

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: P830211

Luminaire Tested: **OHBL-30HE-NL-UNV-L730-CD**

Issue Date: 5/3/2024



**Test Information**

Test Method: LM-79-08  
Report Number: P830211  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (P472951)  
Test Lab: INNOVATION CENTER  
Issue Date: 5/3/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: METALUX  
Catalog Number: OHBL-30HE-NL-UNV-L730-CD  
Description: 30000 LUMEN OHBL HE LED LUMINAIRE WITH 70CRI, 3000K LEDS AND NO LENS  
Light Source: -  
Ballast/Driver: -

**Summary**

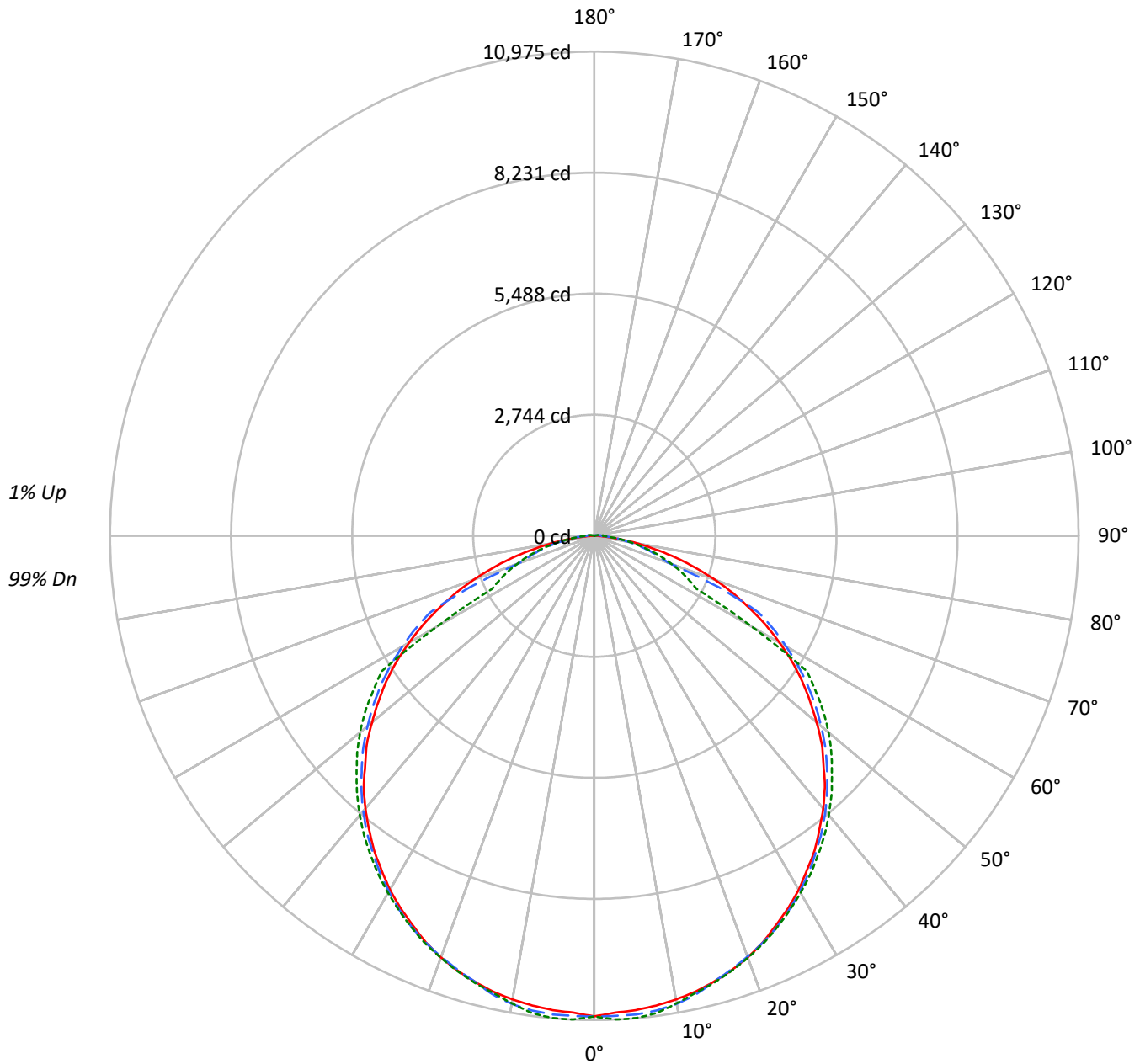
Lumens per Lamp: N/A  
Luminaire Lumens: 30588.0 lumens  
Efficiency: N/A  
Efficacy: 186.7 lumens/watt  
Spacing Criteria (0/90/45): 1.26 / 1.28 / 1.39  
Luminous Opening: Rectangular (W 1.8' x L: 3.78' x H: 0')  
CIE Type: Direct

Input Watts (W): 163.8  
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: P830211

CATALOG NUMBER: OHBL-30HE-NL-UNV-L730-CD

### Luminous Intensity Polar Plot





TEST NUMBER: P830211

CATALOG NUMBER: OHBL-30HE-NL-UNV-L730-CD

**COEFFICIENT OF UTILIZATION - ZONAL CAVITY METHOD:**

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |    |    |    |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|----|
| RF  | 20  |     |     |     | 20  |     |     |     |     | 20  |     |     |     |     | 20  |     |     |    |    | 20 |
| RC  | 80  |     |     |     | 70  |     |     |     |     | 50  |     |     |     |     | 30  |     |     |    |    | 0  |
| RW  | 70  | 50  | 30  | 10  | 70  | 50  | 30  | 10  | 50  | 30  | 10  | 50  | 30  | 10  | 50  | 30  | 10  | 50 | 30 | 10 |
| RCR |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |    |    |    |
| 0   | 119 | 119 | 119 | 119 | 116 | 116 | 116 | 116 | 111 | 111 | 111 | 106 | 106 | 106 | 102 | 102 | 102 | 99 |    |    |
| 1   | 109 | 105 | 100 | 97  | 106 | 102 | 99  | 95  | 98  | 95  | 92  | 94  | 91  | 89  | 90  | 88  | 86  | 84 |    |    |
| 2   | 99  | 92  | 85  | 79  | 97  | 90  | 84  | 78  | 86  | 81  | 76  | 83  | 78  | 75  | 80  | 76  | 73  | 71 |    |    |
| 3   | 91  | 81  | 73  | 66  | 88  | 79  | 72  | 66  | 76  | 70  | 64  | 73  | 68  | 63  | 70  | 66  | 62  | 60 |    |    |
| 4   | 83  | 71  | 63  | 56  | 81  | 70  | 62  | 56  | 67  | 60  | 55  | 65  | 59  | 54  | 63  | 58  | 53  | 51 |    |    |
| 5   | 76  | 64  | 55  | 48  | 74  | 63  | 54  | 48  | 60  | 53  | 47  | 58  | 52  | 47  | 57  | 51  | 46  | 44 |    |    |
| 6   | 71  | 57  | 49  | 42  | 69  | 56  | 48  | 42  | 55  | 47  | 42  | 53  | 46  | 41  | 51  | 45  | 41  | 39 |    |    |
| 7   | 65  | 52  | 43  | 37  | 64  | 51  | 43  | 37  | 50  | 42  | 37  | 48  | 41  | 36  | 47  | 41  | 36  | 34 |    |    |
| 8   | 61  | 47  | 39  | 33  | 59  | 47  | 39  | 33  | 45  | 38  | 33  | 44  | 37  | 33  | 43  | 37  | 32  | 30 |    |    |
| 9   | 57  | 43  | 35  | 30  | 55  | 43  | 35  | 30  | 42  | 35  | 30  | 41  | 34  | 29  | 40  | 34  | 29  | 27 |    |    |
| 10  | 53  | 40  | 32  | 27  | 52  | 40  | 32  | 27  | 39  | 32  | 27  | 38  | 31  | 27  | 37  | 31  | 26  | 25 |    |    |

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

|     | 0°    | 45°   | 90°   |
|-----|-------|-------|-------|
| 0°  | 17230 | 17230 | 17230 |
| 5°  | 17135 | 17289 | 17420 |
| 10° | 17139 | 17302 | 17281 |
| 15° | 17136 | 17133 | 17171 |
| 20° | 17113 | 17087 | 17129 |
| 25° | 16996 | 17083 | 17096 |
| 30° | 16917 | 17004 | 17071 |
| 35° | 16808 | 16900 | 17058 |
| 40° | 16663 | 16820 | 17069 |
| 45° | 16422 | 16670 | 17034 |
| 50° | 16175 | 16504 | 17050 |
| 55° | 15865 | 16276 | 16862 |
| 60° | 15334 | 15878 | 13127 |
| 65° | 14508 | 15351 | 8835  |
| 70° | 13418 | 8149  | 8574  |
| 75° | 11704 | 7744  | 8188  |
| 80° | 9001  | 7104  | 7504  |
| 85° | 4544  | 7180  | 7353  |



TEST NUMBER: P830211

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 1035.0  | 3.4       |
| 10°-20°   | 2963.6  | 9.7       |
| 20°-30°   | 4509.3  | 14.7      |
| 30°-40°   | 5482.7  | 17.9      |
| 40°-50°   | 5764.8  | 18.8      |
| 50°-60°   | 5264.0  | 17.2      |
| 60°-70°   | 3374.5  | 11.0      |
| 70°-80°   | 1594.1  | 5.2       |
| 80°-90°   | 442.0   | 1.4       |
| 90°-100°  | 117.1   | 0.4       |
| 100°-110° | 32.0    | 0.1       |
| 110°-120° | 8.9     | 0.0       |
| 120°-130° | 0.0     | 0.0       |
| 130°-140° | 0.0     | 0.0       |
| 140°-150° | 0.0     | 0.0       |
| 150°-160° | 0.0     | 0.0       |
| 160°-170° | 0.0     | 0.0       |
| 170°-180° | 0.0     | 0.0       |
| <hr/>     |         |           |
| 0°-30°    | 8508.0  | 27.8      |
| 0°-40°    | 13990.7 | 45.7      |
| 0°-60°    | 25019.5 | 81.8      |
| 0°-90°    | 30430.0 | 99.5      |
| 90°-120°  | 158.0   | 0.5       |
| 90°-150°  | 158.0   | 0.5       |
| 90°-180°  | 158.0   | 0.5       |
| 0°-180°   | 30588.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°    | 22.5° | 45°   | 67.5° | 90°   | Flux |
|------|-------|-------|-------|-------|-------|------|
| 0°   | 10895 | 10895 | 10895 | 10895 | 10895 |      |
| 5°   | 10793 | 10835 | 10891 | 10950 | 10973 | ###  |
| 15°  | 10466 | 10545 | 10465 | 10480 | 10487 | 2955 |
| 25°  | 9740  | 9755  | 9790  | 9805  | 9797  | 4494 |
| 35°  | 8706  | 8654  | 8754  | 8861  | 8836  | 5441 |
| 45°  | 7343  | 7329  | 7454  | 7629  | 7616  | 5675 |
| 55°  | 5754  | 5710  | 5903  | 6100  | 6116  | 5132 |
| 65°  | 3877  | 3877  | 4102  | 2353  | 2361  | 3844 |
| 75°  | 1916  | 1952  | 1267  | 1334  | 1340  | 2019 |
| 85°  | 250   | 317   | 396   | 428   | 405   | 370  |
| 90°  | 0     | 107   | 176   | 208   | 205   | 11   |
| 95°  | 6     | 56    | 126   | 170   | 170   | 3    |
| 105° | 10    | 21    | 31    | 31    | 29    | 10   |
| 115° | 10    | 13    | 19    | 13    | 2     | 7    |
| 125° | 0     | 0     | 0     | 0     | 0     | 0    |
| 135° | 0     | 0     | 0     | 0     | 0     | 0    |
| 145° | 0     | 0     | 0     | 0     | 0     | 0    |
| 155° | 0     | 0     | 0     | 0     | 0     | 0    |
| 165° | 0     | 0     | 0     | 0     | 0     | 0    |
| 175° | 0     | 0     | 0     | 0     | 0     | 0    |
| 180° | 0     | 0     | 0     | 0     | 0     |      |



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**CANDELA DISTRIBUTION (FULL):**

|        | 0°      | 22.5°   | 45°     | 67.5°   | 90°     |
|--------|---------|---------|---------|---------|---------|
| 0°     | 10894.7 | 10894.7 | 10894.7 | 10894.7 | 10894.7 |
| 2.5°   | 10818.2 | 10854.6 | 10894.7 | 10946.3 | 10974.8 |
| 5°     | 10793.3 | 10835.4 | 10890.8 | 10950.1 | 10973.0 |
| 7.5°   | 10739.8 | 10798.9 | 10852.6 | 10894.7 | 10908.0 |
| 10°    | 10672.8 | 10743.7 | 10774.2 | 10770.4 | 10760.9 |
| 12.5°  | 10583.0 | 10657.7 | 10648.1 | 10604.0 | 10611.7 |
| 15°    | 10466.4 | 10544.7 | 10464.6 | 10479.8 | 10487.4 |
| 17.5°  | 10328.8 | 10405.3 | 10311.6 | 10342.1 | 10344.1 |
| 20°    | 10168.3 | 10225.5 | 10152.9 | 10177.8 | 10177.8 |
| 22.5°  | 9975.2  | 10015.3 | 9984.7  | 10001.9 | 10005.7 |
| 25°    | 9740.0  | 9755.2  | 9789.6  | 9805.0  | 9797.3  |
| 27.5°  | 9514.5  | 9495.3  | 9562.3  | 9598.5  | 9579.3  |
| 30°    | 9264.0  | 9233.4  | 9311.7  | 9371.0  | 9348.2  |
| 32.5°  | 8977.2  | 8958.2  | 9048.0  | 9118.7  | 9105.3  |
| 35°    | 8705.8  | 8654.2  | 8753.5  | 8860.6  | 8835.7  |
| 37.5°  | 8384.6  | 8354.0  | 8466.7  | 8579.7  | 8566.3  |
| 40°    | 8071.1  | 8019.5  | 8147.6  | 8281.3  | 8268.0  |
| 42.5°  | 7734.7  | 7673.4  | 7813.0  | 7973.7  | 7958.3  |
| 45°    | 7342.6  | 7329.3  | 7453.6  | 7629.4  | 7616.1  |
| 47.5°  | 6994.9  | 6927.9  | 7101.8  | 7272.0  | 7287.4  |
| 50°    | 6574.2  | 6549.5  | 6708.1  | 6914.6  | 6929.8  |
| 52.5°  | 6163.3  | 6146.1  | 6312.3  | 6520.7  | 6547.4  |
| 55°    | 5754.1  | 5710.1  | 5903.2  | 6100.2  | 6115.5  |
| 57.5°  | 5316.5  | 5270.5  | 5467.5  | 5681.6  | 5714.0  |
| 60°    | 4847.9  | 4804.0  | 5020.0  | 5218.9  | 4150.3  |
| 62.5°  | 4379.6  | 4349.0  | 4574.7  | 3240.3  | 2611.5  |
| 65°    | 3876.9  | 3876.9  | 4102.3  | 2353.2  | 2360.9  |
| 67.5°  | 3406.7  | 3376.1  | 3058.8  | 2114.2  | 2114.2  |
| 70°    | 2901.9  | 2913.5  | 1762.4  | 1852.5  | 1854.3  |
| 72.5°  | 2395.3  | 2437.4  | 1521.8  | 1594.3  | 1598.1  |
| 75°    | 1915.5  | 1951.9  | 1267.4  | 1334.4  | 1340.0  |
| 77.5°  | 1407.0  | 1082.0  | 1018.9  | 1070.7  | 1072.5  |
| 80°    | 988.3   | 682.5   | 780.0   | 829.6   | 823.9   |
| 82.5°  | 577.2   | 477.9   | 571.6   | 608.0   | 606.0   |
| 85°    | 250.4   | 317.4   | 395.7   | 428.3   | 405.2   |
| 87.5°  | 80.1    | 196.9   | 246.5   | 265.7   | 263.7   |
| 90°    | 0.0     | 107.1   | 175.9   | 208.3   | 204.6   |
| 92.5°  | 0.0     | 84.0    | 153.0   | 191.3   | 193.1   |
| 95°    | 5.7     | 55.5    | 126.3   | 170.2   | 170.2   |
| 97.5°  | 3.8     | 40.1    | 89.9    | 133.8   | 137.6   |
| 100°   | 3.8     | 32.4    | 59.3    | 95.5    | 97.6    |
| 102.5° | 9.5     | 26.7    | 36.2    | 61.1    | 63.1    |
| 105°   | 9.5     | 21.0    | 30.6    | 30.6    | 28.7    |



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CATALOG NUMBER: OHBL-30HE-NL-UNV-L730-CD

**CANDELA DISTRIBUTION (continued):**

|        | 0°   | 22.5° | 45°  | 67.5° | 90° |
|--------|------|-------|------|-------|-----|
| 112.5° | 11.5 | 15.4  | 21.0 | 15.4  | 1.8 |
| 115°   | 9.5  | 13.4  | 19.0 | 13.4  | 1.8 |
| 117.5° | 0.0  | 0.0   | 0.0  | 0.0   | 0.0 |
| 120°   | 0.0  | 0.0   | 0.0  | 0.0   | 0.0 |
| 122.5° | 0.0  | 0.0   | 0.0  | 0.0   | 0.0 |
| 125°   | 0.0  | 0.0   | 0.0  | 0.0   | 0.0 |
| 127.5° | 0.0  | 0.0   | 0.0  | 0.0   | 0.0 |
| 130°   | 0.0  | 0.0   | 0.0  | 0.0   | 0.0 |
| 132.5° | 0.0  | 0.0   | 0.0  | 0.0   | 0.0 |
| 135°   | 0.0  | 0.0   | 0.0  | 0.0   | 0.0 |
| 137.5° | 0.0  | 0.0   | 0.0  | 0.0   | 0.0 |
| 140°   | 0.0  | 0.0   | 0.0  | 0.0   | 0.0 |
| 142.5° | 0.0  | 0.0   | 0.0  | 0.0   | 0.0 |
| 145°   | 0.0  | 0.0   | 0.0  | 0.0   | 0.0 |
| 147.5° | 0.0  | 0.0   | 0.0  | 0.0   | 0.0 |
| 150°   | 0.0  | 0.0   | 0.0  | 0.0   | 0.0 |
| 152.5° | 0.0  | 0.0   | 0.0  | 0.0   | 0.0 |
| 155°   | 0.0  | 0.0   | 0.0  | 0.0   | 0.0 |
| 157.5° | 0.0  | 0.0   | 0.0  | 0.0   | 0.0 |
| 160°   | 0.0  | 0.0   | 0.0  | 0.0   | 0.0 |
| 162.5° | 0.0  | 0.0   | 0.0  | 0.0   | 0.0 |
| 165°   | 0.0  | 0.0   | 0.0  | 0.0   | 0.0 |
| 167.5° | 0.0  | 0.0   | 0.0  | 0.0   | 0.0 |
| 170°   | 0.0  | 0.0   | 0.0  | 0.0   | 0.0 |
| 172.5° | 0.0  | 0.0   | 0.0  | 0.0   | 0.0 |
| 175°   | 0.0  | 0.0   | 0.0  | 0.0   | 0.0 |
| 177.5° | 0.0  | 0.0   | 0.0  | 0.0   | 0.0 |
| 180°   | 0.0  | 0.0   | 0.0  | 0.0   | 0.0 |



Report Generated By 670246072 / DESKTOP-50001EG





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







|        |      |      |      |      |     |
|--------|------|------|------|------|-----|
| 107.5° | 9.5  | 19.0 | 26.7 | 17.2 | 5.7 |
| 110°   | 11.5 | 17.2 | 22.9 | 15.4 | 1.8 |



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

Report Prepared for

Cooper Lighting Solutions

METALUX

Report Number: SP1-2307-100-1

Test Date: 07/27/2023

Luminaire Tested: OHB-15SE-N-UNV-L730-CD

Data in this report applies to families of products including OHB-15SE-N-UNV-L730-CD.

### Test Information

Test Method: LM-79-2019  
 Report Number: SP1-2307-100-1  
 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-L730-CD**  
 Description: 15000 LUMEN OHB SE LED LUMINAIRE WITH 70CRI, 3000K LEDS AND NARROW LENS

LENS

### Spectral Parameters

|                           |         |           |      |      |       |
|---------------------------|---------|-----------|------|------|-------|
| CCT (K):                  | 3069    | CRI (Ra): | 71.3 |      |       |
| CIE u':                   | 0.2485  | R1:       | 67.4 | R9:  | -35.7 |
| CIE v':                   | 0.5185  | R2:       | 83.0 | R10: | 60.6  |
| Duv:                      | -0.0010 | R3:       | 94.0 | R11: | 58.9  |
| CIE x:                    | 0.4306  | R4:       | 65.2 | R12: | 49.5  |
| CIE y:                    | 0.3993  | R5:       | 66.6 | R13: | 70.5  |
| CIE z:                    | 0.1702  | R6:       | 76.0 | R14: | 97.0  |
| Peak Wavelength (nm):     | 596     | R7:       | 76.4 |      |       |
| Dominant Wavelength (nm): | 582     | R8:       | 41.9 |      |       |
| Purity:                   | 49.5    |           |      |      |       |
| Rf:                       | 74.9    |           |      |      |       |
| Rg:                       | 92.7    |           |      |      |       |



### Test Conditions

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

REPORT NUMBER: SP1-2307-100-1

| 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           |

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**CIE 1931 Chromaticity Diagram**



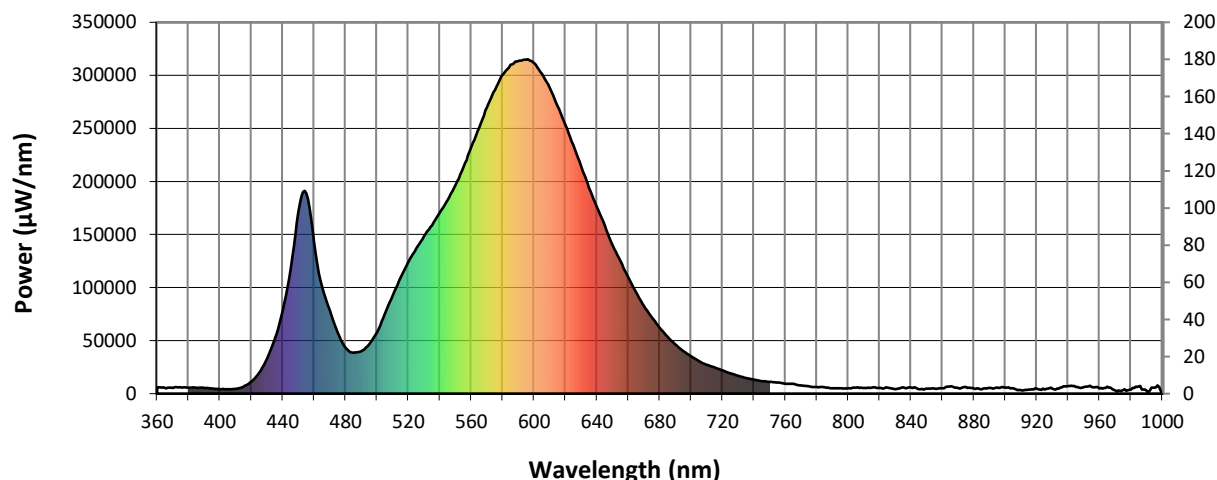
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 3000K 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       | 6099             | NR               | 490       | 40168            | NR               | 620       | 253019           | NR               | 750       | 11053            | NR               | 880       | 4764             | NR               |
| 365       | 5425             | NR               | 495       | 46535            | NR               | 625       | 234501           | NR               | 755       | 10436            | NR               | 885       | 4069             | NR               |
| 370       | 5467             | NR               | 500       | 57902            | NR               | 630       | 214134           | NR               | 760       | 9340             | NR               | 890       | 5470             | NR               |
| 375       | 5866             | NR               | 505       | 75040            | NR               | 635       | 194074           | NR               | 765       | 9223             | NR               | 895       | 5625             | NR               |
| 380       | 5693             | NR               | 510       | 92426            | NR               | 640       | 175837           | NR               | 770       | 7875             | NR               | 900       | 5662             | NR               |
| 385       | 5528             | NR               | 515       | 109218           | NR               | 645       | 158182           | NR               | 775       | 6995             | NR               | 905       | 4976             | NR               |
| 390       | 5323             | NR               | 520       | 124301           | NR               | 650       | 139770           | NR               | 780       | 6291             | NR               | 910       | 3243             | NR               |
| 395       | 4691             | NR               | 525       | 136616           | NR               | 655       | 124825           | NR               | 785       | 5894             | NR               | 915       | 4005             | NR               |
| 400       | 4292             | NR               | 530       | 148525           | NR               | 660       | 109765           | NR               | 790       | 5176             | NR               | 920       | 4854             | NR               |
| 405       | 4106             | NR               | 535       | 158686           | NR               | 665       | 95251            | NR               | 795       | 5191             | NR               | 925       | 3999             | NR               |
| 410       | 4555             | NR               | 540       | 170513           | NR               | 670       | 82640            | NR               | 800       | 4961             | NR               | 930       | 4856             | NR               |
| 415       | 6579             | NR               | 545       | 182793           | NR               | 675       | 71832            | NR               | 805       | 5762             | NR               | 935       | 5652             | NR               |
| 420       | 11281            | NR               | 550       | 196628           | NR               | 680       | 62184            | NR               | 810       | 5247             | NR               | 940       | 7244             | NR               |
| 425       | 19782            | NR               | 555       | 213600           | NR               | 685       | 53604            | NR               | 815       | 5570             | NR               | 945       | 6266             | NR               |
| 430       | 32934            | NR               | 560       | 232241           | NR               | 690       | 46370            | NR               | 820       | 5470             | NR               | 950       | 6258             | NR               |
| 435       | 52004            | NR               | 565       | 250545           | NR               | 695       | 40048            | NR               | 825       | 5780             | NR               | 955       | 6166             | NR               |
| 440       | 77987            | NR               | 570       | 269608           | NR               | 700       | 35148            | NR               | 830       | 4151             | NR               | 960       | 4813             | NR               |
| 445       | 117241           | NR               | 575       | 286007           | NR               | 705       | 30717            | NR               | 835       | 5899             | NR               | 965       | 6539             | NR               |
| 450       | 171397           | NR               | 580       | 300402           | NR               | 710       | 27137            | NR               | 840       | 5774             | NR               | 970       | 2930             | NR               |
| 455       | 188676           | NR               | 585       | 310093           | NR               | 715       | 24655            | NR               | 845       | 4055             | NR               | 975       | 3170             | NR               |
| 460       | 142860           | NR               | 590       | 313605           | NR               | 720       | 21845            | NR               | 850       | 4767             | NR               | 980       | 3959             | NR               |
| 465       | 100906           | NR               | 595       | 314960           | NR               | 725       | 19116            | NR               | 855       | 4780             | NR               | 985       | 6920             | NR               |
| 470       | 78130            | NR               | 600       | 311387           | NR               | 730       | 16889            | NR               | 860       | 5148             | NR               | 990       | 2710             | NR               |
| 475       | 57660            | NR               | 605       | 301618           | NR               | 735       | 14825            | NR               | 865       | 6865             | NR               | 995       | 5566             | NR               |
| 480       | 43089            | NR               | 610       | 288042           | NR               | 740       | 13154            | NR               | 870       | 5392             | NR               | 1000      | 0                | NR               |
| 485       | 38569            | NR               | 615       | 270953           | NR               | 745       | 11725            | NR               | 875       | 6166             | NR               |           |                  |                  |

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Scotopic Flux vs. Wavelength



Scotopic Lumens: 18956.8

S/P: 1.25

| 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       | 6099             | NR               | 490       | 40168            | NR               | 620       | 253019           | NR               | 750       | 11053            | NR               | 880       | 4764             | NR               |
| 365       | 5425             | NR               | 495       | 46535            | NR               | 625       | 234501           | NR               | 755       | 10436            | NR               | 885       | 4069             | NR               |
| 370       | 5467             | NR               | 500       | 57902            | NR               | 630       | 214134           | NR               | 760       | 9340             | NR               | 890       | 5470             | NR               |
| 375       | 5866             | NR               | 505       | 75040            | NR               | 635       | 194074           | NR               | 765       | 9223             | NR               | 895       | 5625             | NR               |
| 380       | 5693             | NR               | 510       | 92426            | NR               | 640       | 175837           | NR               | 770       | 7875             | NR               | 900       | 5662             | NR               |
| 385       | 5528             | NR               | 515       | 109218           | NR               | 645       | 158182           | NR               | 775       | 6995             | NR               | 905       | 4976             | NR               |
| 390       | 5323             | NR               | 520       | 124301           | NR               | 650       | 139770           | NR               | 780       | 6291             | NR               | 910       | 3243             | NR               |
| 395       | 4691             | NR               | 525       | 136616           | NR               | 655       | 124825           | NR               | 785       | 5894             | NR               | 915       | 4005             | NR               |
| 400       | 4292             | NR               | 530       | 148525           | NR               | 660       | 109765           | NR               | 790       | 5176             | NR               | 920       | 4854             | NR               |
| 405       | 4106             | NR               | 535       | 158686           | NR               | 665       | 95251            | NR               | 795       | 5191             | NR               | 925       | 3999             | NR               |
| 410       | 4555             | NR               | 540       | 170513           | NR               | 670       | 82640            | NR               | 800       | 4961             | NR               | 930       | 4856             | NR               |
| 415       | 6579             | NR               | 545       | 182793           | NR               | 675       | 71832            | NR               | 805       | 5762             | NR               | 935       | 5652             | NR               |
| 420       | 11281            | NR               | 550       | 196628           | NR               | 680       | 62184            | NR               | 810       | 5247             | NR               | 940       | 7244             | NR               |
| 425       | 19782            | NR               | 555       | 213600           | NR               | 685       | 53604            | NR               | 815       | 5570             | NR               | 945       | 6266             | NR               |
| 430       | 32934            | NR               | 560       | 232241           | NR               | 690       | 46370            | NR               | 820       | 5470             | NR               | 950       | 6258             | NR               |
| 435       | 52004            | NR               | 565       | 250545           | NR               | 695       | 40048            | NR               | 825       | 5780             | NR               | 955       | 6166             | NR               |
| 440       | 77987            | NR               | 570       | 269608           | NR               | 700       | 35148            | NR               | 830       | 4151             | NR               | 960       | 4813             | NR               |
| 445       | 117241           | NR               | 575       | 286007           | NR               | 705       | 30717            | NR               | 835       | 5899             | NR               | 965       | 6539             | NR               |
| 450       | 171397           | NR               | 580       | 300402           | NR               | 710       | 27137            | NR               | 840       | 5774             | NR               | 970       | 2930             | NR               |
| 455       | 188676           | NR               | 585       | 310093           | NR               | 715       | 24655            | NR               | 845       | 4055             | NR               | 975       | 3170             | NR               |
| 460       | 142860           | NR               | 590       | 313605           | NR               | 720       | 21845            | NR               | 850       | 4767             | NR               | 980       | 3959             | NR               |
| 465       | 100906           | NR               | 595       | 314960           | NR               | 725       | 19116            | NR               | 855       | 4780             | NR               | 985       | 6920             | NR               |
| 470       | 78130            | NR               | 600       | 311387           | NR               | 730       | 16889            | NR               | 860       | 5148             | NR               | 990       | 2710             | NR               |
| 475       | 57660            | NR               | 605       | 301618           | NR               | 735       | 14825            | NR               | 865       | 6865             | NR               | 995       | 5566             | NR               |
| 480       | 43089            | NR               | 610       | 288042           | NR               | 740       | 13154            | NR               | 870       | 5392             | NR               | 1000      | 0                | NR               |
| 485       | 38569            | NR               | 615       | 270953           | NR               | 745       | 11725            | NR               | 875       | 6166             | NR               |           |                  |                  |

REPORT NUMBER: SP1-2307-100-1

**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 7042.8**

**M/P: 0.47**

| 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       | 6099             | NR               | 490       | 40168            | NR               | 620       | 253019           | NR               | 750       | 11053            | NR               | 880       | 4764             | NR               |
| 365       | 5425             | NR               | 495       | 46535            | NR               | 625       | 234501           | NR               | 755       | 10436            | NR               | 885       | 4069             | NR               |
| 370       | 5467             | NR               | 500       | 57902            | NR               | 630       | 214134           | NR               | 760       | 9340             | NR               | 890       | 5470             | NR               |
| 375       | 5866             | NR               | 505       | 75040            | NR               | 635       | 194074           | NR               | 765       | 9223             | NR               | 895       | 5625             | NR               |
| 380       | 5693             | NR               | 510       | 92426            | NR               | 640       | 175837           | NR               | 770       | 7875             | NR               | 900       | 5662             | NR               |
| 385       | 5528             | NR               | 515       | 109218           | NR               | 645       | 158182           | NR               | 775       | 6995             | NR               | 905       | 4976             | NR               |
| 390       | 5323             | NR               | 520       | 124301           | NR               | 650       | 139770           | NR               | 780       | 6291             | NR               | 910       | 3243             | NR               |
| 395       | 4691             | NR               | 525       | 136616           | NR               | 655       | 124825           | NR               | 785       | 5894             | NR               | 915       | 4005             | NR               |
| 400       | 4292             | NR               | 530       | 148525           | NR               | 660       | 109765           | NR               | 790       | 5176             | NR               | 920       | 4854             | NR               |
| 405       | 4106             | NR               | 535       | 158686           | NR               | 665       | 95251            | NR               | 795       | 5191             | NR               | 925       | 3999             | NR               |
| 410       | 4555             | NR               | 540       | 170513           | NR               | 670       | 82640            | NR               | 800       | 4961             | NR               | 930       | 4856             | NR               |
| 415       | 6579             | NR               | 545       | 182793           | NR               | 675       | 71832            | NR               | 805       | 5762             | NR               | 935       | 5652             | NR               |
| 420       | 11281            | NR               | 550       | 196628           | NR               | 680       | 62184            | NR               | 810       | 5247             | NR               | 940       | 7244             | NR               |
| 425       | 19782            | NR               | 555       | 213600           | NR               | 685       | 53604            | NR               | 815       | 5570             | NR               | 945       | 6266             | NR               |
| 430       | 32934            | NR               | 560       | 232241           | NR               | 690       | 46370            | NR               | 820       | 5470             | NR               | 950       | 6258             | NR               |
| 435       | 52004            | NR               | 565       | 250545           | NR               | 695       | 40048            | NR               | 825       | 5780             | NR               | 955       | 6166             | NR               |
| 440       | 77987            | NR               | 570       | 269608           | NR               | 700       | 35148            | NR               | 830       | 4151             | NR               | 960       | 4813             | NR               |
| 445       | 117241           | NR               | 575       | 286007           | NR               | 705       | 30717            | NR               | 835       | 5899             | NR               | 965       | 6539             | NR               |
| 450       | 171397           | NR               | 580       | 300402           | NR               | 710       | 27137            | NR               | 840       | 5774             | NR               | 970       | 2930             | NR               |
| 455       | 188676           | NR               | 585       | 310093           | NR               | 715       | 24655            | NR               | 845       | 4055             | NR               | 975       | 3170             | NR               |
| 460       | 142860           | NR               | 590       | 313605           | NR               | 720       | 21845            | NR               | 850       | 4767             | NR               | 980       | 3959             | NR               |
| 465       | 100906           | NR               | 595       | 314960           | NR               | 725       | 19116            | NR               | 855       | 4780             | NR               | 985       | 6920             | NR               |
| 470       | 78130            | NR               | 600       | 311387           | NR               | 730       | 16889            | NR               | 860       | 5148             | NR               | 990       | 2710             | NR               |
| 475       | 57660            | NR               | 605       | 301618           | NR               | 735       | 14825            | NR               | 865       | 6865             | NR               | 995       | 5566             | NR               |
| 480       | 43089            | NR               | 610       | 288042           | NR               | 740       | 13154            | NR               | 870       | 5392             | NR               | 1000      | 0                | NR               |
| 485       | 38569            | NR               | 615       | 270953           | NR               | 745       | 11725            | NR               | 875       | 6166             | NR               |           |                  |                  |

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**Summary**

$R_f = 74.9$   
 $R_g = 92.7$   
 $CIE R_a = 71.3$   
 $R_g = -35.7$



**Color Vector Graphics**



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 67 | CES51 = 85 | CES76 = 60 |
| CES02 = 62 | CES27 = 90 | CES52 = 83 | CES77 = 76 |
| CES03 = 31 | CES28 = 85 | CES53 = 77 | CES78 = 64 |
| CES04 = 71 | CES29 = 73 | CES54 = 85 | CES79 = 86 |
| CES05 = 49 | CES30 = 90 | CES55 = 82 | CES80 = 85 |
| CES06 = 51 | CES31 = 76 | CES56 = 74 | CES81 = 72 |
| CES07 = 41 | CES32 = 67 | CES57 = 73 | CES82 = 93 |
| CES08 = 40 | CES33 = 84 | CES58 = 73 | CES83 = 92 |
| CES09 = 29 | CES34 = 77 | CES59 = 83 | CES84 = 87 |
| CES10 = 76 | CES35 = 88 | CES60 = 88 | CES85 = 74 |
| CES11 = 59 | CES36 = 89 | CES61 = 79 | CES86 = 64 |
| CES12 = 65 | CES37 = 85 | CES62 = 85 | CES87 = 77 |
| CES13 = 43 | CES38 = 98 | CES63 = 76 | CES88 = 80 |
| CES14 = 74 | CES39 = 98 | CES64 = 62 | CES89 = 67 |
| CES15 = 71 | CES40 = 94 | CES65 = 64 | CES90 = 81 |
| CES16 = 47 | CES41 = 97 | CES66 = 57 | CES91 = 76 |
| CES17 = 50 | CES42 = 88 | CES67 = 55 | CES92 = 55 |
| CES18 = 56 | CES43 = 80 | CES68 = 64 | CES93 = 72 |
| CES19 = 73 | CES44 = 99 | CES69 = 73 | CES94 = 49 |
| CES20 = 66 | CES45 = 86 | CES70 = 60 | CES95 = 66 |
| CES21 = 87 | CES46 = 83 | CES71 = 56 | CES96 = 76 |
| CES22 = 79 | CES47 = 91 | CES72 = 84 | CES97 = 81 |
| CES23 = 92 | CES48 = 76 | CES73 = 53 | CES98 = 76 |
| CES24 = 91 | CES49 = 80 | CES74 = 93 | CES99 = 64 |
| CES25 = 73 | CES50 = 85 | CES75 = 61 |            |



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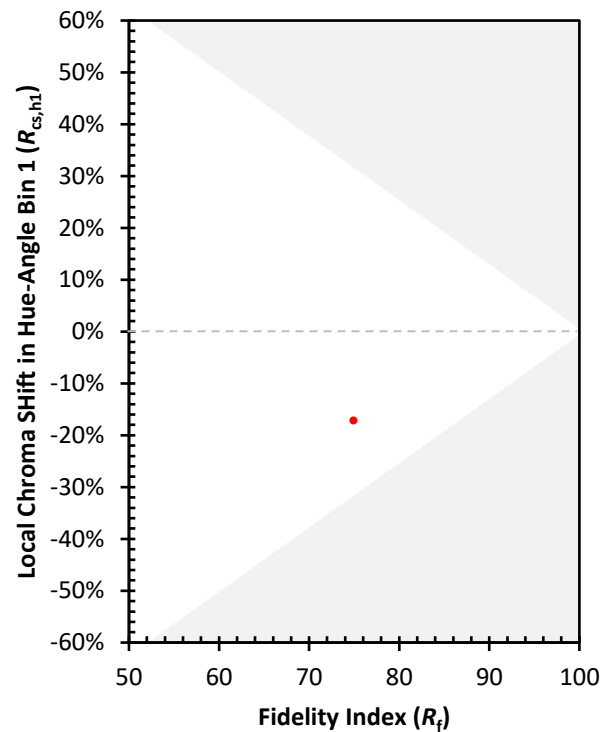
Color Rendition by Hue-Angle Bin



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**Measure Comparisons**



(END OF REPORT)