

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: P880064

Luminaire Tested: **MEM2-HSN-VA-30-830-U-MQ**

Issue Date: 10/01/2024



**Test Information**

Test Method: LM-79-08  
Report Number: P880064  
Test Lab: INNOVATION CENTER(G3)  
Issue Date: 10/01/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: STREETWORKS  
Catalog Number: MEM2-HSN-VA-30-830-U-MQ  
Description: EPIC MODERN SHORT HOUSING 30W 80CRI 3000K VISUAL COMFORT FIXTURE w/  
TYPE V MEDIUM DISTRIBUTION OPTIC  
Light Source: (1) 3000K CCT, 80 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

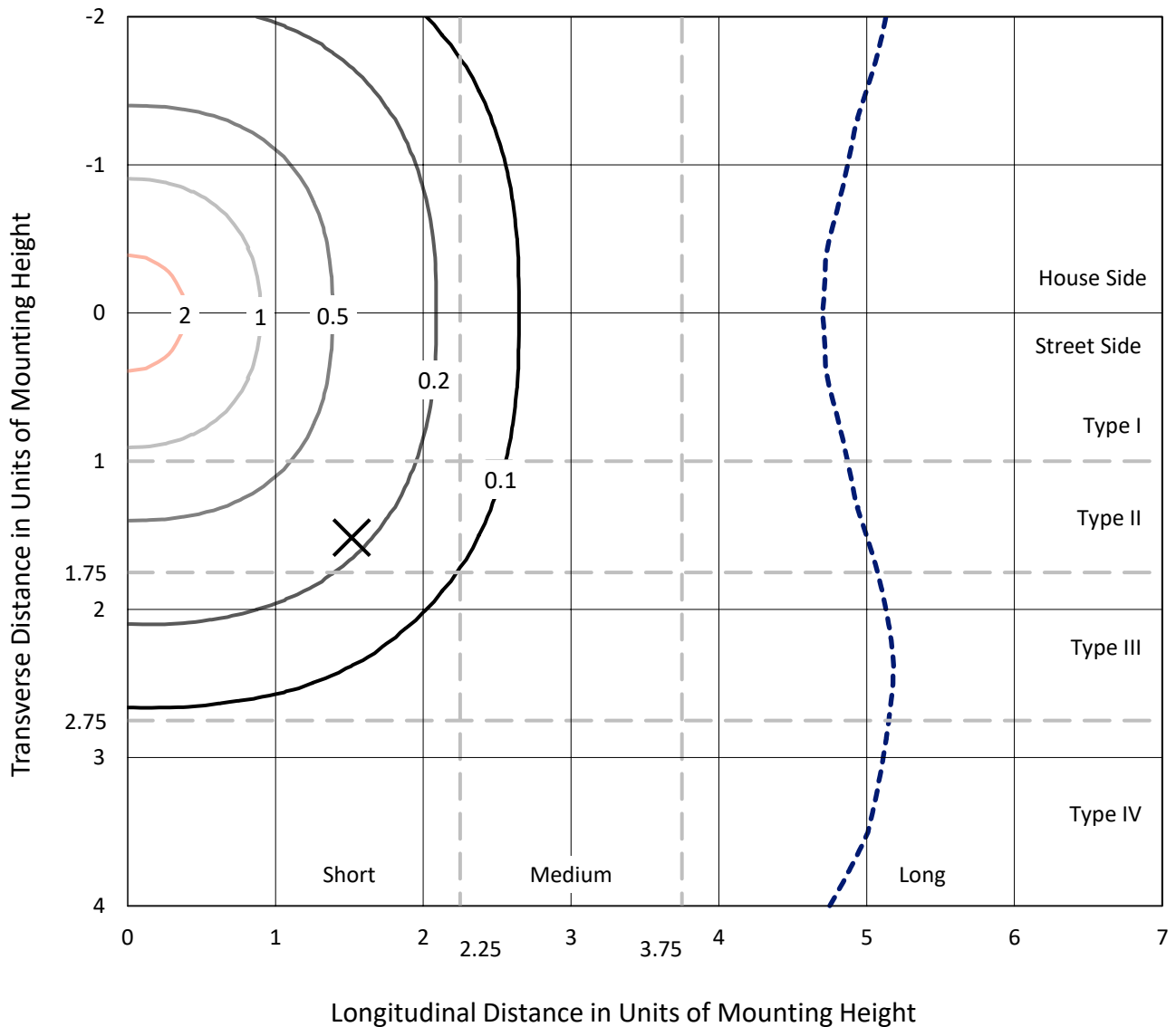
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 3044.9 lumens  
Efficiency: N/A  
Efficacy: 108.7 lumens/watt  
Luminous Opening: Circular (Dia: 1.12' x H: 0')  
IES Classification: Type V - Short  
BUG Rating: B2 - U0 - G1  
  
Input Watts (W): 28  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.99  
Total Harmonic Distortion (THDi): 16%  
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

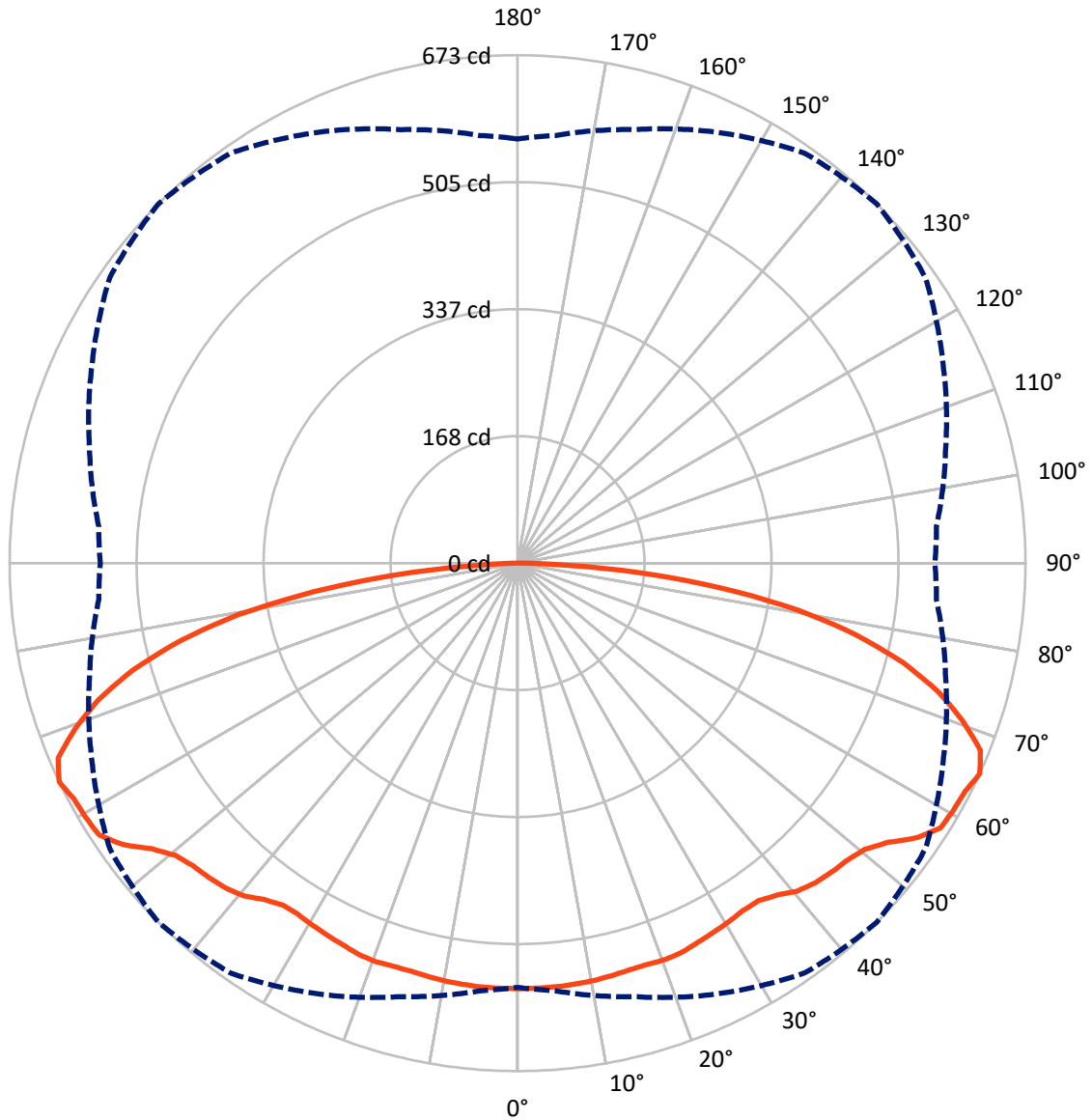
× Max cd  
 - - - 1/2 Max cd



Based on 15 foot mounting height. Maximum calculated value = 2.5 fc  
 Type V - Short - N/A

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### Luminous Intensity Polar Plot



— Vertical Plane Through 45-Deg Lateral    - - - Horizontal Cone Through 65-Deg Vertical

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**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 1522.5   | 0.0    | 1522.5 |
|                    | % Fixture | 50.0     | 0.0    | 50.0   |
| <b>Street Side</b> | Lumens    | 1522.5   | 0.0    | 1522.5 |
|                    | % Fixture | 50.0     | 0.0    | 50.0   |
| <b>Total</b>       | Lumens    | 3044.9   | 0.0    | 3044.9 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 53.8   | 1.8       |
| 10°-20°   | 158.5  | 5.2       |
| 20°-30°   | 256.7  | 8.4       |
| 30°-40°   | 344.9  | 11.3      |
| 40°-50°   | 440.2  | 14.5      |
| 50°-60°   | 541.6  | 17.8      |
| 60°-70°   | 603.1  | 19.8      |
| 70°-80°   | 489.5  | 16.1      |
| 80°-90°   | 156.7  | 5.1       |
| 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°    | 3044.9 | 100.0     |
| 0°-180°   | 3044.9 | 100.0     |



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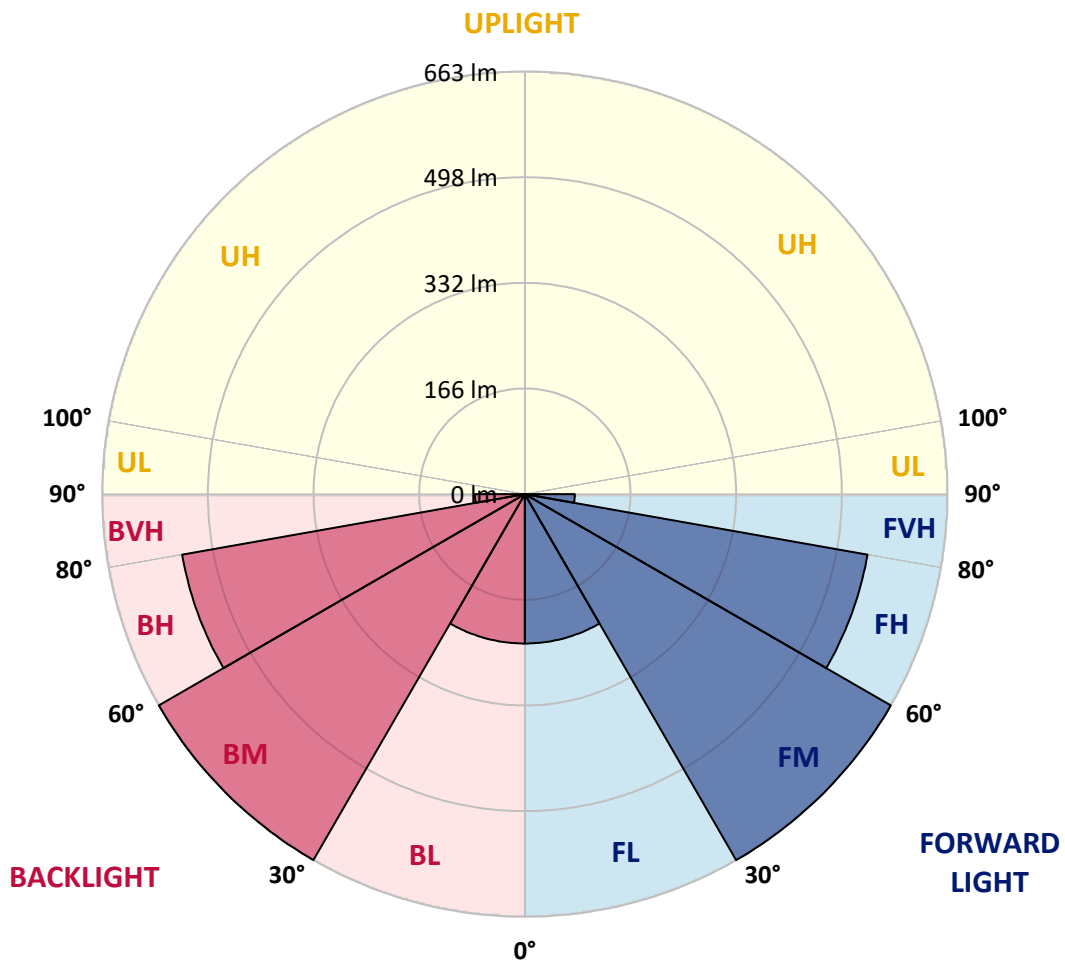
CATALOG NUMBER: MEM2-HSN-VA-30-830-U-MQ

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

| Zone           | Lumens | % Fixture | Zone Rating/Lumen Limit |      |        |
|----------------|--------|-----------|-------------------------|------|--------|
|                |        |           | B                       | U    | G      |
| FL (0°-30°)    | 234.5  | 7.7       |                         |      |        |
| FM (30°-60°)   | 663.4  | 21.8      |                         |      |        |
| FH (60°-80°)   | 546.3  | 17.9      |                         |      | G0/660 |
| FVH (80°-90°)  | 78.3   | 2.6       |                         |      | G1/100 |
| BL (0°-30°)    | 234.5  | 7.7       | B1/500                  |      |        |
| BM (30°-60°)   | 663.4  | 21.8      | B1/1000                 |      |        |
| BH (60°-80°)   | 546.3  | 17.9      | B2/1000                 |      | G0/660 |
| BVH (80°-90°)  | 78.3   | 2.6       |                         |      | G1/100 |
| UL (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |        |
| UH (100°-180°) | 0.0    | 0.0       |                         | U0/0 |        |

**BUG Rating: B2-U0-G1**

Type V Short





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 CATALOG NUMBER: MEM2-HSN-VA-30-830-U-MQ

**CANDELA DISTRIBUTION (FULL):**

|       | 0°    | 5°    | 15°   | 25°   | 35°   | 45°   | 55°   | 65°   | 75°   | 85°   | 90°   |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 563.9 | 563.9 | 563.9 | 563.9 | 563.9 | 563.9 | 563.9 | 563.9 | 563.9 | 563.9 | 563.9 |
| 2.5°  | 563.9 | 563.9 | 563.9 | 563.9 | 563.9 | 563.9 | 563.9 | 563.9 | 563.9 | 563.9 | 563.9 |
| 5°    | 563.9 | 563.9 | 563.9 | 563.9 | 563.9 | 563.9 | 563.9 | 563.9 | 563.1 | 563.9 | 563.9 |
| 7.5°  | 563.1 | 563.1 | 563.1 | 563.1 | 563.1 | 563.1 | 563.1 | 563.1 | 563.1 | 563.1 | 563.1 |
| 10°   | 562.2 | 562.2 | 562.2 | 562.2 | 562.2 | 562.2 | 562.2 | 562.2 | 562.2 | 562.2 | 562.2 |
| 12.5° | 560.6 | 560.6 | 560.6 | 560.6 | 560.6 | 560.6 | 560.6 | 560.6 | 560.6 | 560.6 | 560.6 |
| 15°   | 558.1 | 558.9 | 558.9 | 558.9 | 558.9 | 558.9 | 558.9 | 558.9 | 558.9 | 558.1 | 558.1 |
| 17.5° | 557.2 | 557.2 | 557.2 | 558.1 | 558.9 | 558.9 | 558.9 | 558.1 | 557.2 | 556.4 | 556.4 |
| 20°   | 558.1 | 558.1 | 558.1 | 558.9 | 559.7 | 560.6 | 559.7 | 558.9 | 557.2 | 557.2 | 557.2 |
| 22.5° | 557.2 | 558.1 | 558.1 | 558.9 | 559.7 | 559.7 | 558.9 | 558.1 | 557.2 | 556.4 | 556.4 |
| 25°   | 554.7 | 554.7 | 555.6 | 556.4 | 556.4 | 556.4 | 556.4 | 554.7 | 553.9 | 553.1 | 553.1 |
| 27.5° | 551.4 | 552.2 | 552.2 | 553.1 | 553.9 | 553.9 | 553.1 | 551.4 | 550.6 | 549.7 | 549.7 |
| 30°   | 547.2 | 547.2 | 548.1 | 549.7 | 550.6 | 551.4 | 549.7 | 548.1 | 545.6 | 544.7 | 544.7 |
| 32.5° | 543.1 | 543.9 | 545.6 | 547.2 | 548.1 | 548.9 | 547.2 | 545.6 | 543.1 | 541.4 | 540.6 |
| 35°   | 541.4 | 541.4 | 543.9 | 547.2 | 549.7 | 549.7 | 548.1 | 544.7 | 541.4 | 538.0 | 538.0 |
| 37.5° | 543.9 | 544.7 | 548.1 | 553.9 | 558.1 | 558.1 | 557.2 | 551.4 | 545.6 | 540.6 | 539.7 |
| 40°   | 549.7 | 550.6 | 556.4 | 563.9 | 570.6 | 571.4 | 568.1 | 560.6 | 552.2 | 546.4 | 544.7 |
| 42.5° | 553.1 | 554.7 | 561.4 | 570.6 | 576.4 | 578.9 | 574.8 | 567.2 | 556.4 | 548.9 | 548.1 |
| 45°   | 554.7 | 556.4 | 563.9 | 573.9 | 581.4 | 583.9 | 579.8 | 569.7 | 558.1 | 549.7 | 548.9 |
| 47.5° | 555.6 | 557.2 | 564.7 | 577.3 | 585.6 | 588.1 | 584.8 | 573.1 | 558.9 | 550.6 | 549.7 |
| 50°   | 556.4 | 559.7 | 568.9 | 582.3 | 594.8 | 596.4 | 591.4 | 577.3 | 562.2 | 552.2 | 549.7 |
| 52.5° | 562.2 | 564.7 | 578.1 | 597.3 | 609.8 | 614.8 | 607.3 | 593.1 | 570.6 | 555.6 | 553.9 |
| 55°   | 576.4 | 577.3 | 593.1 | 617.3 | 635.6 | 642.3 | 630.6 | 611.5 | 583.9 | 568.9 | 568.1 |
| 57.5° | 580.6 | 585.6 | 603.1 | 630.6 | 653.2 | 661.5 | 651.5 | 622.3 | 597.3 | 577.3 | 572.3 |
| 60°   | 576.4 | 580.6 | 601.4 | 633.1 | 657.3 | 664.0 | 656.5 | 629.0 | 592.3 | 569.7 | 565.6 |
| 62.5° | 572.3 | 577.3 | 598.9 | 634.8 | 658.2 | 665.7 | 653.2 | 629.8 | 589.8 | 567.2 | 563.1 |
| 65°   | 562.2 | 568.9 | 594.8 | 629.8 | 663.2 | 673.2 | 659.8 | 622.3 | 587.3 | 557.2 | 553.1 |
| 67.5° | 543.1 | 546.4 | 574.8 | 615.6 | 651.5 | 661.5 | 647.3 | 608.1 | 566.4 | 537.2 | 533.9 |
| 70°   | 507.2 | 514.7 | 541.4 | 586.4 | 620.6 | 625.6 | 614.8 | 575.6 | 534.7 | 503.8 | 499.7 |
| 72.5° | 459.6 | 470.5 | 499.7 | 545.6 | 573.1 | 583.1 | 568.9 | 537.2 | 494.7 | 459.6 | 453.8 |
| 75°   | 409.6 | 415.4 | 445.5 | 490.5 | 518.9 | 528.0 | 515.5 | 484.7 | 433.8 | 409.6 | 403.7 |
| 77.5° | 354.5 | 358.7 | 385.4 | 425.4 | 452.1 | 459.6 | 447.1 | 422.1 | 376.2 | 353.7 | 351.2 |
| 80°   | 277.8 | 286.1 | 311.2 | 345.4 | 365.4 | 377.1 | 363.7 | 339.5 | 306.1 | 279.5 | 275.3 |
| 82.5° | 198.5 | 204.4 | 226.9 | 250.3 | 269.4 | 272.8 | 266.9 | 243.6 | 218.6 | 197.7 | 192.7 |
| 85°   | 108.4 | 110.9 | 125.1 | 149.3 | 156.8 | 162.7 | 154.3 | 136.8 | 124.3 | 110.9 | 106.8 |
| 87.5° | 28.4  | 29.2  | 33.4  | 39.2  | 42.5  | 43.4  | 42.5  | 37.5  | 30.9  | 24.2  | 26.7  |
| 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: SP1-2407-176-7

Test Date: 09/27/2024

Luminaire Tested: MEM2-HTN-VA-30-830-U-WQ

Data in this report applies to families of products including MEM2-HTN-VA-30-830-U-WQ



**Test Information**

Test Method: LM-79-2019  
 Report Number: SP1-2407-176-7  
 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-30-830-U-WQ**  
 Description: EPIC MODERN VISUAL COMFORT 30W WAVESTREAM WIDE

**Spectral Parameters**

CCT (K): 2984  
 CIE u': 0.2500  
 CIE v': 0.5264  
 Duv: 0.0033  
 CIE x: 0.4431  
 CIE y: 0.4147  
 CIE z: 0.1422  
 Peak Wavelength (nm): 601  
 Dominant Wavelength (nm): 581  
 Purity: 57.4798  
 Rf: 85.8  
 Rg: 94.1

|           |      |      |      |
|-----------|------|------|------|
| CRI (Ra): | 81.8 |      |      |
| R1:       | 79.4 | R9:  | -1.1 |
| R2:       | 89.9 | R10: | 78.4 |
| R3:       | 96.6 | R11: | 80.8 |
| R4:       | 80.6 | R12: | 72.8 |
| R5:       | 80.1 | R13: | 81.7 |
| R6:       | 88.9 | R14: | 98.5 |
| R7:       | 82.6 | R15: | 70.2 |
| R8:       | 56.0 |      |      |



**Test Conditions**

Stabilization Time: 29M  
 Operation Time: 1H 29M  
 Sphere Temperature (°C): 25.2

REPORT NUMBER: SP1-2407-176-7

| 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**



CCT = 2984K  
 CIE x = 0.4431  
 CIE y = 0.4147  
 Duv = 0.0033

Point lies inside the ANSI 3000K 4-step quadrangle

REPORT NUMBER: SP1-2407-176-7

**Photopic Flux vs. Wavelength**



**Photopic Lumens: NR**

| $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) | $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) | $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) | $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) | $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) |
|-------------------|-----------------------------|-------------------------|-------------------|-----------------------------|-------------------------|-------------------|-----------------------------|-------------------------|-------------------|-----------------------------|-------------------------|-------------------|-----------------------------|-------------------------|
| 360               | 0                           | NR                      | 490               | 260                         | NR                      | 620               | 905                         | NR                      | 750               | 22                          | NR                      | 880               | 0                           | NR                      |
| 365               | 0                           | NR                      | 495               | 312                         | NR                      | 625               | 856                         | NR                      | 755               | 19                          | NR                      | 885               | 0                           | NR                      |
| 370               | 0                           | NR                      | 500               | 362                         | NR                      | 630               | 801                         | NR                      | 760               | 17                          | NR                      | 890               | 0                           | NR                      |
| 375               | 0                           | NR                      | 505               | 399                         | NR                      | 635               | 742                         | NR                      | 765               | 14                          | NR                      | 895               | 0                           | NR                      |
| 380               | 0                           | NR                      | 510               | 425                         | NR                      | 640               | 677                         | NR                      | 770               | 12                          | NR                      | 900               | 0                           | NR                      |
| 385               | 0                           | NR                      | 515               | 446                         | NR                      | 645               | 613                         | NR                      | 775               | 10                          | NR                      | 905               | 0                           | NR                      |
| 390               | 0                           | NR                      | 520               | 459                         | NR                      | 650               | 549                         | NR                      | 780               | 9                           | NR                      | 910               | 0                           | NR                      |
| 395               | 0                           | NR                      | 525               | 473                         | NR                      | 655               | 485                         | NR                      | 785               | 7                           | NR                      | 915               | 0                           | NR                      |
| 400               | 1                           | NR                      | 530               | 490                         | NR                      | 660               | 425                         | NR                      | 790               | 6                           | NR                      | 920               | 0                           | NR                      |
| 405               | 2                           | NR                      | 535               | 511                         | NR                      | 665               | 371                         | NR                      | 795               | 5                           | NR                      | 925               | 0                           | NR                      |
| 410               | 5                           | NR                      | 540               | 535                         | NR                      | 670               | 321                         | NR                      | 800               | 4                           | NR                      | 930               | 0                           | NR                      |
| 415               | 11                          | NR                      | 545               | 565                         | NR                      | 675               | 276                         | NR                      | 805               | 4                           | NR                      | 935               | 0                           | NR                      |
| 420               | 24                          | NR                      | 550               | 595                         | NR                      | 680               | 238                         | NR                      | 810               | 3                           | NR                      | 940               | 0                           | NR                      |
| 425               | 47                          | NR                      | 555               | 631                         | NR                      | 685               | 203                         | NR                      | 815               | 3                           | NR                      | 945               | 0                           | NR                      |
| 430               | 86                          | NR                      | 560               | 672                         | NR                      | 690               | 174                         | NR                      | 820               | 2                           | NR                      | 950               | 0                           | NR                      |
| 435               | 144                         | NR                      | 565               | 715                         | NR                      | 695               | 148                         | NR                      | 825               | 2                           | NR                      | 955               | 0                           | NR                      |
| 440               | 224                         | NR                      | 570               | 763                         | NR                      | 700               | 124                         | NR                      | 830               | 2                           | NR                      | 960               | 0                           | NR                      |
| 445               | 342                         | NR                      | 575               | 814                         | NR                      | 705               | 105                         | NR                      | 835               | 2                           | NR                      | 965               | 0                           | NR                      |
| 450               | 446                         | NR                      | 580               | 866                         | NR                      | 710               | 88                          | NR                      | 840               | 1                           | NR                      | 970               | 0                           | NR                      |
| 455               | 357                         | NR                      | 585               | 912                         | NR                      | 715               | 73                          | NR                      | 845               | 1                           | NR                      | 975               | 0                           | NR                      |
| 460               | 237                         | NR                      | 590               | 954                         | NR                      | 720               | 59                          | NR                      | 850               | 1                           | NR                      | 980               | 0                           | NR                      |
| 465               | 202                         | NR                      | 595               | 981                         | NR                      | 725               | 48                          | NR                      | 855               | 1                           | NR                      | 985               | 0                           | NR                      |
| 470               | 172                         | NR                      | 600               | 996                         | NR                      | 730               | 40                          | NR                      | 860               | 1                           | NR                      | 990               | 0                           | NR                      |
| 475               | 152                         | NR                      | 605               | 996                         | NR                      | 735               | 34                          | NR                      | 865               | 1                           | NR                      | 995               | 0                           | NR                      |
| 480               | 171                         | NR                      | 610               | 980                         | NR                      | 740               | 29                          | NR                      | 870               | 0                           | NR                      | 1000              | 0                           | NR                      |
| 485               | 210                         | NR                      | 615               | 947                         | NR                      | 745               | 25                          | NR                      | 875               | 0                           | NR                      |                   |                             |                         |

REPORT NUMBER: SP1-2407-176-7

**Scotopic Flux vs. Wavelength**



**Scotopic Lumens: NR**

**S/P: 1.32**

| 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    | 260                      | NR            | 620    | 905                      | NR            | 750    | 22                       | NR            | 880    | 0                        | NR            |
| 365    | 0                        | NR            | 495    | 312                      | NR            | 625    | 856                      | NR            | 755    | 19                       | NR            | 885    | 0                        | NR            |
| 370    | 0                        | NR            | 500    | 362                      | NR            | 630    | 801                      | NR            | 760    | 17                       | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 399                      | NR            | 635    | 742                      | NR            | 765    | 14                       | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 425                      | NR            | 640    | 677                      | NR            | 770    | 12                       | NR            | 900    | 0                        | NR            |
| 385    | 0                        | NR            | 515    | 446                      | NR            | 645    | 613                      | NR            | 775    | 10                       | NR            | 905    | 0                        | NR            |
| 390    | 0                        | NR            | 520    | 459                      | NR            | 650    | 549                      | NR            | 780    | 9                        | NR            | 910    | 0                        | NR            |
| 395    | 0                        | NR            | 525    | 473                      | NR            | 655    | 485                      | NR            | 785    | 7                        | NR            | 915    | 0                        | NR            |
| 400    | 1                        | NR            | 530    | 490                      | NR            | 660    | 425                      | NR            | 790    | 6                        | NR            | 920    | 0                        | NR            |
| 405    | 2                        | NR            | 535    | 511                      | NR            | 665    | 371                      | NR            | 795    | 5                        | NR            | 925    | 0                        | NR            |
| 410    | 5                        | NR            | 540    | 535                      | NR            | 670    | 321                      | NR            | 800    | 4                        | NR            | 930    | 0                        | NR            |
| 415    | 11                       | NR            | 545    | 565                      | NR            | 675    | 276                      | NR            | 805    | 4                        | NR            | 935    | 0                        | NR            |
| 420    | 24                       | NR            | 550    | 595                      | NR            | 680    | 238                      | NR            | 810    | 3                        | NR            | 940    | 0                        | NR            |
| 425    | 47                       | NR            | 555    | 631                      | NR            | 685    | 203                      | NR            | 815    | 3                        | NR            | 945    | 0                        | NR            |
| 430    | 86                       | NR            | 560    | 672                      | NR            | 690    | 174                      | NR            | 820    | 2                        | NR            | 950    | 0                        | NR            |
| 435    | 144                      | NR            | 565    | 715                      | NR            | 695    | 148                      | NR            | 825    | 2                        | NR            | 955    | 0                        | NR            |
| 440    | 224                      | NR            | 570    | 763                      | NR            | 700    | 124                      | NR            | 830    | 2                        | NR            | 960    | 0                        | NR            |
| 445    | 342                      | NR            | 575    | 814                      | NR            | 705    | 105                      | NR            | 835    | 2                        | NR            | 965    | 0                        | NR            |
| 450    | 446                      | NR            | 580    | 866                      | NR            | 710    | 88                       | NR            | 840    | 1                        | NR            | 970    | 0                        | NR            |
| 455    | 357                      | NR            | 585    | 912                      | NR            | 715    | 73                       | NR            | 845    | 1                        | NR            | 975    | 0                        | NR            |
| 460    | 237                      | NR            | 590    | 954                      | NR            | 720    | 59                       | NR            | 850    | 1                        | NR            | 980    | 0                        | NR            |
| 465    | 202                      | NR            | 595    | 981                      | NR            | 725    | 48                       | NR            | 855    | 1                        | NR            | 985    | 0                        | NR            |
| 470    | 172                      | NR            | 600    | 996                      | NR            | 730    | 40                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 152                      | NR            | 605    | 996                      | NR            | 735    | 34                       | NR            | 865    | 1                        | NR            | 995    | 0                        | NR            |
| 480    | 171                      | NR            | 610    | 980                      | NR            | 740    | 29                       | NR            | 870    | 0                        | NR            | 1000   | 0                        | NR            |
| 485    | 210                      | NR            | 615    | 947                      | NR            | 745    | 25                       | NR            | 875    | 0                        | NR            |        |                          |               |

REPORT NUMBER: SP1-2407-176-7

**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: NR**

**M/P: 2.51**

| 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    | 260                      | NR            | 620    | 905                      | NR            | 750    | 22                       | NR            | 880    | 0                        | NR            |
| 365    | 0                        | NR            | 495    | 312                      | NR            | 625    | 856                      | NR            | 755    | 19                       | NR            | 885    | 0                        | NR            |
| 370    | 0                        | NR            | 500    | 362                      | NR            | 630    | 801                      | NR            | 760    | 17                       | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 399                      | NR            | 635    | 742                      | NR            | 765    | 14                       | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 425                      | NR            | 640    | 677                      | NR            | 770    | 12                       | NR            | 900    | 0                        | NR            |
| 385    | 0                        | NR            | 515    | 446                      | NR            | 645    | 613                      | NR            | 775    | 10                       | NR            | 905    | 0                        | NR            |
| 390    | 0                        | NR            | 520    | 459                      | NR            | 650    | 549                      | NR            | 780    | 9                        | NR            | 910    | 0                        | NR            |
| 395    | 0                        | NR            | 525    | 473                      | NR            | 655    | 485                      | NR            | 785    | 7                        | NR            | 915    | 0                        | NR            |
| 400    | 1                        | NR            | 530    | 490                      | NR            | 660    | 425                      | NR            | 790    | 6                        | NR            | 920    | 0                        | NR            |
| 405    | 2                        | NR            | 535    | 511                      | NR            | 665    | 371                      | NR            | 795    | 5                        | NR            | 925    | 0                        | NR            |
| 410    | 5                        | NR            | 540    | 535                      | NR            | 670    | 321                      | NR            | 800    | 4                        | NR            | 930    | 0                        | NR            |
| 415    | 11                       | NR            | 545    | 565                      | NR            | 675    | 276                      | NR            | 805    | 4                        | NR            | 935    | 0                        | NR            |
| 420    | 24                       | NR            | 550    | 595                      | NR            | 680    | 238                      | NR            | 810    | 3                        | NR            | 940    | 0                        | NR            |
| 425    | 47                       | NR            | 555    | 631                      | NR            | 685    | 203                      | NR            | 815    | 3                        | NR            | 945    | 0                        | NR            |
| 430    | 86                       | NR            | 560    | 672                      | NR            | 690    | 174                      | NR            | 820    | 2                        | NR            | 950    | 0                        | NR            |
| 435    | 144                      | NR            | 565    | 715                      | NR            | 695    | 148                      | NR            | 825    | 2                        | NR            | 955    | 0                        | NR            |
| 440    | 224                      | NR            | 570    | 763                      | NR            | 700    | 124                      | NR            | 830    | 2                        | NR            | 960    | 0                        | NR            |
| 445    | 342                      | NR            | 575    | 814                      | NR            | 705    | 105                      | NR            | 835    | 2                        | NR            | 965    | 0                        | NR            |
| 450    | 446                      | NR            | 580    | 866                      | NR            | 710    | 88                       | NR            | 840    | 1                        | NR            | 970    | 0                        | NR            |
| 455    | 357                      | NR            | 585    | 912                      | NR            | 715    | 73                       | NR            | 845    | 1                        | NR            | 975    | 0                        | NR            |
| 460    | 237                      | NR            | 590    | 954                      | NR            | 720    | 59                       | NR            | 850    | 1                        | NR            | 980    | 0                        | NR            |
| 465    | 202                      | NR            | 595    | 981                      | NR            | 725    | 48                       | NR            | 855    | 1                        | NR            | 985    | 0                        | NR            |
| 470    | 172                      | NR            | 600    | 996                      | NR            | 730    | 40                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 152                      | NR            | 605    | 996                      | NR            | 735    | 34                       | NR            | 865    | 1                        | NR            | 995    | 0                        | NR            |
| 480    | 171                      | NR            | 610    | 980                      | NR            | 740    | 29                       | NR            | 870    | 0                        | NR            | 1000   | 0                        | NR            |
| 485    | 210                      | NR            | 615    | 947                      | NR            | 745    | 25                       | NR            | 875    | 0                        | NR            |        |                          |               |

**Summary**

$R_f = 85.8$   
 $R_g = 94.1$   
 $CIE R_a = 81.8$   
 $R_g = -1.1$



**Color Vector Graphics**



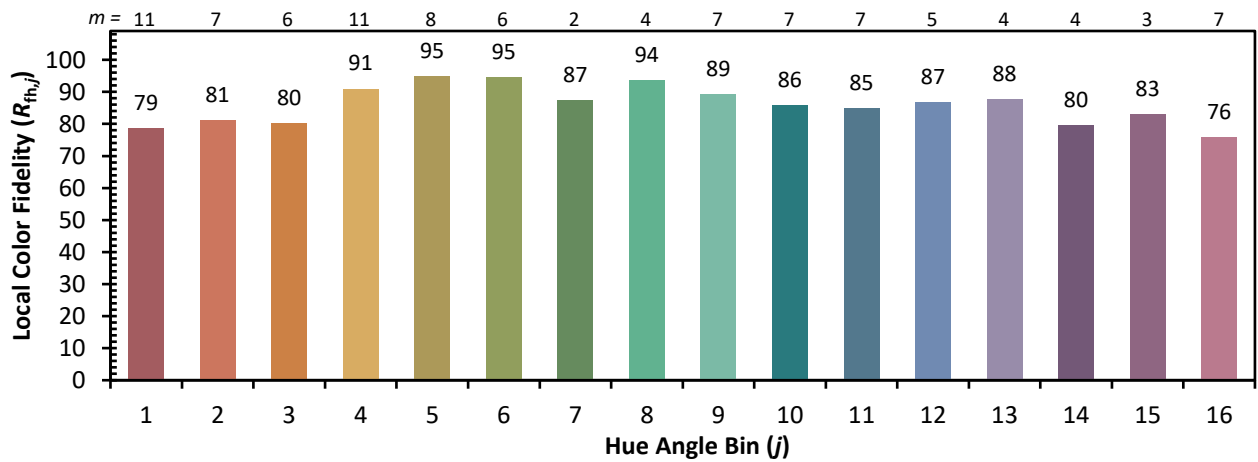
Individual Sample Fidelity Index ( $R_{f,i}$ )

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 86 | CES51 = 95 | CES76 = 84 |
| CES02 = 63 | CES27 = 95 | CES52 = 94 | CES77 = 86 |
| CES03 = 31 | CES28 = 95 | CES53 = 90 | CES78 = 83 |
| CES04 = 70 | CES29 = 89 | CES54 = 91 | CES79 = 90 |
| CES05 = 50 | CES30 = 95 | CES55 = 91 | CES80 = 90 |
| CES06 = 51 | CES31 = 91 | CES56 = 87 | CES81 = 70 |
| CES07 = 42 | CES32 = 85 | CES57 = 86 | CES82 = 96 |
| CES08 = 41 | CES33 = 93 | CES58 = 87 | CES83 = 94 |
| CES09 = 29 | CES34 = 94 | CES59 = 92 | CES84 = 92 |
| CES10 = 76 | CES35 = 97 | CES60 = 94 | CES85 = 77 |
| CES11 = 59 | CES36 = 90 | CES61 = 90 | CES86 = 66 |
| CES12 = 65 | CES37 = 97 | CES62 = 94 | CES87 = 84 |
| CES13 = 43 | CES38 = 97 | CES63 = 88 | CES88 = 86 |
| CES14 = 74 | CES39 = 98 | CES64 = 84 | CES89 = 75 |
| CES15 = 72 | CES40 = 95 | CES65 = 80 | CES90 = 88 |
| CES16 = 47 | CES41 = 97 | CES66 = 83 | CES91 = 81 |
| CES17 = 50 | CES42 = 99 | CES67 = 82 | CES92 = 64 |
| CES18 = 56 | CES43 = 93 | CES68 = 84 | CES93 = 79 |
| CES19 = 72 | CES44 = 99 | CES69 = 89 | CES94 = 60 |
| CES20 = 67 | CES45 = 94 | CES70 = 82 | CES95 = 74 |
| CES21 = 87 | CES46 = 90 | CES71 = 81 | CES96 = 83 |
| CES22 = 79 | CES47 = 93 | CES72 = 93 | CES97 = 89 |
| CES23 = 92 | CES48 = 83 | CES73 = 77 | CES98 = 84 |
| CES24 = 91 | CES49 = 92 | CES74 = 92 | CES99 = 75 |
| CES25 = 72 | CES50 = 95 | CES75 = 83 |            |





Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)