

Scaled data based on original data using

LM-41-14 Approved Method for Photometric Testing Of Indoor Fluorescent Luminaires

Test Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

Brand: METALUX

Report Number: 236P317

Luminaire Tested: **HBE-632-N-UNV-EB82-UPL-U**

Issue Date: 3/3/2020



**Test Information**

Test Method: LM-41-14  
Report Number: 236P317  
Test Lab: METALUX RESEARCH LABS  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: METALUX  
Catalog Number: HBE-632-N-UNV-EB82-UPL-U  
Description: OPEN HIGH BAY LUMINAIRE WITH SIDE ENCLOSURES AND SPECULAR REFLECTOR, NARROW DISTRIBUTION WITH UPLIGHT  
Light Source: -  
SIX 32 WATT T8 - 3100 LUMENS EA  
Ballast/Driver: -

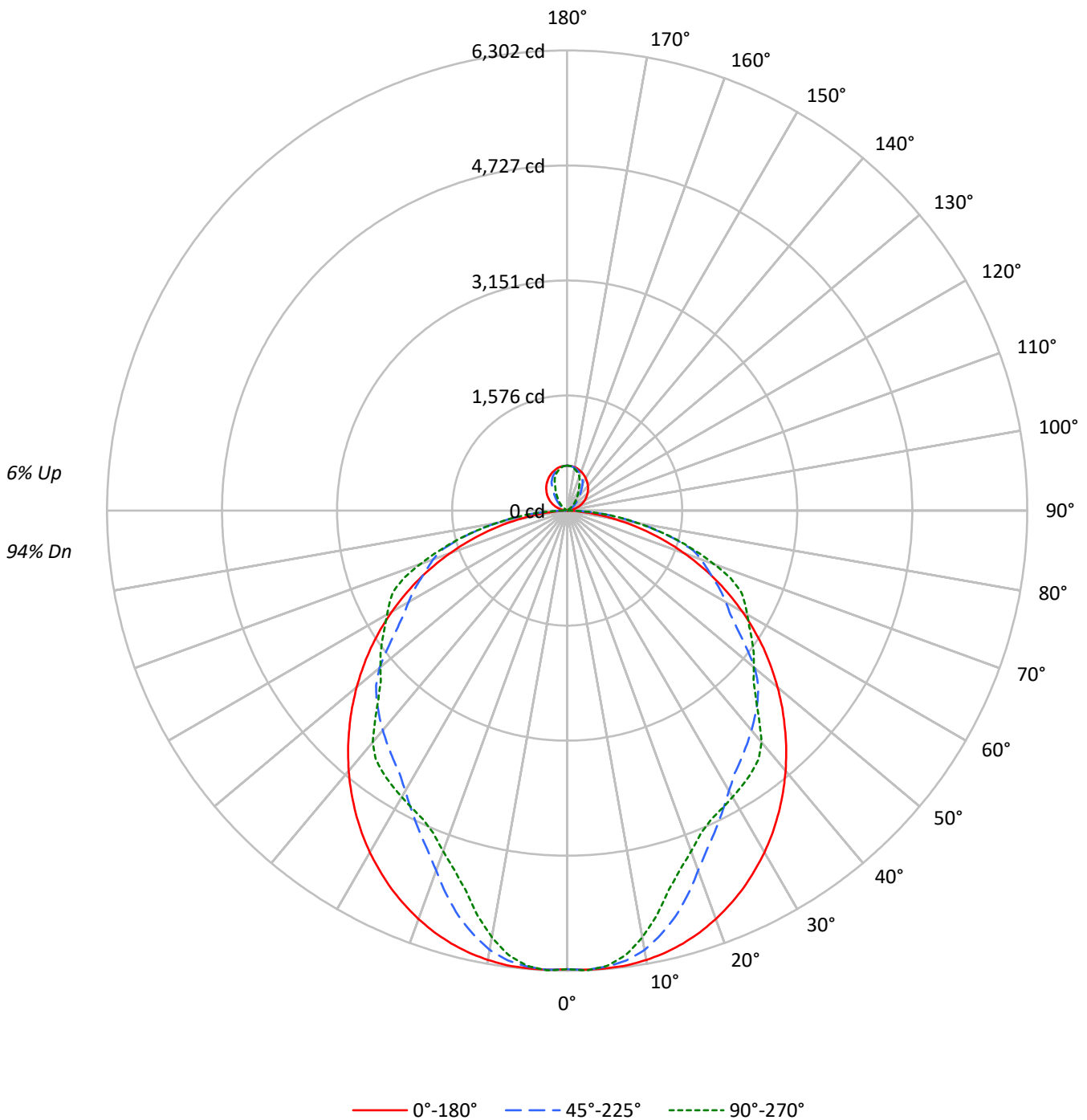
**Summary**

Lumens per Lamp: 3100 (6 lamps)  
Luminaire Lumens: 18107.3 lumens  
Efficiency: 97.4%  
Efficacy: 81.2 lumens/watt  
Spacing Criteria (0/90/45): 1.27 / 1.07 / 1.28  
Luminous Opening: Rectangular (W 1.65' x L: 4' x H: 0')  
CIE Type: Direct

Input Watts (W): 223  
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: 25 FT

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### Luminous Intensity Polar Plot





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**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 | 0  |
| RCR |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |    |    |    |
| 0   | 114 | 114 | 114 | 114 | 111 | 111 | 111 | 111 | 105 | 105 | 105 | 99 | 99 | 99 | 94 | 94 | 94 | 91 |
| 1   | 104 | 99  | 95  | 91  | 101 | 96  | 92  | 89  | 91  | 88  | 85  | 86 | 83 | 81 | 82 | 80 | 78 | 75 |
| 2   | 94  | 86  | 79  | 73  | 91  | 83  | 77  | 72  | 79  | 74  | 69  | 75 | 70 | 67 | 71 | 67 | 64 | 62 |
| 3   | 86  | 75  | 67  | 60  | 83  | 73  | 65  | 59  | 69  | 63  | 58  | 66 | 60 | 56 | 63 | 58 | 54 | 52 |
| 4   | 78  | 66  | 58  | 51  | 75  | 65  | 56  | 50  | 61  | 54  | 49  | 58 | 52 | 48 | 56 | 51 | 46 | 44 |
| 5   | 72  | 59  | 50  | 44  | 69  | 58  | 49  | 43  | 55  | 48  | 42  | 52 | 46 | 41 | 50 | 45 | 40 | 38 |
| 6   | 66  | 53  | 44  | 38  | 64  | 52  | 44  | 38  | 50  | 42  | 37  | 47 | 41 | 36 | 45 | 40 | 35 | 33 |
| 7   | 62  | 48  | 40  | 34  | 59  | 47  | 39  | 33  | 45  | 38  | 33  | 43 | 37 | 32 | 41 | 36 | 31 | 29 |
| 8   | 57  | 44  | 36  | 30  | 55  | 43  | 35  | 30  | 41  | 34  | 29  | 40 | 33 | 29 | 38 | 32 | 28 | 26 |
| 9   | 54  | 40  | 32  | 27  | 52  | 40  | 32  | 27  | 38  | 31  | 26  | 37 | 30 | 26 | 35 | 30 | 25 | 24 |
| 10  | 50  | 37  | 30  | 24  | 49  | 37  | 29  | 24  | 35  | 29  | 24  | 34 | 28 | 24 | 33 | 27 | 23 | 21 |

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

|     | 0°    | 45°   | 90°   |
|-----|-------|-------|-------|
| 0°  | 10271 | 10271 | 10271 |
| 5°  | 10327 | 10287 | 10274 |
| 10° | 10375 | 10146 | 9850  |
| 15° | 10388 | 9733  | 9103  |
| 20° | 10358 | 9128  | 8639  |
| 25° | 10298 | 8688  | 8416  |
| 30° | 10204 | 8367  | 8554  |
| 35° | 10082 | 8291  | 8764  |
| 40° | 9933  | 8382  | 8841  |
| 45° | 9753  | 8528  | 8451  |
| 50° | 9569  | 8536  | 8486  |
| 55° | 9356  | 8133  | 8808  |
| 60° | 9068  | 8208  | 9310  |
| 65° | 8693  | 8558  | 10167 |
| 70° | 8156  | 9336  | 10216 |
| 75° | 7366  | 9798  | 9880  |
| 80° | 6092  | 9274  | 9265  |
| 85° | 3827  | 8329  | 8498  |



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**ZONAL LUMENS:**

**CANDELA DISTRIBUTION:**

| Zone      | Lumens  | % Fixture | % Lamp |      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|-----------|---------|-----------|--------|------|------|-------|------|-------|------|------|
| 0°-10°    | 593.0   | 3.3       | 3.2    | 0°   | 6282 | 6282  | 6282 | 6282  | 6282 |      |
| 10°-20°   | 1618.3  | 8.9       | 8.7    | 5°   | 6292 | 6284  | 6268 | 6249  | 6260 | 599  |
| 20°-30°   | 2313.3  | 12.8      | 12.4   | 15°  | 6137 | 6044  | 5750 | 5468  | 5378 | 1732 |
| 30°-40°   | 2755.5  | 15.2      | 14.8   | 25°  | 5708 | 5371  | 4816 | 4658  | 4665 | 2629 |
| 40°-50°   | 2860.8  | 15.8      | 15.4   | 35°  | 5051 | 4395  | 4154 | 4322  | 4391 | 3159 |
| 50°-60°   | 2645.3  | 14.6      | 14.2   | 45°  | 4218 | 3484  | 3688 | 3700  | 3655 | 3255 |
| 60°-70°   | 2260.5  | 12.5      | 12.2   | 55°  | 3282 | 2742  | 2853 | 3019  | 3090 | 2930 |
| 70°-80°   | 1492.7  | 8.2       | 8.0    | 65°  | 2247 | 2031  | 2212 | 2523  | 2628 | 2220 |
| 80°-90°   | 469.4   | 2.6       | 2.5    | 75°  | 1166 | 1209  | 1551 | 1559  | 1564 | 1234 |
| 90°-100°  | 23.2    | 0.1       | 0.1    | 85°  | 204  | 423   | 444  | 452   | 453  | 262  |
| 100°-110° | 39.9    | 0.2       | 0.2    | 90°  | 3    | 8     | 14   | 18    | 20   | 12   |
| 110°-120° | 72.0    | 0.4       | 0.4    | 95°  | 26   | 21    | 22   | 18    | 10   | 32   |
| 120°-130° | 121.9   | 0.7       | 0.7    | 105° | 121  | 24    | 25   | 23    | 19   | 130  |
| 130°-140° | 186.5   | 1.0       | 1.0    | 115° | 227  | 98    | 28   | 39    | 30   | 225  |
| 140°-150° | 220.6   | 1.2       | 1.2    | 125° | 320  | 203   | 106  | 47    | 34   | 287  |
| 150°-160° | 218.0   | 1.2       | 1.2    | 135° | 403  | 347   | 204  | 151   | 133  | 312  |
| 160°-170° | 159.0   | 0.9       | 0.9    | 145° | 477  | 446   | 334  | 267   | 245  | 299  |
| 170°-180° | 57.7    | 0.3       | 0.3    | 155° | 540  | 523   | 484  | 427   | 395  | 249  |
| 0°-30°    | 4524.6  | 25.0      | 24.3   | 165° | 588  | 583   | 565  | 549   | 543  | 166  |
| 0°-40°    | 7280.0  | 40.2      | 39.1   | 175° | 612  | 612   | 610  | 607   | 608  | 58   |
| 0°-60°    | 12786.1 | 70.6      | 68.7   | 180° | 615  | 615   | 615  | 615   | 615  |      |
| 0°-90°    | 17008.8 | 93.9      | 91.4   |      |      |       |      |       |      |      |
| 90°-120°  | 135.1   | 0.7       | 0.7    |      |      |       |      |       |      |      |
| 90°-150°  | 664.0   | 3.7       | 3.6    |      |      |       |      |       |      |      |
| 90°-180°  | 1099.0  | 6.1       | 5.9    |      |      |       |      |       |      |      |
| 0°-180°   | 18107.3 | 100.0     | 97.4   |      |      |       |      |       |      |      |



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**CANDELA DISTRIBUTION (FULL):**

|        | 0°   | 22.5° | 45°  | 67.5° | 90°  |
|--------|------|-------|------|-------|------|
| 0°     | 6282 | 6282  | 6282 | 6282  | 6282 |
| 2.5°   | 6293 | 6294  | 6293 | 6286  | 6302 |
| 5°     | 6292 | 6284  | 6268 | 6249  | 6260 |
| 7.5°   | 6282 | 6257  | 6216 | 6156  | 6141 |
| 10°    | 6249 | 6210  | 6111 | 5975  | 5933 |
| 12.5°  | 6203 | 6141  | 5944 | 5747  | 5675 |
| 15°    | 6137 | 6044  | 5750 | 5468  | 5378 |
| 17.5°  | 6053 | 5914  | 5509 | 5206  | 5149 |
| 20°    | 5953 | 5756  | 5246 | 5009  | 4965 |
| 22.5°  | 5836 | 5571  | 5012 | 4825  | 4785 |
| 25°    | 5708 | 5371  | 4816 | 4658  | 4665 |
| 27.5°  | 5559 | 5149  | 4619 | 4552  | 4597 |
| 30°    | 5405 | 4906  | 4432 | 4479  | 4531 |
| 32.5°  | 5234 | 4649  | 4270 | 4402  | 4465 |
| 35°    | 5051 | 4395  | 4154 | 4322  | 4391 |
| 37.5°  | 4858 | 4157  | 4041 | 4236  | 4302 |
| 40°    | 4654 | 3932  | 3927 | 4135  | 4142 |
| 42.5°  | 4441 | 3709  | 3810 | 3956  | 3892 |
| 45°    | 4218 | 3484  | 3688 | 3700  | 3655 |
| 47.5°  | 3995 | 3265  | 3550 | 3463  | 3462 |
| 50°    | 3762 | 3075  | 3356 | 3271  | 3336 |
| 52.5°  | 3524 | 2907  | 3097 | 3143  | 3221 |
| 55°    | 3282 | 2742  | 2853 | 3019  | 3090 |
| 57.5°  | 3029 | 2576  | 2650 | 2884  | 2958 |
| 60°    | 2773 | 2405  | 2510 | 2745  | 2847 |
| 62.5°  | 2512 | 2227  | 2367 | 2634  | 2744 |
| 65°    | 2247 | 2031  | 2212 | 2523  | 2628 |
| 67.5°  | 1975 | 1780  | 2073 | 2390  | 2423 |
| 70°    | 1706 | 1534  | 1953 | 2139  | 2137 |
| 72.5°  | 1436 | 1359  | 1809 | 1846  | 1848 |
| 75°    | 1166 | 1209  | 1551 | 1559  | 1564 |
| 77.5°  | 901  | 1052  | 1261 | 1272  | 1269 |
| 80°    | 647  | 913   | 985  | 984   | 984  |
| 82.5°  | 408  | 682   | 703  | 709   | 710  |
| 85°    | 204  | 423   | 444  | 452   | 453  |
| 87.5°  | 60   | 185   | 203  | 206   | 206  |
| 90°    | 3    | 8     | 14   | 18    | 20   |
| 92.5°  | 21   | 27    | 27   | 20    | 8    |
| 95°    | 26   | 21    | 22   | 18    | 10   |
| 97.5°  | 44   | 22    | 22   | 19    | 13   |
| 100°   | 71   | 24    | 23   | 20    | 16   |
| 102.5° | 98   | 24    | 24   | 22    | 18   |
| 105°   | 121  | 24    | 25   | 23    | 19   |
| 107.5° | 149  | 36    | 28   | 24    | 20   |
| 110°   | 177  | 55    | 34   | 25    | 23   |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°  | 22.5° | 45° | 67.5° | 90° |
|--------|-----|-------|-----|-------|-----|
| 112.5° | 202 | 76    | 26  | 28    | 24  |
| 115°   | 227 | 98    | 28  | 39    | 30  |
| 117.5° | 252 | 121   | 37  | 27    | 36  |
| 120°   | 276 | 149   | 58  | 27    | 25  |
| 122.5° | 298 | 175   | 81  | 32    | 25  |
| 125°   | 320 | 203   | 106 | 47    | 34  |
| 127.5° | 344 | 239   | 130 | 72    | 52  |
| 130°   | 364 | 276   | 151 | 100   | 77  |
| 132.5° | 384 | 314   | 176 | 128   | 106 |
| 135°   | 403 | 347   | 204 | 151   | 133 |
| 137.5° | 423 | 376   | 235 | 176   | 159 |
| 140°   | 443 | 402   | 265 | 203   | 184 |
| 142.5° | 461 | 424   | 297 | 234   | 212 |
| 145°   | 477 | 446   | 334 | 267   | 245 |
| 147.5° | 494 | 467   | 380 | 301   | 279 |
| 150°   | 511 | 488   | 422 | 336   | 315 |
| 152.5° | 526 | 506   | 457 | 378   | 349 |
| 155°   | 540 | 523   | 484 | 427   | 395 |
| 157.5° | 553 | 542   | 509 | 470   | 447 |
| 160°   | 565 | 558   | 530 | 503   | 490 |
| 162.5° | 577 | 571   | 548 | 529   | 520 |
| 165°   | 588 | 583   | 565 | 549   | 543 |
| 167.5° | 597 | 595   | 580 | 566   | 561 |
| 170°   | 604 | 602   | 593 | 583   | 580 |
| 172.5° | 608 | 608   | 603 | 598   | 596 |
| 175°   | 612 | 612   | 610 | 607   | 608 |
| 177.5° | 613 | 614   | 614 | 613   | 614 |
| 180°   | 615 | 615   | 615 | 615   | 615 |

(END OF REPORT)