

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: P829289

Luminaire Tested: **OHB-24SE-W-UNV-L740-CD**

Issue Date: 5/3/2024



**Test Information**

Test Method: LM-79-08  
Report Number: P829289  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2106-285-4)  
Test Lab: INNOVATION CENTER  
Issue Date: 5/3/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: METALUX  
Catalog Number: OHB-24SE-W-UNV-L740-CD  
Description: 24000 LUMEN OHB SE LED LUMINAIRE WITH 70CRI, 4000K LEDS AND WIDE LENS  
Light Source: -  
Ballast/Driver: -

**Summary**

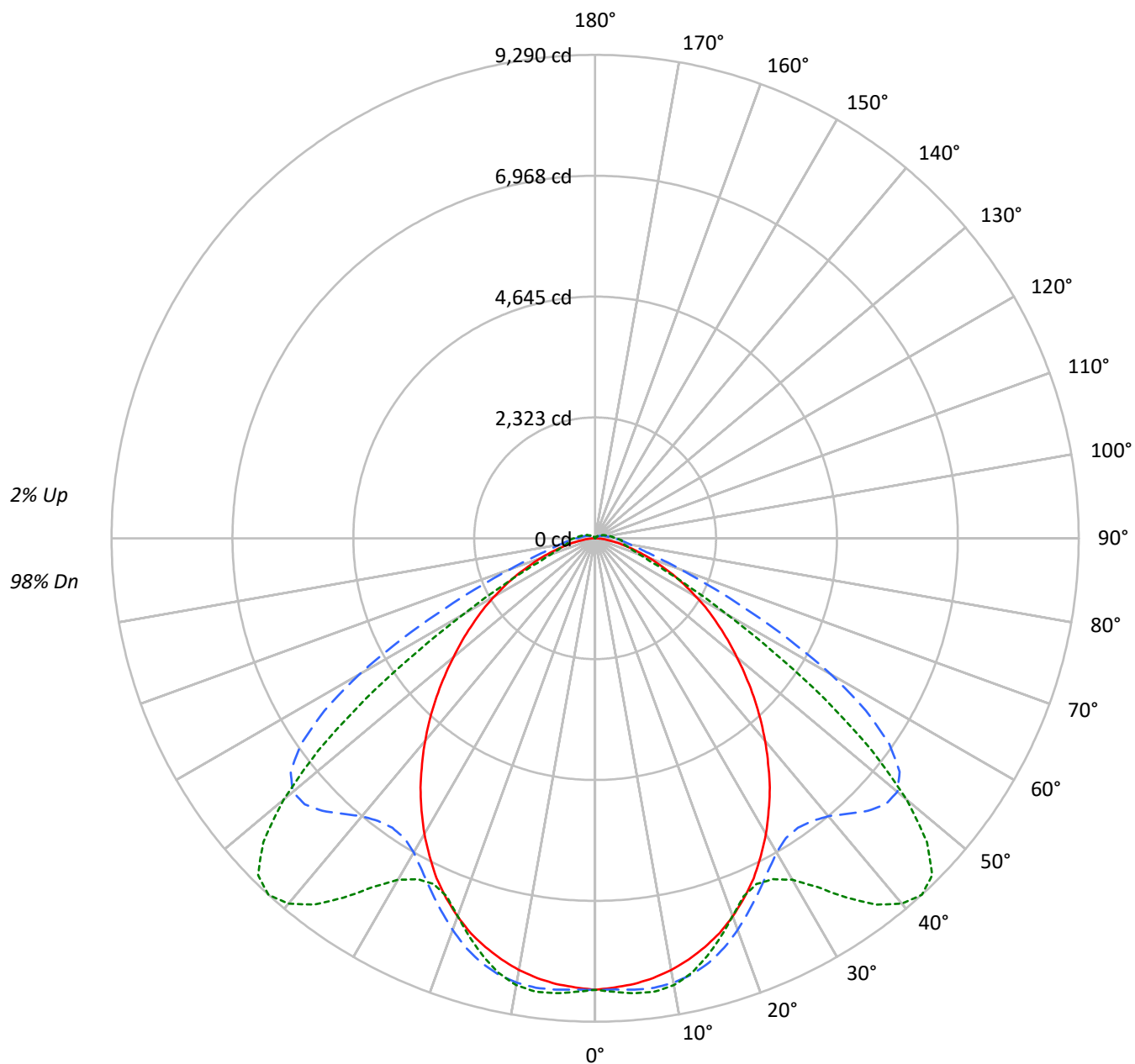
Lumens per Lamp: N/A  
Luminaire Lumens: 25982.0 lumens  
Efficiency: N/A  
Efficacy: 177.2 lumens/watt  
Spacing Criteria (0/90/45): 1.14 / 1.58 / 1.62  
Luminous Opening: Rectangular w/ Sides (W: 1.67' x L: 1.93' x H: 0.17')  
CIE Type: Direct

Input Watts (W): 146.6  
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: P829289

CATALOG NUMBER: OHB-24SE-W-UNV-L740-CD

### Luminous Intensity Polar Plot





TEST NUMBER: P829289

CATALOG NUMBER: OHB-24SE-W-UNV-L740-CD

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

|     |     |     |     |     |  |     |     |     |     |  |     |     |     |  |     |     |     |  |     |     |     |
|-----|-----|-----|-----|-----|--|-----|-----|-----|-----|--|-----|-----|-----|--|-----|-----|-----|--|-----|-----|-----|
| RF  | 20  |     |     |     |  | 20  |     |     |     |  | 20  |     |     |  |     | 20  |     |  |     |     | 20  |
| RC  | 80  |     |     |     |  | 70  |     |     |     |  | 50  |     |     |  |     | 30  |     |  |     |     | 10  |
| RW  | 70  | 50  | 30  | 10  |  | 70  | 50  | 30  | 10  |  | 50  | 30  | 10  |  | 50  | 30  | 10  |  | 50  | 30  | 10  |
| RCR |     |     |     |     |  |     |     |     |     |  |     |     |     |  |     |     |     |  |     |     |     |
| 0   | 119 | 119 | 119 | 119 |  | 116 | 116 | 116 | 116 |  | 110 | 110 | 110 |  | 105 | 105 | 105 |  | 100 | 100 | 100 |
| 1   | 109 | 104 | 100 | 96  |  | 106 | 102 | 98  | 95  |  | 97  | 94  | 91  |  | 93  | 90  | 88  |  | 89  | 87  | 85  |
| 2   | 99  | 91  | 85  | 79  |  | 96  | 89  | 83  | 78  |  | 85  | 80  | 76  |  | 82  | 77  | 74  |  | 78  | 75  | 72  |
| 3   | 90  | 80  | 72  | 66  |  | 88  | 78  | 71  | 65  |  | 75  | 69  | 64  |  | 72  | 67  | 62  |  | 69  | 65  | 61  |
| 4   | 83  | 71  | 62  | 56  |  | 80  | 69  | 61  | 55  |  | 67  | 60  | 54  |  | 64  | 58  | 53  |  | 62  | 57  | 52  |
| 5   | 76  | 63  | 54  | 48  |  | 74  | 62  | 54  | 47  |  | 60  | 52  | 47  |  | 57  | 51  | 46  |  | 55  | 50  | 45  |
| 6   | 70  | 57  | 48  | 41  |  | 68  | 56  | 47  | 41  |  | 54  | 46  | 41  |  | 52  | 45  | 40  |  | 50  | 44  | 40  |
| 7   | 65  | 51  | 43  | 36  |  | 63  | 50  | 42  | 36  |  | 49  | 41  | 36  |  | 47  | 40  | 35  |  | 45  | 40  | 35  |
| 8   | 60  | 47  | 38  | 32  |  | 58  | 46  | 38  | 32  |  | 44  | 37  | 32  |  | 43  | 36  | 31  |  | 42  | 36  | 31  |
| 9   | 56  | 43  | 34  | 29  |  | 55  | 42  | 34  | 29  |  | 41  | 34  | 28  |  | 39  | 33  | 28  |  | 38  | 32  | 28  |
| 10  | 52  | 39  | 31  | 26  |  | 51  | 39  | 31  | 26  |  | 38  | 31  | 26  |  | 36  | 30  | 26  |  | 35  | 30  | 25  |

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

|     | 0°    | 45°   | 90°   |
|-----|-------|-------|-------|
| 0°  | 28987 | 28987 | 28987 |
| 5°  | 28612 | 28872 | 29175 |
| 10° | 28149 | 28754 | 29068 |
| 15° | 27497 | 28205 | 27997 |
| 20° | 26644 | 27163 | 26489 |
| 25° | 25540 | 25921 | 25818 |
| 30° | 24111 | 24979 | 27623 |
| 35° | 22500 | 25360 | 32122 |
| 40° | 20655 | 27370 | 36876 |
| 45° | 18736 | 30925 | 39325 |
| 50° | 16746 | 34042 | 36260 |
| 55° | 14873 | 33819 | 27401 |
| 60° | 12972 | 28426 | 16525 |
| 65° | 10978 | 19467 | 9833  |
| 70° | 8752  | 12447 | 6928  |
| 75° | 6471  | 8781  | 6194  |
| 80° | 4426  | 7525  | 6572  |
| 85° | 2710  | 7905  | 9140  |



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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 829.2   | 3.2       |
| 10°-20°   | 2348.1  | 9.0       |
| 20°-30°   | 3436.1  | 13.2      |
| 30°-40°   | 4462.5  | 17.2      |
| 40°-50°   | 5449.3  | 21.0      |
| 50°-60°   | 4798.9  | 18.5      |
| 60°-70°   | 2500.8  | 9.6       |
| 70°-80°   | 1072.4  | 4.1       |
| 80°-90°   | 515.0   | 2.0       |
| 90°-100°  | 242.0   | 0.9       |
| 100°-110° | 150.4   | 0.6       |
| 110°-120° | 88.9    | 0.3       |
| 120°-130° | 48.3    | 0.2       |
| 130°-140° | 24.2    | 0.1       |
| 140°-150° | 11.7    | 0.0       |
| 150°-160° | 4.1     | 0.0       |
| 160°-170° | 0.0     | 0.0       |
| 170°-180° | 0.0     | 0.0       |
| <hr/>     |         |           |
| 0°-30°    | 6613.5  | 25.5      |
| 0°-40°    | 11076.0 | 42.6      |
| 0°-60°    | 21324.2 | 82.1      |
| 0°-90°    | 25412.4 | 97.8      |
| 90°-120°  | 481.3   | 1.9       |
| 90°-150°  | 565.5   | 2.2       |
| 90°-180°  | 570.0   | 2.2       |
| 0°-180°   | 25982.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 8678 | 8678  | 8678 | 8678  | 8678 |      |
| 5°   | 8597 | 8662  | 8709 | 8786  | 8777 | 815  |
| 15°  | 8135 | 8363  | 8444 | 8380  | 8312 | 2290 |
| 25°  | 7208 | 7594  | 7464 | 7324  | 7331 | 3308 |
| 35°  | 5850 | 6468  | 6792 | 7921  | 8428 | 3647 |
| 45°  | 4308 | 5420  | 7408 | 8970  | 9157 | 3322 |
| 55°  | 2868 | 4748  | 6899 | 6049  | 5377 | 2574 |
| 65°  | 1646 | 3289  | 3158 | 1756  | 1511 | 1628 |
| 75°  | 663  | 1539  | 1015 | 695   | 659  | 723  |
| 85°  | 140  | 548   | 517  | 506   | 511  | 157  |
| 90°  | 2    | 198   | 341  | 389   | 399  | 10   |
| 95°  | 4    | 116   | 272  | 318   | 328  | 3    |
| 105° | 8    | 66    | 176  | 212   | 215  | 8    |
| 115° | 11   | 37    | 109  | 133   | 137  | 12   |
| 125° | 13   | 19    | 64   | 82    | 84   | 11   |
| 135° | 11   | 11    | 30   | 50    | 52   | 9    |
| 145° | 15   | 11    | 13   | 24    | 28   | 9    |
| 155° | 15   | 15    | 11   | 11    | 11   | 5    |
| 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°     | 8677.5 | 8677.5 | 8677.5 | 8677.5 | 8677.5 |
| 2.5°   | 8640.1 | 8677.5 | 8679.4 | 8731.8 | 8726.2 |
| 5°     | 8597.0 | 8662.5 | 8709.3 | 8786.1 | 8776.7 |
| 7.5°   | 8525.9 | 8628.8 | 8711.2 | 8795.5 | 8788.0 |
| 10°    | 8424.8 | 8565.2 | 8673.8 | 8743.0 | 8720.6 |
| 12.5°  | 8293.7 | 8479.1 | 8585.8 | 8600.8 | 8557.7 |
| 15°    | 8134.6 | 8363.0 | 8443.5 | 8379.8 | 8312.4 |
| 17.5°  | 7954.9 | 8222.6 | 8250.7 | 8112.1 | 8027.9 |
| 20°    | 7730.2 | 8035.4 | 8007.3 | 7816.3 | 7722.7 |
| 22.5°  | 7481.2 | 7829.4 | 7739.6 | 7539.2 | 7449.4 |
| 25°    | 7207.9 | 7593.5 | 7464.3 | 7323.9 | 7331.4 |
| 27.5°  | 6887.7 | 7325.8 | 7200.4 | 7264.0 | 7383.8 |
| 30°    | 6562.0 | 7045.0 | 6968.2 | 7338.9 | 7574.8 |
| 32.5°  | 6204.4 | 6756.7 | 6825.9 | 7558.0 | 7943.6 |
| 35°    | 5850.5 | 6468.4 | 6792.2 | 7921.2 | 8428.5 |
| 37.5°  | 5459.3 | 6176.3 | 6846.5 | 8340.5 | 8872.2 |
| 40°    | 5079.2 | 5891.7 | 6970.1 | 8716.8 | 9166.2 |
| 42.5°  | 4691.7 | 5637.1 | 7177.9 | 8939.6 | 9289.7 |
| 45°    | 4307.9 | 5419.9 | 7408.2 | 8969.6 | 9156.8 |
| 47.5°  | 3924.1 | 5236.5 | 7567.3 | 8731.8 | 8645.7 |
| 50°    | 3553.4 | 5073.6 | 7578.5 | 8160.8 | 7808.8 |
| 52.5°  | 3207.0 | 4923.8 | 7372.6 | 7250.9 | 6704.2 |
| 55°    | 2868.2 | 4747.8 | 6899.0 | 6049.0 | 5376.9 |
| 57.5°  | 2559.3 | 4504.4 | 6168.8 | 4757.2 | 4023.3 |
| 60°    | 2231.6 | 4174.9 | 5225.2 | 3480.4 | 2901.9 |
| 62.5°  | 1930.2 | 3764.9 | 4167.5 | 2422.6 | 2085.6 |
| 65°    | 1645.6 | 3289.4 | 3158.4 | 1756.1 | 1510.8 |
| 67.5°  | 1344.2 | 2797.0 | 2330.9 | 1280.6 | 1123.3 |
| 70°    | 1108.3 | 2340.2 | 1735.5 | 996.0  | 904.3  |
| 72.5°  | 866.8  | 1905.9 | 1297.4 | 808.8  | 758.2  |
| 75°    | 662.7  | 1538.9 | 1014.7 | 694.6  | 659.0  |
| 77.5°  | 488.6  | 1216.9 | 816.3  | 614.1  | 580.4  |
| 80°    | 342.6  | 958.6  | 683.3  | 548.5  | 535.4  |
| 82.5°  | 230.3  | 741.4  | 582.2  | 522.3  | 524.2  |
| 85°    | 140.4  | 548.5  | 516.7  | 505.5  | 511.1  |
| 87.5°  | 67.4   | 389.4  | 443.7  | 460.6  | 466.2  |
| 90°    | 1.9    | 198.5  | 340.7  | 389.4  | 398.8  |
| 92.5°  | 0.0    | 151.6  | 299.5  | 348.2  | 357.6  |
| 95°    | 3.7    | 116.1  | 271.5  | 318.3  | 327.6  |
| 97.5°  | 3.7    | 95.5   | 243.4  | 292.1  | 297.7  |
| 100°   | 5.6    | 82.4   | 217.2  | 264.0  | 269.6  |
| 102.5° | 5.6    | 73.0   | 194.7  | 235.9  | 239.6  |
| 105°   | 7.5    | 65.5   | 176.0  | 211.6  | 215.3  |



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CATALOG NUMBER: OHB-24SE-W-UNV-L740-CD

**CANDELA DISTRIBUTION (continued):**

|        | 0°   | 22.5° | 45°   | 67.5° | 90°   |
|--------|------|-------|-------|-------|-------|
| 112.5° | 11.2 | 44.9  | 123.6 | 149.8 | 153.5 |
| 115°   | 11.2 | 37.4  | 108.6 | 132.9 | 136.7 |
| 117.5° | 13.1 | 33.7  | 95.5  | 117.9 | 119.8 |
| 120°   | 13.1 | 28.1  | 82.4  | 104.8 | 106.7 |
| 122.5° | 13.1 | 22.5  | 73.0  | 93.6  | 95.5  |
| 125°   | 13.1 | 18.7  | 63.7  | 82.4  | 84.2  |
| 127.5° | 11.2 | 13.1  | 54.3  | 73.0  | 74.9  |
| 130°   | 11.2 | 11.2  | 44.9  | 63.7  | 67.4  |
| 132.5° | 11.2 | 11.2  | 37.4  | 56.2  | 59.9  |
| 135°   | 11.2 | 11.2  | 30.0  | 50.5  | 52.4  |
| 137.5° | 11.2 | 11.2  | 24.3  | 43.1  | 46.8  |
| 140°   | 11.2 | 11.2  | 18.7  | 37.4  | 39.3  |
| 142.5° | 13.1 | 11.2  | 16.8  | 31.8  | 33.7  |
| 145°   | 15.0 | 11.2  | 13.1  | 24.3  | 28.1  |
| 147.5° | 15.0 | 13.1  | 13.1  | 20.6  | 22.5  |
| 150°   | 15.0 | 15.0  | 11.2  | 15.0  | 18.7  |
| 152.5° | 15.0 | 15.0  | 11.2  | 11.2  | 15.0  |
| 155°   | 15.0 | 15.0  | 11.2  | 11.2  | 11.2  |
| 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° | 9.4 | 58.0 | 157.3 | 189.1 | 192.8 |
| 110°   | 9.4 | 50.5 | 138.5 | 168.5 | 172.2 |



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

Report Prepared for

Cooper Lighting Solutions

METALUX

Report Number: SP1-2307-100-3

Test Date: 08/03/2023

Luminaire Tested: OHB-15SE-N-UNV-L740-CD

Data in this report applies to families of products including OHB-15SE-N-UNV-L740-CD.

### Test Information

Test Method: LM-79-2019  
 Report Number: SP1-2307-100-3  
 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-L740-CD**  
 Description: 15000 LUMEN OHB SE LED LUMINAIRE WITH 70CRI, 4000K LEDS AND NARROW LENS

LENS

### Spectral Parameters

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 4013   | CRI (Ra): | 71.9 |      |       |
| CIE u':                   | 0.2243 | R1:       | 67.7 | R9:  | -37.4 |
| CIE v':                   | 0.5023 | R2:       | 81.2 | R10: | 55.0  |
| Duv:                      | 0.0009 | R3:       | 90.6 | R11: | 61.2  |
| CIE x:                    | 0.3803 | R4:       | 67.3 | R12: | 42.7  |
| CIE y:                    | 0.3785 | R5:       | 67.5 | R13: | 70.6  |
| CIE z:                    | 0.2412 | R6:       | 72.5 | R14: | 94.8  |
| Peak Wavelength (nm):     | 454    | R7:       | 80.1 |      |       |
| Dominant Wavelength (nm): | 578    | R8:       | 48.1 |      |       |
| Purity:                   | 27.9   |           |      |      |       |
| Rf:                       | 74.7   |           |      |      |       |
| Rg:                       | 90.6   |           |      |      |       |



### Test Conditions

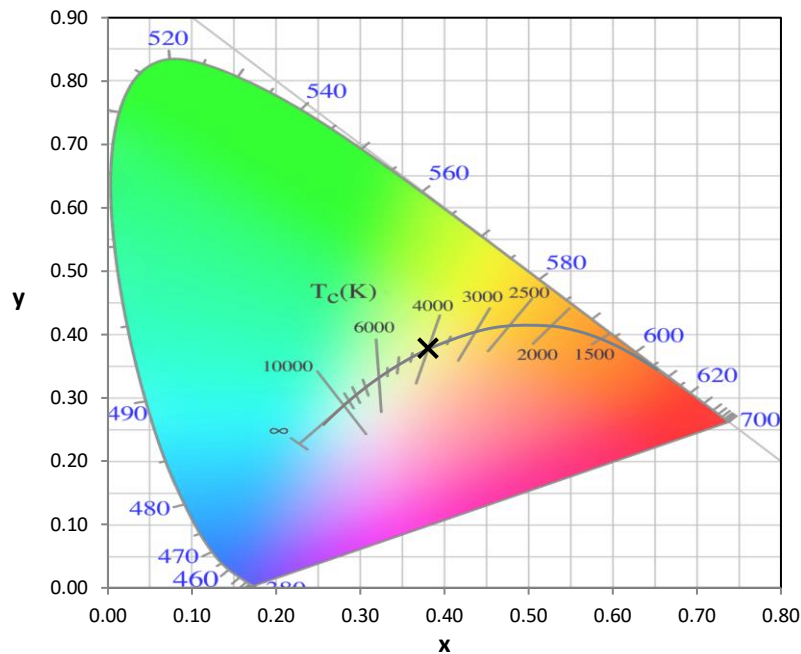
Stabilization Time: 24M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.7/58%  
 Sphere Temperature (°C): 25.2

REPORT NUMBER: SP1-2307-100-3

| 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: SP1-2307-100-3

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

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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       | 6930             | NR               | 490       | 55345            | NR               | 620       | 204359           | NR               | 750       | 9973             | NR               | 880       | 7740             | NR               |
| 365       | 6548             | NR               | 495       | 63140            | NR               | 625       | 187136           | NR               | 755       | 9262             | NR               | 885       | 6139             | NR               |
| 370       | 6520             | NR               | 500       | 77260            | NR               | 630       | 169554           | NR               | 760       | 8423             | NR               | 890       | 6392             | NR               |
| 375       | 7463             | NR               | 505       | 98785            | NR               | 635       | 152565           | NR               | 765       | 8205             | NR               | 895       | 5061             | NR               |
| 380       | 7033             | NR               | 510       | 119863           | NR               | 640       | 136700           | NR               | 770       | 6817             | NR               | 900       | 7326             | NR               |
| 385       | 6403             | NR               | 515       | 140055           | NR               | 645       | 122449           | NR               | 775       | 6792             | NR               | 905       | 5039             | NR               |
| 390       | 5734             | NR               | 520       | 157790           | NR               | 650       | 108580           | NR               | 780       | 6216             | NR               | 910       | 5717             | NR               |
| 395       | 5717             | NR               | 525       | 171938           | NR               | 655       | 96370            | NR               | 785       | 5732             | NR               | 915       | 5977             | NR               |
| 400       | 4977             | NR               | 530       | 184920           | NR               | 660       | 84194            | NR               | 790       | 5647             | NR               | 920       | 5766             | NR               |
| 405       | 5006             | NR               | 535       | 196020           | NR               | 665       | 73166            | NR               | 795       | 5584             | NR               | 925       | 6611             | NR               |
| 410       | 5959             | NR               | 540       | 208194           | NR               | 670       | 63358            | NR               | 800       | 5174             | NR               | 930       | 7338             | NR               |
| 415       | 9179             | NR               | 545       | 219324           | NR               | 675       | 55149            | NR               | 805       | 5757             | NR               | 935       | 6930             | NR               |
| 420       | 15787            | NR               | 550       | 230377           | NR               | 680       | 47533            | NR               | 810       | 6012             | NR               | 940       | 8242             | NR               |
| 425       | 28518            | NR               | 555       | 242973           | NR               | 685       | 41350            | NR               | 815       | 5577             | NR               | 945       | 8766             | NR               |
| 430       | 48907            | NR               | 560       | 256802           | NR               | 690       | 35841            | NR               | 820       | 5086             | NR               | 950       | 10931            | NR               |
| 435       | 79961            | NR               | 565       | 268752           | NR               | 695       | 31197            | NR               | 825       | 6404             | NR               | 955       | 8190             | NR               |
| 440       | 122565           | NR               | 570       | 279406           | NR               | 700       | 27528            | NR               | 830       | 5767             | NR               | 960       | 6809             | NR               |
| 445       | 185397           | NR               | 575       | 286045           | NR               | 705       | 24001            | NR               | 835       | 6610             | NR               | 965       | 7570             | NR               |
| 450       | 269609           | NR               | 580       | 291082           | NR               | 710       | 21755            | NR               | 840       | 6428             | NR               | 970       | 6365             | NR               |
| 455       | 300483           | NR               | 585       | 291620           | NR               | 715       | 20058            | NR               | 845       | 6469             | NR               | 975       | 6203             | NR               |
| 460       | 229777           | NR               | 590       | 286117           | NR               | 720       | 17690            | NR               | 850       | 5020             | NR               | 980       | 9515             | NR               |
| 465       | 159722           | NR               | 595       | 280083           | NR               | 725       | 15738            | NR               | 855       | 6786             | NR               | 985       | 7323             | NR               |
| 470       | 119038           | NR               | 600       | 270967           | NR               | 730       | 13744            | NR               | 860       | 5776             | NR               | 990       | 9023             | NR               |
| 475       | 86663            | NR               | 605       | 255964           | NR               | 735       | 12435            | NR               | 865       | 7909             | NR               | 995       | 8813             | NR               |
| 480       | 62772            | NR               | 610       | 239107           | NR               | 740       | 11118            | NR               | 870       | 6451             | NR               | 1000      | 6436             | NR               |
| 485       | 54561            | NR               | 615       | 221194           | NR               | 745       | 10318            | NR               | 875       | 7611             | NR               |           |                  |                  |

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Scotopic Flux vs. Wavelength



Scotopic Lumens: 24452.5

S/P: 1.56

| 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       | 6930             | NR               | 490       | 55345            | NR               | 620       | 204359           | NR               | 750       | 9973             | NR               | 880       | 7740             | NR               |
| 365       | 6548             | NR               | 495       | 63140            | NR               | 625       | 187136           | NR               | 755       | 9262             | NR               | 885       | 6139             | NR               |
| 370       | 6520             | NR               | 500       | 77260            | NR               | 630       | 169554           | NR               | 760       | 8423             | NR               | 890       | 6392             | NR               |
| 375       | 7463             | NR               | 505       | 98785            | NR               | 635       | 152565           | NR               | 765       | 8205             | NR               | 895       | 5061             | NR               |
| 380       | 7033             | NR               | 510       | 119863           | NR               | 640       | 136700           | NR               | 770       | 6817             | NR               | 900       | 7326             | NR               |
| 385       | 6403             | NR               | 515       | 140055           | NR               | 645       | 122449           | NR               | 775       | 6792             | NR               | 905       | 5039             | NR               |
| 390       | 5734             | NR               | 520       | 157790           | NR               | 650       | 108580           | NR               | 780       | 6216             | NR               | 910       | 5717             | NR               |
| 395       | 5717             | NR               | 525       | 171938           | NR               | 655       | 96370            | NR               | 785       | 5732             | NR               | 915       | 5977             | NR               |
| 400       | 4977             | NR               | 530       | 184920           | NR               | 660       | 84194            | NR               | 790       | 5647             | NR               | 920       | 5766             | NR               |
| 405       | 5006             | NR               | 535       | 196020           | NR               | 665       | 73166            | NR               | 795       | 5584             | NR               | 925       | 6611             | NR               |
| 410       | 5959             | NR               | 540       | 208194           | NR               | 670       | 63358            | NR               | 800       | 5174             | NR               | 930       | 7338             | NR               |
| 415       | 9179             | NR               | 545       | 219324           | NR               | 675       | 55149            | NR               | 805       | 5757             | NR               | 935       | 6930             | NR               |
| 420       | 15787            | NR               | 550       | 230377           | NR               | 680       | 47533            | NR               | 810       | 6012             | NR               | 940       | 8242             | NR               |
| 425       | 28518            | NR               | 555       | 242973           | NR               | 685       | 41350            | NR               | 815       | 5577             | NR               | 945       | 8766             | NR               |
| 430       | 48907            | NR               | 560       | 256802           | NR               | 690       | 35841            | NR               | 820       | 5086             | NR               | 950       | 10931            | NR               |
| 435       | 79961            | NR               | 565       | 268752           | NR               | 695       | 31197            | NR               | 825       | 6404             | NR               | 955       | 8190             | NR               |
| 440       | 122565           | NR               | 570       | 279406           | NR               | 700       | 27528            | NR               | 830       | 5767             | NR               | 960       | 6809             | NR               |
| 445       | 185397           | NR               | 575       | 286045           | NR               | 705       | 24001            | NR               | 835       | 6610             | NR               | 965       | 7570             | NR               |
| 450       | 269609           | NR               | 580       | 291082           | NR               | 710       | 21755            | NR               | 840       | 6428             | NR               | 970       | 6365             | NR               |
| 455       | 300483           | NR               | 585       | 291620           | NR               | 715       | 20058            | NR               | 845       | 6469             | NR               | 975       | 6203             | NR               |
| 460       | 229777           | NR               | 590       | 286117           | NR               | 720       | 17690            | NR               | 850       | 5020             | NR               | 980       | 9515             | NR               |
| 465       | 159722           | NR               | 595       | 280083           | NR               | 725       | 15738            | NR               | 855       | 6786             | NR               | 985       | 7323             | NR               |
| 470       | 119038           | NR               | 600       | 270967           | NR               | 730       | 13744            | NR               | 860       | 5776             | NR               | 990       | 9023             | NR               |
| 475       | 86663            | NR               | 605       | 255964           | NR               | 735       | 12435            | NR               | 865       | 7909             | NR               | 995       | 8813             | NR               |
| 480       | 62772            | NR               | 610       | 239107           | NR               | 740       | 11118            | NR               | 870       | 6451             | NR               | 1000      | 6436             | NR               |
| 485       | 54561            | NR               | 615       | 221194           | NR               | 745       | 10318            | NR               | 875       | 7611             | NR               |           |                  |                  |

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**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 9678.5**

**M/P: 0.62**

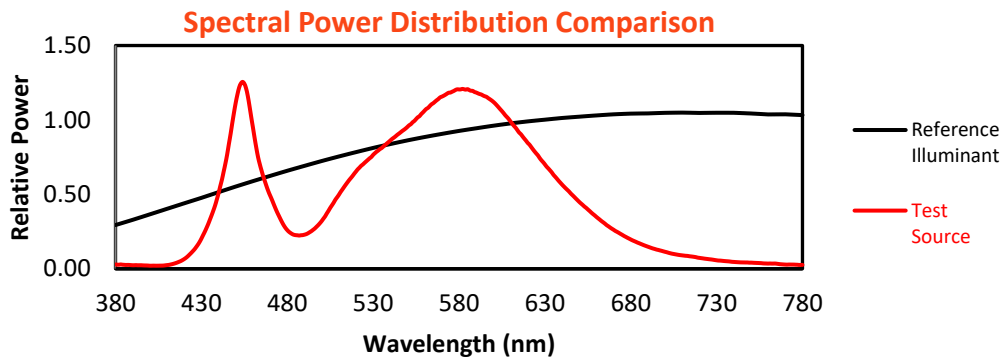
| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 6930             | NR               | 490       | 55345            | NR               | 620       | 204359           | NR               | 750       | 9973             | NR               | 880       | 7740             | NR               |
| 365       | 6548             | NR               | 495       | 63140            | NR               | 625       | 187136           | NR               | 755       | 9262             | NR               | 885       | 6139             | NR               |
| 370       | 6520             | NR               | 500       | 77260            | NR               | 630       | 169554           | NR               | 760       | 8423             | NR               | 890       | 6392             | NR               |
| 375       | 7463             | NR               | 505       | 98785            | NR               | 635       | 152565           | NR               | 765       | 8205             | NR               | 895       | 5061             | NR               |
| 380       | 7033             | NR               | 510       | 119863           | NR               | 640       | 136700           | NR               | 770       | 6817             | NR               | 900       | 7326             | NR               |
| 385       | 6403             | NR               | 515       | 140055           | NR               | 645       | 122449           | NR               | 775       | 6792             | NR               | 905       | 5039             | NR               |
| 390       | 5734             | NR               | 520       | 157790           | NR               | 650       | 108580           | NR               | 780       | 6216             | NR               | 910       | 5717             | NR               |
| 395       | 5717             | NR               | 525       | 171938           | NR               | 655       | 96370            | NR               | 785       | 5732             | NR               | 915       | 5977             | NR               |
| 400       | 4977             | NR               | 530       | 184920           | NR               | 660       | 84194            | NR               | 790       | 5647             | NR               | 920       | 5766             | NR               |
| 405       | 5006             | NR               | 535       | 196020           | NR               | 665       | 73166            | NR               | 795       | 5584             | NR               | 925       | 6611             | NR               |
| 410       | 5959             | NR               | 540       | 208194           | NR               | 670       | 63358            | NR               | 800       | 5174             | NR               | 930       | 7338             | NR               |
| 415       | 9179             | NR               | 545       | 219324           | NR               | 675       | 55149            | NR               | 805       | 5757             | NR               | 935       | 6930             | NR               |
| 420       | 15787            | NR               | 550       | 230377           | NR               | 680       | 47533            | NR               | 810       | 6012             | NR               | 940       | 8242             | NR               |
| 425       | 28518            | NR               | 555       | 242973           | NR               | 685       | 41350            | NR               | 815       | 5577             | NR               | 945       | 8766             | NR               |
| 430       | 48907            | NR               | 560       | 256802           | NR               | 690       | 35841            | NR               | 820       | 5086             | NR               | 950       | 10931            | NR               |
| 435       | 79961            | NR               | 565       | 268752           | NR               | 695       | 31197            | NR               | 825       | 6404             | NR               | 955       | 8190             | NR               |
| 440       | 122565           | NR               | 570       | 279406           | NR               | 700       | 27528            | NR               | 830       | 5767             | NR               | 960       | 6809             | NR               |
| 445       | 185397           | NR               | 575       | 286045           | NR               | 705       | 24001            | NR               | 835       | 6610             | NR               | 965       | 7570             | NR               |
| 450       | 269609           | NR               | 580       | 291082           | NR               | 710       | 21755            | NR               | 840       | 6428             | NR               | 970       | 6365             | NR               |
| 455       | 300483           | NR               | 585       | 291620           | NR               | 715       | 20058            | NR               | 845       | 6469             | NR               | 975       | 6203             | NR               |
| 460       | 229777           | NR               | 590       | 286117           | NR               | 720       | 17690            | NR               | 850       | 5020             | NR               | 980       | 9515             | NR               |
| 465       | 159722           | NR               | 595       | 280083           | NR               | 725       | 15738            | NR               | 855       | 6786             | NR               | 985       | 7323             | NR               |
| 470       | 119038           | NR               | 600       | 270967           | NR               | 730       | 13744            | NR               | 860       | 5776             | NR               | 990       | 9023             | NR               |
| 475       | 86663            | NR               | 605       | 255964           | NR               | 735       | 12435            | NR               | 865       | 7909             | NR               | 995       | 8813             | NR               |
| 480       | 62772            | NR               | 610       | 239107           | NR               | 740       | 11118            | NR               | 870       | 6451             | NR               | 1000      | 6436             | NR               |
| 485       | 54561            | NR               | 615       | 221194           | NR               | 745       | 10318            | NR               | 875       | 7611             | NR               |           |                  |                  |

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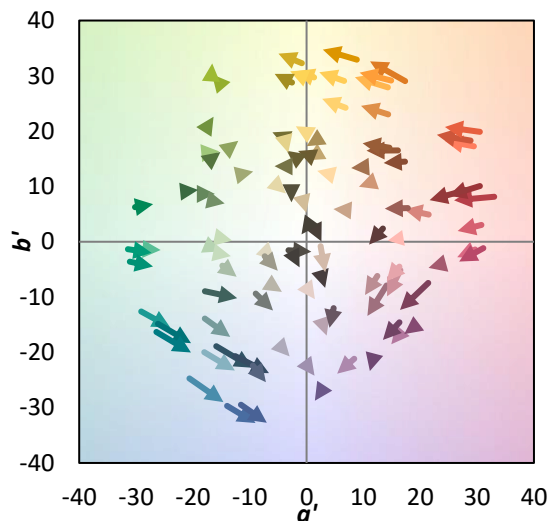
**TM-30-18**

**Summary**

$R_f = 74.7$   
 $R_g = 90.6$   
 CIE  $R_a = 71.9$   
 $R_g = -37.4$



**Color Vector Graphics**



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

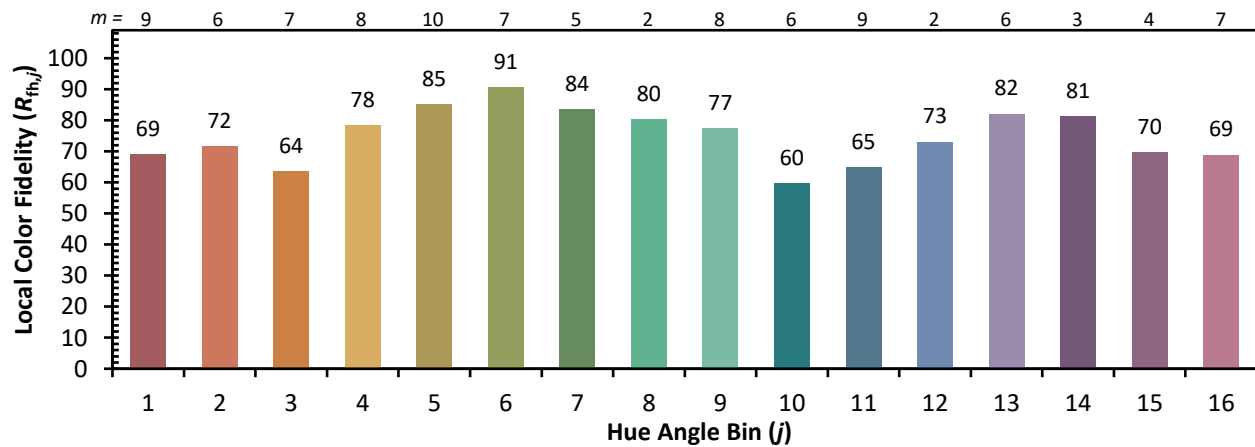
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 68 | CES51 = 85 | CES76 = 58 |
| CES02 = 61 | CES27 = 90 | CES52 = 85 | CES77 = 72 |
| CES03 = 30 | CES28 = 84 | CES53 = 77 | CES78 = 61 |
| CES04 = 70 | CES29 = 77 | CES54 = 83 | CES79 = 85 |
| CES05 = 47 | CES30 = 93 | CES55 = 80 | CES80 = 83 |
| CES06 = 50 | CES31 = 80 | CES56 = 73 | CES81 = 78 |
| CES07 = 39 | CES32 = 70 | CES57 = 71 | CES82 = 93 |
| CES08 = 39 | CES33 = 90 | CES58 = 71 | CES83 = 94 |
| CES09 = 29 | CES34 = 76 | CES59 = 84 | CES84 = 85 |
| CES10 = 74 | CES35 = 87 | CES60 = 85 | CES85 = 75 |
| CES11 = 57 | CES36 = 82 | CES61 = 78 | CES86 = 70 |
| CES12 = 63 | CES37 = 83 | CES62 = 76 | CES87 = 77 |
| CES13 = 42 | CES38 = 91 | CES63 = 73 | CES88 = 81 |
| CES14 = 74 | CES39 = 98 | CES64 = 59 | CES89 = 70 |
| CES15 = 71 | CES40 = 95 | CES65 = 61 | CES90 = 82 |
| CES16 = 46 | CES41 = 97 | CES66 = 53 | CES91 = 68 |
| CES17 = 49 | CES42 = 87 | CES67 = 50 | CES92 = 55 |
| CES18 = 56 | CES43 = 84 | CES68 = 62 | CES93 = 72 |
| CES19 = 72 | CES44 = 99 | CES69 = 70 | CES94 = 51 |
| CES20 = 64 | CES45 = 89 | CES70 = 57 | CES95 = 63 |
| CES21 = 86 | CES46 = 86 | CES71 = 49 | CES96 = 76 |
| CES22 = 78 | CES47 = 92 | CES72 = 83 | CES97 = 84 |
| CES23 = 92 | CES48 = 78 | CES73 = 50 | CES98 = 76 |
| CES24 = 91 | CES49 = 83 | CES74 = 89 | CES99 = 63 |
| CES25 = 72 | CES50 = 86 | CES75 = 55 |            |



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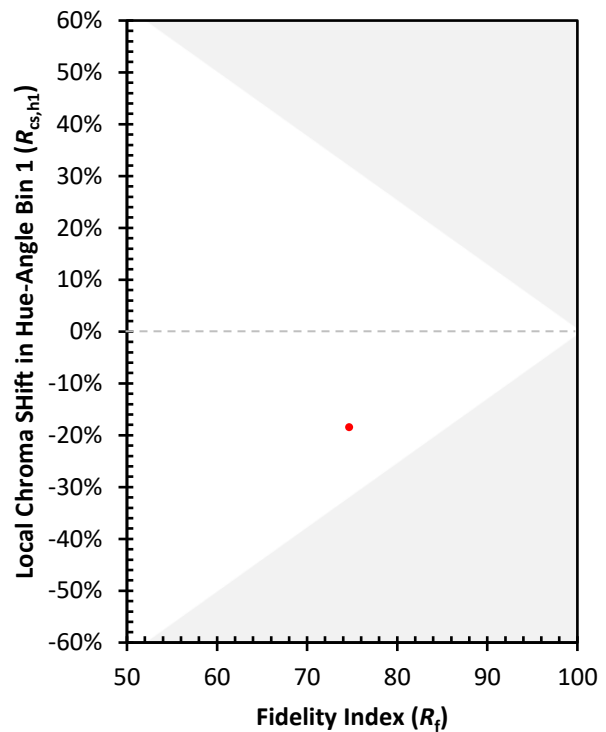
**Color Rendition by Hue-Angle Bin**



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**Measure Comparisons**



(END OF REPORT)