

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: P1216309

Luminaire Tested: 24-ID2-60-DBD-L930-U

Issue Date: 12/5/2025

**Test Information**

Test Method: LM-79-2019  
Report Number: P1216309  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-2508-510-11)  
Test Lab: INNOVATION CENTER  
Issue Date: 12/5/2025  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: CORELITE  
Catalog Number: 24-ID2-60-DBD-L930-U  
Description: 2X4 IN DEPTH TROFFER WITH 2INCH DOUBLE BARREL DROP  
Light Source: 3000K CCT, 90 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

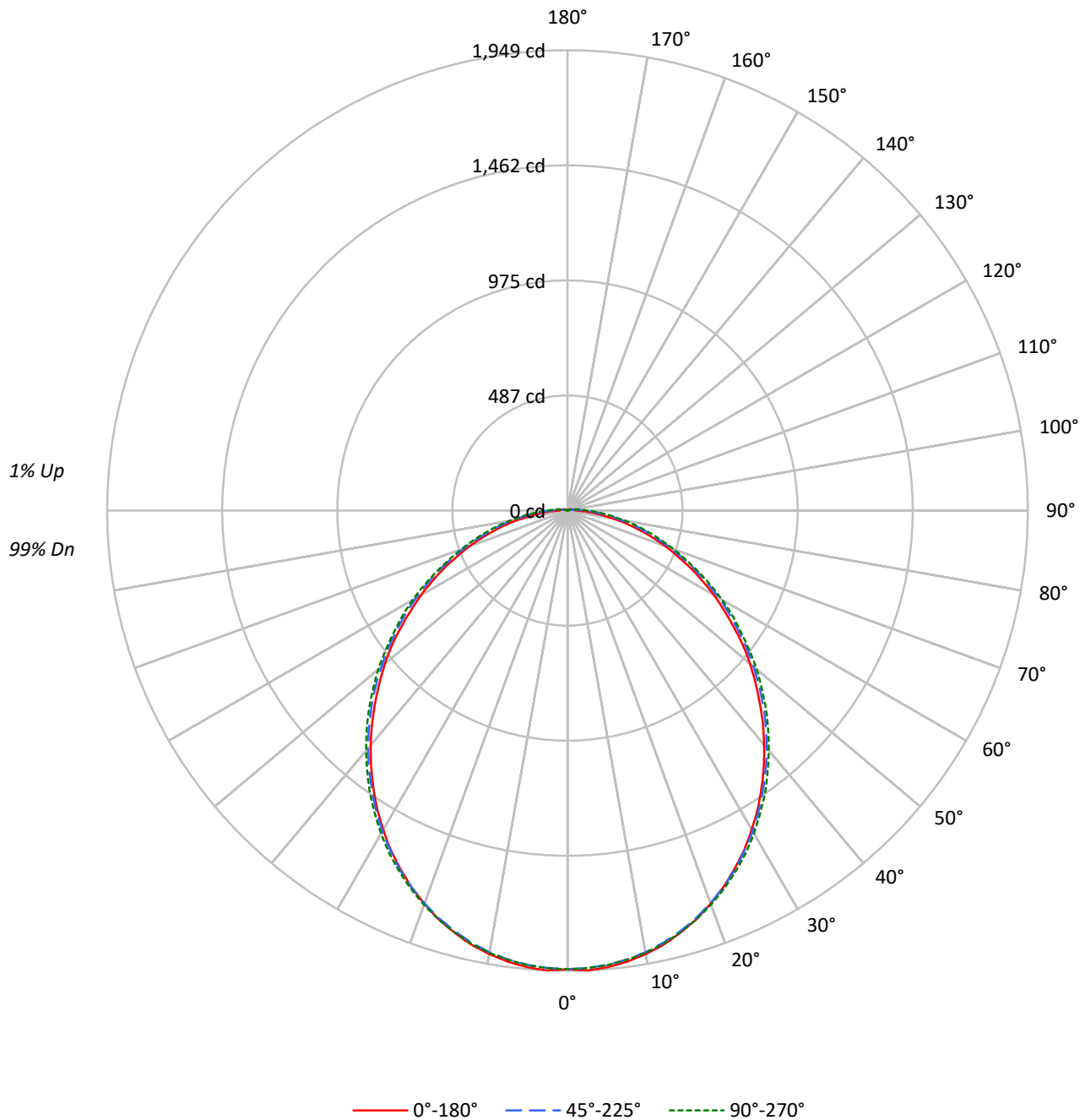
Lumens per Lamp: N/A  
Luminaire Lumens: 5241.0 lumens  
Efficiency: N/A  
Efficacy: 101.0 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.21 / 1.31  
Luminous Opening: Rectangular w/ Sides (W: 2' x L: 4' x H: 0.15')  
CIE Type: Direct

Input Watts (W): 51.9  
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



TEST NUMBER: P1216309  
CATALOG NUMBER: 24-ID2-60-DBD-L930-U

### Luminous Intensity Polar Plot



TEST NUMBER: P1216309

CATALOG NUMBER: 24-ID2-60-DBD-L930-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   | 119 | 119 | 119 | 119 | 116 | 116 | 116 | 116 | 110 | 110 | 110 | 105 | 105 | 105 | 101 | 101 | 101 |
| 1   | 108 | 103 | 99  | 95  | 105 | 101 | 97  | 93  | 96  | 93  | 90  | 92  | 90  | 87  | 88  | 86  | 84  |
| 2   | 98  | 90  | 83  | 77  | 96  | 88  | 82  | 76  | 84  | 79  | 74  | 81  | 76  | 73  | 78  | 74  | 71  |
| 3   | 90  | 79  | 71  | 65  | 87  | 78  | 70  | 64  | 74  | 68  | 63  | 71  | 66  | 61  | 69  | 64  | 60  |
| 4   | 82  | 70  | 62  | 55  | 80  | 69  | 61  | 54  | 66  | 59  | 54  | 64  | 58  | 53  | 61  | 56  | 52  |
| 5   | 76  | 63  | 54  | 47  | 74  | 62  | 53  | 47  | 60  | 52  | 46  | 57  | 51  | 46  | 55  | 50  | 45  |
| 6   | 70  | 57  | 48  | 41  | 68  | 56  | 47  | 41  | 54  | 46  | 41  | 52  | 45  | 40  | 50  | 44  | 40  |
| 7   | 65  | 52  | 43  | 37  | 63  | 51  | 42  | 37  | 49  | 42  | 36  | 47  | 41  | 36  | 46  | 40  | 35  |
| 8   | 61  | 47  | 39  | 33  | 59  | 46  | 38  | 33  | 45  | 38  | 32  | 44  | 37  | 32  | 42  | 36  | 32  |
| 9   | 57  | 43  | 35  | 30  | 55  | 43  | 35  | 29  | 41  | 34  | 29  | 40  | 34  | 29  | 39  | 33  | 29  |
| 10  | 53  | 40  | 32  | 27  | 52  | 39  | 32  | 27  | 38  | 31  | 27  | 37  | 31  | 26  | 36  | 31  | 26  |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2613 | 2613 | 2613 |
| 5°  | 2613 | 2590 | 2592 |
| 10° | 2588 | 2558 | 2564 |
| 15° | 2551 | 2515 | 2524 |
| 20° | 2502 | 2462 | 2476 |
| 25° | 2442 | 2402 | 2417 |
| 30° | 2372 | 2329 | 2351 |
| 35° | 2293 | 2246 | 2276 |
| 40° | 2206 | 2160 | 2190 |
| 45° | 2111 | 2066 | 2103 |
| 50° | 2020 | 1965 | 2009 |
| 55° | 1912 | 1857 | 1897 |
| 60° | 1808 | 1750 | 1802 |
| 65° | 1691 | 1630 | 1673 |
| 70° | 1572 | 1498 | 1551 |
| 75° | 1424 | 1367 | 1443 |
| 80° | 1268 | 1237 | 1341 |
| 85° | 1135 | 1122 | 1279 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2111 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 183.4  | 3.5       |
| 10°-20°   | 520.3  | 9.9       |
| 20°-30°   | 772.4  | 14.7      |
| 30°-40°   | 903.1  | 17.2      |
| 40°-50°   | 903.6  | 17.2      |
| 50°-60°   | 788.3  | 15.0      |
| 60°-70°   | 590.3  | 11.3      |
| 70°-80°   | 359.6  | 6.9       |
| 80°-90°   | 151.7  | 2.9       |
| 90°-100°  | 44.8   | 0.9       |
| 100°-110° | 13.8   | 0.3       |
| 110°-120° | 5.2    | 0.1       |
| 120°-130° | 2.7    | 0.1       |
| 130°-140° | 1.2    | 0.0       |
| 140°-150° | 0.6    | 0.0       |
| 150°-160° | 0.0    | 0.0       |
| 160°-170° | 0.0    | 0.0       |
| 170°-180° | 0.0    | 0.0       |
| 0°-30°    | 1476.1 | 28.2      |
| 0°-40°    | 2379.2 | 45.4      |
| 0°-60°    | 4071.1 | 77.7      |
| 0°-90°    | 5172.7 | 98.7      |
| 90°-120°  | 63.9   | 1.2       |
| 90°-150°  | 68.3   | 1.3       |
| 90°-180°  | 68.0   | 1.3       |
| 0°-180°   | 5241.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1942 | 1942  | 1942 | 1942  | 1942 |      |
| 5°   | 1941 | 1935  | 1931 | 1928  | 1932 | 184  |
| 15°  | 1850 | 1846  | 1844 | 1845  | 1848 | 521  |
| 25°  | 1674 | 1673  | 1678 | 1681  | 1685 | 771  |
| 35°  | 1433 | 1434  | 1444 | 1454  | 1459 | 896  |
| 45°  | 1151 | 1157  | 1172 | 1185  | 1188 | 889  |
| 55°  | 859  | 865   | 882  | 894   | 896  | 770  |
| 65°  | 574  | 581   | 599  | 608   | 610  | 569  |
| 75°  | 312  | 324   | 341  | 354   | 355  | 332  |
| 85°  | 105  | 119   | 139  | 152   | 154  | 105  |
| 90°  | 34   | 52    | 68   | 80    | 83   | 23   |
| 95°  | 29   | 28    | 40   | 50    | 52   | 22   |
| 105° | 19   | 15    | 9    | 9     | 11   | 20   |
| 115° | 12   | 9     | 5    | 1     | 0    | 11   |
| 125° | 6    | 6     | 3    | 0     | 0    | 6    |
| 135° | 4    | 3     | 1    | 1     | 0    | 3    |
| 145° | 1    | 1     | 1    | 1     | 1    | 1    |
| 155° | 0    | 0     | 0    | 0     | 0    | 0    |
| 165° | 0    | 0     | 0    | 0     | 0    | 0    |
| 175° | 0    | 0     | 0    | 0     | 0    | 0    |
| 180° | 0    | 0     | 0    | 0     | 0    | 0    |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1942.0 | 1942.0 | 1942.0 | 1942.0 | 1942.0 |
| 2.5°   | 1949.2 | 1942.7 | 1938.4 | 1936.3 | 1939.1 |
| 5°     | 1941.3 | 1934.8 | 1931.2 | 1928.4 | 1932.0 |
| 7.5°   | 1926.9 | 1920.4 | 1917.6 | 1916.1 | 1919.0 |
| 10°    | 1906.8 | 1900.3 | 1898.9 | 1896.7 | 1901.7 |
| 12.5°  | 1882.3 | 1875.9 | 1874.4 | 1873.7 | 1878.7 |
| 15°    | 1850.0 | 1845.6 | 1844.2 | 1844.9 | 1848.5 |
| 17.5°  | 1814.7 | 1809.7 | 1809.0 | 1810.4 | 1814.7 |
| 20°    | 1771.6 | 1768.7 | 1769.4 | 1773.0 | 1776.6 |
| 22.5°  | 1725.5 | 1722.6 | 1725.5 | 1727.0 | 1732.7 |
| 25°    | 1673.7 | 1673.0 | 1678.1 | 1680.9 | 1685.2 |
| 27.5°  | 1620.5 | 1620.5 | 1623.4 | 1628.4 | 1634.9 |
| 30°    | 1560.1 | 1560.8 | 1568.0 | 1572.3 | 1578.8 |
| 32.5°  | 1499.0 | 1500.4 | 1506.9 | 1514.1 | 1518.4 |
| 35°    | 1432.8 | 1434.2 | 1443.6 | 1453.6 | 1458.7 |
| 37.5°  | 1365.2 | 1368.8 | 1379.6 | 1388.9 | 1392.5 |
| 40°    | 1295.4 | 1299.7 | 1311.9 | 1323.5 | 1325.6 |
| 42.5°  | 1224.9 | 1229.2 | 1243.6 | 1255.8 | 1258.0 |
| 45°    | 1150.8 | 1157.3 | 1172.4 | 1184.6 | 1188.2 |
| 47.5°  | 1079.6 | 1086.1 | 1101.2 | 1114.1 | 1115.6 |
| 50°    | 1008.4 | 1012.7 | 1027.8 | 1040.1 | 1045.8 |
| 52.5°  | 937.2  | 941.5  | 955.9  | 971.0  | 970.3  |
| 55°    | 858.8  | 864.6  | 881.8  | 894.1  | 895.5  |
| 57.5°  | 785.4  | 793.4  | 811.3  | 823.6  | 827.9  |
| 60°    | 715.7  | 722.1  | 740.1  | 750.2  | 756.7  |
| 62.5°  | 643.0  | 650.9  | 668.2  | 679.7  | 682.6  |
| 65°    | 574.0  | 581.2  | 599.2  | 607.8  | 609.9  |
| 67.5°  | 502.8  | 512.8  | 529.4  | 540.2  | 541.6  |
| 70°    | 440.9  | 448.1  | 463.9  | 474.7  | 475.4  |
| 72.5°  | 374.0  | 384.1  | 399.9  | 412.9  | 416.5  |
| 75°    | 312.2  | 323.7  | 340.9  | 353.9  | 355.3  |
| 77.5°  | 253.2  | 265.4  | 287.0  | 299.9  | 300.7  |
| 80°    | 198.5  | 212.2  | 231.6  | 246.7  | 246.7  |
| 82.5°  | 147.4  | 163.3  | 185.6  | 199.2  | 198.5  |
| 85°    | 105.0  | 119.4  | 138.8  | 152.5  | 153.9  |
| 87.5°  | 65.5   | 80.6   | 99.3   | 110.8  | 113.6  |
| 90°    | 34.5   | 52.5   | 68.3   | 79.8   | 82.7   |
| 92.5°  | 31.6   | 38.1   | 53.2   | 64.0   | 66.2   |
| 95°    | 28.8   | 28.1   | 39.6   | 49.6   | 52.5   |
| 97.5°  | 25.9   | 21.6   | 28.1   | 36.7   | 39.6   |
| 100°   | 23.0   | 19.4   | 20.1   | 25.9   | 28.1   |
| 102.5° | 20.9   | 17.3   | 12.2   | 16.5   | 18.7   |
| 105°   | 18.7   | 15.1   | 8.6    | 8.6    | 10.8   |
| 107.5° | 16.5   | 13.7   | 7.9    | 3.6    | 5.0    |
| 110°   | 14.4   | 12.2   | 6.5    | 1.4    | 0.7    |

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CATALOG NUMBER: 24-ID2-60-DBD-L930-U

**CANDELA DISTRIBUTION (continued):**

|        | 0°   | 22.5° | 45° | 67.5° | 90° |
|--------|------|-------|-----|-------|-----|
| 112.5° | 12.9 | 10.8  | 5.8 | 0.7   | 0.0 |
| 115°   | 11.5 | 9.4   | 5.0 | 0.7   | 0.0 |
| 117.5° | 10.1 | 8.6   | 4.3 | 0.0   | 0.0 |
| 120°   | 8.6  | 7.2   | 3.6 | 0.0   | 0.0 |
| 122.5° | 7.9  | 6.5   | 2.9 | 0.0   | 0.0 |
| 125°   | 6.5  | 5.8   | 2.9 | 0.0   | 0.0 |
| 127.5° | 5.8  | 5.0   | 2.2 | 0.0   | 0.0 |
| 130°   | 5.0  | 4.3   | 1.4 | 0.0   | 0.0 |
| 132.5° | 4.3  | 3.6   | 1.4 | 0.0   | 0.0 |
| 135°   | 3.6  | 2.9   | 0.7 | 0.7   | 0.0 |
| 137.5° | 2.9  | 2.2   | 0.7 | 0.7   | 0.0 |
| 140°   | 2.2  | 2.2   | 0.7 | 0.7   | 0.0 |
| 142.5° | 2.2  | 1.4   | 0.7 | 0.7   | 0.0 |
| 145°   | 1.4  | 1.4   | 0.7 | 0.7   | 0.7 |
| 147.5° | 1.4  | 0.7   | 0.7 | 0.7   | 0.7 |
| 150°   | 0.7  | 0.7   | 0.7 | 0.7   | 0.7 |
| 152.5° | 0.0  | 0.0   | 0.0 | 0.0   | 0.0 |
| 155°   | 0.0  | 0.0   | 0.0 | 0.0   | 0.0 |
| 157.5° | 0.0  | 0.0   | 0.0 | 0.0   | 0.0 |
| 160°   | 0.0  | 0.0   | 0.0 | 0.0   | 0.0 |
| 162.5° | 0.0  | 0.0   | 0.0 | 0.0   | 0.0 |
| 165°   | 0.0  | 0.0   | 0.0 | 0.0   | 0.0 |
| 167.5° | 0.0  | 0.0   | 0.0 | 0.0   | 0.0 |
| 170°   | 0.0  | 0.0   | 0.0 | 0.0   | 0.0 |
| 172.5° | 0.0  | 0.0   | 0.0 | 0.0   | 0.0 |
| 175°   | 0.0  | 0.0   | 0.0 | 0.0   | 0.0 |
| 177.5° | 0.0  | 0.0   | 0.0 | 0.0   | 0.0 |
| 180°   | 0.0  | 0.0   | 0.0 | 0.0   | 0.0 |

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**CIE UGR TABLE:**

| Reflectances:   |      |                  |       |       |       |       |                |       |       |       |       |
|-----------------|------|------------------|-------|-------|-------|-------|----------------|-------|-------|-------|-------|
| Ceiling         |      | 0.7              | 0.7   | 0.5   | 0.5   | 0.3   | 0.7            | 0.7   | 0.5   | 0.5   | 0.3   |
| Wall            |      | 0.5              | 0.3   | 0.5   | 0.3   | 0.3   | 0.5            | 0.3   | 0.5   | 0.3   | 0.3   |
| Reference plane |      | 0.2              | 0.2   | 0.2   | 0.2   | 0.2   | 0.2            | 0.2   | 0.2   | 0.2   | 0.2   |
| Room dimensions |      | Viewed crosswise |       |       |       |       | Viewed endwise |       |       |       |       |
| X=2H            | Y=2H | 13.77            | 15.37 | 14.16 | 15.71 | 16.06 | 14.17          | 15.77 | 14.56 | 16.11 | 16.46 |
|                 | 3H   | 15.43            | 16.87 | 15.83 | 17.23 | 17.62 | 15.94          | 17.38 | 16.33 | 17.74 | 18.13 |
|                 | 4H   | 16.04            | 17.40 | 16.46 | 17.78 | 18.19 | 16.66          | 18.02 | 17.08 | 18.40 | 18.80 |
|                 | 6H   | 16.49            | 17.76 | 16.93 | 18.15 | 18.57 | 17.27          | 18.54 | 17.70 | 18.93 | 19.35 |
|                 | 8H   | 16.64            | 17.85 | 17.09 | 18.27 | 18.70 | 17.52          | 18.73 | 17.97 | 19.15 | 19.58 |
|                 | 12H  | 16.75            | 17.91 | 17.21 | 18.32 | 18.78 | 17.75          | 18.91 | 18.20 | 19.32 | 19.78 |
| 4H              | 2H   | 14.40            | 15.77 | 14.82 | 16.14 | 16.55 | 14.72          | 16.08 | 15.14 | 16.46 | 16.87 |
|                 | 3H   | 16.28            | 17.43 | 16.71 | 17.85 | 18.28 | 16.71          | 17.86 | 17.14 | 18.28 | 18.71 |
|                 | 4H   | 17.02            | 18.06 | 17.47 | 18.50 | 18.96 | 17.57          | 18.61 | 18.02 | 19.05 | 19.52 |
|                 | 6H   | 17.60            | 18.51 | 18.08 | 18.98 | 19.47 | 18.34          | 19.25 | 18.82 | 19.72 | 20.20 |
|                 | 8H   | 17.80            | 18.66 | 18.28 | 19.12 | 19.62 | 18.66          | 19.52 | 19.14 | 19.98 | 20.48 |
|                 | 12H  | 17.96            | 18.73 | 18.46 | 19.23 | 19.73 | 18.96          | 19.73 | 19.46 | 20.23 | 20.73 |
| 8H              | 4H   | 17.36            | 18.22 | 17.84 | 18.69 | 19.18 | 17.86          | 18.71 | 18.34 | 19.18 | 19.67 |
|                 | 6H   | 18.08            | 18.80 | 18.60 | 19.31 | 19.81 | 18.77          | 19.48 | 19.28 | 19.99 | 20.50 |
|                 | 8H   | 18.37            | 19.01 | 18.89 | 19.54 | 20.05 | 19.19          | 19.84 | 19.72 | 20.36 | 20.88 |
|                 | 12H  | 18.61            | 19.18 | 19.14 | 19.70 | 20.28 | 19.61          | 20.18 | 20.14 | 20.70 | 21.29 |
| 12H             | 4H   | 17.42            | 18.19 | 17.92 | 18.69 | 19.19 | 17.88          | 18.66 | 18.38 | 19.15 | 19.65 |
|                 | 6H   | 18.17            | 18.82 | 18.70 | 19.35 | 19.86 | 18.82          | 19.47 | 19.35 | 20.00 | 20.51 |
|                 | 8H   | 18.53            | 19.10 | 19.05 | 19.61 | 20.20 | 19.32          | 19.89 | 19.84 | 20.40 | 20.99 |



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

Report Prepared for

Cooper Lighting Solutions

Corelite

Report Number: SP1-2506-458-9

Test Date: 08/26/2025

Luminaire Tested: 22ID2-55-CFR1-L930-U

Data in this report applies to families of products including 22ID2-55-CFR1-L930-U

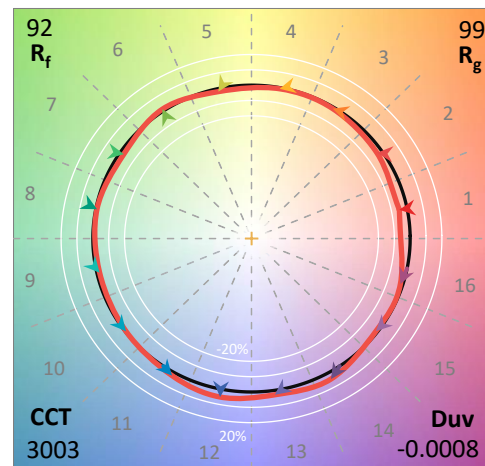
### Test Information

Test Method: LM-79-2019  
 Report Number: SP1-2506-458-9  
 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-L930-U**  
 Description: 2X2 CGTX WITH INDEPTH FRAME AND CFR1 LENS - 5500 LUMEN 3000K 90CRI

### Spectral Parameters

CCT (K): 3003  
 CIE  $u'$ : 0.2507  
 CIE  $v'$ : 0.5202  
 Duv: -0.0008  
 CIE x: 0.4356  
 CIE y: 0.4017  
 CIE z: 0.1627  
 Peak Wavelength (nm): 618  
 Dominant Wavelength (nm): 583  
 Purity: 51.31044  
 R<sub>f</sub>: 91.9  
 R<sub>g</sub>: 99.2

CRI (Ra): 93.2  
 R1: 93.7  
 R2: 97.2  
 R3: 98.7  
 R4: 93.5  
 R5: 93.6  
 R6: 96.3  
 R7: 91.5  
 R8: 81.5  
 R9: 59.0  
 R10: 92.7  
 R11: 94.9  
 R12: 82.6  
 R13: 94.8  
 R14: 99.1  
 R15: 89.5



### Test Conditions

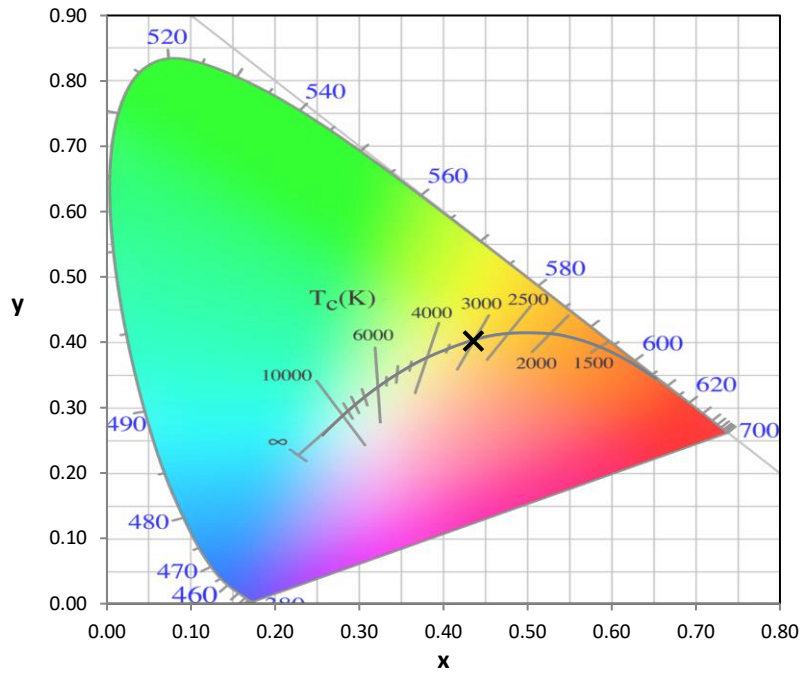
Stabilization Time: 32M  
 Operation Time: 1H 32M  
 Sphere Temperature (°C): 25.2

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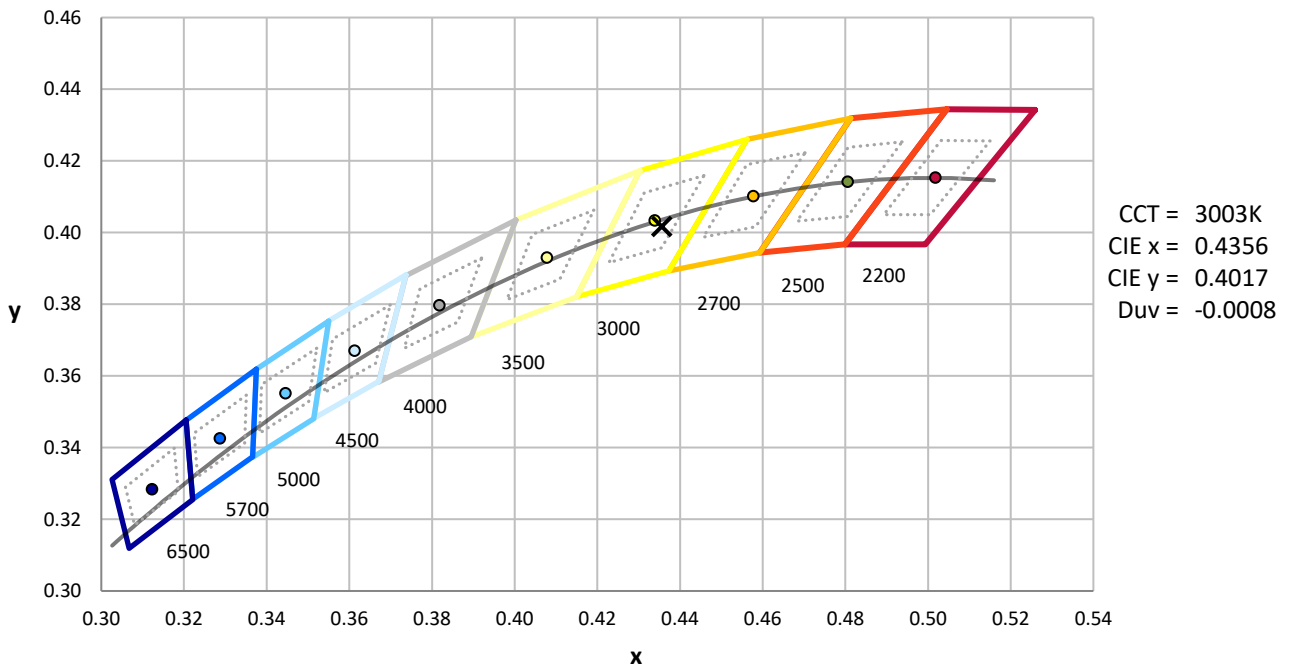
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date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



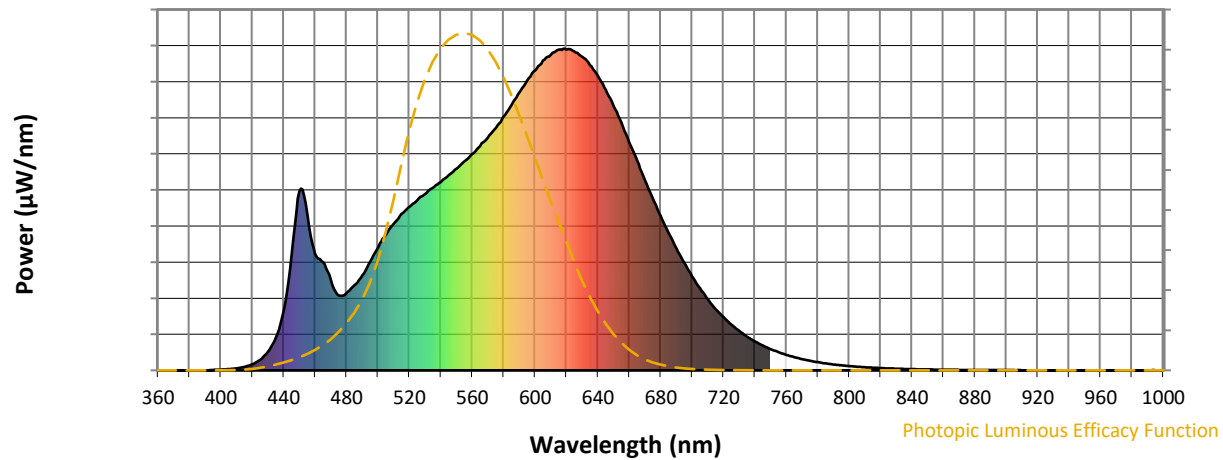
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 3000K 4-step quadrangle

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### Photopic Flux vs. Wavelength

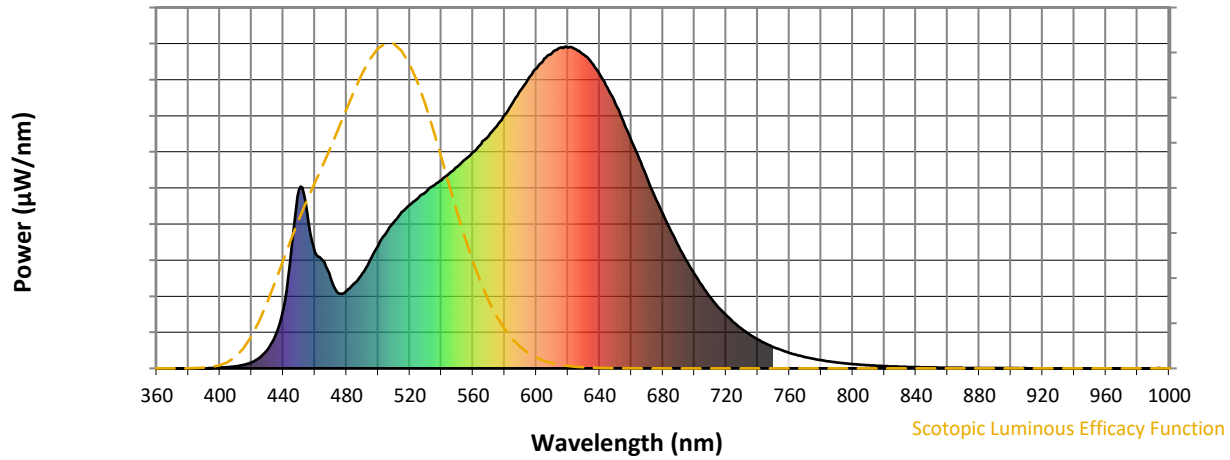


### Photopic Lumens: NR

| $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) |
|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|
| 360               | 0                                    | NR                             | 490               | 296                                  | NR                             | 620               | 997                                  | NR                             | 750               | 66                                   | NR                             | 880               | 1                                    | NR                             |
| 365               | 0                                    | NR                             | 495               | 338                                  | NR                             | 625               | 992                                  | NR                             | 755               | 56                                   | NR                             | 885               | 1                                    | NR                             |
| 370               | 0                                    | NR                             | 500               | 381                                  | NR                             | 630               | 975                                  | NR                             | 760               | 48                                   | NR                             | 890               | 1                                    | NR                             |
| 375               | 0                                    | NR                             | 505               | 421                                  | NR                             | 635               | 949                                  | NR                             | 765               | 41                                   | NR                             | 895               | 1                                    | NR                             |
| 380               | 0                                    | NR                             | 510               | 456                                  | NR                             | 640               | 916                                  | NR                             | 770               | 35                                   | NR                             | 900               | 1                                    | NR                             |
| 385               | 0                                    | NR                             | 515               | 487                                  | NR                             | 645               | 871                                  | NR                             | 775               | 30                                   | NR                             | 905               | 1                                    | NR                             |
| 390               | 0                                    | NR                             | 520               | 508                                  | NR                             | 650               | 821                                  | NR                             | 780               | 26                                   | NR                             | 910               | 1                                    | NR                             |
| 395               | 1                                    | NR                             | 525               | 529                                  | NR                             | 655               | 769                                  | NR                             | 785               | 22                                   | NR                             | 915               | 0                                    | NR                             |
| 400               | 2                                    | NR                             | 530               | 548                                  | NR                             | 660               | 709                                  | NR                             | 790               | 18                                   | NR                             | 920               | 0                                    | NR                             |
| 405               | 4                                    | NR                             | 535               | 568                                  | NR                             | 665               | 652                                  | NR                             | 795               | 16                                   | NR                             | 925               | 0                                    | NR                             |
| 410               | 6                                    | NR                             | 540               | 585                                  | NR                             | 670               | 591                                  | NR                             | 800               | 13                                   | NR                             | 930               | 0                                    | NR                             |
| 415               | 11                                   | NR                             | 545               | 607                                  | NR                             | 675               | 534                                  | NR                             | 805               | 11                                   | NR                             | 935               | 0                                    | NR                             |
| 420               | 19                                   | NR                             | 550               | 627                                  | NR                             | 680               | 480                                  | NR                             | 810               | 10                                   | NR                             | 940               | 0                                    | NR                             |
| 425               | 33                                   | NR                             | 555               | 649                                  | NR                             | 685               | 427                                  | NR                             | 815               | 8                                    | NR                             | 945               | 0                                    | NR                             |
| 430               | 58                                   | NR                             | 560               | 673                                  | NR                             | 690               | 380                                  | NR                             | 820               | 7                                    | NR                             | 950               | 0                                    | NR                             |
| 435               | 103                                  | NR                             | 565               | 697                                  | NR                             | 695               | 334                                  | NR                             | 825               | 6                                    | NR                             | 955               | 0                                    | NR                             |
| 440               | 184                                  | NR                             | 570               | 723                                  | NR                             | 700               | 292                                  | NR                             | 830               | 5                                    | NR                             | 960               | 0                                    | NR                             |
| 445               | 360                                  | NR                             | 575               | 753                                  | NR                             | 705               | 255                                  | NR                             | 835               | 4                                    | NR                             | 965               | 0                                    | NR                             |
| 450               | 557                                  | NR                             | 580               | 789                                  | NR                             | 710               | 221                                  | NR                             | 840               | 4                                    | NR                             | 970               | 0                                    | NR                             |
| 455               | 486                                  | NR                             | 585               | 825                                  | NR                             | 715               | 190                                  | NR                             | 845               | 3                                    | NR                             | 975               | 0                                    | NR                             |
| 460               | 362                                  | NR                             | 590               | 864                                  | NR                             | 720               | 166                                  | NR                             | 850               | 3                                    | NR                             | 980               | 0                                    | NR                             |
| 465               | 337                                  | NR                             | 595               | 902                                  | NR                             | 725               | 143                                  | NR                             | 855               | 2                                    | NR                             | 985               | 0                                    | NR                             |
| 470               | 279                                  | NR                             | 600               | 932                                  | NR                             | 730               | 122                                  | NR                             | 860               | 2                                    | NR                             | 990               | 0                                    | NR                             |
| 475               | 233                                  | NR                             | 605               | 963                                  | NR                             | 735               | 105                                  | NR                             | 865               | 2                                    | NR                             | 995               | 0                                    | NR                             |
| 480               | 241                                  | NR                             | 610               | 981                                  | NR                             | 740               | 90                                   | NR                             | 870               | 1                                    | NR                             | 1000              | 0                                    | NR                             |
| 485               | 264                                  | NR                             | 615               | 997                                  | NR                             | 745               | 77                                   | NR                             | 875               | 1                                    | NR                             |                   |                                      |                                |

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### Scotopic Flux vs. Wavelength



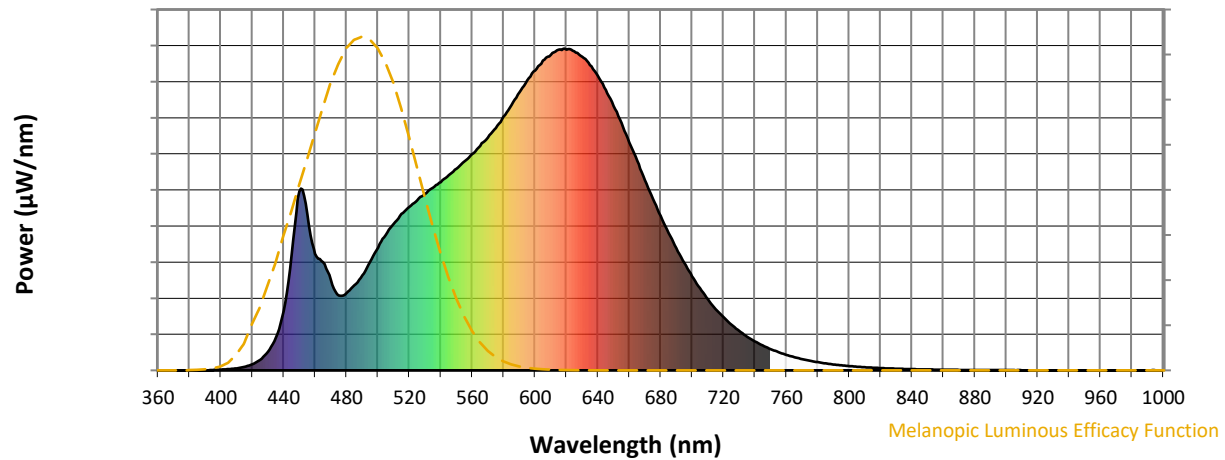
Scotopic Lumens: NR

S/P: 1.43

| 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       | 296                         | NR               | 620       | 997                         | NR               | 750       | 66                          | NR               | 880       | 1                           | NR               |
| 365       | 0                           | NR               | 495       | 338                         | NR               | 625       | 992                         | NR               | 755       | 56                          | NR               | 885       | 1                           | NR               |
| 370       | 0                           | NR               | 500       | 381                         | NR               | 630       | 975                         | NR               | 760       | 48                          | NR               | 890       | 1                           | NR               |
| 375       | 0                           | NR               | 505       | 421                         | NR               | 635       | 949                         | NR               | 765       | 41                          | NR               | 895       | 1                           | NR               |
| 380       | 0                           | NR               | 510       | 456                         | NR               | 640       | 916                         | NR               | 770       | 35                          | NR               | 900       | 1                           | NR               |
| 385       | 0                           | NR               | 515       | 487                         | NR               | 645       | 871                         | NR               | 775       | 30                          | NR               | 905       | 1                           | NR               |
| 390       | 0                           | NR               | 520       | 508                         | NR               | 650       | 821                         | NR               | 780       | 26                          | NR               | 910       | 1                           | NR               |
| 395       | 1                           | NR               | 525       | 529                         | NR               | 655       | 769                         | NR               | 785       | 22                          | NR               | 915       | 0                           | NR               |
| 400       | 2                           | NR               | 530       | 548                         | NR               | 660       | 709                         | NR               | 790       | 18                          | NR               | 920       | 0                           | NR               |
| 405       | 4                           | NR               | 535       | 568                         | NR               | 665       | 652                         | NR               | 795       | 16                          | NR               | 925       | 0                           | NR               |
| 410       | 6                           | NR               | 540       | 585                         | NR               | 670       | 591                         | NR               | 800       | 13                          | NR               | 930       | 0                           | NR               |
| 415       | 11                          | NR               | 545       | 607                         | NR               | 675       | 534                         | NR               | 805       | 11                          | NR               | 935       | 0                           | NR               |
| 420       | 19                          | NR               | 550       | 627                         | NR               | 680       | 480                         | NR               | 810       | 10                          | NR               | 940       | 0                           | NR               |
| 425       | 33                          | NR               | 555       | 649                         | NR               | 685       | 427                         | NR               | 815       | 8                           | NR               | 945       | 0                           | NR               |
| 430       | 58                          | NR               | 560       | 673                         | NR               | 690       | 380                         | NR               | 820       | 7                           | NR               | 950       | 0                           | NR               |
| 435       | 103                         | NR               | 565       | 697                         | NR               | 695       | 334                         | NR               | 825       | 6                           | NR               | 955       | 0                           | NR               |
| 440       | 184                         | NR               | 570       | 723                         | NR               | 700       | 292                         | NR               | 830       | 5                           | NR               | 960       | 0                           | NR               |
| 445       | 360                         | NR               | 575       | 753                         | NR               | 705       | 255                         | NR               | 835       | 4                           | NR               | 965       | 0                           | NR               |
| 450       | 557                         | NR               | 580       | 789                         | NR               | 710       | 221                         | NR               | 840       | 4                           | NR               | 970       | 0                           | NR               |
| 455       | 486                         | NR               | 585       | 825                         | NR               | 715       | 190                         | NR               | 845       | 3                           | NR               | 975       | 0                           | NR               |
| 460       | 362                         | NR               | 590       | 864                         | NR               | 720       | 166                         | NR               | 850       | 3                           | NR               | 980       | 0                           | NR               |
| 465       | 337                         | NR               | 595       | 902                         | NR               | 725       | 143                         | NR               | 855       | 2                           | NR               | 985       | 0                           | NR               |
| 470       | 279                         | NR               | 600       | 932                         | NR               | 730       | 122                         | NR               | 860       | 2                           | NR               | 990       | 0                           | NR               |
| 475       | 233                         | NR               | 605       | 963                         | NR               | 735       | 105                         | NR               | 865       | 2                           | NR               | 995       | 0                           | NR               |
| 480       | 241                         | NR               | 610       | 981                         | NR               | 740       | 90                          | NR               | 870       | 1                           | NR               | 1000      | 0                           | NR               |
| 485       | 264                         | NR               | 615       | 997                         | NR               | 745       | 77                          | NR               | 875       | 1                           | NR               |           |                             |                  |

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### Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 2.82

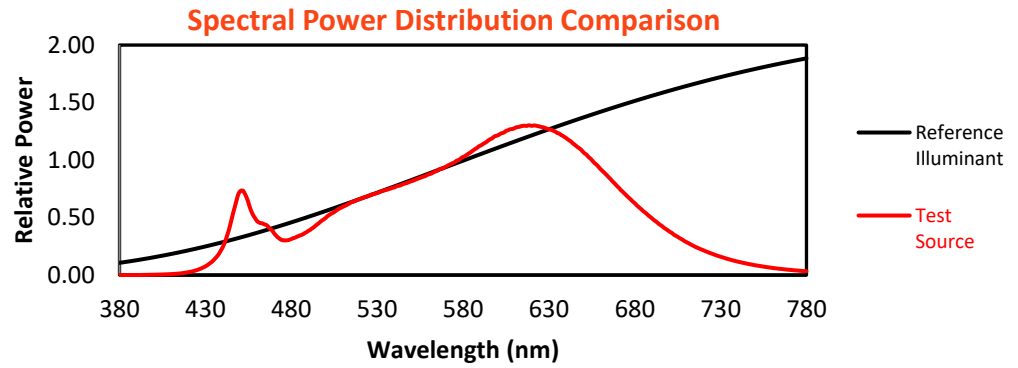
| λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) |
|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|
| 360       | 0                           | NR               | 490       | 296                         | NR               | 620       | 997                         | NR               | 750       | 66                          | NR               | 880       | 1                           | NR               |
| 365       | 0                           | NR               | 495       | 338                         | NR               | 625       | 992                         | NR               | 755       | 56                          | NR               | 885       | 1                           | NR               |
| 370       | 0                           | NR               | 500       | 381                         | NR               | 630       | 975                         | NR               | 760       | 48                          | NR               | 890       | 1                           | NR               |
| 375       | 0                           | NR               | 505       | 421                         | NR               | 635       | 949                         | NR               | 765       | 41                          | NR               | 895       | 1                           | NR               |
| 380       | 0                           | NR               | 510       | 456                         | NR               | 640       | 916                         | NR               | 770       | 35                          | NR               | 900       | 1                           | NR               |
| 385       | 0                           | NR               | 515       | 487                         | NR               | 645       | 871                         | NR               | 775       | 30                          | NR               | 905       | 1                           | NR               |
| 390       | 0                           | NR               | 520       | 508                         | NR               | 650       | 821                         | NR               | 780       | 26                          | NR               | 910       | 1                           | NR               |
| 395       | 1                           | NR               | 525       | 529                         | NR               | 655       | 769                         | NR               | 785       | 22                          | NR               | 915       | 0                           | NR               |
| 400       | 2                           | NR               | 530       | 548                         | NR               | 660       | 709                         | NR               | 790       | 18                          | NR               | 920       | 0                           | NR               |
| 405       | 4                           | NR               | 535       | 568                         | NR               | 665       | 652                         | NR               | 795       | 16                          | NR               | 925       | 0                           | NR               |
| 410       | 6                           | NR               | 540       | 585                         | NR               | 670       | 591                         | NR               | 800       | 13                          | NR               | 930       | 0                           | NR               |
| 415       | 11                          | NR               | 545       | 607                         | NR               | 675       | 534                         | NR               | 805       | 11                          | NR               | 935       | 0                           | NR               |
| 420       | 19                          | NR               | 550       | 627                         | NR               | 680       | 480                         | NR               | 810       | 10                          | NR               | 940       | 0                           | NR               |
| 425       | 33                          | NR               | 555       | 649                         | NR               | 685       | 427                         | NR               | 815       | 8                           | NR               | 945       | 0                           | NR               |
| 430       | 58                          | NR               | 560       | 673                         | NR               | 690       | 380                         | NR               | 820       | 7                           | NR               | 950       | 0                           | NR               |
| 435       | 103                         | NR               | 565       | 697                         | NR               | 695       | 334                         | NR               | 825       | 6                           | NR               | 955       | 0                           | NR               |
| 440       | 184                         | NR               | 570       | 723                         | NR               | 700       | 292                         | NR               | 830       | 5                           | NR               | 960       | 0                           | NR               |
| 445       | 360                         | NR               | 575       | 753                         | NR               | 705       | 255                         | NR               | 835       | 4                           | NR               | 965       | 0                           | NR               |
| 450       | 557                         | NR               | 580       | 789                         | NR               | 710       | 221                         | NR               | 840       | 4                           | NR               | 970       | 0                           | NR               |
| 455       | 486                         | NR               | 585       | 825                         | NR               | 715       | 190                         | NR               | 845       | 3                           | NR               | 975       | 0                           | NR               |
| 460       | 362                         | NR               | 590       | 864                         | NR               | 720       | 166                         | NR               | 850       | 3                           | NR               | 980       | 0                           | NR               |
| 465       | 337                         | NR               | 595       | 902                         | NR               | 725       | 143                         | NR               | 855       | 2                           | NR               | 985       | 0                           | NR               |
| 470       | 279                         | NR               | 600       | 932                         | NR               | 730       | 122                         | NR               | 860       | 2                           | NR               | 990       | 0                           | NR               |
| 475       | 233                         | NR               | 605       | 963                         | NR               | 735       | 105                         | NR               | 865       | 2                           | NR               | 995       | 0                           | NR               |
| 480       | 241                         | NR               | 610       | 981                         | NR               | 740       | 90                          | NR               | 870       | 1                           | NR               | 1000      | 0                           | NR               |
| 485       | 264                         | NR               | 615       | 997                         | NR               | 745       | 77                          | NR               | 875       | 1                           | NR               |           |                             |                  |

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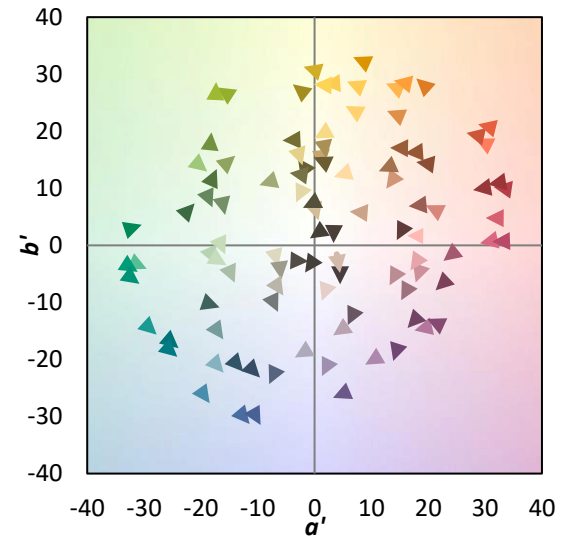
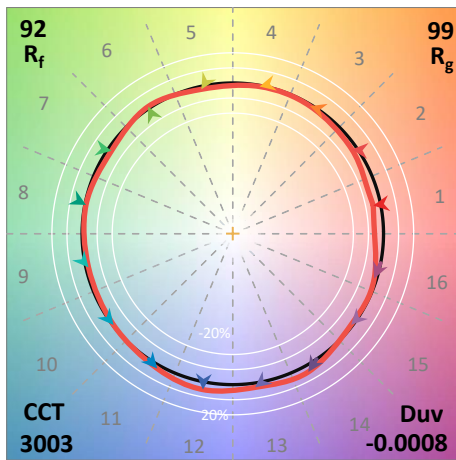
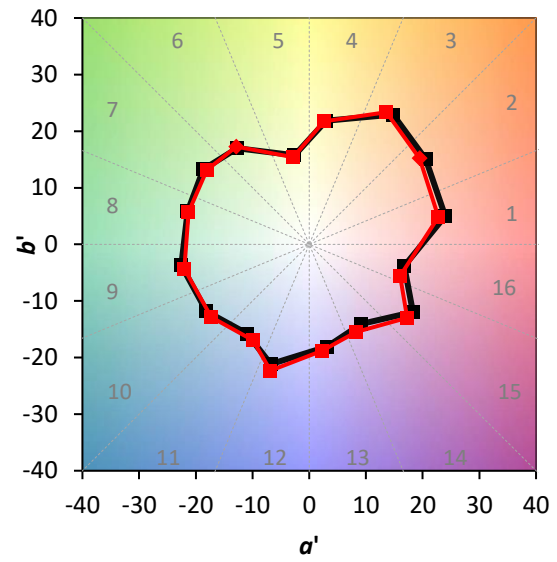
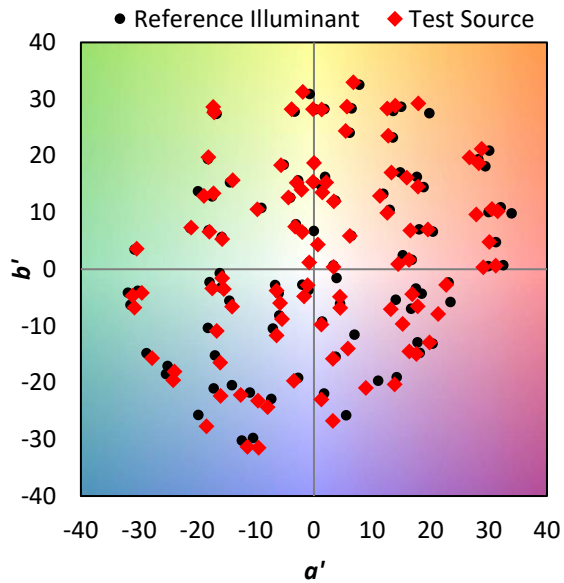
TM-30-18

### Summary

$R_f = 91.9$   
 $R_g = 99.2$   
 $\text{CIE } R_a = 93.2$   
 $R_9 = 59.0$



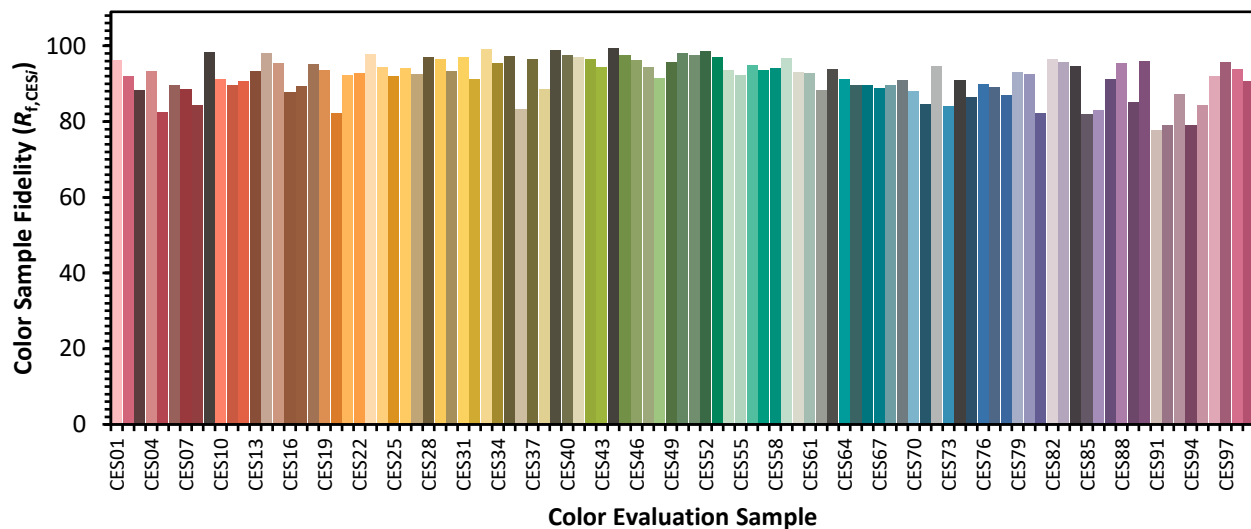
### Color Vector Graphics



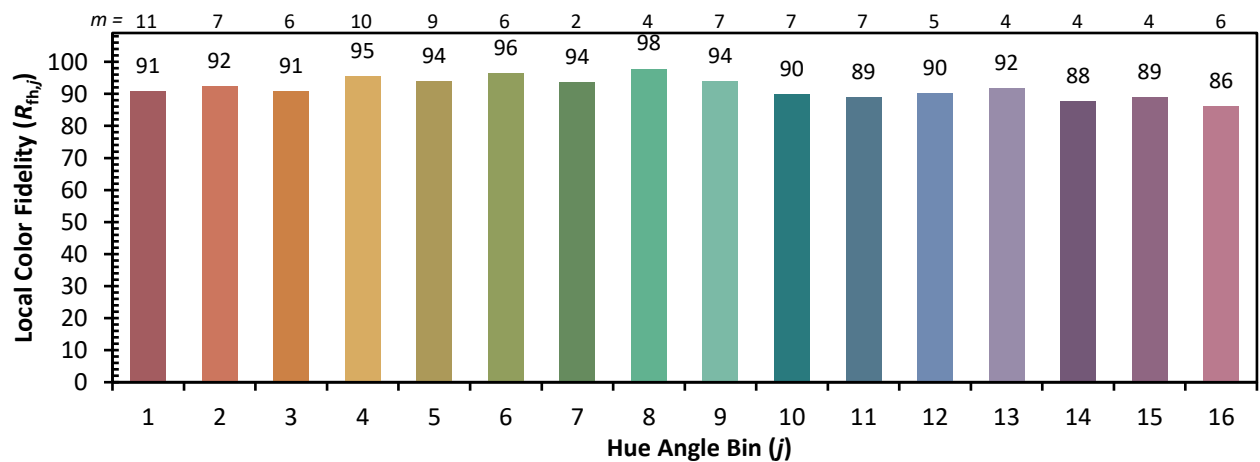
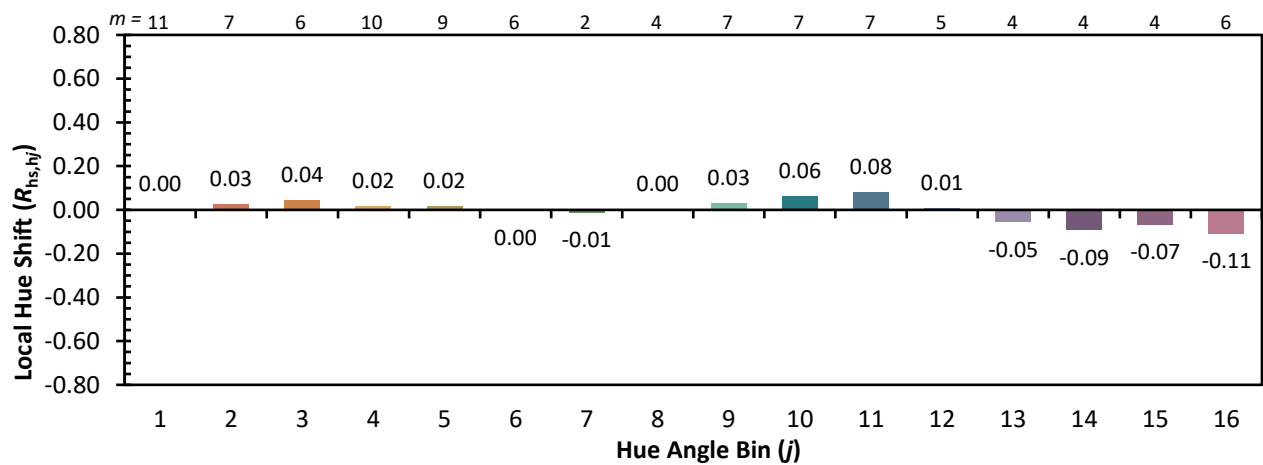
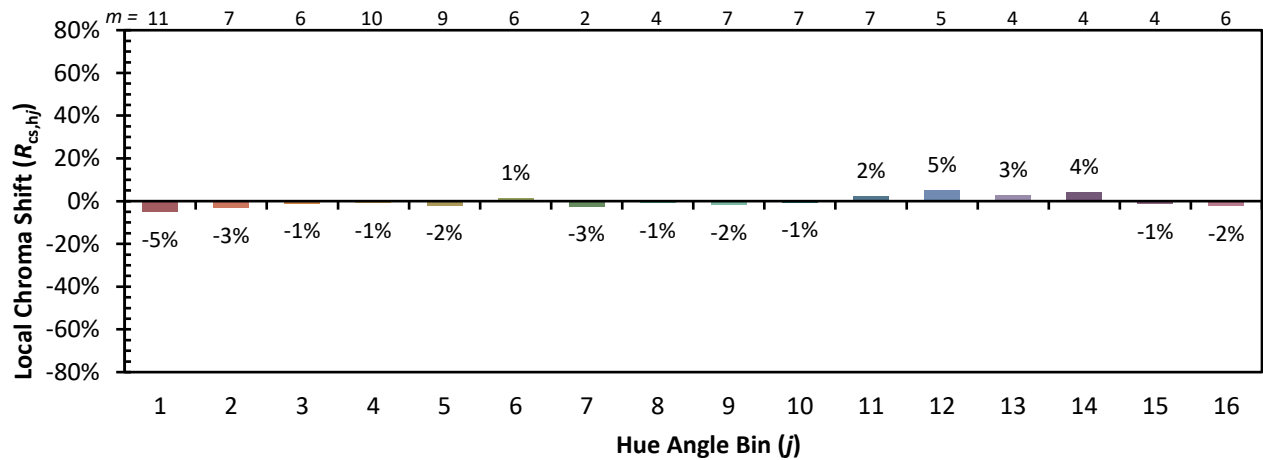


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

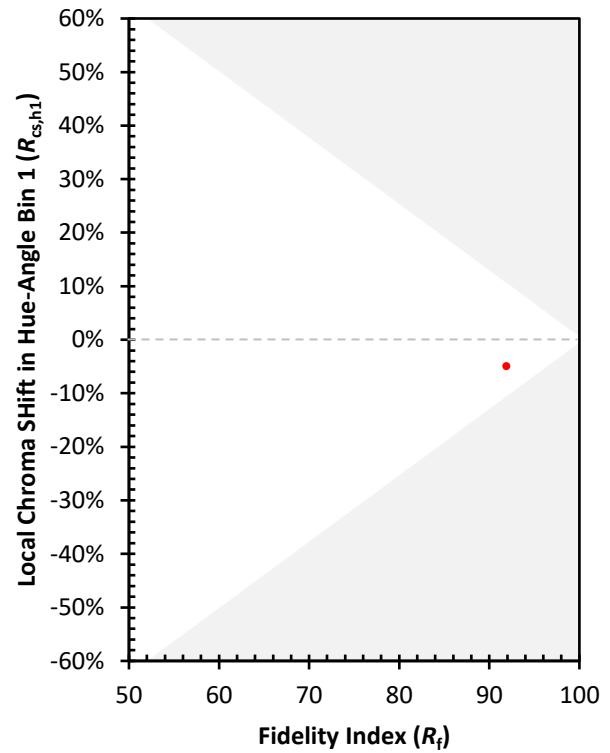
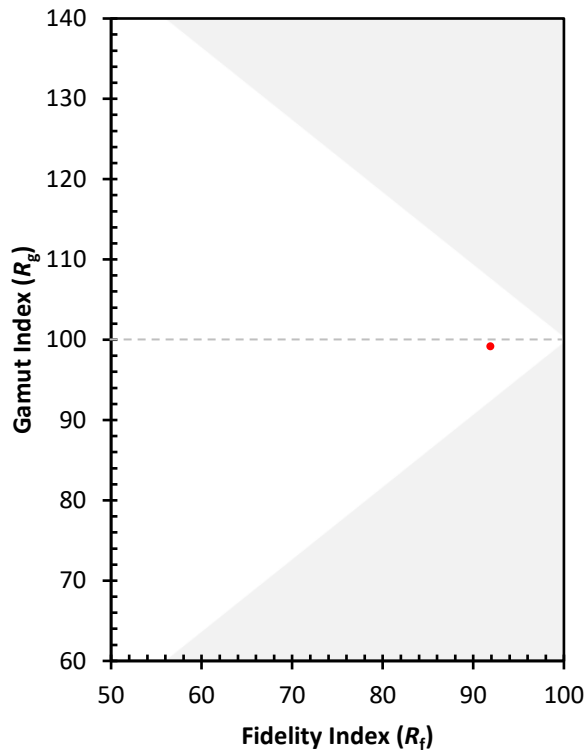
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 94 | CES51 = 97 | CES76 = 90 |
| CES02 = 63 | CES27 = 92 | CES52 = 99 | CES77 = 89 |
| CES03 = 32 | CES28 = 97 | CES53 = 97 | CES78 = 87 |
| CES04 = 70 | CES29 = 97 | CES54 = 94 | CES79 = 93 |
| CES05 = 51 | CES30 = 93 | CES55 = 92 | CES80 = 93 |
| CES06 = 51 | CES31 = 97 | CES56 = 95 | CES81 = 82 |
| CES07 = 43 | CES32 = 91 | CES57 = 94 | CES82 = 97 |
| CES08 = 42 | CES33 = 99 | CES58 = 94 | CES83 = 96 |
| CES09 = 29 | CES34 = 95 | CES59 = 97 | CES84 = 95 |
| CES10 = 76 | CES35 = 97 | CES60 = 93 | CES85 = 82 |
| CES11 = 59 | CES36 = 83 | CES61 = 93 | CES86 = 83 |
| CES12 = 65 | CES37 = 97 | CES62 = 88 | CES87 = 91 |
| CES13 = 44 | CES38 = 89 | CES63 = 94 | CES88 = 96 |
| CES14 = 74 | CES39 = 99 | CES64 = 91 | CES89 = 85 |
| CES15 = 72 | CES40 = 98 | CES65 = 90 | CES90 = 96 |
| CES16 = 48 | CES41 = 97 | CES66 = 90 | CES91 = 78 |
| CES17 = 50 | CES42 = 96 | CES67 = 89 | CES92 = 79 |
| CES18 = 57 | CES43 = 94 | CES68 = 90 | CES93 = 87 |
| CES19 = 72 | CES44 = 99 | CES69 = 91 | CES94 = 79 |
| CES20 = 67 | CES45 = 98 | CES70 = 88 | CES95 = 84 |
| CES21 = 86 | CES46 = 96 | CES71 = 85 | CES96 = 92 |
| CES22 = 79 | CES47 = 94 | CES72 = 95 | CES97 = 96 |
| CES23 = 92 | CES48 = 91 | CES73 = 84 | CES98 = 94 |
| CES24 = 91 | CES49 = 96 | CES74 = 91 | CES99 = 91 |
| CES25 = 72 | CES50 = 98 | CES75 = 87 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)