

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: P879549

Luminaire Tested: **MEM2-HSN-VA-160-750-U-WQ**

Issue Date: 10/01/2024



**Test Information**

Test Method: LM-79-08  
Report Number: P879549  
Test Lab: INNOVATION CENTER(G3)  
Issue Date: 10/01/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: STREETWORKS  
Catalog Number: MEM2-HSN-VA-160-750-U-WQ  
Description: EPIC MODERN SHORT HOUSING 160W 70CRI 5000K VISUAL COMFORT FIXTURE  
w/ TYPE V WIDE DISTRIBUTION OPTIC  
Light Source: (1) 5000K CCT, 70 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

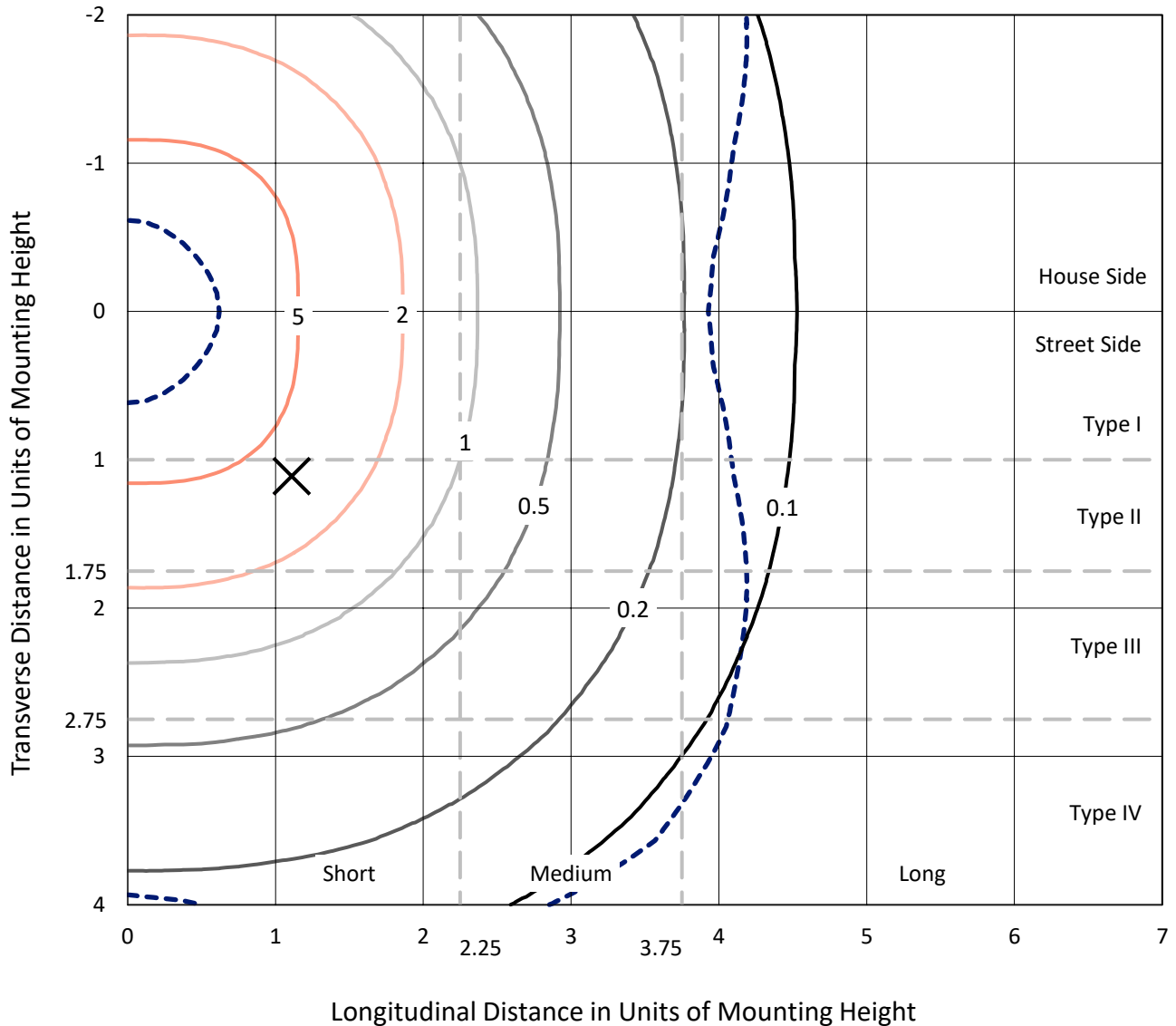
Lumens per Lamp: N/A  
Luminaire Lumens: 19130.1 lumens  
Efficiency: N/A  
Efficacy: 122.6 lumens/watt  
Luminous Opening: Circular (Dia: 1.12' x H: 0')  
IES Classification: Type V - Short  
BUG Rating: B4 - U0 - G3

Input Watts (W): 156  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.995  
Total Harmonic Distortion (THDi): 6.6%  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

REPORT NUMBER: P879549  
 CATALOG NUMBER: MEM2-HSN-VA-160-750-U-WQ

### Iso-Footcandle Lines of Horizontal Illumination

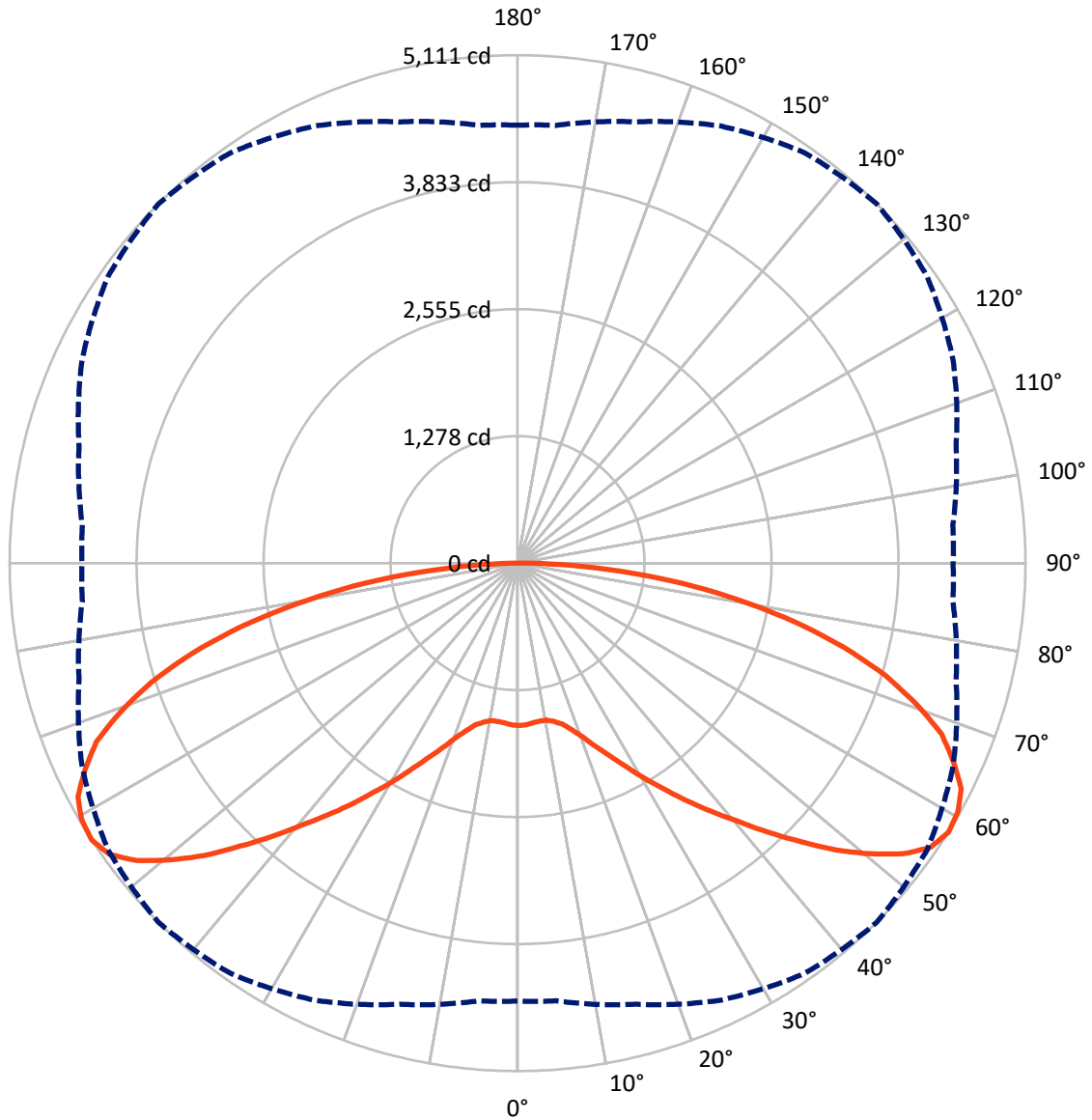
× Max cd  
 - - - 1/2 Max cd



Based on 15 foot mounting height. Maximum calculated value = 7.3 fc  
 Type V - Short - N/A

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### Luminous Intensity Polar Plot



— Vertical Plane Through 45-Deg Lateral    - - - Horizontal Cone Through 57.5-Deg Vertical

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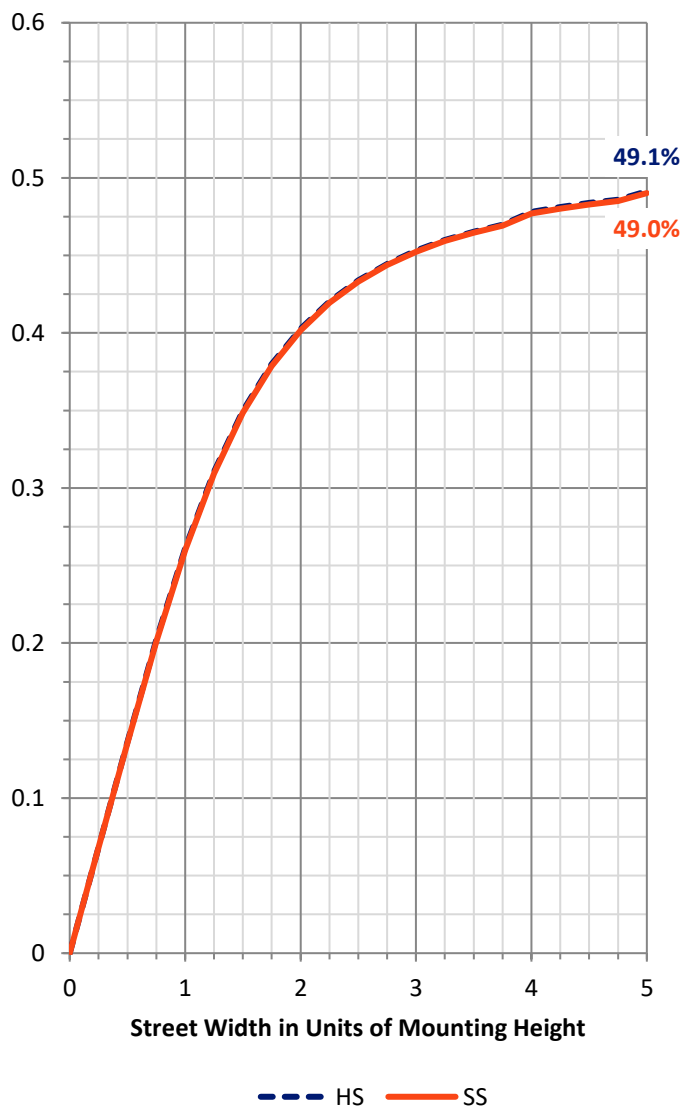
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 9565.0   | 0.0    | 9565.0  |
|                    | % Fixture | 50.0     | 0.0    | 50.0    |
| <b>Street Side</b> | Lumens    | 9565.0   | 0.0    | 9565.0  |
|                    | % Fixture | 50.0     | 0.0    | 50.0    |
| <b>Total</b>       | Lumens    | 19130.1  | 0.0    | 19130.1 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 153.8   | 0.8       |
| 10°-20°   | 483.6   | 2.5       |
| 20°-30°   | 994.0   | 5.2       |
| 30°-40°   | 1813.7  | 9.5       |
| 40°-50°   | 2974.3  | 15.5      |
| 50°-60°   | 4167.8  | 21.8      |
| 60°-70°   | 4360.1  | 22.8      |
| 70°-80°   | 3185.6  | 16.7      |
| 80°-90°   | 997.1   | 5.2       |
| 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°    | 19130.1 | 100.0     |
| 0°-180°   | 19130.1 | 100.0     |



REPORT NUMBER: P879549

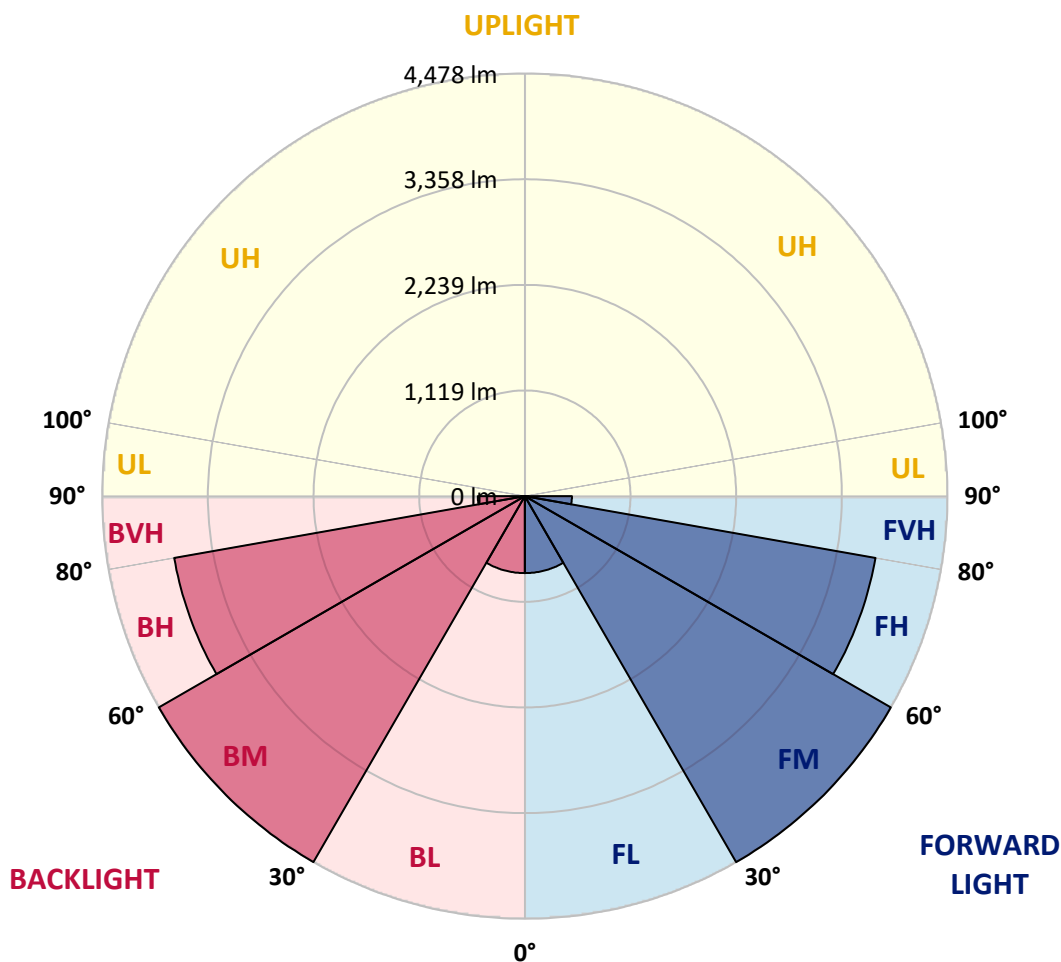
CATALOG NUMBER: MEM2-HSN-VA-160-750-U-WQ

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

| Zone           | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|----------------|--------|-----------|-------------------------|------|---------|
|                |        |           | B                       | U    | G       |
| FL (0°-30°)    | 815.7  | 4.3       |                         |      |         |
| FM (30°-60°)   | 4478.0 | 23.4      |                         |      |         |
| FH (60°-80°)   | 3772.8 | 19.7      |                         |      | G2/5000 |
| FVH (80°-90°)  | 498.6  | 2.6       |                         |      | G3/500  |
| BL (0°-30°)    | 815.7  | 4.3       | B2/1000                 |      |         |
| BM (30°-60°)   | 4478.0 | 23.4      | B3/5000                 |      |         |
| BH (60°-80°)   | 3772.8 | 19.7      | B4/5000                 |      | G2/5000 |
| BVH (80°-90°)  | 498.6  | 2.6       |                         |      | G3/500  |
| UL (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B4-U0-G3**

Type V Short





REPORT NUMBER: P879549

CATALOG NUMBER: MEM2-HSN-VA-160-750-U-WQ

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 75°    | 85°    | 90°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1633.3 | 1633.3 | 1633.3 | 1633.3 | 1633.3 | 1633.3 | 1633.3 | 1633.3 | 1633.3 | 1633.3 | 1633.3 |
| 2.5°  | 1627.3 | 1629.7 | 1628.5 | 1628.5 | 1627.3 | 1628.5 | 1630.9 | 1632.1 | 1630.9 | 1632.1 | 1630.9 |
| 5°    | 1616.6 | 1616.6 | 1615.4 | 1614.2 | 1614.2 | 1614.2 | 1614.2 | 1614.2 | 1615.4 | 1615.4 | 1616.6 |
| 7.5°  | 1603.4 | 1603.4 | 1603.4 | 1605.8 | 1604.6 | 1605.8 | 1605.8 | 1604.6 | 1603.4 | 1603.4 | 1604.6 |
| 10°   | 1605.8 | 1604.6 | 1603.4 | 1605.8 | 1604.6 | 1605.8 | 1605.8 | 1603.4 | 1604.6 | 1605.8 | 1607.0 |
| 12.5° | 1626.1 | 1623.7 | 1627.3 | 1630.9 | 1633.3 | 1635.7 | 1634.5 | 1633.3 | 1629.7 | 1626.1 | 1626.1 |
| 15°   | 1670.5 | 1668.1 | 1671.7 | 1676.5 | 1677.7 | 1678.9 | 1682.5 | 1677.7 | 1676.5 | 1670.5 | 1669.3 |
| 17.5° | 1734.0 | 1732.8 | 1740.0 | 1749.6 | 1754.4 | 1760.4 | 1754.4 | 1749.6 | 1736.4 | 1734.0 | 1737.6 |
| 20°   | 1825.1 | 1821.5 | 1835.8 | 1851.4 | 1856.2 | 1863.4 | 1858.6 | 1849.0 | 1835.8 | 1821.5 | 1821.5 |
| 22.5° | 1941.3 | 1949.7 | 1956.9 | 1968.9 | 1988.0 | 2000.0 | 1984.4 | 1967.7 | 1948.5 | 1940.1 | 1934.1 |
| 25°   | 2092.3 | 2091.1 | 2098.3 | 2122.2 | 2134.2 | 2142.6 | 2140.2 | 2117.5 | 2100.7 | 2088.7 | 2087.5 |
| 27.5° | 2237.3 | 2251.7 | 2266.0 | 2281.6 | 2311.6 | 2315.2 | 2311.6 | 2284.0 | 2257.7 | 2248.1 | 2244.5 |
| 30°   | 2430.2 | 2427.8 | 2441.0 | 2478.2 | 2508.1 | 2510.5 | 2500.9 | 2467.4 | 2437.4 | 2419.4 | 2421.8 |
| 32.5° | 2618.4 | 2599.2 | 2633.9 | 2659.1 | 2684.3 | 2710.6 | 2685.5 | 2659.1 | 2633.9 | 2595.6 | 2607.6 |
| 35°   | 2789.7 | 2805.3 | 2824.5 | 2876.0 | 2927.5 | 2938.3 | 2921.5 | 2867.6 | 2818.5 | 2800.5 | 2780.1 |
| 37.5° | 2999.4 | 2999.4 | 3031.8 | 3107.3 | 3154.0 | 3170.8 | 3146.8 | 3092.9 | 3024.6 | 2998.2 | 2988.6 |
| 40°   | 3210.3 | 3210.3 | 3259.5 | 3323.0 | 3392.5 | 3416.5 | 3390.1 | 3319.4 | 3263.1 | 3194.8 | 3205.5 |
| 42.5° | 3415.3 | 3432.0 | 3496.7 | 3574.6 | 3671.7 | 3704.1 | 3666.9 | 3572.2 | 3490.7 | 3426.0 | 3416.5 |
| 45°   | 3641.7 | 3668.1 | 3738.8 | 3867.0 | 3949.7 | 3996.4 | 3944.9 | 3863.4 | 3719.6 | 3657.3 | 3623.8 |
| 47.5° | 3888.6 | 3906.6 | 4008.4 | 4130.7 | 4264.9 | 4314.0 | 4252.9 | 4119.9 | 3997.6 | 3887.4 | 3882.6 |
| 50°   | 4103.1 | 4099.5 | 4230.1 | 4399.1 | 4551.3 | 4598.0 | 4548.9 | 4405.1 | 4206.2 | 4083.9 | 4095.9 |
| 52.5° | 4263.7 | 4284.0 | 4421.9 | 4630.4 | 4792.1 | 4860.4 | 4780.2 | 4607.6 | 4400.3 | 4273.3 | 4234.9 |
| 55°   | 4367.9 | 4401.5 | 4562.1 | 4787.3 | 4971.9 | 5045.0 | 4965.9 | 4767.0 | 4540.5 | 4376.3 | 4353.5 |
| 57.5° | 4406.3 | 4420.7 | 4595.6 | 4850.9 | 5039.0 | 5110.9 | 5029.4 | 4835.3 | 4568.0 | 4396.7 | 4382.3 |
| 60°   | 4347.6 | 4361.9 | 4551.3 | 4812.5 | 5028.2 | 5089.3 | 5024.6 | 4796.9 | 4524.9 | 4350.0 | 4326.0 |
| 62.5° | 4203.8 | 4243.3 | 4453.0 | 4711.8 | 4958.7 | 5010.2 | 4943.1 | 4693.9 | 4442.2 | 4231.3 | 4196.6 |
| 65°   | 4031.2 | 4073.1 | 4251.7 | 4540.5 | 4764.6 | 4819.7 | 4767.0 | 4527.3 | 4252.9 | 4050.4 | 4016.8 |
| 67.5° | 3790.3 | 3797.5 | 4007.2 | 4299.6 | 4536.9 | 4604.0 | 4512.9 | 4294.8 | 3996.4 | 3804.7 | 3778.3 |
| 70°   | 3489.5 | 3494.3 | 3717.2 | 3988.1 | 4206.2 | 4261.3 | 4201.4 | 3968.9 | 3701.7 | 3493.1 | 3475.2 |
| 72.5° | 3103.7 | 3148.0 | 3332.6 | 3601.0 | 3804.7 | 3869.4 | 3791.5 | 3593.8 | 3346.9 | 3140.8 | 3100.1 |
| 75°   | 2693.9 | 2721.4 | 2882.0 | 3142.0 | 3317.0 | 3397.3 | 3333.8 | 3142.0 | 2882.0 | 2711.8 | 2675.9 |
| 77.5° | 2214.5 | 2251.7 | 2408.7 | 2627.9 | 2772.9 | 2859.2 | 2789.7 | 2619.6 | 2408.7 | 2252.9 | 2251.7 |
| 80°   | 1749.6 | 1740.0 | 1882.6 | 2071.9 | 2215.7 | 2266.0 | 2222.9 | 2057.5 | 1868.2 | 1747.2 | 1730.4 |
| 82.5° | 1213.9 | 1211.5 | 1366.1 | 1493.1 | 1614.2 | 1671.7 | 1605.8 | 1499.1 | 1352.9 | 1245.1 | 1210.3 |
| 85°   | 690.2  | 705.8  | 807.7  | 886.8  | 989.8  | 1024.6 | 1001.8 | 901.1  | 770.5  | 675.9  | 669.9  |
| 87.5° | 239.7  | 261.2  | 280.4  | 337.9  | 405.0  | 435.0  | 402.6  | 387.1  | 343.9  | 298.4  | 300.8  |
| 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: SP1-2407-176-10

Test Date: 09/25/2024

Luminaire Tested: MEM2-HTN-VA-130-750-U-RW

Data in this report applies to families of products including MEM2-HTN-VA-130-750-U-RW



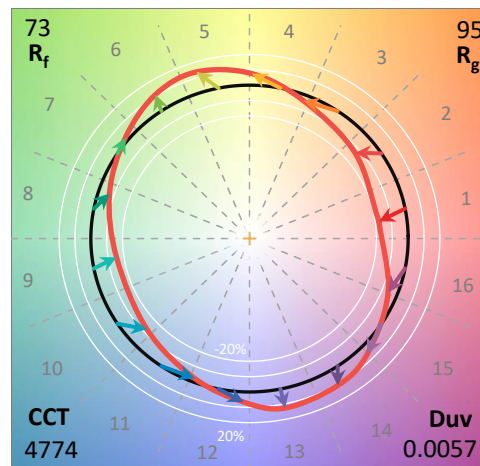
**Test Information**

Test Method: LM-79-2019  
 Report Number: SP1-2407-176-10  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry: 4π  
 Issue Date: 09/27/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: Streetworks  
 Catalog Number: **MEM2-HTN-VA-130-750-U-RW**  
 Description: EPIC MODERN VISUAL COMFORT 130W WAVESTREAM RECTANGULAR WIDE

**Spectral Parameters**

CCT (K): 4774  
 CIE u': 0.2100  
 CIE v': 0.4945  
 Duv: 0.0057  
 CIE x: 0.3535  
 CIE y: 0.3699  
 CIE z: 0.2766  
 Peak Wavelength (nm): 444  
 Dominant Wavelength (nm): 571  
 Purity: 17.0787  
 Rf: 73.1  
 Rg: 94.9

|           |      |      |       |
|-----------|------|------|-------|
| CRI (Ra): | 70.8 |      |       |
| R1:       | 67.0 | R9:  | -40.0 |
| R2:       | 75.4 | R10: | 43.4  |
| R3:       | 83.5 | R11: | 69.3  |
| R4:       | 71.8 | R12: | 45.5  |
| R5:       | 68.4 | R13: | 67.9  |
| R6:       | 67.5 | R14: | 90.8  |
| R7:       | 80.0 | R15: | 58.2  |
| R8:       | 53.1 |      |       |



**Test Conditions**

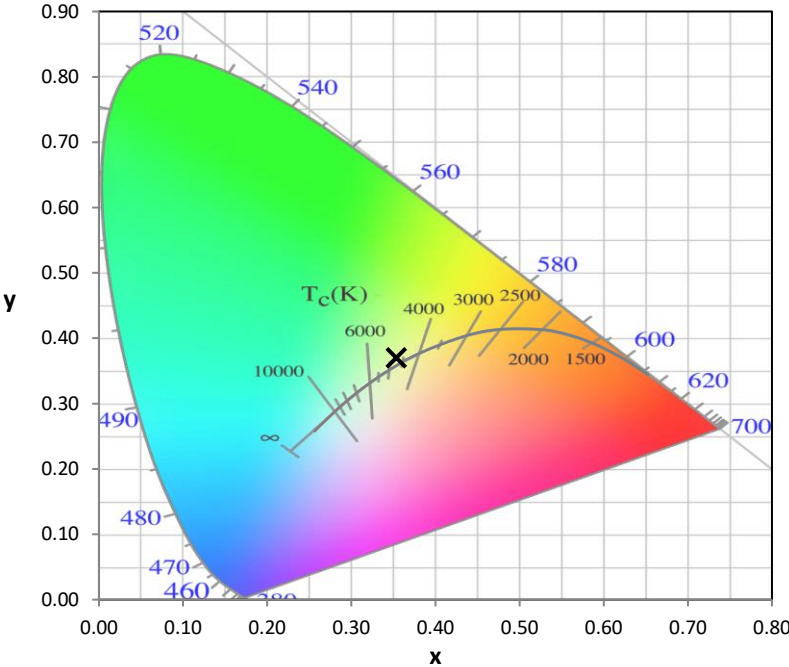
Stabilization Time: 37M  
 Operation Time: 1H 37M  
 Sphere Temperature (°C): 25.2

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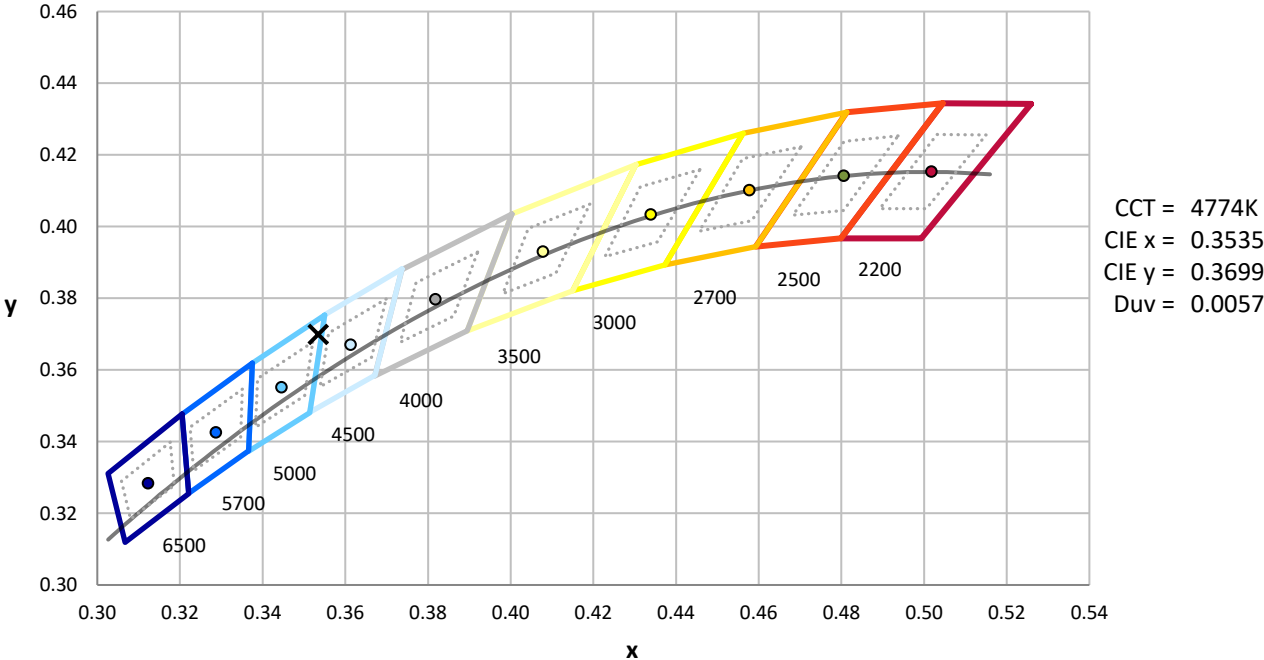
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date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



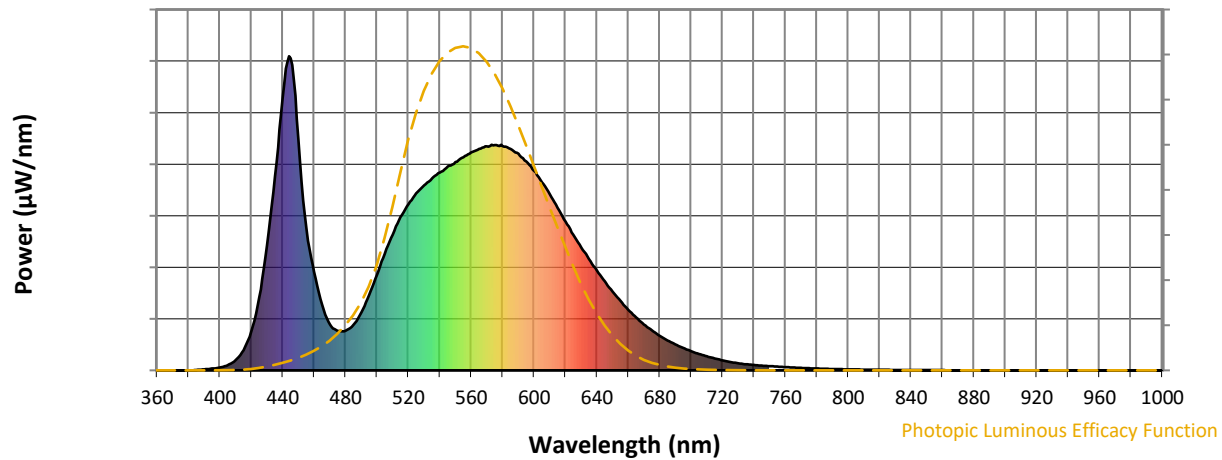
CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies inside the ANSI 5000K 7-step quadrangle

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**Photopic Flux vs. Wavelength**

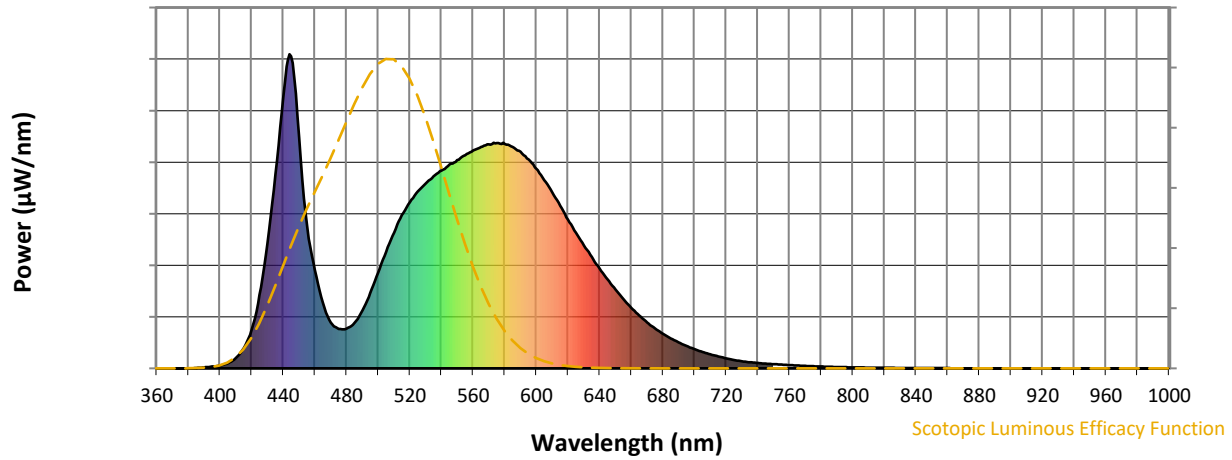


**Photopic Lumens: NR**

| $\lambda$<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               | 184                         | NR                      | 620               | 474                         | NR                      | 750               | 13                          | NR                      | 880               | 0                           | NR                      |
| 365               | 0                           | NR                      | 495               | 239                         | NR                      | 625               | 432                         | NR                      | 755               | 12                          | NR                      | 885               | 0                           | NR                      |
| 370               | 0                           | NR                      | 500               | 305                         | NR                      | 630               | 392                         | NR                      | 760               | 10                          | NR                      | 890               | 0                           | NR                      |
| 375               | 0                           | NR                      | 505               | 371                         | NR                      | 635               | 354                         | NR                      | 765               | 9                           | NR                      | 895               | 0                           | NR                      |
| 380               | 0                           | NR                      | 510               | 432                         | NR                      | 640               | 318                         | NR                      | 770               | 8                           | NR                      | 900               | 0                           | NR                      |
| 385               | 1                           | NR                      | 515               | 488                         | NR                      | 645               | 283                         | NR                      | 775               | 7                           | NR                      | 905               | 0                           | NR                      |
| 390               | 3                           | NR                      | 520               | 529                         | NR                      | 650               | 251                         | NR                      | 780               | 6                           | NR                      | 910               | 0                           | NR                      |
| 395               | 6                           | NR                      | 525               | 563                         | NR                      | 655               | 221                         | NR                      | 785               | 5                           | NR                      | 915               | 0                           | NR                      |
| 400               | 9                           | NR                      | 530               | 589                         | NR                      | 660               | 193                         | NR                      | 790               | 4                           | NR                      | 920               | 0                           | NR                      |
| 405               | 16                          | NR                      | 535               | 611                         | NR                      | 665               | 169                         | NR                      | 795               | 4                           | NR                      | 925               | 0                           | NR                      |
| 410               | 33                          | NR                      | 540               | 629                         | NR                      | 670               | 146                         | NR                      | 800               | 3                           | NR                      | 930               | 0                           | NR                      |
| 415               | 64                          | NR                      | 545               | 649                         | NR                      | 675               | 127                         | NR                      | 805               | 3                           | NR                      | 935               | 0                           | NR                      |
| 420               | 124                         | NR                      | 550               | 663                         | NR                      | 680               | 110                         | NR                      | 810               | 2                           | NR                      | 940               | 0                           | NR                      |
| 425               | 233                         | NR                      | 555               | 678                         | NR                      | 685               | 95                          | NR                      | 815               | 2                           | NR                      | 945               | 0                           | NR                      |
| 430               | 397                         | NR                      | 560               | 693                         | NR                      | 690               | 83                          | NR                      | 820               | 2                           | NR                      | 950               | 0                           | NR                      |
| 435               | 617                         | NR                      | 565               | 705                         | NR                      | 695               | 71                          | NR                      | 825               | 2                           | NR                      | 955               | 0                           | NR                      |
| 440               | 868                         | NR                      | 570               | 713                         | NR                      | 700               | 61                          | NR                      | 830               | 1                           | NR                      | 960               | 0                           | NR                      |
| 445               | 994                         | NR                      | 575               | 717                         | NR                      | 705               | 52                          | NR                      | 835               | 1                           | NR                      | 965               | 0                           | NR                      |
| 450               | 736                         | NR                      | 580               | 715                         | NR                      | 710               | 45                          | NR                      | 840               | 1                           | NR                      | 970               | 0                           | NR                      |
| 455               | 454                         | NR                      | 585               | 705                         | NR                      | 715               | 38                          | NR                      | 845               | 1                           | NR                      | 975               | 0                           | NR                      |
| 460               | 314                         | NR                      | 590               | 689                         | NR                      | 720               | 32                          | NR                      | 850               | 1                           | NR                      | 980               | 0                           | NR                      |
| 465               | 210                         | NR                      | 595               | 665                         | NR                      | 725               | 27                          | NR                      | 855               | 1                           | NR                      | 985               | 0                           | NR                      |
| 470               | 146                         | NR                      | 600               | 635                         | NR                      | 730               | 23                          | NR                      | 860               | 1                           | NR                      | 990               | 0                           | NR                      |
| 475               | 126                         | NR                      | 605               | 599                         | NR                      | 735               | 19                          | NR                      | 865               | 0                           | NR                      | 995               | 0                           | NR                      |
| 480               | 126                         | NR                      | 610               | 561                         | NR                      | 740               | 17                          | NR                      | 870               | 0                           | NR                      | 1000              | 0                           | NR                      |
| 485               | 144                         | NR                      | 615               | 517                         | NR                      | 745               | 15                          | NR                      | 875               | 0                           | NR                      |                   |                             |                         |

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**Scotopic Flux vs. Wavelength**



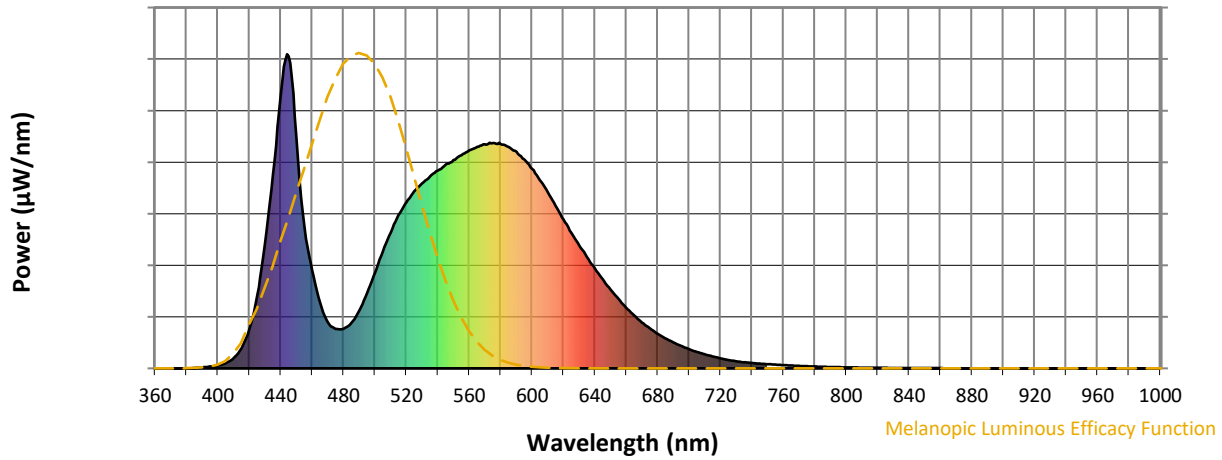
**Scotopic Lumens: NR**

**S/P: 1.71**

| 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    | 184                      | NR            | 620    | 474                      | NR            | 750    | 13                       | NR            | 880    | 0                        | NR            |
| 365    | 0                        | NR            | 495    | 239                      | NR            | 625    | 432                      | NR            | 755    | 12                       | NR            | 885    | 0                        | NR            |
| 370    | 0                        | NR            | 500    | 305                      | NR            | 630    | 392                      | NR            | 760    | 10                       | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 371                      | NR            | 635    | 354                      | NR            | 765    | 9                        | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 432                      | NR            | 640    | 318                      | NR            | 770    | 8                        | NR            | 900    | 0                        | NR            |
| 385    | 1                        | NR            | 515    | 488                      | NR            | 645    | 283                      | NR            | 775    | 7                        | NR            | 905    | 0                        | NR            |
| 390    | 3                        | NR            | 520    | 529                      | NR            | 650    | 251                      | NR            | 780    | 6                        | NR            | 910    | 0                        | NR            |
| 395    | 6                        | NR            | 525    | 563                      | NR            | 655    | 221                      | NR            | 785    | 5                        | NR            | 915    | 0                        | NR            |
| 400    | 9                        | NR            | 530    | 589                      | NR            | 660    | 193                      | NR            | 790    | 4                        | NR            | 920    | 0                        | NR            |
| 405    | 16                       | NR            | 535    | 611                      | NR            | 665    | 169                      | NR            | 795    | 4                        | NR            | 925    | 0                        | NR            |
| 410    | 33                       | NR            | 540    | 629                      | NR            | 670    | 146                      | NR            | 800    | 3                        | NR            | 930    | 0                        | NR            |
| 415    | 64                       | NR            | 545    | 649                      | NR            | 675    | 127                      | NR            | 805    | 3                        | NR            | 935    | 0                        | NR            |
| 420    | 124                      | NR            | 550    | 663                      | NR            | 680    | 110                      | NR            | 810    | 2                        | NR            | 940    | 0                        | NR            |
| 425    | 233                      | NR            | 555    | 678                      | NR            | 685    | 95                       | NR            | 815    | 2                        | NR            | 945    | 0                        | NR            |
| 430    | 397                      | NR            | 560    | 693                      | NR            | 690    | 83                       | NR            | 820    | 2                        | NR            | 950    | 0                        | NR            |
| 435    | 617                      | NR            | 565    | 705                      | NR            | 695    | 71                       | NR            | 825    | 2                        | NR            | 955    | 0                        | NR            |
| 440    | 868                      | NR            | 570    | 713                      | NR            | 700    | 61                       | NR            | 830    | 1                        | NR            | 960    | 0                        | NR            |
| 445    | 994                      | NR            | 575    | 717                      | NR            | 705    | 52                       | NR            | 835    | 1                        | NR            | 965    | 0                        | NR            |
| 450    | 736                      | NR            | 580    | 715                      | NR            | 710    | 45                       | NR            | 840    | 1                        | NR            | 970    | 0                        | NR            |
| 455    | 454                      | NR            | 585    | 705                      | NR            | 715    | 38                       | NR            | 845    | 1                        | NR            | 975    | 0                        | NR            |
| 460    | 314                      | NR            | 590    | 689                      | NR            | 720    | 32                       | NR            | 850    | 1                        | NR            | 980    | 0                        | NR            |
| 465    | 210                      | NR            | 595    | 665                      | NR            | 725    | 27                       | NR            | 855    | 1                        | NR            | 985    | 0                        | NR            |
| 470    | 146                      | NR            | 600    | 635                      | NR            | 730    | 23                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 126                      | NR            | 605    | 599                      | NR            | 735    | 19                       | NR            | 865    | 0                        | NR            | 995    | 0                        | NR            |
| 480    | 126                      | NR            | 610    | 561                      | NR            | 740    | 17                       | NR            | 870    | 0                        | NR            | 1000   | 0                        | NR            |
| 485    | 144                      | NR            | 615    | 517                      | NR            | 745    | 15                       | NR            | 875    | 0                        | NR            |        |                          |               |

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**Melanopic Flux vs. Wavelength**



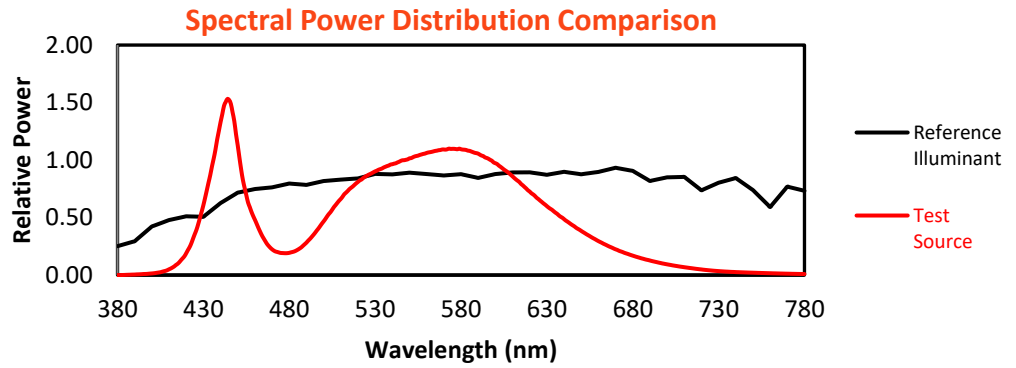
**Melanopic Lumens: NR**

**M/P: 3.39**

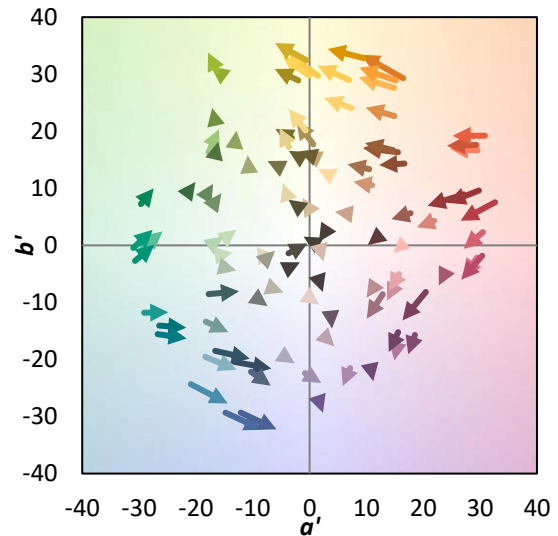
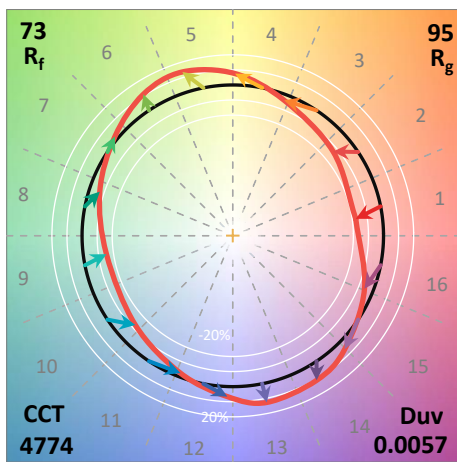
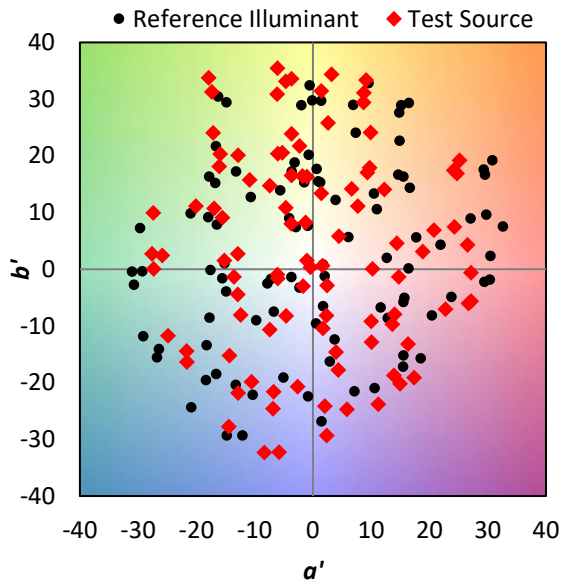
| λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) |
|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|
| 360    | 0                        | NR            | 490    | 184                      | NR            | 620    | 474                      | NR            | 750    | 13                       | NR            | 880    | 0                        | NR            |
| 365    | 0                        | NR            | 495    | 239                      | NR            | 625    | 432                      | NR            | 755    | 12                       | NR            | 885    | 0                        | NR            |
| 370    | 0                        | NR            | 500    | 305                      | NR            | 630    | 392                      | NR            | 760    | 10                       | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 371                      | NR            | 635    | 354                      | NR            | 765    | 9                        | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 432                      | NR            | 640    | 318                      | NR            | 770    | 8                        | NR            | 900    | 0                        | NR            |
| 385    | 1                        | NR            | 515    | 488                      | NR            | 645    | 283                      | NR            | 775    | 7                        | NR            | 905    | 0                        | NR            |
| 390    | 3                        | NR            | 520    | 529                      | NR            | 650    | 251                      | NR            | 780    | 6                        | NR            | 910    | 0                        | NR            |
| 395    | 6                        | NR            | 525    | 563                      | NR            | 655    | 221                      | NR            | 785    | 5                        | NR            | 915    | 0                        | NR            |
| 400    | 9                        | NR            | 530    | 589                      | NR            | 660    | 193                      | NR            | 790    | 4                        | NR            | 920    | 0                        | NR            |
| 405    | 16                       | NR            | 535    | 611                      | NR            | 665    | 169                      | NR            | 795    | 4                        | NR            | 925    | 0                        | NR            |
| 410    | 33                       | NR            | 540    | 629                      | NR            | 670    | 146                      | NR            | 800    | 3                        | NR            | 930    | 0                        | NR            |
| 415    | 64                       | NR            | 545    | 649                      | NR            | 675    | 127                      | NR            | 805    | 3                        | NR            | 935    | 0                        | NR            |
| 420    | 124                      | NR            | 550    | 663                      | NR            | 680    | 110                      | NR            | 810    | 2                        | NR            | 940    | 0                        | NR            |
| 425    | 233                      | NR            | 555    | 678                      | NR            | 685    | 95                       | NR            | 815    | 2                        | NR            | 945    | 0                        | NR            |
| 430    | 397                      | NR            | 560    | 693                      | NR            | 690    | 83                       | NR            | 820    | 2                        | NR            | 950    | 0                        | NR            |
| 435    | 617                      | NR            | 565    | 705                      | NR            | 695    | 71                       | NR            | 825    | 2                        | NR            | 955    | 0                        | NR            |
| 440    | 868                      | NR            | 570    | 713                      | NR            | 700    | 61                       | NR            | 830    | 1                        | NR            | 960    | 0                        | NR            |
| 445    | 994                      | NR            | 575    | 717                      | NR            | 705    | 52                       | NR            | 835    | 1                        | NR            | 965    | 0                        | NR            |
| 450    | 736                      | NR            | 580    | 715                      | NR            | 710    | 45                       | NR            | 840    | 1                        | NR            | 970    | 0                        | NR            |
| 455    | 454                      | NR            | 585    | 705                      | NR            | 715    | 38                       | NR            | 845    | 1                        | NR            | 975    | 0                        | NR            |
| 460    | 314                      | NR            | 590    | 689                      | NR            | 720    | 32                       | NR            | 850    | 1                        | NR            | 980    | 0                        | NR            |
| 465    | 210                      | NR            | 595    | 665                      | NR            | 725    | 27                       | NR            | 855    | 1                        | NR            | 985    | 0                        | NR            |
| 470    | 146                      | NR            | 600    | 635                      | NR            | 730    | 23                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 126                      | NR            | 605    | 599                      | NR            | 735    | 19                       | NR            | 865    | 0                        | NR            | 995    | 0                        | NR            |
| 480    | 126                      | NR            | 610    | 561                      | NR            | 740    | 17                       | NR            | 870    | 0                        | NR            | 1000   | 0                        | NR            |
| 485    | 144                      | NR            | 615    | 517                      | NR            | 745    | 15                       | NR            | 875    | 0                        | NR            |        |                          |               |

**Summary**

$R_f = 73.1$   
 $R_g = 94.9$   
 $CIE R_a = 70.8$   
 $R_9 = -40.0$

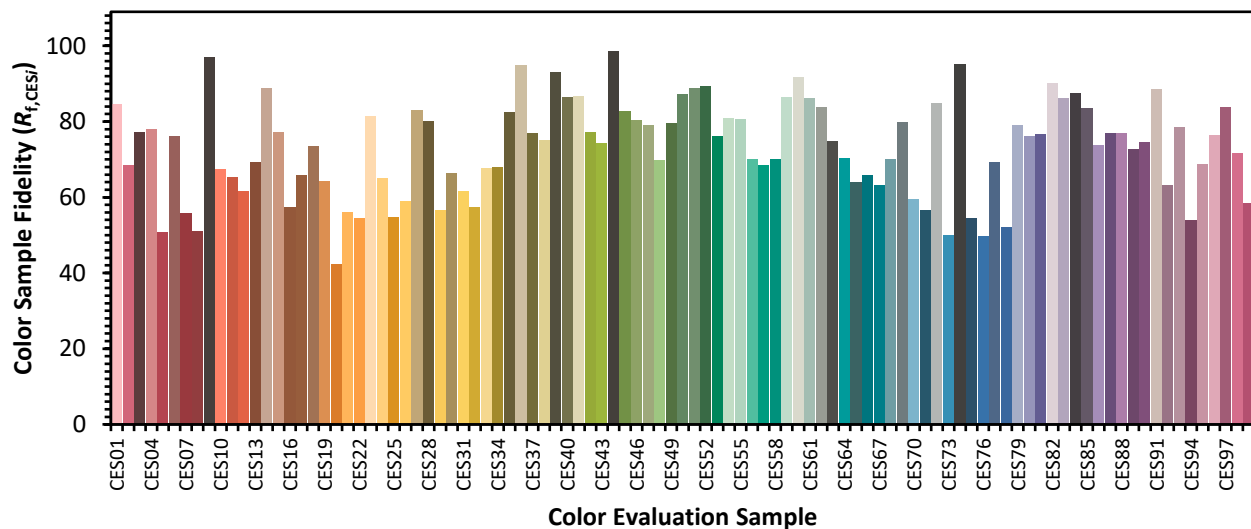


**Color Vector Graphics**



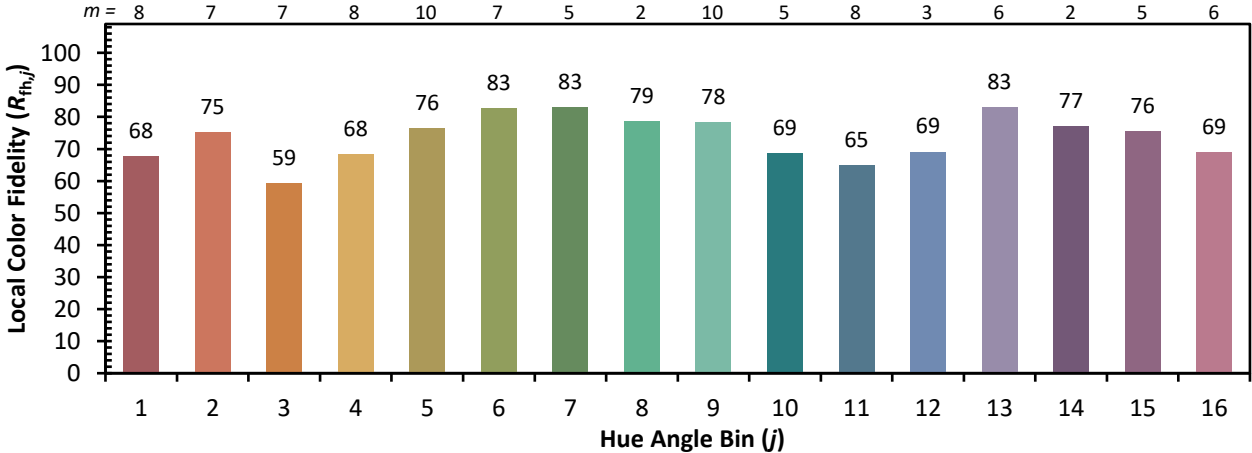
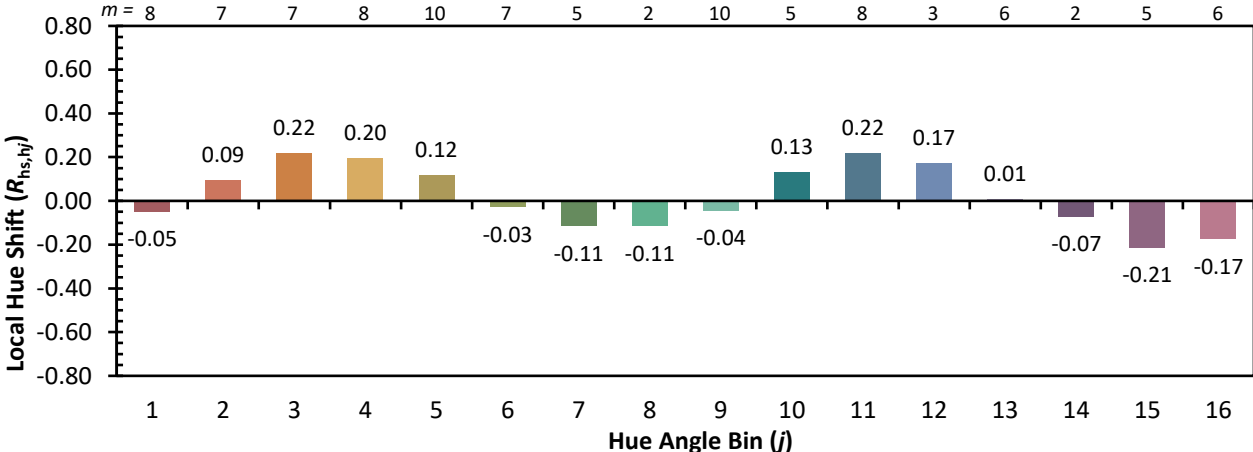
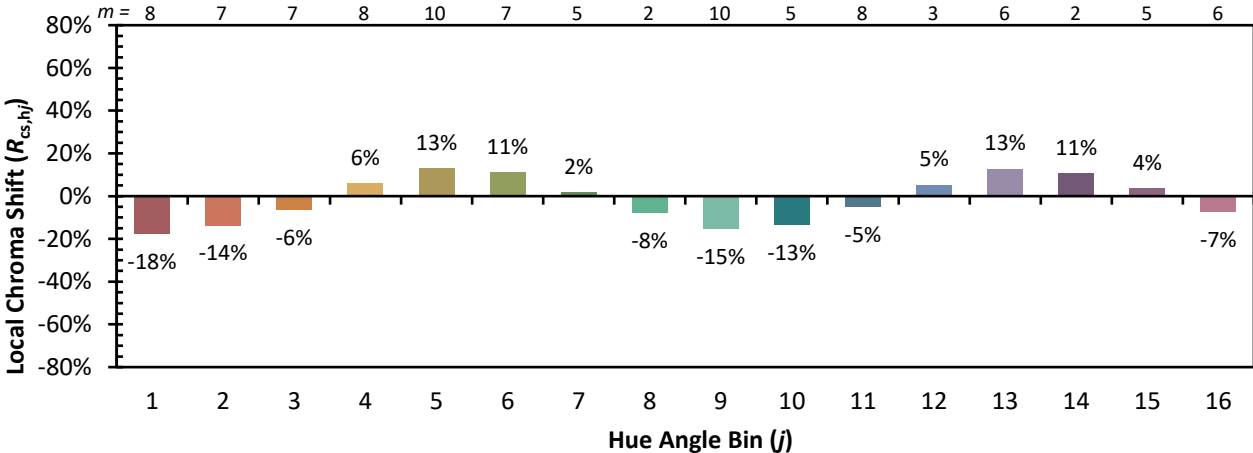
**Individual Sample Fidelity Index ( $R_{f,i}$ )**

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 59 | CES51 = 89 | CES76 = 50 |
| CES02 = 59 | CES27 = 83 | CES52 = 89 | CES77 = 69 |
| CES03 = 30 | CES28 = 80 | CES53 = 76 | CES78 = 52 |
| CES04 = 69 | CES29 = 57 | CES54 = 81 | CES79 = 79 |
| CES05 = 46 | CES30 = 66 | CES55 = 81 | CES80 = 76 |
| CES06 = 50 | CES31 = 62 | CES56 = 70 | CES81 = 77 |
| CES07 = 39 | CES32 = 57 | CES57 = 69 | CES82 = 90 |
| CES08 = 38 | CES33 = 68 | CES58 = 70 | CES83 = 86 |
| CES09 = 29 | CES34 = 68 | CES59 = 86 | CES84 = 88 |
| CES10 = 73 | CES35 = 83 | CES60 = 92 | CES85 = 84 |
| CES11 = 56 | CES36 = 95 | CES61 = 86 | CES86 = 74 |
| CES12 = 61 | CES37 = 77 | CES62 = 84 | CES87 = 77 |
| CES13 = 41 | CES38 = 75 | CES63 = 75 | CES88 = 77 |
| CES14 = 74 | CES39 = 93 | CES64 = 70 | CES89 = 73 |
| CES15 = 70 | CES40 = 86 | CES65 = 64 | CES90 = 75 |
| CES16 = 46 | CES41 = 87 | CES66 = 66 | CES91 = 89 |
| CES17 = 49 | CES42 = 77 | CES67 = 63 | CES92 = 63 |
| CES18 = 55 | CES43 = 74 | CES68 = 70 | CES93 = 78 |
| CES19 = 71 | CES44 = 99 | CES69 = 80 | CES94 = 54 |
| CES20 = 64 | CES45 = 83 | CES70 = 60 | CES95 = 69 |
| CES21 = 85 | CES46 = 80 | CES71 = 57 | CES96 = 76 |
| CES22 = 77 | CES47 = 79 | CES72 = 85 | CES97 = 84 |
| CES23 = 91 | CES48 = 70 | CES73 = 50 | CES98 = 72 |
| CES24 = 90 | CES49 = 80 | CES74 = 95 | CES99 = 58 |
| CES25 = 71 | CES50 = 87 | CES75 = 55 |            |

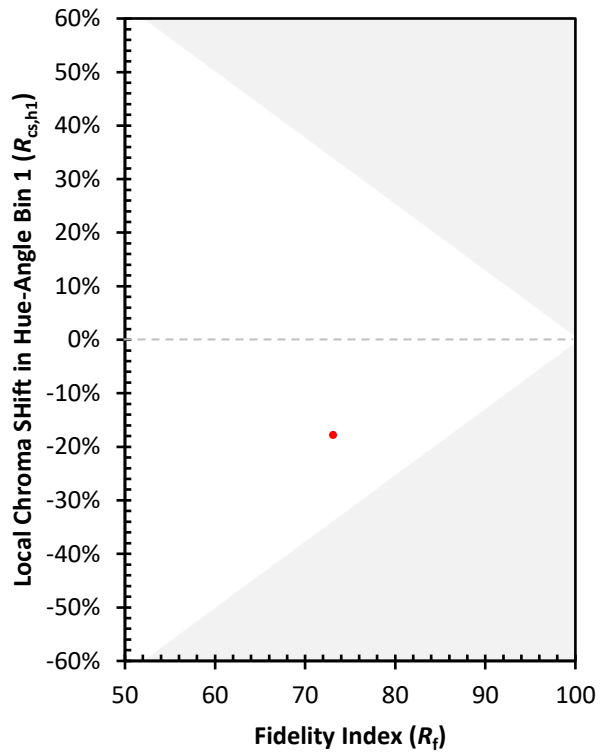
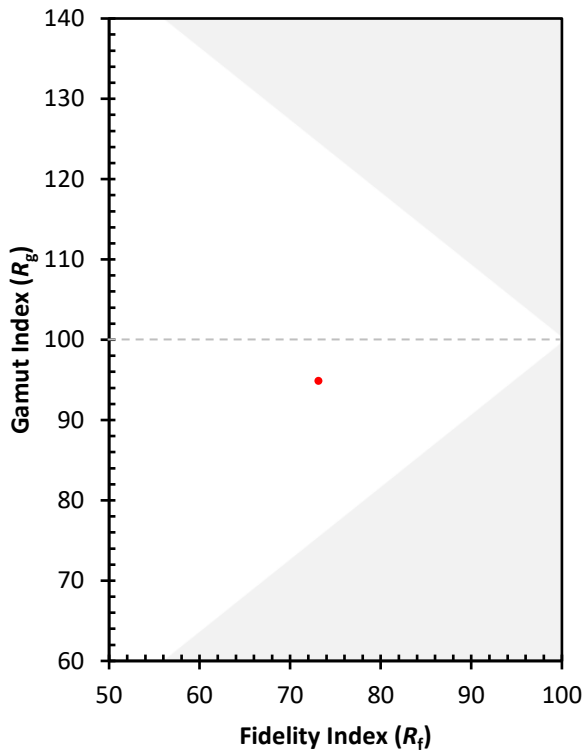




Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)