

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: P868243

Luminaire Tested: **MEM2-HSN-SA-100-727-U-5WQ**

Issue Date: 08/21/2024

**Test Information**

Test Method: LM-79-08  
Report Number: P868243  
Test Lab: INNOVATION CENTER(G3)  
Issue Date: 08/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: STREETWORKS  
Catalog Number: MEM2-HSN-SA-100-727-U-5WQ  
Description: EPIC MODERN SHORT HOUSING DISCRETE LED ARRAYS 100W 70CRI 2700K  
FITXURE w/ TYPE V SQUARE WIDE DISTRIBUTION OPTIC  
Light Source: (20) 2700K CCT, 70 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

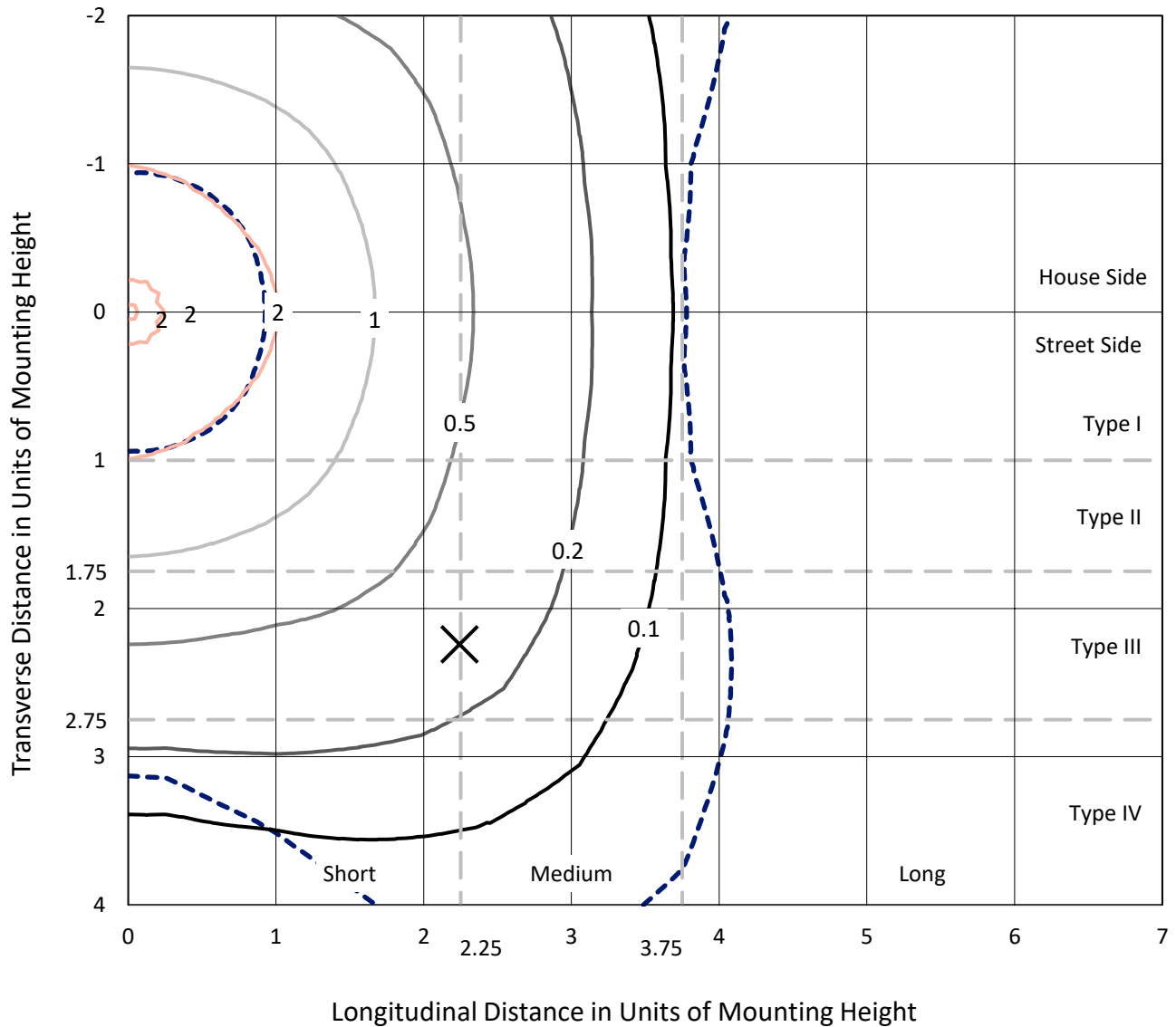
Lumens per Lamp: N/A  
Luminaire Lumens: 12243 lumens  
Efficiency: N/A  
Efficacy: 136.0 lumens/watt  
Luminous Opening: Rectangular (W 0.67' x L: 0.33' x H: 0')  
IES Classification: Type V - Short  
BUG Rating: B4 - U0 - G2

Input Watts (W): 90  
Input Voltage (V): 120  
Input Current (A<sub>in</sub>): NR  
Voltage Rise (V): NR  
Power Factor: 0.99  
Total Harmonic Distortion (THDi): 6.20%  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

REPORT NUMBER: P868243  
 CATALOG NUMBER: MEM2-HSN-SA-100-727-U-5WQ

### Iso-Footcandle Lines of Horizontal Illumination

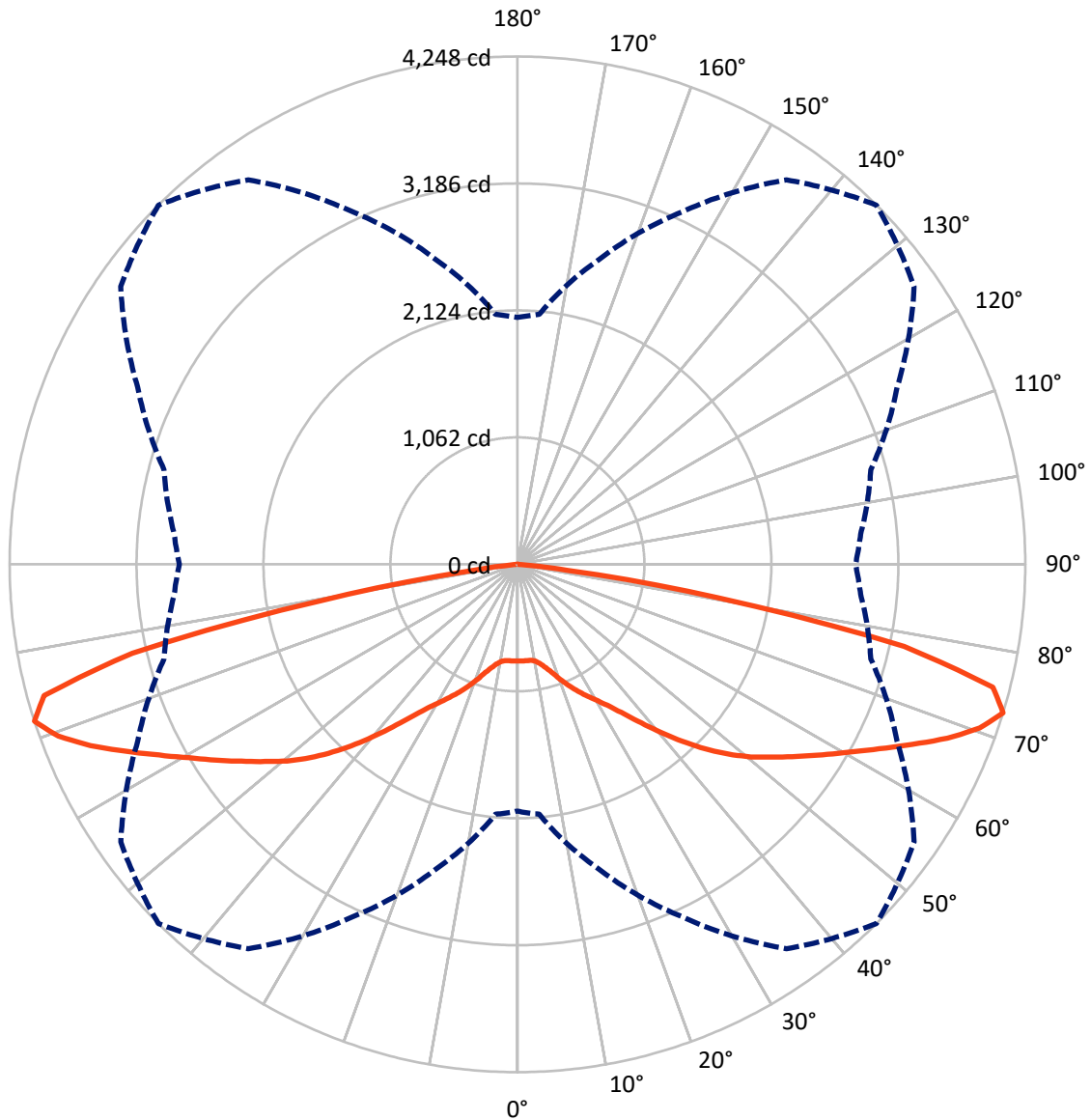
× Max cd  
 - - - 1/2 Max cd



Based on 20 foot mounting height. Maximum calculated value = 2.2 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    | 6121.5   | 0.0    | 6121.5  |
|                    | % Fixture | 50.0     | 0.0    | 50.0    |
| <b>Street Side</b> | Lumens    | 6121.5   | 0.0    | 6121.5  |
|                    | % Fixture | 50.0     | 0.0    | 50.0    |
| <b>Total</b>       | Lumens    | 12243.0  | 0.0    | 12243.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 77.5    | 0.6       |
| 10°-20°   | 258.5   | 2.1       |
| 20°-30°   | 533.4   | 4.4       |
| 30°-40°   | 982.0   | 8.0       |
| 40°-50°   | 1726.7  | 14.1      |
| 50°-60°   | 2504.3  | 20.5      |
| 60°-70°   | 3264.7  | 26.7      |
| 70°-80°   | 2713.7  | 22.2      |
| 80°-90°   | 182.2   | 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°    | 12243.0 | 100.0     |
| 0°-180°   | 12243.0 | 100.0     |

**Coefficient of Utilization**



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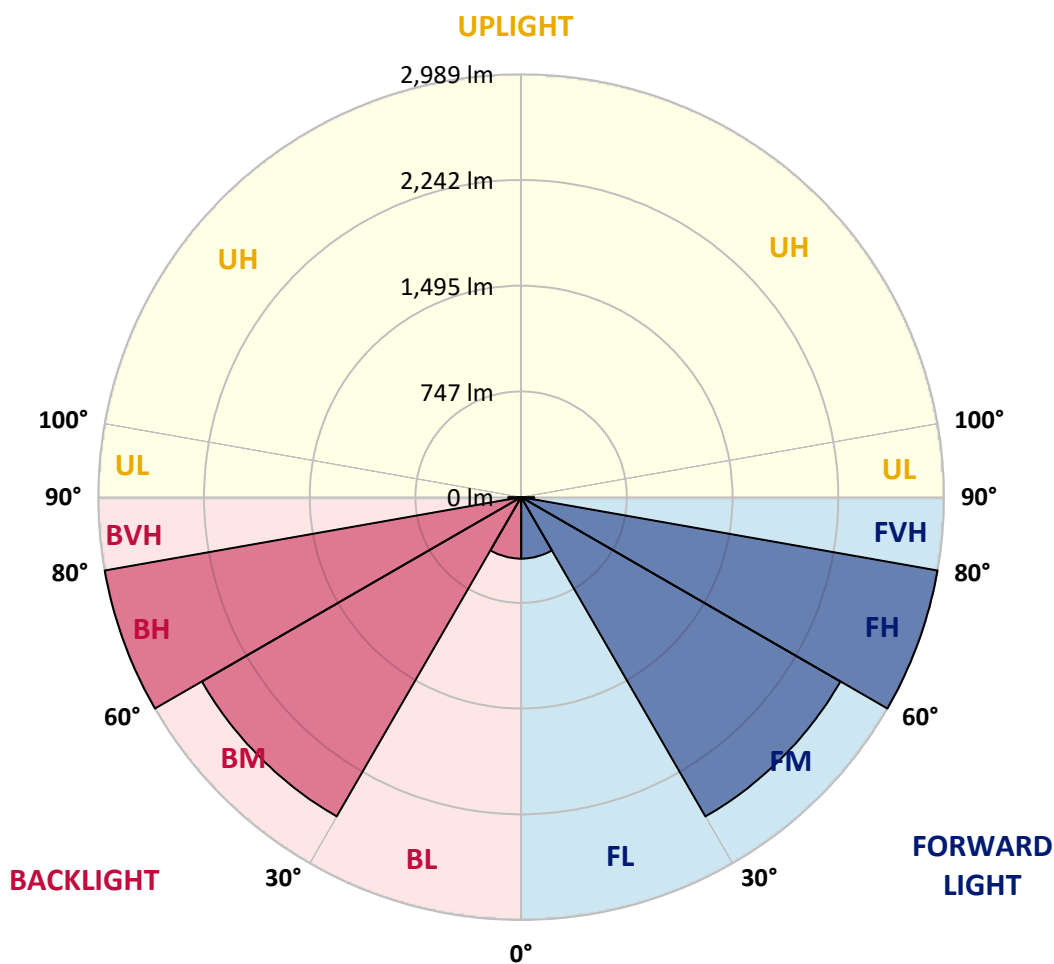
CATALOG NUMBER: MEM2-HSN-SA-100-727-U-5WQ

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 434.7  | 3.6       |                         |      |         |
| FM   | (30°-60°)   | 2606.5 | 21.3      |                         |      |         |
| FH   | (60°-80°)   | 2989.2 | 24.4      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 91.1   | 0.7       |                         |      | G1/100  |
| BL   | (0°-30°)    | 434.7  | 3.6       | B1/500                  |      |         |
| BM   | (30°-60°)   | 2606.5 | 21.3      | B3/5000                 |      |         |
| BH   | (60°-80°)   | 2989.2 | 24.4      | B4/5000                 |      | G2/5000 |
| BVH  | (80°-90°)   | 91.1   | 0.7       |                         |      | G1/100  |
| 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





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CATALOG NUMBER: MEM2-HSN-SA-100-727-U-5WQ

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 75°    | 85°    | 90°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 808.3  | 808.3  | 808.3  | 808.3  | 808.3  | 808.3  | 808.3  | 808.3  | 808.3  | 808.3  | 808.3  |
| 2.5°  | 805.7  | 807.0  | 807.0  | 807.0  | 808.3  | 809.5  | 810.8  | 812.1  | 814.6  | 815.9  | 815.9  |
| 5°    | 809.5  | 808.3  | 807.0  | 809.5  | 809.5  | 809.5  | 810.8  | 812.1  | 812.1  | 812.1  | 813.3  |
| 7.5°  | 805.7  | 807.0  | 805.7  | 805.7  | 809.5  | 810.8  | 809.5  | 808.3  | 808.3  | 809.5  | 809.5  |
| 10°   | 819.7  | 818.4  | 817.1  | 817.1  | 820.9  | 822.2  | 820.9  | 819.7  | 819.7  | 822.2  | 822.2  |
| 12.5° | 851.4  | 853.9  | 846.3  | 846.3  | 851.4  | 853.9  | 850.1  | 848.9  | 850.1  | 852.7  | 852.7  |
| 15°   | 900.9  | 899.6  | 894.5  | 889.5  | 894.5  | 898.3  | 893.3  | 890.7  | 892.0  | 898.3  | 893.3  |
| 17.5° | 955.4  | 956.7  | 951.6  | 946.6  | 950.4  | 955.4  | 947.8  | 941.5  | 942.8  | 945.3  | 942.8  |
| 20°   | 1016.3 | 1015.1 | 1013.8 | 1013.8 | 1021.4 | 1027.8 | 1016.3 | 1001.1 | 997.3  | 994.8  | 994.8  |
| 22.5° | 1060.8 | 1064.6 | 1065.8 | 1077.2 | 1095.0 | 1101.4 | 1086.1 | 1065.8 | 1050.6 | 1043.0 | 1037.9 |
| 25°   | 1130.5 | 1126.7 | 1124.2 | 1136.9 | 1163.5 | 1174.9 | 1155.9 | 1128.0 | 1112.8 | 1111.5 | 1115.3 |
| 27.5° | 1194.0 | 1194.0 | 1199.1 | 1211.7 | 1237.1 | 1248.5 | 1232.0 | 1204.1 | 1196.5 | 1196.5 | 1192.7 |
| 30°   | 1276.5 | 1272.7 | 1277.7 | 1299.3 | 1318.3 | 1325.9 | 1312.0 | 1293.0 | 1286.6 | 1286.6 | 1280.3 |
| 32.5° | 1372.9 | 1374.2 | 1381.8 | 1395.7 | 1414.8 | 1416.0 | 1411.0 | 1402.1 | 1398.3 | 1394.5 | 1400.8 |
| 35°   | 1520.1 | 1520.1 | 1517.5 | 1527.7 | 1532.8 | 1535.3 | 1537.8 | 1534.0 | 1534.0 | 1534.0 | 1529.0 |
| 37.5° | 1702.8 | 1692.6 | 1691.4 | 1682.5 | 1676.1 | 1682.5 | 1693.9 | 1706.6 | 1716.7 | 1710.4 | 1707.9 |
| 40°   | 1884.2 | 1879.2 | 1863.9 | 1850.0 | 1844.9 | 1847.4 | 1861.4 | 1888.0 | 1899.5 | 1899.5 | 1909.6 |
| 42.5° | 2079.6 | 2069.5 | 2050.5 | 2034.0 | 2020.0 | 2023.8 | 2036.5 | 2069.5 | 2094.9 | 2106.3 | 2101.2 |
| 45°   | 2254.7 | 2245.9 | 2226.8 | 2211.6 | 2201.4 | 2200.2 | 2216.7 | 2238.2 | 2272.5 | 2282.7 | 2290.3 |
| 47.5° | 2404.5 | 2398.1 | 2381.6 | 2366.4 | 2370.2 | 2371.5 | 2376.5 | 2395.6 | 2423.5 | 2437.4 | 2436.2 |
| 50°   | 2526.3 | 2521.2 | 2506.0 | 2512.3 | 2522.5 | 2532.6 | 2526.3 | 2539.0 | 2556.7 | 2563.1 | 2568.1 |
| 52.5° | 2637.9 | 2630.3 | 2620.2 | 2631.6 | 2658.2 | 2678.5 | 2682.3 | 2673.5 | 2678.5 | 2682.3 | 2678.5 |
| 55°   | 2748.3 | 2739.4 | 2736.9 | 2757.2 | 2797.8 | 2835.9 | 2832.1 | 2806.7 | 2800.3 | 2792.7 | 2788.9 |
| 57.5° | 2838.4 | 2832.1 | 2842.2 | 2876.5 | 2955.1 | 3005.9 | 2989.4 | 2931.0 | 2905.7 | 2887.9 | 2882.8 |
| 60°   | 2895.5 | 2894.2 | 2917.1 | 2997.0 | 3116.3 | 3187.3 | 3160.7 | 3060.5 | 3003.4 | 2986.9 | 2979.2 |
| 62.5° | 2926.0 | 2927.2 | 2967.8 | 3109.9 | 3300.3 | 3396.7 | 3349.7 | 3196.2 | 3107.4 | 3090.9 | 3093.4 |
| 65°   | 2953.9 | 2950.1 | 3003.4 | 3205.1 | 3499.5 | 3630.2 | 3566.7 | 3359.9 | 3230.5 | 3197.5 | 3197.5 |
| 67.5° | 2974.2 | 2978.0 | 3057.9 | 3300.3 | 3693.6 | 3880.1 | 3787.5 | 3533.7 | 3362.4 | 3313.0 | 3306.6 |
| 70°   | 2717.9 | 2754.7 | 3004.6 | 3363.7 | 3847.1 | 4100.9 | 3979.1 | 3640.3 | 3367.5 | 3226.7 | 3212.7 |
| 72.5° | 2064.4 | 2098.7 | 2639.2 | 3250.8 | 3925.8 | 4248.1 | 4050.1 | 3504.5 | 3060.5 | 2881.5 | 2828.3 |
| 75°   | 1361.5 | 1385.6 | 1966.7 | 2839.7 | 3707.6 | 4108.5 | 3688.5 | 3018.6 | 2409.5 | 2177.3 | 2191.3 |
| 77.5° | 606.5  | 683.9  | 1253.6 | 2215.4 | 3054.1 | 3306.6 | 2813.0 | 2059.3 | 1471.9 | 1246.0 | 1221.9 |
| 80°   | 253.8  | 277.9  | 473.3  | 1181.3 | 1770.0 | 1693.9 | 1197.8 | 690.3  | 439.0  | 341.3  | 329.9  |
| 82.5° | 73.6   | 76.1   | 93.9   | 204.3  | 360.4  | 423.8  | 255.0  | 129.4  | 123.1  | 97.7   | 90.1   |
| 85°   | 5.1    | 5.1    | 7.6    | 12.7   | 17.8   | 29.2   | 33.0   | 38.1   | 43.1   | 36.8   | 36.8   |
| 87.5° | 2.5    | 2.5    | 2.5    | 3.8    | 3.8    | 5.1    | 3.8    | 3.8    | 3.8    | 3.8    | 3.8    |
| 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: SP1-2407-157-3

Test Date: 08/07/2024

Luminaire Tested: MEM2-HTN-SA-40-727-U-5WQ-2

Data in this report applies to families of products including MEM2-HTN-SA-40-727-U-5WQ-2



**Test Information**

Test Method: LM-79-2019  
 Report Number: SP1-2407-157-3  
 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-40-727-U-5WQ-2**  
 Description: Epic Modern Light Square 40W 5WQ Optic and Flare Trim

**Spectral Parameters**

CCT (K): 2747  
 CIE u': 0.2606  
 CIE v': 0.5257  
 Duv: -0.0005  
 CIE x: 0.4552  
 CIE y: 0.4082  
 CIE z: 0.1366  
 Peak Wavelength (nm): 597  
 Dominant Wavelength (nm): 584  
 Purity: 59.16856  
 Rf: 75.5  
 Rg: 93.6

|           |      |      |       |
|-----------|------|------|-------|
| CRI (Ra): | 71.7 |      |       |
| R1:       | 68.1 | R9:  | -35.3 |
| R2:       | 83.9 | R10: | 64.2  |
| R3:       | 94.7 | R11: | 61.7  |
| R4:       | 66.3 | R12: | 53.9  |
| R5:       | 67.4 | R13: | 71.2  |
| R6:       | 78.7 | R14: | 97.6  |
| R7:       | 75.0 | R15: | 59.3  |
| R8:       | 39.4 |      |       |



**Test Conditions**

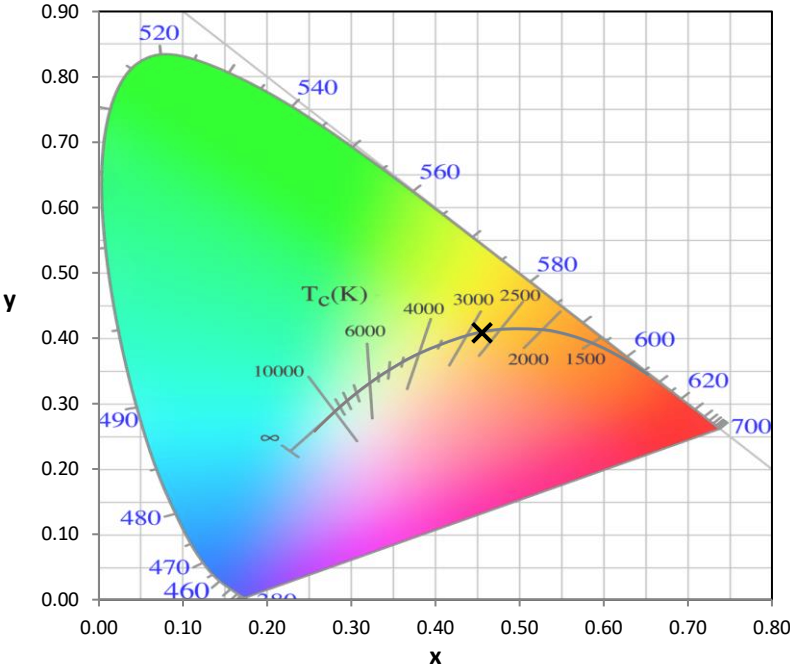
Stabilization Time: 22M  
 Operation Time: 1H 22M  
 Sphere Temperature (°C): 24.2

REPORT NUMBER: SP1-2407-157-3

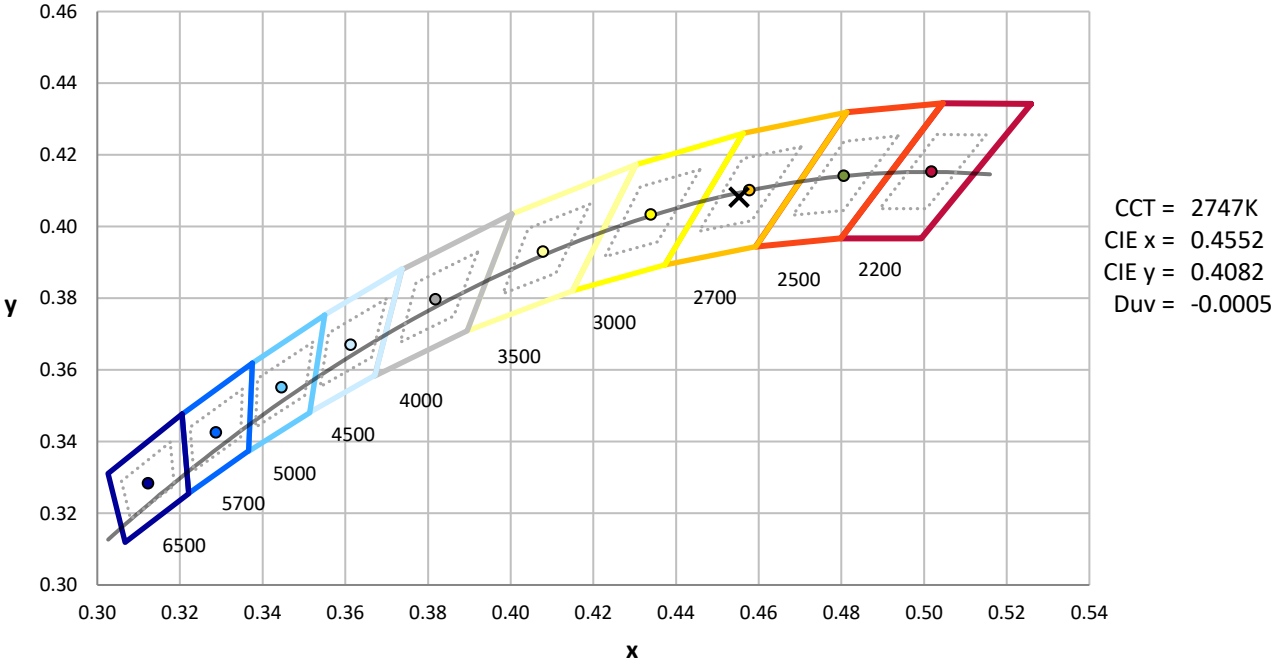
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| 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           |

REPORT NUMBER: SP1-2407-157-3

CIE 1931 Chromaticity Diagram



CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies inside the ANSI 2700K 4-step quadrangle

REPORT NUMBER: SP1-2407-157-3

**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               | 103                         | NR                      | 620               | 846                         | NR                      | 750               | 20                          | NR                      | 880               | 0                           | NR                      |
| 365               | 0                           | NR                      | 495               | 130                         | NR                      | 625               | 784                         | NR                      | 755               | 17                          | NR                      | 885               | 1                           | NR                      |
| 370               | 0                           | NR                      | 500               | 171                         | NR                      | 630               | 720                         | NR                      | 760               | 15                          | NR                      | 890               | 0                           | NR                      |
| 375               | 0                           | NR                      | 505               | 221                         | NR                      | 635               | 652                         | NR                      | 765               | 13                          | NR                      | 895               | 0                           | NR                      |
| 380               | 0                           | NR                      | 510               | 268                         | NR                      | 640               | 587                         | NR                      | 770               | 11                          | NR                      | 900               | 0                           | NR                      |
| 385               | 0                           | NR                      | 515               | 313                         | NR                      | 645               | 521                         | NR                      | 775               | 9                           | NR                      | 905               | 0                           | NR                      |
| 390               | 0                           | NR                      | 520               | 350                         | NR                      | 650               | 461                         | NR                      | 780               | 8                           | NR                      | 910               | 0                           | NR                      |
| 395               | 0                           | NR                      | 525               | 381                         | NR                      | 655               | 406                         | NR                      | 785               | 7                           | NR                      | 915               | 0                           | NR                      |
| 400               | 0                           | NR                      | 530               | 407                         | NR                      | 660               | 353                         | NR                      | 790               | 6                           | NR                      | 920               | 0                           | NR                      |
| 405               | 2                           | NR                      | 535               | 435                         | NR                      | 665               | 307                         | NR                      | 795               | 5                           | NR                      | 925               | 0                           | NR                      |
| 410               | 4                           | NR                      | 540               | 462                         | NR                      | 670               | 264                         | NR                      | 800               | 4                           | NR                      | 930               | 0                           | NR                      |
| 415               | 9                           | NR                      | 545               | 496                         | NR                      | 675               | 227                         | NR                      | 805               | 4                           | NR                      | 935               | 0                           | NR                      |
| 420               | 20                          | NR                      | 550               | 534                         | NR                      | 680               | 196                         | NR                      | 810               | 3                           | NR                      | 940               | 0                           | NR                      |
| 425               | 38                          | NR                      | 555               | 582                         | NR                      | 685               | 167                         | NR                      | 815               | 3                           | NR                      | 945               | 0                           | NR                      |
| 430               | 69                          | NR                      | 560               | 638                         | NR                      | 690               | 144                         | NR                      | 820               | 2                           | NR                      | 950               | 0                           | NR                      |
| 435               | 120                         | NR                      | 565               | 700                         | NR                      | 695               | 122                         | NR                      | 825               | 2                           | NR                      | 955               | 0                           | NR                      |
| 440               | 193                         | NR                      | 570               | 767                         | NR                      | 700               | 103                         | NR                      | 830               | 2                           | NR                      | 960               | 0                           | NR                      |
| 445               | 316                         | NR                      | 575               | 836                         | NR                      | 705               | 88                          | NR                      | 835               | 2                           | NR                      | 965               | 0                           | NR                      |
| 450               | 469                         | NR                      | 580               | 898                         | NR                      | 710               | 74                          | NR                      | 840               | 1                           | NR                      | 970               | 0                           | NR                      |
| 455               | 431                         | NR                      | 585               | 947                         | NR                      | 715               | 63                          | NR                      | 845               | 1                           | NR                      | 975               | 0                           | NR                      |
| 460               | 264                         | NR                      | 590               | 982                         | NR                      | 720               | 54                          | NR                      | 850               | 1                           | NR                      | 980               | 0                           | NR                      |
| 465               | 197                         | NR                      | 595               | 997                         | NR                      | 725               | 46                          | NR                      | 855               | 1                           | NR                      | 985               | 0                           | NR                      |
| 470               | 155                         | NR                      | 600               | 997                         | NR                      | 730               | 39                          | NR                      | 860               | 1                           | NR                      | 990               | 0                           | NR                      |
| 475               | 108                         | NR                      | 605               | 978                         | NR                      | 735               | 33                          | NR                      | 865               | 1                           | NR                      | 995               | 0                           | NR                      |
| 480               | 90                          | NR                      | 610               | 947                         | NR                      | 740               | 28                          | NR                      | 870               | 1                           | NR                      | 1000              | 0                           | NR                      |
| 485               | 92                          | NR                      | 615               | 900                         | NR                      | 745               | 24                          | NR                      | 875               | 1                           | NR                      |                   |                             |                         |

REPORT NUMBER: SP1-2407-157-3

**Scotopic Flux vs. Wavelength**



**Scotopic Lumens: NR**

**S/P: 1.13**

| 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    | 103                      | NR            | 620    | 846                      | NR            | 750    | 20                       | NR            | 880    | 0                        | NR            |
| 365    | 0                        | NR            | 495    | 130                      | NR            | 625    | 784                      | NR            | 755    | 17                       | NR            | 885    | 1                        | NR            |
| 370    | 0                        | NR            | 500    | 171                      | NR            | 630    | 720                      | NR            | 760    | 15                       | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 221                      | NR            | 635    | 652                      | NR            | 765    | 13                       | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 268                      | NR            | 640    | 587                      | NR            | 770    | 11                       | NR            | 900    | 0                        | NR            |
| 385    | 0                        | NR            | 515    | 313                      | NR            | 645    | 521                      | NR            | 775    | 9                        | NR            | 905    | 0                        | NR            |
| 390    | 0                        | NR            | 520    | 350                      | NR            | 650    | 461                      | NR            | 780    | 8                        | NR            | 910    | 0                        | NR            |
| 395    | 0                        | NR            | 525    | 381                      | NR            | 655    | 406                      | NR            | 785    | 7                        | NR            | 915    | 0                        | NR            |
| 400    | 0                        | NR            | 530    | 407                      | NR            | 660    | 353                      | NR            | 790    | 6                        | NR            | 920    | 0                        | NR            |
| 405    | 2                        | NR            | 535    | 435                      | NR            | 665    | 307                      | NR            | 795    | 5                        | NR            | 925    | 0                        | NR            |
| 410    | 4                        | NR            | 540    | 462                      | NR            | 670    | 264                      | NR            | 800    | 4                        | NR            | 930    | 0                        | NR            |
| 415    | 9                        | NR            | 545    | 496                      | NR            | 675    | 227                      | NR            | 805    | 4                        | NR            | 935    | 0                        | NR            |
| 420    | 20                       | NR            | 550    | 534                      | NR            | 680    | 196                      | NR            | 810    | 3                        | NR            | 940    | 0                        | NR            |
| 425    | 38                       | NR            | 555    | 582                      | NR            | 685    | 167                      | NR            | 815    | 3                        | NR            | 945    | 0                        | NR            |
| 430    | 69                       | NR            | 560    | 638                      | NR            | 690    | 144                      | NR            | 820    | 2                        | NR            | 950    | 0                        | NR            |
| 435    | 120                      | NR            | 565    | 700                      | NR            | 695    | 122                      | NR            | 825    | 2                        | NR            | 955    | 0                        | NR            |
| 440    | 193                      | NR            | 570    | 767                      | NR            | 700    | 103                      | NR            | 830    | 2                        | NR            | 960    | 0                        | NR            |
| 445    | 316                      | NR            | 575    | 836                      | NR            | 705    | 88                       | NR            | 835    | 2                        | NR            | 965    | 0                        | NR            |
| 450    | 469                      | NR            | 580    | 898                      | NR            | 710    | 74                       | NR            | 840    | 1                        | NR            | 970    | 0                        | NR            |
| 455    | 431                      | NR            | 585    | 947                      | NR            | 715    | 63                       | NR            | 845    | 1                        | NR            | 975    | 0                        | NR            |
| 460    | 264                      | NR            | 590    | 982                      | NR            | 720    | 54                       | NR            | 850    | 1                        | NR            | 980    | 0                        | NR            |
| 465    | 197                      | NR            | 595    | 997                      | NR            | 725    | 46                       | NR            | 855    | 1                        | NR            | 985    | 0                        | NR            |
| 470    | 155                      | NR            | 600    | 997                      | NR            | 730    | 39                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 108                      | NR            | 605    | 978                      | NR            | 735    | 33                       | NR            | 865    | 1                        | NR            | 995    | 0                        | NR            |
| 480    | 90                       | NR            | 610    | 947                      | NR            | 740    | 28                       | NR            | 870    | 1                        | NR            | 1000   | 0                        | NR            |
| 485    | 92                       | NR            | 615    | 900                      | NR            | 745    | 24                       | NR            | 875    | 1                        | NR            |        |                          |               |

REPORT NUMBER: SP1-2407-157-3

**Melanopic Flux vs. Wavelength**



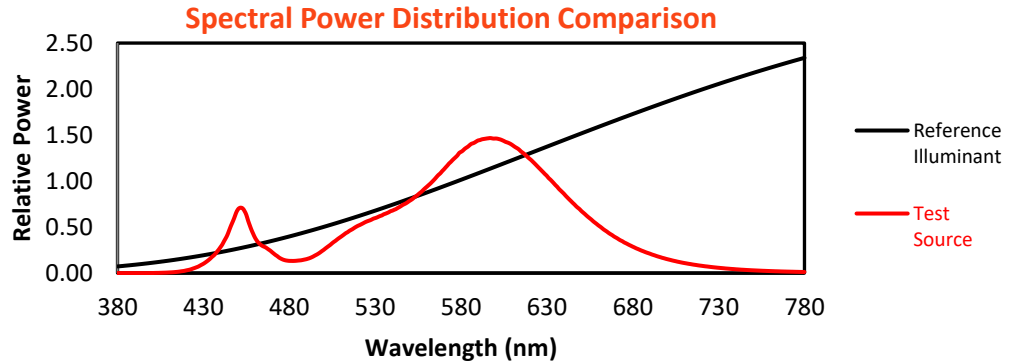
**Melanopic Lumens: NR**

**M/P: 2.04**

| 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    | 103                      | NR            | 620    | 846                      | NR            | 750    | 20                       | NR            | 880    | 0                        | NR            |
| 365    | 0                        | NR            | 495    | 130                      | NR            | 625    | 784                      | NR            | 755    | 17                       | NR            | 885    | 1                        | NR            |
| 370    | 0                        | NR            | 500    | 171                      | NR            | 630    | 720                      | NR            | 760    | 15                       | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 221                      | NR            | 635    | 652                      | NR            | 765    | 13                       | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 268                      | NR            | 640    | 587                      | NR            | 770    | 11                       | NR            | 900    | 0                        | NR            |
| 385    | 0                        | NR            | 515    | 313                      | NR            | 645    | 521                      | NR            | 775    | 9                        | NR            | 905    | 0                        | NR            |
| 390    | 0                        | NR            | 520    | 350                      | NR            | 650    | 461                      | NR            | 780    | 8                        | NR            | 910    | 0                        | NR            |
| 395    | 0                        | NR            | 525    | 381                      | NR            | 655    | 406                      | NR            | 785    | 7                        | NR            | 915    | 0                        | NR            |
| 400    | 0                        | NR            | 530    | 407                      | NR            | 660    | 353                      | NR            | 790    | 6                        | NR            | 920    | 0                        | NR            |
| 405    | 2                        | NR            | 535    | 435                      | NR            | 665    | 307                      | NR            | 795    | 5                        | NR            | 925    | 0                        | NR            |
| 410    | 4                        | NR            | 540    | 462                      | NR            | 670    | 264                      | NR            | 800    | 4                        | NR            | 930    | 0                        | NR            |
| 415    | 9                        | NR            | 545    | 496                      | NR            | 675    | 227                      | NR            | 805    | 4                        | NR            | 935    | 0                        | NR            |
| 420    | 20                       | NR            | 550    | 534                      | NR            | 680    | 196                      | NR            | 810    | 3                        | NR            | 940    | 0                        | NR            |
| 425    | 38                       | NR            | 555    | 582                      | NR            | 685    | 167                      | NR            | 815    | 3                        | NR            | 945    | 0                        | NR            |
| 430    | 69                       | NR            | 560    | 638                      | NR            | 690    | 144                      | NR            | 820    | 2                        | NR            | 950    | 0                        | NR            |
| 435    | 120                      | NR            | 565    | 700                      | NR            | 695    | 122                      | NR            | 825    | 2                        | NR            | 955    | 0                        | NR            |
| 440    | 193                      | NR            | 570    | 767                      | NR            | 700    | 103                      | NR            | 830    | 2                        | NR            | 960    | 0                        | NR            |
| 445    | 316                      | NR            | 575    | 836                      | NR            | 705    | 88                       | NR            | 835    | 2                        | NR            | 965    | 0                        | NR            |
| 450    | 469                      | NR            | 580    | 898                      | NR            | 710    | 74                       | NR            | 840    | 1                        | NR            | 970    | 0                        | NR            |
| 455    | 431                      | NR            | 585    | 947                      | NR            | 715    | 63                       | NR            | 845    | 1                        | NR            | 975    | 0                        | NR            |
| 460    | 264                      | NR            | 590    | 982                      | NR            | 720    | 54                       | NR            | 850    | 1                        | NR            | 980    | 0                        | NR            |
| 465    | 197                      | NR            | 595    | 997                      | NR            | 725    | 46                       | NR            | 855    | 1                        | NR            | 985    | 0                        | NR            |
| 470    | 155                      | NR            | 600    | 997                      | NR            | 730    | 39                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 108                      | NR            | 605    | 978                      | NR            | 735    | 33                       | NR            | 865    | 1                        | NR            | 995    | 0                        | NR            |
| 480    | 90                       | NR            | 610    | 947                      | NR            | 740    | 28                       | NR            | 870    | 1                        | NR            | 1000   | 0                        | NR            |
| 485    | 92                       | NR            | 615    | 900                      | NR            | 745    | 24                       | NR            | 875    | 1                        | NR            |        |                          |               |

**Summary**

$R_f = 75.5$   
 $R_g = 93.6$   
 $CIE R_a = 71.7$   
 $R_g = -35.3$



**Color Vector Graphics**



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 68 | CES51 = 87 | CES76 = 63 |
| CES02 = 63 | CES27 = 90 | CES52 = 85 | CES77 = 79 |
| CES03 = 31 | CES28 = 87 | CES53 = 78 | CES78 = 66 |
| CES04 = 71 | CES29 = 71 | CES54 = 86 | CES79 = 87 |
| CES05 = 50 | CES30 = 85 | CES55 = 84 | CES80 = 85 |
| CES06 = 52 | CES31 = 74 | CES56 = 75 | CES81 = 67 |
| CES07 = 42 | CES32 = 66 | CES57 = 75 | CES82 = 93 |
| CES08 = 41 | CES33 = 80 | CES58 = 76 | CES83 = 91 |
| CES09 = 29 | CES34 = 79 | CES59 = 85 | CES84 = 89 |
| CES10 = 77 | CES35 = 89 | CES60 = 90 | CES85 = 72 |
| CES11 = 60 | CES36 = 93 | CES61 = 81 | CES86 = 59 |
| CES12 = 66 | CES37 = 88 | CES62 = 91 | CES87 = 77 |
| CES13 = 43 | CES38 = 93 | CES63 = 77 | CES88 = 79 |
| CES14 = 74 | CES39 = 97 | CES64 = 67 | CES89 = 65 |
| CES15 = 72 | CES40 = 93 | CES65 = 66 | CES90 = 80 |
| CES16 = 48 | CES41 = 93 | CES66 = 63 | CES91 = 80 |
| CES17 = 51 | CES42 = 89 | CES67 = 61 | CES92 = 55 |
| CES18 = 57 | CES43 = 78 | CES68 = 68 | CES93 = 72 |
| CES19 = 73 | CES44 = 99 | CES69 = 78 | CES94 = 48 |
| CES20 = 67 | CES45 = 85 | CES70 = 63 | CES95 = 66 |
| CES21 = 88 | CES46 = 81 | CES71 = 61 | CES96 = 76 |
| CES22 = 80 | CES47 = 86 | CES72 = 86 | CES97 = 81 |
| CES23 = 92 | CES48 = 74 | CES73 = 56 | CES98 = 76 |
| CES24 = 91 | CES49 = 79 | CES74 = 93 | CES99 = 64 |
| CES25 = 73 | CES50 = 86 | CES75 = 66 |            |

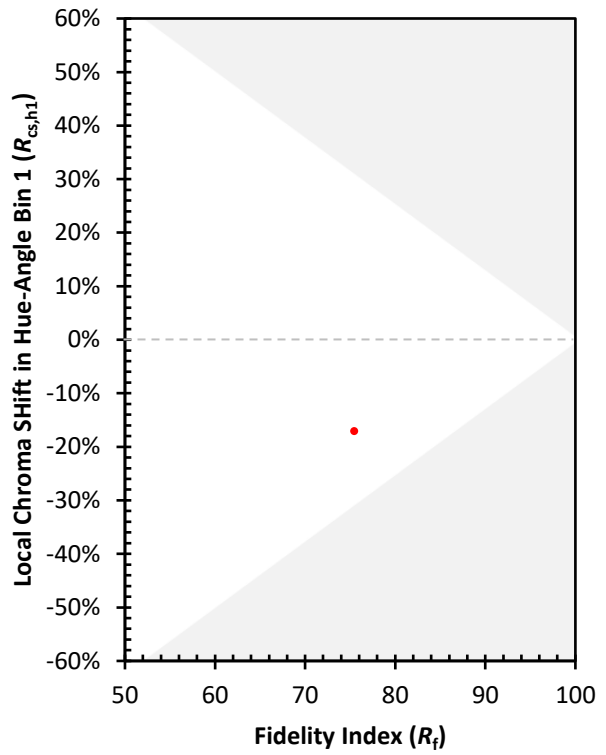




Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)