

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: P1436526

Luminaire Tested: EHBR1-42-UNV-M-L935-UPL24

Issue Date: 3/25/2026

**Test Information**

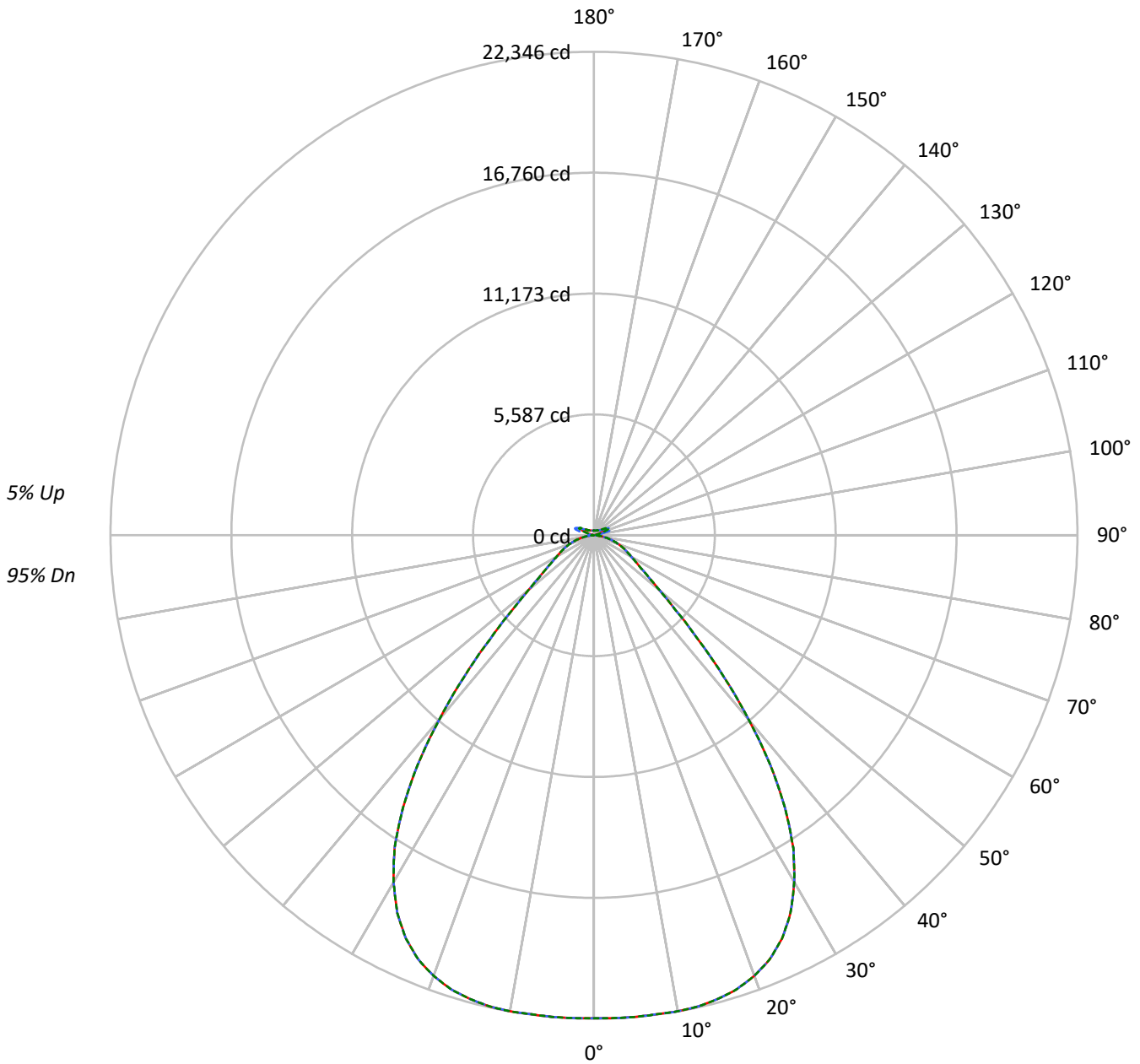
Test Method: LM-79-2019  
Report Number: P1436526  
REPORT IS A COMBINATION OF REPORTS P1436094 AND P1431635  
Test Lab: INNOVATION CENTER  
Issue Date: 3/25/2026  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: METALUX  
Catalog Number: EHBR1-42-UNV-M-L935-UPL24  
Description: Elevate Round Highbay at, 42000 lumens, 3500K 90CRI LEDs with M lens  
Light Source: -  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 39929.6 lumens  
Efficiency: N/A  
Efficacy: 165.8 lumens/watt  
Spacing Criteria (0/90/45): 1.21 / 1.21 / 1.15  
Luminous Opening: Vertical Cylinder (Dia: 1.71' x H: 0.1')  
CIE Type: Direct  
  
Input Watts (W): 240.9  
Input Voltage (V): NR  
Input Current (A<sub>in</sub>): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P1436526  
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### Luminous Intensity Polar Plot



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



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

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |    |    |    |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|----|----|----|----|----|
| RF  | 20  |     |     |     | 20  |     |     |     | 20  |     |     |     | 20  |     |    |    | 20 |    |    |    |    |
| RC  | 80  |     |     |     | 70  |     |     |     | 50  |     |     |     | 30  |     |    |    | 10 |    |    | 0  |    |
| RW  | 70  | 50  | 30  | 10  | 70  | 50  | 30  | 10  | 50  | 30  | 10  | 50  | 30  | 10  | 50 | 30 | 10 | 50 | 30 | 10 | 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 | 107 | 103 | 101 | 107 | 104 | 101 | 98  | 99  | 97  | 94  | 94  | 92  | 91  | 90 | 88 | 87 | 87 | 87 | 87 | 85 |
| 2   | 103 | 96  | 91  | 87  | 100 | 94  | 89  | 85  | 90  | 86  | 83  | 86  | 83  | 80  | 82 | 80 | 78 | 78 | 78 | 78 | 76 |
| 3   | 96  | 88  | 81  | 76  | 93  | 86  | 80  | 75  | 82  | 77  | 73  | 79  | 75  | 71  | 76 | 72 | 70 | 70 | 70 | 70 | 67 |
| 4   | 89  | 80  | 73  | 67  | 87  | 78  | 72  | 67  | 75  | 70  | 65  | 72  | 68  | 64  | 70 | 66 | 63 | 63 | 63 | 63 | 61 |
| 5   | 83  | 73  | 66  | 60  | 81  | 72  | 65  | 60  | 69  | 63  | 59  | 67  | 62  | 58  | 65 | 60 | 57 | 57 | 57 | 57 | 55 |
| 6   | 78  | 67  | 60  | 54  | 76  | 66  | 59  | 54  | 64  | 58  | 53  | 62  | 56  | 52  | 60 | 55 | 51 | 51 | 51 | 51 | 50 |
| 7   | 73  | 62  | 54  | 49  | 71  | 61  | 54  | 49  | 59  | 53  | 48  | 57  | 52  | 48  | 55 | 51 | 47 | 47 | 47 | 47 | 45 |
| 8   | 69  | 57  | 50  | 45  | 67  | 56  | 49  | 45  | 55  | 49  | 44  | 53  | 48  | 44  | 52 | 47 | 43 | 43 | 43 | 43 | 41 |
| 9   | 65  | 53  | 46  | 41  | 63  | 52  | 46  | 41  | 51  | 45  | 41  | 50  | 44  | 40  | 48 | 43 | 40 | 40 | 40 | 40 | 38 |
| 10  | 61  | 49  | 43  | 38  | 60  | 49  | 42  | 38  | 48  | 42  | 37  | 46  | 41  | 37  | 45 | 40 | 37 | 37 | 37 | 37 | 35 |

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

|     | 0°     | 45°    | 90°    |
|-----|--------|--------|--------|
| 0°  | 104839 | 104839 | 104839 |
| 5°  | 104660 | 104660 | 104660 |
| 10° | 105151 | 105151 | 105151 |
| 15° | 105755 | 105755 | 105755 |
| 20° | 105436 | 105436 | 105436 |
| 25° | 102973 | 102973 | 102973 |
| 30° | 96287  | 96287  | 96287  |
| 35° | 83857  | 83857  | 83857  |
| 40° | 64267  | 64267  | 64267  |
| 45° | 41984  | 41984  | 41984  |
| 50° | 26467  | 26467  | 26467  |
| 55° | 19729  | 19729  | 19729  |
| 60° | 16610  | 16610  | 16610  |
| 65° | 15105  | 15105  | 15105  |
| 70° | 13759  | 13759  | 13759  |
| 75° | 11778  | 11778  | 11778  |
| 80° | 9071   | 9071   | 9071   |
| 85° | 4757   | 4757   | 4757   |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
 Vertical Angle: 45°  
 Luminance: 41984 cd/sqm



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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 2132.2  | 5.3       |
| 10°-20°   | 6261.7  | 15.7      |
| 20°-30°   | 9395.4  | 23.5      |
| 30°-40°   | 9452.8  | 23.7      |
| 40°-50°   | 5411.0  | 13.6      |
| 50°-60°   | 2474.9  | 6.2       |
| 60°-70°   | 1570.3  | 3.9       |
| 70°-80°   | 880.8   | 2.2       |
| 80°-90°   | 210.5   | 0.5       |
| 90°-100°  | 61.0    | 0.2       |
| 100°-110° | 382.3   | 1.0       |
| 110°-120° | 683.7   | 1.7       |
| 120°-130° | 401.2   | 1.0       |
| 130°-140° | 246.1   | 0.6       |
| 140°-150° | 170.7   | 0.4       |
| 150°-160° | 110.9   | 0.3       |
| 160°-170° | 63.2    | 0.2       |
| 170°-180° | 20.9    | 0.1       |
| 0°-30°    | 17789.4 | 44.6      |
| 0°-40°    | 27242.2 | 68.2      |
| 0°-60°    | 35128.0 | 88.0      |
| 0°-90°    | 37789.7 | 94.6      |
| 90°-120°  | 1127.0  | 2.8       |
| 90°-150°  | 1945.0  | 4.9       |
| 90°-180°  | 2140.0  | 5.4       |
| 0°-180°   | 39929.6 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°    | 22.5° | 45°   | 67.5° | 90°   | Flux |
|------|-------|-------|-------|-------|-------|------|
| 0°   | 22325 | 22325 | 22325 | 22325 | 22325 |      |
| 5°   | 22346 | 22346 | 22346 | 22346 | 22346 | 2132 |
| 15°  | 22187 | 22187 | 22187 | 22187 | 22187 | 6262 |
| 25°  | 20564 | 20564 | 20564 | 20564 | 20564 | 9395 |
| 35°  | 15391 | 15391 | 15391 | 15391 | 15391 | 9453 |
| 45°  | 6793  | 6793  | 6793  | 6793  | 6793  | 5411 |
| 55°  | 2666  | 2666  | 2666  | 2666  | 2666  | 2475 |
| 65°  | 1577  | 1577  | 1577  | 1577  | 1577  | 1570 |
| 75°  | 830   | 830   | 830   | 830   | 830   | 881  |
| 85°  | 164   | 164   | 164   | 164   | 164   | 200  |
| 90°  | 16    | 26    | 44    | 28    | 16    | 14   |
| 95°  | 27    | 45    | 99    | 49    | 31    | 26   |
| 105° | 134   | 263   | 672   | 290   | 176   | 179  |
| 115° | 615   | 647   | 795   | 762   | 757   | 566  |
| 125° | 444   | 414   | 425   | 431   | 484   | 404  |
| 135° | 323   | 314   | 325   | 305   | 304   | 253  |
| 145° | 266   | 262   | 278   | 274   | 273   | 168  |
| 155° | 233   | 230   | 241   | 241   | 241   | 109  |
| 165° | 218   | 218   | 224   | 224   | 223   | 62   |
| 175° | 216   | 216   | 219   | 219   | 219   | 21   |
| 180° | 218   | 218   | 218   | 218   | 218   |      |



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**CANDELA DISTRIBUTION (FULL):**

|        | 0°      | 22.5°   | 45°     | 67.5°   | 90°     |
|--------|---------|---------|---------|---------|---------|
| 0°     | 22324.8 | 22324.8 | 22324.8 | 22324.8 | 22324.8 |
| 2.5°   | 22335.7 | 22335.7 | 22335.7 | 22335.7 | 22335.7 |
| 5°     | 22346.5 | 22346.5 | 22346.5 | 22346.5 | 22346.5 |
| 7.5°   | 22331.2 | 22331.2 | 22331.2 | 22331.2 | 22331.2 |
| 10°    | 22340.8 | 22340.8 | 22340.8 | 22340.8 | 22340.8 |
| 12.5°  | 22302.5 | 22302.5 | 22302.5 | 22302.5 | 22302.5 |
| 15°    | 22186.8 | 22186.8 | 22186.8 | 22186.8 | 22186.8 |
| 17.5°  | 21995.9 | 21995.9 | 21995.9 | 21995.9 | 21995.9 |
| 20°    | 21670.1 | 21670.1 | 21670.1 | 21670.1 | 21670.1 |
| 22.5°  | 21222.3 | 21222.3 | 21222.3 | 21222.3 | 21222.3 |
| 25°    | 20563.7 | 20563.7 | 20563.7 | 20563.7 | 20563.7 |
| 27.5°  | 19677.7 | 19677.7 | 19677.7 | 19677.7 | 19677.7 |
| 30°    | 18520.8 | 18520.8 | 18520.8 | 18520.8 | 18520.8 |
| 32.5°  | 17151.3 | 17151.3 | 17151.3 | 17151.3 | 17151.3 |
| 35°    | 15390.8 | 15390.8 | 15390.8 | 15390.8 | 15390.8 |
| 37.5°  | 13396.5 | 13396.5 | 13396.5 | 13396.5 | 13396.5 |
| 40°    | 11139.1 | 11139.1 | 11139.1 | 11139.1 | 11139.1 |
| 42.5°  | 8901.4  | 8901.4  | 8901.4  | 8901.4  | 8901.4  |
| 45°    | 6792.8  | 6792.8  | 6792.8  | 6792.8  | 6792.8  |
| 47.5°  | 5113.4  | 5113.4  | 5113.4  | 5113.4  | 5113.4  |
| 50°    | 3944.5  | 3944.5  | 3944.5  | 3944.5  | 3944.5  |
| 52.5°  | 3186.9  | 3186.9  | 3186.9  | 3186.9  | 3186.9  |
| 55°    | 2666.2  | 2666.2  | 2666.2  | 2666.2  | 2666.2  |
| 57.5°  | 2283.0  | 2283.0  | 2283.0  | 2283.0  | 2283.0  |
| 60°    | 1996.8  | 1996.8  | 1996.8  | 1996.8  | 1996.8  |
| 62.5°  | 1775.9  | 1775.9  | 1775.9  | 1775.9  | 1775.9  |
| 65°    | 1576.6  | 1576.6  | 1576.6  | 1576.6  | 1576.6  |
| 67.5°  | 1393.2  | 1393.2  | 1393.2  | 1393.2  | 1393.2  |
| 70°    | 1207.3  | 1207.3  | 1207.3  | 1207.3  | 1207.3  |
| 72.5°  | 1020.2  | 1020.2  | 1020.2  | 1020.2  | 1020.2  |
| 75°    | 829.7   | 829.7   | 829.7   | 829.7   | 829.7   |
| 77.5°  | 649.0   | 649.0   | 649.0   | 649.0   | 649.0   |
| 80°    | 477.2   | 477.2   | 477.2   | 477.2   | 477.2   |
| 82.5°  | 311.1   | 311.1   | 311.1   | 311.1   | 311.1   |
| 85°    | 163.5   | 163.5   | 163.5   | 163.5   | 163.5   |
| 87.5°  | 46.7    | 46.7    | 46.7    | 46.7    | 46.7    |
| 90°    | 16.0    | 25.7    | 44.1    | 28.2    | 16.0    |
| 92.5°  | 23.3    | 39.2    | 71.1    | 36.7    | 20.8    |
| 95°    | 26.9    | 45.3    | 99.2    | 49.0    | 30.6    |
| 97.5°  | 34.3    | 50.2    | 113.9   | 60.0    | 47.8    |
| 100°   | 45.3    | 58.8    | 177.6   | 73.5    | 63.7    |
| 102.5° | 77.1    | 125.0   | 377.3   | 138.4   | 96.8    |
| 105°   | 133.5   | 263.4   | 672.5   | 290.3   | 176.4   |
| 107.5° | 231.5   | 471.7   | 886.8   | 514.5   | 334.4   |
| 110°   | 432.4   | 625.9   | 929.7   | 706.8   | 535.3   |



TEST NUMBER: P1436526

CATALOG NUMBER: EHBR1-42-UNV-M-L935-UPL24

**CANDELA DISTRIBUTION (continued):**

|        | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|--------|-------|-------|-------|-------|-------|
| 112.5° | 584.3 | 672.5 | 890.6 | 780.3 | 697.0 |
| 115°   | 614.9 | 646.8 | 795.0 | 762.0 | 757.1 |
| 117.5° | 594.1 | 590.5 | 674.9 | 684.7 | 731.3 |
| 120°   | 550.1 | 525.5 | 563.5 | 597.8 | 660.3 |
| 122.5° | 494.9 | 465.5 | 482.6 | 508.4 | 570.8 |
| 125°   | 443.5 | 414.0 | 425.1 | 431.2 | 483.9 |
| 127.5° | 398.2 | 378.5 | 384.6 | 377.3 | 410.4 |
| 130°   | 367.5 | 350.3 | 358.9 | 341.8 | 357.7 |
| 132.5° | 341.8 | 330.7 | 340.5 | 319.8 | 324.6 |
| 135°   | 323.4 | 313.6 | 324.6 | 305.0 | 303.8 |
| 137.5° | 307.4 | 298.9 | 309.9 | 295.2 | 291.6 |
| 140°   | 292.7 | 285.4 | 297.6 | 286.7 | 284.2 |
| 142.5° | 276.9 | 271.9 | 286.7 | 279.3 | 276.9 |
| 145°   | 265.8 | 262.1 | 278.1 | 274.4 | 273.2 |
| 147.5° | 256.0 | 253.6 | 268.3 | 267.0 | 267.0 |
| 150°   | 247.4 | 245.0 | 259.7 | 258.5 | 259.7 |
| 152.5° | 238.9 | 236.5 | 249.9 | 248.7 | 249.9 |
| 155°   | 232.7 | 230.3 | 241.4 | 241.4 | 241.4 |
| 157.5° | 227.9 | 226.6 | 235.2 | 235.2 | 235.2 |
| 160°   | 224.1 | 223.0 | 230.3 | 230.3 | 229.0 |
| 162.5° | 220.5 | 219.2 | 227.9 | 226.6 | 226.6 |
| 165°   | 218.1 | 218.1 | 224.1 | 224.1 | 223.0 |
| 167.5° | 218.1 | 216.8 | 223.0 | 223.0 | 221.7 |
| 170°   | 216.8 | 216.8 | 221.7 | 220.5 | 219.2 |
| 172.5° | 216.8 | 216.8 | 221.7 | 220.5 | 219.2 |
| 175°   | 215.6 | 215.6 | 219.2 | 219.2 | 219.2 |
| 177.5° | 216.8 | 216.8 | 219.2 | 219.2 | 218.1 |
| 180°   | 218.1 | 218.1 | 218.1 | 218.1 | 218.1 |



TEST NUMBER: P1436526  
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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 | 18.61            | 19.80 | 19.07 | 20.22 | 20.68 | 18.61          | 19.80 | 19.07 | 20.22 | 20.68 |
|                 | 3H   | 20.10            | 21.15 | 20.57 | 21.59 | 22.09 | 20.10          | 21.15 | 20.57 | 21.59 | 22.09 |
|                 | 4H   | 20.62            | 21.60 | 21.12 | 22.06 | 22.58 | 20.62          | 21.60 | 21.12 | 22.06 | 22.58 |
|                 | 6H   | 20.95            | 21.85 | 21.46 | 22.33 | 22.85 | 20.95          | 21.85 | 21.46 | 22.33 | 22.85 |
|                 | 8H   | 21.02            | 21.87 | 21.54 | 22.37 | 22.90 | 21.02          | 21.87 | 21.54 | 22.37 | 22.90 |
|                 | 12H  | 21.03            | 21.85 | 21.56 | 22.34 | 22.89 | 21.03          | 21.85 | 21.56 | 22.34 | 22.89 |
| 4H              | 2H   | 19.05            | 20.03 | 19.55 | 20.49 | 21.01 | 19.05          | 20.03 | 19.55 | 20.49 | 21.01 |
|                 | 3H   | 20.75            | 21.56 | 21.26 | 22.06 | 22.60 | 20.75          | 21.56 | 21.26 | 22.06 | 22.60 |
|                 | 4H   | 21.38            | 22.10 | 21.91 | 22.62 | 23.19 | 21.38          | 22.10 | 21.91 | 22.62 | 23.19 |
|                 | 6H   | 21.81            | 22.43 | 22.36 | 22.97 | 23.57 | 21.81          | 22.43 | 22.36 | 22.97 | 23.57 |
|                 | 8H   | 21.90            | 22.48 | 22.46 | 23.03 | 23.62 | 21.90          | 22.48 | 22.46 | 23.03 | 23.62 |
|                 | 12H  | 21.93            | 22.44 | 22.51 | 23.02 | 23.62 | 21.93          | 22.44 | 22.51 | 23.02 | 23.62 |
| 8H              | 4H   | 21.56            | 22.14 | 22.12 | 22.68 | 23.28 | 21.56          | 22.14 | 22.12 | 22.68 | 23.28 |
|                 | 6H   | 22.07            | 22.54 | 22.66 | 23.14 | 23.74 | 22.07          | 22.54 | 22.66 | 23.14 | 23.74 |
|                 | 8H   | 22.21            | 22.63 | 22.82 | 23.24 | 23.85 | 22.21          | 22.63 | 22.82 | 23.24 | 23.85 |
|                 | 12H  | 22.28            | 22.65 | 22.88 | 23.24 | 23.93 | 22.28          | 22.65 | 22.88 | 23.24 | 23.93 |
| 12H             | 4H   | 21.55            | 22.06 | 22.12 | 22.64 | 23.24 | 21.55          | 22.06 | 22.12 | 22.64 | 23.24 |
|                 | 6H   | 22.07            | 22.50 | 22.68 | 23.10 | 23.72 | 22.07          | 22.50 | 22.68 | 23.10 | 23.72 |
|                 | 8H   | 22.24            | 22.62 | 22.85 | 23.20 | 23.89 | 22.24          | 22.62 | 22.85 | 23.20 | 23.89 |

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



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

Report Prepared for

Cooper Lighting Solutions

Metalux

Report Number: SP1-2506-472-6

Test Date: 08/01/2025

Luminaire Tested: EHBR-60-L935-N

Data in this report applies to families of products including EHBR-60-L935-N

**Test Information**

Test Method: LM-79-2019  
 Report Number: SP1-2506-472-6  
 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-L935-N**  
 Description: Elevate Round Highbay at, 60000 lumens, 3500K 90CRI LEDs with N lens

**Spectral Parameters**

CCT (K): 3406  
 CIE u': 0.2394  
 CIE v': 0.5094  
 Duv: -0.0028  
 CIE x: 0.4076  
 CIE y: 0.3856  
 CIE z: 0.2068  
 Peak Wavelength (nm): 630  
 Dominant Wavelength (nm): 582  
 Purity: 38.0517  
 Rf: 91.3  
 Rg: 100

CRI (Ra): 94.6  
 R1: 96.6  
 R2: 98.4  
 R3: 98.1  
 R4: 95.8  
 R5: 96.2  
 R6: 95.4  
 R7: 91.8  
 R8: 84.4  
 R9: 63.8  
 R10: 94.7  
 R11: 96.6  
 R12: 80.9  
 R13: 97.4  
 R14: 98.3  
 R15: 93.1



**Test Conditions**

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

REPORT NUMBER: SP1-2506-472-6

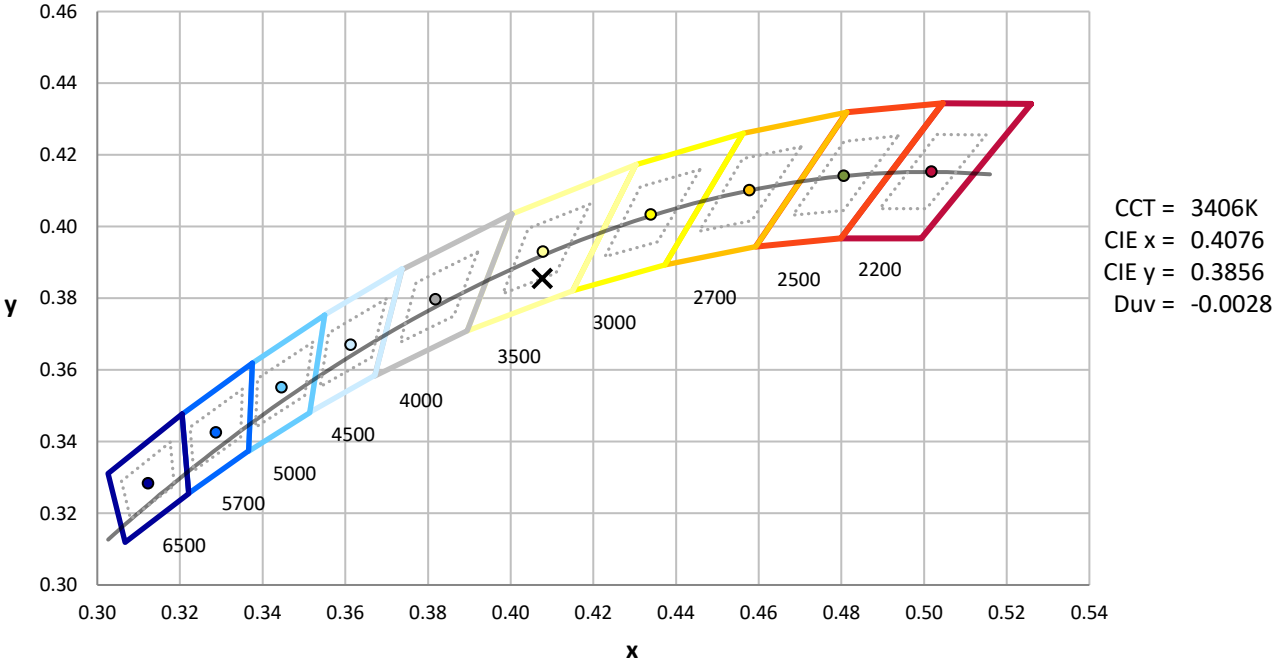
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date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

REPORT NUMBER: SP1-2506-472-6

CIE 1931 Chromaticity Diagram



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



CCT = 3406K  
 CIE x = 0.4076  
 CIE y = 0.3856  
 Duv = -0.0028

Point lies inside the ANSI 3500K 4-step quadrangle

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**Photopic Flux vs. Wavelength**

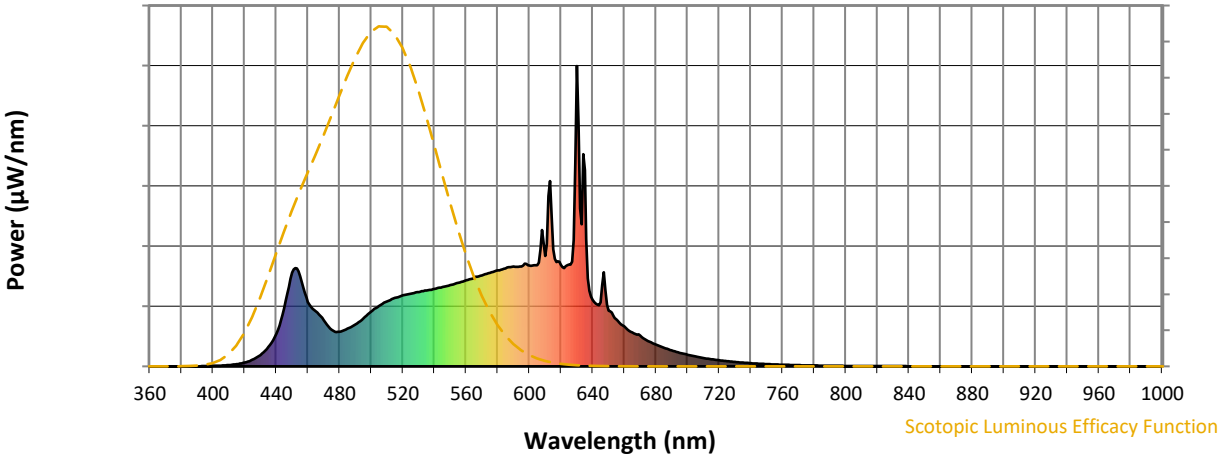


**Photopic Lumens: NR**

| λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) |
|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|
| 360    | 0                        | NR            | 490    | 140                      | NR            | 620    | 338                      | NR            | 750    | 8                        | NR            | 880    | 0                        | NR            |
| 365    | 0                        | NR            | 495    | 159                      | NR            | 625    | 339                      | NR            | 755    | 7                        | NR            | 885    | 0                        | NR            |
| 370    | 0                        | NR            | 500    | 182                      | NR            | 630    | 1000                     | NR            | 760    | 5                        | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 202                      | NR            | 635    | 653                      | NR            | 765    | 5                        | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 216                      | NR            | 640    | 222                      | NR            | 770    | 4                        | NR            | 900    | 0                        | NR            |
| 385    | 0                        | NR            | 515    | 228                      | NR            | 645    | 214                      | NR            | 775    | 3                        | NR            | 905    | 0                        | NR            |
| 390    | 0                        | NR            | 520    | 236                      | NR            | 650    | 185                      | NR            | 780    | 3                        | NR            | 910    | 0                        | NR            |
| 395    | 1                        | NR            | 525    | 242                      | NR            | 655    | 157                      | NR            | 785    | 3                        | NR            | 915    | 0                        | NR            |
| 400    | 2                        | NR            | 530    | 248                      | NR            | 660    | 133                      | NR            | 790    | 2                        | NR            | 920    | 0                        | NR            |
| 405    | 3                        | NR            | 535    | 253                      | NR            | 665    | 113                      | NR            | 795    | 2                        | NR            | 925    | 0                        | NR            |
| 410    | 4                        | NR            | 540    | 258                      | NR            | 670    | 103                      | NR            | 800    | 2                        | NR            | 930    | 0                        | NR            |
| 415    | 7                        | NR            | 545    | 264                      | NR            | 675    | 85                       | NR            | 805    | 1                        | NR            | 935    | 0                        | NR            |
| 420    | 13                       | NR            | 550    | 270                      | NR            | 680    | 72                       | NR            | 810    | 1                        | NR            | 940    | 0                        | NR            |
| 425    | 22                       | NR            | 555    | 278                      | NR            | 685    | 62                       | NR            | 815    | 1                        | NR            | 945    | 0                        | NR            |
| 430    | 38                       | NR            | 560    | 286                      | NR            | 690    | 53                       | NR            | 820    | 1                        | NR            | 950    | 0                        | NR            |
| 435    | 65                       | NR            | 565    | 295                      | NR            | 695    | 45                       | NR            | 825    | 1                        | NR            | 955    | 0                        | NR            |
| 440    | 108                      | NR            | 570    | 303                      | NR            | 700    | 39                       | NR            | 830    | 1                        | NR            | 960    | 0                        | NR            |
| 445    | 193                      | NR            | 575    | 311                      | NR            | 705    | 33                       | NR            | 835    | 1                        | NR            | 965    | 0                        | NR            |
| 450    | 312                      | NR            | 580    | 319                      | NR            | 710    | 28                       | NR            | 840    | 1                        | NR            | 970    | 0                        | NR            |
| 455    | 300                      | NR            | 585    | 326                      | NR            | 715    | 24                       | NR            | 845    | 0                        | NR            | 975    | 0                        | NR            |
| 460    | 214                      | NR            | 590    | 332                      | NR            | 720    | 20                       | NR            | 850    | 0                        | NR            | 980    | 0                        | NR            |
| 465    | 184                      | NR            | 595    | 333                      | NR            | 725    | 17                       | NR            | 855    | 0                        | NR            | 985    | 0                        | NR            |
| 470    | 153                      | NR            | 600    | 336                      | NR            | 730    | 15                       | NR            | 860    | 0                        | NR            | 990    | 0                        | NR            |
| 475    | 122                      | NR            | 605    | 337                      | NR            | 735    | 12                       | NR            | 865    | 0                        | NR            | 995    | 0                        | NR            |
| 480    | 115                      | NR            | 610    | 367                      | NR            | 740    | 10                       | NR            | 870    | 0                        | NR            | 1000   | 0                        | NR            |
| 485    | 125                      | NR            | 615    | 390                      | NR            | 745    | 9                        | NR            | 875    | 0                        | NR            |        |                          |               |

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**Scotopic Flux vs. Wavelength**



**Scotopic Lumens: NR**

**S/P: 1.62**

| 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    | 140                      | NR            | 620    | 338                      | NR            | 750    | 8                        | NR            | 880    | 0                        | NR            |
| 365    | 0                        | NR            | 495    | 159                      | NR            | 625    | 339                      | NR            | 755    | 7                        | NR            | 885    | 0                        | NR            |
| 370    | 0                        | NR            | 500    | 182                      | NR            | 630    | 1000                     | NR            | 760    | 5                        | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 202                      | NR            | 635    | 653                      | NR            | 765    | 5                        | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 216                      | NR            | 640    | 222                      | NR            | 770    | 4                        | NR            | 900    | 0                        | NR            |
| 385    | 0                        | NR            | 515    | 228                      | NR            | 645    | 214                      | NR            | 775    | 3                        | NR            | 905    | 0                        | NR            |
| 390    | 0                        | NR            | 520    | 236                      | NR            | 650    | 185                      | NR            | 780    | 3                        | NR            | 910    | 0                        | NR            |
| 395    | 1                        | NR            | 525    | 242                      | NR            | 655    | 157                      | NR            | 785    | 3                        | NR            | 915    | 0                        | NR            |
| 400    | 2                        | NR            | 530    | 248                      | NR            | 660    | 133                      | NR            | 790    | 2                        | NR            | 920    | 0                        | NR            |
| 405    | 3                        | NR            | 535    | 253                      | NR            | 665    | 113                      | NR            | 795    | 2                        | NR            | 925    | 0                        | NR            |
| 410    | 4                        | NR            | 540    | 258                      | NR            | 670    | 103                      | NR            | 800    | 2                        | NR            | 930    | 0                        | NR            |
| 415    | 7                        | NR            | 545    | 264                      | NR            | 675    | 85                       | NR            | 805    | 1                        | NR            | 935    | 0                        | NR            |
| 420    | 13                       | NR            | 550    | 270                      | NR            | 680    | 72                       | NR            | 810    | 1                        | NR            | 940    | 0                        | NR            |
| 425    | 22                       | NR            | 555    | 278                      | NR            | 685    | 62                       | NR            | 815    | 1                        | NR            | 945    | 0                        | NR            |
| 430    | 38                       | NR            | 560    | 286                      | NR            | 690    | 53                       | NR            | 820    | 1                        | NR            | 950    | 0                        | NR            |
| 435    | 65                       | NR            | 565    | 295                      | NR            | 695    | 45                       | NR            | 825    | 1                        | NR            | 955    | 0                        | NR            |
| 440    | 108                      | NR            | 570    | 303                      | NR            | 700    | 39                       | NR            | 830    | 1                        | NR            | 960    | 0                        | NR            |
| 445    | 193                      | NR            | 575    | 311                      | NR            | 705    | 33                       | NR            | 835    | 1                        | NR            | 965    | 0                        | NR            |
| 450    | 312                      | NR            | 580    | 319                      | NR            | 710    | 28                       | NR            | 840    | 1                        | NR            | 970    | 0                        | NR            |
| 455    | 300                      | NR            | 585    | 326                      | NR            | 715    | 24                       | NR            | 845    | 0                        | NR            | 975    | 0                        | NR            |
| 460    | 214                      | NR            | 590    | 332                      | NR            | 720    | 20                       | NR            | 850    | 0                        | NR            | 980    | 0                        | NR            |
| 465    | 184                      | NR            | 595    | 333                      | NR            | 725    | 17                       | NR            | 855    | 0                        | NR            | 985    | 0                        | NR            |
| 470    | 153                      | NR            | 600    | 336                      | NR            | 730    | 15                       | NR            | 860    | 0                        | NR            | 990    | 0                        | NR            |
| 475    | 122                      | NR            | 605    | 337                      | NR            | 735    | 12                       | NR            | 865    | 0                        | NR            | 995    | 0                        | NR            |
| 480    | 115                      | NR            | 610    | 367                      | NR            | 740    | 10                       | NR            | 870    | 0                        | NR            | 1000   | 0                        | NR            |
| 485    | 125                      | NR            | 615    | 390                      | NR            | 745    | 9                        | NR            | 875    | 0                        | NR            |        |                          |               |

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**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: NR**

**M/P: 3.3**

| 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    | 140                      | NR            | 620    | 338                      | NR            | 750    | 8                        | NR            | 880    | 0                        | NR            |
| 365    | 0                        | NR            | 495    | 159                      | NR            | 625    | 339                      | NR            | 755    | 7                        | NR            | 885    | 0                        | NR            |
| 370    | 0                        | NR            | 500    | 182                      | NR            | 630    | 1000                     | NR            | 760    | 5                        | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 202                      | NR            | 635    | 653                      | NR            | 765    | 5                        | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 216                      | NR            | 640    | 222                      | NR            | 770    | 4                        | NR            | 900    | 0                        | NR            |
| 385    | 0                        | NR            | 515    | 228                      | NR            | 645    | 214                      | NR            | 775    | 3                        | NR            | 905    | 0                        | NR            |
| 390    | 0                        | NR            | 520    | 236                      | NR            | 650    | 185                      | NR            | 780    | 3                        | NR            | 910    | 0                        | NR            |
| 395    | 1                        | NR            | 525    | 242                      | NR            | 655    | 157                      | NR            | 785    | 3                        | NR            | 915    | 0                        | NR            |
| 400    | 2                        | NR            | 530    | 248                      | NR            | 660    | 133                      | NR            | 790    | 2                        | NR            | 920    | 0                        | NR            |
| 405    | 3                        | NR            | 535    | 253                      | NR            | 665    | 113                      | NR            | 795    | 2                        | NR            | 925    | 0                        | NR            |
| 410    | 4                        | NR            | 540    | 258                      | NR            | 670    | 103                      | NR            | 800    | 2                        | NR            | 930    | 0                        | NR            |
| 415    | 7                        | NR            | 545    | 264                      | NR            | 675    | 85                       | NR            | 805    | 1                        | NR            | 935    | 0                        | NR            |
| 420    | 13                       | NR            | 550    | 270                      | NR            | 680    | 72                       | NR            | 810    | 1                        | NR            | 940    | 0                        | NR            |
| 425    | 22                       | NR            | 555    | 278                      | NR            | 685    | 62                       | NR            | 815    | 1                        | NR            | 945    | 0                        | NR            |
| 430    | 38                       | NR            | 560    | 286                      | NR            | 690    | 53                       | NR            | 820    | 1                        | NR            | 950    | 0                        | NR            |
| 435    | 65                       | NR            | 565    | 295                      | NR            | 695    | 45                       | NR            | 825    | 1                        | NR            | 955    | 0                        | NR            |
| 440    | 108                      | NR            | 570    | 303                      | NR            | 700    | 39                       | NR            | 830    | 1                        | NR            | 960    | 0                        | NR            |
| 445    | 193                      | NR            | 575    | 311                      | NR            | 705    | 33                       | NR            | 835    | 1                        | NR            | 965    | 0                        | NR            |
| 450    | 312                      | NR            | 580    | 319                      | NR            | 710    | 28                       | NR            | 840    | 1                        | NR            | 970    | 0                        | NR            |
| 455    | 300                      | NR            | 585    | 326                      | NR            | 715    | 24                       | NR            | 845    | 0                        | NR            | 975    | 0                        | NR            |
| 460    | 214                      | NR            | 590    | 332                      | NR            | 720    | 20                       | NR            | 850    | 0                        | NR            | 980    | 0                        | NR            |
| 465    | 184                      | NR            | 595    | 333                      | NR            | 725    | 17                       | NR            | 855    | 0                        | NR            | 985    | 0                        | NR            |
| 470    | 153                      | NR            | 600    | 336                      | NR            | 730    | 15                       | NR            | 860    | 0                        | NR            | 990    | 0                        | NR            |
| 475    | 122                      | NR            | 605    | 337                      | NR            | 735    | 12                       | NR            | 865    | 0                        | NR            | 995    | 0                        | NR            |
| 480    | 115                      | NR            | 610    | 367                      | NR            | 740    | 10                       | NR            | 870    | 0                        | NR            | 1000   | 0                        | NR            |
| 485    | 125                      | NR            | 615    | 390                      | NR            | 745    | 9                        | NR            | 875    | 0                        | NR            |        |                          |               |

**Summary**

$R_f = 91.3$   
 $R_g = 100$   
 $CIE R_a = 94.6$   
 $R_9 = 63.8$



**Color Vector Graphics**



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 94 | CES51 = 97 | CES76 = 90 |
| CES02 = 63 | CES27 = 92 | CES52 = 98 | CES77 = 86 |
| CES03 = 31 | CES28 = 97 | CES53 = 98 | CES78 = 86 |
| CES04 = 70 | CES29 = 97 | CES54 = 93 | CES79 = 90 |
| CES05 = 50 | CES30 = 92 | CES55 = 92 | CES80 = 91 |
| CES06 = 51 | CES31 = 97 | CES56 = 96 | CES81 = 74 |
| CES07 = 43 | CES32 = 89 | CES57 = 94 | CES82 = 96 |
| CES08 = 41 | CES33 = 99 | CES58 = 95 | CES83 = 94 |
| CES09 = 29 | CES34 = 94 | CES59 = 98 | CES84 = 95 |
| CES10 = 75 | CES35 = 97 | CES60 = 92 | CES85 = 79 |
| CES11 = 58 | CES36 = 81 | CES61 = 93 | CES86 = 79 |
| CES12 = 64 | CES37 = 96 | CES62 = 86 | CES87 = 92 |
| CES13 = 44 | CES38 = 87 | CES63 = 94 | CES88 = 98 |
| CES14 = 74 | CES39 = 99 | CES64 = 91 | CES89 = 84 |
| CES15 = 72 | CES40 = 97 | CES65 = 90 | CES90 = 96 |
| CES16 = 48 | CES41 = 96 | CES66 = 89 | CES91 = 75 |
| CES17 = 49 | CES42 = 94 | CES67 = 88 | CES92 = 76 |
| CES18 = 56 | CES43 = 93 | CES68 = 89 | CES93 = 86 |
| CES19 = 71 | CES44 = 99 | CES69 = 90 | CES94 = 74 |
| CES20 = 67 | CES45 = 97 | CES70 = 88 | CES95 = 83 |
| CES21 = 86 | CES46 = 97 | CES71 = 83 | CES96 = 92 |
| CES22 = 78 | CES47 = 91 | CES72 = 94 | CES97 = 96 |
| CES23 = 91 | CES48 = 91 | CES73 = 83 | CES98 = 95 |
| CES24 = 90 | CES49 = 96 | CES74 = 90 | CES99 = 92 |
| CES25 = 71 | CES50 = 98 | CES75 = 85 |            |



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)