

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: FAIL-SAFE

Report Number: 766687

Luminaire Tested: **HPKC-100xxxx**

Issue Date: 3/3/2020

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: 766687
Test Lab:
Issue Date: 3/3/2020
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: FAIL-SAFE
Catalog Number: HPKC-100xxxx
Description: FAIL-SAFE SHALLOW PARKING GARAGE LIGHT
Light Source: 023 - 100W HPS CL BU MED 9500 LUMENS
Ballast/Driver: -

| Luminaire Equipment: | <u>Sample No.</u> | <u>Condition</u> | <u>Description</u> |
|----------------------|-------------------|------------------|---------------------------|
| | AS-5443-1 | Good | WHITE TWIN R-EVOLVE FLOOD |
| | AS-5443-2 | Good | REFLECTOR |
| | AS-5443-3 | Good | DRIVER |
| | AS-5443-4 | Good | UPPER MODULE |
| | AS-5443-5 | Good | LENS |
| | AS-5443-6 | Good | DRIVER 2 |
| | AS-5443-7 | Good | TRIM RING |

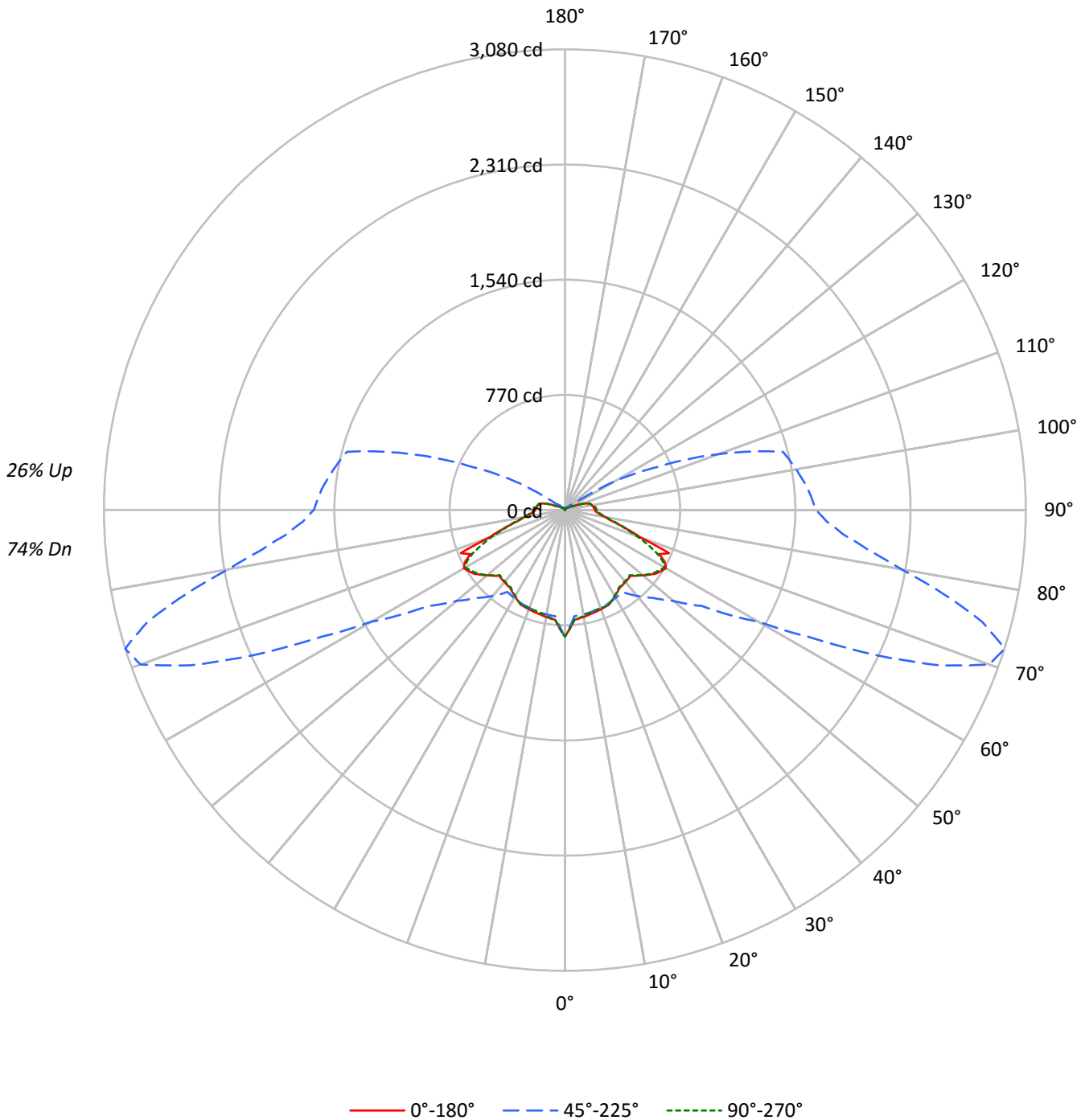
Summary

Lumens per Lamp: 9500 (1 lamp)
Luminaire Lumens: 8064.4 lumens
Efficiency: 84.9%
Efficacy: 80.6 lumens/watt
Spacing Criteria (0/90/45): 1.18 / 1.18 / 1.97
Luminous Opening: Point Source (0' x 0' x 0')
CIE Type: Semi-Direct

Input Watts (W): 100
Input Voltage (V): NR
Input Current (Ain): NR
Voltage Rise (V): 3.0
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 | 96 | 96 | 96 | 96 | 91 | 91 | 91 | 91 | 82 | 82 | 82 | 74 | 74 | 74 | 67 | 67 | 67 | 63 |
| 1 | 82 | 75 | 70 | 64 | 77 | 71 | 66 | 61 | 63 | 59 | 55 | 56 | 53 | 49 | 49 | 47 | 44 | 41 |
| 2 | 72 | 62 | 54 | 47 | 67 | 58 | 51 | 45 | 52 | 46 | 40 | 45 | 40 | 36 | 39 | 36 | 32 | 29 |
| 3 | 64 | 52 | 43 | 36 | 60 | 49 | 41 | 34 | 43 | 37 | 31 | 38 | 32 | 28 | 33 | 28 | 24 | 21 |
| 4 | 58 | 45 | 36 | 29 | 54 | 42 | 34 | 27 | 37 | 30 | 25 | 33 | 27 | 22 | 28 | 23 | 19 | 16 |
| 5 | 52 | 39 | 30 | 24 | 49 | 37 | 29 | 23 | 33 | 26 | 20 | 29 | 23 | 18 | 25 | 20 | 16 | 13 |
| 6 | 48 | 35 | 26 | 20 | 45 | 33 | 25 | 19 | 29 | 22 | 17 | 25 | 20 | 15 | 22 | 17 | 13 | 11 |
| 7 | 44 | 31 | 23 | 17 | 41 | 29 | 22 | 16 | 26 | 19 | 15 | 23 | 17 | 13 | 20 | 15 | 11 | 9 |
| 8 | 41 | 28 | 20 | 15 | 38 | 27 | 19 | 14 | 24 | 17 | 13 | 21 | 15 | 11 | 18 | 13 | 10 | 8 |
| 9 | 38 | 26 | 18 | 13 | 36 | 24 | 17 | 12 | 22 | 15 | 11 | 19 | 14 | 10 | 17 | 12 | 9 | 7 |
| 10 | 36 | 24 | 16 | 12 | 33 | 22 | 16 | 11 | 20 | 14 | 10 | 18 | 13 | 9 | 16 | 11 | 8 | 6 |

AVERAGE LUMINANCE (cd/sqm):

| | 0° | 90° | 180° |
|-----|--|-----|------|
| 0° | Luminaire represents a point source (luminous area is zero). | | |
| 5° | No luminance values can be calculated. | | |
| 10° | | | |
| 15° | | | |
| 20° | | | |
| 25° | | | |
| 30° | | | |
| 35° | | | |
| 40° | | | |
| 45° | | | |
| 50° | | | |
| 55° | | | |
| 60° | | | |
| 65° | | | |
| 70° | | | |
| 75° | | | |
| 80° | | | |
| 85° | | | |



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ZONAL LUMENS:

CANDELA DISTRIBUTION:

| Zone | Lumens | % Fixture | % Lamp | | 0° | 45° | 90° | 135° | 180° | Flux |
|-----------|--------|-----------|--------|------|-----|------|-----|------|------|------|
| 0°-10° | 70.1 | 0.9 | 0.7 | 0° | 846 | 846 | 846 | 846 | 846 | |
| 10°-20° | 200.2 | 2.5 | 2.1 | 5° | 736 | 713 | 736 | 713 | 736 | 71 |
| 20°-30° | 317.4 | 3.9 | 3.3 | 15° | 714 | 703 | 702 | 703 | 714 | 203 |
| 30°-40° | 423.6 | 5.3 | 4.5 | 25° | 697 | 688 | 696 | 688 | 697 | 318 |
| 40°-50° | 567.6 | 7.0 | 6.0 | 35° | 636 | 668 | 631 | 668 | 636 | 407 |
| 50°-60° | 814.5 | 10.1 | 8.6 | 45° | 621 | 830 | 615 | 830 | 621 | 506 |
| 60°-70° | 1273.4 | 15.8 | 13.4 | 55° | 741 | 1118 | 730 | 1118 | 741 | 660 |
| 70°-80° | 1302.9 | 16.2 | 13.7 | 65° | 694 | 2294 | 676 | 2294 | 694 | 709 |
| 80°-90° | 1033.9 | 12.8 | 10.9 | 75° | 373 | 2888 | 381 | 2888 | 373 | 407 |
| 90°-100° | 973.8 | 12.1 | 10.3 | 85° | 221 | 1868 | 232 | 1868 | 221 | 191 |
| 100°-110° | 701.4 | 8.7 | 7.4 | 90° | 200 | 1678 | 212 | 1678 | 200 | 110 |
| 110°-120° | 309.7 | 3.8 | 3.3 | 95° | 195 | 1630 | 206 | 1630 | 195 | 156 |
| 120°-130° | 74.5 | 0.9 | 0.8 | 105° | 172 | 1508 | 171 | 1508 | 172 | 160 |
| 130°-140° | 19.7 | 0.2 | 0.2 | 115° | 65 | 683 | 63 | 683 | 65 | 82 |
| 140°-150° | 8.3 | 0.1 | 0.1 | 125° | 28 | 76 | 28 | 76 | 28 | 32 |
| 150°-160° | 3.0 | 0.0 | 0.0 | 135° | 20 | 35 | 22 | 35 | 20 | 16 |
| 160°-170° | 1.2 | 0.0 | 0.0 | 145° | 15 | 15 | 15 | 15 | 15 | 9 |
| 170°-180° | 0.2 | 0.0 | 0.0 | 155° | 5 | 2 | 6 | 2 | 5 | 3 |
| 0°-30° | 587.8 | 7.3 | 6.2 | 165° | 3 | 17 | 3 | 17 | 3 | 1 |
| 0°-40° | 1011.3 | 12.5 | 10.6 | 175° | 0 | 0 | 0 | 0 | 0 | 0 |
| 0°-60° | 2393.4 | 29.7 | 25.2 | 180° | 0 | 0 | 0 | 0 | 0 | 0 |
| 0°-90° | 6003.6 | 74.4 | 63.2 | | | | | | | |
| 90°-120° | 1984.9 | 24.6 | 20.9 | | | | | | | |
| 90°-150° | 2087.5 | 25.9 | 22.0 | | | | | | | |
| 90°-180° | 2092.0 | 25.9 | 22.0 | | | | | | | |
| 0°-180° | 8064.4 | 100.0 | 84.9 | | | | | | | |



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CANDELA DISTRIBUTION (FULL):

| | 0° | 5° | 15° | 25° | 35° | 45° | 55° | 65° | 75° | 85° | 90° |
|-------|-----|-----|-----|------|------|------|------|------|-----|-----|-----|
| 0° | 846 | 846 | 846 | 846 | 846 | 846 | 846 | 846 | 846 | 846 | 846 |
| 5° | 736 | 711 | 716 | 709 | 718 | 713 | 711 | 744 | 738 | 732 | 736 |
| 15° | 714 | 708 | 710 | 708 | 702 | 703 | 704 | 707 | 697 | 701 | 702 |
| 25° | 697 | 701 | 693 | 691 | 694 | 688 | 695 | 697 | 691 | 696 | 696 |
| 35° | 636 | 635 | 643 | 650 | 671 | 668 | 668 | 654 | 638 | 631 | 631 |
| 45° | 621 | 638 | 649 | 697 | 770 | 830 | 774 | 694 | 642 | 625 | 615 |
| 50° | 678 | 698 | 727 | 783 | 894 | 943 | 895 | 783 | 709 | 681 | 678 |
| 55° | 741 | 770 | 817 | 796 | 992 | 1118 | 990 | 875 | 812 | 746 | 730 |
| 60° | 779 | 860 | 904 | 1103 | 1277 | 1493 | 1243 | 1137 | 886 | 815 | 768 |
| 62.5° | 754 | 871 | 907 | 1274 | 1562 | 1835 | 1474 | 1296 | 867 | 826 | 736 |
| 65° | 694 | 859 | 857 | 1387 | 1728 | 2294 | 1685 | 1396 | 817 | 819 | 676 |
| 67.5° | 753 | 812 | 777 | 1421 | 1962 | 2712 | 1815 | 1440 | 762 | 773 | 595 |
| 70° | 541 | 742 | 692 | 1377 | 2023 | 3018 | 1903 | 1393 | 691 | 712 | 513 |
| 72.5° | 453 | 664 | 612 | 1297 | 1986 | 3080 | 1907 | 1314 | 613 | 646 | 433 |
| 75° | 373 | 590 | 537 | 1192 | 1888 | 2888 | 1861 | 1218 | 535 | 580 | 381 |
| 77.5° | 309 | 515 | 474 | 1087 | 1781 | 2593 | 1784 | 1140 | 468 | 519 | 321 |
| 80° | 275 | 462 | 431 | 1001 | 1662 | 2285 | 1692 | 1065 | 422 | 476 | 280 |
| 82.5° | 241 | 419 | 409 | 941 | 1586 | 2046 | 1626 | 1010 | 394 | 431 | 250 |
| 85° | 221 | 384 | 402 | 903 | 1562 | 1868 | 1602 | 974 | 386 | 390 | 232 |
| 87.5° | 206 | 350 | 404 | 876 | 1586 | 1752 | 1615 | 945 | 386 | 350 | 218 |
| 90° | 200 | 319 | 411 | 858 | 1634 | 1678 | 1649 | 923 | 394 | 313 | 212 |
| 95° | 195 | 272 | 436 | 830 | 1774 | 1630 | 1731 | 858 | 429 | 333 | 206 |
| 105° | 172 | 184 | 427 | 586 | 1488 | 1508 | 1403 | 584 | 446 | 179 | 171 |
| 115° | 65 | 63 | 100 | 144 | 342 | 683 | 379 | 126 | 128 | 62 | 63 |
| 125° | 28 | 27 | 28 | 35 | 61 | 76 | 61 | 35 | 27 | 25 | 28 |
| 135° | 20 | 20 | 20 | 21 | 26 | 35 | 27 | 21 | 20 | 21 | 22 |
| 145° | 15 | 15 | 14 | 12 | 10 | 15 | 10 | 12 | 14 | 15 | 15 |
| 155° | 5 | 5 | 4 | 2 | 2 | 2 | 3 | 2 | 4 | 5 | 6 |
| 165° | 3 | 3 | 2 | 2 | 16 | 17 | 14 | 2 | 2 | 3 | 3 |
| 175° | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 180° | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |



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CANDELA DISTRIBUTION (continued):

| | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|-------|-----|------|------|------|------|------|------|------|------|------|
| 0° | 846 | 846 | 846 | 846 | 846 | 846 | 846 | 846 | 846 | 846 |
| 5° | 732 | 738 | 744 | 711 | 713 | 718 | 709 | 716 | 711 | 736 |
| 15° | 701 | 697 | 707 | 704 | 703 | 702 | 708 | 710 | 708 | 714 |
| 25° | 696 | 691 | 697 | 695 | 688 | 694 | 691 | 693 | 701 | 697 |
| 35° | 631 | 638 | 654 | 668 | 668 | 671 | 650 | 643 | 635 | 636 |
| 45° | 625 | 642 | 694 | 774 | 830 | 770 | 697 | 649 | 638 | 621 |
| 50° | 681 | 709 | 783 | 895 | 943 | 894 | 783 | 727 | 698 | 678 |
| 55° | 746 | 812 | 875 | 990 | 1118 | 992 | 796 | 817 | 770 | 741 |
| 60° | 815 | 886 | 1137 | 1243 | 1493 | 1277 | 1103 | 904 | 860 | 779 |
| 62.5° | 826 | 867 | 1296 | 1474 | 1835 | 1562 | 1274 | 907 | 871 | 754 |
| 65° | 819 | 817 | 1396 | 1685 | 2294 | 1728 | 1387 | 857 | 859 | 694 |
| 67.5° | 773 | 762 | 1440 | 1815 | 2712 | 1962 | 1421 | 777 | 812 | 753 |
| 70° | 712 | 691 | 1393 | 1903 | 3018 | 2023 | 1377 | 692 | 742 | 541 |
| 72.5° | 646 | 613 | 1314 | 1907 | 3080 | 1986 | 1297 | 612 | 664 | 453 |
| 75° | 580 | 535 | 1218 | 1861 | 2888 | 1888 | 1192 | 537 | 590 | 373 |
| 77.5° | 519 | 468 | 1140 | 1784 | 2593 | 1781 | 1087 | 474 | 515 | 309 |
| 80° | 476 | 422 | 1065 | 1692 | 2285 | 1662 | 1001 | 431 | 462 | 275 |
| 82.5° | 431 | 394 | 1010 | 1626 | 2046 | 1586 | 941 | 409 | 419 | 241 |
| 85° | 390 | 386 | 974 | 1602 | 1868 | 1562 | 903 | 402 | 384 | 221 |
| 87.5° | 350 | 386 | 945 | 1615 | 1752 | 1586 | 876 | 404 | 350 | 206 |
| 90° | 313 | 394 | 923 | 1649 | 1678 | 1634 | 858 | 411 | 319 | 200 |
| 95° | 333 | 429 | 858 | 1731 | 1630 | 1774 | 830 | 436 | 272 | 195 |
| 105° | 179 | 446 | 584 | 1403 | 1508 | 1488 | 586 | 427 | 184 | 172 |
| 115° | 62 | 128 | 126 | 379 | 683 | 342 | 144 | 100 | 63 | 65 |
| 125° | 25 | 27 | 35 | 61 | 76 | 61 | 35 | 28 | 27 | 28 |
| 135° | 21 | 20 | 21 | 27 | 35 | 26 | 21 | 20 | 20 | 20 |
| 145° | 15 | 14 | 12 | 10 | 15 | 10 | 12 | 14 | 15 | 15 |
| 155° | 5 | 4 | 2 | 3 | 2 | 2 | 2 | 4 | 5 | 5 |
| 165° | 3 | 2 | 2 | 14 | 17 | 16 | 2 | 2 | 3 | 3 |
| 175° | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 180° | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

(END OF REPORT)