

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: P828295

Luminaire Tested: **OHBL-18HE-MCL-UNV-L940-CD-UPL18**

Issue Date: 5/3/2024



**Test Information**

Test Method: LM-79-08  
Report Number: P828295  
REPORT IS A COMBINATION OF REPORTS P826156 AND G3-2310-221-8  
Test Lab: INNOVATION CENTER  
Issue Date: 5/3/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: METALUX  
Catalog Number: OHBL-18HE-MCL-UNV-L940-CD-UPL18  
Description:  
Light Source: -  
Ballast/Driver: -

**Summary**

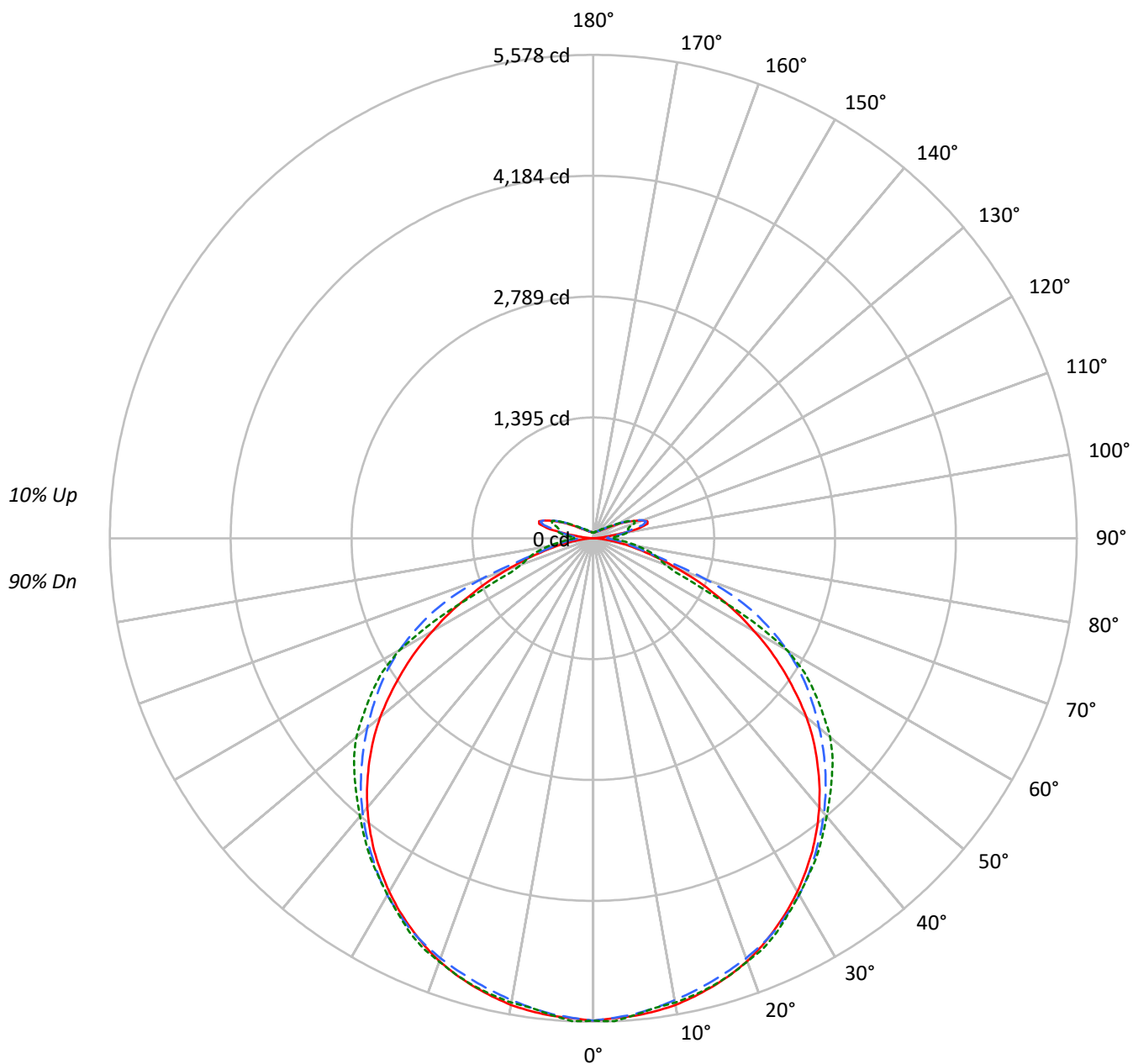
Lumens per Lamp: N/A  
Luminaire Lumens: 17288.8 lumens  
Efficiency: N/A  
Efficacy: 149.9 lumens/watt  
Spacing Criteria (0/90/45): 1.26 / 1.27 / 1.39  
Luminous Opening: Rectangular w/ Sides (W: 3.78' x L: 1.67' x H: 0.17')  
CIE Type: Semi-Direct

Input Watts (W): 115.3  
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: P828295

CATALOG NUMBER: OHBL-18HE-MCL-UNV-L940-CD-UPL18

### Luminous Intensity Polar Plot





TEST NUMBER: P828295

CATALOG NUMBER: OHBL-18HE-MCL-UNV-L940-CD-UPL18

**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 | 50 | 30 | 10 |
| RCR |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |    |    |    |    |    |
| 0   | 117 | 117 | 117 | 117 | 113 | 113 | 113 | 113 | 106 | 106 | 106 | 99 | 99 | 99 | 93 | 93 | 93 | 90 |    |    |
| 1   | 107 | 102 | 98  | 94  | 103 | 99  | 95  | 92  | 93  | 90  | 87  | 87 | 85 | 83 | 82 | 80 | 79 | 76 |    |    |
| 2   | 97  | 89  | 83  | 77  | 94  | 87  | 81  | 76  | 82  | 77  | 72  | 77 | 73 | 69 | 72 | 69 | 66 | 64 |    |    |
| 3   | 89  | 79  | 71  | 64  | 86  | 76  | 69  | 63  | 72  | 66  | 61  | 68 | 63 | 59 | 64 | 60 | 56 | 54 |    |    |
| 4   | 81  | 70  | 61  | 55  | 78  | 68  | 60  | 54  | 64  | 57  | 52  | 60 | 55 | 50 | 57 | 52 | 48 | 46 |    |    |
| 5   | 75  | 62  | 53  | 47  | 72  | 61  | 52  | 46  | 57  | 50  | 45  | 54 | 48 | 43 | 51 | 46 | 42 | 40 |    |    |
| 6   | 69  | 56  | 47  | 41  | 66  | 54  | 46  | 40  | 52  | 45  | 39  | 49 | 43 | 38 | 47 | 41 | 37 | 35 |    |    |
| 7   | 64  | 51  | 42  | 36  | 62  | 49  | 41  | 36  | 47  | 40  | 35  | 45 | 38 | 34 | 43 | 37 | 33 | 31 |    |    |
| 8   | 59  | 46  | 38  | 32  | 57  | 45  | 37  | 32  | 43  | 36  | 31  | 41 | 35 | 30 | 39 | 33 | 29 | 27 |    |    |
| 9   | 55  | 42  | 34  | 29  | 54  | 41  | 34  | 28  | 39  | 33  | 28  | 38 | 32 | 27 | 36 | 30 | 26 | 25 |    |    |
| 10  | 52  | 39  | 31  | 26  | 50  | 38  | 31  | 26  | 36  | 30  | 25  | 35 | 29 | 25 | 33 | 28 | 24 | 22 |    |    |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 9507 | 9507 | 9507 |
| 5°  | 9399 | 9365 | 9428 |
| 10° | 9319 | 9219 | 9363 |
| 15° | 9214 | 9108 | 9341 |
| 20° | 9108 | 9037 | 9299 |
| 25° | 8950 | 8966 | 9260 |
| 30° | 8780 | 8855 | 9131 |
| 35° | 8585 | 8682 | 9083 |
| 40° | 8344 | 8504 | 9005 |
| 45° | 8029 | 8297 | 9008 |
| 50° | 7620 | 8063 | 9009 |
| 55° | 7011 | 7831 | 8757 |
| 60° | 6235 | 7494 | 8194 |
| 65° | 5255 | 6876 | 5275 |
| 70° | 4130 | 5357 | 3908 |
| 75° | 2986 | 3171 | 4096 |
| 80° | 1954 | 2624 | 4129 |
| 85° | 978  | 2383 | 4342 |



TEST NUMBER: P828295

CATALOG NUMBER: OHBL-18HE-MCL-UNV-L940-CD-UPL18

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 524.8   | 3.0       |
| 10°-20°   | 1505.0  | 8.7       |
| 20°-30°   | 2298.6  | 13.3      |
| 30°-40°   | 2789.0  | 16.1      |
| 40°-50°   | 2923.1  | 16.9      |
| 50°-60°   | 2648.8  | 15.3      |
| 60°-70°   | 1775.9  | 10.3      |
| 70°-80°   | 797.5   | 4.6       |
| 80°-90°   | 293.3   | 1.7       |
| 90°-100°  | 236.0   | 1.4       |
| 100°-110° | 558.1   | 3.2       |
| 110°-120° | 464.8   | 2.7       |
| 120°-130° | 224.7   | 1.3       |
| 130°-140° | 114.4   | 0.7       |
| 140°-150° | 67.1    | 0.4       |
| 150°-160° | 40.0    | 0.2       |
| 160°-170° | 21.2    | 0.1       |
| 170°-180° | 6.5     | 0.0       |
| <hr/>     |         |           |
| 0°-30°    | 4328.5  | 25.0      |
| 0°-40°    | 7117.4  | 41.2      |
| 0°-60°    | 12689.4 | 73.4      |
| 0°-90°    | 15556.1 | 90.0      |
| 90°-120°  | 1258.9  | 7.3       |
| 90°-150°  | 1665.0  | 9.6       |
| 90°-180°  | 1733.0  | 10.0      |
| 0°-180°   | 17288.8 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 5566 | 5566  | 5566 | 5566  | 5566 |      |
| 5°   | 5530 | 5549  | 5511 | 5528  | 5520 | 526  |
| 15°  | 5350 | 5330  | 5292 | 5338  | 5345 | 1511 |
| 25°  | 4971 | 4949  | 4984 | 5029  | 5015 | 2291 |
| 35°  | 4406 | 4416  | 4461 | 4509  | 4491 | 2754 |
| 45°  | 3656 | 3716  | 3785 | 3882  | 3894 | 2817 |
| 55°  | 2691 | 2820  | 3012 | 3133  | 3126 | 2402 |
| 65°  | 1579 | 1826  | 2073 | 1750  | 1429 | 1573 |
| 75°  | 621  | 901   | 663  | 678   | 723  | 679  |
| 85°  | 107  | 205   | 263  | 318   | 333  | 131  |
| 90°  | 4    | 90    | 166  | 210   | 222  | 9    |
| 95°  | 34   | 114   | 206  | 259   | 283  | 105  |
| 105° | 648  | 657   | 590  | 439   | 412  | 615  |
| 115° | 452  | 461   | 474  | 475   | 476  | 456  |
| 125° | 223  | 234   | 248  | 250   | 249  | 210  |
| 135° | 136  | 139   | 144  | 150   | 152  | 108  |
| 145° | 101  | 104   | 106  | 108   | 109  | 64   |
| 155° | 83   | 85    | 86   | 87    | 86   | 39   |
| 165° | 73   | 74    | 74   | 75    | 75   | 21   |
| 175° | 67   | 67    | 67   | 66    | 66   | 6    |
| 180° | 66   | 66    | 66   | 66    | 66   |      |



TEST NUMBER: P828295

CATALOG NUMBER: OHBL-18HE-MCL-UNV-L940-CD-UPL18

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 5566.2 | 5566.2 | 5566.2 | 5566.2 | 5566.2 |
| 2.5°   | 5543.7 | 5567.1 | 5538.0 | 5569.4 | 5577.5 |
| 5°     | 5530.0 | 5549.3 | 5510.7 | 5527.6 | 5520.4 |
| 7.5°   | 5505.1 | 5511.5 | 5465.6 | 5479.3 | 5464.8 |
| 10°    | 5468.0 | 5464.8 | 5410.9 | 5437.4 | 5440.6 |
| 12.5°  | 5413.2 | 5403.6 | 5355.3 | 5395.6 | 5396.4 |
| 15°    | 5350.5 | 5329.6 | 5291.8 | 5338.5 | 5344.9 |
| 17.5°  | 5278.0 | 5250.7 | 5225.8 | 5286.1 | 5276.5 |
| 20°    | 5193.5 | 5161.4 | 5156.6 | 5222.6 | 5198.4 |
| 22.5°  | 5088.9 | 5064.0 | 5075.3 | 5138.1 | 5122.8 |
| 25°    | 4970.6 | 4948.9 | 4983.5 | 5029.4 | 5014.9 |
| 27.5°  | 4845.8 | 4833.0 | 4872.5 | 4907.8 | 4879.7 |
| 30°    | 4709.1 | 4701.8 | 4754.1 | 4783.1 | 4747.7 |
| 32.5°  | 4560.1 | 4562.6 | 4612.5 | 4651.9 | 4618.9 |
| 35°    | 4405.6 | 4416.1 | 4461.2 | 4508.7 | 4490.9 |
| 37.5°  | 4235.8 | 4259.1 | 4304.3 | 4358.2 | 4339.7 |
| 40°    | 4056.3 | 4090.1 | 4140.0 | 4205.2 | 4188.4 |
| 42.5°  | 3862.4 | 3905.0 | 3969.4 | 4041.9 | 4040.2 |
| 45°    | 3656.4 | 3715.9 | 3785.1 | 3881.7 | 3893.8 |
| 47.5°  | 3442.2 | 3509.1 | 3596.8 | 3725.6 | 3744.1 |
| 50°    | 3209.6 | 3293.4 | 3402.8 | 3557.3 | 3568.6 |
| 52.5°  | 2950.5 | 3064.8 | 3209.6 | 3357.8 | 3344.1 |
| 55°    | 2690.6 | 2820.1 | 3012.5 | 3133.2 | 3126.0 |
| 57.5°  | 2431.4 | 2577.0 | 2810.5 | 2896.6 | 2895.8 |
| 60°    | 2141.6 | 2325.9 | 2581.1 | 2646.2 | 2581.9 |
| 62.5°  | 1873.7 | 2071.6 | 2336.5 | 2288.9 | 2068.4 |
| 65°    | 1579.1 | 1826.2 | 2073.3 | 1749.7 | 1428.6 |
| 67.5°  | 1317.5 | 1575.1 | 1761.0 | 1198.4 | 1026.1 |
| 70°    | 1054.3 | 1338.4 | 1373.0 | 889.4  | 877.3  |
| 72.5°  | 820.9  | 1123.6 | 947.3  | 761.4  | 800.0  |
| 75°    | 621.3  | 901.4  | 663.2  | 678.5  | 722.8  |
| 77.5°  | 453.2  | 692.2  | 515.9  | 594.8  | 631.0  |
| 80°    | 311.4  | 490.1  | 420.9  | 499.8  | 524.7  |
| 82.5°  | 195.5  | 323.5  | 337.3  | 402.4  | 428.2  |
| 85°    | 107.0  | 205.2  | 263.2  | 317.9  | 333.2  |
| 87.5°  | 44.3   | 124.0  | 201.2  | 245.4  | 258.3  |
| 90°    | 4.3    | 90.2   | 165.5  | 209.7  | 222.1  |
| 92.5°  | 12.1   | 81.0   | 158.8  | 203.7  | 216.3  |
| 95°    | 33.8   | 114.0  | 205.5  | 258.7  | 282.7  |
| 97.5°  | 171.2  | 219.0  | 285.0  | 339.3  | 356.5  |
| 100°   | 352.0  | 395.1  | 373.0  | 401.4  | 409.1  |
| 102.5° | 550.1  | 568.5  | 449.4  | 422.5  | 419.7  |
| 105°   | 647.5  | 656.7  | 590.2  | 439.0  | 411.8  |



TEST NUMBER: P828295

CATALOG NUMBER: OHBL-18HE-MCL-UNV-L940-CD-UPL18

**CANDELA DISTRIBUTION (continued):**

|        | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|--------|-------|-------|-------|-------|-------|
| 112.5° | 529.1 | 538.2 | 543.8 | 537.1 | 517.1 |
| 115°   | 452.5 | 460.9 | 473.7 | 475.0 | 475.7 |
| 117.5° | 386.4 | 390.6 | 404.4 | 407.5 | 409.9 |
| 120°   | 323.8 | 330.6 | 344.6 | 346.0 | 345.1 |
| 122.5° | 271.6 | 279.4 | 292.7 | 294.0 | 293.1 |
| 125°   | 223.0 | 234.2 | 248.4 | 249.9 | 249.0 |
| 127.5° | 190.8 | 198.6 | 212.8 | 214.4 | 213.4 |
| 130°   | 166.4 | 173.3 | 182.6 | 186.7 | 187.5 |
| 132.5° | 150.7 | 154.2 | 161.7 | 165.8 | 167.5 |
| 135°   | 135.9 | 139.4 | 144.5 | 150.2 | 151.9 |
| 137.5° | 125.5 | 128.1 | 131.5 | 137.3 | 138.9 |
| 140°   | 115.9 | 118.5 | 120.2 | 125.2 | 126.9 |
| 142.5° | 107.2 | 110.7 | 112.4 | 115.7 | 117.4 |
| 145°   | 101.1 | 103.7 | 106.3 | 108.0 | 108.8 |
| 147.5° | 95.9  | 97.6  | 99.4  | 101.1 | 101.9 |
| 150°   | 90.7  | 92.4  | 94.2  | 95.0  | 95.9  |
| 152.5° | 87.2  | 88.1  | 89.8  | 90.7  | 90.7  |
| 155°   | 82.9  | 85.4  | 86.2  | 87.1  | 86.3  |
| 157.5° | 80.2  | 81.9  | 82.8  | 83.6  | 83.6  |
| 160°   | 77.6  | 78.4  | 79.3  | 80.2  | 80.2  |
| 162.5° | 75.8  | 75.8  | 76.7  | 77.6  | 77.6  |
| 165°   | 73.2  | 74.1  | 74.1  | 74.9  | 74.9  |
| 167.5° | 71.5  | 72.3  | 72.3  | 72.3  | 73.2  |
| 170°   | 69.7  | 69.7  | 70.6  | 69.8  | 69.8  |
| 172.5° | 68.0  | 68.9  | 68.9  | 68.1  | 68.1  |
| 175°   | 67.1  | 67.1  | 67.2  | 66.3  | 66.3  |
| 177.5° | 67.0  | 67.1  | 66.3  | 65.5  | 64.7  |
| 180°   | 66.3  | 66.3  | 66.3  | 66.3  | 66.3  |



Report Generated By 670246072 / DESKTOP-50001EG





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







|        |       |       |       |       |       |
|--------|-------|-------|-------|-------|-------|
| 107.5° | 654.3 | 665.6 | 639.4 | 513.5 | 439.5 |
| 110°   | 600.4 | 615.4 | 609.5 | 564.5 | 506.1 |



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

Report Prepared for

Cooper Lighting Solutions

METALUX

Report Number: SP1-2307-100-8

Test Date: 08/01/2023

Luminaire Tested: OHB-15SE-N-UNV-L940-CD

Data in this report applies to families of products including OHB-15SE-N-UNV-L940-CD.

### Test Information

Test Method: LM-79-2019  
 Report Number: SP1-2307-100-8  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry:  $4\pi$   
 Issue Date: 08/04/2023  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: METALUX  
 Catalog Number: **OHB-15SE-N-UNV-L940-CD**  
 Description: 15000 LUMEN OHB SE LED LUMINAIRE WITH 90CRI, 4000K LEDS AND NARROW LENS

LENS

### Spectral Parameters

CCT (K): 3979  
 CIE u': 0.2254  
 CIE v': 0.5020  
 Duv: 0.0001  
 CIE x: 0.3813  
 CIE y: 0.3773  
 CIE z: 0.2414  
 Peak Wavelength (nm): 455  
 Dominant Wavelength (nm): 579  
 Purity: 27.8  
 Rf: 88.6  
 Rg: 96.2

CRI (Ra): 91.5  
 R1: 91.7  
 R2: 96.4  
 R3: 97.6  
 R4: 89.2  
 R5: 90.3  
 R6: 93.0  
 R7: 91.6  
 R8: 81.9  
 R9: 57.0  
 R10: 89.6  
 R11: 89.1  
 R12: 69.6  
 R13: 93.4  
 R14: 98.9



### Test Conditions

Stabilization Time: 23M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.7/57%  
 Sphere Temperature (°C): 25.2

REPORT NUMBER: SP1-2307-100-8

| 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: SP1-2307-100-8

**CIE 1931 Chromaticity Diagram**



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



Point lies inside the ANSI 4000K 4-step quadrangle

REPORT NUMBER: SP1-2307-100-8

**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       | 6299             | NR               | 490       | 95290            | NR               | 620       | 202945           | NR               | 750       | 17048            | NR               | 880       | 6802             | NR               |
| 365       | 5178             | NR               | 495       | 104168           | NR               | 625       | 198934           | NR               | 755       | 15396            | NR               | 885       | 7389             | NR               |
| 370       | 5490             | NR               | 500       | 113725           | NR               | 630       | 192455           | NR               | 760       | 13359            | NR               | 890       | 5235             | NR               |
| 375       | 6104             | NR               | 505       | 126034           | NR               | 635       | 185651           | NR               | 765       | 12573            | NR               | 895       | 4778             | NR               |
| 380       | 6149             | NR               | 510       | 134848           | NR               | 640       | 177659           | NR               | 770       | 10940            | NR               | 900       | 5847             | NR               |
| 385       | 5688             | NR               | 515       | 142720           | NR               | 645       | 169230           | NR               | 775       | 9589             | NR               | 905       | 5969             | NR               |
| 390       | 5262             | NR               | 520       | 149276           | NR               | 650       | 157607           | NR               | 780       | 8802             | NR               | 910       | 6399             | NR               |
| 395       | 4581             | NR               | 525       | 154675           | NR               | 655       | 148474           | NR               | 785       | 8257             | NR               | 915       | 5912             | NR               |
| 400       | 4118             | NR               | 530       | 159852           | NR               | 660       | 137175           | NR               | 790       | 7397             | NR               | 920       | 6048             | NR               |
| 405       | 4084             | NR               | 535       | 164319           | NR               | 665       | 125124           | NR               | 795       | 7591             | NR               | 925       | 5552             | NR               |
| 410       | 4438             | NR               | 540       | 169099           | NR               | 670       | 113759           | NR               | 800       | 7116             | NR               | 930       | 7244             | NR               |
| 415       | 5782             | NR               | 545       | 173030           | NR               | 675       | 102656           | NR               | 805       | 6905             | NR               | 935       | 6076             | NR               |
| 420       | 8737             | NR               | 550       | 175415           | NR               | 680       | 92651            | NR               | 810       | 6711             | NR               | 940       | 6581             | NR               |
| 425       | 14203            | NR               | 555       | 179385           | NR               | 685       | 82728            | NR               | 815       | 6202             | NR               | 945       | 7094             | NR               |
| 430       | 23287            | NR               | 560       | 183651           | NR               | 690       | 72755            | NR               | 820       | 6421             | NR               | 950       | 6374             | NR               |
| 435       | 39198            | NR               | 565       | 186704           | NR               | 695       | 64864            | NR               | 825       | 6067             | NR               | 955       | 5408             | NR               |
| 440       | 65090            | NR               | 570       | 189735           | NR               | 700       | 57132            | NR               | 830       | 6507             | NR               | 960       | 5406             | NR               |
| 445       | 111800           | NR               | 575       | 192391           | NR               | 705       | 50899            | NR               | 835       | 6304             | NR               | 965       | 5676             | NR               |
| 450       | 185327           | NR               | 580       | 195587           | NR               | 710       | 44715            | NR               | 840       | 5605             | NR               | 970       | 6132             | NR               |
| 455       | 231910           | NR               | 585       | 198690           | NR               | 715       | 39661            | NR               | 845       | 5975             | NR               | 975       | 7732             | NR               |
| 460       | 199850           | NR               | 590       | 200528           | NR               | 720       | 35220            | NR               | 850       | 5252             | NR               | 980       | 4497             | NR               |
| 465       | 159032           | NR               | 595       | 204245           | NR               | 725       | 31033            | NR               | 855       | 6570             | NR               | 985       | 1796             | NR               |
| 470       | 134681           | NR               | 600       | 206961           | NR               | 730       | 27573            | NR               | 860       | 6167             | NR               | 990       | 6719             | NR               |
| 475       | 109873           | NR               | 605       | 207509           | NR               | 735       | 24077            | NR               | 865       | 5558             | NR               | 995       | 10730            | NR               |
| 480       | 92595            | NR               | 610       | 206751           | NR               | 740       | 21375            | NR               | 870       | 5280             | NR               | 1000      | 10317            | NR               |
| 485       | 90323            | NR               | 615       | 205233           | NR               | 745       | 19152            | NR               | 875       | 5889             | NR               |           |                  |                  |

REPORT NUMBER: SP1-2307-100-8

Scotopic Flux vs. Wavelength



Scotopic Lumens: 22729.8

S/P: 1.79

| 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       | 6299             | NR               | 490       | 95290            | NR               | 620       | 202945           | NR               | 750       | 17048            | NR               | 880       | 6802             | NR               |
| 365       | 5178             | NR               | 495       | 104168           | NR               | 625       | 198934           | NR               | 755       | 15396            | NR               | 885       | 7389             | NR               |
| 370       | 5490             | NR               | 500       | 113725           | NR               | 630       | 192455           | NR               | 760       | 13359            | NR               | 890       | 5235             | NR               |
| 375       | 6104             | NR               | 505       | 126034           | NR               | 635       | 185651           | NR               | 765       | 12573            | NR               | 895       | 4778             | NR               |
| 380       | 6149             | NR               | 510       | 134848           | NR               | 640       | 177659           | NR               | 770       | 10940            | NR               | 900       | 5847             | NR               |
| 385       | 5688             | NR               | 515       | 142720           | NR               | 645       | 169230           | NR               | 775       | 9589             | NR               | 905       | 5969             | NR               |
| 390       | 5262             | NR               | 520       | 149276           | NR               | 650       | 157607           | NR               | 780       | 8802             | NR               | 910       | 6399             | NR               |
| 395       | 4581             | NR               | 525       | 154675           | NR               | 655       | 148474           | NR               | 785       | 8257             | NR               | 915       | 5912             | NR               |
| 400       | 4118             | NR               | 530       | 159852           | NR               | 660       | 137175           | NR               | 790       | 7397             | NR               | 920       | 6048             | NR               |
| 405       | 4084             | NR               | 535       | 164319           | NR               | 665       | 125124           | NR               | 795       | 7591             | NR               | 925       | 5552             | NR               |
| 410       | 4438             | NR               | 540       | 169099           | NR               | 670       | 113759           | NR               | 800       | 7116             | NR               | 930       | 7244             | NR               |
| 415       | 5782             | NR               | 545       | 173030           | NR               | 675       | 102656           | NR               | 805       | 6905             | NR               | 935       | 6076             | NR               |
| 420       | 8737             | NR               | 550       | 175415           | NR               | 680       | 92651            | NR               | 810       | 6711             | NR               | 940       | 6581             | NR               |
| 425       | 14203            | NR               | 555       | 179385           | NR               | 685       | 82728            | NR               | 815       | 6202             | NR               | 945       | 7094             | NR               |
| 430       | 23287            | NR               | 560       | 183651           | NR               | 690       | 72755            | NR               | 820       | 6421             | NR               | 950       | 6374             | NR               |
| 435       | 39198            | NR               | 565       | 186704           | NR               | 695       | 64864            | NR               | 825       | 6067             | NR               | 955       | 5408             | NR               |
| 440       | 65090            | NR               | 570       | 189735           | NR               | 700       | 57132            | NR               | 830       | 6507             | NR               | 960       | 5406             | NR               |
| 445       | 111800           | NR               | 575       | 192391           | NR               | 705       | 50899            | NR               | 835       | 6304             | NR               | 965       | 5676             | NR               |
| 450       | 185327           | NR               | 580       | 195587           | NR               | 710       | 44715            | NR               | 840       | 5605             | NR               | 970       | 6132             | NR               |
| 455       | 231910           | NR               | 585       | 198690           | NR               | 715       | 39661            | NR               | 845       | 5975             | NR               | 975       | 7732             | NR               |
| 460       | 199850           | NR               | 590       | 200528           | NR               | 720       | 35220            | NR               | 850       | 5252             | NR               | 980       | 4497             | NR               |
| 465       | 159032           | NR               | 595       | 204245           | NR               | 725       | 31033            | NR               | 855       | 6570             | NR               | 985       | 1796             | NR               |
| 470       | 134681           | NR               | 600       | 206961           | NR               | 730       | 27573            | NR               | 860       | 6167             | NR               | 990       | 6719             | NR               |
| 475       | 109873           | NR               | 605       | 207509           | NR               | 735       | 24077            | NR               | 865       | 5558             | NR               | 995       | 10730            | NR               |
| 480       | 92595            | NR               | 610       | 206751           | NR               | 740       | 21375            | NR               | 870       | 5280             | NR               | 1000      | 10317            | NR               |
| 485       | 90323            | NR               | 615       | 205233           | NR               | 745       | 19152            | NR               | 875       | 5889             | NR               |           |                  |                  |

REPORT NUMBER: SP1-2307-100-8

**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 9423.4**

**M/P: 0.74**

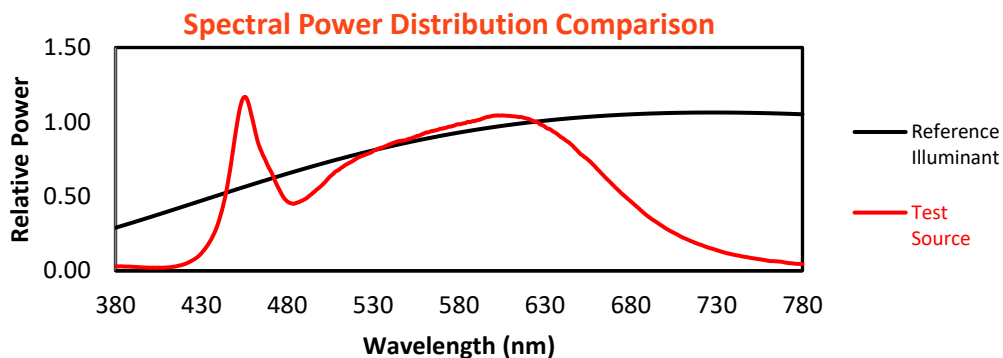
| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 6299             | NR               | 490       | 95290            | NR               | 620       | 202945           | NR               | 750       | 17048            | NR               | 880       | 6802             | NR               |
| 365       | 5178             | NR               | 495       | 104168           | NR               | 625       | 198934           | NR               | 755       | 15396            | NR               | 885       | 7389             | NR               |
| 370       | 5490             | NR               | 500       | 113725           | NR               | 630       | 192455           | NR               | 760       | 13359            | NR               | 890       | 5235             | NR               |
| 375       | 6104             | NR               | 505       | 126034           | NR               | 635       | 185651           | NR               | 765       | 12573            | NR               | 895       | 4778             | NR               |
| 380       | 6149             | NR               | 510       | 134848           | NR               | 640       | 177659           | NR               | 770       | 10940            | NR               | 900       | 5847             | NR               |
| 385       | 5688             | NR               | 515       | 142720           | NR               | 645       | 169230           | NR               | 775       | 9589             | NR               | 905       | 5969             | NR               |
| 390       | 5262             | NR               | 520       | 149276           | NR               | 650       | 157607           | NR               | 780       | 8802             | NR               | 910       | 6399             | NR               |
| 395       | 4581             | NR               | 525       | 154675           | NR               | 655       | 148474           | NR               | 785       | 8257             | NR               | 915       | 5912             | NR               |
| 400       | 4118             | NR               | 530       | 159852           | NR               | 660       | 137175           | NR               | 790       | 7397             | NR               | 920       | 6048             | NR               |
| 405       | 4084             | NR               | 535       | 164319           | NR               | 665       | 125124           | NR               | 795       | 7591             | NR               | 925       | 5552             | NR               |
| 410       | 4438             | NR               | 540       | 169099           | NR               | 670       | 113759           | NR               | 800       | 7116             | NR               | 930       | 7244             | NR               |
| 415       | 5782             | NR               | 545       | 173030           | NR               | 675       | 102656           | NR               | 805       | 6905             | NR               | 935       | 6076             | NR               |
| 420       | 8737             | NR               | 550       | 175415           | NR               | 680       | 92651            | NR               | 810       | 6711             | NR               | 940       | 6581             | NR               |
| 425       | 14203            | NR               | 555       | 179385           | NR               | 685       | 82728            | NR               | 815       | 6202             | NR               | 945       | 7094             | NR               |
| 430       | 23287            | NR               | 560       | 183651           | NR               | 690       | 72755            | NR               | 820       | 6421             | NR               | 950       | 6374             | NR               |
| 435       | 39198            | NR               | 565       | 186704           | NR               | 695       | 64864            | NR               | 825       | 6067             | NR               | 955       | 5408             | NR               |
| 440       | 65090            | NR               | 570       | 189735           | NR               | 700       | 57132            | NR               | 830       | 6507             | NR               | 960       | 5406             | NR               |
| 445       | 111800           | NR               | 575       | 192391           | NR               | 705       | 50899            | NR               | 835       | 6304             | NR               | 965       | 5676             | NR               |
| 450       | 185327           | NR               | 580       | 195587           | NR               | 710       | 44715            | NR               | 840       | 5605             | NR               | 970       | 6132             | NR               |
| 455       | 231910           | NR               | 585       | 198690           | NR               | 715       | 39661            | NR               | 845       | 5975             | NR               | 975       | 7732             | NR               |
| 460       | 199850           | NR               | 590       | 200528           | NR               | 720       | 35220            | NR               | 850       | 5252             | NR               | 980       | 4497             | NR               |
| 465       | 159032           | NR               | 595       | 204245           | NR               | 725       | 31033            | NR               | 855       | 6570             | NR               | 985       | 1796             | NR               |
| 470       | 134681           | NR               | 600       | 206961           | NR               | 730       | 27573            | NR               | 860       | 6167             | NR               | 990       | 6719             | NR               |
| 475       | 109873           | NR               | 605       | 207509           | NR               | 735       | 24077            | NR               | 865       | 5558             | NR               | 995       | 10730            | NR               |
| 480       | 92595            | NR               | 610       | 206751           | NR               | 740       | 21375            | NR               | 870       | 5280             | NR               | 1000      | 10317            | NR               |
| 485       | 90323            | NR               | 615       | 205233           | NR               | 745       | 19152            | NR               | 875       | 5889             | NR               |           |                  |                  |

REPORT NUMBER: SP1-2307-100-8

**TM-30-18**

**Summary**

$R_f = 88.6$   
 $R_g = 96.2$   
 $CIE R_a = 91.5$   
 $R_9 = 57.0$



**Color Vector Graphics**



REPORT NUMBER: SP1-2307-100-8

**TM-30-18**

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

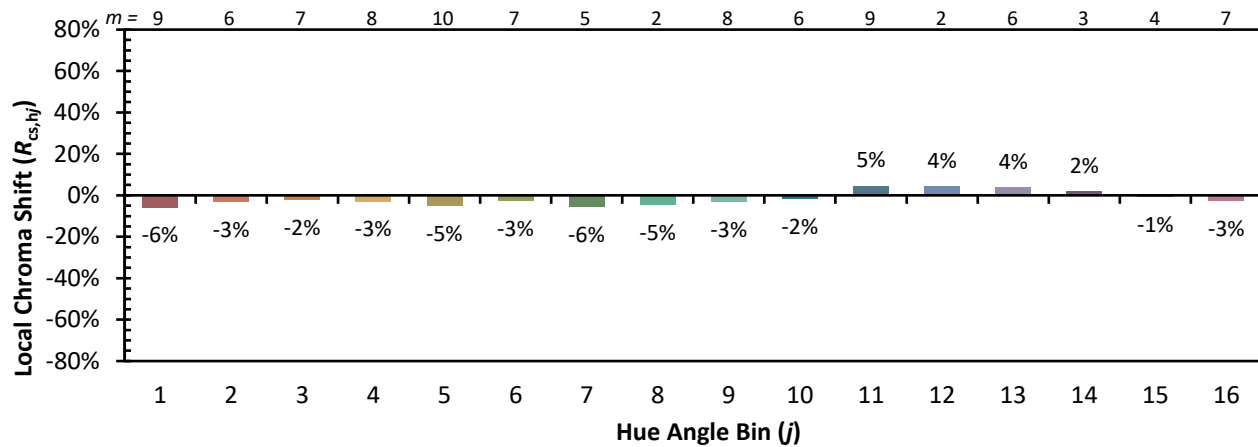
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 95 | CES51 = 92 | CES76 = 88 |
| CES02 = 62 | CES27 = 87 | CES52 = 95 | CES77 = 88 |
| CES03 = 31 | CES28 = 96 | CES53 = 92 | CES78 = 85 |
| CES04 = 69 | CES29 = 92 | CES54 = 88 | CES79 = 95 |
| CES05 = 49 | CES30 = 80 | CES55 = 85 | CES80 = 93 |
| CES06 = 50 | CES31 = 93 | CES56 = 87 | CES81 = 85 |
| CES07 = 42 | CES32 = 94 | CES57 = 84 | CES82 = 97 |
| CES08 = 41 | CES33 = 90 | CES58 = 84 | CES83 = 96 |
| CES09 = 29 | CES34 = 96 | CES59 = 94 | CES84 = 93 |
| CES10 = 74 | CES35 = 97 | CES60 = 88 | CES85 = 81 |
| CES11 = 57 | CES36 = 74 | CES61 = 88 | CES86 = 85 |
| CES12 = 63 | CES37 = 96 | CES62 = 76 | CES87 = 90 |
| CES13 = 43 | CES38 = 75 | CES63 = 86 | CES88 = 94 |
| CES14 = 74 | CES39 = 97 | CES64 = 81 | CES89 = 86 |
| CES15 = 71 | CES40 = 97 | CES65 = 83 | CES90 = 91 |
| CES16 = 47 | CES41 = 91 | CES66 = 78 | CES91 = 67 |
| CES17 = 49 | CES42 = 98 | CES67 = 78 | CES92 = 76 |
| CES18 = 56 | CES43 = 96 | CES68 = 83 | CES93 = 85 |
| CES19 = 71 | CES44 = 99 | CES69 = 84 | CES94 = 79 |
| CES20 = 66 | CES45 = 97 | CES70 = 83 | CES95 = 81 |
| CES21 = 85 | CES46 = 94 | CES71 = 74 | CES96 = 91 |
| CES22 = 78 | CES47 = 90 | CES72 = 92 | CES97 = 94 |
| CES23 = 91 | CES48 = 82 | CES73 = 79 | CES98 = 92 |
| CES24 = 90 | CES49 = 94 | CES74 = 89 | CES99 = 89 |
| CES25 = 71 | CES50 = 93 | CES75 = 78 |            |



REPORT NUMBER: SP1-2307-100-8

**TM-30-18**

Color Rendition by Hue-Angle Bin



REPORT NUMBER: SP1-2307-100-8

**TM-30-18**

**Measure Comparisons**



(END OF REPORT)