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: P1356962

Luminaire Tested: 2ASL4-5HE-2-G52-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: | P1356962 |
| | TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2511-597-7) |
| Test Lab: | INNOVATION CENTER |
| Issue Date: | 2/17/2026 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS |
| Product Line: | FAIL-SAFE |
| Catalog Number: | 2ASL4-5HE-2-G52-UNV |
| Description: | 2FT 500 LUMEN PER FOOT 4ASL LED LUMINAIRE WITH OPL LENS AND G52 LEDS 2 ROW |
| Light Source: | - |
| Ballast/Driver: | - |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 496.0 lumens |
| Efficiency: | N/A |
| Efficacy: | 55.1 lumens/watt |
| Spacing Criteria (0/90/45): | 1.21 / 1.3 / 1.4 |
| Luminous Opening: | Rectangular w/ Sides (W: 0.33' x L: 1.98' x H: 0.1') |
| CIE Type: | Direct |

| | |
|---|---|
| Input Watts (W): | 9 |
| 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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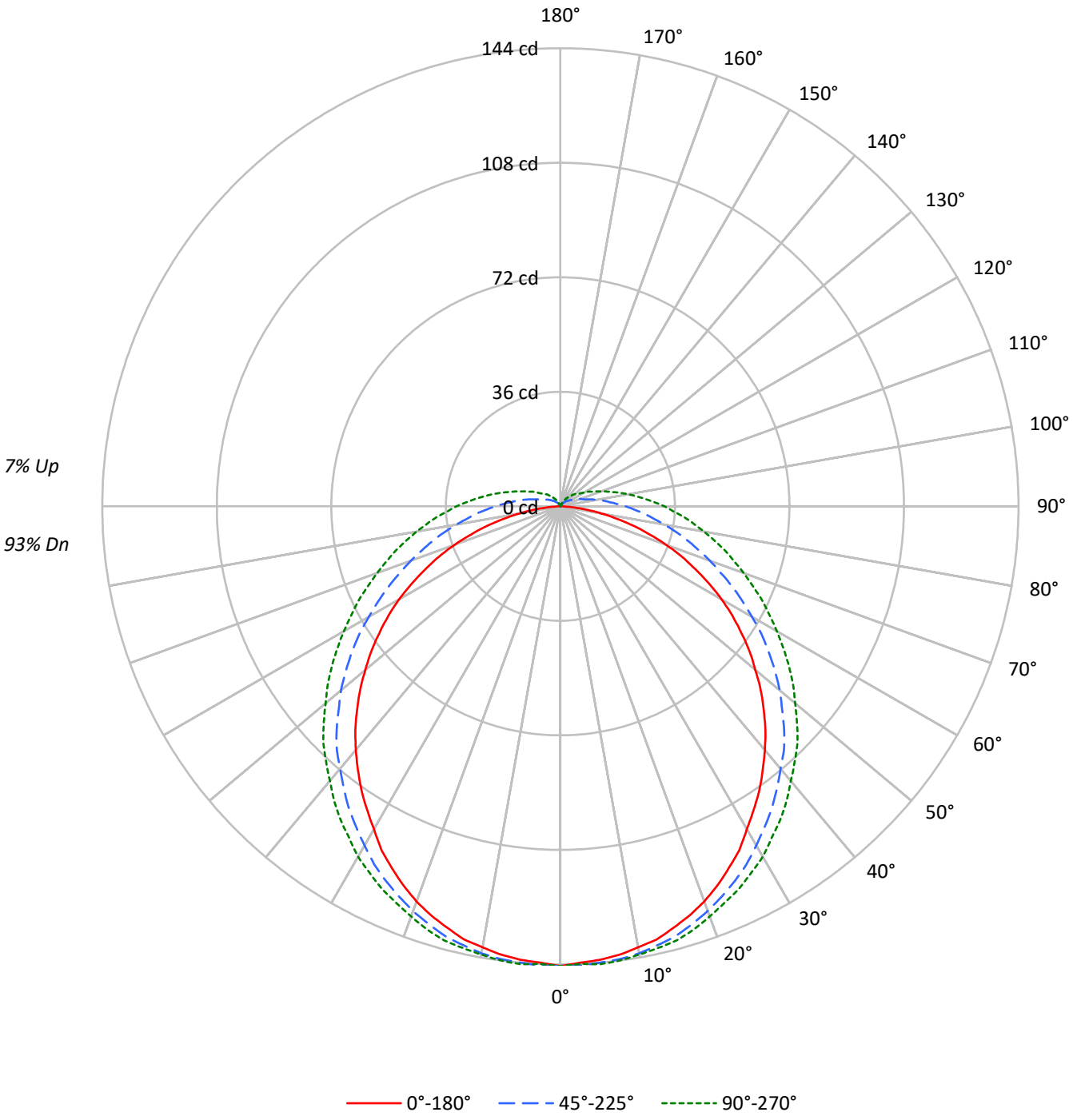
Scaled Data Report

TEST NUMBER: P1356962
CATALOG NUMBER: 2ASL4-5HE-2-G52-UNV

## Luminous Intensity Polar Plot



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TEST NUMBER: P1356962
CATALOG NUMBER: 2ASL4-5HE-2-G52-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 | 95 | 95 | 95 | 93 |
| 1 | 105 | 100 | 95 | 90 | 102 | 97 | 92 | 88 | 91 | 87 | 84 | 86 | 83 | 80 | 81 | 79 | 77 | 74 |
| 2 | 95 | 86 | 79 | 72 | 92 | 84 | 77 | 71 | 79 | 73 | 68 | 74 | 70 | 65 | 70 | 66 | 63 | 60 |
| 3 | 86 | 75 | 66 | 59 | 83 | 73 | 65 | 58 | 69 | 62 | 56 | 65 | 59 | 55 | 62 | 57 | 53 | 50 |
| 4 | 79 | 66 | 57 | 50 | 76 | 64 | 56 | 49 | 61 | 54 | 48 | 58 | 51 | 46 | 55 | 49 | 45 | 42 |
| 5 | 72 | 59 | 50 | 43 | 70 | 57 | 49 | 42 | 54 | 47 | 41 | 52 | 45 | 40 | 49 | 43 | 39 | 36 |
| 6 | 67 | 53 | 44 | 37 | 64 | 52 | 43 | 37 | 49 | 41 | 36 | 47 | 40 | 35 | 44 | 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 | 34 | 29 | 41 | 33 | 28 | 39 | 32 | 28 | 37 | 31 | 27 | 25 |
| 9 | 54 | 40 | 32 | 26 | 52 | 39 | 31 | 26 | 37 | 30 | 25 | 36 | 29 | 25 | 34 | 29 | 24 | 22 |
| 10 | 50 | 37 | 29 | 24 | 49 | 36 | 28 | 23 | 35 | 28 | 23 | 33 | 27 | 22 | 32 | 26 | 22 | 20 |

## AVERAGE LUMINANCE (cd/sqm):

| | 0° | 45° | 90° |
|---|---|---|---|
| 0° | 2358 | 2358 | 2358 |
| 5° | 2333 | 2306 | 2304 |
| 10° | 2311 | 2261 | 2247 |
| 15° | 2285 | 2210 | 2202 |
| 20° | 2252 | 2149 | 2139 |
| 25° | 2203 | 2087 | 2085 |
| 30° | 2143 | 2018 | 2030 |
| 35° | 2094 | 1955 | 1968 |
| 40° | 2040 | 1885 | 1902 |
| 45° | 1982 | 1825 | 1853 |
| 50° | 1911 | 1747 | 1781 |
| 55° | 1839 | 1663 | 1725 |
| 60° | 1752 | 1567 | 1664 |
| 65° | 1624 | 1478 | 1618 |
| 70° | 1475 | 1395 | 1573 |
| 75° | 1270 | 1326 | 1560 |
| 80° | 955 | 1266 | 1556 |
| 85° | 526 | 1251 | 1601 |

## MAXIMUM LUMINANCE 45°-90°:

Horizontal Angle: 0°
Vertical Angle: 45°
Luminance: 1982 cd/sqm

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Scaled Data Report

TEST NUMBER: P1356962
CATALOG NUMBER: 2ASL4-5HE-2-G52-UNV

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 13.7 | 2.8 |
| 10°-20° | 39.4 | 7.9 |
| 20°-30° | 59.7 | 12.0 |
| 30°-40° | 72.2 | 14.6 |
| 40°-50° | 76.1 | 15.3 |
| 50°-60° | 71.0 | 14.3 |
| 60°-70° | 58.6 | 11.8 |
| 70°-80° | 42.5 | 8.6 |
| 80°-90° | 26.9 | 5.4 |
| 90°-100° | 16.0 | 3.2 |
| 100°-110° | 9.2 | 1.9 |
| 110°-120° | 5.2 | 1.1 |
| 120°-130° | 3.0 | 0.6 |
| 130°-140° | 1.6 | 0.3 |
| 140°-150° | 0.7 | 0.1 |
| 150°-160° | 0.1 | 0.0 |
| 160°-170° | 0.0 | 0.0 |
| 170°-180° | 0.0 | 0.0 |
| 0°-30° | 112.8 | 22.7 |
| 0°-40° | 185.0 | 37.3 |
| 0°-60° | 332.1 | 66.9 |
| 0°-90° | 460.1 | 92.8 |
| 90°-120° | 30.5 | 6.1 |
| 90°-150° | 35.8 | 7.2 |
| 90°-180° | 36.0 | 7.3 |
| 0°-180° | 496.0 | 100.0 |

**CANDELA DISTRIBUTION:**

| | 0° | 22.5° | 45° | 67.5° | 90° | Flux |
|---|---|---|---|---|---|---|
| 0° | 144 | 144 | 144 | 144 | 144 | |
| 5° | 143 | 144 | 144 | 144 | 144 | 14 |
| 15° | 137 | 139 | 140 | 140 | 141 | 39 |
| 25° | 125 | 127 | 130 | 132 | 133 | 58 |
| 35° | 109 | 112 | 116 | 119 | 120 | 68 |
| 45° | 90 | 94 | 100 | 104 | 105 | 70 |
| 55° | 70 | 74 | 80 | 85 | 88 | 62 |
| 65° | 47 | 52 | 60 | 67 | 70 | 46 |
| 75° | 24 | 30 | 41 | 50 | 54 | 25 |
| 85° | 4 | 14 | 26 | 35 | 39 | 6 |
| 90° | 0 | 9 | 20 | 29 | 33 | 0 |
| 95° | 0 | 6 | 15 | 24 | 27 | 0 |
| 105° | 0 | 2 | 9 | 15 | 17 | 0 |
| 115° | 0 | 1 | 5 | 9 | 11 | 0 |
| 125° | 0 | 0 | 3 | 6 | 7 | 0 |
| 135° | 0 | 0 | 2 | 4 | 4 | 0 |
| 145° | 0 | 0 | 1 | 2 | 3 | 0 |
| 155° | 0 | 0 | 0 | 0 | 1 | 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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Scaled Data Report

TEST NUMBER: P1356962
CATALOG NUMBER: 2ASL4-5HE-2-G52-UNV

**CANDELA DISTRIBUTION (FULL):**

| | 0° | 22.5° | 45° | 67.5° | 90° |
|---|---|---|---|---|---|
| 0° | 144.5 | 144.5 | 144.5 | 144.5 | 144.5 |
| 2.5° | 143.6 | 144.9 | 144.5 | 144.0 | 144.0 |
| 5° | 143.1 | 144.5 | 144.0 | 144.0 | 144.5 |
| 7.5° | 142.2 | 143.6 | 143.6 | 143.6 | 144.0 |
| 10° | 140.8 | 142.7 | 142.7 | 142.7 | 143.1 |
| 12.5° | 139.5 | 140.8 | 141.3 | 141.8 | 142.2 |
| 15° | 137.2 | 139.0 | 139.9 | 140.4 | 141.3 |
| 17.5° | 134.9 | 136.3 | 137.7 | 139.0 | 139.5 |
| 20° | 132.2 | 134.0 | 135.4 | 136.8 | 137.2 |
| 22.5° | 129.0 | 130.8 | 132.7 | 134.0 | 134.9 |
| 25° | 125.4 | 127.2 | 129.9 | 131.8 | 132.7 |
| 27.5° | 121.8 | 123.6 | 126.8 | 129.0 | 129.9 |
| 30° | 117.2 | 119.9 | 123.1 | 125.9 | 127.2 |
| 32.5° | 113.1 | 115.9 | 119.5 | 122.7 | 123.6 |
| 35° | 109.0 | 111.8 | 115.9 | 119.0 | 120.4 |
| 37.5° | 104.5 | 107.7 | 111.8 | 115.4 | 116.8 |
| 40° | 100.0 | 103.1 | 107.7 | 111.8 | 112.7 |
| 42.5° | 95.4 | 98.6 | 104.0 | 107.7 | 109.0 |
| 45° | 90.4 | 94.0 | 99.5 | 103.6 | 105.4 |
| 47.5° | 85.4 | 89.1 | 94.5 | 99.0 | 100.9 |
| 50° | 80.0 | 84.1 | 90.0 | 94.5 | 96.3 |
| 52.5° | 75.0 | 79.1 | 85.0 | 90.0 | 92.2 |
| 55° | 69.5 | 73.6 | 80.0 | 85.4 | 87.7 |
| 57.5° | 64.1 | 68.2 | 75.0 | 80.9 | 83.1 |
| 60° | 58.6 | 62.7 | 69.5 | 76.3 | 78.6 |
| 62.5° | 52.7 | 57.2 | 64.5 | 71.3 | 74.1 |
| 65° | 46.8 | 51.8 | 59.5 | 66.8 | 70.0 |
| 67.5° | 41.3 | 46.3 | 54.5 | 62.7 | 65.4 |
| 70° | 35.4 | 40.9 | 50.0 | 58.2 | 61.3 |
| 72.5° | 29.5 | 35.4 | 45.4 | 54.1 | 57.2 |
| 75° | 24.1 | 30.4 | 41.3 | 50.0 | 53.6 |
| 77.5° | 18.2 | 25.9 | 37.3 | 46.3 | 49.5 |
| 80° | 13.2 | 21.4 | 33.2 | 42.7 | 45.9 |
| 82.5° | 8.6 | 17.3 | 29.5 | 39.1 | 42.3 |
| 85° | 4.5 | 14.1 | 26.4 | 35.4 | 39.1 |
| 87.5° | 1.4 | 10.9 | 23.2 | 32.3 | 35.4 |
| 90° | 0.0 | 8.6 | 20.4 | 29.1 | 32.7 |
| 92.5° | 0.0 | 6.8 | 17.7 | 26.4 | 29.5 |
| 95° | 0.0 | 5.5 | 15.4 | 23.6 | 26.8 |
| 97.5° | 0.0 | 4.5 | 13.6 | 21.4 | 24.1 |
| 100° | 0.0 | 3.6 | 11.8 | 19.1 | 21.8 |
| 102.5° | 0.0 | 2.7 | 10.0 | 16.8 | 19.5 |
| 105° | 0.0 | 1.8 | 8.6 | 15.0 | 17.3 |
| 107.5° | 0.0 | 1.4 | 7.3 | 13.2 | 15.4 |
| 110° | 0.0 | 1.4 | 6.8 | 11.4 | 13.6 |

TEST NUMBER: P1356962
CATALOG NUMBER: 2ASL4-5HE-2-G52-UNV

**CANDELA DISTRIBUTION (continued):**

| | 0° | 22.5° | 45° | 67.5° | 90° |
|---|---|---|---|---|---|
| 112.5° | 0.0 | *0.9* | 5.9 | 10.4 | 12.3 |
| 115° | 0.0 | *0.9* | 5.0 | 9.1 | 10.9 |
| 117.5° | 0.0 | *0.9* | 4.5 | 8.2 | 10.0 |
| 120° | 0.0 | *0.9* | 4.1 | 7.3 | 8.6 |
| 122.5° | 0.0 | *0.5* | 3.6 | 6.4 | 7.7 |
| 125° | 0.0 | *0.5* | 3.2 | 5.9 | 6.8 |
| 127.5° | 0.0 | *0.5* | 2.7 | 5.5 | 6.4 |
| 130° | 0.0 | *0.5* | 2.7 | 5.0 | 5.9 |
| 132.5° | 0.0 | *0.0* | 2.3 | 4.5 | 5.5 |
| 135° | 0.0 | *0.0* | 1.8 | 3.6 | 4.5 |
| 137.5° | 0.0 | *0.0* | 1.8 | 3.2 | 4.1 |
| 140° | 0.0 | *0.0* | 1.4 | 3.2 | 3.6 |
| 142.5° | 0.0 | *0.0* | 0.9 | 2.7 | 3.2 |
| 145° | 0.0 | *0.0* | 0.9 | 2.3 | 2.7 |
| 147.5° | 0.0 | *0.0* | 0.5 | 1.8 | 2.3 |
| 150° | 0.0 | *0.0* | 0.5 | 1.4 | 1.8 |
| 152.5° | 0.0 | *0.0* | 0.0 | 0.9 | 1.4 |
| 155° | 0.0 | *0.0* | 0.0 | 0.5 | 0.9 |
| 157.5° | 0.0 | *0.0* | 0.0 | 0.0 | 0.5 |
| 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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Scaled Data Report

TEST NUMBER: P1356962
CATALOG NUMBER: 2ASL4-5HE-2-G52-UNV

**CIE UGR TABLE:**

| Reflectances: | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ceiling | 0.7 | 0.7 | 0.5 | 0.5 | 0.3 | 0.7 | 0.7 | 0.5 | 0.5 | 0.3 |
| | Wall | 0.5 | 0.3 | 0.5 | 0.3 | 0.3 | 0.5 | 0.3 | 0.5 | 0.3 | 0.3 |
| | Reference plane | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| Room dimensions | | Viewed crosswise | | | | | Viewed endwise | | | | |
| X=2H | Y=2H | 12.26 | 13.80 | 12.74 | 14.26 | 14.75 | 14.24 | 15.77 | 14.71 | 16.23 | 16.72 |
| | 3H | 13.77 | 15.17 | 14.25 | 15.64 | 16.17 | 16.65 | 18.05 | 17.14 | 18.52 | 19.05 |
| | 4H | 14.25 | 15.57 | 14.75 | 16.06 | 16.61 | 17.83 | 19.16 | 18.34 | 19.65 | 20.19 |
| | 6H | 14.52 | 15.76 | 15.04 | 16.26 | 16.82 | 19.05 | 20.29 | 19.57 | 20.79 | 21.35 |
| | 8H | 14.58 | 15.76 | 15.11 | 16.29 | 16.85 | 19.67 | 20.86 | 20.21 | 21.38 | 21.95 |
| | 12H | 14.59 | 15.73 | 15.13 | 16.25 | 16.84 | 20.34 | 21.48 | 20.88 | 22.00 | 22.60 |
| 4H | 2H | 13.13 | 14.45 | 13.63 | 14.94 | 15.49 | 14.67 | 16.00 | 15.18 | 16.49 | 17.03 |
| | 3H | 14.87 | 16.00 | 15.39 | 16.53 | 17.10 | 17.32 | 18.45 | 17.84 | 18.98 | 19.55 |
| | 4H | 15.48 | 16.51 | 16.02 | 17.05 | 17.65 | 18.67 | 19.71 | 19.21 | 20.25 | 20.85 |
| | 6H | 15.88 | 16.80 | 16.44 | 17.36 | 17.97 | 20.09 | 21.01 | 20.65 | 21.57 | 22.19 |
| | 8H | 15.98 | 16.84 | 16.54 | 17.41 | 18.03 | 20.82 | 21.68 | 21.39 | 22.25 | 22.87 |
| | 12H | 16.03 | 16.81 | 16.61 | 17.40 | 18.03 | 21.61 | 22.40 | 22.20 | 22.99 | 23.62 |
| 8H | 4H | 16.15 | 17.01 | 16.72 | 17.58 | 18.21 | 18.90 | 19.76 | 19.46 | 20.32 | 20.95 |
| | 6H | 16.74 | 17.47 | 17.34 | 18.08 | 18.71 | 20.49 | 21.22 | 21.09 | 21.83 | 22.46 |
| | 8H | 16.93 | 17.59 | 17.54 | 18.21 | 18.85 | 21.37 | 22.03 | 21.97 | 22.65 | 23.29 |
| | 12H | 17.05 | 17.64 | 17.66 | 18.25 | 18.96 | 22.35 | 22.94 | 22.96 | 23.54 | 24.25 |
| 12H | 4H | 16.34 | 17.13 | 16.93 | 17.72 | 18.35 | 18.91 | 19.69 | 19.49 | 20.28 | 20.91 |
| | 6H | 17.03 | 17.69 | 17.64 | 18.31 | 18.96 | 20.53 | 21.19 | 21.14 | 21.81 | 22.46 |
| | 8H | 17.32 | 17.91 | 17.93 | 18.52 | 19.23 | 21.48 | 22.07 | 22.09 | 22.67 | 23.38 |

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

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

Report Prepared for

Cooper Lighting Solutions

Fail-Safe

Report Number: SP1-2511-597-8

Test Date: 01/22/2026

Luminaire Tested: 4ASL-2-G520-UNV-OPL-1_600mA

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

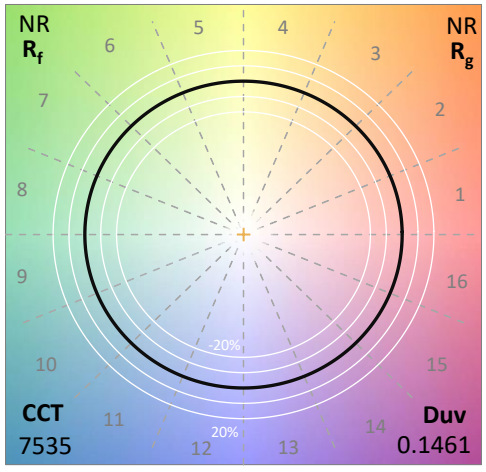
Report Generated By FNC07603 / LDUCLS01DT446
Version: v7.05

## Test Information

| | |
|---|---|
| Test Method: | LM-79-2019 |
| Report Number: | SP1-2511-597-8 |
| 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-G520-UNV-OPL-1_600mA** |
| Description: | 2foot 4ASL LED LUMINAIRE WITH OPL LENS AND GREEN 520NM LEDS with 1 rows at 600mA |

## Spectral Parameters

| | | | | | |
|---|---|---|---|---|---|
| CCT (K): | 7535 | CRI (Ra): | -11.7 | | |
| CIE u': | 0.0718 | R1: | -30.6 | R9: | -351.9 |
| CIE v': | 0.5710 | R2: | 5.1 | R10: | -75.5 |
| Duv: | 0.1461 | R3: | 5.6 | R11: | -78.0 |
| CIE x: | 0.1962 | R4: | -51.7 | R12: | -14.7 |
| CIE y: | 0.6931 | R5: | -6.4 | R13: | -32.5 |
| CIE z: | 0.1107 | R6: | -0.6 | R14: | 52.7 |
| Peak Wavelength (nm): | 524 | R7: | 10.9 | R15: | -37.0 |
| Dominant Wavelength (nm): | 529 | R8: | -25.8 | | |
| Purity: | 75.95236 | | | | |
| Rf: | NR | | | | |
| Rg: | NR | | | | |




## Test Conditions

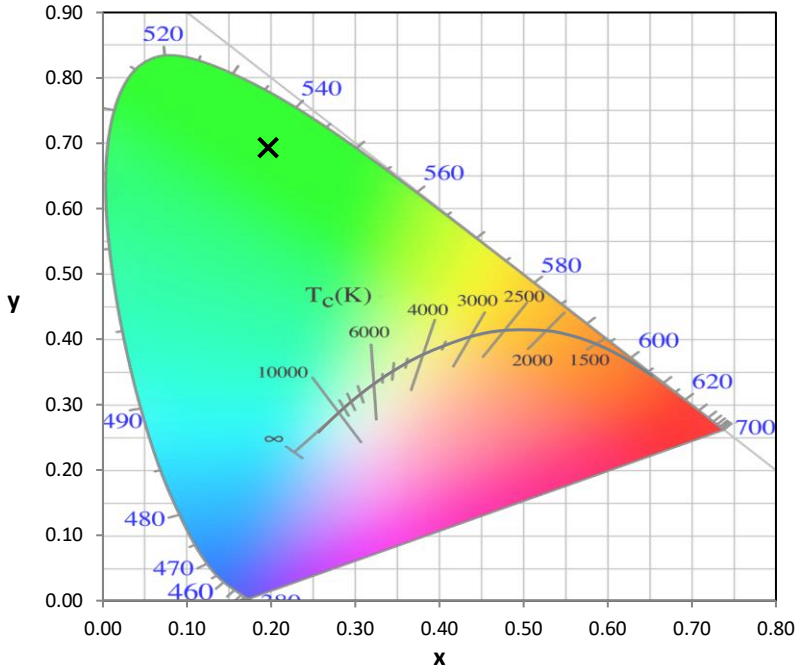
| | |
|---|---|
| Stabilization Time: | 48M |
| Operation Time: | 1H 48M |
| Sphere Temperature (°C): | 25.1 |

REPORT NUMBER: SP1-2511-597-8

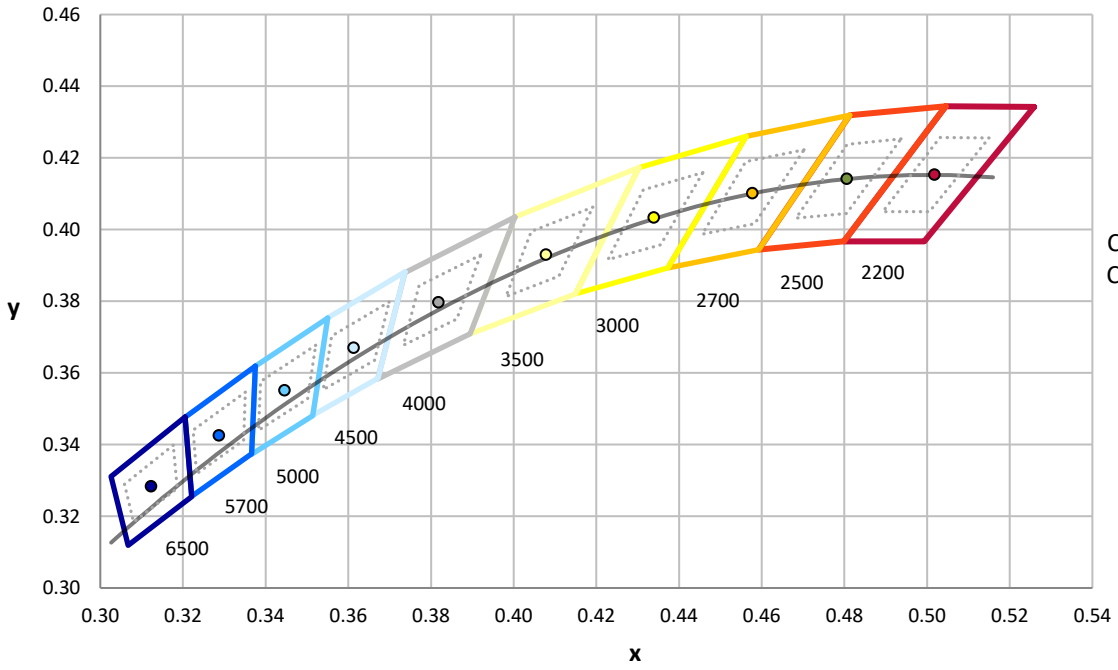
| Measurement and Test Equipment | | | |
|---|---|---|---|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | 76INCH SPHERE IN0058 | 12/16/2025 | 6/16/2026 |
| Power Meter | XITRON INXT2011004 | 10/21/2025 | 10/21/2026 |
| AC Power Source | CHROMA 61603 IN0063 | 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: SP1-2511-597-8

## CIE 1931 Chromaticity Diagram




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

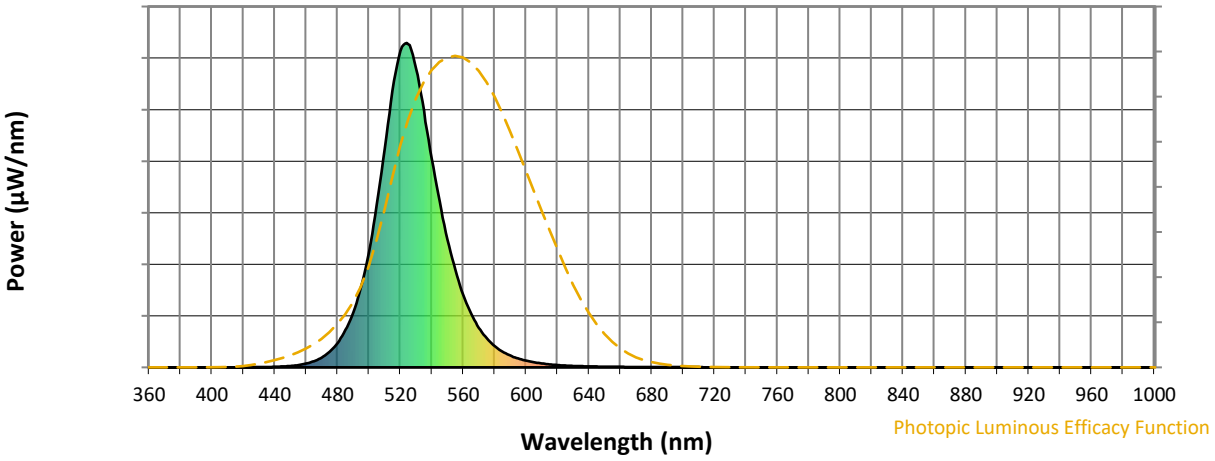



CCT = 7535K
CIE x = 0.1962
CIE y = 0.6931
Duv = 0.1461

Point lies outside the range

REPORT NUMBER: SP1-2511-597-8

## 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 | 169 | NR | 620 | 7 | NR | 750 | 0 | NR | 880 | 0 | NR |
| 365 | 0 | NR | 495 | 249 | NR | 625 | 6 | NR | 755 | 0 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 356 | NR | 630 | 4 | NR | 760 | 0 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 502 | NR | 635 | 4 | NR | 765 | 0 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 674 | NR | 640 | 3 | NR | 770 | 0 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 853 | NR | 645 | 3 | NR | 775 | 0 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 976 | NR | 650 | 2 | NR | 780 | 0 | NR | 910 | 0 | NR |
| 395 | 0 | NR | 525 | 996 | NR | 655 | 2 | NR | 785 | 0 | NR | 915 | 0 | NR |
| 400 | 0 | NR | 530 | 920 | NR | 660 | 2 | NR | 790 | 0 | NR | 920 | 0 | NR |
| 405 | 0 | NR | 535 | 792 | NR | 665 | 1 | NR | 795 | 0 | NR | 925 | 0 | NR |
| 410 | 0 | NR | 540 | 642 | NR | 670 | 1 | NR | 800 | 0 | NR | 930 | 0 | NR |
| 415 | 0 | NR | 545 | 511 | NR | 675 | 1 | NR | 805 | 0 | NR | 935 | 0 | NR |
| 420 | 0 | NR | 550 | 394 | NR | 680 | 1 | NR | 810 | 0 | NR | 940 | 0 | NR |
| 425 | 1 | NR | 555 | 300 | NR | 685 | 1 | NR | 815 | 0 | NR | 945 | 0 | NR |
| 430 | 1 | NR | 560 | 224 | NR | 690 | 1 | NR | 820 | 0 | NR | 950 | 0 | NR |
| 435 | 1 | NR | 565 | 166 | NR | 695 | 1 | NR | 825 | 0 | NR | 955 | 0 | NR |
| 440 | 2 | NR | 570 | 122 | NR | 700 | 1 | NR | 830 | 0 | NR | 960 | 0 | NR |
| 445 | 3 | NR | 575 | 90 | NR | 705 | 1 | NR | 835 | 0 | NR | 965 | 0 | NR |
| 450 | 4 | NR | 580 | 66 | NR | 710 | 1 | NR | 840 | 0 | NR | 970 | 0 | NR |
| 455 | 7 | NR | 585 | 48 | NR | 715 | 0 | NR | 845 | 0 | NR | 975 | 0 | NR |
| 460 | 12 | NR | 590 | 36 | NR | 720 | 0 | NR | 850 | 0 | NR | 980 | 0 | NR |
| 465 | 19 | NR | 595 | 27 | NR | 725 | 0 | NR | 855 | 0 | NR | 985 | 0 | NR |
| 470 | 31 | NR | 600 | 21 | NR | 730 | 0 | NR | 860 | 0 | NR | 990 | 0 | NR |
| 475 | 49 | NR | 605 | 16 | NR | 735 | 0 | NR | 865 | 0 | NR | 995 | 0 | NR |
| 480 | 75 | NR | 610 | 12 | NR | 740 | 0 | NR | 870 | 0 | NR | 1000 | 0 | NR |
| 485 | 115 | NR | 615 | 9 | NR | 745 | 0 | NR | 875 | 0 | NR | | | |

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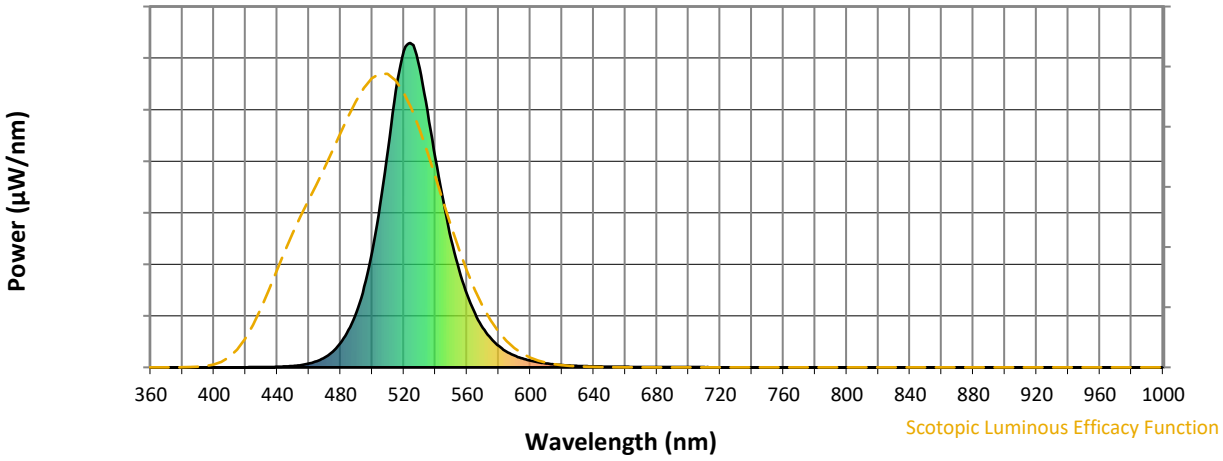
## Scotopic Flux vs. Wavelength




**Scotopic Lumens: NR** **S/P: 2.63**

| 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 | 169 | NR | 620 | 7 | NR | 750 | 0 | NR | 880 | 0 | NR |
| 365 | 0 | NR | 495 | 249 | NR | 625 | 6 | NR | 755 | 0 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 356 | NR | 630 | 4 | NR | 760 | 0 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 502 | NR | 635 | 4 | NR | 765 | 0 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 674 | NR | 640 | 3 | NR | 770 | 0 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 853 | NR | 645 | 3 | NR | 775 | 0 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 976 | NR | 650 | 2 | NR | 780 | 0 | NR | 910 | 0 | NR |
| 395 | 0 | NR | 525 | 996 | NR | 655 | 2 | NR | 785 | 0 | NR | 915 | 0 | NR |
| 400 | 0 | NR | 530 | 920 | NR | 660 | 2 | NR | 790 | 0 | NR | 920 | 0 | NR |
| 405 | 0 | NR | 535 | 792 | NR | 665 | 1 | NR | 795 | 0 | NR | 925 | 0 | NR |
| 410 | 0 | NR | 540 | 642 | NR | 670 | 1 | NR | 800 | 0 | NR | 930 | 0 | NR |
| 415 | 0 | NR | 545 | 511 | NR | 675 | 1 | NR | 805 | 0 | NR | 935 | 0 | NR |
| 420 | 0 | NR | 550 | 394 | NR | 680 | 1 | NR | 810 | 0 | NR | 940 | 0 | NR |
| 425 | 1 | NR | 555 | 300 | NR | 685 | 1 | NR | 815 | 0 | NR | 945 | 0 | NR |
| 430 | 1 | NR | 560 | 224 | NR | 690 | 1 | NR | 820 | 0 | NR | 950 | 0 | NR |
| 435 | 1 | NR | 565 | 166 | NR | 695 | 1 | NR | 825 | 0 | NR | 955 | 0 | NR |
| 440 | 2 | NR | 570 | 122 | NR | 700 | 1 | NR | 830 | 0 | NR | 960 | 0 | NR |
| 445 | 3 | NR | 575 | 90 | NR | 705 | 1 | NR | 835 | 0 | NR | 965 | 0 | NR |
| 450 | 4 | NR | 580 | 66 | NR | 710 | 1 | NR | 840 | 0 | NR | 970 | 0 | NR |
| 455 | 7 | NR | 585 | 48 | NR | 715 | 0 | NR | 845 | 0 | NR | 975 | 0 | NR |
| 460 | 12 | NR | 590 | 36 | NR | 720 | 0 | NR | 850 | 0 | NR | 980 | 0 | NR |
| 465 | 19 | NR | 595 | 27 | NR | 725 | 0 | NR | 855 | 0 | NR | 985 | 0 | NR |
| 470 | 31 | NR | 600 | 21 | NR | 730 | 0 | NR | 860 | 0 | NR | 990 | 0 | NR |
| 475 | 49 | NR | 605 | 16 | NR | 735 | 0 | NR | 865 | 0 | NR | 995 | 0 | NR |
| 480 | 75 | NR | 610 | 12 | NR | 740 | 0 | NR | 870 | 0 | NR | 1000 | 0 | NR |
| 485 | 115 | NR | 615 | 9 | NR | 745 | 0 | NR | 875 | 0 | NR | | | |

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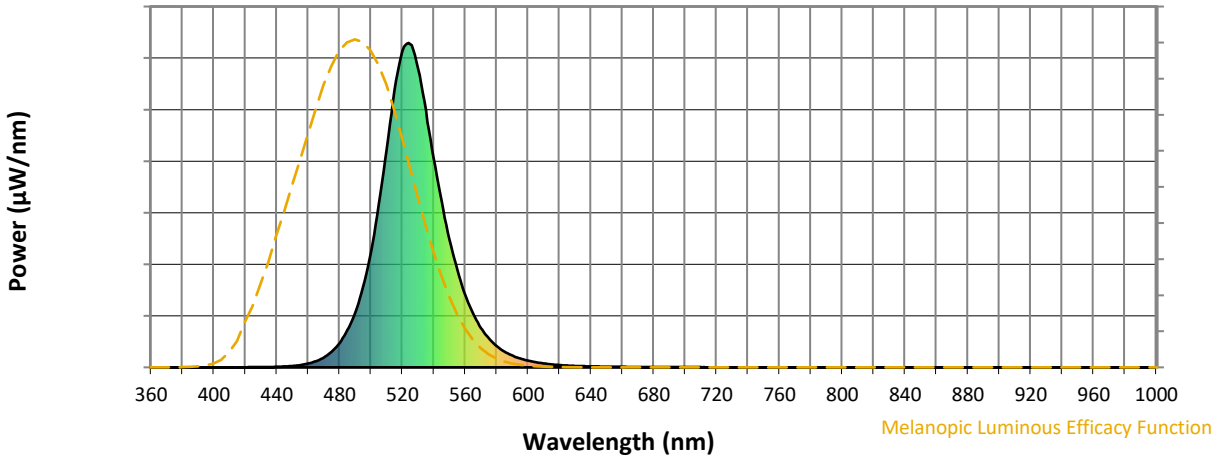
## Melanopic Flux vs. Wavelength




**Melanopic Lumens: NR** **M/P: 4.87**

| 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 | 169 | NR | 620 | 7 | NR | 750 | 0 | NR | 880 | 0 | NR |
| 365 | 0 | NR | 495 | 249 | NR | 625 | 6 | NR | 755 | 0 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 356 | NR | 630 | 4 | NR | 760 | 0 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 502 | NR | 635 | 4 | NR | 765 | 0 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 674 | NR | 640 | 3 | NR | 770 | 0 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 853 | NR | 645 | 3 | NR | 775 | 0 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 976 | NR | 650 | 2 | NR | 780 | 0 | NR | 910 | 0 | NR |
| 395 | 0 | NR | 525 | 996 | NR | 655 | 2 | NR | 785 | 0 | NR | 915 | 0 | NR |
| 400 | 0 | NR | 530 | 920 | NR | 660 | 2 | NR | 790 | 0 | NR | 920 | 0 | NR |
| 405 | 0 | NR | 535 | 792 | NR | 665 | 1 | NR | 795 | 0 | NR | 925 | 0 | NR |
| 410 | 0 | NR | 540 | 642 | NR | 670 | 1 | NR | 800 | 0 | NR | 930 | 0 | NR |
| 415 | 0 | NR | 545 | 511 | NR | 675 | 1 | NR | 805 | 0 | NR | 935 | 0 | NR |
| 420 | 0 | NR | 550 | 394 | NR | 680 | 1 | NR | 810 | 0 | NR | 940 | 0 | NR |
| 425 | 1 | NR | 555 | 300 | NR | 685 | 1 | NR | 815 | 0 | NR | 945 | 0 | NR |
| 430 | 1 | NR | 560 | 224 | NR | 690 | 1 | NR | 820 | 0 | NR | 950 | 0 | NR |
| 435 | 1 | NR | 565 | 166 | NR | 695 | 1 | NR | 825 | 0 | NR | 955 | 0 | NR |
| 440 | 2 | NR | 570 | 122 | NR | 700 | 1 | NR | 830 | 0 | NR | 960 | 0 | NR |
| 445 | 3 | NR | 575 | 90 | NR | 705 | 1 | NR | 835 | 0 | NR | 965 | 0 | NR |
| 450 | 4 | NR | 580 | 66 | NR | 710 | 1 | NR | 840 | 0 | NR | 970 | 0 | NR |
| 455 | 7 | NR | 585 | 48 | NR | 715 | 0 | NR | 845 | 0 | NR | 975 | 0 | NR |
| 460 | 12 | NR | 590 | 36 | NR | 720 | 0 | NR | 850 | 0 | NR | 980 | 0 | NR |
| 465 | 19 | NR | 595 | 27 | NR | 725 | 0 | NR | 855 | 0 | NR | 985 | 0 | NR |
| 470 | 31 | NR | 600 | 21 | NR | 730 | 0 | NR | 860 | 0 | NR | 990 | 0 | NR |
| 475 | 49 | NR | 605 | 16 | NR | 735 | 0 | NR | 865 | 0 | NR | 995 | 0 | NR |
| 480 | 75 | NR | 610 | 12 | NR | 740 | 0 | NR | 870 | 0 | NR | 1000 | 0 | NR |
| 485 | 115 | NR | 615 | 9 | NR | 745 | 0 | NR | 875 | 0 | NR | | | |

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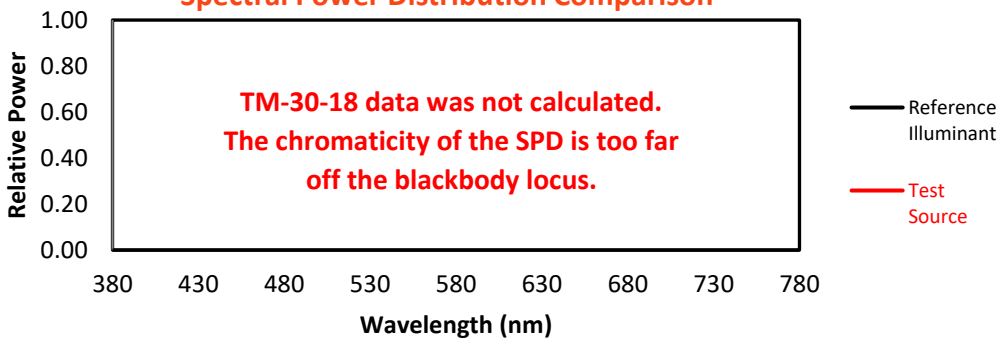
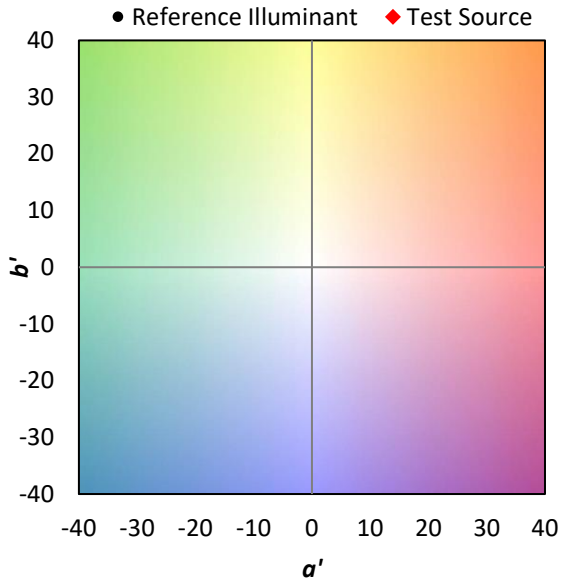
## Summary

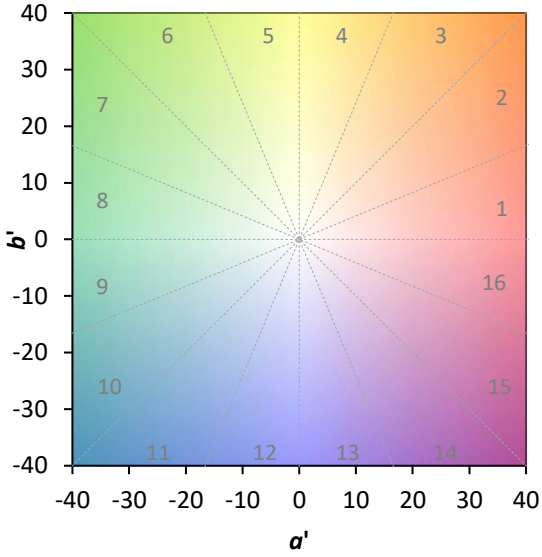
$R_f$ = 0
$R_g$ = 0
CIE $R_a$ = -11.7
$R_9$ = -351.9

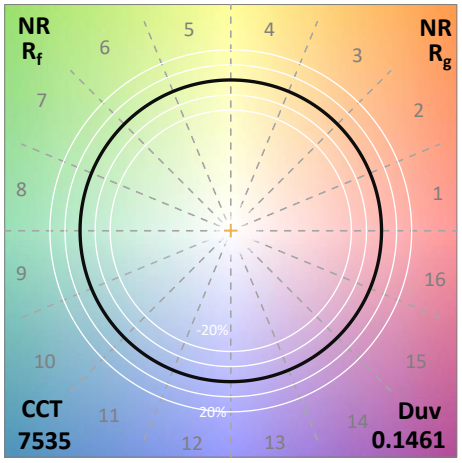
## Spectral Power Distribution Comparison

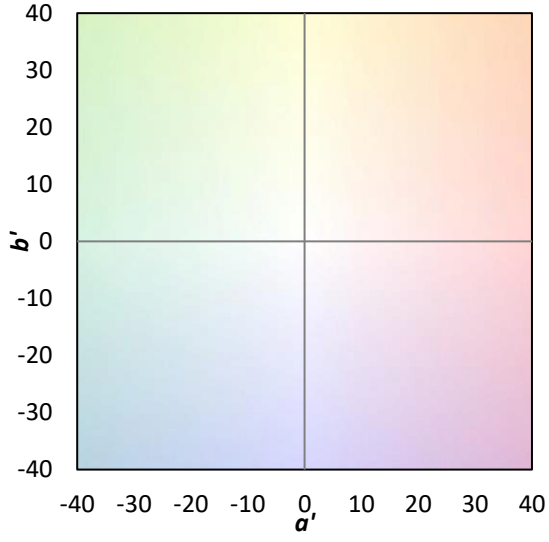



## Color Vector Graphics



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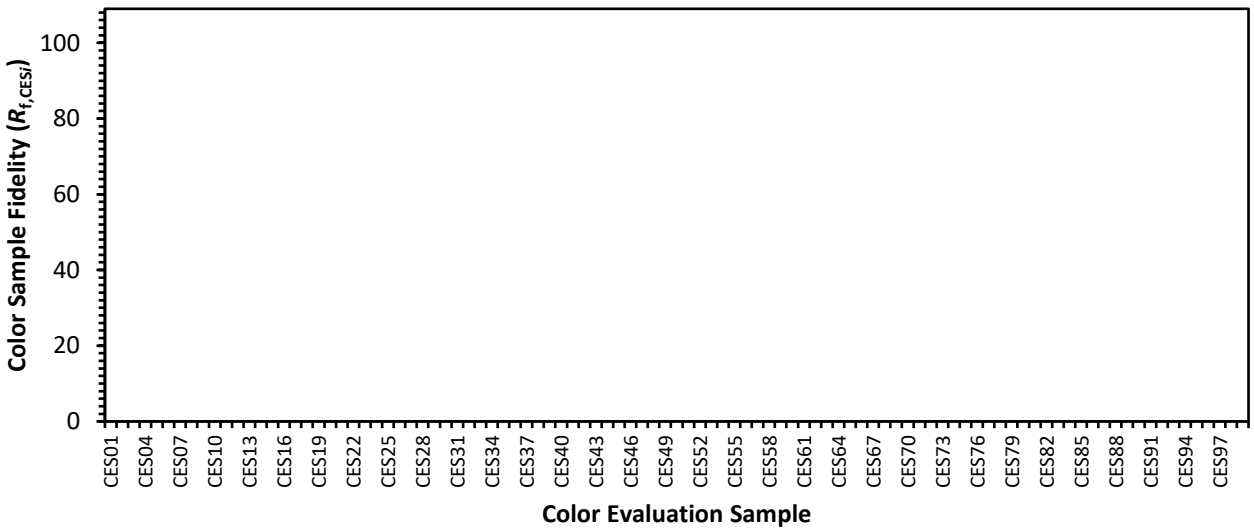
**Individual Sample Fidelity Index ($R_{f,i}$)**

| | | | |
|---|---|---|---|
| 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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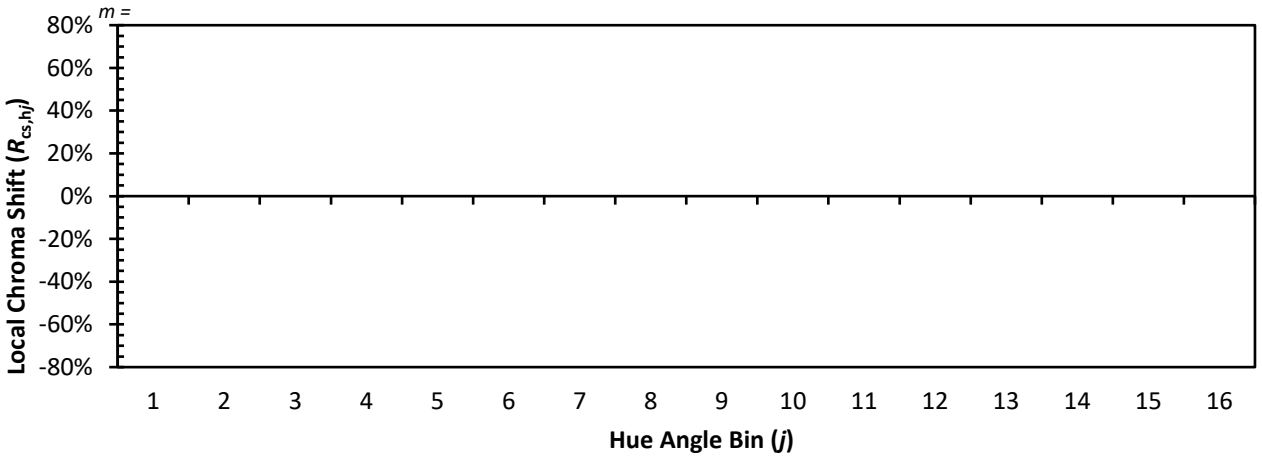
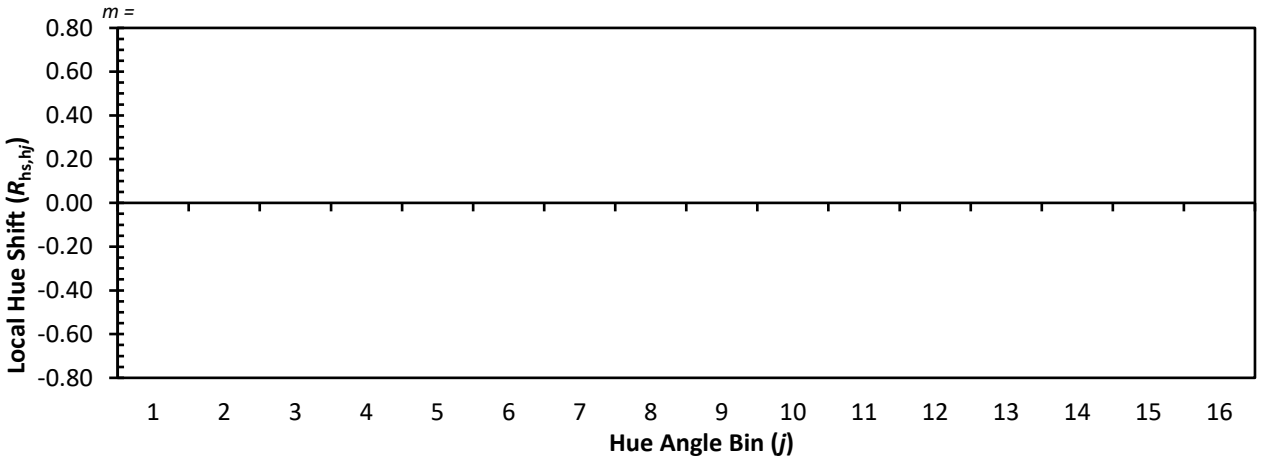
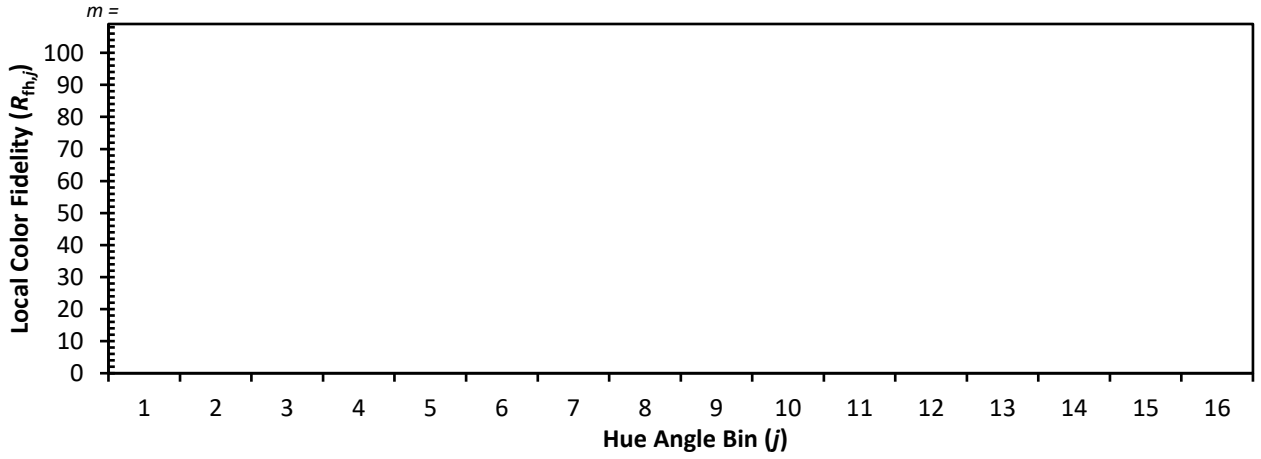
## Color Rendition by Hue-Angle Bin



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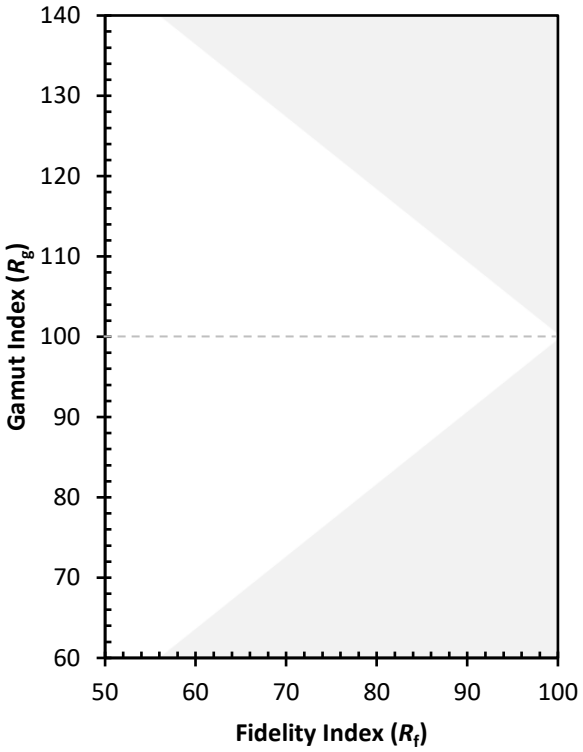
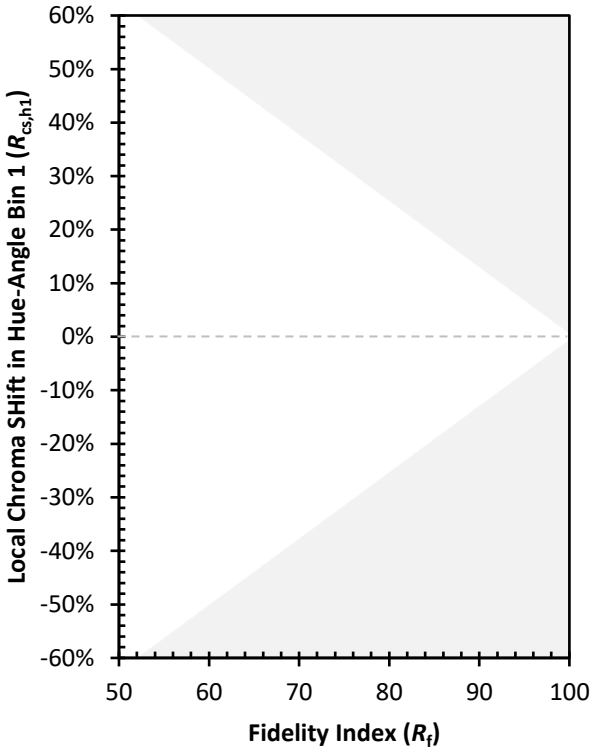
## Measure Comparisons




(END OF REPORT)