

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: P437866

Luminaire Tested: **ISS-SA1F-740-U-T2-HSS**

Issue Date: 12/9/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P437866  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-2011-074-7)  
Test Lab: INNOVATION CENTER  
Issue Date: 12/9/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: ISS-SA1F-740-U-T2-HSS  
Description: IMPACT ELITE LED QUARTER SPHERE LUMINAIRE  
(1) 70 CRI, 4000K, 1200mA LIGHTSQUARE WITH 16 LEDS AND TYPE II OPTICS  
WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

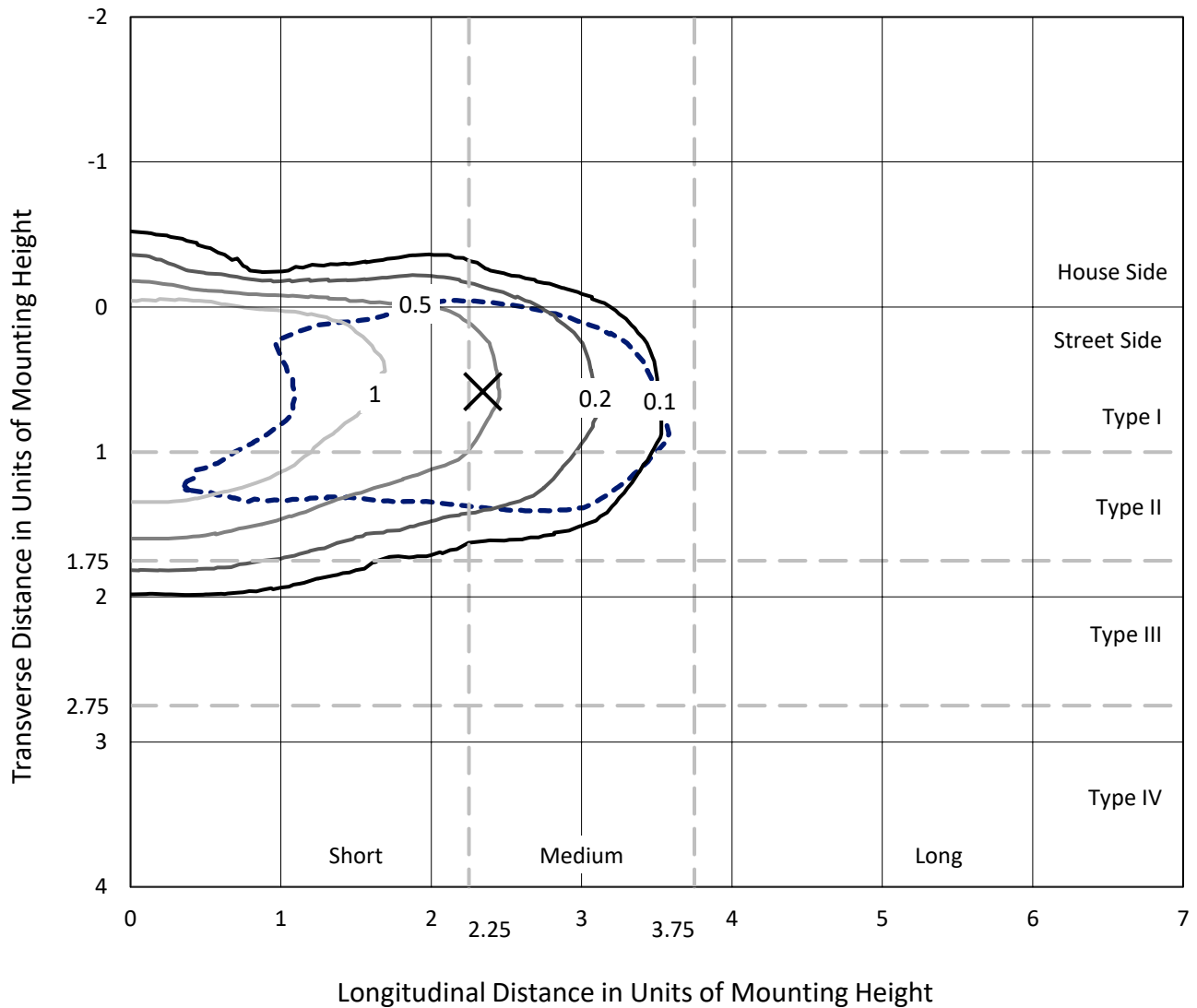
Lumens per Lamp: N/A  
Luminaire Lumens: 6024 lumens  
Efficiency: N/A  
Efficacy: 91.3 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 0.5' x H: 0')  
IES Classification: Type II - Medium  
BUG Rating: B1 - U0 - G2  
  
Input Watts (W): 66  
Input Voltage (V): NR  
Input Current (Ain): NR  
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



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### Iso-Footcandle Lines of Horizontal Illumination

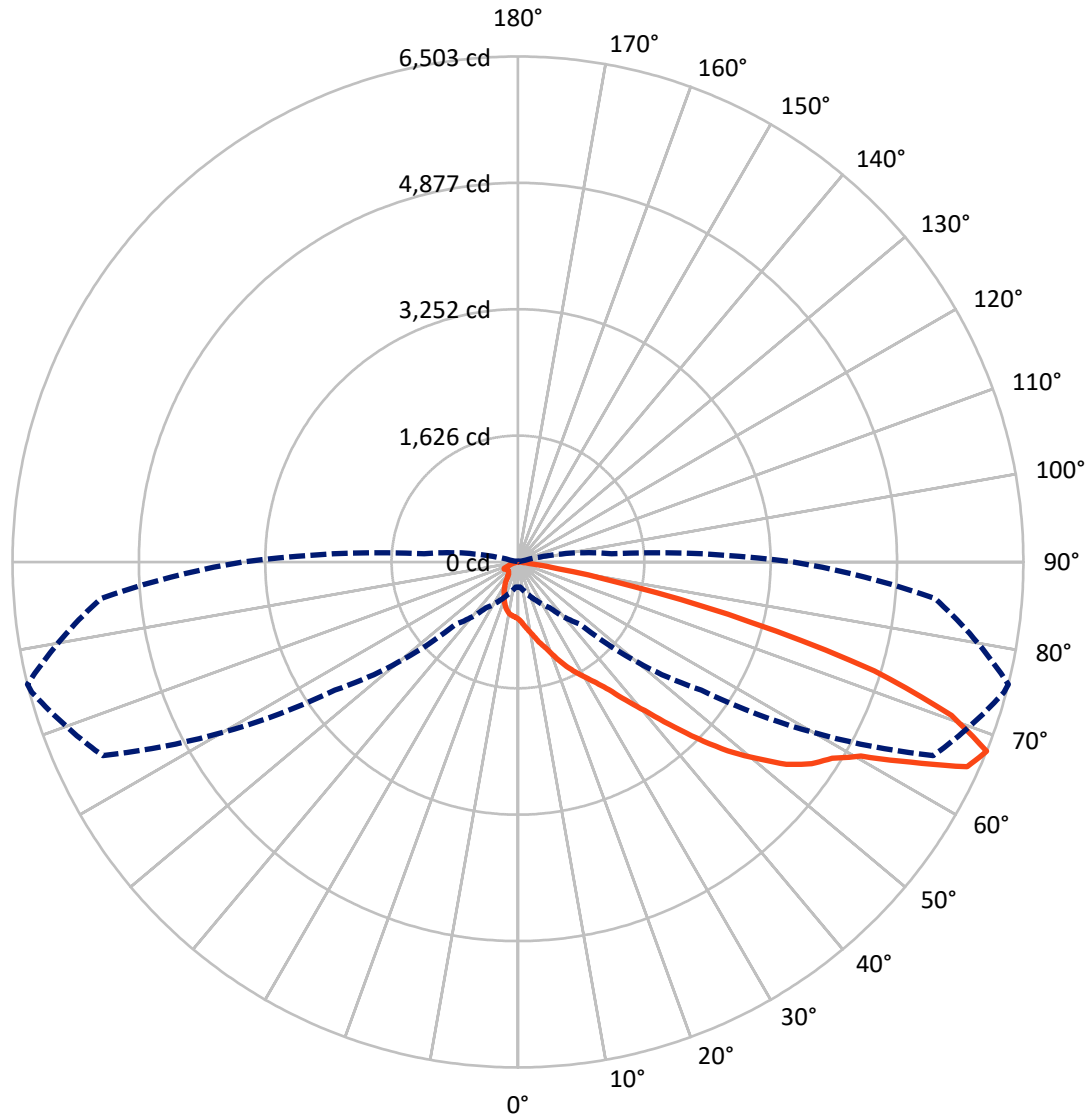
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 1.8 fc  
 Type II - Medium - N/A

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### Luminous Intensity Polar Plot



— Vertical Plane Through 76-Deg Lateral      - - - Horizontal Cone Through 67.5-Deg Vertical

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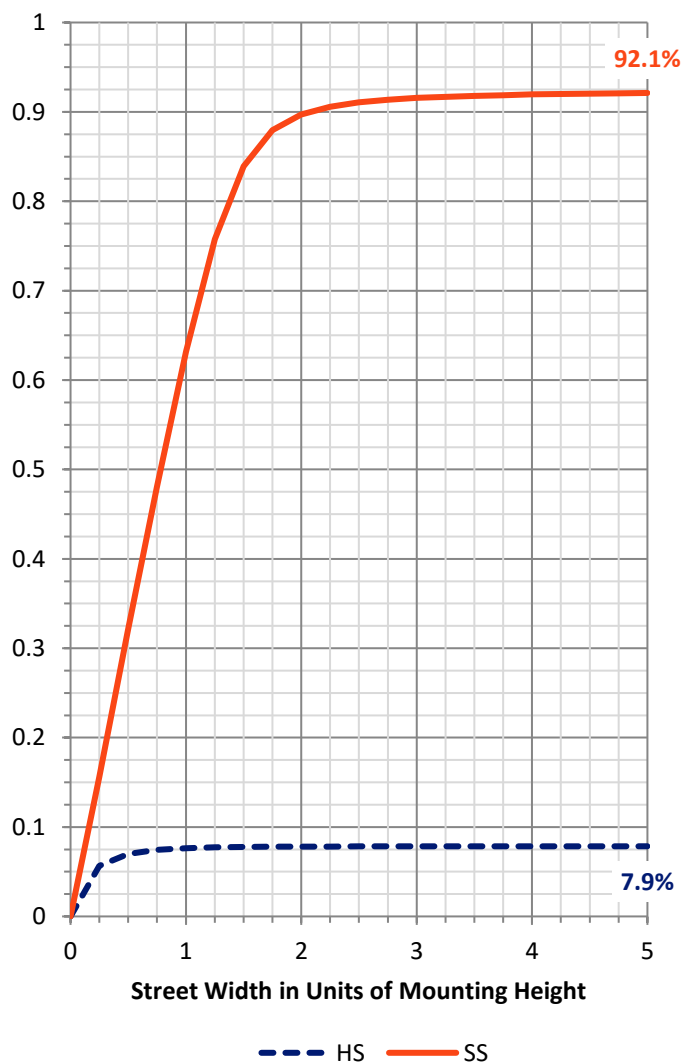
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 476.6    | 0.0    | 476.6  |
|                    | % Fixture | 7.9      | 0.0    | 7.9    |
| <b>Street Side</b> | Lumens    | 5547.4   | 0.0    | 5547.4 |
|                    | % Fixture | 92.1     | 0.0    | 92.1   |
| <b>Total</b>       | Lumens    | 6024.0   | 0.0    | 6024.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 70.3   | 1.2       |
| 10°-20°   | 195.8  | 3.2       |
| 20°-30°   | 337.8  | 5.6       |
| 30°-40°   | 601.8  | 10.0      |
| 40°-50°   | 1071.6 | 17.8      |
| 50°-60°   | 1606.9 | 26.7      |
| 60°-70°   | 1522.0 | 25.3      |
| 70°-80°   | 593.2  | 9.8       |
| 80°-90°   | 24.6   | 0.4       |
| 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°    | 6024.0 | 100.0     |
| 0°-180°   | 6024.0 | 100.0     |

**Coefficient of Utilization**



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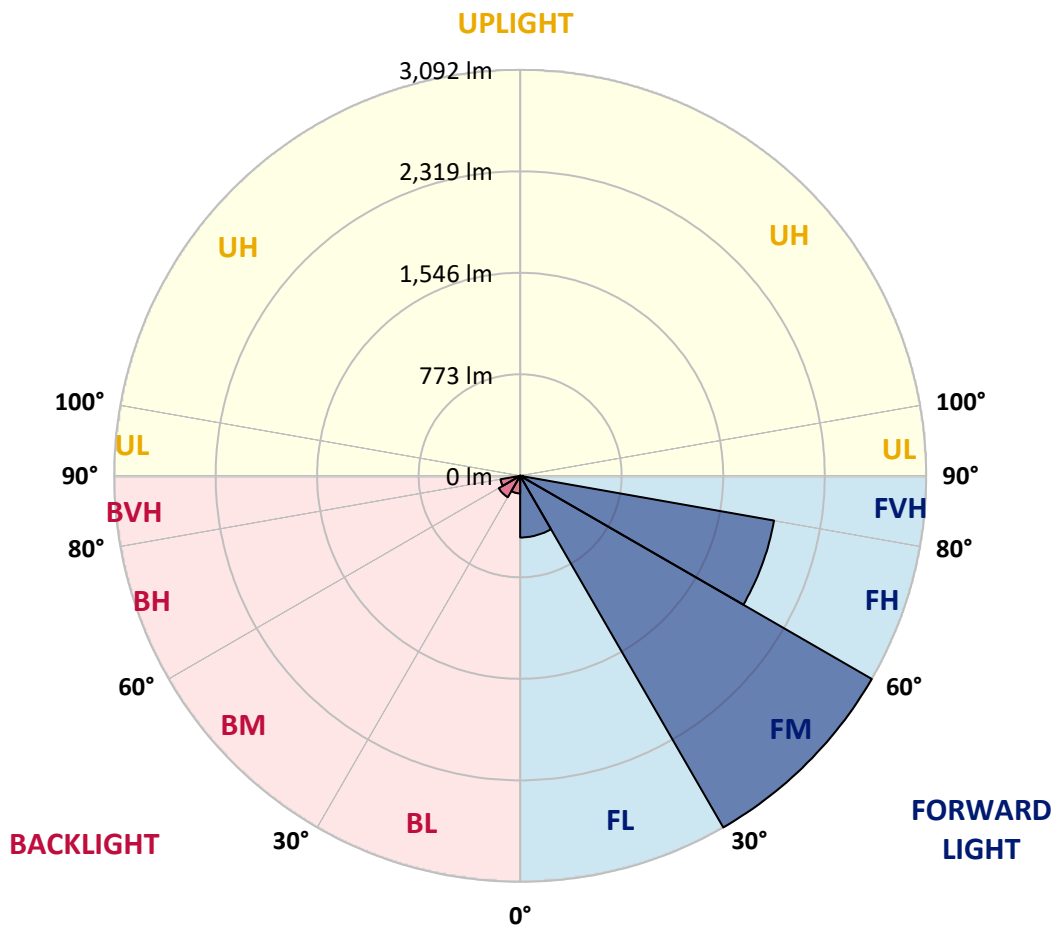
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**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone           | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|----------------|--------|-----------|-------------------------|------|---------|
|                |        |           | B                       | U    | G       |
| FL (0°-30°)    | 469.7  | 7.8       |                         |      |         |
| FM (30°-60°)   | 3092.2 | 51.3      |                         |      |         |
| FH (60°-80°)   | 1963.1 | 32.6      |                         |      | G2/5000 |
| FVH (80°-90°)  | 22.4   | 0.4       |                         |      | G1/100  |
| BL (0°-30°)    | 134.2  | 2.2       | B1/500                  |      |         |
| BM (30°-60°)   | 188.1  | 3.1       | B0/220                  |      |         |
| BH (60°-80°)   | 152.1  | 2.5       | B1/500                  |      | G1/500  |
| BVH (80°-90°)  | 2.2    | 0.0       |                         |      | G0/10   |
| UL (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B1-U0-G2**

Type II Medium





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 75°    | 76°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 732.6  | 732.6  | 732.6  | 732.6  | 732.6  | 732.6  | 732.6  | 732.6  | 732.6  | 732.6  | 732.6  |
| 2.5°  | 867.8  | 859.4  | 853.7  | 850.9  | 845.3  | 828.4  | 814.3  | 788.9  | 766.4  | 766.4  | 752.3  |
| 5°    | 946.7  | 943.9  | 932.6  | 927.0  | 924.2  | 912.9  | 887.5  | 856.6  | 819.9  | 817.1  | 783.3  |
| 7.5°  | 969.3  | 972.1  | 972.1  | 977.7  | 980.5  | 974.9  | 952.3  | 924.2  | 876.3  | 870.6  | 819.9  |
| 10°   | 960.8  | 960.8  | 969.3  | 986.2  | 1008.7 | 1020.0 | 1017.2 | 994.6  | 938.3  | 932.6  | 862.2  |
| 12.5° | 929.8  | 935.4  | 949.5  | 977.7  | 1020.0 | 1053.8 | 1073.5 | 1065.1 | 1008.7 | 1003.1 | 918.5  |
| 15°   | 887.5  | 893.2  | 918.5  | 958.0  | 1014.3 | 1079.1 | 1124.2 | 1149.6 | 1093.2 | 1087.6 | 977.7  |
| 17.5° | 828.4  | 834.0  | 862.2  | 921.4  | 1000.2 | 1090.4 | 1177.8 | 1228.5 | 1180.6 | 1163.7 | 1039.7 |
| 20°   | 805.8  | 811.5  | 834.0  | 881.9  | 974.9  | 1090.4 | 1225.7 | 1321.5 | 1284.8 | 1270.7 | 1118.6 |
| 22.5° | 896.0  | 893.2  | 873.5  | 879.1  | 949.5  | 1082.0 | 1262.3 | 1437.0 | 1408.8 | 1389.1 | 1203.1 |
| 25°   | 1059.4 | 1070.7 | 1042.5 | 977.7  | 966.4  | 1073.5 | 1287.6 | 1527.1 | 1524.3 | 1504.6 | 1290.5 |
| 27.5° | 1248.2 | 1253.8 | 1222.8 | 1155.2 | 1062.2 | 1090.4 | 1315.8 | 1617.3 | 1631.4 | 1614.5 | 1358.1 |
| 30°   | 1403.2 | 1422.9 | 1400.3 | 1338.4 | 1239.7 | 1163.7 | 1335.5 | 1699.0 | 1746.9 | 1724.4 | 1422.9 |
| 32.5° | 1625.8 | 1634.2 | 1611.7 | 1521.5 | 1420.1 | 1304.5 | 1372.2 | 1769.5 | 1873.7 | 1854.0 | 1499.0 |
| 35°   | 1859.6 | 1870.9 | 1828.6 | 1730.0 | 1606.0 | 1476.4 | 1459.5 | 1865.3 | 2056.8 | 2017.4 | 1614.5 |
| 37.5° | 2068.1 | 2079.4 | 2059.7 | 1938.5 | 1817.4 | 1679.3 | 1614.5 | 1994.9 | 2279.4 | 2254.1 | 1758.2 |
| 40°   | 2234.4 | 2262.5 | 2256.9 | 2152.6 | 2039.9 | 1916.0 | 1837.1 | 2147.0 | 2535.8 | 2513.3 | 1941.3 |
| 42.5° | 2403.4 | 2423.1 | 2411.9 | 2335.8 | 2256.9 | 2180.8 | 2082.2 | 2358.3 | 2865.5 | 2854.2 | 2169.6 |
| 45°   | 2614.7 | 2645.7 | 2631.6 | 2569.7 | 2473.9 | 2456.9 | 2364.0 | 2611.9 | 3257.1 | 3240.2 | 2445.7 |
| 47.5° | 2927.5 | 2955.7 | 2933.1 | 2848.6 | 2738.7 | 2707.7 | 2628.8 | 2899.3 | 3640.3 | 3631.9 | 2719.0 |
| 50°   | 3096.5 | 3124.7 | 3183.9 | 3198.0 | 3124.7 | 2958.5 | 2865.5 | 3172.6 | 3984.1 | 3970.0 | 2981.0 |
| 52.5° | 3037.4 | 3062.7 | 3206.4 | 3341.7 | 3502.3 | 3361.4 | 3152.9 | 3468.5 | 4299.7 | 4325.0 | 3237.4 |
| 55°   | 2783.8 | 2817.6 | 3023.3 | 3240.2 | 3629.1 | 3817.8 | 3578.4 | 3803.8 | 4547.6 | 4584.2 | 3406.5 |
| 57.5° | 2271.0 | 2310.4 | 2575.3 | 2910.6 | 3434.7 | 3933.4 | 4105.2 | 4265.8 | 4716.7 | 4764.6 | 3623.4 |
| 60°   | 1360.9 | 1422.9 | 1696.2 | 2141.4 | 2868.3 | 3660.1 | 4480.0 | 4930.8 | 5046.3 | 5068.9 | 4085.5 |
| 62.5° | 755.1  | 741.0  | 960.8  | 1327.1 | 1978.0 | 2972.6 | 4423.6 | 5739.4 | 5669.0 | 5669.0 | 4874.4 |
| 65°   | 453.6  | 467.7  | 580.4  | 788.9  | 1149.6 | 1961.0 | 3944.6 | 6238.2 | 6331.1 | 6350.9 | 5514.0 |
| 67.5° | 321.2  | 324.0  | 405.7  | 541.0  | 718.5  | 1129.9 | 2876.8 | 5894.4 | 6474.8 | 6503.0 | 5387.2 |
| 70°   | 208.5  | 211.3  | 290.2  | 386.0  | 512.8  | 622.7  | 1758.2 | 4857.5 | 5931.0 | 5917.0 | 4764.6 |
| 72.5° | 126.8  | 132.4  | 183.1  | 284.6  | 394.5  | 352.2  | 946.7  | 3510.7 | 4699.8 | 4795.6 | 3739.0 |
| 75°   | 78.9   | 84.5   | 109.9  | 197.2  | 276.1  | 239.5  | 417.0  | 2344.2 | 3031.7 | 3105.0 | 2414.7 |
| 77.5° | 45.1   | 50.7   | 70.4   | 112.7  | 197.2  | 166.2  | 197.2  | 1231.3 | 1468.0 | 1515.9 | 969.3  |
| 80°   | 16.9   | 19.7   | 36.6   | 56.4   | 121.2  | 101.4  | 90.2   | 417.0  | 467.7  | 524.1  | 295.8  |
| 82.5° | 2.8    | 5.6    | 16.9   | 33.8   | 47.9   | 47.9   | 39.4   | 126.8  | 129.6  | 138.1  | 78.9   |
| 85°   | 0.0    | 0.0    | 5.6    | 8.5    | 8.5    | 8.5    | 14.1   | 25.4   | 39.4   | 39.4   | 22.5   |
| 87.5° | 0.0    | 0.0    | 0.0    | 0.0    | 2.8    | 2.8    | 2.8    | 5.6    | 5.6    | 5.6    | 5.6    |
| 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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 CATALOG NUMBER: ISS-SA1F-740-U-T2-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 732.6  | 732.6  | 732.6 | 732.6 | 732.6 | 732.6 | 732.6 | 732.6 | 732.6 | 732.6 | 732.6 |
| 2.5°  | 738.2  | 732.6  | 710.0 | 687.5 | 670.6 | 656.5 | 634.0 | 634.0 | 625.5 | 617.1 | 619.9 |
| 5°    | 757.9  | 741.0  | 698.8 | 656.5 | 617.1 | 580.4 | 549.4 | 535.3 | 515.6 | 510.0 | 507.2 |
| 7.5°  | 783.3  | 752.3  | 681.9 | 614.2 | 549.4 | 501.5 | 462.1 | 436.7 | 414.2 | 408.6 | 411.4 |
| 10°   | 814.3  | 769.2  | 662.1 | 557.9 | 479.0 | 419.8 | 374.7 | 355.0 | 329.7 | 321.2 | 312.8 |
| 12.5° | 859.4  | 788.9  | 631.1 | 495.9 | 408.6 | 349.4 | 284.6 | 236.7 | 219.8 | 214.1 | 214.1 |
| 15°   | 896.0  | 800.2  | 591.7 | 436.7 | 349.4 | 256.4 | 202.9 | 194.4 | 191.6 | 191.6 | 191.6 |
| 17.5° | 938.3  | 808.7  | 543.8 | 380.4 | 270.5 | 188.8 | 177.5 | 177.5 | 174.7 | 174.7 | 171.9 |
| 20°   | 983.3  | 811.5  | 493.1 | 329.7 | 191.6 | 169.1 | 160.6 | 157.8 | 152.2 | 149.3 | 149.3 |
| 22.5° | 1034.1 | 808.7  | 436.7 | 270.5 | 169.1 | 155.0 | 140.9 | 135.2 | 129.6 | 124.0 | 124.0 |
| 25°   | 1076.3 | 803.0  | 386.0 | 194.4 | 155.0 | 135.2 | 121.2 | 112.7 | 107.1 | 104.3 | 101.4 |
| 27.5° | 1113.0 | 772.0  | 335.3 | 166.2 | 140.9 | 121.2 | 104.3 | 95.8  | 90.2  | 87.3  | 87.3  |
| 30°   | 1115.8 | 721.3  | 293.0 | 155.0 | 129.6 | 107.1 | 90.2  | 84.5  | 81.7  | 78.9  | 78.9  |
| 32.5° | 1132.7 | 670.6  | 247.9 | 146.5 | 115.5 | 95.8  | 81.7  | 76.1  | 70.4  | 70.4  | 70.4  |
| 35°   | 1166.5 | 625.5  | 191.6 | 132.4 | 104.3 | 84.5  | 73.3  | 67.6  | 64.8  | 62.0  | 62.0  |
| 37.5° | 1220.0 | 594.5  | 157.8 | 121.2 | 95.8  | 76.1  | 67.6  | 62.0  | 59.2  | 56.4  | 56.4  |
| 40°   | 1290.5 | 577.6  | 143.7 | 109.9 | 84.5  | 70.4  | 62.0  | 56.4  | 50.7  | 47.9  | 47.9  |
| 42.5° | 1411.6 | 577.6  | 132.4 | 98.6  | 76.1  | 64.8  | 56.4  | 50.7  | 45.1  | 42.3  | 42.3  |
| 45°   | 1552.5 | 600.1  | 124.0 | 87.3  | 67.6  | 59.2  | 50.7  | 42.3  | 36.6  | 33.8  | 33.8  |
| 47.5° | 1707.5 | 642.4  | 115.5 | 78.9  | 62.0  | 53.5  | 45.1  | 33.8  | 28.2  | 25.4  | 25.4  |
| 50°   | 1887.8 | 704.4  | 109.9 | 70.4  | 56.4  | 47.9  | 36.6  | 25.4  | 22.5  | 19.7  | 19.7  |
| 52.5° | 2039.9 | 766.4  | 101.4 | 64.8  | 50.7  | 42.3  | 28.2  | 22.5  | 16.9  | 16.9  | 16.9  |
| 55°   | 2183.6 | 834.0  | 95.8  | 59.2  | 47.9  | 33.8  | 22.5  | 16.9  | 14.1  | 14.1  | 14.1  |
| 57.5° | 2375.2 | 918.5  | 87.3  | 53.5  | 39.4  | 25.4  | 19.7  | 14.1  | 11.3  | 11.3  | 11.3  |
| 60°   | 2766.9 | 1107.3 | 76.1  | 47.9  | 33.8  | 22.5  | 16.9  | 14.1  | 11.3  | 8.5   | 8.5   |
| 62.5° | 3403.7 | 1414.4 | 64.8  | 42.3  | 25.4  | 19.7  | 14.1  | 11.3  | 8.5   | 5.6   | 5.6   |
| 65°   | 3806.6 | 1490.5 | 53.5  | 33.8  | 19.7  | 14.1  | 11.3  | 8.5   | 5.6   | 2.8   | 2.8   |
| 67.5° | 3547.4 | 1211.6 | 42.3  | 25.4  | 16.9  | 11.3  | 8.5   | 5.6   | 2.8   | 0.0   | 0.0   |
| 70°   | 2995.1 | 915.7  | 31.0  | 16.9  | 14.1  | 8.5   | 5.6   | 2.8   | 0.0   | 0.0   | 0.0   |
| 72.5° | 2366.8 | 695.9  | 28.2  | 14.1  | 11.3  | 5.6   | 5.6   | 2.8   | 0.0   | 0.0   | 0.0   |
| 75°   | 1552.5 | 357.8  | 22.5  | 14.1  | 8.5   | 5.6   | 2.8   | 2.8   | 0.0   | 0.0   | 0.0   |
| 77.5° | 611.4  | 135.2  | 16.9  | 11.3  | 8.5   | 5.6   | 2.8   | 2.8   | 0.0   | 0.0   | 0.0   |
| 80°   | 166.2  | 45.1   | 8.5   | 5.6   | 5.6   | 2.8   | 2.8   | 2.8   | 0.0   | 0.0   | 0.0   |
| 82.5° | 42.3   | 19.7   | 5.6   | 5.6   | 2.8   | 2.8   | 2.8   | 2.8   | 2.8   | 0.0   | 0.0   |
| 85°   | 14.1   | 5.6    | 5.6   | 2.8   | 2.8   | 2.8   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 87.5° | 5.6    | 5.6    | 5.6   | 2.8   | 2.8   | 2.8   | 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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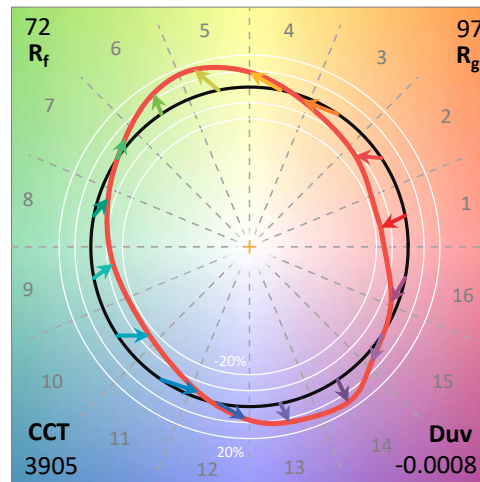
**Test Information**

Test Method: LM-79-08  
 Report Number: SP1-2101-121-2  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1  
 Measurement Geometry: 4π  
 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 | R9:  | -29.7 |
| CIE u':                   | 0.2273  | R1:       | 68.9 | R10: | 46.2  |
| CIE v':                   | 0.5024  | R2:       | 77.0 | R11: | 68.8  |
| Duv:                      | -0.0008 | R3:       | 84.0 | R12: | 45.6  |
| CIE x:                    | 0.3841  | R4:       | 71.6 | R13: | 69.5  |
| CIE y:                    | 0.3774  | R5:       | 68.9 | R14: | 90.7  |
| CIE z:                    | 0.2385  | R6:       | 68.3 |      |       |
| 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**

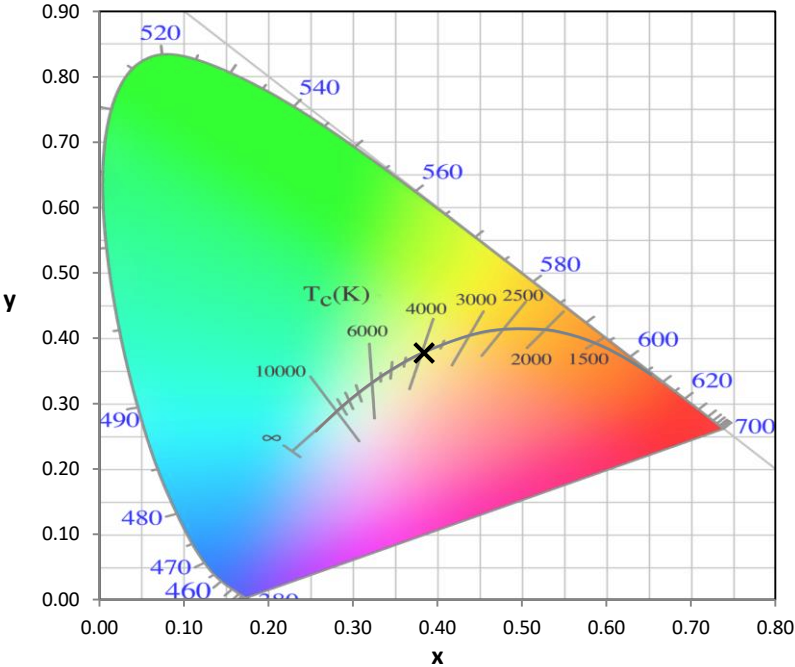
Stabilization Time: 211M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.8/312%  
 Sphere Temperature (°C): 24.1

REPORT NUMBER: SP1-2101-121-2

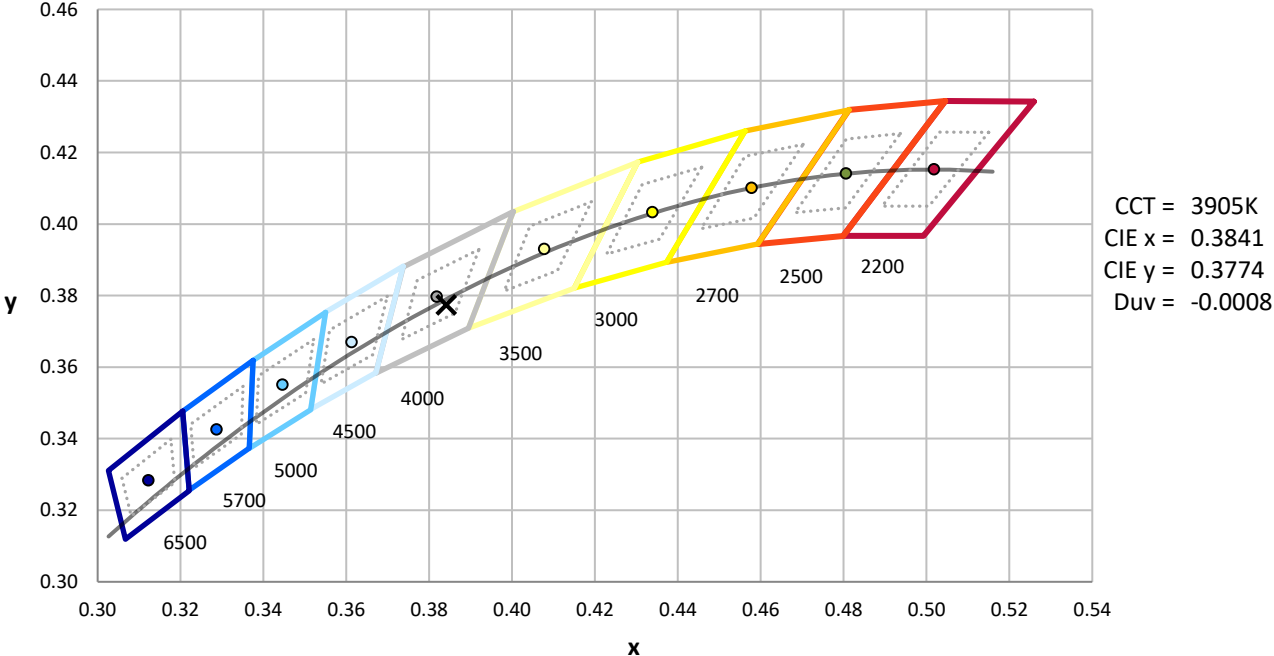
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date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

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CIE 1931 Chromaticity Diagram



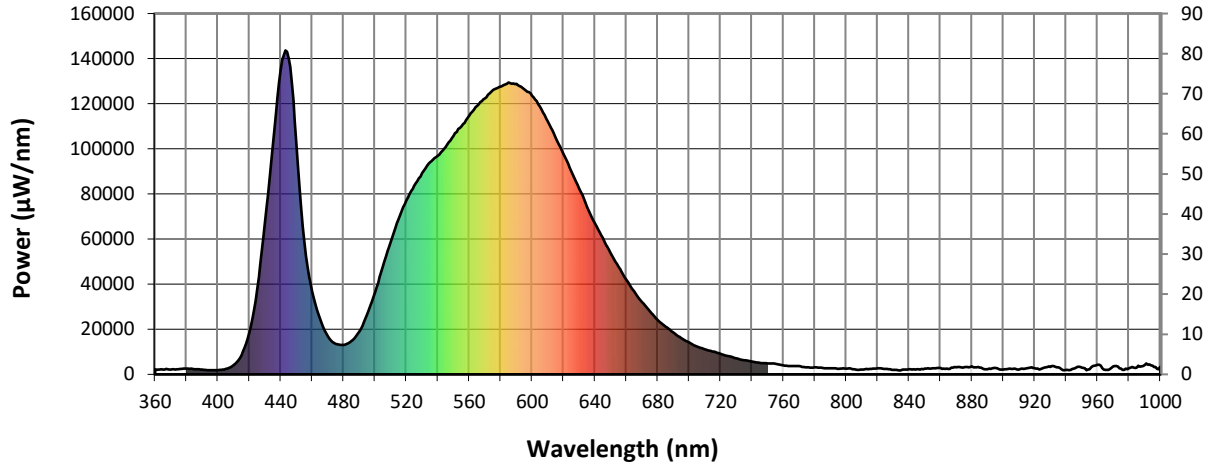
CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies inside the ANSI 4000K 4-step quadrangle

REPORT NUMBER: SP1-2101-121-2

**Photopic Flux vs. Wavelength**

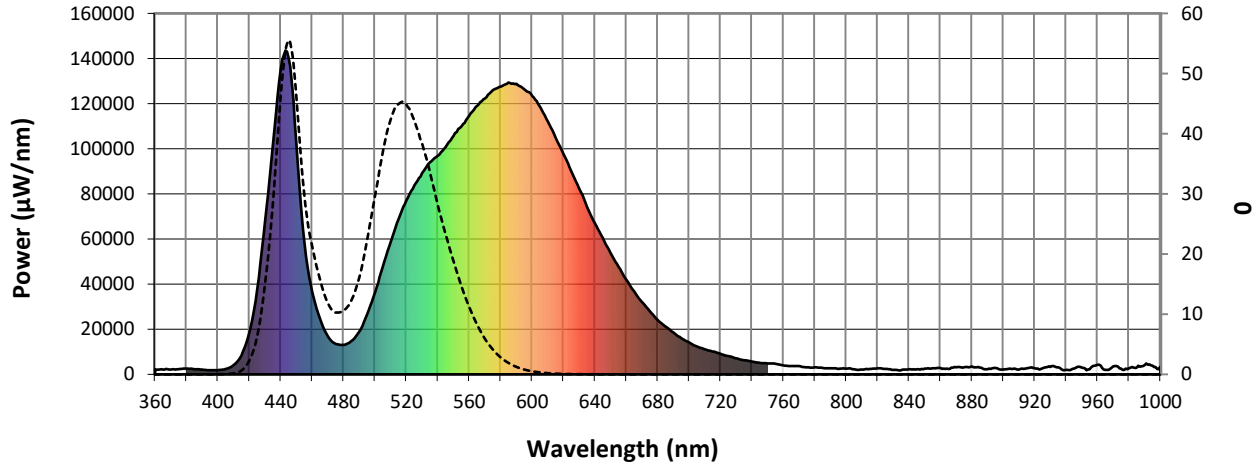


#####

| λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) |
|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|
| 360    | 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           |        |               |               |

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Scotopic Flux vs. Wavelength

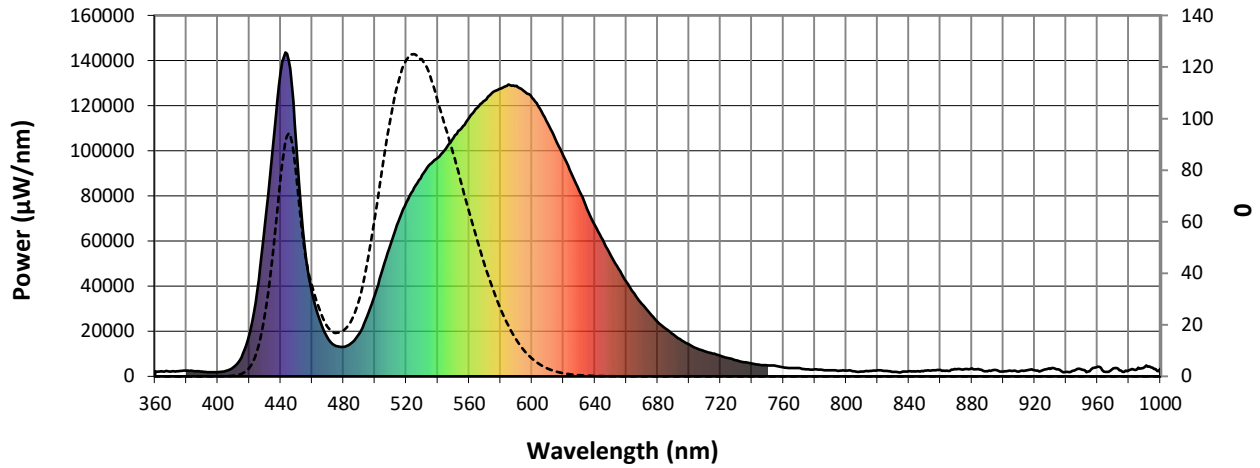


Scotopic Lumens: 10425.8 S/P: 1.47

| λ (nm) | Power (µW/nm) | Lumens (Φ/nm) | λ (nm) | Power (µW/nm) | Lumens (Φ/nm) | λ (nm) | Power (µW/nm) | Lumens (Φ/nm) | λ (nm) | Power (µW/nm) | Lumens (Φ/nm) | λ (nm) | Power (µW/nm) | Lumens (Φ/nm) |
|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|
| 360    | 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**

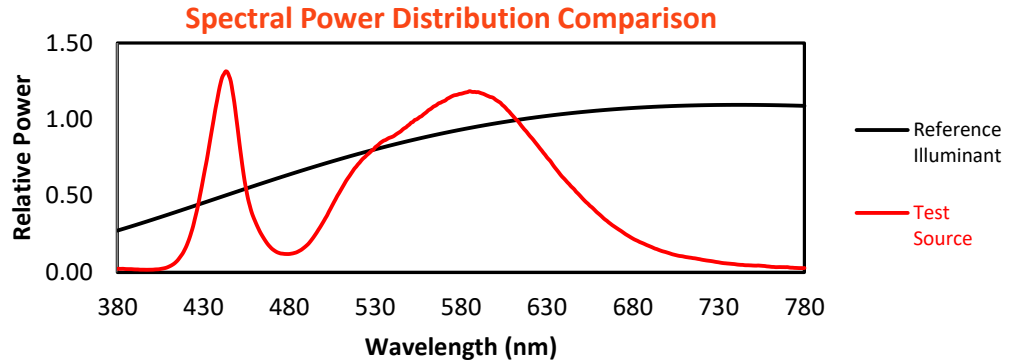


**Melanopic Lumens: 3927.2 M/P: 0.55**

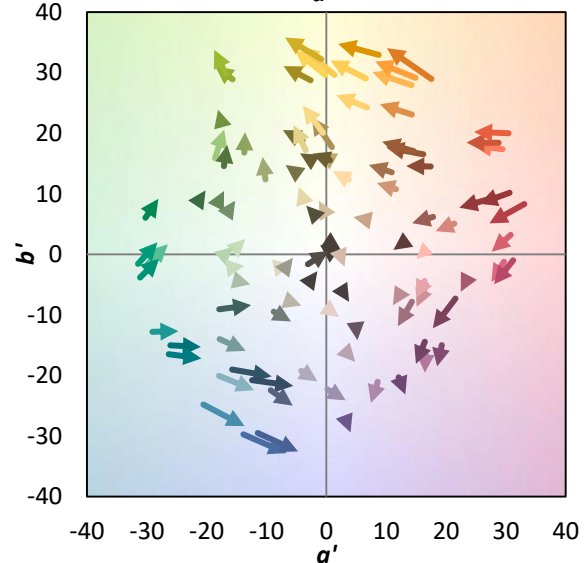
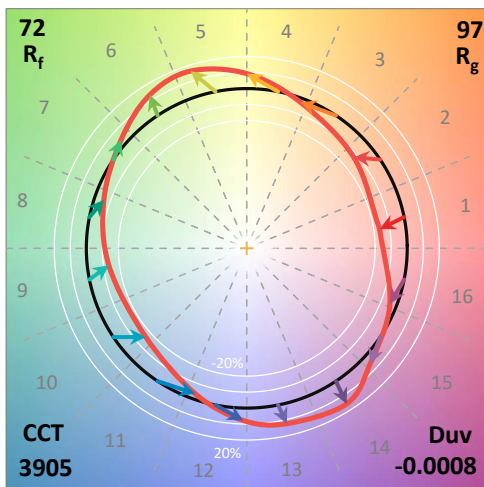
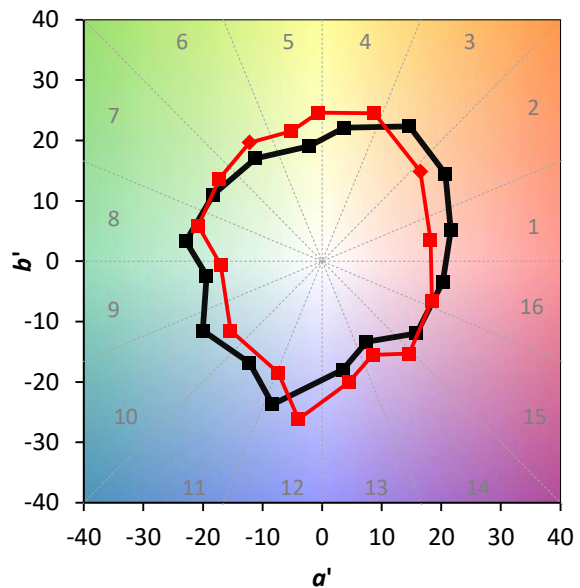
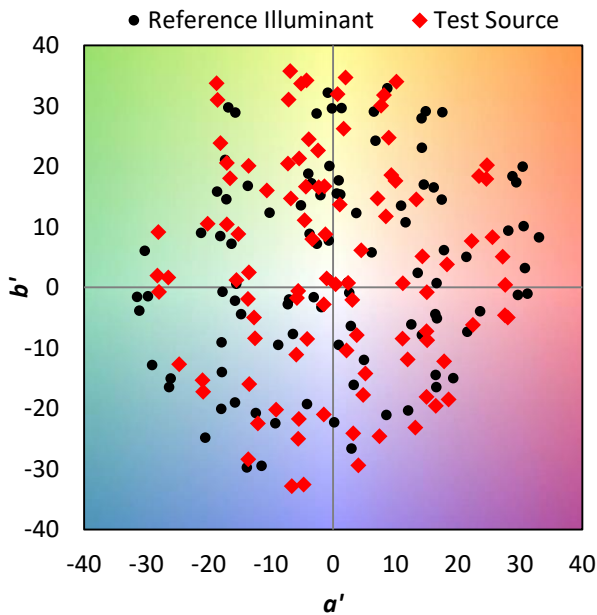
| λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) |
|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|
| 360    | 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           |        |               |               |

**Summary**

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



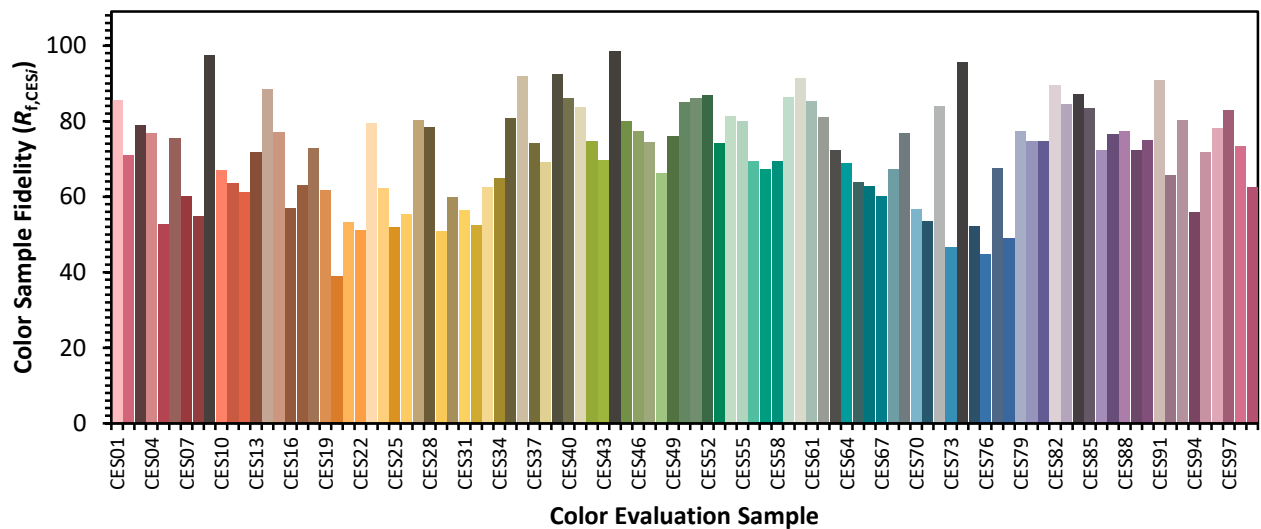
**Color Vector Graphics**



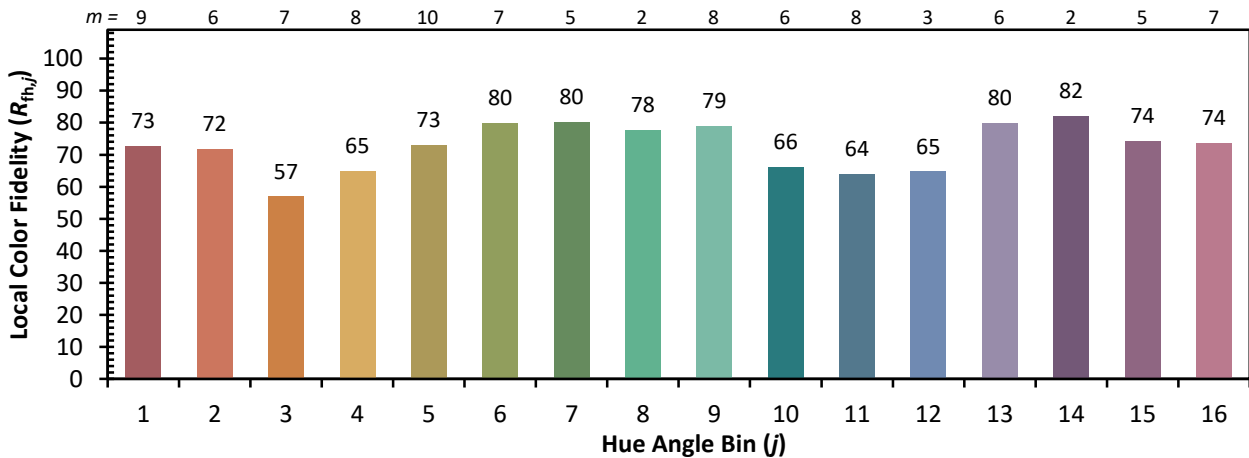
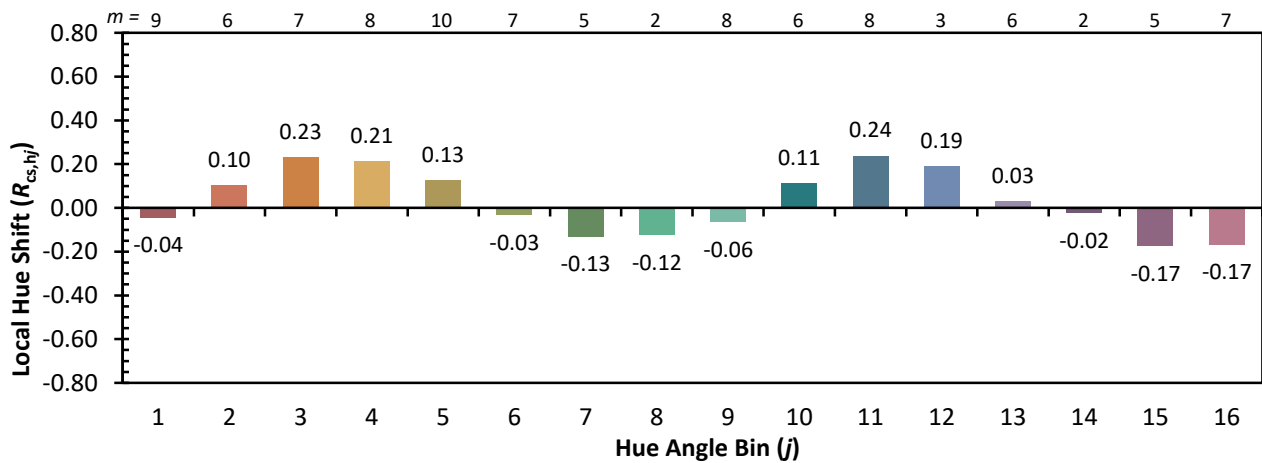
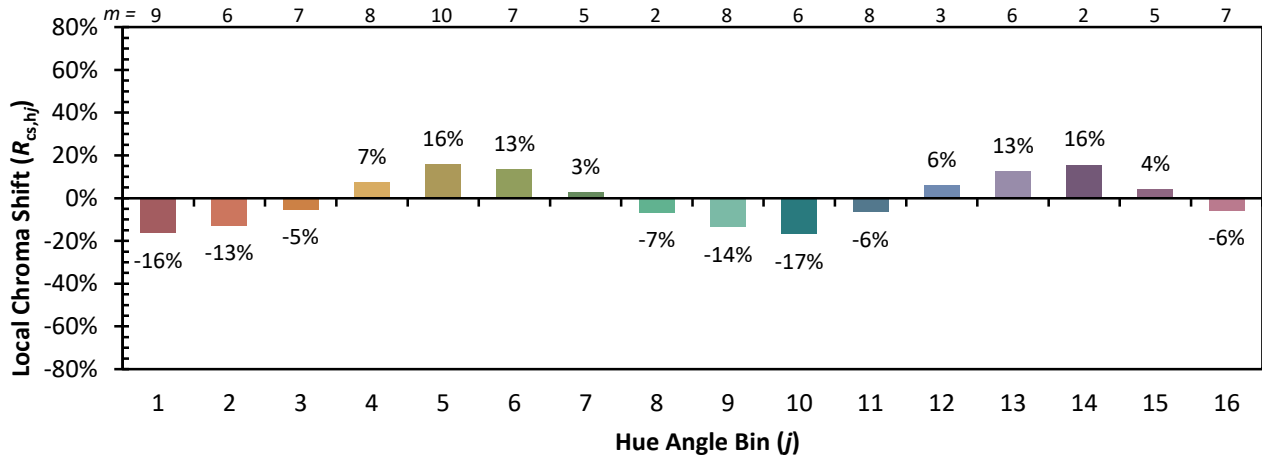


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

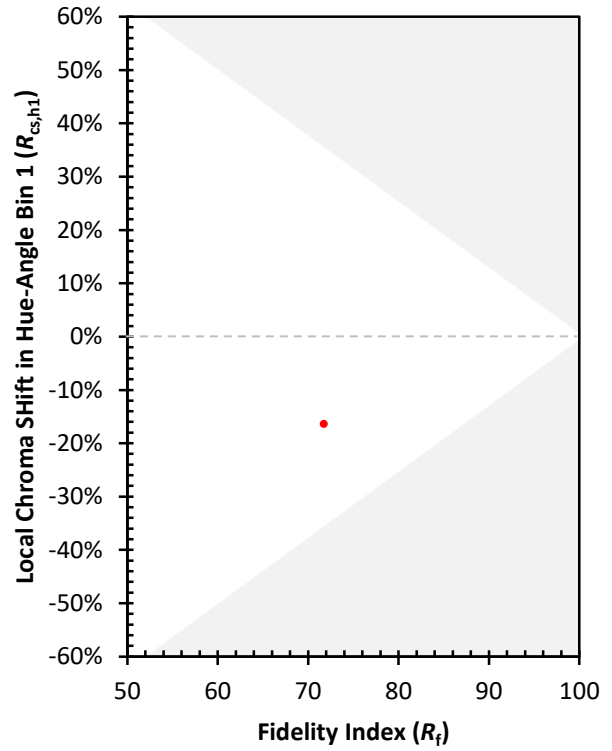
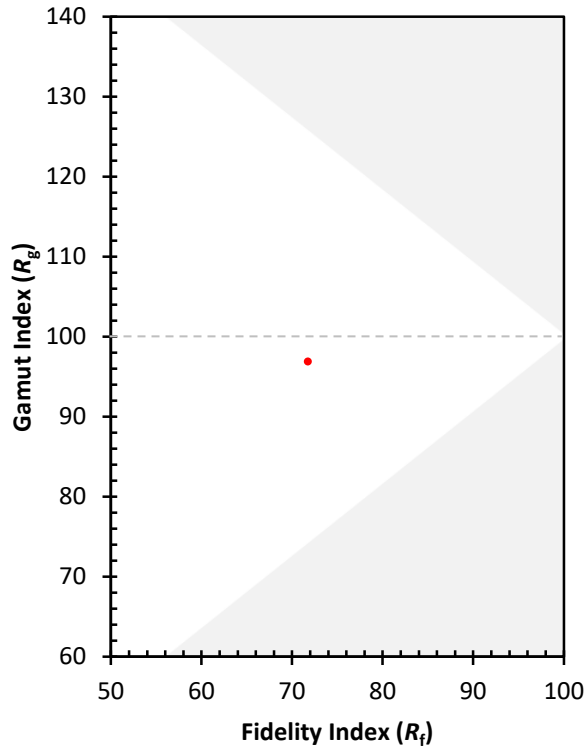
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 55 | CES51 = 86 | CES76 = 45 |
| CES02 = 61 | CES27 = 80 | CES52 = 87 | CES77 = 68 |
| CES03 = 30 | CES28 = 79 | CES53 = 74 | CES78 = 49 |
| CES04 = 70 | CES29 = 51 | CES54 = 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)