Cooper Lighting Solutions Photometric Lab
1121 Highway 74 South
Peachtree City, GA 30269

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: FAIL-SAFE

Report Number: P1357545

Luminaire Tested: 8ASL4-35VHE-3-R63-UNV

Issue Date: 2/17/2026

Cooper Lighting Solutions Photometric Lab
1121 Highway 74 South
Peachtree City, GA 30269

Scaled Data Report

**Test Information**

| | |
|---|---|
| Test Method: | LM-79-2019 |
| Report Number: | P1357545 |
| | TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2511-597-12) |
| Test Lab: | INNOVATION CENTER |
| Issue Date: | 2/17/2026 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS |
| Product Line: | FAIL-SAFE |
| Catalog Number: | 8ASL4-35VHE-3-R63-UNV |
| Description: | 8FT 3500 LUMEN PER FOOT 4ASL LED LUMINAIRE WITH OPL LENS AND R63 LEDS 3 ROW |
| Light Source: | - |
| Ballast/Driver: | - |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 7248.0 lumens |
| Efficiency: | N/A |
| Efficacy: | 38.7 lumens/watt |
| Spacing Criteria (0/90/45): | 1.21 / 1.3 / 1.39 |
| Luminous Opening: | Rectangular w/ Sides (W: 0.33' x L: 7.98' x H: 0.1') |
| CIE Type: | Direct |

| | |
|---|---|
| Input Watts (W): | 187.1 |
| Input Voltage (V): | NR |
| 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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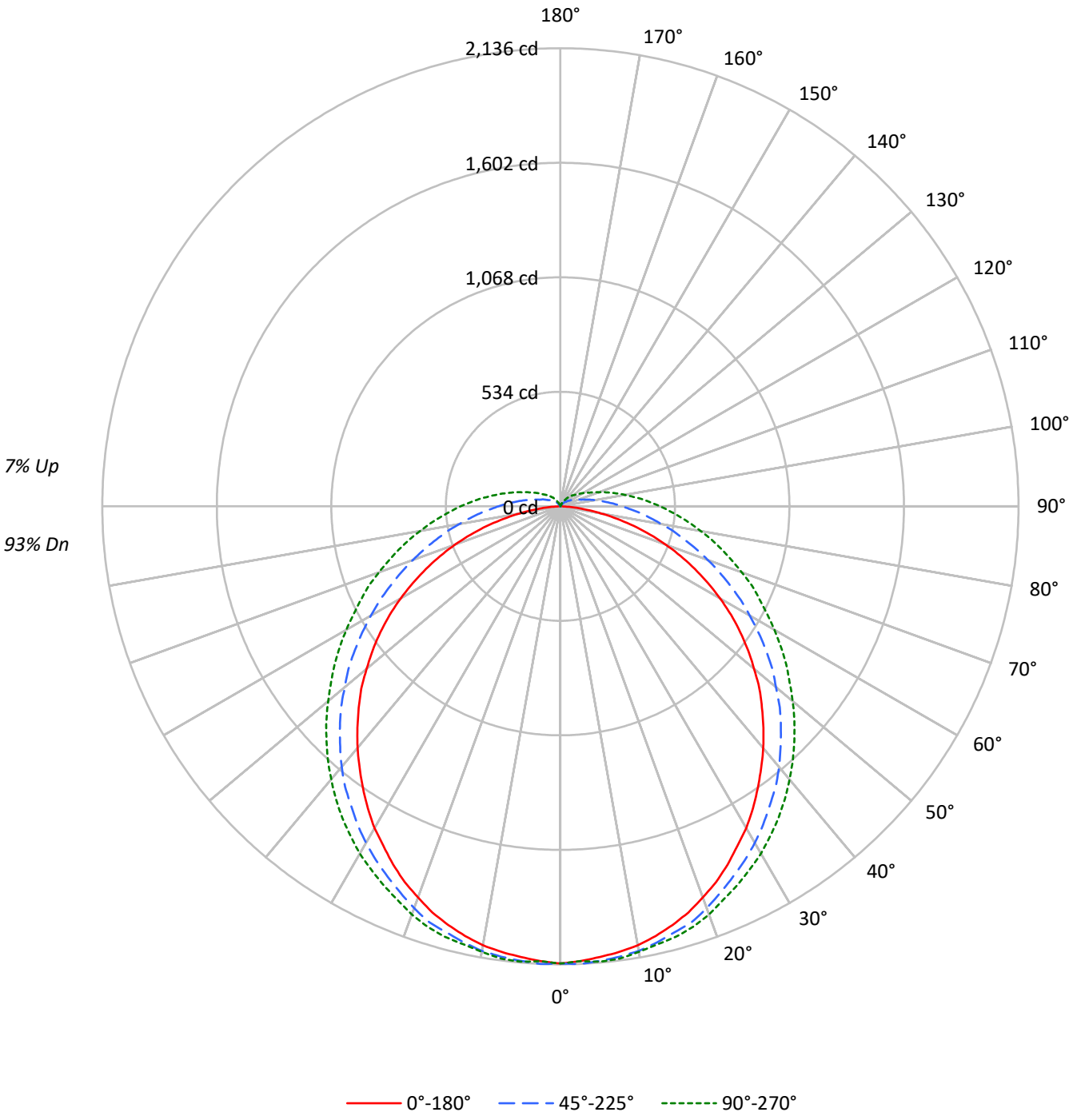
Scaled Data Report

TEST NUMBER: P1357545
CATALOG NUMBER: 8ASL4-35VHE-3-R63-UNV

## Luminous Intensity Polar Plot



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Scaled Data Report

TEST NUMBER: P1357545
CATALOG NUMBER: 8ASL4-35VHE-3-R63-UNV

## COEFFICIENT OF UTILIZATION - ZONAL CAVITY METHOD:

| RF | 20 | | | | 20 | | | | 20 | | | 20 | | | 20 | | | 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RC | 80 | | | | 70 | | | | 50 | | | 30 | | | 10 | | | 0 |
| RW | 70 | 50 | 30 | 10 | 70 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 0 |
| RCR | | | | | | | | | | | | | | | | | | |
| 0 | 117 | 117 | 117 | 117 | 114 | 114 | 114 | 114 | 107 | 107 | 107 | 101 | 101 | 101 | 96 | 96 | 96 | 93 |
| 1 | 105 | 100 | 95 | 91 | 102 | 97 | 92 | 88 | 91 | 88 | 84 | 86 | 83 | 80 | 81 | 79 | 77 | 74 |
| 2 | 95 | 86 | 79 | 72 | 92 | 84 | 77 | 71 | 79 | 73 | 68 | 75 | 70 | 66 | 71 | 67 | 63 | 61 |
| 3 | 86 | 75 | 67 | 60 | 83 | 73 | 65 | 59 | 69 | 62 | 57 | 65 | 60 | 55 | 62 | 57 | 53 | 50 |
| 4 | 79 | 66 | 57 | 50 | 76 | 65 | 56 | 49 | 61 | 54 | 48 | 58 | 52 | 47 | 55 | 50 | 45 | 43 |
| 5 | 73 | 59 | 50 | 43 | 70 | 58 | 49 | 42 | 55 | 47 | 41 | 52 | 45 | 40 | 49 | 44 | 39 | 37 |
| 6 | 67 | 53 | 44 | 37 | 64 | 52 | 43 | 37 | 49 | 42 | 36 | 47 | 40 | 35 | 45 | 39 | 34 | 32 |
| 7 | 62 | 48 | 39 | 33 | 60 | 47 | 38 | 32 | 45 | 37 | 32 | 43 | 36 | 31 | 41 | 35 | 30 | 28 |
| 8 | 58 | 44 | 35 | 29 | 56 | 43 | 35 | 29 | 41 | 34 | 28 | 39 | 32 | 28 | 37 | 32 | 27 | 25 |
| 9 | 54 | 40 | 32 | 26 | 52 | 39 | 31 | 26 | 38 | 30 | 25 | 36 | 30 | 25 | 35 | 29 | 24 | 22 |
| 10 | 50 | 37 | 29 | 24 | 49 | 36 | 29 | 23 | 35 | 28 | 23 | 33 | 27 | 23 | 32 | 26 | 22 | 20 |

## AVERAGE LUMINANCE (cd/sqm):

| | 0° | 45° | 90° |
|---|---|---|---|
| 0° | 8627 | 8627 | 8627 |
| 5° | 8560 | 8472 | 8430 |
| 10° | 8522 | 8313 | 8217 |
| 15° | 8438 | 8115 | 8036 |
| 20° | 8321 | 7925 | 7832 |
| 25° | 8183 | 7685 | 7600 |
| 30° | 8037 | 7477 | 7404 |
| 35° | 7854 | 7241 | 7186 |
| 40° | 7689 | 7025 | 6956 |
| 45° | 7512 | 6763 | 6725 |
| 50° | 7309 | 6481 | 6486 |
| 55° | 7092 | 6213 | 6270 |
| 60° | 6805 | 5898 | 6051 |
| 65° | 6441 | 5598 | 5870 |
| 70° | 5974 | 5301 | 5728 |
| 75° | 5287 | 5032 | 5630 |
| 80° | 4231 | 4838 | 5589 |
| 85° | 2687 | 4817 | 5671 |

## MAXIMUM LUMINANCE 45°-90°:

Horizontal Angle: 0°
Vertical Angle: 45°
Luminance: 7512 cd/sqm

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Scaled Data Report

TEST NUMBER: P1357545
CATALOG NUMBER: 8ASL4-35VHE-3-R63-UNV

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 202.1 | 2.8 |
| 10°-20° | 580.4 | 8.0 |
| 20°-30° | 877.5 | 12.1 |
| 30°-40° | 1062.5 | 14.7 |
| 40°-50° | 1116.0 | 15.4 |
| 50°-60° | 1041.2 | 14.4 |
| 60°-70° | 860.5 | 11.9 |
| 70°-80° | 619.5 | 8.5 |
| 80°-90° | 385.0 | 5.3 |
| 90°-100° | 225.6 | 3.1 |
| 100°-110° | 129.1 | 1.8 |
| 110°-120° | 72.9 | 1.0 |
| 120°-130° | 41.9 | 0.6 |
| 130°-140° | 22.6 | 0.3 |
| 140°-150° | 9.5 | 0.1 |
| 150°-160° | 1.8 | 0.0 |
| 160°-170° | 0.0 | 0.0 |
| 170°-180° | 0.0 | 0.0 |
| 0°-30° | 1660.0 | 22.9 |
| 0°-40° | 2722.6 | 37.6 |
| 0°-60° | 4879.7 | 67.3 |
| 0°-90° | 6744.7 | 93.1 |
| 90°-120° | 427.5 | 5.9 |
| 90°-150° | 501.5 | 6.9 |
| 90°-180° | 503.0 | 6.9 |
| 0°-180° | 7248.0 | 100.0 |

**CANDELA DISTRIBUTION:**

| | 0° | 22.5° | 45° | 67.5° | 90° | Flux |
|---|---|---|---|---|---|---|
| 0° | 2132 | 2132 | 2132 | 2132 | 2132 | |
| 5° | 2110 | 2127 | 2127 | 2127 | 2132 | 200 |
| 15° | 2021 | 2048 | 2056 | 2070 | 2079 | 570 |
| 25° | 1844 | 1875 | 1906 | 1932 | 1950 | 849 |
| 35° | 1604 | 1649 | 1702 | 1751 | 1773 | 1004 |
| 45° | 1330 | 1378 | 1454 | 1516 | 1542 | 1026 |
| 55° | 1024 | 1081 | 1170 | 1254 | 1285 | 915 |
| 65° | 691 | 758 | 873 | 984 | 1024 | 684 |
| 75° | 355 | 443 | 598 | 727 | 780 | 375 |
| 85° | 66 | 199 | 377 | 510 | 558 | 81 |
| 90° | 0 | 120 | 288 | 412 | 465 | 3 |
| 95° | 0 | 75 | 217 | 332 | 381 | 0 |
| 105° | 0 | 27 | 120 | 208 | 244 | 0 |
| 115° | 0 | 13 | 71 | 128 | 151 | 0 |
| 125° | 0 | 9 | 44 | 84 | 98 | 0 |
| 135° | 0 | 0 | 27 | 53 | 66 | 0 |
| 145° | 0 | 0 | 13 | 31 | 36 | 0 |
| 155° | 0 | 0 | 0 | 9 | 13 | 0 |
| 165° | 0 | 0 | 0 | 0 | 0 | 0 |
| 175° | 0 | 0 | 0 | 0 | 0 | 0 |
| 180° | 0 | 0 | 0 | 0 | 0 | |

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TEST NUMBER: P1357545
CATALOG NUMBER: 8ASL4-35VHE-3-R63-UNV

**CANDELA DISTRIBUTION (FULL):**

| | 0° | 22.5° | 45° | 67.5° | 90° |
|---|---|---|---|---|---|
| 0° | 2131.7 | *2131.7* | 2131.7 | 2131.7 | 2131.7 |
| 2.5° | *2122.9* | *2136.2* | *2136.2* | *2122.9* | *2122.9* |
| 5° | 2109.6 | *2127.3* | 2127.3 | 2127.3 | 2131.7 |
| 7.5° | 2096.3 | *2118.4* | 2118.4 | 2118.4 | 2127.3 |
| 10° | 2078.6 | *2100.7* | 2105.1 | 2105.1 | 2109.6 |
| 12.5° | 2052.0 | *2078.6* | 2083.0 | 2087.4 | 2091.8 |
| 15° | 2020.9 | *2047.5* | 2056.4 | 2069.7 | 2078.6 |
| 17.5° | 1985.5 | *2016.5* | 2034.2 | 2047.5 | 2056.4 |
| 20° | 1941.2 | *1972.2* | 1994.3 | 2012.1 | 2025.4 |
| 22.5° | 1896.8 | *1923.4* | 1950.0 | 1972.2 | 1985.5 |
| 25° | 1843.7 | *1874.7* | 1905.7 | 1932.3 | 1950.0 |
| 27.5° | 1786.0 | *1821.5* | 1861.4 | 1892.4 | 1910.1 |
| 30° | 1732.9 | *1768.3* | 1812.6 | 1852.5 | 1870.3 |
| 32.5° | 1670.8 | *1710.7* | 1759.5 | 1799.3 | 1821.5 |
| 35° | 1604.3 | *1648.7* | 1701.8 | 1750.6 | 1772.8 |
| 37.5° | 1537.9 | *1582.2* | 1648.7 | 1697.4 | 1719.6 |
| 40° | 1471.4 | *1515.7* | 1586.6 | 1639.8 | 1662.0 |
| 42.5° | 1400.5 | *1444.8* | 1520.1 | 1577.7 | 1604.3 |
| 45° | 1329.6 | *1378.3* | 1453.7 | 1515.7 | 1542.3 |
| 47.5° | 1258.7 | *1307.4* | 1387.2 | 1453.7 | 1480.2 |
| 50° | 1178.9 | *1232.1* | 1311.8 | 1387.2 | 1413.8 |
| 52.5° | 1103.5 | *1156.7* | 1245.4 | 1320.7 | 1347.3 |
| 55° | 1023.8 | *1081.4* | 1170.0 | 1254.2 | 1285.2 |
| 57.5° | 944.0 | *1001.6* | 1094.7 | 1183.3 | 1218.8 |
| 60° | 859.8 | *921.8* | 1019.3 | 1112.4 | 1152.3 |
| 62.5° | 775.6 | *842.1* | 948.4 | 1045.9 | 1085.8 |
| 65° | 691.4 | *757.9* | 873.1 | 983.9 | 1023.8 |
| 67.5° | 607.2 | *678.1* | 802.2 | 917.4 | 966.1 |
| 70° | 523.0 | *598.3* | 731.3 | 850.9 | 899.7 |
| 72.5° | 438.8 | *518.5* | 664.8 | 788.9 | 837.6 |
| 75° | 354.6 | *443.2* | 598.3 | 726.8 | 780.0 |
| 77.5° | 270.3 | *372.3* | 540.7 | 669.2 | 722.4 |
| 80° | 195.0 | *310.2* | 478.6 | 611.6 | 664.8 |
| 82.5° | 124.1 | *248.2* | 425.5 | 558.4 | 611.6 |
| 85° | 66.5 | *199.4* | 376.7 | 509.7 | 558.4 |
| 87.5° | 22.2 | *155.1* | 328.0 | 460.9 | 509.7 |
| 90° | 0.0 | *119.7* | 288.1 | 412.2 | 465.3 |
| 92.5° | 0.0 | *93.1* | 252.6 | 372.3 | 421.0 |
| 95° | 0.0 | *75.3* | 217.2 | 332.4 | 381.1 |
| 97.5° | 0.0 | *62.0* | 190.6 | 296.9 | 341.3 |
| 100° | 0.0 | *48.8* | 164.0 | 265.9 | 305.8 |
| 102.5° | 0.0 | *39.9* | 141.8 | 234.9 | 274.8 |
| 105° | 0.0 | *26.6* | 119.7 | 208.3 | 243.8 |
| 107.5° | 0.0 | *22.2* | 101.9 | 186.1 | 217.2 |
| 110° | 0.0 | *17.7* | 93.1 | 159.5 | 190.6 |

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TEST NUMBER: P1357545
CATALOG NUMBER: 8ASL4-35VHE-3-R63-UNV

**CANDELA DISTRIBUTION (continued):**

| | 0° | 22.5° | 45° | 67.5° | 90° |
|---|---|---|---|---|---|
| 112.5° | 0.0 | *13.3* | 84.2 | 141.8 | 172.8 |
| 115° | 0.0 | *13.3* | 70.9 | 128.5 | 150.7 |
| 117.5° | 0.0 | *13.3* | 62.0 | 115.2 | 137.4 |
| 120° | 0.0 | *8.9* | 57.6 | 101.9 | 124.1 |
| 122.5° | 0.0 | *8.9* | 48.8 | 93.1 | 110.8 |
| 125° | 0.0 | *8.9* | 44.3 | 84.2 | 97.5 |
| 127.5° | 0.0 | *4.4* | 39.9 | 75.3 | 88.6 |
| 130° | 0.0 | *4.4* | 35.5 | 66.5 | 79.8 |
| 132.5° | 0.0 | *4.4* | 31.0 | 62.0 | 75.3 |
| 135° | 0.0 | *0.0* | 26.6 | 53.2 | 66.5 |
| 137.5° | 0.0 | *0.0* | 22.2 | 48.8 | 57.6 |
| 140° | 0.0 | *0.0* | 17.7 | 39.9 | 53.2 |
| 142.5° | 0.0 | *0.0* | 13.3 | 35.5 | 44.3 |
| 145° | 0.0 | *0.0* | 13.3 | 31.0 | 35.5 |
| 147.5° | 0.0 | *0.0* | 8.9 | 22.2 | 31.0 |
| 150° | 0.0 | *0.0* | 4.4 | 17.7 | 22.2 |
| 152.5° | 0.0 | *0.0* | 0.0 | 13.3 | 17.7 |
| 155° | 0.0 | *0.0* | 0.0 | 8.9 | 13.3 |
| 157.5° | 0.0 | *0.0* | 0.0 | 0.0 | 4.4 |
| 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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TEST NUMBER: P1357545
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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 | 16.83 | 18.37 | 17.30 | 18.83 | 19.31 | 18.90 | 20.44 | 19.37 | 20.90 | 21.38 |
| | 3H | 18.33 | 19.74 | 18.81 | 20.20 | 20.72 | 21.39 | 22.79 | 21.87 | 23.26 | 23.78 |
| | 4H | 18.81 | 20.14 | 19.31 | 20.63 | 21.16 | 22.60 | 23.93 | 23.10 | 24.41 | 24.95 |
| | 6H | 19.09 | 20.33 | 19.60 | 20.82 | 21.38 | 23.88 | 25.12 | 24.40 | 25.62 | 26.17 |
| | 8H | 19.14 | 20.33 | 19.67 | 20.85 | 21.41 | 24.55 | 25.74 | 25.08 | 26.26 | 26.82 |
| | 12H | 19.15 | 20.29 | 19.69 | 20.80 | 21.39 | 25.30 | 26.44 | 25.83 | 26.95 | 27.54 |
| 4H | 2H | 17.72 | 19.05 | 18.22 | 19.53 | 20.07 | 19.34 | 20.67 | 19.84 | 21.15 | 21.69 |
| | 3H | 19.45 | 20.59 | 19.97 | 21.11 | 21.68 | 22.04 | 23.18 | 22.56 | 23.70 | 24.26 |
| | 4H | 20.06 | 21.10 | 20.59 | 21.63 | 22.23 | 23.43 | 24.47 | 23.96 | 25.00 | 25.60 |
| | 6H | 20.46 | 21.37 | 21.01 | 21.94 | 22.54 | 24.90 | 25.82 | 25.45 | 26.38 | 26.99 |
| | 8H | 20.55 | 21.41 | 21.11 | 21.97 | 22.59 | 25.67 | 26.54 | 26.24 | 27.10 | 27.72 |
| | 12H | 20.59 | 21.38 | 21.18 | 21.97 | 22.59 | 26.55 | 27.33 | 27.13 | 27.92 | 28.55 |
| 8H | 4H | 20.75 | 21.61 | 21.31 | 22.17 | 22.79 | 23.64 | 24.51 | 24.20 | 25.07 | 25.69 |
| | 6H | 21.33 | 22.06 | 21.92 | 22.66 | 23.29 | 25.28 | 26.01 | 25.88 | 26.62 | 27.24 |
| | 8H | 21.51 | 22.17 | 22.11 | 22.79 | 23.42 | 26.20 | 26.86 | 26.80 | 27.47 | 28.11 |
| | 12H | 21.63 | 22.22 | 22.23 | 22.82 | 23.52 | 27.26 | 27.85 | 27.86 | 28.45 | 29.15 |
| 12H | 4H | 20.95 | 21.73 | 21.53 | 22.32 | 22.95 | 23.65 | 24.43 | 24.23 | 25.02 | 25.65 |
| | 6H | 21.63 | 22.29 | 22.23 | 22.90 | 23.54 | 25.32 | 25.98 | 25.92 | 26.60 | 27.23 |
| | 8H | 21.91 | 22.50 | 22.51 | 23.10 | 23.81 | 26.30 | 26.89 | 26.91 | 27.50 | 28.20 |

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

Report Prepared for

Cooper Lighting Solutions

Fail-Safe

Report Number: SP1-2511-597-7

Test Date: 01/21/2026

Luminaire Tested: 4ASL-2-R630-UNV-OPL-1_600mA

Data in this report applies to families of products including 4ASL

Report Generated By FNC07603 / LDUCLS01DT446
Version: v7.05

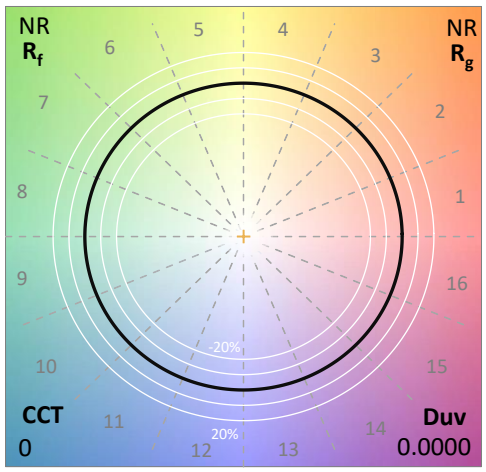
## Test Information

| | |
|---|---|
| Test Method: | LM-79-2019 |
| Report Number: | SP1-2511-597-7 |
| Test Lab: | COOPER LIGHTING SOLUTIONS |
| Photometer: | SP1 - 76IN SPHERE |
| Measurement Geometry: | 4π |
| Issue Date: | 01/29/2026 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS |
| Product Line: | Fail-Safe |
| Catalog Number: | **4ASL-2-R630-UNV-OPL-1_600mA** |
| Description: | 2foot 4ASL LED LUMINAIRE WITH OPL LENS AND RED 630NM LEDS with 1 rows at 600mA |

## Spectral Parameters

| | | | | | |
|---|---|---|---|---|---|
| CCT (K): | 0 | CRI (Ra): | 0.0 | | |
| CIE u': | 0.5395 | R1: | 0.0 | R9: | 0.0 |
| CIE v': | 0.5190 | R2: | 0.0 | R10: | 0.0 |
| Duv: | 0.0000 | R3: | 0.0 | R11: | 0.0 |
| CIE x: | 0.7004 | R4: | 0.0 | R12: | 0.0 |
| CIE y: | 0.2995 | R5: | 0.0 | R13: | 0.0 |
| CIE z: | 0.0001 | R6: | 0.0 | R14: | 0.0 |
| Peak Wavelength (nm): | 638 | R7: | 0.0 | R15: | 0.0 |
| Dominant Wavelength (nm): | 624 | R8: | 0.0 | | |
| Purity: | 99.9862 | | | | |

| | |
|---|---|
| Rf: | NR |
| Rg: | NR |




## Test Conditions

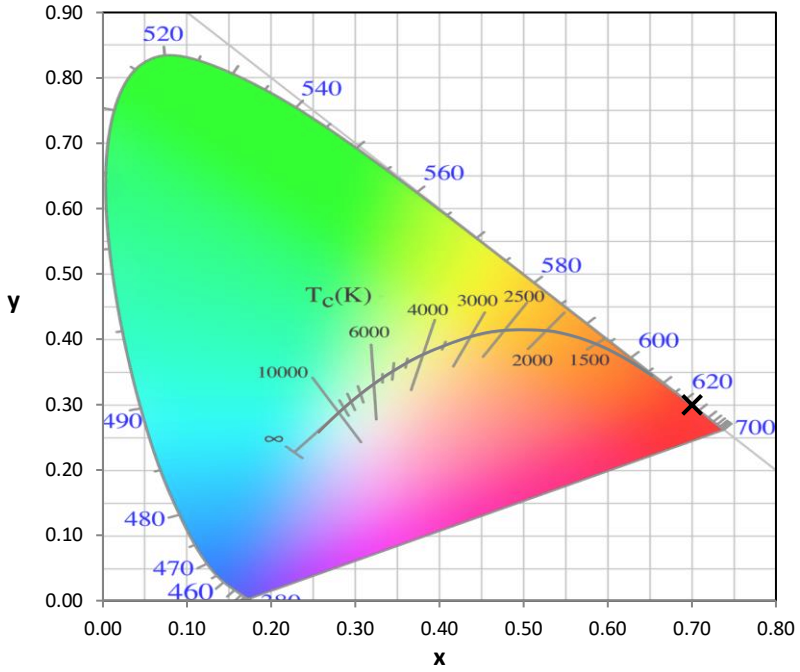
| | |
|---|---|
| Stabilization Time: | 69M |
| Operation Time: | 2H 9M |
| Sphere Temperature (°C): | 25.1 |

REPORT NUMBER: SP1-2511-597-7

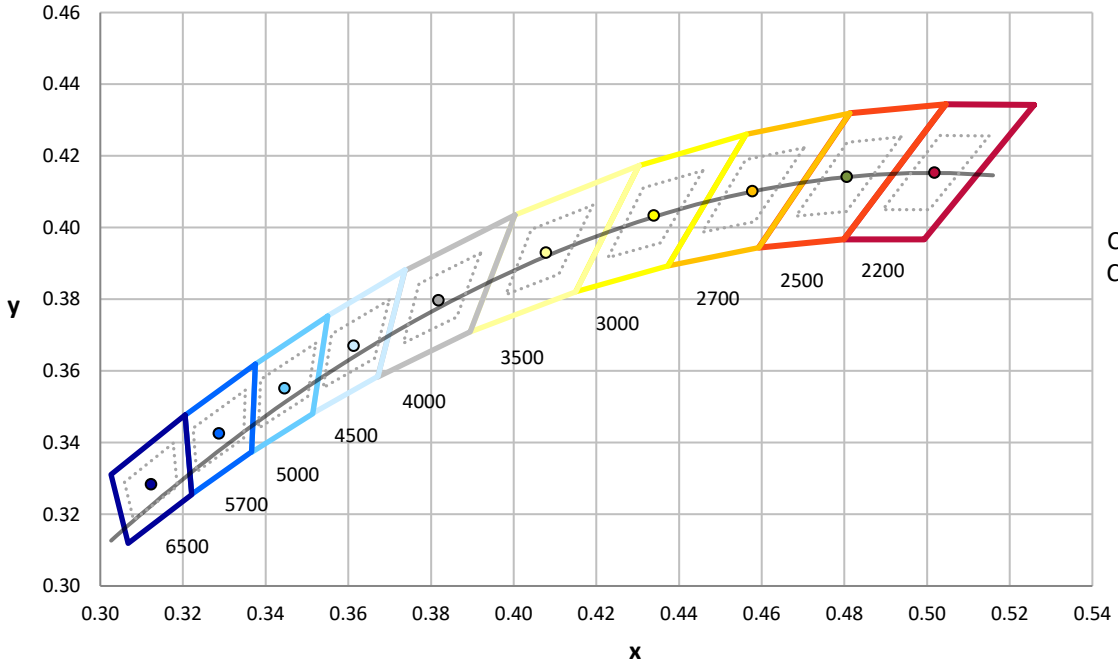
| Measurement and Test Equipment | | | |
|---|---|---|---|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | 76INCH SPHERE IN0058 | 12/16/2025 | 6/16/2026 |
| Power Meter | XITRON INXT2011004 | 10/21/2025 | 10/21/2026 |
| AC Power Source | CHROMA 61603 IN0063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

REPORT NUMBER: SP1-2511-597-7

## CIE 1931 Chromaticity Diagram




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

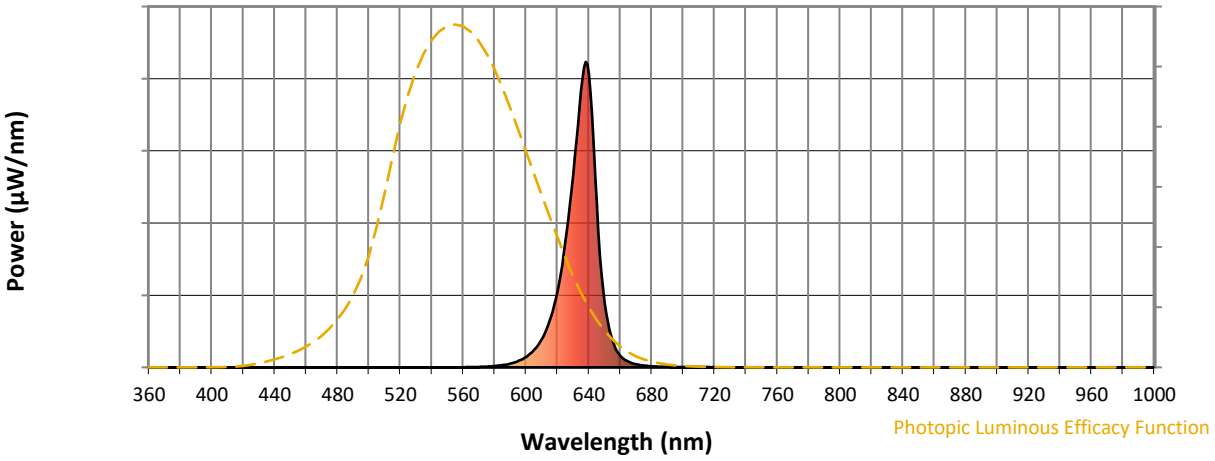



CCT = 0K
CIE x = 0.7004
CIE y = 0.2995
Duv = 0.0000

Point lies outside the range

REPORT NUMBER: SP1-2511-597-7

## Photopic Flux vs. Wavelength




## Photopic Lumens: NR

| λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 360 | 0 | NR | 490 | 0 | NR | 620 | 248 | NR | 750 | 0 | NR | 880 | 0 | NR |
| 365 | 0 | NR | 495 | 0 | NR | 625 | 409 | NR | 755 | 0 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 0 | NR | 630 | 630 | NR | 760 | 0 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 0 | NR | 635 | 903 | NR | 765 | 0 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 0 | NR | 640 | 960 | NR | 770 | 0 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 0 | NR | 645 | 535 | NR | 775 | 0 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 0 | NR | 650 | 212 | NR | 780 | 0 | NR | 910 | 0 | NR |
| 395 | 0 | NR | 525 | 0 | NR | 655 | 88 | NR | 785 | 0 | NR | 915 | 0 | NR |
| 400 | 0 | NR | 530 | 0 | NR | 660 | 38 | NR | 790 | 0 | NR | 920 | 0 | NR |
| 405 | 0 | NR | 535 | 0 | NR | 665 | 19 | NR | 795 | 0 | NR | 925 | 0 | NR |
| 410 | 0 | NR | 540 | 0 | NR | 670 | 10 | NR | 800 | 0 | NR | 930 | 0 | NR |
| 415 | 0 | NR | 545 | 0 | NR | 675 | 6 | NR | 805 | 0 | NR | 935 | 0 | NR |
| 420 | 0 | NR | 550 | 0 | NR | 680 | 4 | NR | 810 | 0 | NR | 940 | 0 | NR |
| 425 | 0 | NR | 555 | 0 | NR | 685 | 2 | NR | 815 | 0 | NR | 945 | 0 | NR |
| 430 | 0 | NR | 560 | 0 | NR | 690 | 2 | NR | 820 | 0 | NR | 950 | 0 | NR |
| 435 | 0 | NR | 565 | 1 | NR | 695 | 1 | NR | 825 | 0 | NR | 955 | 0 | NR |
| 440 | 0 | NR | 570 | 2 | NR | 700 | 1 | NR | 830 | 0 | NR | 960 | 0 | NR |
| 445 | 0 | NR | 575 | 3 | NR | 705 | 1 | NR | 835 | 0 | NR | 965 | 0 | NR |
| 450 | 0 | NR | 580 | 4 | NR | 710 | 1 | NR | 840 | 0 | NR | 970 | 0 | NR |
| 455 | 0 | NR | 585 | 7 | NR | 715 | 1 | NR | 845 | 0 | NR | 975 | 0 | NR |
| 460 | 0 | NR | 590 | 12 | NR | 720 | 1 | NR | 850 | 0 | NR | 980 | 0 | NR |
| 465 | 0 | NR | 595 | 20 | NR | 725 | 0 | NR | 855 | 0 | NR | 985 | 0 | NR |
| 470 | 0 | NR | 600 | 34 | NR | 730 | 0 | NR | 860 | 0 | NR | 990 | 0 | NR |
| 475 | 0 | NR | 605 | 56 | NR | 735 | 0 | NR | 865 | 0 | NR | 995 | 0 | NR |
| 480 | 0 | NR | 610 | 92 | NR | 740 | 0 | NR | 870 | 0 | NR | 1000 | 0 | NR |
| 485 | 0 | NR | 615 | 152 | NR | 745 | 0 | NR | 875 | 0 | NR | | | |

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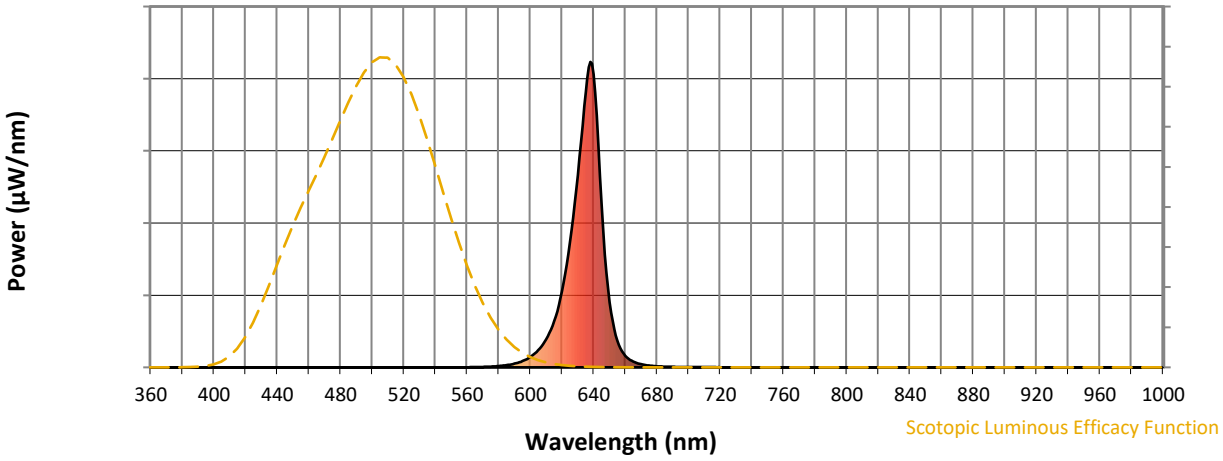
## Scotopic Flux vs. Wavelength




**Scotopic Lumens: NR** **S/P: 0.05**

| λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 360 | 0 | NR | 490 | 0 | NR | 620 | 248 | NR | 750 | 0 | NR | 880 | 0 | NR |
| 365 | 0 | NR | 495 | 0 | NR | 625 | 409 | NR | 755 | 0 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 0 | NR | 630 | 630 | NR | 760 | 0 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 0 | NR | 635 | 903 | NR | 765 | 0 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 0 | NR | 640 | 960 | NR | 770 | 0 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 0 | NR | 645 | 535 | NR | 775 | 0 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 0 | NR | 650 | 212 | NR | 780 | 0 | NR | 910 | 0 | NR |
| 395 | 0 | NR | 525 | 0 | NR | 655 | 88 | NR | 785 | 0 | NR | 915 | 0 | NR |
| 400 | 0 | NR | 530 | 0 | NR | 660 | 38 | NR | 790 | 0 | NR | 920 | 0 | NR |
| 405 | 0 | NR | 535 | 0 | NR | 665 | 19 | NR | 795 | 0 | NR | 925 | 0 | NR |
| 410 | 0 | NR | 540 | 0 | NR | 670 | 10 | NR | 800 | 0 | NR | 930 | 0 | NR |
| 415 | 0 | NR | 545 | 0 | NR | 675 | 6 | NR | 805 | 0 | NR | 935 | 0 | NR |
| 420 | 0 | NR | 550 | 0 | NR | 680 | 4 | NR | 810 | 0 | NR | 940 | 0 | NR |
| 425 | 0 | NR | 555 | 0 | NR | 685 | 2 | NR | 815 | 0 | NR | 945 | 0 | NR |
| 430 | 0 | NR | 560 | 0 | NR | 690 | 2 | NR | 820 | 0 | NR | 950 | 0 | NR |
| 435 | 0 | NR | 565 | 1 | NR | 695 | 1 | NR | 825 | 0 | NR | 955 | 0 | NR |
| 440 | 0 | NR | 570 | 2 | NR | 700 | 1 | NR | 830 | 0 | NR | 960 | 0 | NR |
| 445 | 0 | NR | 575 | 3 | NR | 705 | 1 | NR | 835 | 0 | NR | 965 | 0 | NR |
| 450 | 0 | NR | 580 | 4 | NR | 710 | 1 | NR | 840 | 0 | NR | 970 | 0 | NR |
| 455 | 0 | NR | 585 | 7 | NR | 715 | 1 | NR | 845 | 0 | NR | 975 | 0 | NR |
| 460 | 0 | NR | 590 | 12 | NR | 720 | 1 | NR | 850 | 0 | NR | 980 | 0 | NR |
| 465 | 0 | NR | 595 | 20 | NR | 725 | 0 | NR | 855 | 0 | NR | 985 | 0 | NR |
| 470 | 0 | NR | 600 | 34 | NR | 730 | 0 | NR | 860 | 0 | NR | 990 | 0 | NR |
| 475 | 0 | NR | 605 | 56 | NR | 735 | 0 | NR | 865 | 0 | NR | 995 | 0 | NR |
| 480 | 0 | NR | 610 | 92 | NR | 740 | 0 | NR | 870 | 0 | NR | 1000 | 0 | NR |
| 485 | 0 | NR | 615 | 152 | NR | 745 | 0 | NR | 875 | 0 | NR | | | |

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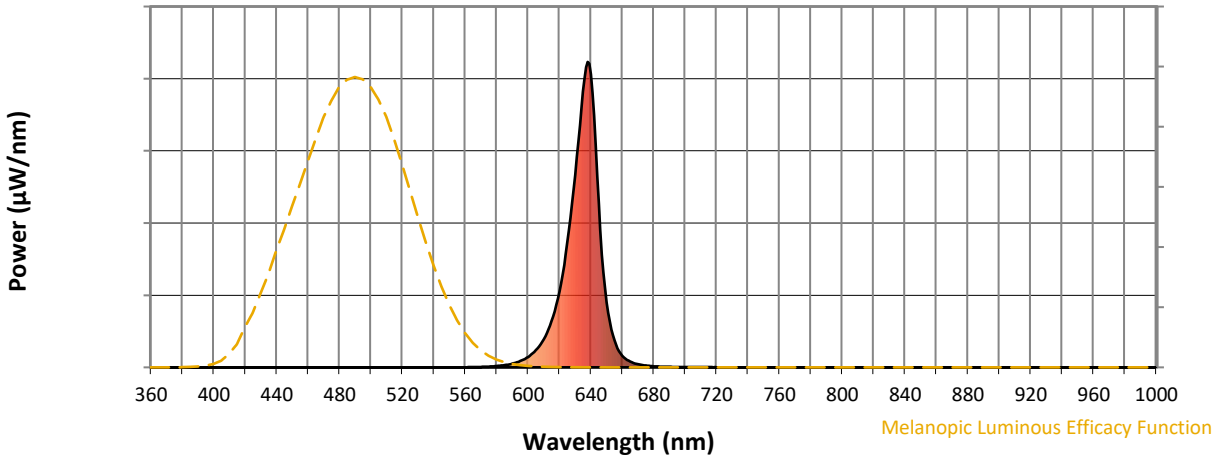
## Melanopic Flux vs. Wavelength




**Melanopic Lumens: NR** **M/P: 0.02**

| λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 360 | 0 | NR | 490 | 0 | NR | 620 | 248 | NR | 750 | 0 | NR | 880 | 0 | NR |
| 365 | 0 | NR | 495 | 0 | NR | 625 | 409 | NR | 755 | 0 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 0 | NR | 630 | 630 | NR | 760 | 0 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 0 | NR | 635 | 903 | NR | 765 | 0 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 0 | NR | 640 | 960 | NR | 770 | 0 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 0 | NR | 645 | 535 | NR | 775 | 0 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 0 | NR | 650 | 212 | NR | 780 | 0 | NR | 910 | 0 | NR |
| 395 | 0 | NR | 525 | 0 | NR | 655 | 88 | NR | 785 | 0 | NR | 915 | 0 | NR |
| 400 | 0 | NR | 530 | 0 | NR | 660 | 38 | NR | 790 | 0 | NR | 920 | 0 | NR |
| 405 | 0 | NR | 535 | 0 | NR | 665 | 19 | NR | 795 | 0 | NR | 925 | 0 | NR |
| 410 | 0 | NR | 540 | 0 | NR | 670 | 10 | NR | 800 | 0 | NR | 930 | 0 | NR |
| 415 | 0 | NR | 545 | 0 | NR | 675 | 6 | NR | 805 | 0 | NR | 935 | 0 | NR |
| 420 | 0 | NR | 550 | 0 | NR | 680 | 4 | NR | 810 | 0 | NR | 940 | 0 | NR |
| 425 | 0 | NR | 555 | 0 | NR | 685 | 2 | NR | 815 | 0 | NR | 945 | 0 | NR |
| 430 | 0 | NR | 560 | 0 | NR | 690 | 2 | NR | 820 | 0 | NR | 950 | 0 | NR |
| 435 | 0 | NR | 565 | 1 | NR | 695 | 1 | NR | 825 | 0 | NR | 955 | 0 | NR |
| 440 | 0 | NR | 570 | 2 | NR | 700 | 1 | NR | 830 | 0 | NR | 960 | 0 | NR |
| 445 | 0 | NR | 575 | 3 | NR | 705 | 1 | NR | 835 | 0 | NR | 965 | 0 | NR |
| 450 | 0 | NR | 580 | 4 | NR | 710 | 1 | NR | 840 | 0 | NR | 970 | 0 | NR |
| 455 | 0 | NR | 585 | 7 | NR | 715 | 1 | NR | 845 | 0 | NR | 975 | 0 | NR |
| 460 | 0 | NR | 590 | 12 | NR | 720 | 1 | NR | 850 | 0 | NR | 980 | 0 | NR |
| 465 | 0 | NR | 595 | 20 | NR | 725 | 0 | NR | 855 | 0 | NR | 985 | 0 | NR |
| 470 | 0 | NR | 600 | 34 | NR | 730 | 0 | NR | 860 | 0 | NR | 990 | 0 | NR |
| 475 | 0 | NR | 605 | 56 | NR | 735 | 0 | NR | 865 | 0 | NR | 995 | 0 | NR |
| 480 | 0 | NR | 610 | 92 | NR | 740 | 0 | NR | 870 | 0 | NR | 1000 | 0 | NR |
| 485 | 0 | NR | 615 | 152 | NR | 745 | 0 | NR | 875 | 0 | NR | | | |

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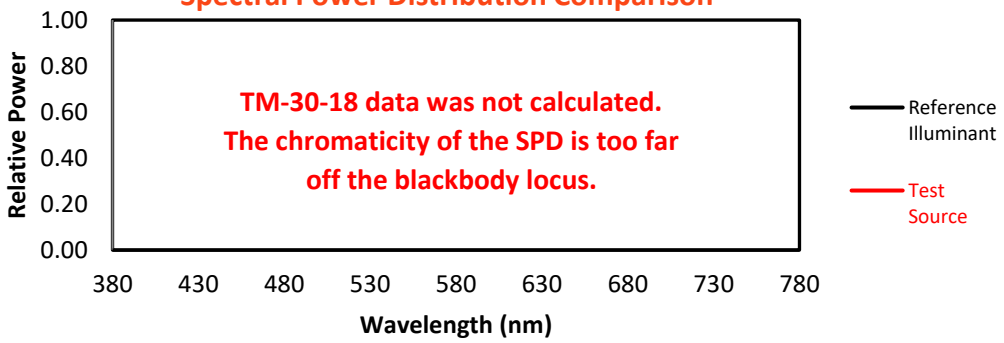
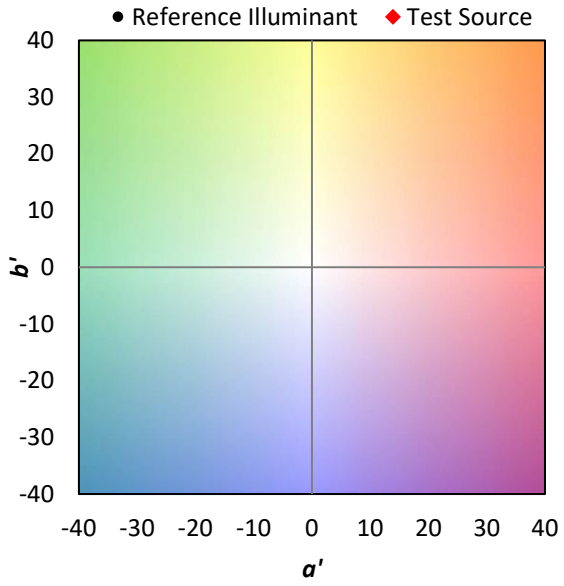
## Summary

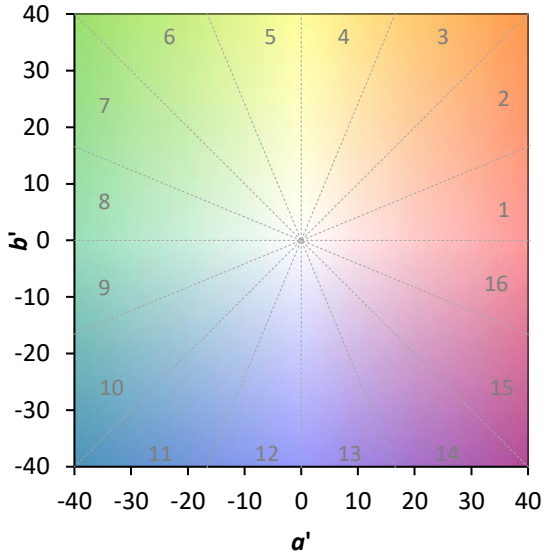
$R_f$ = 0
$R_g$ = 0
CIE $R_a$ = 0.0
$R_9$ = 0.0

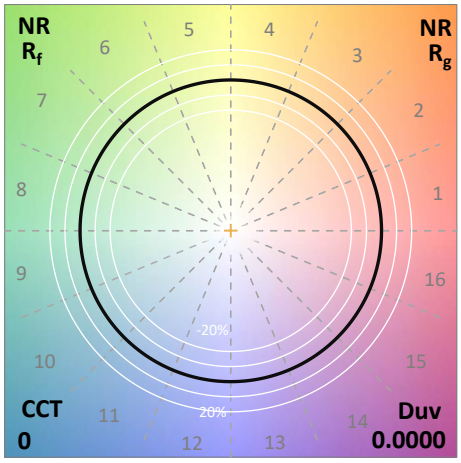
## Spectral Power Distribution Comparison

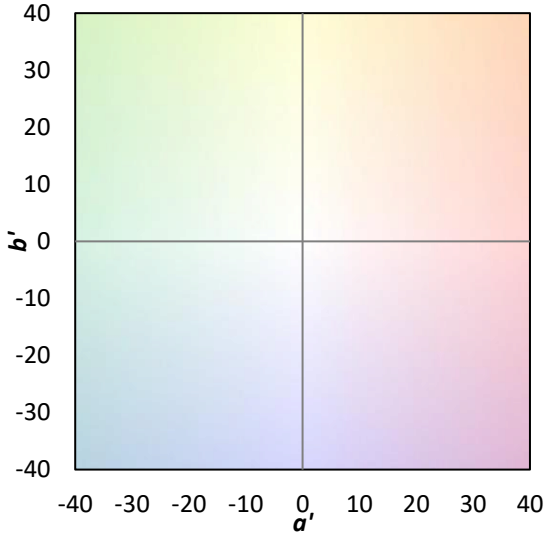



## Color Vector Graphics



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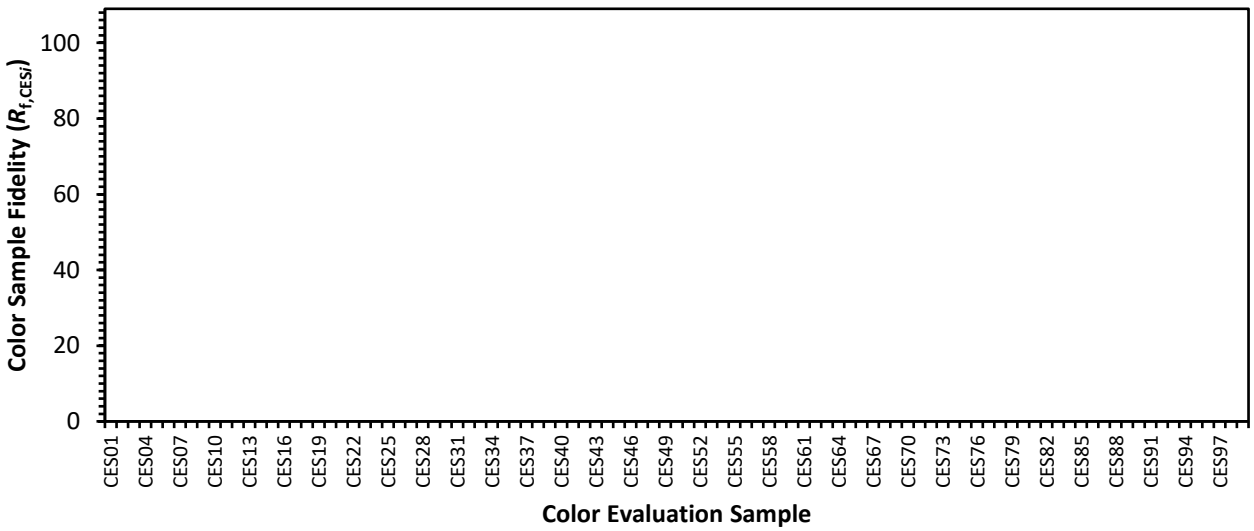
Individual Sample Fidelity Index ($R_{f,i}$)

| | | | |
|---|---|---|---|
| CES01 = 0 | CES26 = 0 | CES51 = 0 | CES76 = 0 |
| CES02 = 0 | CES27 = 0 | CES52 = 0 | CES77 = 0 |
| CES03 = 0 | CES28 = 0 | CES53 = 0 | CES78 = 0 |
| CES04 = 0 | CES29 = 0 | CES54 = 0 | CES79 = 0 |
| CES05 = 0 | CES30 = 0 | CES55 = 0 | CES80 = 0 |
| CES06 = 0 | CES31 = 0 | CES56 = 0 | CES81 = 0 |
| CES07 = 0 | CES32 = 0 | CES57 = 0 | CES82 = 0 |
| CES08 = 0 | CES33 = 0 | CES58 = 0 | CES83 = 0 |
| CES09 = 0 | CES34 = 0 | CES59 = 0 | CES84 = 0 |
| CES10 = 0 | CES35 = 0 | CES60 = 0 | CES85 = 0 |
| CES11 = 0 | CES36 = 0 | CES61 = 0 | CES86 = 0 |
| CES12 = 0 | CES37 = 0 | CES62 = 0 | CES87 = 0 |
| CES13 = 0 | CES38 = 0 | CES63 = 0 | CES88 = 0 |
| CES14 = 0 | CES39 = 0 | CES64 = 0 | CES89 = 0 |
| CES15 = 0 | CES40 = 0 | CES65 = 0 | CES90 = 0 |
| CES16 = 0 | CES41 = 0 | CES66 = 0 | CES91 = 0 |
| CES17 = 0 | CES42 = 0 | CES67 = 0 | CES92 = 0 |
| CES18 = 0 | CES43 = 0 | CES68 = 0 | CES93 = 0 |
| CES19 = 0 | CES44 = 0 | CES69 = 0 | CES94 = 0 |
| CES20 = 0 | CES45 = 0 | CES70 = 0 | CES95 = 0 |
| CES21 = 0 | CES46 = 0 | CES71 = 0 | CES96 = 0 |
| CES22 = 0 | CES47 = 0 | CES72 = 0 | CES97 = 0 |
| CES23 = 0 | CES48 = 0 | CES73 = 0 | CES98 = 0 |
| CES24 = 0 | CES49 = 0 | CES74 = 0 | CES99 = 0 |
| CES25 = 0 | CES50 = 0 | CES75 = 0 | |



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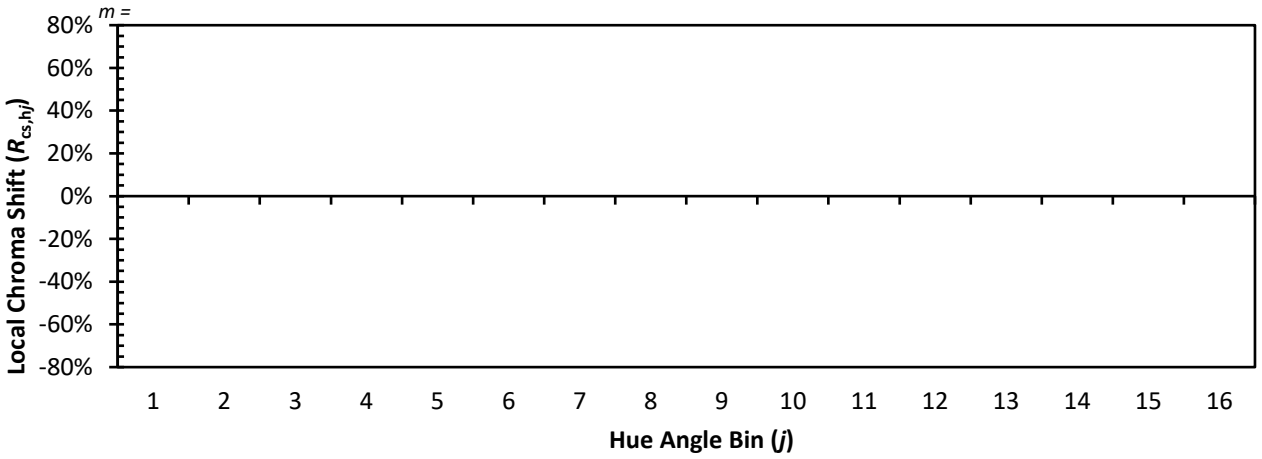
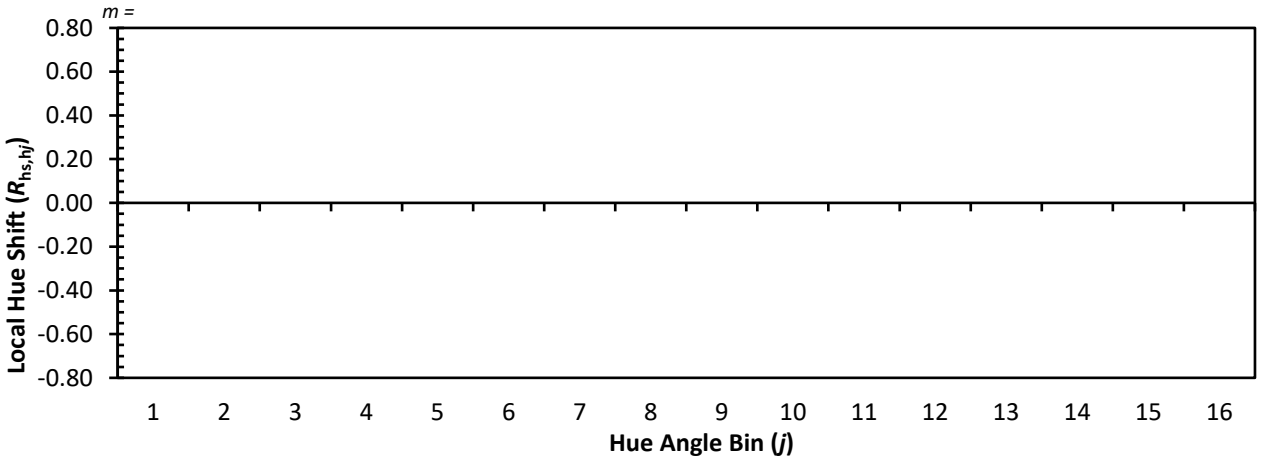
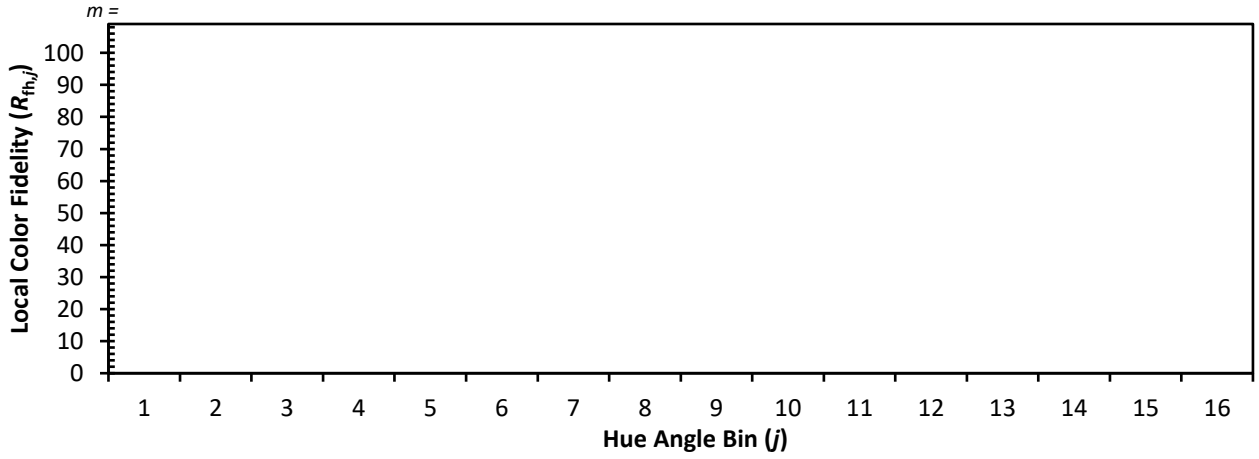
## Color Rendition by Hue-Angle Bin



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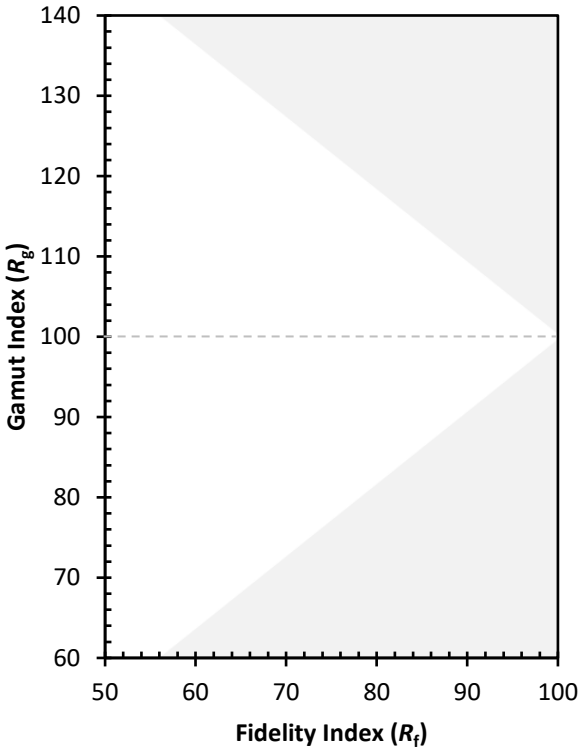
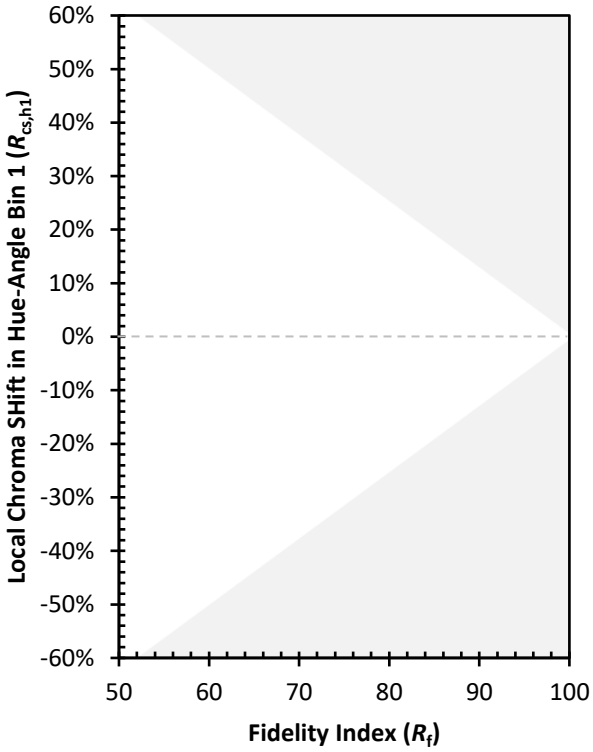
## Measure Comparisons




(END OF REPORT)