

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: P867767

Luminaire Tested: **MEM2-HTN-SA-100-740-U-T5R**

Issue Date: 08/21/2024



**Test Information**

Test Method: LM-79-08  
Report Number: P867767  
Test Lab: INNOVATION CENTER(G3)  
Issue Date: 08/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: STREETWORKS  
Catalog Number: MEM2-HTN-SA-100-740-U-T5R  
Description: EPIC MODERN TALL HOUSING DISCRETE LED ARRAYS 100W 70CRI 4000K  
FIXTURE w/ TYPE V ROUND DISTRIBUTION OPTIC  
Light Source: (20) 4000K CCT, 70 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

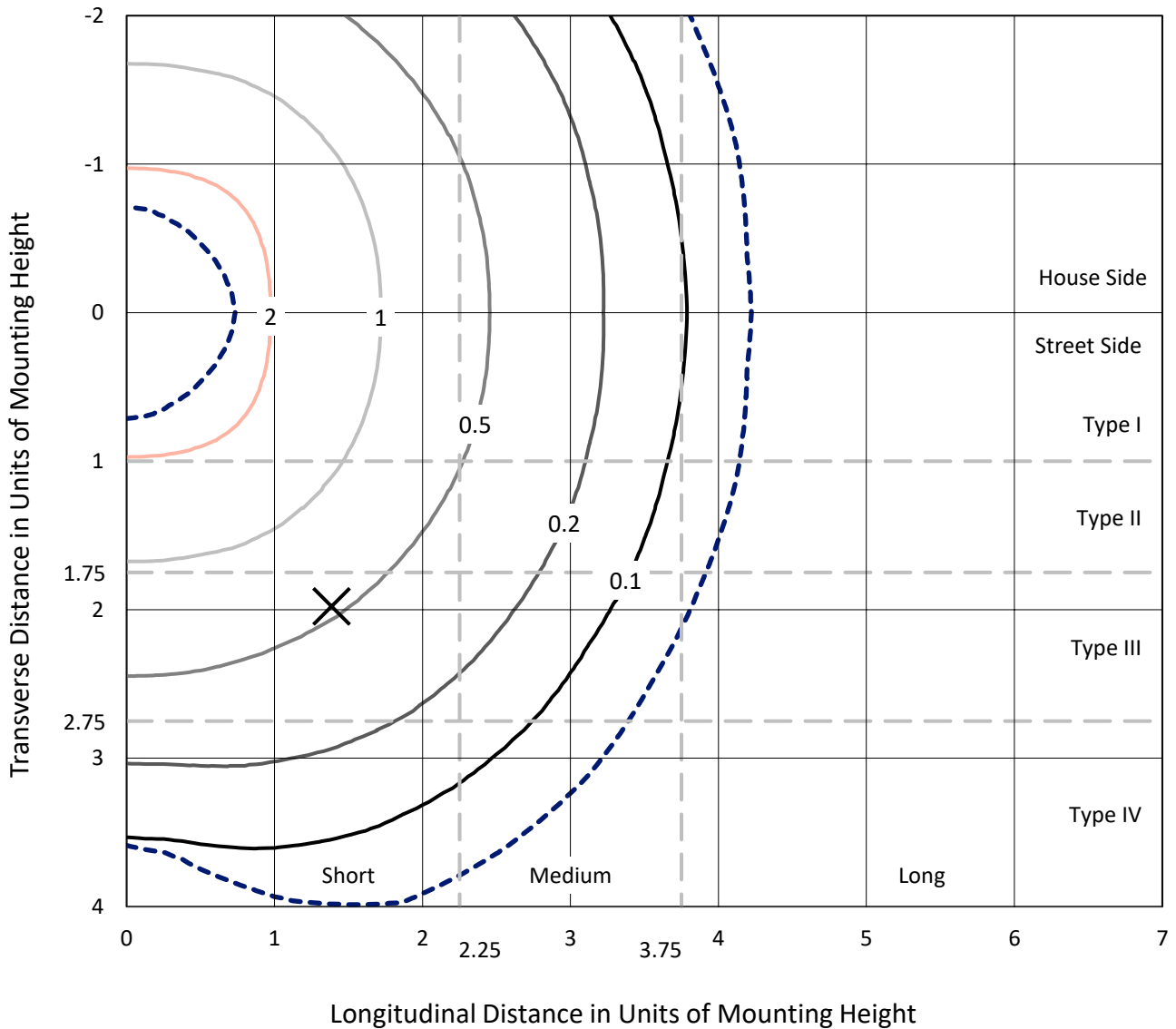
Lumens per Lamp: N/A  
Luminaire Lumens: 13153.3 lumens  
Efficiency: N/A  
Efficacy: 146.1 lumens/watt  
Luminous Opening: Rectangular (W 0.67' x L: 0.33' x H: 0')  
IES Classification: Type V - Short  
BUG Rating: B4 - U0 - G2

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: P867767  
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### Iso-Footcandle Lines of Horizontal Illumination

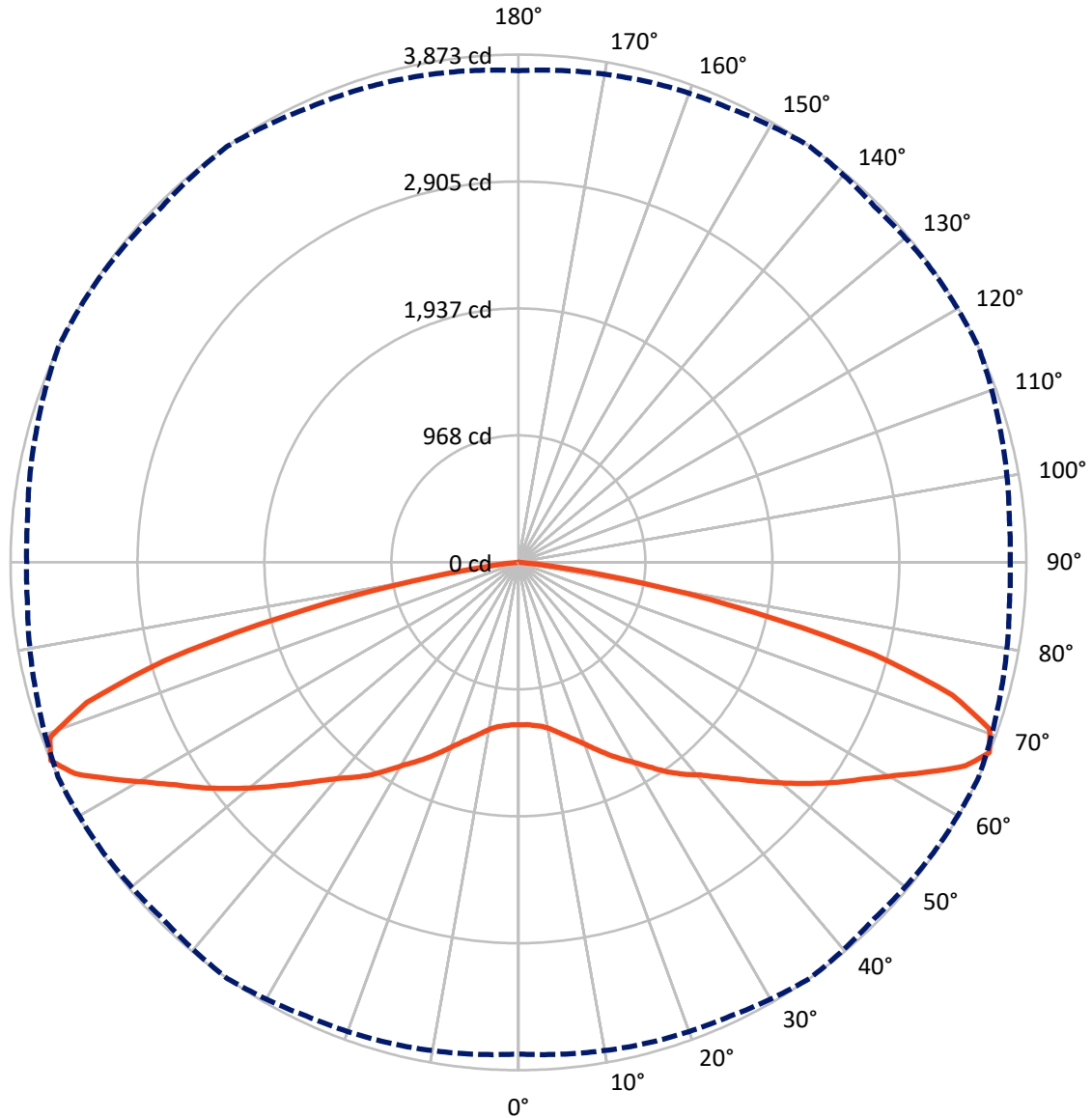
✕ Max cd  
 - - - - 1/2 Max cd



Based on 20 foot mounting height. Maximum calculated value = 3.1 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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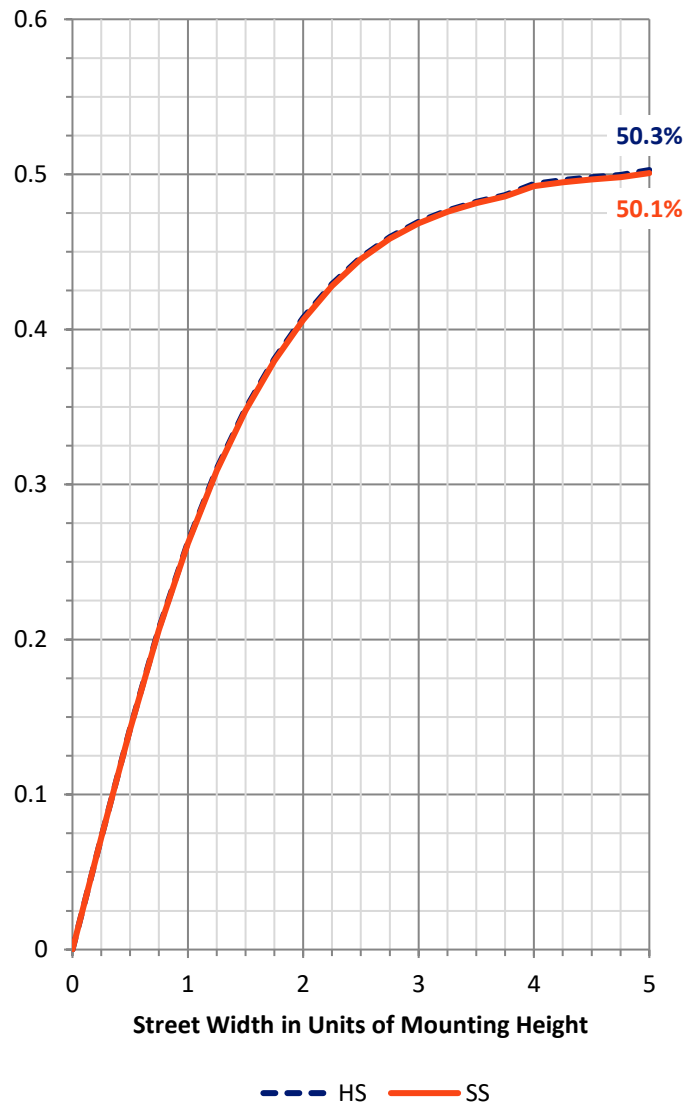
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 6576.6   | 0.0    | 6576.6  |
|                    | % Fixture | 50.0     | 0.0    | 50.0    |
| <b>Street Side</b> | Lumens    | 6576.6   | 0.0    | 6576.6  |
|                    | % Fixture | 50.0     | 0.0    | 50.0    |
| <b>Total</b>       | Lumens    | 13153.3  | 0.0    | 13153.3 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 120.5   | 0.9       |
| 10°-20°   | 394.9   | 3.0       |
| 20°-30°   | 754.7   | 5.7       |
| 30°-40°   | 1219.6  | 9.3       |
| 40°-50°   | 1785.1  | 13.6      |
| 50°-60°   | 2559.8  | 19.5      |
| 60°-70°   | 3587.8  | 27.3      |
| 70°-80°   | 2531.5  | 19.2      |
| 80°-90°   | 199.3   | 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°    | 13153.3 | 100.0     |
| 0°-180°   | 13153.3 | 100.0     |



REPORT NUMBER: P867767

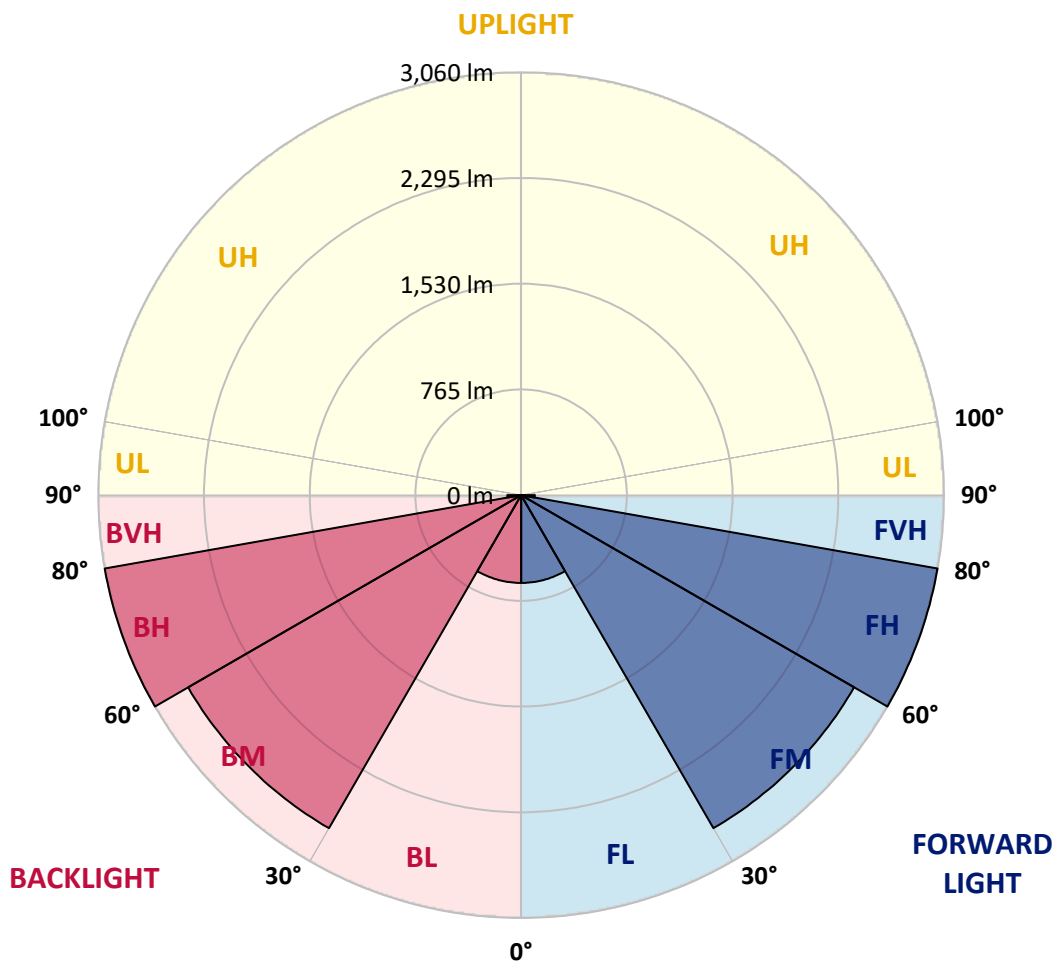
CATALOG NUMBER: MEM2-HTN-SA-100-740-U-T5R

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

| Zone           | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|----------------|--------|-----------|-------------------------|------|---------|
|                |        |           | B                       | U    | G       |
| FL (0°-30°)    | 635.0  | 4.8       |                         |      |         |
| FM (30°-60°)   | 2782.3 | 21.2      |                         |      |         |
| FH (60°-80°)   | 3059.7 | 23.3      |                         |      | G2/5000 |
| FVH (80°-90°)  | 99.6   | 0.8       |                         |      | G1/100  |
| BL (0°-30°)    | 635.0  | 4.8       | B2/1000                 |      |         |
| BM (30°-60°)   | 2782.3 | 21.2      | B3/5000                 |      |         |
| BH (60°-80°)   | 3059.7 | 23.3      | B4/5000                 |      | G2/5000 |
| BVH (80°-90°)  | 99.6   | 0.8       |                         |      | 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-HTN-SA-100-740-U-T5R

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 75°    | 85°    | 90°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1239.0 | 1239.0 | 1239.0 | 1239.0 | 1239.0 | 1239.0 | 1239.0 | 1239.0 | 1239.0 | 1239.0 | 1239.0 |
| 2.5°  | 1246.7 | 1244.1 | 1241.6 | 1241.6 | 1239.0 | 1241.6 | 1239.0 | 1241.6 | 1239.0 | 1239.0 | 1239.0 |
| 5°    | 1254.4 | 1251.8 | 1251.8 | 1251.8 | 1249.2 | 1249.2 | 1249.2 | 1249.2 | 1246.7 | 1244.1 | 1246.7 |
| 7.5°  | 1262.0 | 1262.0 | 1259.5 | 1264.6 | 1262.0 | 1264.6 | 1264.6 | 1267.2 | 1262.0 | 1259.5 | 1262.0 |
| 10°   | 1282.5 | 1282.5 | 1282.5 | 1287.6 | 1287.6 | 1295.3 | 1295.3 | 1297.9 | 1295.3 | 1290.2 | 1290.2 |
| 12.5° | 1326.0 | 1323.5 | 1323.5 | 1323.5 | 1328.6 | 1333.7 | 1338.8 | 1338.8 | 1336.3 | 1328.6 | 1328.6 |
| 15°   | 1374.7 | 1379.8 | 1374.7 | 1372.1 | 1374.7 | 1379.8 | 1384.9 | 1384.9 | 1382.4 | 1379.8 | 1379.8 |
| 17.5° | 1433.6 | 1436.1 | 1431.0 | 1425.9 | 1425.9 | 1433.6 | 1436.1 | 1436.1 | 1433.6 | 1428.4 | 1428.4 |
| 20°   | 1484.8 | 1487.3 | 1487.3 | 1484.8 | 1487.3 | 1492.4 | 1495.0 | 1497.6 | 1489.9 | 1482.2 | 1482.2 |
| 22.5° | 1528.3 | 1530.8 | 1536.0 | 1546.2 | 1556.4 | 1561.6 | 1559.0 | 1559.0 | 1546.2 | 1538.5 | 1536.0 |
| 25°   | 1582.0 | 1589.7 | 1600.0 | 1612.8 | 1630.7 | 1643.5 | 1638.4 | 1628.1 | 1617.9 | 1602.5 | 1600.0 |
| 27.5° | 1687.0 | 1687.0 | 1676.8 | 1681.9 | 1702.4 | 1715.2 | 1710.0 | 1702.4 | 1681.9 | 1671.6 | 1669.1 |
| 30°   | 1768.9 | 1768.9 | 1768.9 | 1763.8 | 1776.6 | 1792.0 | 1786.8 | 1774.0 | 1763.8 | 1758.7 | 1758.7 |
| 32.5° | 1848.3 | 1843.1 | 1850.8 | 1861.1 | 1866.2 | 1871.3 | 1871.3 | 1861.1 | 1843.1 | 1835.5 | 1835.5 |
| 35°   | 1922.5 | 1927.6 | 1935.3 | 1950.7 | 1963.5 | 1955.8 | 1943.0 | 1935.3 | 1917.4 | 1902.0 | 1902.0 |
| 37.5° | 1994.2 | 1999.3 | 2007.0 | 2030.0 | 2050.5 | 2047.9 | 2032.6 | 2012.1 | 1989.1 | 1976.3 | 1968.6 |
| 40°   | 2045.4 | 2047.9 | 2068.4 | 2104.3 | 2132.4 | 2142.7 | 2129.9 | 2101.7 | 2065.9 | 2040.3 | 2042.8 |
| 42.5° | 2106.8 | 2111.9 | 2145.2 | 2196.4 | 2237.4 | 2252.7 | 2234.8 | 2196.4 | 2145.2 | 2111.9 | 2111.9 |
| 45°   | 2196.4 | 2199.0 | 2242.5 | 2306.5 | 2360.3 | 2385.9 | 2360.3 | 2306.5 | 2239.9 | 2206.7 | 2204.1 |
| 47.5° | 2286.0 | 2293.7 | 2342.3 | 2419.1 | 2498.5 | 2529.2 | 2501.1 | 2431.9 | 2352.6 | 2311.6 | 2306.5 |
| 50°   | 2388.4 | 2393.5 | 2452.4 | 2557.4 | 2647.0 | 2687.9 | 2652.1 | 2565.0 | 2478.0 | 2426.8 | 2429.4 |
| 52.5° | 2488.3 | 2503.6 | 2583.0 | 2693.0 | 2800.6 | 2846.6 | 2795.4 | 2700.7 | 2608.6 | 2559.9 | 2557.4 |
| 55°   | 2636.7 | 2654.6 | 2723.8 | 2846.6 | 2959.3 | 3010.5 | 2961.8 | 2856.9 | 2757.0 | 2703.3 | 2693.0 |
| 57.5° | 2823.6 | 2833.8 | 2895.3 | 3020.7 | 3115.4 | 3164.1 | 3135.9 | 3038.6 | 2943.9 | 2877.4 | 2864.6 |
| 60°   | 3036.1 | 3046.3 | 3095.0 | 3223.0 | 3299.7 | 3335.6 | 3325.3 | 3269.0 | 3205.0 | 3174.3 | 3166.6 |
| 62.5° | 3338.1 | 3340.7 | 3366.3 | 3440.5 | 3517.3 | 3532.7 | 3507.1 | 3494.3 | 3514.8 | 3481.5 | 3489.2 |
| 65°   | 3683.7 | 3683.7 | 3676.1 | 3686.3 | 3745.2 | 3727.3 | 3709.3 | 3765.7 | 3755.4 | 3699.1 | 3688.9 |
| 67.5° | 3750.3 | 3765.7 | 3796.4 | 3819.4 | 3873.2 | 3839.9 | 3862.9 | 3873.2 | 3809.2 | 3758.0 | 3750.3 |
| 70°   | 3356.1 | 3374.0 | 3545.5 | 3650.5 | 3814.3 | 3845.0 | 3770.8 | 3732.4 | 3660.7 | 3566.0 | 3540.4 |
| 72.5° | 2288.6 | 2378.2 | 2872.2 | 3210.2 | 3461.0 | 3499.4 | 3458.5 | 3409.8 | 3266.5 | 3192.2 | 3141.0 |
| 75°   | 1827.8 | 1876.4 | 2316.7 | 2649.5 | 2798.0 | 2795.4 | 2631.6 | 2577.8 | 2465.2 | 2455.0 | 2465.2 |
| 77.5° | 1116.1 | 1126.4 | 1559.0 | 1820.1 | 1838.0 | 1827.8 | 1761.2 | 1720.3 | 1735.6 | 1658.8 | 1671.6 |
| 80°   | 340.5  | 371.2  | 588.8  | 888.3  | 954.9  | 924.1  | 911.3  | 926.7  | 942.1  | 965.1  | 1000.9 |
| 82.5° | 69.1   | 87.0   | 117.8  | 256.0  | 291.8  | 289.3  | 286.7  | 317.4  | 345.6  | 358.4  | 435.2  |
| 85°   | 7.7    | 7.7    | 10.2   | 20.5   | 43.5   | 69.1   | 71.7   | 64.0   | 97.3   | 94.7   | 66.6   |
| 87.5° | 2.6    | 2.6    | 2.6    | 2.6    | 2.6    | 5.1    | 5.1    | 5.1    | 5.1    | 5.1    | 5.1    |
| 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: SP1-2407-157-5

Test Date: 08/07/2024

Luminaire Tested: MEM2-HTN-SA-40-740-U-5WQ-2

Data in this report applies to families of products including MEM2-HTN-SA-40-740-U-5WQ-2



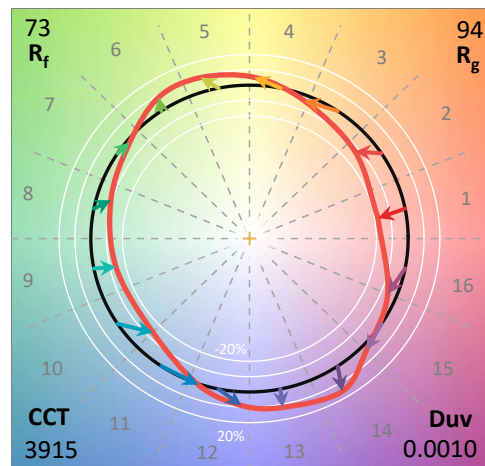
**Test Information**

Test Method: LM-79-2019  
 Report Number: SP1-2407-157-5  
 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-40-740-U-5WQ-2**  
 Description: Epic Modern Light Square 40W 5WQ Optic and Flare Trim

**Spectral Parameters**

CCT (K): 3915  
 CIE u': 0.2262  
 CIE v': 0.5044  
 Duv: 0.0010  
 CIE x: 0.3850  
 CIE y: 0.3816  
 CIE z: 0.2334  
 Peak Wavelength (nm): 449  
 Dominant Wavelength (nm): 578  
 Purity: 30.05482  
 R<sub>f</sub>: 73.2  
 R<sub>g</sub>: 93.9

|           |      |      |       |
|-----------|------|------|-------|
| CRI (Ra): | 71.0 |      |       |
| R1:       | 67.6 | R9:  | -38.4 |
| R2:       | 78.3 | R10: | 48.9  |
| R3:       | 87.1 | R11: | 65.3  |
| R4:       | 69.7 | R12: | 40.4  |
| R5:       | 67.4 | R13: | 69.3  |
| R6:       | 69.3 | R14: | 92.6  |
| R7:       | 79.7 | R15: | 59.9  |
| R8:       | 48.7 |      |       |



**Test Conditions**

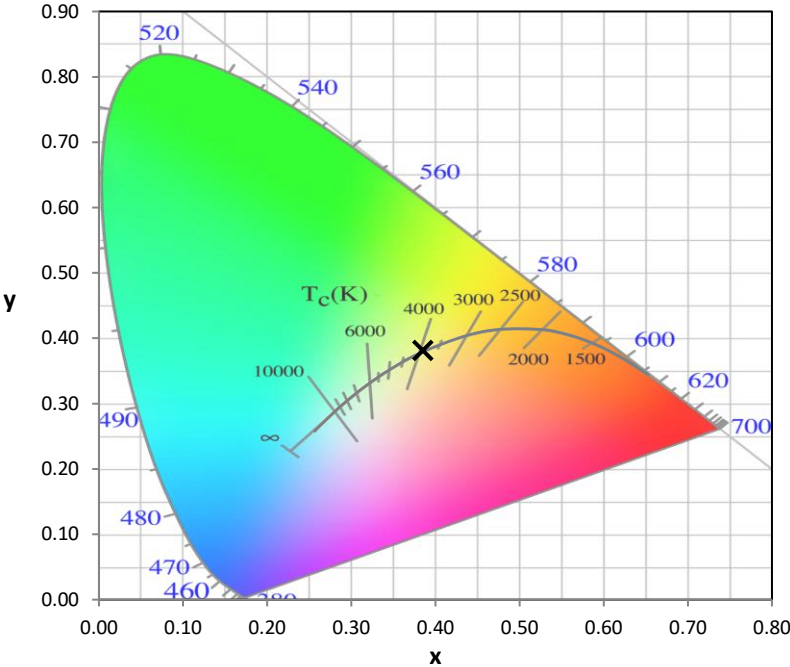
Stabilization Time: 21M  
 Operation Time: 1H 21M  
 Sphere Temperature (°C): 24.2

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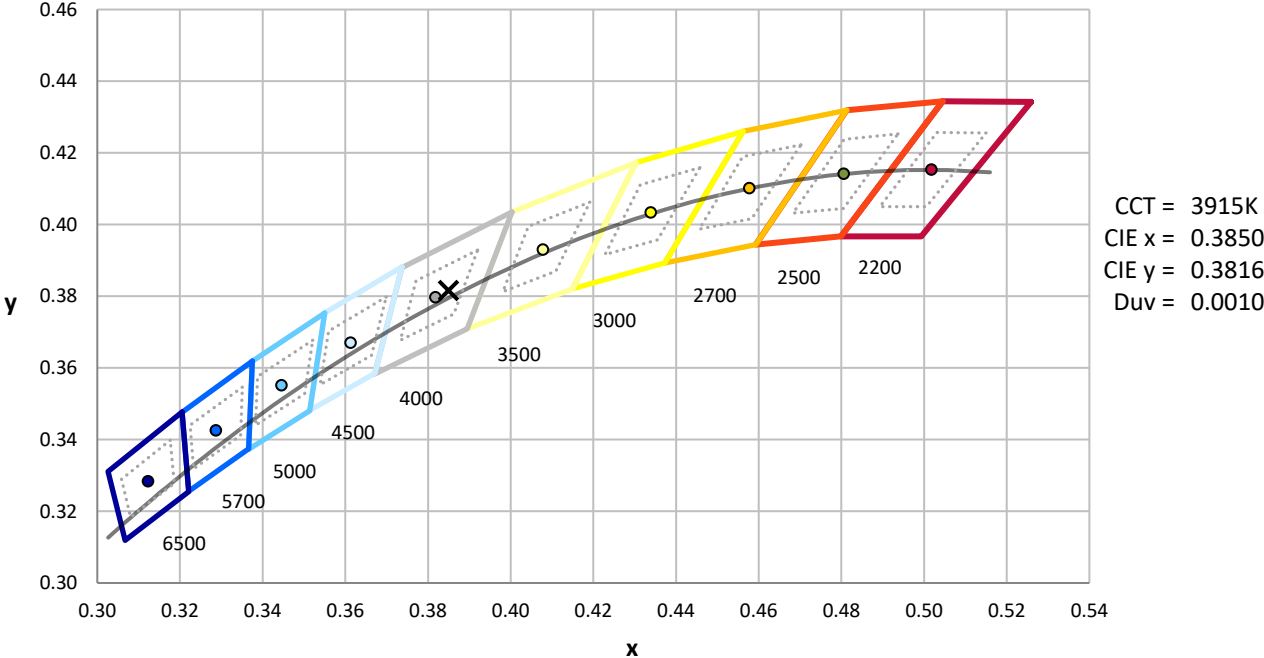
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date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

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**CIE 1931 Chromaticity Diagram**



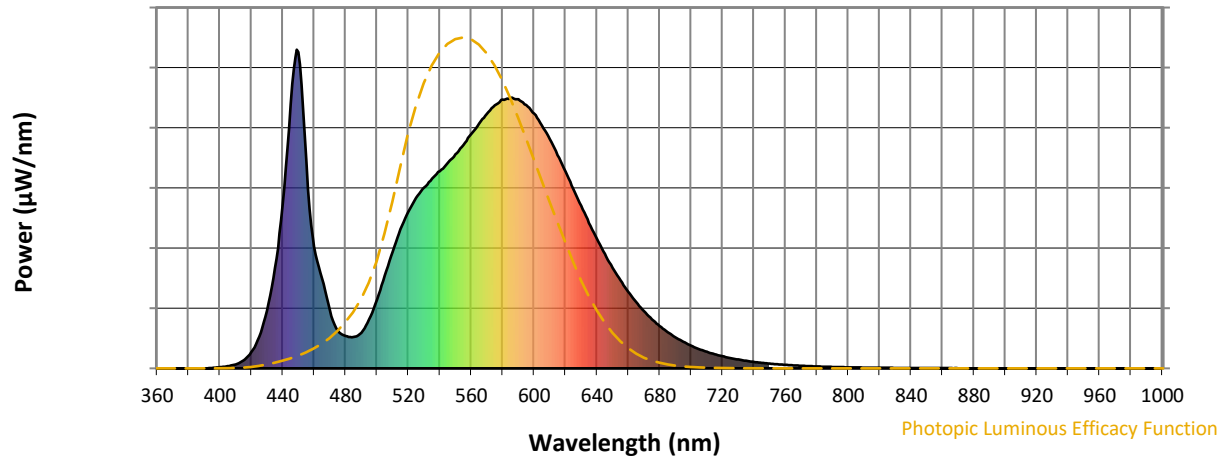
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 4000K 4-step quadrangle

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**Photopic Flux vs. Wavelength**

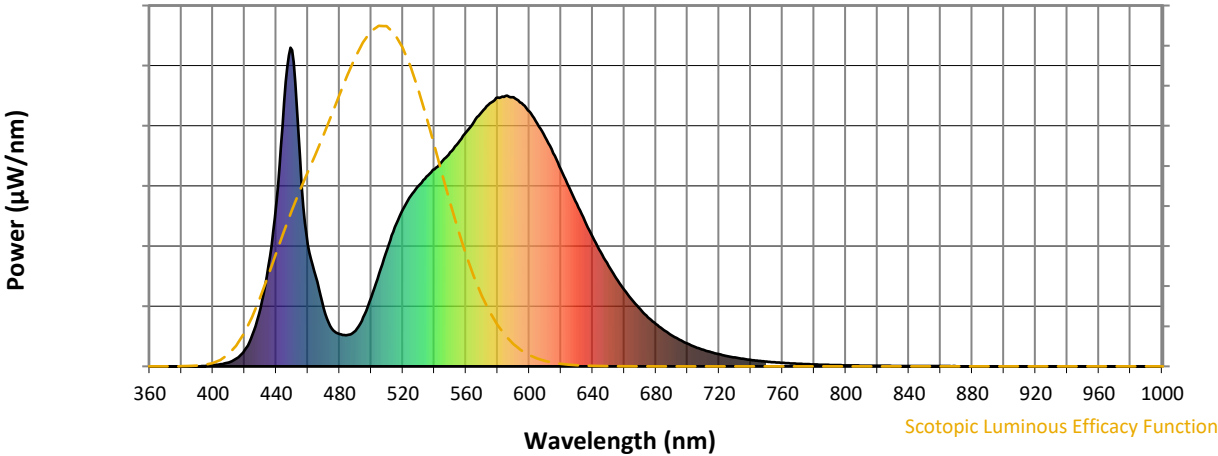


**Photopic Lumens: NR**

| λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) |
|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|
| 360    | 0                        | NR            | 490    | 112                      | NR            | 620    | 618                      | NR            | 750    | 15                       | NR            | 880    | 0                        | NR            |
| 365    | 0                        | NR            | 495    | 153                      | NR            | 625    | 563                      | NR            | 755    | 13                       | NR            | 885    | 0                        | NR            |
| 370    | 0                        | NR            | 500    | 216                      | NR            | 630    | 510                      | NR            | 760    | 11                       | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 291                      | NR            | 635    | 456                      | NR            | 765    | 9                        | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 366                      | NR            | 640    | 407                      | NR            | 770    | 8                        | NR            | 900    | 0                        | NR            |
| 385    | 0                        | NR            | 515    | 436                      | NR            | 645    | 359                      | NR            | 775    | 7                        | NR            | 905    | 0                        | NR            |
| 390    | 0                        | NR            | 520    | 492                      | NR            | 650    | 316                      | NR            | 780    | 6                        | NR            | 910    | 0                        | NR            |
| 395    | 2                        | NR            | 525    | 536                      | NR            | 655    | 277                      | NR            | 785    | 5                        | NR            | 915    | 0                        | NR            |
| 400    | 4                        | NR            | 530    | 567                      | NR            | 660    | 240                      | NR            | 790    | 4                        | NR            | 920    | 0                        | NR            |
| 405    | 7                        | NR            | 535    | 596                      | NR            | 665    | 208                      | NR            | 795    | 4                        | NR            | 925    | 0                        | NR            |
| 410    | 12                       | NR            | 540    | 619                      | NR            | 670    | 179                      | NR            | 800    | 3                        | NR            | 930    | 0                        | NR            |
| 415    | 25                       | NR            | 545    | 644                      | NR            | 675    | 154                      | NR            | 805    | 3                        | NR            | 935    | 0                        | NR            |
| 420    | 51                       | NR            | 550    | 671                      | NR            | 680    | 133                      | NR            | 810    | 3                        | NR            | 940    | 0                        | NR            |
| 425    | 100                      | NR            | 555    | 701                      | NR            | 685    | 114                      | NR            | 815    | 2                        | NR            | 945    | 0                        | NR            |
| 430    | 180                      | NR            | 560    | 735                      | NR            | 690    | 98                       | NR            | 820    | 2                        | NR            | 950    | 0                        | NR            |
| 435    | 315                      | NR            | 565    | 768                      | NR            | 695    | 83                       | NR            | 825    | 2                        | NR            | 955    | 0                        | NR            |
| 440    | 514                      | NR            | 570    | 798                      | NR            | 700    | 71                       | NR            | 830    | 1                        | NR            | 960    | 0                        | NR            |
| 445    | 828                      | NR            | 575    | 825                      | NR            | 705    | 61                       | NR            | 835    | 1                        | NR            | 965    | 0                        | NR            |
| 450    | 992                      | NR            | 580    | 843                      | NR            | 710    | 52                       | NR            | 840    | 1                        | NR            | 970    | 0                        | NR            |
| 455    | 652                      | NR            | 585    | 848                      | NR            | 715    | 44                       | NR            | 845    | 1                        | NR            | 975    | 0                        | NR            |
| 460    | 382                      | NR            | 590    | 844                      | NR            | 720    | 38                       | NR            | 850    | 1                        | NR            | 980    | 0                        | NR            |
| 465    | 282                      | NR            | 595    | 826                      | NR            | 725    | 32                       | NR            | 855    | 1                        | NR            | 985    | 0                        | NR            |
| 470    | 180                      | NR            | 600    | 800                      | NR            | 730    | 28                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 119                      | NR            | 605    | 762                      | NR            | 735    | 24                       | NR            | 865    | 1                        | NR            | 995    | 0                        | NR            |
| 480    | 101                      | NR            | 610    | 719                      | NR            | 740    | 20                       | NR            | 870    | 1                        | NR            | 1000   | 0                        | NR            |
| 485    | 98                       | NR            | 615    | 669                      | NR            | 745    | 17                       | NR            | 875    | 0                        | NR            |        |                          |               |

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Scotopic Flux vs. Wavelength

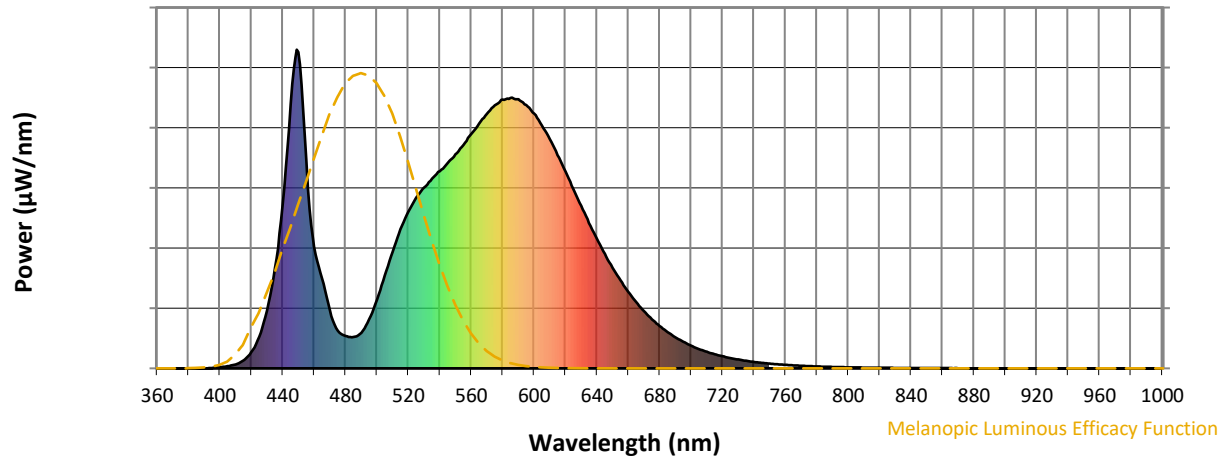


Scotopic Lumens: NR S/P: 1.49

| λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) |
|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|
| 360    | 0                        | NR            | 490    | 112                      | NR            | 620    | 618                      | NR            | 750    | 15                       | NR            | 880    | 0                        | NR            |
| 365    | 0                        | NR            | 495    | 153                      | NR            | 625    | 563                      | NR            | 755    | 13                       | NR            | 885    | 0                        | NR            |
| 370    | 0                        | NR            | 500    | 216                      | NR            | 630    | 510                      | NR            | 760    | 11                       | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 291                      | NR            | 635    | 456                      | NR            | 765    | 9                        | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 366                      | NR            | 640    | 407                      | NR            | 770    | 8                        | NR            | 900    | 0                        | NR            |
| 385    | 0                        | NR            | 515    | 436                      | NR            | 645    | 359                      | NR            | 775    | 7                        | NR            | 905    | 0                        | NR            |
| 390    | 0                        | NR            | 520    | 492                      | NR            | 650    | 316                      | NR            | 780    | 6                        | NR            | 910    | 0                        | NR            |
| 395    | 2                        | NR            | 525    | 536                      | NR            | 655    | 277                      | NR            | 785    | 5                        | NR            | 915    | 0                        | NR            |
| 400    | 4                        | NR            | 530    | 567                      | NR            | 660    | 240                      | NR            | 790    | 4                        | NR            | 920    | 0                        | NR            |
| 405    | 7                        | NR            | 535    | 596                      | NR            | 665    | 208                      | NR            | 795    | 4                        | NR            | 925    | 0                        | NR            |
| 410    | 12                       | NR            | 540    | 619                      | NR            | 670    | 179                      | NR            | 800    | 3                        | NR            | 930    | 0                        | NR            |
| 415    | 25                       | NR            | 545    | 644                      | NR            | 675    | 154                      | NR            | 805    | 3                        | NR            | 935    | 0                        | NR            |
| 420    | 51                       | NR            | 550    | 671                      | NR            | 680    | 133                      | NR            | 810    | 3                        | NR            | 940    | 0                        | NR            |
| 425    | 100                      | NR            | 555    | 701                      | NR            | 685    | 114                      | NR            | 815    | 2                        | NR            | 945    | 0                        | NR            |
| 430    | 180                      | NR            | 560    | 735                      | NR            | 690    | 98                       | NR            | 820    | 2                        | NR            | 950    | 0                        | NR            |
| 435    | 315                      | NR            | 565    | 768                      | NR            | 695    | 83                       | NR            | 825    | 2                        | NR            | 955    | 0                        | NR            |
| 440    | 514                      | NR            | 570    | 798                      | NR            | 700    | 71                       | NR            | 830    | 1                        | NR            | 960    | 0                        | NR            |
| 445    | 828                      | NR            | 575    | 825                      | NR            | 705    | 61                       | NR            | 835    | 1                        | NR            | 965    | 0                        | NR            |
| 450    | 992                      | NR            | 580    | 843                      | NR            | 710    | 52                       | NR            | 840    | 1                        | NR            | 970    | 0                        | NR            |
| 455    | 652                      | NR            | 585    | 848                      | NR            | 715    | 44                       | NR            | 845    | 1                        | NR            | 975    | 0                        | NR            |
| 460    | 382                      | NR            | 590    | 844                      | NR            | 720    | 38                       | NR            | 850    | 1                        | NR            | 980    | 0                        | NR            |
| 465    | 282                      | NR            | 595    | 826                      | NR            | 725    | 32                       | NR            | 855    | 1                        | NR            | 985    | 0                        | NR            |
| 470    | 180                      | NR            | 600    | 800                      | NR            | 730    | 28                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 119                      | NR            | 605    | 762                      | NR            | 735    | 24                       | NR            | 865    | 1                        | NR            | 995    | 0                        | NR            |
| 480    | 101                      | NR            | 610    | 719                      | NR            | 740    | 20                       | NR            | 870    | 1                        | NR            | 1000   | 0                        | NR            |
| 485    | 98                       | NR            | 615    | 669                      | NR            | 745    | 17                       | NR            | 875    | 0                        | NR            |        |                          |               |

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**Melanopic Flux vs. Wavelength**



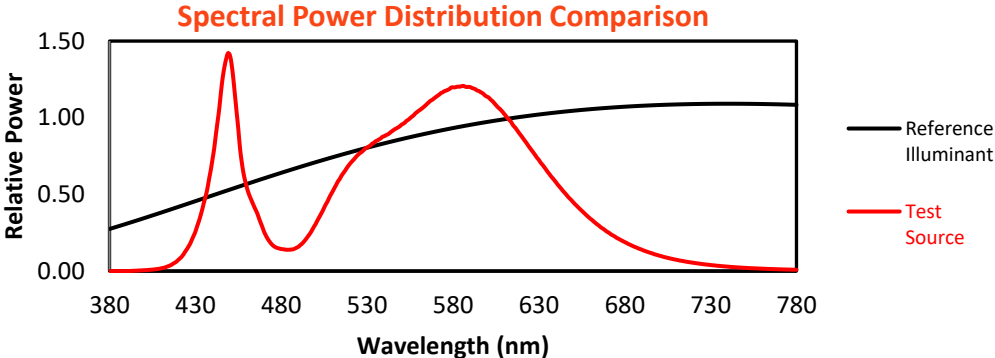
**Melanopic Lumens: NR**

**M/P: 2.88**

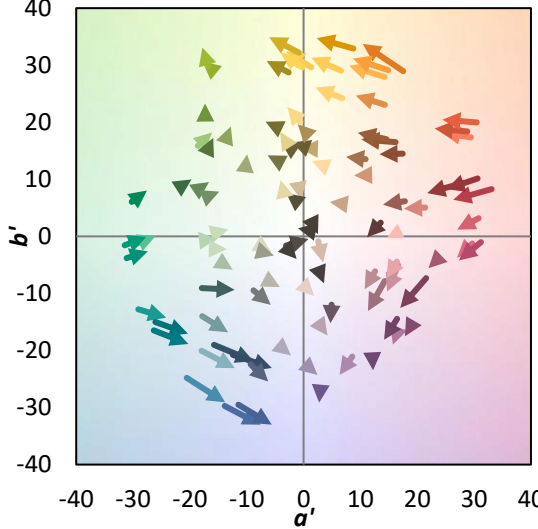
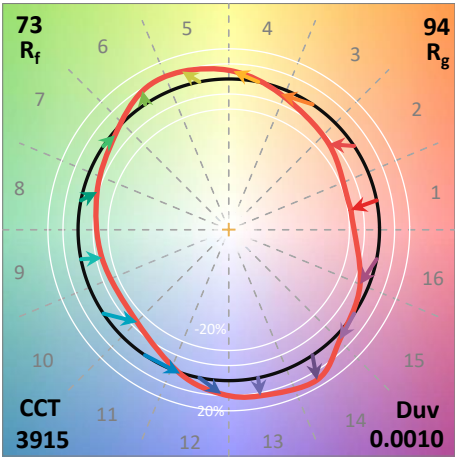
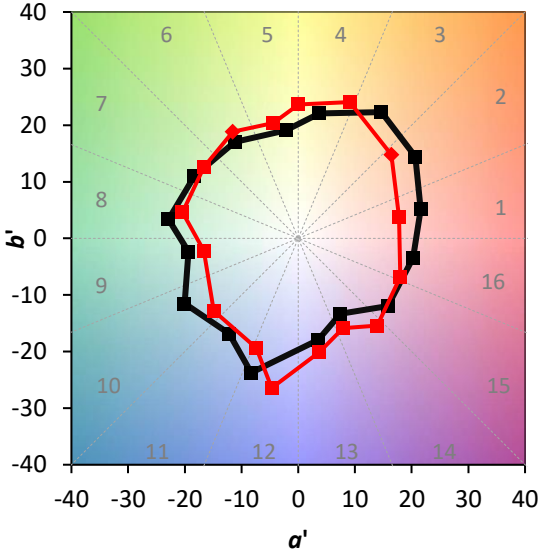
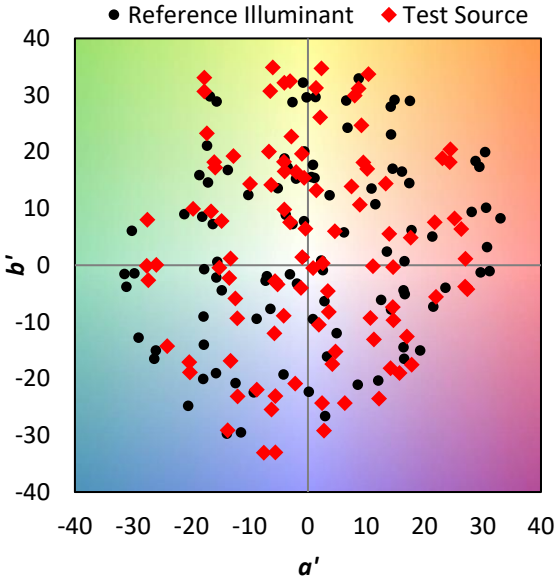
| λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) |
|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|
| 360    | 0                        | NR            | 490    | 112                      | NR            | 620    | 618                      | NR            | 750    | 15                       | NR            | 880    | 0                        | NR            |
| 365    | 0                        | NR            | 495    | 153                      | NR            | 625    | 563                      | NR            | 755    | 13                       | NR            | 885    | 0                        | NR            |
| 370    | 0                        | NR            | 500    | 216                      | NR            | 630    | 510                      | NR            | 760    | 11                       | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 291                      | NR            | 635    | 456                      | NR            | 765    | 9                        | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 366                      | NR            | 640    | 407                      | NR            | 770    | 8                        | NR            | 900    | 0                        | NR            |
| 385    | 0                        | NR            | 515    | 436                      | NR            | 645    | 359                      | NR            | 775    | 7                        | NR            | 905    | 0                        | NR            |
| 390    | 0                        | NR            | 520    | 492                      | NR            | 650    | 316                      | NR            | 780    | 6                        | NR            | 910    | 0                        | NR            |
| 395    | 2                        | NR            | 525    | 536                      | NR            | 655    | 277                      | NR            | 785    | 5                        | NR            | 915    | 0                        | NR            |
| 400    | 4                        | NR            | 530    | 567                      | NR            | 660    | 240                      | NR            | 790    | 4                        | NR            | 920    | 0                        | NR            |
| 405    | 7                        | NR            | 535    | 596                      | NR            | 665    | 208                      | NR            | 795    | 4                        | NR            | 925    | 0                        | NR            |
| 410    | 12                       | NR            | 540    | 619                      | NR            | 670    | 179                      | NR            | 800    | 3                        | NR            | 930    | 0                        | NR            |
| 415    | 25                       | NR            | 545    | 644                      | NR            | 675    | 154                      | NR            | 805    | 3                        | NR            | 935    | 0                        | NR            |
| 420    | 51                       | NR            | 550    | 671                      | NR            | 680    | 133                      | NR            | 810    | 3                        | NR            | 940    | 0                        | NR            |
| 425    | 100                      | NR            | 555    | 701                      | NR            | 685    | 114                      | NR            | 815    | 2                        | NR            | 945    | 0                        | NR            |
| 430    | 180                      | NR            | 560    | 735                      | NR            | 690    | 98                       | NR            | 820    | 2                        | NR            | 950    | 0                        | NR            |
| 435    | 315                      | NR            | 565    | 768                      | NR            | 695    | 83                       | NR            | 825    | 2                        | NR            | 955    | 0                        | NR            |
| 440    | 514                      | NR            | 570    | 798                      | NR            | 700    | 71                       | NR            | 830    | 1                        | NR            | 960    | 0                        | NR            |
| 445    | 828                      | NR            | 575    | 825                      | NR            | 705    | 61                       | NR            | 835    | 1                        | NR            | 965    | 0                        | NR            |
| 450    | 992                      | NR            | 580    | 843                      | NR            | 710    | 52                       | NR            | 840    | 1                        | NR            | 970    | 0                        | NR            |
| 455    | 652                      | NR            | 585    | 848                      | NR            | 715    | 44                       | NR            | 845    | 1                        | NR            | 975    | 0                        | NR            |
| 460    | 382                      | NR            | 590    | 844                      | NR            | 720    | 38                       | NR            | 850    | 1                        | NR            | 980    | 0                        | NR            |
| 465    | 282                      | NR            | 595    | 826                      | NR            | 725    | 32                       | NR            | 855    | 1                        | NR            | 985    | 0                        | NR            |
| 470    | 180                      | NR            | 600    | 800                      | NR            | 730    | 28                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 119                      | NR            | 605    | 762                      | NR            | 735    | 24                       | NR            | 865    | 1                        | NR            | 995    | 0                        | NR            |
| 480    | 101                      | NR            | 610    | 719                      | NR            | 740    | 20                       | NR            | 870    | 1                        | NR            | 1000   | 0                        | NR            |
| 485    | 98                       | NR            | 615    | 669                      | NR            | 745    | 17                       | NR            | 875    | 0                        | NR            |        |                          |               |

**Summary**

$R_f = 73.2$   
 $R_g = 93.9$   
 CIE  $R_a = 71.0$   
 $R_g = -38.4$

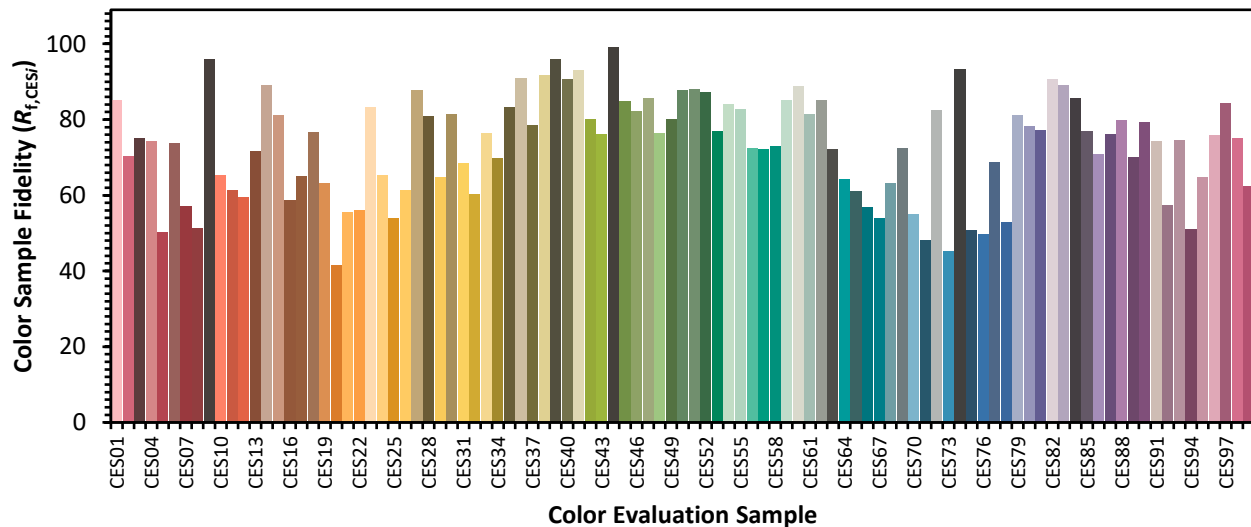


**Color Vector Graphics**



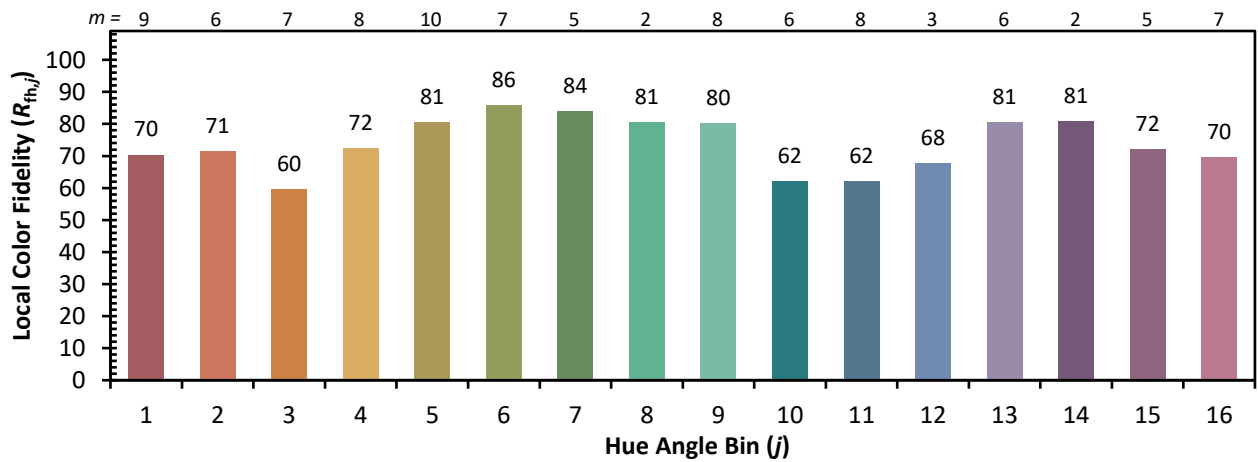
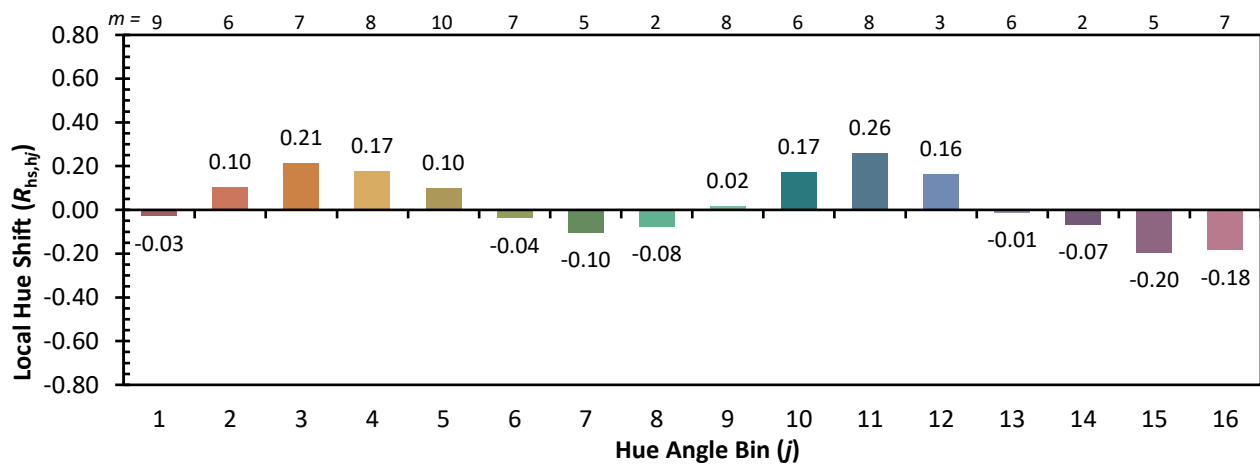
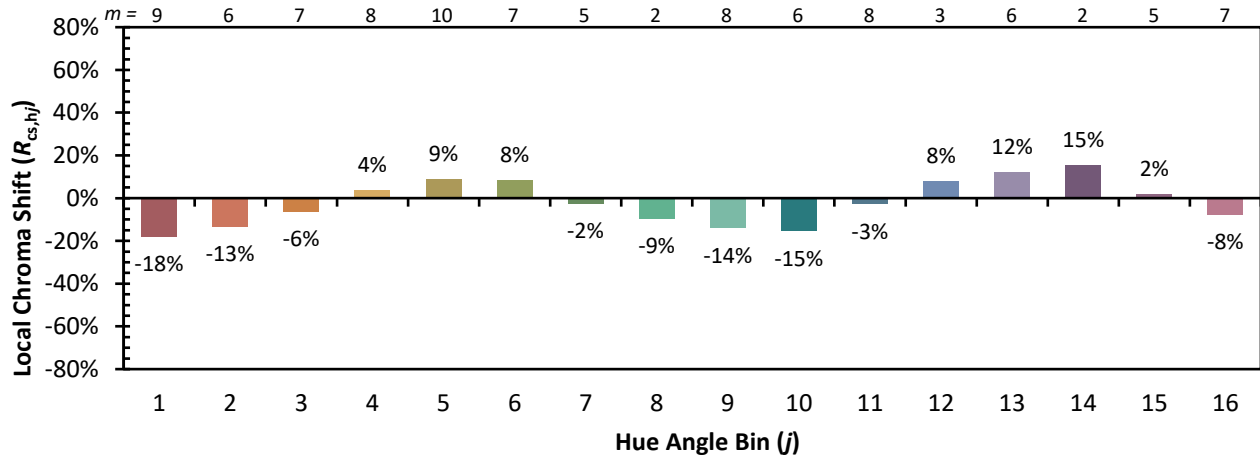
Individual Sample Fidelity Index ( $R_{f,i}$ )

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 61 | CES51 = 88 | CES76 = 50 |
| CES02 = 61 | CES27 = 88 | CES52 = 87 | CES77 = 69 |
| CES03 = 30 | CES28 = 81 | CES53 = 77 | CES78 = 53 |
| CES04 = 70 | CES29 = 65 | CES54 = 84 | CES79 = 81 |
| CES05 = 47 | CES30 = 81 | CES55 = 83 | CES80 = 78 |
| CES06 = 50 | CES31 = 69 | CES56 = 73 | CES81 = 77 |
| CES07 = 40 | CES32 = 60 | CES57 = 72 | CES82 = 91 |
| CES08 = 39 | CES33 = 76 | CES58 = 73 | CES83 = 89 |
| CES09 = 29 | CES34 = 70 | CES59 = 85 | CES84 = 86 |
| CES10 = 74 | CES35 = 83 | CES60 = 89 | CES85 = 77 |
| CES11 = 57 | CES36 = 91 | CES61 = 81 | CES86 = 71 |
| CES12 = 63 | CES37 = 79 | CES62 = 85 | CES87 = 76 |
| CES13 = 42 | CES38 = 92 | CES63 = 72 | CES88 = 80 |
| CES14 = 74 | CES39 = 96 | CES64 = 64 | CES89 = 70 |
| CES15 = 71 | CES40 = 91 | CES65 = 61 | CES90 = 79 |
| CES16 = 46 | CES41 = 93 | CES66 = 57 | CES91 = 74 |
| CES17 = 49 | CES42 = 80 | CES67 = 54 | CES92 = 57 |
| CES18 = 56 | CES43 = 76 | CES68 = 63 | CES93 = 74 |
| CES19 = 72 | CES44 = 99 | CES69 = 73 | CES94 = 51 |
| CES20 = 65 | CES45 = 85 | CES70 = 55 | CES95 = 65 |
| CES21 = 86 | CES46 = 82 | CES71 = 48 | CES96 = 76 |
| CES22 = 78 | CES47 = 86 | CES72 = 83 | CES97 = 84 |
| CES23 = 92 | CES48 = 77 | CES73 = 45 | CES98 = 75 |
| CES24 = 91 | CES49 = 80 | CES74 = 93 | CES99 = 62 |
| CES25 = 72 | CES50 = 88 | CES75 = 51 |            |

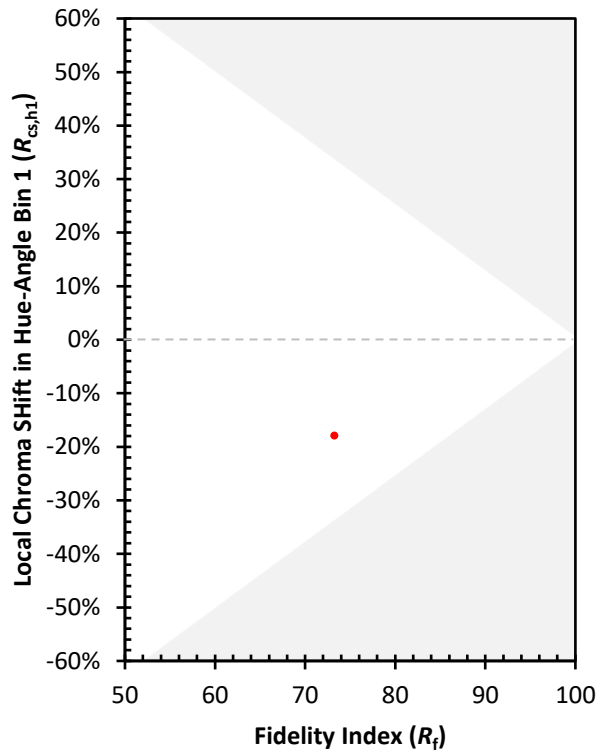
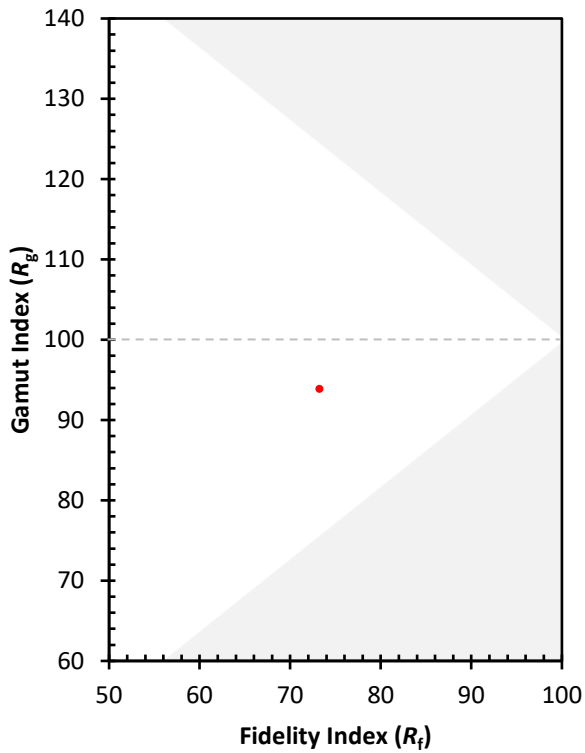




Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)