

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: P1433886

Luminaire Tested: EHBR1-42-UNV-W-L940-UPL24

Issue Date: 3/20/2026

**Test Information**

Test Method: LM-79-2019  
Report Number: P1433886  
REPORT IS A COMBINATION OF REPORTS P1431823 AND P1431635  
Test Lab: INNOVATION CENTER  
Issue Date: 3/20/2026  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: METALUX  
Catalog Number: EHBR1-42-UNV-W-L940-UPL24  
Description: Elevate Round Highbay at, 42000 lumens, 4000K 90CRI LEDs with W lens  
Light Source: -  
Ballast/Driver: -

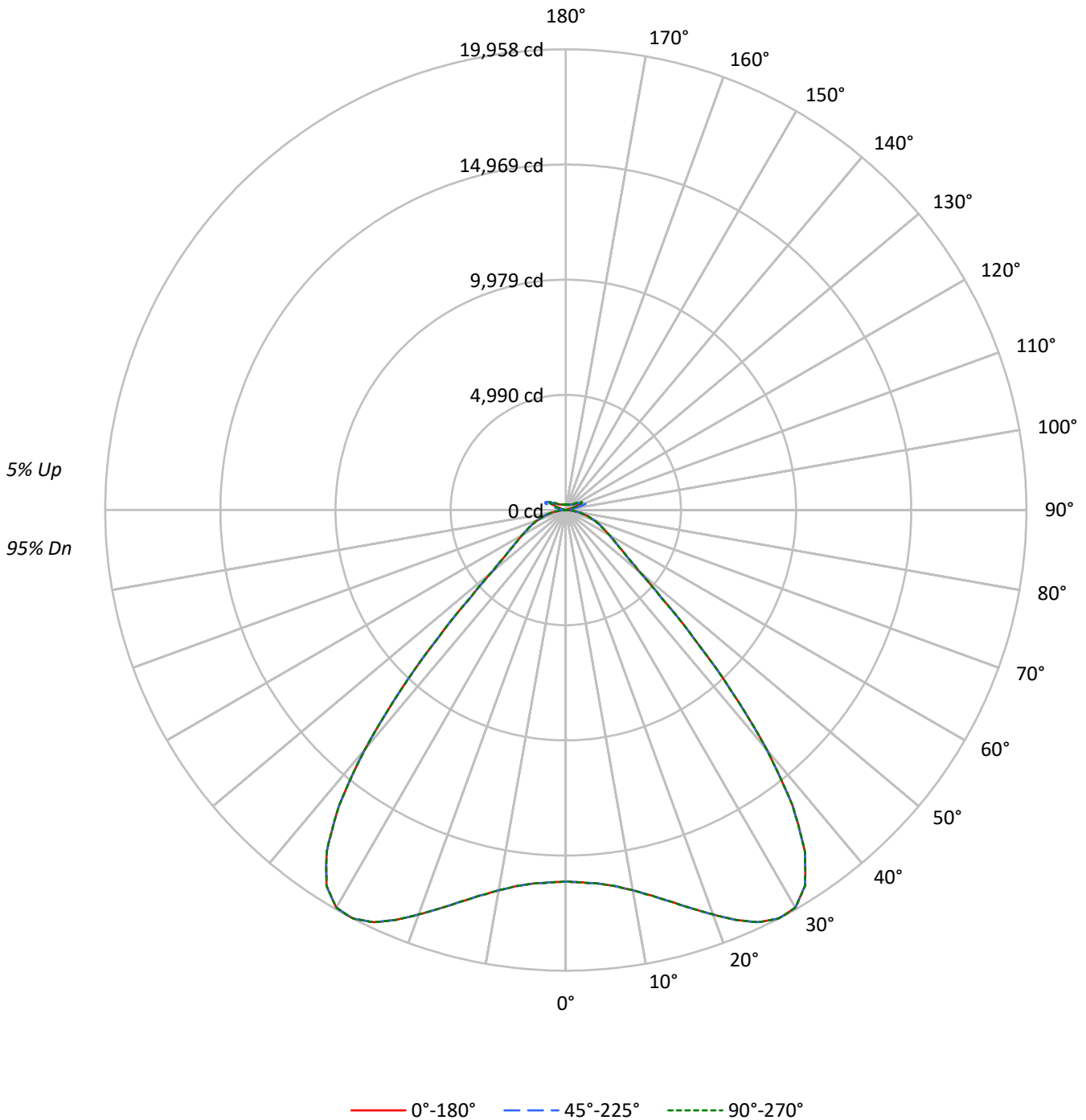
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 40693.9 lumens  
Efficiency: N/A  
Efficacy: 168.9 lumens/watt  
Spacing Criteria (0/90/45): 1.54 / 1.54 / 1.31  
Luminous Opening: Vertical Cylinder (Dia: 1.71' x H: 0.1')  
CIE Type: Direct

Input Watts (W): 240.9  
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: P1433886  
CATALOG NUMBER: EHBR1-42-UNV-W-L940-UPL24

### Luminous Intensity Polar Plot





TEST NUMBER: P1433886  
 CATALOG NUMBER: EHBR1-42-UNV-W-L940-UPL24

**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 | 0  |
| RCR |     |     |     |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |    |    |    |
| 0   | 118 | 118 | 118 | 118 | 114 | 114 | 114 | 114 | 108 | 108 | 108 | 102 | 102 | 102 | 97 | 97 | 97 | 97 | 97 | 97 | 95 |
| 1   | 110 | 106 | 103 | 100 | 107 | 103 | 100 | 98  | 98  | 96  | 94  | 94  | 92  | 90  | 89 | 88 | 86 | 86 | 86 | 86 | 84 |
| 2   | 102 | 96  | 90  | 86  | 99  | 93  | 88  | 84  | 89  | 85  | 81  | 85  | 82  | 79  | 81 | 79 | 76 | 76 | 76 | 76 | 74 |
| 3   | 95  | 86  | 80  | 74  | 92  | 84  | 78  | 73  | 81  | 76  | 71  | 77  | 73  | 70  | 74 | 71 | 68 | 68 | 68 | 68 | 66 |
| 4   | 88  | 78  | 71  | 65  | 86  | 77  | 70  | 65  | 73  | 68  | 63  | 71  | 66  | 62  | 68 | 64 | 60 | 60 | 60 | 60 | 58 |
| 5   | 82  | 71  | 63  | 58  | 80  | 70  | 63  | 57  | 67  | 61  | 56  | 65  | 59  | 55  | 62 | 58 | 54 | 54 | 54 | 54 | 52 |
| 6   | 76  | 65  | 57  | 52  | 74  | 64  | 57  | 51  | 61  | 55  | 50  | 59  | 54  | 50  | 57 | 53 | 49 | 49 | 49 | 49 | 47 |
| 7   | 71  | 59  | 52  | 46  | 69  | 58  | 51  | 46  | 57  | 50  | 45  | 55  | 49  | 45  | 53 | 48 | 44 | 44 | 44 | 44 | 42 |
| 8   | 67  | 55  | 47  | 42  | 65  | 54  | 47  | 42  | 52  | 46  | 41  | 51  | 45  | 41  | 49 | 44 | 40 | 40 | 40 | 40 | 38 |
| 9   | 62  | 50  | 43  | 38  | 61  | 50  | 43  | 38  | 48  | 42  | 38  | 47  | 41  | 37  | 46 | 40 | 37 | 37 | 37 | 37 | 35 |
| 10  | 59  | 47  | 40  | 35  | 57  | 46  | 39  | 35  | 45  | 39  | 34  | 44  | 38  | 34  | 42 | 37 | 34 | 34 | 34 | 34 | 32 |

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

|     | 0°     | 45°    | 90°    |
|-----|--------|--------|--------|
| 0°  | 75575  | 75575  | 75575  |
| 5°  | 76076  | 76076  | 76076  |
| 10° | 78720  | 78720  | 78720  |
| 15° | 83708  | 83708  | 83708  |
| 20° | 90741  | 90741  | 90741  |
| 25° | 98645  | 98645  | 98645  |
| 30° | 103397 | 103397 | 103397 |
| 35° | 98417  | 98417  | 98417  |
| 40° | 78093  | 78093  | 78093  |
| 45° | 48268  | 48268  | 48268  |
| 50° | 27950  | 27950  | 27950  |
| 55° | 21147  | 21147  | 21147  |
| 60° | 18141  | 18141  | 18141  |
| 65° | 16385  | 16385  | 16385  |
| 70° | 15072  | 15072  | 15072  |
| 75° | 13317  | 13317  | 13317  |
| 80° | 10852  | 10852  | 10852  |
| 85° | 6398   | 6398   | 6398   |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
 Vertical Angle: 45°  
 Luminance: 48268 cd/sqm



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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 1565.8  | 3.8       |
| 10°-20°   | 5019.7  | 12.3      |
| 20°-30°   | 9060.8  | 22.3      |
| 30°-40°   | 10949.0 | 26.9      |
| 40°-50°   | 6255.5  | 15.4      |
| 50°-60°   | 2649.4  | 6.5       |
| 60°-70°   | 1708.9  | 4.2       |
| 70°-80°   | 993.6   | 2.4       |
| 80°-90°   | 267.0   | 0.7       |
| 90°-100°  | 64.0    | 0.2       |
| 100°-110° | 394.5   | 1.0       |
| 110°-120° | 704.7   | 1.7       |
| 120°-130° | 414.6   | 1.0       |
| 130°-140° | 256.9   | 0.6       |
| 140°-150° | 180.6   | 0.4       |
| 150°-160° | 118.4   | 0.3       |
| 160°-170° | 68.0    | 0.2       |
| 170°-180° | 22.6    | 0.1       |
| 0°-30°    | 15646.2 | 38.4      |
| 0°-40°    | 26595.2 | 65.4      |
| 0°-60°    | 35500.1 | 87.2      |
| 0°-90°    | 38469.6 | 94.5      |
| 90°-120°  | 1163.2  | 2.9       |
| 90°-150°  | 2015.3  | 5.0       |
| 90°-180°  | 2224.0  | 5.5       |
| 0°-180°   | 40693.9 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°    | 22.5° | 45°   | 67.5° | 90°   | Flux  |
|------|-------|-------|-------|-------|-------|-------|
| 0°   | 16093 | 16093 | 16093 | 16093 | 16093 |       |
| 5°   | 16244 | 16244 | 16244 | 16244 | 16244 | 1566  |
| 15°  | 17562 | 17562 | 17562 | 17562 | 17562 | 5020  |
| 25°  | 19699 | 19699 | 19699 | 19699 | 19699 | 9061  |
| 35°  | 18063 | 18063 | 18063 | 18063 | 18063 | 10949 |
| 45°  | 7810  | 7810  | 7810  | 7810  | 7810  | 6255  |
| 55°  | 2858  | 2858  | 2858  | 2858  | 2858  | 2649  |
| 65°  | 1710  | 1710  | 1710  | 1710  | 1710  | 1709  |
| 75°  | 938   | 938   | 938   | 938   | 938   | 994   |
| 85°  | 220   | 220   | 220   | 220   | 220   | 253   |
| 90°  | 18    | 28    | 47    | 30    | 18    | 18    |
| 95°  | 29    | 48    | 103   | 52    | 33    | 28    |
| 105° | 138   | 272   | 693   | 300   | 183   | 185   |
| 115° | 634   | 667   | 819   | 785   | 780   | 584   |
| 125° | 458   | 428   | 440   | 446   | 500   | 418   |
| 135° | 338   | 328   | 339   | 319   | 317   | 264   |
| 145° | 282   | 278   | 294   | 290   | 289   | 178   |
| 155° | 249   | 246   | 258   | 258   | 258   | 116   |
| 165° | 235   | 235   | 241   | 241   | 240   | 67    |
| 175° | 234   | 234   | 238   | 238   | 238   | 22    |
| 180° | 237   | 237   | 237   | 237   | 237   |       |



TEST NUMBER: P1433886

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°      | 22.5°   | 45°     | 67.5°   | 90°     |
|--------|---------|---------|---------|---------|---------|
| 0°     | 16093.1 | 16093.1 | 16093.1 | 16093.1 | 16093.1 |
| 2.5°   | 16147.1 | 16147.1 | 16147.1 | 16147.1 | 16147.1 |
| 5°     | 16243.5 | 16243.5 | 16243.5 | 16243.5 | 16243.5 |
| 7.5°   | 16433.2 | 16433.2 | 16433.2 | 16433.2 | 16433.2 |
| 10°    | 16725.1 | 16725.1 | 16725.1 | 16725.1 | 16725.1 |
| 12.5°  | 17104.4 | 17104.4 | 17104.4 | 17104.4 | 17104.4 |
| 15°    | 17561.5 | 17561.5 | 17561.5 | 17561.5 | 17561.5 |
| 17.5°  | 18084.8 | 18084.8 | 18084.8 | 18084.8 | 18084.8 |
| 20°    | 18650.0 | 18650.0 | 18650.0 | 18650.0 | 18650.0 |
| 22.5°  | 19219.0 | 19219.0 | 19219.0 | 19219.0 | 19219.0 |
| 25°    | 19699.3 | 19699.3 | 19699.3 | 19699.3 | 19699.3 |
| 27.5°  | 19957.7 | 19957.7 | 19957.7 | 19957.7 | 19957.7 |
| 30°    | 19888.3 | 19888.3 | 19888.3 | 19888.3 | 19888.3 |
| 32.5°  | 19298.7 | 19298.7 | 19298.7 | 19298.7 | 19298.7 |
| 35°    | 18063.0 | 18063.0 | 18063.0 | 18063.0 | 18063.0 |
| 37.5°  | 16136.2 | 16136.2 | 16136.2 | 16136.2 | 16136.2 |
| 40°    | 13535.5 | 13535.5 | 13535.5 | 13535.5 | 13535.5 |
| 42.5°  | 10594.1 | 10594.1 | 10594.1 | 10594.1 | 10594.1 |
| 45°    | 7809.6  | 7809.6  | 7809.6  | 7809.6  | 7809.6  |
| 47.5°  | 5581.9  | 5581.9  | 5581.9  | 5581.9  | 5581.9  |
| 50°    | 4165.5  | 4165.5  | 4165.5  | 4165.5  | 4165.5  |
| 52.5°  | 3372.7  | 3372.7  | 3372.7  | 3372.7  | 3372.7  |
| 55°    | 2857.8  | 2857.8  | 2857.8  | 2857.8  | 2857.8  |
| 57.5°  | 2481.7  | 2481.7  | 2481.7  | 2481.7  | 2481.7  |
| 60°    | 2180.8  | 2180.8  | 2180.8  | 2180.8  | 2180.8  |
| 62.5°  | 1930.1  | 1930.1  | 1930.1  | 1930.1  | 1930.1  |
| 65°    | 1710.2  | 1710.2  | 1710.2  | 1710.2  | 1710.2  |
| 67.5°  | 1516.0  | 1516.0  | 1516.0  | 1516.0  | 1516.0  |
| 70°    | 1322.5  | 1322.5  | 1322.5  | 1322.5  | 1322.5  |
| 72.5°  | 1129.6  | 1129.6  | 1129.6  | 1129.6  | 1129.6  |
| 75°    | 938.1   | 938.1   | 938.1   | 938.1   | 938.1   |
| 77.5°  | 753.5   | 753.5   | 753.5   | 753.5   | 753.5   |
| 80°    | 570.9   | 570.9   | 570.9   | 570.9   | 570.9   |
| 82.5°  | 391.6   | 391.6   | 391.6   | 391.6   | 391.6   |
| 85°    | 219.9   | 219.9   | 219.9   | 219.9   | 219.9   |
| 87.5°  | 69.4    | 69.4    | 69.4    | 69.4    | 69.4    |
| 90°    | 17.7    | 27.8    | 46.7    | 30.3    | 17.7    |
| 92.5°  | 24.6    | 41.0    | 73.7    | 38.4    | 22.1    |
| 95°    | 29.0    | 47.9    | 103.3   | 51.7    | 32.8    |
| 97.5°  | 36.5    | 52.9    | 118.4   | 63.0    | 50.4    |
| 100°   | 47.9    | 61.8    | 183.9   | 76.9    | 66.8    |
| 102.5° | 80.6    | 129.8   | 389.1   | 143.6   | 100.8   |
| 105°   | 138.5   | 272.0   | 692.6   | 299.7   | 182.6   |
| 107.5° | 239.2   | 486.1   | 912.9   | 530.2   | 345.1   |
| 110°   | 446.4   | 645.4   | 957.6   | 728.5   | 552.2   |



TEST NUMBER: P1433886

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**CANDELA DISTRIBUTION (continued):**

|        | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|--------|-------|-------|-------|-------|-------|
| 112.5° | 602.6 | 693.2 | 917.4 | 804.0 | 718.4 |
| 115°   | 634.1 | 666.8 | 819.2 | 785.2 | 780.2 |
| 117.5° | 612.7 | 608.9 | 695.8 | 705.8 | 753.7 |
| 120°   | 567.4 | 542.1 | 581.2 | 616.5 | 680.7 |
| 122.5° | 510.6 | 480.4 | 498.1 | 524.5 | 588.7 |
| 125°   | 458.5 | 428.2 | 439.6 | 445.9 | 500.0 |
| 127.5° | 411.9 | 391.7 | 398.0 | 390.5 | 424.5 |
| 130°   | 381.0 | 363.3 | 372.2 | 354.6 | 371.0 |
| 132.5° | 355.8 | 344.4 | 354.5 | 333.2 | 338.2 |
| 135°   | 337.5 | 327.5 | 338.8 | 318.6 | 317.4 |
| 137.5° | 321.8 | 313.0 | 324.3 | 309.2 | 305.5 |
| 140°   | 308.0 | 300.5 | 313.0 | 301.8 | 299.2 |
| 142.5° | 292.4 | 287.2 | 302.4 | 294.9 | 292.4 |
| 145°   | 281.6 | 277.8 | 294.2 | 290.5 | 289.2 |
| 147.5° | 272.2 | 269.7 | 284.8 | 283.5 | 283.5 |
| 150°   | 263.4 | 260.9 | 276.0 | 274.7 | 276.0 |
| 152.5° | 254.6 | 252.1 | 265.9 | 264.7 | 265.9 |
| 155°   | 248.9 | 246.4 | 257.8 | 257.8 | 257.8 |
| 157.5° | 243.9 | 242.6 | 251.5 | 251.5 | 251.5 |
| 160°   | 240.6 | 239.4 | 247.0 | 247.0 | 245.7 |
| 162.5° | 237.6 | 236.3 | 245.1 | 243.8 | 243.8 |
| 165°   | 235.1 | 235.1 | 241.3 | 241.3 | 240.1 |
| 167.5° | 235.1 | 233.7 | 240.1 | 240.1 | 238.8 |
| 170°   | 233.7 | 233.7 | 238.8 | 237.6 | 236.3 |
| 172.5° | 234.4 | 234.4 | 239.4 | 238.2 | 236.9 |
| 175°   | 233.8 | 233.8 | 237.6 | 237.6 | 237.6 |
| 177.5° | 235.1 | 235.1 | 237.6 | 237.6 | 236.4 |
| 180°   | 237.0 | 237.0 | 237.0 | 237.0 | 237.0 |



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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 | 19.08            | 20.30 | 19.54 | 20.73 | 21.18 | 19.08          | 20.30 | 19.54 | 20.73 | 21.18 |
|                 | 3H   | 20.58            | 21.66 | 21.06 | 22.11 | 22.61 | 20.58          | 21.66 | 21.06 | 22.11 | 22.61 |
|                 | 4H   | 21.14            | 22.15 | 21.64 | 22.61 | 23.13 | 21.14          | 22.15 | 21.64 | 22.61 | 23.13 |
|                 | 6H   | 21.53            | 22.46 | 22.04 | 22.93 | 23.46 | 21.53          | 22.46 | 22.04 | 22.93 | 23.46 |
|                 | 8H   | 21.63            | 22.51 | 22.15 | 23.01 | 23.54 | 21.63          | 22.51 | 22.15 | 23.01 | 23.54 |
|                 | 12H  | 21.67            | 22.51 | 22.19 | 23.00 | 23.56 | 21.67          | 22.51 | 22.19 | 23.00 | 23.56 |
| 4H              | 2H   | 19.53            | 20.54 | 20.03 | 21.00 | 21.51 | 19.53          | 20.54 | 20.03 | 21.00 | 21.51 |
|                 | 3H   | 21.25            | 22.08 | 21.76 | 22.59 | 23.12 | 21.25          | 22.08 | 21.76 | 22.59 | 23.12 |
|                 | 4H   | 21.93            | 22.67 | 22.46 | 23.19 | 23.76 | 21.93          | 22.67 | 22.46 | 23.19 | 23.76 |
|                 | 6H   | 22.42            | 23.07 | 22.98 | 23.61 | 24.20 | 22.42          | 23.07 | 22.98 | 23.61 | 24.20 |
|                 | 8H   | 22.56            | 23.16 | 23.12 | 23.70 | 24.30 | 22.56          | 23.16 | 23.12 | 23.70 | 24.30 |
|                 | 12H  | 22.62            | 23.15 | 23.19 | 23.73 | 24.33 | 22.62          | 23.15 | 23.19 | 23.73 | 24.33 |
| 8H              | 4H   | 22.13            | 22.73 | 22.69 | 23.28 | 23.87 | 22.13          | 22.73 | 22.69 | 23.28 | 23.87 |
|                 | 6H   | 22.73            | 23.22 | 23.32 | 23.81 | 24.42 | 22.73          | 23.22 | 23.32 | 23.81 | 24.42 |
|                 | 8H   | 22.91            | 23.35 | 23.52 | 23.96 | 24.58 | 22.91          | 23.35 | 23.52 | 23.96 | 24.58 |
|                 | 12H  | 23.02            | 23.41 | 23.62 | 24.00 | 24.69 | 23.02          | 23.41 | 23.62 | 24.00 | 24.69 |
| 12H             | 4H   | 22.13            | 22.66 | 22.70 | 23.24 | 23.84 | 22.13          | 22.66 | 22.70 | 23.24 | 23.84 |
|                 | 6H   | 22.74            | 23.18 | 23.35 | 23.79 | 24.41 | 22.74          | 23.18 | 23.35 | 23.79 | 24.41 |
|                 | 8H   | 22.97            | 23.36 | 23.57 | 23.94 | 24.63 | 22.97          | 23.36 | 23.57 | 23.94 | 24.63 |

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

Report Prepared for

Cooper Lighting Solutions

Metalux

Report Number: SP1-2506-472-7

Test Date: 08/04/2025

Luminaire Tested: EHBR-60-L940-N

Data in this report applies to families of products including EHBR-60-L940-N

**Test Information**

Test Method: LM-79-2019  
 Report Number: SP1-2506-472-7  
 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-L940-N**  
 Description: Elevate Round Highbay at, 60000 lumens, 4000K 90CRI LEDs with N lens

**Spectral Parameters**

CCT (K): 3963  
 CIE u': 0.2267  
 CIE v': 0.5003  
 Duv: -0.0016  
 CIE x: 0.3810  
 CIE y: 0.3738  
 CIE z: 0.2453  
 Peak Wavelength (nm): 630  
 Dominant Wavelength (nm): 580  
 Purity: 26.49712  
 Rf: 90.7  
 Rg: 101

|           |      |      |      |
|-----------|------|------|------|
| CRI (Ra): | 93.4 |      |      |
| R1:       | 95.2 | R9:  | 66.4 |
| R2:       | 95.1 | R10: | 86.6 |
| R3:       | 93.3 | R11: | 94.4 |
| R4:       | 94.5 | R12: | 75.4 |
| R5:       | 94.2 | R13: | 95.0 |
| R6:       | 92.9 | R14: | 95.4 |
| R7:       | 94.0 | R15: | 92.8 |
| R8:       | 87.7 |      |      |



**Test Conditions**

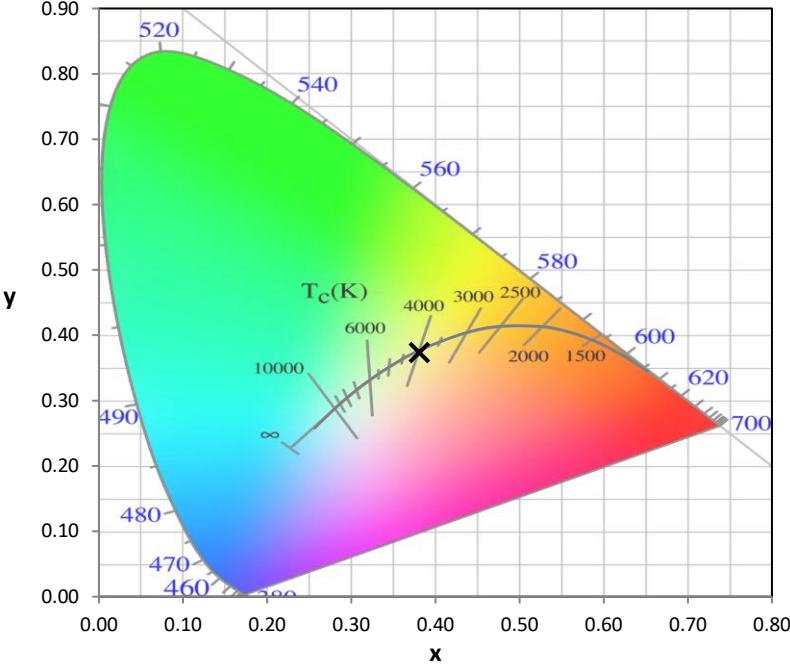
Stabilization Time: 44M  
 Operation Time: 1H 44M  
 Sphere Temperature (°C): 25.0

REPORT NUMBER: SP1-2506-472-7

| 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 4000K 4-step quadrangle

REPORT NUMBER: SP1-2506-472-7

**Photopic Flux vs. Wavelength**



**Photopic Lumens: NR**

| $\lambda$ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | $\lambda$ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | $\lambda$ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | $\lambda$ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | $\lambda$ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) |
|----------------|--------------------------|---------------|----------------|--------------------------|---------------|----------------|--------------------------|---------------|----------------|--------------------------|---------------|----------------|--------------------------|---------------|
| 360            | 0                        | NR            | 490            | 141                      | NR            | 620            | 276                      | NR            | 750            | 5                        | NR            | 880            | 0                        | NR            |
| 365            | 0                        | NR            | 495            | 167                      | NR            | 625            | 279                      | NR            | 755            | 4                        | NR            | 885            | 0                        | NR            |
| 370            | 0                        | NR            | 500            | 193                      | NR            | 630            | 1000                     | NR            | 760            | 4                        | NR            | 890            | 0                        | NR            |
| 375            | 0                        | NR            | 505            | 215                      | NR            | 635            | 628                      | NR            | 765            | 3                        | NR            | 895            | 0                        | NR            |
| 380            | 0                        | NR            | 510            | 230                      | NR            | 640            | 164                      | NR            | 770            | 3                        | NR            | 900            | 0                        | NR            |
| 385            | 0                        | NR            | 515            | 243                      | NR            | 645            | 161                      | NR            | 775            | 2                        | NR            | 905            | 0                        | NR            |
| 390            | 1                        | NR            | 520            | 251                      | NR            | 650            | 137                      | NR            | 780            | 2                        | NR            | 910            | 0                        | NR            |
| 395            | 2                        | NR            | 525            | 256                      | NR            | 655            | 111                      | NR            | 785            | 2                        | NR            | 915            | 0                        | NR            |
| 400            | 3                        | NR            | 530            | 262                      | NR            | 660            | 92                       | NR            | 790            | 1                        | NR            | 920            | 0                        | NR            |
| 405            | 4                        | NR            | 535            | 267                      | NR            | 665            | 76                       | NR            | 795            | 1                        | NR            | 925            | 0                        | NR            |
| 410            | 6                        | NR            | 540            | 271                      | NR            | 670            | 71                       | NR            | 800            | 1                        | NR            | 930            | 0                        | NR            |
| 415            | 11                       | NR            | 545            | 276                      | NR            | 675            | 56                       | NR            | 805            | 1                        | NR            | 935            | 0                        | NR            |
| 420            | 20                       | NR            | 550            | 280                      | NR            | 680            | 47                       | NR            | 810            | 1                        | NR            | 940            | 0                        | NR            |
| 425            | 37                       | NR            | 555            | 285                      | NR            | 685            | 40                       | NR            | 815            | 1                        | NR            | 945            | 0                        | NR            |
| 430            | 63                       | NR            | 560            | 290                      | NR            | 690            | 34                       | NR            | 820            | 1                        | NR            | 950            | 0                        | NR            |
| 435            | 108                      | NR            | 565            | 294                      | NR            | 695            | 29                       | NR            | 825            | 1                        | NR            | 955            | 0                        | NR            |
| 440            | 186                      | NR            | 570            | 296                      | NR            | 700            | 25                       | NR            | 830            | 0                        | NR            | 960            | 0                        | NR            |
| 445            | 323                      | NR            | 575            | 298                      | NR            | 705            | 21                       | NR            | 835            | 0                        | NR            | 965            | 0                        | NR            |
| 450            | 403                      | NR            | 580            | 299                      | NR            | 710            | 18                       | NR            | 840            | 0                        | NR            | 970            | 0                        | NR            |
| 455            | 293                      | NR            | 585            | 298                      | NR            | 715            | 15                       | NR            | 845            | 0                        | NR            | 975            | 0                        | NR            |
| 460            | 214                      | NR            | 590            | 296                      | NR            | 720            | 13                       | NR            | 850            | 0                        | NR            | 980            | 0                        | NR            |
| 465            | 180                      | NR            | 595            | 288                      | NR            | 725            | 11                       | NR            | 855            | 0                        | NR            | 985            | 0                        | NR            |
| 470            | 132                      | NR            | 600            | 286                      | NR            | 730            | 9                        | NR            | 860            | 0                        | NR            | 990            | 0                        | NR            |
| 475            | 109                      | NR            | 605            | 282                      | NR            | 735            | 8                        | NR            | 865            | 0                        | NR            | 995            | 0                        | NR            |
| 480            | 110                      | NR            | 610            | 311                      | NR            | 740            | 7                        | NR            | 870            | 0                        | NR            | 1000           | 0                        | NR            |
| 485            | 121                      | NR            | 615            | 334                      | NR            | 745            | 6                        | NR            | 875            | 0                        | NR            |                |                          |               |

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**Scotopic Flux vs. Wavelength**



**Scotopic Lumens: NR**

**S/P: 1.76**

| $\lambda$<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               | 141                         | NR                      | 620               | 276                         | NR                      | 750               | 5                           | NR                      | 880               | 0                           | NR                      |
| 365               | 0                           | NR                      | 495               | 167                         | NR                      | 625               | 279                         | NR                      | 755               | 4                           | NR                      | 885               | 0                           | NR                      |
| 370               | 0                           | NR                      | 500               | 193                         | NR                      | 630               | 1000                        | NR                      | 760               | 4                           | NR                      | 890               | 0                           | NR                      |
| 375               | 0                           | NR                      | 505               | 215                         | NR                      | 635               | 628                         | NR                      | 765               | 3                           | NR                      | 895               | 0                           | NR                      |
| 380               | 0                           | NR                      | 510               | 230                         | NR                      | 640               | 164                         | NR                      | 770               | 3                           | NR                      | 900               | 0                           | NR                      |
| 385               | 0                           | NR                      | 515               | 243                         | NR                      | 645               | 161                         | NR                      | 775               | 2                           | NR                      | 905               | 0                           | NR                      |
| 390               | 1                           | NR                      | 520               | 251                         | NR                      | 650               | 137                         | NR                      | 780               | 2                           | NR                      | 910               | 0                           | NR                      |
| 395               | 2                           | NR                      | 525               | 256                         | NR                      | 655               | 111                         | NR                      | 785               | 2                           | NR                      | 915               | 0                           | NR                      |
| 400               | 3                           | NR                      | 530               | 262                         | NR                      | 660               | 92                          | NR                      | 790               | 1                           | NR                      | 920               | 0                           | NR                      |
| 405               | 4                           | NR                      | 535               | 267                         | NR                      | 665               | 76                          | NR                      | 795               | 1                           | NR                      | 925               | 0                           | NR                      |
| 410               | 6                           | NR                      | 540               | 271                         | NR                      | 670               | 71                          | NR                      | 800               | 1                           | NR                      | 930               | 0                           | NR                      |
| 415               | 11                          | NR                      | 545               | 276                         | NR                      | 675               | 56                          | NR                      | 805               | 1                           | NR                      | 935               | 0                           | NR                      |
| 420               | 20                          | NR                      | 550               | 280                         | NR                      | 680               | 47                          | NR                      | 810               | 1                           | NR                      | 940               | 0                           | NR                      |
| 425               | 37                          | NR                      | 555               | 285                         | NR                      | 685               | 40                          | NR                      | 815               | 1                           | NR                      | 945               | 0                           | NR                      |
| 430               | 63                          | NR                      | 560               | 290                         | NR                      | 690               | 34                          | NR                      | 820               | 1                           | NR                      | 950               | 0                           | NR                      |
| 435               | 108                         | NR                      | 565               | 294                         | NR                      | 695               | 29                          | NR                      | 825               | 1                           | NR                      | 955               | 0                           | NR                      |
| 440               | 186                         | NR                      | 570               | 296                         | NR                      | 700               | 25                          | NR                      | 830               | 0                           | NR                      | 960               | 0                           | NR                      |
| 445               | 323                         | NR                      | 575               | 298                         | NR                      | 705               | 21                          | NR                      | 835               | 0                           | NR                      | 965               | 0                           | NR                      |
| 450               | 403                         | NR                      | 580               | 299                         | NR                      | 710               | 18                          | NR                      | 840               | 0                           | NR                      | 970               | 0                           | NR                      |
| 455               | 293                         | NR                      | 585               | 298                         | NR                      | 715               | 15                          | NR                      | 845               | 0                           | NR                      | 975               | 0                           | NR                      |
| 460               | 214                         | NR                      | 590               | 296                         | NR                      | 720               | 13                          | NR                      | 850               | 0                           | NR                      | 980               | 0                           | NR                      |
| 465               | 180                         | NR                      | 595               | 288                         | NR                      | 725               | 11                          | NR                      | 855               | 0                           | NR                      | 985               | 0                           | NR                      |
| 470               | 132                         | NR                      | 600               | 286                         | NR                      | 730               | 9                           | NR                      | 860               | 0                           | NR                      | 990               | 0                           | NR                      |
| 475               | 109                         | NR                      | 605               | 282                         | NR                      | 735               | 8                           | NR                      | 865               | 0                           | NR                      | 995               | 0                           | NR                      |
| 480               | 110                         | NR                      | 610               | 311                         | NR                      | 740               | 7                           | NR                      | 870               | 0                           | NR                      | 1000              | 0                           | NR                      |
| 485               | 121                         | NR                      | 615               | 334                         | NR                      | 745               | 6                           | NR                      | 875               | 0                           | NR                      |                   |                             |                         |

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Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 3.64

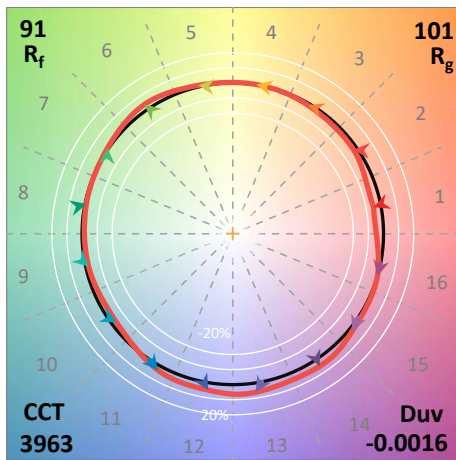
| λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) |
|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|
| 360    | 0                        | NR            | 490    | 141                      | NR            | 620    | 276                      | NR            | 750    | 5                        | NR            | 880    | 0                        | NR            |
| 365    | 0                        | NR            | 495    | 167                      | NR            | 625    | 279                      | NR            | 755    | 4                        | NR            | 885    | 0                        | NR            |
| 370    | 0                        | NR            | 500    | 193                      | NR            | 630    | 1000                     | NR            | 760    | 4                        | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 215                      | NR            | 635    | 628                      | NR            | 765    | 3                        | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 230                      | NR            | 640    | 164                      | NR            | 770    | 3                        | NR            | 900    | 0                        | NR            |
| 385    | 0                        | NR            | 515    | 243                      | NR            | 645    | 161                      | NR            | 775    | 2                        | NR            | 905    | 0                        | NR            |
| 390    | 1                        | NR            | 520    | 251                      | NR            | 650    | 137                      | NR            | 780    | 2                        | NR            | 910    | 0                        | NR            |
| 395    | 2                        | NR            | 525    | 256                      | NR            | 655    | 111                      | NR            | 785    | 2                        | NR            | 915    | 0                        | NR            |
| 400    | 3                        | NR            | 530    | 262                      | NR            | 660    | 92                       | NR            | 790    | 1                        | NR            | 920    | 0                        | NR            |
| 405    | 4                        | NR            | 535    | 267                      | NR            | 665    | 76                       | NR            | 795    | 1                        | NR            | 925    | 0                        | NR            |
| 410    | 6                        | NR            | 540    | 271                      | NR            | 670    | 71                       | NR            | 800    | 1                        | NR            | 930    | 0                        | NR            |
| 415    | 11                       | NR            | 545    | 276                      | NR            | 675    | 56                       | NR            | 805    | 1                        | NR            | 935    | 0                        | NR            |
| 420    | 20                       | NR            | 550    | 280                      | NR            | 680    | 47                       | NR            | 810    | 1                        | NR            | 940    | 0                        | NR            |
| 425    | 37                       | NR            | 555    | 285                      | NR            | 685    | 40                       | NR            | 815    | 1                        | NR            | 945    | 0                        | NR            |
| 430    | 63                       | NR            | 560    | 290                      | NR            | 690    | 34                       | NR            | 820    | 1                        | NR            | 950    | 0                        | NR            |
| 435    | 108                      | NR            | 565    | 294                      | NR            | 695    | 29                       | NR            | 825    | 1                        | NR            | 955    | 0                        | NR            |
| 440    | 186                      | NR            | 570    | 296                      | NR            | 700    | 25                       | NR            | 830    | 0                        | NR            | 960    | 0                        | NR            |
| 445    | 323                      | NR            | 575    | 298                      | NR            | 705    | 21                       | NR            | 835    | 0                        | NR            | 965    | 0                        | NR            |
| 450    | 403                      | NR            | 580    | 299                      | NR            | 710    | 18                       | NR            | 840    | 0                        | NR            | 970    | 0                        | NR            |
| 455    | 293                      | NR            | 585    | 298                      | NR            | 715    | 15                       | NR            | 845    | 0                        | NR            | 975    | 0                        | NR            |
| 460    | 214                      | NR            | 590    | 296                      | NR            | 720    | 13                       | NR            | 850    | 0                        | NR            | 980    | 0                        | NR            |
| 465    | 180                      | NR            | 595    | 288                      | NR            | 725    | 11                       | NR            | 855    | 0                        | NR            | 985    | 0                        | NR            |
| 470    | 132                      | NR            | 600    | 286                      | NR            | 730    | 9                        | NR            | 860    | 0                        | NR            | 990    | 0                        | NR            |
| 475    | 109                      | NR            | 605    | 282                      | NR            | 735    | 8                        | NR            | 865    | 0                        | NR            | 995    | 0                        | NR            |
| 480    | 110                      | NR            | 610    | 311                      | NR            | 740    | 7                        | NR            | 870    | 0                        | NR            | 1000   | 0                        | NR            |
| 485    | 121                      | NR            | 615    | 334                      | NR            | 745    | 6                        | NR            | 875    | 0                        | NR            |        |                          |               |

**Summary**

$R_f = 90.7$   
 $R_g = 101$   
 $CIE R_a = 93.4$   
 $R_9 = 66.4$



**Color Vector Graphics**



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 90 | CES51 = 99 | CES76 = 83 |
| CES02 = 62 | CES27 = 93 | CES52 = 97 | CES77 = 87 |
| CES03 = 31 | CES28 = 94 | CES53 = 95 | CES78 = 79 |
| CES04 = 69 | CES29 = 91 | CES54 = 96 | CES79 = 94 |
| CES05 = 49 | CES30 = 98 | CES55 = 95 | CES80 = 91 |
| CES06 = 50 | CES31 = 92 | CES56 = 95 | CES81 = 80 |
| CES07 = 42 | CES32 = 84 | CES57 = 94 | CES82 = 96 |
| CES08 = 41 | CES33 = 95 | CES58 = 95 | CES83 = 95 |
| CES09 = 29 | CES34 = 90 | CES59 = 98 | CES84 = 93 |
| CES10 = 74 | CES35 = 94 | CES60 = 93 | CES85 = 82 |
| CES11 = 57 | CES36 = 84 | CES61 = 93 | CES86 = 84 |
| CES12 = 63 | CES37 = 92 | CES62 = 90 | CES87 = 90 |
| CES13 = 43 | CES38 = 93 | CES63 = 92 | CES88 = 97 |
| CES14 = 74 | CES39 = 98 | CES64 = 91 | CES89 = 84 |
| CES15 = 71 | CES40 = 96 | CES65 = 88 | CES90 = 99 |
| CES16 = 47 | CES41 = 98 | CES66 = 88 | CES91 = 74 |
| CES17 = 49 | CES42 = 89 | CES67 = 87 | CES92 = 78 |
| CES18 = 56 | CES43 = 89 | CES68 = 87 | CES93 = 87 |
| CES19 = 71 | CES44 = 99 | CES69 = 88 | CES94 = 75 |
| CES20 = 66 | CES45 = 93 | CES70 = 84 | CES95 = 83 |
| CES21 = 85 | CES46 = 95 | CES71 = 80 | CES96 = 91 |
| CES22 = 78 | CES47 = 92 | CES72 = 93 | CES97 = 93 |
| CES23 = 91 | CES48 = 96 | CES73 = 78 | CES98 = 93 |
| CES24 = 90 | CES49 = 93 | CES74 = 92 | CES99 = 94 |
| CES25 = 71 | CES50 = 99 | CES75 = 81 |            |



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)