

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: P385646

Luminaire Tested: **GWC-SA1B-722-U-T4FT-HSS**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P385646  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-17)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GWC-SA1B-722-U-T4FT-HSS  
Description: GALLEON WALL LUMINAIRE  
(1) 70 CRI, 2200K, 800mA LIGHTSQUARE WITH 16 LEDS AND TYPE IV FORWARD  
THROW OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 3186 lumens  
Efficiency: N/A  
Efficacy: 72.4 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 0.5' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B0 - U0 - G1

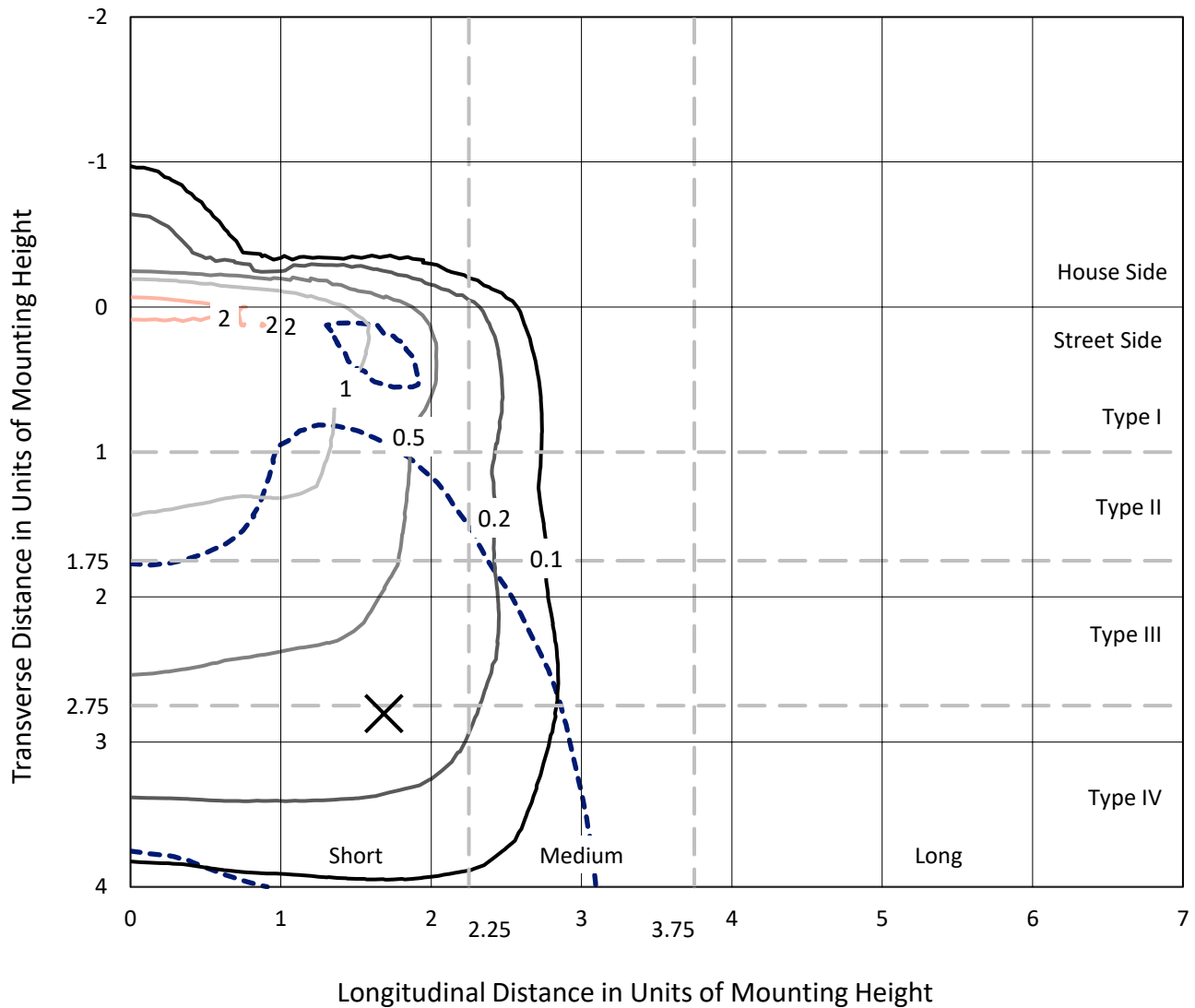
Input Watts (W): 44  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT



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## Iso-Footcandle Lines of Horizontal Illumination

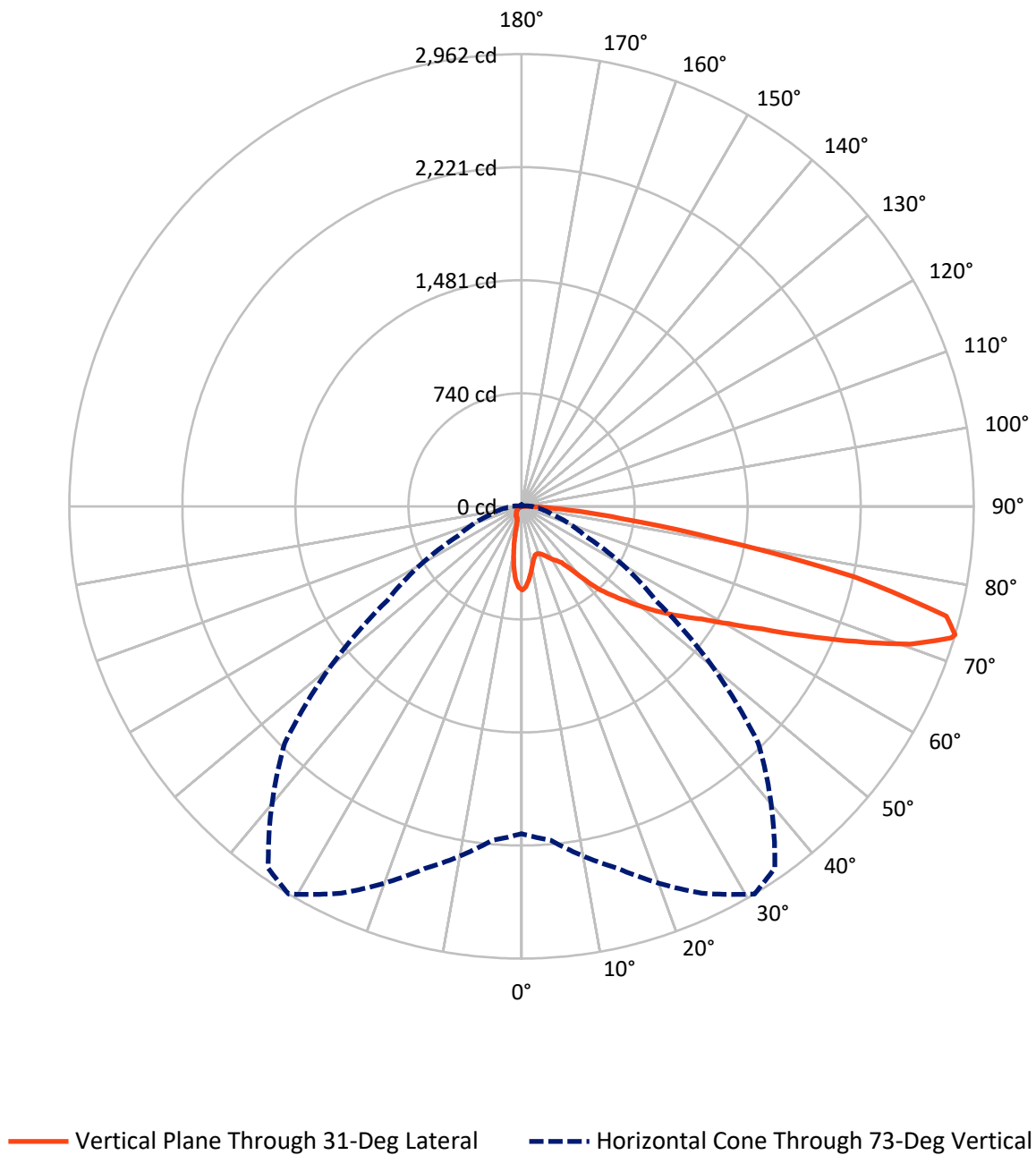
× Max cd  
 --- 1/2 Max cd



Based on 15 foot mounting height. Maximum calculated value = 2.4 fc  
 Type IV - Short - N/A

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## Luminous Intensity Polar Plot



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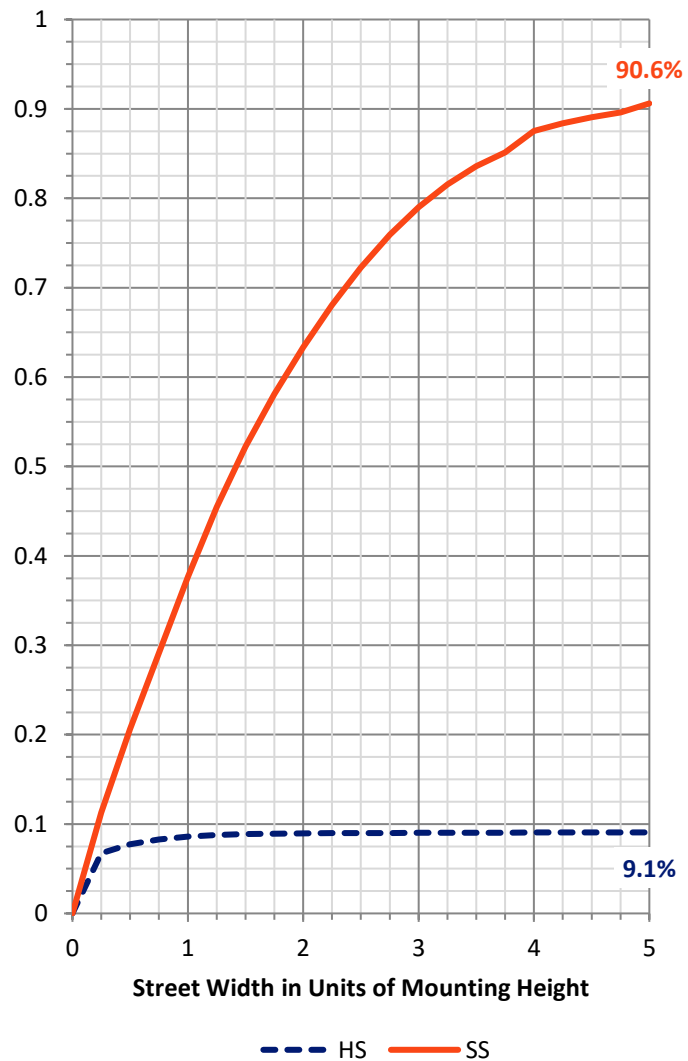
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 290.4    | 0.0    | 290.4  |
|                    | % Fixture | 9.1      | 0.0    | 9.1    |
| <b>Street Side</b> | Lumens    | 2895.6   | 0.0    | 2895.6 |
|                    | % Fixture | 90.9     | 0.0    | 90.9   |
| <b>Total</b>       | Lumens    | 3186.0   | 0.0    | 3186.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 45.4   | 1.4       |
| 10°-20°   | 98.7   | 3.1       |
| 20°-30°   | 147.9  | 4.6       |
| 30°-40°   | 235.2  | 7.4       |
| 40°-50°   | 420.1  | 13.2      |
| 50°-60°   | 651.8  | 20.5      |
| 60°-70°   | 866.5  | 27.2      |
| 70°-80°   | 651.8  | 20.5      |
| 80°-90°   | 68.5   | 2.1       |
| 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°    | 3186.0 | 100.0     |
| 0°-180°   | 3186.0 | 100.0     |

**Coefficient of Utilization**



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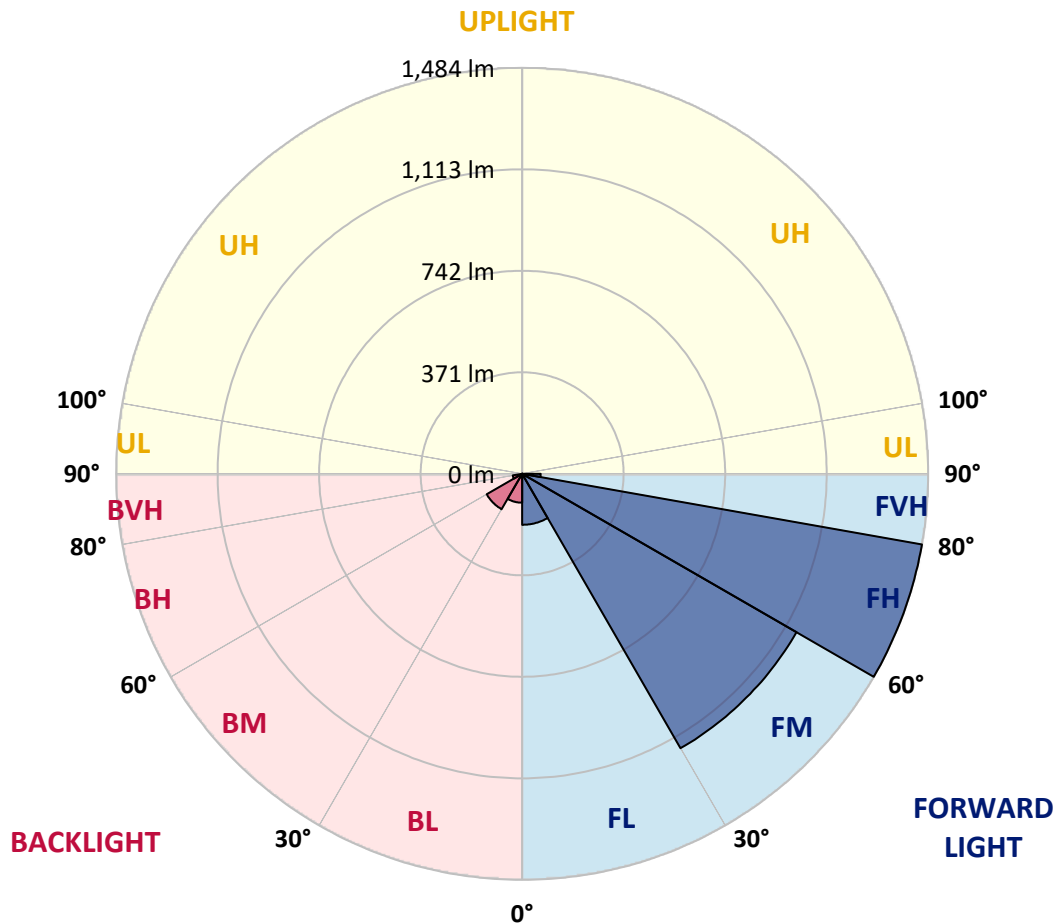
CATALOG NUMBER: GWC-SA1B-722-U-T4FT-HSS

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 186.4  | 5.9       |                         |      |         |
| FM   | (30°-60°)   | 1157.7 | 36.3      |                         |      |         |
| FH   | (60°-80°)   | 1483.6 | 46.6      |                         |      | G1/1800 |
| FVH  | (80°-90°)   | 67.9   | 2.1       |                         |      | G1/100  |
| BL   | (0°-30°)    | 105.6  | 3.3       | B0/110                  |      |         |
| BM   | (30°-60°)   | 149.5  | 4.7       | B0/220                  |      |         |
| BH   | (60°-80°)   | 34.7   | 1.1       | B0/110                  |      | G0/110  |
| BVH  | (80°-90°)   | 0.6    | 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 IV Short



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 31°    | 35°    | 45°    | 55°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 548.2  | 548.2  | 548.2  | 548.2  | 548.2  | 548.2  | 548.2  | 548.2  | 548.2  | 548.2  | 548.2  |
| 2.5°  | 519.5  | 521.7  | 524.0  | 524.5  | 528.4  | 528.5  | 534.1  | 538.3  | 542.5  | 546.6  | 548.0  |
| 5°    | 466.2  | 469.7  | 473.9  | 478.2  | 486.4  | 489.7  | 503.4  | 517.4  | 530.9  | 543.6  | 549.9  |
| 7.5°  | 409.2  | 413.3  | 419.2  | 429.7  | 438.9  | 445.3  | 466.9  | 491.9  | 516.8  | 540.4  | 553.9  |
| 10°   | 357.3  | 361.1  | 367.3  | 378.4  | 392.6  | 401.3  | 430.5  | 465.1  | 501.7  | 537.4  | 560.0  |
| 12.5° | 324.3  | 326.3  | 329.7  | 341.6  | 354.4  | 364.2  | 398.5  | 441.4  | 489.2  | 537.2  | 569.8  |
| 15°   | 318.2  | 318.8  | 316.0  | 321.3  | 331.3  | 340.8  | 375.6  | 422.2  | 479.7  | 539.7  | 582.6  |
| 17.5° | 327.9  | 327.6  | 318.2  | 317.6  | 325.5  | 333.3  | 364.3  | 408.9  | 473.0  | 545.5  | 599.1  |
| 20°   | 342.5  | 341.4  | 325.2  | 322.3  | 330.7  | 338.0  | 363.6  | 403.9  | 470.5  | 555.2  | 619.2  |
| 22.5° | 362.0  | 360.1  | 334.7  | 331.6  | 340.6  | 348.3  | 373.2  | 408.8  | 472.7  | 568.1  | 642.6  |
| 25°   | 386.2  | 383.4  | 351.1  | 347.7  | 356.9  | 364.5  | 390.5  | 422.7  | 479.2  | 583.9  | 672.3  |
| 27.5° | 413.5  | 409.4  | 377.3  | 368.4  | 378.8  | 386.8  | 413.6  | 443.9  | 489.5  | 600.5  | 708.6  |
| 30°   | 439.2  | 433.9  | 404.9  | 390.2  | 403.0  | 411.9  | 438.6  | 469.1  | 506.1  | 626.3  | 758.3  |
| 32.5° | 465.1  | 459.1  | 429.5  | 412.1  | 423.6  | 433.3  | 464.3  | 503.9  | 537.1  | 665.6  | 824.4  |
| 35°   | 524.6  | 518.4  | 482.1  | 453.2  | 453.1  | 458.5  | 500.3  | 551.4  | 578.1  | 720.3  | 903.3  |
| 37.5° | 624.9  | 621.3  | 586.7  | 531.9  | 517.3  | 511.2  | 549.4  | 608.2  | 637.0  | 795.6  | 992.3  |
| 40°   | 734.6  | 731.5  | 692.7  | 643.1  | 620.8  | 605.8  | 619.9  | 687.2  | 720.3  | 887.6  | 1083.2 |
| 42.5° | 858.6  | 843.8  | 774.5  | 759.7  | 739.8  | 728.4  | 715.8  | 784.7  | 822.5  | 987.7  | 1173.3 |
| 45°   | 971.1  | 946.2  | 856.4  | 833.9  | 829.4  | 832.2  | 839.2  | 915.6  | 937.6  | 1106.6 | 1263.1 |
| 47.5° | 1038.2 | 1018.5 | 949.6  | 928.1  | 926.8  | 945.4  | 998.4  | 1063.6 | 1052.2 | 1210.3 | 1342.2 |
| 50°   | 1101.9 | 1084.2 | 1026.9 | 1032.2 | 1038.0 | 1063.3 | 1179.1 | 1215.7 | 1156.8 | 1304.3 | 1414.7 |
| 52.5° | 1153.5 | 1126.4 | 1096.5 | 1126.2 | 1154.6 | 1195.3 | 1365.6 | 1352.3 | 1231.0 | 1379.1 | 1476.7 |
| 55°   | 1183.3 | 1171.0 | 1185.5 | 1215.4 | 1268.7 | 1334.8 | 1541.6 | 1466.0 | 1285.3 | 1447.4 | 1518.0 |
| 57.5° | 1292.4 | 1268.3 | 1297.1 | 1323.0 | 1392.5 | 1485.0 | 1692.3 | 1550.6 | 1324.4 | 1489.7 | 1527.5 |
| 60°   | 1424.5 | 1405.0 | 1422.0 | 1465.0 | 1558.9 | 1667.5 | 1833.3 | 1619.7 | 1344.8 | 1516.8 | 1502.9 |
| 62.5° | 1634.7 | 1608.9 | 1598.3 | 1646.5 | 1770.9 | 1889.6 | 1940.2 | 1667.5 | 1340.3 | 1504.8 | 1418.4 |
| 65°   | 1916.2 | 1889.6 | 1842.2 | 1885.8 | 2044.1 | 2127.8 | 2059.8 | 1677.7 | 1309.1 | 1407.7 | 1204.8 |
| 67.5° | 2204.6 | 2185.3 | 2144.8 | 2218.4 | 2361.2 | 2388.1 | 2186.2 | 1653.0 | 1208.7 | 1141.4 | 851.2  |
| 70°   | 2395.2 | 2386.9 | 2413.2 | 2576.0 | 2703.4 | 2695.6 | 2302.2 | 1520.7 | 942.1  | 701.9  | 421.1  |
| 72.5° | 2257.8 | 2297.4 | 2492.0 | 2787.1 | 2942.7 | 2879.1 | 2242.7 | 1167.7 | 538.5  | 270.0  | 121.8  |
| 73°   | 2144.0 | 2194.7 | 2456.6 | 2795.0 | 2961.5 | 2891.9 | 2192.6 | 1071.8 | 459.0  | 213.1  | 92.3   |
| 75°   | 1491.5 | 1553.7 | 2033.8 | 2603.1 | 2873.3 | 2755.3 | 1827.7 | 656.0  | 212.7  | 94.5   | 37.3   |
| 77.5° | 724.2  | 770.2  | 1119.9 | 1880.8 | 2234.6 | 2152.7 | 1137.8 | 244.5  | 96.0   | 59.1   | 17.1   |
| 80°   | 270.3  | 300.6  | 486.1  | 957.2  | 1291.4 | 1325.2 | 500.5  | 92.5   | 63.9   | 47.6   | 8.7    |
| 82.5° | 70.8   | 78.9   | 179.3  | 426.9  | 661.8  | 692.7  | 157.8  | 46.6   | 46.8   | 39.1   | 5.3    |
| 85°   | 22.6   | 25.9   | 56.0   | 191.6  | 311.8  | 273.8  | 41.2   | 22.6   | 34.0   | 29.2   | 3.0    |
| 87.5° | 2.8    | 3.6    | 17.8   | 45.1   | 68.8   | 38.2   | 6.4    | 6.7    | 14.5   | 16.2   | 1.7    |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

REPORT NUMBER: P385646

CATALOG NUMBER: GWC-SA1B-722-U-T4FT-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°   | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 548.2  | 548.2 | 548.2 | 548.2 | 548.2 | 548.2 | 548.2 | 548.2 | 548.2 | 548.2 | 548.2 |
| 2.5°  | 549.4  | 548.6 | 548.8 | 544.7 | 542.1 | 536.8 | 531.3 | 528.8 | 526.2 | 525.1 | 526.2 |
| 5°    | 552.2  | 550.8 | 546.8 | 534.3 | 521.0 | 503.9 | 487.8 | 475.7 | 460.4 | 456.2 | 460.5 |
| 7.5°  | 556.6  | 553.8 | 541.9 | 516.5 | 487.0 | 454.3 | 417.5 | 390.7 | 368.7 | 354.5 | 359.7 |
| 10°   | 563.0  | 557.7 | 533.8 | 490.6 | 437.9 | 379.9 | 327.7 | 287.0 | 258.2 | 246.3 | 245.9 |
| 12.5° | 573.7  | 563.7 | 523.8 | 457.0 | 377.9 | 300.6 | 232.1 | 188.0 | 164.6 | 149.5 | 149.2 |
| 15°   | 585.6  | 570.9 | 511.2 | 416.6 | 308.1 | 215.3 | 149.5 | 116.0 | 100.9 | 96.0  | 95.4  |
| 17.5° | 600.1  | 579.2 | 494.8 | 366.8 | 234.9 | 142.7 | 97.6  | 87.9  | 87.3  | 86.8  | 86.8  |
| 20°   | 618.3  | 589.0 | 473.8 | 309.9 | 166.7 | 95.3  | 82.9  | 83.6  | 83.9  | 83.3  | 83.4  |
| 22.5° | 639.5  | 599.0 | 448.7 | 248.8 | 112.7 | 79.7  | 79.4  | 80.1  | 80.4  | 80.1  | 80.3  |
| 25°   | 664.2  | 610.5 | 418.1 | 184.7 | 81.4  | 75.6  | 76.4  | 77.5  | 78.3  | 78.3  | 78.3  |
| 27.5° | 694.7  | 624.6 | 381.3 | 128.9 | 70.3  | 71.4  | 73.6  | 75.6  | 76.7  | 77.0  | 77.0  |
| 30°   | 734.5  | 642.0 | 337.2 | 88.4  | 63.9  | 65.8  | 69.8  | 73.7  | 75.8  | 76.1  | 76.2  |
| 32.5° | 784.7  | 661.7 | 286.1 | 65.3  | 58.5  | 59.9  | 64.2  | 70.8  | 74.7  | 75.3  | 75.3  |
| 35°   | 842.2  | 684.4 | 231.0 | 56.9  | 54.6  | 55.0  | 58.5  | 65.9  | 72.8  | 74.5  | 74.7  |
| 37.5° | 905.2  | 706.9 | 175.7 | 53.2  | 51.3  | 51.3  | 53.8  | 60.2  | 68.3  | 73.6  | 74.2  |
| 40°   | 964.0  | 720.4 | 123.2 | 50.2  | 48.3  | 48.3  | 50.5  | 55.2  | 62.8  | 70.8  | 72.5  |
| 42.5° | 1018.2 | 725.1 | 85.7  | 47.4  | 45.5  | 46.0  | 47.9  | 51.6  | 57.4  | 65.3  | 66.9  |
| 45°   | 1074.0 | 724.3 | 62.5  | 44.1  | 42.7  | 44.1  | 45.5  | 48.3  | 52.5  | 57.1  | 57.4  |
| 47.5° | 1116.1 | 717.8 | 49.6  | 41.0  | 40.1  | 41.9  | 43.2  | 45.1  | 47.4  | 47.1  | 47.1  |
| 50°   | 1155.6 | 701.9 | 39.9  | 36.8  | 37.4  | 39.6  | 40.2  | 40.8  | 41.0  | 38.0  | 37.7  |
| 52.5° | 1185.5 | 677.1 | 32.0  | 32.3  | 34.8  | 36.9  | 36.3  | 35.4  | 33.8  | 30.2  | 29.6  |
| 55°   | 1195.5 | 629.4 | 25.1  | 26.7  | 30.9  | 33.7  | 31.3  | 29.3  | 26.3  | 23.4  | 22.8  |
| 57.5° | 1177.4 | 567.8 | 20.4  | 20.7  | 26.0  | 28.4  | 25.7  | 23.4  | 20.1  | 17.6  | 17.1  |
| 60°   | 1139.0 | 499.4 | 16.8  | 15.6  | 20.1  | 22.1  | 20.4  | 18.1  | 15.1  | 13.3  | 13.1  |
| 62.5° | 1063.0 | 426.4 | 13.9  | 12.2  | 15.3  | 17.0  | 15.9  | 14.2  | 11.7  | 10.4  | 10.3  |
| 65°   | 903.0  | 341.1 | 11.2  | 9.8   | 11.8  | 13.3  | 12.3  | 11.1  | 9.2   | 8.3   | 8.1   |
| 67.5° | 630.3  | 230.6 | 9.2   | 8.1   | 9.4   | 10.4  | 9.7   | 9.0   | 7.3   | 7.2   | 7.3   |
| 70°   | 304.0  | 111.2 | 7.6   | 6.5   | 7.3   | 8.1   | 7.8   | 7.3   | 7.0   | 8.1   | 9.4   |
| 72.5° | 87.2   | 37.3  | 6.1   | 5.5   | 5.9   | 6.4   | 6.7   | 6.5   | 7.6   | 9.8   | 11.4  |
| 73°   | 67.0   | 30.1  | 5.8   | 5.1   | 5.6   | 6.2   | 6.5   | 6.4   | 7.8   | 10.0  | 11.4  |
| 75°   | 28.7   | 14.5  | 4.4   | 4.2   | 4.7   | 5.5   | 5.8   | 5.8   | 7.8   | 10.1  | 10.9  |
| 77.5° | 12.9   | 7.8   | 2.8   | 3.3   | 4.1   | 4.4   | 4.8   | 4.8   | 6.2   | 7.8   | 7.8   |
| 80°   | 7.3    | 4.2   | 2.2   | 2.5   | 3.0   | 3.0   | 3.0   | 2.7   | 2.8   | 3.1   | 3.4   |
| 82.5° | 4.7    | 2.8   | 1.7   | 2.0   | 1.9   | 1.6   | 1.2   | 1.2   | 1.1   | 1.2   | 1.6   |
| 85°   | 2.7    | 1.6   | 1.6   | 1.2   | 0.8   | 0.6   | 0.8   | 0.6   | 0.2   | 0.0   | 0.2   |
| 87.5° | 1.6    | 0.9   | 0.5   | 0.0   | 0.0   | 0.0   | 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   |



LM-79-08: Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

STREETWORKS

Report Number: SP1-2101-121-4

Luminaire Tested: IFLD-S-SA2B-722-U-T3R

Test Date: 03/03/2021

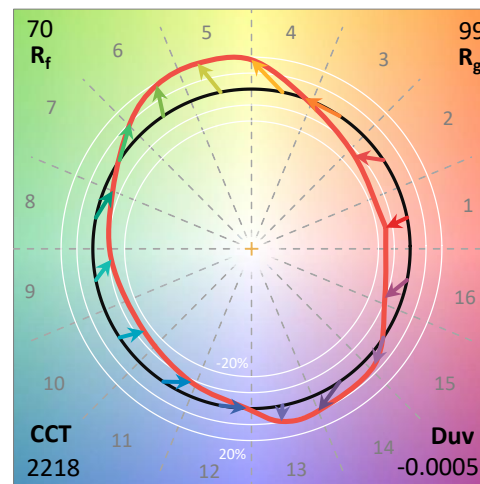
### Test Information

Test Method: LM-79-08  
 Report Number: SP1-2101-121-4  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1  
 Measurement Geometry:  $4\pi$   
 Issue Date: 03/03/2021  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: STREETWORKS  
 Catalog Number: **IFLD-S-SA2B-722-U-T3R**  
 Description: STREETWORKS INF FLOOD

PROGRAMMED @ 800mA.

### Spectral Parameters

|                           |         |           |      |      |       |
|---------------------------|---------|-----------|------|------|-------|
| CCT (K):                  | 2218    | CRI (Ra): | 72.2 |      |       |
| CIE u':                   | 0.2889  | R1:       | 69.1 | R9:  | -16.8 |
| CIE v':                   | 0.5350  | R2:       | 83.2 | R10: | 61.9  |
| Duv:                      | -0.0005 | R3:       | 95.4 | R11: | 60.1  |
| CIE x:                    | 0.5026  | R4:       | 66.4 | R12: | 51.2  |
| CIE y:                    | 0.4136  | R5:       | 66.2 | R13: | 71.3  |
| CIE z:                    | 0.0839  | R6:       | 76.7 | R14: | 97.1  |
| Peak Wavelength (nm):     | 606     | R7:       | 76.7 |      |       |
| Dominant Wavelength (nm): | 587     | R8:       | 43.9 |      |       |
| Purity:                   | 75.3    |           |      |      |       |
| Rf:                       | 70      |           |      |      |       |
| Rg:                       | 99.3    |           |      |      |       |



### Test Conditions

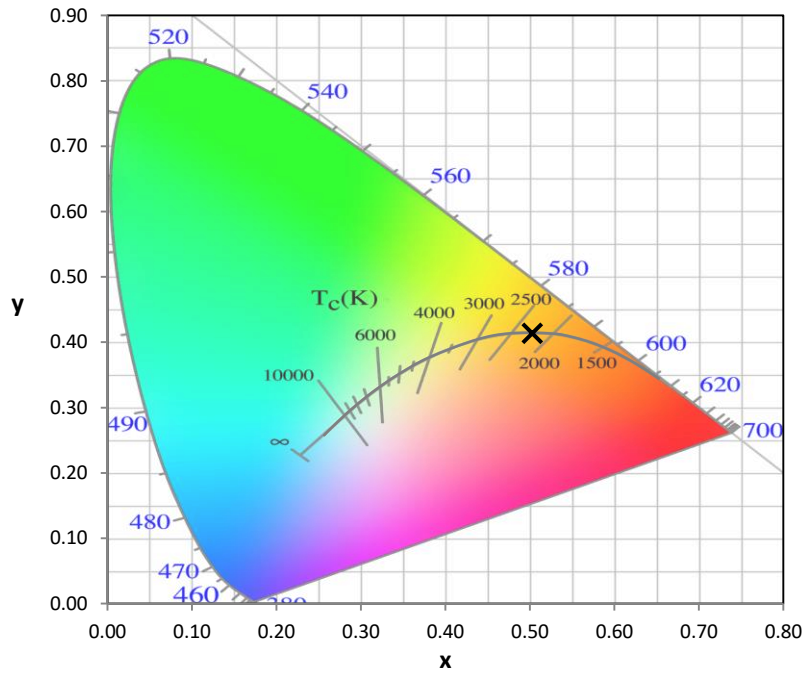
Stabilization Time: 95M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.3/31%  
 Sphere Temperature (°C): 24.8

REPORT NUMBER: SP1-2101-121-4

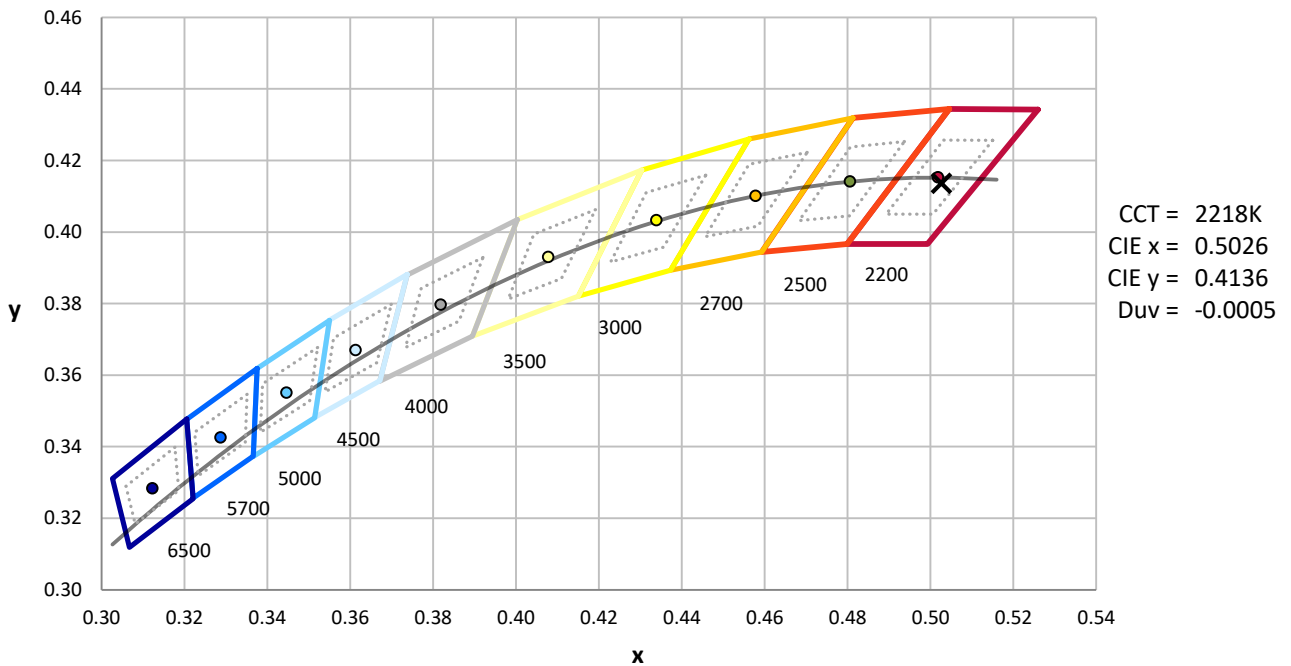
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date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



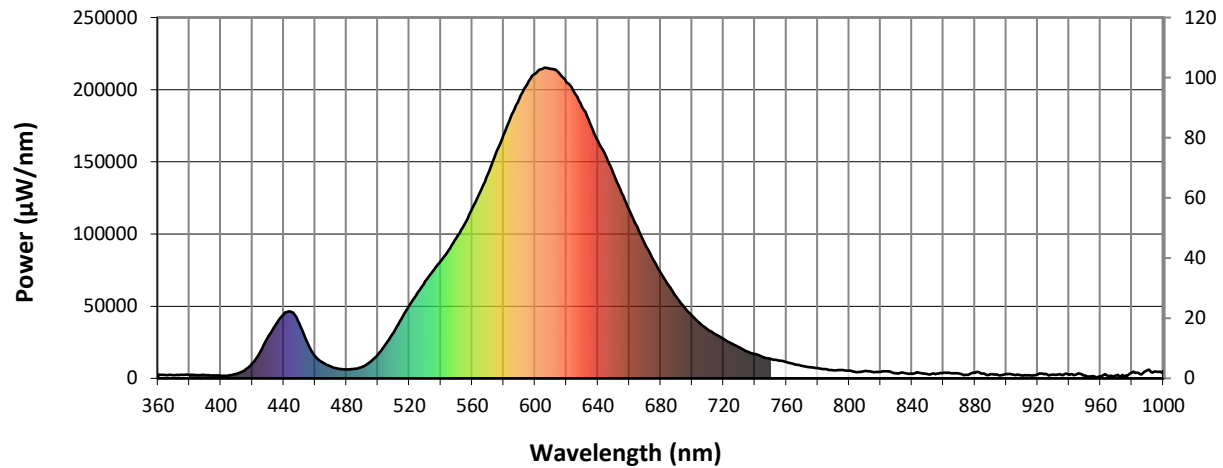
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 2200K 4-step quadrangle

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### Photopic Flux vs. Wavelength

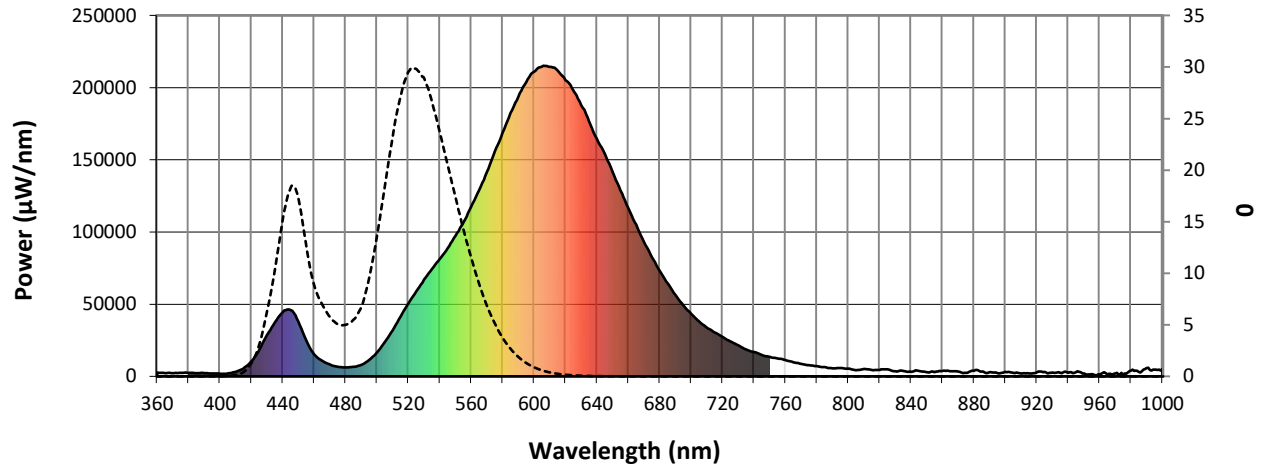


#####

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 2623             | 0.0              | 490       | 7941             | 1.1              | 620       | 205150           | 53.4             | 750       | 13431            | 0.0              | 880       | 3867             | 0.0              |
| 365       | 2260             | 0.0              | 495       | 11299            | 2.0              | 625       | 198277           | 43.7             | 755       | 12426            | 0.0              | 885       | 3345             | 0.0              |
| 370       | 2306             | 0.0              | 500       | 16633            | 3.7              | 630       | 187878           | 34.0             | 760       | 11385            | 0.0              | 890       | 2956             | 0.0              |
| 375       | 2437             | 0.0              | 505       | 23672            | 6.6              | 635       | 176836           | 26.6             | 765       | 9797             | 0.0              | 895       | 2272             | 0.0              |
| 380       | 2473             | 0.0              | 510       | 32025            | 11.0             | 640       | 164455           | 19.7             | 770       | 8562             | 0.0              | 900       | 3003             | 0.0              |
| 385       | 2203             | 0.0              | 515       | 41295            | 17.1             | 645       | 154086           | 14.8             | 775       | 7810             | 0.0              | 905       | 2480             | 0.0              |
| 390       | 2262             | 0.0              | 520       | 50628            | 24.6             | 650       | 141592           | 10.3             | 780       | 7052             | 0.0              | 910       | 2068             | 0.0              |
| 395       | 2028             | 0.0              | 525       | 58836            | 31.6             | 655       | 128604           | 7.4              | 785       | 6345             | 0.0              | 915       | 2064             | 0.0              |
| 400       | 1806             | 0.0              | 530       | 67109            | 39.5             | 660       | 116713           | 4.9              | 790       | 5524             | 0.0              | 920       | 2581             | 0.0              |
| 405       | 1945             | 0.0              | 535       | 74404            | 46.1             | 665       | 104993           | 3.3              | 795       | 5788             | 0.0              | 925       | 3137             | 0.0              |
| 410       | 3199             | 0.0              | 540       | 81280            | 53.0             | 670       | 93149            | 2.0              | 800       | 5282             | 0.0              | 930       | 2747             | 0.0              |
| 415       | 5572             | 0.0              | 545       | 88806            | 59.1             | 675       | 82543            | 1.4              | 805       | 4258             | 0.0              | 935       | 2471             | 0.0              |
| 420       | 10322            | 0.0              | 550       | 97367            | 66.2             | 680       | 73089            | 0.8              | 810       | 5156             | 0.0              | 940       | 2339             | 0.0              |
| 425       | 18494            | 0.1              | 555       | 106598           | 72.8             | 685       | 64438            | 0.6              | 815       | 4391             | 0.0              | 945       | 2917             | 0.0              |
| 430       | 28541            | 0.2              | 560       | 117615           | 79.9             | 690       | 56546            | 0.3              | 820       | 4383             | 0.0              | 950       | 1966             | 0.0              |
| 435       | 37453            | 0.4              | 565       | 129103           | 85.8             | 695       | 49328            | 0.2              | 825       | 4881             | 0.0              | 955       | 1580             | 0.0              |
| 440       | 44455            | 0.7              | 570       | 141415           | 92.0             | 700       | 43493            | 0.1              | 830       | 3588             | 0.0              | 960       | 1318             | 0.0              |
| 445       | 45934            | 1.0              | 575       | 155854           | 97.0             | 705       | 38035            | 0.1              | 835       | 3835             | 0.0              | 965       | 1419             | 0.0              |
| 450       | 37926            | 1.0              | 580       | 168613           | 100.2            | 710       | 33716            | 0.0              | 840       | 3014             | 0.0              | 970       | 1917             | 0.0              |
| 455       | 24793            | 0.8              | 585       | 182390           | 101.3            | 715       | 30449            | 0.0              | 845       | 3765             | 0.0              | 975       | 1210             | 0.0              |
| 460       | 15340            | 0.6              | 590       | 194054           | 100.3            | 720       | 27240            | 0.0              | 850       | 2906             | 0.0              | 980       | 3915             | 0.0              |
| 465       | 10883            | 0.6              | 595       | 203639           | 96.5             | 725       | 24231            | 0.0              | 855       | 2947             | 0.0              | 985       | 3180             | 0.0              |
| 470       | 8138             | 0.5              | 600       | 211043           | 91.0             | 730       | 21490            | 0.0              | 860       | 3864             | 0.0              | 990       | 5676             | 0.0              |
| 475       | 6653             | 0.5              | 605       | 214591           | 83.1             | 735       | 18548            | 0.0              | 865       | 3546             | 0.0              | 995       | 4736             | 0.0              |
| 480       | 6220             | 0.6              | 610       | 214337           | 73.6             | 740       | 16963            | 0.0              | 870       | 3253             | 0.0              | 1000      | 5113             | 0.0              |
| 485       | 6613             | 0.8              | 615       | 211915           | 64.0             | 745       | 14922            | 0.0              | 875       | 2450             | 0.0              |           |                  |                  |

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### Scotopic Flux vs. Wavelength



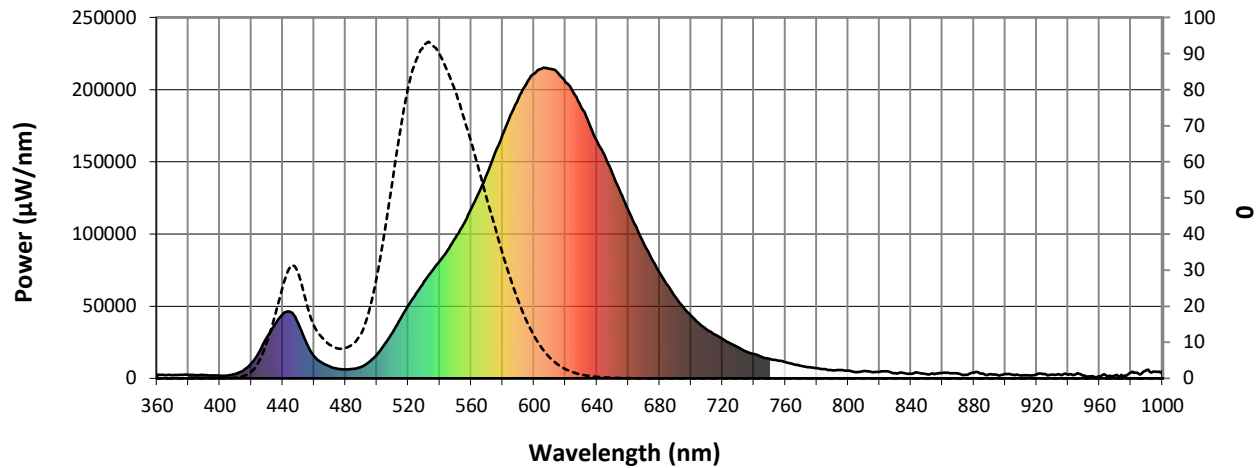
Scotopic Lumens: 7290.1

S/P: 0.84

| 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       | 2623             | 0.0              | 490       | 7941             | 12.2             | 620       | 205150           | 2.6              | 750       | 13431            | 0.0              | 880       | 3867             | 0.0              |
| 365       | 2260             | 0.0              | 495       | 11299            | 18.3             | 625       | 198277           | 1.7              | 755       | 12426            | 0.0              | 885       | 3345             | 0.0              |
| 370       | 2306             | 0.0              | 500       | 16633            | 27.8             | 630       | 187878           | 1.1              | 760       | 11385            | 0.0              | 890       | 2956             | 0.0              |
| 375       | 2437             | 0.0              | 505       | 23672            | 40.2             | 635       | 176836           | 0.7              | 765       | 9797             | 0.0              | 895       | 2272             | 0.0              |
| 380       | 2473             | 0.0              | 510       | 32025            | 54.3             | 640       | 164455           | 0.4              | 770       | 8562             | 0.0              | 900       | 3003             | 0.0              |
| 385       | 2203             | 0.0              | 515       | 41295            | 68.4             | 645       | 154086           | 0.3              | 775       | 7810             | 0.0              | 905       | 2480             | 0.0              |
| 390       | 2262             | 0.0              | 520       | 50628            | 80.5             | 650       | 141592           | 0.2              | 780       | 7052             | 0.0              | 910       | 2068             | 0.0              |
| 395       | 2028             | 0.0              | 525       | 58836            | 88.0             | 655       | 128604           | 0.1              | 785       | 6345             | 0.0              | 915       | 2064             | 0.0              |
| 400       | 1806             | 0.0              | 530       | 67109            | 92.5             | 660       | 116713           | 0.1              | 790       | 5524             | 0.0              | 920       | 2581             | 0.0              |
| 405       | 1945             | 0.1              | 535       | 74404            | 92.7             | 665       | 104993           | 0.0              | 795       | 5788             | 0.0              | 925       | 3137             | 0.0              |
| 410       | 3199             | 0.2              | 540       | 81280            | 89.8             | 670       | 93149            | 0.0              | 800       | 5282             | 0.0              | 930       | 2747             | 0.0              |
| 415       | 5572             | 0.6              | 545       | 88806            | 85.1             | 675       | 82543            | 0.0              | 805       | 4258             | 0.0              | 935       | 2471             | 0.0              |
| 420       | 10322            | 1.7              | 550       | 97367            | 79.6             | 680       | 73089            | 0.0              | 810       | 5156             | 0.0              | 940       | 2339             | 0.0              |
| 425       | 18494            | 4.5              | 555       | 106598           | 72.8             | 685       | 64438            | 0.0              | 815       | 4391             | 0.0              | 945       | 2917             | 0.0              |
| 430       | 28541            | 9.7              | 560       | 117615           | 65.7             | 690       | 56546            | 0.0              | 820       | 4383             | 0.0              | 950       | 1966             | 0.0              |
| 435       | 37453            | 16.7             | 565       | 129103           | 57.9             | 695       | 49328            | 0.0              | 825       | 4881             | 0.0              | 955       | 1580             | 0.0              |
| 440       | 44455            | 24.8             | 570       | 141415           | 49.9             | 700       | 43493            | 0.0              | 830       | 3588             | 0.0              | 960       | 1318             | 0.0              |
| 445       | 45934            | 30.8             | 575       | 155854           | 42.4             | 705       | 38035            | 0.0              | 835       | 3835             | 0.0              | 965       | 1419             | 0.0              |
| 450       | 37926            | 29.4             | 580       | 168613           | 34.7             | 710       | 33716            | 0.0              | 840       | 3014             | 0.0              | 970       | 1917             | 0.0              |
| 455       | 24793            | 21.7             | 585       | 182390           | 27.9             | 715       | 30449            | 0.0              | 845       | 3765             | 0.0              | 975       | 1210             | 0.0              |
| 460       | 15340            | 14.8             | 590       | 194054           | 21.6             | 720       | 27240            | 0.0              | 850       | 2906             | 0.0              | 980       | 3915             | 0.0              |
| 465       | 10883            | 11.5             | 595       | 203639           | 16.2             | 725       | 24231            | 0.0              | 855       | 2947             | 0.0              | 985       | 3180             | 0.0              |
| 470       | 8138             | 9.4              | 600       | 211043           | 11.9             | 730       | 21490            | 0.0              | 860       | 3864             | 0.0              | 990       | 5676             | 0.0              |
| 475       | 6653             | 8.3              | 605       | 214591           | 8.4              | 735       | 18548            | 0.0              | 865       | 3546             | 0.0              | 995       | 4736             | 0.0              |
| 480       | 6220             | 8.4              | 610       | 214337           | 5.8              | 740       | 16963            | 0.0              | 870       | 3253             | 0.0              | 1000      | 5113             | 0.0              |
| 485       | 6613             | 9.6              | 615       | 211915           | 3.9              | 745       | 14922            | 0.0              | 875       | 2450             | 0.0              |           |                  |                  |

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### Melanopic Flux vs. Wavelength



**Melanopic Lumens: 2276.7**

**M/P: 0.26**

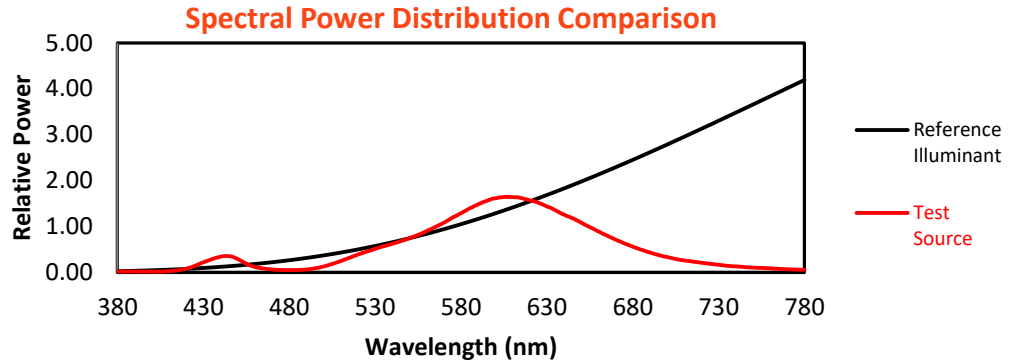
| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 2623             | 0.0              | 490       | 7941             | 6.6              | 620       | 205150           | 0.2              | 750       | 13431            | 0.0              | 880       | 3867             | 0.0              |
| 365       | 2260             | 0.0              | 495       | 11299            | 9.3              | 625       | 198277           | 0.1              | 755       | 12426            | 0.0              | 885       | 3345             | 0.0              |
| 370       | 2306             | 0.0              | 500       | 16633            | 13.4             | 630       | 187878           | 0.1              | 760       | 11385            | 0.0              | 890       | 2956             | 0.0              |
| 375       | 2437             | 0.0              | 505       | 23672            | 18.2             | 635       | 176836           | 0.0              | 765       | 9797             | 0.0              | 895       | 2272             | 0.0              |
| 380       | 2473             | 0.0              | 510       | 32025            | 23.0             | 640       | 164455           | 0.0              | 770       | 8562             | 0.0              | 900       | 3003             | 0.0              |
| 385       | 2203             | 0.0              | 515       | 41295            | 27.0             | 645       | 154086           | 0.0              | 775       | 7810             | 0.0              | 905       | 2480             | 0.0              |
| 390       | 2262             | 0.0              | 520       | 50628            | 29.5             | 650       | 141592           | 0.0              | 780       | 7052             | 0.0              | 910       | 2068             | 0.0              |
| 395       | 2028             | 0.0              | 525       | 58836            | 29.8             | 655       | 128604           | 0.0              | 785       | 6345             | 0.0              | 915       | 2064             | 0.0              |
| 400       | 1806             | 0.0              | 530       | 67109            | 29.0             | 660       | 116713           | 0.0              | 790       | 5524             | 0.0              | 920       | 2581             | 0.0              |
| 405       | 1945             | 0.0              | 535       | 74404            | 26.8             | 665       | 104993           | 0.0              | 795       | 5788             | 0.0              | 925       | 3137             | 0.0              |
| 410       | 3199             | 0.1              | 540       | 81280            | 23.8             | 670       | 93149            | 0.0              | 800       | 5282             | 0.0              | 930       | 2747             | 0.0              |
| 415       | 5572             | 0.4              | 545       | 88806            | 20.6             | 675       | 82543            | 0.0              | 805       | 4258             | 0.0              | 935       | 2471             | 0.0              |
| 420       | 10322            | 1.2              | 550       | 97367            | 17.5             | 680       | 73089            | 0.0              | 810       | 5156             | 0.0              | 940       | 2339             | 0.0              |
| 425       | 18494            | 2.9              | 555       | 106598           | 14.4             | 685       | 64438            | 0.0              | 815       | 4391             | 0.0              | 945       | 2917             | 0.0              |
| 430       | 28541            | 6.0              | 560       | 117615           | 11.6             | 690       | 56546            | 0.0              | 820       | 4383             | 0.0              | 950       | 1966             | 0.0              |
| 435       | 37453            | 10.0             | 565       | 129103           | 9.1              | 695       | 49328            | 0.0              | 825       | 4881             | 0.0              | 955       | 1580             | 0.0              |
| 440       | 44455            | 14.9             | 570       | 141415           | 6.9              | 700       | 43493            | 0.0              | 830       | 3588             | 0.0              | 960       | 1318             | 0.0              |
| 445       | 45934            | 18.1             | 575       | 155854           | 5.2              | 705       | 38035            | 0.0              | 835       | 3835             | 0.0              | 965       | 1419             | 0.0              |
| 450       | 37926            | 17.5             | 580       | 168613           | 3.8              | 710       | 33716            | 0.0              | 840       | 3014             | 0.0              | 970       | 1917             | 0.0              |
| 455       | 24793            | 13.0             | 585       | 182390           | 2.7              | 715       | 30449            | 0.0              | 845       | 3765             | 0.0              | 975       | 1210             | 0.0              |
| 460       | 15340            | 9.0              | 590       | 194054           | 1.9              | 720       | 27240            | 0.0              | 850       | 2906             | 0.0              | 980       | 3915             | 0.0              |
| 465       | 10883            | 7.1              | 595       | 203639           | 1.3              | 725       | 24231            | 0.0              | 855       | 2947             | 0.0              | 985       | 3180             | 0.0              |
| 470       | 8138             | 5.8              | 600       | 211043           | 0.9              | 730       | 21490            | 0.0              | 860       | 3864             | 0.0              | 990       | 5676             | 0.0              |
| 475       | 6653             | 5.1              | 605       | 214591           | 0.6              | 735       | 18548            | 0.0              | 865       | 3546             | 0.0              | 995       | 4736             | 0.0              |
| 480       | 6220             | 5.0              | 610       | 214337           | 0.4              | 740       | 16963            | 0.0              | 870       | 3253             | 0.0              | 1000      | 5113             | 0.0              |
| 485       | 6613             | 5.5              | 615       | 211915           | 0.3              | 745       | 14922            | 0.0              | 875       | 2450             | 0.0              |           |                  |                  |

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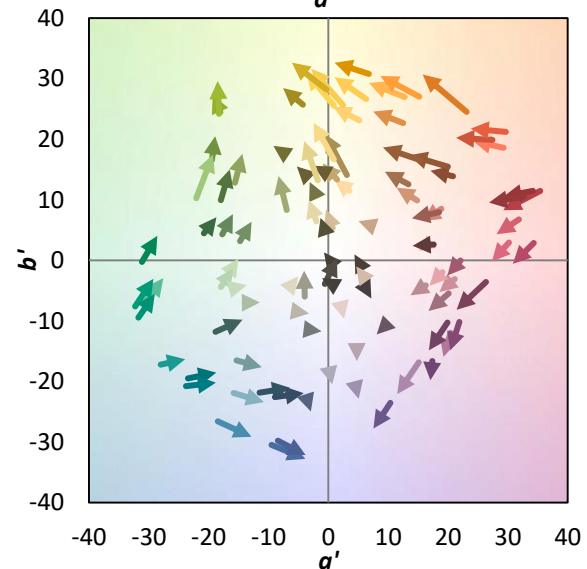
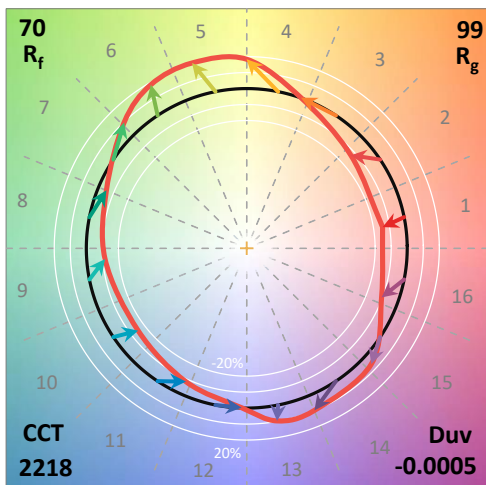
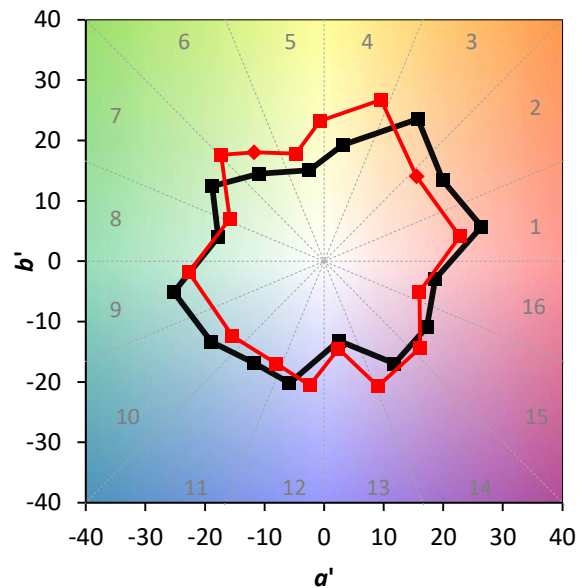
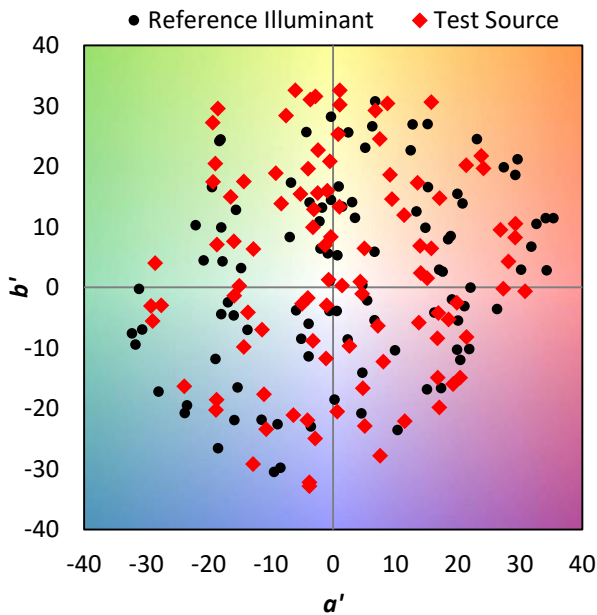
TM-30-18

### Summary

$R_f = 70$   
 $R_g = 99.3$   
 CIE  $R_a = 72.2$   
 $R_g = -16.8$



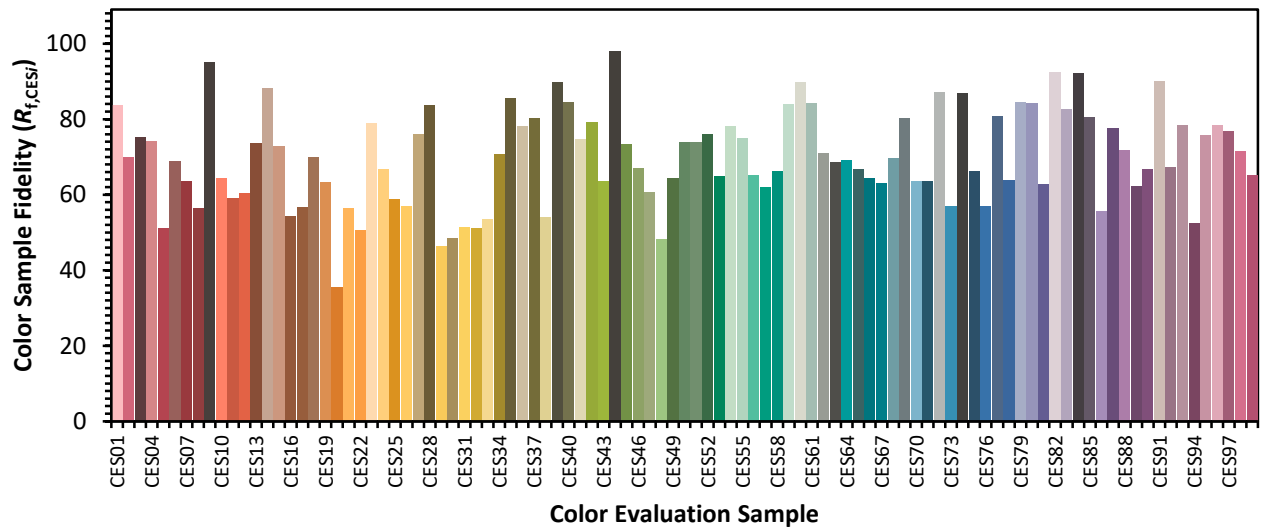
### Color Vector Graphics



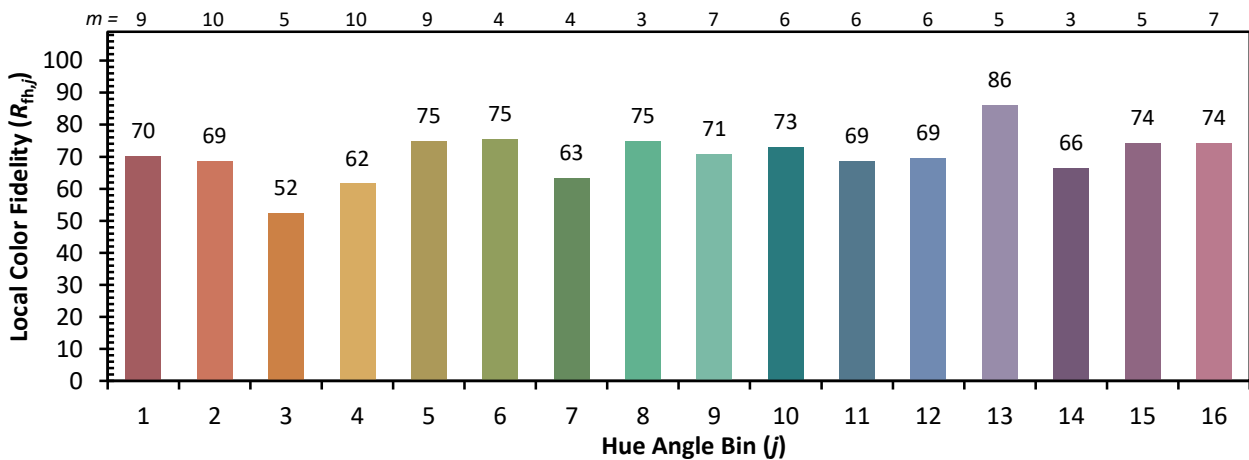
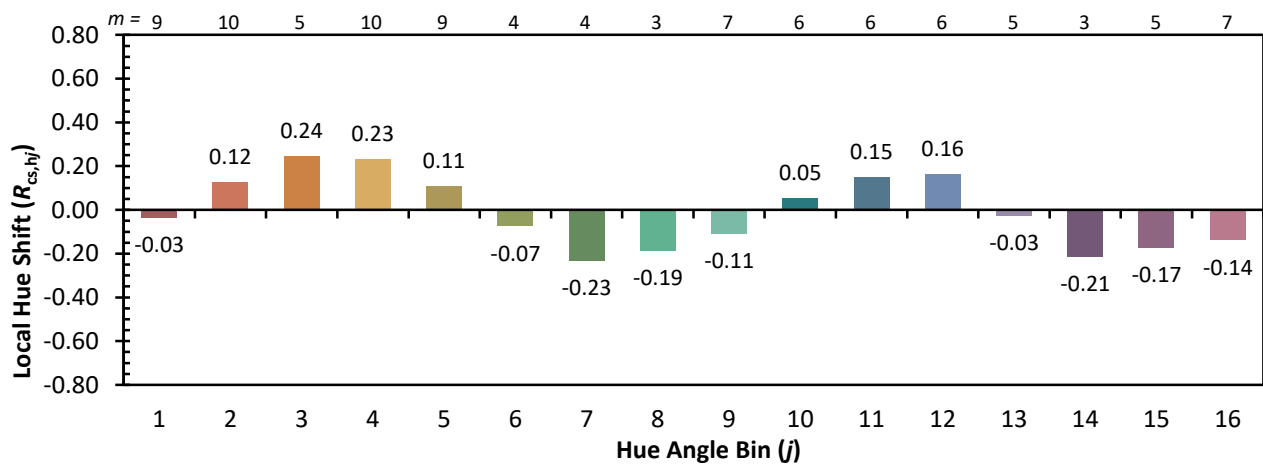
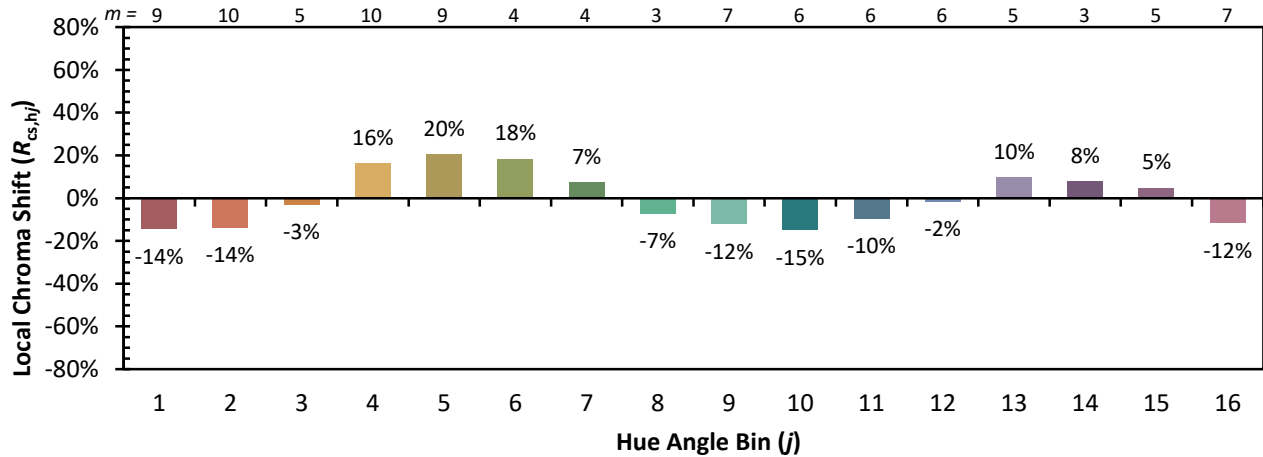


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

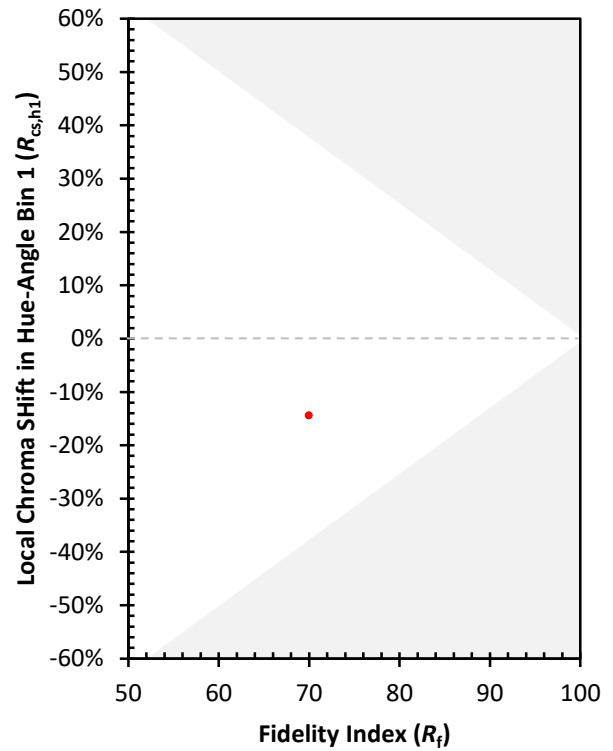
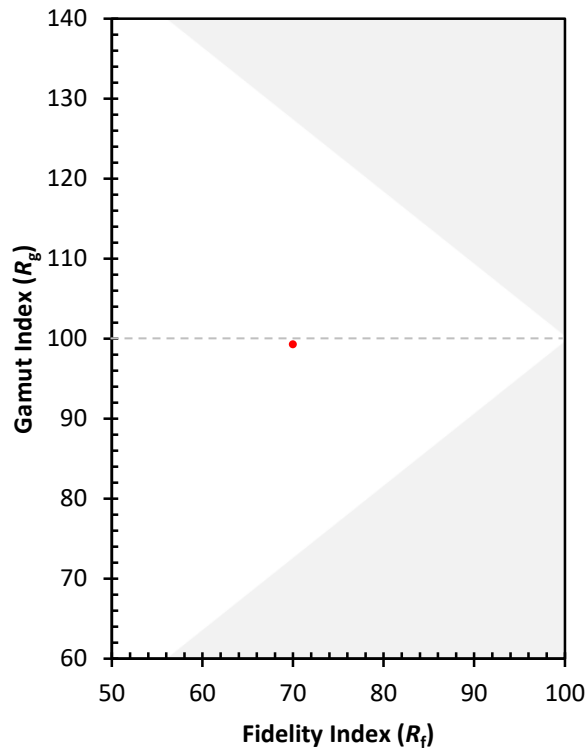
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 87 | CES26 = 57 | CES51 = 74 | CES76 = 57 |
| CES02 = 65 | CES27 = 76 | CES52 = 76 | CES77 = 81 |
| CES03 = 32 | CES28 = 84 | CES53 = 65 | CES78 = 64 |
| CES04 = 72 | CES29 = 46 | CES54 = 78 | CES79 = 85 |
| CES05 = 52 | CES30 = 48 | CES55 = 75 | CES80 = 84 |
| CES06 = 52 | CES31 = 52 | CES56 = 65 | CES81 = 63 |
| CES07 = 44 | CES32 = 51 | CES57 = 62 | CES82 = 92 |
| CES08 = 43 | CES33 = 54 | CES58 = 66 | CES83 = 83 |
| CES09 = 29 | CES34 = 71 | CES59 = 84 | CES84 = 92 |
| CES10 = 79 | CES35 = 86 | CES60 = 90 | CES85 = 81 |
| CES11 = 62 | CES36 = 78 | CES61 = 84 | CES86 = 56 |
| CES12 = 68 | CES37 = 80 | CES62 = 71 | CES87 = 78 |
| CES13 = 45 | CES38 = 54 | CES63 = 68 | CES88 = 72 |
| CES14 = 75 | CES39 = 90 | CES64 = 69 | CES89 = 62 |
| CES15 = 72 | CES40 = 85 | CES65 = 67 | CES90 = 67 |
| CES16 = 49 | CES41 = 75 | CES66 = 64 | CES91 = 90 |
| CES17 = 51 | CES42 = 79 | CES67 = 63 | CES92 = 67 |
| CES18 = 57 | CES43 = 64 | CES68 = 70 | CES93 = 78 |
| CES19 = 74 | CES44 = 98 | CES69 = 80 | CES94 = 52 |
| CES20 = 68 | CES45 = 73 | CES70 = 64 | CES95 = 76 |
| CES21 = 89 | CES46 = 67 | CES71 = 64 | CES96 = 78 |
| CES22 = 81 | CES47 = 61 | CES72 = 87 | CES97 = 77 |
| CES23 = 92 | CES48 = 48 | CES73 = 57 | CES98 = 72 |
| CES24 = 92 | CES49 = 64 | CES74 = 87 | CES99 = 65 |
| CES25 = 74 | CES50 = 74 | CES75 = 66 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)