

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: 236P217

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

Issue Date: 3/3/2020



Test Information

Test Method: LM-41-14
Report Number: 236P217
Test Lab: METALUX RESEARCH LABS
Issue Date: 3/3/2020
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: METALUX
Catalog Number: HBL-632-N-UNV-EB82-UPL-U
Description: OPEN HIGH BAY LUMINAIRE WITH SPECULAR REFLECTOR, NARROW
DISTRIBUTION WITH UPLIGHT
Light Source: SIX 32 WATT T8 - 3100 LUMENS EA
Ballast/Driver: -

Summary

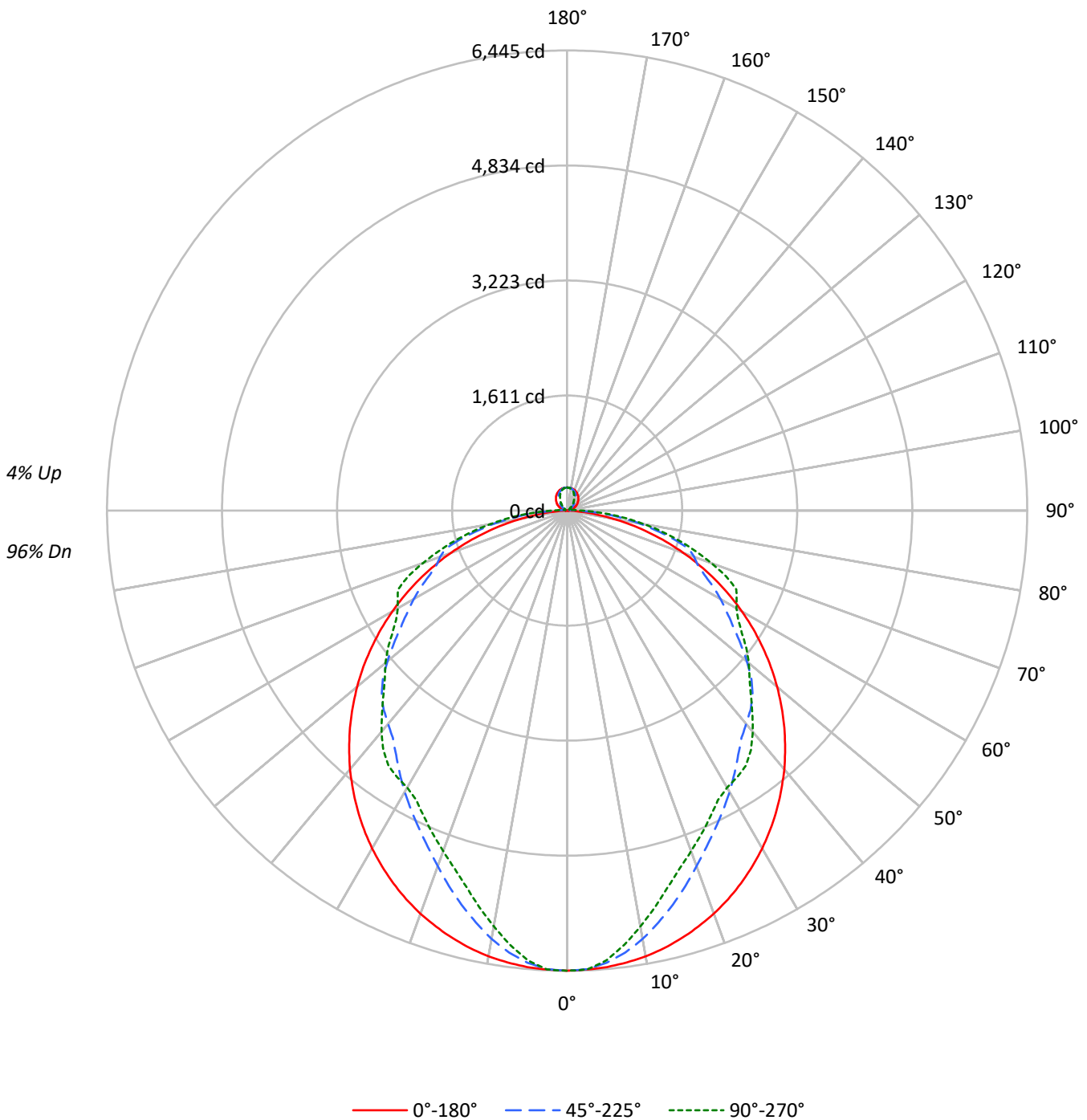
Lumens per Lamp: 3100 (6 lamps)
Luminaire Lumens: 17828.4 lumens
Efficiency: 95.9%
Efficacy: 78.2 lumens/watt
Spacing Criteria (0/90/45): 1.26 / 1.03 / 1.25
Luminous Opening: Rectangular (W 1.58' x L: 4.02' x H: 0')
CIE Type: Direct

Input Watts (W): 228
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 | 113 | 113 | 113 | 113 | 110 | 110 | 110 | 110 | 104 | 104 | 104 | 99 | 99 | 99 | 94 | 94 | 94 | 92 |
| 1 | 103 | 98 | 93 | 89 | 99 | 95 | 91 | 87 | 90 | 87 | 84 | 86 | 83 | 81 | 82 | 80 | 78 | 75 |
| 2 | 93 | 85 | 78 | 72 | 90 | 82 | 76 | 71 | 78 | 73 | 69 | 75 | 70 | 66 | 71 | 67 | 64 | 62 |
| 3 | 84 | 74 | 66 | 59 | 82 | 72 | 65 | 59 | 69 | 62 | 57 | 66 | 60 | 56 | 63 | 58 | 54 | 52 |
| 4 | 77 | 65 | 57 | 50 | 75 | 64 | 56 | 50 | 61 | 54 | 49 | 58 | 52 | 47 | 56 | 51 | 46 | 44 |
| 5 | 71 | 58 | 50 | 43 | 69 | 57 | 49 | 43 | 55 | 47 | 42 | 52 | 46 | 41 | 50 | 45 | 40 | 38 |
| 6 | 66 | 53 | 44 | 38 | 63 | 51 | 43 | 37 | 49 | 42 | 37 | 47 | 41 | 36 | 45 | 40 | 35 | 33 |
| 7 | 61 | 48 | 39 | 33 | 59 | 47 | 39 | 33 | 45 | 38 | 32 | 43 | 37 | 32 | 42 | 36 | 31 | 29 |
| 8 | 57 | 44 | 35 | 30 | 55 | 43 | 35 | 29 | 41 | 34 | 29 | 40 | 33 | 29 | 38 | 32 | 28 | 26 |
| 9 | 53 | 40 | 32 | 27 | 51 | 39 | 32 | 27 | 38 | 31 | 26 | 37 | 30 | 26 | 35 | 30 | 26 | 24 |
| 10 | 50 | 37 | 29 | 24 | 48 | 36 | 29 | 24 | 35 | 28 | 24 | 34 | 28 | 24 | 33 | 27 | 23 | 22 |

AVERAGE LUMINANCE (cd/sqm):

| | 0° | 45° | 90° |
|-----|-------|-------|-------|
| 0° | 10897 | 10897 | 10897 |
| 5° | 10893 | 10793 | 10730 |
| 10° | 10883 | 10459 | 10152 |
| 15° | 10853 | 10004 | 9548 |
| 20° | 10810 | 9536 | 9131 |
| 25° | 10747 | 9160 | 8835 |
| 30° | 10667 | 8881 | 8742 |
| 35° | 10566 | 8624 | 9005 |
| 40° | 10442 | 8603 | 8923 |
| 45° | 10286 | 8785 | 8694 |
| 50° | 10101 | 8646 | 8735 |
| 55° | 9863 | 8375 | 8805 |
| 60° | 9560 | 8393 | 9255 |
| 65° | 9146 | 8473 | 10458 |
| 70° | 8562 | 9353 | 10619 |
| 75° | 7702 | 10080 | 10596 |
| 80° | 6368 | 9912 | 10652 |
| 85° | 3899 | 10126 | 11484 |



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ZONAL LUMENS:

CANDELA DISTRIBUTION:

| Zone | Lumens | % Fixture | % Lamp | | 0° | 22.5° | 45° | 67.5° | 90° | Flux |
|-----------|---------|-----------|--------|------|------|-------|------|-------|------|------|
| 0°-10° | 598.8 | 3.4 | 3.2 | 0° | 6445 | 6445 | 6445 | 6445 | 6445 | |
| 10°-20° | 1623.8 | 9.1 | 8.7 | 5° | 6418 | 6393 | 6359 | 6315 | 6322 | 610 |
| 20°-30° | 2334.3 | 13.1 | 12.6 | 15° | 6200 | 6016 | 5715 | 5510 | 5455 | 1750 |
| 30°-40° | 2765.4 | 15.5 | 14.9 | 25° | 5761 | 5325 | 4910 | 4770 | 4736 | 2655 |
| 40°-50° | 2871.1 | 16.1 | 15.4 | 35° | 5119 | 4470 | 4178 | 4292 | 4363 | 3201 |
| 50°-60° | 2625.0 | 14.7 | 14.1 | 45° | 4302 | 3602 | 3674 | 3655 | 3636 | 3317 |
| 60°-70° | 2220.9 | 12.5 | 11.9 | 55° | 3346 | 2730 | 2841 | 2956 | 2987 | 2989 |
| 70°-80° | 1500.0 | 8.4 | 8.1 | 65° | 2286 | 1979 | 2118 | 2473 | 2614 | 2260 |
| 80°-90° | 546.1 | 3.1 | 2.9 | 75° | 1179 | 1145 | 1543 | 1599 | 1622 | 1249 |
| 90°-100° | 80.0 | 0.4 | 0.4 | 85° | 201 | 435 | 522 | 577 | 592 | 262 |
| 100°-110° | 40.0 | 0.2 | 0.2 | 90° | 3 | 53 | 117 | 164 | 182 | 13 |
| 110°-120° | 53.5 | 0.3 | 0.3 | 95° | 19 | 34 | 77 | 104 | 107 | 21 |
| 120°-130° | 84.3 | 0.5 | 0.5 | 105° | 60 | 27 | 28 | 35 | 37 | 66 |
| 130°-140° | 116.3 | 0.7 | 0.6 | 115° | 125 | 71 | 33 | 31 | 27 | 124 |
| 140°-150° | 131.4 | 0.7 | 0.7 | 125° | 176 | 132 | 80 | 52 | 41 | 158 |
| 150°-160° | 121.6 | 0.7 | 0.7 | 135° | 222 | 194 | 142 | 109 | 95 | 171 |
| 160°-170° | 85.4 | 0.5 | 0.5 | 145° | 262 | 246 | 207 | 176 | 164 | 164 |
| 170°-180° | 30.5 | 0.2 | 0.2 | 155° | 291 | 285 | 266 | 243 | 233 | 135 |
| 0°-30° | 4556.9 | 25.6 | 24.5 | 165° | 313 | 312 | 304 | 295 | 291 | 88 |
| 0°-40° | 7322.3 | 41.1 | 39.4 | 175° | 322 | 322 | 322 | 320 | 319 | 31 |
| 0°-60° | 12818.5 | 71.9 | 68.9 | 180° | 323 | 323 | 323 | 323 | 323 | |
| 0°-90° | 17085.4 | 95.8 | 91.9 | | | | | | | |
| 90°-120° | 173.6 | 1.0 | 0.9 | | | | | | | |
| 90°-150° | 505.5 | 2.8 | 2.7 | | | | | | | |
| 90°-180° | 743.0 | 4.2 | 4.0 | | | | | | | |
| 0°-180° | 17828.4 | 100.0 | 95.9 | | | | | | | |



TEST NUMBER: 236P217

CATALOG NUMBER: HBL-632-N-UNV-EB82-UPL-U

CANDELA DISTRIBUTION (FULL):

| | 0° | 22.5° | 45° | 67.5° | 90° |
|--------|------|-------|------|-------|------|
| 0° | 6445 | 6445 | 6445 | 6445 | 6445 |
| 2.5° | 6434 | 6431 | 6428 | 6417 | 6434 |
| 5° | 6418 | 6393 | 6359 | 6315 | 6322 |
| 7.5° | 6384 | 6333 | 6242 | 6151 | 6134 |
| 10° | 6339 | 6250 | 6092 | 5951 | 5913 |
| 12.5° | 6278 | 6142 | 5908 | 5733 | 5687 |
| 15° | 6200 | 6016 | 5715 | 5510 | 5455 |
| 17.5° | 6110 | 5866 | 5511 | 5295 | 5252 |
| 20° | 6008 | 5700 | 5300 | 5110 | 5075 |
| 22.5° | 5892 | 5519 | 5098 | 4943 | 4908 |
| 25° | 5761 | 5325 | 4910 | 4770 | 4736 |
| 27.5° | 5618 | 5123 | 4730 | 4595 | 4573 |
| 30° | 5464 | 4912 | 4549 | 4440 | 4478 |
| 32.5° | 5297 | 4692 | 4363 | 4352 | 4429 |
| 35° | 5119 | 4470 | 4178 | 4292 | 4363 |
| 37.5° | 4927 | 4251 | 4012 | 4211 | 4228 |
| 40° | 4731 | 4033 | 3898 | 4060 | 4043 |
| 42.5° | 4519 | 3817 | 3798 | 3864 | 3839 |
| 45° | 4302 | 3602 | 3674 | 3655 | 3636 |
| 47.5° | 4073 | 3379 | 3500 | 3445 | 3462 |
| 50° | 3840 | 3155 | 3287 | 3273 | 3321 |
| 52.5° | 3597 | 2934 | 3059 | 3121 | 3162 |
| 55° | 3346 | 2730 | 2841 | 2956 | 2987 |
| 57.5° | 3090 | 2559 | 2652 | 2778 | 2838 |
| 60° | 2827 | 2394 | 2482 | 2629 | 2737 |
| 62.5° | 2559 | 2205 | 2298 | 2534 | 2676 |
| 65° | 2286 | 1979 | 2118 | 2473 | 2614 |
| 67.5° | 2009 | 1734 | 1976 | 2384 | 2415 |
| 70° | 1732 | 1518 | 1892 | 2139 | 2148 |
| 72.5° | 1452 | 1329 | 1793 | 1864 | 1882 |
| 75° | 1179 | 1145 | 1543 | 1599 | 1622 |
| 77.5° | 913 | 985 | 1273 | 1338 | 1358 |
| 80° | 654 | 882 | 1018 | 1075 | 1094 |
| 82.5° | 409 | 670 | 765 | 821 | 838 |
| 85° | 201 | 435 | 522 | 577 | 592 |
| 87.5° | 57 | 219 | 299 | 349 | 363 |
| 90° | 3 | 53 | 117 | 164 | 182 |
| 92.5° | 30 | 58 | 106 | 130 | 129 |
| 95° | 19 | 34 | 77 | 104 | 107 |
| 97.5° | 25 | 26 | 55 | 82 | 86 |
| 100° | 37 | 24 | 39 | 63 | 67 |
| 102.5° | 47 | 23 | 31 | 46 | 51 |
| 105° | 60 | 27 | 28 | 35 | 37 |
| 107.5° | 78 | 35 | 28 | 31 | 29 |
| 110° | 94 | 45 | 29 | 29 | 25 |



TEST NUMBER: 236P217

CATALOG NUMBER: HBL-632-N-UNV-EB82-UPL-U

CANDELA DISTRIBUTION (continued):

| | 0° | 22.5° | 45° | 67.5° | 90° |
|--------|-----|-------|-----|-------|-----|
| 112.5° | 111 | 59 | 30 | 30 | 27 |
| 115° | 125 | 71 | 33 | 31 | 27 |
| 117.5° | 140 | 86 | 43 | 31 | 29 |
| 120° | 153 | 102 | 54 | 35 | 29 |
| 122.5° | 165 | 117 | 67 | 43 | 34 |
| 125° | 176 | 132 | 80 | 52 | 41 |
| 127.5° | 187 | 149 | 95 | 64 | 53 |
| 130° | 199 | 164 | 111 | 78 | 65 |
| 132.5° | 211 | 179 | 126 | 93 | 79 |
| 135° | 222 | 194 | 142 | 109 | 95 |
| 137.5° | 232 | 208 | 158 | 125 | 112 |
| 140° | 244 | 222 | 175 | 143 | 129 |
| 142.5° | 253 | 235 | 191 | 159 | 147 |
| 145° | 262 | 246 | 207 | 176 | 164 |
| 147.5° | 270 | 257 | 223 | 193 | 181 |
| 150° | 278 | 267 | 238 | 209 | 199 |
| 152.5° | 286 | 277 | 255 | 227 | 217 |
| 155° | 291 | 285 | 266 | 243 | 233 |
| 157.5° | 299 | 294 | 279 | 260 | 251 |
| 160° | 304 | 301 | 288 | 273 | 267 |
| 162.5° | 309 | 307 | 297 | 285 | 280 |
| 165° | 313 | 312 | 304 | 295 | 291 |
| 167.5° | 316 | 316 | 311 | 304 | 301 |
| 170° | 320 | 319 | 317 | 312 | 309 |
| 172.5° | 321 | 322 | 320 | 318 | 316 |
| 175° | 322 | 322 | 322 | 320 | 319 |
| 177.5° | 322 | 322 | 322 | 321 | 320 |
| 180° | 323 | 323 | 323 | 323 | 323 |

(END OF REPORT)