

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: P30626

Luminaire Tested: **HBE-447T5-N-UNV-EBT1**

Issue Date: 3/3/2020



**Test Information**

Test Method: LM-41-14  
Report Number: P30626  
Test Lab: INNOVATION CENTER-P3  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: METALUX  
Catalog Number: HBE-447T5-N-UNV-EBT1  
Description: METALUX F-BAY HBE SERIES, ENCLOSED OPEN BODY FLUORESCENT WITH METAL SIDE RAILS, NARROW DISTRIBUTION SPECULAR ALUMINUM REFLECTOR, WITH NO UPLIGHT  
Light Source: (4) BIPIN T5 LINEAR FLUORESCENT LAMP 4100K - 4285 LUMENS EA  
GE F54T5-47W 841-ECO 47W  
Ballast/Driver: GE ELECTRONIC BALLAST  
GE 454MVPS90E

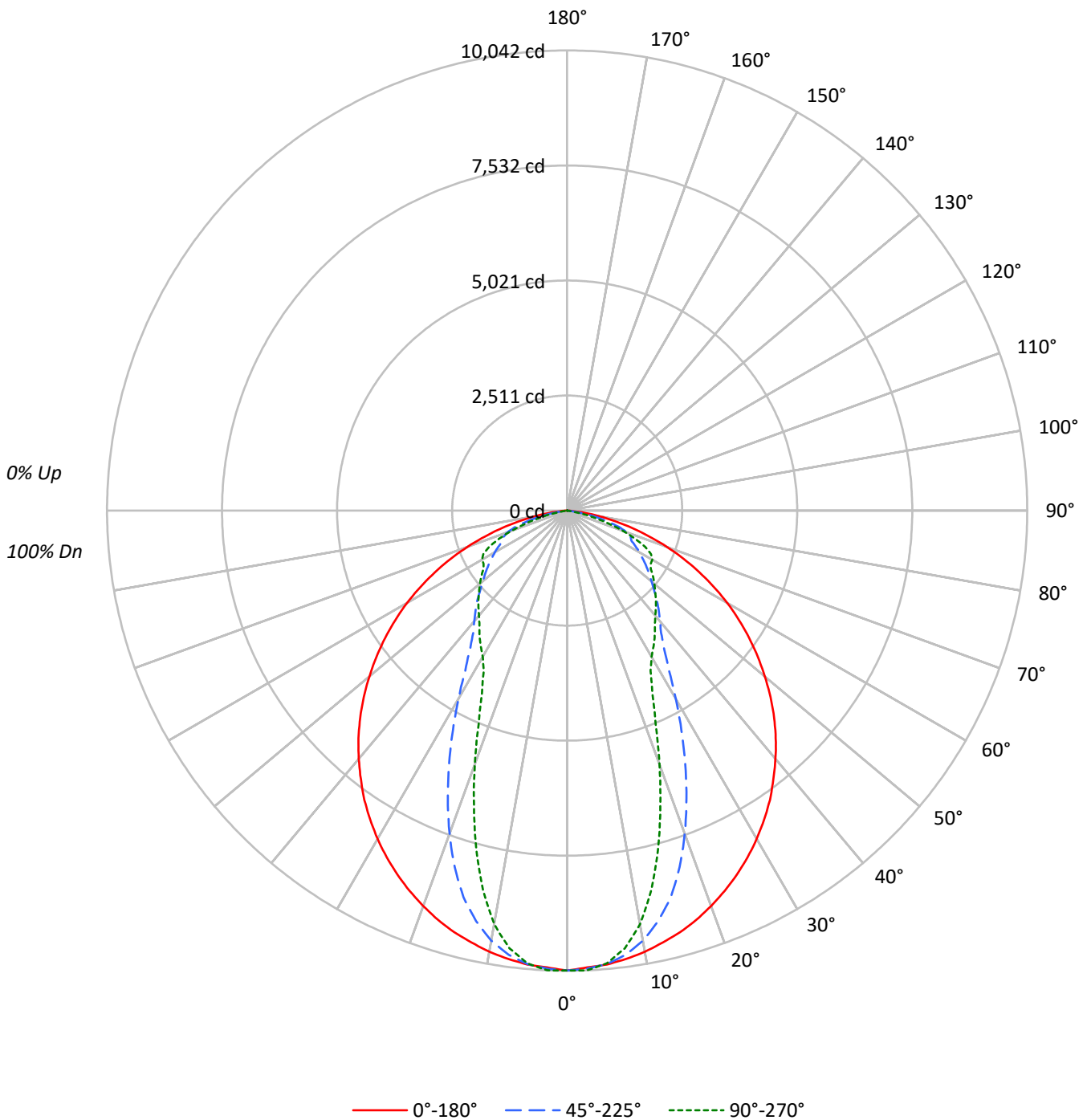
**Summary**

Lumens per Lamp: 4285 (4 lamps)  
Luminaire Lumens: 17025.5 lumens  
Efficiency: 99.3%  
Efficacy: 82.3 lumens/watt  
Spacing Criteria (0/90/45): 1.23 / 0.71 / 0.89  
Luminous Opening: Rectangular (W 1.23' x L: 4' x H: 0')  
CIE Type: Direct  
  
Input Watts (W): 206.8  
Input Voltage (V): NR  
Input Current (A<sub>in</sub>): 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   | 118 | 118 | 118 | 118 | 116 | 116 | 116 | 116 | 110 | 110 | 110 | 106 | 106 | 106 | 101 | 101 | 101 | 99 |
| 1   | 109 | 105 | 101 | 98  | 107 | 103 | 99  | 96  | 99  | 96  | 93  | 95  | 93  | 90  | 91  | 89  | 88  | 86 |
| 2   | 100 | 93  | 87  | 82  | 98  | 91  | 85  | 81  | 88  | 83  | 79  | 84  | 80  | 77  | 81  | 78  | 75  | 73 |
| 3   | 92  | 83  | 75  | 69  | 90  | 81  | 74  | 69  | 78  | 72  | 68  | 76  | 71  | 66  | 73  | 69  | 65  | 63 |
| 4   | 85  | 74  | 66  | 60  | 83  | 73  | 65  | 60  | 70  | 64  | 59  | 68  | 63  | 58  | 66  | 61  | 57  | 55 |
| 5   | 79  | 67  | 59  | 53  | 77  | 66  | 58  | 52  | 64  | 57  | 52  | 62  | 56  | 51  | 60  | 55  | 51  | 49 |
| 6   | 73  | 61  | 53  | 47  | 72  | 60  | 52  | 47  | 58  | 51  | 46  | 57  | 51  | 46  | 55  | 50  | 46  | 44 |
| 7   | 69  | 56  | 48  | 42  | 67  | 55  | 47  | 42  | 54  | 47  | 42  | 52  | 46  | 41  | 51  | 45  | 41  | 39 |
| 8   | 64  | 52  | 44  | 38  | 63  | 51  | 43  | 38  | 50  | 43  | 38  | 48  | 42  | 38  | 47  | 42  | 37  | 36 |
| 9   | 60  | 48  | 40  | 35  | 59  | 47  | 40  | 35  | 46  | 39  | 35  | 45  | 39  | 35  | 44  | 38  | 34  | 33 |
| 10  | 57  | 44  | 37  | 32  | 56  | 44  | 37  | 32  | 43  | 36  | 32  | 42  | 36  | 32  | 41  | 36  | 32  | 30 |

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

|     | 0°    | 45°   | 90°   |
|-----|-------|-------|-------|
| 0°  | 21974 | 21974 | 21974 |
| 5°  | 21851 | 21827 | 21796 |
| 10° | 21735 | 21181 | 20376 |
| 15° | 21588 | 19802 | 17370 |
| 20° | 21392 | 17487 | 13715 |
| 25° | 21173 | 14725 | 10609 |
| 30° | 20916 | 11965 | 9305  |
| 35° | 20614 | 9862  | 8908  |
| 40° | 20217 | 8999  | 8554  |
| 45° | 19781 | 8579  | 8477  |
| 50° | 19185 | 8178  | 8464  |
| 55° | 18519 | 8035  | 8496  |
| 60° | 17681 | 7969  | 9388  |
| 65° | 16489 | 7998  | 9749  |
| 70° | 14799 | 8891  | 8232  |
| 75° | 12443 | 7621  | 5456  |
| 80° | 9254  | 4375  | 1336  |
| 85° | 4245  | 50    | 0     |



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**ZONAL LUMENS:**

**CANDELA DISTRIBUTION:**

| Zone      | Lumens  | % Fixture | % Lamp |      | 0°    | 22.5° | 45°   | 67.5° | 90°   | Flux |
|-----------|---------|-----------|--------|------|-------|-------|-------|-------|-------|------|
| 0°-10°    | 933.9   | 5.5       | 5.4    | 0°   | 10037 | 10037 | 10037 | 10037 | 10037 |      |
| 10°-20°   | 2410.4  | 14.2      | 14.1   | 5°   | 9943  | 9953  | 9932  | 9888  | 9918  | 944  |
| 20°-30°   | 2941.1  | 17.3      | 17.2   | 15°  | 9525  | 9371  | 8737  | 7944  | 7664  | 2686 |
| 30°-40°   | 2937.1  | 17.3      | 17.1   | 25°  | 8765  | 8116  | 6096  | 4725  | 4392  | 4039 |
| 40°-50°   | 2701.9  | 15.9      | 15.8   | 35°  | 7713  | 6163  | 3690  | 3364  | 3333  | 4819 |
| 50°-60°   | 2275.0  | 13.4      | 13.3   | 45°  | 6389  | 3953  | 2771  | 2733  | 2738  | 4922 |
| 60°-70°   | 1800.5  | 10.6      | 10.5   | 55°  | 4852  | 2269  | 2105  | 2198  | 2226  | 4334 |
| 70°-80°   | 918.1   | 5.4       | 5.4    | 65°  | 3183  | 1398  | 1544  | 1854  | 1882  | 3144 |
| 80°-90°   | 107.2   | 0.6       | 0.6    | 75°  | 1471  | 772   | 901   | 719   | 645   | 1568 |
| 90°-100°  | 0.3     | 0.0       | 0.0    | 85°  | 169   | 100   | 2     | 1     | 0     | 262  |
| 100°-110° | 0.0     | 0.0       | 0.0    | 90°  | 4     | 1     | 2     | 1     | 5     | 5    |
| 110°-120° | 0.0     | 0.0       | 0.0    | 95°  | 0     | 0     | 0     | 0     | 0     | 0    |
| 120°-130° | 0.0     | 0.0       | 0.0    | 105° | 0     | 0     | 0     | 0     | 0     | 0    |
| 130°-140° | 0.0     | 0.0       | 0.0    | 115° | 0     | 0     | 0     | 0     | 0     | 0    |
| 140°-150° | 0.0     | 0.0       | 0.0    | 125° | 0     | 0     | 0     | 0     | 0     | 0    |
| 150°-160° | 0.0     | 0.0       | 0.0    | 135° | 0     | 0     | 0     | 0     | 0     | 0    |
| 160°-170° | 0.0     | 0.0       | 0.0    | 145° | 0     | 0     | 0     | 0     | 0     | 0    |
| 170°-180° | 0.0     | 0.0       | 0.0    | 155° | 0     | 0     | 0     | 0     | 0     | 0    |
| 0°-30°    | 6285.4  | 36.9      | 36.7   | 165° | 0     | 0     | 0     | 0     | 0     | 0    |
| 0°-40°    | 9222.5  | 54.2      | 53.8   | 175° | 0     | 0     | 0     | 0     | 0     | 0    |
| 0°-60°    | 14199.4 | 83.4      | 82.8   | 180° | 0     | 0     | 0     | 0     | 0     | 0    |
| 0°-90°    | 17025.2 | 100.0     | 99.3   |      |       |       |       |       |       |      |
| 90°-120°  | 0.3     | 0.0       | 0.0    |      |       |       |       |       |       |      |
| 90°-150°  | 0.3     | 0.0       | 0.0    |      |       |       |       |       |       |      |
| 90°-180°  | 0.0     | 0.0       | 0.0    |      |       |       |       |       |       |      |
| 0°-180°   | 17025.5 | 100.0     | 99.3   |      |       |       |       |       |       |      |



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**CANDELA DISTRIBUTION (FULL):**

|        | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|--------|-------|-------|-------|-------|-------|
| 0°     | 10037 | 10037 | 10037 | 10037 | 10037 |
| 2.5°   | 9980  | 9994  | 10006 | 10002 | 10042 |
| 5°     | 9943  | 9953  | 9932  | 9888  | 9918  |
| 7.5°   | 9869  | 9865  | 9778  | 9644  | 9634  |
| 10°    | 9777  | 9738  | 9528  | 9251  | 9166  |
| 12.5°  | 9654  | 9571  | 9177  | 8673  | 8483  |
| 15°    | 9525  | 9371  | 8737  | 7944  | 7664  |
| 17.5°  | 9367  | 9120  | 8160  | 7119  | 6765  |
| 20°    | 9182  | 8829  | 7506  | 6274  | 5887  |
| 22.5°  | 8984  | 8492  | 6804  | 5450  | 5051  |
| 25°    | 8765  | 8116  | 6096  | 4725  | 4392  |
| 27.5°  | 8530  | 7687  | 5402  | 4145  | 3942  |
| 30°    | 8274  | 7208  | 4733  | 3766  | 3681  |
| 32.5°  | 7998  | 6694  | 4140  | 3543  | 3509  |
| 35°    | 7713  | 6163  | 3690  | 3364  | 3333  |
| 37.5°  | 7395  | 5598  | 3364  | 3173  | 3143  |
| 40°    | 7074  | 5038  | 3149  | 3009  | 2993  |
| 42.5°  | 6739  | 4482  | 2956  | 2862  | 2864  |
| 45°    | 6389  | 3953  | 2771  | 2733  | 2738  |
| 47.5°  | 6018  | 3432  | 2574  | 2577  | 2606  |
| 50°    | 5633  | 2962  | 2401  | 2437  | 2485  |
| 52.5°  | 5248  | 2574  | 2251  | 2316  | 2364  |
| 55°    | 4852  | 2269  | 2105  | 2198  | 2226  |
| 57.5°  | 4447  | 2029  | 1957  | 2057  | 2163  |
| 60°    | 4038  | 1807  | 1820  | 1997  | 2144  |
| 62.5°  | 3604  | 1593  | 1680  | 1963  | 2064  |
| 65°    | 3183  | 1398  | 1544  | 1854  | 1882  |
| 67.5°  | 2752  | 1229  | 1499  | 1643  | 1603  |
| 70°    | 2312  | 1060  | 1389  | 1345  | 1286  |
| 72.5°  | 1876  | 903   | 1181  | 1029  | 967   |
| 75°    | 1471  | 772   | 901   | 719   | 645   |
| 77.5°  | 1083  | 674   | 624   | 422   | 350   |
| 80°    | 734   | 535   | 347   | 156   | 106   |
| 82.5°  | 416   | 312   | 100   | 13    | 5     |
| 85°    | 169   | 100   | 2     | 1     | 0     |
| 87.5°  | 26    | 2     | 5     | 1     | 4     |
| 90°    | 4     | 1     | 2     | 1     | 5     |
| 92.5°  | 0     | 0     | 0     | 0     | 0     |
| 95°    | 0     | 0     | 0     | 0     | 0     |
| 97.5°  | 0     | 0     | 0     | 0     | 0     |
| 100°   | 0     | 0     | 0     | 0     | 0     |
| 102.5° | 0     | 0     | 0     | 0     | 0     |
| 105°   | 0     | 0     | 0     | 0     | 0     |
| 107.5° | 0     | 0     | 0     | 0     | 0     |
| 110°   | 0     | 0     | 0     | 0     | 0     |



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**CANDELA DISTRIBUTION (continued):**

|        | 0° | 22.5° | 45° | 67.5° | 90° |
|--------|----|-------|-----|-------|-----|
| 112.5° | 0  | 0     | 0   | 0     | 0   |
| 115°   | 0  | 0     | 0   | 0     | 0   |
| 117.5° | 0  | 0     | 0   | 0     | 0   |
| 120°   | 0  | 0     | 0   | 0     | 0   |
| 122.5° | 0  | 0     | 0   | 0     | 0   |
| 125°   | 0  | 0     | 0   | 0     | 0   |
| 127.5° | 0  | 0     | 0   | 0     | 0   |
| 130°   | 0  | 0     | 0   | 0     | 0   |
| 132.5° | 0  | 0     | 0   | 0     | 0   |
| 135°   | 0  | 0     | 0   | 0     | 0   |
| 137.5° | 0  | 0     | 0   | 0     | 0   |
| 140°   | 0  | 0     | 0   | 0     | 0   |
| 142.5° | 0  | 0     | 0   | 0     | 0   |
| 145°   | 0  | 0     | 0   | 0     | 0   |
| 147.5° | 0  | 0     | 0   | 0     | 0   |
| 150°   | 0  | 0     | 0   | 0     | 0   |
| 152.5° | 0  | 0     | 0   | 0     | 0   |
| 155°   | 0  | 0     | 0   | 0     | 0   |
| 157.5° | 0  | 0     | 0   | 0     | 0   |
| 160°   | 0  | 0     | 0   | 0     | 0   |
| 162.5° | 0  | 0     | 0   | 0     | 0   |
| 165°   | 0  | 0     | 0   | 0     | 0   |
| 167.5° | 0  | 0     | 0   | 0     | 0   |
| 170°   | 0  | 0     | 0   | 0     | 0   |
| 172.5° | 0  | 0     | 0   | 0     | 0   |
| 175°   | 0  | 0     | 0   | 0     | 0   |
| 177.5° | 0  | 0     | 0   | 0     | 0   |
| 180°   | 0  | 0     | 0   | 0     | 0   |

(END OF REPORT)