

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: P1432759

Luminaire Tested: EHBR1-48-UNV-N-L835-UPL30

Issue Date: 3/20/2026

**Test Information**

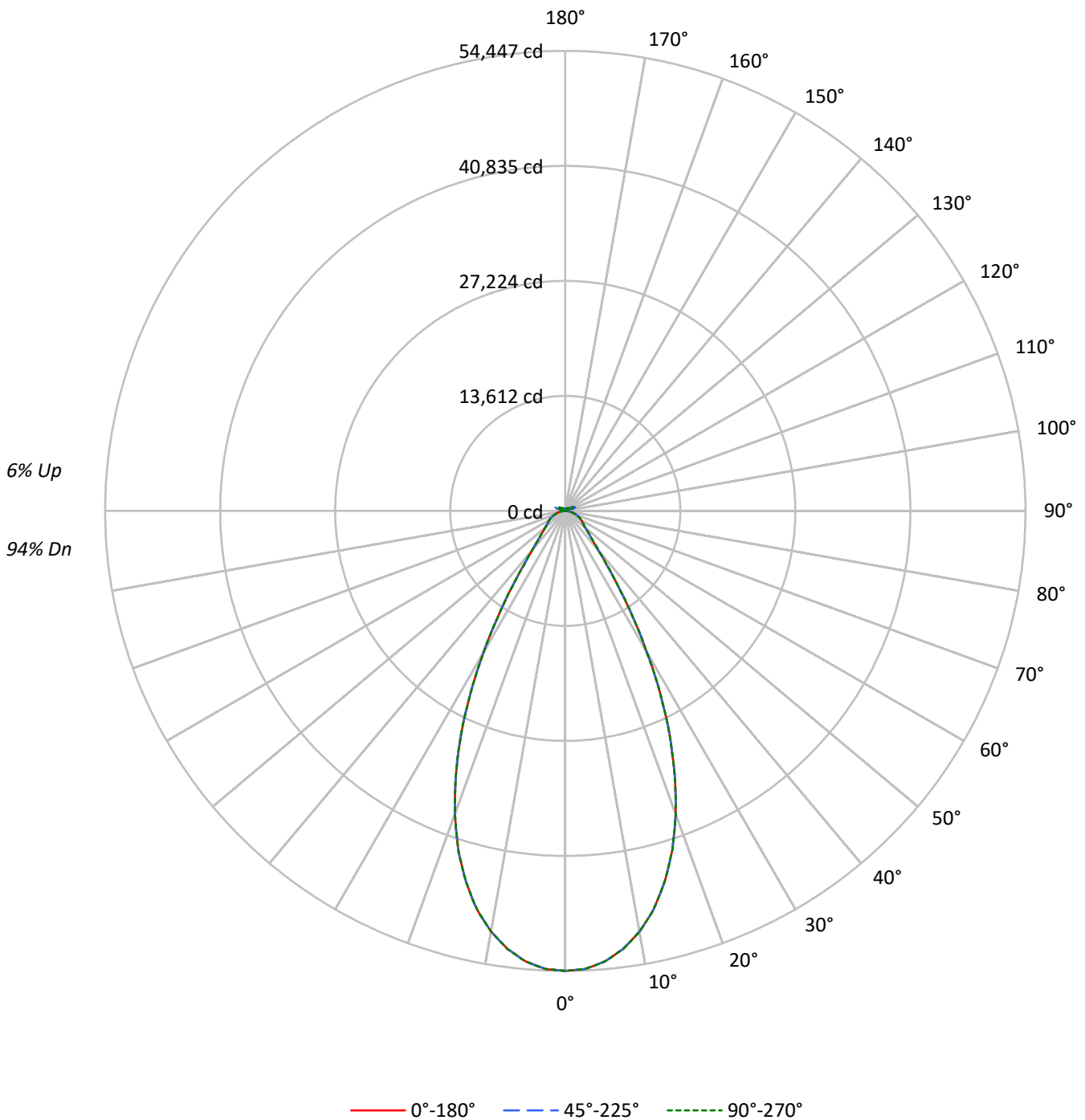
Test Method: LM-79-2019  
Report Number: P1432759  
REPORT IS A COMBINATION OF REPORTS P1431848 AND P1431635  
Test Lab: INNOVATION CENTER  
Issue Date: 3/20/2026  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: METALUX  
Catalog Number: EHBR1-48-UNV-N-L835-UPL30  
Description: Elevate Round Highbay at, 48000 lumens, 3500K 80CRI LEDs with N lens  
Light Source: -  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 49532.2 lumens  
Efficiency: N/A  
Efficacy: 176.5 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: Direct  
  
Input Watts (W): 280.6  
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

TEST NUMBER: P1432759  
CATALOG NUMBER: EHBR1-48-UNV-N-L835-UPL30

### Luminous Intensity Polar Plot





TEST NUMBER: P1432759

CATALOG NUMBER: EHBR1-48-UNV-N-L835-UPL30

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

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |    |    |    |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|----|----|----|----|----|
| RF  | 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 | 50 | 30 | 10 | 0  |
| RCR |     |     |     |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |    |    |    |
| 0   | 118 | 118 | 118 | 118 | 114 | 114 | 114 | 114 | 108 | 108 | 108 | 102 | 102 | 102 | 97 | 97 | 97 | 97 | 97 | 97 | 94 |
| 1   | 111 | 108 | 105 | 102 | 108 | 105 | 102 | 100 | 100 | 98  | 96  | 95  | 93  | 92  | 91 | 89 | 88 | 88 | 88 | 88 | 86 |
| 2   | 104 | 99  | 94  | 90  | 101 | 96  | 92  | 88  | 92  | 89  | 86  | 88  | 85  | 83  | 85 | 82 | 80 | 80 | 80 | 80 | 78 |
| 3   | 98  | 91  | 85  | 81  | 96  | 89  | 84  | 79  | 85  | 81  | 77  | 82  | 79  | 76  | 79 | 76 | 74 | 74 | 74 | 74 | 72 |
| 4   | 93  | 84  | 78  | 73  | 90  | 82  | 77  | 72  | 80  | 75  | 71  | 77  | 73  | 69  | 74 | 71 | 68 | 68 | 68 | 68 | 66 |
| 5   | 87  | 78  | 72  | 67  | 85  | 77  | 71  | 66  | 74  | 69  | 65  | 72  | 68  | 64  | 70 | 66 | 63 | 63 | 63 | 63 | 61 |
| 6   | 83  | 73  | 66  | 62  | 81  | 72  | 66  | 61  | 70  | 64  | 60  | 68  | 63  | 60  | 66 | 62 | 59 | 59 | 59 | 59 | 57 |
| 7   | 79  | 68  | 62  | 57  | 77  | 67  | 61  | 57  | 66  | 60  | 56  | 64  | 59  | 56  | 62 | 58 | 55 | 55 | 55 | 55 | 53 |
| 8   | 75  | 64  | 58  | 54  | 73  | 64  | 57  | 53  | 62  | 57  | 53  | 60  | 56  | 52  | 59 | 55 | 52 | 52 | 52 | 52 | 50 |
| 9   | 71  | 61  | 54  | 50  | 69  | 60  | 54  | 50  | 59  | 53  | 49  | 57  | 52  | 49  | 56 | 52 | 48 | 48 | 48 | 48 | 47 |
| 10  | 68  | 57  | 51  | 47  | 66  | 57  | 51  | 47  | 55  | 50  | 47  | 54  | 50  | 46  | 53 | 49 | 46 | 46 | 46 | 46 | 44 |

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

|     | 0°     | 45°    | 90°    |
|-----|--------|--------|--------|
| 0°  | 255686 | 255686 | 255686 |
| 5°  | 250722 | 250722 | 250722 |
| 10° | 237965 | 237965 | 237965 |
| 15° | 216517 | 216517 | 216517 |
| 20° | 185724 | 185724 | 185724 |
| 25° | 146101 | 146101 | 146101 |
| 30° | 100263 | 100263 | 100263 |
| 35° | 59560  | 59560  | 59560  |
| 40° | 35240  | 35240  | 35240  |
| 45° | 25297  | 25297  | 25297  |
| 50° | 20794  | 20794  | 20794  |
| 55° | 18898  | 18898  | 18898  |
| 60° | 18091  | 18091  | 18091  |
| 65° | 17255  | 17255  | 17255  |
| 70° | 16047  | 16047  | 16047  |
| 75° | 14507  | 14507  | 14507  |
| 80° | 12040  | 12040  | 12040  |
| 85° | 7623   | 7623   | 7623   |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
 Vertical Angle: 45°  
 Luminance: 25297 cd/sqm



TEST NUMBER: P1432759

CATALOG NUMBER: EHBR1-48-UNV-N-L835-UPL30

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 5015.4  | 10.1      |
| 10°-20°   | 12589.5 | 25.4      |
| 20°-30°   | 13163.6 | 26.6      |
| 30°-40°   | 7132.4  | 14.4      |
| 40°-50°   | 3281.3  | 6.6       |
| 50°-60°   | 2312.4  | 4.7       |
| 60°-70°   | 1779.5  | 3.6       |
| 70°-80°   | 1078.8  | 2.2       |
| 80°-90°   | 309.0   | 0.6       |
| 90°-100°  | 82.0    | 0.2       |
| 100°-110° | 512.8   | 1.0       |
| 110°-120° | 917.0   | 1.9       |
| 120°-130° | 538.1   | 1.1       |
| 130°-140° | 330.1   | 0.7       |
| 140°-150° | 228.9   | 0.5       |
| 150°-160° | 148.7   | 0.3       |
| 160°-170° | 84.8    | 0.2       |
| 170°-180° | 28.0    | 0.1       |
| 0°-30°    | 30768.4 | 62.1      |
| 0°-40°    | 37900.9 | 76.5      |
| 0°-60°    | 43494.5 | 87.8      |
| 0°-90°    | 46661.8 | 94.2      |
| 90°-120°  | 1511.9  | 3.1       |
| 90°-150°  | 2608.9  | 5.3       |
| 90°-180°  | 2870.0  | 5.8       |
| 0°-180°   | 49532.2 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°    | 22.5° | 45°   | 67.5° | 90°   | Flux  |
|------|-------|-------|-------|-------|-------|-------|
| 0°   | 54447 | 54447 | 54447 | 54447 | 54447 |       |
| 5°   | 53533 | 53533 | 53533 | 53533 | 53533 | 5015  |
| 15°  | 45424 | 45424 | 45424 | 45424 | 45424 | 12589 |
| 25°  | 29176 | 29176 | 29176 | 29176 | 29176 | 13164 |
| 35°  | 10931 | 10931 | 10931 | 10931 | 10931 | 7132  |
| 45°  | 4093  | 4093  | 4093  | 4093  | 4093  | 3281  |
| 55°  | 2554  | 2554  | 2554  | 2554  | 2554  | 2312  |
| 65°  | 1801  | 1801  | 1801  | 1801  | 1801  | 1780  |
| 75°  | 1022  | 1022  | 1022  | 1022  | 1022  | 1079  |
| 85°  | 262   | 262   | 262   | 262   | 262   | 291   |
| 90°  | 23    | 36    | 61    | 39    | 23    | 23    |
| 95°  | 36    | 61    | 133   | 66    | 41    | 35    |
| 105° | 179   | 353   | 902   | 389   | 237   | 240   |
| 115° | 825   | 868   | 1066  | 1022  | 1015  | 760   |
| 125° | 595   | 555   | 570   | 578   | 649   | 542   |
| 135° | 434   | 421   | 435   | 409   | 408   | 339   |
| 145° | 357   | 352   | 373   | 368   | 366   | 226   |
| 155° | 312   | 309   | 324   | 324   | 324   | 146   |
| 165° | 292   | 292   | 301   | 301   | 299   | 84    |
| 175° | 289   | 289   | 294   | 294   | 294   | 28    |
| 180° | 292   | 292   | 292   | 292   | 292   |       |



TEST NUMBER: P1432759

CATALOG NUMBER: EHBR1-48-UNV-N-L835-UPL30

**CANDELA DISTRIBUTION (FULL):**

|        | 0°      | 22.5°   | 45°     | 67.5°   | 90°     |
|--------|---------|---------|---------|---------|---------|
| 0°     | 54446.6 | 54446.6 | 54446.6 | 54446.6 | 54446.6 |
| 2.5°   | 54253.5 | 54253.5 | 54253.5 | 54253.5 | 54253.5 |
| 5°     | 53533.2 | 53533.2 | 53533.2 | 53533.2 | 53533.2 |
| 7.5°   | 52303.5 | 52303.5 | 52303.5 | 52303.5 | 52303.5 |
| 10°    | 50559.0 | 50559.0 | 50559.0 | 50559.0 | 50559.0 |
| 12.5°  | 48304.5 | 48304.5 | 48304.5 | 48304.5 | 48304.5 |
| 15°    | 45424.1 | 45424.1 | 45424.1 | 45424.1 | 45424.1 |
| 17.5°  | 42082.4 | 42082.4 | 42082.4 | 42082.4 | 42082.4 |
| 20°    | 38171.7 | 38171.7 | 38171.7 | 38171.7 | 38171.7 |
| 22.5°  | 33817.5 | 33817.5 | 33817.5 | 33817.5 | 33817.5 |
| 25°    | 29176.3 | 29176.3 | 29176.3 | 29176.3 | 29176.3 |
| 27.5°  | 24256.1 | 24256.1 | 24256.1 | 24256.1 | 24256.1 |
| 30°    | 19285.5 | 19285.5 | 19285.5 | 19285.5 | 19285.5 |
| 32.5°  | 14801.0 | 14801.0 | 14801.0 | 14801.0 | 14801.0 |
| 35°    | 10931.3 | 10931.3 | 10931.3 | 10931.3 | 10931.3 |
| 37.5°  | 8026.2  | 8026.2  | 8026.2  | 8026.2  | 8026.2  |
| 40°    | 6108.0  | 6108.0  | 6108.0  | 6108.0  | 6108.0  |
| 42.5°  | 4897.7  | 4897.7  | 4897.7  | 4897.7  | 4897.7  |
| 45°    | 4093.0  | 4093.0  | 4093.0  | 4093.0  | 4093.0  |
| 47.5°  | 3513.0  | 3513.0  | 3513.0  | 3513.0  | 3513.0  |
| 50°    | 3099.0  | 3099.0  | 3099.0  | 3099.0  | 3099.0  |
| 52.5°  | 2796.6  | 2796.6  | 2796.6  | 2796.6  | 2796.6  |
| 55°    | 2553.9  | 2553.9  | 2553.9  | 2553.9  | 2553.9  |
| 57.5°  | 2357.0  | 2357.0  | 2357.0  | 2357.0  | 2357.0  |
| 60°    | 2174.8  | 2174.8  | 2174.8  | 2174.8  | 2174.8  |
| 62.5°  | 1992.6  | 1992.6  | 1992.6  | 1992.6  | 1992.6  |
| 65°    | 1801.0  | 1801.0  | 1801.0  | 1801.0  | 1801.0  |
| 67.5°  | 1605.7  | 1605.7  | 1605.7  | 1605.7  | 1605.7  |
| 70°    | 1408.0  | 1408.0  | 1408.0  | 1408.0  | 1408.0  |
| 72.5°  | 1215.7  | 1215.7  | 1215.7  | 1215.7  | 1215.7  |
| 75°    | 1021.9  | 1021.9  | 1021.9  | 1021.9  | 1021.9  |
| 77.5°  | 831.9   | 831.9   | 831.9   | 831.9   | 831.9   |
| 80°    | 633.4   | 633.4   | 633.4   | 633.4   | 633.4   |
| 82.5°  | 443.4   | 443.4   | 443.4   | 443.4   | 443.4   |
| 85°    | 262.0   | 262.0   | 262.0   | 262.0   | 262.0   |
| 87.5°  | 93.8    | 93.8    | 93.8    | 93.8    | 93.8    |
| 90°    | 22.9    | 36.1    | 60.7    | 39.4    | 22.9    |
| 92.5°  | 31.2    | 52.6    | 95.3    | 49.3    | 27.9    |
| 95°    | 36.2    | 60.8    | 133.0   | 65.7    | 41.1    |
| 97.5°  | 46.0    | 67.4    | 152.8   | 80.5    | 64.1    |
| 100°   | 60.8    | 78.8    | 238.3   | 98.6    | 85.4    |
| 102.5° | 103.5   | 167.6   | 506.0   | 185.7   | 129.8   |
| 105°   | 179.1   | 353.3   | 902.0   | 389.4   | 236.6   |
| 107.5° | 310.5   | 632.5   | 1189.5  | 690.0   | 448.5   |
| 110°   | 580.0   | 839.6   | 1247.0  | 948.0   | 718.0   |



TEST NUMBER: P1432759

CATALOG NUMBER: EHBR1-48-UNV-N-L835-UPL30

**CANDELA DISTRIBUTION (continued):**

|        | 0°    | 22.5° | 45°    | 67.5°  | 90°    |
|--------|-------|-------|--------|--------|--------|
| 112.5° | 783.7 | 902.0 | 1194.5 | 1046.6 | 934.9  |
| 115°   | 824.7 | 867.5 | 1066.3 | 1022.0 | 1015.4 |
| 117.5° | 796.8 | 792.0 | 905.3  | 918.4  | 980.9  |
| 120°   | 737.7 | 704.9 | 755.8  | 801.8  | 885.5  |
| 122.5° | 663.8 | 624.3 | 647.4  | 681.8  | 765.7  |
| 125°   | 594.7 | 555.4 | 570.1  | 578.3  | 649.0  |
| 127.5° | 534.0 | 507.6 | 515.9  | 506.0  | 550.4  |
| 130°   | 492.9 | 469.9 | 481.4  | 458.4  | 479.7  |
| 132.5° | 458.4 | 443.6 | 456.7  | 428.8  | 435.4  |
| 135°   | 433.8 | 420.6 | 435.4  | 409.1  | 407.5  |
| 137.5° | 412.4 | 400.9 | 415.7  | 395.9  | 391.0  |
| 140°   | 392.6 | 382.8 | 399.2  | 384.5  | 381.2  |
| 142.5° | 371.3 | 364.7 | 384.5  | 374.6  | 371.3  |
| 145°   | 356.6 | 351.6 | 373.0  | 368.0  | 366.4  |
| 147.5° | 343.4 | 340.1 | 359.9  | 358.2  | 358.2  |
| 150°   | 331.9 | 328.6 | 348.3  | 346.7  | 348.3  |
| 152.5° | 320.4 | 317.1 | 335.1  | 333.5  | 335.1  |
| 155°   | 312.1 | 308.9 | 323.7  | 323.7  | 323.7  |
| 157.5° | 305.6 | 303.9 | 315.4  | 315.4  | 315.4  |
| 160°   | 300.7 | 299.1 | 308.9  | 308.9  | 307.2  |
| 162.5° | 295.8 | 294.1 | 305.6  | 303.9  | 303.9  |
| 165°   | 292.5 | 292.5 | 300.7  | 300.7  | 299.1  |
| 167.5° | 292.5 | 290.8 | 299.1  | 299.1  | 297.4  |
| 170°   | 290.8 | 290.8 | 297.4  | 295.8  | 294.1  |
| 172.5° | 290.8 | 290.8 | 297.4  | 295.8  | 294.1  |
| 175°   | 289.2 | 289.2 | 294.1  | 294.1  | 294.1  |
| 177.5° | 290.8 | 290.8 | 294.1  | 294.1  | 292.5  |
| 180°   | 292.5 | 292.5 | 292.5  | 292.5  | 292.5  |



TEST NUMBER: P1432759  
 CATALOG NUMBER: EHBR1-48-UNV-N-L835-UPL30

**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 | 18.22            | 19.30 | 18.69 | 19.73 | 20.20 | 18.22          | 19.30 | 18.69 | 19.73 | 20.20 |
|                 | 3H   | 20.00            | 20.96 | 20.48 | 21.41 | 21.92 | 20.00          | 20.96 | 20.48 | 21.41 | 21.92 |
|                 | 4H   | 20.66            | 21.55 | 21.16 | 22.02 | 22.55 | 20.66          | 21.55 | 21.16 | 22.02 | 22.55 |
|                 | 6H   | 21.12            | 21.94 | 21.63 | 22.42 | 22.96 | 21.12          | 21.94 | 21.63 | 22.42 | 22.96 |
|                 | 8H   | 21.24            | 22.01 | 21.77 | 22.52 | 23.07 | 21.24          | 22.01 | 21.77 | 22.52 | 23.07 |
|                 | 12H  | 21.29            | 22.03 | 21.83 | 22.53 | 23.10 | 21.29          | 22.03 | 21.83 | 22.53 | 23.10 |
| 4H              | 2H   | 18.76            | 19.65 | 19.27 | 20.12 | 20.65 | 18.76          | 19.65 | 19.27 | 20.12 | 20.65 |
|                 | 3H   | 20.73            | 21.47 | 21.25 | 21.99 | 22.53 | 20.73          | 21.47 | 21.25 | 21.99 | 22.53 |
|                 | 4H   | 21.50            | 22.17 | 22.04 | 22.70 | 23.28 | 21.50          | 22.17 | 22.04 | 22.70 | 23.28 |
|                 | 6H   | 22.08            | 22.65 | 22.64 | 23.20 | 23.80 | 22.08          | 22.65 | 22.64 | 23.20 | 23.80 |
|                 | 8H   | 22.23            | 22.77 | 22.80 | 23.32 | 23.93 | 22.23          | 22.77 | 22.80 | 23.32 | 23.93 |
|                 | 12H  | 22.31            | 22.78 | 22.90 | 23.37 | 23.98 | 22.31          | 22.78 | 22.90 | 23.37 | 23.98 |
| 8H              | 4H   | 21.73            | 22.27 | 22.30 | 22.82 | 23.42 | 21.73          | 22.27 | 22.30 | 22.82 | 23.42 |
|                 | 6H   | 22.42            | 22.85 | 23.02 | 23.45 | 24.06 | 22.42          | 22.85 | 23.02 | 23.45 | 24.06 |
|                 | 8H   | 22.64            | 23.02 | 23.26 | 23.63 | 24.26 | 22.64          | 23.02 | 23.26 | 23.63 | 24.26 |
|                 | 12H  | 22.78            | 23.11 | 23.39 | 23.70 | 24.41 | 22.78          | 23.11 | 23.39 | 23.70 | 24.41 |
| 12H             | 4H   | 21.73            | 22.20 | 22.32 | 22.78 | 23.39 | 21.73          | 22.20 | 22.32 | 22.78 | 23.39 |
|                 | 6H   | 22.44            | 22.82 | 23.06 | 23.44 | 24.06 | 22.44          | 22.82 | 23.06 | 23.44 | 24.06 |
|                 | 8H   | 22.70            | 23.04 | 23.32 | 23.63 | 24.33 | 22.70          | 23.04 | 23.32 | 23.63 | 24.33 |

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

Report Prepared for

Cooper Lighting Solutions

Metalux

Report Number: SP1-2506-472-3

Test Date: 07/31/2025

Luminaire Tested: EHBR-60-L835-N

Data in this report applies to families of products including EHBR-60-L835-N

**Test Information**

Test Method: LM-79-2019  
 Report Number: SP1-2506-472-3  
 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-L835-N**  
 Description: Elevate Round Highbay at, 60000 lumens, 3500K 80CRI LEDs with N lens

**Spectral Parameters**

CCT (K): 3468  
 CIE u': 0.2375  
 CIE v': 0.5091  
 Duv: -0.0021  
 CIE x: 0.4049  
 CIE y: 0.3856  
 CIE z: 0.2095  
 Peak Wavelength (nm): 630  
 Dominant Wavelength (nm): 581  
 Purity: 37.24544  
 R<sub>f</sub>: 80.1  
 R<sub>g</sub>: 101

|           |      |      |      |
|-----------|------|------|------|
| CRI (Ra): | 82.1 |      |      |
| R1:       | 82.9 | R9:  | 27.6 |
| R2:       | 85.6 | R10: | 63.8 |
| R3:       | 85.9 | R11: | 81.2 |
| R4:       | 82.8 | R12: | 57.2 |
| R5:       | 81.0 | R13: | 82.6 |
| R6:       | 79.7 | R14: | 91.0 |
| R7:       | 86.5 | R15: | 79.4 |
| R8:       | 72.1 |      |      |



**Test Conditions**

Stabilization Time: 39M  
 Operation Time: 1H 39M  
 Sphere Temperature (°C): 25.0

REPORT NUMBER: SP1-2506-472-3

| 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: SP1-2506-472-3

CIE 1931 Chromaticity Diagram



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



CCT = 3468K  
 CIE x = 0.4049  
 CIE y = 0.3856  
 Duv = -0.0021

Point lies inside the ANSI 3500K 4-step quadrangle

REPORT NUMBER: SP1-2506-472-3

**Photopic Flux vs. Wavelength**



**Photopic Lumens: NR**

| $\lambda$ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | $\lambda$ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | $\lambda$ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | $\lambda$ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | $\lambda$ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) |
|----------------|--------------------------|---------------|----------------|--------------------------|---------------|----------------|--------------------------|---------------|----------------|--------------------------|---------------|----------------|--------------------------|---------------|
| 360            | 0                        | NR            | 490            | 60                       | NR            | 620            | 327                      | NR            | 750            | 7                        | NR            | 880            | 0                        | NR            |
| 365            | 0                        | NR            | 495            | 82                       | NR            | 625            | 322                      | NR            | 755            | 6                        | NR            | 885            | 0                        | NR            |
| 370            | 0                        | NR            | 500            | 114                      | NR            | 630            | 1000                     | NR            | 760            | 5                        | NR            | 890            | 0                        | NR            |
| 375            | 0                        | NR            | 505            | 152                      | NR            | 635            | 645                      | NR            | 765            | 4                        | NR            | 895            | 0                        | NR            |
| 380            | 0                        | NR            | 510            | 189                      | NR            | 640            | 197                      | NR            | 770            | 4                        | NR            | 900            | 0                        | NR            |
| 385            | 1                        | NR            | 515            | 222                      | NR            | 645            | 189                      | NR            | 775            | 3                        | NR            | 905            | 0                        | NR            |
| 390            | 2                        | NR            | 520            | 248                      | NR            | 650            | 163                      | NR            | 780            | 3                        | NR            | 910            | 0                        | NR            |
| 395            | 3                        | NR            | 525            | 268                      | NR            | 655            | 134                      | NR            | 785            | 2                        | NR            | 915            | 0                        | NR            |
| 400            | 4                        | NR            | 530            | 283                      | NR            | 660            | 113                      | NR            | 790            | 2                        | NR            | 920            | 0                        | NR            |
| 405            | 6                        | NR            | 535            | 294                      | NR            | 665            | 94                       | NR            | 795            | 2                        | NR            | 925            | 0                        | NR            |
| 410            | 9                        | NR            | 540            | 305                      | NR            | 670            | 87                       | NR            | 800            | 2                        | NR            | 930            | 0                        | NR            |
| 415            | 18                       | NR            | 545            | 314                      | NR            | 675            | 70                       | NR            | 805            | 1                        | NR            | 935            | 0                        | NR            |
| 420            | 34                       | NR            | 550            | 323                      | NR            | 680            | 60                       | NR            | 810            | 1                        | NR            | 940            | 0                        | NR            |
| 425            | 62                       | NR            | 555            | 335                      | NR            | 685            | 51                       | NR            | 815            | 1                        | NR            | 945            | 0                        | NR            |
| 430            | 102                      | NR            | 560            | 346                      | NR            | 690            | 44                       | NR            | 820            | 1                        | NR            | 950            | 0                        | NR            |
| 435            | 159                      | NR            | 565            | 356                      | NR            | 695            | 38                       | NR            | 825            | 1                        | NR            | 955            | 0                        | NR            |
| 440            | 241                      | NR            | 570            | 364                      | NR            | 700            | 32                       | NR            | 830            | 1                        | NR            | 960            | 0                        | NR            |
| 445            | 363                      | NR            | 575            | 371                      | NR            | 705            | 28                       | NR            | 835            | 1                        | NR            | 965            | 0                        | NR            |
| 450            | 389                      | NR            | 580            | 375                      | NR            | 710            | 24                       | NR            | 840            | 1                        | NR            | 970            | 0                        | NR            |
| 455            | 245                      | NR            | 585            | 375                      | NR            | 715            | 20                       | NR            | 845            | 0                        | NR            | 975            | 0                        | NR            |
| 460            | 158                      | NR            | 590            | 373                      | NR            | 720            | 17                       | NR            | 850            | 0                        | NR            | 980            | 0                        | NR            |
| 465            | 120                      | NR            | 595            | 364                      | NR            | 725            | 15                       | NR            | 855            | 0                        | NR            | 985            | 0                        | NR            |
| 470            | 79                       | NR            | 600            | 357                      | NR            | 730            | 13                       | NR            | 860            | 0                        | NR            | 990            | 0                        | NR            |
| 475            | 57                       | NR            | 605            | 349                      | NR            | 735            | 11                       | NR            | 865            | 0                        | NR            | 995            | 0                        | NR            |
| 480            | 51                       | NR            | 610            | 371                      | NR            | 740            | 9                        | NR            | 870            | 0                        | NR            | 1000           | 0                        | NR            |
| 485            | 51                       | NR            | 615            | 387                      | NR            | 745            | 8                        | NR            | 875            | 0                        | NR            |                |                          |               |

REPORT NUMBER: SP1-2506-472-3

**Scotopic Flux vs. Wavelength**



**Scotopic Lumens: NR**

**S/P: 1.43**

| λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) |
|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|
| 360    | 0                        | NR            | 490    | 60                       | NR            | 620    | 327                      | NR            | 750    | 7                        | NR            | 880    | 0                        | NR            |
| 365    | 0                        | NR            | 495    | 82                       | NR            | 625    | 322                      | NR            | 755    | 6                        | NR            | 885    | 0                        | NR            |
| 370    | 0                        | NR            | 500    | 114                      | NR            | 630    | 1000                     | NR            | 760    | 5                        | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 152                      | NR            | 635    | 645                      | NR            | 765    | 4                        | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 189                      | NR            | 640    | 197                      | NR            | 770    | 4                        | NR            | 900    | 0                        | NR            |
| 385    | 1                        | NR            | 515    | 222                      | NR            | 645    | 189                      | NR            | 775    | 3                        | NR            | 905    | 0                        | NR            |
| 390    | 2                        | NR            | 520    | 248                      | NR            | 650    | 163                      | NR            | 780    | 3                        | NR            | 910    | 0                        | NR            |
| 395    | 3                        | NR            | 525    | 268                      | NR            | 655    | 134                      | NR            | 785    | 2                        | NR            | 915    | 0                        | NR            |
| 400    | 4                        | NR            | 530    | 283                      | NR            | 660    | 113                      | NR            | 790    | 2                        | NR            | 920    | 0                        | NR            |
| 405    | 6                        | NR            | 535    | 294                      | NR            | 665    | 94                       | NR            | 795    | 2                        | NR            | 925    | 0                        | NR            |
| 410    | 9                        | NR            | 540    | 305                      | NR            | 670    | 87                       | NR            | 800    | 2                        | NR            | 930    | 0                        | NR            |
| 415    | 18                       | NR            | 545    | 314                      | NR            | 675    | 70                       | NR            | 805    | 1                        | NR            | 935    | 0                        | NR            |
| 420    | 34                       | NR            | 550    | 323                      | NR            | 680    | 60                       | NR            | 810    | 1                        | NR            | 940    | 0                        | NR            |
| 425    | 62                       | NR            | 555    | 335                      | NR            | 685    | 51                       | NR            | 815    | 1                        | NR            | 945    | 0                        | NR            |
| 430    | 102                      | NR            | 560    | 346                      | NR            | 690    | 44                       | NR            | 820    | 1                        | NR            | 950    | 0                        | NR            |
| 435    | 159                      | NR            | 565    | 356                      | NR            | 695    | 38                       | NR            | 825    | 1                        | NR            | 955    | 0                        | NR            |
| 440    | 241                      | NR            | 570    | 364                      | NR            | 700    | 32                       | NR            | 830    | 1                        | NR            | 960    | 0                        | NR            |
| 445    | 363                      | NR            | 575    | 371                      | NR            | 705    | 28                       | NR            | 835    | 1                        | NR            | 965    | 0                        | NR            |
| 450    | 389                      | NR            | 580    | 375                      | NR            | 710    | 24                       | NR            | 840    | 1                        | NR            | 970    | 0                        | NR            |
| 455    | 245                      | NR            | 585    | 375                      | NR            | 715    | 20                       | NR            | 845    | 0                        | NR            | 975    | 0                        | NR            |
| 460    | 158                      | NR            | 590    | 373                      | NR            | 720    | 17                       | NR            | 850    | 0                        | NR            | 980    | 0                        | NR            |
| 465    | 120                      | NR            | 595    | 364                      | NR            | 725    | 15                       | NR            | 855    | 0                        | NR            | 985    | 0                        | NR            |
| 470    | 79                       | NR            | 600    | 357                      | NR            | 730    | 13                       | NR            | 860    | 0                        | NR            | 990    | 0                        | NR            |
| 475    | 57                       | NR            | 605    | 349                      | NR            | 735    | 11                       | NR            | 865    | 0                        | NR            | 995    | 0                        | NR            |
| 480    | 51                       | NR            | 610    | 371                      | NR            | 740    | 9                        | NR            | 870    | 0                        | NR            | 1000   | 0                        | NR            |
| 485    | 51                       | NR            | 615    | 387                      | NR            | 745    | 8                        | NR            | 875    | 0                        | NR            |        |                          |               |

REPORT NUMBER: SP1-2506-472-3

**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: NR**

**M/P: 2.75**

| λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) |
|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|
| 360    | 0                        | NR            | 490    | 60                       | NR            | 620    | 327                      | NR            | 750    | 7                        | NR            | 880    | 0                        | NR            |
| 365    | 0                        | NR            | 495    | 82                       | NR            | 625    | 322                      | NR            | 755    | 6                        | NR            | 885    | 0                        | NR            |
| 370    | 0                        | NR            | 500    | 114                      | NR            | 630    | 1000                     | NR            | 760    | 5                        | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 152                      | NR            | 635    | 645                      | NR            | 765    | 4                        | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 189                      | NR            | 640    | 197                      | NR            | 770    | 4                        | NR            | 900    | 0                        | NR            |
| 385    | 1                        | NR            | 515    | 222                      | NR            | 645    | 189                      | NR            | 775    | 3                        | NR            | 905    | 0                        | NR            |
| 390    | 2                        | NR            | 520    | 248                      | NR            | 650    | 163                      | NR            | 780    | 3                        | NR            | 910    | 0                        | NR            |
| 395    | 3                        | NR            | 525    | 268                      | NR            | 655    | 134                      | NR            | 785    | 2                        | NR            | 915    | 0                        | NR            |
| 400    | 4                        | NR            | 530    | 283                      | NR            | 660    | 113                      | NR            | 790    | 2                        | NR            | 920    | 0                        | NR            |
| 405    | 6                        | NR            | 535    | 294                      | NR            | 665    | 94                       | NR            | 795    | 2                        | NR            | 925    | 0                        | NR            |
| 410    | 9                        | NR            | 540    | 305                      | NR            | 670    | 87                       | NR            | 800    | 2                        | NR            | 930    | 0                        | NR            |
| 415    | 18                       | NR            | 545    | 314                      | NR            | 675    | 70                       | NR            | 805    | 1                        | NR            | 935    | 0                        | NR            |
| 420    | 34                       | NR            | 550    | 323                      | NR            | 680    | 60                       | NR            | 810    | 1                        | NR            | 940    | 0                        | NR            |
| 425    | 62                       | NR            | 555    | 335                      | NR            | 685    | 51                       | NR            | 815    | 1                        | NR            | 945    | 0                        | NR            |
| 430    | 102                      | NR            | 560    | 346                      | NR            | 690    | 44                       | NR            | 820    | 1                        | NR            | 950    | 0                        | NR            |
| 435    | 159                      | NR            | 565    | 356                      | NR            | 695    | 38                       | NR            | 825    | 1                        | NR            | 955    | 0                        | NR            |
| 440    | 241                      | NR            | 570    | 364                      | NR            | 700    | 32                       | NR            | 830    | 1                        | NR            | 960    | 0                        | NR            |
| 445    | 363                      | NR            | 575    | 371                      | NR            | 705    | 28                       | NR            | 835    | 1                        | NR            | 965    | 0                        | NR            |
| 450    | 389                      | NR            | 580    | 375                      | NR            | 710    | 24                       | NR            | 840    | 1                        | NR            | 970    | 0                        | NR            |
| 455    | 245                      | NR            | 585    | 375                      | NR            | 715    | 20                       | NR            | 845    | 0                        | NR            | 975    | 0                        | NR            |
| 460    | 158                      | NR            | 590    | 373                      | NR            | 720    | 17                       | NR            | 850    | 0                        | NR            | 980    | 0                        | NR            |
| 465    | 120                      | NR            | 595    | 364                      | NR            | 725    | 15                       | NR            | 855    | 0                        | NR            | 985    | 0                        | NR            |
| 470    | 79                       | NR            | 600    | 357                      | NR            | 730    | 13                       | NR            | 860    | 0                        | NR            | 990    | 0                        | NR            |
| 475    | 57                       | NR            | 605    | 349                      | NR            | 735    | 11                       | NR            | 865    | 0                        | NR            | 995    | 0                        | NR            |
| 480    | 51                       | NR            | 610    | 371                      | NR            | 740    | 9                        | NR            | 870    | 0                        | NR            | 1000   | 0                        | NR            |
| 485    | 51                       | NR            | 615    | 387                      | NR            | 745    | 8                        | NR            | 875    | 0                        | NR            |        |                          |               |

**Summary**

$R_f = 80.1$   
 $R_g = 101$   
 $CIE R_a = 82.1$   
 $R_9 = 27.6$



**Color Vector Graphics**



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 68 | CES51 = 90 | CES76 = 59 |
| CES02 = 62 | CES27 = 89 | CES52 = 90 | CES77 = 78 |
| CES03 = 31 | CES28 = 84 | CES53 = 81 | CES78 = 61 |
| CES04 = 70 | CES29 = 66 | CES54 = 91 | CES79 = 86 |
| CES05 = 49 | CES30 = 77 | CES55 = 90 | CES80 = 82 |
| CES06 = 51 | CES31 = 69 | CES56 = 80 | CES81 = 79 |
| CES07 = 42 | CES32 = 62 | CES57 = 79 | CES82 = 92 |
| CES08 = 41 | CES33 = 74 | CES58 = 81 | CES83 = 89 |
| CES09 = 29 | CES34 = 72 | CES59 = 92 | CES84 = 89 |
| CES10 = 75 | CES35 = 85 | CES60 = 94 | CES85 = 82 |
| CES11 = 58 | CES36 = 97 | CES61 = 90 | CES86 = 78 |
| CES12 = 64 | CES37 = 79 | CES62 = 92 | CES87 = 82 |
| CES13 = 43 | CES38 = 85 | CES63 = 78 | CES88 = 86 |
| CES14 = 74 | CES39 = 94 | CES64 = 79 | CES89 = 76 |
| CES15 = 71 | CES40 = 89 | CES65 = 76 | CES90 = 85 |
| CES16 = 47 | CES41 = 89 | CES66 = 73 | CES91 = 83 |
| CES17 = 49 | CES42 = 77 | CES67 = 70 | CES92 = 73 |
| CES18 = 56 | CES43 = 74 | CES68 = 76 | CES93 = 84 |
| CES19 = 72 | CES44 = 99 | CES69 = 81 | CES94 = 65 |
| CES20 = 66 | CES45 = 83 | CES70 = 68 | CES95 = 79 |
| CES21 = 86 | CES46 = 82 | CES71 = 64 | CES96 = 85 |
| CES22 = 78 | CES47 = 81 | CES72 = 88 | CES97 = 85 |
| CES23 = 92 | CES48 = 80 | CES73 = 60 | CES98 = 82 |
| CES24 = 91 | CES49 = 80 | CES74 = 97 | CES99 = 81 |
| CES25 = 72 | CES50 = 89 | CES75 = 64 |            |



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)