

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: McGRAW-EDISON

Report Number: P437184

Luminaire Tested: **ISS-SA1B-740-U-T3-HSS**

Issue Date: 12/9/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P437184  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-2011-074-9)  
Test Lab: INNOVATION CENTER  
Issue Date: 12/9/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: ISS-SA1B-740-U-T3-HSS  
Description: IMPACT ELITE LED QUARTER SPHERE LUMINAIRE  
(1) 70 CRI, 4000K, 450mA LIGHTSQUARE WITH 16 LEDS AND TYPE III OPTICS  
WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 2562 lumens  
Efficiency: N/A  
Efficacy: 100.9 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 0.5' x H: 0')  
IES Classification: Type III - Short  
BUG Rating: B0 - U0 - G1

Input Watts (W): 25.4  
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

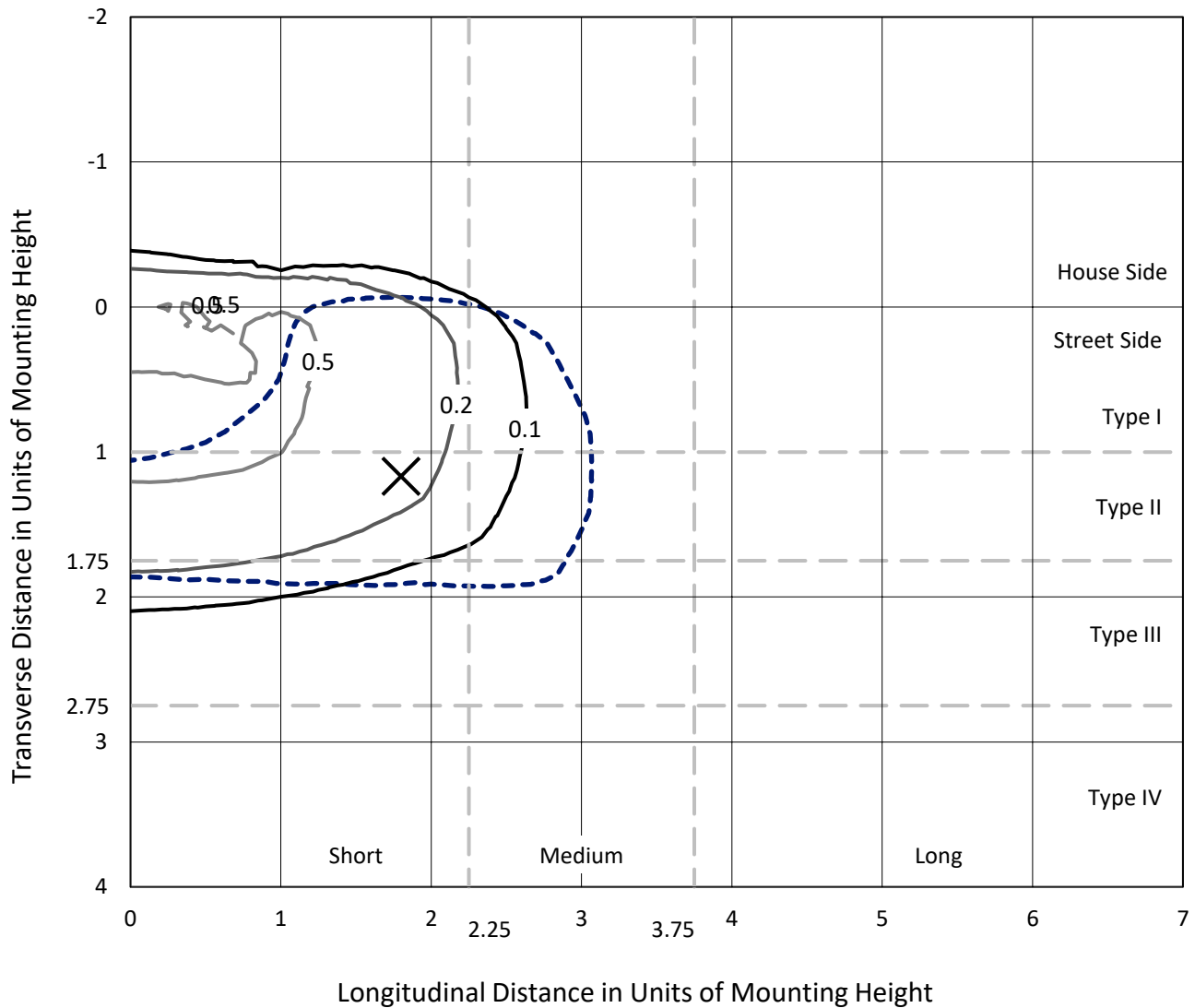


REPORT NUMBER: P437184

CATALOG NUMBER: ISS-SA1B-740-U-T3-HSS

## Iso-Footcandle Lines of Horizontal Illumination

✕ Max cd  
 - - - 1/2 Max cd

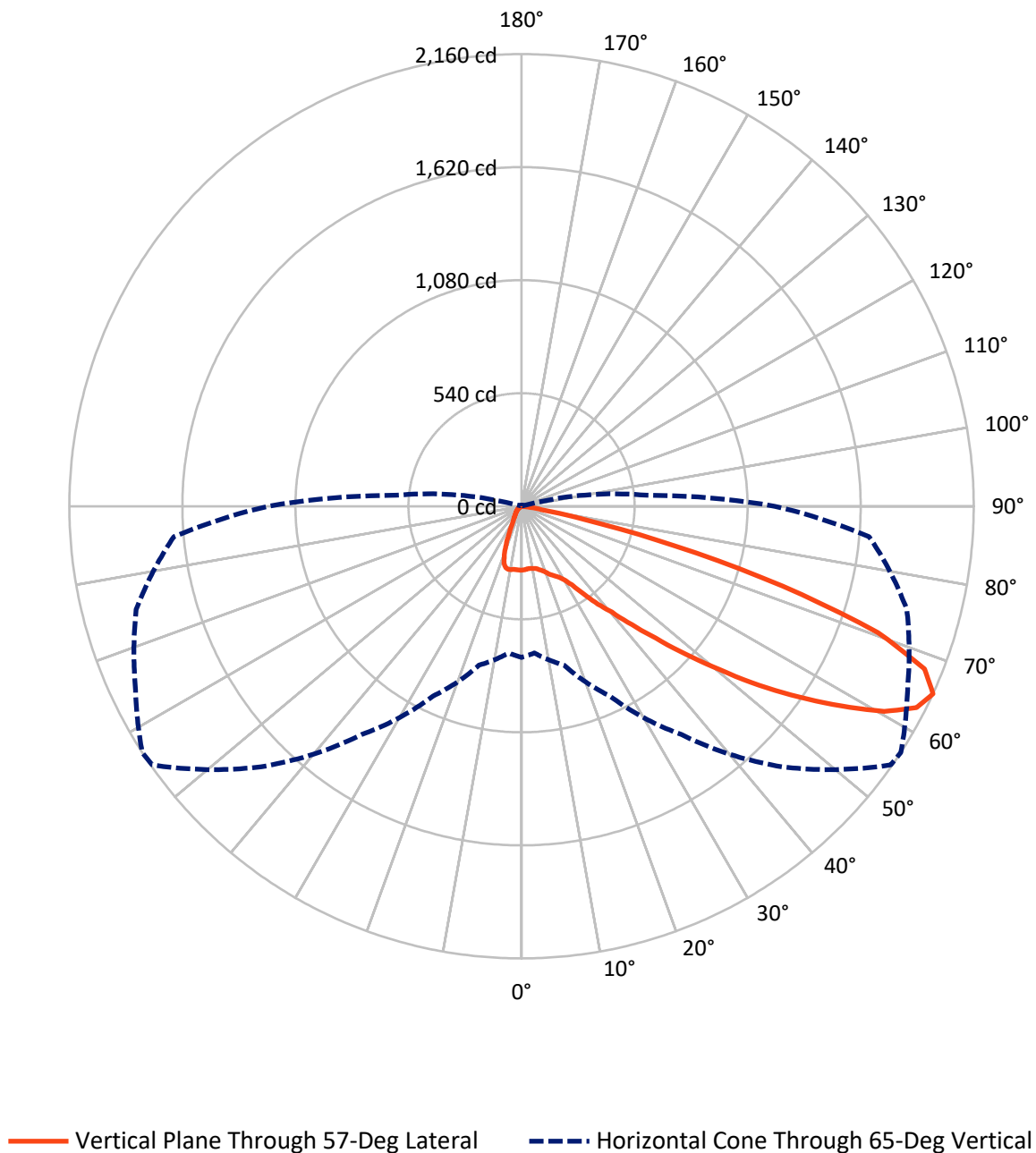


Based on 25 foot mounting height. Maximum calculated value = 0.6 fc  
 Type III - Short - N/A

REPORT NUMBER: P437184

CATALOG NUMBER: ISS-SA1B-740-U-T3-HSS

## Luminous Intensity Polar Plot



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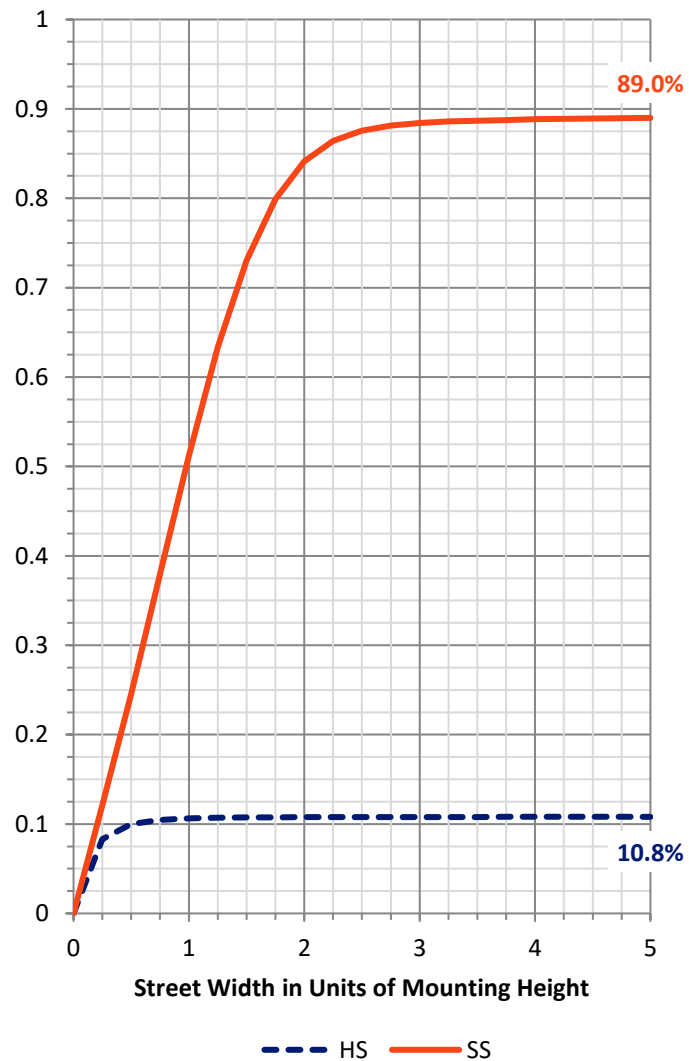
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 279.4    | 0.0    | 279.4  |
|                    | % Fixture | 10.9     | 0.0    | 10.9   |
| <b>Street Side</b> | Lumens    | 2282.5   | 0.0    | 2282.5 |
|                    | % Fixture | 89.1     | 0.0    | 89.1   |
| <b>Total</b>       | Lumens    | 2562.0   | 0.0    | 2562.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 28.3   | 1.1       |
| 10°-20°   | 76.7   | 3.0       |
| 20°-30°   | 132.4  | 5.2       |
| 30°-40°   | 234.5  | 9.2       |
| 40°-50°   | 425.4  | 16.6      |
| 50°-60°   | 716.5  | 28.0      |
| 60°-70°   | 736.7  | 28.8      |
| 70°-80°   | 204.2  | 8.0       |
| 80°-90°   | 7.2    | 0.3       |
| 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°    | 2562.0 | 100.0     |
| 0°-180°   | 2562.0 | 100.0     |

**Coefficient of Utilization**



REPORT NUMBER: P437184

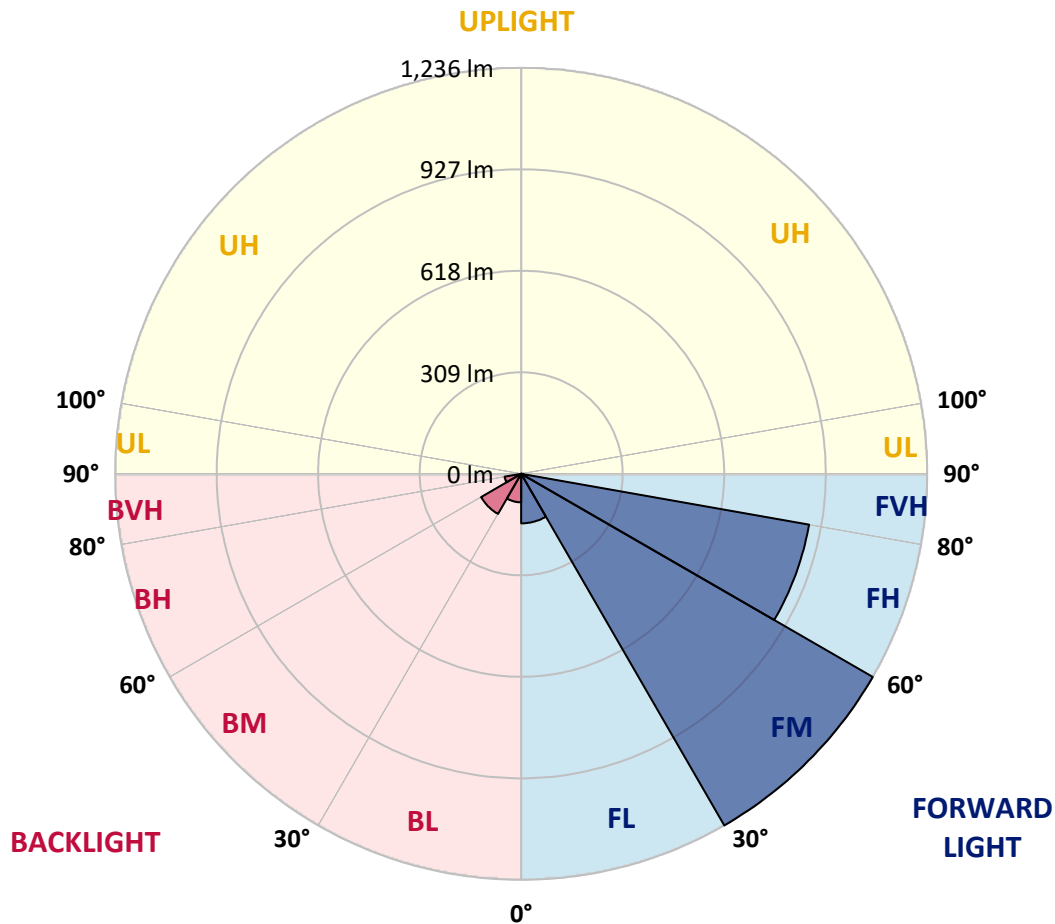
CATALOG NUMBER: ISS-SA1B-740-U-T3-HSS

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 150.6  | 5.9       |                         |      |         |
| FM   | (30°-60°)   | 1235.5 | 48.2      |                         |      |         |
| FH   | (60°-80°)   | 889.7  | 34.7      |                         |      | G1/1800 |
| FVH  | (80°-90°)   | 6.7    | 0.3       |                         |      | G0/10   |
| BL   | (0°-30°)    | 86.8   | 3.4       | B0/110                  |      |         |
| BM   | (30°-60°)   | 140.9  | 5.5       | B0/220                  |      |         |
| BH   | (60°-80°)   | 51.2   | 2.0       | B0/110                  |      | G0/110  |
| BVH  | (80°-90°)   | 0.5    | 0.0       |                         |      | G0/10   |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B0-U0-G1**

Type III Short



REPORT NUMBER: P437184

CATALOG NUMBER: ISS-SA1B-740-U-T3-HSS

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 57°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 304.8  | 304.8  | 304.8  | 304.8  | 304.8  | 304.8  | 304.8  | 304.8  | 304.8  | 304.8  | 304.8  |
| 2.5°  | 296.1  | 296.1  | 298.6  | 299.8  | 299.8  | 301.1  | 302.3  | 303.6  | 303.6  | 303.6  | 306.1  |
| 5°    | 281.1  | 279.9  | 282.4  | 284.9  | 288.6  | 293.6  | 297.3  | 299.8  | 303.6  | 307.3  | 308.6  |
| 7.5°  | 267.4  | 267.4  | 269.9  | 273.6  | 281.1  | 288.6  | 296.1  | 299.8  | 306.1  | 313.6  | 316.1  |
| 10°   | 263.6  | 262.4  | 266.1  | 269.9  | 277.4  | 286.1  | 297.3  | 302.3  | 311.1  | 321.1  | 324.8  |
| 12.5° | 261.1  | 261.1  | 262.4  | 268.6  | 276.1  | 287.4  | 301.1  | 304.8  | 318.6  | 329.8  | 338.6  |
| 15°   | 259.9  | 259.9  | 262.4  | 267.4  | 276.1  | 288.6  | 307.3  | 313.6  | 329.8  | 346.1  | 353.6  |
| 17.5° | 269.9  | 268.6  | 267.4  | 269.9  | 278.6  | 292.3  | 317.3  | 323.6  | 343.6  | 363.6  | 372.3  |
| 20°   | 299.8  | 298.6  | 294.8  | 286.1  | 286.1  | 302.3  | 329.8  | 337.3  | 363.6  | 383.6  | 388.5  |
| 22.5° | 356.1  | 359.8  | 346.1  | 323.6  | 307.3  | 314.8  | 346.1  | 354.8  | 384.8  | 406.0  | 406.0  |
| 25°   | 437.3  | 432.3  | 419.8  | 382.3  | 349.8  | 334.8  | 359.8  | 368.6  | 404.8  | 429.8  | 424.8  |
| 27.5° | 522.2  | 523.5  | 506.0  | 463.5  | 411.0  | 371.1  | 374.8  | 384.8  | 426.0  | 454.8  | 443.5  |
| 30°   | 589.7  | 584.7  | 576.0  | 541.0  | 483.5  | 428.5  | 403.5  | 409.8  | 449.8  | 482.2  | 472.3  |
| 32.5° | 649.7  | 647.2  | 635.9  | 605.9  | 554.7  | 496.0  | 451.0  | 452.3  | 483.5  | 523.5  | 511.0  |
| 35°   | 703.4  | 705.9  | 700.9  | 667.2  | 620.9  | 566.0  | 514.7  | 518.5  | 542.2  | 583.4  | 558.5  |
| 37.5° | 770.8  | 770.8  | 762.1  | 730.9  | 695.9  | 640.9  | 592.2  | 593.4  | 605.9  | 639.7  | 608.4  |
| 40°   | 829.6  | 832.1  | 830.8  | 807.1  | 773.3  | 723.4  | 664.7  | 664.7  | 668.4  | 708.4  | 692.1  |
| 42.5° | 909.5  | 913.3  | 912.0  | 889.5  | 863.3  | 827.1  | 777.1  | 773.3  | 770.8  | 820.8  | 803.3  |
| 45°   | 1012.0 | 1020.7 | 1024.5 | 997.0  | 973.2  | 952.0  | 913.3  | 898.3  | 904.5  | 950.8  | 937.0  |
| 47.5° | 1109.4 | 1119.4 | 1136.9 | 1123.2 | 1111.9 | 1111.9 | 1059.5 | 1057.0 | 1047.0 | 1100.7 | 1063.2 |
| 50°   | 1201.9 | 1203.1 | 1228.1 | 1249.4 | 1283.1 | 1276.8 | 1241.9 | 1226.9 | 1211.9 | 1248.1 | 1180.6 |
| 52.5° | 1254.3 | 1269.3 | 1301.8 | 1363.0 | 1436.8 | 1466.7 | 1430.5 | 1421.8 | 1391.8 | 1386.8 | 1294.3 |
| 55°   | 1303.1 | 1303.1 | 1354.3 | 1460.5 | 1585.4 | 1649.1 | 1619.2 | 1609.2 | 1549.2 | 1531.7 | 1411.8 |
| 57.5° | 1319.3 | 1314.3 | 1383.0 | 1518.0 | 1705.4 | 1816.6 | 1822.8 | 1800.3 | 1716.6 | 1662.9 | 1531.7 |
| 60°   | 1238.1 | 1229.4 | 1301.8 | 1480.5 | 1737.8 | 1937.7 | 2005.2 | 1990.2 | 1861.5 | 1790.3 | 1657.9 |
| 62.5° | 1004.5 | 1015.7 | 1108.2 | 1301.8 | 1622.9 | 1925.3 | 2126.4 | 2117.7 | 1969.0 | 1876.5 | 1707.9 |
| 65°   | 722.1  | 703.4  | 785.8  | 1000.7 | 1331.8 | 1760.3 | 2153.9 | 2160.1 | 2035.2 | 1905.3 | 1666.6 |
| 67.5° | 404.8  | 387.3  | 456.0  | 619.7  | 947.0  | 1444.3 | 2041.4 | 2076.4 | 1987.7 | 1834.0 | 1489.2 |
| 70°   | 154.9  | 164.9  | 212.4  | 306.1  | 558.5  | 997.0  | 1756.6 | 1806.6 | 1742.8 | 1530.5 | 1109.4 |
| 72.5° | 55.0   | 62.5   | 87.5   | 136.2  | 258.6  | 537.2  | 1228.1 | 1303.1 | 1284.3 | 1063.2 | 634.7  |
| 75°   | 32.5   | 33.7   | 45.0   | 66.2   | 113.7  | 209.9  | 693.4  | 755.9  | 725.9  | 526.0  | 262.4  |
| 77.5° | 22.5   | 22.5   | 28.7   | 40.0   | 65.0   | 83.7   | 271.1  | 307.3  | 316.1  | 189.9  | 77.5   |
| 80°   | 13.7   | 15.0   | 20.0   | 26.2   | 37.5   | 38.7   | 83.7   | 98.7   | 92.5   | 67.5   | 27.5   |
| 82.5° | 6.2    | 6.2    | 11.2   | 17.5   | 18.7   | 16.2   | 26.2   | 28.7   | 33.7   | 30.0   | 12.5   |
| 85°   | 0.0    | 0.0    | 3.7    | 6.2    | 5.0    | 3.7    | 8.7    | 8.7    | 11.2   | 13.7   | 6.2    |
| 87.5° | 0.0    | 0.0    | 0.0    | 0.0    | 1.2    | 1.2    | 1.2    | 1.2    | 1.2    | 2.5    | 1.2    |
| 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: P437184

CATALOG NUMBER: ISS-SA1B-740-U-T3-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°   | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 304.8  | 304.8 | 304.8 | 304.8 | 304.8 | 304.8 | 304.8 | 304.8 | 304.8 | 304.8 | 304.8 |
| 2.5°  | 306.1  | 307.3 | 306.1 | 304.8 | 304.8 | 303.6 | 303.6 | 303.6 | 303.6 | 303.6 | 303.6 |
| 5°    | 308.6  | 309.8 | 308.6 | 306.1 | 303.6 | 301.1 | 298.6 | 298.6 | 298.6 | 298.6 | 301.1 |
| 7.5°  | 316.1  | 316.1 | 313.6 | 308.6 | 302.3 | 299.8 | 294.8 | 293.6 | 291.1 | 289.8 | 291.1 |
| 10°   | 327.3  | 327.3 | 322.3 | 314.8 | 304.8 | 294.8 | 286.1 | 273.6 | 266.1 | 261.1 | 259.9 |
| 12.5° | 338.6  | 337.3 | 331.1 | 321.1 | 304.8 | 282.4 | 253.6 | 222.4 | 203.6 | 189.9 | 187.4 |
| 15°   | 353.6  | 352.3 | 342.3 | 324.8 | 297.3 | 249.9 | 193.6 | 151.2 | 128.7 | 118.7 | 117.4 |
| 17.5° | 369.8  | 367.3 | 353.6 | 327.3 | 273.6 | 188.7 | 127.4 | 98.7  | 90.0  | 87.5  | 87.5  |
| 20°   | 387.3  | 383.6 | 362.3 | 323.6 | 226.1 | 128.7 | 88.7  | 82.5  | 81.2  | 80.0  | 80.0  |
| 22.5° | 401.0  | 394.8 | 368.6 | 304.8 | 168.7 | 88.7  | 78.7  | 77.5  | 76.2  | 75.0  | 75.0  |
| 25°   | 416.0  | 406.0 | 373.6 | 263.6 | 111.2 | 76.2  | 73.7  | 72.5  | 70.0  | 68.7  | 68.7  |
| 27.5° | 433.5  | 418.5 | 381.1 | 207.4 | 77.5  | 68.7  | 66.2  | 65.0  | 61.2  | 58.7  | 58.7  |
| 30°   | 456.0  | 437.3 | 384.8 | 151.2 | 65.0  | 60.0  | 57.5  | 55.0  | 50.0  | 47.5  | 47.5  |
| 32.5° | 492.2  | 476.0 | 377.3 | 101.2 | 58.7  | 53.7  | 50.0  | 45.0  | 40.0  | 37.5  | 36.2  |
| 35°   | 538.5  | 516.0 | 351.1 | 71.2  | 52.5  | 47.5  | 41.2  | 35.0  | 31.2  | 30.0  | 30.0  |
| 37.5° | 589.7  | 559.7 | 311.1 | 57.5  | 47.5  | 41.2  | 35.0  | 28.7  | 25.0  | 23.7  | 23.7  |
| 40°   | 662.2  | 615.9 | 256.1 | 50.0  | 41.2  | 35.0  | 28.7  | 23.7  | 21.2  | 20.0  | 20.0  |
| 42.5° | 757.1  | 687.1 | 193.6 | 46.2  | 37.5  | 30.0  | 23.7  | 20.0  | 17.5  | 16.2  | 16.2  |
| 45°   | 863.3  | 762.1 | 141.2 | 41.2  | 32.5  | 25.0  | 18.7  | 16.2  | 13.7  | 12.5  | 12.5  |
| 47.5° | 969.5  | 815.8 | 97.4  | 37.5  | 27.5  | 21.2  | 16.2  | 12.5  | 10.0  | 10.0  | 8.7   |
| 50°   | 1061.9 | 844.6 | 70.0  | 32.5  | 25.0  | 17.5  | 12.5  | 10.0  | 8.7   | 7.5   | 7.5   |
| 52.5° | 1143.2 | 857.1 | 53.7  | 28.7  | 21.2  | 15.0  | 10.0  | 8.7   | 7.5   | 7.5   | 7.5   |
| 55°   | 1211.9 | 847.1 | 42.5  | 25.0  | 18.7  | 12.5  | 8.7   | 7.5   | 6.2   | 6.2   | 6.2   |
| 57.5° | 1279.3 | 817.1 | 33.7  | 21.2  | 15.0  | 8.7   | 7.5   | 6.2   | 5.0   | 5.0   | 5.0   |
| 60°   | 1314.3 | 778.3 | 27.5  | 17.5  | 12.5  | 7.5   | 6.2   | 5.0   | 5.0   | 3.7   | 3.7   |
| 62.5° | 1290.6 | 699.6 | 22.5  | 15.0  | 8.7   | 6.2   | 5.0   | 3.7   | 3.7   | 2.5   | 2.5   |
| 65°   | 1210.6 | 599.7 | 17.5  | 11.2  | 6.2   | 5.0   | 3.7   | 3.7   | 2.5   | 1.2   | 1.2   |
| 67.5° | 1020.7 | 469.8 | 13.7  | 8.7   | 5.0   | 3.7   | 2.5   | 2.5   | 1.2   | 0.0   | 0.0   |
| 70°   | 729.6  | 309.8 | 11.2  | 6.2   | 3.7   | 3.7   | 2.5   | 1.2   | 0.0   | 0.0   | 0.0   |
| 72.5° | 421.0  | 149.9 | 8.7   | 3.7   | 2.5   | 2.5   | 1.2   | 1.2   | 0.0   | 0.0   | 0.0   |
| 75°   | 157.4  | 52.5  | 7.5   | 3.7   | 2.5   | 1.2   | 1.2   | 1.2   | 0.0   | 0.0   | 0.0   |
| 77.5° | 52.5   | 21.2  | 6.2   | 5.0   | 3.7   | 1.2   | 1.2   | 0.0   | 0.0   | 0.0   | 0.0   |
| 80°   | 16.2   | 10.0  | 2.5   | 2.5   | 2.5   | 1.2   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 82.5° | 8.7    | 5.0   | 1.2   | 1.2   | 1.2   | 1.2   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 85°   | 3.7    | 2.5   | 1.2   | 1.2   | 1.2   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 87.5° | 1.2    | 1.2   | 1.2   | 1.2   | 1.2   | 1.2   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 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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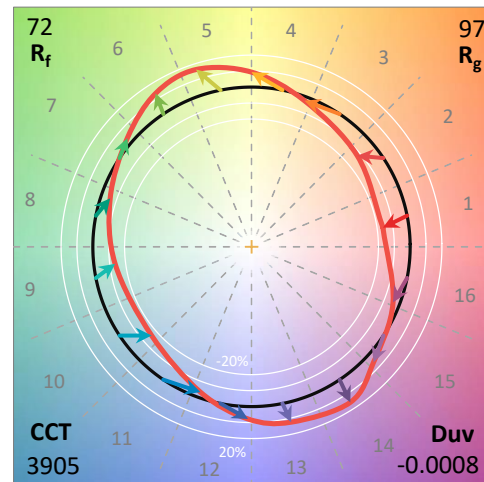
### Test Information

Test Method: LM-79-08  
 Report Number: SP1-2101-121-2  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1  
 Measurement Geometry:  $4\pi$   
 Issue Date: 03/05/2021  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: STREETWORKS  
 Catalog Number: **IFLD-S-SA2A-740-U-T3R-HSS**  
 Description: STREETWORKS INF FLOOD

SHIELD, DRIVER PROGRAMMED @ 615mA.

### Spectral Parameters

|                           |         |           |      |      |       |
|---------------------------|---------|-----------|------|------|-------|
| CCT (K):                  | 3905    | CRI (Ra): | 71.2 |      |       |
| CIE u':                   | 0.2273  | R1:       | 68.9 | R9:  | -29.7 |
| CIE v':                   | 0.5024  | R2:       | 77.0 | R10: | 46.2  |
| Duv:                      | -0.0008 | R3:       | 84.0 | R11: | 68.8  |
| CIE x:                    | 0.3841  | R4:       | 71.6 | R12: | 45.6  |
| CIE y:                    | 0.3774  | R5:       | 68.9 | R13: | 69.5  |
| CIE z:                    | 0.2385  | R6:       | 68.3 | R14: | 90.7  |
| Peak Wavelength (nm):     | 443     | R7:       | 78.7 |      |       |
| Dominant Wavelength (nm): | 579     | R8:       | 52.2 |      |       |
| Purity:                   | 28.7    |           |      |      |       |
| Rf:                       | 71.7    |           |      |      |       |
| Rg:                       | 96.9    |           |      |      |       |



### Test Conditions

Stabilization Time: 211M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.8/312%  
 Sphere Temperature (°C): 24.1

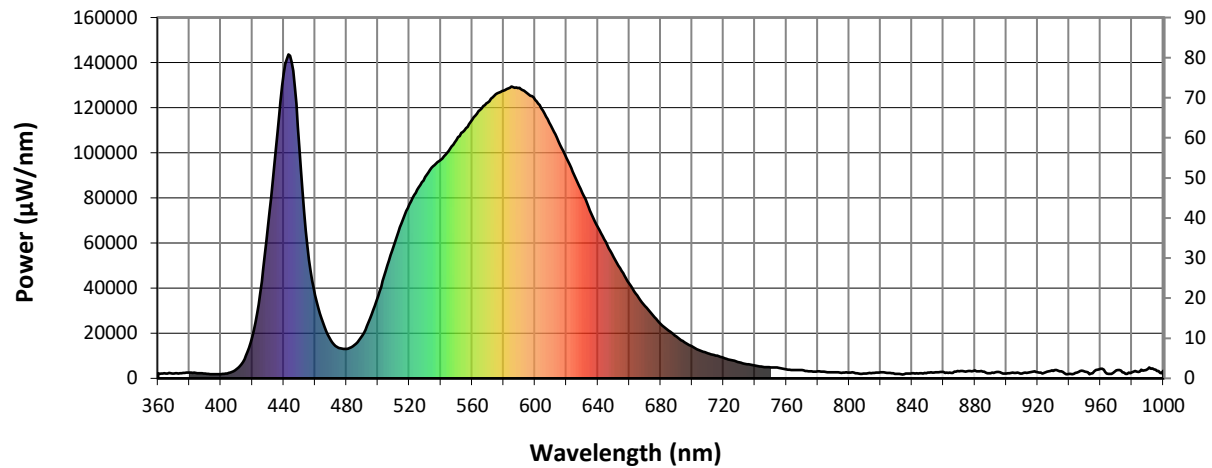
REPORT NUMBER: SP1-2101-121-2

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



REPORT NUMBER: SP1-2101-121-2

### Photopic Flux vs. Wavelength

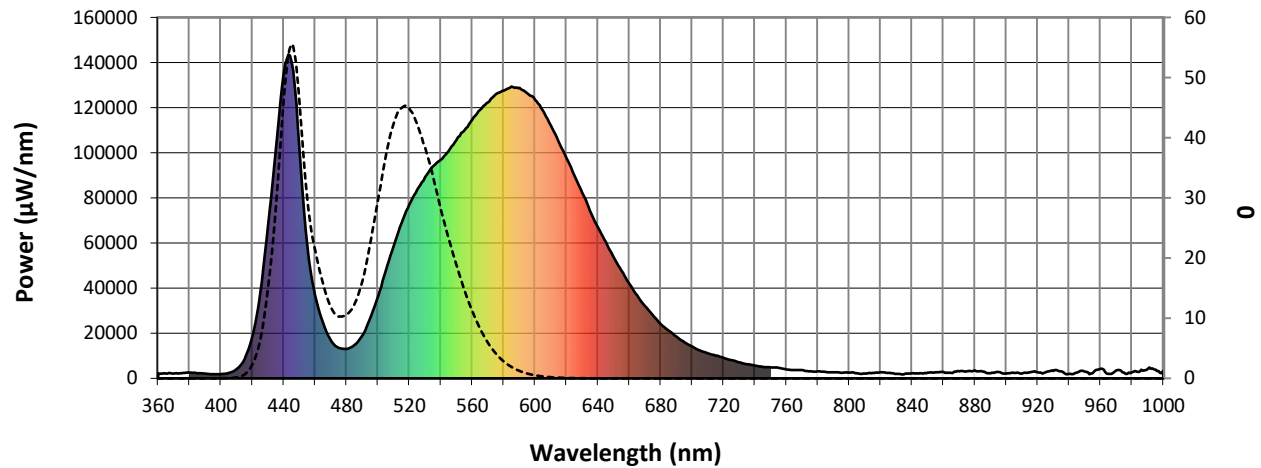


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| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 2304             | 0.0              | 490       | 19043            | 2.7              | 620       | 97577            | 25.4             | 750       | 4830             | 0.0              | 880       | 3505             | 0.0              |
| 365       | 2150             | 0.0              | 495       | 26606            | 4.8              | 625       | 90158            | 19.9             | 755       | 4664             | 0.0              | 885       | 2991             | 0.0              |
| 370       | 2146             | 0.0              | 500       | 36376            | 8.0              | 630       | 82240            | 14.9             | 760       | 4006             | 0.0              | 890       | 2327             | 0.0              |
| 375       | 2332             | 0.0              | 505       | 47714            | 13.3             | 635       | 74361            | 11.2             | 765       | 3715             | 0.0              | 895       | 2775             | 0.0              |
| 380       | 2527             | 0.0              | 510       | 58741            | 20.2             | 640       | 66994            | 8.0              | 770       | 3696             | 0.0              | 900       | 2141             | 0.0              |
| 385       | 2304             | 0.0              | 515       | 68716            | 28.5             | 645       | 60405            | 5.8              | 775       | 3117             | 0.0              | 905       | 2421             | 0.0              |
| 390       | 2064             | 0.0              | 520       | 77136            | 37.4             | 650       | 53806            | 3.9              | 780       | 3062             | 0.0              | 910       | 2200             | 0.0              |
| 395       | 1856             | 0.0              | 525       | 83567            | 44.9             | 655       | 47610            | 2.7              | 785       | 2907             | 0.0              | 915       | 2716             | 0.0              |
| 400       | 1856             | 0.0              | 530       | 89283            | 52.6             | 660       | 42018            | 1.8              | 790       | 2655             | 0.0              | 920       | 2656             | 0.0              |
| 405       | 2374             | 0.0              | 535       | 94097            | 58.4             | 665       | 36742            | 1.2              | 795       | 2467             | 0.0              | 925       | 2671             | 0.0              |
| 410       | 4084             | 0.0              | 540       | 96845            | 63.1             | 670       | 32105            | 0.7              | 800       | 2609             | 0.0              | 930       | 3292             | 0.0              |
| 415       | 8543             | 0.0              | 545       | 100829           | 67.1             | 675       | 27946            | 0.5              | 805       | 2293             | 0.0              | 935       | 3188             | 0.0              |
| 420       | 18394            | 0.1              | 550       | 105648           | 71.8             | 680       | 24146            | 0.3              | 810       | 2188             | 0.0              | 940       | 1997             | 0.0              |
| 425       | 37987            | 0.2              | 555       | 110017           | 75.1             | 685       | 21191            | 0.2              | 815       | 2386             | 0.0              | 945       | 2623             | 0.0              |
| 430       | 67605            | 0.5              | 560       | 114586           | 77.9             | 690       | 18544            | 0.1              | 820       | 2712             | 0.0              | 950       | 2969             | 0.0              |
| 435       | 102160           | 1.2              | 565       | 118987           | 79.1             | 695       | 16058            | 0.1              | 825       | 2473             | 0.0              | 955       | 2277             | 0.0              |
| 440       | 135103           | 2.1              | 570       | 122326           | 79.5             | 700       | 14133            | 0.0              | 830       | 1969             | 0.0              | 960       | 4267             | 0.0              |
| 445       | 140126           | 2.9              | 575       | 125968           | 78.4             | 705       | 12309            | 0.0              | 835       | 1917             | 0.0              | 965       | 2034             | 0.0              |
| 450       | 102339           | 2.7              | 580       | 127613           | 75.8             | 710       | 11142            | 0.0              | 840       | 2248             | 0.0              | 970       | 3586             | 0.0              |
| 455       | 58751            | 2.0              | 585       | 129466           | 71.9             | 715       | 10143            | 0.0              | 845       | 2266             | 0.0              | 975       | 2505             | 0.0              |
| 460       | 36892            | 1.5              | 590       | 128813           | 66.6             | 720       | 9072             | 0.0              | 850       | 2558             | 0.0              | 980       | 2666             | 0.0              |
| 465       | 24637            | 1.3              | 595       | 126387           | 59.9             | 725       | 8130             | 0.0              | 855       | 2767             | 0.0              | 985       | 2934             | 0.0              |
| 470       | 16738            | 1.0              | 600       | 123477           | 53.2             | 730       | 7149             | 0.0              | 860       | 2826             | 0.0              | 990       | 4120             | 0.0              |
| 475       | 13456            | 1.1              | 605       | 118718           | 46.0             | 735       | 6311             | 0.0              | 865       | 2385             | 0.0              | 995       | 3858             | 0.0              |
| 480       | 13081            | 1.2              | 610       | 112091           | 38.5             | 740       | 5711             | 0.0              | 870       | 3194             | 0.0              | 1000      | 3405             | 0.0              |
| 485       | 14734            | 1.7              | 615       | 105039           | 31.7             | 745       | 5111             | 0.0              | 875       | 3189             | 0.0              |           |                  |                  |

REPORT NUMBER: SP1-2101-121-2

### Scotopic Flux vs. Wavelength



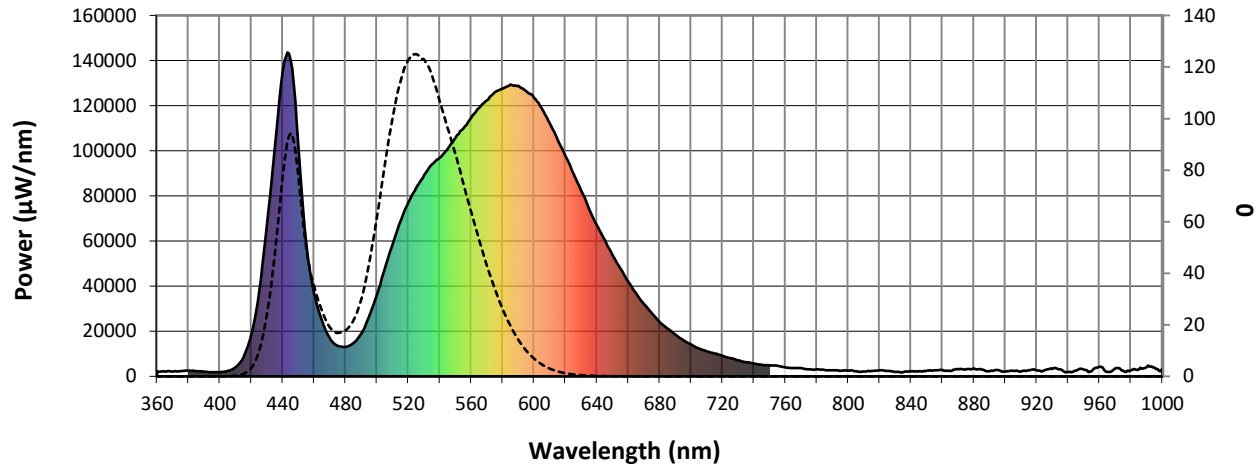
Scotopic Lumens: 10425.8

S/P: 1.47

| 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       | 2304             | 0.0              | 490       | 19043            | 29.3             | 620       | 97577            | 1.2              | 750       | 4830             | 0.0              | 880       | 3505             | 0.0              |
| 365       | 2150             | 0.0              | 495       | 26606            | 43.0             | 625       | 90158            | 0.8              | 755       | 4664             | 0.0              | 885       | 2991             | 0.0              |
| 370       | 2146             | 0.0              | 500       | 36376            | 60.8             | 630       | 82240            | 0.5              | 760       | 4006             | 0.0              | 890       | 2327             | 0.0              |
| 375       | 2332             | 0.0              | 505       | 47714            | 81.1             | 635       | 74361            | 0.3              | 765       | 3715             | 0.0              | 895       | 2775             | 0.0              |
| 380       | 2527             | 0.0              | 510       | 58741            | 99.6             | 640       | 66994            | 0.2              | 770       | 3696             | 0.0              | 900       | 2141             | 0.0              |
| 385       | 2304             | 0.0              | 515       | 68716            | 113.9            | 645       | 60405            | 0.1              | 775       | 3117             | 0.0              | 905       | 2421             | 0.0              |
| 390       | 2064             | 0.0              | 520       | 77136            | 122.6            | 650       | 53806            | 0.1              | 780       | 3062             | 0.0              | 910       | 2200             | 0.0              |
| 395       | 1856             | 0.0              | 525       | 83567            | 125.0            | 655       | 47610            | 0.0              | 785       | 2907             | 0.0              | 915       | 2716             | 0.0              |
| 400       | 1856             | 0.0              | 530       | 89283            | 123.1            | 660       | 42018            | 0.0              | 790       | 2655             | 0.0              | 920       | 2656             | 0.0              |
| 405       | 2374             | 0.1              | 535       | 94097            | 117.3            | 665       | 36742            | 0.0              | 795       | 2467             | 0.0              | 925       | 2671             | 0.0              |
| 410       | 4084             | 0.2              | 540       | 96845            | 107.0            | 670       | 32105            | 0.0              | 800       | 2609             | 0.0              | 930       | 3292             | 0.0              |
| 415       | 8543             | 0.9              | 545       | 100829           | 96.7             | 675       | 27946            | 0.0              | 805       | 2293             | 0.0              | 935       | 3188             | 0.0              |
| 420       | 18394            | 3.0              | 550       | 105648           | 86.4             | 680       | 24146            | 0.0              | 810       | 2188             | 0.0              | 940       | 1997             | 0.0              |
| 425       | 37987            | 9.3              | 555       | 110017           | 75.2             | 685       | 21191            | 0.0              | 815       | 2386             | 0.0              | 945       | 2623             | 0.0              |
| 430       | 67605            | 23.0             | 560       | 114586           | 64.0             | 690       | 18544            | 0.0              | 820       | 2712             | 0.0              | 950       | 2969             | 0.0              |
| 435       | 102160           | 45.7             | 565       | 118987           | 53.4             | 695       | 16058            | 0.0              | 825       | 2473             | 0.0              | 955       | 2277             | 0.0              |
| 440       | 135103           | 75.5             | 570       | 122326           | 43.2             | 700       | 14133            | 0.0              | 830       | 1969             | 0.0              | 960       | 4267             | 0.0              |
| 445       | 140126           | 93.8             | 575       | 125968           | 34.3             | 705       | 12309            | 0.0              | 835       | 1917             | 0.0              | 965       | 2034             | 0.0              |
| 450       | 102339           | 79.3             | 580       | 127613           | 26.3             | 710       | 11142            | 0.0              | 840       | 2248             | 0.0              | 970       | 3586             | 0.0              |
| 455       | 58751            | 51.3             | 585       | 129466           | 19.8             | 715       | 10143            | 0.0              | 845       | 2266             | 0.0              | 975       | 2505             | 0.0              |
| 460       | 36892            | 35.6             | 590       | 128813           | 14.3             | 720       | 9072             | 0.0              | 850       | 2558             | 0.0              | 980       | 2666             | 0.0              |
| 465       | 24637            | 26.0             | 595       | 126387           | 10.1             | 725       | 8130             | 0.0              | 855       | 2767             | 0.0              | 985       | 2934             | 0.0              |
| 470       | 16738            | 19.3             | 600       | 123477           | 7.0              | 730       | 7149             | 0.0              | 860       | 2826             | 0.0              | 990       | 4120             | 0.0              |
| 475       | 13456            | 16.8             | 605       | 118718           | 4.7              | 735       | 6311             | 0.0              | 865       | 2385             | 0.0              | 995       | 3858             | 0.0              |
| 480       | 13081            | 17.7             | 610       | 112091           | 3.0              | 740       | 5711             | 0.0              | 870       | 3194             | 0.0              | 1000      | 3405             | 0.0              |
| 485       | 14734            | 21.4             | 615       | 105039           | 1.9              | 745       | 5111             | 0.0              | 875       | 3189             | 0.0              |           |                  |                  |

REPORT NUMBER: SP1-2101-121-2

### Melanopic Flux vs. Wavelength



**Melanopic Lumens: 3927.2**

**M/P: 0.55**

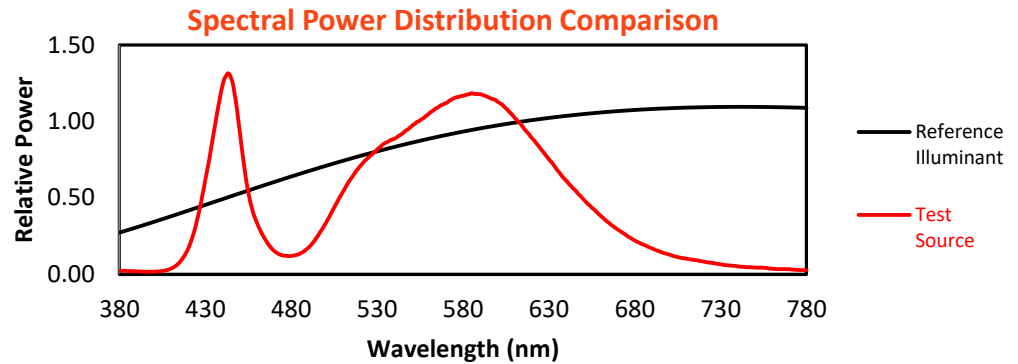
| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 2304             | 0.0              | 490       | 19043            | 15.8             | 620       | 97577            | 0.1              | 750       | 4830             | 0.0              | 880       | 3505             | 0.0              |
| 365       | 2150             | 0.0              | 495       | 26606            | 22.0             | 625       | 90158            | 0.0              | 755       | 4664             | 0.0              | 885       | 2991             | 0.0              |
| 370       | 2146             | 0.0              | 500       | 36376            | 29.2             | 630       | 82240            | 0.0              | 760       | 4006             | 0.0              | 890       | 2327             | 0.0              |
| 375       | 2332             | 0.0              | 505       | 47714            | 36.6             | 635       | 74361            | 0.0              | 765       | 3715             | 0.0              | 895       | 2775             | 0.0              |
| 380       | 2527             | 0.0              | 510       | 58741            | 42.2             | 640       | 66994            | 0.0              | 770       | 3696             | 0.0              | 900       | 2141             | 0.0              |
| 385       | 2304             | 0.0              | 515       | 68716            | 44.9             | 645       | 60405            | 0.0              | 775       | 3117             | 0.0              | 905       | 2421             | 0.0              |
| 390       | 2064             | 0.0              | 520       | 77136            | 44.9             | 650       | 53806            | 0.0              | 780       | 3062             | 0.0              | 910       | 2200             | 0.0              |
| 395       | 1856             | 0.0              | 525       | 83567            | 42.4             | 655       | 47610            | 0.0              | 785       | 2907             | 0.0              | 915       | 2716             | 0.0              |
| 400       | 1856             | 0.0              | 530       | 89283            | 38.6             | 660       | 42018            | 0.0              | 790       | 2655             | 0.0              | 920       | 2656             | 0.0              |
| 405       | 2374             | 0.0              | 535       | 94097            | 33.9             | 665       | 36742            | 0.0              | 795       | 2467             | 0.0              | 925       | 2671             | 0.0              |
| 410       | 4084             | 0.2              | 540       | 96845            | 28.3             | 670       | 32105            | 0.0              | 800       | 2609             | 0.0              | 930       | 3292             | 0.0              |
| 415       | 8543             | 0.6              | 545       | 100829           | 23.4             | 675       | 27946            | 0.0              | 805       | 2293             | 0.0              | 935       | 3188             | 0.0              |
| 420       | 18394            | 2.1              | 550       | 105648           | 19.0             | 680       | 24146            | 0.0              | 810       | 2188             | 0.0              | 940       | 1997             | 0.0              |
| 425       | 37987            | 5.9              | 555       | 110017           | 14.8             | 685       | 21191            | 0.0              | 815       | 2386             | 0.0              | 945       | 2623             | 0.0              |
| 430       | 67605            | 14.3             | 560       | 114586           | 11.3             | 690       | 18544            | 0.0              | 820       | 2712             | 0.0              | 950       | 2969             | 0.0              |
| 435       | 102160           | 27.3             | 565       | 118987           | 8.4              | 695       | 16058            | 0.0              | 825       | 2473             | 0.0              | 955       | 2277             | 0.0              |
| 440       | 135103           | 45.1             | 570       | 122326           | 6.0              | 700       | 14133            | 0.0              | 830       | 1969             | 0.0              | 960       | 4267             | 0.0              |
| 445       | 140126           | 55.3             | 575       | 125968           | 4.2              | 705       | 12309            | 0.0              | 835       | 1917             | 0.0              | 965       | 2034             | 0.0              |
| 450       | 102339           | 47.2             | 580       | 127613           | 2.9              | 710       | 11142            | 0.0              | 840       | 2248             | 0.0              | 970       | 3586             | 0.0              |
| 455       | 58751            | 30.8             | 585       | 129466           | 1.9              | 715       | 10143            | 0.0              | 845       | 2266             | 0.0              | 975       | 2505             | 0.0              |
| 460       | 36892            | 21.7             | 590       | 128813           | 1.3              | 720       | 9072             | 0.0              | 850       | 2558             | 0.0              | 980       | 2666             | 0.0              |
| 465       | 24637            | 16.1             | 595       | 126387           | 0.8              | 725       | 8130             | 0.0              | 855       | 2767             | 0.0              | 985       | 2934             | 0.0              |
| 470       | 16738            | 12.0             | 600       | 123477           | 0.5              | 730       | 7149             | 0.0              | 860       | 2826             | 0.0              | 990       | 4120             | 0.0              |
| 475       | 13456            | 10.3             | 605       | 118718           | 0.3              | 735       | 6311             | 0.0              | 865       | 2385             | 0.0              | 995       | 3858             | 0.0              |
| 480       | 13081            | 10.5             | 610       | 112091           | 0.2              | 740       | 5711             | 0.0              | 870       | 3194             | 0.0              | 1000      | 3405             | 0.0              |
| 485       | 14734            | 12.1             | 615       | 105039           | 0.1              | 745       | 5111             | 0.0              | 875       | 3189             | 0.0              |           |                  |                  |

REPORT NUMBER: SP1-2101-121-2

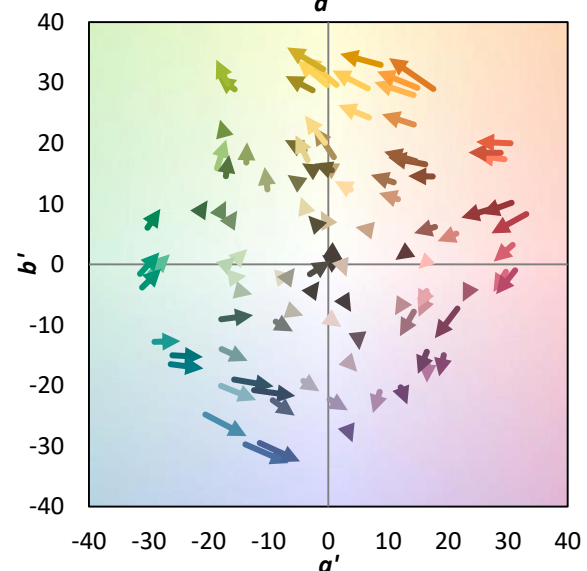
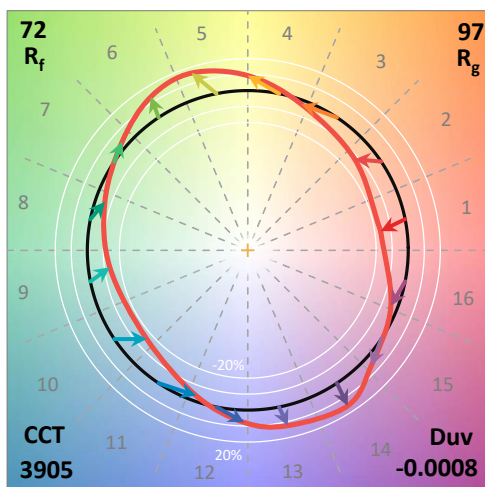
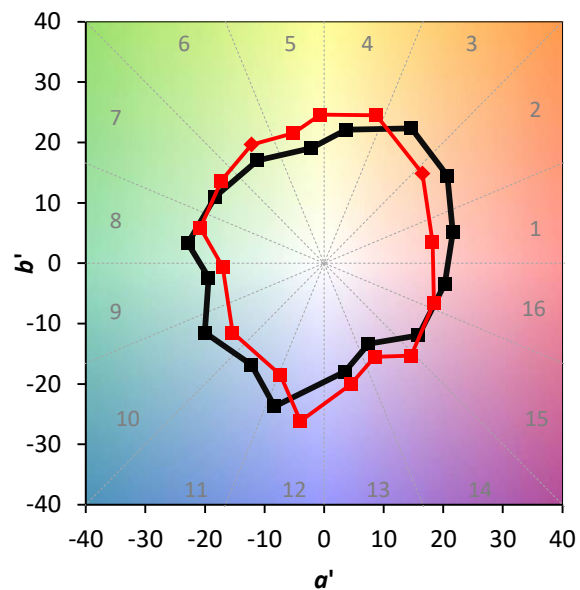
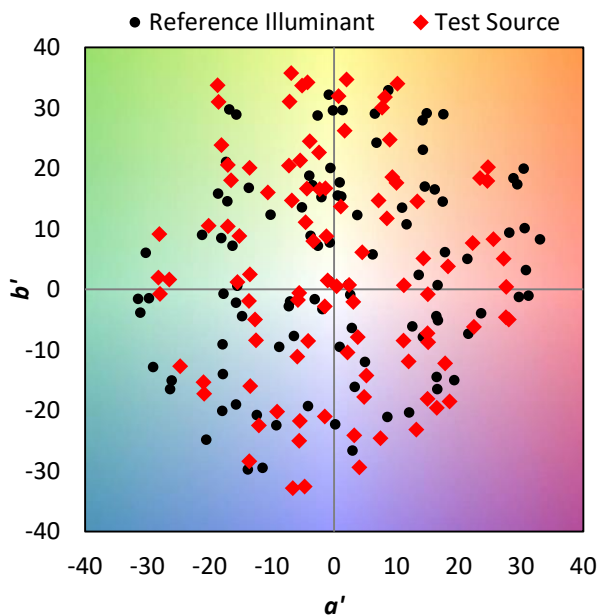
TM-30-18

### Summary

$R_f = 71.7$   
 $R_g = 96.9$   
 CIE  $R_a = 71.2$   
 $R_g = -29.7$



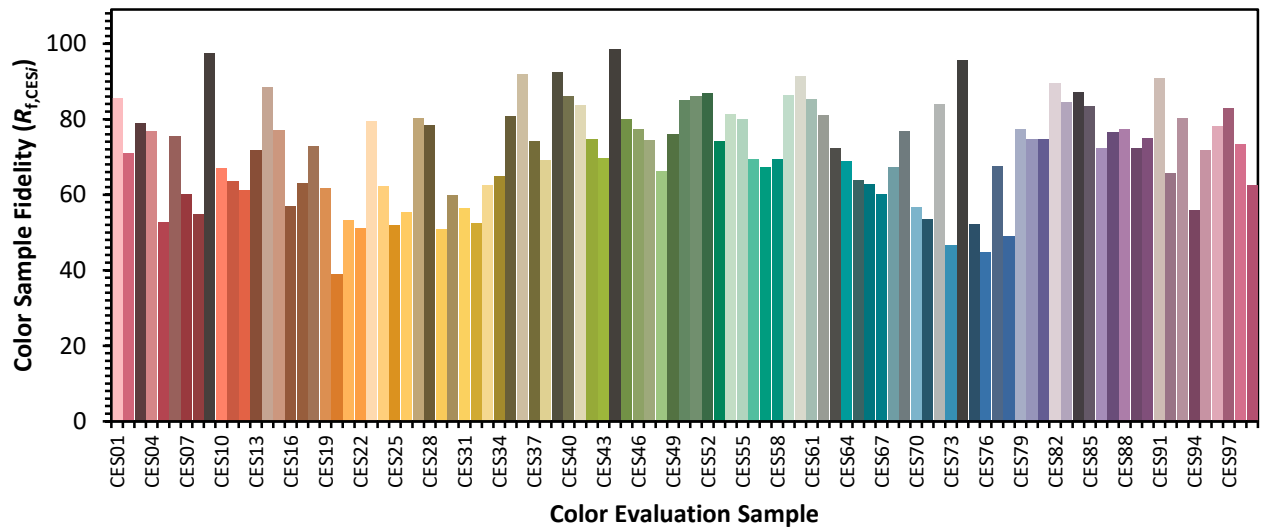
### Color Vector Graphics

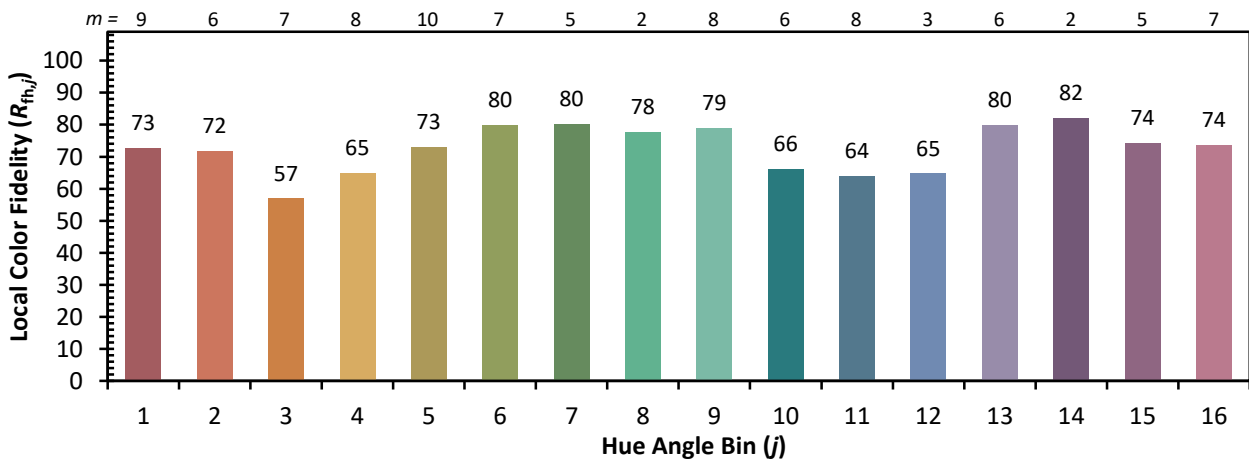
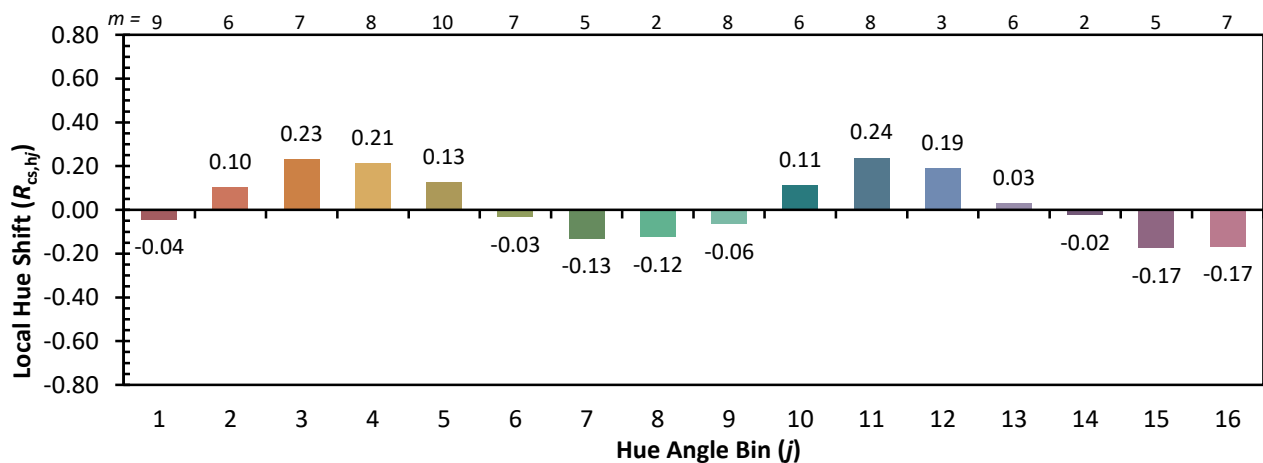
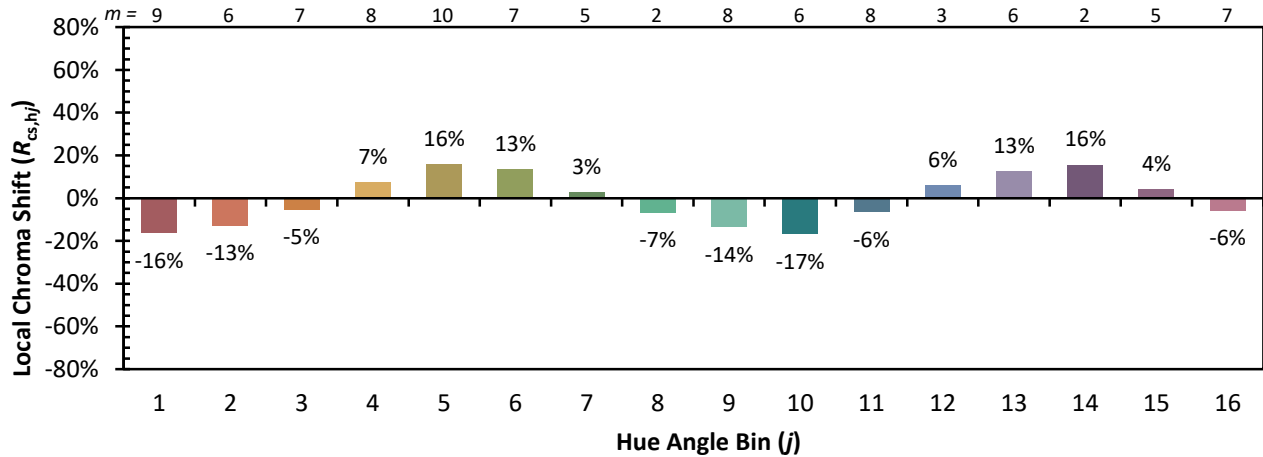




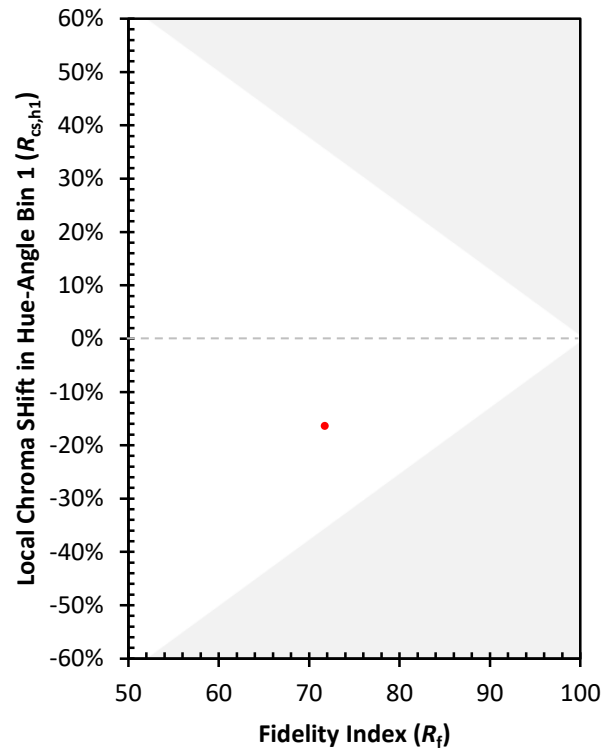
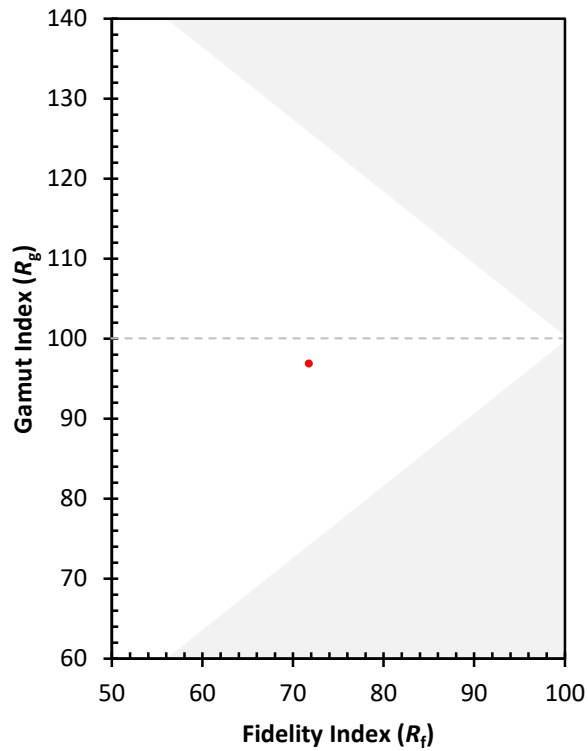
**Individual Sample Fidelity Index ( $R_{f,i}$ )**

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 55 | CES51 = 86 | CES76 = 45 |
| CES02 = 61 | CES27 = 80 | CES52 = 87 | CES77 = 68 |
| CES03 = 30 | CES28 = 79 | CES53 = 74 | CES78 = 49 |
| CES04 = 70 | CES29 = 51 | CES54 = 81 | CES79 = 77 |
| CES05 = 47 | CES30 = 60 | CES55 = 80 | CES80 = 75 |
| CES06 = 50 | CES31 = 56 | CES56 = 69 | CES81 = 75 |
| CES07 = 40 | CES32 = 52 | CES57 = 67 | CES82 = 90 |
| CES08 = 39 | CES33 = 62 | CES58 = 69 | CES83 = 85 |
| CES09 = 29 | CES34 = 65 | CES59 = 86 | CES84 = 87 |
| CES10 = 74 | CES35 = 81 | CES60 = 91 | CES85 = 83 |
| CES11 = 57 | CES36 = 92 | CES61 = 85 | CES86 = 72 |
| CES12 = 63 | CES37 = 74 | CES62 = 81 | CES87 = 77 |
| CES13 = 42 | CES38 = 69 | CES63 = 72 | CES88 = 77 |
| CES14 = 74 | CES39 = 92 | CES64 = 69 | CES89 = 72 |
| CES15 = 71 | CES40 = 86 | CES65 = 64 | CES90 = 75 |
| CES16 = 46 | CES41 = 84 | CES66 = 63 | CES91 = 91 |
| CES17 = 49 | CES42 = 75 | CES67 = 60 | CES92 = 66 |
| CES18 = 56 | CES43 = 70 | CES68 = 67 | CES93 = 80 |
| CES19 = 72 | CES44 = 98 | CES69 = 77 | CES94 = 56 |
| CES20 = 65 | CES45 = 80 | CES70 = 57 | CES95 = 72 |
| CES21 = 86 | CES46 = 77 | CES71 = 53 | CES96 = 78 |
| CES22 = 78 | CES47 = 74 | CES72 = 84 | CES97 = 83 |
| CES23 = 92 | CES48 = 66 | CES73 = 47 | CES98 = 73 |
| CES24 = 91 | CES49 = 76 | CES74 = 96 | CES99 = 63 |
| CES25 = 72 | CES50 = 85 | CES75 = 52 |            |



**Color Rendition by Hue-Angle Bin**


**Measure Comparisons**



(END OF REPORT)