

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: INVUE

Report Number: P553740

Luminaire Tested: **LXS-VA2-740-U-SYM-A**

Issue Date: 7/13/2021

**Test Information**

Test Method: LM-79-08  
Report Number: P553740  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1803-687-4)  
Test Lab: INNOVATION CENTER  
Issue Date: 7/13/2021  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: INVUE  
Catalog Number: LXS-VA2-740-U-SYM-A  
Description: LUXESCAPE OUTDOOR ARCHITECTURAL LUMINAIRE  
70 CRI, 4000K LEDS AND TYPE V OPTIC, ARM MOUNT  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 5356 lumens  
Efficiency: N/A  
Efficacy: 130.6 lumens/watt  
Luminous Opening: Circular (Dia: 1.62' x H: 0')  
IES Classification: Type V - Short  
BUG Rating: B3 - U0 - G2

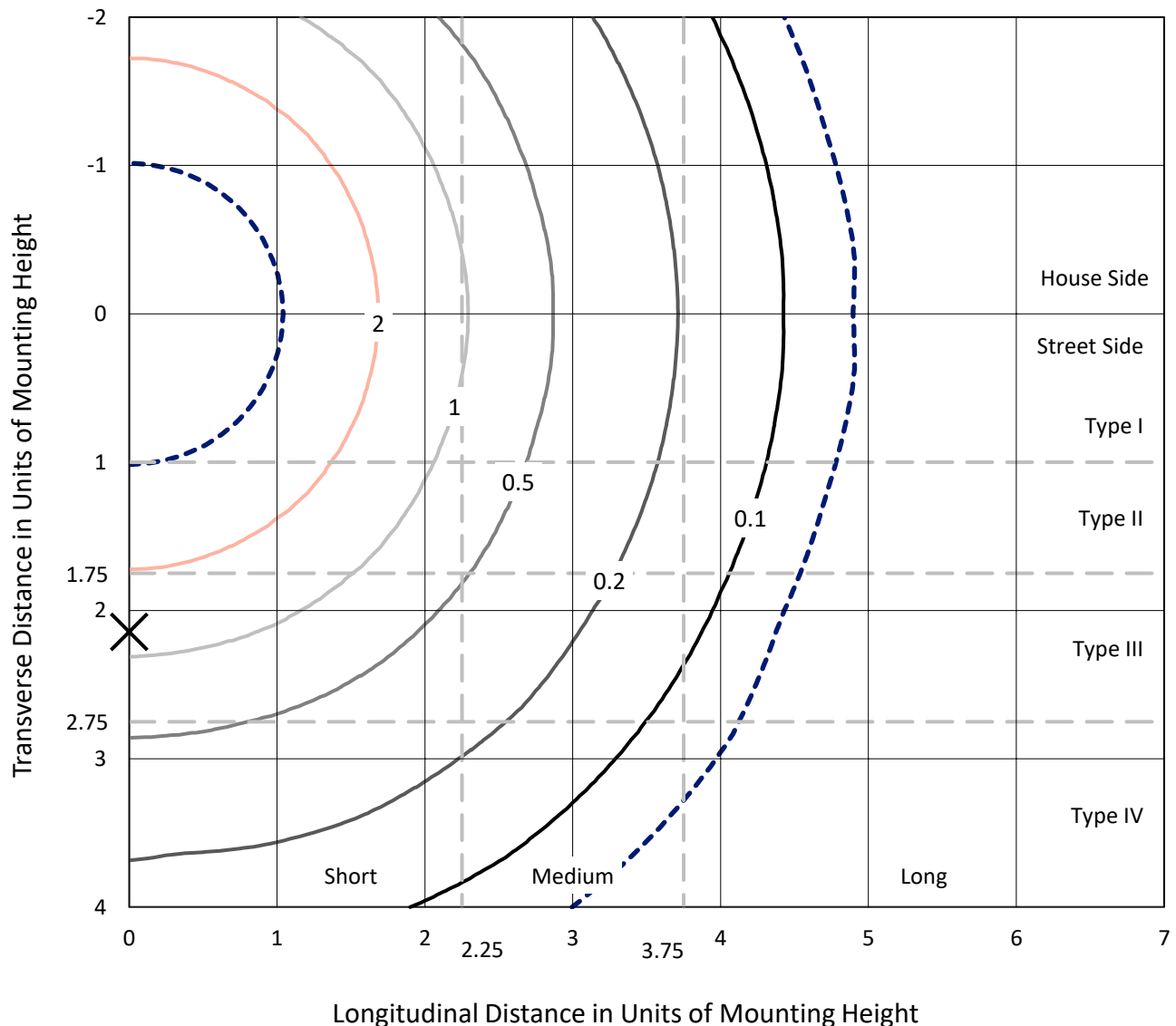
Input Watts (W): 41  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT



CATALOG NUMBER: LXS-VA2-740-U-SYM-A

## Iso-Footcandle Lines of Horizontal Illumination

--- 1/2 Max cd

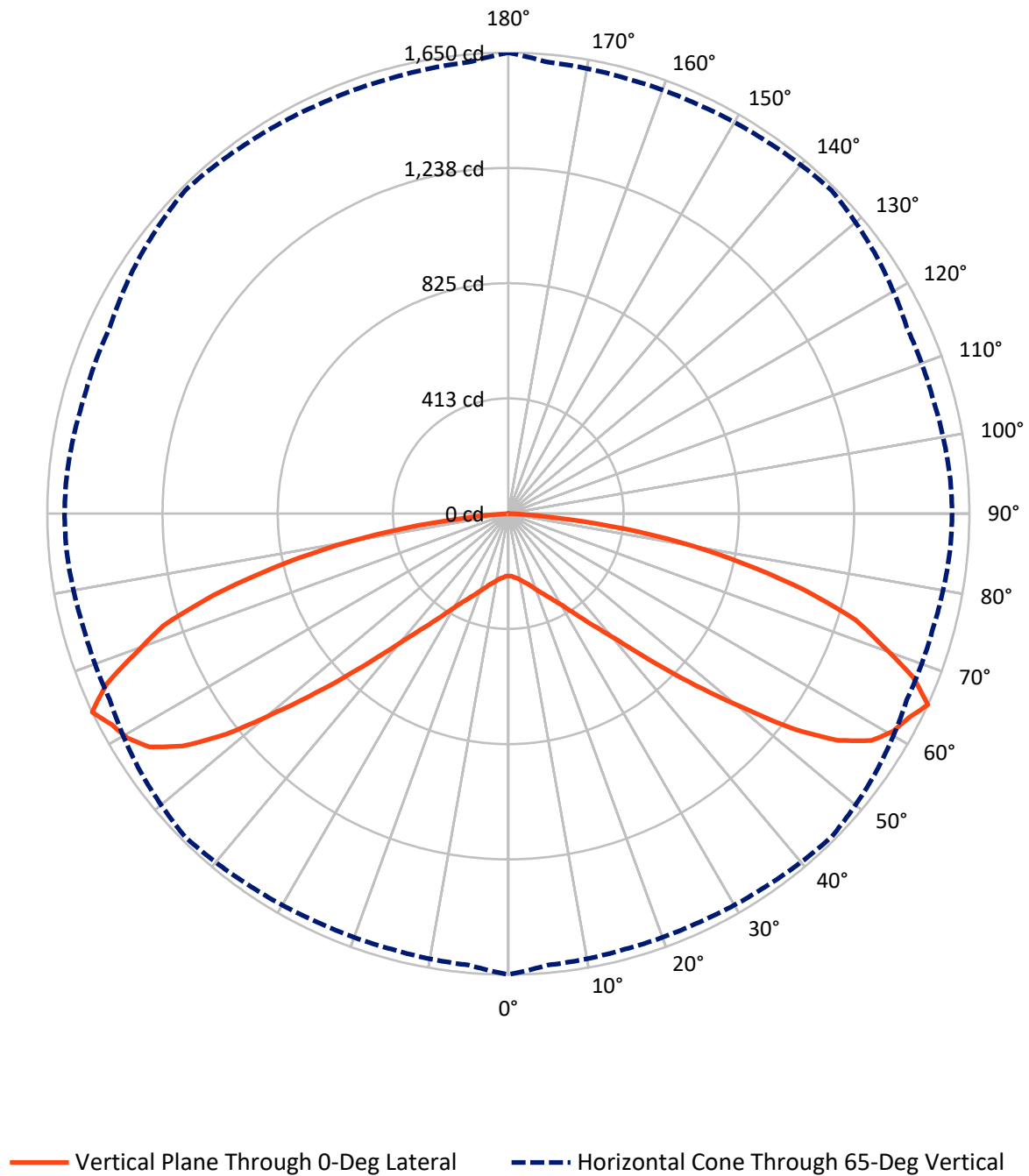


Based on 10 foot mounting height. Maximum calculated value = 2.9 fc  
Type V - Short - N/A

REPORT NUMBER: P553740

CATALOG NUMBER: LXS-VA2-740-U-SYM-A

## Luminous Intensity Polar Plot



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CATALOG NUMBER: LXS-VA2-740-U-SYM-A

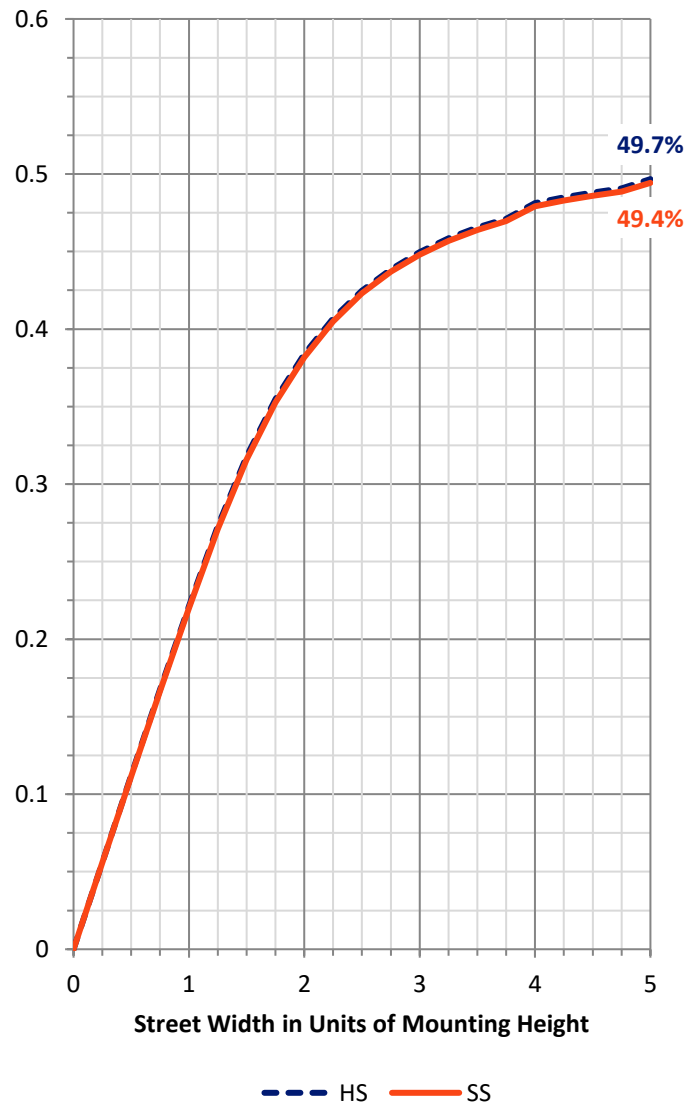
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 2678.0   | 0.0    | 2678.0 |
|                    | % Fixture | 50.0     | 0.0    | 50.0   |
| <b>Street Side</b> | Lumens    | 2678.0   | 0.0    | 2678.0 |
|                    | % Fixture | 50.0     | 0.0    | 50.0   |
| <b>Total</b>       | Lumens    | 5356.0   | 0.0    | 5356.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 22.1   | 0.4       |
| 10°-20°   | 75.0   | 1.4       |
| 20°-30°   | 152.9  | 2.9       |
| 30°-40°   | 292.0  | 5.5       |
| 40°-50°   | 620.8  | 11.6      |
| 50°-60°   | 1223.9 | 22.9      |
| 60°-70°   | 1554.7 | 29.0      |
| 70°-80°   | 1165.8 | 21.8      |
| 80°-90°   | 248.6  | 4.6       |
| 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°    | 5356.0 | 100.0     |
| 0°-180°   | 5356.0 | 100.0     |



REPORT NUMBER: P553740

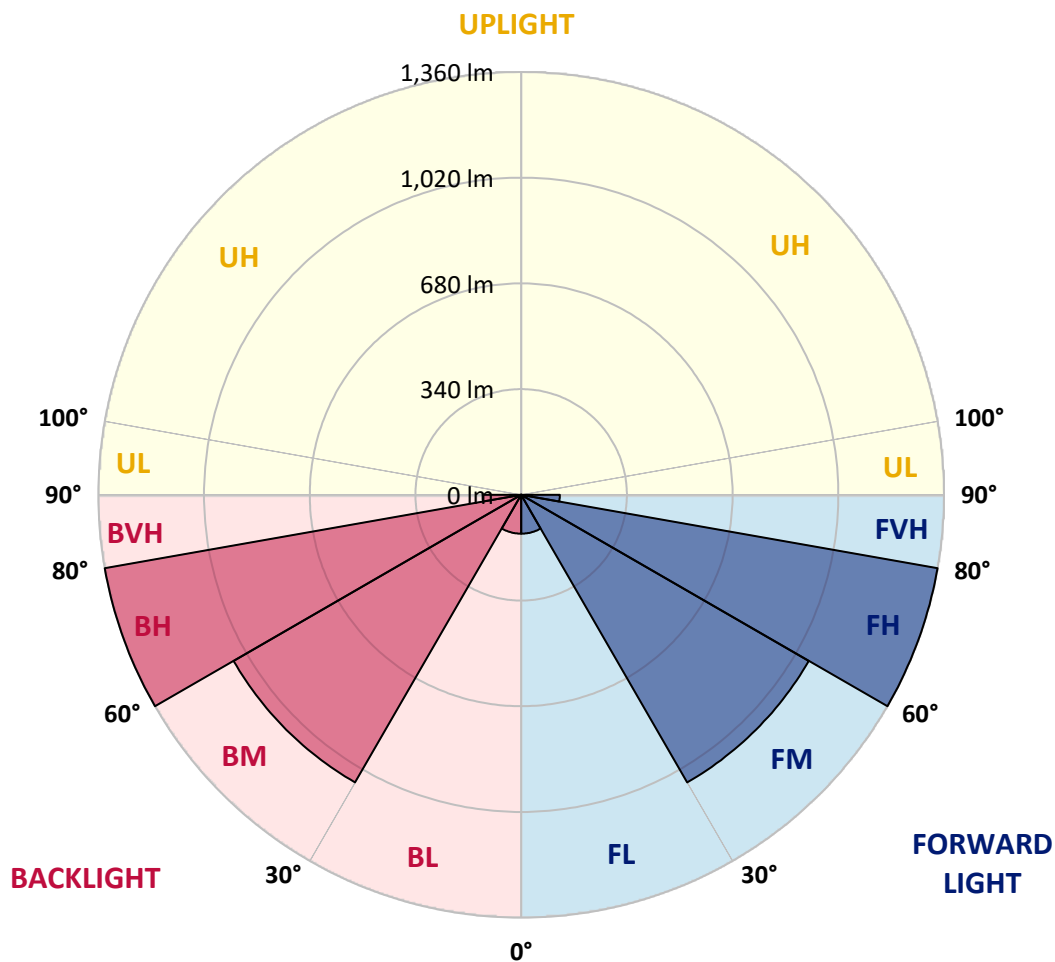
CATALOG NUMBER: LXS-VA2-740-U-SYM-A

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 125.0  | 2.3       |                         |      |         |
| FM   | (30°-60°)   | 1068.4 | 19.9      |                         |      |         |
| FH   | (60°-80°)   | 1360.3 | 25.4      |                         |      | G1/1800 |
| FVH  | (80°-90°)   | 124.3  | 2.3       |                         |      | G2/225  |
| BL   | (0°-30°)    | 125.0  | 2.3       | B1/500                  |      |         |
| BM   | (30°-60°)   | 1068.4 | 19.9      | B2/2500                 |      |         |
| BH   | (60°-80°)   | 1360.3 | 25.4      | B3/2500                 |      | G1/1800 |
| BVH  | (80°-90°)   | 124.3  | 2.3       |                         |      | G2/225  |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B3-U0-G2**

Type V Short



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CATALOG NUMBER: LXS-VA2-740-U-SYM-A

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 75°    | 85°    | 90°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 223.5  | 223.5  | 223.5  | 223.5  | 223.5  | 223.5  | 223.5  | 223.5  | 223.5  | 223.5  | 223.5  |
| 2.5°  | 223.5  | 223.5  | 223.5  | 223.5  | 223.5  | 223.5  | 223.5  | 223.5  | 223.5  | 223.5  | 223.5  |
| 5°    | 229.5  | 227.5  | 227.5  | 227.5  | 227.5  | 227.5  | 227.5  | 227.5  | 227.5  | 227.5  | 227.5  |
| 7.5°  | 233.5  | 233.5  | 233.5  | 233.5  | 233.5  | 233.5  | 233.5  | 233.5  | 233.5  | 233.5  | 233.5  |
| 10°   | 241.5  | 241.5  | 241.5  | 241.5  | 241.5  | 241.5  | 239.5  | 239.5  | 239.5  | 239.5  | 239.5  |
| 12.5° | 251.5  | 251.5  | 251.5  | 249.5  | 249.5  | 249.5  | 249.5  | 249.5  | 249.5  | 249.5  | 249.5  |
| 15°   | 261.4  | 261.4  | 261.4  | 261.4  | 261.4  | 259.4  | 259.4  | 259.4  | 259.4  | 259.4  | 259.4  |
| 17.5° | 275.4  | 275.4  | 275.4  | 273.4  | 273.4  | 273.4  | 273.4  | 271.4  | 273.4  | 273.4  | 273.4  |
| 20°   | 291.4  | 291.4  | 289.4  | 289.4  | 289.4  | 289.4  | 287.4  | 287.4  | 287.4  | 287.4  | 287.4  |
| 22.5° | 309.3  | 309.3  | 307.3  | 307.3  | 307.3  | 305.3  | 305.3  | 303.3  | 303.3  | 303.3  | 303.3  |
| 25°   | 329.3  | 329.3  | 327.3  | 327.3  | 327.3  | 325.3  | 323.3  | 323.3  | 323.3  | 323.3  | 323.3  |
| 27.5° | 353.2  | 353.2  | 351.2  | 351.2  | 349.2  | 347.3  | 345.3  | 345.3  | 345.3  | 345.3  | 345.3  |
| 30°   | 381.2  | 381.2  | 381.2  | 379.2  | 377.2  | 375.2  | 373.2  | 371.2  | 371.2  | 371.2  | 371.2  |
| 32.5° | 419.1  | 417.1  | 417.1  | 413.1  | 413.1  | 409.1  | 407.1  | 405.1  | 405.1  | 405.1  | 403.1  |
| 35°   | 465.0  | 463.0  | 461.0  | 461.0  | 457.0  | 453.0  | 449.0  | 447.0  | 445.0  | 445.0  | 445.0  |
| 37.5° | 518.9  | 518.9  | 514.9  | 510.9  | 508.9  | 504.9  | 500.9  | 498.9  | 496.9  | 496.9  | 492.9  |
| 40°   | 586.7  | 586.7  | 584.7  | 580.7  | 574.8  | 570.8  | 570.8  | 566.8  | 564.8  | 562.8  | 560.8  |
| 42.5° | 680.5  | 678.5  | 674.5  | 670.6  | 668.6  | 658.6  | 656.6  | 652.6  | 650.6  | 650.6  | 646.6  |
| 45°   | 798.3  | 800.3  | 796.3  | 788.3  | 786.3  | 782.3  | 772.3  | 772.3  | 766.3  | 762.4  | 764.4  |
| 47.5° | 938.0  | 940.0  | 934.0  | 926.0  | 918.0  | 906.0  | 910.0  | 902.1  | 900.1  | 896.1  | 890.1  |
| 50°   | 1095.6 | 1093.6 | 1087.7 | 1079.7 | 1077.7 | 1065.7 | 1061.7 | 1055.7 | 1051.7 | 1055.7 | 1047.7 |
| 52.5° | 1283.2 | 1283.2 | 1275.3 | 1257.3 | 1247.3 | 1247.3 | 1237.3 | 1231.3 | 1225.4 | 1225.4 | 1219.4 |
| 55°   | 1432.9 | 1430.9 | 1420.9 | 1413.0 | 1405.0 | 1389.0 | 1391.0 | 1377.0 | 1365.1 | 1367.1 | 1375.0 |
| 57.5° | 1532.7 | 1524.7 | 1518.7 | 1500.8 | 1498.8 | 1496.8 | 1474.8 | 1460.9 | 1460.9 | 1454.9 | 1460.9 |
| 60°   | 1582.6 | 1584.6 | 1572.6 | 1560.6 | 1548.7 | 1550.7 | 1526.7 | 1522.7 | 1514.7 | 1516.7 | 1522.7 |
| 62.5° | 1608.5 | 1624.5 | 1622.5 | 1610.5 | 1628.5 | 1590.6 | 1606.5 | 1580.6 | 1570.6 | 1568.6 | 1564.6 |
| 65°   | 1650.4 | 1622.5 | 1614.5 | 1614.5 | 1622.5 | 1636.5 | 1608.5 | 1574.6 | 1574.6 | 1586.6 | 1588.6 |
| 67.5° | 1562.6 | 1560.6 | 1570.6 | 1592.6 | 1578.6 | 1578.6 | 1552.7 | 1536.7 | 1528.7 | 1542.7 | 1534.7 |
| 70°   | 1422.9 | 1434.9 | 1436.9 | 1474.8 | 1502.8 | 1472.8 | 1476.8 | 1438.9 | 1428.9 | 1450.9 | 1434.9 |
| 72.5° | 1299.2 | 1247.3 | 1285.2 | 1333.1 | 1351.1 | 1371.0 | 1339.1 | 1309.2 | 1299.2 | 1311.2 | 1315.2 |
| 75°   | 1097.6 | 1061.7 | 1113.6 | 1155.5 | 1155.5 | 1177.5 | 1139.5 | 1131.6 | 1129.6 | 1125.6 | 1129.6 |
| 77.5° | 862.1  | 840.2  | 874.1  | 912.0  | 944.0  | 936.0  | 926.0  | 906.0  | 910.0  | 920.0  | 912.0  |
| 80°   | 628.6  | 594.7  | 616.7  | 654.6  | 690.5  | 694.5  | 698.5  | 670.6  | 666.6  | 682.5  | 680.5  |
| 82.5° | 373.2  | 355.2  | 373.2  | 405.1  | 437.1  | 445.0  | 445.0  | 435.1  | 427.1  | 441.1  | 447.0  |
| 85°   | 127.7  | 141.7  | 131.7  | 141.7  | 165.6  | 171.6  | 177.6  | 171.6  | 177.6  | 187.6  | 175.6  |
| 87.5° | 2.0    | 2.0    | 2.0    | 2.0    | 2.0    | 2.0    | 2.0    | 2.0    | 2.0    | 2.0    | 2.0    |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

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Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269



LM-79-2019: Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

INVUE

Report Number: SP1-2205-670-4

Test Date: 07/01/2022

Luminaire Tested: LXS-VA1-740-U-ASW-A

Data in this report applies to families of products including LXS-VA1-740.

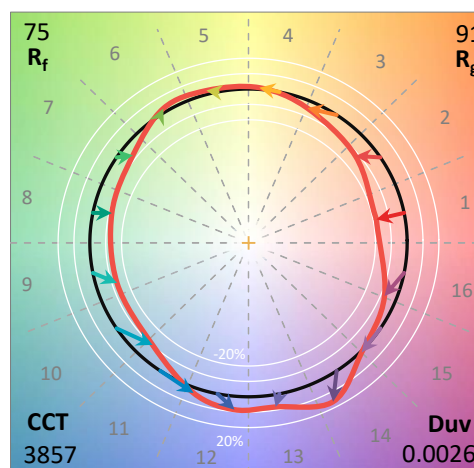
### Test Information

Test Method: LM-79-2019  
 Report Number: SP1-2205-670-4  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry:  $4\pi$   
 Issue Date: 07/01/2022  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: INVUE  
 Catalog Number: **LXS-VA1-740-U-ASW-A**  
 Description: INVUE LUXESCAPE

ARM MOUNT

### Spectral Parameters

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 3857   | CRI (Ra): | 71.9 |      |       |
| CIE u':                   | 0.2263 | R1:       | 67.8 | R9:  | -35.4 |
| CIE v':                   | 0.5075 | R2:       | 80.8 | R10: | 54.2  |
| Duv:                      | 0.0026 | R3:       | 90.4 | R11: | 61.9  |
| CIE x:                    | 0.3890 | R4:       | 67.8 | R12: | 38.9  |
| CIE y:                    | 0.3876 | R5:       | 67.1 | R13: | 70.5  |
| CIE z:                    | 0.2234 | R6:       | 71.9 | R14: | 94.7  |
| Peak Wavelength (nm):     | 454    | R7:       | 80.8 |      |       |
| Dominant Wavelength (nm): | 578    | R8:       | 48.4 |      |       |
| Purity:                   | 33.2   |           |      |      |       |
| Rf:                       | 74.8   |           |      |      |       |
| Rg:                       | 91     |           |      |      |       |



### Test Conditions

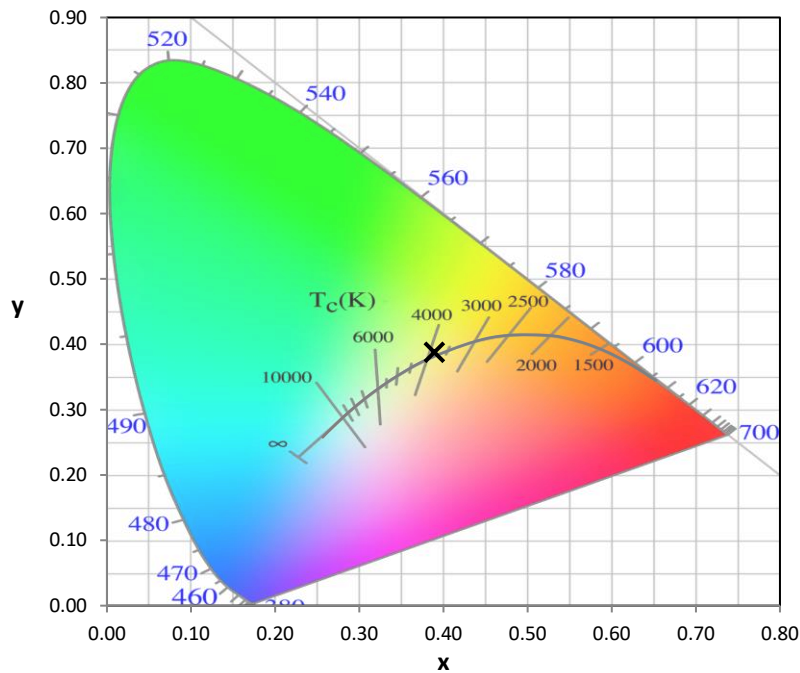
Stabilization Time: 247M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.5/62%  
 Sphere Temperature (°C): 25.6

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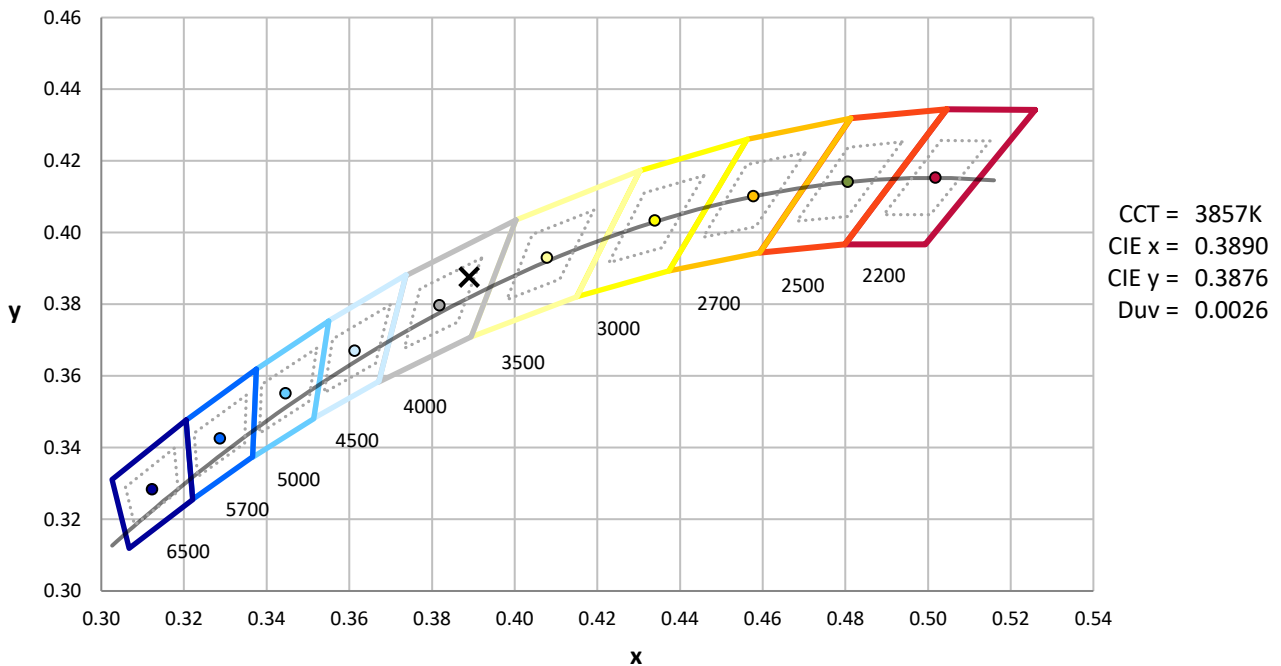
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | 76INCH SPHERE IN0058  | 2/7/2022         | 8/7/2022             |
| Power Meter                    | XITRON 2801 IN0071    | 11/29/2021       | 11/29/2022           |
| AC Power Source                | CHROMA 61603 IN0063   | 11/29/2021       | 11/29/2022           |
| DC Power Source                | AGILENT E3634A IN0208 | 11/29/2021       | 11/29/2022           |
| Sphere Thermometer             | ONSET IN0085          | 11/29/2021       | 11/29/2022           |
| Room Thermometer               | ONSET IN0046          | 11/29/2021       | 11/29/2022           |

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**CIE 1931 Chromaticity Diagram**



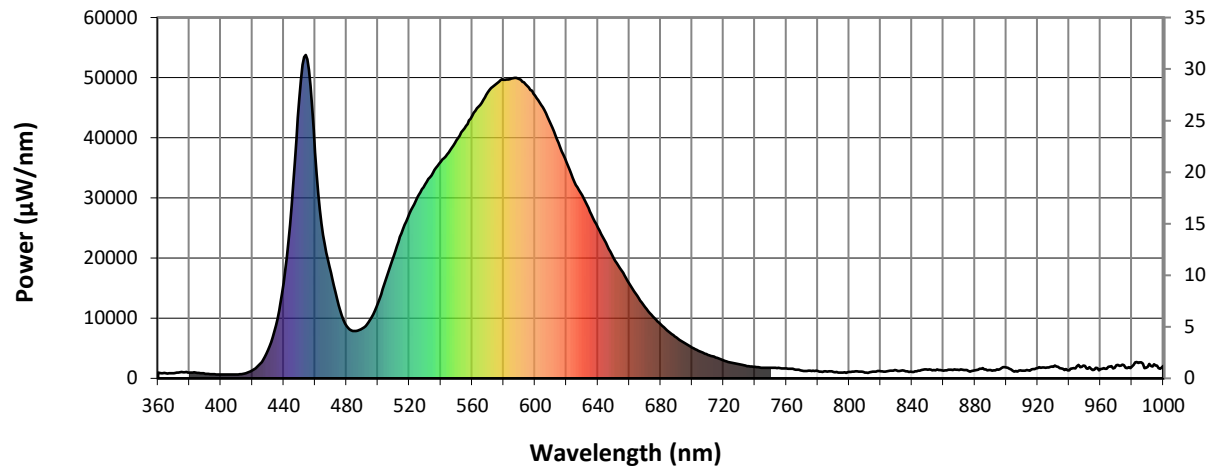
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 4000K 4-step quadrangle

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**Photopic Flux vs. Wavelength**

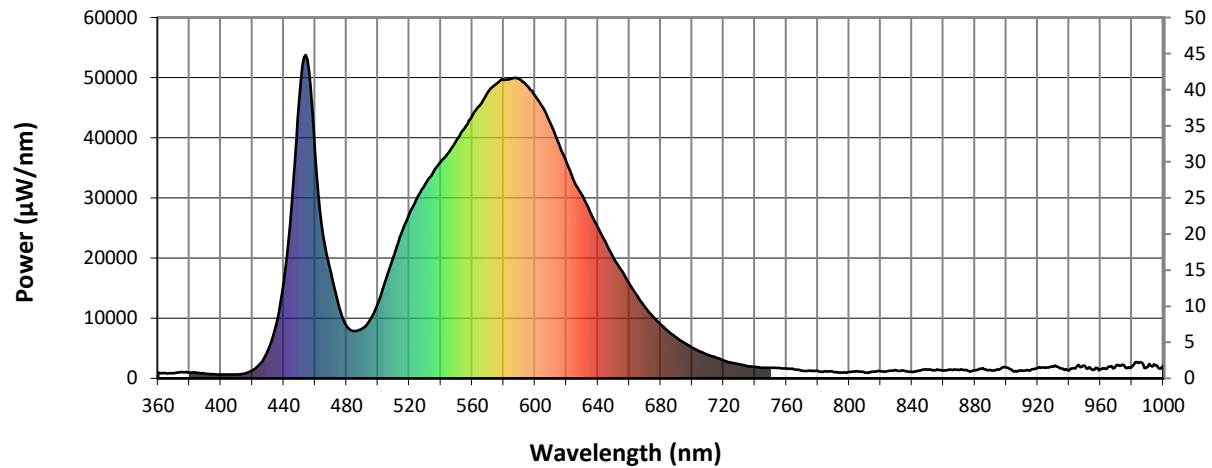


#####

| 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       | 947              | NR               | 490       | 8278             | NR               | 620       | 35923            | NR               | 750       | 1756             | NR               | 880       | 1334             | NR               |
| 365       | 838              | NR               | 495       | 9729             | NR               | 625       | 32734            | NR               | 755       | 1740             | NR               | 885       | 1679             | NR               |
| 370       | 842              | NR               | 500       | 12546            | NR               | 630       | 30434            | NR               | 760       | 1656             | NR               | 890       | 1374             | NR               |
| 375       | 1046             | NR               | 505       | 16368            | NR               | 635       | 27712            | NR               | 765       | 1506             | NR               | 895       | 1455             | NR               |
| 380       | 963              | NR               | 510       | 20312            | NR               | 640       | 25062            | NR               | 770       | 1292             | NR               | 900       | 1837             | NR               |
| 385       | 900              | NR               | 515       | 24128            | NR               | 645       | 22549            | NR               | 775       | 1263             | NR               | 905       | 1101             | NR               |
| 390       | 768              | NR               | 520       | 27426            | NR               | 650       | 19997            | NR               | 780       | 1222             | NR               | 910       | 1253             | NR               |
| 395       | 673              | NR               | 525       | 30032            | NR               | 655       | 17955            | NR               | 785       | 1156             | NR               | 915       | 1283             | NR               |
| 400       | 649              | NR               | 530       | 32270            | NR               | 660       | 15768            | NR               | 790       | 1090             | NR               | 920       | 1728             | NR               |
| 405       | 632              | NR               | 535       | 34190            | NR               | 665       | 13707            | NR               | 795       | 964              | NR               | 925       | 1742             | NR               |
| 410       | 649              | NR               | 540       | 36035            | NR               | 670       | 11877            | NR               | 800       | 1057             | NR               | 930       | 1944             | NR               |
| 415       | 796              | NR               | 545       | 37557            | NR               | 675       | 10247            | NR               | 805       | 1191             | NR               | 935       | 1659             | NR               |
| 420       | 1331             | NR               | 550       | 39565            | NR               | 680       | 8994             | NR               | 810       | 969              | NR               | 940       | 1350             | NR               |
| 425       | 2430             | NR               | 555       | 41537            | NR               | 685       | 7774             | NR               | 815       | 1104             | NR               | 945       | 2049             | NR               |
| 430       | 4669             | NR               | 560       | 43649            | NR               | 690       | 6795             | NR               | 820       | 1159             | NR               | 950       | 2090             | NR               |
| 435       | 8795             | NR               | 565       | 45446            | NR               | 695       | 5887             | NR               | 825       | 1209             | NR               | 955       | 1409             | NR               |
| 440       | 15873            | NR               | 570       | 47583            | NR               | 700       | 5131             | NR               | 830       | 1309             | NR               | 960       | 1549             | NR               |
| 445       | 28752            | NR               | 575       | 48903            | NR               | 705       | 4466             | NR               | 835       | 1271             | NR               | 965       | 1912             | NR               |
| 450       | 46625            | NR               | 580       | 49648            | NR               | 710       | 3906             | NR               | 840       | 1064             | NR               | 970       | 2208             | NR               |
| 455       | 53028            | NR               | 585       | 49883            | NR               | 715       | 3458             | NR               | 845       | 1254             | NR               | 975       | 2191             | NR               |
| 460       | 37593            | NR               | 590       | 49763            | NR               | 720       | 2962             | NR               | 850       | 1460             | NR               | 980       | 1948             | NR               |
| 465       | 23860            | NR               | 595       | 48622            | NR               | 725       | 2602             | NR               | 855       | 1351             | NR               | 985       | 2686             | NR               |
| 470       | 17548            | NR               | 600       | 46962            | NR               | 730       | 2333             | NR               | 860       | 1304             | NR               | 990       | 1925             | NR               |
| 475       | 12160            | NR               | 605       | 45045            | NR               | 735       | 2050             | NR               | 865       | 1417             | NR               | 995       | 2149             | NR               |
| 480       | 8684             | NR               | 610       | 42242            | NR               | 740       | 1899             | NR               | 870       | 1408             | NR               | 1000      | 2060             | NR               |
| 485       | 7873             | NR               | 615       | 39152            | NR               | 745       | 1770             | NR               | 875       | 1361             | NR               |           |                  |                  |

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Scotopic Flux vs. Wavelength



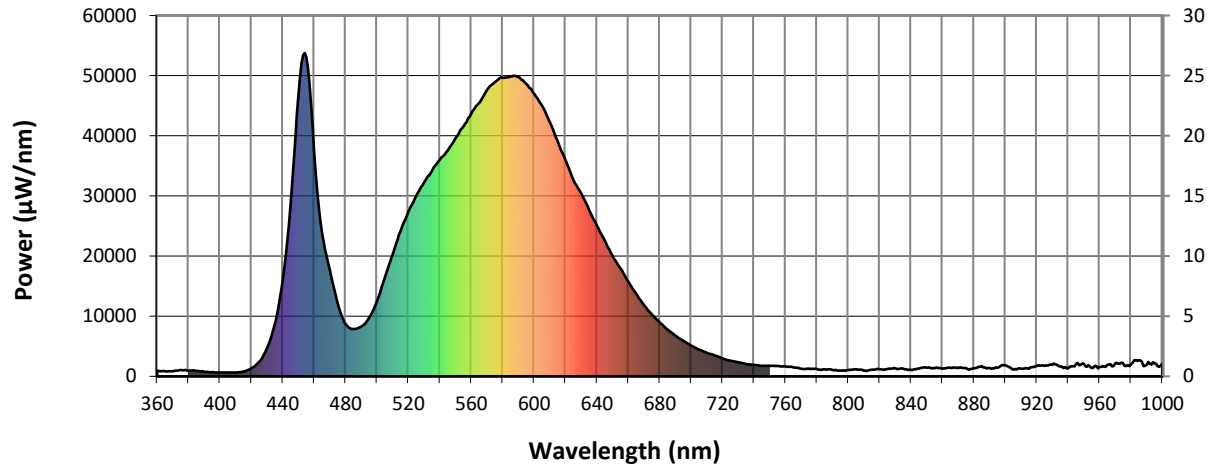
Scotopic Lumens: 4054.9

S/P: 1.51

| 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       | 947              | NR               | 490       | 8278             | NR               | 620       | 35923            | NR               | 750       | 1756             | NR               | 880       | 1334             | NR               |
| 365       | 838              | NR               | 495       | 9729             | NR               | 625       | 32734            | NR               | 755       | 1740             | NR               | 885       | 1679             | NR               |
| 370       | 842              | NR               | 500       | 12546            | NR               | 630       | 30434            | NR               | 760       | 1656             | NR               | 890       | 1374             | NR               |
| 375       | 1046             | NR               | 505       | 16368            | NR               | 635       | 27712            | NR               | 765       | 1506             | NR               | 895       | 1455             | NR               |
| 380       | 963              | NR               | 510       | 20312            | NR               | 640       | 25062            | NR               | 770       | 1292             | NR               | 900       | 1837             | NR               |
| 385       | 900              | NR               | 515       | 24128            | NR               | 645       | 22549            | NR               | 775       | 1263             | NR               | 905       | 1101             | NR               |
| 390       | 768              | NR               | 520       | 27426            | NR               | 650       | 19997            | NR               | 780       | 1222             | NR               | 910       | 1253             | NR               |
| 395       | 673              | NR               | 525       | 30032            | NR               | 655       | 17955            | NR               | 785       | 1156             | NR               | 915       | 1283             | NR               |
| 400       | 649              | NR               | 530       | 32270            | NR               | 660       | 15768            | NR               | 790       | 1090             | NR               | 920       | 1728             | NR               |
| 405       | 632              | NR               | 535       | 34190            | NR               | 665       | 13707            | NR               | 795       | 964              | NR               | 925       | 1742             | NR               |
| 410       | 649              | NR               | 540       | 36035            | NR               | 670       | 11877            | NR               | 800       | 1057             | NR               | 930       | 1944             | NR               |
| 415       | 796              | NR               | 545       | 37557            | NR               | 675       | 10247            | NR               | 805       | 1191             | NR               | 935       | 1659             | NR               |
| 420       | 1331             | NR               | 550       | 39565            | NR               | 680       | 8994             | NR               | 810       | 969              | NR               | 940       | 1350             | NR               |
| 425       | 2430             | NR               | 555       | 41537            | NR               | 685       | 7774             | NR               | 815       | 1104             | NR               | 945       | 2049             | NR               |
| 430       | 4669             | NR               | 560       | 43649            | NR               | 690       | 6795             | NR               | 820       | 1159             | NR               | 950       | 2090             | NR               |
| 435       | 8795             | NR               | 565       | 45446            | NR               | 695       | 5887             | NR               | 825       | 1209             | NR               | 955       | 1409             | NR               |
| 440       | 15873            | NR               | 570       | 47583            | NR               | 700       | 5131             | NR               | 830       | 1309             | NR               | 960       | 1549             | NR               |
| 445       | 28752            | NR               | 575       | 48903            | NR               | 705       | 4466             | NR               | 835       | 1271             | NR               | 965       | 1912             | NR               |
| 450       | 46625            | NR               | 580       | 49648            | NR               | 710       | 3906             | NR               | 840       | 1064             | NR               | 970       | 2208             | NR               |
| 455       | 53028            | NR               | 585       | 49883            | NR               | 715       | 3458             | NR               | 845       | 1254             | NR               | 975       | 2191             | NR               |
| 460       | 37593            | NR               | 590       | 49763            | NR               | 720       | 2962             | NR               | 850       | 1460             | NR               | 980       | 1948             | NR               |
| 465       | 23860            | NR               | 595       | 48622            | NR               | 725       | 2602             | NR               | 855       | 1351             | NR               | 985       | 2686             | NR               |
| 470       | 17548            | NR               | 600       | 46962            | NR               | 730       | 2333             | NR               | 860       | 1304             | NR               | 990       | 1925             | NR               |
| 475       | 12160            | NR               | 605       | 45045            | NR               | 735       | 2050             | NR               | 865       | 1417             | NR               | 995       | 2149             | NR               |
| 480       | 8684             | NR               | 610       | 42242            | NR               | 740       | 1899             | NR               | 870       | 1408             | NR               | 1000      | 2060             | NR               |
| 485       | 7873             | NR               | 615       | 39152            | NR               | 745       | 1770             | NR               | 875       | 1361             | NR               |           |                  |                  |

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**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 1575.2 S/P: 0.59**

| 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       | 947              | NR               | 490       | 8278             | NR               | 620       | 35923            | NR               | 750       | 1756             | NR               | 880       | 1334             | NR               |
| 365       | 838              | NR               | 495       | 9729             | NR               | 625       | 32734            | NR               | 755       | 1740             | NR               | 885       | 1679             | NR               |
| 370       | 842              | NR               | 500       | 12546            | NR               | 630       | 30434            | NR               | 760       | 1656             | NR               | 890       | 1374             | NR               |
| 375       | 1046             | NR               | 505       | 16368            | NR               | 635       | 27712            | NR               | 765       | 1506             | NR               | 895       | 1455             | NR               |
| 380       | 963              | NR               | 510       | 20312            | NR               | 640       | 25062            | NR               | 770       | 1292             | NR               | 900       | 1837             | NR               |
| 385       | 900              | NR               | 515       | 24128            | NR               | 645       | 22549            | NR               | 775       | 1263             | NR               | 905       | 1101             | NR               |
| 390       | 768              | NR               | 520       | 27426            | NR               | 650       | 19997            | NR               | 780       | 1222             | NR               | 910       | 1253             | NR               |
| 395       | 673              | NR               | 525       | 30032            | NR               | 655       | 17955            | NR               | 785       | 1156             | NR               | 915       | 1283             | NR               |
| 400       | 649              | NR               | 530       | 32270            | NR               | 660       | 15768            | NR               | 790       | 1090             | NR               | 920       | 1728             | NR               |
| 405       | 632              | NR               | 535       | 34190            | NR               | 665       | 13707            | NR               | 795       | 964              | NR               | 925       | 1742             | NR               |
| 410       | 649              | NR               | 540       | 36035            | NR               | 670       | 11877            | NR               | 800       | 1057             | NR               | 930       | 1944             | NR               |
| 415       | 796              | NR               | 545       | 37557            | NR               | 675       | 10247            | NR               | 805       | 1191             | NR               | 935       | 1659             | NR               |
| 420       | 1331             | NR               | 550       | 39565            | NR               | 680       | 8994             | NR               | 810       | 969              | NR               | 940       | 1350             | NR               |
| 425       | 2430             | NR               | 555       | 41537            | NR               | 685       | 7774             | NR               | 815       | 1104             | NR               | 945       | 2049             | NR               |
| 430       | 4669             | NR               | 560       | 43649            | NR               | 690       | 6795             | NR               | 820       | 1159             | NR               | 950       | 2090             | NR               |
| 435       | 8795             | NR               | 565       | 45446            | NR               | 695       | 5887             | NR               | 825       | 1209             | NR               | 955       | 1409             | NR               |
| 440       | 15873            | NR               | 570       | 47583            | NR               | 700       | 5131             | NR               | 830       | 1309             | NR               | 960       | 1549             | NR               |
| 445       | 28752            | NR               | 575       | 48903            | NR               | 705       | 4466             | NR               | 835       | 1271             | NR               | 965       | 1912             | NR               |
| 450       | 46625            | NR               | 580       | 49648            | NR               | 710       | 3906             | NR               | 840       | 1064             | NR               | 970       | 2208             | NR               |
| 455       | 53028            | NR               | 585       | 49883            | NR               | 715       | 3458             | NR               | 845       | 1254             | NR               | 975       | 2191             | NR               |
| 460       | 37593            | NR               | 590       | 49763            | NR               | 720       | 2962             | NR               | 850       | 1460             | NR               | 980       | 1948             | NR               |
| 465       | 23860            | NR               | 595       | 48622            | NR               | 725       | 2602             | NR               | 855       | 1351             | NR               | 985       | 2686             | NR               |
| 470       | 17548            | NR               | 600       | 46962            | NR               | 730       | 2333             | NR               | 860       | 1304             | NR               | 990       | 1925             | NR               |
| 475       | 12160            | NR               | 605       | 45045            | NR               | 735       | 2050             | NR               | 865       | 1417             | NR               | 995       | 2149             | NR               |
| 480       | 8684             | NR               | 610       | 42242            | NR               | 740       | 1899             | NR               | 870       | 1408             | NR               | 1000      | 2060             | NR               |
| 485       | 7873             | NR               | 615       | 39152            | NR               | 745       | 1770             | NR               | 875       | 1361             | NR               |           |                  |                  |

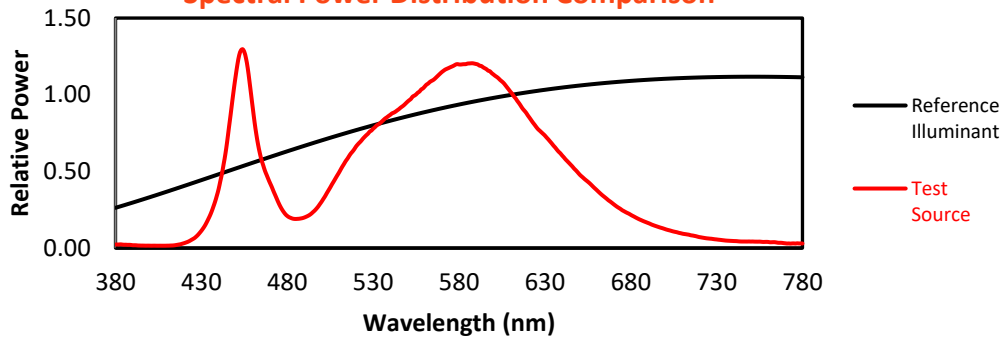
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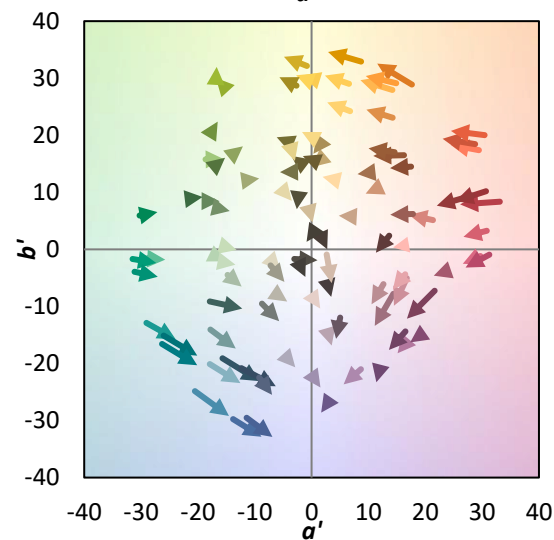
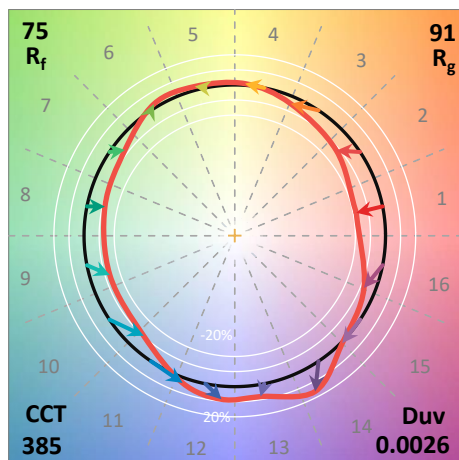
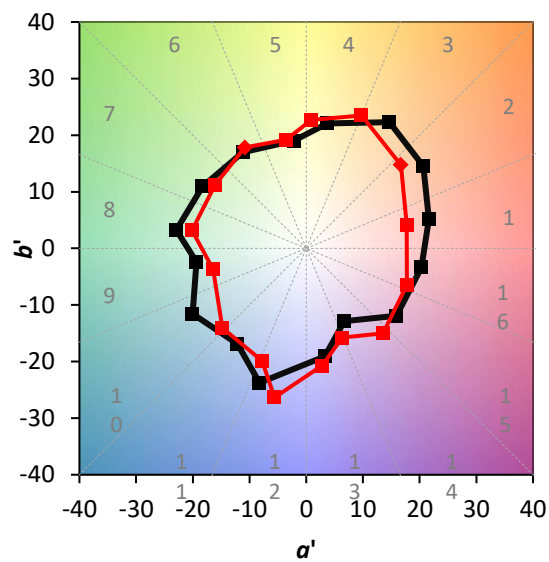
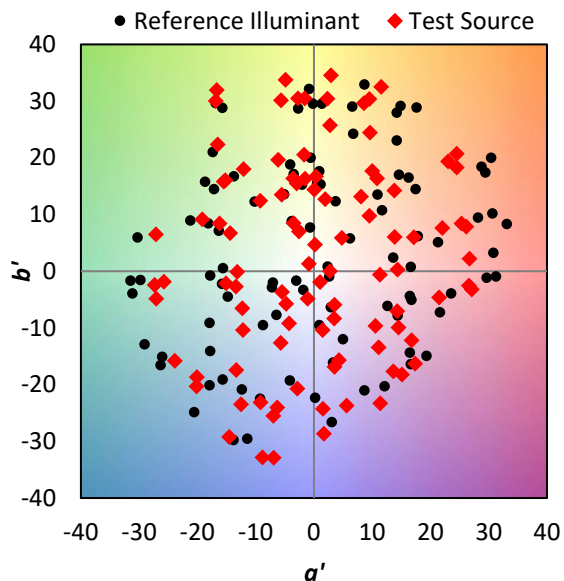
**Summary**

$R_f = 74.8$   
 $R_g = 91$   
 CIE  $R_a = 71.9$   
 $R_g = -35.4$

**Spectral Power Distribution Comparison**



**Color Vector Graphics**

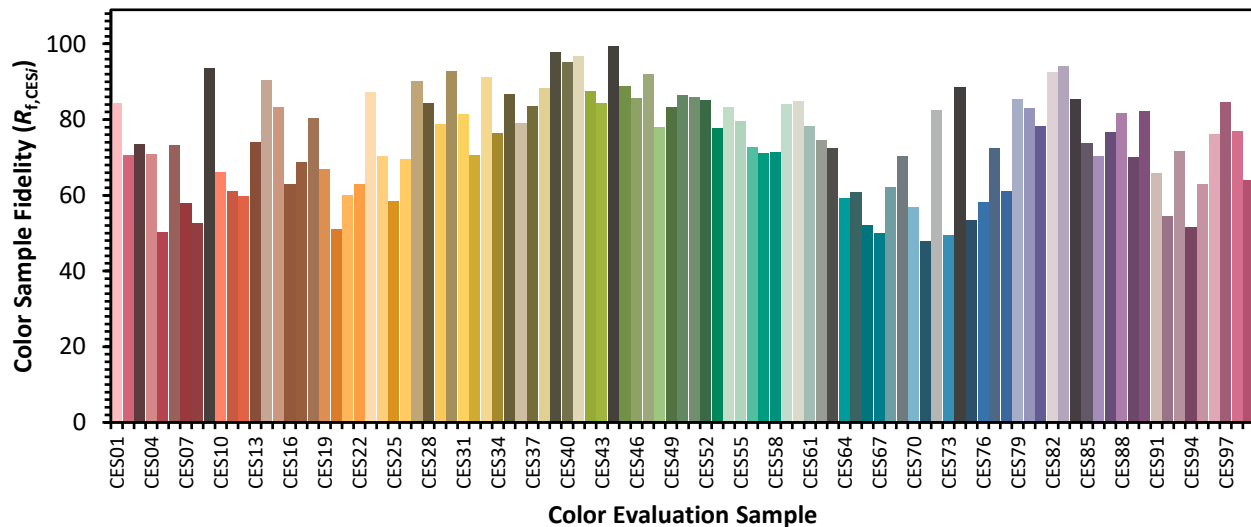


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Individual Sample Fidelity Index ( $R_{f,i}$ )

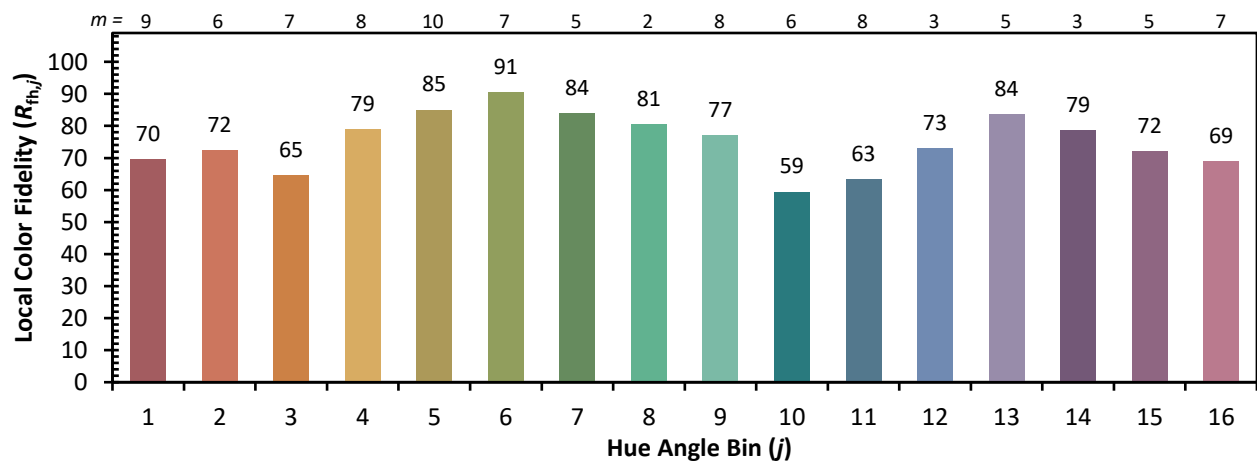
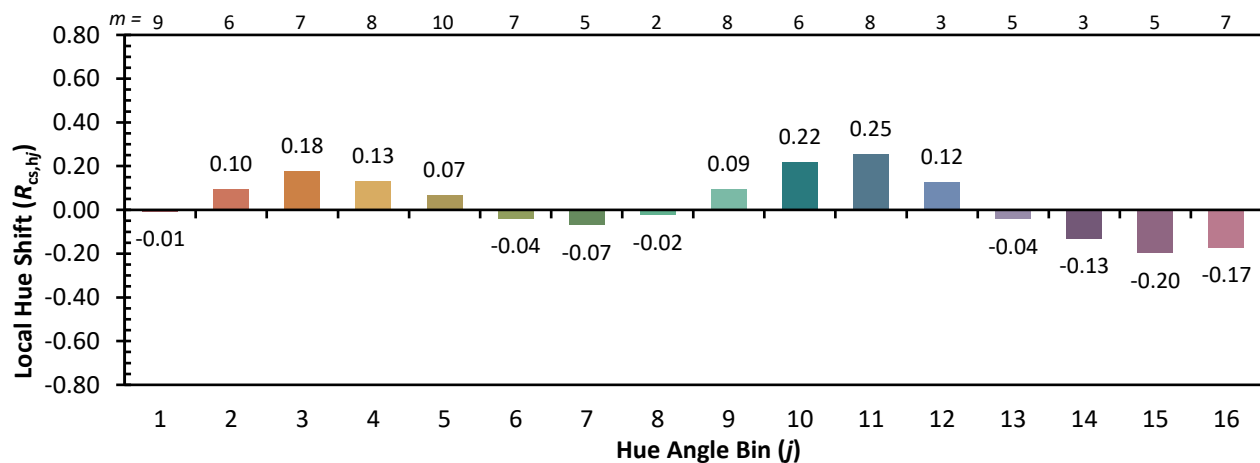
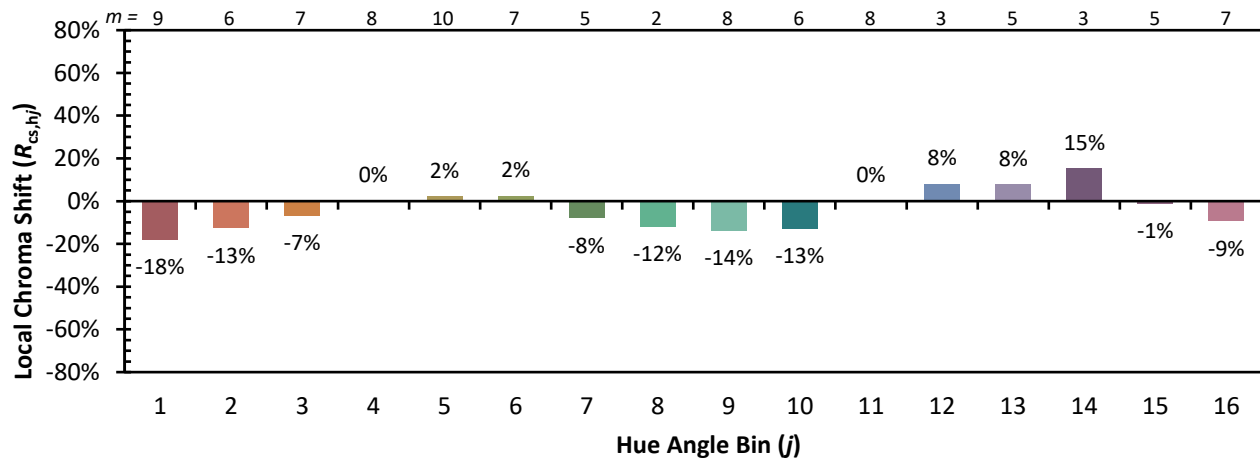
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 69 | CES51 = 86 | CES76 = 58 |
| CES02 = 61 | CES27 = 90 | CES52 = 85 | CES77 = 73 |
| CES03 = 30 | CES28 = 84 | CES53 = 78 | CES78 = 61 |
| CES04 = 70 | CES29 = 79 | CES54 = 83 | CES79 = 85 |
| CES05 = 47 | CES30 = 93 | CES55 = 80 | CES80 = 83 |
| CES06 = 50 | CES31 = 81 | CES56 = 73 | CES81 = 78 |
| CES07 = 40 | CES32 = 71 | CES57 = 71 | CES82 = 93 |
| CES08 = 39 | CES33 = 91 | CES58 = 71 | CES83 = 94 |
| CES09 = 29 | CES34 = 77 | CES59 = 84 | CES84 = 85 |
| CES10 = 74 | CES35 = 87 | CES60 = 85 | CES85 = 74 |
| CES11 = 57 | CES36 = 79 | CES61 = 78 | CES86 = 70 |
| CES12 = 63 | CES37 = 83 | CES62 = 74 | CES87 = 77 |
| CES13 = 42 | CES38 = 88 | CES63 = 72 | CES88 = 82 |
| CES14 = 74 | CES39 = 98 | CES64 = 59 | CES89 = 70 |
| CES15 = 71 | CES40 = 95 | CES65 = 61 | CES90 = 82 |
| CES16 = 46 | CES41 = 97 | CES66 = 52 | CES91 = 66 |
| CES17 = 49 | CES42 = 87 | CES67 = 50 | CES92 = 55 |
| CES18 = 56 | CES43 = 84 | CES68 = 62 | CES93 = 72 |
| CES19 = 72 | CES44 = 99 | CES69 = 70 | CES94 = 51 |
| CES20 = 65 | CES45 = 89 | CES70 = 57 | CES95 = 63 |
| CES21 = 86 | CES46 = 86 | CES71 = 48 | CES96 = 76 |
| CES22 = 78 | CES47 = 92 | CES72 = 83 | CES97 = 85 |
| CES23 = 92 | CES48 = 78 | CES73 = 49 | CES98 = 77 |
| CES24 = 91 | CES49 = 83 | CES74 = 88 | CES99 = 64 |
| CES25 = 72 | CES50 = 87 | CES75 = 54 |            |



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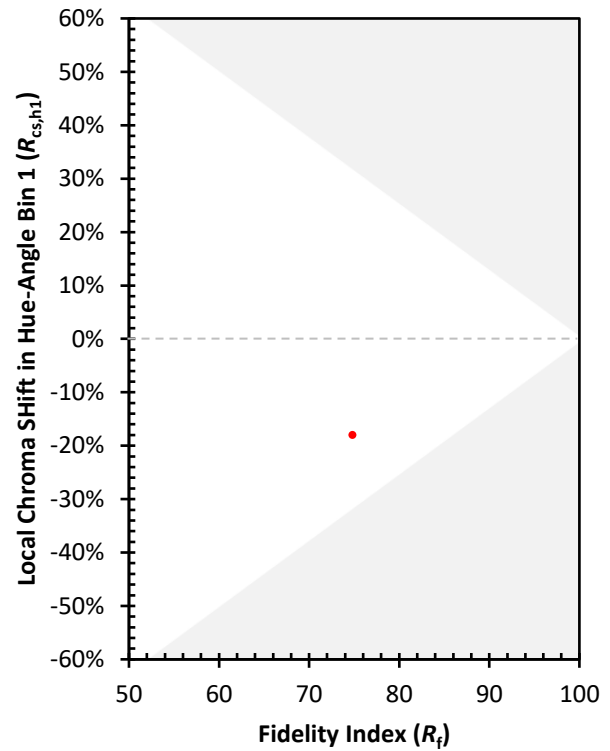
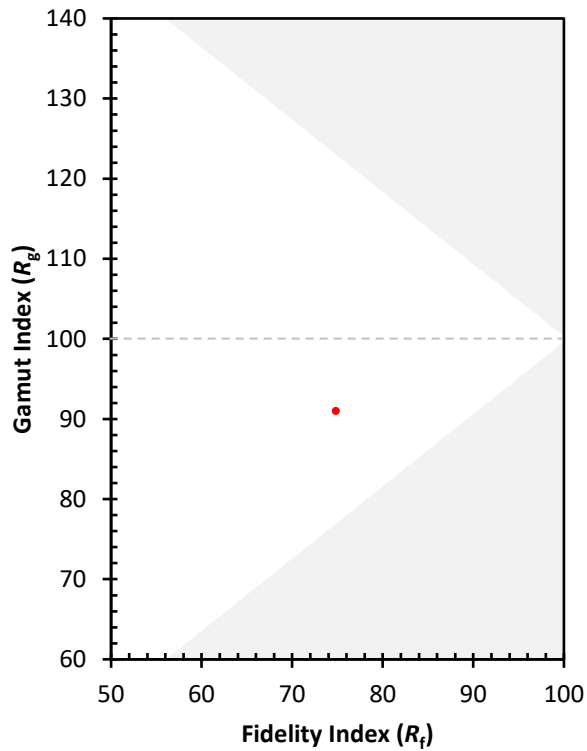
**Color Rendition by Hue-Angle Bin**



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**Measure Comparisons**



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