

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: McGRAW-EDISON

Report Number: P385790

Luminaire Tested: **GWC-SA1B-827-U-5MQ**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P385790  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-6)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GWC-SA1B-827-U-5MQ  
Description: GALLEON WALL LUMINAIRE  
(1) 80 CRI, 2700K, 800mA LIGHTSQUARE WITH 16 LEDS AND TYPE V MEDIUM OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 4714 lumens  
Efficiency: N/A  
Efficacy: 107.1 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 0.5' x H: 0')  
IES Classification: Type V - Short  
BUG Rating: B3 - U0 - G1

Input Watts (W): 44  
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: 28.75 FT



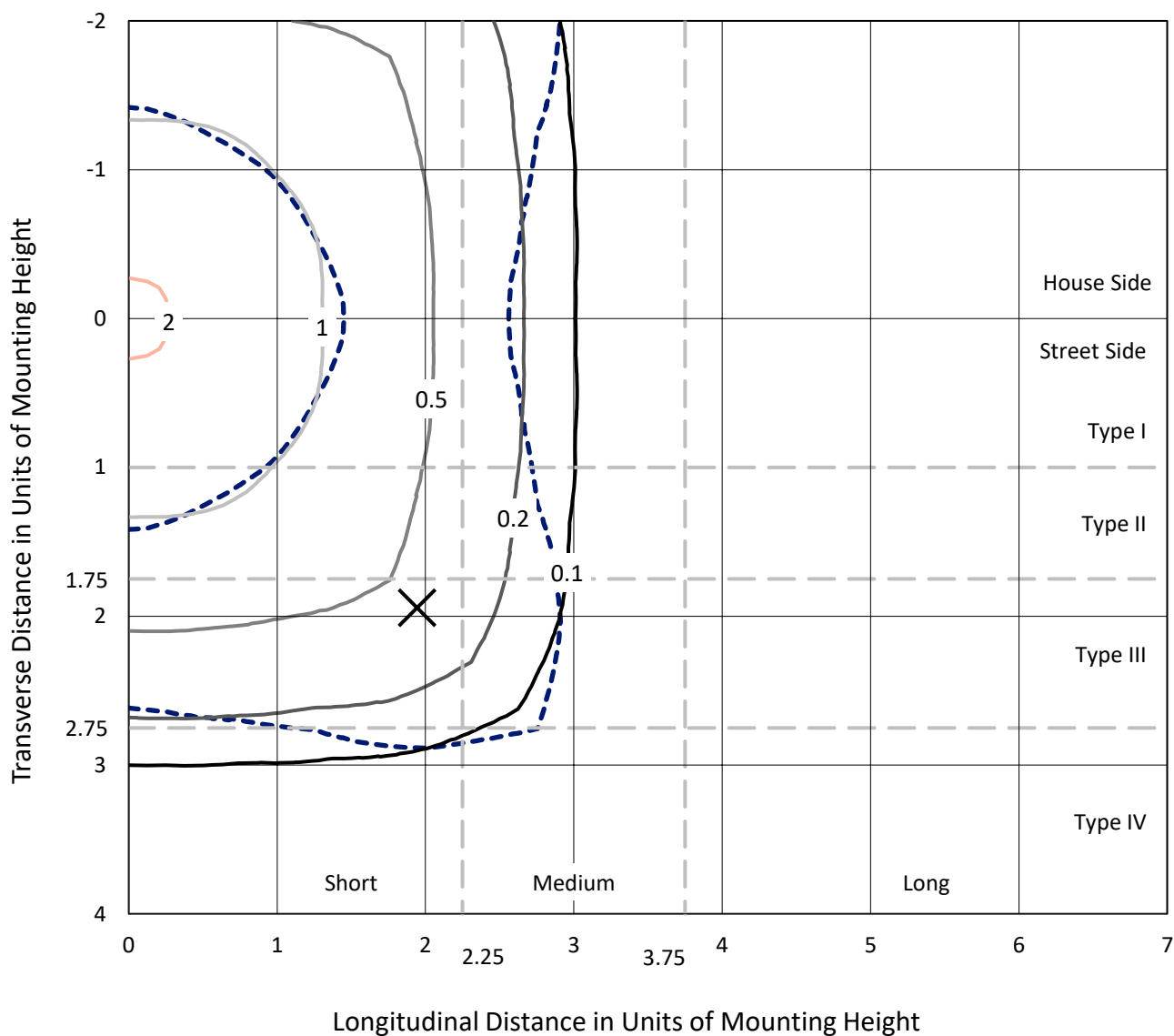
REPORT NUMBER: P385790

CATALOG NUMBER: GWC-SA1B-827-U-5MQ

## Iso-Footcandle Lines of Horizontal Illumination

× Max cd

--- 1/2 Max cd

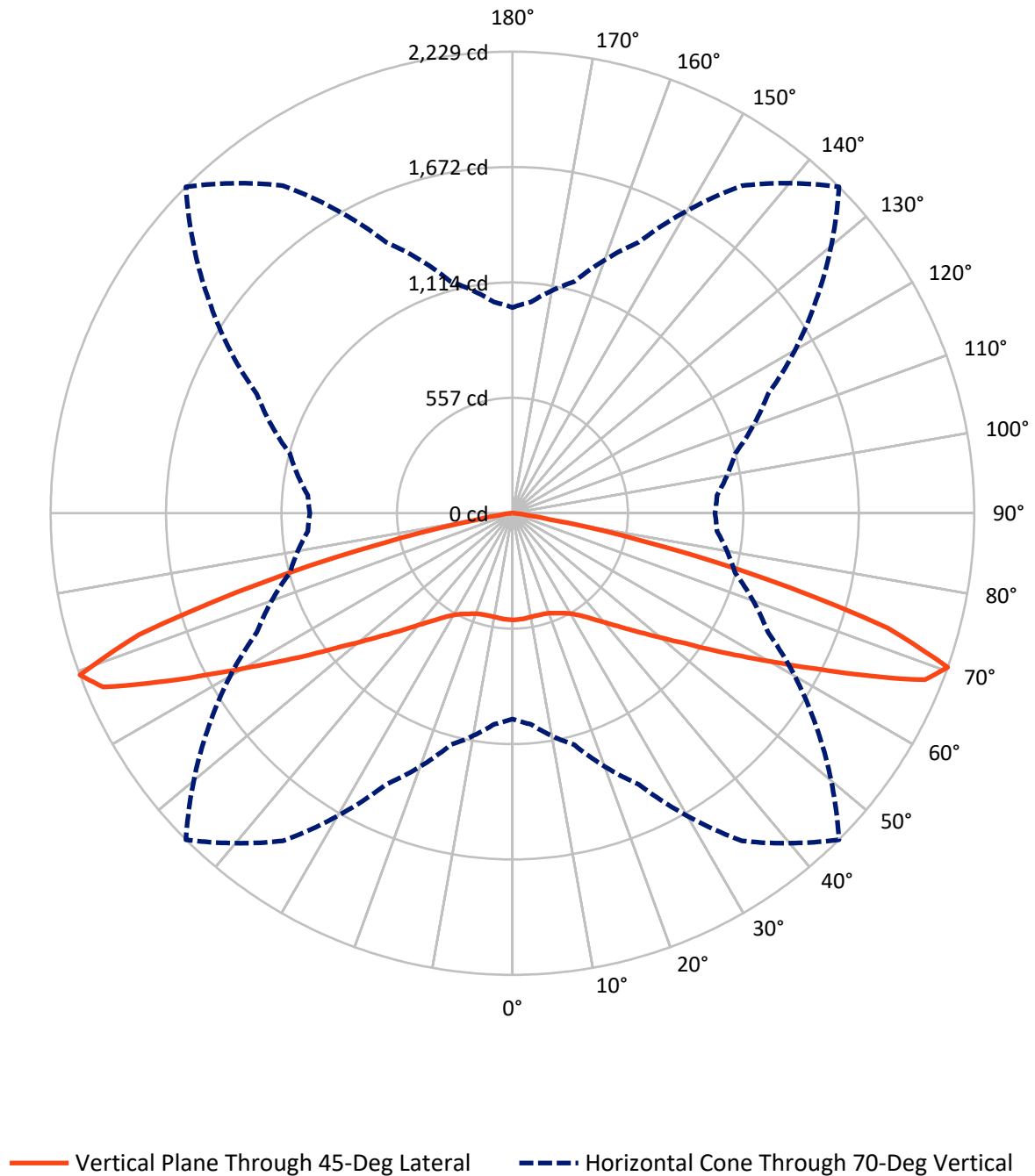


Based on 15 foot mounting height. Maximum calculated value = 2.3 fc  
 Type V - Short - N/A

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## Luminous Intensity Polar Plot



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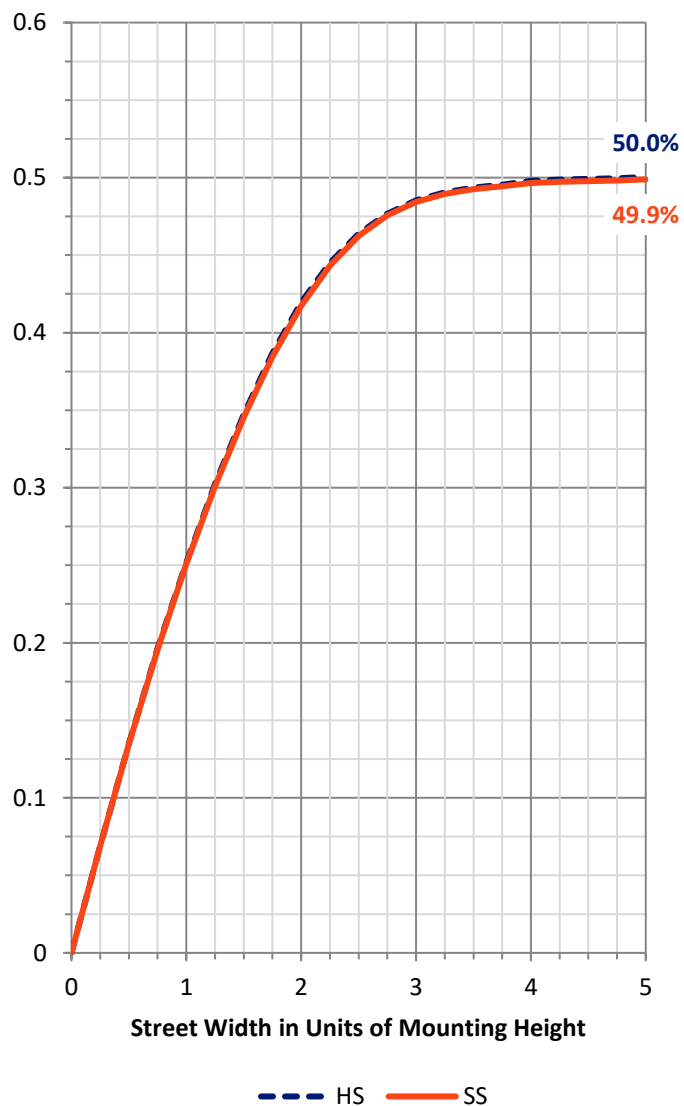
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 2357.0   | 0.0    | 2357.0 |
|                    | % Fixture | 50.0     | 0.0    | 50.0   |
| <b>Street Side</b> | Lumens    | 2357.0   | 0.0    | 2357.0 |
|                    | % Fixture | 50.0     | 0.0    | 50.0   |
| <b>Total</b>       | Lumens    | 4714.0   | 0.0    | 4714.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 48.8   | 1.0       |
| 10°-20°   | 143.1  | 3.0       |
| 20°-30°   | 243.7  | 5.2       |
| 30°-40°   | 386.5  | 8.2       |
| 40°-50°   | 628.9  | 13.3      |
| 50°-60°   | 1037.0 | 22.0      |
| 60°-70°   | 1522.3 | 32.3      |
| 70°-80°   | 673.2  | 14.3      |
| 80°-90°   | 30.5   | 0.6       |
| 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°    | 4714.0 | 100.0     |
| 0°-180°   | 4714.0 | 100.0     |

**Coefficient of Utilization**



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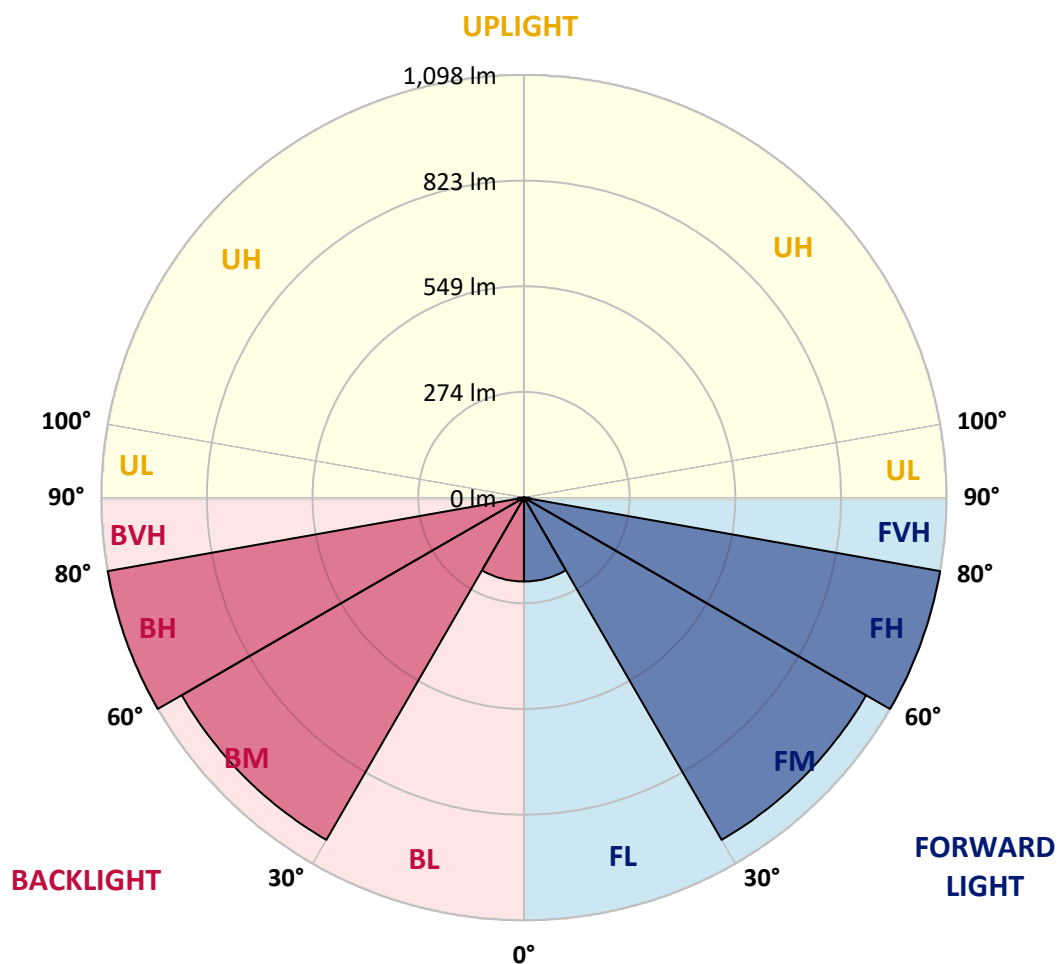
CATALOG NUMBER: GWC-SA1B-827-U-5MQ

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 217.8  | 4.6       |                         |      |         |
| FM   | (30°-60°)   | 1026.2 | 21.8      |                         |      |         |
| FH   | (60°-80°)   | 1097.8 | 23.3      |                         |      | G1/1800 |
| FVH  | (80°-90°)   | 15.2   | 0.3       |                         |      | G1/100  |
| BL   | (0°-30°)    | 217.8  | 4.6       | B1/500                  |      |         |
| BM   | (30°-60°)   | 1026.2 | 21.8      | B2/2500                 |      |         |
| BH   | (60°-80°)   | 1097.8 | 23.3      | B3/2500                 |      | G1/1800 |
| BVH  | (80°-90°)   | 15.2   | 0.3       |                         |      | G1/100  |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B3-U0-G1**

Type V Short



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 75°    | 85°    | 90°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 514.8  | 514.8  | 514.8  | 514.8  | 514.8  | 514.8  | 514.8  | 514.8  | 514.8  | 514.8  | 514.8  |
| 2.5°  | 514.1  | 513.6  | 514.7  | 514.5  | 513.6  | 513.8  | 513.8  | 514.2  | 514.2  | 513.9  | 513.9  |
| 5°    | 512.2  | 511.9  | 513.1  | 513.1  | 512.2  | 512.5  | 512.8  | 513.3  | 513.1  | 512.8  | 512.7  |
| 7.5°  | 509.8  | 509.7  | 510.9  | 510.9  | 510.3  | 510.6  | 510.3  | 510.5  | 510.2  | 509.8  | 509.4  |
| 10°   | 505.9  | 506.3  | 507.4  | 507.7  | 507.7  | 507.8  | 507.5  | 506.7  | 506.3  | 505.8  | 505.3  |
| 12.5° | 502.4  | 502.2  | 503.8  | 504.5  | 505.8  | 507.2  | 506.3  | 504.1  | 503.1  | 502.2  | 501.9  |
| 15°   | 500.0  | 500.2  | 501.7  | 503.1  | 505.3  | 508.3  | 507.2  | 503.8  | 501.9  | 500.8  | 500.5  |
| 17.5° | 499.6  | 499.9  | 501.9  | 504.4  | 506.7  | 510.0  | 509.4  | 505.9  | 502.8  | 500.8  | 500.3  |
| 20°   | 500.6  | 500.8  | 503.9  | 507.5  | 511.6  | 514.7  | 513.3  | 509.5  | 505.3  | 502.2  | 501.4  |
| 22.5° | 502.7  | 503.3  | 507.2  | 512.8  | 519.1  | 523.3  | 521.6  | 515.2  | 508.6  | 504.7  | 503.6  |
| 25°   | 509.1  | 509.2  | 514.5  | 522.2  | 529.7  | 534.5  | 532.5  | 523.4  | 515.0  | 510.6  | 509.2  |
| 27.5° | 522.3  | 522.8  | 528.1  | 537.0  | 543.4  | 546.5  | 545.3  | 537.9  | 530.8  | 526.1  | 526.5  |
| 30°   | 541.5  | 542.1  | 548.1  | 557.9  | 561.8  | 562.6  | 562.3  | 558.8  | 552.3  | 546.0  | 546.5  |
| 32.5° | 564.9  | 565.2  | 573.2  | 582.1  | 585.2  | 585.8  | 585.2  | 582.1  | 574.3  | 565.9  | 566.3  |
| 35°   | 595.0  | 596.0  | 603.6  | 612.2  | 614.7  | 615.9  | 614.8  | 610.8  | 602.7  | 594.4  | 594.1  |
| 37.5° | 632.2  | 632.3  | 640.3  | 649.2  | 652.3  | 652.6  | 651.4  | 648.7  | 638.6  | 631.1  | 630.6  |
| 40°   | 675.2  | 675.8  | 685.2  | 694.7  | 696.0  | 694.6  | 696.3  | 694.7  | 684.3  | 675.7  | 677.1  |
| 42.5° | 727.6  | 729.0  | 740.3  | 749.6  | 746.1  | 745.3  | 746.4  | 746.8  | 738.4  | 728.0  | 727.0  |
| 45°   | 788.6  | 789.9  | 803.9  | 811.4  | 809.1  | 803.9  | 806.1  | 809.9  | 798.2  | 785.2  | 786.5  |
| 47.5° | 858.2  | 861.3  | 876.3  | 883.3  | 877.6  | 870.6  | 874.8  | 880.4  | 866.7  | 850.6  | 849.8  |
| 50°   | 935.6  | 939.5  | 959.5  | 969.3  | 963.5  | 950.6  | 957.6  | 961.4  | 941.5  | 920.8  | 919.1  |
| 52.5° | 1018.1 | 1022.0 | 1047.2 | 1067.4 | 1063.7 | 1043.6 | 1053.4 | 1049.5 | 1026.7 | 998.8  | 996.6  |
| 55°   | 1111.6 | 1113.2 | 1140.3 | 1173.1 | 1176.8 | 1162.0 | 1161.4 | 1155.0 | 1121.3 | 1089.0 | 1087.4 |
| 57.5° | 1207.7 | 1208.8 | 1243.9 | 1282.6 | 1300.2 | 1300.2 | 1282.7 | 1269.2 | 1224.4 | 1186.9 | 1183.0 |
| 60°   | 1311.4 | 1315.3 | 1354.2 | 1406.8 | 1448.0 | 1460.1 | 1429.2 | 1392.3 | 1343.6 | 1297.9 | 1293.3 |
| 62.5° | 1403.8 | 1408.3 | 1467.8 | 1546.1 | 1612.2 | 1656.5 | 1581.0 | 1520.8 | 1432.2 | 1358.9 | 1350.3 |
| 65°   | 1415.5 | 1427.7 | 1514.3 | 1656.1 | 1804.1 | 1892.6 | 1747.8 | 1599.4 | 1438.0 | 1336.1 | 1327.4 |
| 67.5° | 1292.7 | 1313.3 | 1430.3 | 1651.1 | 1957.0 | 2146.9 | 1854.4 | 1554.5 | 1334.4 | 1221.7 | 1212.1 |
| 70°   | 993.3  | 1023.3 | 1158.2 | 1444.2 | 1930.7 | 2228.8 | 1787.6 | 1360.9 | 1112.5 | 991.3  | 977.7  |
| 72.5° | 545.0  | 557.3  | 678.7  | 989.0  | 1547.8 | 1894.0 | 1491.0 | 1006.3 | 737.8  | 600.3  | 577.6  |
| 75°   | 172.9  | 177.2  | 239.0  | 404.7  | 875.5  | 1254.5 | 947.2  | 493.9  | 271.9  | 200.5  | 198.1  |
| 77.5° | 76.8   | 77.2   | 86.4   | 118.1  | 301.6  | 635.6  | 362.3  | 134.5  | 92.7   | 81.0   | 83.6   |
| 80°   | 48.5   | 48.5   | 53.5   | 58.5   | 82.1   | 184.6  | 98.0   | 64.0   | 54.6   | 50.7   | 51.8   |
| 82.5° | 23.2   | 25.7   | 34.8   | 37.4   | 45.1   | 62.1   | 50.2   | 41.8   | 36.5   | 27.1   | 25.3   |
| 85°   | 15.3   | 12.8   | 22.0   | 24.8   | 26.2   | 29.8   | 29.2   | 27.6   | 23.9   | 13.6   | 15.1   |
| 87.5° | 6.9    | 6.6    | 11.4   | 10.5   | 9.8    | 7.5    | 11.2   | 13.9   | 13.4   | 6.7    | 6.7    |
| 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)

INVUE

Report Number: SP1-2104-224-5

Luminaire Tested: CCW-SA-2A-827-U-SL4

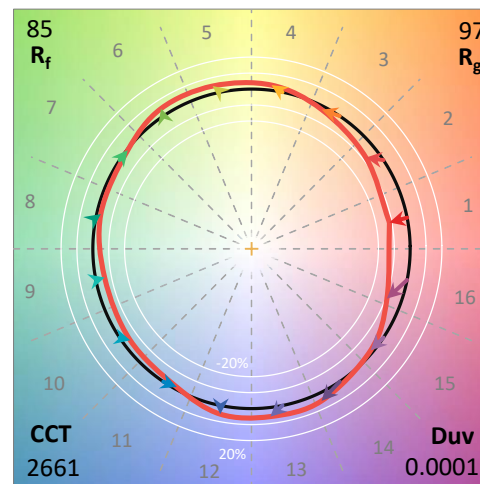
Test Date: 04/27/2021

### Test Information

Test Method: LM-79-08  
 Report Number: SP1-2104-224-5  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1  
 Measurement Geometry:  $4\pi$   
 Issue Date: 04/27/2021  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: INVUE  
 Catalog Number: **CCW-SA-2A-827-U-SL4**  
 Description: INVUE WALL PACK ClearCurve Light Square

### Spectral Parameters

|                           |        |           |      |      |      |
|---------------------------|--------|-----------|------|------|------|
| CCT (K):                  | 2661   | CRI (Ra): | 82.2 |      |      |
| CIE u':                   | 0.2642 | R1:       | 80.7 | R9:  | 5.2  |
| CIE v':                   | 0.5282 | R2:       | 91.5 | R10: | 82.2 |
| Duv:                      | 0.0001 | R3:       | 94.9 | R11: | 81.4 |
| CIE x:                    | 0.4631 | R4:       | 80.7 | R12: | 80.4 |
| CIE y:                    | 0.4115 | R5:       | 81.5 | R13: | 83.2 |
| CIE z:                    | 0.1254 | R6:       | 91.6 | R14: | 97.8 |
| Peak Wavelength (nm):     | 606    | R7:       | 81.0 |      |      |
| Dominant Wavelength (nm): | 584    | R8:       | 56.0 |      |      |
| Purity:                   | 62.8   |           |      |      |      |
| Rf:                       | 85.3   |           |      |      |      |
| Rg:                       | 96.5   |           |      |      |      |



### Test Conditions

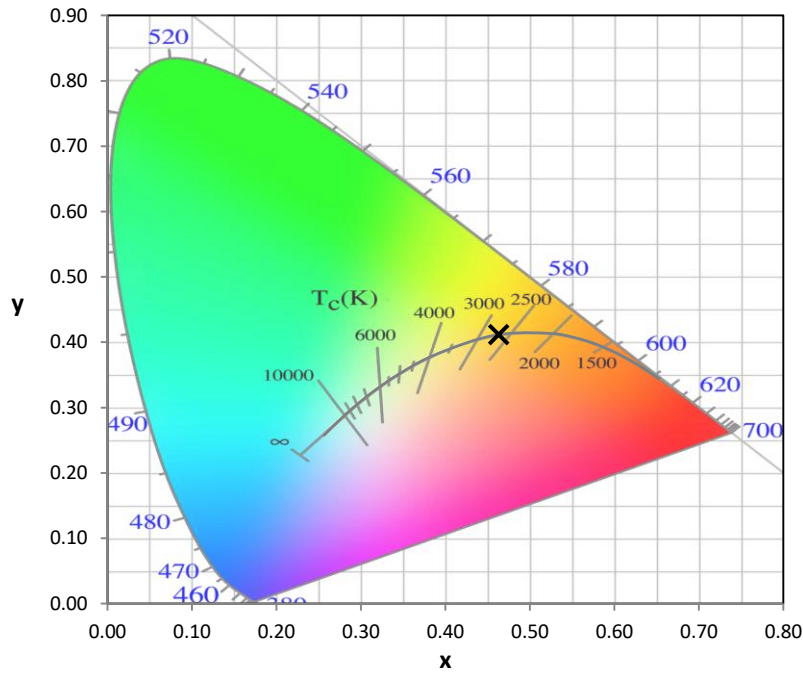
Stabilization Time: 163M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.0/47%  
 Sphere Temperature (°C): 24.1

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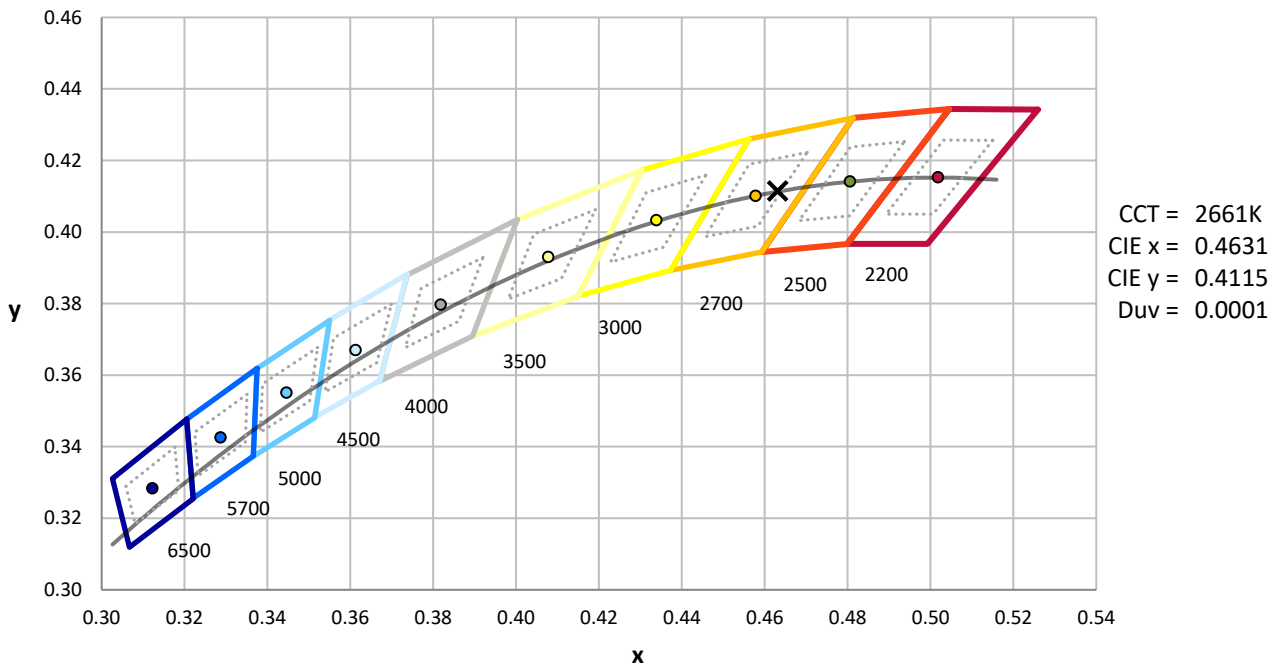
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date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

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**CIE 1931 Chromaticity Diagram**



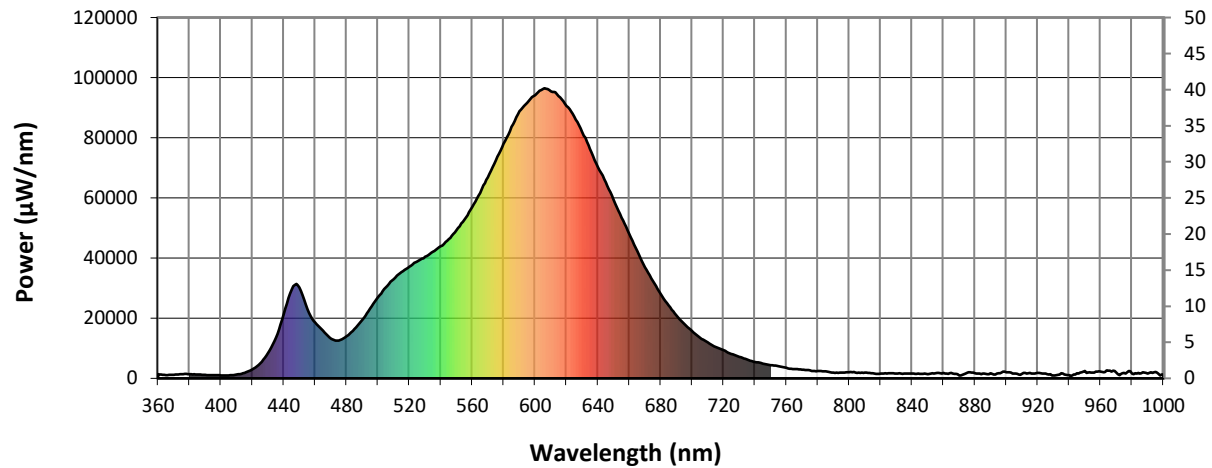
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 2700K 4-step quadrangle

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### Photopic Flux vs. Wavelength

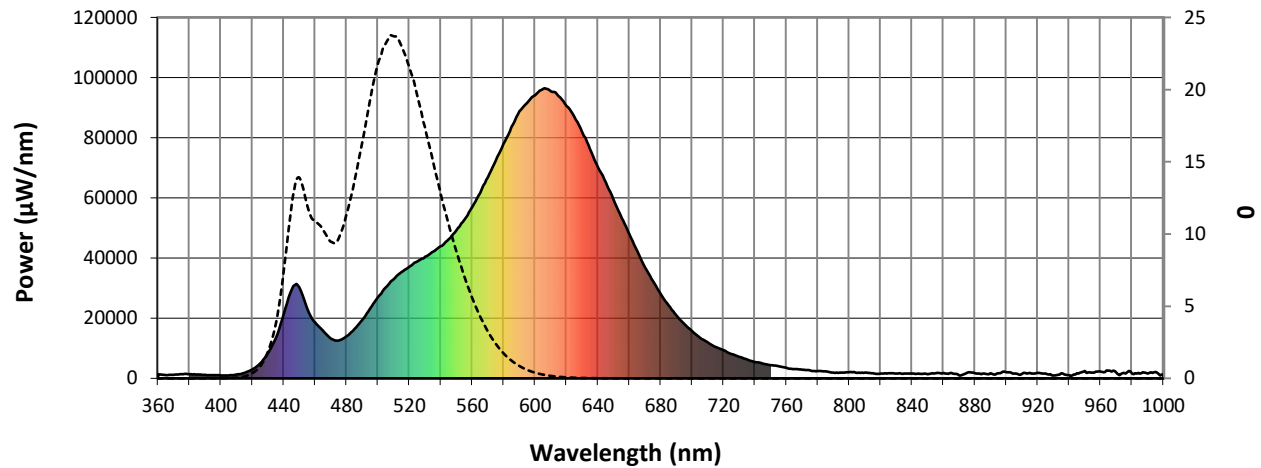


#####

| 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       | 1379             | 0.0              | 490       | 19477            | 2.8              | 620       | 90616            | 23.6             | 750       | 4384             | 0.0              | 880       | 1655             | 0.0              |
| 365       | 1114             | 0.0              | 495       | 23200            | 4.2              | 625       | 87050            | 19.2             | 755       | 4013             | 0.0              | 885       | 1597             | 0.0              |
| 370       | 1169             | 0.0              | 500       | 26999            | 6.0              | 630       | 81805            | 14.8             | 760       | 3486             | 0.0              | 890       | 1696             | 0.0              |
| 375       | 1418             | 0.0              | 505       | 30185            | 8.4              | 635       | 76273            | 11.5             | 765       | 3111             | 0.0              | 895       | 1694             | 0.0              |
| 380       | 1358             | 0.0              | 510       | 33025            | 11.3             | 640       | 70276            | 8.4              | 770       | 2922             | 0.0              | 900       | 2016             | 0.0              |
| 385       | 1234             | 0.0              | 515       | 35307            | 14.6             | 645       | 65174            | 6.3              | 775       | 2649             | 0.0              | 905       | 1631             | 0.0              |
| 390       | 1133             | 0.0              | 520       | 37140            | 18.0             | 650       | 59417            | 4.3              | 780       | 2399             | 0.0              | 910       | 1506             | 0.0              |
| 395       | 1066             | 0.0              | 525       | 38834            | 20.8             | 655       | 53417            | 3.1              | 785       | 2386             | 0.0              | 915       | 1763             | 0.0              |
| 400       | 982              | 0.0              | 530       | 40401            | 23.8             | 660       | 48038            | 2.0              | 790       | 1912             | 0.0              | 920       | 1860             | 0.0              |
| 405       | 996              | 0.0              | 535       | 42121            | 26.1             | 665       | 42350            | 1.3              | 795       | 1902             | 0.0              | 925       | 1612             | 0.0              |
| 410       | 1276             | 0.0              | 540       | 43918            | 28.6             | 670       | 36925            | 0.8              | 800       | 2023             | 0.0              | 930       | 976              | 0.0              |
| 415       | 1798             | 0.0              | 545       | 46244            | 30.8             | 675       | 32385            | 0.5              | 805       | 1813             | 0.0              | 935       | 1702             | 0.0              |
| 420       | 2943             | 0.0              | 550       | 49225            | 33.5             | 680       | 28089            | 0.3              | 810       | 1888             | 0.0              | 940       | 1083             | 0.0              |
| 425       | 4989             | 0.0              | 555       | 52758            | 36.0             | 685       | 24306            | 0.2              | 815       | 1669             | 0.0              | 945       | 1672             | 0.0              |
| 430       | 8360             | 0.1              | 560       | 56904            | 38.7             | 690       | 20941            | 0.1              | 820       | 1558             | 0.0              | 950       | 2462             | 0.0              |
| 435       | 13537            | 0.2              | 565       | 61643            | 41.0             | 695       | 18065            | 0.1              | 825       | 1689             | 0.0              | 955       | 1958             | 0.0              |
| 440       | 21265            | 0.3              | 570       | 66872            | 43.5             | 700       | 15715            | 0.0              | 830       | 1632             | 0.0              | 960       | 2236             | 0.0              |
| 445       | 29496            | 0.6              | 575       | 72519            | 45.1             | 705       | 13502            | 0.0              | 835       | 1615             | 0.0              | 965       | 2541             | 0.0              |
| 450       | 30225            | 0.8              | 580       | 78030            | 46.4             | 710       | 11899            | 0.0              | 840       | 1583             | 0.0              | 970       | 1960             | 0.0              |
| 455       | 23120            | 0.8              | 585       | 83595            | 46.4             | 715       | 10427            | 0.0              | 845       | 1541             | 0.0              | 975       | 1763             | 0.0              |
| 460       | 18596            | 0.8              | 590       | 88814            | 45.9             | 720       | 9351             | 0.0              | 850       | 1350             | 0.0              | 980       | 1627             | 0.0              |
| 465       | 15865            | 0.8              | 595       | 91588            | 43.4             | 725       | 8139             | 0.0              | 855       | 1689             | 0.0              | 985       | 1556             | 0.0              |
| 470       | 13251            | 0.8              | 600       | 94210            | 40.6             | 730       | 7143             | 0.0              | 860       | 1763             | 0.0              | 990       | 1638             | 0.0              |
| 475       | 12609            | 1.0              | 605       | 96240            | 37.3             | 735       | 6273             | 0.0              | 865       | 1765             | 0.0              | 995       | 2124             | 0.0              |
| 480       | 14016            | 1.3              | 610       | 95474            | 32.8             | 740       | 5462             | 0.0              | 870       | 942              | 0.0              | 1000      | 1228             | 0.0              |
| 485       | 16368            | 1.9              | 615       | 93812            | 28.3             | 745       | 4946             | 0.0              | 875       | 1844             | 0.0              |           |                  |                  |

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### Scotopic Flux vs. Wavelength



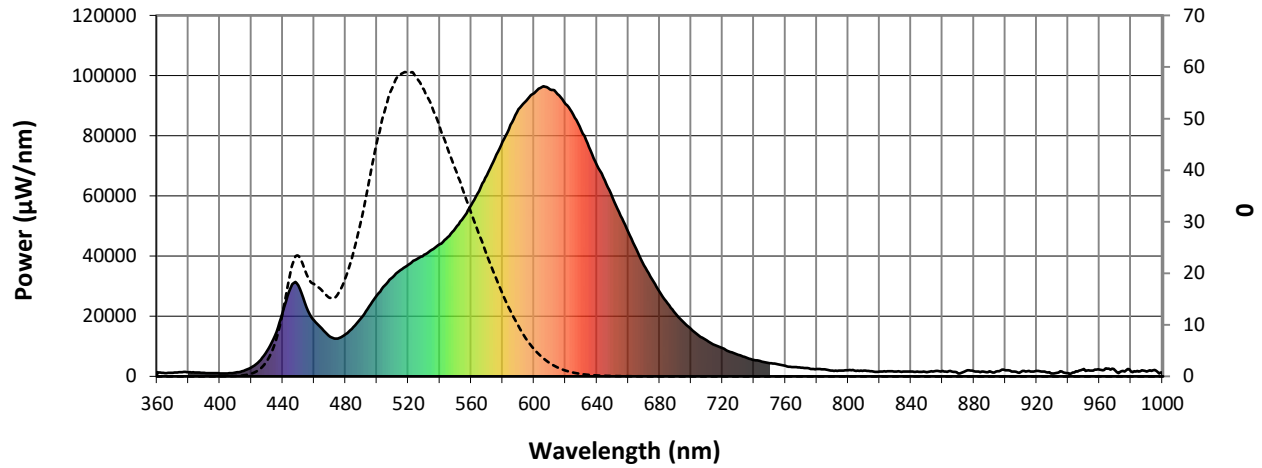
Scotopic Lumens: 5165.4

S/P: 1.2

| $\lambda$<br>(nm) | Power<br>( $\mu\text{W/nm}$ ) | Lumens<br>( $\Phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W/nm}$ ) | Lumens<br>( $\Phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W/nm}$ ) | Lumens<br>( $\Phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W/nm}$ ) | Lumens<br>( $\Phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W/nm}$ ) | Lumens<br>( $\Phi/\text{nm}$ ) |
|-------------------|-------------------------------|--------------------------------|-------------------|-------------------------------|--------------------------------|-------------------|-------------------------------|--------------------------------|-------------------|-------------------------------|--------------------------------|-------------------|-------------------------------|--------------------------------|
| 360               | 1379                          | 0.0                            | 490               | 19477                         | 30.0                           | 620               | 90616                         | 1.1                            | 750               | 4384                          | 0.0                            | 880               | 1655                          | 0.0                            |
| 365               | 1114                          | 0.0                            | 495               | 23200                         | 37.5                           | 625               | 87050                         | 0.7                            | 755               | 4013                          | 0.0                            | 885               | 1597                          | 0.0                            |
| 370               | 1169                          | 0.0                            | 500               | 26999                         | 45.2                           | 630               | 81805                         | 0.5                            | 760               | 3486                          | 0.0                            | 890               | 1696                          | 0.0                            |
| 375               | 1418                          | 0.0                            | 505               | 30185                         | 51.3                           | 635               | 76273                         | 0.3                            | 765               | 3111                          | 0.0                            | 895               | 1694                          | 0.0                            |
| 380               | 1358                          | 0.0                            | 510               | 33025                         | 56.0                           | 640               | 70276                         | 0.2                            | 770               | 2922                          | 0.0                            | 900               | 2016                          | 0.0                            |
| 385               | 1234                          | 0.0                            | 515               | 35307                         | 58.5                           | 645               | 65174                         | 0.1                            | 775               | 2649                          | 0.0                            | 905               | 1631                          | 0.0                            |
| 390               | 1133                          | 0.0                            | 520               | 37140                         | 59.0                           | 650               | 59417                         | 0.1                            | 780               | 2399                          | 0.0                            | 910               | 1506                          | 0.0                            |
| 395               | 1066                          | 0.0                            | 525               | 38834                         | 58.1                           | 655               | 53417                         | 0.0                            | 785               | 2386                          | 0.0                            | 915               | 1763                          | 0.0                            |
| 400               | 982                           | 0.0                            | 530               | 40401                         | 55.7                           | 660               | 48038                         | 0.0                            | 790               | 1912                          | 0.0                            | 920               | 1860                          | 0.0                            |
| 405               | 996                           | 0.0                            | 535               | 42121                         | 52.5                           | 665               | 42350                         | 0.0                            | 795               | 1902                          | 0.0                            | 925               | 1612                          | 0.0                            |
| 410               | 1276                          | 0.1                            | 540               | 43918                         | 48.5                           | 670               | 36925                         | 0.0                            | 800               | 2023                          | 0.0                            | 930               | 976                           | 0.0                            |
| 415               | 1798                          | 0.2                            | 545               | 46244                         | 44.3                           | 675               | 32385                         | 0.0                            | 805               | 1813                          | 0.0                            | 935               | 1702                          | 0.0                            |
| 420               | 2943                          | 0.5                            | 550               | 49225                         | 40.3                           | 680               | 28089                         | 0.0                            | 810               | 1888                          | 0.0                            | 940               | 1083                          | 0.0                            |
| 425               | 4989                          | 1.2                            | 555               | 52758                         | 36.1                           | 685               | 24306                         | 0.0                            | 815               | 1669                          | 0.0                            | 945               | 1672                          | 0.0                            |
| 430               | 8360                          | 2.8                            | 560               | 56904                         | 31.8                           | 690               | 20941                         | 0.0                            | 820               | 1558                          | 0.0                            | 950               | 2462                          | 0.0                            |
| 435               | 13537                         | 6.1                            | 565               | 61643                         | 27.7                           | 695               | 18065                         | 0.0                            | 825               | 1689                          | 0.0                            | 955               | 1958                          | 0.0                            |
| 440               | 21265                         | 11.9                           | 570               | 66872                         | 23.6                           | 700               | 15715                         | 0.0                            | 830               | 1632                          | 0.0                            | 960               | 2236                          | 0.0                            |
| 445               | 29496                         | 19.8                           | 575               | 72519                         | 19.7                           | 705               | 13502                         | 0.0                            | 835               | 1615                          | 0.0                            | 965               | 2541                          | 0.0                            |
| 450               | 30225                         | 23.4                           | 580               | 78030                         | 16.1                           | 710               | 11899                         | 0.0                            | 840               | 1583                          | 0.0                            | 970               | 1960                          | 0.0                            |
| 455               | 23120                         | 20.2                           | 585               | 83595                         | 12.8                           | 715               | 10427                         | 0.0                            | 845               | 1541                          | 0.0                            | 975               | 1763                          | 0.0                            |
| 460               | 18596                         | 18.0                           | 590               | 88814                         | 9.9                            | 720               | 9351                          | 0.0                            | 850               | 1350                          | 0.0                            | 980               | 1627                          | 0.0                            |
| 465               | 15865                         | 16.8                           | 595               | 91588                         | 7.3                            | 725               | 8139                          | 0.0                            | 855               | 1689                          | 0.0                            | 985               | 1556                          | 0.0                            |
| 470               | 13251                         | 15.3                           | 600               | 94210                         | 5.3                            | 730               | 7143                          | 0.0                            | 860               | 1763                          | 0.0                            | 990               | 1638                          | 0.0                            |
| 475               | 12609                         | 15.8                           | 605               | 96240                         | 3.8                            | 735               | 6273                          | 0.0                            | 865               | 1765                          | 0.0                            | 995               | 2124                          | 0.0                            |
| 480               | 14016                         | 18.9                           | 610               | 95474                         | 2.6                            | 740               | 5462                          | 0.0                            | 870               | 942                           | 0.0                            | 1000              | 1228                          | 0.0                            |
| 485               | 16368                         | 23.7                           | 615               | 93812                         | 1.7                            | 745               | 4946                          | 0.0                            | 875               | 1844                          | 0.0                            |                   |                               |                                |

REPORT NUMBER: SP1-2104-224-5

### Melanopic Flux vs. Wavelength


**Melanopic Lumens: 1892.1      M/P: 0.44**

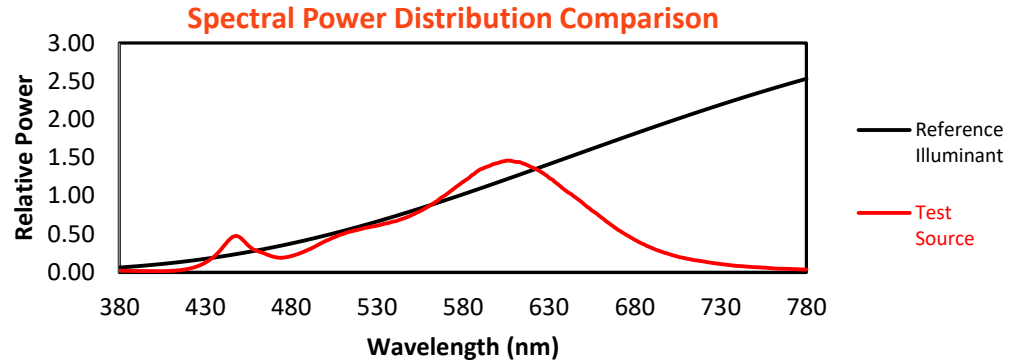
| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 1379             | 0.0              | 490       | 19477            | 16.2             | 620       | 90616            | 0.1              | 750       | 4384             | 0.0              | 880       | 1655             | 0.0              |
| 365       | 1114             | 0.0              | 495       | 23200            | 19.2             | 625       | 87050            | 0.0              | 755       | 4013             | 0.0              | 885       | 1597             | 0.0              |
| 370       | 1169             | 0.0              | 500       | 26999            | 21.7             | 630       | 81805            | 0.0              | 760       | 3486             | 0.0              | 890       | 1696             | 0.0              |
| 375       | 1418             | 0.0              | 505       | 30185            | 23.2             | 635       | 76273            | 0.0              | 765       | 3111             | 0.0              | 895       | 1694             | 0.0              |
| 380       | 1358             | 0.0              | 510       | 33025            | 23.7             | 640       | 70276            | 0.0              | 770       | 2922             | 0.0              | 900       | 2016             | 0.0              |
| 385       | 1234             | 0.0              | 515       | 35307            | 23.1             | 645       | 65174            | 0.0              | 775       | 2649             | 0.0              | 905       | 1631             | 0.0              |
| 390       | 1133             | 0.0              | 520       | 37140            | 21.6             | 650       | 59417            | 0.0              | 780       | 2399             | 0.0              | 910       | 1506             | 0.0              |
| 395       | 1066             | 0.0              | 525       | 38834            | 19.7             | 655       | 53417            | 0.0              | 785       | 2386             | 0.0              | 915       | 1763             | 0.0              |
| 400       | 982              | 0.0              | 530       | 40401            | 17.5             | 660       | 48038            | 0.0              | 790       | 1912             | 0.0              | 920       | 1860             | 0.0              |
| 405       | 996              | 0.0              | 535       | 42121            | 15.2             | 665       | 42350            | 0.0              | 795       | 1902             | 0.0              | 925       | 1612             | 0.0              |
| 410       | 1276             | 0.0              | 540       | 43918            | 12.9             | 670       | 36925            | 0.0              | 800       | 2023             | 0.0              | 930       | 976              | 0.0              |
| 415       | 1798             | 0.1              | 545       | 46244            | 10.7             | 675       | 32385            | 0.0              | 805       | 1813             | 0.0              | 935       | 1702             | 0.0              |
| 420       | 2943             | 0.3              | 550       | 49225            | 8.8              | 680       | 28089            | 0.0              | 810       | 1888             | 0.0              | 940       | 1083             | 0.0              |
| 425       | 4989             | 0.8              | 555       | 52758            | 7.1              | 685       | 24306            | 0.0              | 815       | 1669             | 0.0              | 945       | 1672             | 0.0              |
| 430       | 8360             | 1.8              | 560       | 56904            | 5.6              | 690       | 20941            | 0.0              | 820       | 1558             | 0.0              | 950       | 2462             | 0.0              |
| 435       | 13537            | 3.6              | 565       | 61643            | 4.3              | 695       | 18065            | 0.0              | 825       | 1689             | 0.0              | 955       | 1958             | 0.0              |
| 440       | 21265            | 7.1              | 570       | 66872            | 3.3              | 700       | 15715            | 0.0              | 830       | 1632             | 0.0              | 960       | 2236             | 0.0              |
| 445       | 29496            | 11.6             | 575       | 72519            | 2.4              | 705       | 13502            | 0.0              | 835       | 1615             | 0.0              | 965       | 2541             | 0.0              |
| 450       | 30225            | 13.9             | 580       | 78030            | 1.7              | 710       | 11899            | 0.0              | 840       | 1583             | 0.0              | 970       | 1960             | 0.0              |
| 455       | 23120            | 12.1             | 585       | 83595            | 1.2              | 715       | 10427            | 0.0              | 845       | 1541             | 0.0              | 975       | 1763             | 0.0              |
| 460       | 18596            | 11.0             | 590       | 88814            | 0.9              | 720       | 9351             | 0.0              | 850       | 1350             | 0.0              | 980       | 1627             | 0.0              |
| 465       | 15865            | 10.4             | 595       | 91588            | 0.6              | 725       | 8139             | 0.0              | 855       | 1689             | 0.0              | 985       | 1556             | 0.0              |
| 470       | 13251            | 9.5              | 600       | 94210            | 0.4              | 730       | 7143             | 0.0              | 860       | 1763             | 0.0              | 990       | 1638             | 0.0              |
| 475       | 12609            | 9.6              | 605       | 96240            | 0.3              | 735       | 6273             | 0.0              | 865       | 1765             | 0.0              | 995       | 2124             | 0.0              |
| 480       | 14016            | 11.3             | 610       | 95474            | 0.2              | 740       | 5462             | 0.0              | 870       | 942              | 0.0              | 1000      | 1228             | 0.0              |
| 485       | 16368            | 13.5             | 615       | 93812            | 0.1              | 745       | 4946             | 0.0              | 875       | 1844             | 0.0              |           |                  |                  |

REPORT NUMBER: SP1-2104-224-5

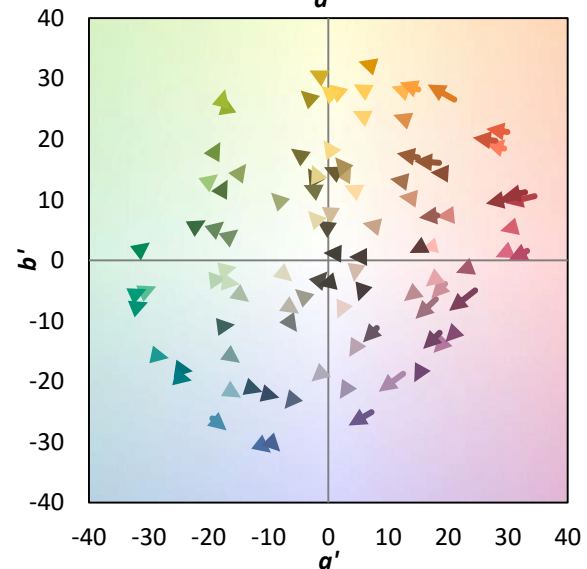
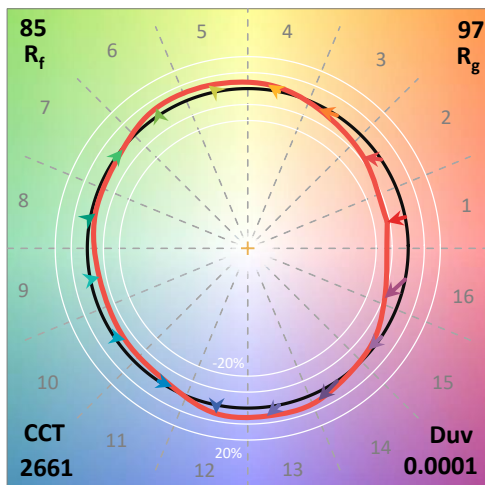
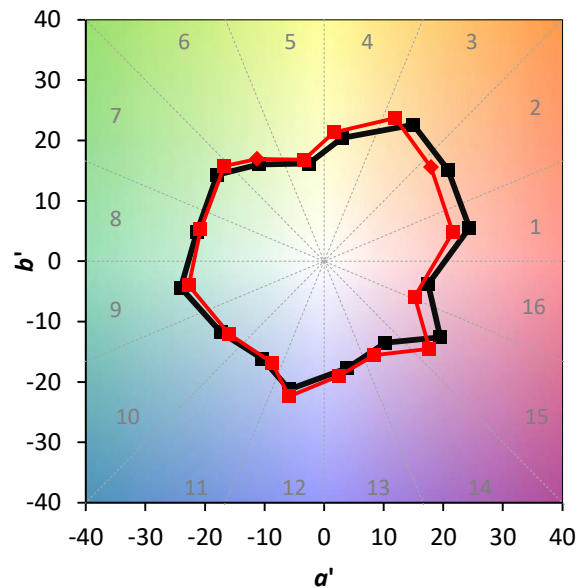
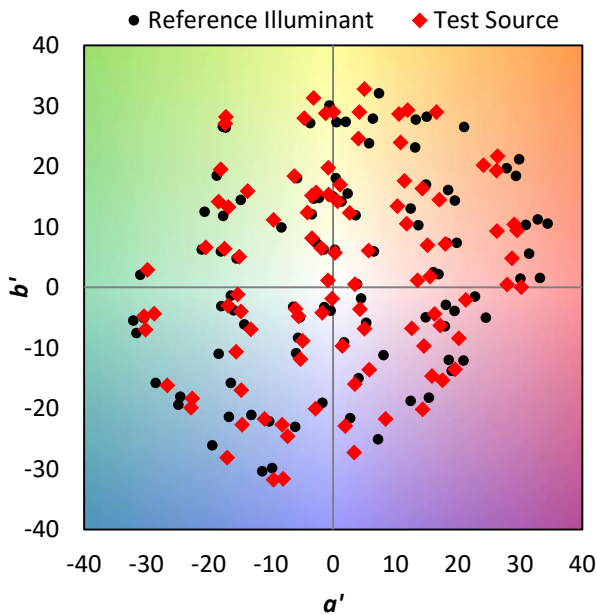
TM-30-18

### Summary

$R_f = 85.3$   
 $R_g = 96.5$   
 CIE  $R_a = 82.2$   
 $R_9 = 5.2$

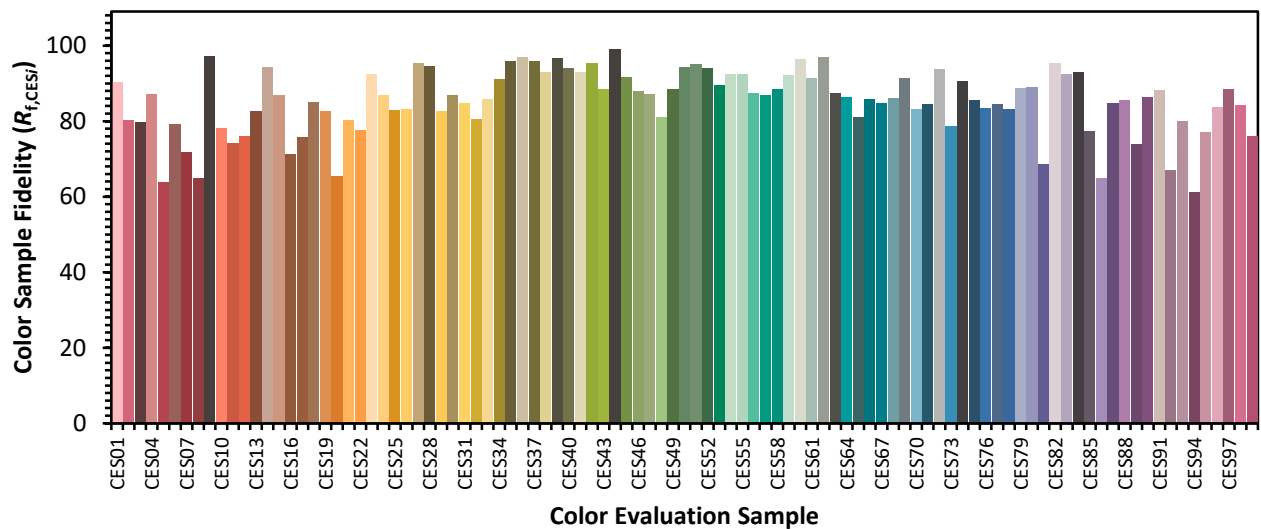


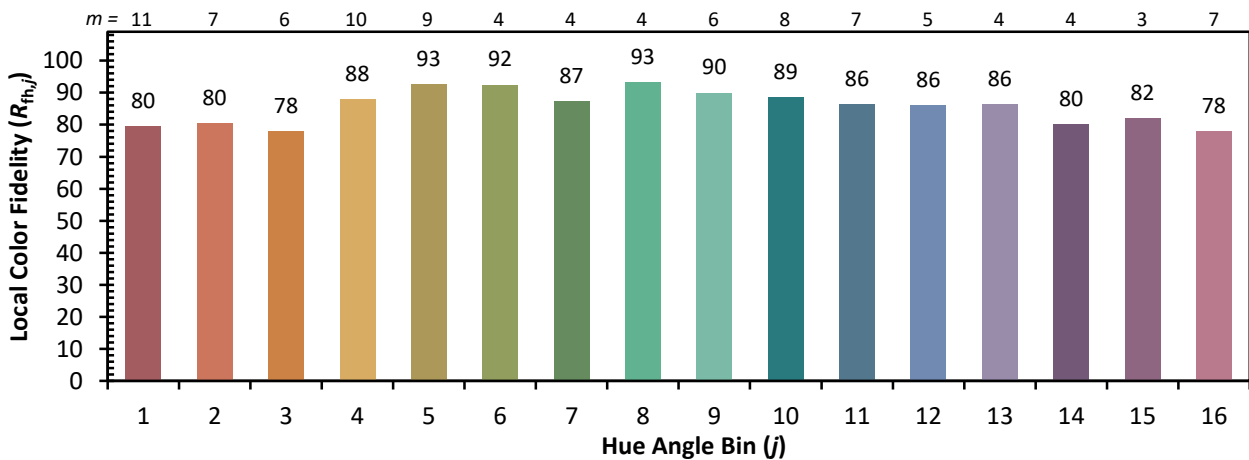
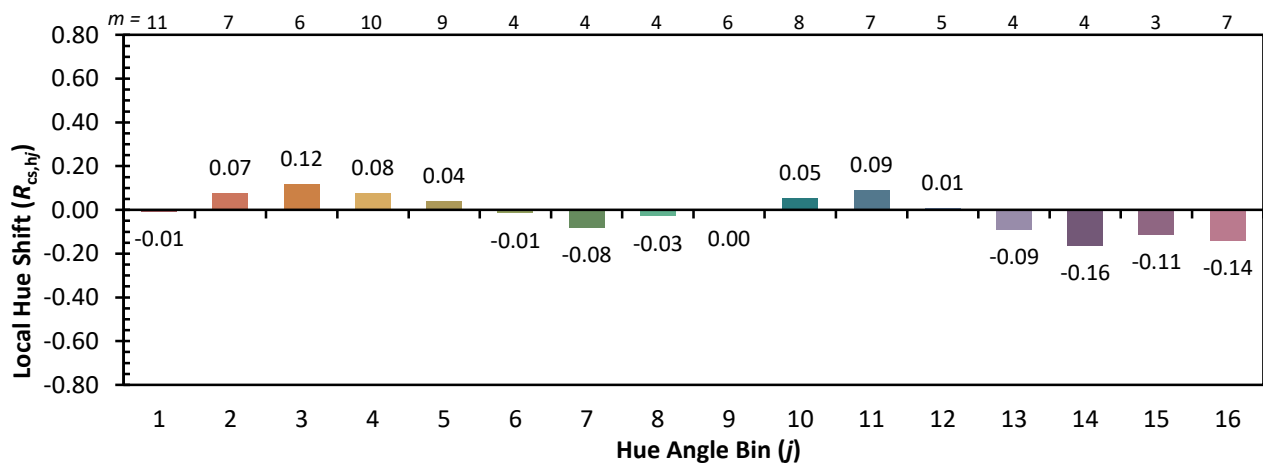
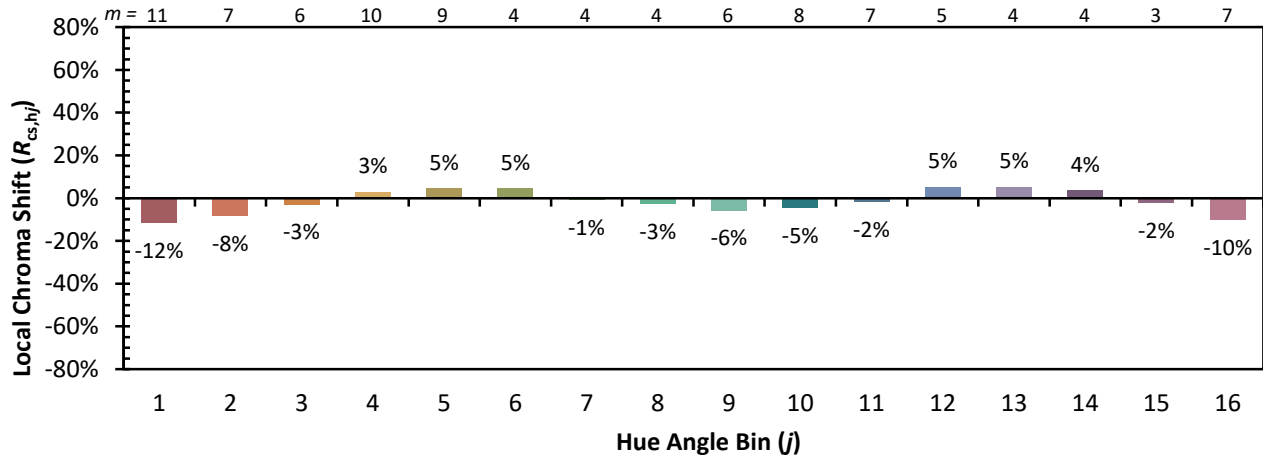
### Color Vector Graphics



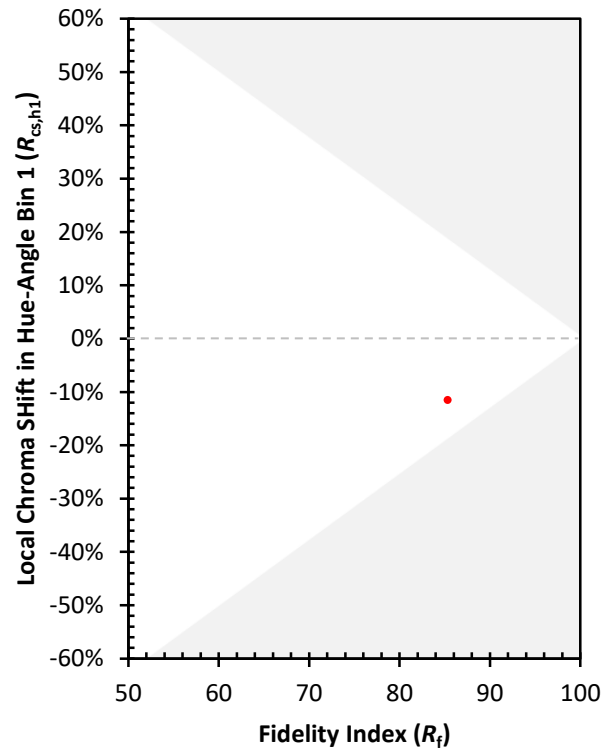
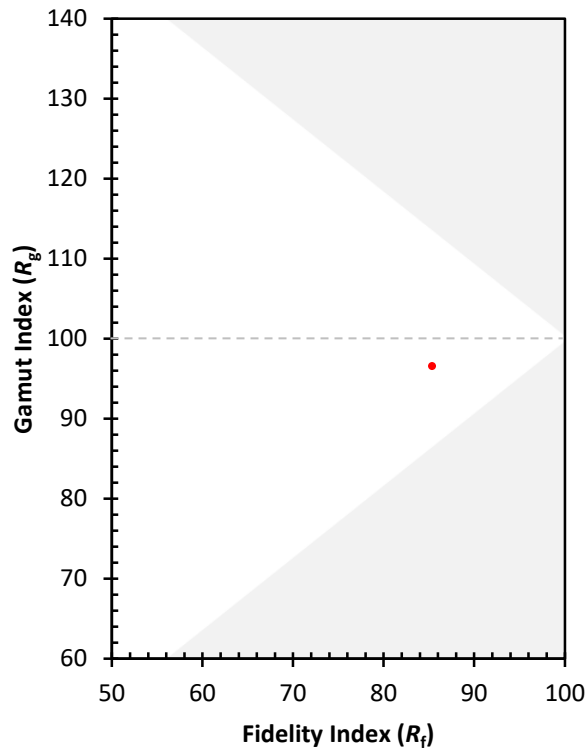
Individual Sample Fidelity Index ( $R_{f,i}$ )

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 87 | CES26 = 83 | CES51 = 95 | CES76 = 83 |
| CES02 = 64 | CES27 = 95 | CES52 = 94 | CES77 = 85 |
| CES03 = 32 | CES28 = 95 | CES53 = 89 | CES78 = 83 |
| CES04 = 71 | CES29 = 83 | CES54 = 92 | CES79 = 89 |
| CES05 = 51 | CES30 = 87 | CES55 = 92 | CES80 = 89 |
| CES06 = 52 | CES31 = 85 | CES56 = 87 | CES81 = 69 |
| CES07 = 43 | CES32 = 81 | CES57 = 87 | CES82 = 95 |
| CES08 = 42 | CES33 = 86 | CES58 = 88 | CES83 = 92 |
| CES09 = 29 | CES34 = 91 | CES59 = 92 | CES84 = 93 |
| CES10 = 77 | CES35 = 96 | CES60 = 96 | CES85 = 77 |
| CES11 = 60 | CES36 = 97 | CES61 = 91 | CES86 = 65 |
| CES12 = 66 | CES37 = 96 | CES62 = 97 | CES87 = 85 |
| CES13 = 44 | CES38 = 93 | CES63 = 87 | CES88 = 85 |
| CES14 = 74 | CES39 = 97 | CES64 = 86 | CES89 = 74 |
| CES15 = 72 | CES40 = 94 | CES65 = 81 | CES90 = 86 |
| CES16 = 48 | CES41 = 93 | CES66 = 86 | CES91 = 88 |
| CES17 = 50 | CES42 = 95 | CES67 = 85 | CES92 = 67 |
| CES18 = 57 | CES43 = 88 | CES68 = 86 | CES93 = 80 |
| CES19 = 73 | CES44 = 99 | CES69 = 91 | CES94 = 61 |
| CES20 = 67 | CES45 = 92 | CES70 = 83 | CES95 = 77 |
| CES21 = 87 | CES46 = 88 | CES71 = 85 | CES96 = 84 |
| CES22 = 80 | CES47 = 87 | CES72 = 94 | CES97 = 88 |
| CES23 = 92 | CES48 = 81 | CES73 = 79 | CES98 = 84 |
| CES24 = 91 | CES49 = 88 | CES74 = 90 | CES99 = 76 |
| CES25 = 72 | CES50 = 94 | CES75 = 86 |            |



**Color Rendition by Hue-Angle Bin**


**Measure Comparisons**



(END OF REPORT)