

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: P1432563

Luminaire Tested: EHBR1-12-UNV-N-L835-UPL12

Issue Date: 3/20/2026

**Test Information**

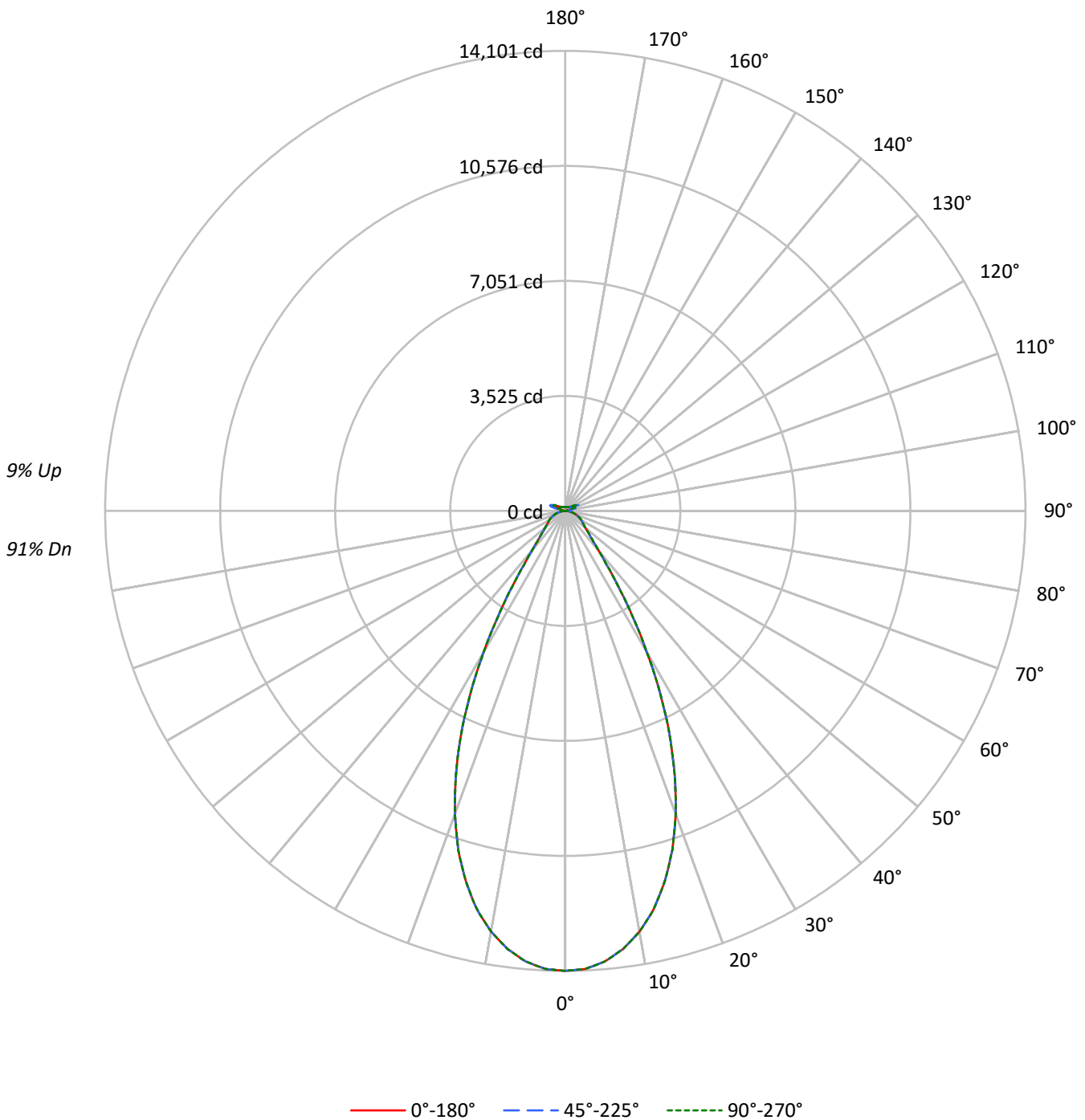
Test Method: LM-79-2019  
Report Number: P1432563  
REPORT IS A COMBINATION OF REPORTS P1431652 AND P1431635  
Test Lab: INNOVATION CENTER  
Issue Date: 3/20/2026  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: METALUX  
Catalog Number: EHBR1-12-UNV-N-L835-UPL12  
Description: Elevate Round Highbay at, 12000 lumens, 3500K 80CRI LEDs with N lens  
Light Source: -  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 13223.4 lumens  
Efficiency: N/A  
Efficacy: 183.4 lumens/watt  
Spacing Criteria (0/90/45): 0.82 / 0.82 / 0.8  
Luminous Opening: Vertical Cylinder (Dia: 1.71' x H: 0.1')  
CIE Type: Direct  
  
Input Watts (W): 72.1  
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: P1432563  
CATALOG NUMBER: EHBR1-12-UNV-N-L835-UPL12

### Luminous Intensity Polar Plot





TEST NUMBER: P1432563

CATALOG NUMBER: EHBR1-12-UNV-N-L835-UPL12

**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   | 117 | 117 | 117 | 117 | 113 | 113 | 113 | 113 | 106 | 106 | 106 | 100 | 100 | 100 | 94 | 94 | 94 | 94 | 94 | 94 | 91 |
| 1   | 110 | 107 | 104 | 101 | 107 | 104 | 101 | 99  | 98  | 96  | 94  | 93  | 91  | 90  | 88 | 87 | 86 | 86 | 86 | 86 | 83 |
| 2   | 104 | 98  | 93  | 89  | 100 | 95  | 91  | 87  | 91  | 87  | 84  | 86  | 83  | 81  | 82 | 80 | 78 | 78 | 78 | 78 | 76 |
| 3   | 97  | 90  | 84  | 80  | 95  | 88  | 83  | 78  | 84  | 80  | 76  | 80  | 77  | 74  | 77 | 74 | 72 | 72 | 72 | 72 | 70 |
| 4   | 92  | 83  | 77  | 72  | 89  | 81  | 76  | 71  | 78  | 73  | 69  | 75  | 71  | 68  | 72 | 69 | 66 | 66 | 66 | 66 | 64 |
| 5   | 87  | 77  | 71  | 66  | 84  | 76  | 70  | 65  | 73  | 68  | 64  | 70  | 66  | 63  | 68 | 64 | 61 | 61 | 61 | 61 | 59 |
| 6   | 82  | 72  | 66  | 61  | 80  | 71  | 65  | 60  | 68  | 63  | 59  | 66  | 62  | 58  | 64 | 60 | 57 | 57 | 57 | 57 | 55 |
| 7   | 78  | 68  | 61  | 56  | 76  | 66  | 60  | 56  | 64  | 59  | 55  | 62  | 58  | 54  | 61 | 56 | 53 | 53 | 53 | 53 | 52 |
| 8   | 74  | 63  | 57  | 53  | 72  | 63  | 56  | 52  | 61  | 55  | 52  | 59  | 54  | 51  | 57 | 53 | 50 | 50 | 50 | 50 | 48 |
| 9   | 70  | 60  | 54  | 49  | 69  | 59  | 53  | 49  | 57  | 52  | 48  | 56  | 51  | 48  | 54 | 50 | 47 | 47 | 47 | 47 | 46 |
| 10  | 67  | 57  | 50  | 46  | 65  | 56  | 50  | 46  | 54  | 49  | 46  | 53  | 48  | 45  | 52 | 48 | 44 | 44 | 44 | 44 | 43 |

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

|     | 0°    | 45°   | 90°   |
|-----|-------|-------|-------|
| 0°  | 66220 | 66220 | 66220 |
| 5°  | 64934 | 64934 | 64934 |
| 10° | 61631 | 61631 | 61631 |
| 15° | 56075 | 56075 | 56075 |
| 20° | 48100 | 48100 | 48100 |
| 25° | 37839 | 37839 | 37839 |
| 30° | 25967 | 25967 | 25967 |
| 35° | 15425 | 15425 | 15425 |
| 40° | 9127  | 9127  | 9127  |
| 45° | 6551  | 6551  | 6551  |
| 50° | 5385  | 5385  | 5385  |
| 55° | 4894  | 4894  | 4894  |
| 60° | 4685  | 4685  | 4685  |
| 65° | 4468  | 4468  | 4468  |
| 70° | 4155  | 4155  | 4155  |
| 75° | 3756  | 3756  | 3756  |
| 80° | 3119  | 3119  | 3119  |
| 85° | 1976  | 1976  | 1976  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
 Vertical Angle: 45°  
 Luminance: 6551 cd/sqm



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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 1298.9  | 9.8       |
| 10°-20°   | 3260.5  | 24.7      |
| 20°-30°   | 3409.2  | 25.8      |
| 30°-40°   | 1847.2  | 14.0      |
| 40°-50°   | 849.8   | 6.4       |
| 50°-60°   | 598.9   | 4.5       |
| 60°-70°   | 460.9   | 3.5       |
| 70°-80°   | 279.4   | 2.1       |
| 80°-90°   | 80.7    | 0.6       |
| 90°-100°  | 32.5    | 0.2       |
| 100°-110° | 203.3   | 1.5       |
| 110°-120° | 363.5   | 2.7       |
| 120°-130° | 213.3   | 1.6       |
| 130°-140° | 130.8   | 1.0       |
| 140°-150° | 90.7    | 0.7       |
| 150°-160° | 59.0    | 0.4       |
| 160°-170° | 33.6    | 0.3       |
| 170°-180° | 11.1    | 0.1       |
| 0°-30°    | 7968.7  | 60.3      |
| 0°-40°    | 9815.9  | 74.2      |
| 0°-60°    | 11264.6 | 85.2      |
| 0°-90°    | 12085.6 | 91.4      |
| 90°-120°  | 599.3   | 4.5       |
| 90°-150°  | 1034.1  | 7.8       |
| 90°-180°  | 1138.0  | 8.6       |
| 0°-180°   | 13223.4 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°    | 22.5° | 45°   | 67.5° | 90°   | Flux |
|------|-------|-------|-------|-------|-------|------|
| 0°   | 14101 | 14101 | 14101 | 14101 | 14101 |      |
| 5°   | 13864 | 13864 | 13864 | 13864 | 13864 | 1299 |
| 15°  | 11764 | 11764 | 11764 | 11764 | 11764 | 3261 |
| 25°  | 7556  | 7556  | 7556  | 7556  | 7556  | 3409 |
| 35°  | 2831  | 2831  | 2831  | 2831  | 2831  | 1847 |
| 45°  | 1060  | 1060  | 1060  | 1060  | 1060  | 850  |
| 55°  | 661   | 661   | 661   | 661   | 661   | 599  |
| 65°  | 466   | 466   | 466   | 466   | 466   | 461  |
| 75°  | 265   | 265   | 265   | 265   | 265   | 279  |
| 85°  | 68    | 68    | 68    | 68    | 68    | 75   |
| 90°  | 9     | 14    | 24    | 15    | 9     | 7    |
| 95°  | 14    | 24    | 53    | 26    | 16    | 14   |
| 105° | 71    | 140   | 358   | 154   | 94    | 95   |
| 115° | 327   | 344   | 423   | 405   | 402   | 301  |
| 125° | 236   | 220   | 226   | 229   | 257   | 215  |
| 135° | 172   | 167   | 173   | 162   | 162   | 135  |
| 145° | 141   | 139   | 148   | 146   | 145   | 90   |
| 155° | 124   | 122   | 128   | 128   | 128   | 58   |
| 165° | 116   | 116   | 119   | 119   | 118   | 33   |
| 175° | 115   | 115   | 117   | 117   | 117   | 11   |
| 180° | 116   | 116   | 116   | 116   | 116   |      |



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**CANDELA DISTRIBUTION (FULL):**

|        | 0°      | 22.5°   | 45°     | 67.5°   | 90°     |
|--------|---------|---------|---------|---------|---------|
| 0°     | 14101.0 | 14101.0 | 14101.0 | 14101.0 | 14101.0 |
| 2.5°   | 14051.1 | 14051.1 | 14051.1 | 14051.1 | 14051.1 |
| 5°     | 13864.5 | 13864.5 | 13864.5 | 13864.5 | 13864.5 |
| 7.5°   | 13546.1 | 13546.1 | 13546.1 | 13546.1 | 13546.1 |
| 10°    | 13094.3 | 13094.3 | 13094.3 | 13094.3 | 13094.3 |
| 12.5°  | 12510.3 | 12510.3 | 12510.3 | 12510.3 | 12510.3 |
| 15°    | 11764.3 | 11764.3 | 11764.3 | 11764.3 | 11764.3 |
| 17.5°  | 10898.9 | 10898.9 | 10898.9 | 10898.9 | 10898.9 |
| 20°    | 9886.0  | 9886.0  | 9886.0  | 9886.0  | 9886.0  |
| 22.5°  | 8758.3  | 8758.3  | 8758.3  | 8758.3  | 8758.3  |
| 25°    | 7556.4  | 7556.4  | 7556.4  | 7556.4  | 7556.4  |
| 27.5°  | 6282.1  | 6282.1  | 6282.1  | 6282.1  | 6282.1  |
| 30°    | 4994.7  | 4994.7  | 4994.7  | 4994.7  | 4994.7  |
| 32.5°  | 3833.3  | 3833.3  | 3833.3  | 3833.3  | 3833.3  |
| 35°    | 2831.1  | 2831.1  | 2831.1  | 2831.1  | 2831.1  |
| 37.5°  | 2078.7  | 2078.7  | 2078.7  | 2078.7  | 2078.7  |
| 40°    | 1581.9  | 1581.9  | 1581.9  | 1581.9  | 1581.9  |
| 42.5°  | 1268.5  | 1268.5  | 1268.5  | 1268.5  | 1268.5  |
| 45°    | 1060.0  | 1060.0  | 1060.0  | 1060.0  | 1060.0  |
| 47.5°  | 909.9   | 909.9   | 909.9   | 909.9   | 909.9   |
| 50°    | 802.6   | 802.6   | 802.6   | 802.6   | 802.6   |
| 52.5°  | 724.3   | 724.3   | 724.3   | 724.3   | 724.3   |
| 55°    | 661.4   | 661.4   | 661.4   | 661.4   | 661.4   |
| 57.5°  | 610.4   | 610.4   | 610.4   | 610.4   | 610.4   |
| 60°    | 563.2   | 563.2   | 563.2   | 563.2   | 563.2   |
| 62.5°  | 516.1   | 516.1   | 516.1   | 516.1   | 516.1   |
| 65°    | 466.4   | 466.4   | 466.4   | 466.4   | 466.4   |
| 67.5°  | 415.8   | 415.8   | 415.8   | 415.8   | 415.8   |
| 70°    | 364.6   | 364.6   | 364.6   | 364.6   | 364.6   |
| 72.5°  | 314.9   | 314.9   | 314.9   | 314.9   | 314.9   |
| 75°    | 264.6   | 264.6   | 264.6   | 264.6   | 264.6   |
| 77.5°  | 215.5   | 215.5   | 215.5   | 215.5   | 215.5   |
| 80°    | 164.1   | 164.1   | 164.1   | 164.1   | 164.1   |
| 82.5°  | 114.8   | 114.8   | 114.8   | 114.8   | 114.8   |
| 85°    | 67.9    | 67.9    | 67.9    | 67.9    | 67.9    |
| 87.5°  | 24.3    | 24.3    | 24.3    | 24.3    | 24.3    |
| 90°    | 8.8     | 14.1    | 23.9    | 15.3    | 8.8     |
| 92.5°  | 12.4    | 20.8    | 37.8    | 19.5    | 11.1    |
| 95°    | 14.4    | 24.0    | 52.8    | 26.1    | 16.3    |
| 97.5°  | 18.2    | 26.7    | 60.6    | 31.9    | 25.4    |
| 100°   | 24.0    | 31.2    | 94.4    | 39.1    | 33.8    |
| 102.5° | 41.0    | 66.4    | 200.6   | 73.6    | 51.5    |
| 105°   | 71.0    | 140.0   | 357.5   | 154.4   | 93.8    |
| 107.5° | 123.1   | 250.8   | 471.5   | 273.6   | 177.8   |
| 110°   | 229.9   | 332.8   | 494.4   | 375.8   | 284.6   |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|--------|-------|-------|-------|-------|-------|
| 112.5° | 310.7 | 357.5 | 473.5 | 414.8 | 370.5 |
| 115°   | 327.0 | 343.9 | 422.7 | 405.0 | 402.5 |
| 117.5° | 315.8 | 313.9 | 358.9 | 364.0 | 388.9 |
| 120°   | 292.5 | 279.4 | 299.5 | 317.8 | 351.0 |
| 122.5° | 263.1 | 247.5 | 256.6 | 270.3 | 303.5 |
| 125°   | 235.7 | 220.1 | 226.0 | 229.2 | 257.3 |
| 127.5° | 211.7 | 201.2 | 204.5 | 200.6 | 218.2 |
| 130°   | 195.4 | 186.3 | 190.8 | 181.7 | 190.2 |
| 132.5° | 181.7 | 175.8 | 181.0 | 170.0 | 172.6 |
| 135°   | 171.9 | 166.7 | 172.6 | 162.1 | 161.6 |
| 137.5° | 163.5 | 158.9 | 164.8 | 157.0 | 155.0 |
| 140°   | 155.6 | 151.8 | 158.3 | 152.4 | 151.1 |
| 142.5° | 147.2 | 144.6 | 152.4 | 148.5 | 147.2 |
| 145°   | 141.3 | 139.3 | 147.9 | 145.8 | 145.3 |
| 147.5° | 136.1 | 134.8 | 142.6 | 142.0 | 142.0 |
| 150°   | 131.6 | 130.2 | 138.1 | 137.4 | 138.1 |
| 152.5° | 127.0 | 125.7 | 132.9 | 132.2 | 132.9 |
| 155°   | 123.7 | 122.5 | 128.3 | 128.3 | 128.3 |
| 157.5° | 121.1 | 120.4 | 125.1 | 125.1 | 125.1 |
| 160°   | 119.2 | 118.5 | 122.5 | 122.5 | 121.8 |
| 162.5° | 117.2 | 116.6 | 121.1 | 120.4 | 120.4 |
| 165°   | 115.9 | 115.9 | 119.2 | 119.2 | 118.5 |
| 167.5° | 115.9 | 115.3 | 118.5 | 118.5 | 117.9 |
| 170°   | 115.3 | 115.3 | 117.9 | 117.2 | 116.6 |
| 172.5° | 115.3 | 115.3 | 117.9 | 117.2 | 116.6 |
| 175°   | 114.6 | 114.6 | 116.6 | 116.6 | 116.6 |
| 177.5° | 115.3 | 115.3 | 116.6 | 116.6 | 115.9 |
| 180°   | 115.9 | 115.9 | 115.9 | 115.9 | 115.9 |



TEST NUMBER: P1432563  
 CATALOG NUMBER: EHBR1-12-UNV-N-L835-UPL12

**CIE UGR TABLE:**

| Reflectances:   |      |                  |       |       |       |       |                |       |       |       |       |
|-----------------|------|------------------|-------|-------|-------|-------|----------------|-------|-------|-------|-------|
| Ceiling         |      | 0.7              | 0.7   | 0.5   | 0.5   | 0.3   | 0.7            | 0.7   | 0.5   | 0.5   | 0.3   |
| Wall            |      | 0.5              | 0.3   | 0.5   | 0.3   | 0.3   | 0.5            | 0.3   | 0.5   | 0.3   | 0.3   |
| Reference plane |      | 0.2              | 0.2   | 0.2   | 0.2   | 0.2   | 0.2            | 0.2   | 0.2   | 0.2   | 0.2   |
| Room dimensions |      | Viewed crosswise |       |       |       |       | Viewed endwise |       |       |       |       |
| X=2H            | Y=2H | 13.30            | 14.34 | 13.82 | 14.83 | 15.36 | 13.30          | 14.34 | 13.82 | 14.83 | 15.36 |
|                 | 3H   | 15.08            | 16.00 | 15.61 | 16.51 | 17.08 | 15.08          | 16.00 | 15.61 | 16.51 | 17.08 |
|                 | 4H   | 15.73            | 16.60 | 16.29 | 17.12 | 17.71 | 15.73          | 16.60 | 16.29 | 17.12 | 17.71 |
|                 | 6H   | 16.19            | 16.99 | 16.76 | 17.52 | 18.12 | 16.19          | 16.99 | 16.76 | 17.52 | 18.12 |
|                 | 8H   | 16.31            | 17.06 | 16.89 | 17.62 | 18.23 | 16.31          | 17.06 | 16.89 | 17.62 | 18.23 |
|                 | 12H  | 16.37            | 17.08 | 16.95 | 17.63 | 18.26 | 16.37          | 17.08 | 16.95 | 17.63 | 18.26 |
| 4H              | 2H   | 13.84            | 14.70 | 14.39 | 15.22 | 15.81 | 13.84          | 14.70 | 14.39 | 15.22 | 15.81 |
|                 | 3H   | 15.81            | 16.52 | 16.37 | 17.09 | 17.69 | 15.81          | 16.52 | 16.37 | 17.09 | 17.69 |
|                 | 4H   | 16.58            | 17.22 | 17.16 | 17.80 | 18.44 | 16.58          | 17.22 | 17.16 | 17.80 | 18.44 |
|                 | 6H   | 17.15            | 17.70 | 17.76 | 18.30 | 18.97 | 17.15          | 17.70 | 17.76 | 18.30 | 18.97 |
|                 | 8H   | 17.31            | 17.82 | 17.92 | 18.42 | 19.09 | 17.31          | 17.82 | 17.92 | 18.42 | 19.09 |
|                 | 12H  | 17.39            | 17.84 | 18.02 | 18.47 | 19.14 | 17.39          | 17.84 | 18.02 | 18.47 | 19.14 |
| 8H              | 4H   | 16.81            | 17.32 | 17.42 | 17.92 | 18.59 | 16.81          | 17.32 | 17.42 | 17.92 | 18.59 |
|                 | 6H   | 17.49            | 17.91 | 18.13 | 18.55 | 19.23 | 17.49          | 17.91 | 18.13 | 18.55 | 19.23 |
|                 | 8H   | 17.71            | 18.08 | 18.37 | 18.74 | 19.43 | 17.71          | 18.08 | 18.37 | 18.74 | 19.43 |
|                 | 12H  | 17.85            | 18.17 | 18.51 | 18.81 | 19.57 | 17.85          | 18.17 | 18.51 | 18.81 | 19.57 |
| 12H             | 4H   | 16.80            | 17.26 | 17.43 | 17.89 | 18.56 | 16.80          | 17.26 | 17.43 | 17.89 | 18.56 |
|                 | 6H   | 17.51            | 17.88 | 18.18 | 18.54 | 19.23 | 17.51          | 17.88 | 18.18 | 18.54 | 19.23 |
|                 | 8H   | 17.78            | 18.10 | 18.43 | 18.74 | 19.50 | 17.78          | 18.10 | 18.43 | 18.74 | 19.50 |

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**

| 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    | 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**

| 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    | 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

| 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    | 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  $R_a = 82.1$   
 $R_9 = 27.6$

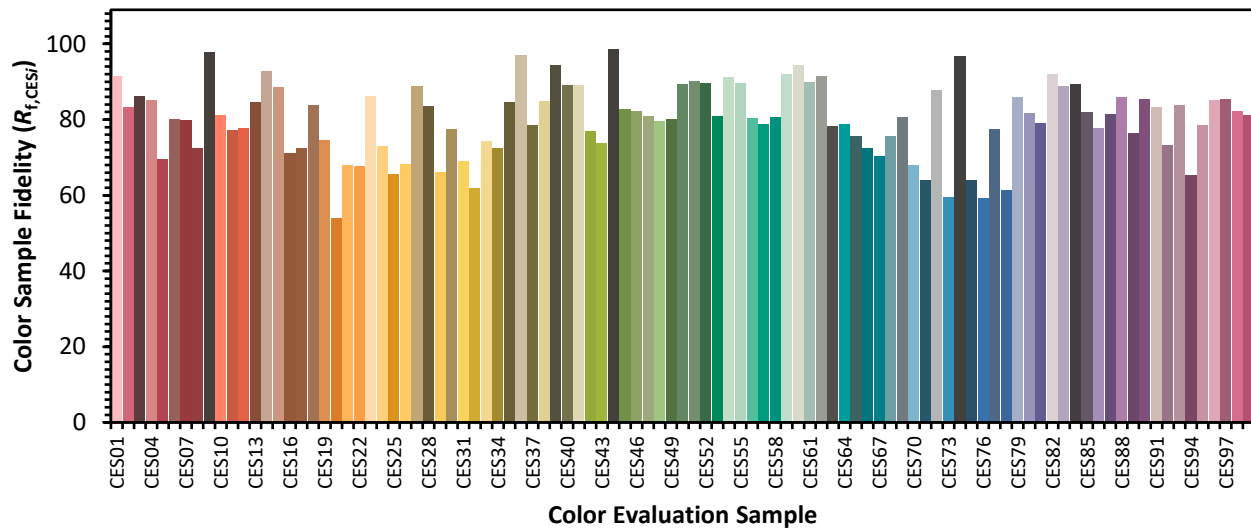


**Color Vector Graphics**

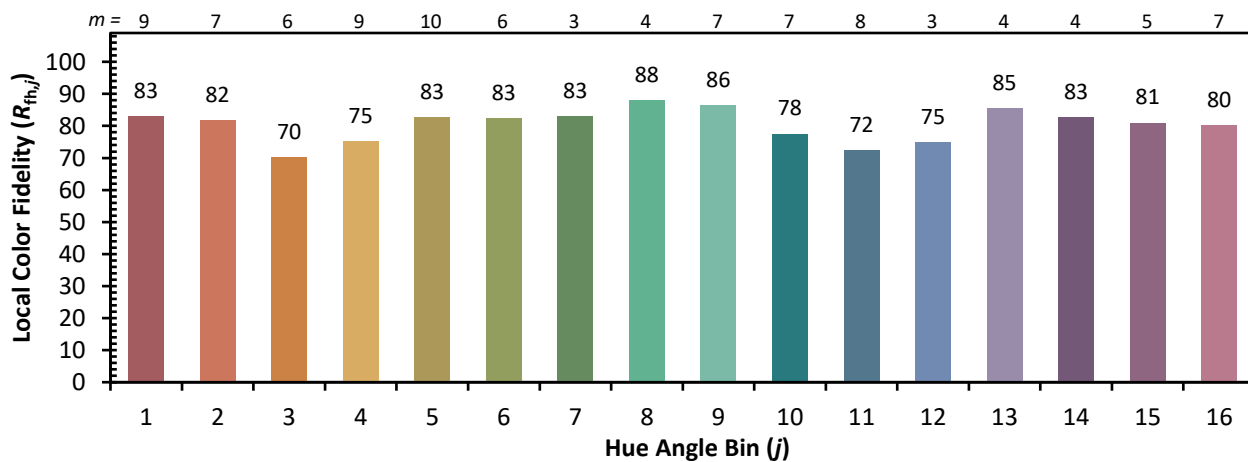


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

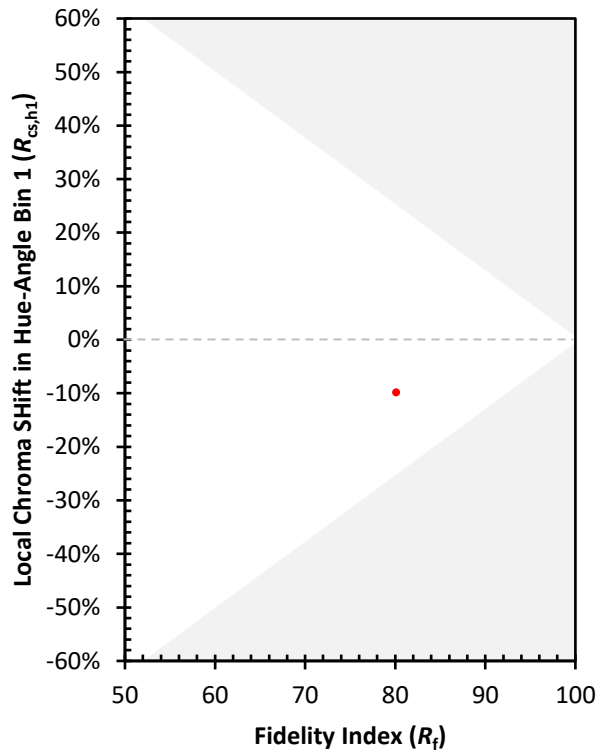
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 68 | CES51 = 90 | CES76 = 59 |
| CES02 = 62 | CES27 = 89 | CES52 = 90 | CES77 = 78 |
| CES03 = 31 | CES28 = 84 | CES53 = 81 | CES78 = 61 |
| CES04 = 70 | CES29 = 66 | CES54 = 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)