

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



Scaled data based on original data using  
LM-79-2019 Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Test Report Prepared for  
Cooper Lighting Solutions

Brand: METALUX

Report Number: P1436474

Luminaire Tested: EHBR1-54-UNV-M-L930

Issue Date: 3/25/2026

**Test Information**

Test Method: LM-79-2019  
Report Number: P1436474  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-2603-725-1)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/25/2026  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: METALUX  
Catalog Number: EHBR1-54-UNV-M-L930  
Description: Elevate Round Highbay at, 54000 lumens, 3000K 90CRI LEDs with M lens  
Light Source: -  
Ballast/Driver: -

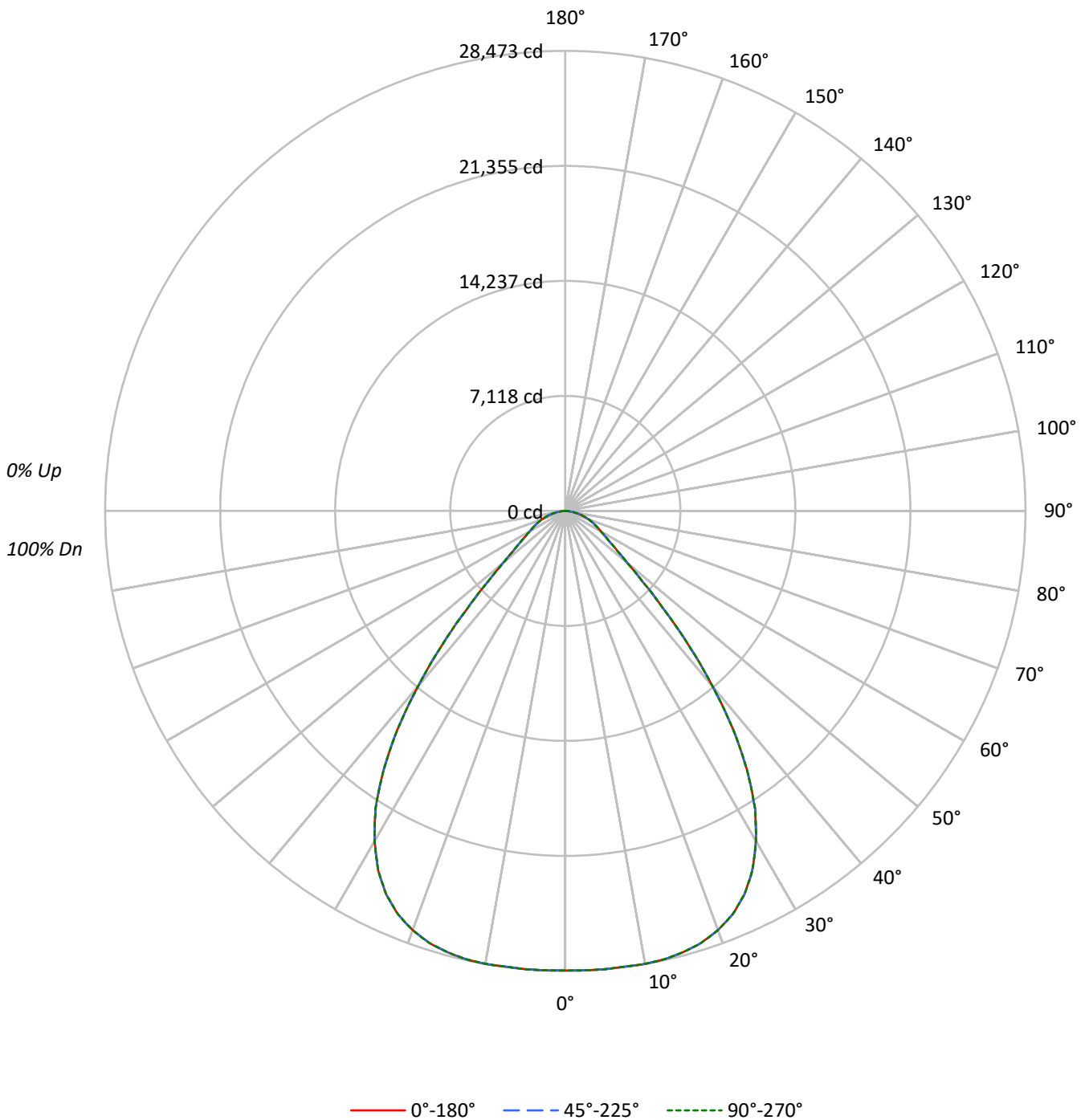
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 48145.5 lumens  
Efficiency: N/A  
Efficacy: 162.7 lumens/watt  
Spacing Criteria (0/90/45): 1.21 / 1.21 / 1.15  
Luminous Opening: Circular (Dia: 1.71' x H: 0')  
CIE Type: Direct

Input Watts (W): 296  
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: 24 FT

TEST NUMBER: P1436474  
CATALOG NUMBER: EHBR1-54-UNV-M-L930

### Luminous Intensity Polar Plot





TEST NUMBER: P1436474  
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**COEFFICIENT OF UTILIZATION - ZONAL CAVITY METHOD:**

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| RF  | 20  |     |     |     | 20  |     |     |     | 20  |     |     |     | 20  |     |     |     | 20  |     |
| RC  | 80  |     |     |     | 70  |     |     |     | 50  |     |     |     | 30  |     |     |     | 10  | 0   |
| RW  | 70  | 50  | 30  | 10  | 70  | 50  | 30  | 10  | 50  | 30  | 10  | 50  | 30  | 10  | 50  | 30  | 10  | 0   |
| RCR |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 0   | 119 | 119 | 119 | 119 | 116 | 116 | 116 | 116 | 111 | 111 | 111 | 106 | 106 | 106 | 102 | 102 | 102 | 100 |
| 1   | 112 | 108 | 105 | 102 | 109 | 106 | 103 | 100 | 102 | 99  | 97  | 98  | 96  | 94  | 94  | 93  | 92  | 90  |
| 2   | 104 | 98  | 93  | 88  | 102 | 96  | 91  | 87  | 93  | 89  | 85  | 90  | 86  | 83  | 87  | 84  | 82  | 80  |
| 3   | 97  | 89  | 83  | 78  | 95  | 87  | 82  | 77  | 85  | 80  | 76  | 82  | 78  | 74  | 80  | 76  | 73  | 71  |
| 4   | 91  | 81  | 74  | 69  | 89  | 80  | 73  | 68  | 78  | 72  | 68  | 75  | 71  | 67  | 73  | 69  | 66  | 64  |
| 5   | 85  | 74  | 67  | 62  | 83  | 73  | 66  | 61  | 71  | 65  | 61  | 70  | 64  | 60  | 68  | 63  | 60  | 58  |
| 6   | 79  | 68  | 61  | 56  | 78  | 67  | 61  | 55  | 66  | 60  | 55  | 64  | 59  | 55  | 63  | 58  | 54  | 52  |
| 7   | 74  | 63  | 56  | 51  | 73  | 62  | 55  | 50  | 61  | 55  | 50  | 60  | 54  | 50  | 58  | 53  | 50  | 48  |
| 8   | 70  | 58  | 51  | 46  | 69  | 58  | 51  | 46  | 57  | 50  | 46  | 55  | 50  | 46  | 54  | 49  | 45  | 44  |
| 9   | 66  | 54  | 47  | 42  | 65  | 54  | 47  | 42  | 53  | 47  | 42  | 52  | 46  | 42  | 51  | 46  | 42  | 40  |
| 10  | 62  | 51  | 44  | 39  | 61  | 50  | 44  | 39  | 49  | 43  | 39  | 48  | 43  | 39  | 48  | 42  | 39  | 37  |

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

|     | 0°     | 45°    | 90°    |
|-----|--------|--------|--------|
| 0°  | 133584 | 133584 | 133584 |
| 5°  | 134224 | 134224 | 134224 |
| 10° | 135741 | 135741 | 135741 |
| 15° | 137441 | 137441 | 137441 |
| 20° | 137987 | 137987 | 137987 |
| 25° | 135766 | 135766 | 135766 |
| 30° | 127966 | 127966 | 127966 |
| 35° | 112425 | 112425 | 112425 |
| 40° | 87009  | 87009  | 87009  |
| 45° | 57482  | 57482  | 57482  |
| 50° | 36718  | 36718  | 36718  |
| 55° | 27815  | 27815  | 27815  |
| 60° | 23897  | 23897  | 23897  |
| 65° | 22320  | 22320  | 22320  |
| 70° | 21122  | 21122  | 21122  |
| 75° | 19182  | 19182  | 19182  |
| 80° | 16443  | 16443  | 16443  |
| 85° | 11224  | 11224  | 11224  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
 Vertical Angle: 45°  
 Luminance: 57482 cd/sqm



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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 2716.8  | 5.6       |
| 10°-20°   | 7978.5  | 16.6      |
| 20°-30°   | 11971.4 | 24.9      |
| 30°-40°   | 12044.5 | 25.0      |
| 40°-50°   | 6894.6  | 14.3      |
| 50°-60°   | 3153.4  | 6.5       |
| 60°-70°   | 2000.7  | 4.2       |
| 70°-80°   | 1122.3  | 2.3       |
| 80°-90°   | 263.2   | 0.5       |
| 90°-100°  | 0.0     | 0.0       |
| 100°-110° | 0.0     | 0.0       |
| 110°-120° | 0.0     | 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       |
| 0°-30°    | 22666.7 | 47.1      |
| 0°-40°    | 34711.3 | 72.1      |
| 0°-60°    | 44759.3 | 93.0      |
| 0°-90°    | 48145.5 | 100.0     |
| 90°-120°  | 0.0     | 0.0       |
| 90°-150°  | 0.0     | 0.0       |
| 90°-180°  | 0.0     | 0.0       |
| 0°-180°   | 48145.5 | 100.0     |

**CANDELA DISTRIBUTION:**

|     | 0°    | 22.5° | 45°   | 67.5° | 90°   | Flux  |
|-----|-------|-------|-------|-------|-------|-------|
| 0°  | 28446 | 28446 | 28446 | 28446 | 28446 |       |
| 5°  | 28473 | 28473 | 28473 | 28473 | 28473 | 2717  |
| 15° | 28270 | 28270 | 28270 | 28270 | 28270 | 7978  |
| 25° | 26202 | 26202 | 26202 | 26202 | 26202 | 11971 |
| 35° | 19611 | 19611 | 19611 | 19611 | 19611 | 12045 |
| 45° | 8655  | 8655  | 8655  | 8655  | 8655  | 6895  |
| 55° | 3397  | 3397  | 3397  | 3397  | 3397  | 3153  |
| 65° | 2009  | 2009  | 2009  | 2009  | 2009  | 2001  |
| 75° | 1057  | 1057  | 1057  | 1057  | 1057  | 1122  |
| 85° | 208   | 208   | 208   | 208   | 208   | 263   |
| 90° | 0     | 0     | 0     | 0     | 0     |       |



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 22.5°   | 45°     | 67.5°   | 90°     |
|-------|---------|---------|---------|---------|---------|
| 0°    | 28445.7 | 28445.7 | 28445.7 | 28445.7 | 28445.7 |
| 2.5°  | 28459.5 | 28459.5 | 28459.5 | 28459.5 | 28459.5 |
| 5°    | 28473.3 | 28473.3 | 28473.3 | 28473.3 | 28473.3 |
| 7.5°  | 28453.8 | 28453.8 | 28453.8 | 28453.8 | 28453.8 |
| 10°   | 28466.0 | 28466.0 | 28466.0 | 28466.0 | 28466.0 |
| 12.5° | 28417.2 | 28417.2 | 28417.2 | 28417.2 | 28417.2 |
| 15°   | 28269.9 | 28269.9 | 28269.9 | 28269.9 | 28269.9 |
| 17.5° | 28026.5 | 28026.5 | 28026.5 | 28026.5 | 28026.5 |
| 20°   | 27611.4 | 27611.4 | 27611.4 | 27611.4 | 27611.4 |
| 22.5° | 27040.8 | 27040.8 | 27040.8 | 27040.8 | 27040.8 |
| 25°   | 26201.7 | 26201.7 | 26201.7 | 26201.7 | 26201.7 |
| 27.5° | 25072.8 | 25072.8 | 25072.8 | 25072.8 | 25072.8 |
| 30°   | 23598.8 | 23598.8 | 23598.8 | 23598.8 | 23598.8 |
| 32.5° | 21853.8 | 21853.8 | 21853.8 | 21853.8 | 21853.8 |
| 35°   | 19610.6 | 19610.6 | 19610.6 | 19610.6 | 19610.6 |
| 37.5° | 17069.5 | 17069.5 | 17069.5 | 17069.5 | 17069.5 |
| 40°   | 14193.2 | 14193.2 | 14193.2 | 14193.2 | 14193.2 |
| 42.5° | 11342.0 | 11342.0 | 11342.0 | 11342.0 | 11342.0 |
| 45°   | 8655.2  | 8655.2  | 8655.2  | 8655.2  | 8655.2  |
| 47.5° | 6515.4  | 6515.4  | 6515.4  | 6515.4  | 6515.4  |
| 50°   | 5025.9  | 5025.9  | 5025.9  | 5025.9  | 5025.9  |
| 52.5° | 4060.7  | 4060.7  | 4060.7  | 4060.7  | 4060.7  |
| 55°   | 3397.3  | 3397.3  | 3397.3  | 3397.3  | 3397.3  |
| 57.5° | 2908.9  | 2908.9  | 2908.9  | 2908.9  | 2908.9  |
| 60°   | 2544.3  | 2544.3  | 2544.3  | 2544.3  | 2544.3  |
| 62.5° | 2262.7  | 2262.7  | 2262.7  | 2262.7  | 2262.7  |
| 65°   | 2008.7  | 2008.7  | 2008.7  | 2008.7  | 2008.7  |
| 67.5° | 1775.1  | 1775.1  | 1775.1  | 1775.1  | 1775.1  |
| 70°   | 1538.3  | 1538.3  | 1538.3  | 1538.3  | 1538.3  |
| 72.5° | 1299.8  | 1299.8  | 1299.8  | 1299.8  | 1299.8  |
| 75°   | 1057.2  | 1057.2  | 1057.2  | 1057.2  | 1057.2  |
| 77.5° | 827.0   | 827.0   | 827.0   | 827.0   | 827.0   |
| 80°   | 608.0   | 608.0   | 608.0   | 608.0   | 608.0   |
| 82.5° | 396.4   | 396.4   | 396.4   | 396.4   | 396.4   |
| 85°   | 208.3   | 208.3   | 208.3   | 208.3   | 208.3   |
| 87.5° | 59.4    | 59.4    | 59.4    | 59.4    | 59.4    |
| 90°   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |



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**CIE UGR TABLE:**

| Reflectances:   |      |                  |       |       |       |       |                |       |       |       |       |
|-----------------|------|------------------|-------|-------|-------|-------|----------------|-------|-------|-------|-------|
| Ceiling         |      | 0.7              | 0.7   | 0.5   | 0.5   | 0.3   | 0.7            | 0.7   | 0.5   | 0.5   | 0.3   |
| Wall            |      | 0.5              | 0.3   | 0.5   | 0.3   | 0.3   | 0.5            | 0.3   | 0.5   | 0.3   | 0.3   |
| Reference plane |      | 0.2              | 0.2   | 0.2   | 0.2   | 0.2   | 0.2            | 0.2   | 0.2   | 0.2   | 0.2   |
| Room dimensions |      | Viewed crosswise |       |       |       |       | Viewed endwise |       |       |       |       |
| X=2H            | Y=2H | 20.36            | 21.63 | 20.72 | 21.95 | 22.26 | 20.36          | 21.63 | 20.72 | 21.95 | 22.26 |
|                 | 3H   | 21.93            | 23.07 | 22.32 | 23.40 | 23.76 | 21.93          | 23.07 | 22.32 | 23.40 | 23.76 |
|                 | 4H   | 22.52            | 23.57 | 22.92 | 23.92 | 24.31 | 22.52          | 23.57 | 22.92 | 23.92 | 24.31 |
|                 | 6H   | 22.91            | 23.88 | 23.33 | 24.25 | 24.65 | 22.91          | 23.88 | 23.33 | 24.25 | 24.65 |
|                 | 8H   | 23.02            | 23.93 | 23.45 | 24.32 | 24.73 | 23.02          | 23.93 | 23.45 | 24.32 | 24.73 |
|                 | 12H  | 23.06            | 23.93 | 23.49 | 24.32 | 24.75 | 23.06          | 23.93 | 23.49 | 24.32 | 24.75 |
| 4H              | 2H   | 20.85            | 21.90 | 21.25 | 22.25 | 22.64 | 20.85          | 21.90 | 21.25 | 22.25 | 22.64 |
|                 | 3H   | 22.65            | 23.52 | 23.07 | 23.92 | 24.33 | 22.65          | 23.52 | 23.07 | 23.92 | 24.33 |
|                 | 4H   | 23.36            | 24.13 | 23.79 | 24.55 | 24.99 | 23.36          | 24.13 | 23.79 | 24.55 | 24.99 |
|                 | 6H   | 23.87            | 24.53 | 24.33 | 24.98 | 25.45 | 23.87          | 24.53 | 24.33 | 24.98 | 25.45 |
|                 | 8H   | 24.00            | 24.62 | 24.47 | 25.07 | 25.54 | 24.00          | 24.62 | 24.47 | 25.07 | 25.54 |
|                 | 12H  | 24.07            | 24.61 | 24.55 | 25.10 | 25.57 | 24.07          | 24.61 | 24.55 | 25.10 | 25.57 |
| 8H              | 4H   | 23.58            | 24.21 | 24.05 | 24.65 | 25.12 | 23.58          | 24.21 | 24.05 | 24.65 | 25.12 |
|                 | 6H   | 24.20            | 24.70 | 24.70 | 25.20 | 25.68 | 24.20          | 24.70 | 24.70 | 25.20 | 25.68 |
|                 | 8H   | 24.39            | 24.84 | 24.91 | 25.36 | 25.85 | 24.39          | 24.84 | 24.91 | 25.36 | 25.85 |
|                 | 12H  | 24.51            | 24.91 | 25.02 | 25.40 | 25.98 | 24.51          | 24.91 | 25.02 | 25.40 | 25.98 |
| 12H             | 4H   | 23.58            | 24.13 | 24.07 | 24.62 | 25.09 | 23.58          | 24.13 | 24.07 | 24.62 | 25.09 |
|                 | 6H   | 24.22            | 24.67 | 24.74 | 25.19 | 25.68 | 24.22          | 24.67 | 24.74 | 25.19 | 25.68 |
|                 | 8H   | 24.46            | 24.86 | 24.97 | 25.35 | 25.92 | 24.46          | 24.86 | 24.97 | 25.35 | 25.92 |

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

Report Prepared for

Cooper Lighting Solutions

Metalux

Report Number: SP1-2506-472-5

Test Date: 08/01/2025

Luminaire Tested: EHBR-60-L930-N

Data in this report applies to families of products including EHBR-60-L930-N

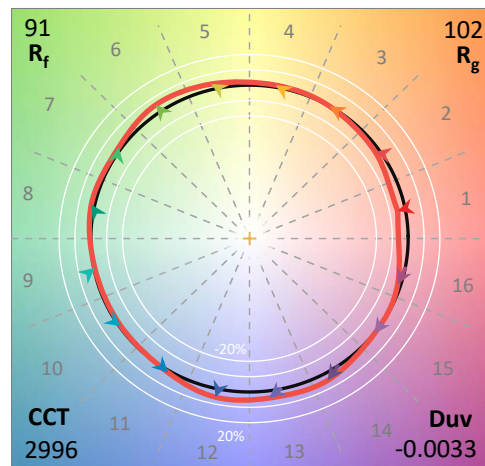
**Test Information**

Test Method: LM-79-2019  
 Report Number: SP1-2506-472-5  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry: 4π  
 Issue Date: 08/05/2025  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: Metalux  
 Catalog Number: **EHBR-60-L930-N**  
 Description: Elevate Round Highbay at, 60000 lumens, 3000K 90CRI LEDs with N lens

**Spectral Parameters**

CCT (K): 2996  
 CIE u': 0.2519  
 CIE v': 0.5169  
 Duv: -0.0033  
 CIE x: 0.4325  
 CIE y: 0.3945  
 CIE z: 0.1730  
 Peak Wavelength (nm): 630  
 Dominant Wavelength (nm): 584  
 Purity: 48.21818  
 Rf: 91.3  
 Rg: 102

|           |      |      |      |
|-----------|------|------|------|
| CRI (Ra): | 94.4 |      |      |
| R1:       | 96.8 | R9:  | 61.4 |
| R2:       | 98.1 | R10: | 94.4 |
| R3:       | 97.8 | R11: | 95.7 |
| R4:       | 95.6 | R12: | 88.5 |
| R5:       | 96.9 | R13: | 97.3 |
| R6:       | 95.7 | R14: | 97.8 |
| R7:       | 90.9 | R15: | 92.3 |
| R8:       | 83.0 |      |      |



**Test Conditions**

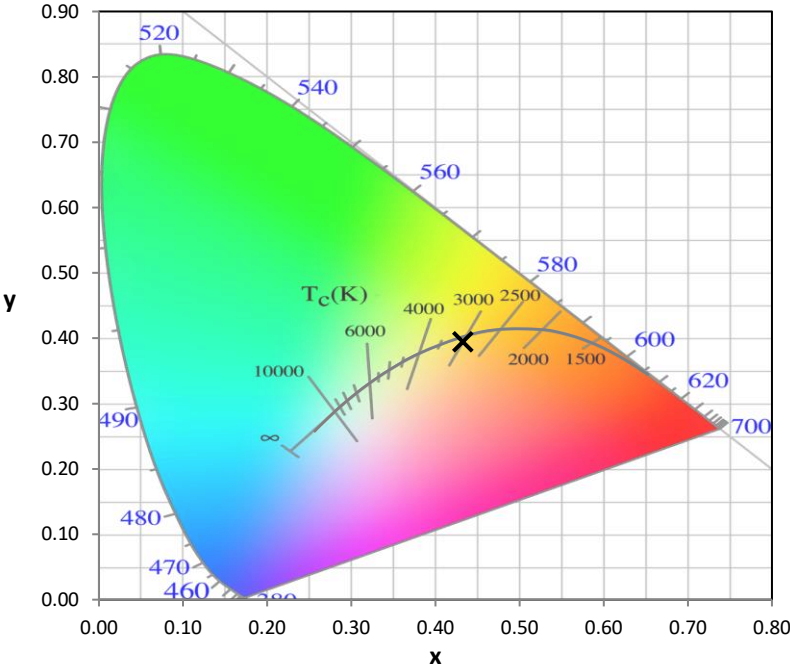
Stabilization Time: 40M  
 Operation Time: 1H 40M  
 Sphere Temperature (°C): 25.0

REPORT NUMBER: SP1-2506-472-5

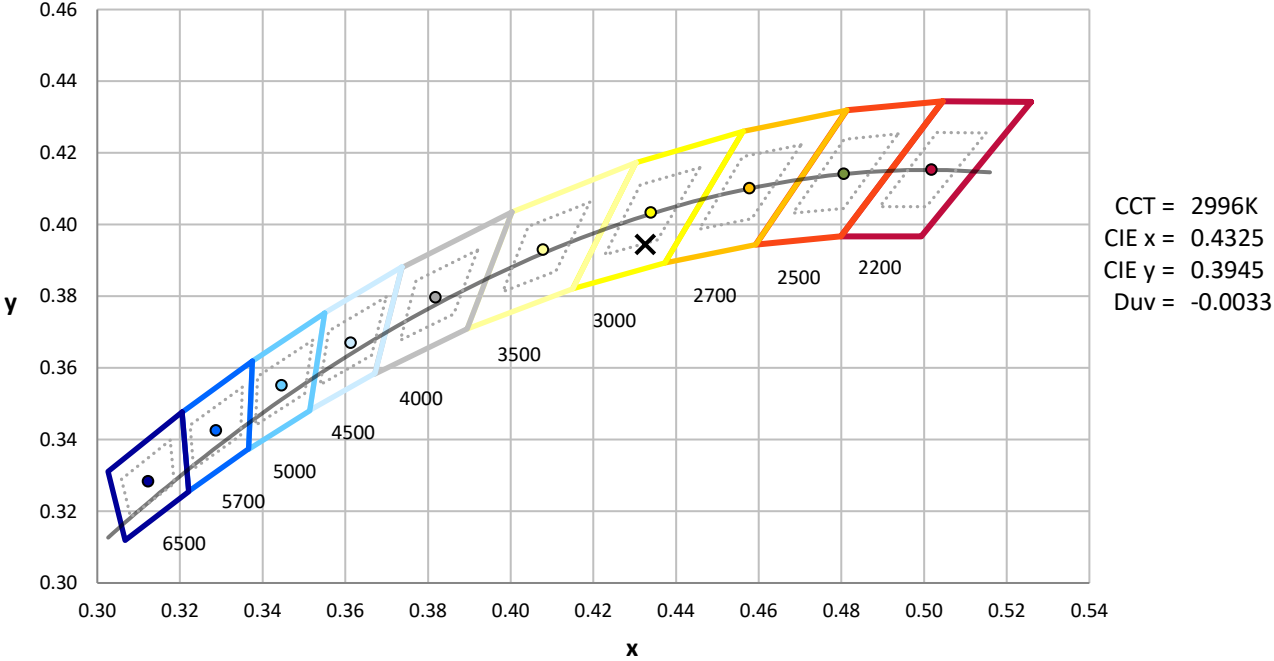
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | 76INCH SPHERE IN0058  | 6/16/2025        | 12/16/2025           |
| Power Meter                    | XITRON INXT2011004    | 1/21/2025        | 1/21/2026            |
| AC Power Source                | CHROMA 61603 IN0063   | 10/22/2024       | 10/22/2025           |
| DC Power Source                | AGILENT E3634A IN0208 | 10/22/2024       | 10/22/2025           |
| Sphere Thermometer             | ONSET IN0085          | 10/22/2024       | 10/22/2025           |
| Room Thermometer               | ONSET IN0046          | 10/22/2024       | 10/22/2025           |

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CIE 1931 Chromaticity Diagram



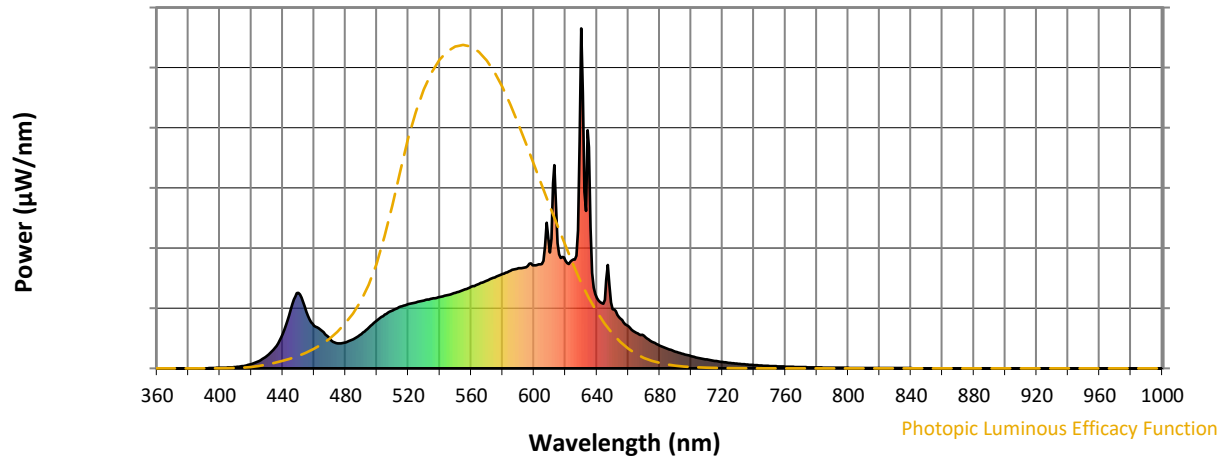
CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies inside the ANSI 3000K 7-step quadrangle

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**Photopic Flux vs. Wavelength**

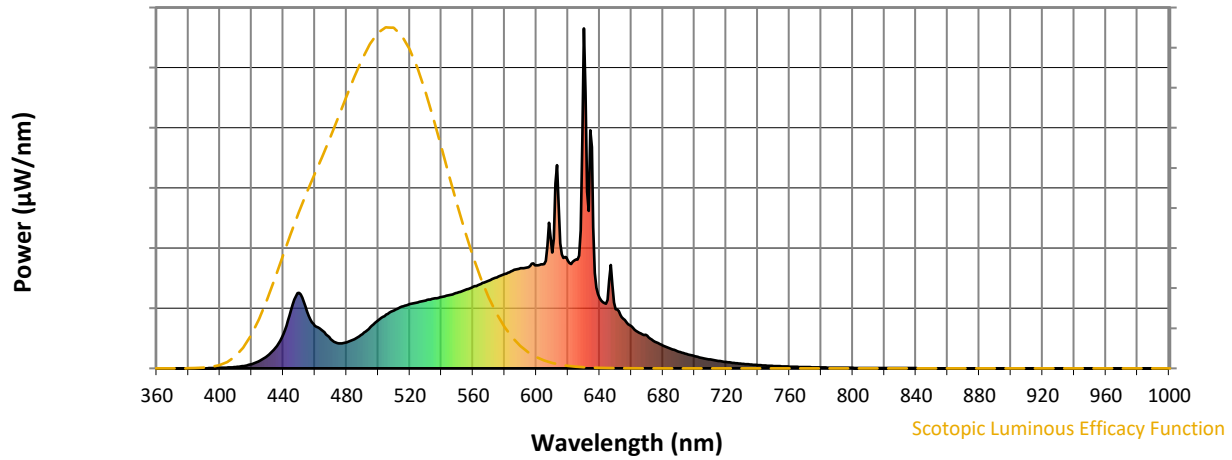


**Photopic Lumens: NR**

| $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) | $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) | $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) | $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) | $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) |
|-------------------|-----------------------------|-------------------------|-------------------|-----------------------------|-------------------------|-------------------|-----------------------------|-------------------------|-------------------|-----------------------------|-------------------------|-------------------|-----------------------------|-------------------------|
| 360               | 0                           | NR                      | 490               | 101                         | NR                      | 620               | 317                         | NR                      | 750               | 7                           | NR                      | 880               | 0                           | NR                      |
| 365               | 0                           | NR                      | 495               | 121                         | NR                      | 625               | 320                         | NR                      | 755               | 6                           | NR                      | 885               | 0                           | NR                      |
| 370               | 0                           | NR                      | 500               | 141                         | NR                      | 630               | 1000                        | NR                      | 760               | 5                           | NR                      | 890               | 0                           | NR                      |
| 375               | 0                           | NR                      | 505               | 158                         | NR                      | 635               | 651                         | NR                      | 765               | 4                           | NR                      | 895               | 0                           | NR                      |
| 380               | 0                           | NR                      | 510               | 171                         | NR                      | 640               | 207                         | NR                      | 770               | 4                           | NR                      | 900               | 0                           | NR                      |
| 385               | 0                           | NR                      | 515               | 182                         | NR                      | 645               | 201                         | NR                      | 775               | 3                           | NR                      | 905               | 0                           | NR                      |
| 390               | 0                           | NR                      | 520               | 189                         | NR                      | 650               | 174                         | NR                      | 780               | 3                           | NR                      | 910               | 0                           | NR                      |
| 395               | 1                           | NR                      | 525               | 194                         | NR                      | 655               | 146                         | NR                      | 785               | 2                           | NR                      | 915               | 0                           | NR                      |
| 400               | 1                           | NR                      | 530               | 199                         | NR                      | 660               | 124                         | NR                      | 790               | 2                           | NR                      | 920               | 0                           | NR                      |
| 405               | 3                           | NR                      | 535               | 205                         | NR                      | 665               | 105                         | NR                      | 795               | 2                           | NR                      | 925               | 0                           | NR                      |
| 410               | 4                           | NR                      | 540               | 210                         | NR                      | 670               | 96                          | NR                      | 800               | 1                           | NR                      | 930               | 0                           | NR                      |
| 415               | 7                           | NR                      | 545               | 216                         | NR                      | 675               | 79                          | NR                      | 805               | 1                           | NR                      | 935               | 0                           | NR                      |
| 420               | 13                          | NR                      | 550               | 222                         | NR                      | 680               | 67                          | NR                      | 810               | 1                           | NR                      | 940               | 0                           | NR                      |
| 425               | 22                          | NR                      | 555               | 230                         | NR                      | 685               | 58                          | NR                      | 815               | 1                           | NR                      | 945               | 0                           | NR                      |
| 430               | 37                          | NR                      | 560               | 240                         | NR                      | 690               | 49                          | NR                      | 820               | 1                           | NR                      | 950               | 0                           | NR                      |
| 435               | 60                          | NR                      | 565               | 248                         | NR                      | 695               | 42                          | NR                      | 825               | 1                           | NR                      | 955               | 0                           | NR                      |
| 440               | 101                         | NR                      | 570               | 258                         | NR                      | 700               | 36                          | NR                      | 830               | 1                           | NR                      | 960               | 0                           | NR                      |
| 445               | 172                         | NR                      | 575               | 268                         | NR                      | 705               | 30                          | NR                      | 835               | 1                           | NR                      | 965               | 0                           | NR                      |
| 450               | 223                         | NR                      | 580               | 278                         | NR                      | 710               | 26                          | NR                      | 840               | 1                           | NR                      | 970               | 0                           | NR                      |
| 455               | 167                         | NR                      | 585               | 287                         | NR                      | 715               | 22                          | NR                      | 845               | 0                           | NR                      | 975               | 0                           | NR                      |
| 460               | 126                         | NR                      | 590               | 295                         | NR                      | 720               | 19                          | NR                      | 850               | 0                           | NR                      | 980               | 0                           | NR                      |
| 465               | 111                         | NR                      | 595               | 298                         | NR                      | 725               | 16                          | NR                      | 855               | 0                           | NR                      | 985               | 0                           | NR                      |
| 470               | 86                          | NR                      | 600               | 303                         | NR                      | 730               | 14                          | NR                      | 860               | 0                           | NR                      | 990               | 0                           | NR                      |
| 475               | 74                          | NR                      | 605               | 307                         | NR                      | 735               | 12                          | NR                      | 865               | 0                           | NR                      | 995               | 0                           | NR                      |
| 480               | 77                          | NR                      | 610               | 341                         | NR                      | 740               | 10                          | NR                      | 870               | 0                           | NR                      | 1000              | 0                           | NR                      |
| 485               | 86                          | NR                      | 615               | 368                         | NR                      | 745               | 8                           | NR                      | 875               | 0                           | NR                      |                   |                             |                         |

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**Scotopic Flux vs. Wavelength**



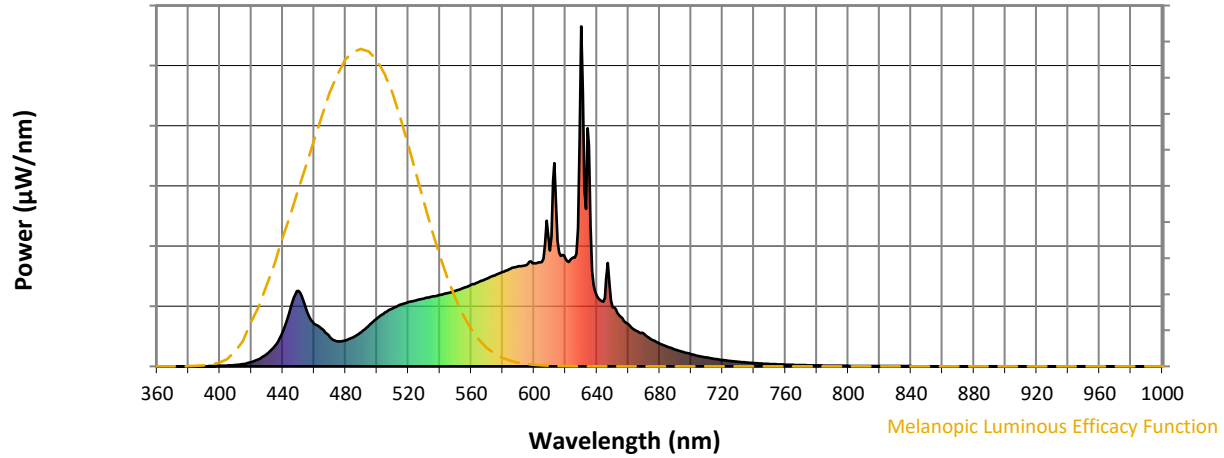
**Scotopic Lumens: NR**

**S/P: 1.44**

| $\lambda$ (nm) | Power W <sup>^</sup> /nm | Lumens ( $\phi$ /nm) | $\lambda$ (nm) | Power W <sup>^</sup> /nm | Lumens ( $\phi$ /nm) | $\lambda$ (nm) | Power W <sup>^</sup> /nm | Lumens ( $\phi$ /nm) | $\lambda$ (nm) | Power W <sup>^</sup> /nm | Lumens ( $\phi$ /nm) | $\lambda$ (nm) | Power W <sup>^</sup> /nm | Lumens ( $\phi$ /nm) |
|----------------|--------------------------|----------------------|----------------|--------------------------|----------------------|----------------|--------------------------|----------------------|----------------|--------------------------|----------------------|----------------|--------------------------|----------------------|
| 360            | 0                        | NR                   | 490            | 101                      | NR                   | 620            | 317                      | NR                   | 750            | 7                        | NR                   | 880            | 0                        | NR                   |
| 365            | 0                        | NR                   | 495            | 121                      | NR                   | 625            | 320                      | NR                   | 755            | 6                        | NR                   | 885            | 0                        | NR                   |
| 370            | 0                        | NR                   | 500            | 141                      | NR                   | 630            | 1000                     | NR                   | 760            | 5                        | NR                   | 890            | 0                        | NR                   |
| 375            | 0                        | NR                   | 505            | 158                      | NR                   | 635            | 651                      | NR                   | 765            | 4                        | NR                   | 895            | 0                        | NR                   |
| 380            | 0                        | NR                   | 510            | 171                      | NR                   | 640            | 207                      | NR                   | 770            | 4                        | NR                   | 900            | 0                        | NR                   |
| 385            | 0                        | NR                   | 515            | 182                      | NR                   | 645            | 201                      | NR                   | 775            | 3                        | NR                   | 905            | 0                        | NR                   |
| 390            | 0                        | NR                   | 520            | 189                      | NR                   | 650            | 174                      | NR                   | 780            | 3                        | NR                   | 910            | 0                        | NR                   |
| 395            | 1                        | NR                   | 525            | 194                      | NR                   | 655            | 146                      | NR                   | 785            | 2                        | NR                   | 915            | 0                        | NR                   |
| 400            | 1                        | NR                   | 530            | 199                      | NR                   | 660            | 124                      | NR                   | 790            | 2                        | NR                   | 920            | 0                        | NR                   |
| 405            | 3                        | NR                   | 535            | 205                      | NR                   | 665            | 105                      | NR                   | 795            | 2                        | NR                   | 925            | 0                        | NR                   |
| 410            | 4                        | NR                   | 540            | 210                      | NR                   | 670            | 96                       | NR                   | 800            | 1                        | NR                   | 930            | 0                        | NR                   |
| 415            | 7                        | NR                   | 545            | 216                      | NR                   | 675            | 79                       | NR                   | 805            | 1                        | NR                   | 935            | 0                        | NR                   |
| 420            | 13                       | NR                   | 550            | 222                      | NR                   | 680            | 67                       | NR                   | 810            | 1                        | NR                   | 940            | 0                        | NR                   |
| 425            | 22                       | NR                   | 555            | 230                      | NR                   | 685            | 58                       | NR                   | 815            | 1                        | NR                   | 945            | 0                        | NR                   |
| 430            | 37                       | NR                   | 560            | 240                      | NR                   | 690            | 49                       | NR                   | 820            | 1                        | NR                   | 950            | 0                        | NR                   |
| 435            | 60                       | NR                   | 565            | 248                      | NR                   | 695            | 42                       | NR                   | 825            | 1                        | NR                   | 955            | 0                        | NR                   |
| 440            | 101                      | NR                   | 570            | 258                      | NR                   | 700            | 36                       | NR                   | 830            | 1                        | NR                   | 960            | 0                        | NR                   |
| 445            | 172                      | NR                   | 575            | 268                      | NR                   | 705            | 30                       | NR                   | 835            | 1                        | NR                   | 965            | 0                        | NR                   |
| 450            | 223                      | NR                   | 580            | 278                      | NR                   | 710            | 26                       | NR                   | 840            | 1                        | NR                   | 970            | 0                        | NR                   |
| 455            | 167                      | NR                   | 585            | 287                      | NR                   | 715            | 22                       | NR                   | 845            | 0                        | NR                   | 975            | 0                        | NR                   |
| 460            | 126                      | NR                   | 590            | 295                      | NR                   | 720            | 19                       | NR                   | 850            | 0                        | NR                   | 980            | 0                        | NR                   |
| 465            | 111                      | NR                   | 595            | 298                      | NR                   | 725            | 16                       | NR                   | 855            | 0                        | NR                   | 985            | 0                        | NR                   |
| 470            | 86                       | NR                   | 600            | 303                      | NR                   | 730            | 14                       | NR                   | 860            | 0                        | NR                   | 990            | 0                        | NR                   |
| 475            | 74                       | NR                   | 605            | 307                      | NR                   | 735            | 12                       | NR                   | 865            | 0                        | NR                   | 995            | 0                        | NR                   |
| 480            | 77                       | NR                   | 610            | 341                      | NR                   | 740            | 10                       | NR                   | 870            | 0                        | NR                   | 1000           | 0                        | NR                   |
| 485            | 86                       | NR                   | 615            | 368                      | NR                   | 745            | 8                        | NR                   | 875            | 0                        | NR                   |                |                          |                      |

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**Melanopic Flux vs. Wavelength**



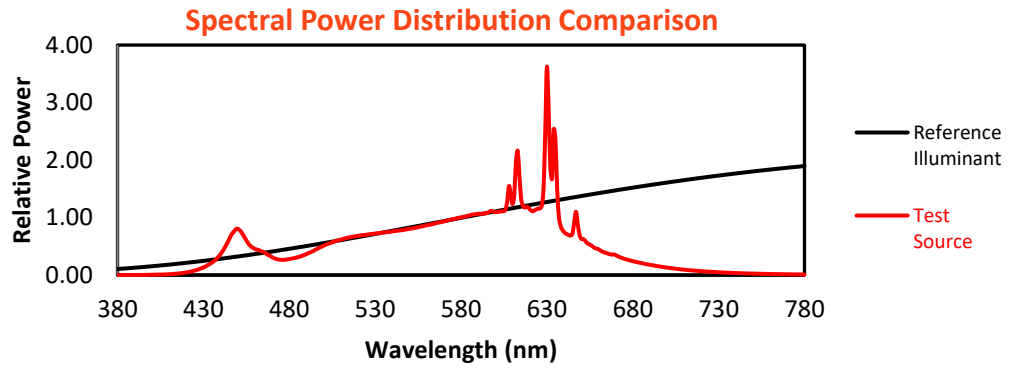
**Melanopic Lumens: NR**

**M/P: 2.85**

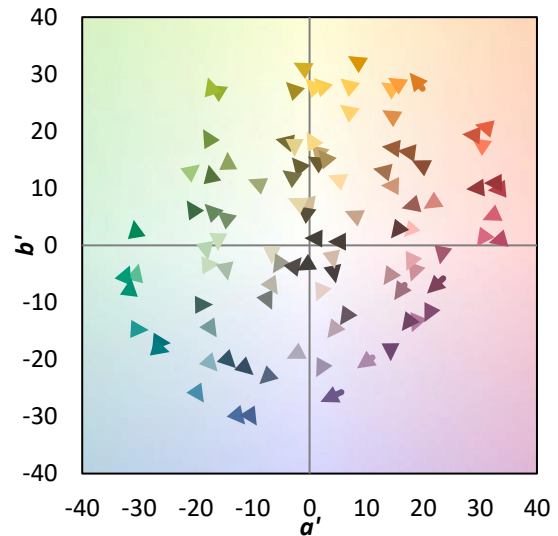
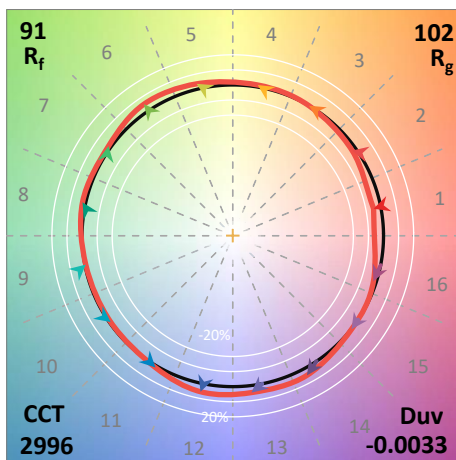
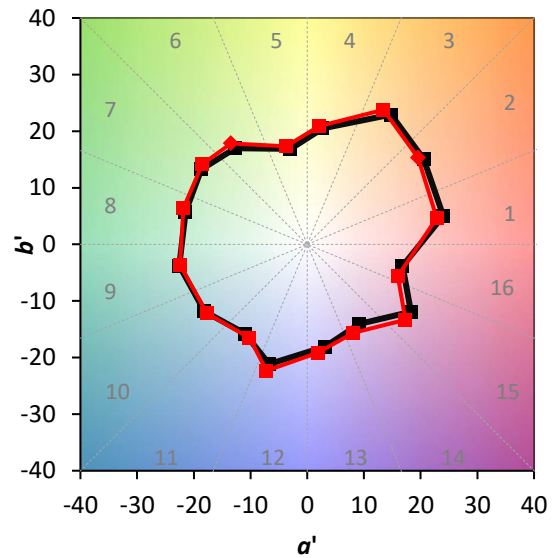
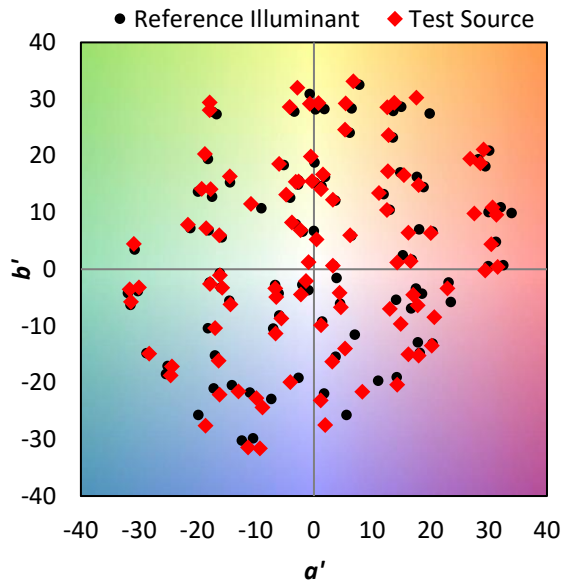
| λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) |
|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|
| 360    | 0                        | NR            | 490    | 101                      | NR            | 620    | 317                      | NR            | 750    | 7                        | NR            | 880    | 0                        | NR            |
| 365    | 0                        | NR            | 495    | 121                      | NR            | 625    | 320                      | NR            | 755    | 6                        | NR            | 885    | 0                        | NR            |
| 370    | 0                        | NR            | 500    | 141                      | NR            | 630    | 1000                     | NR            | 760    | 5                        | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 158                      | NR            | 635    | 651                      | NR            | 765    | 4                        | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 171                      | NR            | 640    | 207                      | NR            | 770    | 4                        | NR            | 900    | 0                        | NR            |
| 385    | 0                        | NR            | 515    | 182                      | NR            | 645    | 201                      | NR            | 775    | 3                        | NR            | 905    | 0                        | NR            |
| 390    | 0                        | NR            | 520    | 189                      | NR            | 650    | 174                      | NR            | 780    | 3                        | NR            | 910    | 0                        | NR            |
| 395    | 1                        | NR            | 525    | 194                      | NR            | 655    | 146                      | NR            | 785    | 2                        | NR            | 915    | 0                        | NR            |
| 400    | 1                        | NR            | 530    | 199                      | NR            | 660    | 124                      | NR            | 790    | 2                        | NR            | 920    | 0                        | NR            |
| 405    | 3                        | NR            | 535    | 205                      | NR            | 665    | 105                      | NR            | 795    | 2                        | NR            | 925    | 0                        | NR            |
| 410    | 4                        | NR            | 540    | 210                      | NR            | 670    | 96                       | NR            | 800    | 1                        | NR            | 930    | 0                        | NR            |
| 415    | 7                        | NR            | 545    | 216                      | NR            | 675    | 79                       | NR            | 805    | 1                        | NR            | 935    | 0                        | NR            |
| 420    | 13                       | NR            | 550    | 222                      | NR            | 680    | 67                       | NR            | 810    | 1                        | NR            | 940    | 0                        | NR            |
| 425    | 22                       | NR            | 555    | 230                      | NR            | 685    | 58                       | NR            | 815    | 1                        | NR            | 945    | 0                        | NR            |
| 430    | 37                       | NR            | 560    | 240                      | NR            | 690    | 49                       | NR            | 820    | 1                        | NR            | 950    | 0                        | NR            |
| 435    | 60                       | NR            | 565    | 248                      | NR            | 695    | 42                       | NR            | 825    | 1                        | NR            | 955    | 0                        | NR            |
| 440    | 101                      | NR            | 570    | 258                      | NR            | 700    | 36                       | NR            | 830    | 1                        | NR            | 960    | 0                        | NR            |
| 445    | 172                      | NR            | 575    | 268                      | NR            | 705    | 30                       | NR            | 835    | 1                        | NR            | 965    | 0                        | NR            |
| 450    | 223                      | NR            | 580    | 278                      | NR            | 710    | 26                       | NR            | 840    | 1                        | NR            | 970    | 0                        | NR            |
| 455    | 167                      | NR            | 585    | 287                      | NR            | 715    | 22                       | NR            | 845    | 0                        | NR            | 975    | 0                        | NR            |
| 460    | 126                      | NR            | 590    | 295                      | NR            | 720    | 19                       | NR            | 850    | 0                        | NR            | 980    | 0                        | NR            |
| 465    | 111                      | NR            | 595    | 298                      | NR            | 725    | 16                       | NR            | 855    | 0                        | NR            | 985    | 0                        | NR            |
| 470    | 86                       | NR            | 600    | 303                      | NR            | 730    | 14                       | NR            | 860    | 0                        | NR            | 990    | 0                        | NR            |
| 475    | 74                       | NR            | 605    | 307                      | NR            | 735    | 12                       | NR            | 865    | 0                        | NR            | 995    | 0                        | NR            |
| 480    | 77                       | NR            | 610    | 341                      | NR            | 740    | 10                       | NR            | 870    | 0                        | NR            | 1000   | 0                        | NR            |
| 485    | 86                       | NR            | 615    | 368                      | NR            | 745    | 8                        | NR            | 875    | 0                        | NR            |        |                          |               |

**Summary**

$R_f = 91.3$   
 $R_g = 102$   
 $CIE R_a = 94.4$   
 $R_9 = 61.4$

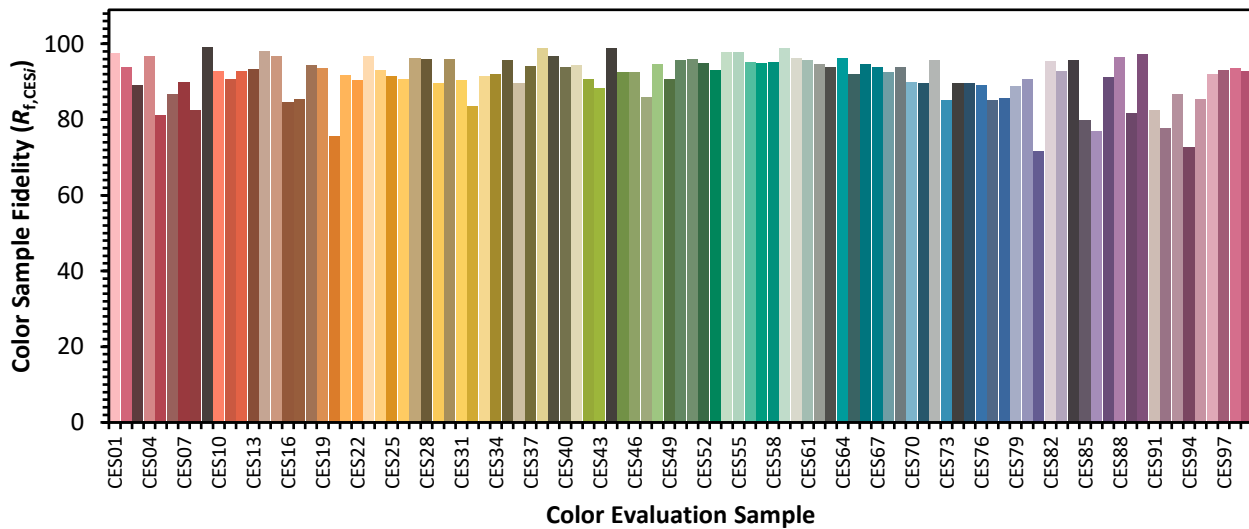


**Color Vector Graphics**

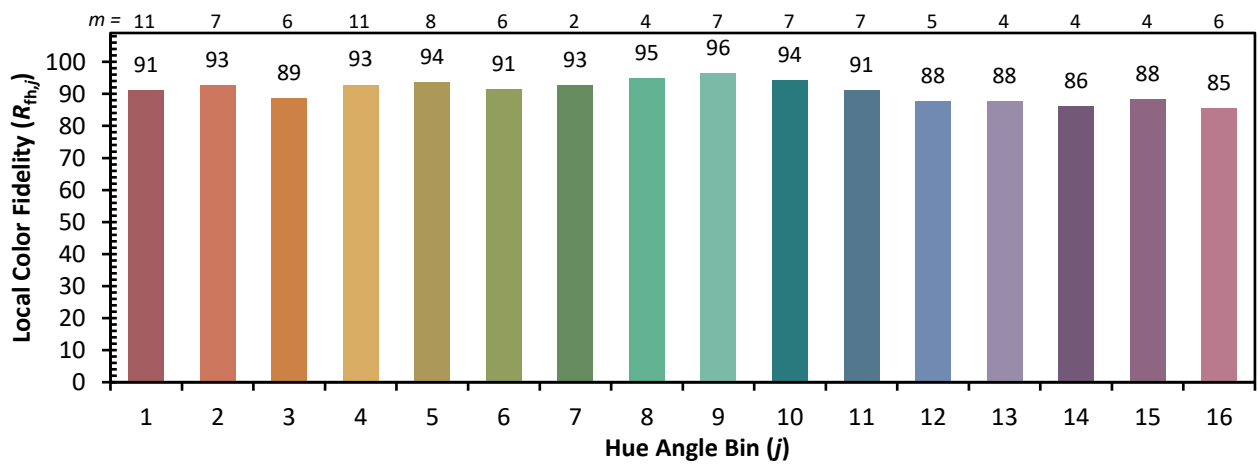
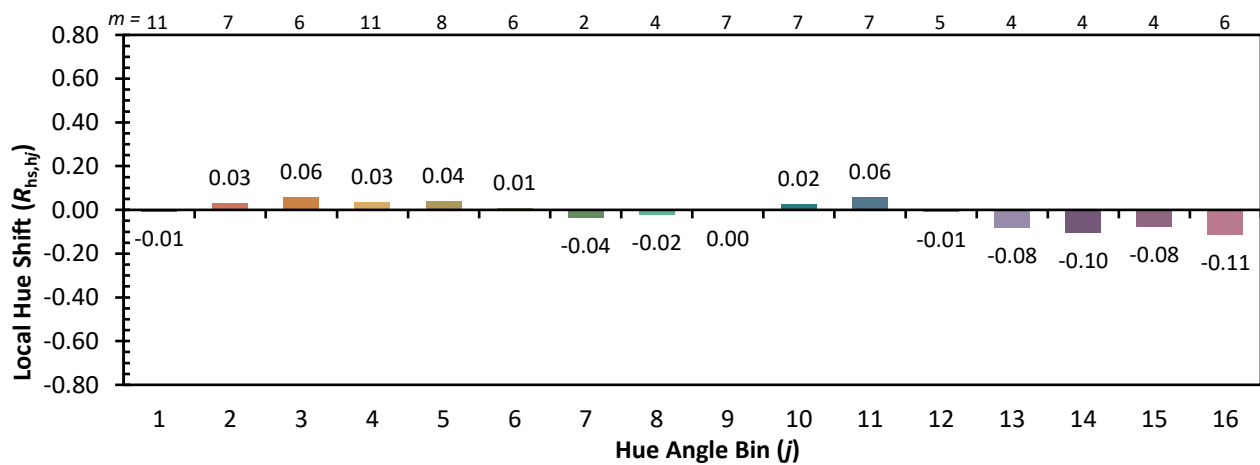
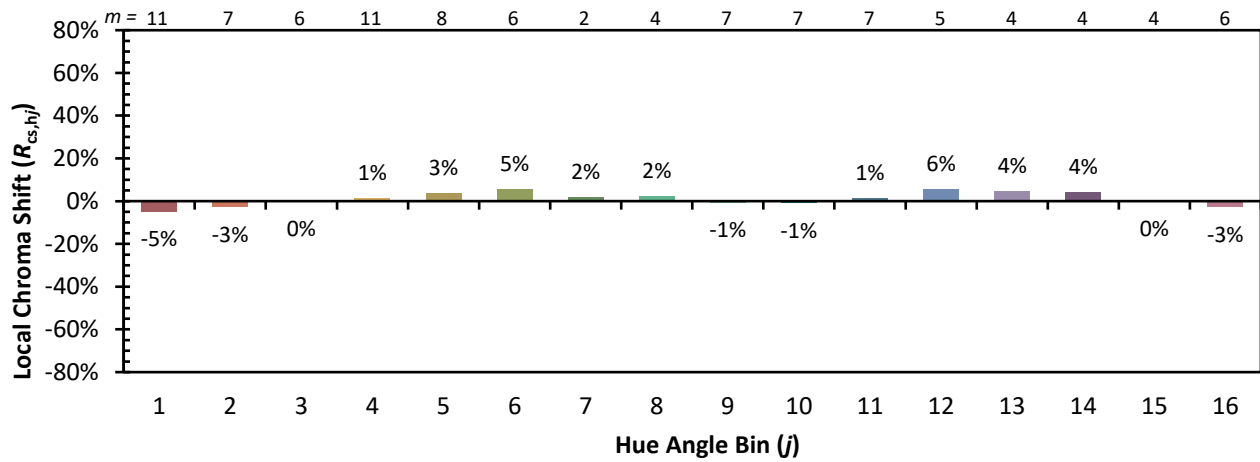


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

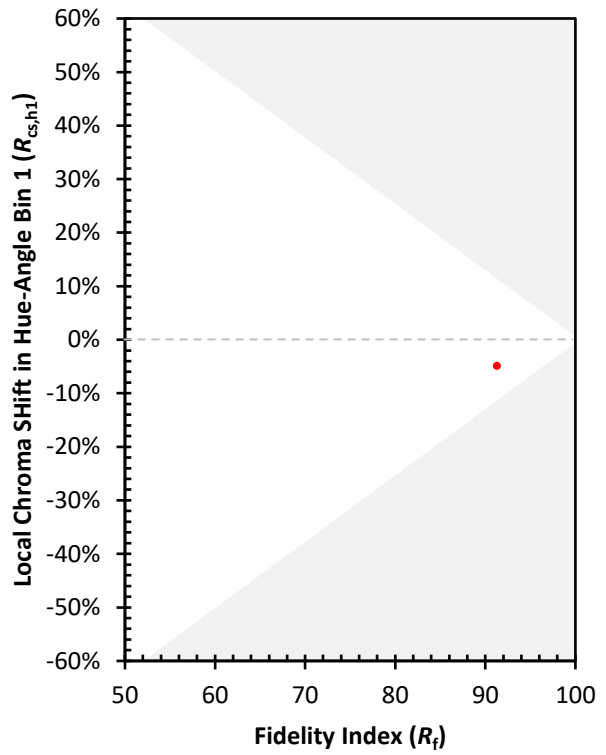
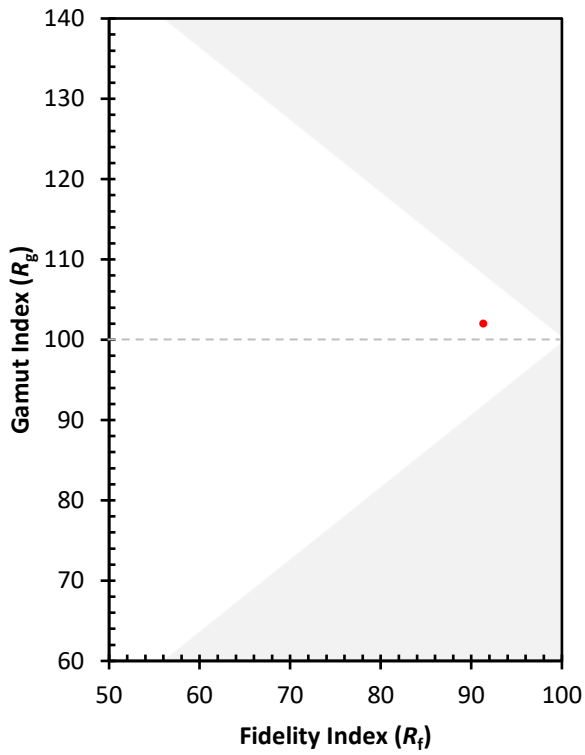
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 91 | CES51 = 96 | CES76 = 89 |
| CES02 = 63 | CES27 = 96 | CES52 = 95 | CES77 = 85 |
| CES03 = 32 | CES28 = 96 | CES53 = 93 | CES78 = 86 |
| CES04 = 70 | CES29 = 90 | CES54 = 98 | CES79 = 89 |
| CES05 = 51 | CES30 = 96 | CES55 = 98 | CES80 = 91 |
| CES06 = 51 | CES31 = 90 | CES56 = 95 | CES81 = 72 |
| CES07 = 44 | CES32 = 84 | CES57 = 95 | CES82 = 95 |
| CES08 = 42 | CES33 = 91 | CES58 = 95 | CES83 = 93 |
| CES09 = 29 | CES34 = 92 | CES59 = 99 | CES84 = 96 |
| CES10 = 76 | CES35 = 96 | CES60 = 96 | CES85 = 80 |
| CES11 = 59 | CES36 = 90 | CES61 = 96 | CES86 = 77 |
| CES12 = 65 | CES37 = 94 | CES62 = 95 | CES87 = 91 |
| CES13 = 44 | CES38 = 99 | CES63 = 94 | CES88 = 96 |
| CES14 = 74 | CES39 = 97 | CES64 = 96 | CES89 = 82 |
| CES15 = 72 | CES40 = 94 | CES65 = 92 | CES90 = 97 |
| CES16 = 48 | CES41 = 94 | CES66 = 95 | CES91 = 82 |
| CES17 = 50 | CES42 = 91 | CES67 = 94 | CES92 = 78 |
| CES18 = 57 | CES43 = 88 | CES68 = 93 | CES93 = 87 |
| CES19 = 72 | CES44 = 99 | CES69 = 94 | CES94 = 73 |
| CES20 = 67 | CES45 = 93 | CES70 = 90 | CES95 = 85 |
| CES21 = 86 | CES46 = 93 | CES71 = 90 | CES96 = 92 |
| CES22 = 79 | CES47 = 86 | CES72 = 96 | CES97 = 93 |
| CES23 = 92 | CES48 = 95 | CES73 = 85 | CES98 = 94 |
| CES24 = 91 | CES49 = 91 | CES74 = 90 | CES99 = 93 |
| CES25 = 72 | CES50 = 96 | CES75 = 90 |            |



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)