

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: P1432642

Luminaire Tested: EHBR1-24-UNV-W-L835

Issue Date: 3/13/2026

**Test Information**

Test Method: LM-79-2019  
Report Number: P1432642  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-2601-654-2)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/13/2026  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: METALUX  
Catalog Number: EHBR1-24-UNV-W-L835  
Description: Elevate Round Highbay at, 24000 lumens, 3500K 80CRI LEDs with W lens  
Light Source: -  
Ballast/Driver: -

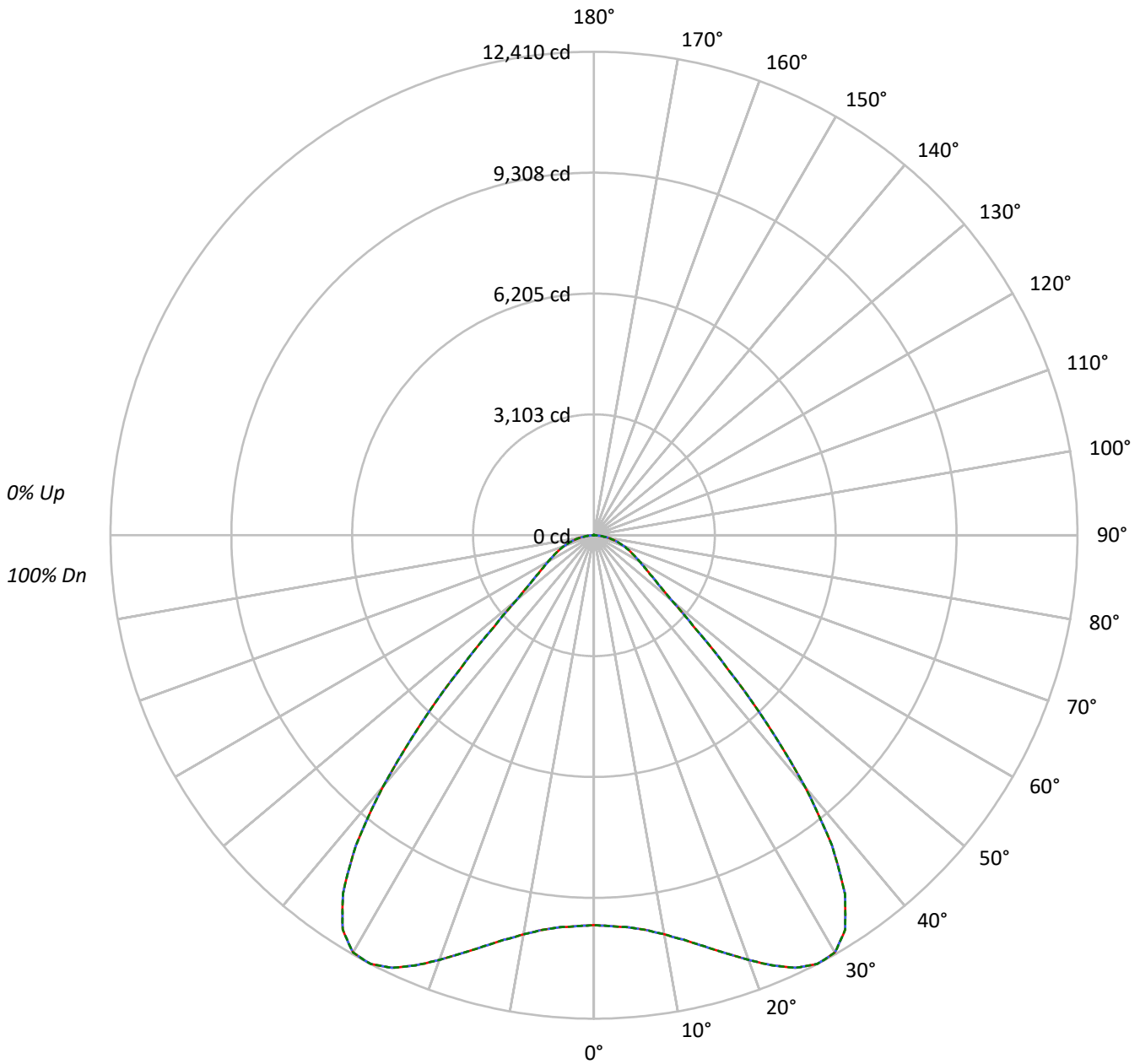
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 23934.5 lumens  
Efficiency: N/A  
Efficacy: 186.6 lumens/watt  
Spacing Criteria (0/90/45): 1.54 / 1.54 / 1.31  
Luminous Opening: Circular (Dia: 1.71' x H: 0')  
CIE Type: Direct

Input Watts (W): 128.3  
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: P1432642  
CATALOG NUMBER: EHBR1-24-UNV-W-L835

### Luminous Intensity Polar Plot



0% Up  
100% Dn

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



TEST NUMBER: P1432642  
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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   | 111 | 108 | 104 | 101 | 109 | 105 | 102 | 100 | 101 | 99  | 96  | 97  | 95  | 94  | 94  | 92  | 91  | 89  |
| 2   | 103 | 97  | 91  | 87  | 101 | 95  | 90  | 86  | 92  | 88  | 84  | 89  | 85  | 82  | 86  | 83  | 80  | 78  |
| 3   | 96  | 88  | 81  | 76  | 94  | 86  | 80  | 75  | 83  | 78  | 74  | 81  | 76  | 72  | 78  | 74  | 71  | 69  |
| 4   | 89  | 79  | 72  | 67  | 87  | 78  | 71  | 66  | 76  | 70  | 65  | 74  | 69  | 64  | 72  | 67  | 64  | 62  |
| 5   | 83  | 72  | 65  | 59  | 81  | 71  | 64  | 59  | 69  | 63  | 58  | 67  | 62  | 58  | 66  | 61  | 57  | 55  |
| 6   | 78  | 66  | 58  | 53  | 76  | 65  | 58  | 53  | 64  | 57  | 52  | 62  | 56  | 52  | 60  | 55  | 51  | 50  |
| 7   | 72  | 61  | 53  | 48  | 71  | 60  | 53  | 47  | 58  | 52  | 47  | 57  | 51  | 47  | 56  | 51  | 47  | 45  |
| 8   | 68  | 56  | 48  | 43  | 66  | 55  | 48  | 43  | 54  | 47  | 43  | 53  | 47  | 43  | 52  | 46  | 42  | 41  |
| 9   | 64  | 52  | 44  | 39  | 62  | 51  | 44  | 39  | 50  | 43  | 39  | 49  | 43  | 39  | 48  | 43  | 39  | 37  |
| 10  | 60  | 48  | 41  | 36  | 59  | 47  | 40  | 36  | 46  | 40  | 36  | 45  | 40  | 35  | 45  | 39  | 35  | 34  |

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

|     | 0°    | 45°   | 90°   |
|-----|-------|-------|-------|
| 0°  | 46995 | 46995 | 46995 |
| 5°  | 47616 | 47616 | 47616 |
| 10° | 49594 | 49594 | 49594 |
| 15° | 53092 | 53092 | 53092 |
| 20° | 57956 | 57956 | 57956 |
| 25° | 63473 | 63473 | 63473 |
| 30° | 67062 | 67062 | 67062 |
| 35° | 64393 | 64393 | 64393 |
| 40° | 51598 | 51598 | 51598 |
| 45° | 32252 | 32252 | 32252 |
| 50° | 18924 | 18924 | 18924 |
| 55° | 14550 | 14550 | 14550 |
| 60° | 12737 | 12737 | 12737 |
| 65° | 11818 | 11818 | 11818 |
| 70° | 11292 | 11292 | 11292 |
| 75° | 10584 | 10584 | 10584 |
| 80° | 9601  | 9601  | 9601  |
| 85° | 7366  | 7366  | 7366  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
 Vertical Angle: 45°  
 Luminance: 32252 cd/sqm



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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 973.6   | 4.1       |
| 10°-20°   | 3121.4  | 13.0      |
| 20°-30°   | 5634.3  | 23.5      |
| 30°-40°   | 6808.5  | 28.4      |
| 40°-50°   | 3889.9  | 16.3      |
| 50°-60°   | 1647.5  | 6.9       |
| 60°-70°   | 1062.7  | 4.4       |
| 70°-80°   | 617.9   | 2.6       |
| 80°-90°   | 163.5   | 0.7       |
| 90°-100°  | 0.8     | 0.0       |
| 100°-110° | 0.9     | 0.0       |
| 110°-120° | 1.2     | 0.0       |
| 120°-130° | 1.3     | 0.0       |
| 130°-140° | 2.5     | 0.0       |
| 140°-150° | 3.2     | 0.0       |
| 150°-160° | 2.7     | 0.0       |
| 160°-170° | 1.9     | 0.0       |
| 170°-180° | 0.7     | 0.0       |
| 0°-30°    | 9729.3  | 40.6      |
| 0°-40°    | 16537.8 | 69.1      |
| 0°-60°    | 22075.2 | 92.2      |
| 0°-90°    | 23919.3 | 99.9      |
| 90°-120°  | 2.9     | 0.0       |
| 90°-150°  | 9.9     | 0.0       |
| 90°-180°  | 15.0    | 0.1       |
| 0°-180°   | 23934.5 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°    | 22.5° | 45°   | 67.5° | 90°   | Flux |
|------|-------|-------|-------|-------|-------|------|
| 0°   | 10007 | 10007 | 10007 | 10007 | 10007 |      |
| 5°   | 10101 | 10101 | 10101 | 10101 | 10101 | 974  |
| 15°  | 10920 | 10920 | 10920 | 10920 | 10920 | 3121 |
| 25°  | 12250 | 12250 | 12250 | 12250 | 12250 | 5634 |
| 35°  | 11232 | 11232 | 11232 | 11232 | 11232 | 6808 |
| 45°  | 4856  | 4856  | 4856  | 4856  | 4856  | 3890 |
| 55°  | 1777  | 1777  | 1777  | 1777  | 1777  | 1647 |
| 65°  | 1064  | 1064  | 1064  | 1064  | 1064  | 1063 |
| 75°  | 583   | 583   | 583   | 583   | 583   | 618  |
| 85°  | 137   | 137   | 137   | 137   | 137   | 157  |
| 90°  | 1     | 1     | 1     | 1     | 1     | 6    |
| 95°  | 1     | 1     | 1     | 1     | 1     | 1    |
| 105° | 1     | 1     | 1     | 1     | 1     | 1    |
| 115° | 1     | 1     | 1     | 1     | 1     | 1    |
| 125° | 2     | 2     | 2     | 2     | 2     | 1    |
| 135° | 3     | 3     | 3     | 3     | 3     | 2    |
| 145° | 5     | 5     | 5     | 5     | 5     | 3    |
| 155° | 6     | 6     | 6     | 6     | 6     | 3    |
| 165° | 7     | 7     | 7     | 7     | 7     | 2    |
| 175° | 8     | 8     | 8     | 8     | 8     | 1    |
| 180° | 8     | 8     | 8     | 8     | 8     |      |



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**CANDELA DISTRIBUTION (FULL):**

|        | 0°      | 22.5°   | 45°     | 67.5°   | 90°     |
|--------|---------|---------|---------|---------|---------|
| 0°     | 10007.2 | 10007.2 | 10007.2 | 10007.2 | 10007.2 |
| 2.5°   | 10040.8 | 10040.8 | 10040.8 | 10040.8 | 10040.8 |
| 5°     | 10100.8 | 10100.8 | 10100.8 | 10100.8 | 10100.8 |
| 7.5°   | 10218.7 | 10218.7 | 10218.7 | 10218.7 | 10218.7 |
| 10°    | 10400.2 | 10400.2 | 10400.2 | 10400.2 | 10400.2 |
| 12.5°  | 10636.1 | 10636.1 | 10636.1 | 10636.1 | 10636.1 |
| 15°    | 10920.4 | 10920.4 | 10920.4 | 10920.4 | 10920.4 |
| 17.5°  | 11245.8 | 11245.8 | 11245.8 | 11245.8 | 11245.8 |
| 20°    | 11597.1 | 11597.1 | 11597.1 | 11597.1 | 11597.1 |
| 22.5°  | 11951.0 | 11951.0 | 11951.0 | 11951.0 | 11951.0 |
| 25°    | 12249.7 | 12249.7 | 12249.7 | 12249.7 | 12249.7 |
| 27.5°  | 12410.3 | 12410.3 | 12410.3 | 12410.3 | 12410.3 |
| 30°    | 12367.2 | 12367.2 | 12367.2 | 12367.2 | 12367.2 |
| 32.5°  | 12000.5 | 12000.5 | 12000.5 | 12000.5 | 12000.5 |
| 35°    | 11232.2 | 11232.2 | 11232.2 | 11232.2 | 11232.2 |
| 37.5°  | 10034.0 | 10034.0 | 10034.0 | 10034.0 | 10034.0 |
| 40°    | 8416.9  | 8416.9  | 8416.9  | 8416.9  | 8416.9  |
| 42.5°  | 6587.8  | 6587.8  | 6587.8  | 6587.8  | 6587.8  |
| 45°    | 4856.3  | 4856.3  | 4856.3  | 4856.3  | 4856.3  |
| 47.5°  | 3471.0  | 3471.0  | 3471.0  | 3471.0  | 3471.0  |
| 50°    | 2590.3  | 2590.3  | 2590.3  | 2590.3  | 2590.3  |
| 52.5°  | 2097.3  | 2097.3  | 2097.3  | 2097.3  | 2097.3  |
| 55°    | 1777.1  | 1777.1  | 1777.1  | 1777.1  | 1777.1  |
| 57.5°  | 1543.2  | 1543.2  | 1543.2  | 1543.2  | 1543.2  |
| 60°    | 1356.1  | 1356.1  | 1356.1  | 1356.1  | 1356.1  |
| 62.5°  | 1200.2  | 1200.2  | 1200.2  | 1200.2  | 1200.2  |
| 65°    | 1063.5  | 1063.5  | 1063.5  | 1063.5  | 1063.5  |
| 67.5°  | 942.8   | 942.8   | 942.8   | 942.8   | 942.8   |
| 70°    | 822.4   | 822.4   | 822.4   | 822.4   | 822.4   |
| 72.5°  | 702.5   | 702.5   | 702.5   | 702.5   | 702.5   |
| 75°    | 583.3   | 583.3   | 583.3   | 583.3   | 583.3   |
| 77.5°  | 468.6   | 468.6   | 468.6   | 468.6   | 468.6   |
| 80°    | 355.0   | 355.0   | 355.0   | 355.0   | 355.0   |
| 82.5°  | 243.5   | 243.5   | 243.5   | 243.5   | 243.5   |
| 85°    | 136.7   | 136.7   | 136.7   | 136.7   | 136.7   |
| 87.5°  | 43.2    | 43.2    | 43.2    | 43.2    | 43.2    |
| 90°    | 0.8     | 0.8     | 0.8     | 0.8     | 0.8     |
| 92.5°  | 0.4     | 0.4     | 0.4     | 0.4     | 0.4     |
| 95°    | 0.8     | 0.8     | 0.8     | 0.8     | 0.8     |
| 97.5°  | 0.8     | 0.8     | 0.8     | 0.8     | 0.8     |
| 100°   | 0.8     | 0.8     | 0.8     | 0.8     | 0.8     |
| 102.5° | 0.8     | 0.8     | 0.8     | 0.8     | 0.8     |
| 105°   | 0.8     | 0.8     | 0.8     | 0.8     | 0.8     |
| 107.5° | 0.8     | 0.8     | 0.8     | 0.8     | 0.8     |
| 110°   | 1.2     | 1.2     | 1.2     | 1.2     | 1.2     |



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 CATALOG NUMBER: EHBR1-24-UNV-W-L835

**CANDELA DISTRIBUTION (continued):**

|        | 0°  | 22.5° | 45° | 67.5° | 90° |
|--------|-----|-------|-----|-------|-----|
| 112.5° | 1.2 | 1.2   | 1.2 | 1.2   | 1.2 |
| 115°   | 1.2 | 1.2   | 1.2 | 1.2   | 1.2 |
| 117.5° | 1.2 | 1.2   | 1.2 | 1.2   | 1.2 |
| 120°   | 1.2 | 1.2   | 1.2 | 1.2   | 1.2 |
| 122.5° | 1.2 | 1.2   | 1.2 | 1.2   | 1.2 |
| 125°   | 1.6 | 1.6   | 1.6 | 1.6   | 1.6 |
| 127.5° | 1.6 | 1.6   | 1.6 | 1.6   | 1.6 |
| 130°   | 2.0 | 2.0   | 2.0 | 2.0   | 2.0 |
| 132.5° | 2.8 | 2.8   | 2.8 | 2.8   | 2.8 |
| 135°   | 3.2 | 3.2   | 3.2 | 3.2   | 3.2 |
| 137.5° | 3.6 | 3.6   | 3.6 | 3.6   | 3.6 |
| 140°   | 4.4 | 4.4   | 4.4 | 4.4   | 4.4 |
| 142.5° | 4.8 | 4.8   | 4.8 | 4.8   | 4.8 |
| 145°   | 5.2 | 5.2   | 5.2 | 5.2   | 5.2 |
| 147.5° | 5.6 | 5.6   | 5.6 | 5.6   | 5.6 |
| 150°   | 5.6 | 5.6   | 5.6 | 5.6   | 5.6 |
| 152.5° | 5.6 | 5.6   | 5.6 | 5.6   | 5.6 |
| 155°   | 6.0 | 6.0   | 6.0 | 6.0   | 6.0 |
| 157.5° | 6.0 | 6.0   | 6.0 | 6.0   | 6.0 |
| 160°   | 6.4 | 6.4   | 6.4 | 6.4   | 6.4 |
| 162.5° | 6.8 | 6.8   | 6.8 | 6.8   | 6.8 |
| 165°   | 6.8 | 6.8   | 6.8 | 6.8   | 6.8 |
| 167.5° | 6.8 | 6.8   | 6.8 | 6.8   | 6.8 |
| 170°   | 6.8 | 6.8   | 6.8 | 6.8   | 6.8 |
| 172.5° | 7.2 | 7.2   | 7.2 | 7.2   | 7.2 |
| 175°   | 7.6 | 7.6   | 7.6 | 7.6   | 7.6 |
| 177.5° | 7.6 | 7.6   | 7.6 | 7.6   | 7.6 |
| 180°   | 8.0 | 8.0   | 8.0 | 8.0   | 8.0 |



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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 | 18.33            | 19.65 | 18.70 | 19.96 | 20.28 | 18.33          | 19.65 | 18.70 | 19.96 | 20.28 |
|                 | 3H   | 19.92            | 21.09 | 20.31 | 21.42 | 21.79 | 19.92          | 21.09 | 20.31 | 21.42 | 21.79 |
|                 | 4H   | 20.55            | 21.64 | 20.95 | 21.99 | 22.37 | 20.55          | 21.64 | 20.95 | 21.99 | 22.37 |
|                 | 6H   | 21.01            | 22.01 | 21.43 | 22.38 | 22.78 | 21.01          | 22.01 | 21.43 | 22.38 | 22.78 |
|                 | 8H   | 21.15            | 22.10 | 21.58 | 22.49 | 22.90 | 21.15          | 22.10 | 21.58 | 22.49 | 22.90 |
|                 | 12H  | 21.23            | 22.13 | 21.66 | 22.51 | 22.95 | 21.23          | 22.13 | 21.66 | 22.51 | 22.95 |
| 4H              | 2H   | 18.83            | 19.91 | 19.23 | 20.27 | 20.65 | 18.83          | 19.91 | 19.23 | 20.27 | 20.65 |
|                 | 3H   | 20.66            | 21.55 | 21.07 | 21.96 | 22.36 | 20.66          | 21.55 | 21.07 | 21.96 | 22.36 |
|                 | 4H   | 21.41            | 22.21 | 21.85 | 22.63 | 23.08 | 21.41          | 22.21 | 21.85 | 22.63 | 23.08 |
|                 | 6H   | 22.00            | 22.69 | 22.47 | 23.14 | 23.61 | 22.00          | 22.69 | 22.47 | 23.14 | 23.61 |
|                 | 8H   | 22.19            | 22.83 | 22.66 | 23.28 | 23.75 | 22.19          | 22.83 | 22.66 | 23.28 | 23.75 |
|                 | 12H  | 22.29            | 22.86 | 22.78 | 23.35 | 23.82 | 22.29          | 22.86 | 22.78 | 23.35 | 23.82 |
| 8H              | 4H   | 21.67            | 22.31 | 22.14 | 22.76 | 23.24 | 21.67          | 22.31 | 22.14 | 22.76 | 23.24 |
|                 | 6H   | 22.38            | 22.91 | 22.89 | 23.41 | 23.89 | 22.38          | 22.91 | 22.89 | 23.41 | 23.89 |
|                 | 8H   | 22.63            | 23.11 | 23.16 | 23.62 | 24.12 | 22.63          | 23.11 | 23.16 | 23.62 | 24.12 |
|                 | 12H  | 22.81            | 23.22 | 23.32 | 23.72 | 24.29 | 22.81          | 23.22 | 23.32 | 23.72 | 24.29 |
| 12H             | 4H   | 21.68            | 22.25 | 22.17 | 22.74 | 23.21 | 21.68          | 22.25 | 22.17 | 22.74 | 23.21 |
|                 | 6H   | 22.42            | 22.89 | 22.94 | 23.41 | 23.90 | 22.42          | 22.89 | 22.94 | 23.41 | 23.90 |
|                 | 8H   | 22.72            | 23.14 | 23.24 | 23.64 | 24.21 | 22.72          | 23.14 | 23.24 | 23.64 | 24.21 |

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

Report Prepared for

Cooper Lighting Solutions

Metalux

Report Number: SP1-2506-472-3

Test Date: 07/31/2025

Luminaire Tested: EHBR-60-L835-N

Data in this report applies to families of products including EHBR-60-L835-N

**Test Information**

Test Method: LM-79-2019  
 Report Number: SP1-2506-472-3  
 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-L835-N**  
 Description: Elevate Round Highbay at, 60000 lumens, 3500K 80CRI LEDs with N lens

**Spectral Parameters**

CCT (K): 3468  
 CIE u': 0.2375  
 CIE v': 0.5091  
 Duv: -0.0021  
 CIE x: 0.4049  
 CIE y: 0.3856  
 CIE z: 0.2095  
 Peak Wavelength (nm): 630  
 Dominant Wavelength (nm): 581  
 Purity: 37.24544  
 Rf: 80.1  
 Rg: 101

|           |      |      |      |
|-----------|------|------|------|
| CRI (Ra): | 82.1 |      |      |
| R1:       | 82.9 | R9:  | 27.6 |
| R2:       | 85.6 | R10: | 63.8 |
| R3:       | 85.9 | R11: | 81.2 |
| R4:       | 82.8 | R12: | 57.2 |
| R5:       | 81.0 | R13: | 82.6 |
| R6:       | 79.7 | R14: | 91.0 |
| R7:       | 86.5 | R15: | 79.4 |
| R8:       | 72.1 |      |      |



**Test Conditions**

Stabilization Time: 39M  
 Operation Time: 1H 39M  
 Sphere Temperature (°C): 25.0

REPORT NUMBER: SP1-2506-472-3

| 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 4-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               | 60                          | NR                      | 620               | 327                         | NR                      | 750               | 7                           | NR                      | 880               | 0                           | NR                      |
| 365               | 0                           | NR                      | 495               | 82                          | NR                      | 625               | 322                         | NR                      | 755               | 6                           | NR                      | 885               | 0                           | NR                      |
| 370               | 0                           | NR                      | 500               | 114                         | NR                      | 630               | 1000                        | NR                      | 760               | 5                           | NR                      | 890               | 0                           | NR                      |
| 375               | 0                           | NR                      | 505               | 152                         | NR                      | 635               | 645                         | NR                      | 765               | 4                           | NR                      | 895               | 0                           | NR                      |
| 380               | 0                           | NR                      | 510               | 189                         | NR                      | 640               | 197                         | NR                      | 770               | 4                           | NR                      | 900               | 0                           | NR                      |
| 385               | 1                           | NR                      | 515               | 222                         | NR                      | 645               | 189                         | NR                      | 775               | 3                           | NR                      | 905               | 0                           | NR                      |
| 390               | 2                           | NR                      | 520               | 248                         | NR                      | 650               | 163                         | NR                      | 780               | 3                           | NR                      | 910               | 0                           | NR                      |
| 395               | 3                           | NR                      | 525               | 268                         | NR                      | 655               | 134                         | NR                      | 785               | 2                           | NR                      | 915               | 0                           | NR                      |
| 400               | 4                           | NR                      | 530               | 283                         | NR                      | 660               | 113                         | NR                      | 790               | 2                           | NR                      | 920               | 0                           | NR                      |
| 405               | 6                           | NR                      | 535               | 294                         | NR                      | 665               | 94                          | NR                      | 795               | 2                           | NR                      | 925               | 0                           | NR                      |
| 410               | 9                           | NR                      | 540               | 305                         | NR                      | 670               | 87                          | NR                      | 800               | 2                           | NR                      | 930               | 0                           | NR                      |
| 415               | 18                          | NR                      | 545               | 314                         | NR                      | 675               | 70                          | NR                      | 805               | 1                           | NR                      | 935               | 0                           | NR                      |
| 420               | 34                          | NR                      | 550               | 323                         | NR                      | 680               | 60                          | NR                      | 810               | 1                           | NR                      | 940               | 0                           | NR                      |
| 425               | 62                          | NR                      | 555               | 335                         | NR                      | 685               | 51                          | NR                      | 815               | 1                           | NR                      | 945               | 0                           | NR                      |
| 430               | 102                         | NR                      | 560               | 346                         | NR                      | 690               | 44                          | NR                      | 820               | 1                           | NR                      | 950               | 0                           | NR                      |
| 435               | 159                         | NR                      | 565               | 356                         | NR                      | 695               | 38                          | NR                      | 825               | 1                           | NR                      | 955               | 0                           | NR                      |
| 440               | 241                         | NR                      | 570               | 364                         | NR                      | 700               | 32                          | NR                      | 830               | 1                           | NR                      | 960               | 0                           | NR                      |
| 445               | 363                         | NR                      | 575               | 371                         | NR                      | 705               | 28                          | NR                      | 835               | 1                           | NR                      | 965               | 0                           | NR                      |
| 450               | 389                         | NR                      | 580               | 375                         | NR                      | 710               | 24                          | NR                      | 840               | 1                           | NR                      | 970               | 0                           | NR                      |
| 455               | 245                         | NR                      | 585               | 375                         | NR                      | 715               | 20                          | NR                      | 845               | 0                           | NR                      | 975               | 0                           | NR                      |
| 460               | 158                         | NR                      | 590               | 373                         | NR                      | 720               | 17                          | NR                      | 850               | 0                           | NR                      | 980               | 0                           | NR                      |
| 465               | 120                         | NR                      | 595               | 364                         | NR                      | 725               | 15                          | NR                      | 855               | 0                           | NR                      | 985               | 0                           | NR                      |
| 470               | 79                          | NR                      | 600               | 357                         | NR                      | 730               | 13                          | NR                      | 860               | 0                           | NR                      | 990               | 0                           | NR                      |
| 475               | 57                          | NR                      | 605               | 349                         | NR                      | 735               | 11                          | NR                      | 865               | 0                           | NR                      | 995               | 0                           | NR                      |
| 480               | 51                          | NR                      | 610               | 371                         | NR                      | 740               | 9                           | NR                      | 870               | 0                           | NR                      | 1000              | 0                           | NR                      |
| 485               | 51                          | NR                      | 615               | 387                         | NR                      | 745               | 8                           | NR                      | 875               | 0                           | NR                      |                   |                             |                         |

REPORT NUMBER: SP1-2506-472-3

**Scotopic Flux vs. Wavelength**



**Scotopic Lumens: NR**

**S/P: 1.43**

| $\lambda$<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               | 60                          | NR                      | 620               | 327                         | NR                      | 750               | 7                           | NR                      | 880               | 0                           | NR                      |
| 365               | 0                           | NR                      | 495               | 82                          | NR                      | 625               | 322                         | NR                      | 755               | 6                           | NR                      | 885               | 0                           | NR                      |
| 370               | 0                           | NR                      | 500               | 114                         | NR                      | 630               | 1000                        | NR                      | 760               | 5                           | NR                      | 890               | 0                           | NR                      |
| 375               | 0                           | NR                      | 505               | 152                         | NR                      | 635               | 645                         | NR                      | 765               | 4                           | NR                      | 895               | 0                           | NR                      |
| 380               | 0                           | NR                      | 510               | 189                         | NR                      | 640               | 197                         | NR                      | 770               | 4                           | NR                      | 900               | 0                           | NR                      |
| 385               | 1                           | NR                      | 515               | 222                         | NR                      | 645               | 189                         | NR                      | 775               | 3                           | NR                      | 905               | 0                           | NR                      |
| 390               | 2                           | NR                      | 520               | 248                         | NR                      | 650               | 163                         | NR                      | 780               | 3                           | NR                      | 910               | 0                           | NR                      |
| 395               | 3                           | NR                      | 525               | 268                         | NR                      | 655               | 134                         | NR                      | 785               | 2                           | NR                      | 915               | 0                           | NR                      |
| 400               | 4                           | NR                      | 530               | 283                         | NR                      | 660               | 113                         | NR                      | 790               | 2                           | NR                      | 920               | 0                           | NR                      |
| 405               | 6                           | NR                      | 535               | 294                         | NR                      | 665               | 94                          | NR                      | 795               | 2                           | NR                      | 925               | 0                           | NR                      |
| 410               | 9                           | NR                      | 540               | 305                         | NR                      | 670               | 87                          | NR                      | 800               | 2                           | NR                      | 930               | 0                           | NR                      |
| 415               | 18                          | NR                      | 545               | 314                         | NR                      | 675               | 70                          | NR                      | 805               | 1                           | NR                      | 935               | 0                           | NR                      |
| 420               | 34                          | NR                      | 550               | 323                         | NR                      | 680               | 60                          | NR                      | 810               | 1                           | NR                      | 940               | 0                           | NR                      |
| 425               | 62                          | NR                      | 555               | 335                         | NR                      | 685               | 51                          | NR                      | 815               | 1                           | NR                      | 945               | 0                           | NR                      |
| 430               | 102                         | NR                      | 560               | 346                         | NR                      | 690               | 44                          | NR                      | 820               | 1                           | NR                      | 950               | 0                           | NR                      |
| 435               | 159                         | NR                      | 565               | 356                         | NR                      | 695               | 38                          | NR                      | 825               | 1                           | NR                      | 955               | 0                           | NR                      |
| 440               | 241                         | NR                      | 570               | 364                         | NR                      | 700               | 32                          | NR                      | 830               | 1                           | NR                      | 960               | 0                           | NR                      |
| 445               | 363                         | NR                      | 575               | 371                         | NR                      | 705               | 28                          | NR                      | 835               | 1                           | NR                      | 965               | 0                           | NR                      |
| 450               | 389                         | NR                      | 580               | 375                         | NR                      | 710               | 24                          | NR                      | 840               | 1                           | NR                      | 970               | 0                           | NR                      |
| 455               | 245                         | NR                      | 585               | 375                         | NR                      | 715               | 20                          | NR                      | 845               | 0                           | NR                      | 975               | 0                           | NR                      |
| 460               | 158                         | NR                      | 590               | 373                         | NR                      | 720               | 17                          | NR                      | 850               | 0                           | NR                      | 980               | 0                           | NR                      |
| 465               | 120                         | NR                      | 595               | 364                         | NR                      | 725               | 15                          | NR                      | 855               | 0                           | NR                      | 985               | 0                           | NR                      |
| 470               | 79                          | NR                      | 600               | 357                         | NR                      | 730               | 13                          | NR                      | 860               | 0                           | NR                      | 990               | 0                           | NR                      |
| 475               | 57                          | NR                      | 605               | 349                         | NR                      | 735               | 11                          | NR                      | 865               | 0                           | NR                      | 995               | 0                           | NR                      |
| 480               | 51                          | NR                      | 610               | 371                         | NR                      | 740               | 9                           | NR                      | 870               | 0                           | NR                      | 1000              | 0                           | NR                      |
| 485               | 51                          | NR                      | 615               | 387                         | NR                      | 745               | 8                           | NR                      | 875               | 0                           | NR                      |                   |                             |                         |

REPORT NUMBER: SP1-2506-472-3

**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: NR**

**M/P: 2.75**

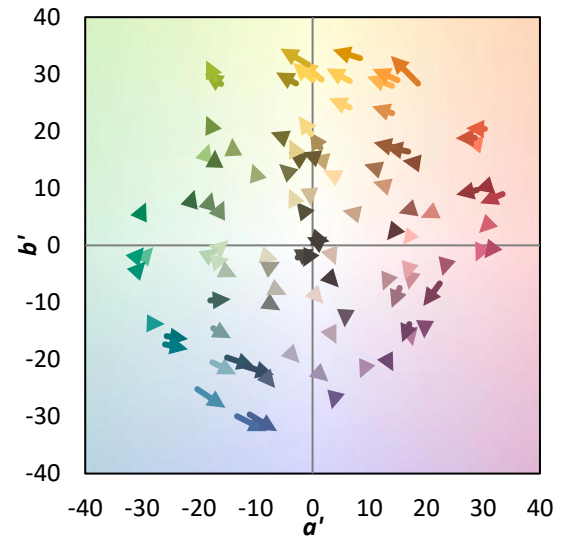
| $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) | $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) | $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) | $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) | $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) |
|-------------------|-----------------------------|-------------------------|-------------------|-----------------------------|-------------------------|-------------------|-----------------------------|-------------------------|-------------------|-----------------------------|-------------------------|-------------------|-----------------------------|-------------------------|
| 360               | 0                           | NR                      | 490               | 60                          | NR                      | 620               | 327                         | NR                      | 750               | 7                           | NR                      | 880               | 0                           | NR                      |
| 365               | 0                           | NR                      | 495               | 82                          | NR                      | 625               | 322                         | NR                      | 755               | 6                           | NR                      | 885               | 0                           | NR                      |
| 370               | 0                           | NR                      | 500               | 114                         | NR                      | 630               | 1000                        | NR                      | 760               | 5                           | NR                      | 890               | 0                           | NR                      |
| 375               | 0                           | NR                      | 505               | 152                         | NR                      | 635               | 645                         | NR                      | 765               | 4                           | NR                      | 895               | 0                           | NR                      |
| 380               | 0                           | NR                      | 510               | 189                         | NR                      | 640               | 197                         | NR                      | 770               | 4                           | NR                      | 900               | 0                           | NR                      |
| 385               | 1                           | NR                      | 515               | 222                         | NR                      | 645               | 189                         | NR                      | 775               | 3                           | NR                      | 905               | 0                           | NR                      |
| 390               | 2                           | NR                      | 520               | 248                         | NR                      | 650               | 163                         | NR                      | 780               | 3                           | NR                      | 910               | 0                           | NR                      |
| 395               | 3                           | NR                      | 525               | 268                         | NR                      | 655               | 134                         | NR                      | 785               | 2                           | NR                      | 915               | 0                           | NR                      |
| 400               | 4                           | NR                      | 530               | 283                         | NR                      | 660               | 113                         | NR                      | 790               | 2                           | NR                      | 920               | 0                           | NR                      |
| 405               | 6                           | NR                      | 535               | 294                         | NR                      | 665               | 94                          | NR                      | 795               | 2                           | NR                      | 925               | 0                           | NR                      |
| 410               | 9                           | NR                      | 540               | 305                         | NR                      | 670               | 87                          | NR                      | 800               | 2                           | NR                      | 930               | 0                           | NR                      |
| 415               | 18                          | NR                      | 545               | 314                         | NR                      | 675               | 70                          | NR                      | 805               | 1                           | NR                      | 935               | 0                           | NR                      |
| 420               | 34                          | NR                      | 550               | 323                         | NR                      | 680               | 60                          | NR                      | 810               | 1                           | NR                      | 940               | 0                           | NR                      |
| 425               | 62                          | NR                      | 555               | 335                         | NR                      | 685               | 51                          | NR                      | 815               | 1                           | NR                      | 945               | 0                           | NR                      |
| 430               | 102                         | NR                      | 560               | 346                         | NR                      | 690               | 44                          | NR                      | 820               | 1                           | NR                      | 950               | 0                           | NR                      |
| 435               | 159                         | NR                      | 565               | 356                         | NR                      | 695               | 38                          | NR                      | 825               | 1                           | NR                      | 955               | 0                           | NR                      |
| 440               | 241                         | NR                      | 570               | 364                         | NR                      | 700               | 32                          | NR                      | 830               | 1                           | NR                      | 960               | 0                           | NR                      |
| 445               | 363                         | NR                      | 575               | 371                         | NR                      | 705               | 28                          | NR                      | 835               | 1                           | NR                      | 965               | 0                           | NR                      |
| 450               | 389                         | NR                      | 580               | 375                         | NR                      | 710               | 24                          | NR                      | 840               | 1                           | NR                      | 970               | 0                           | NR                      |
| 455               | 245                         | NR                      | 585               | 375                         | NR                      | 715               | 20                          | NR                      | 845               | 0                           | NR                      | 975               | 0                           | NR                      |
| 460               | 158                         | NR                      | 590               | 373                         | NR                      | 720               | 17                          | NR                      | 850               | 0                           | NR                      | 980               | 0                           | NR                      |
| 465               | 120                         | NR                      | 595               | 364                         | NR                      | 725               | 15                          | NR                      | 855               | 0                           | NR                      | 985               | 0                           | NR                      |
| 470               | 79                          | NR                      | 600               | 357                         | NR                      | 730               | 13                          | NR                      | 860               | 0                           | NR                      | 990               | 0                           | NR                      |
| 475               | 57                          | NR                      | 605               | 349                         | NR                      | 735               | 11                          | NR                      | 865               | 0                           | NR                      | 995               | 0                           | NR                      |
| 480               | 51                          | NR                      | 610               | 371                         | NR                      | 740               | 9                           | NR                      | 870               | 0                           | NR                      | 1000              | 0                           | NR                      |
| 485               | 51                          | NR                      | 615               | 387                         | NR                      | 745               | 8                           | NR                      | 875               | 0                           | NR                      |                   |                             |                         |

**Summary**

$R_f = 80.1$   
 $R_g = 101$   
 $CIE R_a = 82.1$   
 $R_9 = 27.6$



**Color Vector Graphics**



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 68 | CES51 = 90 | CES76 = 59 |
| CES02 = 62 | CES27 = 89 | CES52 = 90 | CES77 = 78 |
| CES03 = 31 | CES28 = 84 | CES53 = 81 | CES78 = 61 |
| CES04 = 70 | CES29 = 66 | CES54 = 91 | CES79 = 86 |
| CES05 = 49 | CES30 = 77 | CES55 = 90 | CES80 = 82 |
| CES06 = 51 | CES31 = 69 | CES56 = 80 | CES81 = 79 |
| CES07 = 42 | CES32 = 62 | CES57 = 79 | CES82 = 92 |
| CES08 = 41 | CES33 = 74 | CES58 = 81 | CES83 = 89 |
| CES09 = 29 | CES34 = 72 | CES59 = 92 | CES84 = 89 |
| CES10 = 75 | CES35 = 85 | CES60 = 94 | CES85 = 82 |
| CES11 = 58 | CES36 = 97 | CES61 = 90 | CES86 = 78 |
| CES12 = 64 | CES37 = 79 | CES62 = 92 | CES87 = 82 |
| CES13 = 43 | CES38 = 85 | CES63 = 78 | CES88 = 86 |
| CES14 = 74 | CES39 = 94 | CES64 = 79 | CES89 = 76 |
| CES15 = 71 | CES40 = 89 | CES65 = 76 | CES90 = 85 |
| CES16 = 47 | CES41 = 89 | CES66 = 73 | CES91 = 83 |
| CES17 = 49 | CES42 = 77 | CES67 = 70 | CES92 = 73 |
| CES18 = 56 | CES43 = 74 | CES68 = 76 | CES93 = 84 |
| CES19 = 72 | CES44 = 99 | CES69 = 81 | CES94 = 65 |
| CES20 = 66 | CES45 = 83 | CES70 = 68 | CES95 = 79 |
| CES21 = 86 | CES46 = 82 | CES71 = 64 | CES96 = 85 |
| CES22 = 78 | CES47 = 81 | CES72 = 88 | CES97 = 85 |
| CES23 = 92 | CES48 = 80 | CES73 = 60 | CES98 = 82 |
| CES24 = 91 | CES49 = 80 | CES74 = 97 | CES99 = 81 |
| CES25 = 72 | CES50 = 89 | CES75 = 64 |            |



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)