

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: P870192

Luminaire Tested: **MEM2-HTN-SA-130-830-U-5WQ**

Issue Date: 08/21/2024



**Test Information**

Test Method: LM-79-08  
Report Number: P870192  
Test Lab: INNOVATION CENTER(G3)  
Issue Date: 08/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: STREETWORKS  
Catalog Number: MEM2-HTN-SA-130-830-U-5WQ  
Description: EPIC MODERN TALL HOUSING DISCRETE LED ARRAYS 130W 80CRI 3000K  
FITXURE w/ TYPE V SQUARE WIDE DISTRIBUTION OPTIC  
Light Source: (30) 3000K CCT, 80 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

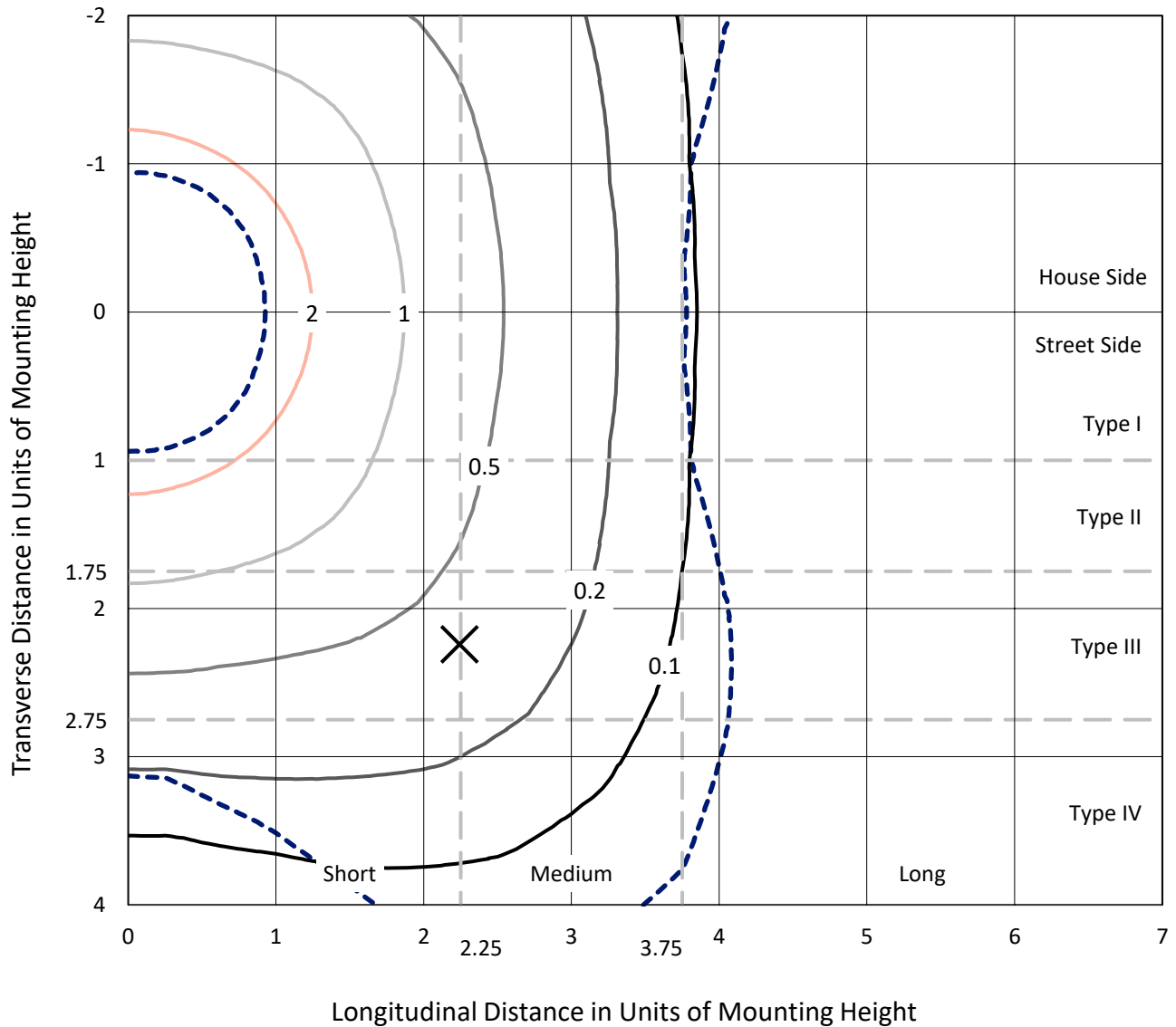
Lumens per Lamp: N/A  
Luminaire Lumens: 15227.7 lumens  
Efficiency: N/A  
Efficacy: 134.8 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 0.33' x H: 0')  
IES Classification: Type V - Short  
BUG Rating: B4 - U0 - G2

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

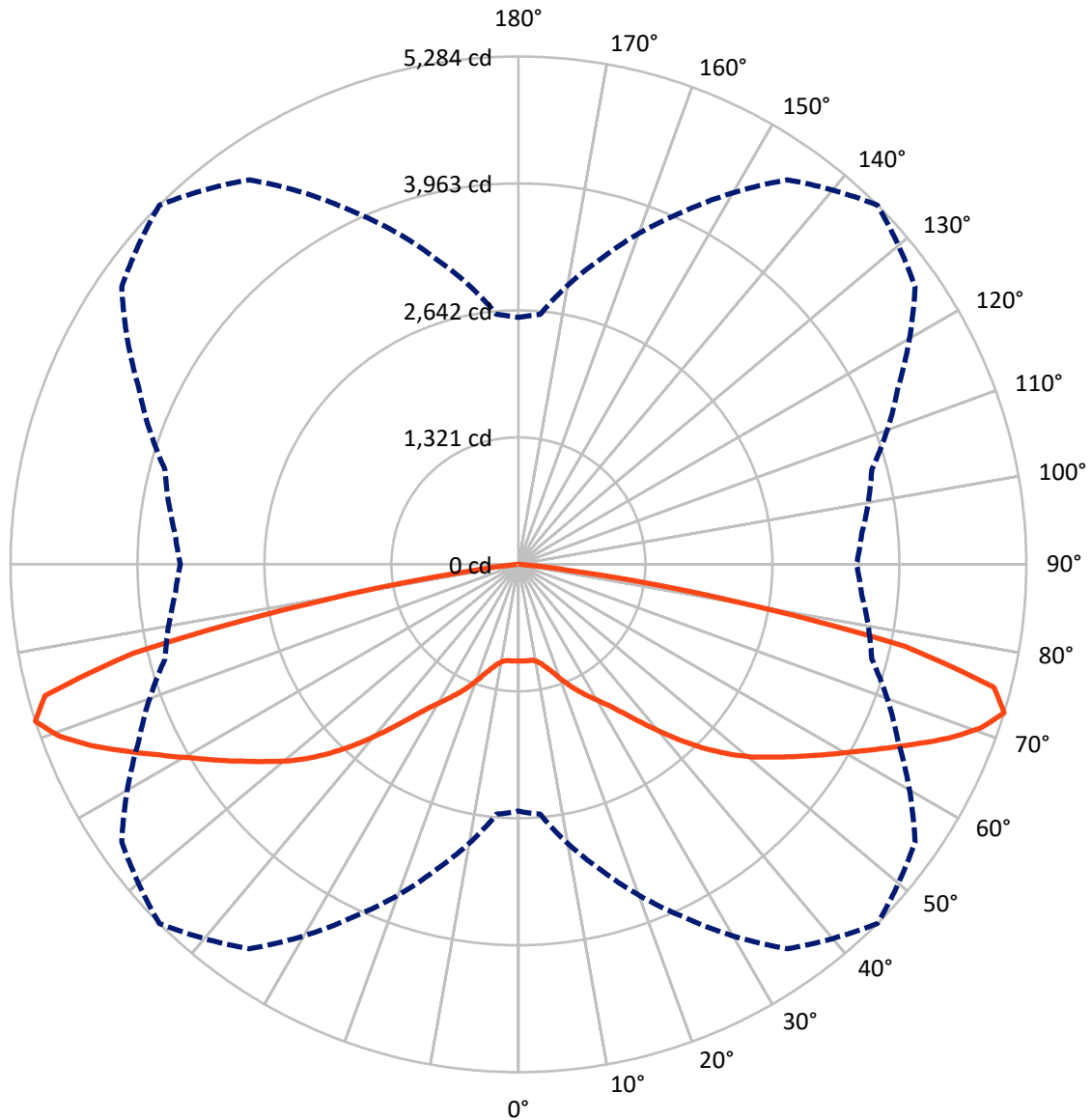
× Max cd  
 - - - 1/2 Max cd



Based on 20 foot mounting height. Maximum calculated value = 2.7 fc  
 Type V - Short - N/A

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### Luminous Intensity Polar Plot



— Vertical Plane Through 45-Deg Lateral      - - - Horizontal Cone Through 72.5-Deg Vertical

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**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 7613.8   | 0.0    | 7613.8  |
|                    | % Fixture | 50.0     | 0.0    | 50.0    |
| <b>Street Side</b> | Lumens    | 7613.8   | 0.0    | 7613.8  |
|                    | % Fixture | 50.0     | 0.0    | 50.0    |
| <b>Total</b>       | Lumens    | 15227.7  | 0.0    | 15227.7 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 96.3    | 0.6       |
| 10°-20°   | 321.6   | 2.1       |
| 20°-30°   | 663.5   | 4.4       |
| 30°-40°   | 1221.5  | 8.0       |
| 40°-50°   | 2147.6  | 14.1      |
| 50°-60°   | 3114.8  | 20.5      |
| 60°-70°   | 4060.5  | 26.7      |
| 70°-80°   | 3375.3  | 22.2      |
| 80°-90°   | 226.6   | 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°    | 15227.7 | 100.0     |
| 0°-180°   | 15227.7 | 100.0     |



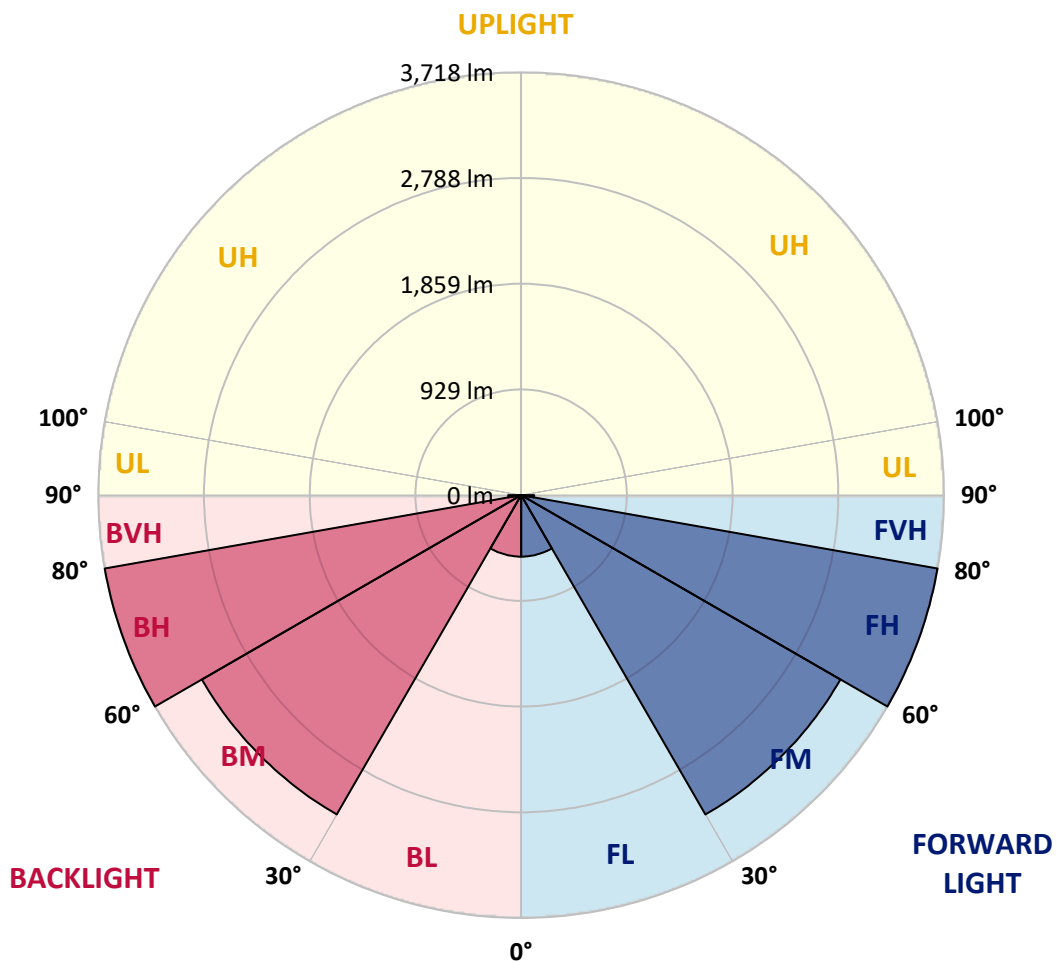
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**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone           | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|----------------|--------|-----------|-------------------------|------|---------|
|                |        |           | B                       | U    | G       |
| FL (0°-30°)    | 540.7  | 3.6       |                         |      |         |
| FM (30°-60°)   | 3241.9 | 21.3      |                         |      |         |
| FH (60°-80°)   | 3717.9 | 24.4      |                         |      | G2/5000 |
| FVH (80°-90°)  | 113.3  | 0.7       |                         |      | G2/225  |
| BL (0°-30°)    | 540.7  | 3.6       | B2/1000                 |      |         |
| BM (30°-60°)   | 3241.9 | 21.3      | B3/5000                 |      |         |
| BH (60°-80°)   | 3717.9 | 24.4      | B4/5000                 |      | G2/5000 |
| BVH (80°-90°)  | 113.3  | 0.7       |                         |      | 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: P870192

CATALOG NUMBER: MEM2-HTN-SA-130-830-U-5WQ

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 75°    | 85°    | 90°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1005.3 | 1005.3 | 1005.3 | 1005.3 | 1005.3 | 1005.3 | 1005.3 | 1005.3 | 1005.3 | 1005.3 | 1005.3 |
| 2.5°  | 1002.1 | 1003.7 | 1003.7 | 1003.7 | 1005.3 | 1006.9 | 1008.4 | 1010.0 | 1013.2 | 1014.8 | 1014.8 |
| 5°    | 1006.9 | 1005.3 | 1003.7 | 1006.9 | 1006.9 | 1006.9 | 1008.4 | 1010.0 | 1010.0 | 1010.0 | 1011.6 |
| 7.5°  | 1002.1 | 1003.7 | 1002.1 | 1002.1 | 1006.9 | 1008.4 | 1006.9 | 1005.3 | 1005.3 | 1006.9 | 1006.9 |
| 10°   | 1019.5 | 1017.9 | 1016.3 | 1016.3 | 1021.1 | 1022.7 | 1021.1 | 1019.5 | 1019.5 | 1022.7 | 1022.7 |
| 12.5° | 1058.9 | 1062.1 | 1052.6 | 1052.6 | 1058.9 | 1062.1 | 1057.4 | 1055.8 | 1057.4 | 1060.5 | 1060.5 |
| 15°   | 1120.5 | 1118.9 | 1112.6 | 1106.3 | 1112.6 | 1117.3 | 1111.0 | 1107.9 | 1109.5 | 1117.3 | 1111.0 |
| 17.5° | 1188.4 | 1189.9 | 1183.6 | 1177.3 | 1182.0 | 1188.4 | 1178.9 | 1171.0 | 1172.6 | 1175.7 | 1172.6 |
| 20°   | 1264.1 | 1262.5 | 1261.0 | 1261.0 | 1270.4 | 1278.3 | 1264.1 | 1245.2 | 1240.4 | 1237.3 | 1237.3 |
| 22.5° | 1319.3 | 1324.1 | 1325.7 | 1339.9 | 1362.0 | 1369.8 | 1350.9 | 1325.7 | 1306.7 | 1297.3 | 1290.9 |
| 25°   | 1406.1 | 1401.4 | 1398.3 | 1414.0 | 1447.2 | 1461.4 | 1437.7 | 1403.0 | 1384.1 | 1382.5 | 1387.2 |
| 27.5° | 1485.1 | 1485.1 | 1491.4 | 1507.1 | 1538.7 | 1552.9 | 1532.4 | 1497.7 | 1488.2 | 1488.2 | 1483.5 |
| 30°   | 1587.6 | 1582.9 | 1589.2 | 1616.0 | 1639.7 | 1649.2 | 1631.8 | 1608.2 | 1600.3 | 1600.3 | 1592.4 |
| 32.5° | 1707.6 | 1709.2 | 1718.6 | 1736.0 | 1759.7 | 1761.2 | 1754.9 | 1743.9 | 1739.1 | 1734.4 | 1742.3 |
| 35°   | 1890.6 | 1890.6 | 1887.5 | 1900.1 | 1906.4 | 1909.6 | 1912.7 | 1908.0 | 1908.0 | 1908.0 | 1901.7 |
| 37.5° | 2117.9 | 2105.3 | 2103.7 | 2092.6 | 2084.8 | 2092.6 | 2106.9 | 2122.6 | 2135.3 | 2127.4 | 2124.2 |
| 40°   | 2343.6 | 2337.3 | 2318.3 | 2301.0 | 2294.7 | 2297.8 | 2315.2 | 2348.3 | 2362.5 | 2362.5 | 2375.1 |
| 42.5° | 2586.6 | 2574.0 | 2550.3 | 2529.8 | 2512.4 | 2517.2 | 2533.0 | 2574.0 | 2605.6 | 2619.8 | 2613.4 |
| 45°   | 2804.4 | 2793.4 | 2769.7 | 2750.7 | 2738.1 | 2736.5 | 2757.1 | 2783.9 | 2826.5 | 2839.1 | 2848.6 |
| 47.5° | 2990.6 | 2982.7 | 2962.2 | 2943.3 | 2948.0 | 2949.6 | 2955.9 | 2979.6 | 3014.3 | 3031.7 | 3030.1 |
| 50°   | 3142.1 | 3135.8 | 3116.9 | 3124.8 | 3137.4 | 3150.0 | 3142.1 | 3157.9 | 3180.0 | 3187.9 | 3194.2 |
| 52.5° | 3281.0 | 3271.5 | 3258.9 | 3273.1 | 3306.3 | 3331.5 | 3336.2 | 3325.2 | 3331.5 | 3336.2 | 3331.5 |
| 55°   | 3418.3 | 3407.3 | 3404.1 | 3429.4 | 3479.9 | 3527.2 | 3522.5 | 3490.9 | 3483.0 | 3473.5 | 3468.8 |
| 57.5° | 3530.4 | 3522.5 | 3535.1 | 3577.7 | 3675.5 | 3738.7 | 3718.2 | 3645.6 | 3614.0 | 3591.9 | 3585.6 |
| 60°   | 3601.4 | 3599.8 | 3628.2 | 3727.6 | 3876.0 | 3964.4 | 3931.2 | 3806.5 | 3735.5 | 3715.0 | 3705.5 |
| 62.5° | 3639.3 | 3640.8 | 3691.3 | 3868.1 | 4104.8 | 4224.8 | 4166.4 | 3975.4 | 3864.9 | 3844.4 | 3847.6 |
| 65°   | 3674.0 | 3669.2 | 3735.5 | 3986.4 | 4352.6 | 4515.1 | 4436.2 | 4179.0 | 4018.0 | 3977.0 | 3977.0 |
| 67.5° | 3699.2 | 3704.0 | 3803.4 | 4104.8 | 4594.0 | 4826.0 | 4710.8 | 4395.2 | 4182.1 | 4120.6 | 4112.7 |
| 70°   | 3380.4 | 3426.2 | 3737.1 | 4183.7 | 4785.0 | 5100.6 | 4949.1 | 4527.8 | 4188.5 | 4013.3 | 3995.9 |
| 72.5° | 2567.7 | 2610.3 | 3282.6 | 4043.3 | 4882.8 | 5283.7 | 5037.5 | 4358.9 | 3806.5 | 3584.0 | 3517.7 |
| 75°   | 1693.4 | 1723.4 | 2446.2 | 3531.9 | 4611.4 | 5110.1 | 4587.7 | 3754.5 | 2996.9 | 2708.1 | 2725.5 |
| 77.5° | 754.4  | 850.6  | 1559.2 | 2755.5 | 3798.6 | 4112.7 | 3498.8 | 2561.4 | 1830.7 | 1549.8 | 1519.8 |
| 80°   | 315.6  | 345.6  | 588.7  | 1469.3 | 2201.5 | 2106.9 | 1489.8 | 858.5  | 546.0  | 424.5  | 410.3  |
| 82.5° | 91.5   | 94.7   | 116.8  | 254.1  | 448.2  | 527.1  | 317.2  | 161.0  | 153.1  | 121.5  | 112.0  |
| 85°   | 6.3    | 6.3    | 9.5    | 15.8   | 22.1   | 36.3   | 41.0   | 47.3   | 53.7   | 45.8   | 45.8   |
| 87.5° | 3.2    | 3.2    | 3.2    | 4.7    | 4.7    | 6.3    | 4.7    | 4.7    | 4.7    | 4.7    | 4.7    |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

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1121 Highway 74 South  
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LM-79-2019: Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Report Prepared for

Cooper Lighting Solutions

Streetworks

Report Number: SP1-2407-157-7

Test Date: 09/05/2024

Luminaire Tested: MEM2-HTN-SA-40-830-U-5WQ

Data in this report applies to families of products including MEM2-HTN-SA-40-830-U-5WQ



**Test Information**

Test Method: LM-79-2019  
 Report Number: SP1-2407-157-7  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry: 4π  
 Issue Date: 09/05/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: Streetworks  
 Catalog Number: **MEM2-HTN-SA-40-830-U-5WQ**  
 Description: Epic Modern Light Square 40W 5WQ Optic

**Spectral Parameters**

CCT (K): 3126  
 CIE u': 0.2465  
 CIE v': 0.5182  
 Duv: -0.0004  
 CIE x: 0.4277  
 CIE y: 0.3997  
 CIE z: 0.1727  
 Peak Wavelength (nm): 601  
 Dominant Wavelength (nm): 582  
 Purity: 48.31913  
 Rf: 84.4  
 Rg: 94.7

|           |      |      |      |
|-----------|------|------|------|
| CRI (Ra): | 82.6 |      |      |
| R1:       | 81.4 | R9:  | 5.1  |
| R2:       | 92.2 | R10: | 82.2 |
| R3:       | 94.9 | R11: | 79.8 |
| R4:       | 80.1 | R12: | 70.4 |
| R5:       | 81.8 | R13: | 84.2 |
| R6:       | 90.5 | R14: | 97.9 |
| R7:       | 81.8 | R15: | 73.6 |
| R8:       | 58.0 |      |      |



**Test Conditions**

Stabilization Time: 22M  
 Operation Time: 1H 22M  
 Sphere Temperature (°C): 24.3

REPORT NUMBER: SP1-2407-157-7

| 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**



Point lies inside the ANSI 3000K 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               | 258                         | NR                      | 620               | 908                         | NR                      | 750               | 26                          | NR                      | 880               | 1                           | NR                      |
| 365               | 0                           | NR                      | 495               | 297                         | NR                      | 625               | 857                         | NR                      | 755               | 22                          | NR                      | 885               | 0                           | NR                      |
| 370               | 0                           | NR                      | 500               | 345                         | NR                      | 630               | 801                         | NR                      | 760               | 19                          | NR                      | 890               | 0                           | NR                      |
| 375               | 0                           | NR                      | 505               | 391                         | NR                      | 635               | 738                         | NR                      | 765               | 16                          | NR                      | 895               | 0                           | NR                      |
| 380               | 0                           | NR                      | 510               | 426                         | NR                      | 640               | 675                         | NR                      | 770               | 14                          | NR                      | 900               | 0                           | NR                      |
| 385               | 0                           | NR                      | 515               | 456                         | NR                      | 645               | 610                         | NR                      | 775               | 12                          | NR                      | 905               | 0                           | NR                      |
| 390               | 0                           | NR                      | 520               | 480                         | NR                      | 650               | 547                         | NR                      | 780               | 10                          | NR                      | 910               | 0                           | NR                      |
| 395               | 0                           | NR                      | 525               | 500                         | NR                      | 655               | 488                         | NR                      | 785               | 9                           | NR                      | 915               | 0                           | NR                      |
| 400               | 0                           | NR                      | 530               | 517                         | NR                      | 660               | 429                         | NR                      | 790               | 7                           | NR                      | 920               | 0                           | NR                      |
| 405               | 2                           | NR                      | 535               | 538                         | NR                      | 665               | 378                         | NR                      | 795               | 6                           | NR                      | 925               | 0                           | NR                      |
| 410               | 4                           | NR                      | 540               | 558                         | NR                      | 670               | 328                         | NR                      | 800               | 5                           | NR                      | 930               | 0                           | NR                      |
| 415               | 9                           | NR                      | 545               | 584                         | NR                      | 675               | 285                         | NR                      | 805               | 5                           | NR                      | 935               | 0                           | NR                      |
| 420               | 16                          | NR                      | 550               | 611                         | NR                      | 680               | 247                         | NR                      | 810               | 4                           | NR                      | 940               | 0                           | NR                      |
| 425               | 31                          | NR                      | 555               | 646                         | NR                      | 685               | 212                         | NR                      | 815               | 3                           | NR                      | 945               | 0                           | NR                      |
| 430               | 56                          | NR                      | 560               | 687                         | NR                      | 690               | 183                         | NR                      | 820               | 3                           | NR                      | 950               | 0                           | NR                      |
| 435               | 101                         | NR                      | 565               | 731                         | NR                      | 695               | 156                         | NR                      | 825               | 3                           | NR                      | 955               | 0                           | NR                      |
| 440               | 178                         | NR                      | 570               | 780                         | NR                      | 700               | 133                         | NR                      | 830               | 2                           | NR                      | 960               | 0                           | NR                      |
| 445               | 323                         | NR                      | 575               | 832                         | NR                      | 705               | 114                         | NR                      | 835               | 2                           | NR                      | 965               | 0                           | NR                      |
| 450               | 566                         | NR                      | 580               | 883                         | NR                      | 710               | 96                          | NR                      | 840               | 2                           | NR                      | 970               | 0                           | NR                      |
| 455               | 645                         | NR                      | 585               | 927                         | NR                      | 715               | 82                          | NR                      | 845               | 1                           | NR                      | 975               | 0                           | NR                      |
| 460               | 457                         | NR                      | 590               | 963                         | NR                      | 720               | 70                          | NR                      | 850               | 1                           | NR                      | 980               | 0                           | NR                      |
| 465               | 365                         | NR                      | 595               | 985                         | NR                      | 725               | 59                          | NR                      | 855               | 1                           | NR                      | 985               | 0                           | NR                      |
| 470               | 317                         | NR                      | 600               | 998                         | NR                      | 730               | 50                          | NR                      | 860               | 1                           | NR                      | 990               | 0                           | NR                      |
| 475               | 244                         | NR                      | 605               | 994                         | NR                      | 735               | 43                          | NR                      | 865               | 1                           | NR                      | 995               | 0                           | NR                      |
| 480               | 218                         | NR                      | 610               | 978                         | NR                      | 740               | 36                          | NR                      | 870               | 1                           | NR                      | 1000              | 0                           | NR                      |
| 485               | 233                         | NR                      | 615               | 947                         | NR                      | 745               | 31                          | NR                      | 875               | 1                           | NR                      |                   |                             |                         |

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**Scotopic Flux vs. Wavelength**



**Scotopic Lumens: NR**

**S/P: 1.42**

| 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    | 258                      | NR            | 620    | 908                      | NR            | 750    | 26                       | NR            | 880    | 1                        | NR            |
| 365    | 0                        | NR            | 495    | 297                      | NR            | 625    | 857                      | NR            | 755    | 22                       | NR            | 885    | 0                        | NR            |
| 370    | 0                        | NR            | 500    | 345                      | NR            | 630    | 801                      | NR            | 760    | 19                       | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 391                      | NR            | 635    | 738                      | NR            | 765    | 16                       | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 426                      | NR            | 640    | 675                      | NR            | 770    | 14                       | NR            | 900    | 0                        | NR            |
| 385    | 0                        | NR            | 515    | 456                      | NR            | 645    | 610                      | NR            | 775    | 12                       | NR            | 905    | 0                        | NR            |
| 390    | 0                        | NR            | 520    | 480                      | NR            | 650    | 547                      | NR            | 780    | 10                       | NR            | 910    | 0                        | NR            |
| 395    | 0                        | NR            | 525    | 500                      | NR            | 655    | 488                      | NR            | 785    | 9                        | NR            | 915    | 0                        | NR            |
| 400    | 0                        | NR            | 530    | 517                      | NR            | 660    | 429                      | NR            | 790    | 7                        | NR            | 920    | 0                        | NR            |
| 405    | 2                        | NR            | 535    | 538                      | NR            | 665    | 378                      | NR            | 795    | 6                        | NR            | 925    | 0                        | NR            |
| 410    | 4                        | NR            | 540    | 558                      | NR            | 670    | 328                      | NR            | 800    | 5                        | NR            | 930    | 0                        | NR            |
| 415    | 9                        | NR            | 545    | 584                      | NR            | 675    | 285                      | NR            | 805    | 5                        | NR            | 935    | 0                        | NR            |
| 420    | 16                       | NR            | 550    | 611                      | NR            | 680    | 247                      | NR            | 810    | 4                        | NR            | 940    | 0                        | NR            |
| 425    | 31                       | NR            | 555    | 646                      | NR            | 685    | 212                      | NR            | 815    | 3                        | NR            | 945    | 0                        | NR            |
| 430    | 56                       | NR            | 560    | 687                      | NR            | 690    | 183                      | NR            | 820    | 3                        | NR            | 950    | 0                        | NR            |
| 435    | 101                      | NR            | 565    | 731                      | NR            | 695    | 156                      | NR            | 825    | 3                        | NR            | 955    | 0                        | NR            |
| 440    | 178                      | NR            | 570    | 780                      | NR            | 700    | 133                      | NR            | 830    | 2                        | NR            | 960    | 0                        | NR            |
| 445    | 323                      | NR            | 575    | 832                      | NR            | 705    | 114                      | NR            | 835    | 2                        | NR            | 965    | 0                        | NR            |
| 450    | 566                      | NR            | 580    | 883                      | NR            | 710    | 96                       | NR            | 840    | 2                        | NR            | 970    | 0                        | NR            |
| 455    | 645                      | NR            | 585    | 927                      | NR            | 715    | 82                       | NR            | 845    | 1                        | NR            | 975    | 0                        | NR            |
| 460    | 457                      | NR            | 590    | 963                      | NR            | 720    | 70                       | NR            | 850    | 1                        | NR            | 980    | 0                        | NR            |
| 465    | 365                      | NR            | 595    | 985                      | NR            | 725    | 59                       | NR            | 855    | 1                        | NR            | 985    | 0                        | NR            |
| 470    | 317                      | NR            | 600    | 998                      | NR            | 730    | 50                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 244                      | NR            | 605    | 994                      | NR            | 735    | 43                       | NR            | 865    | 1                        | NR            | 995    | 0                        | NR            |
| 480    | 218                      | NR            | 610    | 978                      | NR            | 740    | 36                       | NR            | 870    | 1                        | NR            | 1000   | 0                        | NR            |
| 485    | 233                      | NR            | 615    | 947                      | NR            | 745    | 31                       | NR            | 875    | 1                        | NR            |        |                          |               |

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Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 2.79

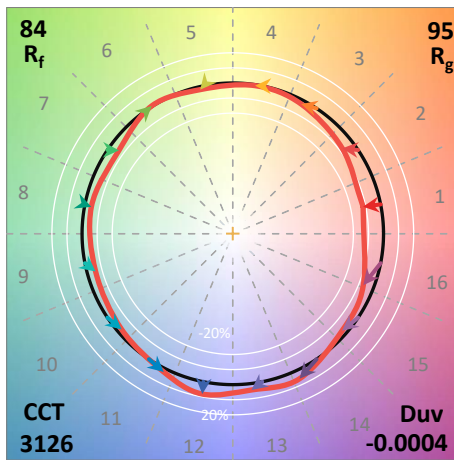
| λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) |
|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|
| 360    | 0                        | NR            | 490    | 258                      | NR            | 620    | 908                      | NR            | 750    | 26                       | NR            | 880    | 1                        | NR            |
| 365    | 0                        | NR            | 495    | 297                      | NR            | 625    | 857                      | NR            | 755    | 22                       | NR            | 885    | 0                        | NR            |
| 370    | 0                        | NR            | 500    | 345                      | NR            | 630    | 801                      | NR            | 760    | 19                       | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 391                      | NR            | 635    | 738                      | NR            | 765    | 16                       | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 426                      | NR            | 640    | 675                      | NR            | 770    | 14                       | NR            | 900    | 0                        | NR            |
| 385    | 0                        | NR            | 515    | 456                      | NR            | 645    | 610                      | NR            | 775    | 12                       | NR            | 905    | 0                        | NR            |
| 390    | 0                        | NR            | 520    | 480                      | NR            | 650    | 547                      | NR            | 780    | 10                       | NR            | 910    | 0                        | NR            |
| 395    | 0                        | NR            | 525    | 500                      | NR            | 655    | 488                      | NR            | 785    | 9                        | NR            | 915    | 0                        | NR            |
| 400    | 0                        | NR            | 530    | 517                      | NR            | 660    | 429                      | NR            | 790    | 7                        | NR            | 920    | 0                        | NR            |
| 405    | 2                        | NR            | 535    | 538                      | NR            | 665    | 378                      | NR            | 795    | 6                        | NR            | 925    | 0                        | NR            |
| 410    | 4                        | NR            | 540    | 558                      | NR            | 670    | 328                      | NR            | 800    | 5                        | NR            | 930    | 0                        | NR            |
| 415    | 9                        | NR            | 545    | 584                      | NR            | 675    | 285                      | NR            | 805    | 5                        | NR            | 935    | 0                        | NR            |
| 420    | 16                       | NR            | 550    | 611                      | NR            | 680    | 247                      | NR            | 810    | 4                        | NR            | 940    | 0                        | NR            |
| 425    | 31                       | NR            | 555    | 646                      | NR            | 685    | 212                      | NR            | 815    | 3                        | NR            | 945    | 0                        | NR            |
| 430    | 56                       | NR            | 560    | 687                      | NR            | 690    | 183                      | NR            | 820    | 3                        | NR            | 950    | 0                        | NR            |
| 435    | 101                      | NR            | 565    | 731                      | NR            | 695    | 156                      | NR            | 825    | 3                        | NR            | 955    | 0                        | NR            |
| 440    | 178                      | NR            | 570    | 780                      | NR            | 700    | 133                      | NR            | 830    | 2                        | NR            | 960    | 0                        | NR            |
| 445    | 323                      | NR            | 575    | 832                      | NR            | 705    | 114                      | NR            | 835    | 2                        | NR            | 965    | 0                        | NR            |
| 450    | 566                      | NR            | 580    | 883                      | NR            | 710    | 96                       | NR            | 840    | 2                        | NR            | 970    | 0                        | NR            |
| 455    | 645                      | NR            | 585    | 927                      | NR            | 715    | 82                       | NR            | 845    | 1                        | NR            | 975    | 0                        | NR            |
| 460    | 457                      | NR            | 590    | 963                      | NR            | 720    | 70                       | NR            | 850    | 1                        | NR            | 980    | 0                        | NR            |
| 465    | 365                      | NR            | 595    | 985                      | NR            | 725    | 59                       | NR            | 855    | 1                        | NR            | 985    | 0                        | NR            |
| 470    | 317                      | NR            | 600    | 998                      | NR            | 730    | 50                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 244                      | NR            | 605    | 994                      | NR            | 735    | 43                       | NR            | 865    | 1                        | NR            | 995    | 0                        | NR            |
| 480    | 218                      | NR            | 610    | 978                      | NR            | 740    | 36                       | NR            | 870    | 1                        | NR            | 1000   | 0                        | NR            |
| 485    | 233                      | NR            | 615    | 947                      | NR            | 745    | 31                       | NR            | 875    | 1                        | NR            |        |                          |               |

**Summary**

$R_f = 84.4$   
 $R_g = 94.7$   
 $CIE R_a = 82.6$   
 $R_9 = 5.1$



**Color Vector Graphics**



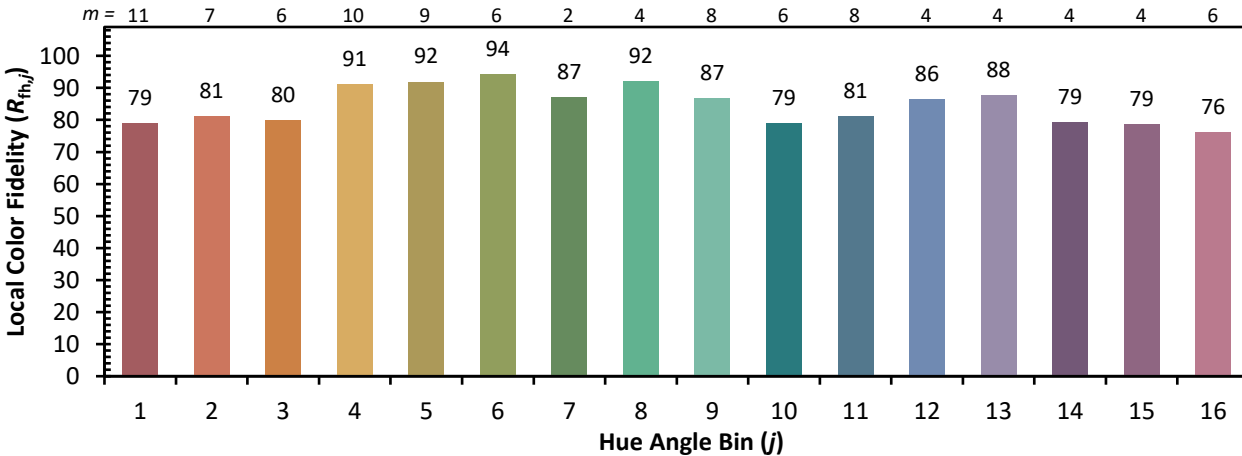
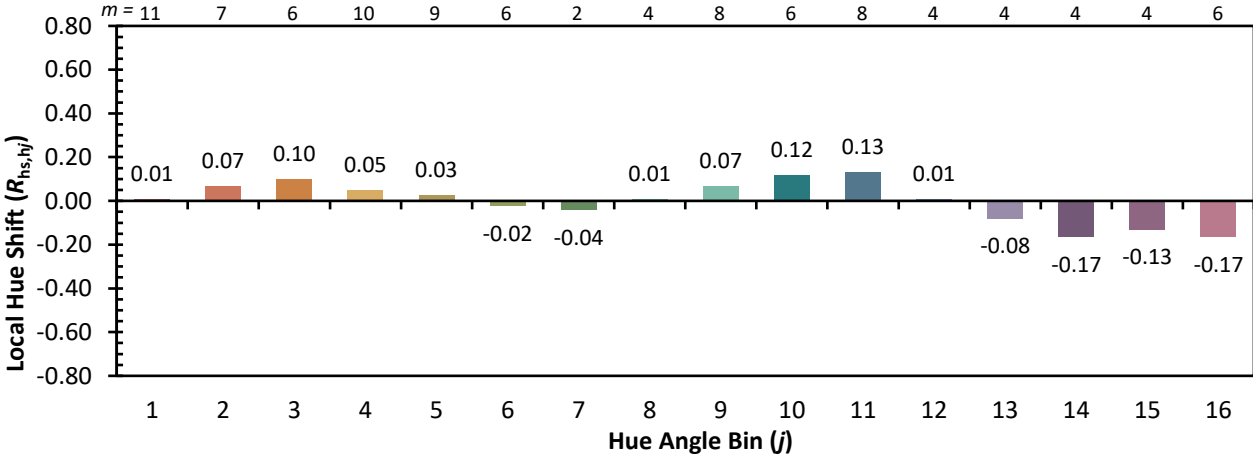
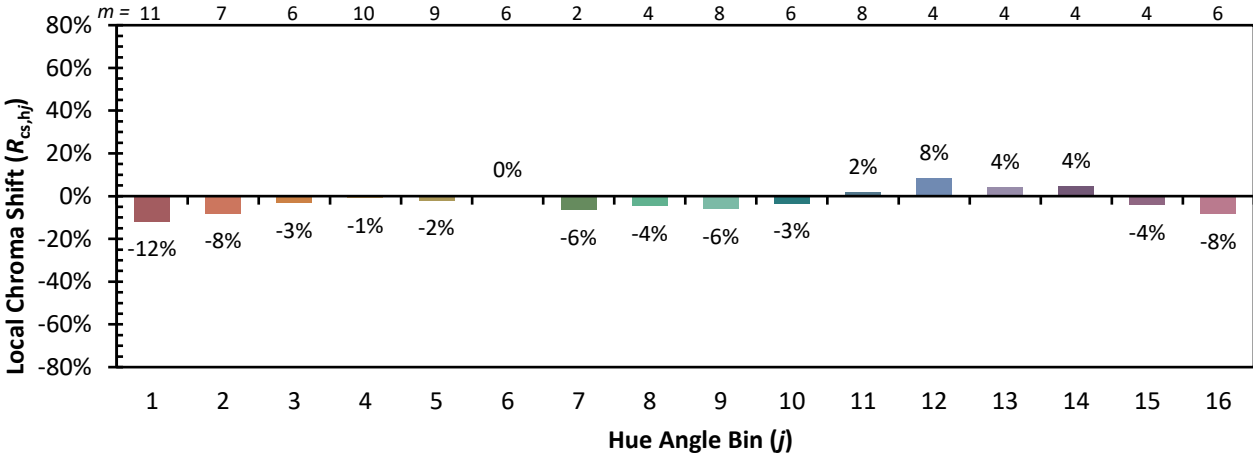
Individual Sample Fidelity Index ( $R_{f,i}$ )

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 86 | CES51 = 93 | CES76 = 82 |
| CES02 = 63 | CES27 = 92 | CES52 = 93 | CES77 = 84 |
| CES03 = 31 | CES28 = 94 | CES53 = 89 | CES78 = 81 |
| CES04 = 70 | CES29 = 92 | CES54 = 89 | CES79 = 90 |
| CES05 = 49 | CES30 = 91 | CES55 = 86 | CES80 = 89 |
| CES06 = 51 | CES31 = 93 | CES56 = 85 | CES81 = 72 |
| CES07 = 42 | CES32 = 85 | CES57 = 83 | CES82 = 95 |
| CES08 = 41 | CES33 = 97 | CES58 = 84 | CES83 = 94 |
| CES09 = 29 | CES34 = 92 | CES59 = 91 | CES84 = 91 |
| CES10 = 76 | CES35 = 96 | CES60 = 90 | CES85 = 74 |
| CES11 = 59 | CES36 = 81 | CES61 = 87 | CES86 = 68 |
| CES12 = 65 | CES37 = 96 | CES62 = 83 | CES87 = 84 |
| CES13 = 43 | CES38 = 86 | CES63 = 87 | CES88 = 88 |
| CES14 = 74 | CES39 = 98 | CES64 = 79 | CES89 = 75 |
| CES15 = 71 | CES40 = 96 | CES65 = 78 | CES90 = 89 |
| CES16 = 47 | CES41 = 96 | CES66 = 77 | CES91 = 73 |
| CES17 = 50 | CES42 = 97 | CES67 = 76 | CES92 = 63 |
| CES18 = 56 | CES43 = 91 | CES68 = 80 | CES93 = 77 |
| CES19 = 72 | CES44 = 99 | CES69 = 85 | CES94 = 61 |
| CES20 = 66 | CES45 = 93 | CES70 = 78 | CES95 = 73 |
| CES21 = 87 | CES46 = 90 | CES71 = 74 | CES96 = 84 |
| CES22 = 79 | CES47 = 94 | CES72 = 91 | CES97 = 88 |
| CES23 = 92 | CES48 = 83 | CES73 = 74 | CES98 = 85 |
| CES24 = 91 | CES49 = 91 | CES74 = 90 | CES99 = 76 |
| CES25 = 72 | CES50 = 93 | CES75 = 78 |            |

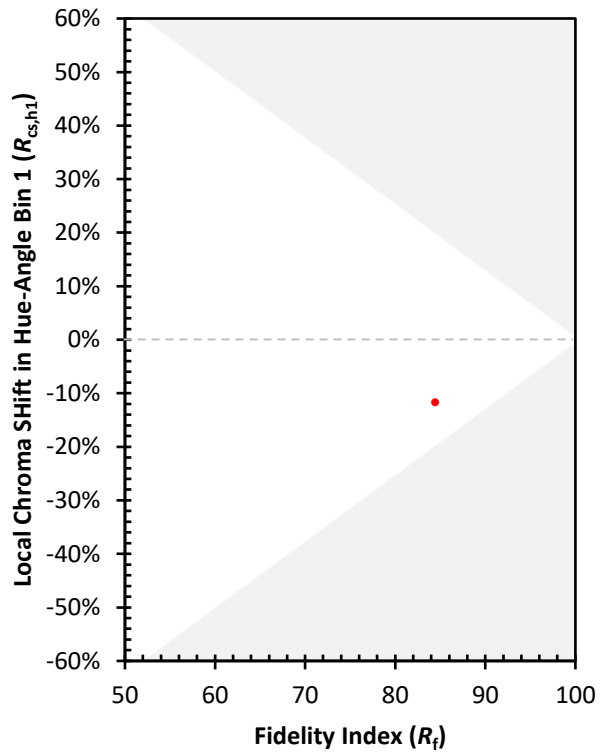




Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)