

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: P348695

Luminaire Tested: **ARCH-N-PA1-19-727-12VDC-5WQ**

Issue Date: 3/3/2020



**Test Information**

Test Method: LM-79-08  
Report Number: P348695  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-2)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: STREETWORKS  
Catalog Number: ARCH-N-PA1-19-727-12VDC-5WQ  
Description: ARCHEON ROADWAY AND AREA LUMINAIRE  
(1) 70 CRI, 2700K, 370mA LIGHT ENGINE WITH 16 LEDS AND  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 2583 lumens  
Efficiency: N/A  
Efficacy: 135.9 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 0.75' x H: 0')  
IES Classification: Type V - Short  
BUG Rating: B2 - U0 - G1

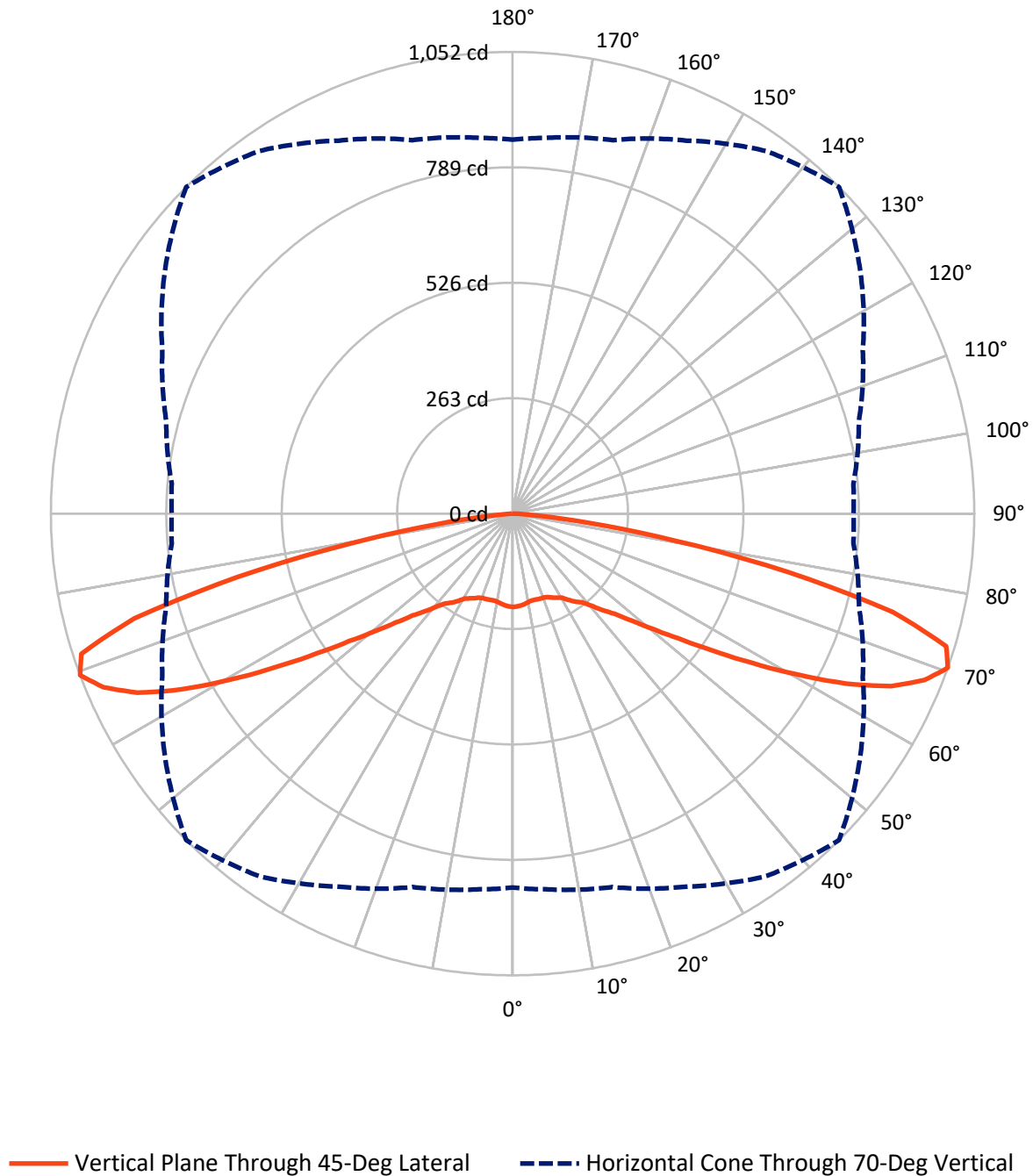
Input Watts (W): 19  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 25 FT



REPORT NUMBER: P348695

CATALOG NUMBER: ARCH-N-PA1-19-727-12VDC-5WQ

## Luminous Intensity Polar Plot



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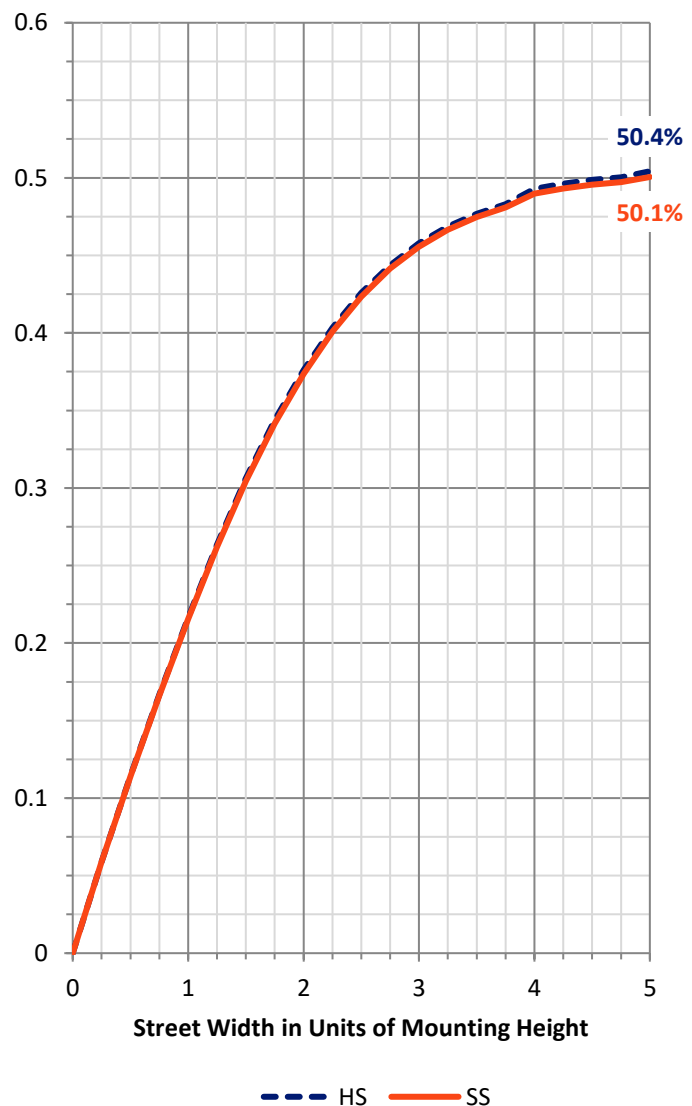
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 1291.5   | 0.0    | 1291.5 |
|                    | % Fixture | 50.0     | 0.0    | 50.0   |
| <b>Street Side</b> | Lumens    | 1291.5   | 0.0    | 1291.5 |
|                    | % Fixture | 50.0     | 0.0    | 50.0   |
| <b>Total</b>       | Lumens    | 2583.0   | 0.0    | 2583.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 19.8   | 0.8       |
| 10°-20°   | 58.0   | 2.2       |
| 20°-30°   | 98.8   | 3.8       |
| 30°-40°   | 154.4  | 6.0       |
| 40°-50°   | 261.7  | 10.1      |
| 50°-60°   | 477.2  | 18.5      |
| 60°-70°   | 821.5  | 31.8      |
| 70°-80°   | 643.9  | 24.9      |
| 80°-90°   | 47.7   | 1.8       |
| 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°    | 2583.0 | 100.0     |
| 0°-180°   | 2583.0 | 100.0     |



REPORT NUMBER: P348695

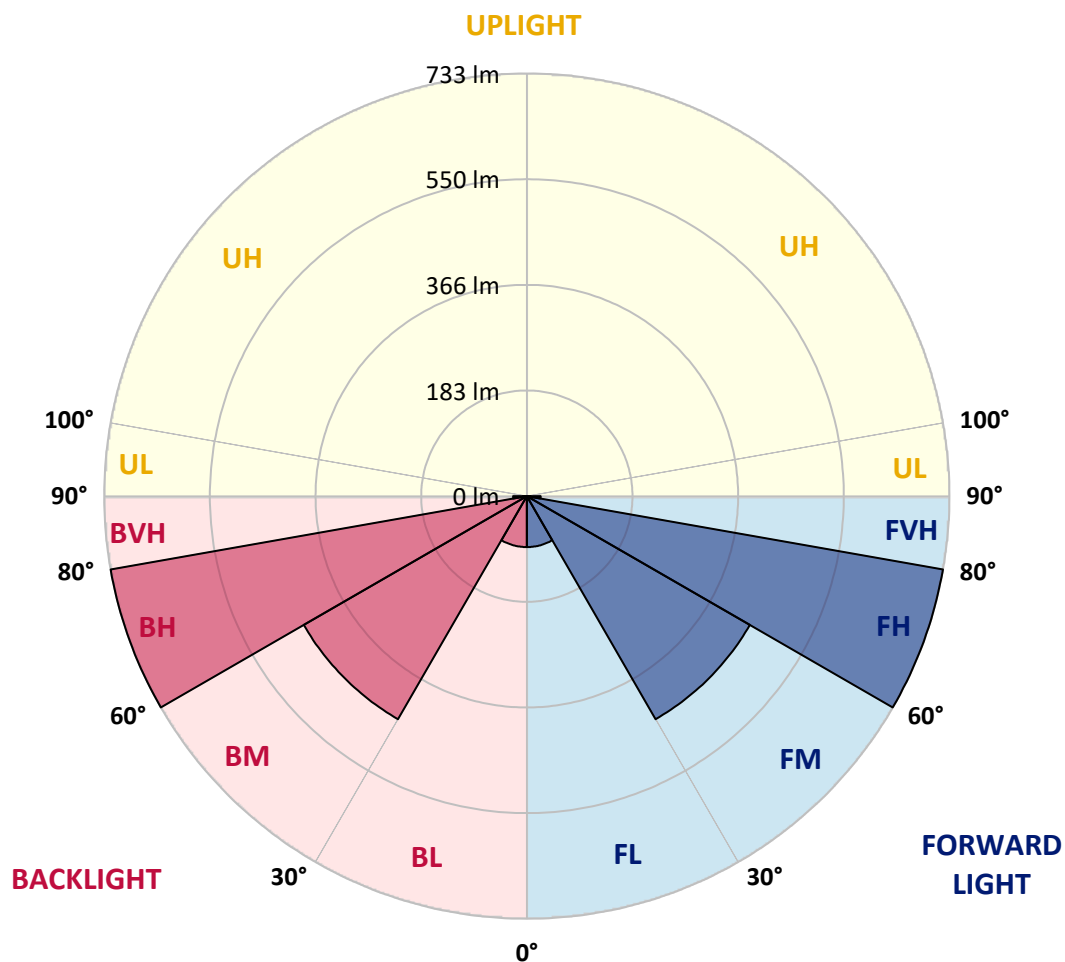
CATALOG NUMBER: ARCH-N-PA1-19-727-12VDC-5WQ

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 88.3   | 3.4       |                         |      |         |
| FM   | (30°-60°)   | 446.6  | 17.3      |                         |      |         |
| FH   | (60°-80°)   | 732.7  | 28.4      |                         |      | G1/1800 |
| FVH  | (80°-90°)   | 23.9   | 0.9       |                         |      | G1/100  |
| BL   | (0°-30°)    | 88.3   | 3.4       | B0/110                  |      |         |
| BM   | (30°-60°)   | 446.6  | 17.3      | B1/1000                 |      |         |
| BH   | (60°-80°)   | 732.7  | 28.4      | B2/1000                 |      | G1/1800 |
| BVH  | (80°-90°)   | 23.9   | 0.9       |                         |      | G1/100  |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B2-U0-G1**

Type V Short



REPORT NUMBER: P348695

CATALOG NUMBER: ARCH-N-PA1-19-727-12VDC-5WQ

**CANDELA DISTRIBUTION (FULL):**

|       | 0°    | 5°    | 15°   | 25°   | 35°    | 45°    | 55°   | 65°   | 75°   | 85°   | 90°   |
|-------|-------|-------|-------|-------|--------|--------|-------|-------|-------|-------|-------|
| 0°    | 212.6 | 212.6 | 212.6 | 212.6 | 212.6  | 212.6  | 212.6 | 212.6 | 212.6 | 212.6 | 212.6 |
| 2.5°  | 211.6 | 211.9 | 211.6 | 211.8 | 211.4  | 211.6  | 211.6 | 211.6 | 211.5 | 211.6 | 211.4 |
| 5°    | 209.8 | 209.9 | 209.6 | 209.8 | 209.5  | 209.8  | 209.8 | 209.8 | 209.6 | 209.7 | 209.3 |
| 7.5°  | 206.9 | 207.1 | 206.9 | 207.1 | 206.8  | 207.2  | 207.1 | 206.9 | 206.6 | 206.6 | 206.3 |
| 10°   | 205.4 | 205.5 | 204.8 | 204.5 | 203.8  | 204.0  | 204.2 | 204.5 | 204.7 | 205.2 | 205.1 |
| 12.5° | 205.5 | 205.5 | 204.5 | 203.4 | 202.2  | 202.5  | 202.9 | 203.9 | 204.9 | 205.8 | 205.9 |
| 15°   | 206.3 | 206.3 | 204.7 | 202.9 | 202.2  | 202.9  | 203.2 | 203.8 | 205.4 | 207.0 | 207.1 |
| 17.5° | 206.9 | 206.9 | 204.5 | 202.5 | 202.4  | 203.6  | 203.5 | 203.8 | 205.6 | 208.0 | 208.1 |
| 20°   | 208.1 | 208.1 | 205.0 | 202.8 | 202.8  | 204.0  | 204.1 | 204.5 | 206.3 | 209.0 | 209.4 |
| 22.5° | 210.5 | 210.6 | 207.4 | 205.6 | 205.7  | 206.5  | 206.8 | 207.5 | 209.1 | 212.0 | 212.5 |
| 25°   | 214.0 | 214.2 | 210.9 | 209.8 | 210.4  | 211.9  | 211.7 | 212.2 | 214.0 | 216.9 | 217.4 |
| 27.5° | 218.9 | 218.5 | 215.4 | 215.0 | 215.6  | 216.6  | 216.5 | 216.6 | 218.0 | 220.6 | 221.2 |
| 30°   | 225.2 | 225.1 | 222.8 | 223.1 | 222.8  | 222.5  | 222.6 | 223.3 | 224.0 | 226.1 | 226.7 |
| 32.5° | 231.4 | 231.5 | 230.2 | 231.5 | 233.3  | 234.6  | 232.7 | 230.8 | 229.9 | 231.0 | 231.5 |
| 35°   | 242.5 | 242.9 | 240.8 | 239.9 | 242.5  | 246.2  | 240.7 | 237.6 | 239.3 | 240.8 | 241.2 |
| 37.5° | 261.4 | 261.6 | 258.0 | 254.6 | 252.7  | 256.3  | 250.8 | 251.0 | 257.0 | 259.7 | 259.7 |
| 40°   | 282.9 | 283.0 | 280.6 | 277.6 | 274.4  | 275.2  | 273.0 | 273.7 | 277.6 | 280.1 | 280.8 |
| 42.5° | 308.5 | 308.3 | 304.5 | 300.2 | 299.3  | 300.2  | 296.4 | 295.9 | 300.4 | 304.9 | 304.9 |
| 45°   | 341.8 | 341.2 | 336.3 | 331.6 | 327.1  | 325.2  | 324.3 | 326.7 | 333.0 | 337.1 | 337.2 |
| 47.5° | 377.6 | 375.9 | 373.4 | 369.6 | 365.7  | 363.8  | 362.3 | 363.5 | 368.0 | 369.6 | 369.8 |
| 50°   | 414.4 | 414.7 | 415.3 | 413.8 | 412.3  | 411.7  | 407.7 | 405.4 | 406.8 | 403.8 | 403.4 |
| 52.5° | 458.1 | 458.7 | 463.7 | 467.9 | 470.4  | 471.6  | 464.0 | 456.1 | 451.6 | 445.8 | 444.1 |
| 55°   | 509.6 | 510.7 | 518.0 | 529.6 | 541.5  | 547.9  | 534.1 | 519.2 | 505.5 | 494.6 | 491.1 |
| 57.5° | 567.0 | 569.0 | 579.0 | 601.3 | 625.8  | 640.7  | 617.5 | 590.5 | 563.9 | 548.3 | 545.6 |
| 60°   | 634.3 | 636.2 | 650.0 | 682.0 | 721.7  | 744.2  | 709.0 | 664.8 | 631.8 | 616.8 | 611.8 |
| 62.5° | 714.5 | 714.6 | 731.6 | 769.0 | 821.4  | 852.7  | 805.0 | 746.0 | 711.9 | 693.9 | 689.0 |
| 65°   | 800.7 | 801.1 | 818.7 | 859.0 | 913.3  | 947.3  | 893.5 | 832.0 | 790.3 | 763.7 | 759.9 |
| 67.5° | 861.6 | 863.4 | 881.9 | 930.5 | 981.2  | 1011.9 | 956.2 | 886.6 | 838.4 | 806.7 | 803.6 |
| 70°   | 851.9 | 858.9 | 880.7 | 937.3 | 1007.9 | 1051.6 | 966.4 | 880.1 | 816.6 | 779.2 | 776.5 |
| 72.5° | 742.9 | 756.3 | 785.4 | 859.7 | 972.6  | 1032.8 | 910.9 | 788.3 | 716.4 | 684.5 | 679.7 |
| 75°   | 505.9 | 527.7 | 571.5 | 678.8 | 830.9  | 894.2  | 766.8 | 628.5 | 560.8 | 516.8 | 513.5 |
| 77.5° | 225.6 | 230.5 | 286.1 | 409.5 | 573.4  | 642.2  | 557.2 | 411.1 | 308.6 | 246.2 | 233.0 |
| 80°   | 62.9  | 63.7  | 84.9  | 152.5 | 287.0  | 377.3  | 308.1 | 160.2 | 90.1  | 63.5  | 59.8  |
| 82.5° | 20.0  | 21.7  | 26.5  | 39.6  | 96.5   | 172.2  | 99.0  | 42.7  | 30.4  | 24.3  | 21.9  |
| 85°   | 9.7   | 9.7   | 13.4  | 16.1  | 24.6   | 38.1   | 26.2  | 19.8  | 17.3  | 11.5  | 10.4  |
| 87.5° | 4.1   | 4.2   | 6.2   | 5.6   | 7.2    | 6.2    | 8.5   | 8.9   | 9.3   | 5.1   | 4.4   |
| 90°   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0    | 0.0    | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |

Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

STREETWORKS

Report Number: SP1-2101-121-5

Luminaire Tested: IFLD-S-SA2E-727-U-T2

Test Date: 03/04/2021

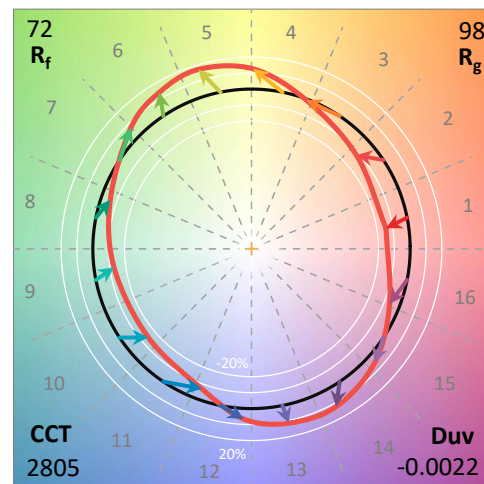
### Test Information

Test Method: LM-79-08  
 Report Number: SP1-2101-121-5  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1  
 Measurement Geometry:  $4\pi$   
 Issue Date: 03/04/2021  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: STREETWORKS  
 Catalog Number: **IFLD-S-SA2E-727-U-T2**  
 Description: STREETWORKS INF FLOOD

PROGRAMMED @ 1500mA.

### Spectral Parameters

|                           |         |           |      |      |       |
|---------------------------|---------|-----------|------|------|-------|
| CCT (K):                  | 2805    | CRI (Ra): | 72.4 |      |       |
| CIE u':                   | 0.2586  | R1:       | 69.8 | R9:  | -15.0 |
| CIE v':                   | 0.5221  | R2:       | 81.3 | R10: | 55.6  |
| Duv:                      | -0.0022 | R3:       | 90.2 | R11: | 61.7  |
| CIE x:                    | 0.4477  | R4:       | 68.5 | R12: | 47.2  |
| CIE y:                    | 0.4017  | R5:       | 67.5 | R13: | 71.4  |
| CIE z:                    | 0.1506  | R6:       | 72.4 | R14: | 93.9  |
| Peak Wavelength (nm):     | 599     | R7:       | 79.4 |      |       |
| Dominant Wavelength (nm): | 584     | R8:       | 49.9 |      |       |
| Purity:                   | 55.3    |           |      |      |       |
| Rf:                       | 71.9    |           |      |      |       |
| Rg:                       | 97.9    |           |      |      |       |



### Test Conditions

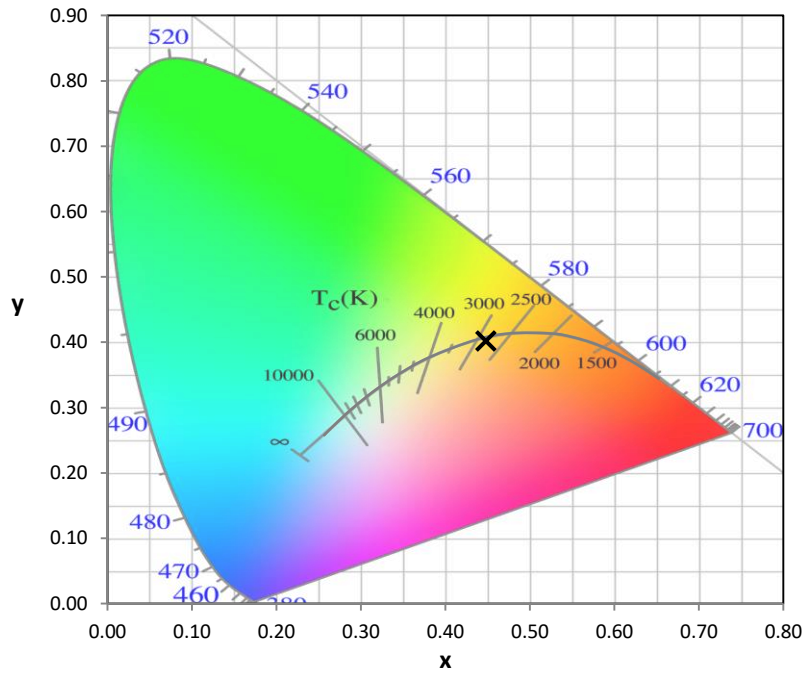
Stabilization Time: 60M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.3/31%  
 Sphere Temperature (°C): 24.8

REPORT NUMBER: SP1-2101-121-5

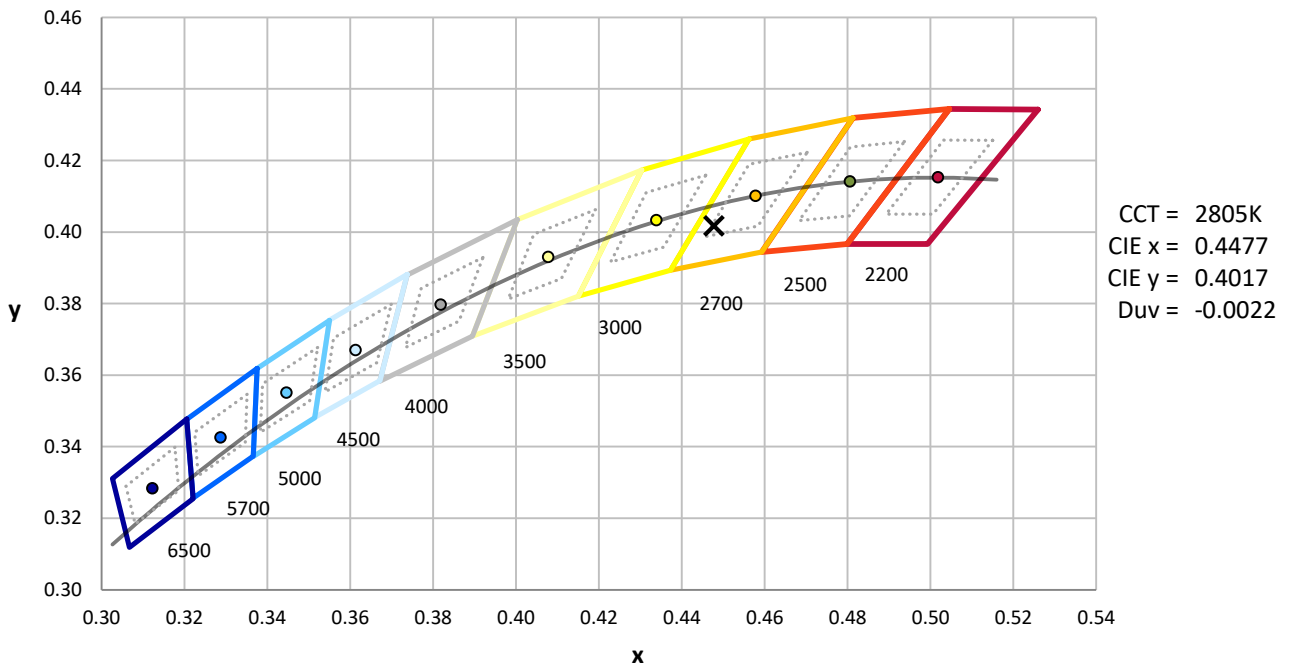
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 1/31/2021        | 7/31/2021            |
| Power Meter                    | IN0071                | 12/1/2020        | 12/1/2021            |
| AC Power Source                | IN0063                | 12/1/2020        | 12/1/2021            |
| DC Power Source                | IN0208                | 12/1/2020        | 12/1/2021            |
| Sphere Thermometer             | IN0085                | 12/1/2020        | 12/1/2021            |
| Room Thermometer               | IN0046                | 12/1/2020        | 12/1/2021            |

REPORT NUMBER: SP1-2101-121-5

**CIE 1931 Chromaticity Diagram**

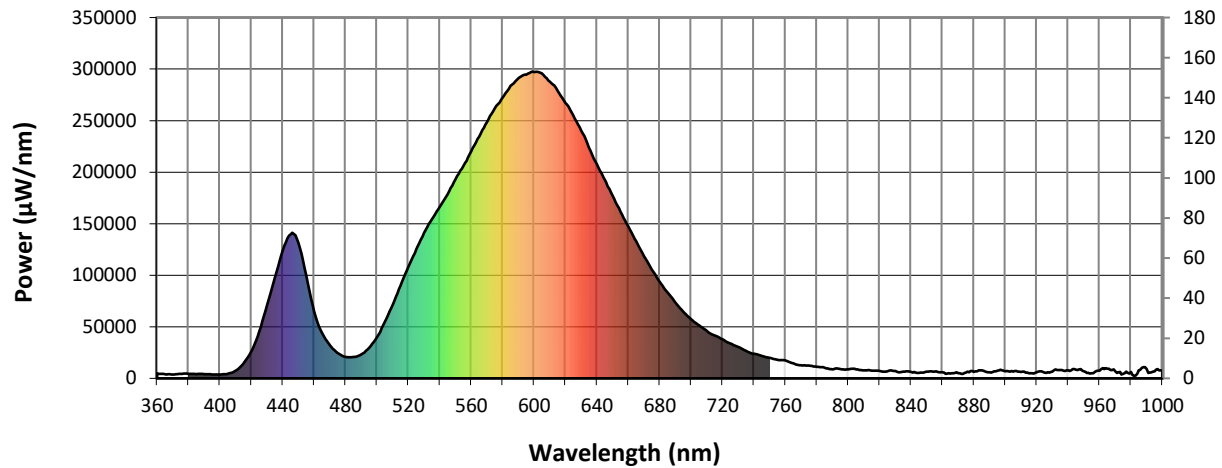


**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



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### Photopic Flux vs. Wavelength

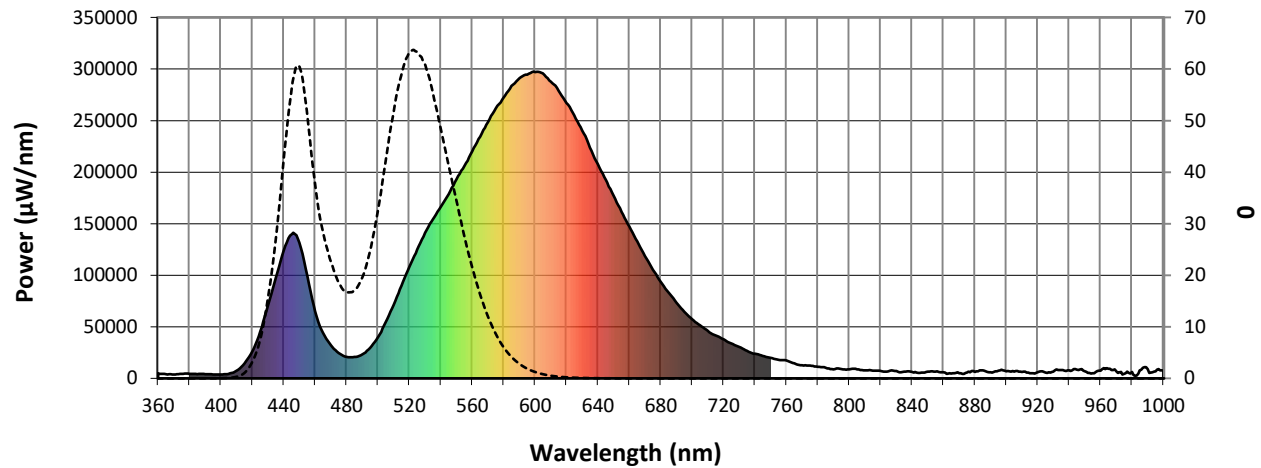


#####

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 4854             | 0.0              | 490       | 23280            | 3.3              | 620       | 266893           | 69.5             | 750       | 19996            | 0.0              | 880       | 6314             | 0.0              |
| 365       | 4049             | 0.0              | 495       | 29582            | 5.4              | 625       | 255096           | 56.3             | 755       | 17900            | 0.0              | 885       | 7853             | 0.0              |
| 370       | 3795             | 0.0              | 500       | 39981            | 8.8              | 630       | 240244           | 43.5             | 760       | 17272            | 0.0              | 890       | 5823             | 0.0              |
| 375       | 4296             | 0.0              | 505       | 54556            | 15.3             | 635       | 223787           | 33.6             | 765       | 14514            | 0.0              | 895       | 7346             | 0.0              |
| 380       | 4496             | 0.0              | 510       | 71364            | 24.5             | 640       | 207566           | 24.8             | 770       | 12643            | 0.0              | 900       | 6920             | 0.0              |
| 385       | 4186             | 0.0              | 515       | 89828            | 37.2             | 645       | 192517           | 18.5             | 775       | 12475            | 0.0              | 905       | 6608             | 0.0              |
| 390       | 3945             | 0.0              | 520       | 108414           | 52.6             | 650       | 177187           | 12.9             | 780       | 11188            | 0.0              | 910       | 6279             | 0.0              |
| 395       | 3780             | 0.0              | 525       | 124929           | 67.1             | 655       | 161553           | 9.3              | 785       | 10229            | 0.0              | 915       | 5131             | 0.0              |
| 400       | 3679             | 0.0              | 530       | 141352           | 83.2             | 660       | 147361           | 6.1              | 790       | 8578             | 0.0              | 920       | 5855             | 0.0              |
| 405       | 4475             | 0.0              | 535       | 154552           | 95.8             | 665       | 132756           | 4.2              | 795       | 9114             | 0.0              | 925       | 5678             | 0.0              |
| 410       | 7499             | 0.0              | 540       | 166297           | 108.4            | 670       | 118534           | 2.6              | 800       | 8597             | 0.0              | 930       | 6661             | 0.0              |
| 415       | 14449            | 0.0              | 545       | 178874           | 119.1            | 675       | 105260           | 1.8              | 805       | 8790             | 0.0              | 935       | 8074             | 0.0              |
| 420       | 26000            | 0.1              | 550       | 193176           | 131.3            | 680       | 93637            | 1.1              | 810       | 7814             | 0.0              | 940       | 7823             | 0.0              |
| 425       | 45491            | 0.2              | 555       | 206008           | 140.7            | 685       | 83217            | 0.7              | 815       | 7533             | 0.0              | 945       | 8364             | 0.0              |
| 430       | 70707            | 0.6              | 560       | 220126           | 149.6            | 690       | 73671            | 0.4              | 820       | 7303             | 0.0              | 950       | 6763             | 0.0              |
| 435       | 98169            | 1.2              | 565       | 234383           | 155.8            | 695       | 64520            | 0.3              | 825       | 6745             | 0.0              | 955       | 4883             | 0.0              |
| 440       | 123846           | 1.9              | 570       | 248161           | 161.4            | 700       | 57442            | 0.2              | 830       | 7209             | 0.0              | 960       | 7488             | 0.0              |
| 445       | 139822           | 2.9              | 575       | 261970           | 163.0            | 705       | 51479            | 0.1              | 835       | 6674             | 0.0              | 965       | 9316             | 0.0              |
| 450       | 131679           | 3.4              | 580       | 272271           | 161.8            | 710       | 45940            | 0.1              | 840       | 6151             | 0.0              | 970       | 6857             | 0.0              |
| 455       | 99242            | 3.3              | 585       | 283822           | 157.7            | 715       | 41575            | 0.0              | 845       | 5371             | 0.0              | 975       | 4388             | 0.0              |
| 460       | 65216            | 2.7              | 590       | 291192           | 150.6            | 720       | 37753            | 0.0              | 850       | 6484             | 0.0              | 980       | 6095             | 0.0              |
| 465       | 44137            | 2.3              | 595       | 294651           | 139.7            | 725       | 33818            | 0.0              | 855       | 6614             | 0.0              | 985       | 7701             | 0.0              |
| 470       | 32002            | 2.0              | 600       | 297168           | 128.1            | 730       | 30414            | 0.0              | 860       | 5959             | 0.0              | 990       | 9045             | 0.0              |
| 475       | 24549            | 1.9              | 605       | 295658           | 114.5            | 735       | 26662            | 0.0              | 865       | 4768             | 0.0              | 995       | 6989             | 0.0              |
| 480       | 20801            | 2.0              | 610       | 287633           | 98.8             | 740       | 23848            | 0.0              | 870       | 5098             | 0.0              | 1000      | 7341             | 0.0              |
| 485       | 20656            | 2.4              | 615       | 279152           | 84.3             | 745       | 21851            | 0.0              | 875       | 5516             | 0.0              |           |                  |                  |

REPORT NUMBER: SP1-2101-121-5

### Scotopic Flux vs. Wavelength



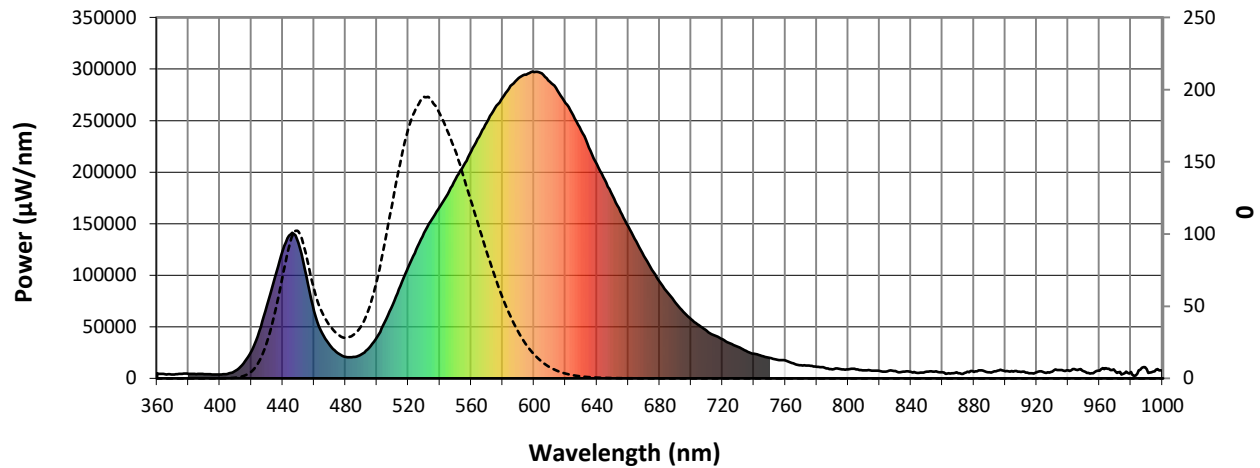
Scotopic Lumens: 15895.6

S/P: 1.11

| λ (nm) | Power (μW/nm) | Lumens (Φ/nm) | λ (nm) | Power (μW/nm) | Lumens (Φ/nm) | λ (nm) | Power (μW/nm) | Lumens (Φ/nm) | λ (nm) | Power (μW/nm) | Lumens (Φ/nm) | λ (nm) | Power (μW/nm) | Lumens (Φ/nm) |
|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|
| 360    | 4854          | 0.0           | 490    | 23280         | 35.8          | 620    | 266893        | 3.3           | 750    | 19996         | 0.0           | 880    | 6314          | 0.0           |
| 365    | 4049          | 0.0           | 495    | 29582         | 47.8          | 625    | 255096        | 2.2           | 755    | 17900         | 0.0           | 885    | 7853          | 0.0           |
| 370    | 3795          | 0.0           | 500    | 39981         | 66.9          | 630    | 240244        | 1.4           | 760    | 17272         | 0.0           | 890    | 5823          | 0.0           |
| 375    | 4296          | 0.0           | 505    | 54556         | 92.7          | 635    | 223787        | 0.9           | 765    | 14514         | 0.0           | 895    | 7346          | 0.0           |
| 380    | 4496          | 0.0           | 510    | 71364         | 121.0         | 640    | 207566        | 0.5           | 770    | 12643         | 0.0           | 900    | 6920          | 0.0           |
| 385    | 4186          | 0.0           | 515    | 89828         | 148.9         | 645    | 192517        | 0.3           | 775    | 12475         | 0.0           | 905    | 6608          | 0.0           |
| 390    | 3945          | 0.0           | 520    | 108414        | 172.3         | 650    | 177187        | 0.2           | 780    | 11188         | 0.0           | 910    | 6279          | 0.0           |
| 395    | 3780          | 0.0           | 525    | 124929        | 186.9         | 655    | 161553        | 0.1           | 785    | 10229         | 0.0           | 915    | 5131          | 0.0           |
| 400    | 3679          | 0.1           | 530    | 141352        | 194.9         | 660    | 147361        | 0.1           | 790    | 8578          | 0.0           | 920    | 5855          | 0.0           |
| 405    | 4475          | 0.1           | 535    | 154552        | 192.6         | 665    | 132756        | 0.0           | 795    | 9114          | 0.0           | 925    | 5678          | 0.0           |
| 410    | 7499          | 0.4           | 540    | 166297        | 183.8         | 670    | 118534        | 0.0           | 800    | 8597          | 0.0           | 930    | 6661          | 0.0           |
| 415    | 14449         | 1.5           | 545    | 178874        | 171.5         | 675    | 105260        | 0.0           | 805    | 8790          | 0.0           | 935    | 8074          | 0.0           |
| 420    | 26000         | 4.3           | 550    | 193176        | 158.0         | 680    | 93637         | 0.0           | 810    | 7814          | 0.0           | 940    | 7823          | 0.0           |
| 425    | 45491         | 11.1          | 555    | 206008        | 140.8         | 685    | 83217         | 0.0           | 815    | 7533          | 0.0           | 945    | 8364          | 0.0           |
| 430    | 70707         | 24.1          | 560    | 220126        | 123.0         | 690    | 73671         | 0.0           | 820    | 7303          | 0.0           | 950    | 6763          | 0.0           |
| 435    | 98169         | 43.9          | 565    | 234383        | 105.2         | 695    | 64520         | 0.0           | 825    | 6745          | 0.0           | 955    | 4883          | 0.0           |
| 440    | 123846        | 69.2          | 570    | 248161        | 87.6          | 700    | 57442         | 0.0           | 830    | 7209          | 0.0           | 960    | 7488          | 0.0           |
| 445    | 139822        | 93.6          | 575    | 261970        | 71.3          | 705    | 51479         | 0.0           | 835    | 6674          | 0.0           | 965    | 9316          | 0.0           |
| 450    | 131679        | 102.1         | 580    | 272271        | 56.1          | 710    | 45940         | 0.0           | 840    | 6151          | 0.0           | 970    | 6857          | 0.0           |
| 455    | 99242         | 86.7          | 585    | 283822        | 43.4          | 715    | 41575         | 0.0           | 845    | 5371          | 0.0           | 975    | 4388          | 0.0           |
| 460    | 65216         | 63.0          | 590    | 291192        | 32.4          | 720    | 37753         | 0.0           | 850    | 6484          | 0.0           | 980    | 6095          | 0.0           |
| 465    | 44137         | 46.6          | 595    | 294651        | 23.5          | 725    | 33818         | 0.0           | 855    | 6614          | 0.0           | 985    | 7701          | 0.0           |
| 470    | 32002         | 36.9          | 600    | 297168        | 16.7          | 730    | 30414         | 0.0           | 860    | 5959          | 0.0           | 990    | 9045          | 0.0           |
| 475    | 24549         | 30.7          | 605    | 295658        | 11.6          | 735    | 26662         | 0.0           | 865    | 4768          | 0.0           | 995    | 6989          | 0.0           |
| 480    | 20801         | 28.1          | 610    | 287633        | 7.8           | 740    | 23848         | 0.0           | 870    | 5098          | 0.0           | 1000   | 7341          | 0.0           |
| 485    | 20656         | 29.9          | 615    | 279152        | 5.2           | 745    | 21851         | 0.0           | 875    | 5516          | 0.0           |        |               |               |

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### Melanopic Flux vs. Wavelength


**Melanopic Lumens: 5527.7**
**M/P: 0.39**

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 4854             | 0.0              | 490       | 23280            | 19.4             | 620       | 266893           | 0.2              | 750       | 19996            | 0.0              | 880       | 6314             | 0.0              |
| 365       | 4049             | 0.0              | 495       | 29582            | 24.4             | 625       | 255096           | 0.1              | 755       | 17900            | 0.0              | 885       | 7853             | 0.0              |
| 370       | 3795             | 0.0              | 500       | 39981            | 32.1             | 630       | 240244           | 0.1              | 760       | 17272            | 0.0              | 890       | 5823             | 0.0              |
| 375       | 4296             | 0.0              | 505       | 54556            | 41.9             | 635       | 223787           | 0.1              | 765       | 14514            | 0.0              | 895       | 7346             | 0.0              |
| 380       | 4496             | 0.0              | 510       | 71364            | 51.2             | 640       | 207566           | 0.0              | 770       | 12643            | 0.0              | 900       | 6920             | 0.0              |
| 385       | 4186             | 0.0              | 515       | 89828            | 58.7             | 645       | 192517           | 0.0              | 775       | 12475            | 0.0              | 905       | 6608             | 0.0              |
| 390       | 3945             | 0.0              | 520       | 108414           | 63.1             | 650       | 177187           | 0.0              | 780       | 11188            | 0.0              | 910       | 6279             | 0.0              |
| 395       | 3780             | 0.0              | 525       | 124929           | 63.4             | 655       | 161553           | 0.0              | 785       | 10229            | 0.0              | 915       | 5131             | 0.0              |
| 400       | 3679             | 0.0              | 530       | 141352           | 61.1             | 660       | 147361           | 0.0              | 790       | 8578             | 0.0              | 920       | 5855             | 0.0              |
| 405       | 4475             | 0.1              | 535       | 154552           | 55.6             | 665       | 132756           | 0.0              | 795       | 9114             | 0.0              | 925       | 5678             | 0.0              |
| 410       | 7499             | 0.3              | 540       | 166297           | 48.7             | 670       | 118534           | 0.0              | 800       | 8597             | 0.0              | 930       | 6661             | 0.0              |
| 415       | 14449            | 1.0              | 545       | 178874           | 41.5             | 675       | 105260           | 0.0              | 805       | 8790             | 0.0              | 935       | 8074             | 0.0              |
| 420       | 26000            | 3.0              | 550       | 193176           | 34.7             | 680       | 93637            | 0.0              | 810       | 7814             | 0.0              | 940       | 7823             | 0.0              |
| 425       | 45491            | 7.1              | 555       | 206008           | 27.8             | 685       | 83217            | 0.0              | 815       | 7533             | 0.0              | 945       | 8364             | 0.0              |
| 430       | 70707            | 14.9             | 560       | 220126           | 21.7             | 690       | 73671            | 0.0              | 820       | 7303             | 0.0              | 950       | 6763             | 0.0              |
| 435       | 98169            | 26.2             | 565       | 234383           | 16.5             | 695       | 64520            | 0.0              | 825       | 6745             | 0.0              | 955       | 4883             | 0.0              |
| 440       | 123846           | 41.4             | 570       | 248161           | 12.1             | 700       | 57442            | 0.0              | 830       | 7209             | 0.0              | 960       | 7488             | 0.0              |
| 445       | 139822           | 55.1             | 575       | 261970           | 8.7              | 705       | 51479            | 0.0              | 835       | 6674             | 0.0              | 965       | 9316             | 0.0              |
| 450       | 131679           | 60.7             | 580       | 272271           | 6.1              | 710       | 45940            | 0.0              | 840       | 6151             | 0.0              | 970       | 6857             | 0.0              |
| 455       | 99242            | 52.0             | 585       | 283822           | 4.2              | 715       | 41575            | 0.0              | 845       | 5371             | 0.0              | 975       | 4388             | 0.0              |
| 460       | 65216            | 38.4             | 590       | 291192           | 2.9              | 720       | 37753            | 0.0              | 850       | 6484             | 0.0              | 980       | 6095             | 0.0              |
| 465       | 44137            | 28.8             | 595       | 294651           | 1.9              | 725       | 33818            | 0.0              | 855       | 6614             | 0.0              | 985       | 7701             | 0.0              |
| 470       | 32002            | 22.9             | 600       | 297168           | 1.3              | 730       | 30414            | 0.0              | 860       | 5959             | 0.0              | 990       | 9045             | 0.0              |
| 475       | 24549            | 18.7             | 605       | 295658           | 0.8              | 735       | 26662            | 0.0              | 865       | 4768             | 0.0              | 995       | 6989             | 0.0              |
| 480       | 20801            | 16.7             | 610       | 287633           | 0.5              | 740       | 23848            | 0.0              | 870       | 5098             | 0.0              | 1000      | 7341             | 0.0              |
| 485       | 20656            | 17.0             | 615       | 279152           | 0.3              | 745       | 21851            | 0.0              | 875       | 5516             | 0.0              |           |                  |                  |

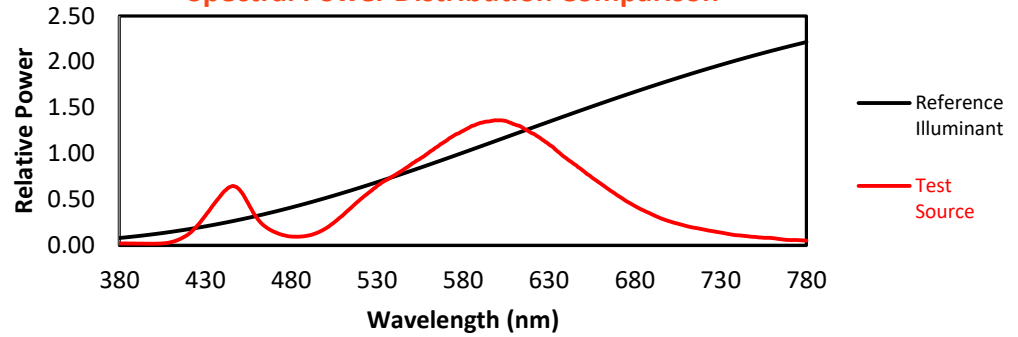
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TM-30-18

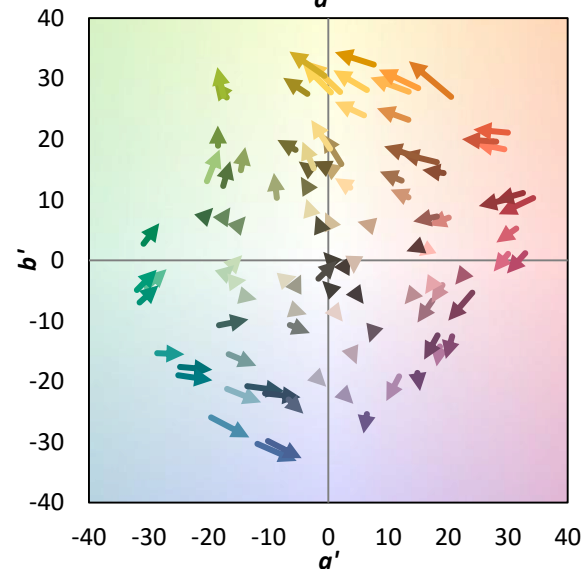
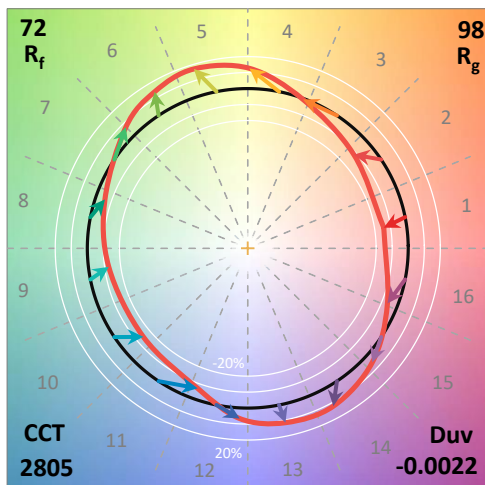
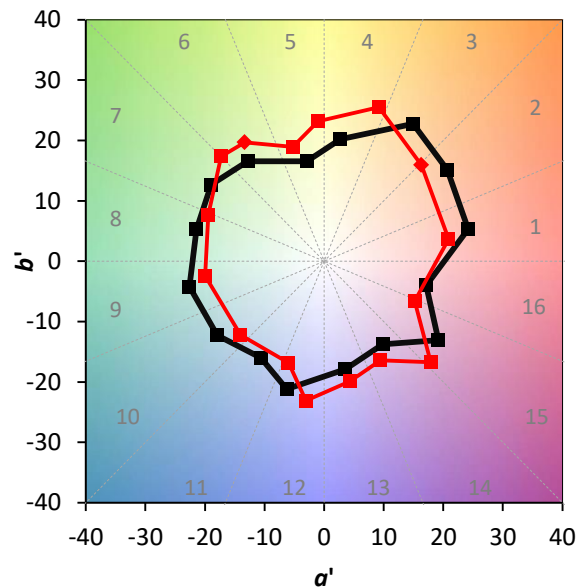
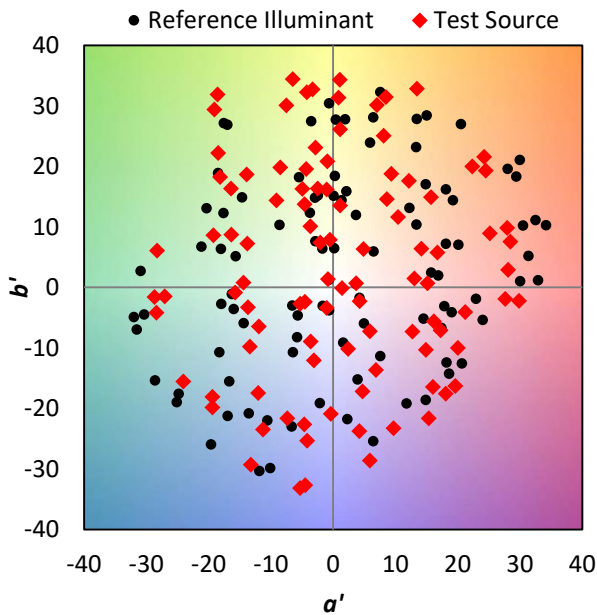
### Summary

$R_f = 71.9$   
 $R_g = 97.9$   
 CIE  $R_a = 72.4$   
 $R_g = -15.0$

### Spectral Power Distribution Comparison

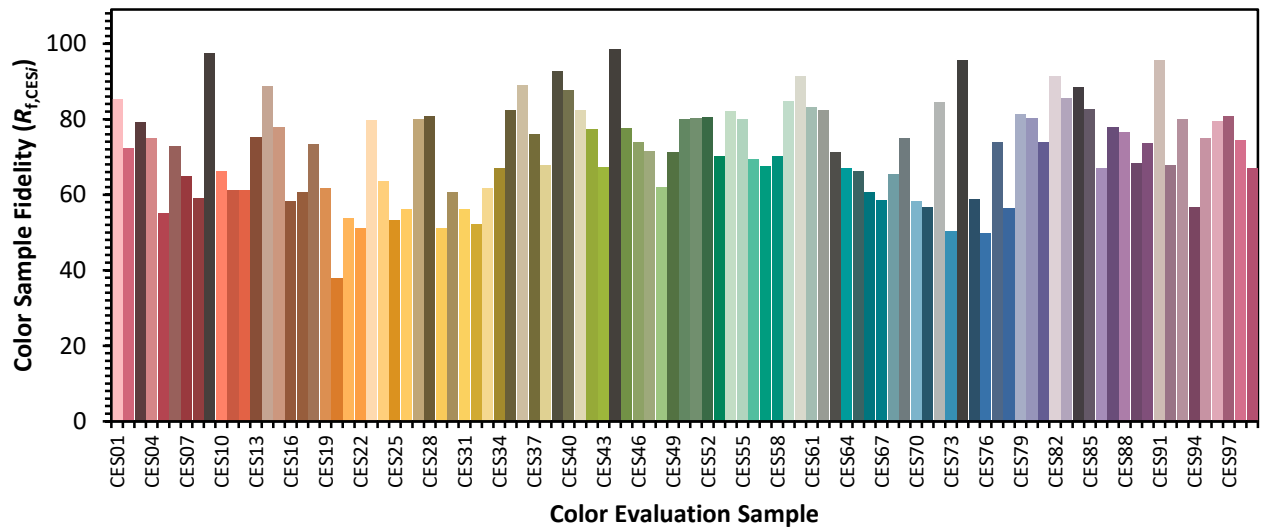


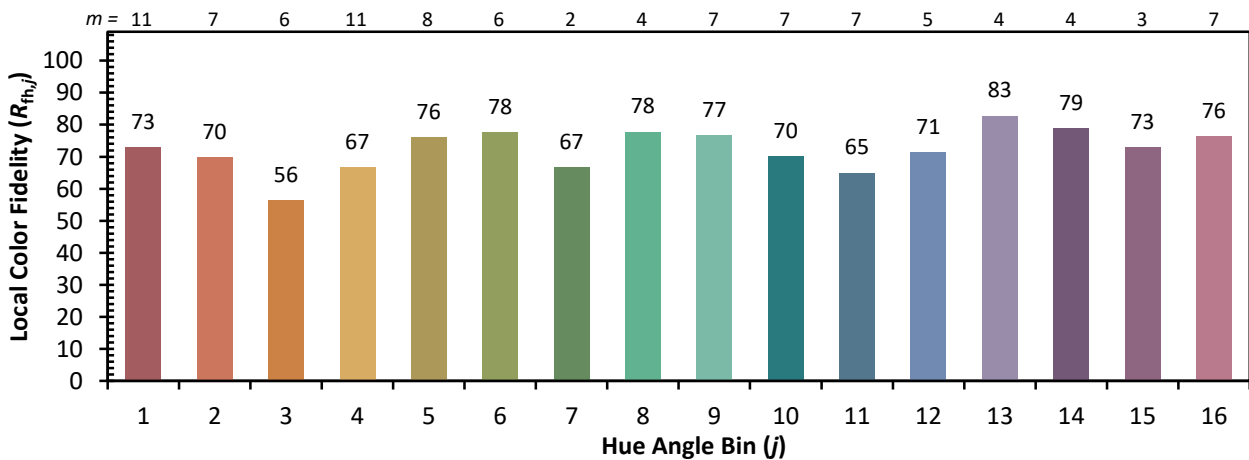
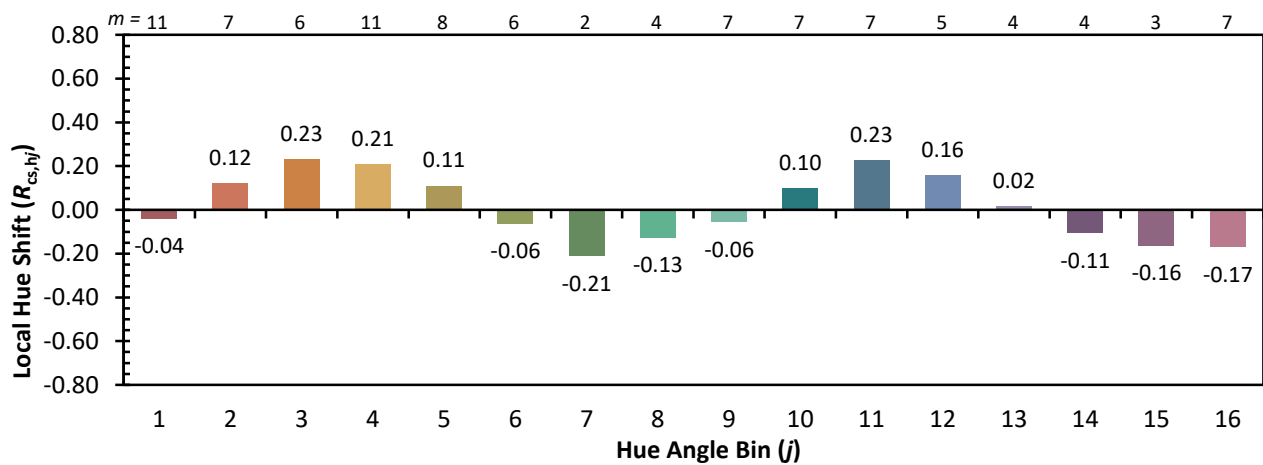
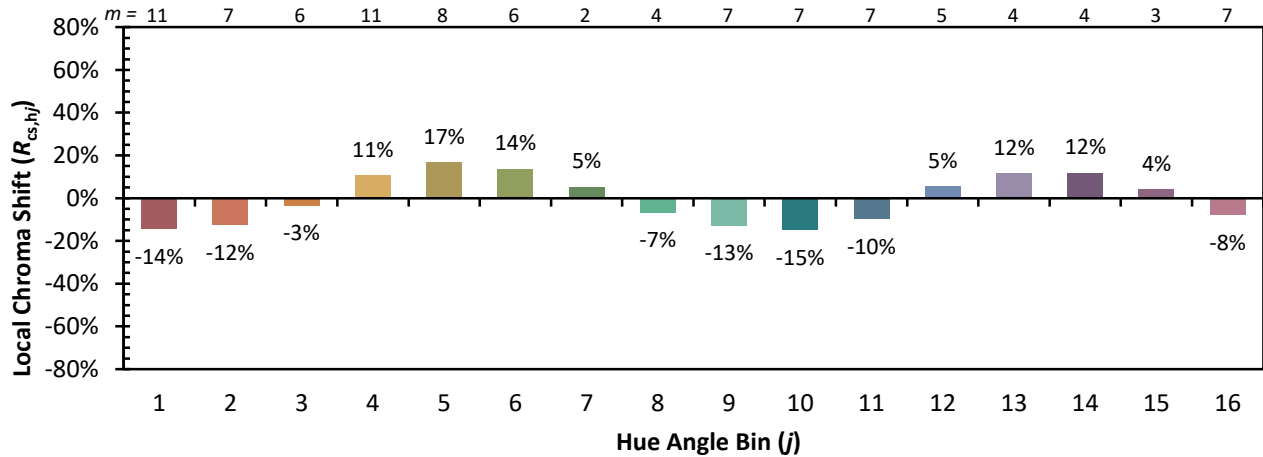
### Color Vector Graphics



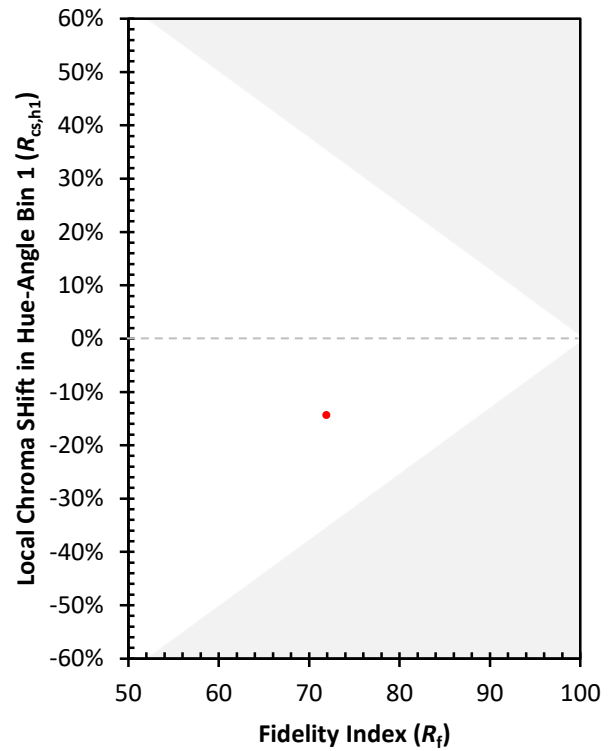
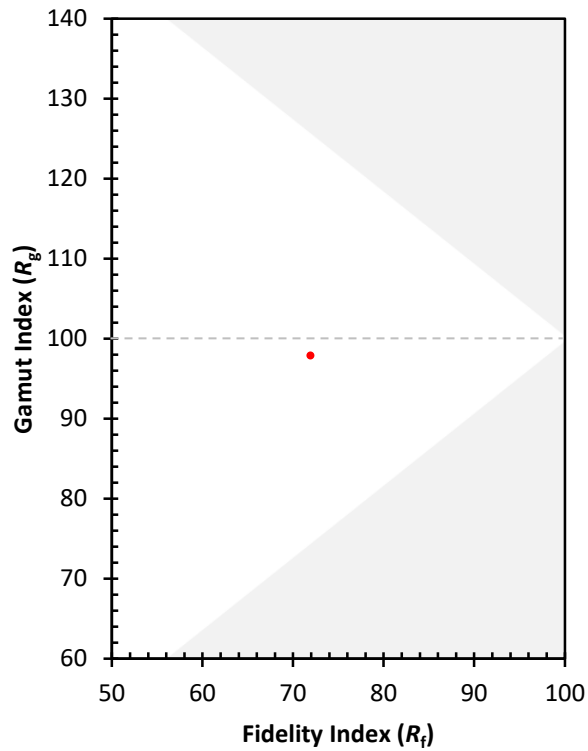
**Individual Sample Fidelity Index ( $R_{f,i}$ )**

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 56 | CES51 = 80 | CES76 = 50 |
| CES02 = 63 | CES27 = 80 | CES52 = 81 | CES77 = 74 |
| CES03 = 31 | CES28 = 81 | CES53 = 70 | CES78 = 56 |
| CES04 = 71 | CES29 = 51 | CES54 = 82 | CES79 = 81 |
| CES05 = 50 | CES30 = 61 | CES55 = 80 | CES80 = 80 |
| CES06 = 52 | CES31 = 56 | CES56 = 69 | CES81 = 74 |
| CES07 = 42 | CES32 = 52 | CES57 = 67 | CES82 = 91 |
| CES08 = 41 | CES33 = 62 | CES58 = 70 | CES83 = 86 |
| CES09 = 29 | CES34 = 67 | CES59 = 85 | CES84 = 89 |
| CES10 = 76 | CES35 = 83 | CES60 = 91 | CES85 = 83 |
| CES11 = 60 | CES36 = 89 | CES61 = 83 | CES86 = 67 |
| CES12 = 66 | CES37 = 76 | CES62 = 82 | CES87 = 78 |
| CES13 = 43 | CES38 = 68 | CES63 = 71 | CES88 = 76 |
| CES14 = 74 | CES39 = 93 | CES64 = 67 | CES89 = 68 |
| CES15 = 71 | CES40 = 88 | CES65 = 66 | CES90 = 74 |
| CES16 = 48 | CES41 = 82 | CES66 = 61 | CES91 = 96 |
| CES17 = 50 | CES42 = 77 | CES67 = 58 | CES92 = 68 |
| CES18 = 57 | CES43 = 67 | CES68 = 65 | CES93 = 80 |
| CES19 = 73 | CES44 = 99 | CES69 = 75 | CES94 = 57 |
| CES20 = 67 | CES45 = 78 | CES70 = 58 | CES95 = 75 |
| CES21 = 88 | CES46 = 74 | CES71 = 57 | CES96 = 79 |
| CES22 = 80 | CES47 = 71 | CES72 = 85 | CES97 = 81 |
| CES23 = 92 | CES48 = 62 | CES73 = 50 | CES98 = 75 |
| CES24 = 91 | CES49 = 71 | CES74 = 96 | CES99 = 67 |
| CES25 = 73 | CES50 = 80 | CES75 = 59 |            |



**Color Rendition by Hue-Angle Bin**


**Measure Comparisons**



(END OF REPORT)