

Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269



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: P828079

Luminaire Tested: **OHBL-30SE-MFL-UNV-L935-CD-UPL15**

Issue Date: 5/3/2024



**Test Information**

Test Method: LM-79-08  
Report Number: P828079  
REPORT IS A COMBINATION OF REPORTS P826127 AND G3-2310-221-10  
Test Lab: INNOVATION CENTER  
Issue Date: 5/3/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: METALUX  
Catalog Number: OHBL-30SE-MFL-UNV-L935-CD-UPL15  
Description:  
Light Source: -  
Ballast/Driver: -

**Summary**

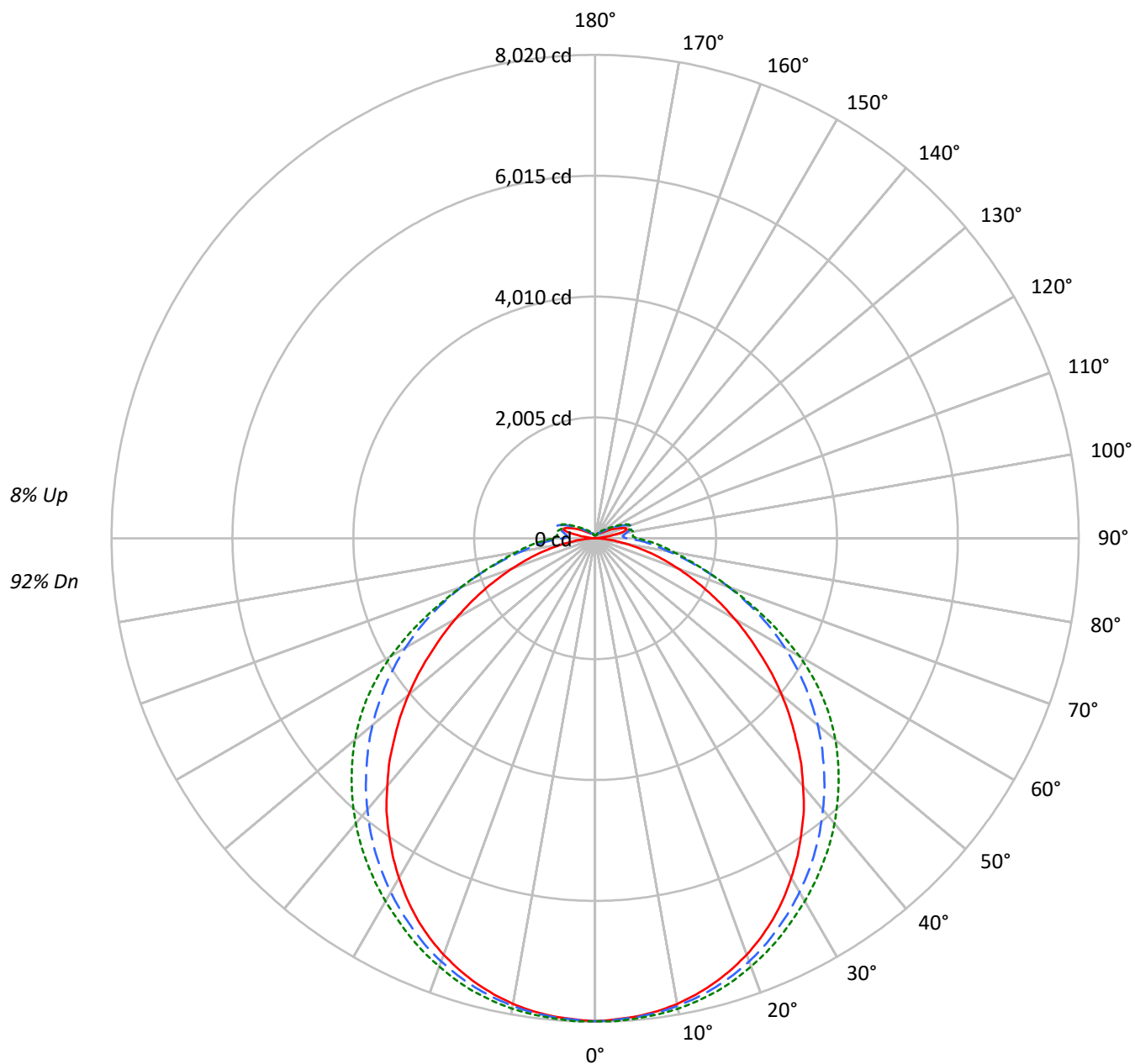
Lumens per Lamp: N/A  
Luminaire Lumens: 25244.4 lumens  
Efficiency: N/A  
Efficacy: 137.0 lumens/watt  
Spacing Criteria (0/90/45): 1.21 / 1.29 / 1.38  
Luminous Opening: Rectangular w/ Sides (W: 3.78' x L: 1.67' x H: 0.17')  
CIE Type: Direct

Input Watts (W): 184.3  
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

TEST NUMBER: P828079

CATALOG NUMBER: OHBL-30SE-MFL-UNV-L935-CD-UPL15

### Luminous Intensity Polar Plot





TEST NUMBER: P828079

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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   | 117 | 117 | 117 | 117 | 113 | 113 | 113 | 113 | 107 | 107 | 107 | 100 | 100 | 100 | 95 | 95 | 95 |
| 1   | 106 | 101 | 97  | 93  | 103 | 98  | 94  | 91  | 93  | 89  | 86  | 87  | 85  | 82  | 82 | 80 | 78 |
| 2   | 97  | 88  | 81  | 75  | 93  | 86  | 79  | 74  | 81  | 75  | 71  | 76  | 72  | 68  | 72 | 69 | 65 |
| 3   | 88  | 77  | 69  | 63  | 85  | 75  | 68  | 61  | 71  | 65  | 59  | 67  | 62  | 57  | 64 | 59 | 55 |
| 4   | 80  | 68  | 60  | 53  | 78  | 67  | 58  | 52  | 63  | 56  | 50  | 60  | 54  | 49  | 57 | 52 | 47 |
| 5   | 74  | 61  | 52  | 45  | 71  | 59  | 51  | 45  | 56  | 49  | 44  | 54  | 47  | 42  | 51 | 46 | 41 |
| 6   | 68  | 55  | 46  | 40  | 66  | 54  | 45  | 39  | 51  | 44  | 38  | 49  | 42  | 37  | 46 | 41 | 36 |
| 7   | 63  | 50  | 41  | 35  | 61  | 49  | 40  | 35  | 46  | 39  | 34  | 44  | 38  | 33  | 42 | 36 | 32 |
| 8   | 59  | 45  | 37  | 31  | 57  | 44  | 36  | 31  | 42  | 35  | 30  | 40  | 34  | 29  | 39 | 33 | 29 |
| 9   | 55  | 42  | 33  | 28  | 53  | 41  | 33  | 28  | 39  | 32  | 27  | 37  | 31  | 27  | 36 | 30 | 26 |
| 10  | 52  | 38  | 30  | 25  | 50  | 38  | 30  | 25  | 36  | 29  | 25  | 35  | 28  | 24  | 33 | 28 | 24 |

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

|     | 0°    | 45°   | 90°   |
|-----|-------|-------|-------|
| 0°  | 13684 | 13684 | 13684 |
| 5°  | 13531 | 13549 | 13654 |
| 10° | 13370 | 13423 | 13640 |
| 15° | 13156 | 13274 | 13604 |
| 20° | 12892 | 13093 | 13526 |
| 25° | 12562 | 12869 | 13448 |
| 30° | 12131 | 12626 | 13373 |
| 35° | 11623 | 12368 | 13322 |
| 40° | 11027 | 12071 | 13280 |
| 45° | 10338 | 11747 | 13214 |
| 50° | 9590  | 11420 | 13128 |
| 55° | 8690  | 11020 | 12925 |
| 60° | 7770  | 10550 | 12415 |
| 65° | 6773  | 9950  | 11497 |
| 70° | 5699  | 9188  | 10516 |
| 75° | 4607  | 8306  | 10001 |
| 80° | 3285  | 7652  | 10476 |
| 85° | 1829  | 7882  | 13132 |



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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 759.2   | 3.0       |
| 10°-20°   | 2178.0  | 8.6       |
| 20°-30°   | 3293.8  | 13.0      |
| 30°-40°   | 3954.2  | 15.7      |
| 40°-50°   | 4084.1  | 16.2      |
| 50°-60°   | 3674.4  | 14.6      |
| 60°-70°   | 2767.9  | 11.0      |
| 70°-80°   | 1671.3  | 6.6       |
| 80°-90°   | 820.6   | 3.3       |
| 90°-100°  | 465.4   | 1.8       |
| 100°-110° | 616.9   | 2.4       |
| 110°-120° | 476.6   | 1.9       |
| 120°-130° | 238.6   | 0.9       |
| 130°-140° | 121.0   | 0.5       |
| 140°-150° | 67.0    | 0.3       |
| 150°-160° | 35.6    | 0.1       |
| 160°-170° | 15.2    | 0.1       |
| 170°-180° | 4.6     | 0.0       |
| 0°-30°    | 6230.9  | 24.7      |
| 0°-40°    | 10185.1 | 40.3      |
| 0°-60°    | 17943.6 | 71.1      |
| 0°-90°    | 23203.4 | 91.9      |
| 90°-120°  | 1558.9  | 6.2       |
| 90°-150°  | 1985.6  | 7.9       |
| 90°-180°  | 2041.0  | 8.1       |
| 0°-180°   | 25244.4 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 8012 | 8012  | 8012 | 8012  | 8012 |      |
| 5°   | 7961 | 7982  | 7973 | 8004  | 7994 | 756  |
| 15°  | 7639 | 7677  | 7712 | 7777  | 7784 | 2154 |
| 25°  | 6977 | 7053  | 7153 | 7265  | 7282 | 3209 |
| 35°  | 5965 | 6104  | 6355 | 6547  | 6586 | 3729 |
| 45°  | 4708 | 4945  | 5359 | 5651  | 5712 | 3635 |
| 55°  | 3335 | 3680  | 4239 | 4559  | 4614 | 2990 |
| 65°  | 2035 | 2451  | 3000 | 3149  | 3114 | 2022 |
| 75°  | 959  | 1376  | 1737 | 1782  | 1765 | 1023 |
| 85°  | 200  | 528   | 871  | 990   | 1008 | 231  |
| 90°  | 2    | 224   | 522  | 659   | 689  | 14   |
| 95°  | 33   | 199   | 462  | 593   | 630  | 91   |
| 105° | 541  | 600   | 659  | 596   | 582  | 513  |
| 115° | 379  | 408   | 500  | 543   | 544  | 383  |
| 125° | 192  | 207   | 271  | 305   | 310  | 180  |
| 135° | 118  | 125   | 151  | 182   | 191  | 93   |
| 145° | 95   | 95    | 99   | 116   | 122  | 60   |
| 155° | 80   | 83    | 83   | 81    | 84   | 35   |
| 165° | 52   | 52    | 53   | 53    | 53   | 15   |
| 175° | 48   | 48    | 48   | 48    | 48   | 5    |
| 180° | 48   | 48    | 48   | 48    | 48   |      |



TEST NUMBER: P828079

CATALOG NUMBER: OHBL-30SE-MFL-UNV-L935-CD-UPL15

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 8011.9 | 8011.9 | 8011.9 | 8011.9 | 8011.9 |
| 2.5°   | 7988.4 | 8008.0 | 7996.2 | 8021.8 | 8019.8 |
| 5°     | 7960.9 | 7982.5 | 7972.7 | 8004.1 | 7994.3 |
| 7.5°   | 7913.9 | 7937.4 | 7935.4 | 7970.8 | 7966.8 |
| 10°    | 7845.2 | 7870.8 | 7878.6 | 7925.7 | 7925.7 |
| 12.5°  | 7751.2 | 7784.5 | 7804.1 | 7860.9 | 7862.9 |
| 15°    | 7639.3 | 7676.6 | 7711.9 | 7776.7 | 7784.5 |
| 17.5°  | 7504.1 | 7551.2 | 7600.2 | 7674.7 | 7684.5 |
| 20°    | 7351.2 | 7404.1 | 7470.8 | 7549.2 | 7560.9 |
| 22.5°  | 7174.7 | 7237.4 | 7323.7 | 7415.8 | 7429.6 |
| 25°    | 6976.6 | 7053.1 | 7153.1 | 7264.8 | 7282.5 |
| 27.5°  | 6751.1 | 6839.3 | 6974.7 | 7100.2 | 7115.8 |
| 30°    | 6506.0 | 6609.9 | 6778.6 | 6927.6 | 6953.1 |
| 32.5°  | 6247.2 | 6366.8 | 6574.7 | 6741.3 | 6776.6 |
| 35°    | 5964.8 | 6104.1 | 6355.0 | 6547.2 | 6586.4 |
| 37.5°  | 5686.4 | 5839.3 | 6123.7 | 6343.2 | 6390.3 |
| 40°    | 5360.9 | 5551.1 | 5876.6 | 6119.8 | 6176.6 |
| 42.5°  | 5055.0 | 5260.9 | 5629.5 | 5894.3 | 5949.2 |
| 45°    | 4707.9 | 4945.2 | 5358.9 | 5651.1 | 5711.9 |
| 47.5°  | 4382.4 | 4639.3 | 5098.2 | 5400.1 | 5462.8 |
| 50°    | 4039.3 | 4321.7 | 4819.7 | 5135.4 | 5200.1 |
| 52.5°  | 3696.2 | 4000.1 | 4531.5 | 4858.9 | 4919.7 |
| 55°    | 3335.3 | 3680.5 | 4239.3 | 4558.9 | 4613.8 |
| 57.5°  | 3000.1 | 3364.8 | 3939.3 | 4243.2 | 4276.6 |
| 60°    | 2668.7 | 3047.1 | 3633.4 | 3900.1 | 3911.8 |
| 62.5°  | 2345.2 | 2743.2 | 3319.7 | 3531.4 | 3515.8 |
| 65°    | 2035.3 | 2451.0 | 3000.1 | 3149.1 | 3113.8 |
| 67.5°  | 1737.2 | 2166.8 | 2672.6 | 2768.7 | 2721.6 |
| 70°    | 1454.9 | 1890.3 | 2354.9 | 2404.0 | 2360.8 |
| 72.5°  | 1205.9 | 1627.5 | 2033.3 | 2074.6 | 2043.2 |
| 75°    | 958.8  | 1376.5 | 1737.2 | 1782.4 | 1764.8 |
| 77.5°  | 727.5  | 1133.3 | 1464.8 | 1523.6 | 1527.5 |
| 80°    | 523.5  | 911.8  | 1227.5 | 1319.7 | 1331.4 |
| 82.5°  | 345.1  | 707.8  | 1029.4 | 1147.1 | 1164.8 |
| 85°    | 200.0  | 527.5  | 870.6  | 990.2  | 1007.8 |
| 87.5°  | 86.2   | 380.4  | 700.0  | 807.8  | 829.4  |
| 90°    | 2.5    | 224.3  | 522.3  | 659.2  | 688.8  |
| 92.5°  | 14.3   | 193.9  | 465.8  | 598.4  | 628.3  |
| 95°    | 33.2   | 199.2  | 461.8  | 592.8  | 629.7  |
| 97.5°  | 150.1  | 273.5  | 493.5  | 609.6  | 642.3  |
| 100°   | 292.6  | 405.3  | 529.6  | 624.4  | 645.9  |
| 102.5° | 463.4  | 526.8  | 567.6  | 607.7  | 616.4  |
| 105°   | 541.2  | 600.4  | 659.0  | 595.7  | 581.6  |



TEST NUMBER: P828079

CATALOG NUMBER: OHBL-30SE-MFL-UNV-L935-CD-UPL15

**CANDELA DISTRIBUTION (continued):**

|        | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|--------|-------|-------|-------|-------|-------|
| 112.5° | 439.8 | 482.9 | 571.5 | 607.5 | 600.3 |
| 115°   | 379.0 | 408.4 | 500.0 | 543.4 | 543.8 |
| 117.5° | 329.3 | 349.3 | 431.0 | 472.4 | 476.7 |
| 120°   | 277.7 | 296.7 | 368.1 | 405.7 | 412.7 |
| 122.5° | 232.7 | 249.1 | 318.0 | 352.8 | 357.8 |
| 125°   | 191.5 | 207.4 | 271.2 | 304.8 | 309.9 |
| 127.5° | 163.8 | 173.5 | 231.2 | 266.4 | 270.7 |
| 130°   | 143.8 | 149.8 | 198.0 | 232.2 | 238.0 |
| 132.5° | 129.6 | 136.8 | 172.3 | 204.6 | 213.2 |
| 135°   | 117.9 | 125.2 | 151.2 | 182.2 | 190.9 |
| 137.5° | 109.6 | 115.2 | 134.2 | 162.4 | 171.2 |
| 140°   | 103.2 | 107.7 | 119.9 | 144.3 | 153.0 |
| 142.5° | 99.3  | 101.0 | 106.6 | 129.8 | 135.7 |
| 145°   | 95.4  | 95.2  | 98.8  | 116.2 | 122.0 |
| 147.5° | 91.2  | 92.9  | 94.6  | 102.4 | 109.2 |
| 150°   | 87.1  | 90.8  | 89.6  | 92.4  | 98.3  |
| 152.5° | 83.8  | 86.6  | 86.2  | 84.3  | 89.1  |
| 155°   | 80.4  | 83.3  | 82.9  | 81.0  | 83.8  |
| 157.5° | 58.3  | 59.2  | 60.0  | 60.8  | 60.8  |
| 160°   | 55.8  | 56.7  | 57.5  | 57.5  | 58.3  |
| 162.5° | 54.2  | 55.0  | 55.0  | 55.8  | 55.8  |
| 165°   | 52.5  | 52.5  | 53.3  | 53.3  | 53.3  |
| 167.5° | 50.8  | 50.8  | 51.7  | 51.7  | 52.5  |
| 170°   | 49.2  | 50.0  | 50.0  | 50.0  | 50.8  |
| 172.5° | 48.3  | 48.3  | 49.2  | 49.2  | 49.2  |
| 175°   | 47.5  | 47.5  | 47.5  | 48.3  | 48.3  |
| 177.5° | 46.7  | 47.5  | 47.5  | 47.5  | 47.5  |
| 180°   | 47.5  | 47.5  | 47.5  | 47.5  | 47.5  |



Report Generated By 670246072 / DESKTOP-50001EG





— 0°-180°    - - 45°-225°    - - - 90°-270°







|        |       |       |       |       |       |
|--------|-------|-------|-------|-------|-------|
| 107.5° | 541.2 | 598.9 | 679.3 | 627.7 | 576.6 |
| 110°   | 500.4 | 553.6 | 637.8 | 650.2 | 608.3 |



LM-79-2019: Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Report Prepared for

Cooper Lighting Solutions

METALUX

Report Number: SP1-2307-100-7

Test Date: 07/28/2023

Luminaire Tested: OHB-15SE-N-UNV-L935-CD

Data in this report applies to families of products including OHB-15SE-N-UNV-L935-CD.

### Test Information

Test Method: LM-79-2019  
 Report Number: SP1-2307-100-7  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry: 4π  
 Issue Date: 08/04/2023  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: METALUX  
 Catalog Number: **OHB-15SE-N-UNV-L935-CD**  
 Description: 15000 LUMEN OHB SE LED LUMINAIRE WITH 90CRI, 3500K LEDS AND NARROW LENS

LENS

### Spectral Parameters

|                           |         |           |      |      |      |
|---------------------------|---------|-----------|------|------|------|
| CCT (K):                  | 3429    | CRI (Ra): | 90.9 |      |      |
| CIE u':                   | 0.2376  | R1:       | 91.1 | R9:  | 50.7 |
| CIE v':                   | 0.5121  | R2:       | 96.7 | R10: | 90.8 |
| Duv:                      | -0.0004 | R3:       | 97.7 | R11: | 88.9 |
| CIE x:                    | 0.4088  | R4:       | 88.8 | R12: | 74.6 |
| CIE y:                    | 0.3916  | R5:       | 90.3 | R13: | 92.9 |
| CIE z:                    | 0.1997  | R6:       | 94.5 | R14: | 99.5 |
| Peak Wavelength (nm):     | 609     | R7:       | 89.8 |      |      |
| Dominant Wavelength (nm): | 581     | R8:       | 78.2 |      |      |
| Purity:                   | 40.4    |           |      |      |      |
| Rf:                       | 88.9    |           |      |      |      |
| Rg:                       | 96.3    |           |      |      |      |



### Test Conditions

Stabilization Time: 23M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.7/55%  
 Sphere Temperature (°C): 25.2

REPORT NUMBER: SP1-2307-100-7

| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | 76INCH SPHERE IN0058  | 2/9/2023         | 8/9/2023             |
| Power Meter                    | XITRON 2801 IN0071    | 11/29/2022       | 11/29/2023           |
| AC Power Source                | CHROMA 61603 IN0063   | 11/28/2022       | 11/28/2023           |
| DC Power Source                | AGILENT E3634A IN0208 | 11/28/2022       | 11/28/2023           |
| Sphere Thermometer             | ONSET IN0085          | 11/28/2022       | 11/28/2023           |
| Room Thermometer               | ONSET IN0046          | 11/28/2022       | 11/28/2023           |

REPORT NUMBER: SP1-2307-100-7

CIE 1931 Chromaticity Diagram



CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies inside the ANSI 3500K 4-step quadrangle

REPORT NUMBER: SP1-2307-100-7

**Photopic Flux vs. Wavelength**



#####

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 5498             | NR               | 490       | 81900            | NR               | 620       | 217907           | NR               | 750       | 17550            | NR               | 880       | 6189             | NR               |
| 365       | 4903             | NR               | 495       | 90120            | NR               | 625       | 213734           | NR               | 755       | 15662            | NR               | 885       | 6187             | NR               |
| 370       | 4767             | NR               | 500       | 98453            | NR               | 630       | 206250           | NR               | 760       | 13792            | NR               | 890       | 3830             | NR               |
| 375       | 5225             | NR               | 505       | 109244           | NR               | 635       | 198796           | NR               | 765       | 12765            | NR               | 895       | 4688             | NR               |
| 380       | 5499             | NR               | 510       | 117784           | NR               | 640       | 189406           | NR               | 770       | 11372            | NR               | 900       | 4680             | NR               |
| 385       | 5081             | NR               | 515       | 125000           | NR               | 645       | 180677           | NR               | 775       | 9965             | NR               | 905       | 4599             | NR               |
| 390       | 4739             | NR               | 520       | 131786           | NR               | 650       | 168402           | NR               | 780       | 9154             | NR               | 910       | 4495             | NR               |
| 395       | 4255             | NR               | 525       | 136796           | NR               | 655       | 157693           | NR               | 785       | 8847             | NR               | 915       | 3983             | NR               |
| 400       | 3864             | NR               | 530       | 142357           | NR               | 660       | 145357           | NR               | 790       | 7937             | NR               | 920       | 4675             | NR               |
| 405       | 3583             | NR               | 535       | 147243           | NR               | 665       | 132743           | NR               | 795       | 6956             | NR               | 925       | 4952             | NR               |
| 410       | 3994             | NR               | 540       | 152273           | NR               | 670       | 120757           | NR               | 800       | 6970             | NR               | 930       | 6097             | NR               |
| 415       | 5055             | NR               | 545       | 157222           | NR               | 675       | 108421           | NR               | 805       | 6299             | NR               | 935       | 5657             | NR               |
| 420       | 7131             | NR               | 550       | 161271           | NR               | 680       | 97325            | NR               | 810       | 6023             | NR               | 940       | 4574             | NR               |
| 425       | 11311            | NR               | 555       | 167038           | NR               | 685       | 86839            | NR               | 815       | 6343             | NR               | 945       | 5252             | NR               |
| 430       | 17754            | NR               | 560       | 173115           | NR               | 690       | 76248            | NR               | 820       | 6462             | NR               | 950       | 5635             | NR               |
| 435       | 28634            | NR               | 565       | 178502           | NR               | 695       | 67406            | NR               | 825       | 5476             | NR               | 955       | 4501             | NR               |
| 440       | 46392            | NR               | 570       | 184331           | NR               | 700       | 60039            | NR               | 830       | 5786             | NR               | 960       | 2938             | NR               |
| 445       | 78344            | NR               | 575       | 189666           | NR               | 705       | 53650            | NR               | 835       | 5884             | NR               | 965       | 5544             | NR               |
| 450       | 131219           | NR               | 580       | 196488           | NR               | 710       | 47273            | NR               | 840       | 4862             | NR               | 970       | 5050             | NR               |
| 455       | 170311           | NR               | 585       | 202769           | NR               | 715       | 41664            | NR               | 845       | 5651             | NR               | 975       | 5575             | NR               |
| 460       | 154269           | NR               | 590       | 207213           | NR               | 720       | 37083            | NR               | 850       | 5178             | NR               | 980       | 2973             | NR               |
| 465       | 126622           | NR               | 595       | 213472           | NR               | 725       | 32494            | NR               | 855       | 5510             | NR               | 985       | 4912             | NR               |
| 470       | 109065           | NR               | 600       | 218473           | NR               | 730       | 28665            | NR               | 860       | 5438             | NR               | 990       | 5454             | NR               |
| 475       | 91762            | NR               | 605       | 220737           | NR               | 735       | 25540            | NR               | 865       | 5848             | NR               | 995       | 6068             | NR               |
| 480       | 78213            | NR               | 610       | 221090           | NR               | 740       | 22878            | NR               | 870       | 4969             | NR               | 1000      | 9406             | NR               |
| 485       | 77035            | NR               | 615       | 220059           | NR               | 745       | 20304            | NR               | 875       | 5438             | NR               |           |                  |                  |

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Scotopic Flux vs. Wavelength



Scotopic Lumens: 19629.6

S/P: 1.6

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 5498             | NR               | 490       | 81900            | NR               | 620       | 217907           | NR               | 750       | 17550            | NR               | 880       | 6189             | NR               |
| 365       | 4903             | NR               | 495       | 90120            | NR               | 625       | 213734           | NR               | 755       | 15662            | NR               | 885       | 6187             | NR               |
| 370       | 4767             | NR               | 500       | 98453            | NR               | 630       | 206250           | NR               | 760       | 13792            | NR               | 890       | 3830             | NR               |
| 375       | 5225             | NR               | 505       | 109244           | NR               | 635       | 198796           | NR               | 765       | 12765            | NR               | 895       | 4688             | NR               |
| 380       | 5499             | NR               | 510       | 117784           | NR               | 640       | 189406           | NR               | 770       | 11372            | NR               | 900       | 4680             | NR               |
| 385       | 5081             | NR               | 515       | 125000           | NR               | 645       | 180677           | NR               | 775       | 9965             | NR               | 905       | 4599             | NR               |
| 390       | 4739             | NR               | 520       | 131786           | NR               | 650       | 168402           | NR               | 780       | 9154             | NR               | 910       | 4495             | NR               |
| 395       | 4255             | NR               | 525       | 136796           | NR               | 655       | 157693           | NR               | 785       | 8847             | NR               | 915       | 3983             | NR               |
| 400       | 3864             | NR               | 530       | 142357           | NR               | 660       | 145357           | NR               | 790       | 7937             | NR               | 920       | 4675             | NR               |
| 405       | 3583             | NR               | 535       | 147243           | NR               | 665       | 132743           | NR               | 795       | 6956             | NR               | 925       | 4952             | NR               |
| 410       | 3994             | NR               | 540       | 152273           | NR               | 670       | 120757           | NR               | 800       | 6970             | NR               | 930       | 6097             | NR               |
| 415       | 5055             | NR               | 545       | 157222           | NR               | 675       | 108421           | NR               | 805       | 6299             | NR               | 935       | 5657             | NR               |
| 420       | 7131             | NR               | 550       | 161271           | NR               | 680       | 97325            | NR               | 810       | 6023             | NR               | 940       | 4574             | NR               |
| 425       | 11311            | NR               | 555       | 167038           | NR               | 685       | 86839            | NR               | 815       | 6343             | NR               | 945       | 5252             | NR               |
| 430       | 17754            | NR               | 560       | 173115           | NR               | 690       | 76248            | NR               | 820       | 6462             | NR               | 950       | 5635             | NR               |
| 435       | 28634            | NR               | 565       | 178502           | NR               | 695       | 67406            | NR               | 825       | 5476             | NR               | 955       | 4501             | NR               |
| 440       | 46392            | NR               | 570       | 184331           | NR               | 700       | 60039            | NR               | 830       | 5786             | NR               | 960       | 2938             | NR               |
| 445       | 78344            | NR               | 575       | 189666           | NR               | 705       | 53650            | NR               | 835       | 5884             | NR               | 965       | 5544             | NR               |
| 450       | 131219           | NR               | 580       | 196488           | NR               | 710       | 47273            | NR               | 840       | 4862             | NR               | 970       | 5050             | NR               |
| 455       | 170311           | NR               | 585       | 202769           | NR               | 715       | 41664            | NR               | 845       | 5651             | NR               | 975       | 5575             | NR               |
| 460       | 154269           | NR               | 590       | 207213           | NR               | 720       | 37083            | NR               | 850       | 5178             | NR               | 980       | 2973             | NR               |
| 465       | 126622           | NR               | 595       | 213472           | NR               | 725       | 32494            | NR               | 855       | 5510             | NR               | 985       | 4912             | NR               |
| 470       | 109065           | NR               | 600       | 218473           | NR               | 730       | 28665            | NR               | 860       | 5438             | NR               | 990       | 5454             | NR               |
| 475       | 91762            | NR               | 605       | 220737           | NR               | 735       | 25540            | NR               | 865       | 5848             | NR               | 995       | 6068             | NR               |
| 480       | 78213            | NR               | 610       | 221090           | NR               | 740       | 22878            | NR               | 870       | 4969             | NR               | 1000      | 9406             | NR               |
| 485       | 77035            | NR               | 615       | 220059           | NR               | 745       | 20304            | NR               | 875       | 5438             | NR               |           |                  |                  |

REPORT NUMBER: SP1-2307-100-7

**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 7912.5**

**M/P: 0.65**

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 5498             | NR               | 490       | 81900            | NR               | 620       | 217907           | NR               | 750       | 17550            | NR               | 880       | 6189             | NR               |
| 365       | 4903             | NR               | 495       | 90120            | NR               | 625       | 213734           | NR               | 755       | 15662            | NR               | 885       | 6187             | NR               |
| 370       | 4767             | NR               | 500       | 98453            | NR               | 630       | 206250           | NR               | 760       | 13792            | NR               | 890       | 3830             | NR               |
| 375       | 5225             | NR               | 505       | 109244           | NR               | 635       | 198796           | NR               | 765       | 12765            | NR               | 895       | 4688             | NR               |
| 380       | 5499             | NR               | 510       | 117784           | NR               | 640       | 189406           | NR               | 770       | 11372            | NR               | 900       | 4680             | NR               |
| 385       | 5081             | NR               | 515       | 125000           | NR               | 645       | 180677           | NR               | 775       | 9965             | NR               | 905       | 4599             | NR               |
| 390       | 4739             | NR               | 520       | 131786           | NR               | 650       | 168402           | NR               | 780       | 9154             | NR               | 910       | 4495             | NR               |
| 395       | 4255             | NR               | 525       | 136796           | NR               | 655       | 157693           | NR               | 785       | 8847             | NR               | 915       | 3983             | NR               |
| 400       | 3864             | NR               | 530       | 142357           | NR               | 660       | 145357           | NR               | 790       | 7937             | NR               | 920       | 4675             | NR               |
| 405       | 3583             | NR               | 535       | 147243           | NR               | 665       | 132743           | NR               | 795       | 6956             | NR               | 925       | 4952             | NR               |
| 410       | 3994             | NR               | 540       | 152273           | NR               | 670       | 120757           | NR               | 800       | 6970             | NR               | 930       | 6097             | NR               |
| 415       | 5055             | NR               | 545       | 157222           | NR               | 675       | 108421           | NR               | 805       | 6299             | NR               | 935       | 5657             | NR               |
| 420       | 7131             | NR               | 550       | 161271           | NR               | 680       | 97325            | NR               | 810       | 6023             | NR               | 940       | 4574             | NR               |
| 425       | 11311            | NR               | 555       | 167038           | NR               | 685       | 86839            | NR               | 815       | 6343             | NR               | 945       | 5252             | NR               |
| 430       | 17754            | NR               | 560       | 173115           | NR               | 690       | 76248            | NR               | 820       | 6462             | NR               | 950       | 5635             | NR               |
| 435       | 28634            | NR               | 565       | 178502           | NR               | 695       | 67406            | NR               | 825       | 5476             | NR               | 955       | 4501             | NR               |
| 440       | 46392            | NR               | 570       | 184331           | NR               | 700       | 60039            | NR               | 830       | 5786             | NR               | 960       | 2938             | NR               |
| 445       | 78344            | NR               | 575       | 189666           | NR               | 705       | 53650            | NR               | 835       | 5884             | NR               | 965       | 5544             | NR               |
| 450       | 131219           | NR               | 580       | 196488           | NR               | 710       | 47273            | NR               | 840       | 4862             | NR               | 970       | 5050             | NR               |
| 455       | 170311           | NR               | 585       | 202769           | NR               | 715       | 41664            | NR               | 845       | 5651             | NR               | 975       | 5575             | NR               |
| 460       | 154269           | NR               | 590       | 207213           | NR               | 720       | 37083            | NR               | 850       | 5178             | NR               | 980       | 2973             | NR               |
| 465       | 126622           | NR               | 595       | 213472           | NR               | 725       | 32494            | NR               | 855       | 5510             | NR               | 985       | 4912             | NR               |
| 470       | 109065           | NR               | 600       | 218473           | NR               | 730       | 28665            | NR               | 860       | 5438             | NR               | 990       | 5454             | NR               |
| 475       | 91762            | NR               | 605       | 220737           | NR               | 735       | 25540            | NR               | 865       | 5848             | NR               | 995       | 6068             | NR               |
| 480       | 78213            | NR               | 610       | 221090           | NR               | 740       | 22878            | NR               | 870       | 4969             | NR               | 1000      | 9406             | NR               |
| 485       | 77035            | NR               | 615       | 220059           | NR               | 745       | 20304            | NR               | 875       | 5438             | NR               |           |                  |                  |

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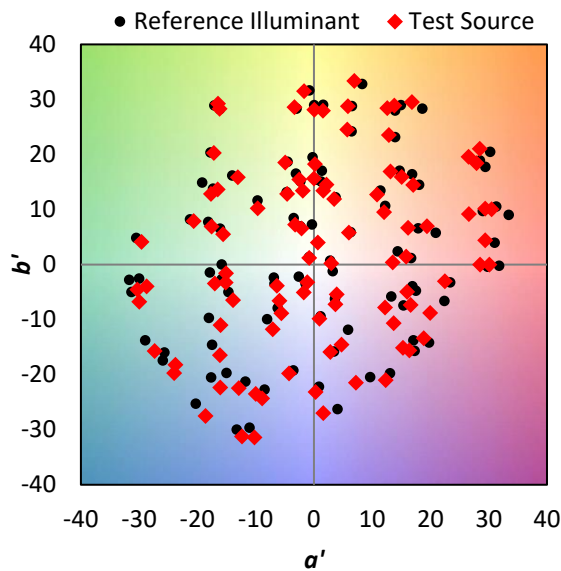
**TM-30-18**

**Summary**

$R_f = 88.9$   
 $R_g = 96.3$   
 $CIE R_a = 90.9$   
 $R_9 = 50.7$



**Color Vector Graphics**



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**Individual Sample Fidelity Index ( $R_{f,i}$ )**

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 95 | CES51 = 92 | CES76 = 89 |
| CES02 = 62 | CES27 = 89 | CES52 = 95 | CES77 = 88 |
| CES03 = 31 | CES28 = 97 | CES53 = 92 | CES78 = 87 |
| CES04 = 70 | CES29 = 93 | CES54 = 89 | CES79 = 93 |
| CES05 = 49 | CES30 = 82 | CES55 = 86 | CES80 = 92 |
| CES06 = 51 | CES31 = 95 | CES56 = 87 | CES81 = 82 |
| CES07 = 42 | CES32 = 94 | CES57 = 85 | CES82 = 97 |
| CES08 = 41 | CES33 = 91 | CES58 = 85 | CES83 = 95 |
| CES09 = 29 | CES34 = 96 | CES59 = 94 | CES84 = 94 |
| CES10 = 75 | CES35 = 97 | CES60 = 89 | CES85 = 80 |
| CES11 = 58 | CES36 = 77 | CES61 = 89 | CES86 = 82 |
| CES12 = 64 | CES37 = 97 | CES62 = 79 | CES87 = 90 |
| CES13 = 43 | CES38 = 78 | CES63 = 88 | CES88 = 93 |
| CES14 = 74 | CES39 = 97 | CES64 = 83 | CES89 = 85 |
| CES15 = 71 | CES40 = 98 | CES65 = 84 | CES90 = 92 |
| CES16 = 47 | CES41 = 92 | CES66 = 80 | CES91 = 72 |
| CES17 = 50 | CES42 = 99 | CES67 = 80 | CES92 = 75 |
| CES18 = 56 | CES43 = 95 | CES68 = 85 | CES93 = 85 |
| CES19 = 71 | CES44 = 99 | CES69 = 86 | CES94 = 77 |
| CES20 = 66 | CES45 = 96 | CES70 = 84 | CES95 = 81 |
| CES21 = 86 | CES46 = 94 | CES71 = 77 | CES96 = 91 |
| CES22 = 78 | CES47 = 91 | CES72 = 93 | CES97 = 93 |
| CES23 = 91 | CES48 = 83 | CES73 = 81 | CES98 = 91 |
| CES24 = 90 | CES49 = 95 | CES74 = 89 | CES99 = 87 |
| CES25 = 71 | CES50 = 93 | CES75 = 81 |            |



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**Color Rendition by Hue-Angle Bin**



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**Measure Comparisons**



(END OF REPORT)