

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: P30628-R2

Luminaire Tested: **HBL-647T5-N-UNV-EBT2-UPL**

Issue Date: 3/3/2020



**Test Information**

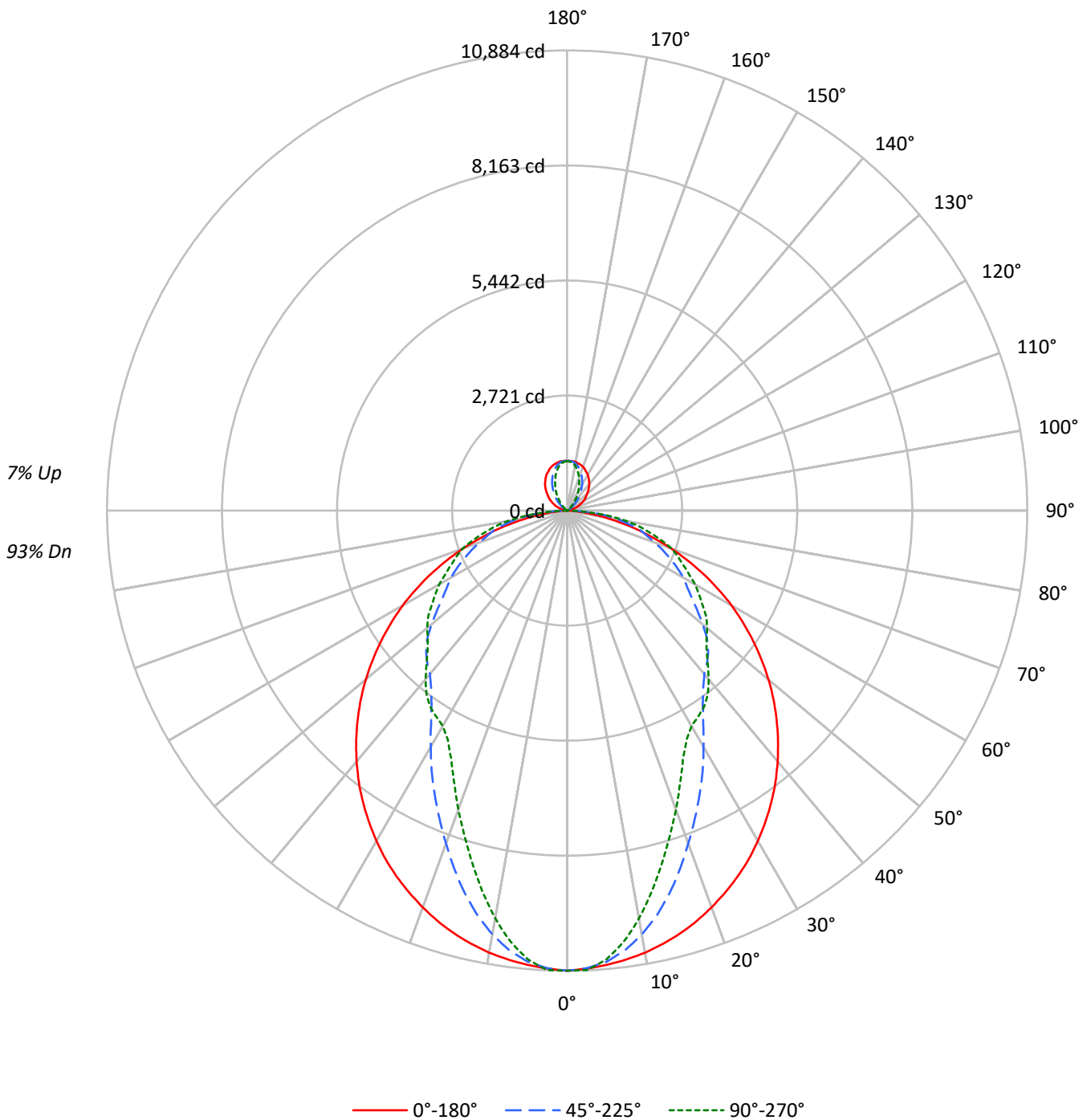
Test Method: LM-41-14  
Report Number: P30628-R2  
Test Lab: INNOVATION CENTER-P3  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: METALUX  
Catalog Number: HBL-647T5-N-UNV-EBT2-UPL  
Description: METALUX F-BAY HBL SERIES, OPEN BODY FLUORESCENT LUMINAIRE,  
WITH A NARROW DISTRIBUTION SPECULAR ALUMINUM REFLECTOR, WITH UPLIGHT  
Light Source: (6) BIPIN T5 LINEAR FLUORESCENT LAMP 4100K - 4285 LUMENS EA  
GE F54T5-47W 841-ECO 47W  
Ballast/Driver: GE ELECTRONIC BALLAST  
GE 454MVPS90E, 254MVPS90E

**Summary**

Lumens per Lamp: 4285 (6 lamps)  
Luminaire Lumens: 25589.5 lumens  
Efficiency: 99.5%  
Efficacy: 82.3 lumens/watt  
Spacing Criteria (0/90/45): 1.23 / 0.84 / 1.07  
Luminous Opening: Rectangular (W 1.23' x L: 4' x H: 0')  
CIE Type: Direct  
  
Input Watts (W): 311  
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   | 117 | 117 | 117 | 117 | 113 | 113 | 113 | 113 | 107 | 107 | 107 | 101 | 101 | 101 | 95 | 95 | 95 | 93 |
| 1   | 107 | 102 | 97  | 94  | 103 | 99  | 95  | 91  | 93  | 90  | 87  | 88  | 86  | 83  | 84 | 82 | 80 | 77 |
| 2   | 97  | 89  | 82  | 76  | 94  | 86  | 80  | 75  | 82  | 77  | 72  | 77  | 73  | 69  | 73 | 70 | 67 | 64 |
| 3   | 89  | 78  | 70  | 64  | 85  | 76  | 69  | 63  | 72  | 66  | 61  | 69  | 63  | 59  | 65 | 61 | 57 | 55 |
| 4   | 81  | 69  | 61  | 54  | 78  | 68  | 60  | 54  | 64  | 58  | 52  | 61  | 55  | 51  | 58 | 53 | 49 | 47 |
| 5   | 75  | 62  | 54  | 47  | 72  | 61  | 53  | 46  | 58  | 51  | 45  | 55  | 49  | 44  | 53 | 47 | 43 | 41 |
| 6   | 69  | 56  | 48  | 41  | 67  | 55  | 47  | 41  | 53  | 45  | 40  | 50  | 44  | 39  | 48 | 43 | 38 | 36 |
| 7   | 64  | 51  | 43  | 37  | 62  | 50  | 42  | 36  | 48  | 41  | 36  | 46  | 40  | 35  | 44 | 38 | 34 | 32 |
| 8   | 60  | 47  | 39  | 33  | 58  | 46  | 38  | 33  | 44  | 37  | 32  | 42  | 36  | 31  | 41 | 35 | 31 | 29 |
| 9   | 56  | 43  | 35  | 30  | 54  | 42  | 35  | 30  | 41  | 34  | 29  | 39  | 33  | 29  | 38 | 32 | 28 | 26 |
| 10  | 53  | 40  | 32  | 27  | 51  | 39  | 32  | 27  | 38  | 31  | 27  | 36  | 30  | 26  | 35 | 30 | 26 | 24 |

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

|     | 0°    | 45°   | 90°   |
|-----|-------|-------|-------|
| 0°  | 23828 | 23828 | 23828 |
| 5°  | 23706 | 23537 | 23422 |
| 10° | 23606 | 22633 | 21775 |
| 15° | 23463 | 21230 | 19594 |
| 20° | 23267 | 19519 | 17525 |
| 25° | 23064 | 17904 | 15660 |
| 30° | 22802 | 16310 | 14872 |
| 35° | 22509 | 14943 | 15108 |
| 40° | 22137 | 14421 | 14884 |
| 45° | 21697 | 14601 | 14446 |
| 50° | 21178 | 14257 | 14720 |
| 55° | 20493 | 13718 | 14928 |
| 60° | 19673 | 13902 | 15290 |
| 65° | 18468 | 13899 | 15660 |
| 70° | 16739 | 14108 | 16847 |
| 75° | 14321 | 15124 | 17230 |
| 80° | 10767 | 15432 | 18041 |
| 85° | 5903  | 14971 | 15046 |



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**ZONAL LUMENS:**

**CANDELA DISTRIBUTION:**

| Zone      | Lumens  | % Fixture | % Lamp |      | 0°    | 22.5° | 45°   | 67.5° | 90°   | Flux |
|-----------|---------|-----------|--------|------|-------|-------|-------|-------|-------|------|
| 0°-10°    | 1005.4  | 3.9       | 3.9    | 0°   | 10884 | 10884 | 10884 | 10884 | 10884 |      |
| 10°-20°   | 2644.1  | 10.3      | 10.3   | 5°   | 10787 | 10764 | 10710 | 10634 | 10658 | ###  |
| 20°-30°   | 3550.0  | 13.9      | 13.8   | 15°  | 10352 | 10052 | 9367  | 8798  | 8645  | 2920 |
| 30°-40°   | 3943.6  | 15.4      | 15.3   | 25°  | 9548  | 8712  | 7412  | 6675  | 6483  | 4399 |
| 40°-50°   | 3934.6  | 15.4      | 15.3   | 35°  | 8422  | 6985  | 5591  | 5564  | 5653  | 5266 |
| 50°-60°   | 3506.3  | 13.7      | 13.6   | 45°  | 7008  | 5171  | 4716  | 4664  | 4666  | 5404 |
| 60°-70°   | 2817.0  | 11.0      | 11.0   | 55°  | 5369  | 3547  | 3594  | 3840  | 3911  | 4797 |
| 70°-80°   | 1835.5  | 7.2       | 7.1    | 65°  | 3565  | 2474  | 2683  | 2932  | 3023  | 3518 |
| 80°-90°   | 592.4   | 2.3       | 2.3    | 75°  | 1693  | 1365  | 1788  | 1976  | 2037  | 1798 |
| 90°-100°  | 15.7    | 0.1       | 0.1    | 85°  | 235   | 460   | 596   | 611   | 599   | 324  |
| 100°-110° | 40.3    | 0.2       | 0.2    | 90°  | 3     | 19    | 37    | 40    | 39    | 9    |
| 110°-120° | 88.0    | 0.3       | 0.3    | 95°  | 12    | 5     | 16    | 2     | 1     | 26   |
| 120°-130° | 167.5   | 0.7       | 0.7    | 105° | 155   | 16    | 31    | 17    | 14    | 164  |
| 130°-140° | 283.2   | 1.1       | 1.1    | 115° | 340   | 118   | 34    | 29    | 25    | 334  |
| 140°-150° | 375.9   | 1.5       | 1.5    | 125° | 527   | 305   | 119   | 34    | 24    | 471  |
| 150°-160° | 386.4   | 1.5       | 1.5    | 135° | 717   | 531   | 320   | 186   | 144   | 553  |
| 160°-170° | 293.9   | 1.1       | 1.1    | 145° | 897   | 771   | 573   | 435   | 389   | 560  |
| 170°-180° | 109.6   | 0.4       | 0.4    | 155° | 1034  | 965   | 832   | 707   | 667   | 479  |
| 0°-30°    | 7199.5  | 28.1      | 28.0   | 165° | 1137  | 1106  | 1055  | 986   | 958   | 321  |
| 0°-40°    | 11143.2 | 43.5      | 43.3   | 175° | 1174  | 1165  | 1167  | 1142  | 1143  | 112  |
| 0°-60°    | 18584.0 | 72.6      | 72.3   | 180° | 1171  | 1171  | 1171  | 1171  | 1171  |      |
| 0°-90°    | 23828.9 | 93.1      | 92.7   |      |       |       |       |       |       |      |
| 90°-120°  | 144.0   | 0.6       | 0.6    |      |       |       |       |       |       |      |
| 90°-150°  | 970.6   | 3.8       | 3.8    |      |       |       |       |       |       |      |
| 90°-180°  | 1761.0  | 6.9       | 6.8    |      |       |       |       |       |       |      |
| 0°-180°   | 25589.5 | 100.0     | 99.5   |      |       |       |       |       |       |      |



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**CANDELA DISTRIBUTION (FULL):**

|        | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|--------|-------|-------|-------|-------|-------|
| 0°     | 10884 | 10884 | 10884 | 10884 | 10884 |
| 2.5°   | 10840 | 10835 | 10835 | 10825 | 10874 |
| 5°     | 10787 | 10764 | 10710 | 10634 | 10658 |
| 7.5°   | 10710 | 10651 | 10485 | 10302 | 10282 |
| 10°    | 10619 | 10505 | 10181 | 9870  | 9795  |
| 12.5°  | 10496 | 10303 | 9802  | 9358  | 9237  |
| 15°    | 10352 | 10052 | 9367  | 8798  | 8645  |
| 17.5°  | 10182 | 9766  | 8881  | 8238  | 8071  |
| 20°    | 9987  | 9441  | 8378  | 7707  | 7522  |
| 22.5°  | 9774  | 9088  | 7891  | 7188  | 6980  |
| 25°    | 9548  | 8712  | 7412  | 6675  | 6483  |
| 27.5°  | 9299  | 8301  | 6937  | 6220  | 6113  |
| 30°    | 9020  | 7871  | 6452  | 5889  | 5883  |
| 32.5°  | 8730  | 7428  | 5991  | 5684  | 5771  |
| 35°    | 8422  | 6985  | 5591  | 5564  | 5653  |
| 37.5°  | 8095  | 6534  | 5282  | 5437  | 5468  |
| 40°    | 7746  | 6079  | 5046  | 5231  | 5208  |
| 42.5°  | 7385  | 5629  | 4894  | 4957  | 4921  |
| 45°    | 7008  | 5171  | 4716  | 4664  | 4666  |
| 47.5°  | 6622  | 4721  | 4486  | 4399  | 4469  |
| 50°    | 6218  | 4285  | 4186  | 4194  | 4322  |
| 52.5°  | 5797  | 3881  | 3878  | 4032  | 4150  |
| 55°    | 5369  | 3547  | 3594  | 3840  | 3911  |
| 57.5°  | 4934  | 3273  | 3365  | 3600  | 3698  |
| 60°    | 4493  | 3029  | 3175  | 3387  | 3492  |
| 62.5°  | 4025  | 2773  | 2937  | 3164  | 3246  |
| 65°    | 3565  | 2474  | 2683  | 2932  | 3023  |
| 67.5°  | 3082  | 2128  | 2451  | 2712  | 2829  |
| 70°    | 2615  | 1834  | 2204  | 2518  | 2632  |
| 72.5°  | 2139  | 1597  | 1976  | 2274  | 2339  |
| 75°    | 1693  | 1365  | 1788  | 1976  | 2037  |
| 77.5°  | 1256  | 1125  | 1511  | 1682  | 1754  |
| 80°    | 854   | 907   | 1224  | 1394  | 1431  |
| 82.5°  | 504   | 699   | 943   | 1027  | 1041  |
| 85°    | 235   | 460   | 596   | 611   | 599   |
| 87.5°  | 56    | 206   | 211   | 229   | 239   |
| 90°    | 3     | 19    | 37    | 40    | 39    |
| 92.5°  | 4     | 8     | 18    | 4     | 3     |
| 95°    | 12    | 5     | 16    | 2     | 1     |
| 97.5°  | 38    | 6     | 18    | 5     | 0     |
| 100°   | 85    | 21    | 30    | 18    | 18    |
| 102.5° | 111   | 10    | 26    | 10    | 8     |
| 105°   | 155   | 16    | 31    | 17    | 14    |
| 107.5° | 194   | 25    | 35    | 20    | 15    |
| 110°   | 243   | 46    | 31    | 18    | 17    |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°   | 22.5° | 45°  | 67.5° | 90°  |
|--------|------|-------|------|-------|------|
| 112.5° | 291  | 82    | 32   | 24    | 22   |
| 115°   | 340  | 118   | 34   | 29    | 25   |
| 117.5° | 384  | 156   | 32   | 24    | 24   |
| 120°   | 429  | 196   | 42   | 16    | 18   |
| 122.5° | 485  | 260   | 89   | 33    | 27   |
| 125°   | 527  | 305   | 119  | 34    | 24   |
| 127.5° | 571  | 362   | 161  | 54    | 35   |
| 130°   | 617  | 413   | 204  | 84    | 52   |
| 132.5° | 667  | 475   | 261  | 137   | 92   |
| 135°   | 717  | 531   | 320  | 186   | 144  |
| 137.5° | 765  | 592   | 382  | 239   | 194  |
| 140°   | 815  | 654   | 446  | 302   | 257  |
| 142.5° | 850  | 706   | 502  | 361   | 316  |
| 145°   | 897  | 771   | 573  | 435   | 389  |
| 147.5° | 937  | 820   | 635  | 500   | 456  |
| 150°   | 978  | 877   | 708  | 574   | 532  |
| 152.5° | 1009 | 923   | 768  | 641   | 597  |
| 155°   | 1034 | 965   | 832  | 707   | 667  |
| 157.5° | 1075 | 1014  | 897  | 786   | 748  |
| 160°   | 1097 | 1051  | 958  | 856   | 816  |
| 162.5° | 1123 | 1082  | 1013 | 923   | 895  |
| 165°   | 1137 | 1106  | 1055 | 986   | 958  |
| 167.5° | 1151 | 1130  | 1095 | 1039  | 1019 |
| 170°   | 1165 | 1145  | 1129 | 1084  | 1076 |
| 172.5° | 1179 | 1167  | 1159 | 1126  | 1123 |
| 175°   | 1174 | 1165  | 1167 | 1142  | 1143 |
| 177.5° | 1179 | 1170  | 1178 | 1155  | 1161 |
| 180°   | 1171 | 1171  | 1171 | 1171  | 1171 |

(END OF REPORT)