

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: P1436648

Luminaire Tested: EHBR1-24-UNV-M-L950-UPL36

Issue Date: 3/25/2026

**Test Information**

Test Method: LM-79-2019  
Report Number: P1436648  
REPORT IS A COMBINATION OF REPORTS P1436072 AND P1431635  
Test Lab: INNOVATION CENTER  
Issue Date: 3/25/2026  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: METALUX  
Catalog Number: EHBR1-24-UNV-M-L950-UPL36  
Description: Elevate Round Highbay at, 24000 lumens, 5000K 90CRI LEDs with M lens  
Light Source: -  
Ballast/Driver: -

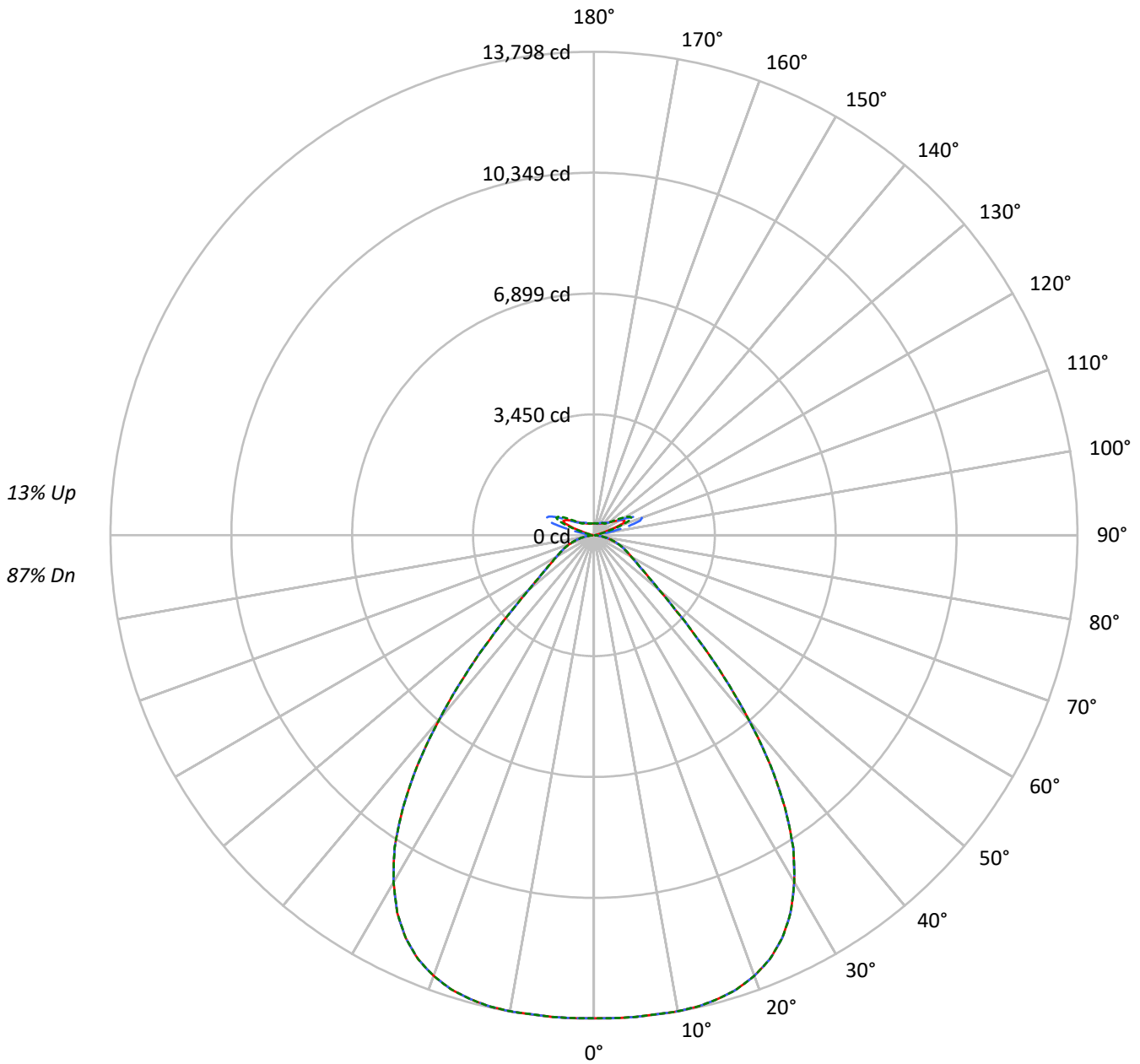
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 26683.7 lumens  
Efficiency: N/A  
Efficacy: 170.3 lumens/watt  
Spacing Criteria (0/90/45): 1.21 / 1.21 / 1.15  
Luminous Opening: Vertical Cylinder (Dia: 1.71' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 156.7  
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: P1436648  
CATALOG NUMBER: EHBR1-24-UNV-M-L950-UPL36

### Luminous Intensity Polar Plot



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



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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 | 50 | 30 | 10 |
| RCR |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |    |    |    |    |    |
| 0   | 116 | 116 | 116 | 116 | 112 | 112 | 112 | 112 | 104 | 104 | 104 | 97 | 97 | 97 | 91 | 91 | 91 | 87 |    |    |
| 1   | 108 | 105 | 102 | 99  | 105 | 101 | 99  | 96  | 95  | 93  | 91  | 89 | 87 | 86 | 84 | 82 | 81 | 78 |    |    |
| 2   | 101 | 95  | 89  | 85  | 97  | 92  | 87  | 83  | 86  | 83  | 79  | 81 | 78 | 76 | 77 | 74 | 72 | 70 |    |    |
| 3   | 94  | 86  | 79  | 74  | 91  | 83  | 77  | 73  | 79  | 74  | 70  | 74 | 71 | 67 | 71 | 67 | 65 | 62 |    |    |
| 4   | 88  | 78  | 71  | 66  | 85  | 76  | 69  | 64  | 72  | 67  | 62  | 68 | 64 | 60 | 65 | 61 | 58 | 56 |    |    |
| 5   | 82  | 71  | 64  | 58  | 79  | 69  | 63  | 58  | 66  | 60  | 56  | 63 | 58 | 54 | 60 | 56 | 53 | 51 |    |    |
| 6   | 76  | 65  | 58  | 53  | 74  | 64  | 57  | 52  | 61  | 55  | 51  | 58 | 53 | 49 | 56 | 51 | 48 | 46 |    |    |
| 7   | 71  | 60  | 53  | 48  | 69  | 59  | 52  | 47  | 56  | 50  | 46  | 54 | 49 | 45 | 52 | 47 | 44 | 42 |    |    |
| 8   | 67  | 56  | 48  | 43  | 65  | 54  | 48  | 43  | 52  | 46  | 42  | 50 | 45 | 41 | 48 | 43 | 40 | 38 |    |    |
| 9   | 63  | 51  | 44  | 40  | 61  | 50  | 44  | 39  | 48  | 43  | 38  | 47 | 41 | 38 | 45 | 40 | 37 | 35 |    |    |
| 10  | 59  | 48  | 41  | 36  | 58  | 47  | 40  | 36  | 45  | 39  | 35  | 44 | 38 | 35 | 42 | 37 | 34 | 32 |    |    |

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

|     | 0°    | 45°   | 90°   |
|-----|-------|-------|-------|
| 0°  | 64732 | 64732 | 64732 |
| 5°  | 64621 | 64621 | 64621 |
| 10° | 64925 | 64925 | 64925 |
| 15° | 65298 | 65298 | 65298 |
| 20° | 65100 | 65100 | 65100 |
| 25° | 63580 | 63580 | 63580 |
| 30° | 59452 | 59452 | 59452 |
| 35° | 51777 | 51777 | 51777 |
| 40° | 39681 | 39681 | 39681 |
| 45° | 25923 | 25923 | 25923 |
| 50° | 16342 | 16342 | 16342 |
| 55° | 12182 | 12182 | 12182 |
| 60° | 10256 | 10256 | 10256 |
| 65° | 9326  | 9326  | 9326  |
| 70° | 8495  | 8495  | 8495  |
| 75° | 7274  | 7274  | 7274  |
| 80° | 5600  | 5600  | 5600  |
| 85° | 2939  | 2939  | 2939  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
 Vertical Angle: 45°  
 Luminance: 25923 cd/sqm



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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 1316.5  | 4.9       |
| 10°-20°   | 3866.3  | 14.5      |
| 20°-30°   | 5801.2  | 21.7      |
| 30°-40°   | 5836.6  | 21.9      |
| 40°-50°   | 3341.0  | 12.5      |
| 50°-60°   | 1528.1  | 5.7       |
| 60°-70°   | 969.5   | 3.6       |
| 70°-80°   | 543.8   | 2.0       |
| 80°-90°   | 133.7   | 0.5       |
| 90°-100°  | 95.4    | 0.4       |
| 100°-110° | 598.0   | 2.2       |
| 110°-120° | 1069.4  | 4.0       |
| 120°-130° | 627.5   | 2.4       |
| 130°-140° | 384.9   | 1.4       |
| 140°-150° | 267.0   | 1.0       |
| 150°-160° | 173.5   | 0.7       |
| 160°-170° | 98.8    | 0.4       |
| 170°-180° | 32.7    | 0.1       |
| 0°-30°    | 10984.0 | 41.2      |
| 0°-40°    | 16820.6 | 63.0      |
| 0°-60°    | 21689.7 | 81.3      |
| 0°-90°    | 23336.7 | 87.5      |
| 90°-120°  | 1762.8  | 6.6       |
| 90°-150°  | 3042.1  | 11.4      |
| 90°-180°  | 3347.0  | 12.5      |
| 0°-180°   | 26683.7 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°    | 22.5° | 45°   | 67.5° | 90°   | Flux |
|------|-------|-------|-------|-------|-------|------|
| 0°   | 13784 | 13784 | 13784 | 13784 | 13784 |      |
| 5°   | 13798 | 13798 | 13798 | 13798 | 13798 | 1317 |
| 15°  | 13699 | 13699 | 13699 | 13699 | 13699 | 3866 |
| 25°  | 12697 | 12697 | 12697 | 12697 | 12697 | 5801 |
| 35°  | 9503  | 9503  | 9503  | 9503  | 9503  | 5837 |
| 45°  | 4194  | 4194  | 4194  | 4194  | 4194  | 3341 |
| 55°  | 1646  | 1646  | 1646  | 1646  | 1646  | 1528 |
| 65°  | 973   | 973   | 973   | 973   | 973   | 970  |
| 75°  | 512   | 512   | 512   | 512   | 512   | 544  |
| 85°  | 101   | 101   | 101   | 101   | 101   | 124  |
| 90°  | 25    | 40    | 69    | 44    | 25    | 16   |
| 95°  | 42    | 71    | 155   | 77    | 48    | 41   |
| 105° | 209   | 412   | 1052  | 454   | 276   | 280  |
| 115° | 962   | 1012  | 1244  | 1192  | 1184  | 886  |
| 125° | 694   | 648   | 665   | 674   | 757   | 632  |
| 135° | 506   | 490   | 508   | 477   | 475   | 396  |
| 145° | 416   | 410   | 435   | 429   | 427   | 263  |
| 155° | 364   | 360   | 377   | 377   | 377   | 170  |
| 165° | 341   | 341   | 351   | 351   | 349   | 97   |
| 175° | 337   | 337   | 343   | 343   | 343   | 32   |
| 180° | 341   | 341   | 341   | 341   | 341   |      |



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**CANDELA DISTRIBUTION (FULL):**

|        | 0°      | 22.5°   | 45°     | 67.5°   | 90°     |
|--------|---------|---------|---------|---------|---------|
| 0°     | 13784.3 | 13784.3 | 13784.3 | 13784.3 | 13784.3 |
| 2.5°   | 13791.1 | 13791.1 | 13791.1 | 13791.1 | 13791.1 |
| 5°     | 13797.7 | 13797.7 | 13797.7 | 13797.7 | 13797.7 |
| 7.5°   | 13788.3 | 13788.3 | 13788.3 | 13788.3 | 13788.3 |
| 10°    | 13794.2 | 13794.2 | 13794.2 | 13794.2 | 13794.2 |
| 12.5°  | 13770.6 | 13770.6 | 13770.6 | 13770.6 | 13770.6 |
| 15°    | 13699.2 | 13699.2 | 13699.2 | 13699.2 | 13699.2 |
| 17.5°  | 13581.3 | 13581.3 | 13581.3 | 13581.3 | 13581.3 |
| 20°    | 13380.0 | 13380.0 | 13380.0 | 13380.0 | 13380.0 |
| 22.5°  | 13103.6 | 13103.6 | 13103.6 | 13103.6 | 13103.6 |
| 25°    | 12696.9 | 12696.9 | 12696.9 | 12696.9 | 12696.9 |
| 27.5°  | 12149.9 | 12149.9 | 12149.9 | 12149.9 | 12149.9 |
| 30°    | 11435.6 | 11435.6 | 11435.6 | 11435.6 | 11435.6 |
| 32.5°  | 10590.0 | 10590.0 | 10590.0 | 10590.0 | 10590.0 |
| 35°    | 9503.0  | 9503.0  | 9503.0  | 9503.0  | 9503.0  |
| 37.5°  | 8271.6  | 8271.6  | 8271.6  | 8271.6  | 8271.6  |
| 40°    | 6877.8  | 6877.8  | 6877.8  | 6877.8  | 6877.8  |
| 42.5°  | 5496.1  | 5496.1  | 5496.1  | 5496.1  | 5496.1  |
| 45°    | 4194.2  | 4194.2  | 4194.2  | 4194.2  | 4194.2  |
| 47.5°  | 3157.3  | 3157.3  | 3157.3  | 3157.3  | 3157.3  |
| 50°    | 2435.5  | 2435.5  | 2435.5  | 2435.5  | 2435.5  |
| 52.5°  | 1967.7  | 1967.7  | 1967.7  | 1967.7  | 1967.7  |
| 55°    | 1646.3  | 1646.3  | 1646.3  | 1646.3  | 1646.3  |
| 57.5°  | 1409.7  | 1409.7  | 1409.7  | 1409.7  | 1409.7  |
| 60°    | 1232.9  | 1232.9  | 1232.9  | 1232.9  | 1232.9  |
| 62.5°  | 1096.5  | 1096.5  | 1096.5  | 1096.5  | 1096.5  |
| 65°    | 973.4   | 973.4   | 973.4   | 973.4   | 973.4   |
| 67.5°  | 860.2   | 860.2   | 860.2   | 860.2   | 860.2   |
| 70°    | 745.4   | 745.4   | 745.4   | 745.4   | 745.4   |
| 72.5°  | 629.8   | 629.8   | 629.8   | 629.8   | 629.8   |
| 75°    | 512.4   | 512.4   | 512.4   | 512.4   | 512.4   |
| 77.5°  | 400.7   | 400.7   | 400.7   | 400.7   | 400.7   |
| 80°    | 294.6   | 294.6   | 294.6   | 294.6   | 294.6   |
| 82.5°  | 192.1   | 192.1   | 192.1   | 192.1   | 192.1   |
| 85°    | 101.0   | 101.0   | 101.0   | 101.0   | 101.0   |
| 87.5°  | 28.8    | 28.8    | 28.8    | 28.8    | 28.8    |
| 90°    | 24.9    | 40.3    | 68.9    | 44.0    | 24.9    |
| 92.5°  | 36.4    | 61.4    | 111.1   | 57.5    | 32.6    |
| 95°    | 42.2    | 70.9    | 155.2   | 76.6    | 47.9    |
| 97.5°  | 53.7    | 78.6    | 178.2   | 93.9    | 74.7    |
| 100°   | 70.9    | 92.0    | 277.8   | 114.9   | 99.7    |
| 102.5° | 120.7   | 195.4   | 590.1   | 216.5   | 151.4   |
| 105°   | 208.8   | 412.0   | 1051.8  | 454.1   | 275.9   |
| 107.5° | 362.1   | 737.7   | 1387.2  | 804.7   | 523.1   |
| 110°   | 676.3   | 979.0   | 1454.2  | 1105.5  | 837.2   |



TEST NUMBER: P1436648

CATALOG NUMBER: EHBR1-24-UNV-M-L950-UPL36

**CANDELA DISTRIBUTION (continued):**

|        | 0°    | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|-------|--------|--------|--------|--------|
| 112.5° | 913.9 | 1051.8 | 1392.9 | 1220.4 | 1090.1 |
| 115°   | 961.8 | 1011.6 | 1243.5 | 1191.7 | 1184.1 |
| 117.5° | 929.2 | 923.5  | 1055.7 | 1071.0 | 1143.8 |
| 120°   | 860.3 | 822.0  | 881.3  | 935.0  | 1032.7 |
| 122.5° | 774.0 | 728.1  | 754.9  | 795.1  | 892.9  |
| 125°   | 693.5 | 647.5  | 664.9  | 674.4  | 756.8  |
| 127.5° | 622.7 | 592.0  | 601.6  | 590.1  | 641.8  |
| 130°   | 574.8 | 548.0  | 561.4  | 534.6  | 559.5  |
| 132.5° | 534.6 | 517.3  | 532.6  | 500.0  | 507.7  |
| 135°   | 505.8 | 490.5  | 507.7  | 477.1  | 475.2  |
| 137.5° | 480.9 | 467.5  | 484.7  | 461.7  | 456.0  |
| 140°   | 458.0 | 446.4  | 465.5  | 448.3  | 444.5  |
| 142.5° | 433.0 | 425.4  | 448.3  | 436.9  | 433.0  |
| 145°   | 415.8 | 410.0  | 434.9  | 429.2  | 427.2  |
| 147.5° | 400.4 | 396.6  | 419.6  | 417.7  | 417.7  |
| 150°   | 387.0 | 383.2  | 406.2  | 404.3  | 406.2  |
| 152.5° | 373.7 | 369.8  | 390.9  | 388.9  | 390.9  |
| 155°   | 364.0 | 360.2  | 377.4  | 377.4  | 377.4  |
| 157.5° | 356.3 | 354.5  | 367.8  | 367.8  | 367.8  |
| 160°   | 350.6 | 348.7  | 360.2  | 360.2  | 358.3  |
| 162.5° | 344.9 | 342.9  | 356.3  | 354.5  | 354.5  |
| 165°   | 341.1 | 341.1  | 350.6  | 350.6  | 348.7  |
| 167.5° | 341.1 | 339.1  | 348.7  | 348.7  | 346.8  |
| 170°   | 339.1 | 339.1  | 346.8  | 344.9  | 342.9  |
| 172.5° | 339.1 | 339.1  | 346.8  | 344.9  | 342.9  |
| 175°   | 337.2 | 337.2  | 342.9  | 342.9  | 342.9  |
| 177.5° | 339.1 | 339.1  | 342.9  | 342.9  | 341.1  |
| 180°   | 341.1 | 341.1  | 341.1  | 341.1  | 341.1  |



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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 | 16.38            | 17.46 | 16.95 | 18.02 | 18.63 | 16.38          | 17.46 | 16.95 | 18.02 | 18.63 |
|                 | 3H   | 17.86            | 18.82 | 18.45 | 19.39 | 20.05 | 17.86          | 18.82 | 18.45 | 19.39 | 20.05 |
|                 | 4H   | 18.38            | 19.28 | 18.99 | 19.86 | 20.54 | 18.38          | 19.28 | 18.99 | 19.86 | 20.54 |
|                 | 6H   | 18.70            | 19.52 | 19.32 | 20.12 | 20.81 | 18.70          | 19.52 | 19.32 | 20.12 | 20.81 |
|                 | 8H   | 18.77            | 19.55 | 19.40 | 20.16 | 20.86 | 18.77          | 19.55 | 19.40 | 20.16 | 20.86 |
|                 | 12H  | 18.78            | 19.52 | 19.41 | 20.13 | 20.85 | 18.78          | 19.52 | 19.41 | 20.13 | 20.85 |
| 4H              | 2H   | 16.81            | 17.71 | 17.42 | 18.29 | 18.97 | 16.81          | 17.71 | 17.42 | 18.29 | 18.97 |
|                 | 3H   | 18.50            | 19.24 | 19.12 | 19.86 | 20.56 | 18.50          | 19.24 | 19.12 | 19.86 | 20.56 |
|                 | 4H   | 19.13            | 19.79 | 19.77 | 20.43 | 21.15 | 19.13          | 19.79 | 19.77 | 20.43 | 21.15 |
|                 | 6H   | 19.55            | 20.12 | 20.21 | 20.78 | 21.52 | 19.55          | 20.12 | 20.21 | 20.78 | 21.52 |
|                 | 8H   | 19.64            | 20.18 | 20.31 | 20.83 | 21.58 | 19.64          | 20.18 | 20.31 | 20.83 | 21.58 |
|                 | 12H  | 19.67            | 20.14 | 20.35 | 20.83 | 21.58 | 19.67          | 20.14 | 20.35 | 20.83 | 21.58 |
| 8H              | 4H   | 19.30            | 19.83 | 19.97 | 20.49 | 21.24 | 19.30          | 19.83 | 19.97 | 20.49 | 21.24 |
|                 | 6H   | 19.81            | 20.24 | 20.50 | 20.95 | 21.70 | 19.81          | 20.24 | 20.50 | 20.95 | 21.70 |
|                 | 8H   | 19.95            | 20.34 | 20.66 | 21.05 | 21.81 | 19.95          | 20.34 | 20.66 | 21.05 | 21.81 |
|                 | 12H  | 20.01            | 20.35 | 20.72 | 21.05 | 21.88 | 20.01          | 20.35 | 20.72 | 21.05 | 21.88 |
| 12H             | 4H   | 19.29            | 19.76 | 19.97 | 20.44 | 21.19 | 19.29          | 19.76 | 19.97 | 20.44 | 21.19 |
|                 | 6H   | 19.81            | 20.20 | 20.52 | 20.91 | 21.68 | 19.81          | 20.20 | 20.52 | 20.91 | 21.68 |
|                 | 8H   | 19.98            | 20.32 | 20.69 | 21.02 | 21.85 | 19.98          | 20.32 | 20.69 | 21.02 | 21.85 |

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

Report Prepared for

Cooper Lighting Solutions

Metalux

Report Number: SP1-2506-472-8

Test Date: 08/04/2025

Luminaire Tested: EHBR-60-L950-N

Data in this report applies to families of products including EHBR-60-L950-N

**Test Information**

Test Method: LM-79-2019  
 Report Number: SP1-2506-472-8  
 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-L950-N**  
 Description: Elevate Round Highbay at, 60000 lumens, 5000K 90CRI LEDs with N lens

**Spectral Parameters**

CCT (K): 4901  
 CIE u': 0.2131  
 CIE v': 0.4853  
 Duv: -0.0008  
 CIE x: 0.3477  
 CIE y: 0.3520  
 CIE z: 0.3003  
 Peak Wavelength (nm): 630  
 Dominant Wavelength (nm): 574  
 Purity: 9.953987  
 Rf: 90.7  
 Rg: 100.5

|           |      |      |      |
|-----------|------|------|------|
| CRI (Ra): | 94.3 |      |      |
| R1:       | 95.8 | R9:  | 72.3 |
| R2:       | 96.5 | R10: | 89.1 |
| R3:       | 94.4 | R11: | 94.9 |
| R4:       | 95.3 | R12: | 68.4 |
| R5:       | 94.1 | R13: | 96.4 |
| R6:       | 92.5 | R14: | 96.4 |
| R7:       | 95.5 | R15: | 93.9 |
| R8:       | 90.1 |      |      |



**Test Conditions**

Stabilization Time: 35M  
 Operation Time: 1H 35M  
 Sphere Temperature (°C): 25.0

REPORT NUMBER: SP1-2506-472-8

| 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**



CCT = 4901K  
 CIE x = 0.3477  
 CIE y = 0.3520  
 Duv = -0.0008

Point lies inside the ANSI 5000K 4-step quadrangle

REPORT NUMBER: SP1-2506-472-8

**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               | 221                         | NR                      | 620               | 326                         | NR                      | 750               | 7                           | NR                      | 880               | 0                           | NR                      |
| 365               | 0                           | NR                      | 495               | 250                         | NR                      | 625               | 325                         | NR                      | 755               | 6                           | NR                      | 885               | 0                           | NR                      |
| 370               | 0                           | NR                      | 500               | 284                         | NR                      | 630               | 1000                        | NR                      | 760               | 5                           | NR                      | 890               | 0                           | NR                      |
| 375               | 0                           | NR                      | 505               | 311                         | NR                      | 635               | 643                         | NR                      | 765               | 4                           | NR                      | 895               | 0                           | NR                      |
| 380               | 0                           | NR                      | 510               | 329                         | NR                      | 640               | 206                         | NR                      | 770               | 4                           | NR                      | 900               | 0                           | NR                      |
| 385               | 1                           | NR                      | 515               | 344                         | NR                      | 645               | 199                         | NR                      | 775               | 3                           | NR                      | 905               | 0                           | NR                      |
| 390               | 2                           | NR                      | 520               | 353                         | NR                      | 650               | 172                         | NR                      | 780               | 3                           | NR                      | 910               | 0                           | NR                      |
| 395               | 3                           | NR                      | 525               | 357                         | NR                      | 655               | 143                         | NR                      | 785               | 2                           | NR                      | 915               | 0                           | NR                      |
| 400               | 5                           | NR                      | 530               | 362                         | NR                      | 660               | 122                         | NR                      | 790               | 2                           | NR                      | 920               | 0                           | NR                      |
| 405               | 6                           | NR                      | 535               | 365                         | NR                      | 665               | 102                         | NR                      | 795               | 2                           | NR                      | 925               | 0                           | NR                      |
| 410               | 9                           | NR                      | 540               | 367                         | NR                      | 670               | 94                          | NR                      | 800               | 2                           | NR                      | 930               | 0                           | NR                      |
| 415               | 15                          | NR                      | 545               | 369                         | NR                      | 675               | 76                          | NR                      | 805               | 1                           | NR                      | 935               | 0                           | NR                      |
| 420               | 26                          | NR                      | 550               | 370                         | NR                      | 680               | 65                          | NR                      | 810               | 1                           | NR                      | 940               | 0                           | NR                      |
| 425               | 47                          | NR                      | 555               | 372                         | NR                      | 685               | 56                          | NR                      | 815               | 1                           | NR                      | 945               | 0                           | NR                      |
| 430               | 81                          | NR                      | 560               | 372                         | NR                      | 690               | 48                          | NR                      | 820               | 1                           | NR                      | 950               | 0                           | NR                      |
| 435               | 143                         | NR                      | 565               | 371                         | NR                      | 695               | 41                          | NR                      | 825               | 1                           | NR                      | 955               | 0                           | NR                      |
| 440               | 243                         | NR                      | 570               | 370                         | NR                      | 700               | 35                          | NR                      | 830               | 1                           | NR                      | 960               | 0                           | NR                      |
| 445               | 434                         | NR                      | 575               | 367                         | NR                      | 705               | 30                          | NR                      | 835               | 1                           | NR                      | 965               | 0                           | NR                      |
| 450               | 675                         | NR                      | 580               | 365                         | NR                      | 710               | 25                          | NR                      | 840               | 1                           | NR                      | 970               | 0                           | NR                      |
| 455               | 615                         | NR                      | 585               | 361                         | NR                      | 715               | 22                          | NR                      | 845               | 0                           | NR                      | 975               | 0                           | NR                      |
| 460               | 418                         | NR                      | 590               | 356                         | NR                      | 720               | 19                          | NR                      | 850               | 0                           | NR                      | 980               | 0                           | NR                      |
| 465               | 344                         | NR                      | 595               | 348                         | NR                      | 725               | 16                          | NR                      | 855               | 0                           | NR                      | 985               | 0                           | NR                      |
| 470               | 272                         | NR                      | 600               | 343                         | NR                      | 730               | 13                          | NR                      | 860               | 0                           | NR                      | 990               | 0                           | NR                      |
| 475               | 206                         | NR                      | 605               | 337                         | NR                      | 735               | 11                          | NR                      | 865               | 0                           | NR                      | 995               | 0                           | NR                      |
| 480               | 190                         | NR                      | 610               | 362                         | NR                      | 740               | 10                          | NR                      | 870               | 0                           | NR                      | 1000              | 0                           | NR                      |
| 485               | 202                         | NR                      | 615               | 381                         | NR                      | 745               | 8                           | NR                      | 875               | 0                           | NR                      |                   |                             |                         |

REPORT NUMBER: SP1-2506-472-8

**Scotopic Flux vs. Wavelength**



**Scotopic Lumens: NR**

**S/P: 2.04**

| $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>$(\phi/\text{nm})$ | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>$(\phi/\text{nm})$ | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>$(\phi/\text{nm})$ | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>$(\phi/\text{nm})$ | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>$(\phi/\text{nm})$ |
|-------------------|--|------------------------------|-------------------|--|------------------------------|-------------------|--|------------------------------|-------------------|--|------------------------------|-------------------|--|------------------------------|
| 360               | 0                                      | NR                           | 490               | 221                                    | NR                           | 620               | 326                                    | NR                           | 750               | 7                                      | NR                           | 880               | 0                                      | NR                           |
| 365               | 0                                      | NR                           | 495               | 250                                    | NR                           | 625               | 325                                    | NR                           | 755               | 6                                      | NR                           | 885               | 0                                      | NR                           |
| 370               | 0                                      | NR                           | 500               | 284                                    | NR                           | 630               | 1000                                   | NR                           | 760               | 5                                      | NR                           | 890               | 0                                      | NR                           |
| 375               | 0                                      | NR                           | 505               | 311                                    | NR                           | 635               | 643                                    | NR                           | 765               | 4                                      | NR                           | 895               | 0                                      | NR                           |
| 380               | 0                                      | NR                           | 510               | 329                                    | NR                           | 640               | 206                                    | NR                           | 770               | 4                                      | NR                           | 900               | 0                                      | NR                           |
| 385               | 1                                      | NR                           | 515               | 344                                    | NR                           | 645               | 199                                    | NR                           | 775               | 3                                      | NR                           | 905               | 0                                      | NR                           |
| 390               | 2                                      | NR                           | 520               | 353                                    | NR                           | 650               | 172                                    | NR                           | 780               | 3                                      | NR                           | 910               | 0                                      | NR                           |
| 395               | 3                                      | NR                           | 525               | 357                                    | NR                           | 655               | 143                                    | NR                           | 785               | 2                                      | NR                           | 915               | 0                                      | NR                           |
| 400               | 5                                      | NR                           | 530               | 362                                    | NR                           | 660               | 122                                    | NR                           | 790               | 2                                      | NR                           | 920               | 0                                      | NR                           |
| 405               | 6                                      | NR                           | 535               | 365                                    | NR                           | 665               | 102                                    | NR                           | 795               | 2                                      | NR                           | 925               | 0                                      | NR                           |
| 410               | 9                                      | NR                           | 540               | 367                                    | NR                           | 670               | 94                                     | NR                           | 800               | 2                                      | NR                           | 930               | 0                                      | NR                           |
| 415               | 15                                     | NR                           | 545               | 369                                    | NR                           | 675               | 76                                     | NR                           | 805               | 1                                      | NR                           | 935               | 0                                      | NR                           |
| 420               | 26                                     | NR                           | 550               | 370                                    | NR                           | 680               | 65                                     | NR                           | 810               | 1                                      | NR                           | 940               | 0                                      | NR                           |
| 425               | 47                                     | NR                           | 555               | 372                                    | NR                           | 685               | 56                                     | NR                           | 815               | 1                                      | NR                           | 945               | 0                                      | NR                           |
| 430               | 81                                     | NR                           | 560               | 372                                    | NR                           | 690               | 48                                     | NR                           | 820               | 1                                      | NR                           | 950               | 0                                      | NR                           |
| 435               | 143                                    | NR                           | 565               | 371                                    | NR                           | 695               | 41                                     | NR                           | 825               | 1                                      | NR                           | 955               | 0                                      | NR                           |
| 440               | 243                                    | NR                           | 570               | 370                                    | NR                           | 700               | 35                                     | NR                           | 830               | 1                                      | NR                           | 960               | 0                                      | NR                           |
| 445               | 434                                    | NR                           | 575               | 367                                    | NR                           | 705               | 30                                     | NR                           | 835               | 1                                      | NR                           | 965               | 0                                      | NR                           |
| 450               | 675                                    | NR                           | 580               | 365                                    | NR                           | 710               | 25                                     | NR                           | 840               | 1                                      | NR                           | 970               | 0                                      | NR                           |
| 455               | 615                                    | NR                           | 585               | 361                                    | NR                           | 715               | 22                                     | NR                           | 845               | 0                                      | NR                           | 975               | 0                                      | NR                           |
| 460               | 418                                    | NR                           | 590               | 356                                    | NR                           | 720               | 19                                     | NR                           | 850               | 0                                      | NR                           | 980               | 0                                      | NR                           |
| 465               | 344                                    | NR                           | 595               | 348                                    | NR                           | 725               | 16                                     | NR                           | 855               | 0                                      | NR                           | 985               | 0                                      | NR                           |
| 470               | 272                                    | NR                           | 600               | 343                                    | NR                           | 730               | 13                                     | NR                           | 860               | 0                                      | NR                           | 990               | 0                                      | NR                           |
| 475               | 206                                    | NR                           | 605               | 337                                    | NR                           | 735               | 11                                     | NR                           | 865               | 0                                      | NR                           | 995               | 0                                      | NR                           |
| 480               | 190                                    | NR                           | 610               | 362                                    | NR                           | 740               | 10                                     | NR                           | 870               | 0                                      | NR                           | 1000              | 0                                      | NR                           |
| 485               | 202                                    | NR                           | 615               | 381                                    | NR                           | 745               | 8                                      | NR                           | 875               | 0                                      | NR                           |                   |  |                              |

REPORT NUMBER: SP1-2506-472-8

Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 4.41

| 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    | 221                      | NR            | 620    | 326                      | NR            | 750    | 7                        | NR            | 880    | 0                        | NR            |
| 365    | 0                        | NR            | 495    | 250                      | NR            | 625    | 325                      | NR            | 755    | 6                        | NR            | 885    | 0                        | NR            |
| 370    | 0                        | NR            | 500    | 284                      | NR            | 630    | 1000                     | NR            | 760    | 5                        | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 311                      | NR            | 635    | 643                      | NR            | 765    | 4                        | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 329                      | NR            | 640    | 206                      | NR            | 770    | 4                        | NR            | 900    | 0                        | NR            |
| 385    | 1                        | NR            | 515    | 344                      | NR            | 645    | 199                      | NR            | 775    | 3                        | NR            | 905    | 0                        | NR            |
| 390    | 2                        | NR            | 520    | 353                      | NR            | 650    | 172                      | NR            | 780    | 3                        | NR            | 910    | 0                        | NR            |
| 395    | 3                        | NR            | 525    | 357                      | NR            | 655    | 143                      | NR            | 785    | 2                        | NR            | 915    | 0                        | NR            |
| 400    | 5                        | NR            | 530    | 362                      | NR            | 660    | 122                      | NR            | 790    | 2                        | NR            | 920    | 0                        | NR            |
| 405    | 6                        | NR            | 535    | 365                      | NR            | 665    | 102                      | NR            | 795    | 2                        | NR            | 925    | 0                        | NR            |
| 410    | 9                        | NR            | 540    | 367                      | NR            | 670    | 94                       | NR            | 800    | 2                        | NR            | 930    | 0                        | NR            |
| 415    | 15                       | NR            | 545    | 369                      | NR            | 675    | 76                       | NR            | 805    | 1                        | NR            | 935    | 0                        | NR            |
| 420    | 26                       | NR            | 550    | 370                      | NR            | 680    | 65                       | NR            | 810    | 1                        | NR            | 940    | 0                        | NR            |
| 425    | 47                       | NR            | 555    | 372                      | NR            | 685    | 56                       | NR            | 815    | 1                        | NR            | 945    | 0                        | NR            |
| 430    | 81                       | NR            | 560    | 372                      | NR            | 690    | 48                       | NR            | 820    | 1                        | NR            | 950    | 0                        | NR            |
| 435    | 143                      | NR            | 565    | 371                      | NR            | 695    | 41                       | NR            | 825    | 1                        | NR            | 955    | 0                        | NR            |
| 440    | 243                      | NR            | 570    | 370                      | NR            | 700    | 35                       | NR            | 830    | 1                        | NR            | 960    | 0                        | NR            |
| 445    | 434                      | NR            | 575    | 367                      | NR            | 705    | 30                       | NR            | 835    | 1                        | NR            | 965    | 0                        | NR            |
| 450    | 675                      | NR            | 580    | 365                      | NR            | 710    | 25                       | NR            | 840    | 1                        | NR            | 970    | 0                        | NR            |
| 455    | 615                      | NR            | 585    | 361                      | NR            | 715    | 22                       | NR            | 845    | 0                        | NR            | 975    | 0                        | NR            |
| 460    | 418                      | NR            | 590    | 356                      | NR            | 720    | 19                       | NR            | 850    | 0                        | NR            | 980    | 0                        | NR            |
| 465    | 344                      | NR            | 595    | 348                      | NR            | 725    | 16                       | NR            | 855    | 0                        | NR            | 985    | 0                        | NR            |
| 470    | 272                      | NR            | 600    | 343                      | NR            | 730    | 13                       | NR            | 860    | 0                        | NR            | 990    | 0                        | NR            |
| 475    | 206                      | NR            | 605    | 337                      | NR            | 735    | 11                       | NR            | 865    | 0                        | NR            | 995    | 0                        | NR            |
| 480    | 190                      | NR            | 610    | 362                      | NR            | 740    | 10                       | NR            | 870    | 0                        | NR            | 1000   | 0                        | NR            |
| 485    | 202                      | NR            | 615    | 381                      | NR            | 745    | 8                        | NR            | 875    | 0                        | NR            |        |                          |               |

**Summary**

$R_f = 90.7$   
 $R_g = 100.5$   
 CIE  $R_a = 94.3$   
 $R_9 = 72.3$

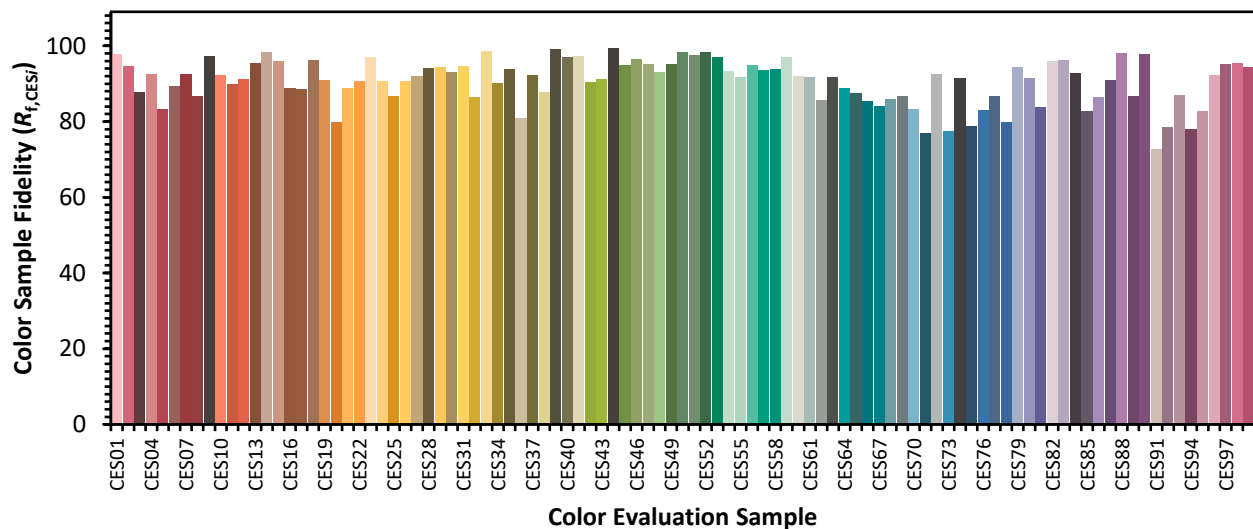


**Color Vector Graphics**



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 91 | CES51 = 98 | CES76 = 83 |
| CES02 = 61 | CES27 = 92 | CES52 = 98 | CES77 = 87 |
| CES03 = 31 | CES28 = 94 | CES53 = 97 | CES78 = 80 |
| CES04 = 69 | CES29 = 94 | CES54 = 93 | CES79 = 94 |
| CES05 = 48 | CES30 = 93 | CES55 = 92 | CES80 = 91 |
| CES06 = 50 | CES31 = 95 | CES56 = 95 | CES81 = 84 |
| CES07 = 41 | CES32 = 86 | CES57 = 94 | CES82 = 96 |
| CES08 = 40 | CES33 = 99 | CES58 = 94 | CES83 = 96 |
| CES09 = 29 | CES34 = 90 | CES59 = 97 | CES84 = 93 |
| CES10 = 73 | CES35 = 94 | CES60 = 92 | CES85 = 83 |
| CES11 = 56 | CES36 = 81 | CES61 = 92 | CES86 = 86 |
| CES12 = 62 | CES37 = 92 | CES62 = 86 | CES87 = 91 |
| CES13 = 43 | CES38 = 88 | CES63 = 92 | CES88 = 98 |
| CES14 = 74 | CES39 = 99 | CES64 = 89 | CES89 = 87 |
| CES15 = 71 | CES40 = 97 | CES65 = 88 | CES90 = 98 |
| CES16 = 47 | CES41 = 97 | CES66 = 85 | CES91 = 73 |
| CES17 = 48 | CES42 = 90 | CES67 = 84 | CES92 = 79 |
| CES18 = 56 | CES43 = 91 | CES68 = 86 | CES93 = 87 |
| CES19 = 70 | CES44 = 99 | CES69 = 87 | CES94 = 78 |
| CES20 = 65 | CES45 = 95 | CES70 = 83 | CES95 = 83 |
| CES21 = 85 | CES46 = 97 | CES71 = 77 | CES96 = 92 |
| CES22 = 77 | CES47 = 95 | CES72 = 92 | CES97 = 95 |
| CES23 = 91 | CES48 = 93 | CES73 = 77 | CES98 = 95 |
| CES24 = 90 | CES49 = 95 | CES74 = 92 | CES99 = 94 |
| CES25 = 70 | CES50 = 98 | CES75 = 79 |            |



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)