

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: P1214834

Luminaire Tested: 22-ID2-35-CFD2-L835-U

Issue Date: 12/4/2025

**Test Information**

Test Method: LM-79-2019  
Report Number: P1214834  
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-ID2-35-CFD2-L835-U  
Description: 2X2 IN DEPTH TROFFER WITH 2INCH CUBE DROP LENS  
Light Source: 3500K CCT, 80 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

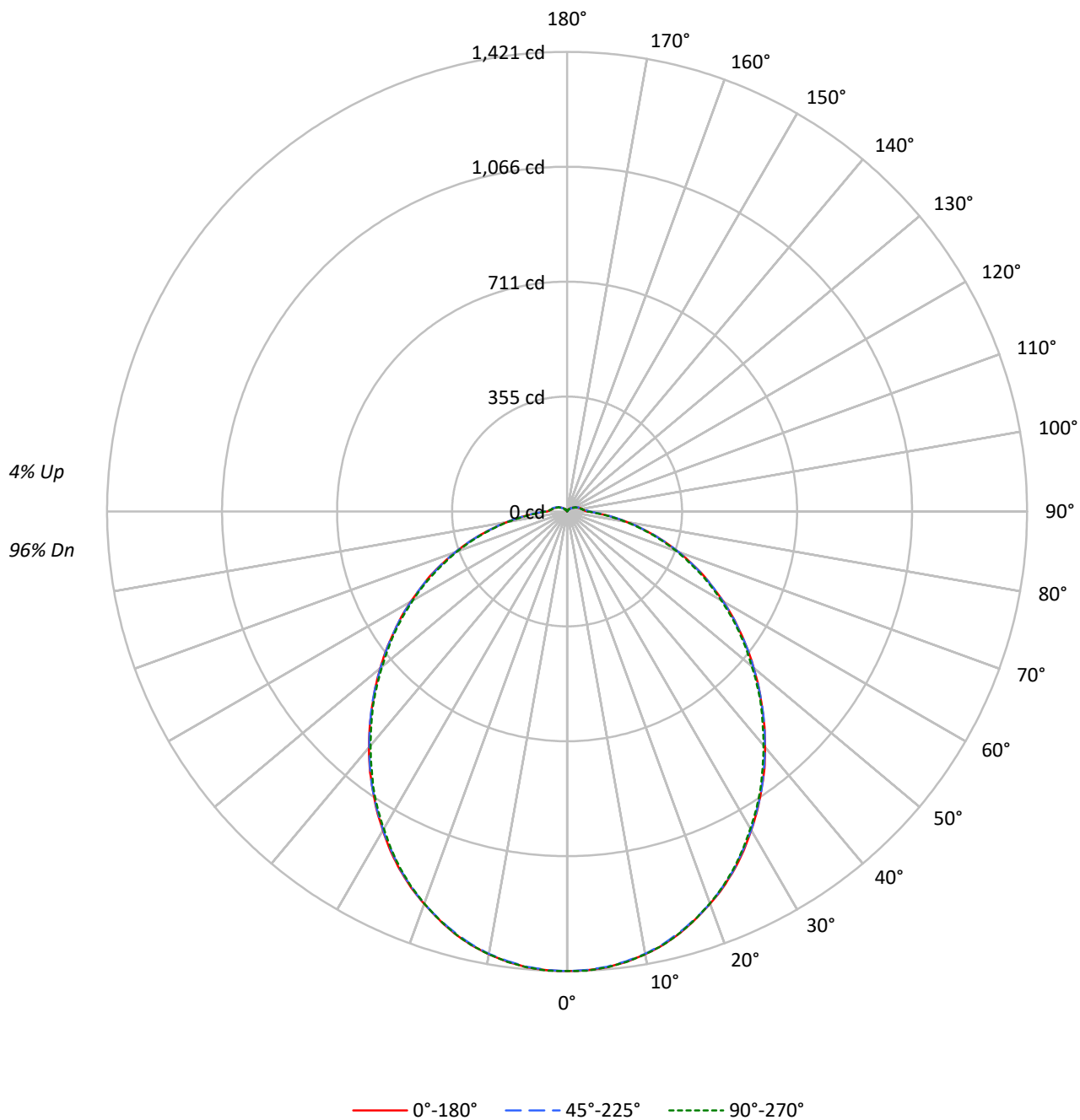
Lumens per Lamp: N/A  
Luminaire Lumens: 4011.3 lumens  
Efficiency: N/A  
Efficacy: 128.6 lumens/watt  
Spacing Criteria (0/90/45): 1.19 / 1.19 / 1.31  
Luminous Opening: Rectangular w/ Sides (W: 2' x L: 2' x H: 0.16')  
CIE Type: Direct

Input Watts (W): 31.2  
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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CATALOG NUMBER: 22-ID2-35-CFD2-L835-U

### Luminous Intensity Polar Plot



TEST NUMBER: P1214834

CATALOG NUMBER: 22-ID2-35-CFD2-L835-U

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

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |    |    |    |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|----|
| RF  | 20  |     |     |     | 20  |     |     |     | 20  |     |     |     | 20  |     |    |    | 20 |
| RC  | 80  |     |     |     | 70  |     |     |     | 50  |     |     |     | 30  |     |    |    | 0  |
| RW  | 70  | 50  | 30  | 10  | 70  | 50  | 30  | 10  | 50  | 30  | 10  | 50  | 30  | 10  | 50 | 30 | 10 |
| RCR |     |     |     |     |     |     |     |     |     |     |     |     |     |     |    |    |    |
| 0   | 118 | 118 | 118 | 118 | 115 | 115 | 115 | 115 | 109 | 109 | 109 | 103 | 103 | 103 | 98 | 98 | 98 |
| 1   | 107 | 102 | 98  | 94  | 104 | 100 | 95  | 92  | 95  | 91  | 88  | 90  | 87  | 85  | 86 | 84 | 82 |
| 2   | 97  | 89  | 82  | 76  | 94  | 87  | 80  | 75  | 83  | 77  | 73  | 79  | 74  | 70  | 75 | 71 | 68 |
| 3   | 89  | 78  | 70  | 63  | 86  | 76  | 69  | 62  | 73  | 66  | 61  | 69  | 64  | 59  | 66 | 62 | 58 |
| 4   | 81  | 69  | 60  | 54  | 79  | 68  | 59  | 53  | 65  | 58  | 52  | 62  | 56  | 51  | 59 | 54 | 50 |
| 5   | 75  | 62  | 53  | 46  | 72  | 61  | 52  | 46  | 58  | 51  | 45  | 56  | 49  | 44  | 53 | 48 | 43 |
| 6   | 69  | 56  | 47  | 40  | 67  | 55  | 46  | 40  | 52  | 45  | 39  | 50  | 44  | 39  | 48 | 43 | 38 |
| 7   | 64  | 51  | 42  | 36  | 62  | 50  | 41  | 36  | 48  | 40  | 35  | 46  | 39  | 34  | 44 | 38 | 34 |
| 8   | 60  | 46  | 38  | 32  | 58  | 45  | 37  | 32  | 44  | 37  | 31  | 42  | 36  | 31  | 41 | 35 | 30 |
| 9   | 56  | 43  | 34  | 29  | 54  | 42  | 34  | 29  | 40  | 33  | 28  | 39  | 33  | 28  | 38 | 32 | 28 |
| 10  | 52  | 39  | 31  | 26  | 51  | 39  | 31  | 26  | 37  | 30  | 26  | 36  | 30  | 25  | 35 | 29 | 25 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3824 | 3824 | 3824 |
| 5°  | 3795 | 3780 | 3795 |
| 10° | 3747 | 3721 | 3747 |
| 15° | 3681 | 3641 | 3679 |
| 20° | 3593 | 3550 | 3589 |
| 25° | 3498 | 3441 | 3486 |
| 30° | 3380 | 3316 | 3362 |
| 35° | 3257 | 3189 | 3243 |
| 40° | 3133 | 3048 | 3108 |
| 45° | 3000 | 2916 | 2984 |
| 50° | 2878 | 2773 | 2846 |
| 55° | 2755 | 2640 | 2730 |
| 60° | 2635 | 2502 | 2597 |
| 65° | 2516 | 2362 | 2463 |
| 70° | 2362 | 2200 | 2323 |
| 75° | 2191 | 2005 | 2148 |
| 80° | 1997 | 1773 | 1959 |
| 85° | 1826 | 1583 | 1769 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 3000 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 134.2  | 3.3       |
| 10°-20°   | 379.8  | 9.5       |
| 20°-30°   | 561.2  | 14.0      |
| 30°-40°   | 654.1  | 16.3      |
| 40°-50°   | 657.1  | 16.4      |
| 50°-60°   | 585.0  | 14.6      |
| 60°-70°   | 456.0  | 11.4      |
| 70°-80°   | 290.8  | 7.2       |
| 80°-90°   | 130.7  | 3.3       |
| 90°-100°  | 60.6   | 1.5       |
| 100°-110° | 43.8   | 1.1       |
| 110°-120° | 29.2   | 0.7       |
| 120°-130° | 16.9   | 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°    | 1075.2 | 26.8      |
| 0°-40°    | 1729.3 | 43.1      |
| 0°-60°    | 2971.5 | 74.1      |
| 0°-90°    | 3849.0 | 96.0      |
| 90°-120°  | 133.6  | 3.3       |
| 90°-150°  | 161.7  | 4.0       |
| 90°-180°  | 162.0  | 4.0       |
| 0°-180°   | 4011.3 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1421 | 1421  | 1421 | 1421  | 1421 |      |
| 5°   | 1415 | 1413  | 1413 | 1414  | 1415 | 134  |
| 15°  | 1350 | 1348  | 1346 | 1348  | 1349 | 380  |
| 25°  | 1222 | 1220  | 1220 | 1218  | 1218 | 562  |
| 35°  | 1047 | 1048  | 1048 | 1043  | 1043 | 655  |
| 45°  | 851  | 855   | 853  | 849   | 847  | 658  |
| 55°  | 654  | 657   | 654  | 651   | 648  | 586  |
| 65°  | 463  | 464   | 461  | 459   | 453  | 457  |
| 75°  | 274  | 278   | 274  | 273   | 268  | 290  |
| 85°  | 113  | 118   | 118  | 116   | 110  | 108  |
| 90°  | 61   | 67    | 69   | 67    | 62   | 36   |
| 95°  | 51   | 55    | 57   | 56    | 52   | 41   |
| 105° | 40   | 41    | 42   | 42    | 40   | 43   |
| 115° | 30   | 29    | 30   | 29    | 29   | 29   |
| 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    | 0    |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1421.1 | 1421.1 | 1421.1 | 1421.1 | 1421.1 |
| 2.5°   | 1420.1 | 1419.1 | 1418.7 | 1419.6 | 1421.1 |
| 5°     | 1414.7 | 1413.2 | 1413.2 | 1413.7 | 1414.7 |
| 7.5°   | 1404.3 | 1403.3 | 1402.3 | 1403.8 | 1404.8 |
| 10°    | 1390.5 | 1389.5 | 1389.0 | 1389.5 | 1390.5 |
| 12.5°  | 1372.7 | 1370.2 | 1370.2 | 1371.2 | 1372.7 |
| 15°    | 1349.5 | 1348.5 | 1346.5 | 1347.5 | 1349.0 |
| 17.5°  | 1321.3 | 1322.3 | 1319.8 | 1320.3 | 1320.8 |
| 20°    | 1291.2 | 1290.7 | 1290.7 | 1290.2 | 1289.7 |
| 22.5°  | 1259.0 | 1257.1 | 1256.6 | 1254.6 | 1256.1 |
| 25°    | 1222.0 | 1220.5 | 1220.0 | 1217.5 | 1218.0 |
| 27.5°  | 1182.0 | 1180.0 | 1178.5 | 1177.5 | 1176.5 |
| 30°    | 1138.0 | 1138.0 | 1137.0 | 1135.0 | 1132.1 |
| 32.5°  | 1094.5 | 1094.0 | 1092.5 | 1090.1 | 1089.1 |
| 35°    | 1047.1 | 1048.1 | 1047.6 | 1042.6 | 1042.6 |
| 37.5°  | 1001.6 | 1001.6 | 999.6  | 996.7  | 992.7  |
| 40°    | 951.7  | 952.7  | 950.2  | 946.8  | 944.3  |
| 42.5°  | 902.3  | 903.3  | 901.8  | 899.3  | 894.9  |
| 45°    | 851.4  | 855.3  | 852.9  | 849.4  | 846.9  |
| 47.5°  | 802.5  | 805.9  | 802.5  | 800.0  | 796.5  |
| 50°    | 753.1  | 755.5  | 751.6  | 749.6  | 744.7  |
| 52.5°  | 704.1  | 706.6  | 703.6  | 701.7  | 696.7  |
| 55°    | 654.2  | 656.7  | 653.7  | 651.3  | 648.3  |
| 57.5°  | 606.8  | 608.8  | 606.3  | 604.8  | 599.4  |
| 60°    | 557.4  | 560.3  | 555.9  | 554.4  | 549.5  |
| 62.5°  | 508.0  | 513.9  | 508.5  | 506.5  | 502.0  |
| 65°    | 463.0  | 464.5  | 461.0  | 458.6  | 453.1  |
| 67.5°  | 413.6  | 416.6  | 412.6  | 410.6  | 405.7  |
| 70°    | 366.2  | 369.6  | 366.6  | 364.7  | 360.2  |
| 72.5°  | 319.7  | 324.6  | 319.7  | 318.2  | 313.8  |
| 75°    | 273.7  | 277.7  | 274.2  | 273.3  | 268.3  |
| 77.5°  | 229.8  | 234.2  | 229.8  | 231.3  | 226.3  |
| 80°    | 187.3  | 192.2  | 187.8  | 188.8  | 183.8  |
| 82.5°  | 149.7  | 152.7  | 151.2  | 150.2  | 145.3  |
| 85°    | 113.2  | 117.6  | 117.6  | 116.1  | 109.7  |
| 87.5°  | 83.0   | 87.0   | 88.4   | 88.0   | 82.0   |
| 90°    | 61.3   | 66.7   | 68.7   | 67.2   | 62.3   |
| 92.5°  | 55.3   | 59.8   | 61.8   | 60.3   | 55.8   |
| 95°    | 51.4   | 55.3   | 56.8   | 55.8   | 51.9   |
| 97.5°  | 48.4   | 51.4   | 52.9   | 51.4   | 48.4   |
| 100°   | 46.0   | 47.9   | 49.4   | 47.9   | 45.5   |
| 102.5° | 43.0   | 44.5   | 46.0   | 44.5   | 42.5   |
| 105°   | 40.5   | 41.0   | 42.5   | 41.5   | 40.0   |
| 107.5° | 38.0   | 38.0   | 39.0   | 38.0   | 37.1   |
| 110°   | 35.1   | 35.1   | 36.1   | 35.1   | 34.1   |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°   | 22.5° | 45°  | 67.5° | 90°  |
|--------|------|-------|------|-------|------|
| 112.5° | 32.1 | 32.1  | 33.1 | 31.6  | 31.6 |
| 115°   | 29.6 | 29.2  | 30.1 | 28.7  | 29.2 |
| 117.5° | 26.7 | 26.2  | 27.2 | 25.7  | 26.2 |
| 120°   | 24.2 | 23.2  | 24.2 | 22.7  | 23.7 |
| 122.5° | 22.2 | 20.8  | 21.7 | 20.3  | 21.2 |
| 125°   | 19.8 | 18.3  | 19.3 | 17.8  | 19.3 |
| 127.5° | 17.8 | 15.8  | 16.8 | 15.3  | 16.8 |
| 130°   | 15.8 | 13.8  | 14.3 | 12.8  | 15.3 |
| 132.5° | 13.8 | 11.9  | 12.4 | 11.4  | 13.3 |
| 135°   | 11.9 | 10.4  | 9.9  | 9.9   | 11.9 |
| 137.5° | 10.4 | 8.9   | 7.9  | 8.4   | 9.9  |
| 140°   | 8.9  | 7.4   | 5.9  | 6.9   | 8.4  |
| 142.5° | 7.4  | 5.9   | 4.4  | 5.9   | 7.4  |
| 145°   | 6.4  | 4.9   | 3.0  | 4.4   | 5.9  |
| 147.5° | 4.9  | 4.0   | 1.5  | 3.5   | 4.4  |
| 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 | 15.08            | 16.63 | 15.51 | 17.03 | 17.45 | 15.03          | 16.58 | 15.46 | 16.98 | 17.39 |
|                 | 3H   | 16.92            | 18.33 | 17.36 | 18.74 | 19.20 | 16.84          | 18.25 | 17.28 | 18.66 | 19.12 |
|                 | 4H   | 17.65            | 18.97 | 18.11 | 19.40 | 19.88 | 17.56          | 18.88 | 18.02 | 19.31 | 19.79 |
|                 | 6H   | 18.23            | 19.46 | 18.71 | 19.91 | 20.40 | 18.14          | 19.37 | 18.61 | 19.81 | 20.30 |
|                 | 8H   | 18.45            | 19.63 | 18.94 | 20.10 | 20.59 | 18.36          | 19.53 | 18.84 | 20.00 | 20.50 |
|                 | 12H  | 18.64            | 19.76 | 19.13 | 20.23 | 20.75 | 18.53          | 19.66 | 19.03 | 20.12 | 20.65 |
| 4H              | 2H   | 15.68            | 17.01 | 16.14 | 17.44 | 17.91 | 15.64          | 16.96 | 16.10 | 17.39 | 17.87 |
|                 | 3H   | 17.75            | 18.86 | 18.22 | 19.34 | 19.84 | 17.68          | 18.80 | 18.15 | 19.27 | 19.77 |
|                 | 4H   | 18.61            | 19.63 | 19.10 | 20.12 | 20.65 | 18.53          | 19.55 | 19.02 | 20.03 | 20.56 |
|                 | 6H   | 19.34            | 20.23 | 19.85 | 20.75 | 21.29 | 19.25          | 20.14 | 19.77 | 20.66 | 21.20 |
|                 | 8H   | 19.62            | 20.46 | 20.14 | 20.97 | 21.53 | 19.53          | 20.36 | 20.05 | 20.88 | 21.44 |
|                 | 12H  | 19.87            | 20.62 | 20.41 | 21.17 | 21.73 | 19.77          | 20.52 | 20.31 | 21.07 | 21.63 |
| 8H              | 4H   | 18.93            | 19.76 | 19.45 | 20.28 | 20.84 | 18.86          | 19.69 | 19.38 | 20.21 | 20.77 |
|                 | 6H   | 19.80            | 20.50 | 20.35 | 21.06 | 21.62 | 19.72          | 20.42 | 20.27 | 20.98 | 21.54 |
|                 | 8H   | 20.17            | 20.81 | 20.74 | 21.38 | 21.96 | 20.09          | 20.72 | 20.66 | 21.29 | 21.87 |
|                 | 12H  | 20.53            | 21.09 | 21.10 | 21.65 | 22.29 | 20.43          | 20.99 | 21.00 | 21.55 | 22.20 |
| 12H             | 4H   | 18.97            | 19.72 | 19.51 | 20.27 | 20.83 | 18.90          | 19.65 | 19.44 | 20.20 | 20.76 |
|                 | 6H   | 19.87            | 20.50 | 20.44 | 21.07 | 21.65 | 19.79          | 20.43 | 20.36 | 21.00 | 21.58 |
|                 | 8H   | 20.31            | 20.87 | 20.88 | 21.43 | 22.08 | 20.23          | 20.79 | 20.80 | 21.35 | 22.00 |

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

Report Prepared for

Cooper Lighting Solutions

Corelite

Report Number: SP1-2506-458-1

Test Date: 07/23/2025

Luminaire Tested: 22ID2-55-CFR1-L835-U

Data in this report applies to families of products including 22ID2-55-CFR1-L835-U

### Test Information

Test Method: LM-79-2019  
 Report Number: SP1-2506-458-1  
 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-L835-U**  
 Description: 2X2 CGTX WITH INDEPTH FRAME AND CFR1 LENS - 5500 LUMEN 3500K 80CRI

### Spectral Parameters

CCT (K): 3440  
 CIE  $u'$ : 0.2370  
 CIE  $v'$ : 0.5132  
 Duv: 0.0005  
 CIE x: 0.4093  
 CIE y: 0.3940  
 CIE z: 0.1967  
 Peak Wavelength (nm): 599  
 Dominant Wavelength (nm): 580  
 Purity: 41.09375  
 R<sub>f</sub>: 84.9  
 R<sub>g</sub>: 94.6

CRI (Ra): 84.2  
 R1: 82.8  
 R2: 91.7  
 R3: 96.7  
 R4: 81.9  
 R5: 82.6  
 R6: 88.8  
 R7: 85.0  
 R8: 63.7  
 R9: 13.6  
 R10: 80.1  
 R11: 81.1  
 R12: 65.8  
 R13: 85.2  
 R14: 98.7  
 R15: 76.2



### Test Conditions

Stabilization Time: 36M  
 Operation Time: 1H 36M  
 Sphere Temperature (°C): 24.0

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

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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 3500K 4-step quadrangle

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### Photopic Flux vs. Wavelength

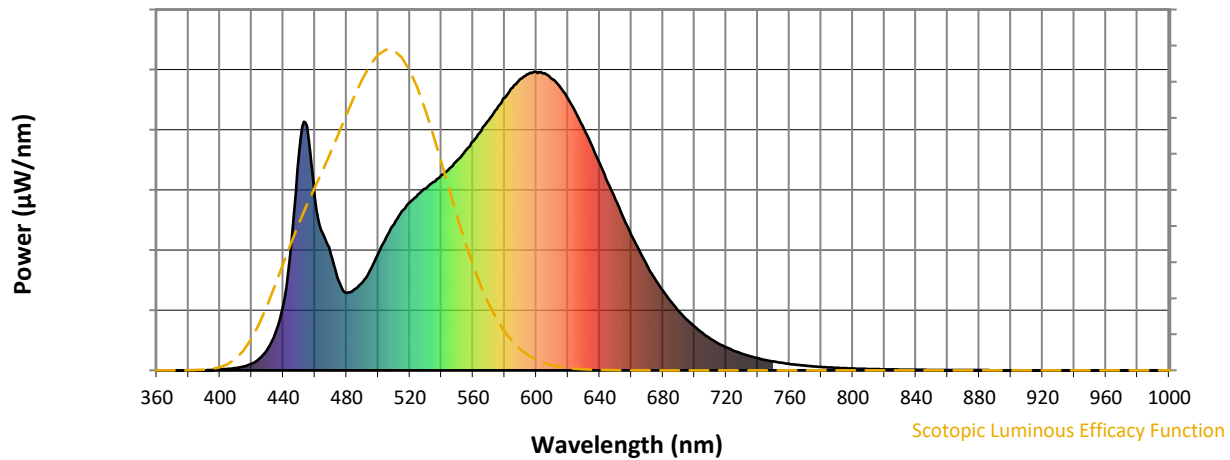


### Photopic Lumens: NR

| $\lambda$<br>(nm) | Power<br>$\text{W}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) |
|-------------------|-------------------------------|--------------------------------|-------------------|-------------------------------|--------------------------------|-------------------|-------------------------------|--------------------------------|-------------------|-------------------------------|--------------------------------|-------------------|-------------------------------|--------------------------------|
| 360               | 0                             | NR                             | 490               | 295                           | NR                             | 620               | 910                           | NR                             | 750               | 30                            | NR                             | 880               | 1                             | NR                             |
| 365               | 0                             | NR                             | 495               | 335                           | NR                             | 625               | 862                           | NR                             | 755               | 25                            | NR                             | 885               | 1                             | NR                             |
| 370               | 0                             | NR                             | 500               | 390                           | NR                             | 630               | 809                           | NR                             | 760               | 21                            | NR                             | 890               | 1                             | NR                             |
| 375               | 0                             | NR                             | 505               | 445                           | NR                             | 635               | 752                           | NR                             | 765               | 18                            | NR                             | 895               | 0                             | NR                             |
| 380               | 0                             | NR                             | 510               | 490                           | NR                             | 640               | 694                           | NR                             | 770               | 16                            | NR                             | 900               | 0                             | NR                             |
| 385               | 0                             | NR                             | 515               | 532                           | NR                             | 645               | 630                           | NR                             | 775               | 13                            | NR                             | 905               | 0                             | NR                             |
| 390               | 0                             | NR                             | 520               | 563                           | NR                             | 650               | 571                           | NR                             | 780               | 12                            | NR                             | 910               | 0                             | NR                             |
| 395               | 2                             | NR                             | 525               | 588                           | NR                             | 655               | 512                           | NR                             | 785               | 10                            | NR                             | 915               | 0                             | NR                             |
| 400               | 3                             | NR                             | 530               | 609                           | NR                             | 660               | 453                           | NR                             | 790               | 8                             | NR                             | 920               | 0                             | NR                             |
| 405               | 5                             | NR                             | 535               | 631                           | NR                             | 665               | 401                           | NR                             | 795               | 7                             | NR                             | 925               | 0                             | NR                             |
| 410               | 8                             | NR                             | 540               | 654                           | NR                             | 670               | 351                           | NR                             | 800               | 6                             | NR                             | 930               | 0                             | NR                             |
| 415               | 13                            | NR                             | 545               | 677                           | NR                             | 675               | 306                           | NR                             | 805               | 5                             | NR                             | 935               | 0                             | NR                             |
| 420               | 23                            | NR                             | 550               | 702                           | NR                             | 680               | 267                           | NR                             | 810               | 5                             | NR                             | 940               | 0                             | NR                             |
| 425               | 40                            | NR                             | 555               | 734                           | NR                             | 685               | 230                           | NR                             | 815               | 4                             | NR                             | 945               | 0                             | NR                             |
| 430               | 70                            | NR                             | 560               | 767                           | NR                             | 690               | 199                           | NR                             | 820               | 4                             | NR                             | 950               | 0                             | NR                             |
| 435               | 126                           | NR                             | 565               | 802                           | NR                             | 695               | 171                           | NR                             | 825               | 3                             | NR                             | 955               | 0                             | NR                             |
| 440               | 221                           | NR                             | 570               | 838                           | NR                             | 700               | 146                           | NR                             | 830               | 3                             | NR                             | 960               | 0                             | NR                             |
| 445               | 418                           | NR                             | 575               | 875                           | NR                             | 705               | 125                           | NR                             | 835               | 2                             | NR                             | 965               | 0                             | NR                             |
| 450               | 729                           | NR                             | 580               | 913                           | NR                             | 710               | 107                           | NR                             | 840               | 2                             | NR                             | 970               | 0                             | NR                             |
| 455               | 816                           | NR                             | 585               | 946                           | NR                             | 715               | 90                            | NR                             | 845               | 2                             | NR                             | 975               | 0                             | NR                             |
| 460               | 578                           | NR                             | 590               | 976                           | NR                             | 720               | 77                            | NR                             | 850               | 1                             | NR                             | 980               | 0                             | NR                             |
| 465               | 458                           | NR                             | 595               | 992                           | NR                             | 725               | 66                            | NR                             | 855               | 1                             | NR                             | 985               | 0                             | NR                             |
| 470               | 390                           | NR                             | 600               | 999                           | NR                             | 730               | 56                            | NR                             | 860               | 1                             | NR                             | 990               | 0                             | NR                             |
| 475               | 299                           | NR                             | 605               | 995                           | NR                             | 735               | 47                            | NR                             | 865               | 1                             | NR                             | 995               | 0                             | NR                             |
| 480               | 260                           | NR                             | 610               | 975                           | NR                             | 740               | 40                            | NR                             | 870               | 1                             | NR                             | 1000              | 0                             | NR                             |
| 485               | 271                           | NR                             | 615               | 948                           | NR                             | 745               | 34                            | NR                             | 875               | 1                             | NR                             |                   |                               |                                |

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### Scotopic Flux vs. Wavelength



Scotopic Lumens: NR

S/P: 1.53

| 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    | 295                      | NR            | 620    | 910                      | NR            | 750    | 30                       | NR            | 880    | 1                        | NR            |
| 365    | 0                        | NR            | 495    | 335                      | NR            | 625    | 862                      | NR            | 755    | 25                       | NR            | 885    | 1                        | NR            |
| 370    | 0                        | NR            | 500    | 390                      | NR            | 630    | 809                      | NR            | 760    | 21                       | NR            | 890    | 1                        | NR            |
| 375    | 0                        | NR            | 505    | 445                      | NR            | 635    | 752                      | NR            | 765    | 18                       | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 490                      | NR            | 640    | 694                      | NR            | 770    | 16                       | NR            | 900    | 0                        | NR            |
| 385    | 0                        | NR            | 515    | 532                      | NR            | 645    | 630                      | NR            | 775    | 13                       | NR            | 905    | 0                        | NR            |
| 390    | 0                        | NR            | 520    | 563                      | NR            | 650    | 571                      | NR            | 780    | 12                       | NR            | 910    | 0                        | NR            |
| 395    | 2                        | NR            | 525    | 588                      | NR            | 655    | 512                      | NR            | 785    | 10                       | NR            | 915    | 0                        | NR            |
| 400    | 3                        | NR            | 530    | 609                      | NR            | 660    | 453                      | NR            | 790    | 8                        | NR            | 920    | 0                        | NR            |
| 405    | 5                        | NR            | 535    | 631                      | NR            | 665    | 401                      | NR            | 795    | 7                        | NR            | 925    | 0                        | NR            |
| 410    | 8                        | NR            | 540    | 654                      | NR            | 670    | 351                      | NR            | 800    | 6                        | NR            | 930    | 0                        | NR            |
| 415    | 13                       | NR            | 545    | 677                      | NR            | 675    | 306                      | NR            | 805    | 5                        | NR            | 935    | 0                        | NR            |
| 420    | 23                       | NR            | 550    | 702                      | NR            | 680    | 267                      | NR            | 810    | 5                        | NR            | 940    | 0                        | NR            |
| 425    | 40                       | NR            | 555    | 734                      | NR            | 685    | 230                      | NR            | 815    | 4                        | NR            | 945    | 0                        | NR            |
| 430    | 70                       | NR            | 560    | 767                      | NR            | 690    | 199                      | NR            | 820    | 4                        | NR            | 950    | 0                        | NR            |
| 435    | 126                      | NR            | 565    | 802                      | NR            | 695    | 171                      | NR            | 825    | 3                        | NR            | 955    | 0                        | NR            |
| 440    | 221                      | NR            | 570    | 838                      | NR            | 700    | 146                      | NR            | 830    | 3                        | NR            | 960    | 0                        | NR            |
| 445    | 418                      | NR            | 575    | 875                      | NR            | 705    | 125                      | NR            | 835    | 2                        | NR            | 965    | 0                        | NR            |
| 450    | 729                      | NR            | 580    | 913                      | NR            | 710    | 107                      | NR            | 840    | 2                        | NR            | 970    | 0                        | NR            |
| 455    | 816                      | NR            | 585    | 946                      | NR            | 715    | 90                       | NR            | 845    | 2                        | NR            | 975    | 0                        | NR            |
| 460    | 578                      | NR            | 590    | 976                      | NR            | 720    | 77                       | NR            | 850    | 1                        | NR            | 980    | 0                        | NR            |
| 465    | 458                      | NR            | 595    | 992                      | NR            | 725    | 66                       | NR            | 855    | 1                        | NR            | 985    | 0                        | NR            |
| 470    | 390                      | NR            | 600    | 999                      | NR            | 730    | 56                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 299                      | NR            | 605    | 995                      | NR            | 735    | 47                       | NR            | 865    | 1                        | NR            | 995    | 0                        | NR            |
| 480    | 260                      | NR            | 610    | 975                      | NR            | 740    | 40                       | NR            | 870    | 1                        | NR            | 1000   | 0                        | NR            |
| 485    | 271                      | NR            | 615    | 948                      | NR            | 745    | 34                       | NR            | 875    | 1                        | NR            |        |                          |               |

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### Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 3.07

| 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       | 295                         | NR               | 620       | 910                         | NR               | 750       | 30                          | NR               | 880       | 1                           | NR               |
| 365       | 0                           | NR               | 495       | 335                         | NR               | 625       | 862                         | NR               | 755       | 25                          | NR               | 885       | 1                           | NR               |
| 370       | 0                           | NR               | 500       | 390                         | NR               | 630       | 809                         | NR               | 760       | 21                          | NR               | 890       | 1                           | NR               |
| 375       | 0                           | NR               | 505       | 445                         | NR               | 635       | 752                         | NR               | 765       | 18                          | NR               | 895       | 0                           | NR               |
| 380       | 0                           | NR               | 510       | 490                         | NR               | 640       | 694                         | NR               | 770       | 16                          | NR               | 900       | 0                           | NR               |
| 385       | 0                           | NR               | 515       | 532                         | NR               | 645       | 630                         | NR               | 775       | 13                          | NR               | 905       | 0                           | NR               |
| 390       | 0                           | NR               | 520       | 563                         | NR               | 650       | 571                         | NR               | 780       | 12                          | NR               | 910       | 0                           | NR               |
| 395       | 2                           | NR               | 525       | 588                         | NR               | 655       | 512                         | NR               | 785       | 10                          | NR               | 915       | 0                           | NR               |
| 400       | 3                           | NR               | 530       | 609                         | NR               | 660       | 453                         | NR               | 790       | 8                           | NR               | 920       | 0                           | NR               |
| 405       | 5                           | NR               | 535       | 631                         | NR               | 665       | 401                         | NR               | 795       | 7                           | NR               | 925       | 0                           | NR               |
| 410       | 8                           | NR               | 540       | 654                         | NR               | 670       | 351                         | NR               | 800       | 6                           | NR               | 930       | 0                           | NR               |
| 415       | 13                          | NR               | 545       | 677                         | NR               | 675       | 306                         | NR               | 805       | 5                           | NR               | 935       | 0                           | NR               |
| 420       | 23                          | NR               | 550       | 702                         | NR               | 680       | 267                         | NR               | 810       | 5                           | NR               | 940       | 0                           | NR               |
| 425       | 40                          | NR               | 555       | 734                         | NR               | 685       | 230                         | NR               | 815       | 4                           | NR               | 945       | 0                           | NR               |
| 430       | 70                          | NR               | 560       | 767                         | NR               | 690       | 199                         | NR               | 820       | 4                           | NR               | 950       | 0                           | NR               |
| 435       | 126                         | NR               | 565       | 802                         | NR               | 695       | 171                         | NR               | 825       | 3                           | NR               | 955       | 0                           | NR               |
| 440       | 221                         | NR               | 570       | 838                         | NR               | 700       | 146                         | NR               | 830       | 3                           | NR               | 960       | 0                           | NR               |
| 445       | 418                         | NR               | 575       | 875                         | NR               | 705       | 125                         | NR               | 835       | 2                           | NR               | 965       | 0                           | NR               |
| 450       | 729                         | NR               | 580       | 913                         | NR               | 710       | 107                         | NR               | 840       | 2                           | NR               | 970       | 0                           | NR               |
| 455       | 816                         | NR               | 585       | 946                         | NR               | 715       | 90                          | NR               | 845       | 2                           | NR               | 975       | 0                           | NR               |
| 460       | 578                         | NR               | 590       | 976                         | NR               | 720       | 77                          | NR               | 850       | 1                           | NR               | 980       | 0                           | NR               |
| 465       | 458                         | NR               | 595       | 992                         | NR               | 725       | 66                          | NR               | 855       | 1                           | NR               | 985       | 0                           | NR               |
| 470       | 390                         | NR               | 600       | 999                         | NR               | 730       | 56                          | NR               | 860       | 1                           | NR               | 990       | 0                           | NR               |
| 475       | 299                         | NR               | 605       | 995                         | NR               | 735       | 47                          | NR               | 865       | 1                           | NR               | 995       | 0                           | NR               |
| 480       | 260                         | NR               | 610       | 975                         | NR               | 740       | 40                          | NR               | 870       | 1                           | NR               | 1000      | 0                           | NR               |
| 485       | 271                         | NR               | 615       | 948                         | NR               | 745       | 34                          | NR               | 875       | 1                           | NR               |           |                             |                  |

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TM-30-18

### Summary

$R_f = 84.9$   
 $R_g = 94.6$   
 $CIE R_a = 84.2$   
 $R_9 = 13.6$



### Color Vector Graphics



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

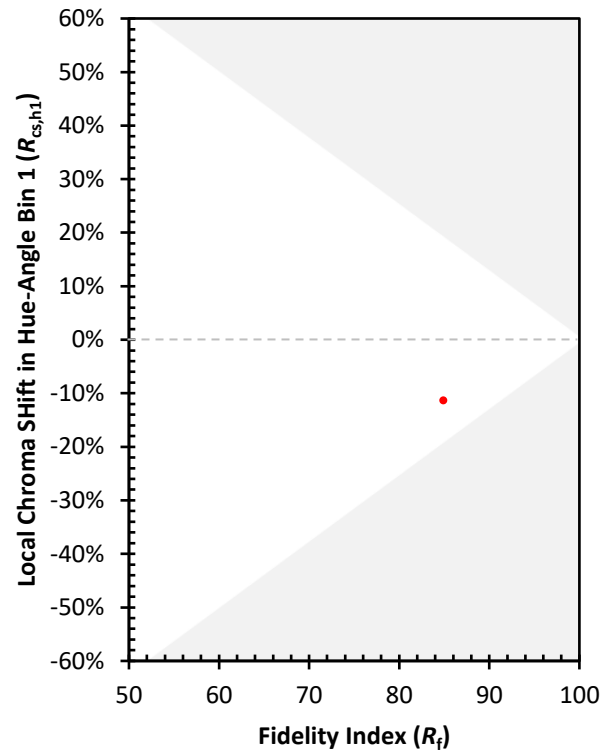
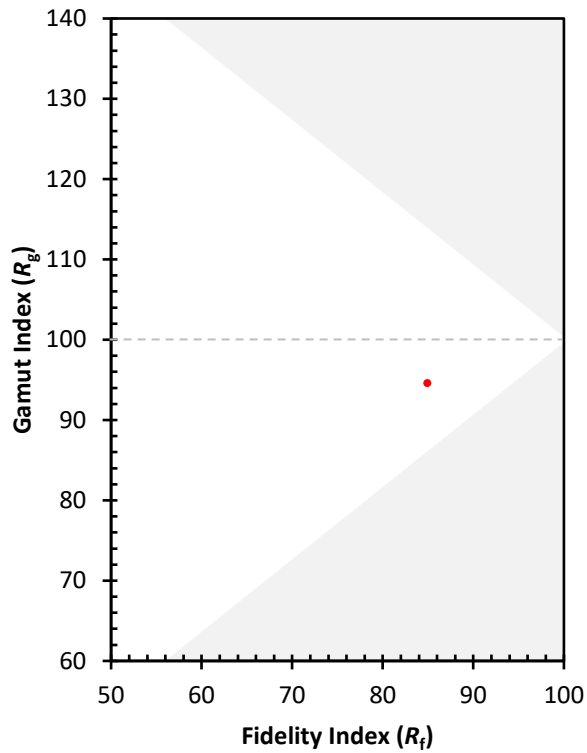
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 87 | CES51 = 92 | CES76 = 81 |
| CES02 = 62 | CES27 = 91 | CES52 = 93 | CES77 = 85 |
| CES03 = 31 | CES28 = 94 | CES53 = 90 | CES78 = 80 |
| CES04 = 70 | CES29 = 92 | CES54 = 89 | CES79 = 92 |
| CES05 = 49 | CES30 = 89 | CES55 = 86 | CES80 = 90 |
| CES06 = 51 | CES31 = 94 | CES56 = 85 | CES81 = 77 |
| CES07 = 41 | CES32 = 86 | CES57 = 83 | CES82 = 96 |
| CES08 = 40 | CES33 = 97 | CES58 = 84 | CES83 = 96 |
| CES09 = 29 | CES34 = 91 | CES59 = 91 | CES84 = 91 |
| CES10 = 75 | CES35 = 95 | CES60 = 89 | CES85 = 76 |
| CES11 = 58 | CES36 = 79 | CES61 = 87 | CES86 = 73 |
| CES12 = 64 | CES37 = 95 | CES62 = 81 | CES87 = 85 |
| CES13 = 43 | CES38 = 84 | CES63 = 85 | CES88 = 89 |
| CES14 = 74 | CES39 = 98 | CES64 = 78 | CES89 = 78 |
| CES15 = 71 | CES40 = 97 | CES65 = 78 | CES90 = 90 |
| CES16 = 47 | CES41 = 95 | CES66 = 75 | CES91 = 71 |
| CES17 = 50 | CES42 = 96 | CES67 = 74 | CES92 = 65 |
| CES18 = 56 | CES43 = 92 | CES68 = 79 | CES93 = 79 |
| CES19 = 72 | CES44 = 99 | CES69 = 83 | CES94 = 64 |
| CES20 = 66 | CES45 = 95 | CES70 = 77 | CES95 = 74 |
| CES21 = 86 | CES46 = 91 | CES71 = 71 | CES96 = 85 |
| CES22 = 78 | CES47 = 94 | CES72 = 90 | CES97 = 90 |
| CES23 = 92 | CES48 = 83 | CES73 = 72 | CES98 = 86 |
| CES24 = 90 | CES49 = 92 | CES74 = 90 | CES99 = 79 |
| CES25 = 72 | CES50 = 93 | CES75 = 75 |            |



### Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)