

Signify Classified - Internal  
Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269



Scaled data based on original data using  
LM-79-08 Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Test Report Prepared for  
Cooper Lighting Solutions  
(formerly Eaton)

Brand: STREETWORKS

Report Number: P879564

Luminaire Tested: **MEM2-HTN-VA-150-740-U-MQ**

Issue Date: 10/01/2024



**Test Information**

Test Method: LM-79-08  
Report Number: P879564  
Test Lab: INNOVATION CENTER(G3)  
Issue Date: 10/01/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: STREETWORKS  
Catalog Number: MEM2-HTN-VA-150-740-U-MQ  
Description: EPIC MODERN TALL HOUSING 150W 70CRI 4000K VISUAL COMFORT FIXTURE w/  
TYPE V MEDIUM DISTRIBUTION OPTIC  
Light Source: (1) 4000K CCT, 70 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

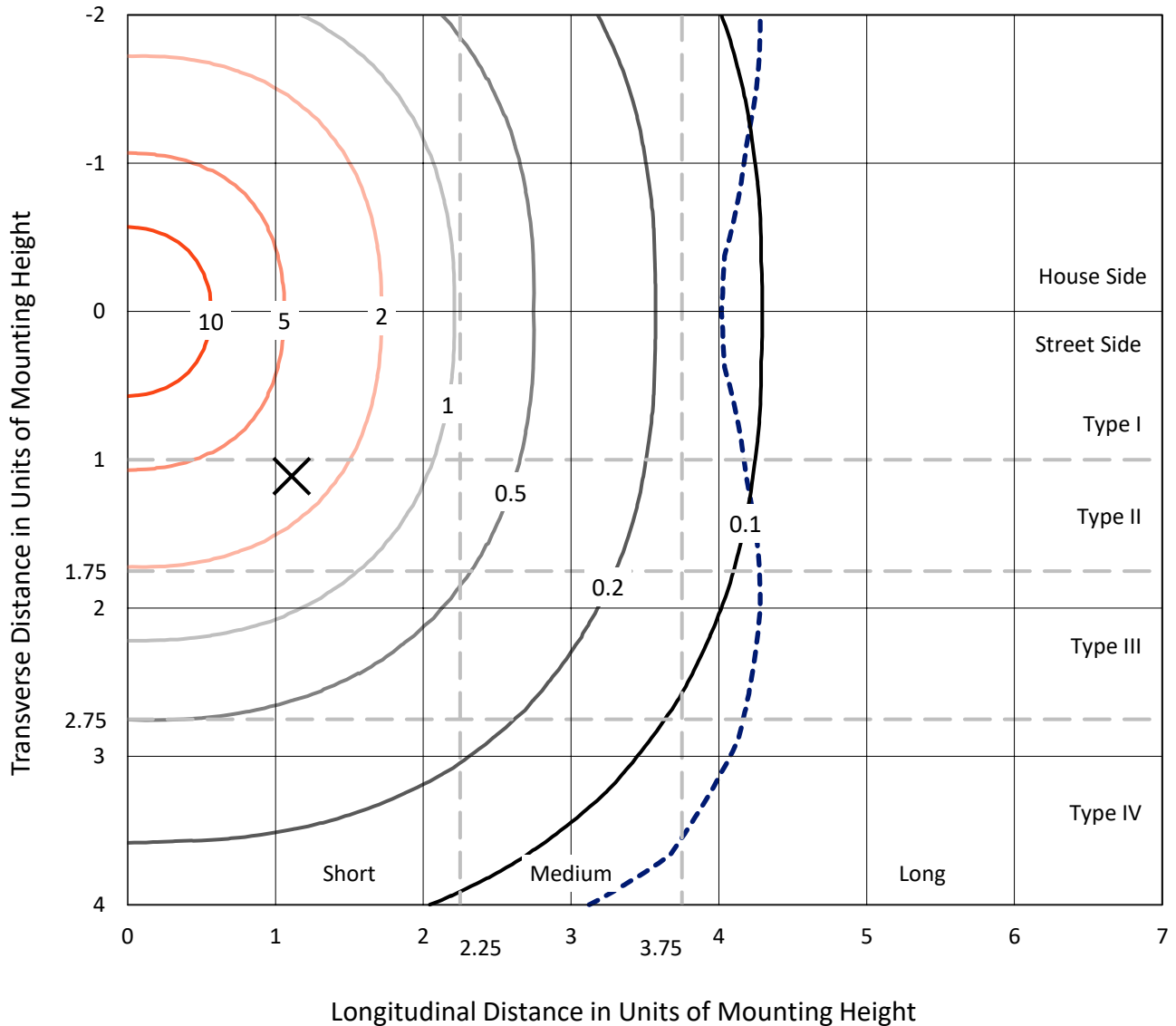
Lumens per Lamp: N/A  
Luminaire Lumens: 18250.3 lumens  
Efficiency: N/A  
Efficacy: 117.0 lumens/watt  
Luminous Opening: Circular (Dia: 1.12' x H: 0')  
IES Classification: Type V - Short  
BUG Rating: B4 - U0 - G3

Input Watts (W): 156  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.995  
Total Harmonic Distortion (THDi): 6.6%  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

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### Iso-Footcandle Lines of Horizontal Illumination

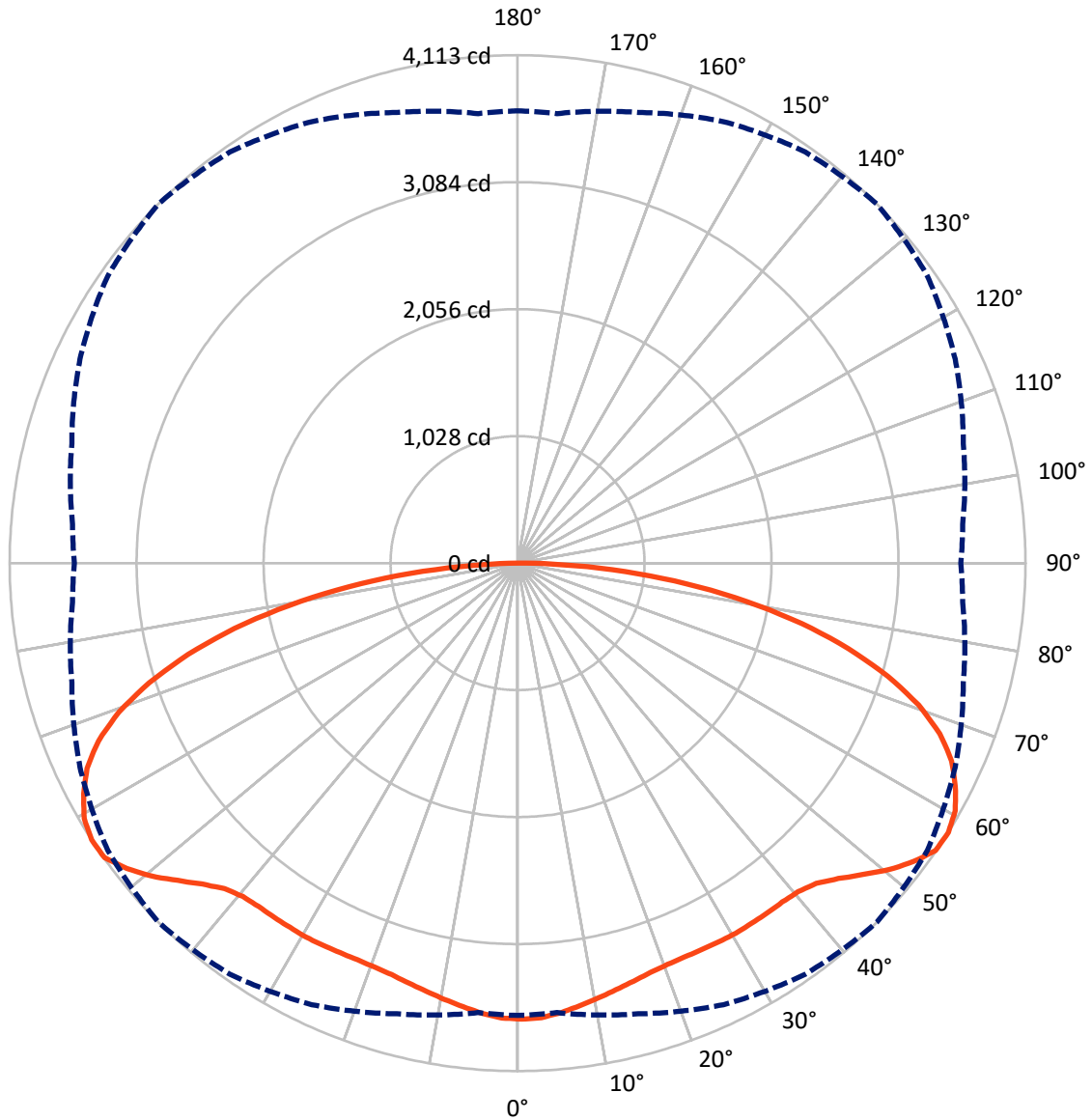
✕ Max cd  
 - - - 1/2 Max cd



Based on 15 foot mounting height. Maximum calculated value = 16.4 fc  
 Type V - Short - N/A

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### Luminous Intensity Polar Plot



— Vertical Plane Through 45-Deg Lateral    - - - Horizontal Cone Through 57.5-Deg Vertical

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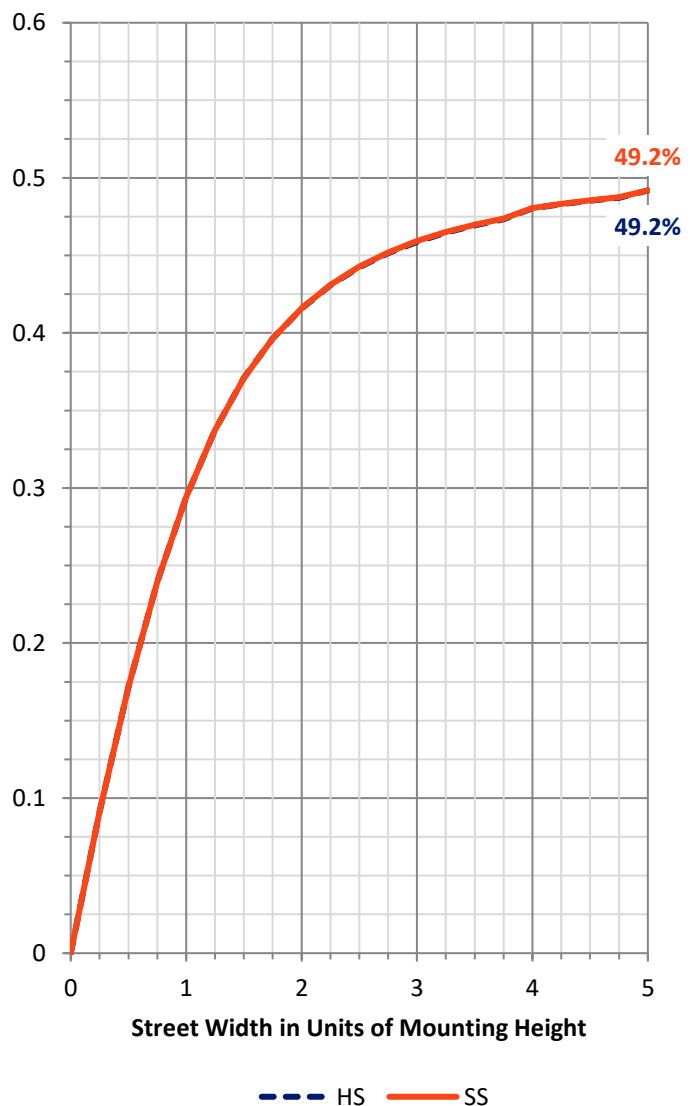
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 9125.1   | 0.0    | 9125.1  |
|                    | % Fixture | 50.0     | 0.0    | 50.0    |
| <b>Street Side</b> | Lumens    | 9125.1   | 0.0    | 9125.1  |
|                    | % Fixture | 50.0     | 0.0    | 50.0    |
| <b>Total</b>       | Lumens    | 18250.3  | 0.0    | 18250.3 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 346.6   | 1.9       |
| 10°-20°   | 993.5   | 5.4       |
| 20°-30°   | 1596.5  | 8.7       |
| 30°-40°   | 2164.1  | 11.9      |
| 40°-50°   | 2763.8  | 15.1      |
| 50°-60°   | 3445.0  | 18.9      |
| 60°-70°   | 3510.4  | 19.2      |
| 70°-80°   | 2601.0  | 14.3      |
| 80°-90°   | 829.4   | 4.5       |
| 90°-100°  | 0.0     | 0.0       |
| 100°-110° | 0.0     | 0.0       |
| 110°-120° | 0.0     | 0.0       |
| 120°-130° | 0.0     | 0.0       |
| 130°-140° | 0.0     | 0.0       |
| 140°-150° | 0.0     | 0.0       |
| 150°-160° | 0.0     | 0.0       |
| 160°-170° | 0.0     | 0.0       |
| 170°-180° | 0.0     | 0.0       |
| 0°-90°    | 18250.3 | 100.0     |
| 0°-180°   | 18250.3 | 100.0     |



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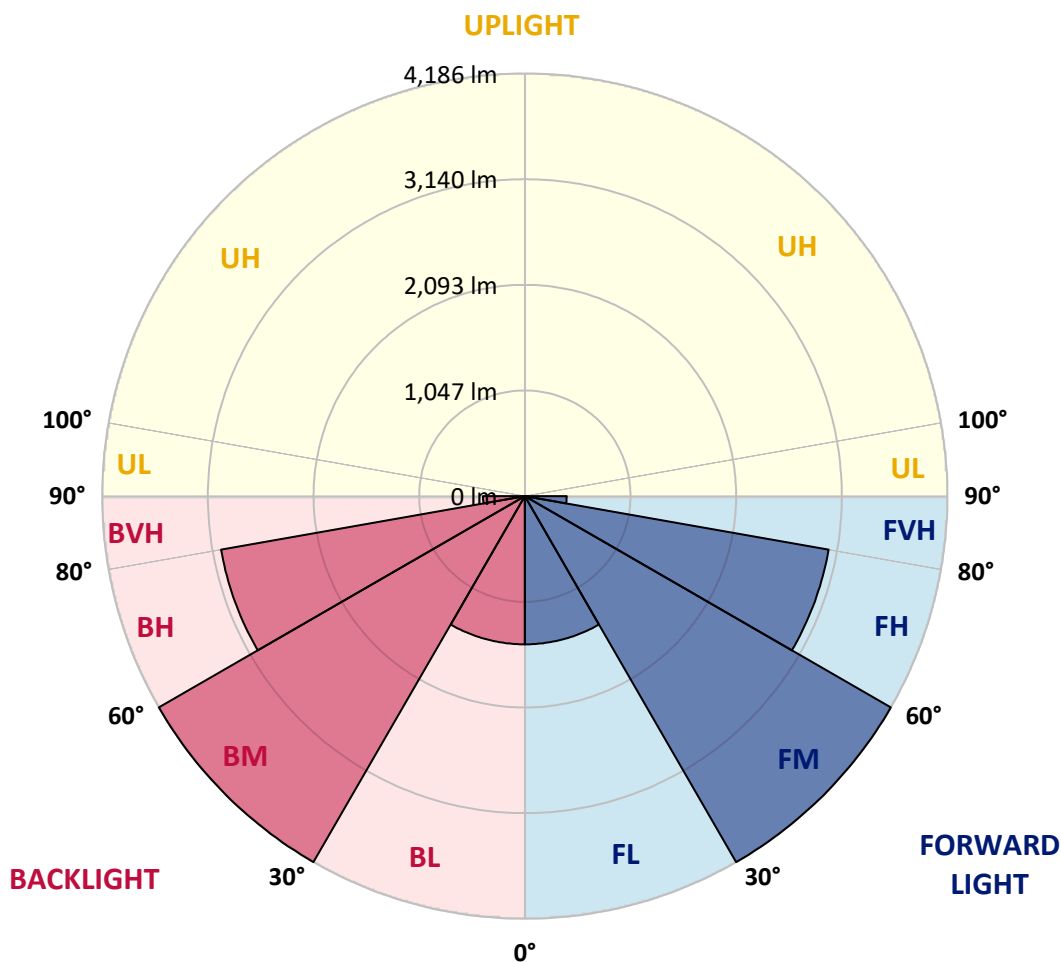
CATALOG NUMBER: MEM2-HTN-VA-150-740-U-MQ

**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 1468.3 | 8.0       |                         |      |         |
| FM   | (30°-60°)   | 4186.5 | 22.9      |                         |      |         |
| FH   | (60°-80°)   | 3055.7 | 16.7      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 414.7  | 2.3       |                         |      | G3/500  |
| BL   | (0°-30°)    | 1468.3 | 8.0       | B3/2500                 |      |         |
| BM   | (30°-60°)   | 4186.5 | 22.9      | B3/5000                 |      |         |
| BH   | (60°-80°)   | 3055.7 | 16.7      | B4/5000                 |      | G2/5000 |
| BVH  | (80°-90°)   | 414.7  | 2.3       |                         |      | G3/500  |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B4-U0-G3**

Type V Short





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CATALOG NUMBER: MEM2-HTN-VA-150-740-U-MQ

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 75°    | 85°    | 90°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 3691.9 | 3691.9 | 3691.9 | 3691.9 | 3691.9 | 3691.9 | 3691.9 | 3691.9 | 3691.9 | 3691.9 | 3691.9 |
| 2.5°  | 3685.6 | 3685.6 | 3684.7 | 3684.7 | 3683.8 | 3684.7 | 3685.6 | 3685.6 | 3684.7 | 3683.8 | 3682.8 |
| 5°    | 3659.2 | 3660.1 | 3660.1 | 3658.3 | 3656.5 | 3656.5 | 3657.4 | 3655.6 | 3656.5 | 3656.5 | 3655.6 |
| 7.5°  | 3621.1 | 3618.3 | 3621.1 | 3620.2 | 3621.1 | 3618.3 | 3622.9 | 3621.1 | 3618.3 | 3620.2 | 3620.2 |
| 10°   | 3578.4 | 3579.3 | 3580.2 | 3579.3 | 3582.0 | 3581.1 | 3580.2 | 3579.3 | 3577.5 | 3579.3 | 3576.6 |
| 12.5° | 3538.4 | 3539.3 | 3542.0 | 3542.9 | 3545.7 | 3544.8 | 3545.7 | 3543.9 | 3542.9 | 3539.3 | 3538.4 |
| 15°   | 3500.2 | 3502.1 | 3505.7 | 3508.4 | 3511.1 | 3512.1 | 3510.2 | 3509.3 | 3504.8 | 3502.1 | 3500.2 |
| 17.5° | 3468.5 | 3468.5 | 3473.9 | 3478.4 | 3483.0 | 3483.9 | 3483.0 | 3478.4 | 3472.1 | 3465.7 | 3466.6 |
| 20°   | 3446.6 | 3446.6 | 3453.0 | 3460.3 | 3466.6 | 3468.5 | 3465.7 | 3457.5 | 3447.6 | 3443.0 | 3442.1 |
| 22.5° | 3436.7 | 3437.6 | 3443.9 | 3452.1 | 3461.2 | 3463.0 | 3457.5 | 3447.6 | 3436.7 | 3428.5 | 3427.6 |
| 25°   | 3437.6 | 3435.7 | 3441.2 | 3453.9 | 3463.9 | 3465.7 | 3461.2 | 3447.6 | 3434.8 | 3427.6 | 3424.8 |
| 27.5° | 3434.8 | 3435.7 | 3442.1 | 3454.8 | 3467.5 | 3471.2 | 3463.9 | 3447.6 | 3430.3 | 3423.9 | 3422.1 |
| 30°   | 3433.9 | 3434.8 | 3436.7 | 3457.5 | 3472.1 | 3478.4 | 3467.5 | 3445.7 | 3431.2 | 3421.2 | 3420.3 |
| 32.5° | 3430.3 | 3425.8 | 3438.5 | 3451.2 | 3469.4 | 3477.5 | 3466.6 | 3446.6 | 3423.0 | 3415.8 | 3412.1 |
| 35°   | 3415.8 | 3420.3 | 3431.2 | 3453.0 | 3473.9 | 3479.4 | 3466.6 | 3442.1 | 3421.2 | 3406.7 | 3405.8 |
| 37.5° | 3413.0 | 3413.0 | 3430.3 | 3453.0 | 3473.9 | 3482.1 | 3471.2 | 3443.9 | 3414.9 | 3396.7 | 3396.7 |
| 40°   | 3409.4 | 3408.5 | 3431.2 | 3459.4 | 3486.6 | 3497.5 | 3483.0 | 3449.4 | 3413.9 | 3396.7 | 3387.6 |
| 42.5° | 3419.4 | 3424.8 | 3451.2 | 3492.1 | 3526.6 | 3544.8 | 3523.9 | 3486.6 | 3444.8 | 3412.1 | 3411.2 |
| 45°   | 3466.6 | 3478.4 | 3505.7 | 3574.7 | 3621.1 | 3642.9 | 3618.3 | 3553.8 | 3488.4 | 3444.8 | 3442.1 |
| 47.5° | 3540.2 | 3536.6 | 3601.1 | 3673.8 | 3741.9 | 3765.5 | 3730.1 | 3654.7 | 3560.2 | 3507.5 | 3493.9 |
| 50°   | 3591.1 | 3600.2 | 3666.5 | 3771.9 | 3873.6 | 3900.9 | 3849.1 | 3751.9 | 3649.2 | 3576.6 | 3563.8 |
| 52.5° | 3660.1 | 3661.9 | 3746.4 | 3880.0 | 3984.4 | 4014.4 | 3964.5 | 3843.6 | 3705.6 | 3614.7 | 3608.4 |
| 55°   | 3668.3 | 3698.3 | 3800.9 | 3946.3 | 4071.7 | 4107.1 | 4045.3 | 3916.3 | 3755.5 | 3642.9 | 3632.0 |
| 57.5° | 3661.9 | 3652.9 | 3777.3 | 3944.5 | 4062.6 | 4112.5 | 4051.7 | 3909.0 | 3736.4 | 3617.4 | 3588.4 |
| 60°   | 3531.1 | 3569.3 | 3706.5 | 3870.0 | 4021.7 | 4071.7 | 4000.8 | 3855.4 | 3666.5 | 3535.7 | 3523.9 |
| 62.5° | 3442.1 | 3458.5 | 3583.8 | 3803.7 | 3928.1 | 3978.1 | 3923.6 | 3752.8 | 3551.1 | 3414.9 | 3398.5 |
| 65°   | 3303.1 | 3315.8 | 3463.0 | 3643.8 | 3817.3 | 3861.8 | 3791.9 | 3648.3 | 3432.1 | 3282.2 | 3252.2 |
| 67.5° | 3081.5 | 3116.0 | 3261.3 | 3491.2 | 3611.1 | 3687.4 | 3624.7 | 3423.0 | 3226.8 | 3079.6 | 3057.8 |
| 70°   | 2823.5 | 2869.8 | 3019.7 | 3207.7 | 3407.6 | 3445.7 | 3359.4 | 3222.3 | 3002.4 | 2845.3 | 2807.1 |
| 72.5° | 2574.5 | 2578.2 | 2718.1 | 2938.8 | 3065.1 | 3136.0 | 3086.9 | 2906.1 | 2690.8 | 2557.3 | 2533.7 |
| 75°   | 2226.6 | 2227.5 | 2381.0 | 2561.8 | 2721.7 | 2768.0 | 2689.9 | 2562.7 | 2371.0 | 2221.2 | 2206.6 |
| 77.5° | 1823.3 | 1847.8 | 1984.0 | 2158.5 | 2284.7 | 2352.0 | 2296.6 | 2153.0 | 1974.1 | 1846.0 | 1831.4 |
| 80°   | 1429.9 | 1460.8 | 1557.1 | 1713.3 | 1822.3 | 1881.4 | 1821.4 | 1696.1 | 1559.8 | 1434.4 | 1436.3 |
| 82.5° | 1009.3 | 1032.0 | 1122.8 | 1229.1 | 1335.4 | 1379.0 | 1353.6 | 1260.9 | 1136.5 | 1026.5 | 996.6  |
| 85°   | 563.2  | 592.3  | 653.2  | 746.7  | 817.6  | 873.9  | 842.1  | 769.5  | 661.3  | 592.3  | 590.5  |
| 87.5° | 165.3  | 179.0  | 203.5  | 266.2  | 333.4  | 357.9  | 350.7  | 332.5  | 291.6  | 261.6  | 242.6  |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

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

Streetworks

Report Number: SP1-2407-176-9

Test Date: 09/25/2024

Luminaire Tested: MEM2-HTN-VA-130-740-U-RW

Data in this report applies to families of products including MEM2-HTN-VA-130-740-U-RW



**Test Information**

Test Method: LM-79-2019  
 Report Number: SP1-2407-176-9  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry: 4π  
 Issue Date: 09/27/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: Streetworks  
 Catalog Number: **MEM2-HTN-VA-130-740-U-RW**  
 Description: EPIC MODERN VISUAL COMFORT 130W WAVESTREAM RECTANGULAR WIDE

**Spectral Parameters**

CCT (K): 3887  
 CIE u': 0.2262  
 CIE v': 0.5060  
 Duv: 0.0018  
 CIE x: 0.3870  
 CIE y: 0.3847  
 CIE z: 0.2283  
 Peak Wavelength (nm): 583  
 Dominant Wavelength (nm): 578  
 Purity: 31.59626  
 Rf: 74.5  
 Rg: 93.5

|           |      |      |       |
|-----------|------|------|-------|
| CRI (Ra): | 71.4 |      |       |
| R1:       | 67.6 | R9:  | -36.8 |
| R2:       | 78.8 | R10: | 50.4  |
| R3:       | 88.2 | R11: | 65.0  |
| R4:       | 69.8 | R12: | 44.4  |
| R5:       | 67.7 | R13: | 69.4  |
| R6:       | 70.3 | R14: | 93.3  |
| R7:       | 80.1 | R15: | 59.9  |
| R8:       | 49.0 |      |       |



**Test Conditions**

Stabilization Time: 50M  
 Operation Time: 1H 50M  
 Sphere Temperature (°C): 25.2

REPORT NUMBER: SP1-2407-176-9

| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 6/18/2024        | 12/18/2024           |
| Power Meter                    | INXT2011004           | 2/8/2024         | 2/8/2025             |
| AC Power Source                | IN0063                | 10/24/2023       | 10/24/2024           |
| DC Power Source                | IN0208                | 10/24/2023       | 10/24/2024           |
| Sphere Thermometer             | IN0085                | 10/24/2023       | 10/24/2024           |
| Room Thermometer               | IN0046                | 10/24/2023       | 10/24/2024           |

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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

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**Photopic Flux vs. Wavelength**

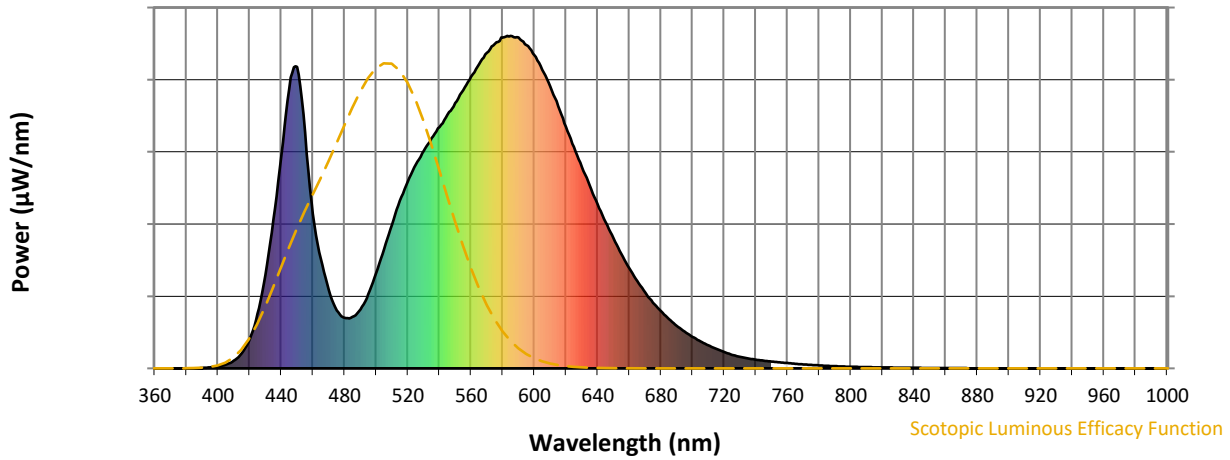


**Photopic Lumens: NR**

| 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    | 177                      | NR            | 620    | 727                      | NR            | 750    | 21                       | NR            | 880    | 0                        | NR            |
| 365    | 0                        | NR            | 495    | 222                      | NR            | 625    | 666                      | NR            | 755    | 18                       | NR            | 885    | 0                        | NR            |
| 370    | 0                        | NR            | 500    | 286                      | NR            | 630    | 606                      | NR            | 760    | 16                       | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 359                      | NR            | 635    | 549                      | NR            | 765    | 14                       | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 433                      | NR            | 640    | 493                      | NR            | 770    | 12                       | NR            | 900    | 0                        | NR            |
| 385    | 0                        | NR            | 515    | 505                      | NR            | 645    | 440                      | NR            | 775    | 10                       | NR            | 905    | 0                        | NR            |
| 390    | 1                        | NR            | 520    | 562                      | NR            | 650    | 390                      | NR            | 780    | 9                        | NR            | 910    | 0                        | NR            |
| 395    | 3                        | NR            | 525    | 613                      | NR            | 655    | 344                      | NR            | 785    | 8                        | NR            | 915    | 0                        | NR            |
| 400    | 6                        | NR            | 530    | 654                      | NR            | 660    | 301                      | NR            | 790    | 7                        | NR            | 920    | 0                        | NR            |
| 405    | 11                       | NR            | 535    | 692                      | NR            | 665    | 263                      | NR            | 795    | 6                        | NR            | 925    | 0                        | NR            |
| 410    | 23                       | NR            | 540    | 726                      | NR            | 670    | 228                      | NR            | 800    | 5                        | NR            | 930    | 0                        | NR            |
| 415    | 45                       | NR            | 545    | 763                      | NR            | 675    | 198                      | NR            | 805    | 4                        | NR            | 935    | 0                        | NR            |
| 420    | 88                       | NR            | 550    | 798                      | NR            | 680    | 172                      | NR            | 810    | 4                        | NR            | 940    | 0                        | NR            |
| 425    | 164                      | NR            | 555    | 837                      | NR            | 685    | 148                      | NR            | 815    | 3                        | NR            | 945    | 0                        | NR            |
| 430    | 281                      | NR            | 560    | 878                      | NR            | 690    | 128                      | NR            | 820    | 3                        | NR            | 950    | 0                        | NR            |
| 435    | 447                      | NR            | 565    | 915                      | NR            | 695    | 110                      | NR            | 825    | 2                        | NR            | 955    | 0                        | NR            |
| 440    | 642                      | NR            | 570    | 948                      | NR            | 700    | 95                       | NR            | 830    | 2                        | NR            | 960    | 0                        | NR            |
| 445    | 838                      | NR            | 575    | 976                      | NR            | 705    | 81                       | NR            | 835    | 2                        | NR            | 965    | 0                        | NR            |
| 450    | 907                      | NR            | 580    | 995                      | NR            | 710    | 69                       | NR            | 840    | 2                        | NR            | 970    | 0                        | NR            |
| 455    | 710                      | NR            | 585    | 1000                     | NR            | 715    | 58                       | NR            | 845    | 1                        | NR            | 975    | 0                        | NR            |
| 460    | 465                      | NR            | 590    | 995                      | NR            | 720    | 49                       | NR            | 850    | 1                        | NR            | 980    | 0                        | NR            |
| 465    | 330                      | NR            | 595    | 972                      | NR            | 725    | 41                       | NR            | 855    | 1                        | NR            | 985    | 0                        | NR            |
| 470    | 236                      | NR            | 600    | 941                      | NR            | 730    | 35                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 174                      | NR            | 605    | 898                      | NR            | 735    | 30                       | NR            | 865    | 1                        | NR            | 995    | 0                        | NR            |
| 480    | 152                      | NR            | 610    | 848                      | NR            | 740    | 26                       | NR            | 870    | 1                        | NR            | 1000   | 0                        | NR            |
| 485    | 155                      | NR            | 615    | 788                      | NR            | 745    | 23                       | NR            | 875    | 0                        | NR            |        |                          |               |

REPORT NUMBER: SP1-2407-176-9

**Scotopic Flux vs. Wavelength**



**Scotopic Lumens: NR**

**S/P: 1.49**

| 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    | 177                      | NR            | 620    | 727                      | NR            | 750    | 21                       | NR            | 880    | 0                        | NR            |
| 365    | 0                        | NR            | 495    | 222                      | NR            | 625    | 666                      | NR            | 755    | 18                       | NR            | 885    | 0                        | NR            |
| 370    | 0                        | NR            | 500    | 286                      | NR            | 630    | 606                      | NR            | 760    | 16                       | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 359                      | NR            | 635    | 549                      | NR            | 765    | 14                       | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 433                      | NR            | 640    | 493                      | NR            | 770    | 12                       | NR            | 900    | 0                        | NR            |
| 385    | 0                        | NR            | 515    | 505                      | NR            | 645    | 440                      | NR            | 775    | 10                       | NR            | 905    | 0                        | NR            |
| 390    | 1                        | NR            | 520    | 562                      | NR            | 650    | 390                      | NR            | 780    | 9                        | NR            | 910    | 0                        | NR            |
| 395    | 3                        | NR            | 525    | 613                      | NR            | 655    | 344                      | NR            | 785    | 8                        | NR            | 915    | 0                        | NR            |
| 400    | 6                        | NR            | 530    | 654                      | NR            | 660    | 301                      | NR            | 790    | 7                        | NR            | 920    | 0                        | NR            |
| 405    | 11                       | NR            | 535    | 692                      | NR            | 665    | 263                      | NR            | 795    | 6                        | NR            | 925    | 0                        | NR            |
| 410    | 23                       | NR            | 540    | 726                      | NR            | 670    | 228                      | NR            | 800    | 5                        | NR            | 930    | 0                        | NR            |
| 415    | 45                       | NR            | 545    | 763                      | NR            | 675    | 198                      | NR            | 805    | 4                        | NR            | 935    | 0                        | NR            |
| 420    | 88                       | NR            | 550    | 798                      | NR            | 680    | 172                      | NR            | 810    | 4                        | NR            | 940    | 0                        | NR            |
| 425    | 164                      | NR            | 555    | 837                      | NR            | 685    | 148                      | NR            | 815    | 3                        | NR            | 945    | 0                        | NR            |
| 430    | 281                      | NR            | 560    | 878                      | NR            | 690    | 128                      | NR            | 820    | 3                        | NR            | 950    | 0                        | NR            |
| 435    | 447                      | NR            | 565    | 915                      | NR            | 695    | 110                      | NR            | 825    | 2                        | NR            | 955    | 0                        | NR            |
| 440    | 642                      | NR            | 570    | 948                      | NR            | 700    | 95                       | NR            | 830    | 2                        | NR            | 960    | 0                        | NR            |
| 445    | 838                      | NR            | 575    | 976                      | NR            | 705    | 81                       | NR            | 835    | 2                        | NR            | 965    | 0                        | NR            |
| 450    | 907                      | NR            | 580    | 995                      | NR            | 710    | 69                       | NR            | 840    | 2                        | NR            | 970    | 0                        | NR            |
| 455    | 710                      | NR            | 585    | 1000                     | NR            | 715    | 58                       | NR            | 845    | 1                        | NR            | 975    | 0                        | NR            |
| 460    | 465                      | NR            | 590    | 995                      | NR            | 720    | 49                       | NR            | 850    | 1                        | NR            | 980    | 0                        | NR            |
| 465    | 330                      | NR            | 595    | 972                      | NR            | 725    | 41                       | NR            | 855    | 1                        | NR            | 985    | 0                        | NR            |
| 470    | 236                      | NR            | 600    | 941                      | NR            | 730    | 35                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 174                      | NR            | 605    | 898                      | NR            | 735    | 30                       | NR            | 865    | 1                        | NR            | 995    | 0                        | NR            |
| 480    | 152                      | NR            | 610    | 848                      | NR            | 740    | 26                       | NR            | 870    | 1                        | NR            | 1000   | 0                        | NR            |
| 485    | 155                      | NR            | 615    | 788                      | NR            | 745    | 23                       | NR            | 875    | 0                        | NR            |        |                          |               |

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**Melanopic Flux vs. Wavelength**



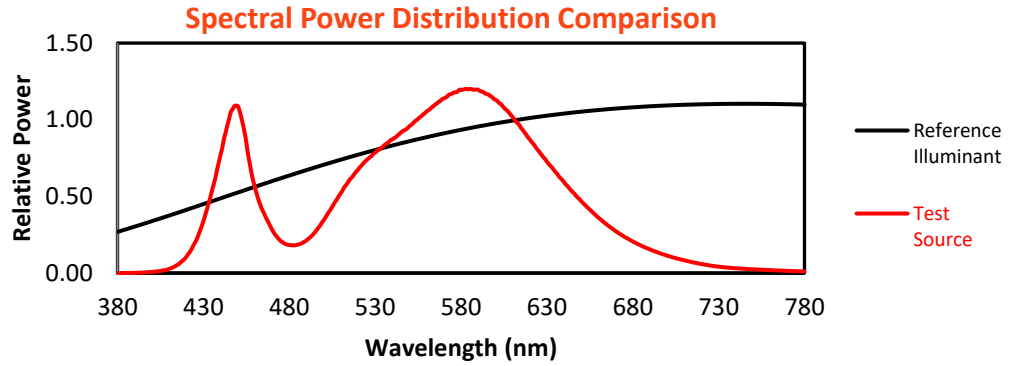
**Melanopic Lumens: NR**

**M/P: 2.89**

| 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    | 177                      | NR            | 620    | 727                      | NR            | 750    | 21                       | NR            | 880    | 0                        | NR            |
| 365    | 0                        | NR            | 495    | 222                      | NR            | 625    | 666                      | NR            | 755    | 18                       | NR            | 885    | 0                        | NR            |
| 370    | 0                        | NR            | 500    | 286                      | NR            | 630    | 606                      | NR            | 760    | 16                       | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 359                      | NR            | 635    | 549                      | NR            | 765    | 14                       | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 433                      | NR            | 640    | 493                      | NR            | 770    | 12                       | NR            | 900    | 0                        | NR            |
| 385    | 0                        | NR            | 515    | 505                      | NR            | 645    | 440                      | NR            | 775    | 10                       | NR            | 905    | 0                        | NR            |
| 390    | 1                        | NR            | 520    | 562                      | NR            | 650    | 390                      | NR            | 780    | 9                        | NR            | 910    | 0                        | NR            |
| 395    | 3                        | NR            | 525    | 613                      | NR            | 655    | 344                      | NR            | 785    | 8                        | NR            | 915    | 0                        | NR            |
| 400    | 6                        | NR            | 530    | 654                      | NR            | 660    | 301                      | NR            | 790    | 7                        | NR            | 920    | 0                        | NR            |
| 405    | 11                       | NR            | 535    | 692                      | NR            | 665    | 263                      | NR            | 795    | 6                        | NR            | 925    | 0                        | NR            |
| 410    | 23                       | NR            | 540    | 726                      | NR            | 670    | 228                      | NR            | 800    | 5                        | NR            | 930    | 0                        | NR            |
| 415    | 45                       | NR            | 545    | 763                      | NR            | 675    | 198                      | NR            | 805    | 4                        | NR            | 935    | 0                        | NR            |
| 420    | 88                       | NR            | 550    | 798                      | NR            | 680    | 172                      | NR            | 810    | 4                        | NR            | 940    | 0                        | NR            |
| 425    | 164                      | NR            | 555    | 837                      | NR            | 685    | 148                      | NR            | 815    | 3                        | NR            | 945    | 0                        | NR            |
| 430    | 281                      | NR            | 560    | 878                      | NR            | 690    | 128                      | NR            | 820    | 3                        | NR            | 950    | 0                        | NR            |
| 435    | 447                      | NR            | 565    | 915                      | NR            | 695    | 110                      | NR            | 825    | 2                        | NR            | 955    | 0                        | NR            |
| 440    | 642                      | NR            | 570    | 948                      | NR            | 700    | 95                       | NR            | 830    | 2                        | NR            | 960    | 0                        | NR            |
| 445    | 838                      | NR            | 575    | 976                      | NR            | 705    | 81                       | NR            | 835    | 2                        | NR            | 965    | 0                        | NR            |
| 450    | 907                      | NR            | 580    | 995                      | NR            | 710    | 69                       | NR            | 840    | 2                        | NR            | 970    | 0                        | NR            |
| 455    | 710                      | NR            | 585    | 1000                     | NR            | 715    | 58                       | NR            | 845    | 1                        | NR            | 975    | 0                        | NR            |
| 460    | 465                      | NR            | 590    | 995                      | NR            | 720    | 49                       | NR            | 850    | 1                        | NR            | 980    | 0                        | NR            |
| 465    | 330                      | NR            | 595    | 972                      | NR            | 725    | 41                       | NR            | 855    | 1                        | NR            | 985    | 0                        | NR            |
| 470    | 236                      | NR            | 600    | 941                      | NR            | 730    | 35                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 174                      | NR            | 605    | 898                      | NR            | 735    | 30                       | NR            | 865    | 1                        | NR            | 995    | 0                        | NR            |
| 480    | 152                      | NR            | 610    | 848                      | NR            | 740    | 26                       | NR            | 870    | 1                        | NR            | 1000   | 0                        | NR            |
| 485    | 155                      | NR            | 615    | 788                      | NR            | 745    | 23                       | NR            | 875    | 0                        | NR            |        |                          |               |

**Summary**

$R_f = 74.5$   
 $R_g = 93.5$   
 $CIE R_a = 71.4$   
 $R_g = -36.8$

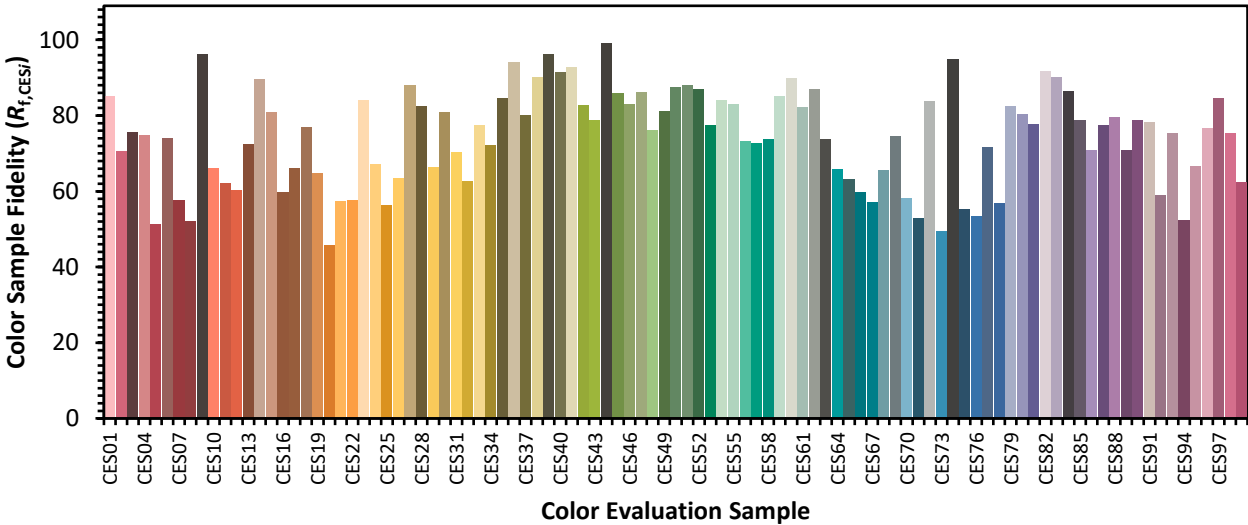


**Color Vector Graphics**



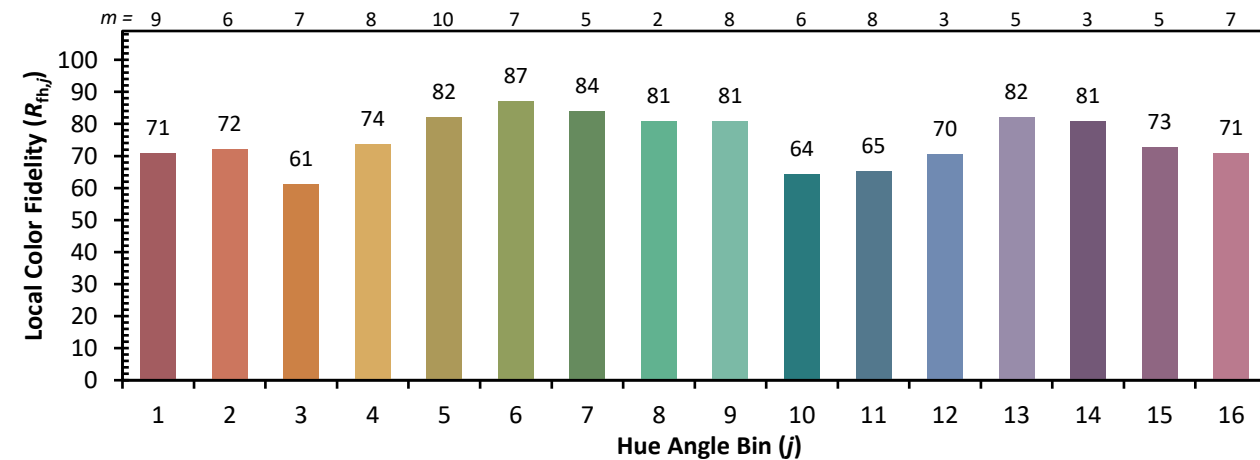
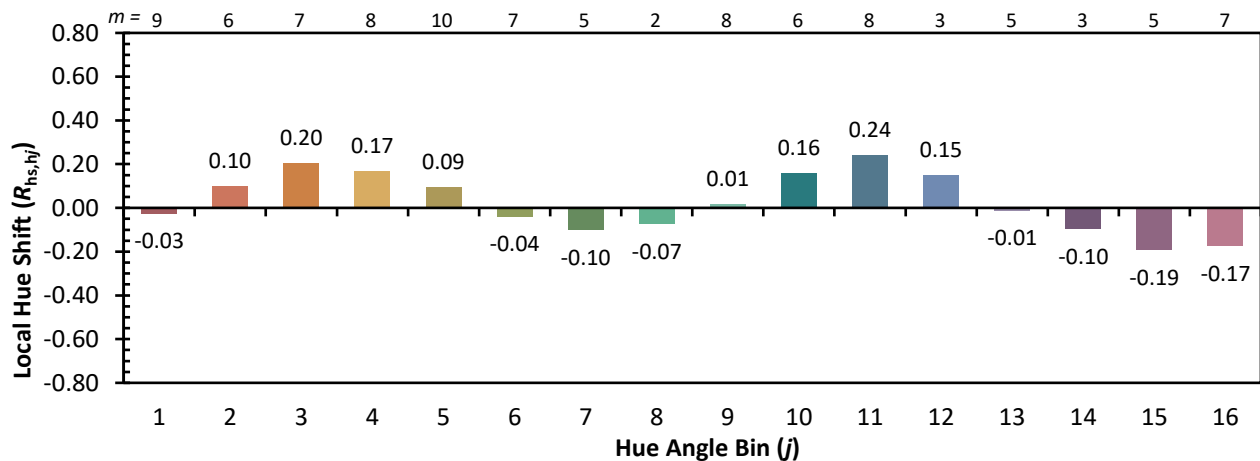
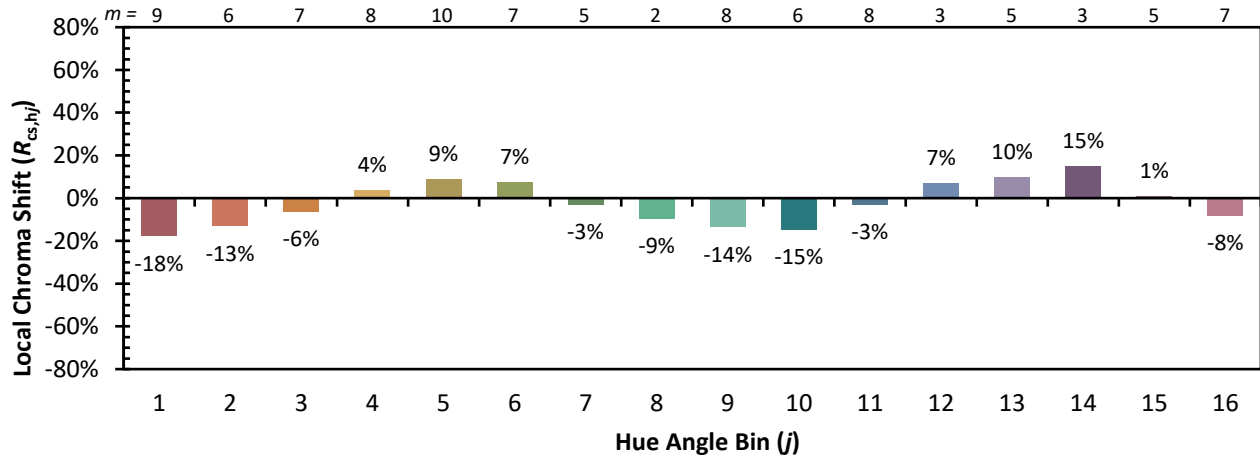
**Individual Sample Fidelity Index ( $R_{f,i}$ )**

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 63 | CES51 = 88 | CES76 = 54 |
| CES02 = 61 | CES27 = 88 | CES52 = 87 | CES77 = 72 |
| CES03 = 30 | CES28 = 82 | CES53 = 77 | CES78 = 57 |
| CES04 = 70 | CES29 = 66 | CES54 = 84 | CES79 = 83 |
| CES05 = 47 | CES30 = 81 | CES55 = 83 | CES80 = 80 |
| CES06 = 50 | CES31 = 70 | CES56 = 73 | CES81 = 78 |
| CES07 = 40 | CES32 = 63 | CES57 = 73 | CES82 = 92 |
| CES08 = 39 | CES33 = 77 | CES58 = 74 | CES83 = 90 |
| CES09 = 29 | CES34 = 72 | CES59 = 85 | CES84 = 87 |
| CES10 = 74 | CES35 = 85 | CES60 = 90 | CES85 = 79 |
| CES11 = 57 | CES36 = 94 | CES61 = 82 | CES86 = 71 |
| CES12 = 63 | CES37 = 80 | CES62 = 87 | CES87 = 77 |
| CES13 = 42 | CES38 = 90 | CES63 = 74 | CES88 = 80 |
| CES14 = 74 | CES39 = 96 | CES64 = 66 | CES89 = 71 |
| CES15 = 71 | CES40 = 92 | CES65 = 63 | CES90 = 79 |
| CES16 = 46 | CES41 = 93 | CES66 = 60 | CES91 = 78 |
| CES17 = 49 | CES42 = 83 | CES67 = 57 | CES92 = 59 |
| CES18 = 56 | CES43 = 79 | CES68 = 65 | CES93 = 75 |
| CES19 = 72 | CES44 = 99 | CES69 = 74 | CES94 = 52 |
| CES20 = 65 | CES45 = 86 | CES70 = 58 | CES95 = 67 |
| CES21 = 86 | CES46 = 83 | CES71 = 53 | CES96 = 77 |
| CES22 = 78 | CES47 = 86 | CES72 = 84 | CES97 = 85 |
| CES23 = 92 | CES48 = 76 | CES73 = 49 | CES98 = 75 |
| CES24 = 91 | CES49 = 81 | CES74 = 95 | CES99 = 62 |
| CES25 = 72 | CES50 = 88 | CES75 = 55 |            |

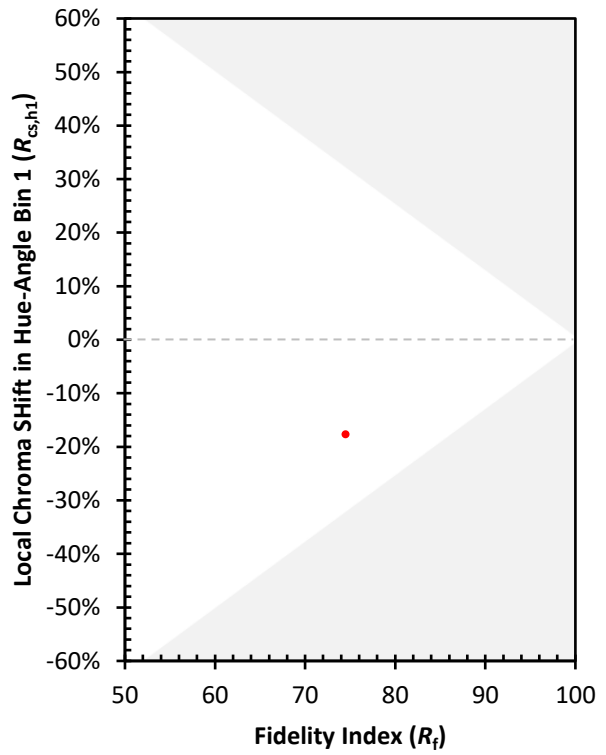
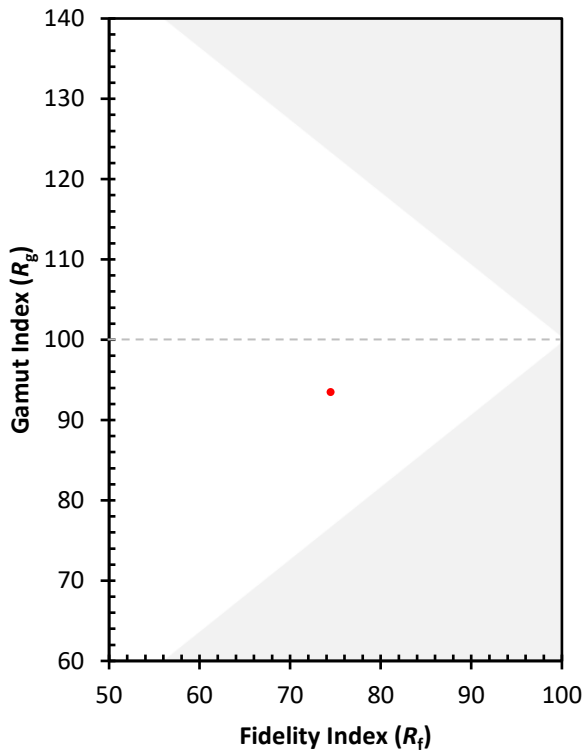




Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)