

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: P1433239

Luminaire Tested: EHBR1-36-UNV-W-L930-UPL36

Issue Date: 3/20/2026

**Test Information**

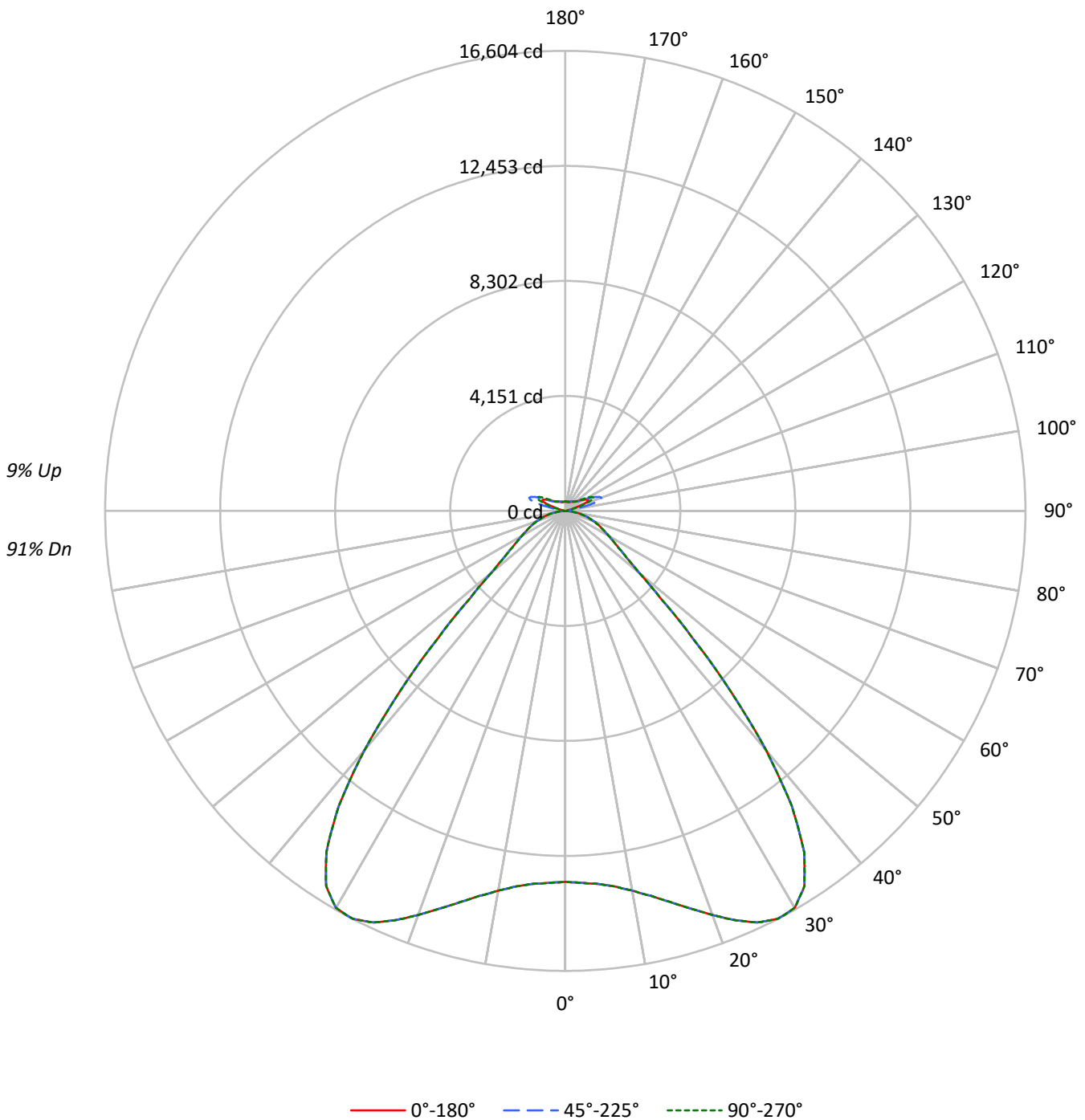
Test Method: LM-79-2019  
Report Number: P1433239  
REPORT IS A COMBINATION OF REPORTS P1431793 AND P1431635  
Test Lab: INNOVATION CENTER  
Issue Date: 3/20/2026  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: METALUX  
Catalog Number: EHBR1-36-UNV-W-L930-UPL36  
Description: Elevate Round Highbay at, 36000 lumens, 3000K 90CRI LEDs with W lens  
Light Source: -  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 35213.2 lumens  
Efficiency: N/A  
Efficacy: 160.2 lumens/watt  
Spacing Criteria (0/90/45): 1.54 / 1.54 / 1.31  
Luminous Opening: Vertical Cylinder (Dia: 1.71' x H: 0.1')  
CIE Type: Direct  
  
Input Watts (W): 219.8  
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: P1433239  
CATALOG NUMBER: EHBR1-36-UNV-W-L930-UPL36

### Luminous Intensity Polar Plot





TEST NUMBER: P1433239  
 CATALOG NUMBER: EHBR1-36-UNV-W-L930-UPL36

**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   | 117 | 117 | 117 | 117 | 113 | 113 | 113 | 113 | 106 | 106 | 106 | 100 | 100 | 100 | 94 | 94 | 94 | 94 | 94 | 94 | 91 |
| 1   | 109 | 105 | 102 | 99  | 105 | 102 | 99  | 96  | 96  | 94  | 92  | 91  | 89  | 87  | 86 | 85 | 83 | 86 | 85 | 83 | 81 |
| 2   | 101 | 95  | 89  | 85  | 98  | 92  | 87  | 83  | 87  | 83  | 80  | 83  | 79  | 77  | 79 | 76 | 74 | 79 | 76 | 74 | 71 |
| 3   | 94  | 85  | 79  | 73  | 91  | 83  | 77  | 72  | 79  | 74  | 70  | 75  | 71  | 68  | 72 | 68 | 65 | 72 | 68 | 65 | 63 |
| 4   | 87  | 77  | 70  | 64  | 84  | 75  | 69  | 64  | 72  | 66  | 62  | 69  | 64  | 60  | 66 | 62 | 58 | 66 | 62 | 58 | 56 |
| 5   | 81  | 70  | 63  | 57  | 79  | 69  | 62  | 56  | 66  | 60  | 55  | 63  | 58  | 54  | 60 | 56 | 52 | 60 | 56 | 52 | 50 |
| 6   | 75  | 64  | 56  | 51  | 73  | 63  | 56  | 50  | 60  | 54  | 49  | 58  | 52  | 48  | 55 | 51 | 47 | 55 | 51 | 47 | 45 |
| 7   | 70  | 59  | 51  | 46  | 68  | 57  | 50  | 45  | 55  | 49  | 44  | 53  | 48  | 43  | 51 | 46 | 43 | 51 | 46 | 43 | 41 |
| 8   | 66  | 54  | 46  | 41  | 64  | 53  | 46  | 41  | 51  | 45  | 40  | 49  | 44  | 39  | 47 | 42 | 39 | 47 | 42 | 39 | 37 |
| 9   | 62  | 50  | 42  | 37  | 60  | 49  | 42  | 37  | 47  | 41  | 37  | 45  | 40  | 36  | 44 | 39 | 35 | 44 | 39 | 35 | 34 |
| 10  | 58  | 46  | 39  | 34  | 56  | 45  | 38  | 34  | 44  | 38  | 33  | 42  | 37  | 33  | 41 | 36 | 32 | 41 | 36 | 32 | 31 |

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

|     | 0°    | 45°   | 90°   |
|-----|-------|-------|-------|
| 0°  | 62877 | 62877 | 62877 |
| 5°  | 63295 | 63295 | 63295 |
| 10° | 65494 | 65494 | 65494 |
| 15° | 69644 | 69644 | 69644 |
| 20° | 75495 | 75495 | 75495 |
| 25° | 82071 | 82071 | 82071 |
| 30° | 86025 | 86025 | 86025 |
| 35° | 81882 | 81882 | 81882 |
| 40° | 64972 | 64972 | 64972 |
| 45° | 40159 | 40159 | 40159 |
| 50° | 23254 | 23254 | 23254 |
| 55° | 17594 | 17594 | 17594 |
| 60° | 15093 | 15093 | 15093 |
| 65° | 13632 | 13632 | 13632 |
| 70° | 12540 | 12540 | 12540 |
| 75° | 11080 | 11080 | 11080 |
| 80° | 9029  | 9029  | 9029  |
| 85° | 5324  | 5324  | 5324  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
 Vertical Angle: 45°  
 Luminance: 40159 cd/sqm



TEST NUMBER: P1433239  
 CATALOG NUMBER: EHBR1-36-UNV-W-L930-UPL36

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 1302.7  | 3.7       |
| 10°-20°   | 4176.3  | 11.9      |
| 20°-30°   | 7538.4  | 21.4      |
| 30°-40°   | 9109.4  | 25.9      |
| 40°-50°   | 5204.5  | 14.8      |
| 50°-60°   | 2204.3  | 6.3       |
| 60°-70°   | 1421.8  | 4.0       |
| 70°-80°   | 826.7   | 2.3       |
| 80°-90°   | 224.6   | 0.6       |
| 90°-100°  | 91.8    | 0.3       |
| 100°-110° | 570.1   | 1.6       |
| 110°-120° | 1018.9  | 2.9       |
| 120°-130° | 598.7   | 1.7       |
| 130°-140° | 369.4   | 1.0       |
| 140°-150° | 258.3   | 0.7       |
| 150°-160° | 168.7   | 0.5       |
| 160°-170° | 96.6    | 0.3       |
| 170°-180° | 32.0    | 0.1       |
| 0°-30°    | 13017.4 | 37.0      |
| 0°-40°    | 22126.8 | 62.8      |
| 0°-60°    | 29535.6 | 83.9      |
| 0°-90°    | 32008.7 | 90.9      |
| 90°-120°  | 1680.8  | 4.8       |
| 90°-150°  | 2907.3  | 8.3       |
| 90°-180°  | 3205.0  | 9.1       |
| 0°-180°   | 35213.2 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°    | 22.5° | 45°   | 67.5° | 90°   | Flux |
|------|-------|-------|-------|-------|-------|------|
| 0°   | 13389 | 13389 | 13389 | 13389 | 13389 |      |
| 5°   | 13514 | 13514 | 13514 | 13514 | 13514 | 1303 |
| 15°  | 14611 | 14611 | 14611 | 14611 | 14611 | 4176 |
| 25°  | 16390 | 16390 | 16390 | 16390 | 16390 | 7538 |
| 35°  | 15028 | 15028 | 15028 | 15028 | 15028 | 9109 |
| 45°  | 6498  | 6498  | 6498  | 6498  | 6498  | 5204 |
| 55°  | 2378  | 2378  | 2378  | 2378  | 2378  | 2204 |
| 65°  | 1423  | 1423  | 1423  | 1423  | 1423  | 1422 |
| 75°  | 780   | 780   | 780   | 780   | 780   | 827  |
| 85°  | 183   | 183   | 183   | 183   | 183   | 211  |
| 90°  | 25    | 39    | 67    | 43    | 25    | 20   |
| 95°  | 41    | 68    | 149   | 74    | 47    | 39   |
| 105° | 200   | 393   | 1002  | 433   | 264   | 267  |
| 115° | 917   | 964   | 1185  | 1135  | 1128  | 844  |
| 125° | 662   | 618   | 635   | 644   | 722   | 603  |
| 135° | 486   | 471   | 487   | 458   | 456   | 380  |
| 145° | 402   | 397   | 421   | 415   | 413   | 255  |
| 155° | 354   | 351   | 367   | 367   | 367   | 165  |
| 165° | 334   | 334   | 343   | 343   | 341   | 95   |
| 175° | 331   | 331   | 336   | 336   | 336   | 32   |
| 180° | 335   | 335   | 335   | 335   | 335   |      |



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**CANDELA DISTRIBUTION (FULL):**

|        | 0°      | 22.5°   | 45°     | 67.5°   | 90°     |
|--------|---------|---------|---------|---------|---------|
| 0°     | 13389.2 | 13389.2 | 13389.2 | 13389.2 | 13389.2 |
| 2.5°   | 13434.1 | 13434.1 | 13434.1 | 13434.1 | 13434.1 |
| 5°     | 13514.4 | 13514.4 | 13514.4 | 13514.4 | 13514.4 |
| 7.5°   | 13672.1 | 13672.1 | 13672.1 | 13672.1 | 13672.1 |
| 10°    | 13915.0 | 13915.0 | 13915.0 | 13915.0 | 13915.0 |
| 12.5°  | 14230.6 | 14230.6 | 14230.6 | 14230.6 | 14230.6 |
| 15°    | 14611.0 | 14611.0 | 14611.0 | 14611.0 | 14611.0 |
| 17.5°  | 15046.4 | 15046.4 | 15046.4 | 15046.4 | 15046.4 |
| 20°    | 15516.5 | 15516.5 | 15516.5 | 15516.5 | 15516.5 |
| 22.5°  | 15989.9 | 15989.9 | 15989.9 | 15989.9 | 15989.9 |
| 25°    | 16389.5 | 16389.5 | 16389.5 | 16389.5 | 16389.5 |
| 27.5°  | 16604.5 | 16604.5 | 16604.5 | 16604.5 | 16604.5 |
| 30°    | 16546.8 | 16546.8 | 16546.8 | 16546.8 | 16546.8 |
| 32.5°  | 16056.2 | 16056.2 | 16056.2 | 16056.2 | 16056.2 |
| 35°    | 15028.2 | 15028.2 | 15028.2 | 15028.2 | 15028.2 |
| 37.5°  | 13425.0 | 13425.0 | 13425.0 | 13425.0 | 13425.0 |
| 40°    | 11261.3 | 11261.3 | 11261.3 | 11261.3 | 11261.3 |
| 42.5°  | 8814.2  | 8814.2  | 8814.2  | 8814.2  | 8814.2  |
| 45°    | 6497.5  | 6497.5  | 6497.5  | 6497.5  | 6497.5  |
| 47.5°  | 4644.1  | 4644.1  | 4644.1  | 4644.1  | 4644.1  |
| 50°    | 3465.6  | 3465.6  | 3465.6  | 3465.6  | 3465.6  |
| 52.5°  | 2806.1  | 2806.1  | 2806.1  | 2806.1  | 2806.1  |
| 55°    | 2377.7  | 2377.7  | 2377.7  | 2377.7  | 2377.7  |
| 57.5°  | 2064.8  | 2064.8  | 2064.8  | 2064.8  | 2064.8  |
| 60°    | 1814.4  | 1814.4  | 1814.4  | 1814.4  | 1814.4  |
| 62.5°  | 1605.7  | 1605.7  | 1605.7  | 1605.7  | 1605.7  |
| 65°    | 1422.9  | 1422.9  | 1422.9  | 1422.9  | 1422.9  |
| 67.5°  | 1261.3  | 1261.3  | 1261.3  | 1261.3  | 1261.3  |
| 70°    | 1100.3  | 1100.3  | 1100.3  | 1100.3  | 1100.3  |
| 72.5°  | 939.8   | 939.8   | 939.8   | 939.8   | 939.8   |
| 75°    | 780.5   | 780.5   | 780.5   | 780.5   | 780.5   |
| 77.5°  | 626.9   | 626.9   | 626.9   | 626.9   | 626.9   |
| 80°    | 475.0   | 475.0   | 475.0   | 475.0   | 475.0   |
| 82.5°  | 325.8   | 325.8   | 325.8   | 325.8   | 325.8   |
| 85°    | 183.0   | 183.0   | 183.0   | 183.0   | 183.0   |
| 87.5°  | 57.7    | 57.7    | 57.7    | 57.7    | 57.7    |
| 90°    | 24.8    | 39.4    | 66.7    | 43.0    | 24.8    |
| 92.5°  | 35.2    | 58.9    | 106.2   | 55.3    | 31.5    |
| 95°    | 41.2    | 68.5    | 148.7   | 74.0    | 46.6    |
| 97.5°  | 52.1    | 75.8    | 170.6   | 90.4    | 72.2    |
| 100°   | 68.5    | 88.6    | 265.4   | 110.4   | 95.9    |
| 102.5° | 115.9   | 187.0   | 562.5   | 207.0   | 145.1   |
| 105°   | 199.7   | 393.0   | 1001.7  | 433.1   | 263.5   |
| 107.5° | 345.6   | 702.8   | 1320.8  | 766.6   | 498.7   |
| 110°   | 645.0   | 933.0   | 1385.1  | 1053.3  | 798.1   |



TEST NUMBER: P1433239

CATALOG NUMBER: EHBR1-36-UNV-W-L930-UPL36

**CANDELA DISTRIBUTION (continued):**

|        | 0°    | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|-------|--------|--------|--------|--------|
| 112.5° | 871.1 | 1002.3 | 1326.7 | 1162.7 | 1038.7 |
| 115°   | 916.6 | 964.0  | 1184.6 | 1135.3 | 1128.1 |
| 117.5° | 885.6 | 880.2  | 1005.9 | 1020.5 | 1089.8 |
| 120°   | 820.0 | 783.6  | 840.1  | 891.1  | 984.1  |
| 122.5° | 738.0 | 694.3  | 719.8  | 758.0  | 851.0  |
| 125°   | 661.9 | 618.2  | 634.7  | 643.8  | 722.1  |
| 127.5° | 594.6 | 565.3  | 574.5  | 563.6  | 612.7  |
| 130°   | 549.5 | 524.0  | 536.7  | 511.2  | 535.0  |
| 132.5° | 512.3 | 495.9  | 510.4  | 479.4  | 486.7  |
| 135°   | 485.5 | 470.9  | 487.3  | 458.1  | 456.4  |
| 137.5° | 462.3 | 449.6  | 466.0  | 444.1  | 438.6  |
| 140°   | 441.6 | 430.6  | 448.8  | 432.4  | 428.7  |
| 142.5° | 418.4 | 411.1  | 432.9  | 422.0  | 418.4  |
| 145°   | 402.5 | 397.0  | 420.7  | 415.3  | 413.4  |
| 147.5° | 388.4 | 384.8  | 406.6  | 404.8  | 404.8  |
| 150°   | 375.7 | 372.1  | 393.9  | 392.1  | 393.9  |
| 152.5° | 363.0 | 359.3  | 379.4  | 377.5  | 379.4  |
| 155°   | 354.3 | 350.7  | 367.1  | 367.1  | 367.1  |
| 157.5° | 347.0 | 345.2  | 358.0  | 358.0  | 358.0  |
| 160°   | 342.1 | 340.3  | 351.2  | 351.2  | 349.4  |
| 162.5° | 337.2 | 335.3  | 348.1  | 346.3  | 346.3  |
| 165°   | 333.6 | 333.6  | 342.6  | 342.6  | 340.9  |
| 167.5° | 333.6 | 331.7  | 340.9  | 340.9  | 339.0  |
| 170°   | 331.7 | 331.7  | 339.0  | 337.2  | 335.3  |
| 172.5° | 332.2 | 332.2  | 339.5  | 337.7  | 335.9  |
| 175°   | 331.0 | 331.0  | 336.4  | 336.4  | 336.4  |
| 177.5° | 332.8 | 332.8  | 336.4  | 336.4  | 334.6  |
| 180°   | 335.2 | 335.2  | 335.2  | 335.2  | 335.2  |



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**CIE UGR TABLE:**

| Reflectances:   |      |                  |       |       |       |       |                |       |       |       |       |
|-----------------|------|------------------|-------|-------|-------|-------|----------------|-------|-------|-------|-------|
| Ceiling         |      | 0.7              | 0.7   | 0.5   | 0.5   | 0.3   | 0.7            | 0.7   | 0.5   | 0.5   | 0.3   |
| Wall            |      | 0.5              | 0.3   | 0.5   | 0.3   | 0.3   | 0.5            | 0.3   | 0.5   | 0.3   | 0.3   |
| Reference plane |      | 0.2              | 0.2   | 0.2   | 0.2   | 0.2   | 0.2            | 0.2   | 0.2   | 0.2   | 0.2   |
| Room dimensions |      | Viewed crosswise |       |       |       |       | Viewed endwise |       |       |       |       |
| X=2H            | Y=2H | 18.16            | 19.32 | 18.68 | 19.82 | 20.36 | 18.16          | 19.32 | 18.68 | 19.82 | 20.36 |
|                 | 3H   | 19.66            | 20.69 | 20.19 | 21.20 | 21.78 | 19.66          | 20.69 | 20.19 | 21.20 | 21.78 |
|                 | 4H   | 20.22            | 21.18 | 20.77 | 21.71 | 22.31 | 20.22          | 21.18 | 20.77 | 21.71 | 22.31 |
|                 | 6H   | 20.60            | 21.49 | 21.17 | 22.03 | 22.64 | 20.60          | 21.49 | 21.17 | 22.03 | 22.64 |
|                 | 8H   | 20.70            | 21.54 | 21.28 | 22.10 | 22.72 | 20.70          | 21.54 | 21.28 | 22.10 | 22.72 |
|                 | 12H  | 20.74            | 21.54 | 21.32 | 22.09 | 22.73 | 20.74          | 21.54 | 21.32 | 22.09 | 22.73 |
| 4H              | 2H   | 18.60            | 19.57 | 19.16 | 20.09 | 20.69 | 18.60          | 19.57 | 19.16 | 20.09 | 20.69 |
|                 | 3H   | 20.32            | 21.11 | 20.89 | 21.68 | 22.30 | 20.32          | 21.11 | 20.89 | 21.68 | 22.30 |
|                 | 4H   | 21.00            | 21.71 | 21.58 | 22.29 | 22.94 | 21.00          | 21.71 | 21.58 | 22.29 | 22.94 |
|                 | 6H   | 21.49            | 22.11 | 22.10 | 22.71 | 23.38 | 21.49          | 22.11 | 22.10 | 22.71 | 23.38 |
|                 | 8H   | 21.62            | 22.20 | 22.24 | 22.80 | 23.48 | 21.62          | 22.20 | 22.24 | 22.80 | 23.48 |
|                 | 12H  | 21.68            | 22.19 | 22.31 | 22.82 | 23.50 | 21.68          | 22.19 | 22.31 | 22.82 | 23.50 |
| 8H              | 4H   | 21.20            | 21.77 | 21.81 | 22.38 | 23.05 | 21.20          | 21.77 | 21.81 | 22.38 | 23.05 |
|                 | 6H   | 21.79            | 22.26 | 22.44 | 22.91 | 23.59 | 21.79          | 22.26 | 22.44 | 22.91 | 23.59 |
|                 | 8H   | 21.98            | 22.40 | 22.64 | 23.06 | 23.76 | 21.98          | 22.40 | 22.64 | 23.06 | 23.76 |
|                 | 12H  | 22.09            | 22.46 | 22.74 | 23.10 | 23.87 | 22.09          | 22.46 | 22.74 | 23.10 | 23.87 |
| 12H             | 4H   | 21.19            | 21.70 | 21.82 | 22.33 | 23.01 | 21.19          | 21.70 | 21.82 | 22.33 | 23.01 |
|                 | 6H   | 21.81            | 22.23 | 22.47 | 22.89 | 23.58 | 21.81          | 22.23 | 22.47 | 22.89 | 23.58 |
|                 | 8H   | 22.03            | 22.40 | 22.69 | 23.05 | 23.81 | 22.03          | 22.40 | 22.69 | 23.05 | 23.81 |

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

Report Prepared for

Cooper Lighting Solutions

Metalux

Report Number: SP1-2506-472-5

Test Date: 08/01/2025

Luminaire Tested: EHBR-60-L930-N

Data in this report applies to families of products including EHBR-60-L930-N

**Test Information**

Test Method: LM-79-2019  
 Report Number: SP1-2506-472-5  
 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-L930-N**  
 Description: Elevate Round Highbay at, 60000 lumens, 3000K 90CRI LEDs with N lens

**Spectral Parameters**

CCT (K): 2996  
 CIE u': 0.2519  
 CIE v': 0.5169  
 Duv: -0.0033  
 CIE x: 0.4325  
 CIE y: 0.3945  
 CIE z: 0.1730  
 Peak Wavelength (nm): 630  
 Dominant Wavelength (nm): 584  
 Purity: 48.21818  
 Rf: 91.3  
 Rg: 102

|           |      |      |      |
|-----------|------|------|------|
| CRI (Ra): | 94.4 |      |      |
| R1:       | 96.8 | R9:  | 61.4 |
| R2:       | 98.1 | R10: | 94.4 |
| R3:       | 97.8 | R11: | 95.7 |
| R4:       | 95.6 | R12: | 88.5 |
| R5:       | 96.9 | R13: | 97.3 |
| R6:       | 95.7 | R14: | 97.8 |
| R7:       | 90.9 | R15: | 92.3 |
| R8:       | 83.0 |      |      |



**Test Conditions**

Stabilization Time: 40M  
 Operation Time: 1H 40M  
 Sphere Temperature (°C): 25.0

REPORT NUMBER: SP1-2506-472-5

| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | 76INCH SPHERE IN0058  | 6/16/2025        | 12/16/2025           |
| Power Meter                    | XITRON INXT2011004    | 1/21/2025        | 1/21/2026            |
| AC Power Source                | CHROMA 61603 IN0063   | 10/22/2024       | 10/22/2025           |
| DC Power Source                | AGILENT E3634A IN0208 | 10/22/2024       | 10/22/2025           |
| Sphere Thermometer             | ONSET IN0085          | 10/22/2024       | 10/22/2025           |
| Room Thermometer               | ONSET IN0046          | 10/22/2024       | 10/22/2025           |

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CIE 1931 Chromaticity Diagram



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



Point lies inside the ANSI 3000K 7-step quadrangle

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**Photopic Flux vs. Wavelength**



**Photopic Lumens: NR**

| $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) | $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) | $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) | $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) | $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) |
|-------------------|-----------------------------|-------------------------|-------------------|-----------------------------|-------------------------|-------------------|-----------------------------|-------------------------|-------------------|-----------------------------|-------------------------|-------------------|-----------------------------|-------------------------|
| 360               | 0                           | NR                      | 490               | 101                         | NR                      | 620               | 317                         | NR                      | 750               | 7                           | NR                      | 880               | 0                           | NR                      |
| 365               | 0                           | NR                      | 495               | 121                         | NR                      | 625               | 320                         | NR                      | 755               | 6                           | NR                      | 885               | 0                           | NR                      |
| 370               | 0                           | NR                      | 500               | 141                         | NR                      | 630               | 1000                        | NR                      | 760               | 5                           | NR                      | 890               | 0                           | NR                      |
| 375               | 0                           | NR                      | 505               | 158                         | NR                      | 635               | 651                         | NR                      | 765               | 4                           | NR                      | 895               | 0                           | NR                      |
| 380               | 0                           | NR                      | 510               | 171                         | NR                      | 640               | 207                         | NR                      | 770               | 4                           | NR                      | 900               | 0                           | NR                      |
| 385               | 0                           | NR                      | 515               | 182                         | NR                      | 645               | 201                         | NR                      | 775               | 3                           | NR                      | 905               | 0                           | NR                      |
| 390               | 0                           | NR                      | 520               | 189                         | NR                      | 650               | 174                         | NR                      | 780               | 3                           | NR                      | 910               | 0                           | NR                      |
| 395               | 1                           | NR                      | 525               | 194                         | NR                      | 655               | 146                         | NR                      | 785               | 2                           | NR                      | 915               | 0                           | NR                      |
| 400               | 1                           | NR                      | 530               | 199                         | NR                      | 660               | 124                         | NR                      | 790               | 2                           | NR                      | 920               | 0                           | NR                      |
| 405               | 3                           | NR                      | 535               | 205                         | NR                      | 665               | 105                         | NR                      | 795               | 2                           | NR                      | 925               | 0                           | NR                      |
| 410               | 4                           | NR                      | 540               | 210                         | NR                      | 670               | 96                          | NR                      | 800               | 1                           | NR                      | 930               | 0                           | NR                      |
| 415               | 7                           | NR                      | 545               | 216                         | NR                      | 675               | 79                          | NR                      | 805               | 1                           | NR                      | 935               | 0                           | NR                      |
| 420               | 13                          | NR                      | 550               | 222                         | NR                      | 680               | 67                          | NR                      | 810               | 1                           | NR                      | 940               | 0                           | NR                      |
| 425               | 22                          | NR                      | 555               | 230                         | NR                      | 685               | 58                          | NR                      | 815               | 1                           | NR                      | 945               | 0                           | NR                      |
| 430               | 37                          | NR                      | 560               | 240                         | NR                      | 690               | 49                          | NR                      | 820               | 1                           | NR                      | 950               | 0                           | NR                      |
| 435               | 60                          | NR                      | 565               | 248                         | NR                      | 695               | 42                          | NR                      | 825               | 1                           | NR                      | 955               | 0                           | NR                      |
| 440               | 101                         | NR                      | 570               | 258                         | NR                      | 700               | 36                          | NR                      | 830               | 1                           | NR                      | 960               | 0                           | NR                      |
| 445               | 172                         | NR                      | 575               | 268                         | NR                      | 705               | 30                          | NR                      | 835               | 1                           | NR                      | 965               | 0                           | NR                      |
| 450               | 223                         | NR                      | 580               | 278                         | NR                      | 710               | 26                          | NR                      | 840               | 1                           | NR                      | 970               | 0                           | NR                      |
| 455               | 167                         | NR                      | 585               | 287                         | NR                      | 715               | 22                          | NR                      | 845               | 0                           | NR                      | 975               | 0                           | NR                      |
| 460               | 126                         | NR                      | 590               | 295                         | NR                      | 720               | 19                          | NR                      | 850               | 0                           | NR                      | 980               | 0                           | NR                      |
| 465               | 111                         | NR                      | 595               | 298                         | NR                      | 725               | 16                          | NR                      | 855               | 0                           | NR                      | 985               | 0                           | NR                      |
| 470               | 86                          | NR                      | 600               | 303                         | NR                      | 730               | 14                          | NR                      | 860               | 0                           | NR                      | 990               | 0                           | NR                      |
| 475               | 74                          | NR                      | 605               | 307                         | NR                      | 735               | 12                          | NR                      | 865               | 0                           | NR                      | 995               | 0                           | NR                      |
| 480               | 77                          | NR                      | 610               | 341                         | NR                      | 740               | 10                          | NR                      | 870               | 0                           | NR                      | 1000              | 0                           | NR                      |
| 485               | 86                          | NR                      | 615               | 368                         | NR                      | 745               | 8                           | NR                      | 875               | 0                           | NR                      |                   |                             |                         |

REPORT NUMBER: SP1-2506-472-5

**Scotopic Flux vs. Wavelength**



**Scotopic Lumens: NR**

**S/P: 1.44**

| 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    | 101                      | NR            | 620    | 317                      | NR            | 750    | 7                        | NR            | 880    | 0                        | NR            |
| 365    | 0                        | NR            | 495    | 121                      | NR            | 625    | 320                      | NR            | 755    | 6                        | NR            | 885    | 0                        | NR            |
| 370    | 0                        | NR            | 500    | 141                      | NR            | 630    | 1000                     | NR            | 760    | 5                        | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 158                      | NR            | 635    | 651                      | NR            | 765    | 4                        | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 171                      | NR            | 640    | 207                      | NR            | 770    | 4                        | NR            | 900    | 0                        | NR            |
| 385    | 0                        | NR            | 515    | 182                      | NR            | 645    | 201                      | NR            | 775    | 3                        | NR            | 905    | 0                        | NR            |
| 390    | 0                        | NR            | 520    | 189                      | NR            | 650    | 174                      | NR            | 780    | 3                        | NR            | 910    | 0                        | NR            |
| 395    | 1                        | NR            | 525    | 194                      | NR            | 655    | 146                      | NR            | 785    | 2                        | NR            | 915    | 0                        | NR            |
| 400    | 1                        | NR            | 530    | 199                      | NR            | 660    | 124                      | NR            | 790    | 2                        | NR            | 920    | 0                        | NR            |
| 405    | 3                        | NR            | 535    | 205                      | NR            | 665    | 105                      | NR            | 795    | 2                        | NR            | 925    | 0                        | NR            |
| 410    | 4                        | NR            | 540    | 210                      | NR            | 670    | 96                       | NR            | 800    | 1                        | NR            | 930    | 0                        | NR            |
| 415    | 7                        | NR            | 545    | 216                      | NR            | 675    | 79                       | NR            | 805    | 1                        | NR            | 935    | 0                        | NR            |
| 420    | 13                       | NR            | 550    | 222                      | NR            | 680    | 67                       | NR            | 810    | 1                        | NR            | 940    | 0                        | NR            |
| 425    | 22                       | NR            | 555    | 230                      | NR            | 685    | 58                       | NR            | 815    | 1                        | NR            | 945    | 0                        | NR            |
| 430    | 37                       | NR            | 560    | 240                      | NR            | 690    | 49                       | NR            | 820    | 1                        | NR            | 950    | 0                        | NR            |
| 435    | 60                       | NR            | 565    | 248                      | NR            | 695    | 42                       | NR            | 825    | 1                        | NR            | 955    | 0                        | NR            |
| 440    | 101                      | NR            | 570    | 258                      | NR            | 700    | 36                       | NR            | 830    | 1                        | NR            | 960    | 0                        | NR            |
| 445    | 172                      | NR            | 575    | 268                      | NR            | 705    | 30                       | NR            | 835    | 1                        | NR            | 965    | 0                        | NR            |
| 450    | 223                      | NR            | 580    | 278                      | NR            | 710    | 26                       | NR            | 840    | 1                        | NR            | 970    | 0                        | NR            |
| 455    | 167                      | NR            | 585    | 287                      | NR            | 715    | 22                       | NR            | 845    | 0                        | NR            | 975    | 0                        | NR            |
| 460    | 126                      | NR            | 590    | 295                      | NR            | 720    | 19                       | NR            | 850    | 0                        | NR            | 980    | 0                        | NR            |
| 465    | 111                      | NR            | 595    | 298                      | NR            | 725    | 16                       | NR            | 855    | 0                        | NR            | 985    | 0                        | NR            |
| 470    | 86                       | NR            | 600    | 303                      | NR            | 730    | 14                       | NR            | 860    | 0                        | NR            | 990    | 0                        | NR            |
| 475    | 74                       | NR            | 605    | 307                      | NR            | 735    | 12                       | NR            | 865    | 0                        | NR            | 995    | 0                        | NR            |
| 480    | 77                       | NR            | 610    | 341                      | NR            | 740    | 10                       | NR            | 870    | 0                        | NR            | 1000   | 0                        | NR            |
| 485    | 86                       | NR            | 615    | 368                      | NR            | 745    | 8                        | NR            | 875    | 0                        | NR            |        |                          |               |

REPORT NUMBER: SP1-2506-472-5

Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 2.85

| 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    | 101                      | NR            | 620    | 317                      | NR            | 750    | 7                        | NR            | 880    | 0                        | NR            |
| 365    | 0                        | NR            | 495    | 121                      | NR            | 625    | 320                      | NR            | 755    | 6                        | NR            | 885    | 0                        | NR            |
| 370    | 0                        | NR            | 500    | 141                      | NR            | 630    | 1000                     | NR            | 760    | 5                        | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 158                      | NR            | 635    | 651                      | NR            | 765    | 4                        | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 171                      | NR            | 640    | 207                      | NR            | 770    | 4                        | NR            | 900    | 0                        | NR            |
| 385    | 0                        | NR            | 515    | 182                      | NR            | 645    | 201                      | NR            | 775    | 3                        | NR            | 905    | 0                        | NR            |
| 390    | 0                        | NR            | 520    | 189                      | NR            | 650    | 174                      | NR            | 780    | 3                        | NR            | 910    | 0                        | NR            |
| 395    | 1                        | NR            | 525    | 194                      | NR            | 655    | 146                      | NR            | 785    | 2                        | NR            | 915    | 0                        | NR            |
| 400    | 1                        | NR            | 530    | 199                      | NR            | 660    | 124                      | NR            | 790    | 2                        | NR            | 920    | 0                        | NR            |
| 405    | 3                        | NR            | 535    | 205                      | NR            | 665    | 105                      | NR            | 795    | 2                        | NR            | 925    | 0                        | NR            |
| 410    | 4                        | NR            | 540    | 210                      | NR            | 670    | 96                       | NR            | 800    | 1                        | NR            | 930    | 0                        | NR            |
| 415    | 7                        | NR            | 545    | 216                      | NR            | 675    | 79                       | NR            | 805    | 1                        | NR            | 935    | 0                        | NR            |
| 420    | 13                       | NR            | 550    | 222                      | NR            | 680    | 67                       | NR            | 810    | 1                        | NR            | 940    | 0                        | NR            |
| 425    | 22                       | NR            | 555    | 230                      | NR            | 685    | 58                       | NR            | 815    | 1                        | NR            | 945    | 0                        | NR            |
| 430    | 37                       | NR            | 560    | 240                      | NR            | 690    | 49                       | NR            | 820    | 1                        | NR            | 950    | 0                        | NR            |
| 435    | 60                       | NR            | 565    | 248                      | NR            | 695    | 42                       | NR            | 825    | 1                        | NR            | 955    | 0                        | NR            |
| 440    | 101                      | NR            | 570    | 258                      | NR            | 700    | 36                       | NR            | 830    | 1                        | NR            | 960    | 0                        | NR            |
| 445    | 172                      | NR            | 575    | 268                      | NR            | 705    | 30                       | NR            | 835    | 1                        | NR            | 965    | 0                        | NR            |
| 450    | 223                      | NR            | 580    | 278                      | NR            | 710    | 26                       | NR            | 840    | 1                        | NR            | 970    | 0                        | NR            |
| 455    | 167                      | NR            | 585    | 287                      | NR            | 715    | 22                       | NR            | 845    | 0                        | NR            | 975    | 0                        | NR            |
| 460    | 126                      | NR            | 590    | 295                      | NR            | 720    | 19                       | NR            | 850    | 0                        | NR            | 980    | 0                        | NR            |
| 465    | 111                      | NR            | 595    | 298                      | NR            | 725    | 16                       | NR            | 855    | 0                        | NR            | 985    | 0                        | NR            |
| 470    | 86                       | NR            | 600    | 303                      | NR            | 730    | 14                       | NR            | 860    | 0                        | NR            | 990    | 0                        | NR            |
| 475    | 74                       | NR            | 605    | 307                      | NR            | 735    | 12                       | NR            | 865    | 0                        | NR            | 995    | 0                        | NR            |
| 480    | 77                       | NR            | 610    | 341                      | NR            | 740    | 10                       | NR            | 870    | 0                        | NR            | 1000   | 0                        | NR            |
| 485    | 86                       | NR            | 615    | 368                      | NR            | 745    | 8                        | NR            | 875    | 0                        | NR            |        |                          |               |

**Summary**

$R_f = 91.3$   
 $R_g = 102$   
 $CIE R_a = 94.4$   
 $R_9 = 61.4$



**Color Vector Graphics**



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 91 | CES51 = 96 | CES76 = 89 |
| CES02 = 63 | CES27 = 96 | CES52 = 95 | CES77 = 85 |
| CES03 = 32 | CES28 = 96 | CES53 = 93 | CES78 = 86 |
| CES04 = 70 | CES29 = 90 | CES54 = 98 | CES79 = 89 |
| CES05 = 51 | CES30 = 96 | CES55 = 98 | CES80 = 91 |
| CES06 = 51 | CES31 = 90 | CES56 = 95 | CES81 = 72 |
| CES07 = 44 | CES32 = 84 | CES57 = 95 | CES82 = 95 |
| CES08 = 42 | CES33 = 91 | CES58 = 95 | CES83 = 93 |
| CES09 = 29 | CES34 = 92 | CES59 = 99 | CES84 = 96 |
| CES10 = 76 | CES35 = 96 | CES60 = 96 | CES85 = 80 |
| CES11 = 59 | CES36 = 90 | CES61 = 96 | CES86 = 77 |
| CES12 = 65 | CES37 = 94 | CES62 = 95 | CES87 = 91 |
| CES13 = 44 | CES38 = 99 | CES63 = 94 | CES88 = 96 |
| CES14 = 74 | CES39 = 97 | CES64 = 96 | CES89 = 82 |
| CES15 = 72 | CES40 = 94 | CES65 = 92 | CES90 = 97 |
| CES16 = 48 | CES41 = 94 | CES66 = 95 | CES91 = 82 |
| CES17 = 50 | CES42 = 91 | CES67 = 94 | CES92 = 78 |
| CES18 = 57 | CES43 = 88 | CES68 = 93 | CES93 = 87 |
| CES19 = 72 | CES44 = 99 | CES69 = 94 | CES94 = 73 |
| CES20 = 67 | CES45 = 93 | CES70 = 90 | CES95 = 85 |
| CES21 = 86 | CES46 = 93 | CES71 = 90 | CES96 = 92 |
| CES22 = 79 | CES47 = 86 | CES72 = 96 | CES97 = 93 |
| CES23 = 92 | CES48 = 95 | CES73 = 85 | CES98 = 94 |
| CES24 = 91 | CES49 = 91 | CES74 = 90 | CES99 = 93 |
| CES25 = 72 | CES50 = 96 | CES75 = 90 |            |



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)