

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: P976369

Luminaire Tested: 22SR-LD2-25-S-UNV-L935-CD1-U

Issue Date: 03/18/2025

**Test Information**

Test Method: LM-79-2019  
Report Number: P976369  
Test Lab: INNOVATION CENTER(P3)  
Issue Date: 03/18/2025  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: METALUX  
Catalog Number: 22SR-LD2-25-S-UNV-L935-CD1-U  
Description: METALUX SKYRIDGE 2x2 2500LM PACKAGE 90CRI 3500K STANDARD TROFFER  
Light Source: 3500K CCT, 90+ CRI LEDS  
Ballast/Driver: -

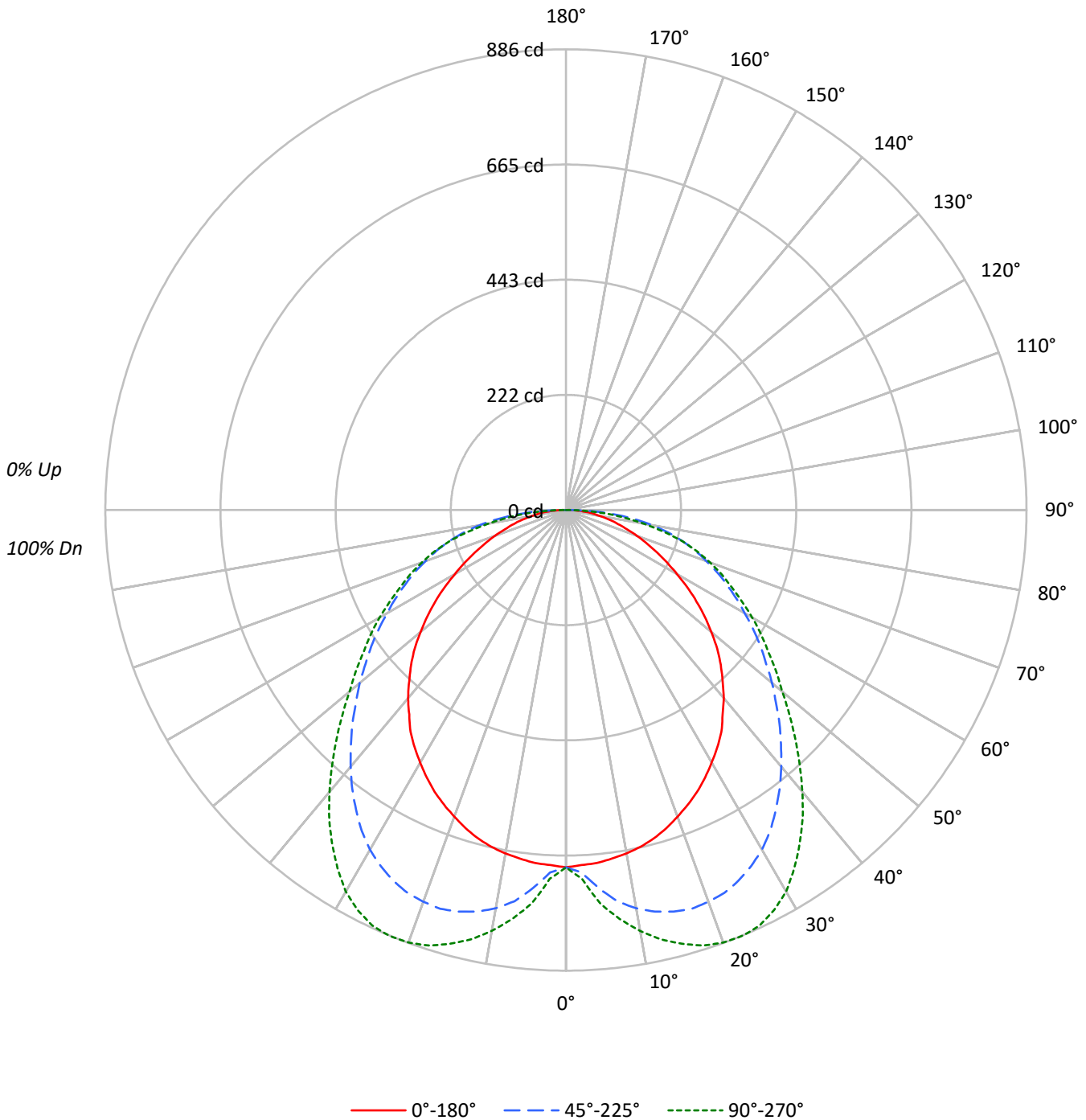
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 2485.4 lumens  
Efficiency: N/A  
Efficacy: 138.8 lumens/watt  
Spacing Criteria (0/90/45): 1.22 / 1.61 / 1.54  
Luminous Opening: Rectangular (W 2' x L: 2' x H: 0')  
CIE Type: Direct

Input Watts (W): 17.9  
Input Voltage (V): 120  
Input Current (A<sub>in</sub>): 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: 28.75 FT

TEST NUMBER: P976369  
CATALOG NUMBER: 22SR-LD2-25-S-UNV-L935-CD1-U

### Luminous Intensity Polar Plot





TEST NUMBER: P976369

CATALOG NUMBER: 22SR-LD2-25-S-UNV-L935-CD1-U

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

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| RF  | 20  |     |     |     | 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  | 50  | 30  | 10  | 0   |
| RCR |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 0   | 119 | 119 | 119 | 119 | 116 | 116 | 116 | 116 | 111 | 111 | 111 | 106 | 106 | 106 | 102 | 102 | 102 | 102 | 102 | 102 | 100 |
| 1   | 108 | 103 | 98  | 94  | 105 | 100 | 96  | 92  | 96  | 93  | 89  | 92  | 89  | 87  | 88  | 86  | 84  | 84  | 84  | 84  | 82  |
| 2   | 98  | 89  | 82  | 76  | 95  | 87  | 80  | 75  | 83  | 78  | 73  | 80  | 75  | 71  | 77  | 73  | 70  | 70  | 70  | 70  | 67  |
| 3   | 89  | 78  | 69  | 62  | 86  | 76  | 68  | 62  | 73  | 66  | 61  | 70  | 65  | 60  | 68  | 63  | 59  | 59  | 59  | 59  | 56  |
| 4   | 81  | 69  | 60  | 53  | 79  | 67  | 59  | 52  | 65  | 57  | 52  | 63  | 56  | 51  | 60  | 55  | 50  | 50  | 50  | 50  | 48  |
| 5   | 75  | 61  | 52  | 45  | 72  | 60  | 52  | 45  | 58  | 50  | 44  | 56  | 49  | 44  | 54  | 48  | 43  | 43  | 43  | 43  | 41  |
| 6   | 69  | 55  | 46  | 39  | 67  | 54  | 46  | 39  | 52  | 45  | 39  | 51  | 44  | 38  | 49  | 43  | 38  | 38  | 38  | 38  | 36  |
| 7   | 64  | 50  | 41  | 35  | 62  | 49  | 41  | 35  | 48  | 40  | 34  | 46  | 39  | 34  | 45  | 39  | 34  | 34  | 34  | 34  | 32  |
| 8   | 59  | 46  | 37  | 31  | 58  | 45  | 37  | 31  | 43  | 36  | 31  | 42  | 35  | 30  | 41  | 35  | 30  | 30  | 30  | 30  | 28  |
| 9   | 55  | 42  | 33  | 28  | 54  | 41  | 33  | 28  | 40  | 33  | 28  | 39  | 32  | 27  | 38  | 32  | 27  | 27  | 27  | 27  | 25  |
| 10  | 52  | 39  | 30  | 25  | 51  | 38  | 30  | 25  | 37  | 30  | 25  | 36  | 29  | 25  | 35  | 29  | 25  | 25  | 25  | 25  | 23  |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1849 | 1849 | 1849 |
| 5°  | 1840 | 1972 | 2053 |
| 10° | 1832 | 2126 | 2246 |
| 15° | 1821 | 2227 | 2406 |
| 20° | 1797 | 2296 | 2535 |
| 25° | 1775 | 2334 | 2618 |
| 30° | 1742 | 2343 | 2632 |
| 35° | 1713 | 2312 | 2575 |
| 40° | 1659 | 2263 | 2485 |
| 45° | 1603 | 2211 | 2375 |
| 50° | 1528 | 2168 | 2273 |
| 55° | 1438 | 2144 | 2228 |
| 60° | 1329 | 2138 | 2228 |
| 65° | 1231 | 2180 | 2241 |
| 70° | 1146 | 2262 | 2319 |
| 75° | 1079 | 2419 | 2407 |
| 80° | 1035 | 2625 | 2349 |
| 85° | 1142 | 2875 | 2322 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 45°  
 Vertical Angle: 87.5°  
 Luminance: 2943 cd/sqm



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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 70.4   | 2.8       |
| 10°-20°   | 221.6  | 8.9       |
| 20°-30°   | 353.5  | 14.2      |
| 30°-40°   | 425.5  | 17.1      |
| 40°-50°   | 426.8  | 17.2      |
| 50°-60°   | 381.5  | 15.4      |
| 60°-70°   | 309.1  | 12.4      |
| 70°-80°   | 215.2  | 8.7       |
| 80°-90°   | 81.8   | 3.3       |
| 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°    | 645.4  | 26.0      |
| 0°-40°    | 1070.9 | 43.1      |
| 0°-60°    | 1879.2 | 75.6      |
| 0°-90°    | 2485.4 | 100.0     |
| 90°-120°  | 0.0    | 0.0       |
| 90°-150°  | 0.0    | 0.0       |
| 90°-180°  | 0.0    | 0.0       |
| 0°-180°   | 2485.4 | 100.0     |

**CANDELA DISTRIBUTION:**

|     | 0°  | 22.5° | 45° | 67.5° | 90° | Flux |
|-----|-----|-------|-----|-------|-----|------|
| 0°  | 687 | 687   | 687 | 687   | 687 |      |
| 5°  | 681 | 697   | 730 | 754   | 760 | 65   |
| 15° | 654 | 730   | 799 | 847   | 864 | 184  |
| 25° | 598 | 692   | 786 | 857   | 882 | 275  |
| 35° | 521 | 604   | 704 | 766   | 784 | 325  |
| 45° | 421 | 493   | 581 | 616   | 624 | 324  |
| 55° | 307 | 384   | 457 | 471   | 475 | 274  |
| 65° | 193 | 283   | 342 | 347   | 352 | 192  |
| 75° | 104 | 191   | 233 | 232   | 232 | 110  |
| 85° | 37  | 82    | 93  | 80    | 75  | 39   |
| 90° | 0   | 0     | 0   | 0     | 0   |      |



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|-------|-------|-------|-------|-------|-------|
| 0°    | 687.2 | 687.2 | 687.2 | 687.2 | 687.2 |
| 2.5°  | 683.6 | 687.2 | 697.9 | 707.4 | 709.9 |
| 5°    | 681.3 | 696.7 | 730.2 | 754.0 | 760.0 |
| 7.5°  | 676.4 | 708.6 | 758.8 | 783.8 | 793.4 |
| 10°   | 670.5 | 721.8 | 777.9 | 810.1 | 822.0 |
| 12.5° | 663.4 | 730.2 | 791.0 | 831.6 | 845.8 |
| 15°   | 653.8 | 730.2 | 799.4 | 847.1 | 863.7 |
| 17.5° | 641.9 | 726.5 | 804.1 | 857.8 | 878.1 |
| 20°   | 627.5 | 719.5 | 801.7 | 863.7 | 885.3 |
| 22.5° | 613.3 | 707.4 | 797.0 | 863.7 | 886.5 |
| 25°   | 597.7 | 692.0 | 786.2 | 856.7 | 881.7 |
| 27.5° | 579.8 | 674.1 | 771.9 | 843.5 | 867.4 |
| 30°   | 560.7 | 652.6 | 754.0 | 824.4 | 847.1 |
| 32.5° | 541.6 | 628.7 | 731.4 | 798.2 | 817.3 |
| 35°   | 521.3 | 603.7 | 703.9 | 765.9 | 783.8 |
| 37.5° | 495.2 | 575.1 | 675.3 | 731.4 | 748.1 |
| 40°   | 472.4 | 548.8 | 644.3 | 694.4 | 707.4 |
| 42.5° | 446.2 | 520.2 | 612.1 | 655.0 | 665.7 |
| 45°   | 421.1 | 492.7 | 581.0 | 615.6 | 624.0 |
| 47.5° | 394.9 | 464.2 | 547.6 | 576.3 | 583.4 |
| 50°   | 365.0 | 436.7 | 517.8 | 541.6 | 542.9 |
| 52.5° | 336.4 | 410.4 | 485.6 | 504.7 | 509.4 |
| 55°   | 306.6 | 384.1 | 457.0 | 471.2 | 474.9 |
| 57.5° | 276.8 | 359.1 | 427.1 | 439.1 | 445.1 |
| 60°   | 246.9 | 332.9 | 397.3 | 408.1 | 414.0 |
| 62.5° | 219.6 | 307.9 | 369.9 | 377.1 | 381.8 |
| 65°   | 193.3 | 282.8 | 342.4 | 347.1 | 352.0 |
| 67.5° | 168.2 | 260.1 | 316.1 | 318.6 | 324.5 |
| 70°   | 145.6 | 237.4 | 287.5 | 289.9 | 294.7 |
| 72.5° | 122.9 | 213.6 | 261.3 | 260.1 | 264.9 |
| 75°   | 103.8 | 190.8 | 232.7 | 231.5 | 231.5 |
| 77.5° | 85.9  | 167.0 | 202.8 | 195.7 | 192.1 |
| 80°   | 66.8  | 141.9 | 169.4 | 155.1 | 151.6 |
| 82.5° | 52.5  | 113.4 | 131.2 | 116.9 | 113.4 |
| 85°   | 37.0  | 82.3  | 93.1  | 79.9  | 75.2  |
| 87.5° | 19.1  | 44.2  | 47.7  | 40.5  | 34.5  |
| 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 | 13.4             | 15.1 | 13.8 | 15.4 | 15.7 | 15.1           | 16.8 | 15.5 | 17.1 | 17.4 |
|                 | 3H   | 15.1             | 16.6 | 15.5 | 16.9 | 17.3 | 17.3           | 18.8 | 17.7 | 19.2 | 19.5 |
|                 | 4H   | 15.7             | 17.2 | 16.1 | 17.5 | 17.9 | 18.3           | 19.7 | 18.7 | 20.1 | 20.5 |
|                 | 6H   | 16.3             | 17.6 | 16.7 | 18.0 | 18.4 | 19.1           | 20.4 | 19.5 | 20.8 | 21.2 |
|                 | 8H   | 16.4             | 17.7 | 16.9 | 18.1 | 18.5 | 19.4           | 20.7 | 19.8 | 21.0 | 21.4 |
|                 | 12H  | 16.6             | 17.8 | 17.0 | 18.2 | 18.6 | 19.6           | 20.8 | 20.0 | 21.2 | 21.6 |
| 4H              | 2H   | 14.6             | 16.0 | 15.0 | 16.4 | 16.7 | 15.8           | 17.3 | 16.2 | 17.6 | 18.0 |
|                 | 3H   | 16.6             | 17.8 | 17.0 | 18.2 | 18.6 | 18.3           | 19.5 | 18.7 | 19.9 | 20.3 |
|                 | 4H   | 17.5             | 18.6 | 18.0 | 19.1 | 19.5 | 19.4           | 20.5 | 19.9 | 20.9 | 21.4 |
|                 | 6H   | 18.3             | 19.2 | 18.7 | 19.7 | 20.1 | 20.4           | 21.3 | 20.8 | 21.8 | 22.2 |
|                 | 8H   | 18.5             | 19.4 | 19.0 | 19.9 | 20.4 | 20.7           | 21.6 | 21.2 | 22.1 | 22.5 |
|                 | 12H  | 18.7             | 19.6 | 19.2 | 20.0 | 20.5 | 21.0           | 21.8 | 21.5 | 22.3 | 22.8 |
| 8H              | 4H   | 18.3             | 19.2 | 18.8 | 19.7 | 20.1 | 19.9           | 20.8 | 20.3 | 21.2 | 21.7 |
|                 | 6H   | 19.4             | 20.1 | 19.9 | 20.6 | 21.1 | 21.0           | 21.8 | 21.5 | 22.3 | 22.7 |
|                 | 8H   | 19.8             | 20.5 | 20.3 | 21.0 | 21.5 | 21.5           | 22.2 | 22.0 | 22.7 | 23.1 |
|                 | 12H  | 20.2             | 20.8 | 20.7 | 21.3 | 21.8 | 21.9           | 22.5 | 22.4 | 23.0 | 23.5 |
| 12H             | 4H   | 18.5             | 19.3 | 18.9 | 19.8 | 20.2 | 19.9           | 20.8 | 20.4 | 21.2 | 21.7 |
|                 | 6H   | 19.6             | 20.3 | 20.1 | 20.8 | 21.3 | 21.1           | 21.8 | 21.7 | 22.3 | 22.8 |
|                 | 8H   | 20.2             | 20.8 | 20.7 | 21.3 | 21.8 | 21.7           | 22.3 | 22.2 | 22.8 | 23.3 |

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

Report Prepared for

Cooper Lighting Solutions

Metalux

Report Number: SP1-2506-457-6

Test Date: 07/01/2025

Luminaire Tested: 24SR-LD2-64-C-UNV-L935-CD1-U

Data in this report applies to families of products including 24SR-LD2-64-C-UNV-L935-CD1-U

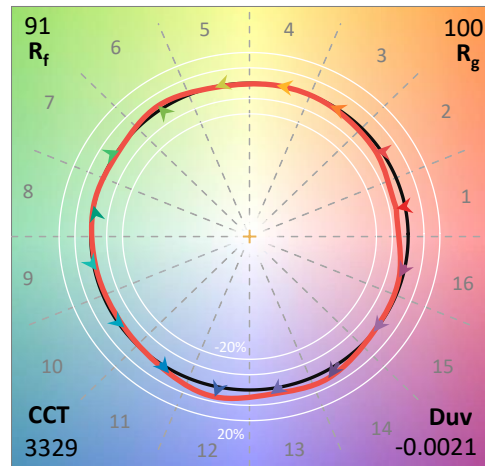
**Test Information**

Test Method: LM-79-2019  
 Report Number: SP1-2506-457-6  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry: 4π  
 Issue Date: 07/02/2025  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: Metalux  
 Catalog Number: **24SR-LD2-64-C-UNV-L935-CD1-U**  
 Description: 2X4 SKYRIDGE 6400LM Fixture with new LTN chip

**Spectral Parameters**

CCT (K): 3329  
 CIE u': 0.2411  
 CIE v': 0.5118  
 Duv: -0.0021  
 CIE x: 0.4128  
 CIE y: 0.3894  
 CIE z: 0.1979  
 Peak Wavelength (nm): 630  
 Dominant Wavelength (nm): 582  
 Purity: 40.74075  
 Rf: 91.4  
 Rg: 100.2

|           |      |      |      |
|-----------|------|------|------|
| CRI (Ra): | 93.9 |      |      |
| R1:       | 95.4 | R9:  | 60.5 |
| R2:       | 97.4 | R10: | 92.5 |
| R3:       | 97.7 | R11: | 95.9 |
| R4:       | 94.9 | R12: | 82.0 |
| R5:       | 95.1 | R13: | 96.0 |
| R6:       | 95.7 | R14: | 98.0 |
| R7:       | 91.7 | R15: | 91.5 |
| R8:       | 83.2 |      |      |



**Test Conditions**

Stabilization Time: 48M  
 Operation Time: 1H 48M  
 Sphere Temperature (°C): 24.0

REPORT NUMBER: SP1-2506-457-6

| 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 3500K 7-step quadrangle

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**Photopic Flux vs. Wavelength**



**Photopic Lumens: NR**

| 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    | 143                      | NR            | 620    | 358                      | NR            | 750    | 9                        | NR            | 880    | 0                        | NR            |
| 365    | 0                        | NR            | 495    | 166                      | NR            | 625    | 357                      | NR            | 755    | 7                        | NR            | 885    | 0                        | NR            |
| 370    | 0                        | NR            | 500    | 191                      | NR            | 630    | 1000                     | NR            | 760    | 6                        | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 210                      | NR            | 635    | 705                      | NR            | 765    | 5                        | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 223                      | NR            | 640    | 239                      | NR            | 770    | 5                        | NR            | 900    | 0                        | NR            |
| 385    | 0                        | NR            | 515    | 233                      | NR            | 645    | 226                      | NR            | 775    | 4                        | NR            | 905    | 0                        | NR            |
| 390    | 1                        | NR            | 520    | 240                      | NR            | 650    | 201                      | NR            | 780    | 3                        | NR            | 910    | 0                        | NR            |
| 395    | 2                        | NR            | 525    | 246                      | NR            | 655    | 170                      | NR            | 785    | 3                        | NR            | 915    | 0                        | NR            |
| 400    | 3                        | NR            | 530    | 251                      | NR            | 660    | 145                      | NR            | 790    | 2                        | NR            | 920    | 0                        | NR            |
| 405    | 4                        | NR            | 535    | 260                      | NR            | 665    | 123                      | NR            | 795    | 2                        | NR            | 925    | 0                        | NR            |
| 410    | 6                        | NR            | 540    | 267                      | NR            | 670    | 113                      | NR            | 800    | 2                        | NR            | 930    | 0                        | NR            |
| 415    | 9                        | NR            | 545    | 276                      | NR            | 675    | 93                       | NR            | 805    | 2                        | NR            | 935    | 0                        | NR            |
| 420    | 16                       | NR            | 550    | 284                      | NR            | 680    | 80                       | NR            | 810    | 1                        | NR            | 940    | 0                        | NR            |
| 425    | 28                       | NR            | 555    | 294                      | NR            | 685    | 69                       | NR            | 815    | 1                        | NR            | 945    | 0                        | NR            |
| 430    | 46                       | NR            | 560    | 303                      | NR            | 690    | 59                       | NR            | 820    | 1                        | NR            | 950    | 0                        | NR            |
| 435    | 75                       | NR            | 565    | 313                      | NR            | 695    | 51                       | NR            | 825    | 1                        | NR            | 955    | 0                        | NR            |
| 440    | 120                      | NR            | 570    | 319                      | NR            | 700    | 43                       | NR            | 830    | 1                        | NR            | 960    | 0                        | NR            |
| 445    | 203                      | NR            | 575    | 327                      | NR            | 705    | 37                       | NR            | 835    | 1                        | NR            | 965    | 0                        | NR            |
| 450    | 311                      | NR            | 580    | 336                      | NR            | 710    | 31                       | NR            | 840    | 1                        | NR            | 970    | 0                        | NR            |
| 455    | 290                      | NR            | 585    | 344                      | NR            | 715    | 26                       | NR            | 845    | 1                        | NR            | 975    | 0                        | NR            |
| 460    | 197                      | NR            | 590    | 349                      | NR            | 720    | 22                       | NR            | 850    | 0                        | NR            | 980    | 0                        | NR            |
| 465    | 163                      | NR            | 595    | 350                      | NR            | 725    | 18                       | NR            | 855    | 0                        | NR            | 985    | 0                        | NR            |
| 470    | 135                      | NR            | 600    | 355                      | NR            | 730    | 15                       | NR            | 860    | 0                        | NR            | 990    | 0                        | NR            |
| 475    | 110                      | NR            | 605    | 357                      | NR            | 735    | 13                       | NR            | 865    | 0                        | NR            | 995    | 0                        | NR            |
| 480    | 108                      | NR            | 610    | 391                      | NR            | 740    | 11                       | NR            | 870    | 0                        | NR            | 1000   | 0                        | NR            |
| 485    | 123                      | NR            | 615    | 421                      | NR            | 745    | 10                       | NR            | 875    | 0                        | NR            |        |                          |               |

REPORT NUMBER: SP1-2506-457-6

**Scotopic Flux vs. Wavelength**



**Scotopic Lumens: NR**

**S/P: 1.57**

| 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    | 143                      | NR            | 620    | 358                      | NR            | 750    | 9                        | NR            | 880    | 0                        | NR            |
| 365    | 0                        | NR            | 495    | 166                      | NR            | 625    | 357                      | NR            | 755    | 7                        | NR            | 885    | 0                        | NR            |
| 370    | 0                        | NR            | 500    | 191                      | NR            | 630    | 1000                     | NR            | 760    | 6                        | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 210                      | NR            | 635    | 705                      | NR            | 765    | 5                        | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 223                      | NR            | 640    | 239                      | NR            | 770    | 5                        | NR            | 900    | 0                        | NR            |
| 385    | 0                        | NR            | 515    | 233                      | NR            | 645    | 226                      | NR            | 775    | 4                        | NR            | 905    | 0                        | NR            |
| 390    | 1                        | NR            | 520    | 240                      | NR            | 650    | 201                      | NR            | 780    | 3                        | NR            | 910    | 0                        | NR            |
| 395    | 2                        | NR            | 525    | 246                      | NR            | 655    | 170                      | NR            | 785    | 3                        | NR            | 915    | 0                        | NR            |
| 400    | 3                        | NR            | 530    | 251                      | NR            | 660    | 145                      | NR            | 790    | 2                        | NR            | 920    | 0                        | NR            |
| 405    | 4                        | NR            | 535    | 260                      | NR            | 665    | 123                      | NR            | 795    | 2                        | NR            | 925    | 0                        | NR            |
| 410    | 6                        | NR            | 540    | 267                      | NR            | 670    | 113                      | NR            | 800    | 2                        | NR            | 930    | 0                        | NR            |
| 415    | 9                        | NR            | 545    | 276                      | NR            | 675    | 93                       | NR            | 805    | 2                        | NR            | 935    | 0                        | NR            |
| 420    | 16                       | NR            | 550    | 284                      | NR            | 680    | 80                       | NR            | 810    | 1                        | NR            | 940    | 0                        | NR            |
| 425    | 28                       | NR            | 555    | 294                      | NR            | 685    | 69                       | NR            | 815    | 1                        | NR            | 945    | 0                        | NR            |
| 430    | 46                       | NR            | 560    | 303                      | NR            | 690    | 59                       | NR            | 820    | 1                        | NR            | 950    | 0                        | NR            |
| 435    | 75                       | NR            | 565    | 313                      | NR            | 695    | 51                       | NR            | 825    | 1                        | NR            | 955    | 0                        | NR            |
| 440    | 120                      | NR            | 570    | 319                      | NR            | 700    | 43                       | NR            | 830    | 1                        | NR            | 960    | 0                        | NR            |
| 445    | 203                      | NR            | 575    | 327                      | NR            | 705    | 37                       | NR            | 835    | 1                        | NR            | 965    | 0                        | NR            |
| 450    | 311                      | NR            | 580    | 336                      | NR            | 710    | 31                       | NR            | 840    | 1                        | NR            | 970    | 0                        | NR            |
| 455    | 290                      | NR            | 585    | 344                      | NR            | 715    | 26                       | NR            | 845    | 1                        | NR            | 975    | 0                        | NR            |
| 460    | 197                      | NR            | 590    | 349                      | NR            | 720    | 22                       | NR            | 850    | 0                        | NR            | 980    | 0                        | NR            |
| 465    | 163                      | NR            | 595    | 350                      | NR            | 725    | 18                       | NR            | 855    | 0                        | NR            | 985    | 0                        | NR            |
| 470    | 135                      | NR            | 600    | 355                      | NR            | 730    | 15                       | NR            | 860    | 0                        | NR            | 990    | 0                        | NR            |
| 475    | 110                      | NR            | 605    | 357                      | NR            | 735    | 13                       | NR            | 865    | 0                        | NR            | 995    | 0                        | NR            |
| 480    | 108                      | NR            | 610    | 391                      | NR            | 740    | 11                       | NR            | 870    | 0                        | NR            | 1000   | 0                        | NR            |
| 485    | 123                      | NR            | 615    | 421                      | NR            | 745    | 10                       | NR            | 875    | 0                        | NR            |        |                          |               |

REPORT NUMBER: SP1-2506-457-6

**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: NR**

**M/P: 3.17**

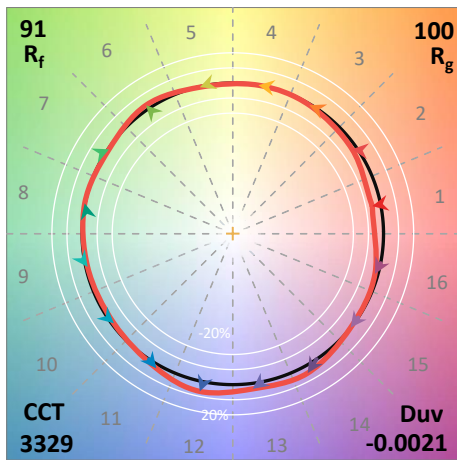
| λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) |
|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|
| 360    | 0                        | NR            | 490    | 143                      | NR            | 620    | 358                      | NR            | 750    | 9                        | NR            | 880    | 0                        | NR            |
| 365    | 0                        | NR            | 495    | 166                      | NR            | 625    | 357                      | NR            | 755    | 7                        | NR            | 885    | 0                        | NR            |
| 370    | 0                        | NR            | 500    | 191                      | NR            | 630    | 1000                     | NR            | 760    | 6                        | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 210                      | NR            | 635    | 705                      | NR            | 765    | 5                        | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 223                      | NR            | 640    | 239                      | NR            | 770    | 5                        | NR            | 900    | 0                        | NR            |
| 385    | 0                        | NR            | 515    | 233                      | NR            | 645    | 226                      | NR            | 775    | 4                        | NR            | 905    | 0                        | NR            |
| 390    | 1                        | NR            | 520    | 240                      | NR            | 650    | 201                      | NR            | 780    | 3                        | NR            | 910    | 0                        | NR            |
| 395    | 2                        | NR            | 525    | 246                      | NR            | 655    | 170                      | NR            | 785    | 3                        | NR            | 915    | 0                        | NR            |
| 400    | 3                        | NR            | 530    | 251                      | NR            | 660    | 145                      | NR            | 790    | 2                        | NR            | 920    | 0                        | NR            |
| 405    | 4                        | NR            | 535    | 260                      | NR            | 665    | 123                      | NR            | 795    | 2                        | NR            | 925    | 0                        | NR            |
| 410    | 6                        | NR            | 540    | 267                      | NR            | 670    | 113                      | NR            | 800    | 2                        | NR            | 930    | 0                        | NR            |
| 415    | 9                        | NR            | 545    | 276                      | NR            | 675    | 93                       | NR            | 805    | 2                        | NR            | 935    | 0                        | NR            |
| 420    | 16                       | NR            | 550    | 284                      | NR            | 680    | 80                       | NR            | 810    | 1                        | NR            | 940    | 0                        | NR            |
| 425    | 28                       | NR            | 555    | 294                      | NR            | 685    | 69                       | NR            | 815    | 1                        | NR            | 945    | 0                        | NR            |
| 430    | 46                       | NR            | 560    | 303                      | NR            | 690    | 59                       | NR            | 820    | 1                        | NR            | 950    | 0                        | NR            |
| 435    | 75                       | NR            | 565    | 313                      | NR            | 695    | 51                       | NR            | 825    | 1                        | NR            | 955    | 0                        | NR            |
| 440    | 120                      | NR            | 570    | 319                      | NR            | 700    | 43                       | NR            | 830    | 1                        | NR            | 960    | 0                        | NR            |
| 445    | 203                      | NR            | 575    | 327                      | NR            | 705    | 37                       | NR            | 835    | 1                        | NR            | 965    | 0                        | NR            |
| 450    | 311                      | NR            | 580    | 336                      | NR            | 710    | 31                       | NR            | 840    | 1                        | NR            | 970    | 0                        | NR            |
| 455    | 290                      | NR            | 585    | 344                      | NR            | 715    | 26                       | NR            | 845    | 1                        | NR            | 975    | 0                        | NR            |
| 460    | 197                      | NR            | 590    | 349                      | NR            | 720    | 22                       | NR            | 850    | 0                        | NR            | 980    | 0                        | NR            |
| 465    | 163                      | NR            | 595    | 350                      | NR            | 725    | 18                       | NR            | 855    | 0                        | NR            | 985    | 0                        | NR            |
| 470    | 135                      | NR            | 600    | 355                      | NR            | 730    | 15                       | NR            | 860    | 0                        | NR            | 990    | 0                        | NR            |
| 475    | 110                      | NR            | 605    | 357                      | NR            | 735    | 13                       | NR            | 865    | 0                        | NR            | 995    | 0                        | NR            |
| 480    | 108                      | NR            | 610    | 391                      | NR            | 740    | 11                       | NR            | 870    | 0                        | NR            | 1000   | 0                        | NR            |
| 485    | 123                      | NR            | 615    | 421                      | NR            | 745    | 10                       | NR            | 875    | 0                        | NR            |        |                          |               |

**Summary**

$R_f = 91.4$   
 $R_g = 100.2$   
 $CIE R_a = 93.9$   
 $R_9 = 60.5$



**Color Vector Graphics**

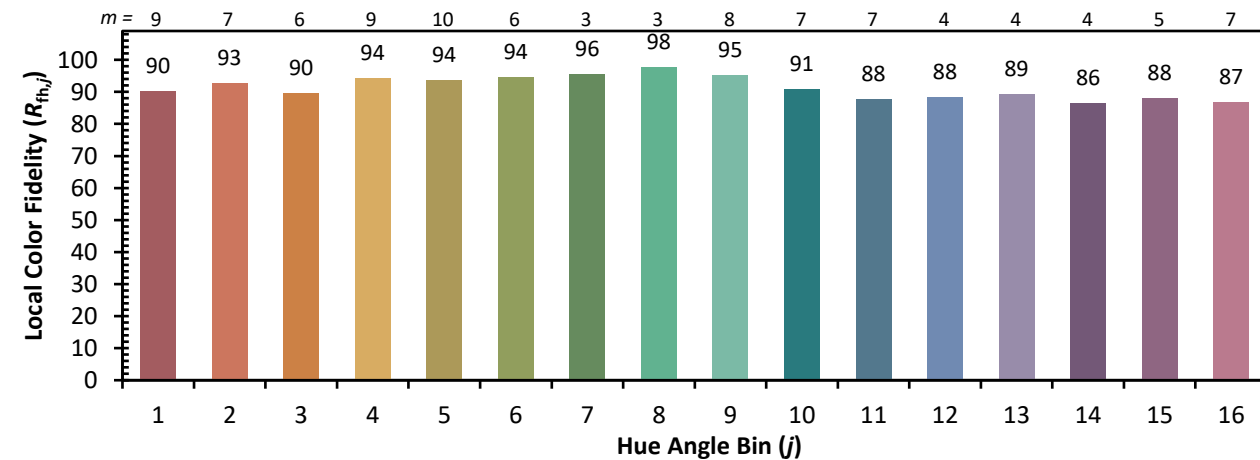
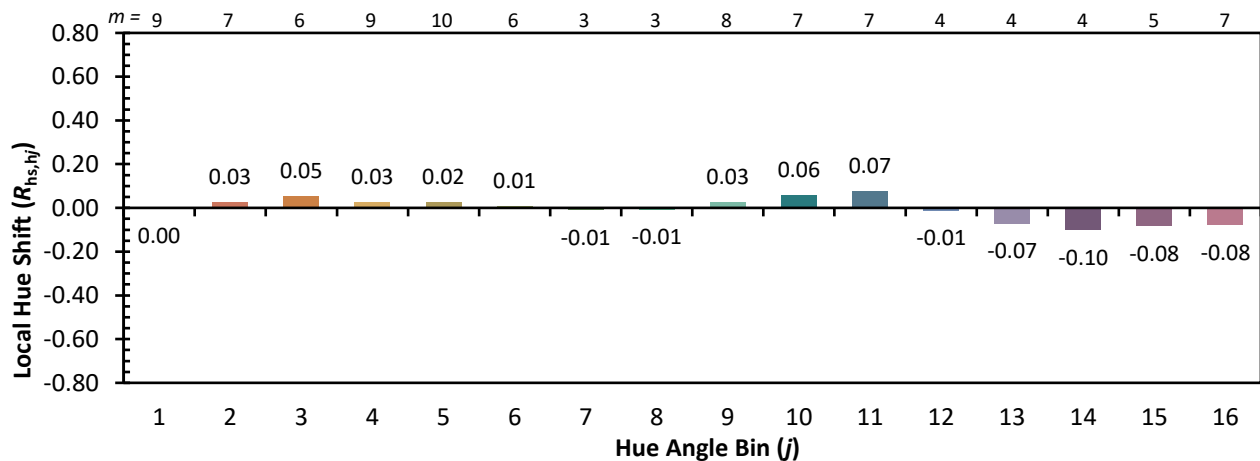
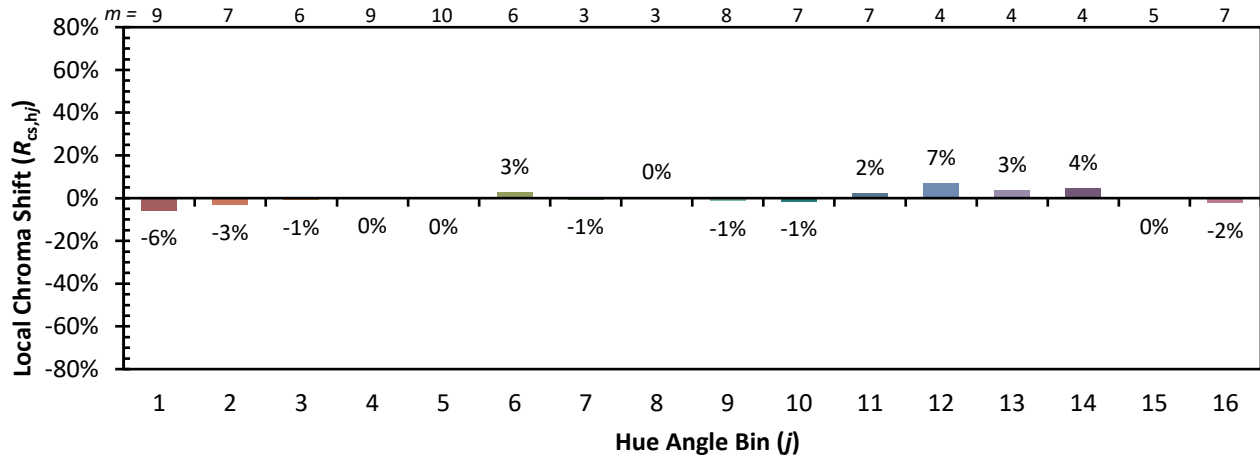


Individual Sample Fidelity Index ( $R_{f,i}$ )

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 93 | CES51 = 98 | CES76 = 88 |
| CES02 = 63 | CES27 = 93 | CES52 = 98 | CES77 = 87 |
| CES03 = 31 | CES28 = 96 | CES53 = 97 | CES78 = 85 |
| CES04 = 70 | CES29 = 95 | CES54 = 95 | CES79 = 91 |
| CES05 = 50 | CES30 = 96 | CES55 = 94 | CES80 = 92 |
| CES06 = 51 | CES31 = 95 | CES56 = 96 | CES81 = 75 |
| CES07 = 43 | CES32 = 87 | CES57 = 95 | CES82 = 96 |
| CES08 = 42 | CES33 = 97 | CES58 = 96 | CES83 = 94 |
| CES09 = 29 | CES34 = 94 | CES59 = 98 | CES84 = 95 |
| CES10 = 75 | CES35 = 96 | CES60 = 94 | CES85 = 80 |
| CES11 = 58 | CES36 = 84 | CES61 = 93 | CES86 = 79 |
| CES12 = 64 | CES37 = 95 | CES62 = 89 | CES87 = 91 |
| CES13 = 44 | CES38 = 91 | CES63 = 94 | CES88 = 97 |
| CES14 = 74 | CES39 = 99 | CES64 = 92 | CES89 = 83 |
| CES15 = 72 | CES40 = 97 | CES65 = 90 | CES90 = 98 |
| CES16 = 48 | CES41 = 97 | CES66 = 90 | CES91 = 77 |
| CES17 = 49 | CES42 = 93 | CES67 = 89 | CES92 = 77 |
| CES18 = 56 | CES43 = 92 | CES68 = 89 | CES93 = 86 |
| CES19 = 71 | CES44 = 99 | CES69 = 91 | CES94 = 74 |
| CES20 = 67 | CES45 = 96 | CES70 = 88 | CES95 = 84 |
| CES21 = 86 | CES46 = 96 | CES71 = 84 | CES96 = 92 |
| CES22 = 78 | CES47 = 91 | CES72 = 94 | CES97 = 95 |
| CES23 = 91 | CES48 = 94 | CES73 = 83 | CES98 = 94 |
| CES24 = 90 | CES49 = 94 | CES74 = 91 | CES99 = 92 |
| CES25 = 71 | CES50 = 98 | CES75 = 86 |            |



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)