

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: P867748

Luminaire Tested: **MEM2-HTN-SA-110-722-U-T5R**

Issue Date: 08/21/2024

**Test Information**

Test Method: LM-79-08  
Report Number: P867748  
Test Lab: INNOVATION CENTER(G3)  
Issue Date: 08/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: STREETWORKS  
Catalog Number: MEM2-HTN-SA-110-722-U-T5R  
Description: EPIC MODERN TALL HOUSING DISCRETE LED ARRAYS 110W 70CRI 2200K  
FIXTURE w/ TYPE V ROUND DISTRIBUTION OPTIC  
Light Source: (30) 2200K CCT, 70 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

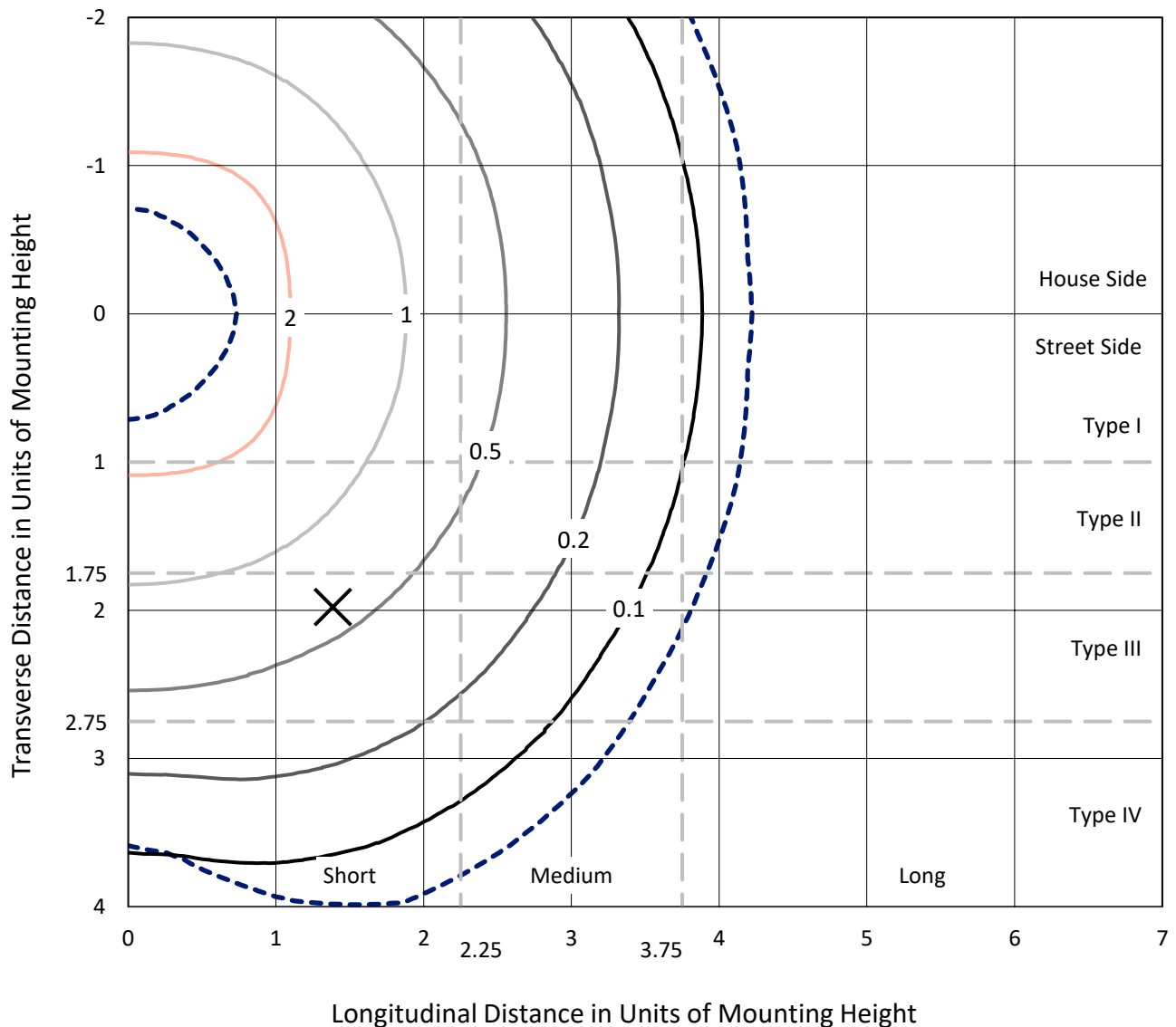
Lumens per Lamp: N/A  
Luminaire Lumens: 14875.2 lumens  
Efficiency: N/A  
Efficacy: 131.6 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 0.33' x H: 0')  
IES Classification: Type V - Short  
BUG Rating: B4 - U0 - G2

Input Watts (W): 113  
Input Voltage (V): 120  
Input Current (A<sub>in</sub>): NR  
Voltage Rise (V): NR  
Power Factor: 0.99  
Total Harmonic Distortion (THDi): 7.77%  
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

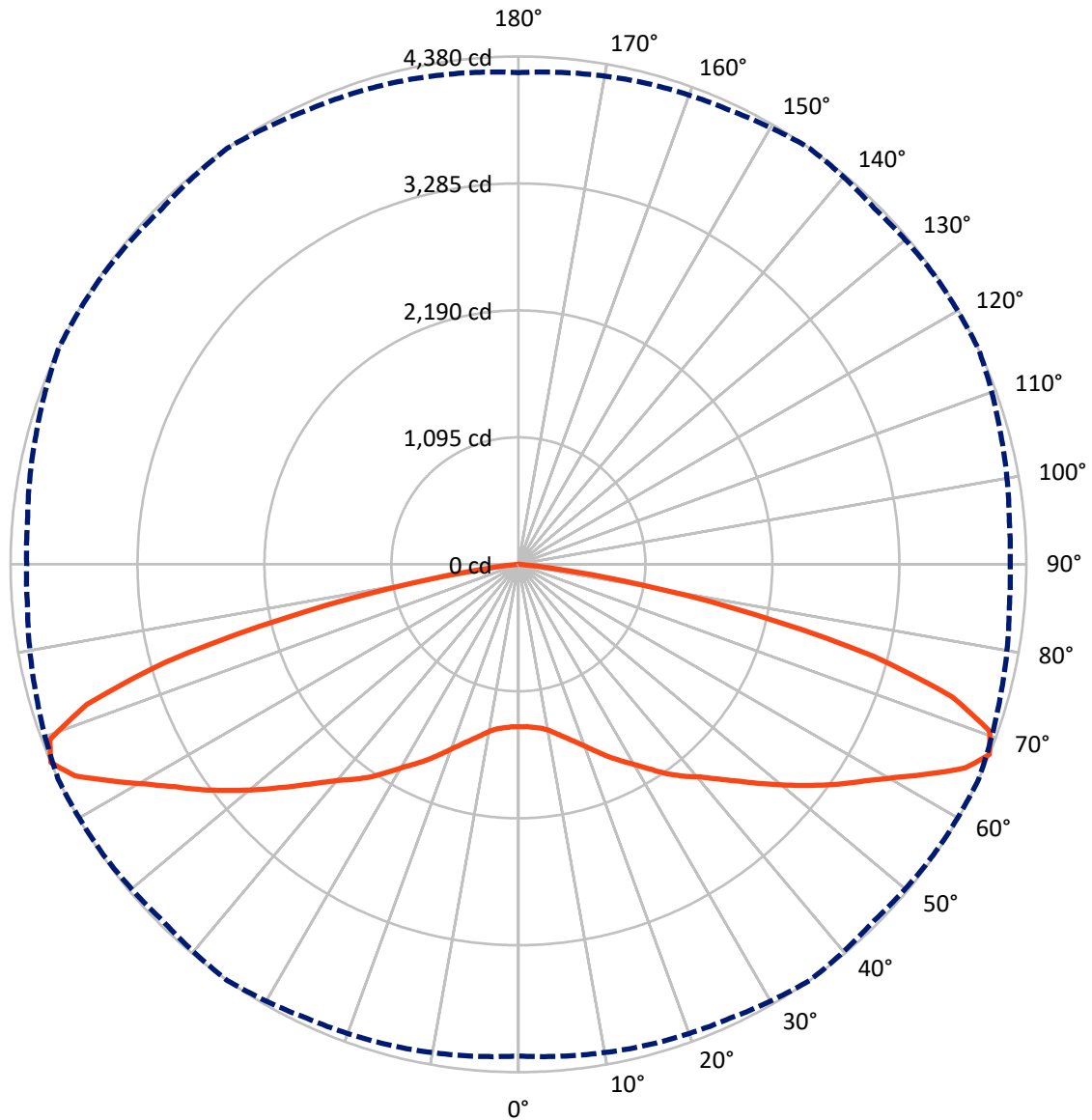
× Max cd  
 - - - 1/2 Max cd



Based on 20 foot mounting height. Maximum calculated value = 3.5 fc  
 Type V - Short - N/A

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### Luminous Intensity Polar Plot



— Vertical Plane Through 35-Deg Lateral    - - - Horizontal Cone Through 67.5-Deg Vertical

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**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 7437.6   | 0.0    | 7437.6  |
|                    | % Fixture | 50.0     | 0.0    | 50.0    |
| <b>Street Side</b> | Lumens    | 7437.6   | 0.0    | 7437.6  |
|                    | % Fixture | 50.0     | 0.0    | 50.0    |
| <b>Total</b>       | Lumens    | 14875.2  | 0.0    | 14875.2 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 136.2   | 0.9       |
| 10°-20°   | 446.6   | 3.0       |
| 20°-30°   | 853.5   | 5.7       |
| 30°-40°   | 1379.3  | 9.3       |
| 40°-50°   | 2018.8  | 13.6      |
| 50°-60°   | 2894.9  | 19.5      |
| 60°-70°   | 4057.5  | 27.3      |
| 70°-80°   | 2863.0  | 19.2      |
| 80°-90°   | 225.4   | 1.5       |
| 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°    | 14875.2 | 100.0     |
| 0°-180°   | 14875.2 | 100.0     |

**Coefficient of Utilization**



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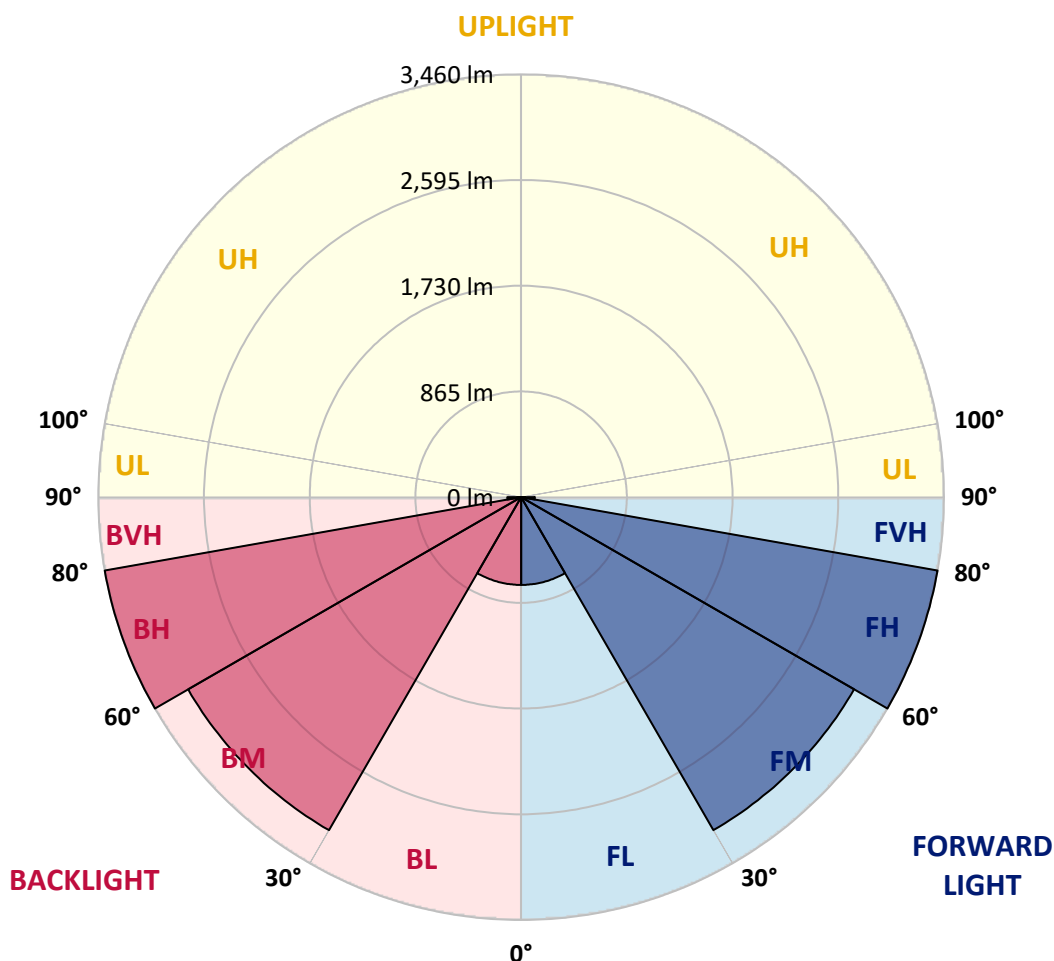
CATALOG NUMBER: MEM2-HTN-SA-110-722-U-T5R

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

| Zone           | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|----------------|--------|-----------|-------------------------|------|---------|
|                |        |           | B                       | U    | G       |
| FL (0°-30°)    | 718.2  | 4.8       |                         |      |         |
| FM (30°-60°)   | 3146.5 | 21.2      |                         |      |         |
| FH (60°-80°)   | 3460.2 | 23.3      |                         |      | G2/5000 |
| FVH (80°-90°)  | 112.7  | 0.8       |                         |      | G2/225  |
| BL (0°-30°)    | 718.2  | 4.8       | B2/1000                 |      |         |
| BM (30°-60°)   | 3146.5 | 21.2      | B3/5000                 |      |         |
| BH (60°-80°)   | 3460.2 | 23.3      | B4/5000                 |      | G2/5000 |
| BVH (80°-90°)  | 112.7  | 0.8       |                         |      | G2/225  |
| UL (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B4-U0-G2**

Type V Short





REPORT NUMBER: P867748

CATALOG NUMBER: MEM2-HTN-SA-110-722-U-T5R

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 75°    | 85°    | 90°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1401.2 | 1401.2 | 1401.2 | 1401.2 | 1401.2 | 1401.2 | 1401.2 | 1401.2 | 1401.2 | 1401.2 | 1401.2 |
| 2.5°  | 1409.9 | 1407.0 | 1404.1 | 1404.1 | 1401.2 | 1404.1 | 1401.2 | 1404.1 | 1401.2 | 1401.2 | 1401.2 |
| 5°    | 1418.6 | 1415.7 | 1415.7 | 1415.7 | 1412.8 | 1412.8 | 1412.8 | 1412.8 | 1409.9 | 1407.0 | 1409.9 |
| 7.5°  | 1427.3 | 1427.3 | 1424.4 | 1430.2 | 1427.3 | 1430.2 | 1430.2 | 1433.1 | 1427.3 | 1424.4 | 1427.3 |
| 10°   | 1450.4 | 1450.4 | 1450.4 | 1456.2 | 1456.2 | 1464.9 | 1464.9 | 1467.8 | 1464.9 | 1459.1 | 1459.1 |
| 12.5° | 1499.6 | 1496.7 | 1496.7 | 1496.7 | 1502.5 | 1508.3 | 1514.1 | 1514.1 | 1511.2 | 1502.5 | 1502.5 |
| 15°   | 1554.6 | 1560.4 | 1554.6 | 1551.8 | 1554.6 | 1560.4 | 1566.2 | 1566.2 | 1563.3 | 1560.4 | 1560.4 |
| 17.5° | 1621.2 | 1624.1 | 1618.3 | 1612.6 | 1612.6 | 1621.2 | 1624.1 | 1624.1 | 1621.2 | 1615.4 | 1615.4 |
| 20°   | 1679.1 | 1682.0 | 1682.0 | 1679.1 | 1682.0 | 1687.8 | 1690.7 | 1693.6 | 1684.9 | 1676.2 | 1676.2 |
| 22.5° | 1728.4 | 1731.2 | 1737.0 | 1748.6 | 1760.2 | 1766.0 | 1763.1 | 1763.1 | 1748.6 | 1739.9 | 1737.0 |
| 25°   | 1789.1 | 1797.8 | 1809.4 | 1823.9 | 1844.2 | 1858.6 | 1852.8 | 1841.3 | 1829.7 | 1812.3 | 1809.4 |
| 27.5° | 1907.8 | 1907.8 | 1896.3 | 1902.1 | 1925.2 | 1939.7 | 1933.9 | 1925.2 | 1902.1 | 1890.5 | 1887.6 |
| 30°   | 2000.5 | 2000.5 | 2000.5 | 1994.7 | 2009.2 | 2026.5 | 2020.8 | 2006.3 | 1994.7 | 1988.9 | 1988.9 |
| 32.5° | 2090.2 | 2084.4 | 2093.1 | 2104.7 | 2110.5 | 2116.3 | 2116.3 | 2104.7 | 2084.4 | 2075.8 | 2075.8 |
| 35°   | 2174.2 | 2180.0 | 2188.7 | 2206.0 | 2220.5 | 2211.8 | 2197.4 | 2188.7 | 2168.4 | 2151.0 | 2151.0 |
| 37.5° | 2255.3 | 2261.0 | 2269.7 | 2295.8 | 2318.9 | 2316.1 | 2298.7 | 2275.5 | 2249.5 | 2235.0 | 2226.3 |
| 40°   | 2313.2 | 2316.1 | 2339.2 | 2379.7 | 2411.6 | 2423.2 | 2408.7 | 2376.8 | 2336.3 | 2307.4 | 2310.3 |
| 42.5° | 2382.6 | 2388.4 | 2426.1 | 2484.0 | 2530.3 | 2547.7 | 2527.4 | 2484.0 | 2426.1 | 2388.4 | 2388.4 |
| 45°   | 2484.0 | 2486.9 | 2536.1 | 2608.5 | 2669.2 | 2698.2 | 2669.2 | 2608.5 | 2533.2 | 2495.5 | 2492.6 |
| 47.5° | 2585.3 | 2594.0 | 2649.0 | 2735.8 | 2825.6 | 2860.3 | 2828.5 | 2750.3 | 2660.6 | 2614.2 | 2608.5 |
| 50°   | 2701.1 | 2706.9 | 2773.5 | 2892.2 | 2993.5 | 3039.8 | 2999.3 | 2900.9 | 2802.4 | 2744.5 | 2747.4 |
| 52.5° | 2814.0 | 2831.4 | 2921.1 | 3045.6 | 3167.2 | 3219.3 | 3161.4 | 3054.3 | 2950.1 | 2895.1 | 2892.2 |
| 55°   | 2981.9 | 3002.2 | 3080.3 | 3219.3 | 3346.7 | 3404.6 | 3349.6 | 3230.9 | 3118.0 | 3057.2 | 3045.6 |
| 57.5° | 3193.3 | 3204.8 | 3274.3 | 3416.2 | 3523.3 | 3578.3 | 3546.5 | 3436.4 | 3329.3 | 3254.1 | 3239.6 |
| 60°   | 3433.5 | 3445.1 | 3500.1 | 3644.9 | 3731.7 | 3772.3 | 3760.7 | 3697.0 | 3624.6 | 3589.9 | 3581.2 |
| 62.5° | 3775.2 | 3778.1 | 3807.0 | 3891.0 | 3977.8 | 3995.2 | 3966.2 | 3951.8 | 3974.9 | 3937.3 | 3946.0 |
| 65°   | 4166.0 | 4166.0 | 4157.3 | 4168.9 | 4235.5 | 4215.2 | 4194.9 | 4258.6 | 4247.1 | 4183.4 | 4171.8 |
| 67.5° | 4241.3 | 4258.6 | 4293.4 | 4319.4 | 4380.2 | 4342.6 | 4368.7 | 4380.2 | 4307.9 | 4250.0 | 4241.3 |
| 70°   | 3795.4 | 3815.7 | 4009.7 | 4128.4 | 4313.6 | 4348.4 | 4264.4 | 4221.0 | 4139.9 | 4032.8 | 4003.9 |
| 72.5° | 2588.2 | 2689.5 | 3248.3 | 3630.4 | 3914.1 | 3957.6 | 3911.2 | 3856.2 | 3694.1 | 3610.1 | 3552.2 |
| 75°   | 2067.1 | 2122.1 | 2620.0 | 2996.4 | 3164.3 | 3161.4 | 2976.1 | 2915.3 | 2787.9 | 2776.4 | 2787.9 |
| 77.5° | 1262.2 | 1273.8 | 1763.1 | 2058.4 | 2078.7 | 2067.1 | 1991.8 | 1945.5 | 1962.9 | 1876.0 | 1890.5 |
| 80°   | 385.0  | 419.8  | 665.9  | 1004.6 | 1079.9 | 1045.1 | 1030.6 | 1048.0 | 1065.4 | 1091.4 | 1132.0 |
| 82.5° | 78.2   | 98.4   | 133.2  | 289.5  | 330.0  | 327.1  | 324.2  | 359.0  | 390.8  | 405.3  | 492.2  |
| 85°   | 8.7    | 8.7    | 11.6   | 23.2   | 49.2   | 78.2   | 81.1   | 72.4   | 110.0  | 107.1  | 75.3   |
| 87.5° | 2.9    | 2.9    | 2.9    | 2.9    | 2.9    | 5.8    | 5.8    | 5.8    | 5.8    | 5.8    | 5.8    |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

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

Report Prepared for

Cooper Lighting Solutions

Streetworks

Report Number: SP1-2407-157-2

Test Date: 08/07/2024

Luminaire Tested: MEM2-HTN-SA-30-722-U-5WQ-2

Data in this report applies to families of products including MEM2-HTN-SA-30-722-U-5WQ-2



**Test Information**

Test Method: LM-79-2019  
 Report Number: SP1-2407-157-2  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry: 4π  
 Issue Date: 08/20/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: Streetworks  
 Catalog Number: **MEM2-HTN-SA-30-722-U-5WQ-2**  
 Description: Epic Modern Light Square 30W 5WQ Optic and Flare Trim

**Spectral Parameters**

CCT (K): 2253  
 CIE u': 0.2868  
 CIE v': 0.5332  
 Duv: -0.0014  
 CIE x: 0.4974  
 CIE y: 0.4110  
 CIE z: 0.0915  
 Peak Wavelength (nm): 603  
 Dominant Wavelength (nm): 587  
 Purity: 72.69432  
 Rf: 76.9  
 Rg: 92.7

|           |      |      |       |
|-----------|------|------|-------|
| CRI (Ra): | 70.6 |      |       |
| R1:       | 68.4 | R9:  | -36.0 |
| R2:       | 88.7 | R10: | 78.2  |
| R3:       | 85.4 | R11: | 61.0  |
| R4:       | 63.5 | R12: | 74.2  |
| R5:       | 69.0 | R13: | 72.8  |
| R6:       | 88.9 | R14: | 92.2  |
| R7:       | 68.5 | R15: | 58.0  |
| R8:       | 32.0 |      |       |



**Test Conditions**

Stabilization Time: 29M  
 Operation Time: 1H 29M  
 Sphere Temperature (°C): 24.1

REPORT NUMBER: SP1-2407-157-2

| 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 2200K 4-step quadrangle

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**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               | 117                         | NR                      | 620               | 896                         | NR                      | 750               | 20                          | NR                      | 880               | 0                           | NR                      |
| 365               | 0                           | NR                      | 495               | 137                         | NR                      | 625               | 838                         | NR                      | 755               | 17                          | NR                      | 885               | 0                           | NR                      |
| 370               | 0                           | NR                      | 500               | 160                         | NR                      | 630               | 774                         | NR                      | 760               | 14                          | NR                      | 890               | 0                           | NR                      |
| 375               | 0                           | NR                      | 505               | 183                         | NR                      | 635               | 704                         | NR                      | 765               | 12                          | NR                      | 895               | 0                           | NR                      |
| 380               | 0                           | NR                      | 510               | 202                         | NR                      | 640               | 635                         | NR                      | 770               | 10                          | NR                      | 900               | 0                           | NR                      |
| 385               | 0                           | NR                      | 515               | 219                         | NR                      | 645               | 565                         | NR                      | 775               | 9                           | NR                      | 905               | 0                           | NR                      |
| 390               | 0                           | NR                      | 520               | 235                         | NR                      | 650               | 501                         | NR                      | 780               | 7                           | NR                      | 910               | 0                           | NR                      |
| 395               | 0                           | NR                      | 525               | 249                         | NR                      | 655               | 440                         | NR                      | 785               | 6                           | NR                      | 915               | 0                           | NR                      |
| 400               | 0                           | NR                      | 530               | 263                         | NR                      | 660               | 383                         | NR                      | 790               | 5                           | NR                      | 920               | 0                           | NR                      |
| 405               | 0                           | NR                      | 535               | 281                         | NR                      | 665               | 332                         | NR                      | 795               | 5                           | NR                      | 925               | 0                           | NR                      |
| 410               | 1                           | NR                      | 540               | 302                         | NR                      | 670               | 286                         | NR                      | 800               | 4                           | NR                      | 930               | 0                           | NR                      |
| 415               | 3                           | NR                      | 545               | 331                         | NR                      | 675               | 245                         | NR                      | 805               | 3                           | NR                      | 935               | 0                           | NR                      |
| 420               | 6                           | NR                      | 550               | 366                         | NR                      | 680               | 210                         | NR                      | 810               | 3                           | NR                      | 940               | 0                           | NR                      |
| 425               | 12                          | NR                      | 555               | 411                         | NR                      | 685               | 178                         | NR                      | 815               | 3                           | NR                      | 945               | 0                           | NR                      |
| 430               | 21                          | NR                      | 560               | 469                         | NR                      | 690               | 152                         | NR                      | 820               | 2                           | NR                      | 950               | 0                           | NR                      |
| 435               | 38                          | NR                      | 565               | 536                         | NR                      | 695               | 129                         | NR                      | 825               | 2                           | NR                      | 955               | 0                           | NR                      |
| 440               | 66                          | NR                      | 570               | 614                         | NR                      | 700               | 109                         | NR                      | 830               | 2                           | NR                      | 960               | 0                           | NR                      |
| 445               | 122                         | NR                      | 575               | 701                         | NR                      | 705               | 92                          | NR                      | 835               | 1                           | NR                      | 965               | 0                           | NR                      |
| 450               | 215                         | NR                      | 580               | 785                         | NR                      | 710               | 77                          | NR                      | 840               | 1                           | NR                      | 970               | 0                           | NR                      |
| 455               | 236                         | NR                      | 585               | 863                         | NR                      | 715               | 66                          | NR                      | 845               | 1                           | NR                      | 975               | 0                           | NR                      |
| 460               | 170                         | NR                      | 590               | 928                         | NR                      | 720               | 55                          | NR                      | 850               | 1                           | NR                      | 980               | 0                           | NR                      |
| 465               | 148                         | NR                      | 595               | 971                         | NR                      | 725               | 47                          | NR                      | 855               | 1                           | NR                      | 985               | 0                           | NR                      |
| 470               | 132                         | NR                      | 600               | 994                         | NR                      | 730               | 40                          | NR                      | 860               | 1                           | NR                      | 990               | 0                           | NR                      |
| 475               | 104                         | NR                      | 605               | 996                         | NR                      | 735               | 33                          | NR                      | 865               | 1                           | NR                      | 995               | 0                           | NR                      |
| 480               | 97                          | NR                      | 610               | 979                         | NR                      | 740               | 28                          | NR                      | 870               | 1                           | NR                      | 1000              | 0                           | NR                      |
| 485               | 105                         | NR                      | 615               | 943                         | NR                      | 745               | 24                          | NR                      | 875               | 0                           | NR                      |                   |                             |                         |

REPORT NUMBER: SP1-2407-157-2

**Scotopic Flux vs. Wavelength**



**Scotopic Lumens: NR S/P: 0.96**

| 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    | 117                      | NR            | 620    | 896                      | NR            | 750    | 20                       | NR            | 880    | 0                        | NR            |
| 365    | 0                        | NR            | 495    | 137                      | NR            | 625    | 838                      | NR            | 755    | 17                       | NR            | 885    | 0                        | NR            |
| 370    | 0                        | NR            | 500    | 160                      | NR            | 630    | 774                      | NR            | 760    | 14                       | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 183                      | NR            | 635    | 704                      | NR            | 765    | 12                       | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 202                      | NR            | 640    | 635                      | NR            | 770    | 10                       | NR            | 900    | 0                        | NR            |
| 385    | 0                        | NR            | 515    | 219                      | NR            | 645    | 565                      | NR            | 775    | 9                        | NR            | 905    | 0                        | NR            |
| 390    | 0                        | NR            | 520    | 235                      | NR            | 650    | 501                      | NR            | 780    | 7                        | NR            | 910    | 0                        | NR            |
| 395    | 0                        | NR            | 525    | 249                      | NR            | 655    | 440                      | NR            | 785    | 6                        | NR            | 915    | 0                        | NR            |
| 400    | 0                        | NR            | 530    | 263                      | NR            | 660    | 383                      | NR            | 790    | 5                        | NR            | 920    | 0                        | NR            |
| 405    | 0                        | NR            | 535    | 281                      | NR            | 665    | 332                      | NR            | 795    | 5                        | NR            | 925    | 0                        | NR            |
| 410    | 1                        | NR            | 540    | 302                      | NR            | 670    | 286                      | NR            | 800    | 4                        | NR            | 930    | 0                        | NR            |
| 415    | 3                        | NR            | 545    | 331                      | NR            | 675    | 245                      | NR            | 805    | 3                        | NR            | 935    | 0                        | NR            |
| 420    | 6                        | NR            | 550    | 366                      | NR            | 680    | 210                      | NR            | 810    | 3                        | NR            | 940    | 0                        | NR            |
| 425    | 12                       | NR            | 555    | 411                      | NR            | 685    | 178                      | NR            | 815    | 3                        | NR            | 945    | 0                        | NR            |
| 430    | 21                       | NR            | 560    | 469                      | NR            | 690    | 152                      | NR            | 820    | 2                        | NR            | 950    | 0                        | NR            |
| 435    | 38                       | NR            | 565    | 536                      | NR            | 695    | 129                      | NR            | 825    | 2                        | NR            | 955    | 0                        | NR            |
| 440    | 66                       | NR            | 570    | 614                      | NR            | 700    | 109                      | NR            | 830    | 2                        | NR            | 960    | 0                        | NR            |
| 445    | 122                      | NR            | 575    | 701                      | NR            | 705    | 92                       | NR            | 835    | 1                        | NR            | 965    | 0                        | NR            |
| 450    | 215                      | NR            | 580    | 785                      | NR            | 710    | 77                       | NR            | 840    | 1                        | NR            | 970    | 0                        | NR            |
| 455    | 236                      | NR            | 585    | 863                      | NR            | 715    | 66                       | NR            | 845    | 1                        | NR            | 975    | 0                        | NR            |
| 460    | 170                      | NR            | 590    | 928                      | NR            | 720    | 55                       | NR            | 850    | 1                        | NR            | 980    | 0                        | NR            |
| 465    | 148                      | NR            | 595    | 971                      | NR            | 725    | 47                       | NR            | 855    | 1                        | NR            | 985    | 0                        | NR            |
| 470    | 132                      | NR            | 600    | 994                      | NR            | 730    | 40                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 104                      | NR            | 605    | 996                      | NR            | 735    | 33                       | NR            | 865    | 1                        | NR            | 995    | 0                        | NR            |
| 480    | 97                       | NR            | 610    | 979                      | NR            | 740    | 28                       | NR            | 870    | 1                        | NR            | 1000   | 0                        | NR            |
| 485    | 105                      | NR            | 615    | 943                      | NR            | 745    | 24                       | NR            | 875    | 0                        | NR            |        |                          |               |

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Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 1.71

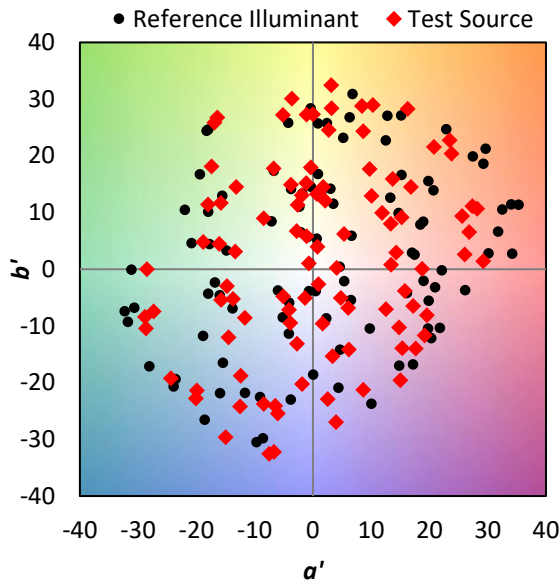
| λ (nm) | Power W <sup>2</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>2</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>2</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>2</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>2</sup> /nm | Lumens (φ/nm) |
|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|
| 360    | 0                        | NR            | 490    | 117                      | NR            | 620    | 896                      | NR            | 750    | 20                       | NR            | 880    | 0                        | NR            |
| 365    | 0                        | NR            | 495    | 137                      | NR            | 625    | 838                      | NR            | 755    | 17                       | NR            | 885    | 0                        | NR            |
| 370    | 0                        | NR            | 500    | 160                      | NR            | 630    | 774                      | NR            | 760    | 14                       | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 183                      | NR            | 635    | 704                      | NR            | 765    | 12                       | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 202                      | NR            | 640    | 635                      | NR            | 770    | 10                       | NR            | 900    | 0                        | NR            |
| 385    | 0                        | NR            | 515    | 219                      | NR            | 645    | 565                      | NR            | 775    | 9                        | NR            | 905    | 0                        | NR            |
| 390    | 0                        | NR            | 520    | 235                      | NR            | 650    | 501                      | NR            | 780    | 7                        | NR            | 910    | 0                        | NR            |
| 395    | 0                        | NR            | 525    | 249                      | NR            | 655    | 440                      | NR            | 785    | 6                        | NR            | 915    | 0                        | NR            |
| 400    | 0                        | NR            | 530    | 263                      | NR            | 660    | 383                      | NR            | 790    | 5                        | NR            | 920    | 0                        | NR            |
| 405    | 0                        | NR            | 535    | 281                      | NR            | 665    | 332                      | NR            | 795    | 5                        | NR            | 925    | 0                        | NR            |
| 410    | 1                        | NR            | 540    | 302                      | NR            | 670    | 286                      | NR            | 800    | 4                        | NR            | 930    | 0                        | NR            |
| 415    | 3                        | NR            | 545    | 331                      | NR            | 675    | 245                      | NR            | 805    | 3                        | NR            | 935    | 0                        | NR            |
| 420    | 6                        | NR            | 550    | 366                      | NR            | 680    | 210                      | NR            | 810    | 3                        | NR            | 940    | 0                        | NR            |
| 425    | 12                       | NR            | 555    | 411                      | NR            | 685    | 178                      | NR            | 815    | 3                        | NR            | 945    | 0                        | NR            |
| 430    | 21                       | NR            | 560    | 469                      | NR            | 690    | 152                      | NR            | 820    | 2                        | NR            | 950    | 0                        | NR            |
| 435    | 38                       | NR            | 565    | 536                      | NR            | 695    | 129                      | NR            | 825    | 2                        | NR            | 955    | 0                        | NR            |
| 440    | 66                       | NR            | 570    | 614                      | NR            | 700    | 109                      | NR            | 830    | 2                        | NR            | 960    | 0                        | NR            |
| 445    | 122                      | NR            | 575    | 701                      | NR            | 705    | 92                       | NR            | 835    | 1                        | NR            | 965    | 0                        | NR            |
| 450    | 215                      | NR            | 580    | 785                      | NR            | 710    | 77                       | NR            | 840    | 1                        | NR            | 970    | 0                        | NR            |
| 455    | 236                      | NR            | 585    | 863                      | NR            | 715    | 66                       | NR            | 845    | 1                        | NR            | 975    | 0                        | NR            |
| 460    | 170                      | NR            | 590    | 928                      | NR            | 720    | 55                       | NR            | 850    | 1                        | NR            | 980    | 0                        | NR            |
| 465    | 148                      | NR            | 595    | 971                      | NR            | 725    | 47                       | NR            | 855    | 1                        | NR            | 985    | 0                        | NR            |
| 470    | 132                      | NR            | 600    | 994                      | NR            | 730    | 40                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 104                      | NR            | 605    | 996                      | NR            | 735    | 33                       | NR            | 865    | 1                        | NR            | 995    | 0                        | NR            |
| 480    | 97                       | NR            | 610    | 979                      | NR            | 740    | 28                       | NR            | 870    | 1                        | NR            | 1000   | 0                        | NR            |
| 485    | 105                      | NR            | 615    | 943                      | NR            | 745    | 24                       | NR            | 875    | 0                        | NR            |        |                          |               |

**Summary**

$R_f = 76.9$   
 $R_g = 92.7$   
 $CIE R_a = 70.6$   
 $R_9 = -36.0$



**Color Vector Graphics**



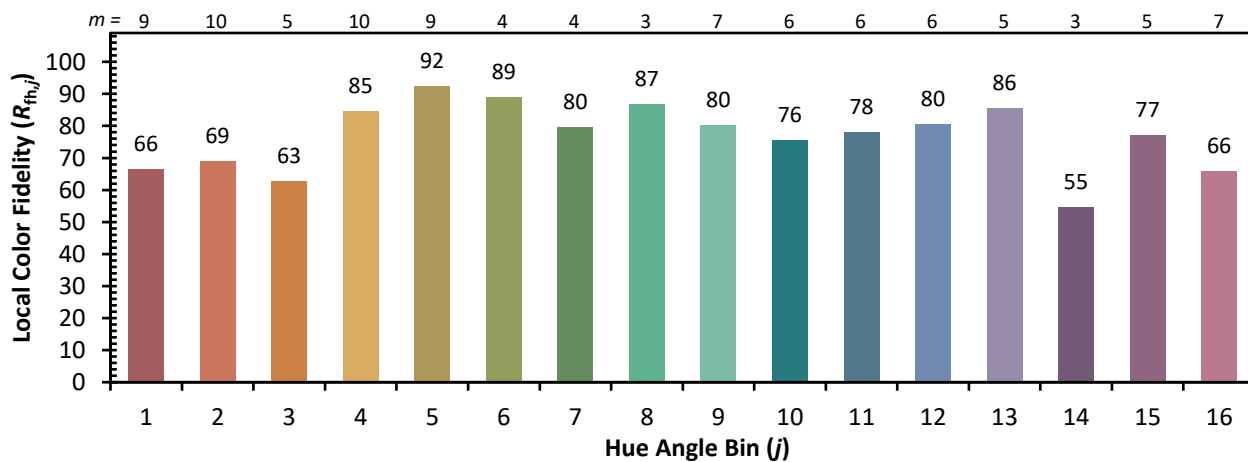
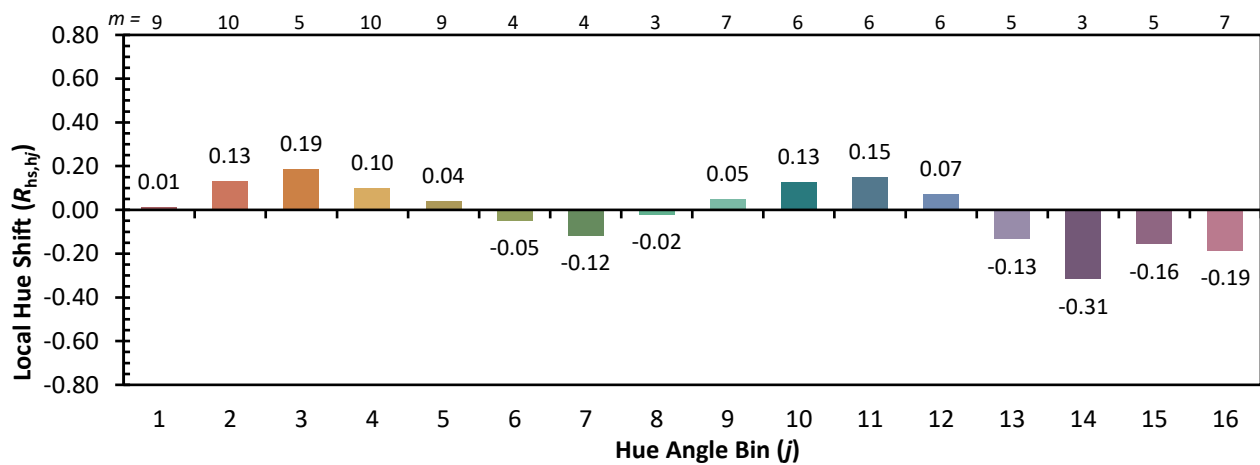
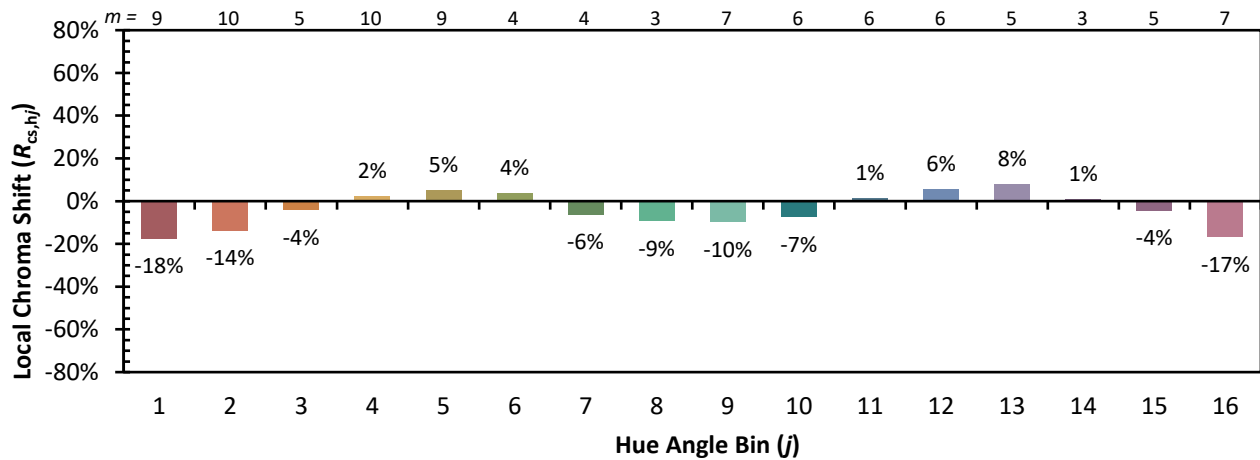
**Individual Sample Fidelity Index ( $R_{f,i}$ )**

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 87 | CES26 = 76 | CES51 = 88 | CES76 = 78 |
| CES02 = 65 | CES27 = 94 | CES52 = 85 | CES77 = 75 |
| CES03 = 32 | CES28 = 93 | CES53 = 80 | CES78 = 79 |
| CES04 = 72 | CES29 = 81 | CES54 = 86 | CES79 = 82 |
| CES05 = 51 | CES30 = 91 | CES55 = 83 | CES80 = 81 |
| CES06 = 52 | CES31 = 83 | CES56 = 77 | CES81 = 51 |
| CES07 = 44 | CES32 = 75 | CES57 = 75 | CES82 = 92 |
| CES08 = 42 | CES33 = 88 | CES58 = 76 | CES83 = 88 |
| CES09 = 29 | CES34 = 88 | CES59 = 84 | CES84 = 90 |
| CES10 = 79 | CES35 = 94 | CES60 = 91 | CES85 = 65 |
| CES11 = 62 | CES36 = 90 | CES61 = 82 | CES86 = 48 |
| CES12 = 68 | CES37 = 97 | CES62 = 91 | CES87 = 76 |
| CES13 = 45 | CES38 = 98 | CES63 = 86 | CES88 = 78 |
| CES14 = 75 | CES39 = 97 | CES64 = 70 | CES89 = 61 |
| CES15 = 72 | CES40 = 94 | CES65 = 71 | CES90 = 80 |
| CES16 = 48 | CES41 = 95 | CES66 = 71 | CES91 = 80 |
| CES17 = 51 | CES42 = 89 | CES67 = 70 | CES92 = 51 |
| CES18 = 57 | CES43 = 80 | CES68 = 74 | CES93 = 68 |
| CES19 = 74 | CES44 = 99 | CES69 = 84 | CES94 = 44 |
| CES20 = 68 | CES45 = 83 | CES70 = 72 | CES95 = 66 |
| CES21 = 88 | CES46 = 81 | CES71 = 75 | CES96 = 75 |
| CES22 = 81 | CES47 = 88 | CES72 = 89 | CES97 = 76 |
| CES23 = 92 | CES48 = 73 | CES73 = 68 | CES98 = 72 |
| CES24 = 92 | CES49 = 82 | CES74 = 85 | CES99 = 63 |
| CES25 = 73 | CES50 = 87 | CES75 = 80 |            |





Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)