

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: P827906

Luminaire Tested: **OHB-24SE-MCL-UNV-L935-CD-UPL36**

Issue Date: 5/3/2024



**Test Information**

Test Method: LM-79-08  
Report Number: P827906  
REPORT IS A COMBINATION OF REPORTS P826294 AND G3-2310-221-2  
Test Lab: INNOVATION CENTER  
Issue Date: 5/3/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: METALUX  
Catalog Number: OHB-24SE-MCL-UNV-L935-CD-UPL36  
Description:  
Light Source: -  
Ballast/Driver: -

**Summary**

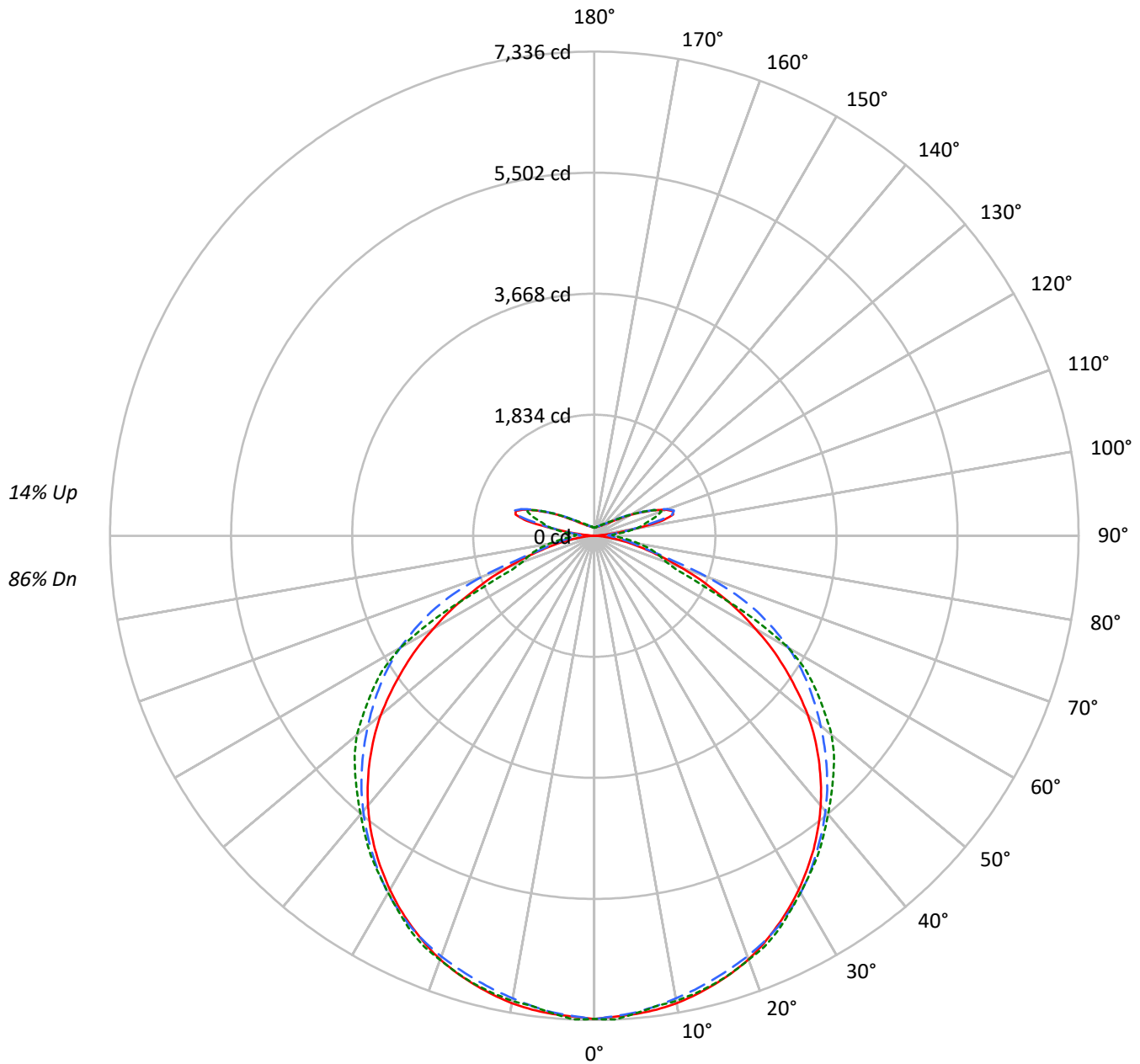
Lumens per Lamp: N/A  
Luminaire Lumens: 23677.6 lumens  
Efficiency: N/A  
Efficacy: 135.0 lumens/watt  
Spacing Criteria (0/90/45): 1.26 / 1.27 / 1.39  
Luminous Opening: Rectangular w/ Sides (W: 1.93' x L: 1.67' x H: 0.17')  
CIE Type: Semi-Direct

Input Watts (W): 175.4  
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: P827906

CATALOG NUMBER: OHB-24SE-MCL-UNV-L935-CD-UPL36

### Luminous Intensity Polar Plot





TEST NUMBER: P827906

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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 | 50 | 30 | 10 |
| RCR |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |    |    |    |    |    |
| 0   | 116 | 116 | 116 | 116 | 112 | 112 | 112 | 112 | 104 | 104 | 104 | 96 | 96 | 96 | 90 | 90 | 90 | 86 |    |    |
| 1   | 106 | 101 | 97  | 94  | 102 | 98  | 94  | 91  | 91  | 88  | 86  | 85 | 83 | 81 | 79 | 78 | 76 | 73 |    |    |
| 2   | 97  | 89  | 82  | 77  | 93  | 86  | 80  | 75  | 80  | 75  | 71  | 75 | 71 | 67 | 70 | 67 | 64 | 61 |    |    |
| 3   | 88  | 78  | 70  | 64  | 85  | 75  | 68  | 63  | 71  | 65  | 60  | 66 | 61 | 57 | 62 | 58 | 54 | 52 |    |    |
| 4   | 81  | 69  | 61  | 54  | 77  | 67  | 59  | 53  | 63  | 56  | 51  | 59 | 53 | 49 | 55 | 51 | 47 | 44 |    |    |
| 5   | 74  | 62  | 53  | 47  | 71  | 60  | 52  | 46  | 56  | 49  | 44  | 53 | 47 | 42 | 50 | 45 | 41 | 38 |    |    |
| 6   | 68  | 55  | 47  | 41  | 66  | 54  | 46  | 40  | 51  | 44  | 38  | 48 | 42 | 37 | 45 | 40 | 36 | 33 |    |    |
| 7   | 63  | 50  | 42  | 36  | 61  | 49  | 41  | 35  | 46  | 39  | 34  | 43 | 37 | 33 | 41 | 36 | 32 | 29 |    |    |
| 8   | 59  | 46  | 37  | 32  | 57  | 44  | 37  | 31  | 42  | 35  | 30  | 40 | 34 | 29 | 38 | 32 | 28 | 26 |    |    |
| 9   | 55  | 42  | 34  | 28  | 53  | 41  | 33  | 28  | 39  | 32  | 27  | 37 | 31 | 26 | 35 | 29 | 26 | 24 |    |    |
| 10  | 51  | 39  | 31  | 26  | 50  | 38  | 30  | 25  | 36  | 29  | 25  | 34 | 28 | 24 | 32 | 27 | 23 | 21 |    |    |

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

|     | 0°    | 45°   | 90°   |
|-----|-------|-------|-------|
| 0°  | 24456 | 24456 | 24456 |
| 5°  | 24178 | 24028 | 24165 |
| 10° | 23973 | 23593 | 23910 |
| 15° | 23702 | 23250 | 23763 |
| 20° | 23430 | 23007 | 23566 |
| 25° | 23023 | 22762 | 23372 |
| 30° | 22587 | 22415 | 22945 |
| 35° | 22084 | 21908 | 22717 |
| 40° | 21464 | 21382 | 22402 |
| 45° | 20653 | 20782 | 22274 |
| 50° | 19603 | 20104 | 22120 |
| 55° | 18034 | 19423 | 21320 |
| 60° | 16040 | 18468 | 19739 |
| 65° | 13517 | 16807 | 12534 |
| 70° | 10625 | 12952 | 9111  |
| 75° | 7681  | 7549  | 9282  |
| 80° | 5029  | 6098  | 8917  |
| 85° | 2518  | 5297  | 8459  |



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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 690.3   | 2.9       |
| 10°-20°   | 1979.5  | 8.4       |
| 20°-30°   | 3023.3  | 12.8      |
| 30°-40°   | 3668.3  | 15.5      |
| 40°-50°   | 3844.7  | 16.2      |
| 50°-60°   | 3483.9  | 14.7      |
| 60°-70°   | 2335.8  | 9.9       |
| 70°-80°   | 1048.9  | 4.4       |
| 80°-90°   | 387.0   | 1.6       |
| 90°-100°  | 343.8   | 1.5       |
| 100°-110° | 1092.5  | 4.6       |
| 110°-120° | 886.5   | 3.7       |
| 120°-130° | 421.7   | 1.8       |
| 130°-140° | 216.2   | 0.9       |
| 140°-150° | 127.3   | 0.5       |
| 150°-160° | 75.7    | 0.3       |
| 160°-170° | 40.0    | 0.2       |
| 170°-180° | 12.2    | 0.1       |
| 0°-30°    | 5693.1  | 24.0      |
| 0°-40°    | 9361.3  | 39.5      |
| 0°-60°    | 16689.9 | 70.5      |
| 0°-90°    | 20461.6 | 86.4      |
| 90°-120°  | 2322.8  | 9.8       |
| 90°-150°  | 3088.0  | 13.0      |
| 90°-180°  | 3216.0  | 13.6      |
| 0°-180°   | 23677.6 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 7321 | 7321  | 7321 | 7321  | 7321 |      |
| 5°   | 7273 | 7299  | 7248 | 7270  | 7261 | 692  |
| 15°  | 7037 | 7010  | 6960 | 7021  | 7030 | 1987 |
| 25°  | 6538 | 6509  | 6555 | 6615  | 6596 | 3014 |
| 35°  | 5795 | 5808  | 5868 | 5930  | 5907 | 3622 |
| 45°  | 4809 | 4887  | 4978 | 5105  | 5121 | 3705 |
| 55°  | 3539 | 3709  | 3962 | 4121  | 4112 | 3159 |
| 65°  | 2077 | 2402  | 2727 | 2301  | 1879 | 2069 |
| 75°  | 817  | 1186  | 872  | 892   | 951  | 893  |
| 85°  | 141  | 270   | 346  | 418   | 438  | 172  |
| 90°  | 8    | 131   | 231  | 284   | 296  | 13   |
| 95°  | 53   | 159   | 260  | 324   | 342  | 194  |
| 105° | 1235 | 1253  | 1215 | 932   | 852  | 1175 |
| 115° | 867  | 859   | 884  | 898   | 892  | 876  |
| 125° | 430  | 446   | 467  | 462   | 455  | 405  |
| 135° | 260  | 266   | 274  | 282   | 284  | 205  |
| 145° | 191  | 196   | 201  | 204   | 206  | 122  |
| 155° | 157  | 161   | 163  | 165   | 164  | 74   |
| 165° | 138  | 139   | 140  | 141   | 142  | 39   |
| 175° | 127  | 127   | 126  | 125   | 126  | 12   |
| 180° | 124  | 124   | 124  | 124   | 124  |      |



TEST NUMBER: P827906

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 7321.0 | 7321.0 | 7321.0 | 7321.0 | 7321.0 |
| 2.5°   | 7291.4 | 7322.1 | 7284.0 | 7325.2 | 7335.8 |
| 5°     | 7273.4 | 7298.8 | 7248.0 | 7270.2 | 7260.7 |
| 7.5°   | 7240.6 | 7249.0 | 7188.7 | 7206.7 | 7187.7 |
| 10°    | 7191.9 | 7187.7 | 7116.8 | 7151.7 | 7155.9 |
| 12.5°  | 7119.9 | 7107.2 | 7043.7 | 7096.6 | 7097.7 |
| 15°    | 7037.3 | 7009.8 | 6960.1 | 7021.4 | 7029.9 |
| 17.5°  | 6942.1 | 6906.1 | 6873.2 | 6952.7 | 6939.9 |
| 20°    | 6830.9 | 6788.6 | 6782.2 | 6869.0 | 6837.3 |
| 22.5°  | 6693.3 | 6660.5 | 6675.3 | 6757.8 | 6737.8 |
| 25°    | 6537.7 | 6509.1 | 6554.6 | 6615.0 | 6595.9 |
| 27.5°  | 6373.6 | 6356.7 | 6408.6 | 6455.1 | 6418.1 |
| 30°    | 6193.7 | 6184.2 | 6252.9 | 6291.1 | 6244.5 |
| 32.5°  | 5997.8 | 6001.0 | 6066.7 | 6118.5 | 6075.1 |
| 35°    | 5794.6 | 5808.3 | 5867.6 | 5930.1 | 5906.8 |
| 37.5°  | 5571.2 | 5601.9 | 5661.2 | 5732.1 | 5707.8 |
| 40°    | 5335.2 | 5379.6 | 5445.2 | 5531.0 | 5508.8 |
| 42.5°  | 5080.1 | 5136.2 | 5220.8 | 5316.1 | 5314.0 |
| 45°    | 4809.1 | 4887.4 | 4978.4 | 5105.4 | 5121.3 |
| 47.5°  | 4527.5 | 4615.3 | 4730.8 | 4900.1 | 4924.4 |
| 50°    | 4221.6 | 4331.7 | 4475.6 | 4678.8 | 4693.7 |
| 52.5°  | 3880.7 | 4031.0 | 4221.6 | 4416.3 | 4398.3 |
| 55°    | 3538.8 | 3709.2 | 3962.2 | 4121.0 | 4111.5 |
| 57.5°  | 3197.9 | 3389.5 | 3696.5 | 3809.8 | 3808.8 |
| 60°    | 2816.8 | 3059.2 | 3394.8 | 3480.6 | 3395.8 |
| 62.5°  | 2464.3 | 2724.8 | 3073.0 | 3010.6 | 2720.5 |
| 65°    | 2076.9 | 2401.9 | 2726.8 | 2301.3 | 1878.9 |
| 67.5°  | 1732.8 | 2071.6 | 2316.2 | 1576.2 | 1349.7 |
| 70°    | 1386.8 | 1760.4 | 1805.9 | 1169.8 | 1153.8 |
| 72.5°  | 1079.8 | 1477.8 | 1245.9 | 1001.4 | 1052.2 |
| 75°    | 817.3  | 1185.6 | 872.3  | 892.3  | 950.6  |
| 77.5°  | 596.0  | 910.3  | 678.5  | 782.3  | 829.9  |
| 80°    | 409.7  | 644.7  | 553.7  | 657.3  | 690.2  |
| 82.5°  | 257.2  | 425.6  | 443.5  | 529.2  | 563.2  |
| 85°    | 140.8  | 269.9  | 346.2  | 418.2  | 438.2  |
| 87.5°  | 58.3   | 163.0  | 264.7  | 322.8  | 339.8  |
| 90°    | 7.8    | 130.8  | 231.4  | 284.4  | 295.8  |
| 92.5°  | 21.9   | 118.8  | 210.3  | 261.0  | 273.4  |
| 95°    | 52.8   | 159.4  | 260.3  | 324.3  | 341.8  |
| 97.5°  | 313.8  | 379.5  | 393.5  | 471.3  | 495.6  |
| 100°   | 672.3  | 723.8  | 618.2  | 640.4  | 660.2  |
| 102.5° | 1052.6 | 1092.2 | 912.0  | 781.8  | 760.0  |
| 105°   | 1235.1 | 1252.7 | 1215.3 | 932.2  | 852.1  |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1015.8 | 1025.7 | 1037.7 | 1043.8 | 1019.3 |
| 115°   | 866.8  | 859.3  | 884.0  | 898.3  | 892.1  |
| 117.5° | 742.7  | 736.4  | 759.0  | 762.0  | 754.9  |
| 120°   | 626.0  | 627.0  | 649.1  | 642.8  | 637.2  |
| 122.5° | 520.2  | 531.8  | 549.2  | 546.2  | 536.5  |
| 125°   | 429.9  | 446.0  | 466.6  | 462.3  | 454.9  |
| 127.5° | 371.0  | 376.0  | 396.1  | 395.1  | 396.2  |
| 130°   | 320.2  | 327.8  | 342.3  | 348.2  | 346.6  |
| 132.5° | 286.2  | 293.9  | 305.4  | 312.2  | 314.7  |
| 135°   | 259.5  | 266.4  | 274.2  | 281.9  | 283.8  |
| 137.5° | 238.9  | 243.9  | 248.9  | 258.4  | 260.2  |
| 140°   | 220.6  | 225.6  | 229.5  | 237.1  | 238.2  |
| 142.5° | 204.5  | 210.6  | 213.7  | 219.3  | 220.4  |
| 145°   | 191.2  | 196.4  | 200.6  | 204.2  | 206.0  |
| 147.5° | 182.2  | 185.6  | 189.8  | 190.6  | 192.5  |
| 150°   | 173.1  | 175.6  | 178.9  | 180.6  | 181.4  |
| 152.5° | 164.8  | 167.2  | 170.6  | 171.4  | 172.2  |
| 155°   | 157.2  | 160.8  | 163.3  | 165.0  | 163.9  |
| 157.5° | 150.6  | 154.2  | 156.7  | 157.5  | 157.5  |
| 160°   | 145.6  | 148.3  | 150.8  | 150.8  | 151.7  |
| 162.5° | 141.7  | 143.3  | 145.0  | 145.8  | 146.7  |
| 165°   | 137.5  | 139.2  | 140.0  | 140.8  | 141.7  |
| 167.5° | 134.2  | 136.0  | 135.8  | 136.7  | 136.7  |
| 170°   | 130.8  | 131.7  | 132.5  | 131.4  | 132.2  |
| 172.5° | 128.3  | 129.2  | 130.0  | 128.9  | 128.9  |
| 175°   | 126.7  | 126.7  | 126.4  | 125.3  | 126.2  |
| 177.5° | 126.0  | 125.8  | 124.8  | 123.7  | 123.5  |
| 180°   | 123.9  | 123.9  | 123.9  | 123.9  | 123.9  |



Report Generated By 670246072 / DESKTOP-50001EG





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







|        |        |        |        |        |        |
|--------|--------|--------|--------|--------|--------|
| 107.5° | 1247.8 | 1265.1 | 1266.8 | 1132.4 | 989.6  |
| 110°   | 1153.0 | 1174.4 | 1181.8 | 1143.8 | 1080.1 |



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

Report Prepared for

Cooper Lighting Solutions

METALUX

Report Number: SP1-2307-100-7

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:  $4\pi$   
 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



Point lies inside the ANSI 3500K 4-step quadrangle

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**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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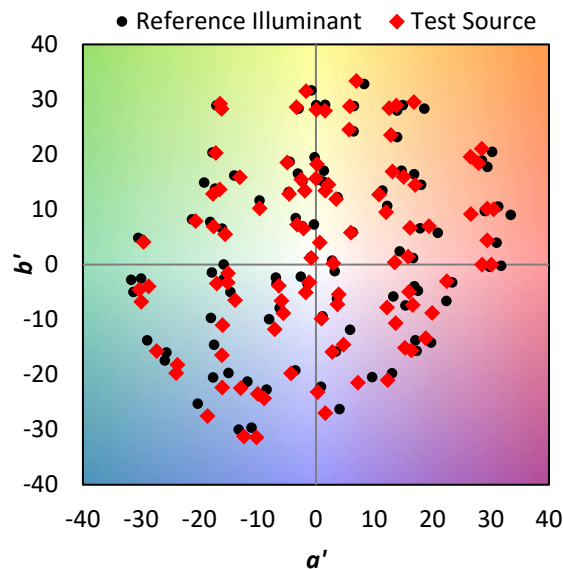
**TM-30-18**

**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)