

Scaled data based on original data using  
LM-79-08 Approved Method: Electrical and Photometric Measurements of Solid-State  
Lighting Products

Test Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

Brand: METALUX

Report Number: P391370

Luminaire Tested: **24CZ2-45VHE-HRP-UNV-L935-CD1-U**

Issue Date: 2/28/2020

This test was performed under the Supervised Manufacturer's Testing Program. The results of this test have not been influenced by sources from within Cooper Lighting Solutions or from external interests.

**Test Information**

Test Method: LM-79-08  
Report Number: P391370  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-1808-918-19)  
Test Lab: INNOVATIONS CENTER(G3)  
Issue Date: 2/28/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: METALUX  
Catalog Number: 24CZ2-45VHE-HRP-UNV-L935-CD1-U  
Description: 2x4 CRUZE LED TROFFER WITH 3500K, 90 LEDS, AND HRP LENS  
Light Source: -  
Ballast/Driver: -

Luminaire Equipment: Sample No.   Condition   Description

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 3271.9 lumens  
Efficiency: N/A  
Efficacy: 110.5 lumens/watt  
Spacing Criteria (0/90/45): 1.26 / 1.3 / 1.41  
Luminous Opening: Rectangular (W 2' x L: 4' x H: 0')  
CIE Type: Direct

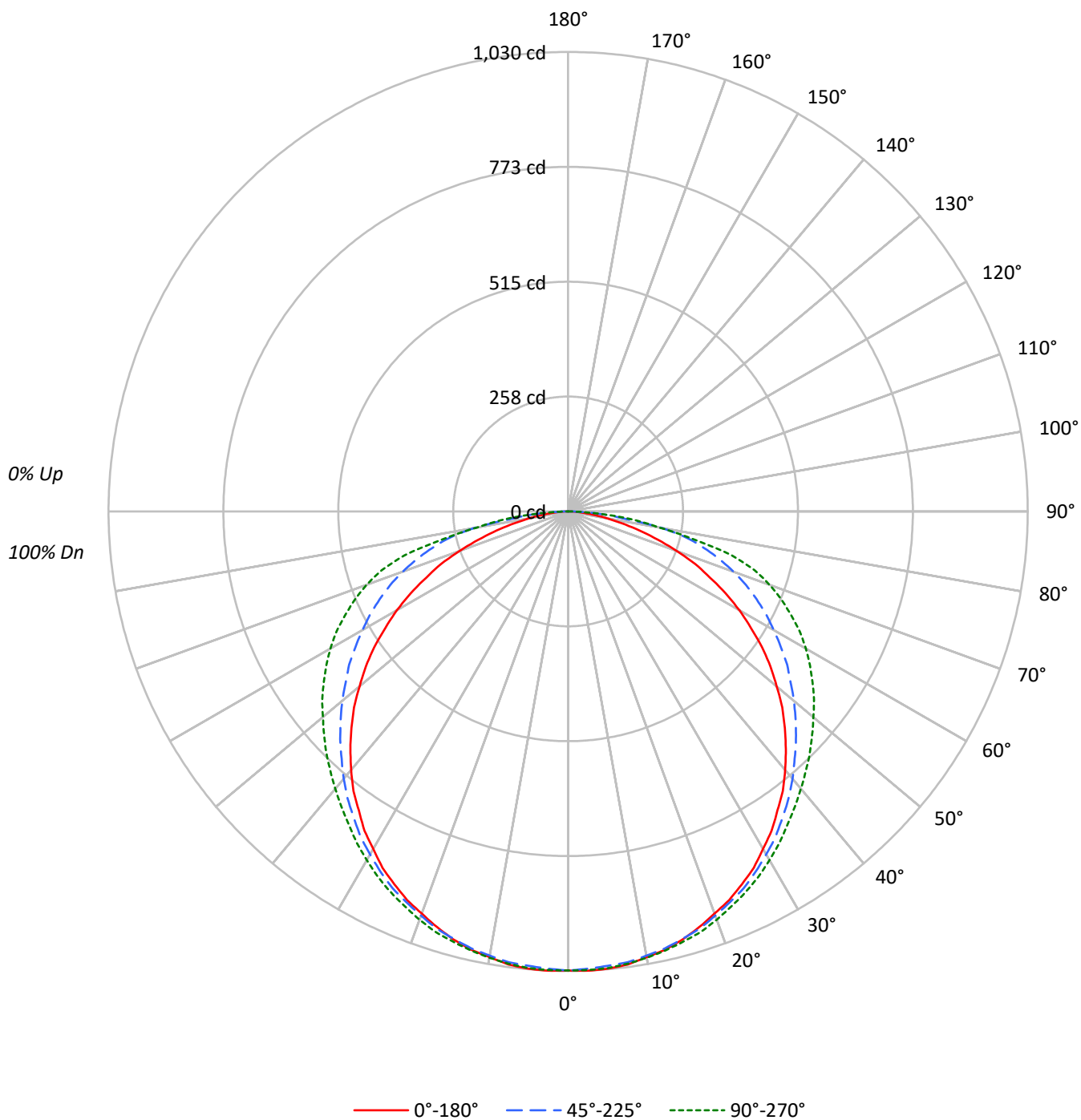
Input Watts (W): 29.6  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 25 FT



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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  |
| RW  | 70  | 50  | 30  | 10  | 70  | 50  | 30  | 10  |  | 50  | 30  | 10  |  | 50  | 30  | 10  |  | 50  | 30  | 10  |
| RCR |     |     |     |     |     |     |     |     |  |     |     |     |  |     |     |     |  |     |     |     |
| 0   | 119 | 119 | 119 | 119 | 116 | 116 | 116 | 116 |  | 111 | 111 | 111 |  | 106 | 106 | 106 |  | 102 | 102 | 102 |
| 1   | 108 | 103 | 98  | 94  | 105 | 100 | 96  | 92  |  | 96  | 93  | 89  |  | 92  | 89  | 87  |  | 88  | 86  | 84  |
| 2   | 97  | 89  | 81  | 75  | 95  | 87  | 80  | 74  |  | 83  | 77  | 72  |  | 80  | 75  | 71  |  | 77  | 73  | 69  |
| 3   | 88  | 77  | 68  | 62  | 86  | 76  | 67  | 61  |  | 72  | 66  | 60  |  | 70  | 64  | 59  |  | 67  | 62  | 58  |
| 4   | 81  | 68  | 59  | 52  | 78  | 67  | 58  | 51  |  | 64  | 57  | 51  |  | 62  | 55  | 50  |  | 59  | 54  | 49  |
| 5   | 74  | 60  | 51  | 44  | 72  | 59  | 51  | 44  |  | 57  | 49  | 43  |  | 55  | 48  | 43  |  | 53  | 47  | 42  |
| 6   | 68  | 54  | 45  | 38  | 66  | 53  | 45  | 38  |  | 51  | 44  | 38  |  | 50  | 43  | 37  |  | 48  | 42  | 37  |
| 7   | 63  | 49  | 40  | 34  | 61  | 48  | 40  | 34  |  | 47  | 39  | 33  |  | 45  | 38  | 33  |  | 44  | 38  | 33  |
| 8   | 59  | 45  | 36  | 30  | 57  | 44  | 36  | 30  |  | 43  | 35  | 30  |  | 41  | 34  | 29  |  | 40  | 34  | 29  |
| 9   | 55  | 41  | 33  | 27  | 53  | 40  | 32  | 27  |  | 39  | 32  | 27  |  | 38  | 31  | 26  |  | 37  | 31  | 26  |
| 10  | 51  | 38  | 30  | 24  | 50  | 37  | 29  | 24  |  | 36  | 29  | 24  |  | 35  | 29  | 24  |  | 34  | 28  | 24  |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1384 | 1384 | 1384 |
| 5°  | 1390 | 1381 | 1388 |
| 10° | 1386 | 1381 | 1388 |
| 15° | 1383 | 1381 | 1390 |
| 20° | 1373 | 1380 | 1394 |
| 25° | 1368 | 1383 | 1397 |
| 30° | 1356 | 1379 | 1402 |
| 35° | 1343 | 1375 | 1407 |
| 40° | 1328 | 1374 | 1425 |
| 45° | 1306 | 1374 | 1458 |
| 50° | 1277 | 1383 | 1501 |
| 55° | 1245 | 1405 | 1568 |
| 60° | 1192 | 1432 | 1655 |
| 65° | 1116 | 1483 | 1757 |
| 70° | 1015 | 1552 | 1890 |
| 75° | 860  | 1637 | 1974 |
| 80° | 679  | 1647 | 1597 |
| 85° | 502  | 1252 | 1403 |



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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 97.6   | 3.0       |
| 10°-20°   | 280.9  | 8.6       |
| 20°-30°   | 429.6  | 13.1      |
| 30°-40°   | 525.1  | 16.0      |
| 40°-50°   | 559.7  | 17.1      |
| 50°-60°   | 535.1  | 16.4      |
| 60°-70°   | 453.3  | 13.9      |
| 70°-80°   | 304.7  | 9.3       |
| 80°-90°   | 85.9   | 2.6       |
| 90°-100°  | 0.0    | 0.0       |
| 100°-110° | 0.0    | 0.0       |
| 110°-120° | 0.0    | 0.0       |
| 120°-130° | 0.0    | 0.0       |
| 130°-140° | 0.0    | 0.0       |
| 140°-150° | 0.0    | 0.0       |
| 150°-160° | 0.0    | 0.0       |
| 160°-170° | 0.0    | 0.0       |
| 170°-180° | 0.0    | 0.0       |
| 0°-30°    | 808.0  | 24.7      |
| 0°-40°    | 1333.2 | 40.7      |
| 0°-60°    | 2428.0 | 74.2      |
| 0°-90°    | 3271.9 | 100.0     |
| 90°-120°  | 0.0    | 0.0       |
| 90°-150°  | 0.0    | 0.0       |
| 90°-180°  | 0.0    | 0.0       |
| 0°-180°   | 3271.9 | 100.0     |

**CANDELA DISTRIBUTION:**

|     | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|-----|------|-------|------|-------|------|------|
| 0°  | 1029 | 1029  | 1029 | 1029  | 1029 |      |
| 5°  | 1029 | 1027  | 1022 | 1027  | 1027 | 98   |
| 15° | 993  | 993   | 992  | 1000  | 998  | 280  |
| 25° | 922  | 925   | 932  | 940   | 941  | 425  |
| 35° | 818  | 824   | 837  | 854   | 857  | 512  |
| 45° | 686  | 698   | 722  | 753   | 766  | 529  |
| 55° | 531  | 550   | 599  | 646   | 669  | 473  |
| 65° | 350  | 386   | 466  | 527   | 552  | 348  |
| 75° | 166  | 226   | 315  | 368   | 380  | 177  |
| 85° | 32   | 66    | 81   | 88    | 91   | 40   |
| 90° | 0    | 0     | 0    | 0     | 0    |      |



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|-------|--------|--------|--------|--------|--------|
| 0°    | 1028.9 | 1028.9 | 1028.9 | 1028.9 | 1028.9 |
| 2.5°  | 1030.5 | 1030.5 | 1025.7 | 1028.9 | 1028.9 |
| 5°    | 1028.9 | 1027.3 | 1022.4 | 1027.3 | 1027.3 |
| 7.5°  | 1024.1 | 1022.4 | 1019.2 | 1024.1 | 1022.4 |
| 10°   | 1014.3 | 1014.3 | 1011.1 | 1015.9 | 1015.9 |
| 12.5° | 1006.2 | 1004.6 | 1003.0 | 1009.4 | 1007.8 |
| 15°   | 993.2  | 993.2  | 991.6  | 999.7  | 998.1  |
| 17.5° | 977.0  | 978.6  | 980.2  | 986.7  | 988.3  |
| 20°   | 959.1  | 962.4  | 964.0  | 973.7  | 973.7  |
| 22.5° | 942.9  | 944.5  | 947.8  | 957.5  | 957.5  |
| 25°   | 921.8  | 925.1  | 931.5  | 939.7  | 941.3  |
| 27.5° | 900.7  | 902.3  | 910.4  | 921.8  | 923.4  |
| 30°   | 873.1  | 878.0  | 887.7  | 900.7  | 902.3  |
| 32.5° | 848.8  | 853.6  | 865.0  | 878.0  | 881.2  |
| 35°   | 817.9  | 824.4  | 837.4  | 853.6  | 856.9  |
| 37.5° | 790.4  | 795.2  | 811.5  | 829.3  | 834.2  |
| 40°   | 756.3  | 766.0  | 782.2  | 803.3  | 811.5  |
| 42.5° | 722.2  | 731.9  | 751.4  | 779.0  | 788.7  |
| 45°   | 686.5  | 697.8  | 722.2  | 753.0  | 766.0  |
| 47.5° | 650.8  | 663.8  | 691.4  | 727.1  | 741.7  |
| 50°   | 610.2  | 626.4  | 660.5  | 701.1  | 717.3  |
| 52.5° | 571.3  | 590.7  | 628.1  | 673.5  | 694.6  |
| 55°   | 530.7  | 550.2  | 598.9  | 645.9  | 668.6  |
| 57.5° | 485.2  | 511.2  | 564.8  | 618.3  | 642.7  |
| 60°   | 443.1  | 467.4  | 532.3  | 590.7  | 615.1  |
| 62.5° | 397.6  | 430.1  | 499.9  | 561.5  | 585.9  |
| 65°   | 350.5  | 386.3  | 465.8  | 527.4  | 551.8  |
| 67.5° | 308.4  | 347.3  | 431.7  | 493.4  | 517.7  |
| 70°   | 258.0  | 306.7  | 394.4  | 456.0  | 480.4  |
| 72.5° | 211.0  | 264.5  | 355.4  | 415.5  | 438.2  |
| 75°   | 165.5  | 225.6  | 314.8  | 368.4  | 379.8  |
| 77.5° | 123.3  | 186.6  | 272.6  | 295.4  | 287.3  |
| 80°   | 87.6   | 149.3  | 212.6  | 201.2  | 206.1  |
| 82.5° | 56.8   | 113.6  | 131.5  | 149.3  | 154.2  |
| 85°   | 32.5   | 66.5   | 81.1   | 87.6   | 90.9   |
| 87.5° | 14.6   | 24.3   | 32.5   | 32.5   | 30.8   |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

(END OF REPORT)