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: METALUX

Report Number: P1433432

Luminaire Tested: EHBR1-12-UNV-N-L935-UPL36

Issue Date: 3/20/2026

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: | P1433432 |
| | REPORT IS A COMBINATION OF REPORTS P1431657 AND P1431635 |
| Test Lab: | INNOVATION CENTER |
| Issue Date: | 3/20/2026 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS |
| Product Line: | METALUX |
| Catalog Number: | EHBR1-12-UNV-N-L935-UPL36 |
| Description: | Elevate Round Highbay at, 12000 lumens, 3500K 90CRI LEDs with N lens |
| Light Source: | - |
| Ballast/Driver: | - |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 14538.1 lumens |
| Efficiency: | N/A |
| Efficacy: | 156.2 lumens/watt |
| Spacing Criteria (0/90/45): | 0.82 / 0.82 / 0.8 |
| Luminous Opening: | Vertical Cylinder (Dia: 1.71' x H: 0.1') |
| CIE Type: | Semi-Direct |

| | |
|---|---|
| Input Watts (W): | 93.1 |
| 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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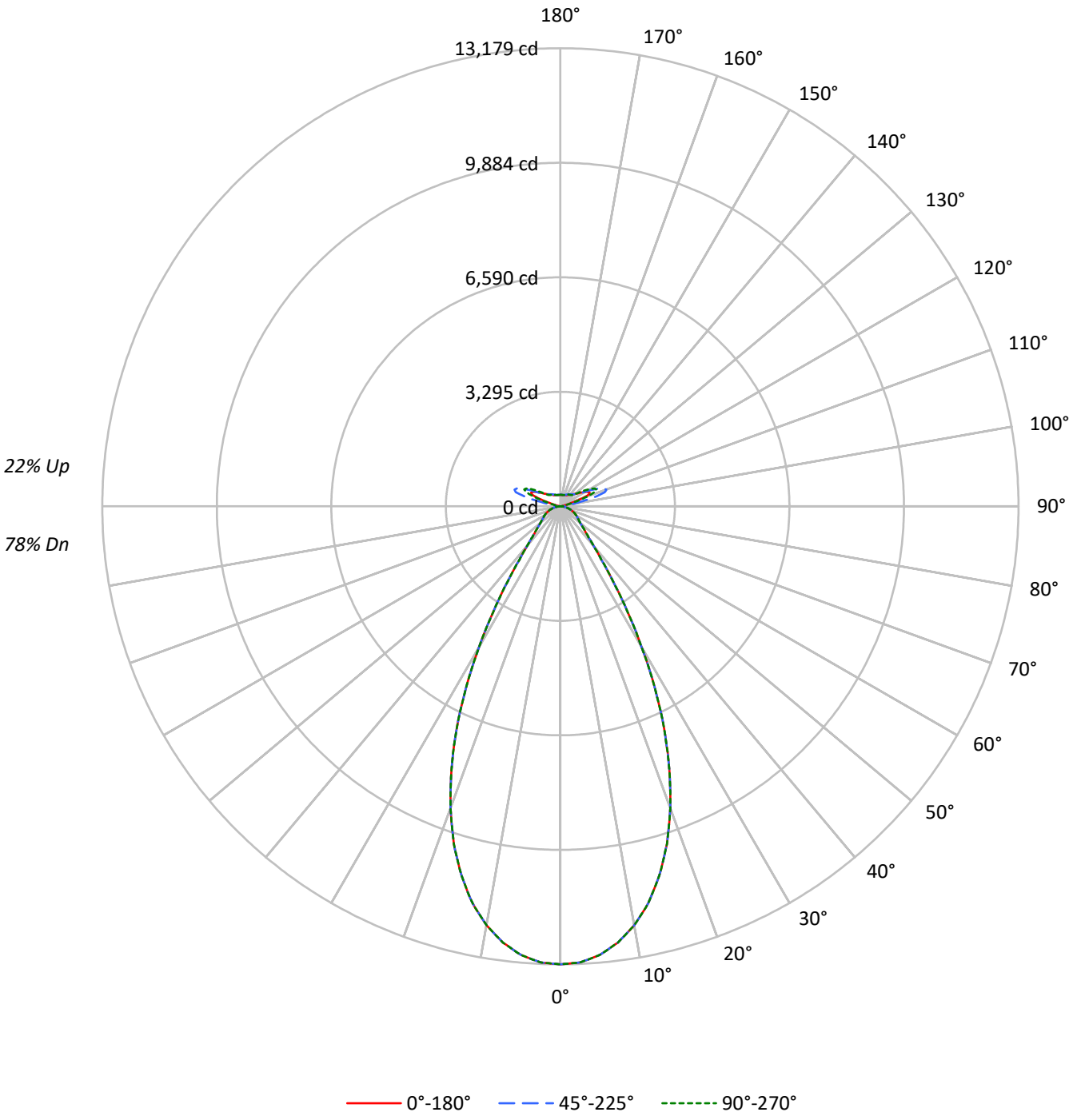
Scaled Data Report

TEST NUMBER: P1433432
CATALOG NUMBER: EHBR1-12-UNV-N-L935-UPL36

## Luminous Intensity Polar Plot



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TEST NUMBER: P1433432
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## 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 | 114 | 114 | 114 | 114 | 109 | 109 | 109 | 109 | 99 | 99 | 99 | 90 | 90 | 90 | 82 | 82 | 82 | 78 |
| 1 | 107 | 103 | 100 | 97 | 102 | 99 | 96 | 94 | 91 | 89 | 87 | 83 | 82 | 80 | 76 | 75 | 74 | 71 |
| 2 | 100 | 94 | 89 | 85 | 95 | 90 | 86 | 82 | 83 | 80 | 77 | 77 | 74 | 72 | 71 | 69 | 67 | 64 |
| 3 | 94 | 86 | 80 | 75 | 90 | 83 | 78 | 73 | 77 | 73 | 69 | 71 | 68 | 65 | 66 | 64 | 62 | 59 |
| 4 | 88 | 79 | 73 | 68 | 84 | 76 | 71 | 66 | 71 | 67 | 63 | 67 | 63 | 60 | 62 | 59 | 57 | 54 |
| 5 | 83 | 73 | 66 | 62 | 79 | 71 | 65 | 60 | 66 | 61 | 58 | 62 | 58 | 55 | 59 | 55 | 53 | 51 |
| 6 | 78 | 68 | 61 | 56 | 75 | 66 | 60 | 55 | 62 | 57 | 53 | 59 | 54 | 51 | 55 | 52 | 49 | 47 |
| 7 | 74 | 63 | 57 | 52 | 71 | 62 | 55 | 51 | 58 | 53 | 49 | 55 | 51 | 48 | 52 | 49 | 46 | 44 |
| 8 | 70 | 59 | 53 | 48 | 67 | 58 | 52 | 47 | 55 | 50 | 46 | 52 | 48 | 44 | 49 | 46 | 43 | 41 |
| 9 | 66 | 56 | 49 | 45 | 64 | 54 | 48 | 44 | 52 | 47 | 43 | 49 | 45 | 42 | 47 | 43 | 40 | 39 |
| 10 | 63 | 52 | 46 | 42 | 61 | 51 | 45 | 41 | 49 | 44 | 40 | 47 | 42 | 39 | 44 | 41 | 38 | 37 |

## AVERAGE LUMINANCE (cd/sqm):

| | 0° | 45° | 90° |
|---|---|---|---|
| 0° | 61892 | 61892 | 61892 |
| 5° | 60690 | 60690 | 60690 |
| 10° | 57602 | 57602 | 57602 |
| 15° | 52410 | 52410 | 52410 |
| 20° | 44957 | 44957 | 44957 |
| 25° | 35366 | 35366 | 35366 |
| 30° | 24269 | 24269 | 24269 |
| 35° | 14417 | 14417 | 14417 |
| 40° | 8530 | 8530 | 8530 |
| 45° | 6123 | 6123 | 6123 |
| 50° | 5034 | 5034 | 5034 |
| 55° | 4575 | 4575 | 4575 |
| 60° | 4379 | 4379 | 4379 |
| 65° | 4176 | 4176 | 4176 |
| 70° | 3884 | 3884 | 3884 |
| 75° | 3511 | 3511 | 3511 |
| 80° | 2916 | 2916 | 2916 |
| 85° | 1845 | 1845 | 1845 |

## MAXIMUM LUMINANCE 45°-90°:

Horizontal Angle: 0°
Vertical Angle: 45°
Luminance: 6123 cd/sqm

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Scaled Data Report

TEST NUMBER: P1433432
CATALOG NUMBER: EHBR1-12-UNV-N-L935-UPL36

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 1214.0 | 8.4 |
| 10°-20° | 3047.4 | 21.0 |
| 20°-30° | 3186.4 | 21.9 |
| 30°-40° | 1726.5 | 11.9 |
| 40°-50° | 794.3 | 5.5 |
| 50°-60° | 559.7 | 3.8 |
| 60°-70° | 430.7 | 3.0 |
| 70°-80° | 261.1 | 1.8 |
| 80°-90° | 79.4 | 0.5 |
| 90°-100° | 92.4 | 0.6 |
| 100°-110° | 578.6 | 4.0 |
| 110°-120° | 1034.7 | 7.1 |
| 120°-130° | 607.1 | 4.2 |
| 130°-140° | 372.4 | 2.6 |
| 140°-150° | 258.3 | 1.8 |
| 150°-160° | 167.8 | 1.2 |
| 160°-170° | 95.6 | 0.7 |
| 170°-180° | 31.6 | 0.2 |
| 0°-30° | 7447.9 | 51.2 |
| 0°-40° | 9174.3 | 63.1 |
| 0°-60° | 10528.3 | 72.4 |
| 0°-90° | 11299.6 | 77.7 |
| 90°-120° | 1705.7 | 11.7 |
| 90°-150° | 2943.5 | 20.2 |
| 90°-180° | 3239.0 | 22.3 |
| 0°-180° | 14538.1 | 100.0 |

**CANDELA DISTRIBUTION:**

| | 0° | 22.5° | 45° | 67.5° | 90° | Flux |
|---|---|---|---|---|---|---|
| 0° | 13179 | 13179 | 13179 | 13179 | 13179 | |
| 5° | 12958 | 12958 | 12958 | 12958 | 12958 | 1214 |
| 15° | 10995 | 10995 | 10995 | 10995 | 10995 | 3047 |
| 25° | 7062 | 7062 | 7062 | 7062 | 7062 | 3186 |
| 35° | 2646 | 2646 | 2646 | 2646 | 2646 | 1726 |
| 45° | 991 | 991 | 991 | 991 | 991 | 794 |
| 55° | 618 | 618 | 618 | 618 | 618 | 560 |
| 65° | 436 | 436 | 436 | 436 | 436 | 431 |
| 75° | 247 | 247 | 247 | 247 | 247 | 261 |
| 85° | 63 | 63 | 63 | 63 | 63 | 70 |
| 90° | 24 | 39 | 67 | 43 | 24 | 15 |
| 95° | 41 | 69 | 150 | 74 | 46 | 39 |
| 105° | 202 | 399 | 1018 | 439 | 267 | 270 |
| 115° | 931 | 979 | 1203 | 1153 | 1146 | 857 |
| 125° | 671 | 626 | 643 | 653 | 732 | 612 |
| 135° | 489 | 475 | 491 | 462 | 460 | 383 |
| 145° | 402 | 397 | 421 | 415 | 413 | 255 |
| 155° | 352 | 348 | 365 | 365 | 365 | 164 |
| 165° | 330 | 330 | 339 | 339 | 337 | 94 |
| 175° | 326 | 326 | 332 | 332 | 332 | 31 |
| 180° | 330 | 330 | 330 | 330 | 330 | |

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Scaled Data Report

TEST NUMBER: P1433432
CATALOG NUMBER: EHBR1-12-UNV-N-L935-UPL36

**CANDELA DISTRIBUTION (FULL):**

| | 0° | 22.5° | 45° | 67.5° | 90° |
|---|---|---|---|---|---|
| 0° | 13179.4 | 13179.4 | 13179.4 | 13179.4 | 13179.4 |
| 2.5° | 13132.7 | 13132.7 | 13132.7 | 13132.7 | 13132.7 |
| 5° | 12958.3 | 12958.3 | 12958.3 | 12958.3 | 12958.3 |
| 7.5° | 12660.7 | 12660.7 | 12660.7 | 12660.7 | 12660.7 |
| 10° | 12238.4 | 12238.4 | 12238.4 | 12238.4 | 12238.4 |
| 12.5° | 11692.7 | 11692.7 | 11692.7 | 11692.7 | 11692.7 |
| 15° | 10995.4 | 10995.4 | 10995.4 | 10995.4 | 10995.4 |
| 17.5° | 10186.5 | 10186.5 | 10186.5 | 10186.5 | 10186.5 |
| 20° | 9239.9 | 9239.9 | 9239.9 | 9239.9 | 9239.9 |
| 22.5° | 8185.9 | 8185.9 | 8185.9 | 8185.9 | 8185.9 |
| 25° | 7062.5 | 7062.5 | 7062.5 | 7062.5 | 7062.5 |
| 27.5° | 5871.5 | 5871.5 | 5871.5 | 5871.5 | 5871.5 |
| 30° | 4668.2 | 4668.2 | 4668.2 | 4668.2 | 4668.2 |
| 32.5° | 3582.7 | 3582.7 | 3582.7 | 3582.7 | 3582.7 |
| 35° | 2646.0 | 2646.0 | 2646.0 | 2646.0 | 2646.0 |
| 37.5° | 1942.8 | 1942.8 | 1942.8 | 1942.8 | 1942.8 |
| 40° | 1478.5 | 1478.5 | 1478.5 | 1478.5 | 1478.5 |
| 42.5° | 1185.6 | 1185.6 | 1185.6 | 1185.6 | 1185.6 |
| 45° | 990.7 | 990.7 | 990.7 | 990.7 | 990.7 |
| 47.5° | 850.4 | 850.4 | 850.4 | 850.4 | 850.4 |
| 50° | 750.2 | 750.2 | 750.2 | 750.2 | 750.2 |
| 52.5° | 676.9 | 676.9 | 676.9 | 676.9 | 676.9 |
| 55° | 618.2 | 618.2 | 618.2 | 618.2 | 618.2 |
| 57.5° | 570.5 | 570.5 | 570.5 | 570.5 | 570.5 |
| 60° | 526.4 | 526.4 | 526.4 | 526.4 | 526.4 |
| 62.5° | 482.3 | 482.3 | 482.3 | 482.3 | 482.3 |
| 65° | 435.9 | 435.9 | 435.9 | 435.9 | 435.9 |
| 67.5° | 388.6 | 388.6 | 388.6 | 388.6 | 388.6 |
| 70° | 340.8 | 340.8 | 340.8 | 340.8 | 340.8 |
| 72.5° | 294.3 | 294.3 | 294.3 | 294.3 | 294.3 |
| 75° | 247.3 | 247.3 | 247.3 | 247.3 | 247.3 |
| 77.5° | 201.4 | 201.4 | 201.4 | 201.4 | 201.4 |
| 80° | 153.4 | 153.4 | 153.4 | 153.4 | 153.4 |
| 82.5° | 107.3 | 107.3 | 107.3 | 107.3 | 107.3 |
| 85° | 63.4 | 63.4 | 63.4 | 63.4 | 63.4 |
| 87.5° | 22.7 | 22.7 | 22.7 | 22.7 | 22.7 |
| 90° | 24.5 | 39.3 | 67.1 | 43.0 | 24.5 |
| 92.5° | 35.3 | 59.4 | 107.5 | 55.6 | 31.5 |
| 95° | 40.8 | 68.6 | 150.2 | 74.1 | 46.3 |
| 97.5° | 51.9 | 76.0 | 172.4 | 90.8 | 72.3 |
| 100° | 68.6 | 89.0 | 268.8 | 111.2 | 96.4 |
| 102.5° | 116.8 | 189.1 | 571.0 | 209.5 | 146.5 |
| 105° | 202.0 | 398.6 | 1017.7 | 439.4 | 266.9 |
| 107.5° | 350.4 | 713.7 | 1342.2 | 778.6 | 506.1 |
| 110° | 654.4 | 947.3 | 1407.1 | 1069.7 | 810.1 |

TEST NUMBER: P1433432
CATALOG NUMBER: EHBR1-12-UNV-N-L935-UPL36

**CANDELA DISTRIBUTION (continued):**

| | 0° | 22.5° | 45° | 67.5° | 90° |
|---|---|---|---|---|---|
| 112.5° | *884.3* | 1017.7 | 1347.7 | 1180.9 | 1054.8 |
| 115° | *930.6* | 978.8 | 1203.2 | 1153.0 | 1145.7 |
| 117.5° | *899.1* | 893.6 | 1021.4 | 1036.3 | 1106.7 |
| 120° | *832.4* | 795.3 | 852.8 | 904.7 | 999.2 |
| 122.5° | *748.9* | 704.5 | 730.4 | 769.3 | 863.9 |
| 125° | *671.0* | 626.5 | 643.3 | 652.6 | 732.2 |
| 127.5° | *602.5* | 572.8 | 582.1 | 571.0 | 621.0 |
| 130° | *556.1* | 530.2 | 543.2 | 517.2 | 541.4 |
| 132.5° | *517.2* | 500.6 | 515.3 | 483.8 | 491.2 |
| 135° | *489.4* | 474.6 | 491.2 | 461.6 | 459.8 |
| 137.5° | *465.3* | 452.3 | 469.0 | 446.7 | 441.2 |
| 140° | *443.1* | 432.0 | 450.4 | 433.8 | 430.1 |
| 142.5° | *419.0* | 411.6 | 433.8 | 422.7 | 419.0 |
| 145° | *402.3* | 396.7 | 420.8 | 415.3 | 413.4 |
| 147.5° | *387.5* | 383.7 | 405.9 | 404.1 | 404.1 |
| 150° | *374.5* | 370.8 | 393.0 | 391.2 | 393.0 |
| 152.5° | *361.5* | 357.8 | 378.2 | 376.3 | 378.2 |
| 155° | *352.2* | 348.5 | 365.2 | 365.2 | 365.2 |
| 157.5° | *344.8* | 343.0 | 355.9 | 355.9 | 355.9 |
| 160° | *339.2* | 337.4 | 348.5 | 348.5 | 346.7 |
| 162.5° | *333.7* | 331.8 | 344.8 | 343.0 | 343.0 |
| 165° | *330.0* | 330.0 | 339.2 | 339.2 | 337.4 |
| 167.5° | *330.0* | 328.1 | 337.4 | 337.4 | 335.5 |
| 170° | *328.1* | 328.1 | 335.5 | 333.7 | 331.8 |
| 172.5° | *328.1* | 328.1 | 335.5 | 333.7 | 331.8 |
| 175° | *326.3* | 326.3 | 331.8 | 331.8 | 331.8 |
| 177.5° | *328.1* | 328.1 | 331.8 | 331.8 | 330.0 |
| 180° | *330.0* | 330.0 | 330.0 | 330.0 | 330.0 |

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Scaled Data Report

TEST NUMBER: P1433432
CATALOG NUMBER: EHBR1-12-UNV-N-L935-UPL36

**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 | 11.96 | 12.86 | 12.67 | 13.56 | 14.38 | 11.96 | 12.86 | 12.67 | 13.56 | 14.38 |
| | 3H | 13.74 | 14.53 | 14.46 | 15.25 | 16.11 | 13.74 | 14.53 | 14.46 | 15.25 | 16.11 |
| | 4H | 14.39 | 15.14 | 15.13 | 15.86 | 16.73 | 14.39 | 15.14 | 15.13 | 15.86 | 16.73 |
| | 6H | 14.84 | 15.53 | 15.59 | 16.26 | 17.15 | 14.84 | 15.53 | 15.59 | 16.26 | 17.15 |
| | 8H | 14.96 | 15.61 | 15.73 | 16.36 | 17.25 | 14.96 | 15.61 | 15.73 | 16.36 | 17.25 |
| | 12H | 15.01 | 15.63 | 15.78 | 16.38 | 17.28 | 15.01 | 15.63 | 15.78 | 16.38 | 17.28 |
| 4H | 2H | 12.49 | 13.24 | 13.24 | 13.96 | 14.84 | 12.49 | 13.24 | 13.24 | 13.96 | 14.84 |
| | 3H | 14.46 | 15.08 | 15.21 | 15.84 | 16.72 | 14.46 | 15.08 | 15.21 | 15.84 | 16.72 |
| | 4H | 15.23 | 15.79 | 15.99 | 16.55 | 17.47 | 15.23 | 15.79 | 15.99 | 16.55 | 17.47 |
| | 6H | 15.79 | 16.28 | 16.58 | 17.06 | 17.99 | 15.79 | 16.28 | 16.58 | 17.06 | 17.99 |
| | 8H | 15.95 | 16.40 | 16.74 | 17.18 | 18.12 | 15.95 | 16.40 | 16.74 | 17.18 | 18.12 |
| | 12H | 16.02 | 16.42 | 16.83 | 17.23 | 18.17 | 16.02 | 16.42 | 16.83 | 17.23 | 18.17 |
| 8H | 4H | 15.45 | 15.90 | 16.24 | 16.68 | 17.62 | 15.45 | 15.90 | 16.24 | 16.68 | 17.62 |
| | 6H | 16.13 | 16.50 | 16.95 | 17.32 | 18.26 | 16.13 | 16.50 | 16.95 | 17.32 | 18.26 |
| | 8H | 16.36 | 16.68 | 17.19 | 17.51 | 18.46 | 16.36 | 16.68 | 17.19 | 17.51 | 18.46 |
| | 12H | 16.49 | 16.77 | 17.32 | 17.58 | 18.60 | 16.49 | 16.77 | 17.32 | 17.58 | 18.60 |
| 12H | 4H | 15.44 | 15.84 | 16.25 | 16.65 | 17.58 | 15.44 | 15.84 | 16.25 | 16.65 | 17.58 |
| | 6H | 16.16 | 16.48 | 16.99 | 17.31 | 18.26 | 16.16 | 16.48 | 16.99 | 17.31 | 18.26 |
| | 8H | 16.42 | 16.70 | 17.24 | 17.51 | 18.52 | 16.42 | 16.70 | 17.24 | 17.51 | 18.52 |

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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

Metalux

Report Number: SP1-2506-472-6

Test Date: 08/01/2025

Luminaire Tested: EHBR-60-L935-N

Data in this report applies to families of products including EHBR-60-L935-N

Report Generated By FNC07603 / LDUCLS01DT446
Version: v7.04

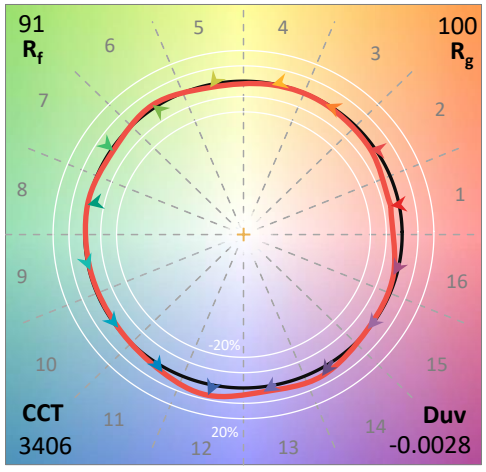
## Test Information

| | |
|---|---|
| Test Method: | LM-79-2019 |
| Report Number: | SP1-2506-472-6 |
| Test Lab: | COOPER LIGHTING SOLUTIONS |
| Photometer: | SP1 - 76IN SPHERE |
| Measurement Geometry: | 4π |
| Issue Date: | 08/05/2025 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS |
| Product Line: | Metalux |
| Catalog Number: | **EHBR-60-L935-N** |
| Description: | Elevate Round Highbay at, 60000 lumens, 3500K 90CRI LEDs with N lens |

## Spectral Parameters

| | |
|---|---|
| CCT (K): | 3406 |
| CIE u': | 0.2394 |
| CIE v': | 0.5094 |
| Duv: | -0.0028 |
| CIE x: | 0.4076 |
| CIE y: | 0.3856 |
| CIE z: | 0.2068 |
| Peak Wavelength (nm): | 630 |
| Dominant Wavelength (nm): | 582 |
| Purity: | 38.0517 |
| Rf: | 91.3 |
| Rg: | 100 |

| | | | | | |
|---|---|---|---|---|---|
| CRI (Ra): | 94.6 | | | | |
| R1: | 96.6 | R9: | 63.8 | | |
| R2: | 98.4 | R10: | 94.7 | | |
| R3: | 98.1 | R11: | 96.6 | | |
| R4: | 95.8 | R12: | 80.9 | | |
| R5: | 96.2 | R13: | 97.4 | | |
| R6: | 95.4 | R14: | 98.3 | | |
| R7: | 91.8 | R15: | 93.1 | | |
| R8: | 84.4 | | | | |




## Test Conditions

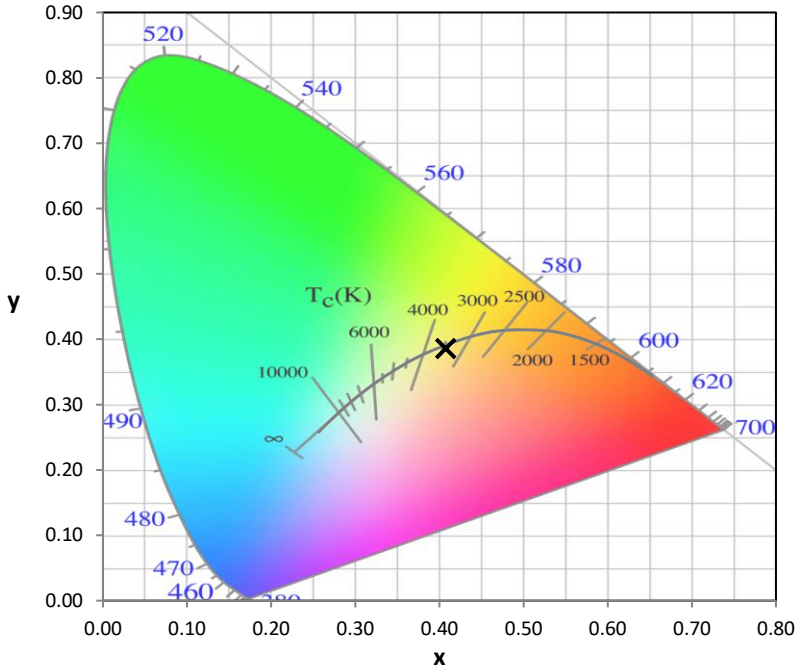
| | |
|---|---|
| Stabilization Time: | 35M |
| Operation Time: | 1H 35M |
| Sphere Temperature (°C): | 25.0 |

REPORT NUMBER: SP1-2506-472-6

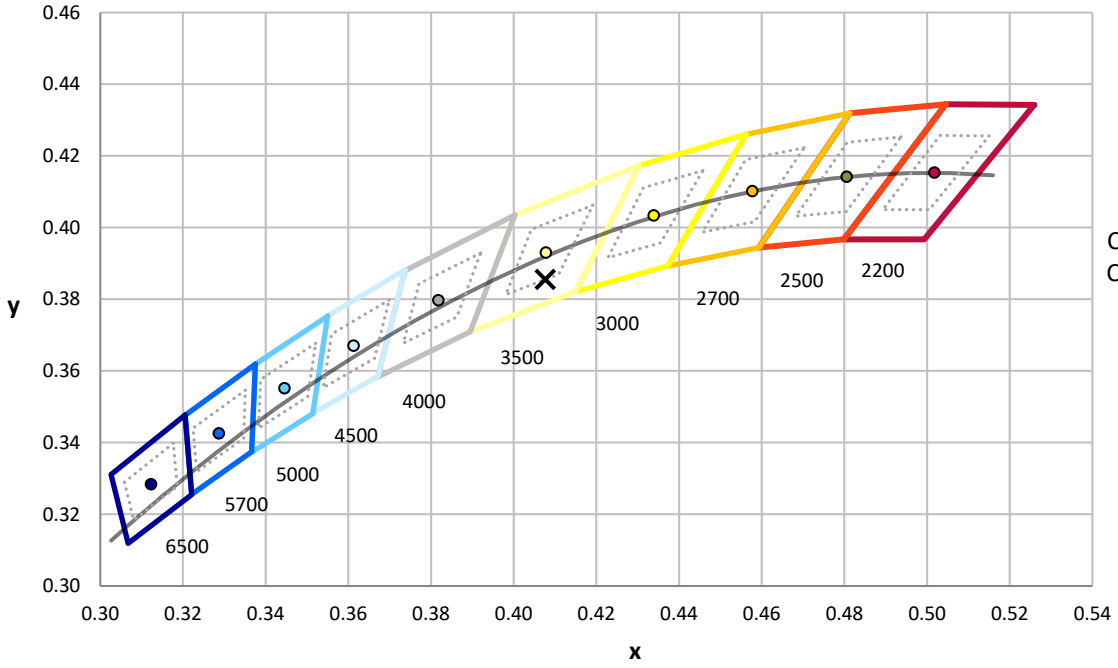
| Measurement and Test Equipment | | | |
|---|---|---|---|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | 76INCH SPHERE IN0058 | 6/16/2025 | 12/16/2025 |
| Power Meter | XITRON INXT2011004 | 1/21/2025 | 1/21/2026 |
| AC Power Source | CHROMA 61603 IN0063 | 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 |

REPORT NUMBER: SP1-2506-472-6

## CIE 1931 Chromaticity Diagram




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

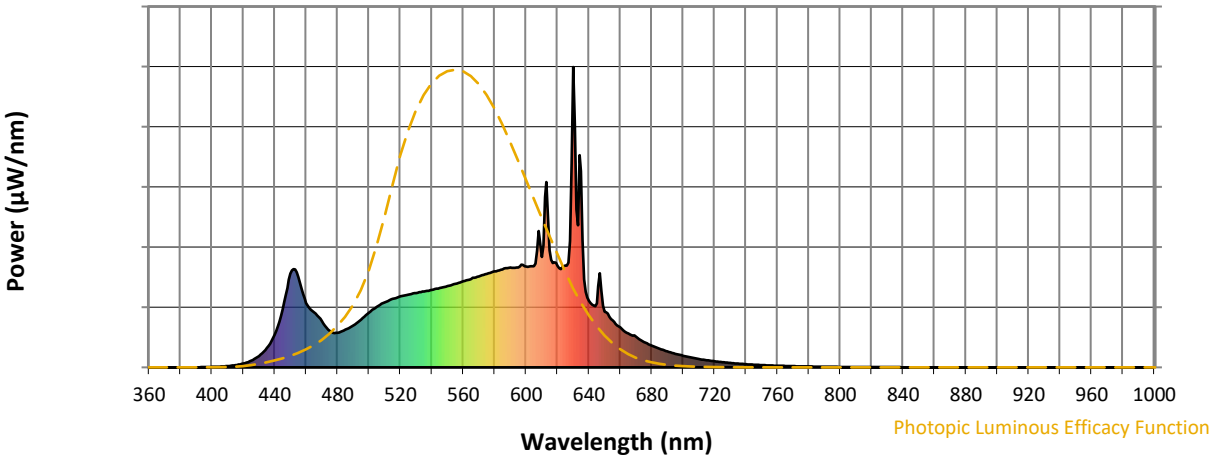



CCT = 3406K
CIE x = 0.4076
CIE y = 0.3856
Duv = -0.0028

Point lies inside the ANSI 3500K 4-step quadrangle

REPORT NUMBER: SP1-2506-472-6

## 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 | 140 | NR | 620 | 338 | NR | 750 | 8 | NR | 880 | 0 | NR |
| 365 | 0 | NR | 495 | 159 | NR | 625 | 339 | NR | 755 | 7 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 182 | NR | 630 | 1000 | NR | 760 | 5 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 202 | NR | 635 | 653 | NR | 765 | 5 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 216 | NR | 640 | 222 | NR | 770 | 4 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 228 | NR | 645 | 214 | NR | 775 | 3 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 236 | NR | 650 | 185 | NR | 780 | 3 | NR | 910 | 0 | NR |
| 395 | 1 | NR | 525 | 242 | NR | 655 | 157 | NR | 785 | 3 | NR | 915 | 0 | NR |
| 400 | 2 | NR | 530 | 248 | NR | 660 | 133 | NR | 790 | 2 | NR | 920 | 0 | NR |
| 405 | 3 | NR | 535 | 253 | NR | 665 | 113 | NR | 795 | 2 | NR | 925 | 0 | NR |
| 410 | 4 | NR | 540 | 258 | NR | 670 | 103 | NR | 800 | 2 | NR | 930 | 0 | NR |
| 415 | 7 | NR | 545 | 264 | NR | 675 | 85 | NR | 805 | 1 | NR | 935 | 0 | NR |
| 420 | 13 | NR | 550 | 270 | NR | 680 | 72 | NR | 810 | 1 | NR | 940 | 0 | NR |
| 425 | 22 | NR | 555 | 278 | NR | 685 | 62 | NR | 815 | 1 | NR | 945 | 0 | NR |
| 430 | 38 | NR | 560 | 286 | NR | 690 | 53 | NR | 820 | 1 | NR | 950 | 0 | NR |
| 435 | 65 | NR | 565 | 295 | NR | 695 | 45 | NR | 825 | 1 | NR | 955 | 0 | NR |
| 440 | 108 | NR | 570 | 303 | NR | 700 | 39 | NR | 830 | 1 | NR | 960 | 0 | NR |
| 445 | 193 | NR | 575 | 311 | NR | 705 | 33 | NR | 835 | 1 | NR | 965 | 0 | NR |
| 450 | 312 | NR | 580 | 319 | NR | 710 | 28 | NR | 840 | 1 | NR | 970 | 0 | NR |
| 455 | 300 | NR | 585 | 326 | NR | 715 | 24 | NR | 845 | 0 | NR | 975 | 0 | NR |
| 460 | 214 | NR | 590 | 332 | NR | 720 | 20 | NR | 850 | 0 | NR | 980 | 0 | NR |
| 465 | 184 | NR | 595 | 333 | NR | 725 | 17 | NR | 855 | 0 | NR | 985 | 0 | NR |
| 470 | 153 | NR | 600 | 336 | NR | 730 | 15 | NR | 860 | 0 | NR | 990 | 0 | NR |
| 475 | 122 | NR | 605 | 337 | NR | 735 | 12 | NR | 865 | 0 | NR | 995 | 0 | NR |
| 480 | 115 | NR | 610 | 367 | NR | 740 | 10 | NR | 870 | 0 | NR | 1000 | 0 | NR |
| 485 | 125 | NR | 615 | 390 | NR | 745 | 9 | NR | 875 | 0 | NR | | | |

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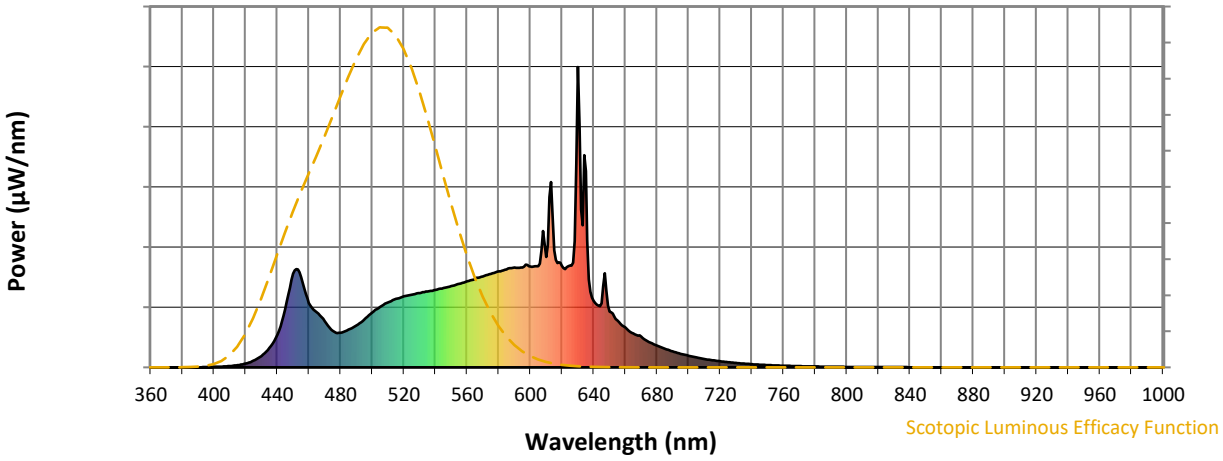
## Scotopic Flux vs. Wavelength




**Scotopic Lumens: NR** **S/P: 1.62**

| 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 | 140 | NR | 620 | 338 | NR | 750 | 8 | NR | 880 | 0 | NR |
| 365 | 0 | NR | 495 | 159 | NR | 625 | 339 | NR | 755 | 7 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 182 | NR | 630 | 1000 | NR | 760 | 5 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 202 | NR | 635 | 653 | NR | 765 | 5 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 216 | NR | 640 | 222 | NR | 770 | 4 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 228 | NR | 645 | 214 | NR | 775 | 3 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 236 | NR | 650 | 185 | NR | 780 | 3 | NR | 910 | 0 | NR |
| 395 | 1 | NR | 525 | 242 | NR | 655 | 157 | NR | 785 | 3 | NR | 915 | 0 | NR |
| 400 | 2 | NR | 530 | 248 | NR | 660 | 133 | NR | 790 | 2 | NR | 920 | 0 | NR |
| 405 | 3 | NR | 535 | 253 | NR | 665 | 113 | NR | 795 | 2 | NR | 925 | 0 | NR |
| 410 | 4 | NR | 540 | 258 | NR | 670 | 103 | NR | 800 | 2 | NR | 930 | 0 | NR |
| 415 | 7 | NR | 545 | 264 | NR | 675 | 85 | NR | 805 | 1 | NR | 935 | 0 | NR |
| 420 | 13 | NR | 550 | 270 | NR | 680 | 72 | NR | 810 | 1 | NR | 940 | 0 | NR |
| 425 | 22 | NR | 555 | 278 | NR | 685 | 62 | NR | 815 | 1 | NR | 945 | 0 | NR |
| 430 | 38 | NR | 560 | 286 | NR | 690 | 53 | NR | 820 | 1 | NR | 950 | 0 | NR |
| 435 | 65 | NR | 565 | 295 | NR | 695 | 45 | NR | 825 | 1 | NR | 955 | 0 | NR |
| 440 | 108 | NR | 570 | 303 | NR | 700 | 39 | NR | 830 | 1 | NR | 960 | 0 | NR |
| 445 | 193 | NR | 575 | 311 | NR | 705 | 33 | NR | 835 | 1 | NR | 965 | 0 | NR |
| 450 | 312 | NR | 580 | 319 | NR | 710 | 28 | NR | 840 | 1 | NR | 970 | 0 | NR |
| 455 | 300 | NR | 585 | 326 | NR | 715 | 24 | NR | 845 | 0 | NR | 975 | 0 | NR |
| 460 | 214 | NR | 590 | 332 | NR | 720 | 20 | NR | 850 | 0 | NR | 980 | 0 | NR |
| 465 | 184 | NR | 595 | 333 | NR | 725 | 17 | NR | 855 | 0 | NR | 985 | 0 | NR |
| 470 | 153 | NR | 600 | 336 | NR | 730 | 15 | NR | 860 | 0 | NR | 990 | 0 | NR |
| 475 | 122 | NR | 605 | 337 | NR | 735 | 12 | NR | 865 | 0 | NR | 995 | 0 | NR |
| 480 | 115 | NR | 610 | 367 | NR | 740 | 10 | NR | 870 | 0 | NR | 1000 | 0 | NR |
| 485 | 125 | NR | 615 | 390 | NR | 745 | 9 | NR | 875 | 0 | NR | | | |

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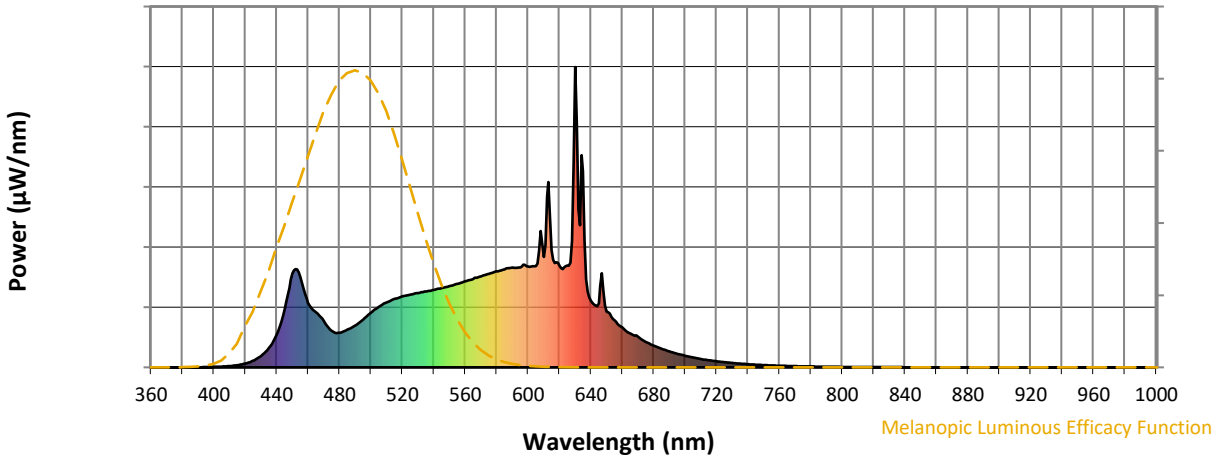
## Melanopic Flux vs. Wavelength




**Melanopic Lumens: NR** **M/P: 3.3**

| 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 | 140 | NR | 620 | 338 | NR | 750 | 8 | NR | 880 | 0 | NR |
| 365 | 0 | NR | 495 | 159 | NR | 625 | 339 | NR | 755 | 7 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 182 | NR | 630 | 1000 | NR | 760 | 5 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 202 | NR | 635 | 653 | NR | 765 | 5 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 216 | NR | 640 | 222 | NR | 770 | 4 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 228 | NR | 645 | 214 | NR | 775 | 3 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 236 | NR | 650 | 185 | NR | 780 | 3 | NR | 910 | 0 | NR |
| 395 | 1 | NR | 525 | 242 | NR | 655 | 157 | NR | 785 | 3 | NR | 915 | 0 | NR |
| 400 | 2 | NR | 530 | 248 | NR | 660 | 133 | NR | 790 | 2 | NR | 920 | 0 | NR |
| 405 | 3 | NR | 535 | 253 | NR | 665 | 113 | NR | 795 | 2 | NR | 925 | 0 | NR |
| 410 | 4 | NR | 540 | 258 | NR | 670 | 103 | NR | 800 | 2 | NR | 930 | 0 | NR |
| 415 | 7 | NR | 545 | 264 | NR | 675 | 85 | NR | 805 | 1 | NR | 935 | 0 | NR |
| 420 | 13 | NR | 550 | 270 | NR | 680 | 72 | NR | 810 | 1 | NR | 940 | 0 | NR |
| 425 | 22 | NR | 555 | 278 | NR | 685 | 62 | NR | 815 | 1 | NR | 945 | 0 | NR |
| 430 | 38 | NR | 560 | 286 | NR | 690 | 53 | NR | 820 | 1 | NR | 950 | 0 | NR |
| 435 | 65 | NR | 565 | 295 | NR | 695 | 45 | NR | 825 | 1 | NR | 955 | 0 | NR |
| 440 | 108 | NR | 570 | 303 | NR | 700 | 39 | NR | 830 | 1 | NR | 960 | 0 | NR |
| 445 | 193 | NR | 575 | 311 | NR | 705 | 33 | NR | 835 | 1 | NR | 965 | 0 | NR |
| 450 | 312 | NR | 580 | 319 | NR | 710 | 28 | NR | 840 | 1 | NR | 970 | 0 | NR |
| 455 | 300 | NR | 585 | 326 | NR | 715 | 24 | NR | 845 | 0 | NR | 975 | 0 | NR |
| 460 | 214 | NR | 590 | 332 | NR | 720 | 20 | NR | 850 | 0 | NR | 980 | 0 | NR |
| 465 | 184 | NR | 595 | 333 | NR | 725 | 17 | NR | 855 | 0 | NR | 985 | 0 | NR |
| 470 | 153 | NR | 600 | 336 | NR | 730 | 15 | NR | 860 | 0 | NR | 990 | 0 | NR |
| 475 | 122 | NR | 605 | 337 | NR | 735 | 12 | NR | 865 | 0 | NR | 995 | 0 | NR |
| 480 | 115 | NR | 610 | 367 | NR | 740 | 10 | NR | 870 | 0 | NR | 1000 | 0 | NR |
| 485 | 125 | NR | 615 | 390 | NR | 745 | 9 | NR | 875 | 0 | NR | | | |

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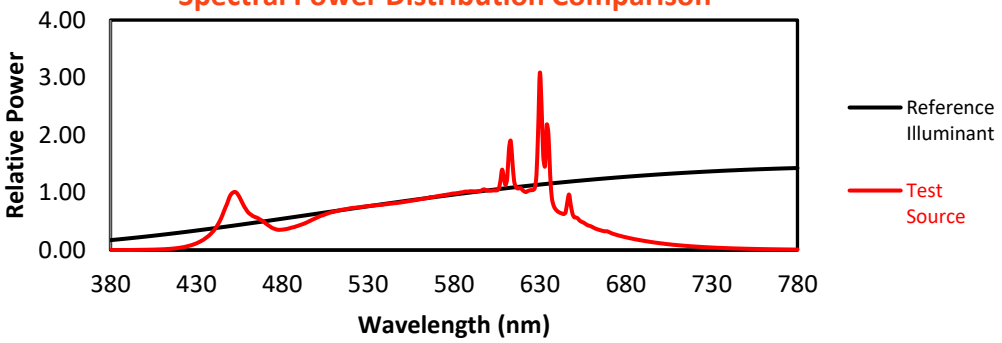
# TM-30-18

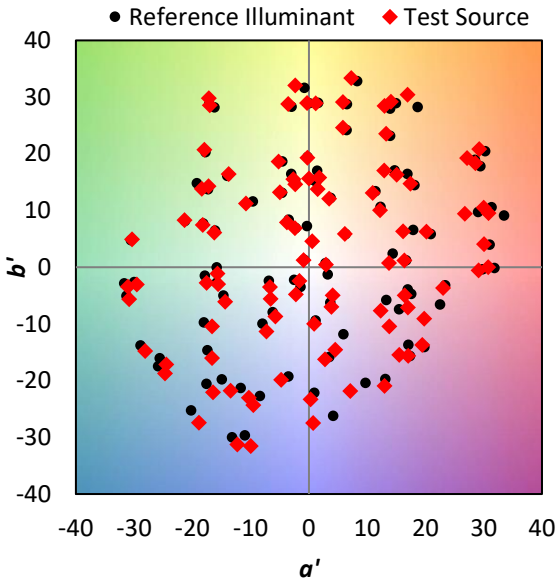
## Summary

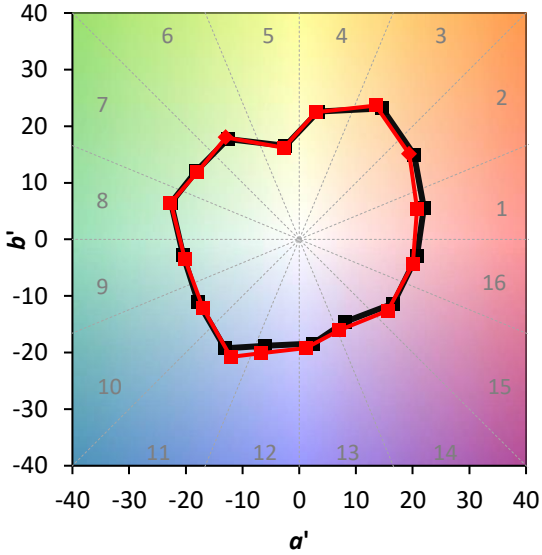
$R_f$ = 91.3
$R_g$ = 100
CIE $R_a$ = 94.6
$R_9$ = 63.8

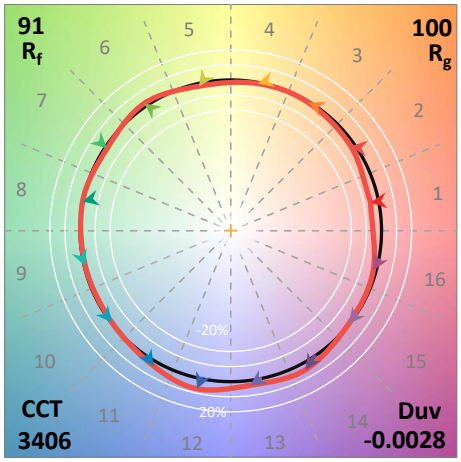
## Spectral Power Distribution Comparison

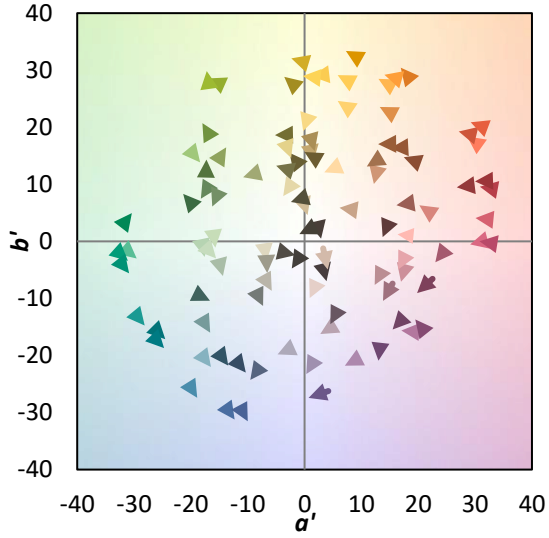



## Color Vector Graphics



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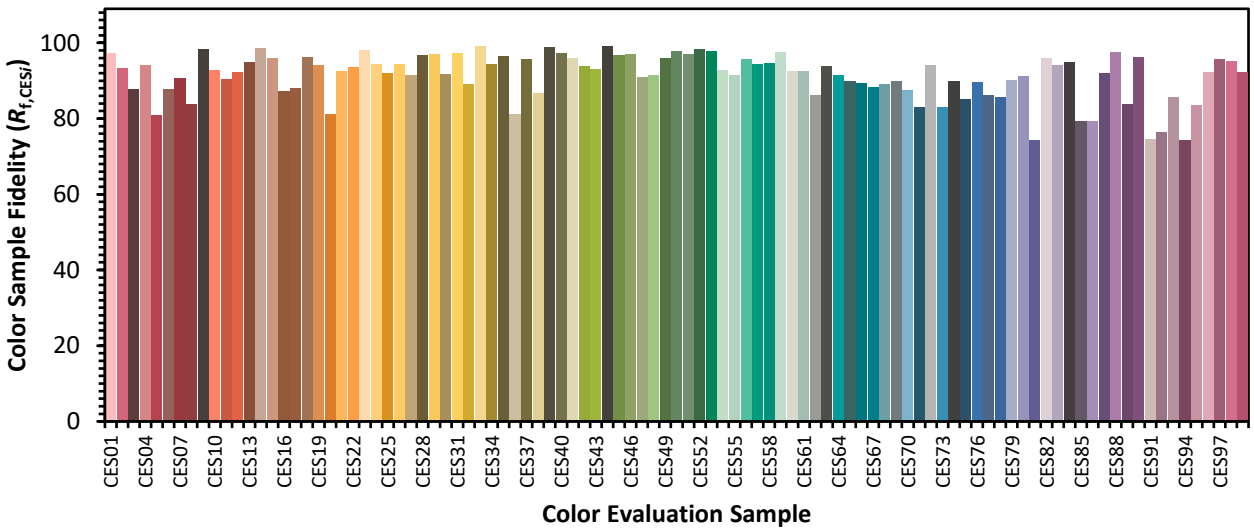
# TM-30-18

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

| | | | |
|---|---|---|---|
| CES01 = 86 | CES26 = 94 | CES51 = 97 | CES76 = 90 |
| CES02 = 63 | CES27 = 92 | CES52 = 98 | CES77 = 86 |
| CES03 = 31 | CES28 = 97 | CES53 = 98 | CES78 = 86 |
| CES04 = 70 | CES29 = 97 | CES54 = 93 | CES79 = 90 |
| CES05 = 50 | CES30 = 92 | CES55 = 92 | CES80 = 91 |
| CES06 = 51 | CES31 = 97 | CES56 = 96 | CES81 = 74 |
| CES07 = 43 | CES32 = 89 | CES57 = 94 | CES82 = 96 |
| CES08 = 41 | CES33 = 99 | CES58 = 95 | CES83 = 94 |
| CES09 = 29 | CES34 = 94 | CES59 = 98 | CES84 = 95 |
| CES10 = 75 | CES35 = 97 | CES60 = 92 | CES85 = 79 |
| CES11 = 58 | CES36 = 81 | CES61 = 93 | CES86 = 79 |
| CES12 = 64 | CES37 = 96 | CES62 = 86 | CES87 = 92 |
| CES13 = 44 | CES38 = 87 | CES63 = 94 | CES88 = 98 |
| CES14 = 74 | CES39 = 99 | CES64 = 91 | CES89 = 84 |
| CES15 = 72 | CES40 = 97 | CES65 = 90 | CES90 = 96 |
| CES16 = 48 | CES41 = 96 | CES66 = 89 | CES91 = 75 |
| CES17 = 49 | CES42 = 94 | CES67 = 88 | CES92 = 76 |
| CES18 = 56 | CES43 = 93 | CES68 = 89 | CES93 = 86 |
| CES19 = 71 | CES44 = 99 | CES69 = 90 | CES94 = 74 |
| CES20 = 67 | CES45 = 97 | CES70 = 88 | CES95 = 83 |
| CES21 = 86 | CES46 = 97 | CES71 = 83 | CES96 = 92 |
| CES22 = 78 | CES47 = 91 | CES72 = 94 | CES97 = 96 |
| CES23 = 91 | CES48 = 91 | CES73 = 83 | CES98 = 95 |
| CES24 = 90 | CES49 = 96 | CES74 = 90 | CES99 = 92 |
| CES25 = 71 | CES50 = 98 | CES75 = 85 | |



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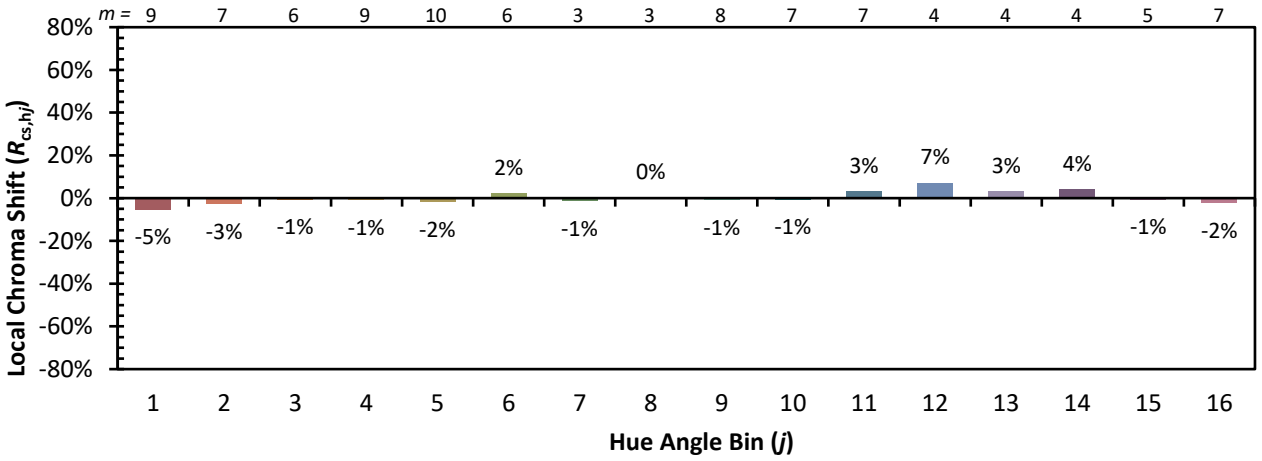
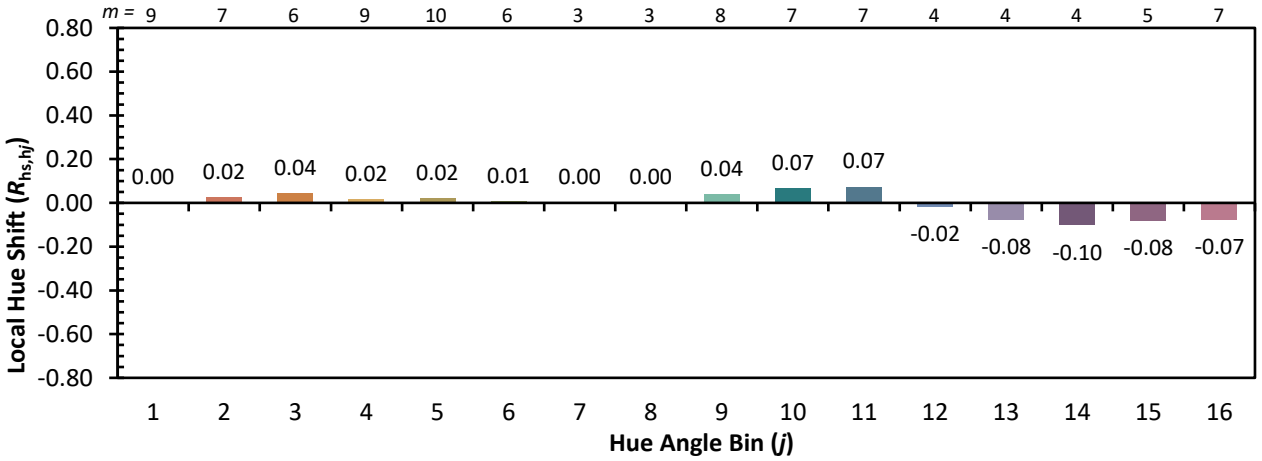
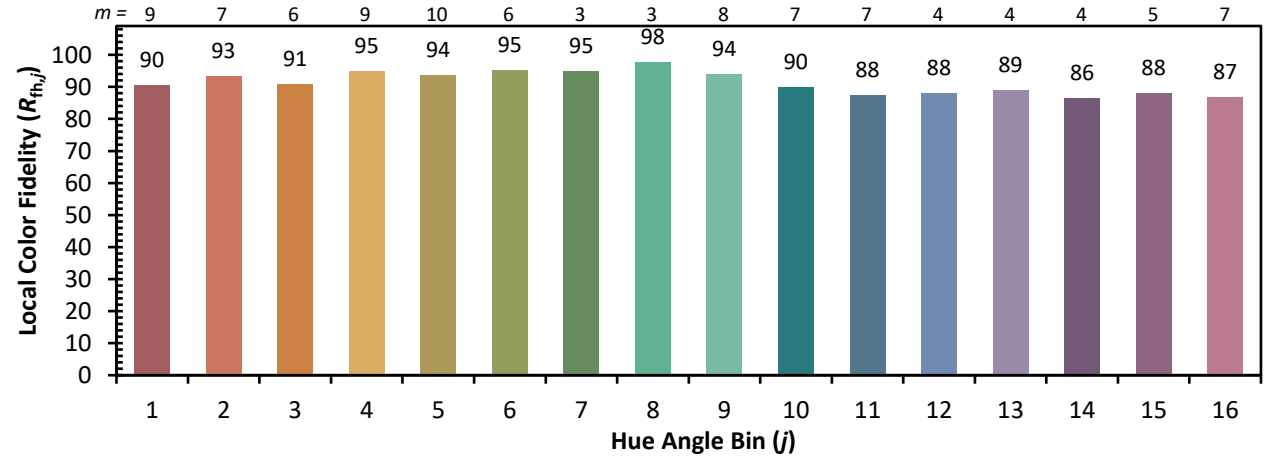
# TM-30-18

## Color Rendition by Hue-Angle Bin



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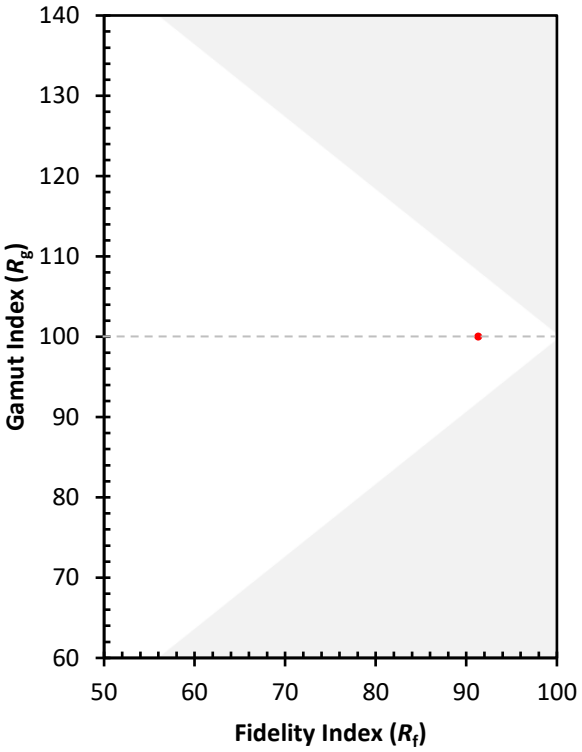
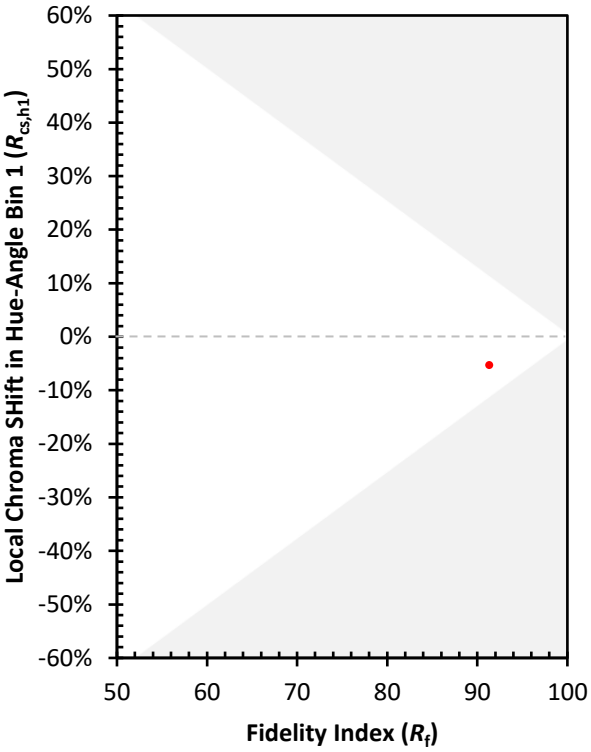
## Measure Comparisons




(END OF REPORT)