

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: P321295

Luminaire Tested: **GLEON-SA1D-740-U-T2R-HSS**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P321295  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-9)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA1D-740-U-T2R-HSS  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(1) 70 CRI, 4000K, 1200mA LIGHTSQUARE WITH 16 LEDS AND TYPE II ROADWAY  
OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 6557 lumens  
Efficiency: N/A  
Efficacy: 97.9 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 0.5' x H: 0')  
IES Classification: Type II - Medium  
BUG Rating: B0 - U0 - G1

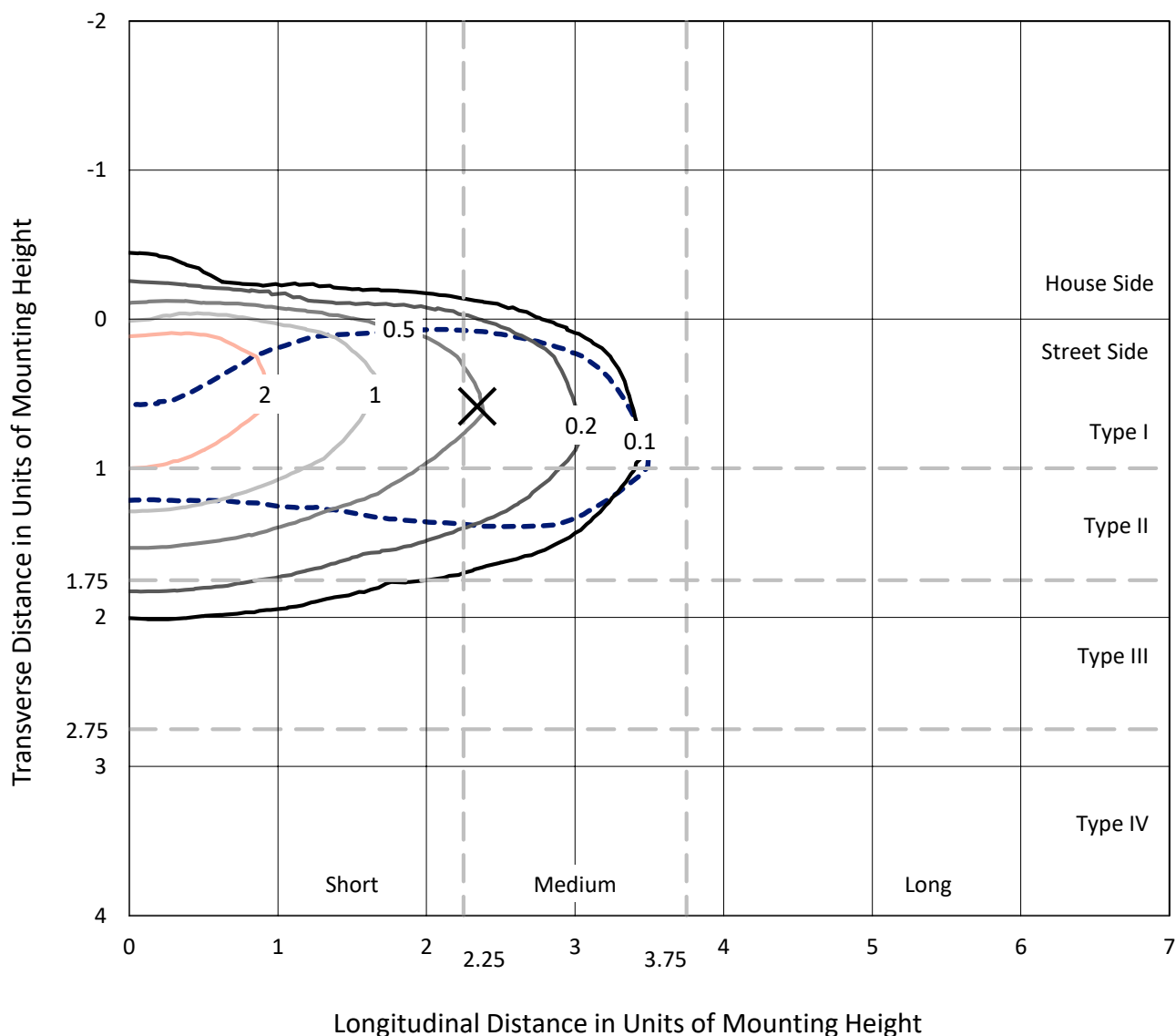
Input Watts (W): 67  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



REPORT NUMBER: P321295  
 CATALOG NUMBER: GLEON-SA1D-740-U-T2R-HSS

## Iso-Footcandle Lines of Horizontal Illumination

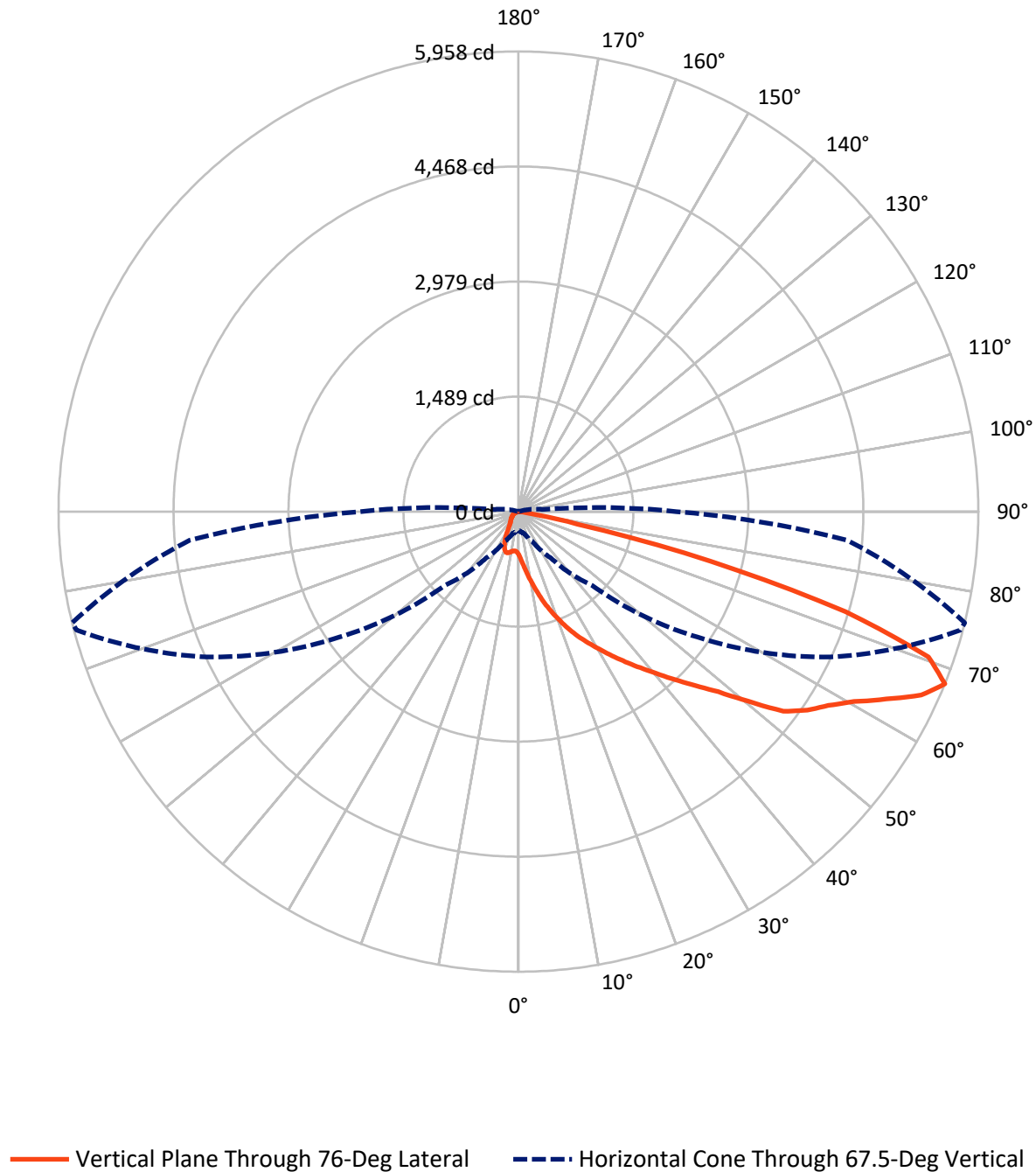
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 3.1 fc  
 Type II - Medium - N/A

REPORT NUMBER: P321295  
CATALOG NUMBER: GLEON-SA1D-740-U-T2R-HSS

## Luminous Intensity Polar Plot



REPORT NUMBER: P321295  
 CATALOG NUMBER: GLEON-SA1D-740-U-T2R-HSS

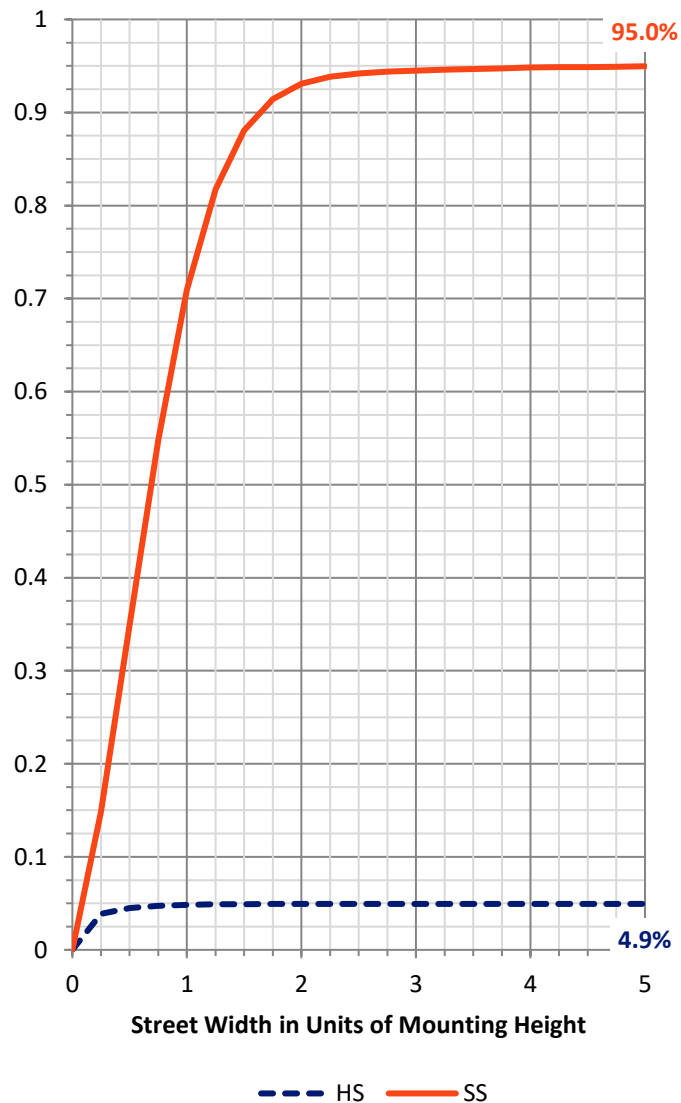
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 325.6    | 0.0    | 325.6  |
|                    | % Fixture | 5.0      | 0.0    | 5.0    |
| <b>Street Side</b> | Lumens    | 6231.4   | 0.0    | 6231.4 |
|                    | % Fixture | 95.0     | 0.0    | 95.0   |
| <b>Total</b>       | Lumens    | 6557.0   | 0.0    | 6557.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 69.2   | 1.1       |
| 10°-20°   | 274.2  | 4.2       |
| 20°-30°   | 557.9  | 8.5       |
| 30°-40°   | 968.3  | 14.8      |
| 40°-50°   | 1368.1 | 20.9      |
| 50°-60°   | 1551.4 | 23.7      |
| 60°-70°   | 1286.8 | 19.6      |
| 70°-80°   | 466.1  | 7.1       |
| 80°-90°   | 15.1   | 0.2       |
| 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°    | 6557.0 | 100.0     |
| 0°-180°   | 6557.0 | 100.0     |

**Coefficient of Utilization**



REPORT NUMBER: P321295

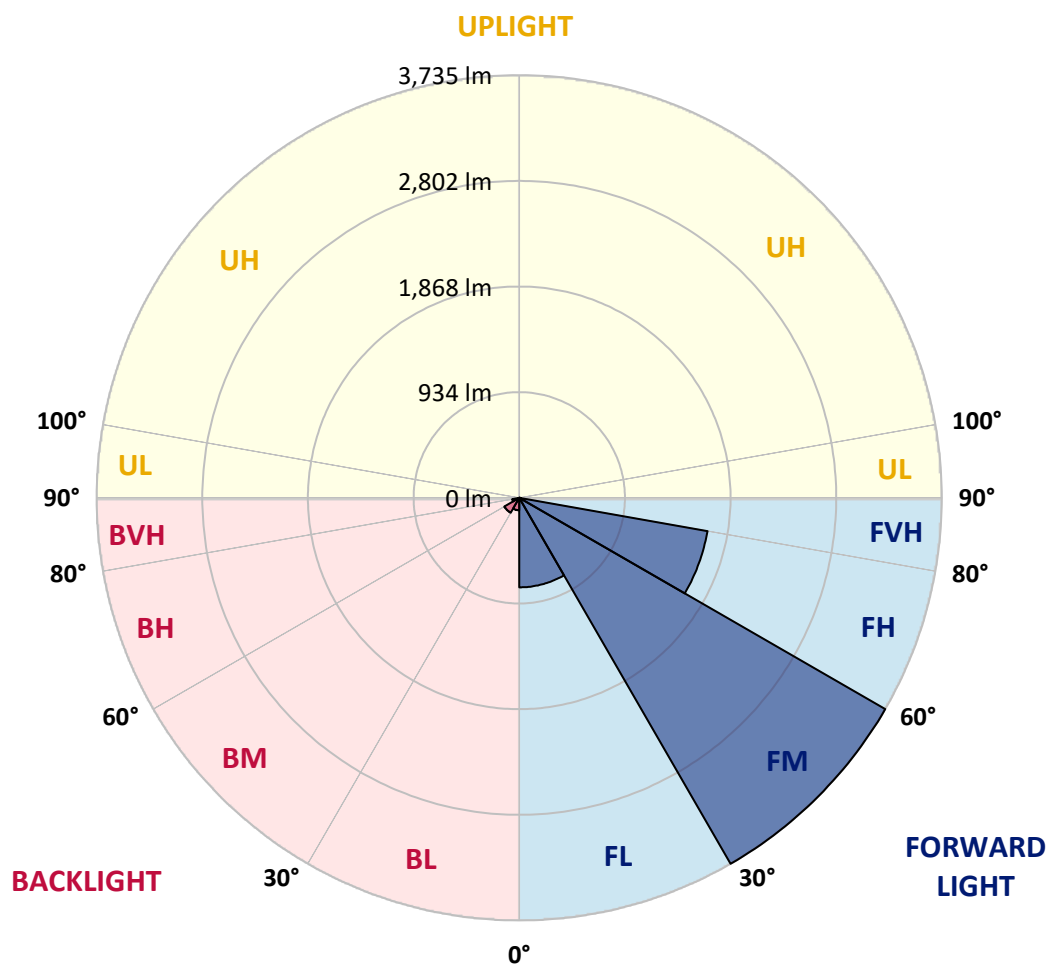
CATALOG NUMBER: GLEON-SA1D-740-U-T2R-HSS

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 791.4  | 12.1      |                         |      |         |
| FM   | (30°-60°)   | 3735.4 | 57.0      |                         |      |         |
| FH   | (60°-80°)   | 1690.0 | 25.8      |                         |      | G1/1800 |
| FVH  | (80°-90°)   | 14.6   | 0.2       |                         |      | G1/100  |
| BL   | (0°-30°)    | 109.8  | 1.7       | B0/110                  |      |         |
| BM   | (30°-60°)   | 152.4  | 2.3       | B0/220                  |      |         |
| BH   | (60°-80°)   | 62.9   | 1.0       | 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 II Medium



REPORT NUMBER: P321295

CATALOG NUMBER: GLEON-SA1D-740-U-T2R-HSS

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 75°    | 76°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 556.2  | 556.2  | 556.2  | 556.2  | 556.2  | 556.2  | 556.2  | 556.2  | 556.2  | 556.2  | 556.2  |
| 2.5°  | 830.3  | 811.6  | 815.9  | 803.9  | 782.0  | 737.2  | 699.0  | 662.8  | 620.6  | 619.1  | 584.4  |
| 5°    | 1119.6 | 1103.8 | 1101.8 | 1077.4 | 1037.7 | 961.6  | 887.5  | 803.0  | 708.8  | 701.9  | 628.0  |
| 7.5°  | 1382.2 | 1369.6 | 1365.0 | 1336.0 | 1262.1 | 1188.0 | 1091.5 | 967.4  | 820.0  | 807.3  | 686.9  |
| 10°   | 1583.9 | 1577.9 | 1579.0 | 1558.3 | 1495.1 | 1426.2 | 1299.5 | 1141.2 | 946.1  | 926.6  | 757.6  |
| 12.5° | 1736.8 | 1738.2 | 1748.5 | 1735.9 | 1700.6 | 1649.4 | 1514.1 | 1326.5 | 1085.7 | 1059.0 | 838.4  |
| 15°   | 1849.1 | 1856.3 | 1875.2 | 1891.0 | 1888.5 | 1844.2 | 1720.1 | 1514.7 | 1234.0 | 1204.4 | 928.3  |
| 17.5° | 1921.8 | 1929.8 | 1957.4 | 1992.5 | 2024.6 | 2014.3 | 1918.9 | 1696.3 | 1384.0 | 1349.8 | 1024.5 |
| 20°   | 1985.6 | 1995.0 | 2024.6 | 2070.9 | 2130.9 | 2143.9 | 2081.2 | 1872.4 | 1533.6 | 1492.0 | 1123.9 |
| 22.5° | 2123.8 | 2123.5 | 2141.6 | 2168.6 | 2225.8 | 2259.1 | 2219.4 | 2035.8 | 1681.6 | 1638.2 | 1225.4 |
| 25°   | 2373.7 | 2364.2 | 2357.9 | 2336.7 | 2349.3 | 2370.0 | 2347.9 | 2188.7 | 1830.4 | 1786.5 | 1328.2 |
| 27.5° | 2670.8 | 2676.5 | 2625.4 | 2568.2 | 2524.0 | 2502.7 | 2466.5 | 2330.3 | 1973.5 | 1925.2 | 1428.8 |
| 30°   | 2984.2 | 2986.0 | 2925.6 | 2852.7 | 2755.3 | 2674.5 | 2611.9 | 2465.7 | 2120.6 | 2068.0 | 1526.5 |
| 32.5° | 3267.0 | 3255.7 | 3196.0 | 3096.6 | 2973.6 | 2882.8 | 2752.7 | 2616.8 | 2276.3 | 2225.5 | 1635.1 |
| 35°   | 3491.0 | 3477.8 | 3405.1 | 3314.6 | 3187.1 | 3095.7 | 2939.1 | 2767.6 | 2440.1 | 2390.4 | 1743.9 |
| 37.5° | 3654.8 | 3639.3 | 3564.6 | 3471.5 | 3361.5 | 3308.3 | 3155.5 | 2931.7 | 2618.8 | 2565.4 | 1858.6 |
| 40°   | 3711.7 | 3698.2 | 3651.4 | 3583.3 | 3494.8 | 3482.7 | 3385.0 | 3120.4 | 2813.3 | 2756.4 | 1988.4 |
| 42.5° | 3677.8 | 3664.6 | 3647.9 | 3624.9 | 3588.2 | 3599.7 | 3601.7 | 3335.6 | 3029.3 | 2973.3 | 2131.8 |
| 45°   | 3543.3 | 3531.6 | 3548.8 | 3582.4 | 3628.1 | 3685.0 | 3799.3 | 3566.9 | 3270.7 | 3210.9 | 2297.6 |
| 47.5° | 3345.4 | 3336.8 | 3384.5 | 3468.4 | 3601.9 | 3758.8 | 3980.0 | 3810.0 | 3541.6 | 3486.2 | 2504.4 |
| 50°   | 3063.8 | 3062.4 | 3157.8 | 3310.9 | 3516.3 | 3794.4 | 4166.8 | 4086.3 | 3918.0 | 3859.7 | 2792.0 |
| 52.5° | 2625.4 | 2628.3 | 2815.9 | 3061.0 | 3366.1 | 3770.3 | 4286.9 | 4441.5 | 4355.8 | 4295.2 | 3041.1 |
| 55°   | 2207.9 | 2225.2 | 2358.2 | 2711.6 | 3135.7 | 3680.7 | 4328.3 | 4607.2 | 4597.5 | 4540.0 | 3179.6 |
| 57.5° | 1799.1 | 1830.4 | 1958.6 | 2288.7 | 2799.2 | 3474.1 | 4305.6 | 4679.1 | 4777.3 | 4733.4 | 3362.3 |
| 60°   | 1356.1 | 1370.4 | 1518.1 | 1826.7 | 2367.4 | 3097.2 | 4140.9 | 4718.1 | 5023.2 | 4992.8 | 3627.5 |
| 62.5° | 862.8  | 898.7  | 1029.7 | 1327.4 | 1843.4 | 2573.7 | 3863.4 | 4717.6 | 5331.0 | 5347.6 | 3969.7 |
| 65°   | 454.5  | 496.5  | 566.0  | 822.6  | 1266.7 | 1989.0 | 3445.9 | 4673.3 | 5708.5 | 5731.7 | 4237.2 |
| 67.5° | 245.1  | 257.1  | 293.9  | 426.9  | 734.6  | 1347.5 | 2832.5 | 4455.0 | 5927.1 | 5957.9 | 4274.5 |
| 70°   | 179.3  | 185.9  | 199.7  | 236.2  | 369.8  | 782.6  | 2066.9 | 3959.9 | 5645.3 | 5633.8 | 3797.9 |
| 72.5° | 137.6  | 148.0  | 158.3  | 173.0  | 212.6  | 417.7  | 1286.8 | 3100.9 | 4504.4 | 4428.5 | 2838.9 |
| 75°   | 108.6  | 110.3  | 125.0  | 138.2  | 159.5  | 237.9  | 571.5  | 1806.0 | 2749.2 | 2569.7 | 1472.2 |
| 77.5° | 86.8   | 87.9   | 96.5   | 108.0  | 128.1  | 156.3  | 177.0  | 710.5  | 877.7  | 783.2  | 319.5  |
| 80°   | 51.4   | 54.3   | 71.8   | 83.3   | 106.3  | 98.5   | 64.6   | 154.3  | 137.0  | 124.1  | 53.7   |
| 82.5° | 28.7   | 31.0   | 40.5   | 65.8   | 74.1   | 47.1   | 32.2   | 41.7   | 32.2   | 31.3   | 15.2   |
| 85°   | 0.0    | 1.4    | 26.1   | 40.8   | 30.2   | 10.3   | 13.5   | 13.8   | 9.5    | 8.9    | 6.0    |
| 87.5° | 0.0    | 0.0    | 8.0    | 7.8    | 1.1    | 1.7    | 3.2    | 4.6    | 3.7    | 3.7    | 3.2    |
| 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: P321295

CATALOG NUMBER: GLEON-SA1D-740-U-T2R-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°   | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 556.2  | 556.2 | 556.2 | 556.2 | 556.2 | 556.2 | 556.2 | 556.2 | 556.2 | 556.2 | 556.2 |
| 2.5°  | 567.1  | 551.6 | 522.3 | 493.6 | 469.5 | 449.6 | 431.8 | 424.6 | 418.9 | 418.0 | 413.4 |
| 5°    | 592.4  | 561.1 | 505.1 | 459.1 | 428.4 | 406.5 | 387.9 | 376.4 | 367.5 | 364.0 | 360.9 |
| 7.5°  | 630.6  | 583.2 | 502.8 | 449.9 | 413.1 | 376.4 | 341.9 | 304.5 | 281.3 | 272.4 | 267.2 |
| 10°   | 677.2  | 612.5 | 511.4 | 447.3 | 383.0 | 305.4 | 248.2 | 200.8 | 181.6 | 175.3 | 173.5 |
| 12.5° | 731.5  | 649.0 | 526.3 | 431.2 | 318.6 | 216.9 | 171.2 | 155.1 | 150.8 | 148.8 | 148.8 |
| 15°   | 793.8  | 689.0 | 537.0 | 384.7 | 235.6 | 164.1 | 148.2 | 140.8 | 136.2 | 133.6 | 133.9 |
| 17.5° | 857.6  | 728.0 | 531.8 | 317.2 | 173.8 | 146.0 | 134.2 | 126.1 | 119.8 | 117.2 | 116.6 |
| 20°   | 922.0  | 764.2 | 503.1 | 236.2 | 147.1 | 132.4 | 119.2 | 110.3 | 104.0 | 101.4 | 100.8 |
| 22.5° | 988.6  | 795.0 | 452.5 | 173.2 | 132.2 | 117.5 | 104.6 | 95.7  | 89.6  | 87.3  | 86.2  |
| 25°   | 1053.5 | 820.0 | 381.8 | 140.2 | 118.1 | 103.4 | 91.1  | 82.7  | 77.3  | 75.0  | 74.7  |
| 27.5° | 1114.2 | 835.8 | 299.9 | 123.8 | 105.7 | 90.8  | 79.6  | 72.1  | 67.5  | 65.8  | 65.5  |
| 30°   | 1168.8 | 837.2 | 221.8 | 111.8 | 94.8  | 79.9  | 69.5  | 62.9  | 58.9  | 57.2  | 56.6  |
| 32.5° | 1223.9 | 825.1 | 161.5 | 100.8 | 84.8  | 70.4  | 60.3  | 55.2  | 52.3  | 50.9  | 50.9  |
| 35°   | 1275.9 | 797.3 | 125.8 | 91.4  | 75.0  | 61.2  | 53.2  | 49.4  | 47.7  | 46.3  | 46.3  |
| 37.5° | 1326.8 | 757.3 | 106.9 | 83.0  | 65.8  | 53.4  | 46.8  | 44.5  | 43.1  | 41.7  | 41.7  |
| 40°   | 1378.5 | 707.1 | 97.1  | 75.3  | 58.3  | 47.4  | 41.7  | 39.6  | 38.2  | 37.1  | 36.8  |
| 42.5° | 1442.0 | 649.0 | 90.8  | 68.1  | 51.7  | 41.9  | 36.8  | 34.5  | 33.3  | 32.2  | 31.6  |
| 45°   | 1515.5 | 599.0 | 85.6  | 60.9  | 46.3  | 37.3  | 31.9  | 29.6  | 27.9  | 26.4  | 26.1  |
| 47.5° | 1621.6 | 562.8 | 78.7  | 53.2  | 41.1  | 32.5  | 27.6  | 25.0  | 22.4  | 21.0  | 20.7  |
| 50°   | 1756.9 | 533.0 | 69.8  | 46.3  | 35.9  | 27.6  | 23.0  | 19.8  | 17.5  | 16.1  | 16.1  |
| 52.5° | 1824.1 | 493.9 | 61.8  | 40.2  | 30.2  | 23.3  | 18.7  | 14.9  | 13.8  | 12.4  | 12.4  |
| 55°   | 1851.1 | 464.0 | 53.7  | 34.2  | 25.0  | 19.2  | 14.7  | 11.5  | 10.6  | 9.8   | 9.5   |
| 57.5° | 1927.0 | 455.4 | 46.8  | 29.0  | 20.7  | 15.2  | 11.2  | 8.6   | 8.0   | 6.9   | 6.9   |
| 60°   | 2049.1 | 459.7 | 40.5  | 24.7  | 16.7  | 11.8  | 8.3   | 6.6   | 6.0   | 4.9   | 4.9   |
| 62.5° | 2180.9 | 454.2 | 34.2  | 21.3  | 12.9  | 8.6   | 5.7   | 4.9   | 4.9   | 2.9   | 2.6   |
| 65°   | 2206.2 | 404.5 | 29.3  | 17.5  | 10.1  | 6.3   | 3.7   | 3.2   | 4.3   | 0.6   | 0.0   |
| 67.5° | 2047.6 | 313.7 | 25.3  | 13.5  | 7.5   | 4.9   | 2.9   | 1.4   | 3.7   | 0.0   | 0.0   |
| 70°   | 1637.4 | 199.4 | 20.4  | 9.8   | 5.7   | 4.0   | 2.3   | 0.6   | 2.9   | 0.0   | 0.0   |
| 72.5° | 1157.8 | 115.8 | 16.1  | 6.9   | 4.9   | 3.2   | 1.7   | 0.0   | 1.7   | 0.0   | 0.0   |
| 75°   | 585.5  | 61.8  | 10.1  | 5.2   | 3.7   | 2.3   | 1.1   | 0.0   | 0.3   | 0.0   | 0.0   |
| 77.5° | 126.7  | 28.7  | 6.3   | 3.7   | 2.6   | 1.4   | 0.6   | 0.0   | 0.0   | 0.0   | 0.0   |
| 80°   | 27.6   | 12.6  | 4.0   | 2.3   | 1.4   | 0.9   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 82.5° | 10.1   | 6.6   | 2.0   | 1.1   | 0.6   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 85°   | 5.5    | 3.4   | 1.1   | 0.6   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 87.5° | 2.9    | 1.1   | 0.3   | 0.3   | 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

MCGRAW, INVUE, LUMARK AND STREETWORKS

DATA VALID FOR LUMINAIRES UTILIZING SA LIGHT ENGINES

Report Number: SP1-2101-121-2

Luminaire Tested: IFLD-S-SA2A-740-U-T3R-HSS

Test Date: 03/05/2021

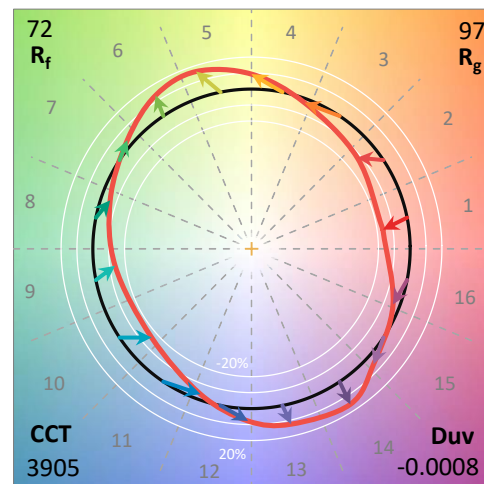
### Test Information

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

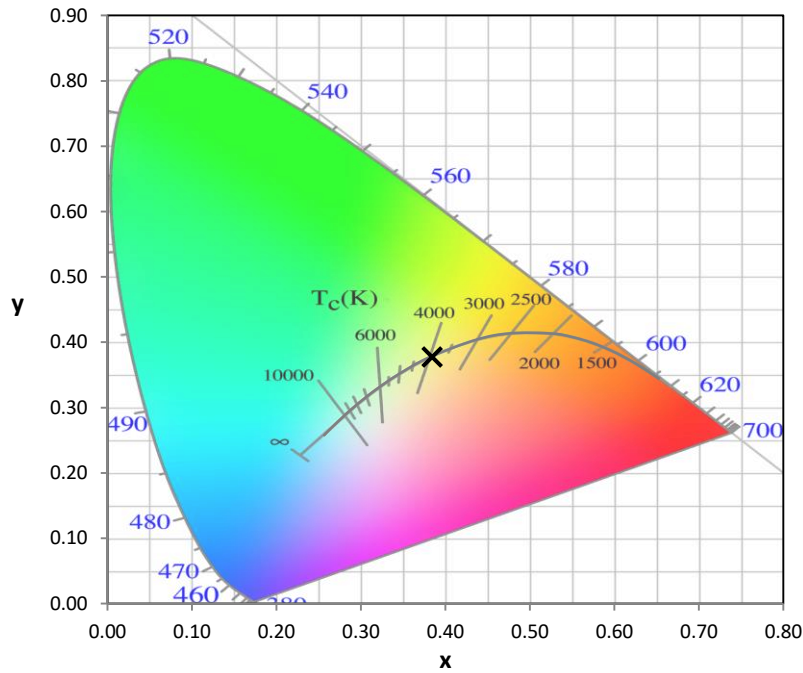
Stabilization Time: 211M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.8/312%  
 Sphere Temperature (°C): 24.1

REPORT NUMBER: SP1-2101-121-2

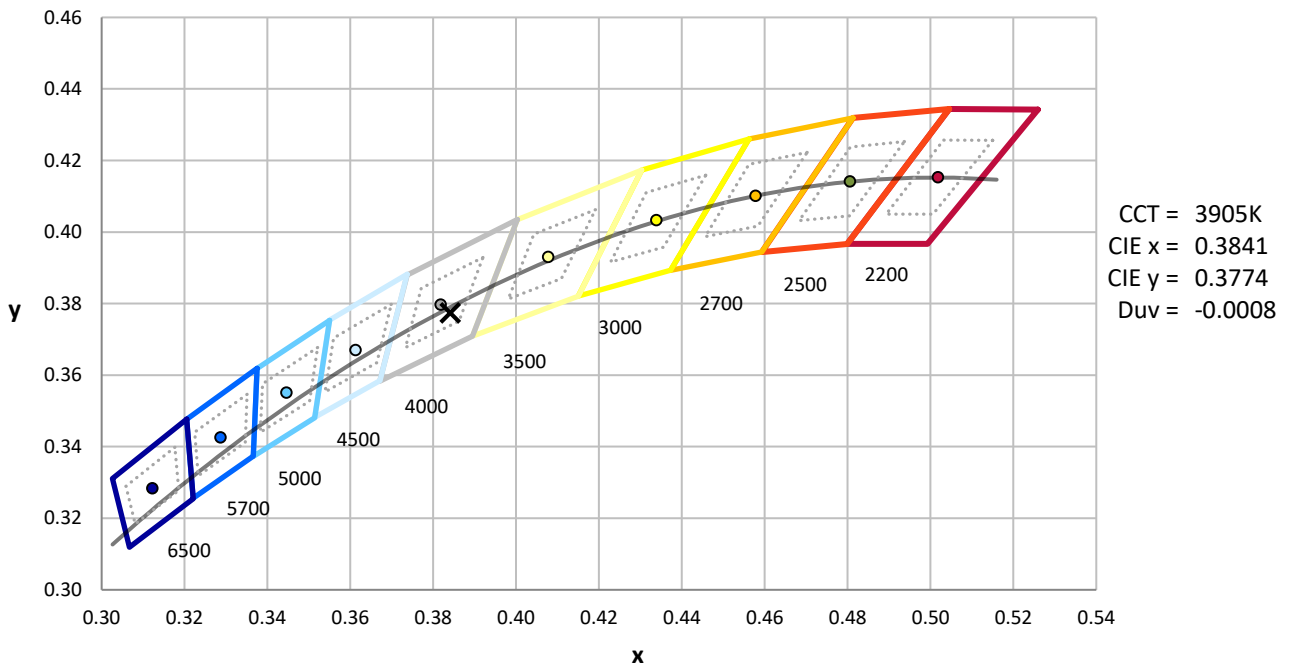
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date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

**CIE 1931 Chromaticity Diagram**



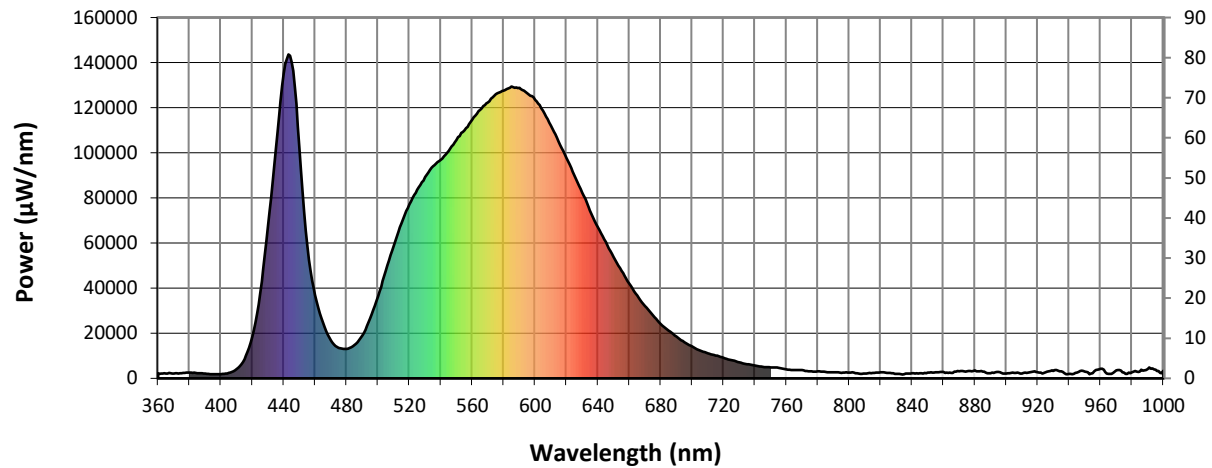
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 4000K 4-step quadrangle

REPORT NUMBER: SP1-2101-121-2

### Photopic Flux vs. Wavelength

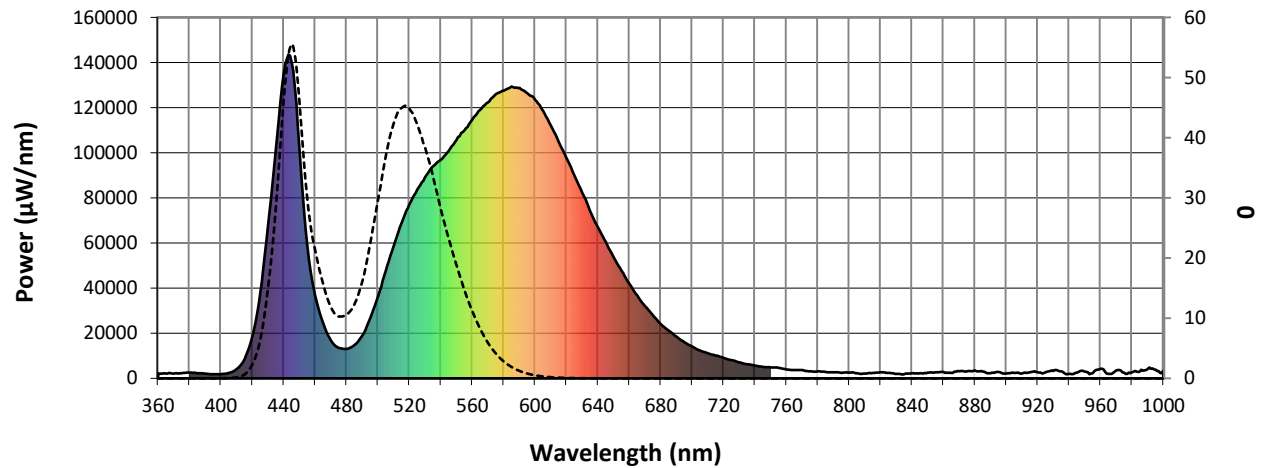


#####

| λ<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

| $\lambda$<br>(nm) | Power<br>( $\mu\text{W/nm}$ ) | Lumens<br>( $\Phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W/nm}$ ) | Lumens<br>( $\Phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W/nm}$ ) | Lumens<br>( $\Phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W/nm}$ ) | Lumens<br>( $\Phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W/nm}$ ) | Lumens<br>( $\Phi/\text{nm}$ ) |
|-------------------|-------------------------------|--------------------------------|-------------------|-------------------------------|--------------------------------|-------------------|-------------------------------|--------------------------------|-------------------|-------------------------------|--------------------------------|-------------------|-------------------------------|--------------------------------|
| 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**

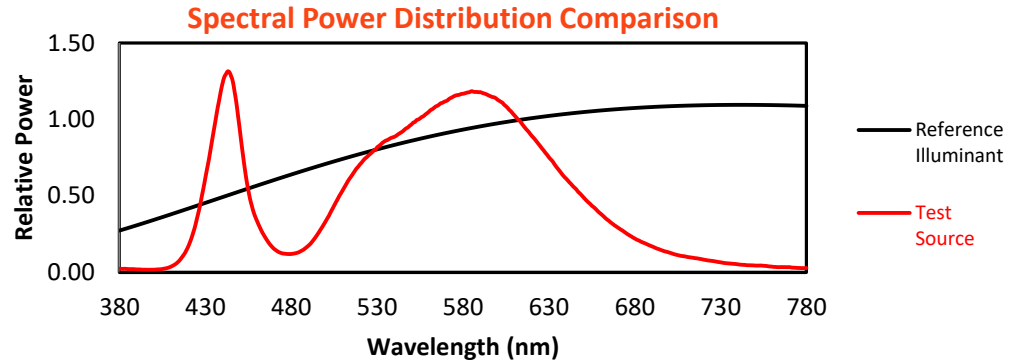
| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 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

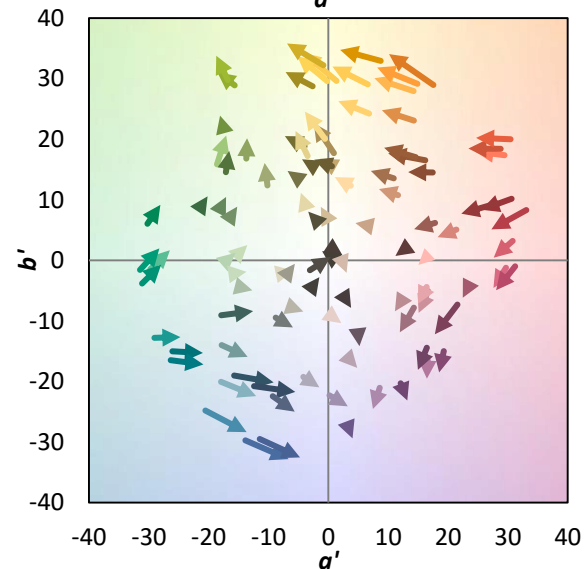
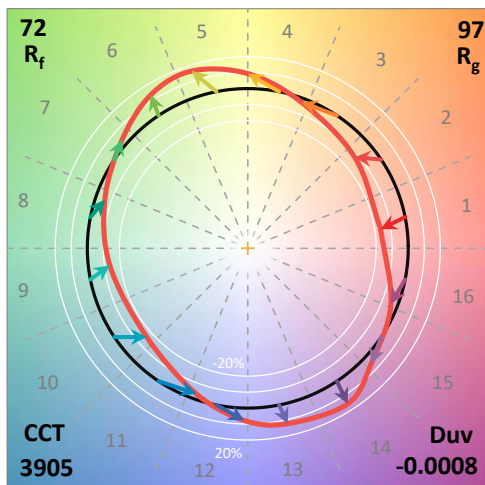
TM-30-18

### Summary

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



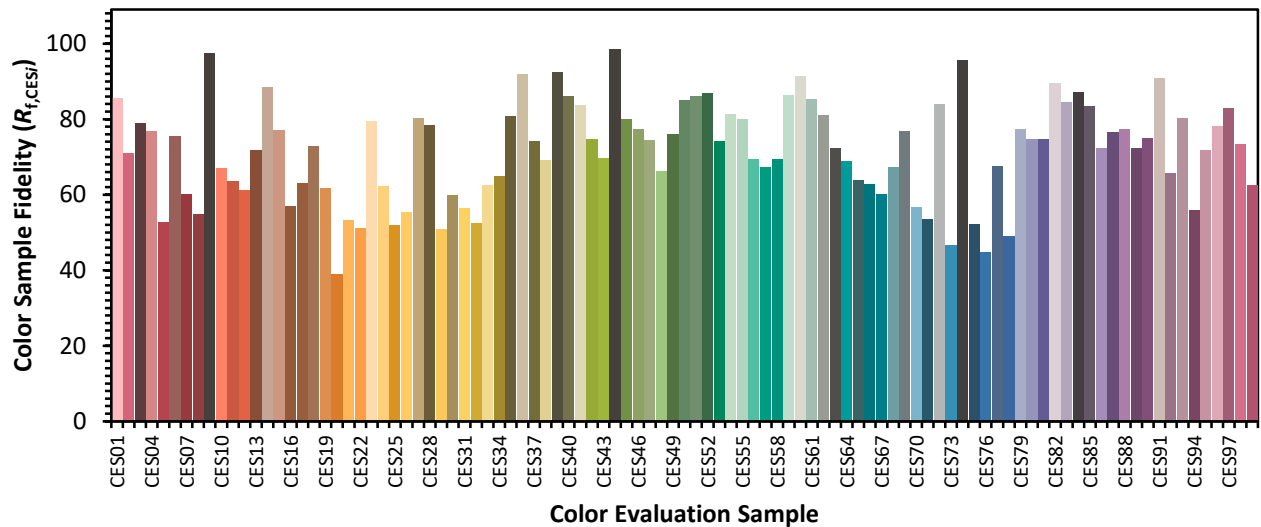
### Color Vector Graphics



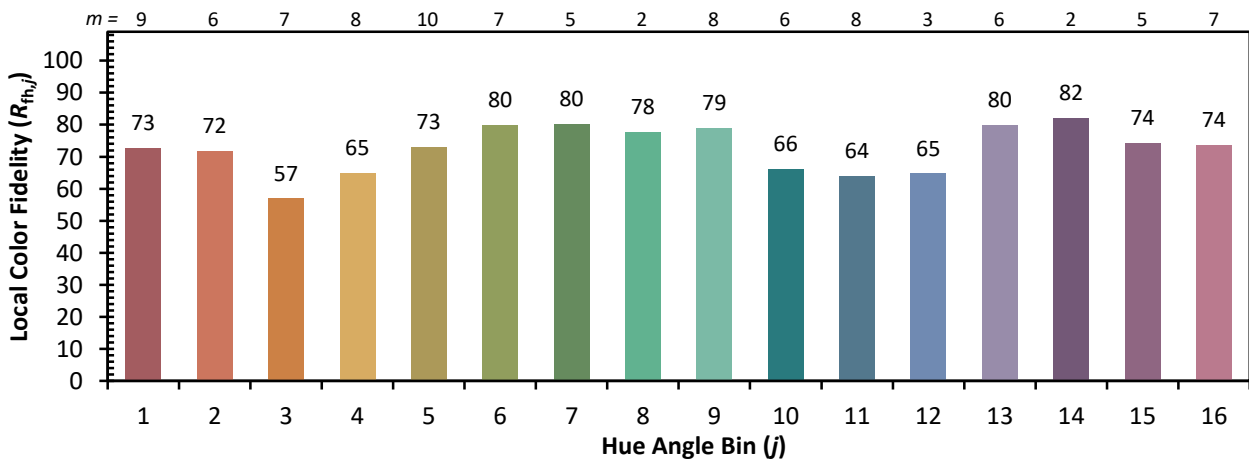
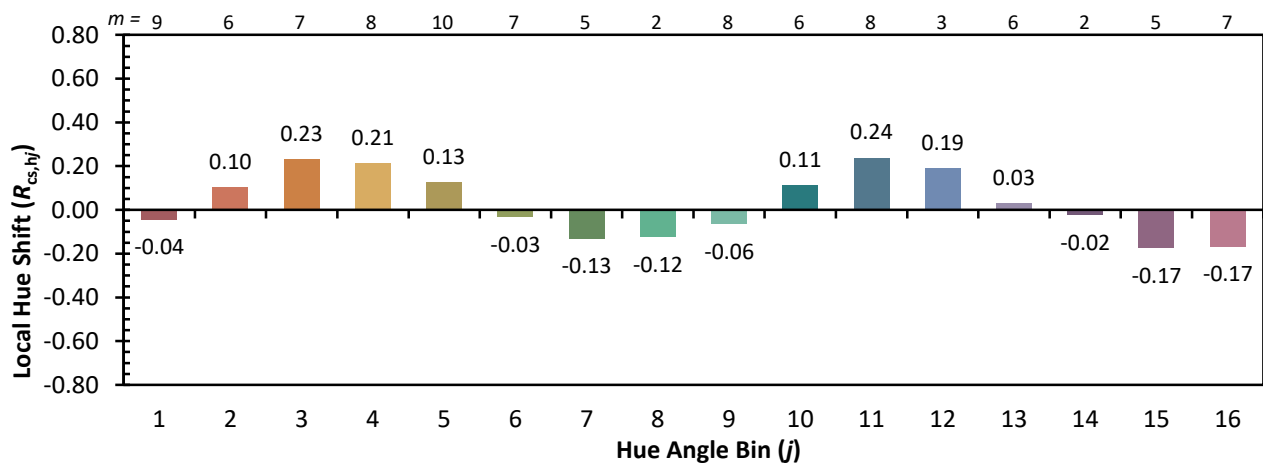
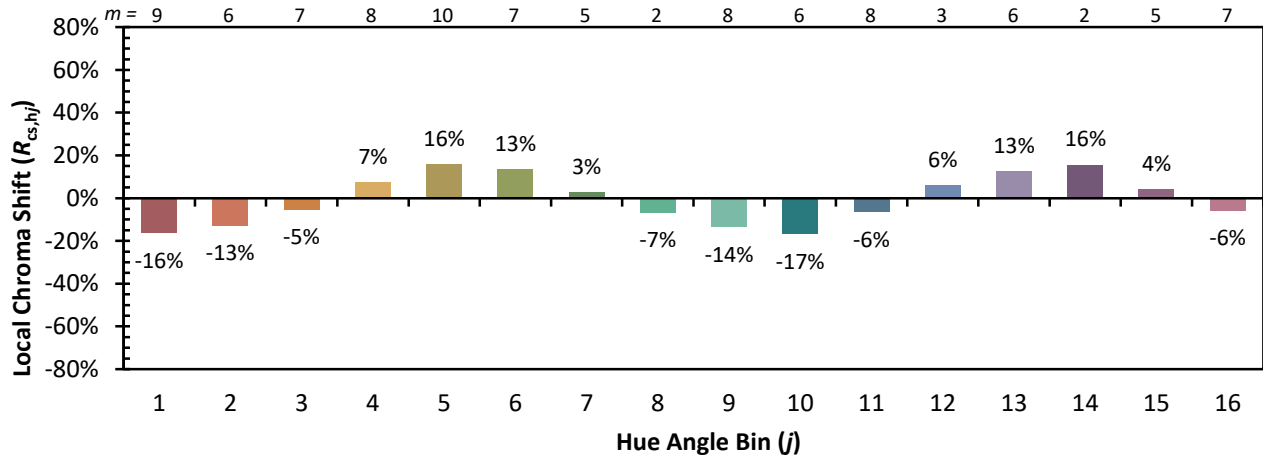


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

|            |            |            |            |
|------------|------------|------------|------------|
| 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)