

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: P553642

Luminaire Tested: **ARB-B1-LED-D1-T2**

Issue Date: 7/12/2021

**Test Information**

Test Method: LM-79-08  
Report Number: P553642  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (P34669)  
Test Lab: INNOVATION CENTER  
Issue Date: 7/12/2021  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: INVUE  
Catalog Number: ARB-B1-LED-D1-T2  
Description: ARBOR OUTDOOR ARCHITECTURAL POST TOP  
70 CRI, 4000K LEDS AND TYPE II OPTIC  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 2045 lumens  
Efficiency: N/A  
Efficacy: 85.2 lumens/watt  
Luminous Opening: Circular (Dia: 1.62' x H: 0')  
IES Classification: Type II - Short  
BUG Rating: B1 - U0 - G1

Input Watts (W): 24  
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: 24 FT

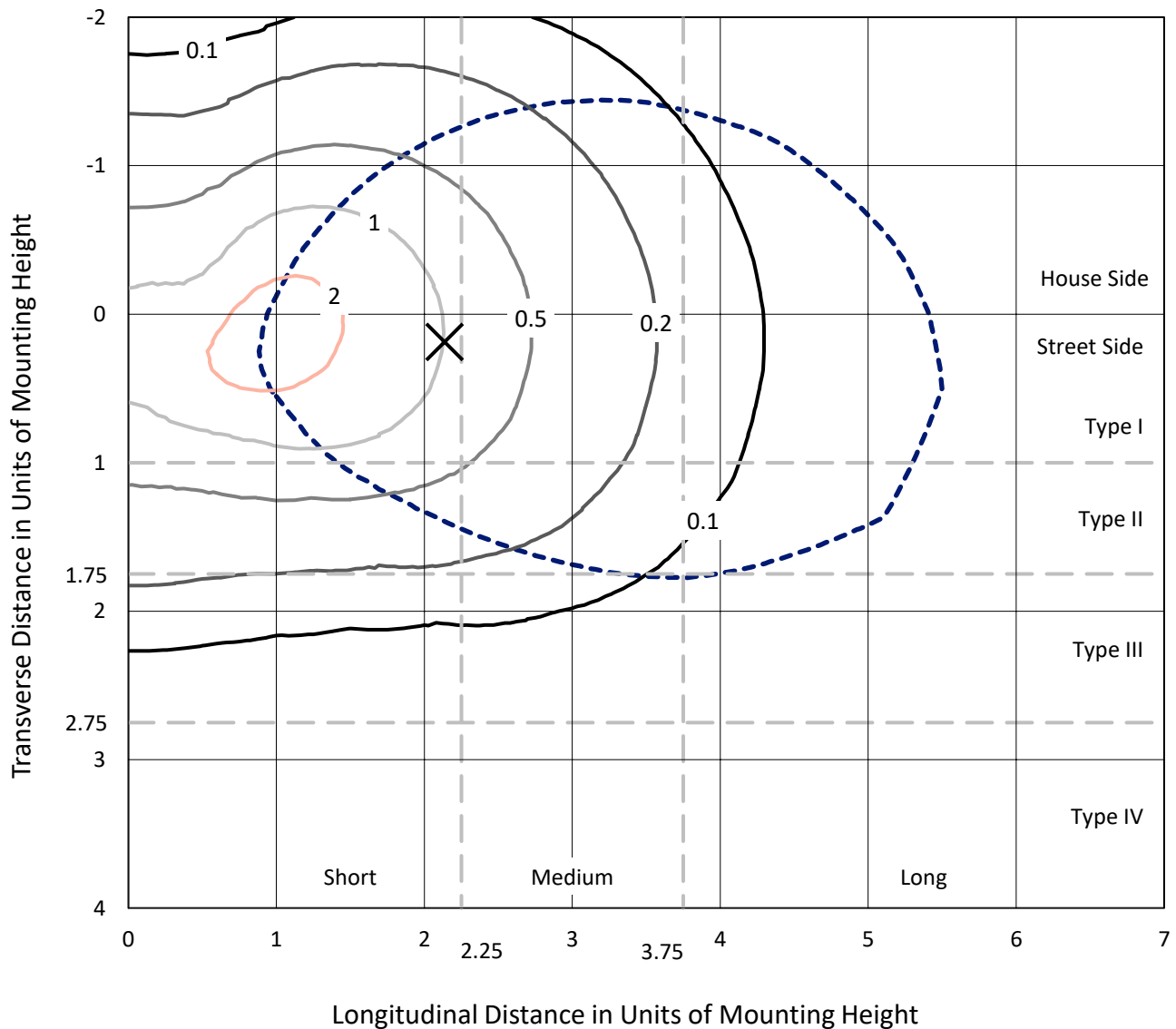


REPORT NUMBER: P553642

CATALOG NUMBER: ARB-B1-LED-D1-T2

## Iso-Footcandle Lines of Horizontal Illumination

× Max cd  
- - - 1/2 Max cd

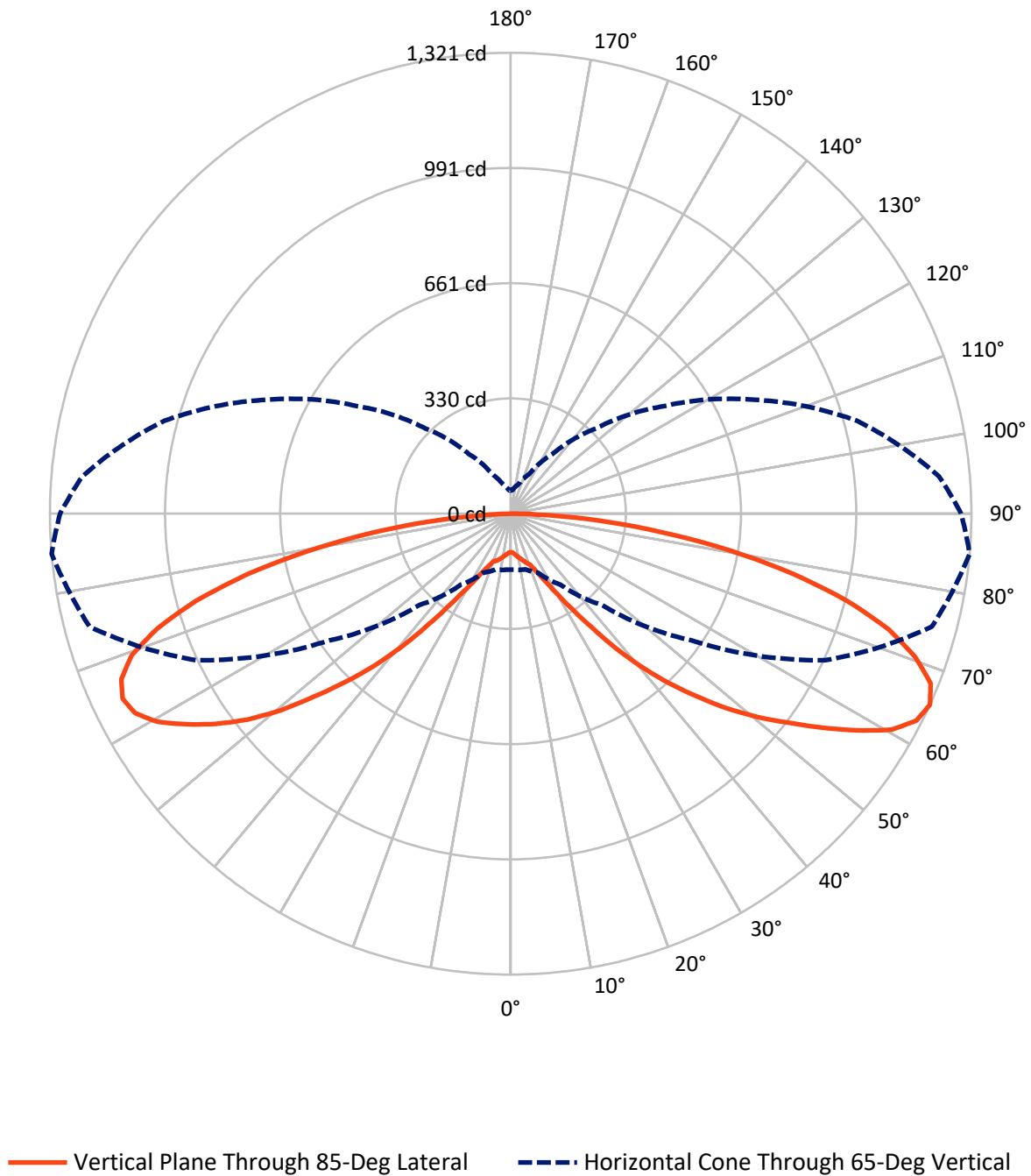


Based on 10 foot mounting height. Maximum calculated value = 2.6 fc  
Type II - Short - N/A

REPORT NUMBER: P553642

CATALOG NUMBER: ARB-B1-LED-D1-T2

## Luminous Intensity Polar Plot



REPORT NUMBER: P553642

CATALOG NUMBER: ARB-B1-LED-D1-T2

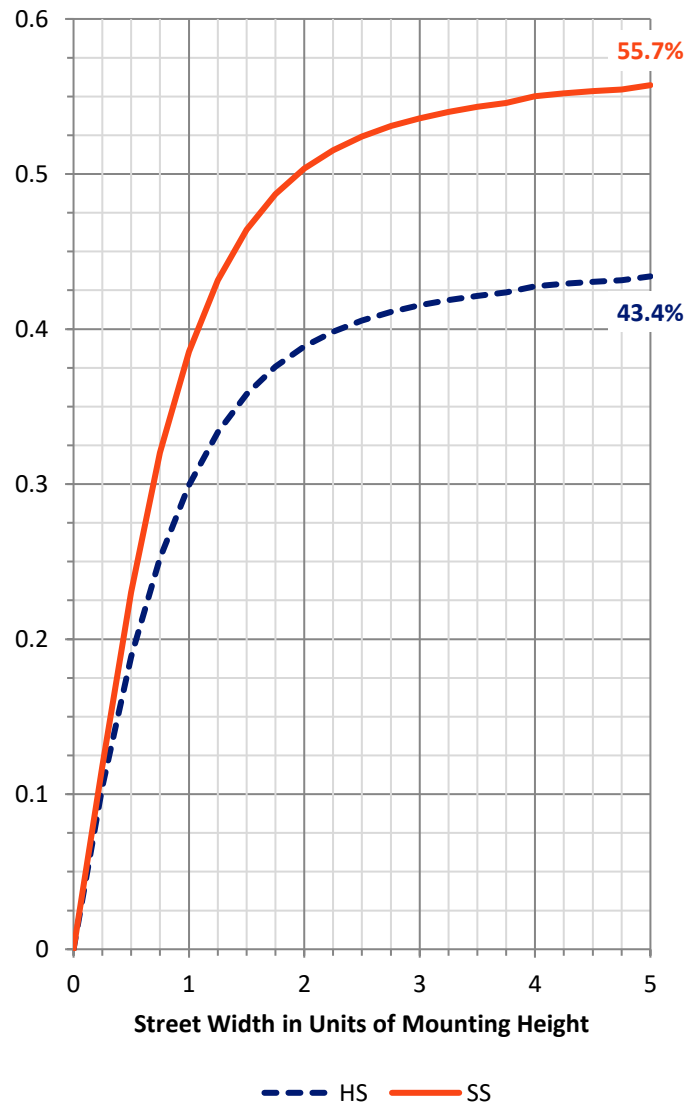
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 897.9    | 0.0    | 897.9  |
|                    | % Fixture | 43.9     | 0.0    | 43.9   |
| <b>Street Side</b> | Lumens    | 1147.1   | 0.0    | 1147.1 |
|                    | % Fixture | 56.1     | 0.0    | 56.1   |
| <b>Total</b>       | Lumens    | 2045.0   | 0.0    | 2045.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 11.2   | 0.5       |
| 10°-20°   | 36.8   | 1.8       |
| 20°-30°   | 74.6   | 3.6       |
| 30°-40°   | 149.1  | 7.3       |
| 40°-50°   | 276.8  | 13.5      |
| 50°-60°   | 433.1  | 21.2      |
| 60°-70°   | 527.5  | 25.8      |
| 70°-80°   | 413.8  | 20.2      |
| 80°-90°   | 122.1  | 6.0       |
| 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°    | 2045.0 | 100.0     |
| 0°-180°   | 2045.0 | 100.0     |

**Coefficient of Utilization**



REPORT NUMBER: P553642

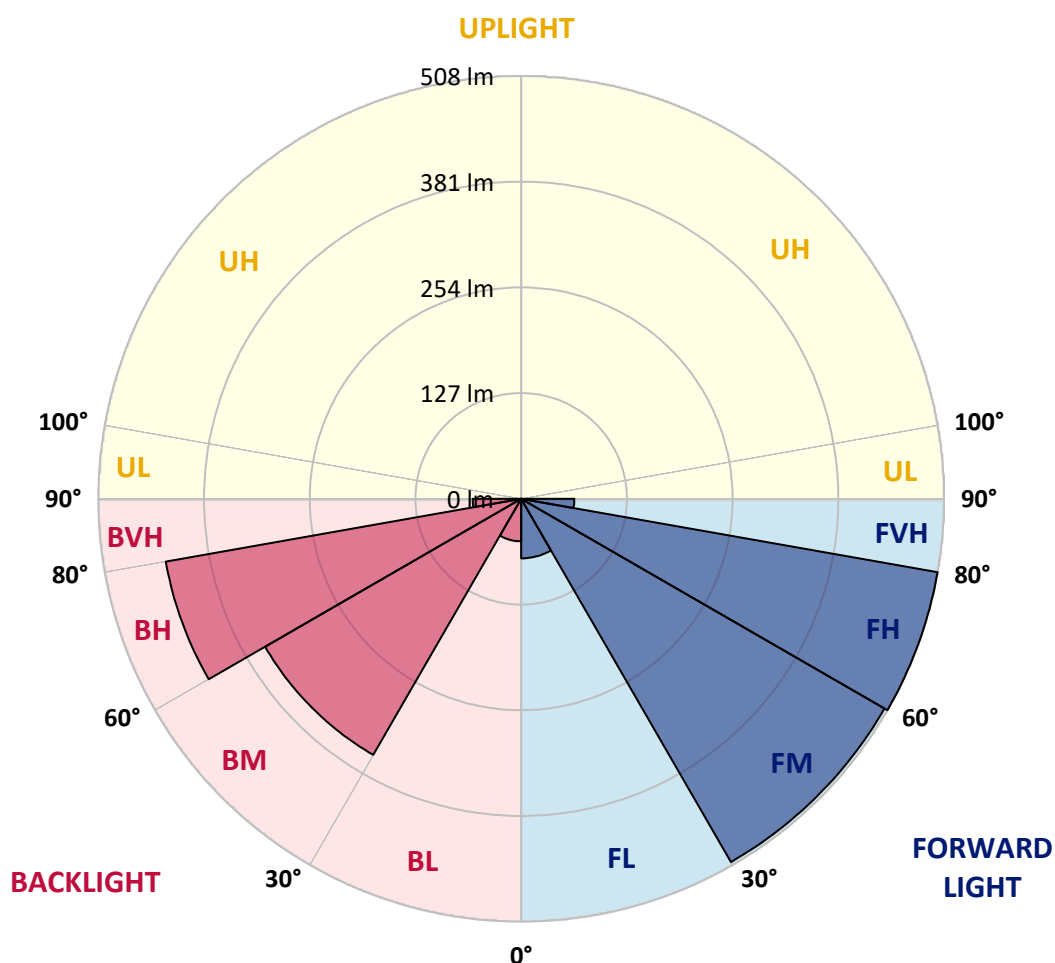
CATALOG NUMBER: ARB-B1-LED-D1-T2

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |        |
|------|-------------|--------|-----------|-------------------------|------|--------|
|      |             |        |           | B                       | U    | G      |
| FL   | (0°-30°)    | 71.5   | 3.5       |                         |      |        |
| FM   | (30°-60°)   | 503.9  | 24.6      |                         |      |        |
| FH   | (60°-80°)   | 507.9  | 24.8      |                         |      | G0/660 |
| FVH  | (80°-90°)   | 63.9   | 3.1       |                         |      | G1/100 |
| BL   | (0°-30°)    | 51.1   | 2.5       | B0/110                  |      |        |
| BM   | (30°-60°)   | 355.1  | 17.4      | B1/1000                 |      |        |
| BH   | (60°-80°)   | 433.4  | 21.2      | B1/500                  |      | G1/500 |
| BVH  | (80°-90°)   | 58.3   | 2.8       |                         |      | G1/100 |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |        |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |        |

**BUG Rating: B1-U0-G1**

Type II Short



REPORT NUMBER: P553642

CATALOG NUMBER: ARB-B1-LED-D1-T2

**CANDELA DISTRIBUTION (FULL):**

|       | 0°    | 5°    | 15°   | 25°   | 35°   | 45°   | 55°   | 65°   | 75°    | 85°    | 90°    |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|
| 0°    | 110.6 | 110.6 | 110.6 | 110.6 | 110.6 | 110.6 | 110.6 | 110.6 | 110.6  | 110.6  | 110.6  |
| 2.5°  | 115.9 | 115.9 | 115.3 | 115.3 | 115.0 | 114.2 | 113.4 | 112.8 | 112.2  | 112.0  | 111.7  |
| 5°    | 120.9 | 120.6 | 120.9 | 120.6 | 120.4 | 119.8 | 119.0 | 118.1 | 117.0  | 116.2  | 115.6  |
| 7.5°  | 124.8 | 124.8 | 125.1 | 125.4 | 125.4 | 125.4 | 124.6 | 123.7 | 122.6  | 121.8  | 120.6  |
| 10°   | 126.5 | 126.8 | 127.6 | 128.8 | 129.9 | 131.3 | 131.0 | 130.2 | 129.0  | 127.4  | 126.2  |
| 12.5° | 126.2 | 126.2 | 127.9 | 130.7 | 134.1 | 136.9 | 138.6 | 138.0 | 135.8  | 133.8  | 132.4  |
| 15°   | 127.9 | 128.5 | 130.2 | 134.1 | 139.4 | 143.9 | 146.7 | 147.5 | 144.4  | 140.8  | 139.1  |
| 17.5° | 142.5 | 142.8 | 141.4 | 143.0 | 148.9 | 155.9 | 159.0 | 160.1 | 155.4  | 148.4  | 145.0  |
| 20°   | 150.6 | 150.9 | 152.3 | 154.8 | 159.6 | 169.9 | 176.6 | 176.1 | 167.9  | 155.1  | 150.3  |
| 22.5° | 151.2 | 151.7 | 154.8 | 162.4 | 171.9 | 185.3 | 198.5 | 199.6 | 190.1  | 171.6  | 164.3  |
| 25°   | 151.2 | 151.7 | 155.4 | 165.1 | 182.2 | 201.3 | 223.9 | 229.0 | 218.3  | 196.5  | 184.7  |
| 27.5° | 151.2 | 152.3 | 158.2 | 170.2 | 192.0 | 223.1 | 250.2 | 262.0 | 252.2  | 228.1  | 213.6  |
| 30°   | 152.0 | 153.1 | 161.8 | 178.9 | 205.5 | 245.2 | 284.7 | 305.4 | 298.1  | 272.6  | 253.3  |
| 32.5° | 161.5 | 161.8 | 169.9 | 188.4 | 222.5 | 267.9 | 323.6 | 353.0 | 352.1  | 329.7  | 302.0  |
| 35°   | 170.2 | 171.3 | 179.1 | 200.7 | 236.5 | 290.8 | 363.0 | 407.3 | 423.5  | 398.9  | 368.1  |
| 37.5° | 171.6 | 173.0 | 184.7 | 211.1 | 250.2 | 315.2 | 405.6 | 467.2 | 504.4  | 488.2  | 454.0  |
| 40°   | 172.7 | 174.7 | 187.3 | 215.3 | 260.9 | 332.8 | 444.2 | 535.5 | 583.1  | 575.5  | 543.6  |
| 42.5° | 173.5 | 176.1 | 188.4 | 215.8 | 264.5 | 344.9 | 476.1 | 595.9 | 660.0  | 662.0  | 632.0  |
| 45°   | 169.1 | 171.9 | 186.1 | 215.0 | 264.0 | 354.1 | 503.8 | 653.9 | 732.5  | 746.5  | 726.7  |
| 47.5° | 170.5 | 173.0 | 185.0 | 214.7 | 267.0 | 365.0 | 529.3 | 705.1 | 802.2  | 833.0  | 810.6  |
| 50°   | 182.5 | 183.3 | 190.3 | 220.0 | 279.4 | 378.7 | 554.2 | 755.8 | 868.3  | 915.6  | 901.3  |
| 52.5° | 190.1 | 188.4 | 192.3 | 223.7 | 289.2 | 394.1 | 583.6 | 807.6 | 941.9  | 994.8  | 996.2  |
| 55°   | 202.1 | 201.5 | 200.4 | 227.6 | 295.3 | 409.5 | 616.9 | 866.1 | 1026.4 | 1081.9 | 1081.6 |
| 57.5° | 198.2 | 199.3 | 200.7 | 225.6 | 296.7 | 416.8 | 648.3 | 924.0 | 1110.4 | 1172.8 | 1159.7 |
| 60°   | 185.9 | 187.5 | 191.7 | 216.9 | 288.3 | 410.6 | 659.8 | 973.5 | 1180.7 | 1256.8 | 1231.3 |
| 62.5° | 174.9 | 176.1 | 179.7 | 203.8 | 271.8 | 394.4 | 653.3 | 997.1 | 1230.2 | 1305.8 | 1279.2 |
| 65°   | 160.4 | 161.5 | 165.4 | 187.0 | 248.3 | 370.0 | 632.6 | 994.0 | 1250.4 | 1321.2 | 1291.8 |
| 67.5° | 143.0 | 144.4 | 149.5 | 170.7 | 225.1 | 344.0 | 605.2 | 964.6 | 1229.7 | 1299.1 | 1272.2 |
| 70°   | 127.1 | 128.2 | 132.1 | 151.2 | 200.7 | 314.1 | 569.3 | 914.5 | 1163.9 | 1230.5 | 1210.1 |
| 72.5° | 111.1 | 111.7 | 114.8 | 132.7 | 175.5 | 280.2 | 520.1 | 835.3 | 1067.6 | 1133.7 | 1116.3 |
| 75°   | 95.2  | 94.3  | 97.4  | 111.7 | 146.1 | 241.6 | 461.0 | 735.1 | 934.9  | 994.5  | 976.1  |
| 77.5° | 77.8  | 77.5  | 80.3  | 90.4  | 117.6 | 201.5 | 388.8 | 610.8 | 776.8  | 824.1  | 815.4  |
| 80°   | 60.5  | 60.7  | 61.3  | 69.1  | 89.6  | 158.2 | 304.3 | 472.8 | 606.9  | 636.0  | 618.1  |
| 82.5° | 43.9  | 43.7  | 43.9  | 48.7  | 65.2  | 114.5 | 219.2 | 341.2 | 425.5  | 433.9  | 429.9  |
| 85°   | 26.6  | 26.6  | 26.3  | 28.3  | 39.7  | 64.9  | 121.8 | 191.5 | 235.4  | 254.7  | 240.4  |
| 87.5° | 9.0   | 9.2   | 9.5   | 11.5  | 13.7  | 17.6  | 30.0  | 51.8  | 62.7   | 75.9   | 66.1   |
| 90°   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0    | 0.0    | 0.0    |

REPORT NUMBER: P553642

CATALOG NUMBER: ARB-B1-LED-D1-T2

**CANDELA DISTRIBUTION (continued):**

|       | 95°    | 105°   | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 110.6  | 110.6  | 110.6 | 110.6 | 110.6 | 110.6 | 110.6 | 110.6 | 110.6 | 110.6 |
| 2.5°  | 111.4  | 111.1  | 110.8 | 110.6 | 110.6 | 110.6 | 110.3 | 110.3 | 110.0 | 110.0 |
| 5°    | 115.3  | 113.9  | 112.5 | 111.4 | 110.6 | 109.4 | 108.9 | 108.0 | 107.8 | 107.8 |
| 7.5°  | 119.5  | 117.3  | 115.0 | 112.5 | 110.6 | 109.2 | 108.0 | 106.9 | 106.4 | 106.4 |
| 10°   | 124.6  | 121.5  | 117.8 | 115.0 | 112.2 | 109.4 | 107.2 | 105.5 | 104.4 | 104.4 |
| 12.5° | 130.4  | 126.2  | 121.5 | 117.8 | 113.6 | 110.0 | 106.6 | 104.1 | 103.0 | 102.7 |
| 15°   | 136.0  | 129.9  | 124.3 | 119.5 | 114.5 | 110.0 | 106.4 | 103.8 | 102.2 | 102.2 |
| 17.5° | 141.4  | 133.0  | 125.7 | 119.2 | 114.5 | 110.0 | 105.8 | 103.0 | 101.3 | 101.0 |
| 20°   | 144.2  | 132.7  | 123.2 | 115.9 | 112.8 | 108.9 | 103.8 | 100.8 | 99.4  | 99.1  |
| 22.5° | 157.3  | 142.2  | 129.0 | 119.8 | 114.8 | 109.4 | 103.3 | 99.9  | 98.8  | 98.5  |
| 25°   | 174.9  | 154.8  | 137.7 | 125.7 | 117.6 | 110.3 | 103.3 | 99.1  | 97.4  | 97.1  |
| 27.5° | 199.0  | 171.6  | 148.4 | 132.1 | 119.8 | 111.1 | 103.0 | 98.0  | 96.0  | 96.0  |
| 30°   | 233.2  | 192.0  | 161.0 | 139.7 | 122.6 | 111.7 | 102.2 | 96.9  | 94.9  | 94.6  |
| 32.5° | 276.0  | 222.5  | 177.5 | 148.4 | 127.4 | 112.2 | 102.2 | 95.7  | 93.2  | 92.9  |
| 35°   | 334.8  | 259.8  | 204.6 | 161.5 | 133.5 | 114.5 | 102.2 | 95.2  | 92.4  | 92.1  |
| 37.5° | 409.0  | 321.3  | 241.8 | 185.0 | 143.0 | 118.7 | 104.4 | 96.9  | 93.8  | 93.5  |
| 40°   | 498.2  | 389.9  | 285.5 | 212.2 | 161.0 | 126.2 | 109.7 | 101.0 | 97.4  | 97.1  |
| 42.5° | 588.7  | 461.9  | 332.8 | 246.0 | 183.6 | 136.6 | 113.4 | 102.7 | 98.8  | 98.3  |
| 45°   | 676.0  | 538.6  | 391.3 | 285.2 | 204.3 | 146.4 | 113.9 | 103.0 | 99.1  | 98.5  |
| 47.5° | 767.0  | 625.1  | 459.1 | 325.5 | 226.2 | 154.5 | 115.6 | 102.4 | 98.5  | 98.0  |
| 50°   | 868.0  | 716.9  | 519.5 | 361.4 | 249.7 | 163.8 | 118.1 | 101.3 | 98.0  | 97.4  |
| 52.5° | 958.7  | 801.1  | 581.9 | 402.5 | 274.6 | 176.6 | 120.4 | 98.8  | 96.0  | 96.0  |
| 55°   | 1037.4 | 875.6  | 637.6 | 441.7 | 297.5 | 189.2 | 121.5 | 97.7  | 92.7  | 92.7  |
| 57.5° | 1108.5 | 933.5  | 688.9 | 473.9 | 318.0 | 198.2 | 126.5 | 95.2  | 88.2  | 88.7  |
| 60°   | 1175.4 | 977.5  | 730.6 | 504.1 | 332.8 | 206.0 | 129.0 | 91.5  | 82.3  | 82.9  |
| 62.5° | 1218.5 | 1011.9 | 759.4 | 526.5 | 342.3 | 209.9 | 128.8 | 89.6  | 76.4  | 76.4  |
| 65°   | 1232.5 | 1028.1 | 772.0 | 536.9 | 344.9 | 208.5 | 124.6 | 87.3  | 69.1  | 66.1  |
| 67.5° | 1212.6 | 1019.2 | 767.0 | 533.8 | 338.1 | 201.8 | 118.7 | 83.7  | 60.5  | 58.8  |
| 70°   | 1160.0 | 974.7  | 740.1 | 517.0 | 321.9 | 188.4 | 110.8 | 75.0  | 54.9  | 50.7  |
| 72.5° | 1065.1 | 901.9  | 688.3 | 483.1 | 298.4 | 171.3 | 101.6 | 65.5  | 50.4  | 48.7  |
| 75°   | 936.0  | 788.2  | 613.6 | 430.8 | 265.6 | 152.0 | 89.6  | 55.7  | 46.2  | 46.7  |
| 77.5° | 776.2  | 657.5  | 512.8 | 366.7 | 228.4 | 127.9 | 76.1  | 45.9  | 41.4  | 43.9  |
| 80°   | 591.7  | 509.4  | 396.4 | 290.3 | 185.0 | 101.9 | 61.6  | 37.2  | 35.5  | 36.7  |
| 82.5° | 409.0  | 353.3  | 280.5 | 204.3 | 133.2 | 77.3  | 45.3  | 29.4  | 27.7  | 27.2  |
| 85°   | 232.3  | 193.4  | 156.5 | 117.8 | 79.5  | 47.6  | 30.8  | 21.6  | 19.6  | 19.6  |
| 87.5° | 63.3   | 57.1   | 45.6  | 34.4  | 25.5  | 18.8  | 15.1  | 11.8  | 10.6  | 10.4  |
| 90°   | 0.0    | 0.0    | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |



Signify Classified - Internal  
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.

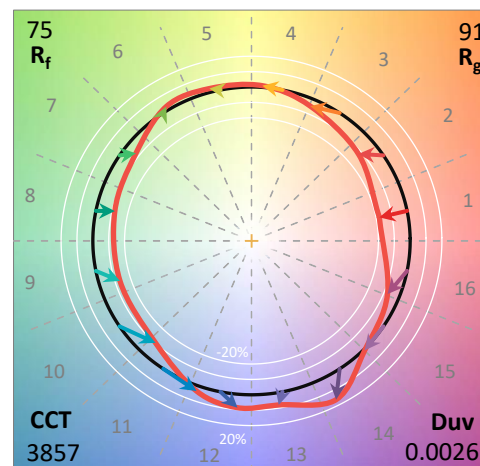
### Test Information

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

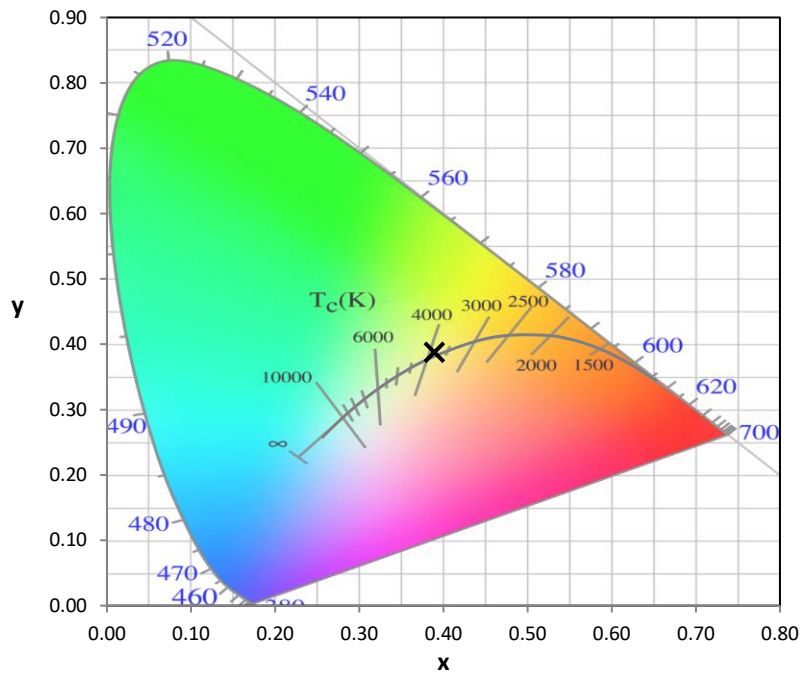
Stabilization Time: 247M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.5/62%  
 Sphere Temperature (°C): 25.6

REPORT NUMBER: SP1-2205-670-4

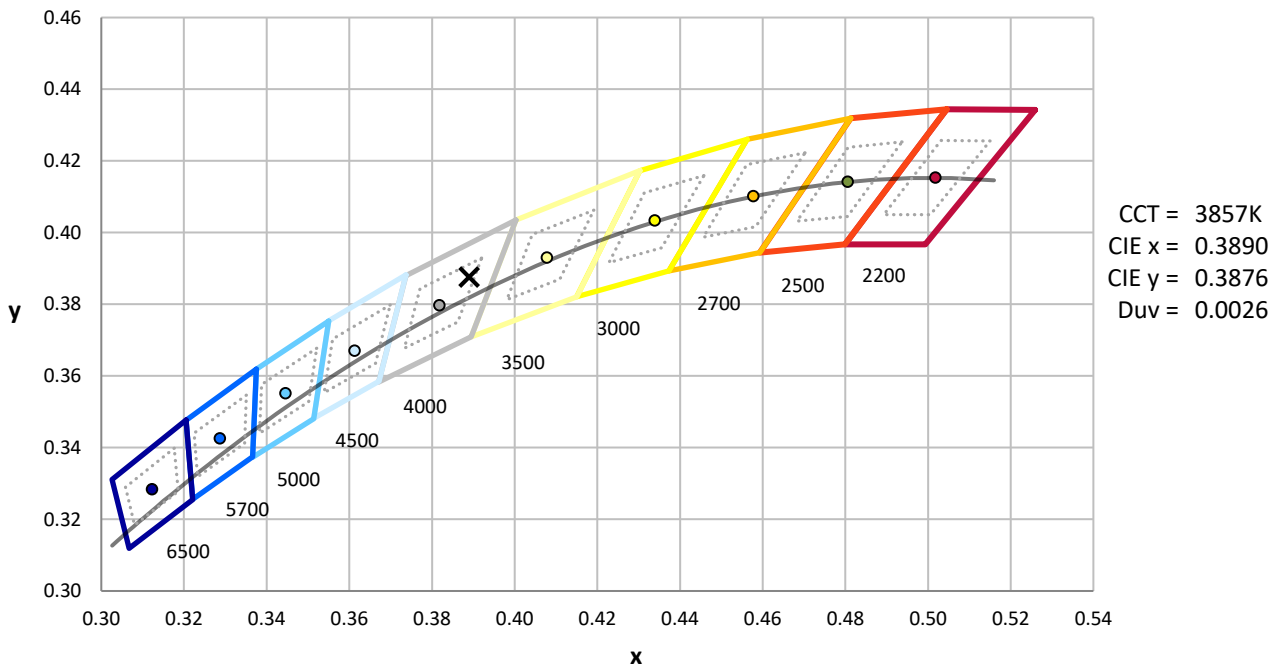
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date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

REPORT NUMBER: SP1-2205-670-4

**CIE 1931 Chromaticity Diagram**



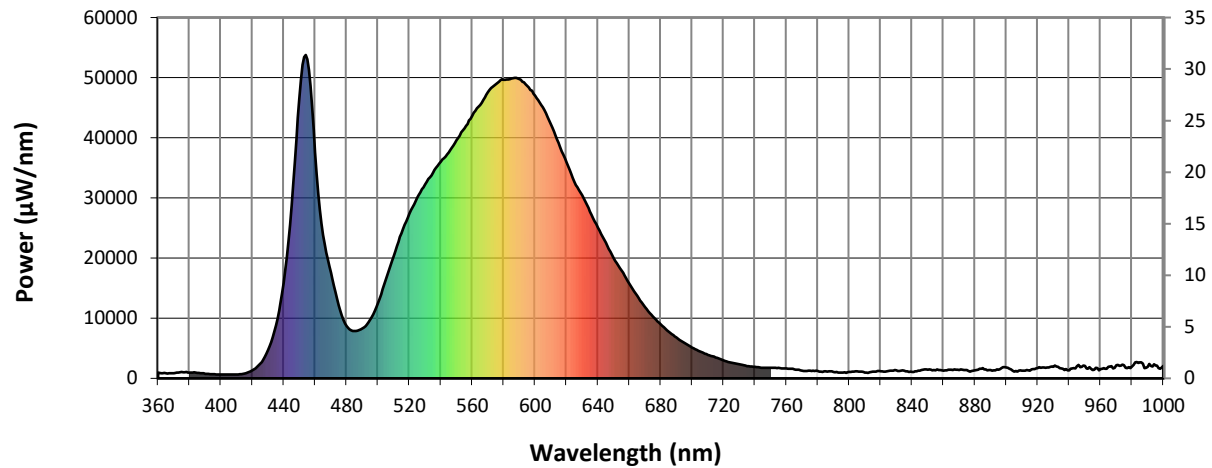
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 4000K 4-step quadrangle

REPORT NUMBER: SP1-2205-670-4

**Photopic Flux vs. Wavelength**

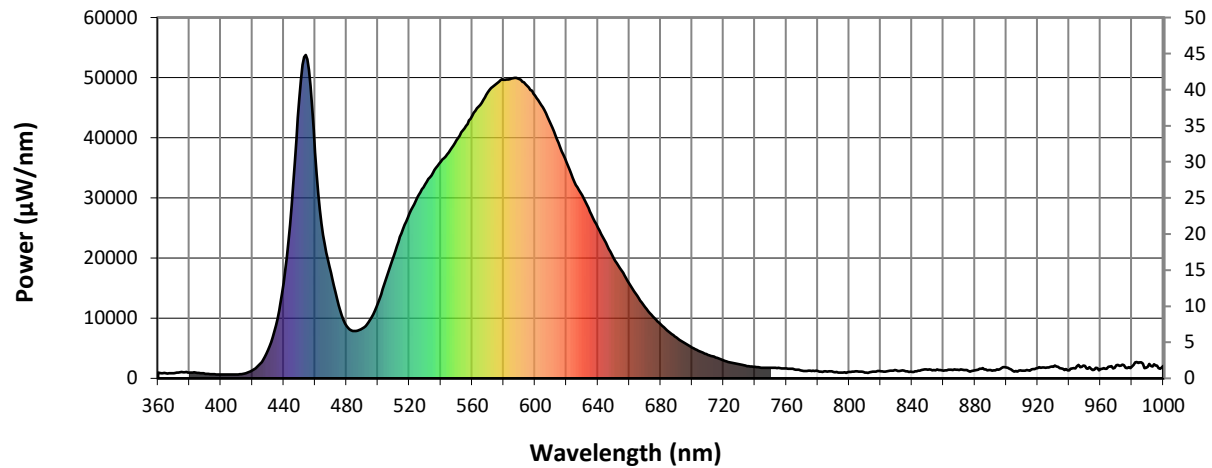


#####

| 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               |           |                  |                  |

REPORT NUMBER: SP1-2205-670-4

Scotopic Flux vs. Wavelength



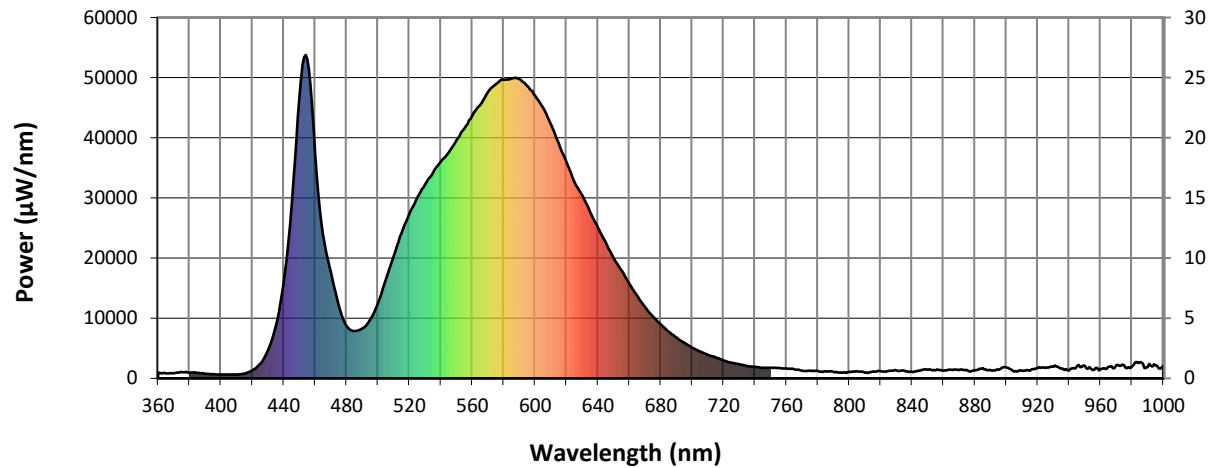
Scotopic Lumens: 4054.9

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               |           |                  |                  |

REPORT NUMBER: SP1-2205-670-4

**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               |           |                  |                  |

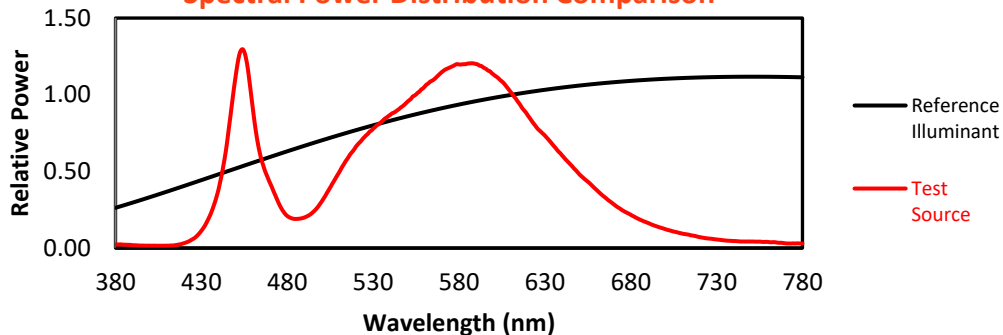
REPORT NUMBER: SP1-2205-670-4

**TM-30-18**

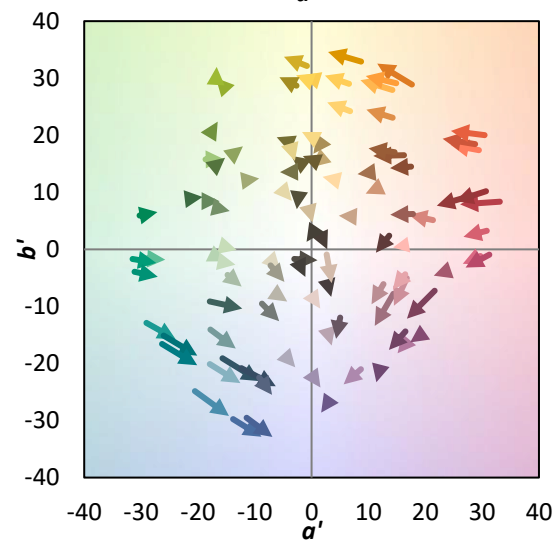
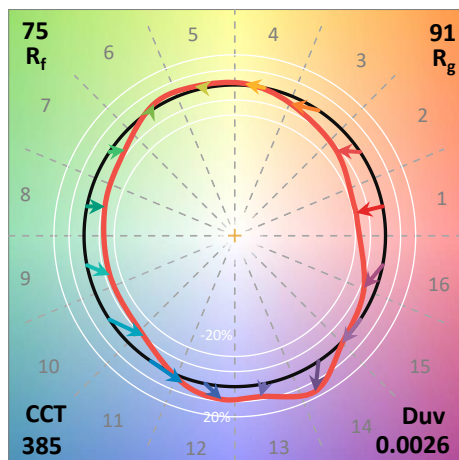
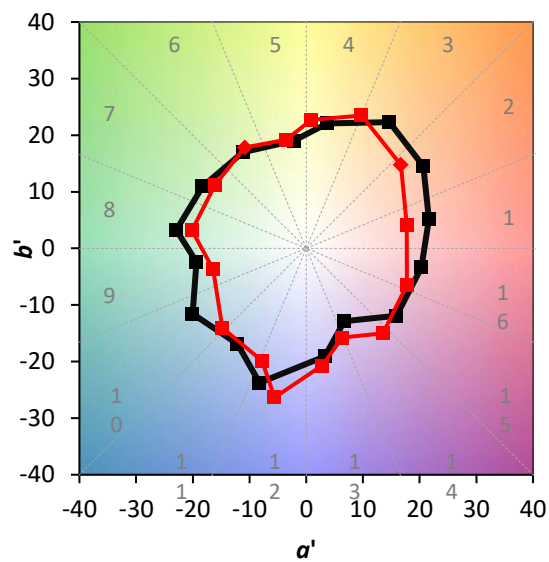
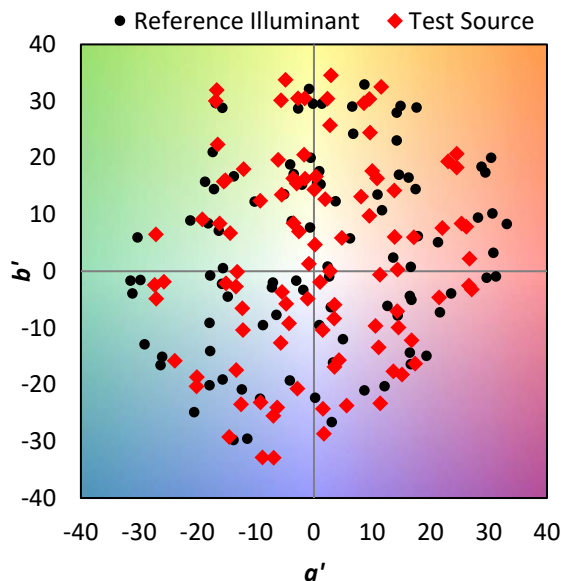
### Summary

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

### Spectral Power Distribution Comparison



### Color Vector Graphics



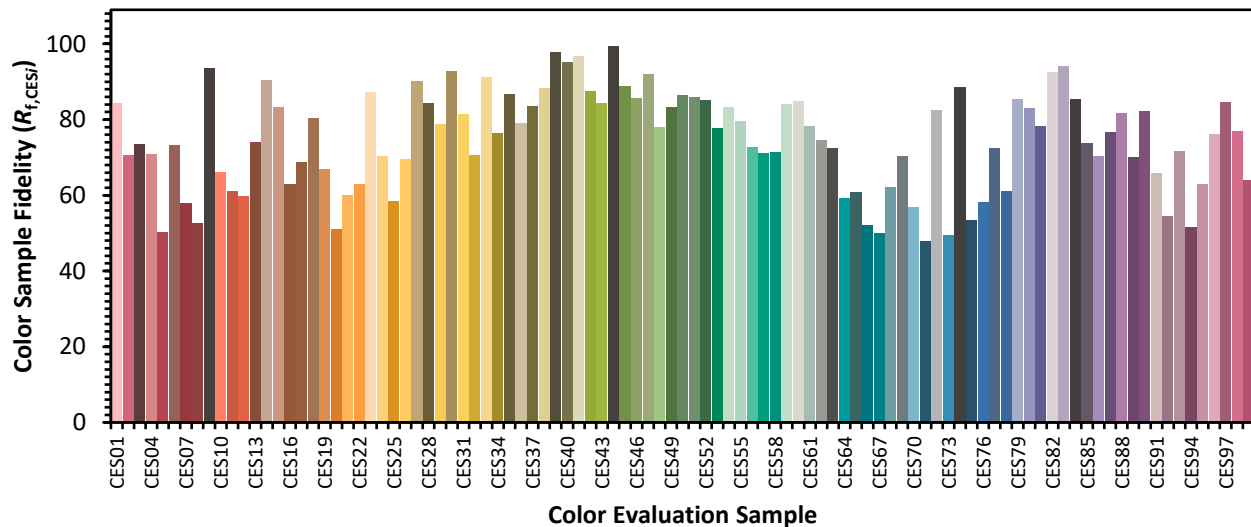


REPORT NUMBER: SP1-2205-670-4

TM-30-18

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

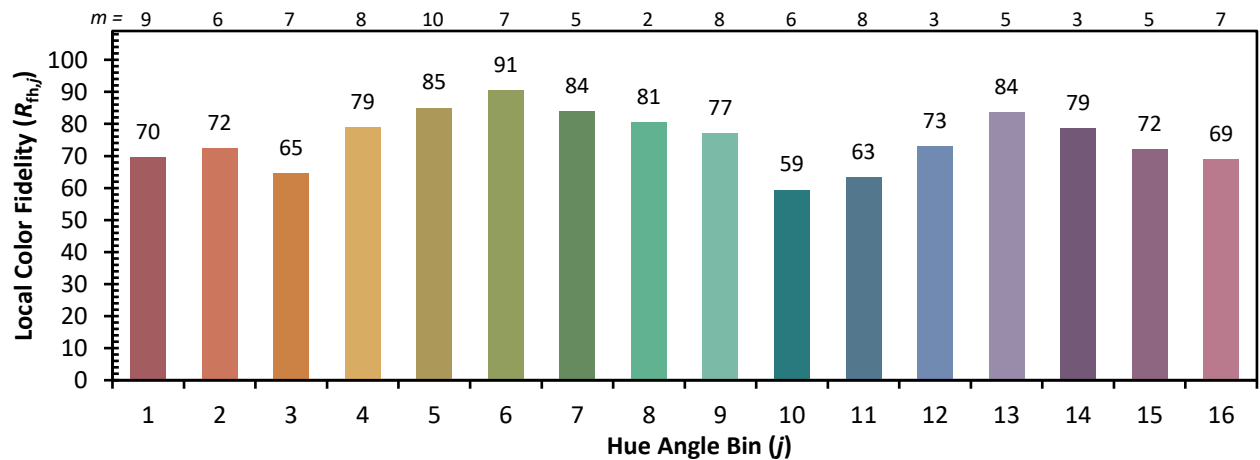
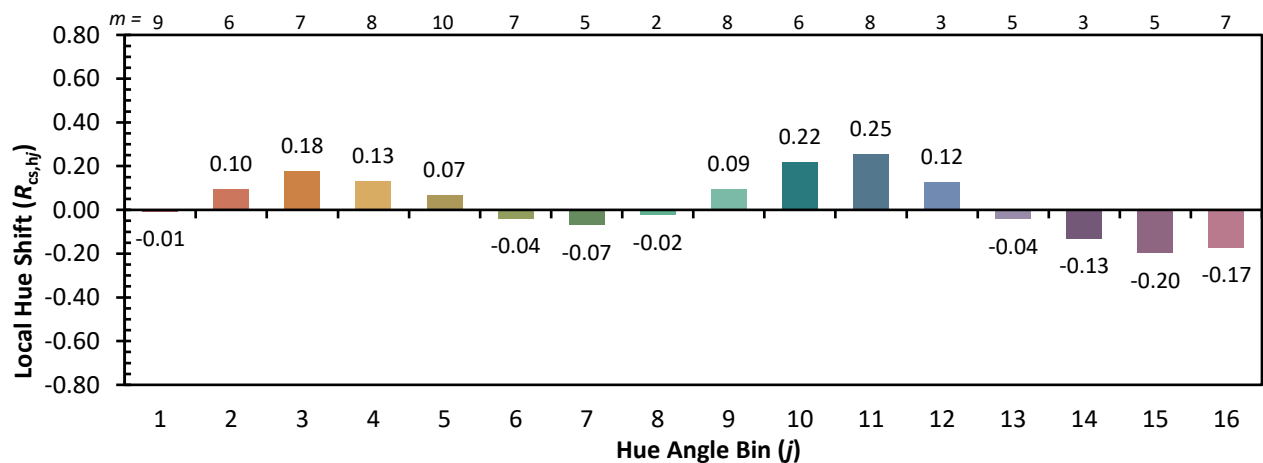
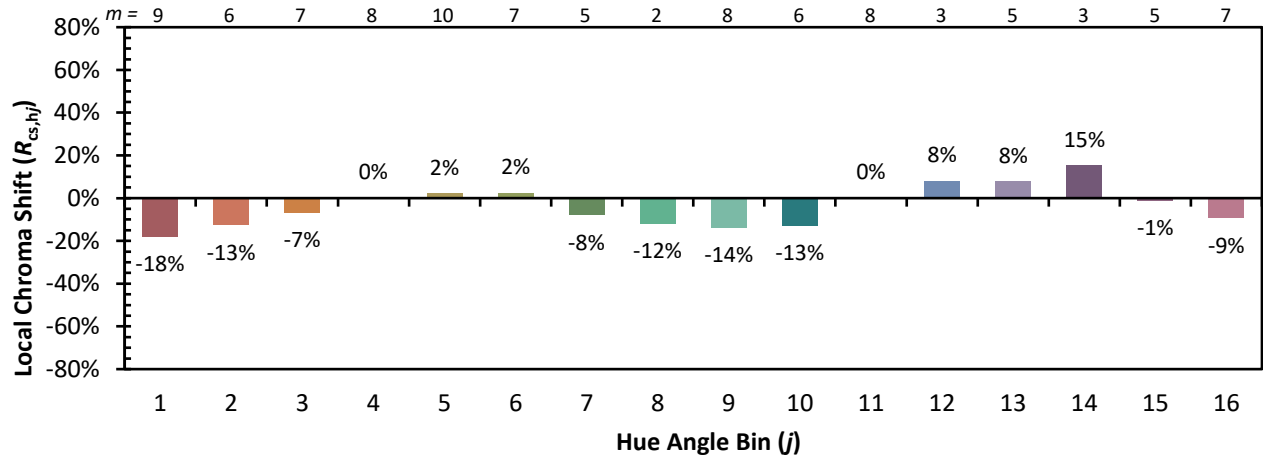
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 69 | CES51 = 86 | CES76 = 58 |
| CES02 = 61 | CES27 = 90 | CES52 = 85 | CES77 = 73 |
| CES03 = 30 | CES28 = 84 | CES53 = 78 | CES78 = 61 |
| CES04 = 70 | CES29 = 79 | CES54 = 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 |            |



REPORT NUMBER: SP1-2205-670-4

**TM-30-18**

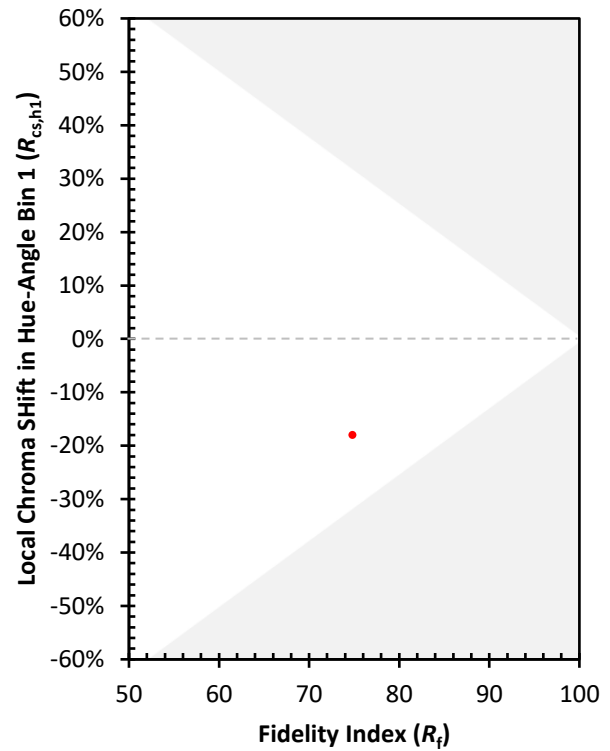
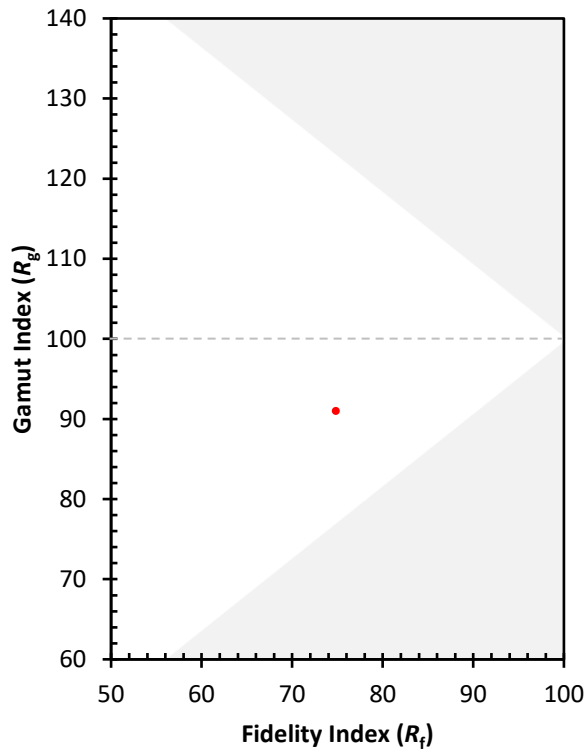
**Color Rendition by Hue-Angle Bin**



REPORT NUMBER: SP1-2205-670-4

**TM-30-18**

**Measure Comparisons**



(END OF REPORT)