.6  | 905.1  | 900.6  |
| 45°    | 856.8  | 860.8  | 858.3  | 854.9  | 852.4  |
| 47.5°  | 807.6  | 811.1  | 807.6  | 805.1  | 801.6  |
| 50°    | 757.9  | 760.4  | 756.4  | 754.4  | 749.4  |
| 52.5°  | 708.6  | 711.1  | 708.1  | 706.2  | 701.2  |
| 55°    | 658.4  | 660.9  | 657.9  | 655.4  | 652.5  |
| 57.5°  | 610.7  | 612.7  | 610.2  | 608.7  | 603.2  |
| 60°    | 560.9  | 563.9  | 559.5  | 558.0  | 553.0  |
| 62.5°  | 511.2  | 517.2  | 511.7  | 509.7  | 505.3  |
| 65°    | 466.0  | 467.5  | 464.0  | 461.5  | 456.0  |
| 67.5°  | 416.2  | 419.2  | 415.2  | 413.3  | 408.3  |
| 70°    | 368.5  | 372.0  | 369.0  | 367.0  | 362.5  |
| 72.5°  | 321.8  | 326.7  | 321.8  | 320.3  | 315.8  |
| 75°    | 275.5  | 279.5  | 276.0  | 275.0  | 270.0  |
| 77.5°  | 231.2  | 235.7  | 231.2  | 232.7  | 227.8  |
| 80°    | 188.5  | 193.4  | 189.0  | 190.0  | 185.0  |
| 82.5°  | 150.7  | 153.7  | 152.2  | 151.2  | 146.2  |
| 85°    | 113.9  | 118.4  | 118.4  | 116.9  | 110.4  |
| 87.5°  | 83.5   | 87.5   | 89.0   | 88.5   | 82.6   |
| 90°    | 61.7   | 67.1   | 69.1   | 67.6   | 62.7   |
| 92.5°  | 55.7   | 60.2   | 62.2   | 60.7   | 56.2   |
| 95°    | 51.7   | 55.7   | 57.2   | 56.2   | 52.2   |
| 97.5°  | 48.7   | 51.7   | 53.2   | 51.7   | 48.7   |
| 100°   | 46.2   | 48.2   | 49.7   | 48.2   | 45.8   |
| 102.5° | 43.3   | 44.8   | 46.2   | 44.8   | 42.8   |
| 105°   | 40.8   | 41.3   | 42.8   | 41.8   | 40.3   |
| 107.5° | 38.3   | 38.3   | 39.3   | 38.3   | 37.3   |
| 110°   | 35.3   | 35.3   | 36.3   | 35.3   | 34.3   |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°   | 22.5° | 45°  | 67.5° | 90°  |
|--------|------|-------|------|-------|------|
| 112.5° | 32.3 | 32.3  | 33.3 | 31.8  | 31.8 |
| 115°   | 29.8 | 29.3  | 30.3 | 28.8  | 29.3 |
| 117.5° | 26.9 | 26.4  | 27.4 | 25.9  | 26.4 |
| 120°   | 24.4 | 23.4  | 24.4 | 22.9  | 23.9 |
| 122.5° | 22.4 | 20.9  | 21.9 | 20.4  | 21.4 |
| 125°   | 19.9 | 18.4  | 19.4 | 17.9  | 19.4 |
| 127.5° | 17.9 | 15.9  | 16.9 | 15.4  | 16.9 |
| 130°   | 15.9 | 13.9  | 14.4 | 12.9  | 15.4 |
| 132.5° | 13.9 | 11.9  | 12.4 | 11.4  | 13.4 |
| 135°   | 11.9 | 10.4  | 9.9  | 9.9   | 11.9 |
| 137.5° | 10.4 | 9.0   | 8.0  | 8.5   | 9.9  |
| 140°   | 9.0  | 7.5   | 6.0  | 7.0   | 8.5  |
| 142.5° | 7.5  | 6.0   | 4.5  | 6.0   | 7.5  |
| 145°   | 6.5  | 5.0   | 3.0  | 4.5   | 6.0  |
| 147.5° | 5.0  | 4.0   | 1.5  | 3.5   | 4.5  |
| 150°   | 4.0  | 2.5   | 0.5  | 2.5   | 3.0  |
| 152.5° | 2.5  | 2.0   | 0.5  | 1.5   | 2.0  |
| 155°   | 1.5  | 1.0   | 0.5  | 1.0   | 1.5  |
| 157.5° | 0.5  | 0.5   | 0.5  | 0.5   | 0.5  |
| 160°   | 0.5  | 0.5   | 0.5  | 0.5   | 0.5  |
| 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 | 15.11            | 16.65 | 15.54 | 17.05 | 17.47 | 15.05          | 16.60 | 15.48 | 17.00 | 17.41 |
|                 | 3H   | 16.94            | 18.35 | 17.39 | 18.76 | 19.22 | 16.87          | 18.27 | 17.31 | 18.68 | 19.14 |
|                 | 4H   | 17.67            | 19.00 | 18.13 | 19.42 | 19.90 | 17.58          | 18.91 | 18.04 | 19.34 | 19.81 |
|                 | 6H   | 18.25            | 19.48 | 18.73 | 19.93 | 20.42 | 18.16          | 19.39 | 18.64 | 19.84 | 20.32 |
|                 | 8H   | 18.48            | 19.65 | 18.96 | 20.12 | 20.62 | 18.38          | 19.55 | 18.87 | 20.02 | 20.52 |
|                 | 12H  | 18.66            | 19.79 | 19.15 | 20.25 | 20.77 | 18.55          | 19.68 | 19.05 | 20.14 | 20.67 |
| 4H              | 2H   | 15.71            | 17.03 | 16.17 | 17.46 | 17.93 | 15.66          | 16.99 | 16.12 | 17.42 | 17.89 |
|                 | 3H   | 17.77            | 18.89 | 18.24 | 19.36 | 19.86 | 17.70          | 18.82 | 18.17 | 19.29 | 19.79 |
|                 | 4H   | 18.63            | 19.65 | 19.13 | 20.14 | 20.67 | 18.55          | 19.57 | 19.05 | 20.06 | 20.59 |
|                 | 6H   | 19.36            | 20.25 | 19.88 | 20.77 | 21.31 | 19.27          | 20.17 | 19.79 | 20.68 | 21.23 |
|                 | 8H   | 19.64            | 20.48 | 20.17 | 21.00 | 21.55 | 19.55          | 20.39 | 20.07 | 20.90 | 21.46 |
|                 | 12H  | 19.89            | 20.64 | 20.43 | 21.19 | 21.75 | 19.79          | 20.54 | 20.33 | 21.09 | 21.65 |
| 8H              | 4H   | 18.95            | 19.79 | 19.47 | 20.30 | 20.86 | 18.88          | 19.71 | 19.40 | 20.23 | 20.79 |
|                 | 6H   | 19.82            | 20.52 | 20.37 | 21.08 | 21.64 | 19.74          | 20.44 | 20.29 | 21.00 | 21.57 |
|                 | 8H   | 20.20            | 20.83 | 20.77 | 21.40 | 21.98 | 20.11          | 20.74 | 20.68 | 21.32 | 21.89 |
|                 | 12H  | 20.55            | 21.11 | 21.12 | 21.67 | 22.32 | 20.46          | 21.02 | 21.02 | 21.58 | 22.22 |
| 12H             | 4H   | 18.99            | 19.74 | 19.53 | 20.29 | 20.85 | 18.92          | 19.68 | 19.46 | 20.22 | 20.78 |
|                 | 6H   | 19.89            | 20.52 | 20.46 | 21.10 | 21.67 | 19.82          | 20.45 | 20.38 | 21.02 | 21.60 |
|                 | 8H   | 20.33            | 20.90 | 20.90 | 21.45 | 22.10 | 20.25          | 20.81 | 20.82 | 21.37 | 22.02 |

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

Report Prepared for

Cooper Lighting Solutions

Corelite

Report Number: SP1-2506-458-11

Test Date: 08/26/2025

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

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

### Test Information

Test Method: LM-79-2019  
 Report Number: SP1-2506-458-11  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry:  $4\pi$   
 Issue Date: 08/27/2025  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: Corelite  
 Catalog Number: **22ID2-55-CFR1-L940-U**  
 Description: 2X2 CGTX WITH INDEPTH FRAME AND CFR1 LENS - 5500 LUMEN 4000K 90CRI

### Spectral Parameters

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

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



### Test Conditions

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

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| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | 76INCH SPHERE IN0058  | 6/16/2025        | 12/16/2025           |
| Power Meter                    | XITRON INXT2011004    | 1/21/2025        | 1/21/2026            |
| AC Power Source                | CHROMA 61603 IN0063   | 10/22/2024       | 10/22/2025           |
| DC Power Source                | AGILENT E3634A IN0208 | 10/22/2024       | 10/22/2025           |
| Sphere Thermometer             | ONSET IN0085          | 10/22/2024       | 10/22/2025           |
| Room Thermometer               | ONSET IN0046          | 10/22/2024       | 10/22/2025           |

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**CIE 1931 Chromaticity Diagram**



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



Point lies inside the ANSI 4000K 4-step quadrangle

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### Photopic Flux vs. Wavelength



### Photopic Lumens: NR

| 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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### Scotopic Flux vs. Wavelength



Scotopic Lumens: NR

S/P: 1.75

| λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</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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### Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 3.61

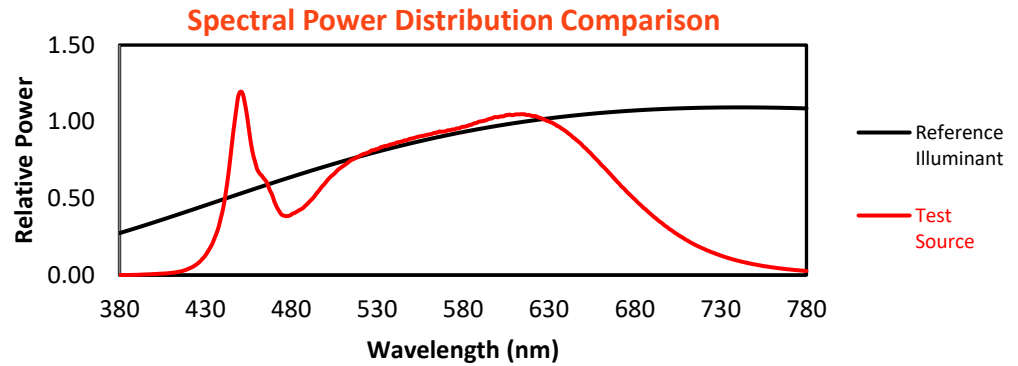
| λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm)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

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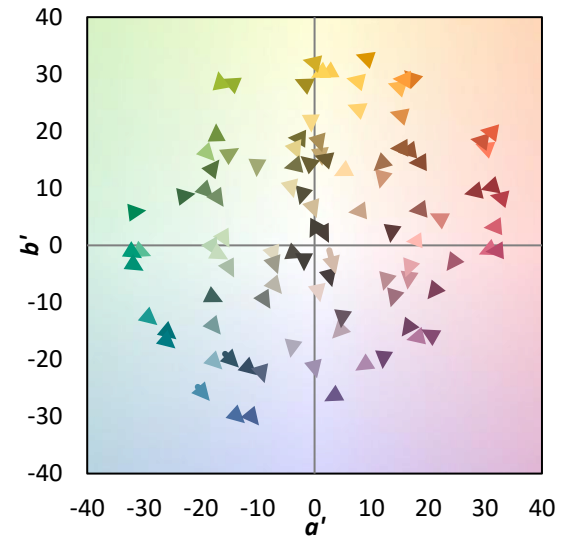
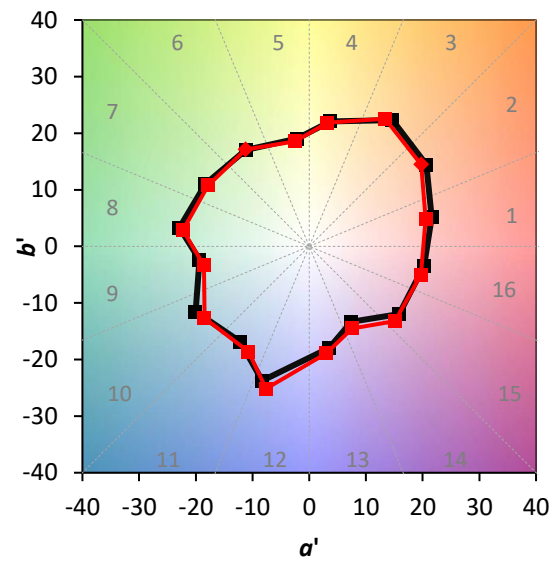
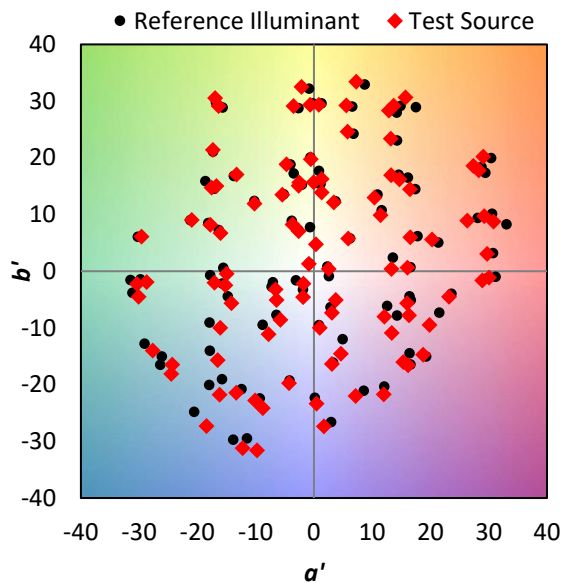
TM-30-18

### Summary

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

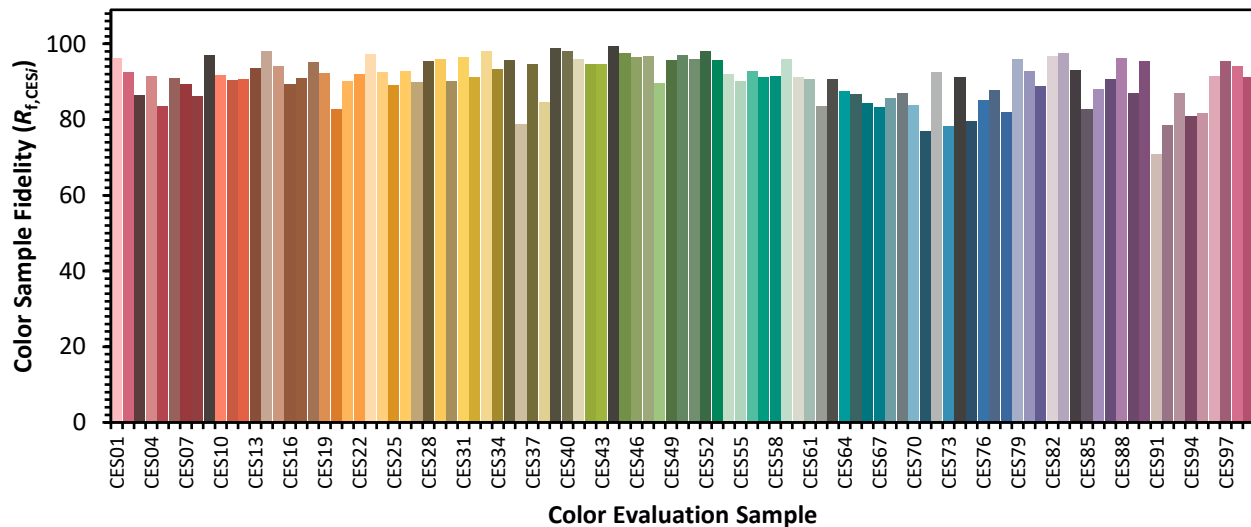


### Color Vector Graphics



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

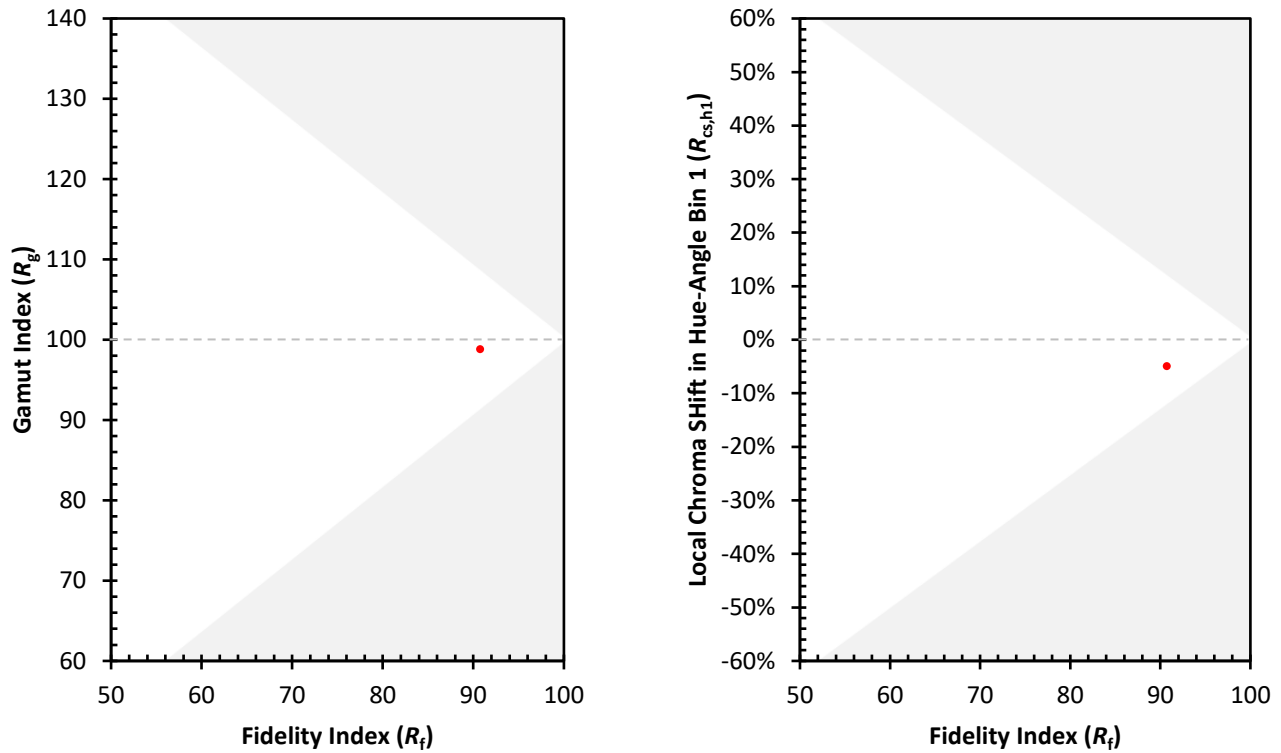
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 93 | CES51 = 96 | CES76 = 85 |
| CES02 = 62 | CES27 = 90 | CES52 = 98 | CES77 = 88 |
| CES03 = 31 | CES28 = 96 | CES53 = 96 | CES78 = 82 |
| CES04 = 69 | CES29 = 96 | CES54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



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)