

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: P321255

Luminaire Tested: **GLEON-SA1D-730-U-T2R-HSS**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P321255  
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-730-U-T2R-HSS  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(1) 70 CRI, 3000K, 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: 5970 lumens  
Efficiency: N/A  
Efficacy: 89.1 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

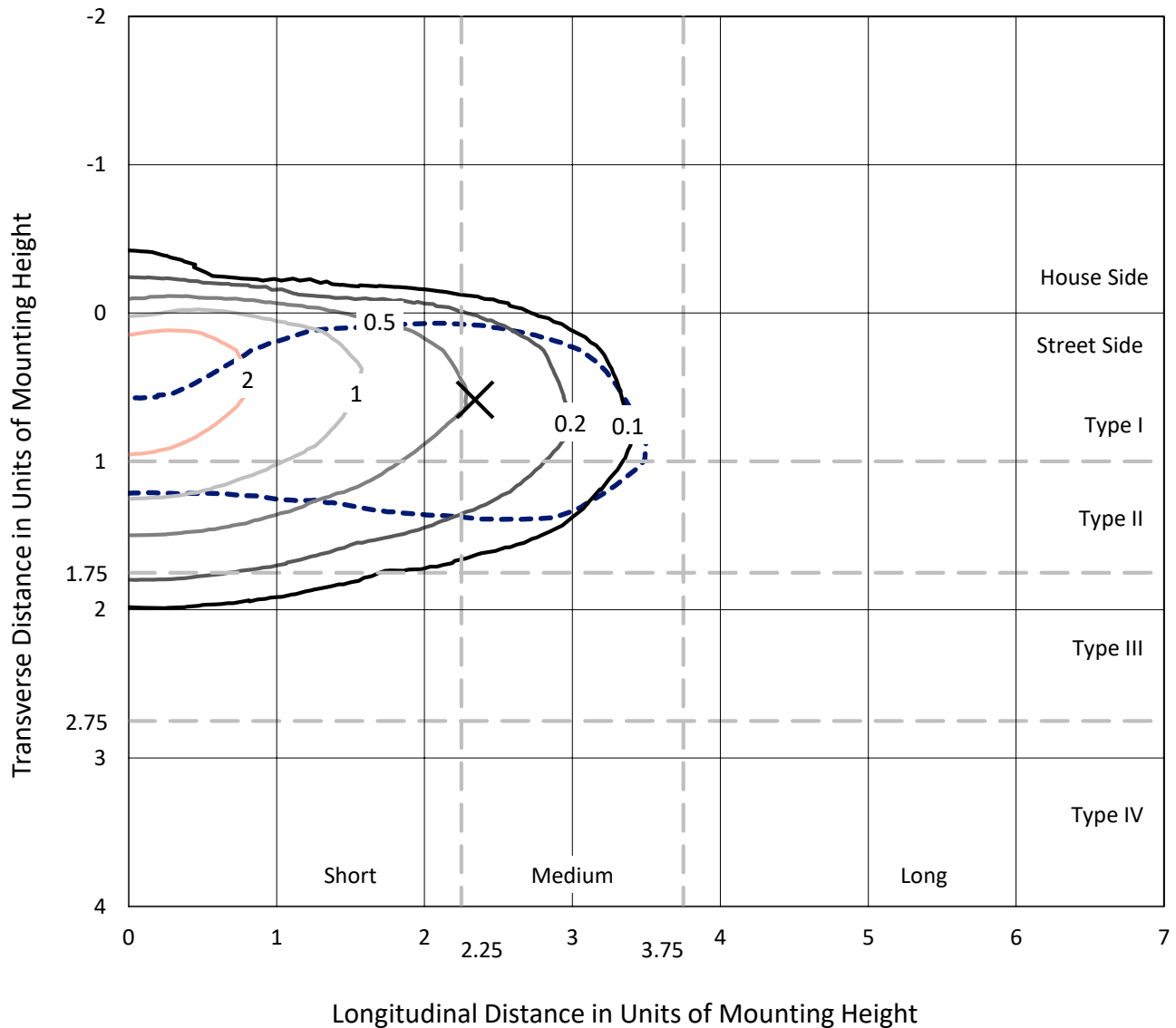
Input Watts (W): 67  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



REPORT NUMBER: P321255  
 CATALOG NUMBER: GLEON-SA1D-730-U-T2R-HSS

## Iso-Footcandle Lines of Horizontal Illumination

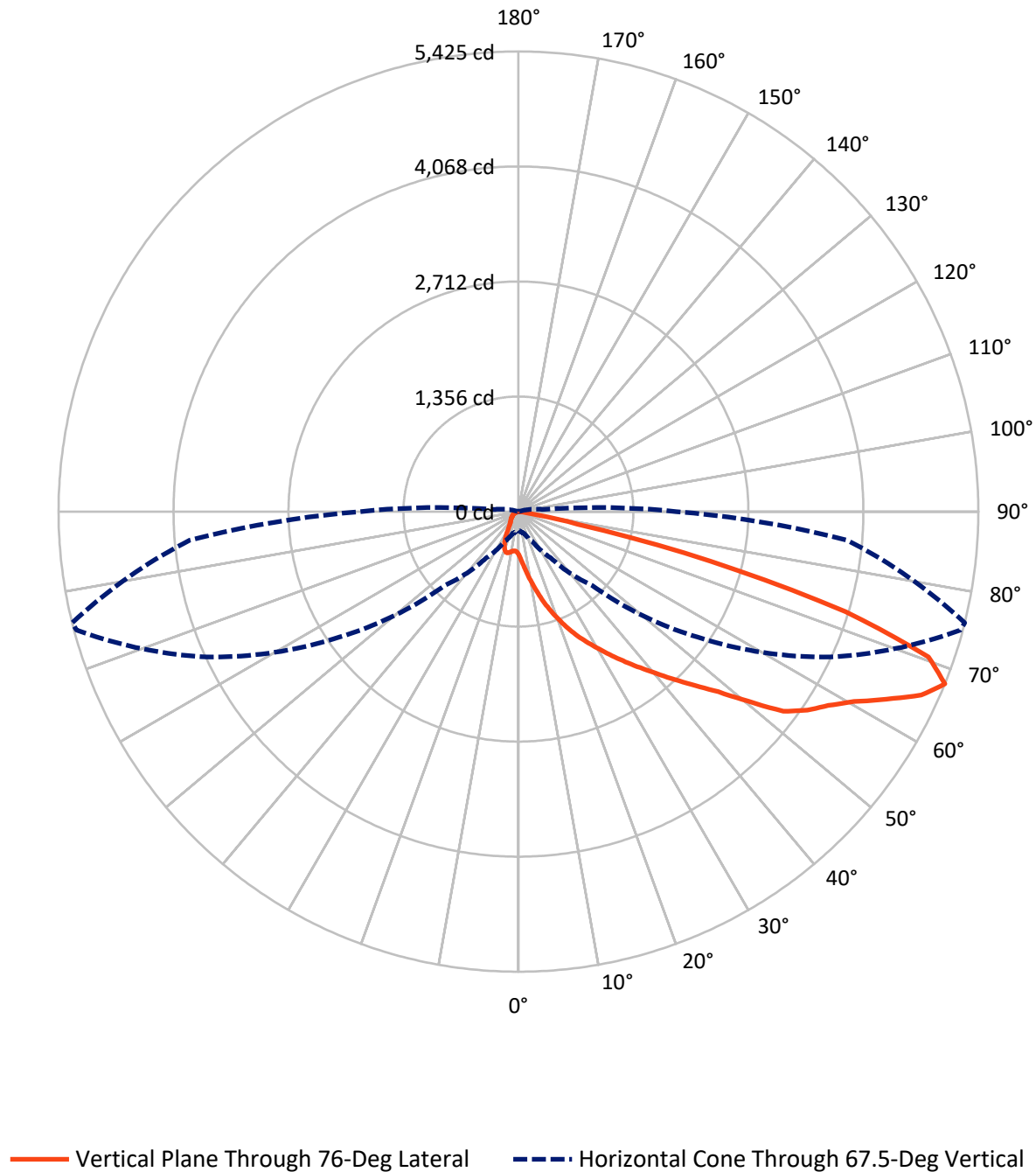
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 2.9 fc  
 Type II - Medium - N/A

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## Luminous Intensity Polar Plot



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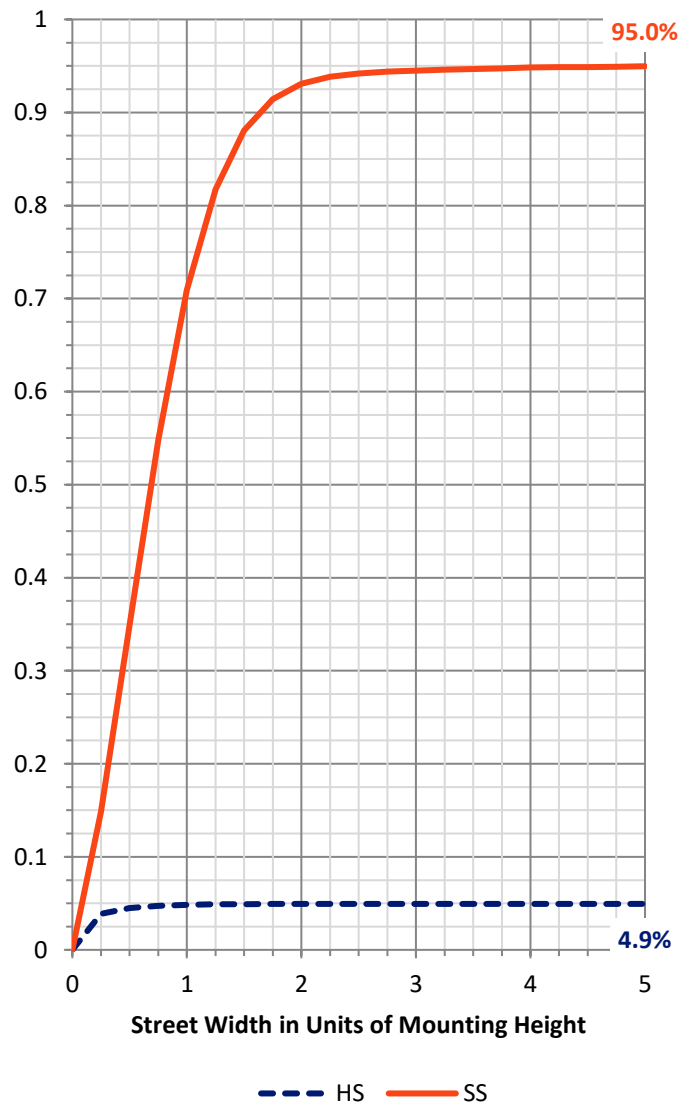
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 296.5    | 0.0    | 296.5  |
|                    | % Fixture | 5.0      | 0.0    | 5.0    |
| <b>Street Side</b> | Lumens    | 5673.5   | 0.0    | 5673.5 |
|                    | % Fixture | 95.0     | 0.0    | 95.0   |
| <b>Total</b>       | Lumens    | 5970.0   | 0.0    | 5970.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 63.0   | 1.1       |
| 10°-20°   | 249.6  | 4.2       |
| 20°-30°   | 507.9  | 8.5       |
| 30°-40°   | 881.6  | 14.8      |
| 40°-50°   | 1245.6 | 20.9      |
| 50°-60°   | 1412.6 | 23.7      |
| 60°-70°   | 1171.6 | 19.6      |
| 70°-80°   | 424.4  | 7.1       |
| 80°-90°   | 13.8   | 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°    | 5970.0 | 100.0     |
| 0°-180°   | 5970.0 | 100.0     |

**Coefficient of Utilization**



REPORT NUMBER: P321255

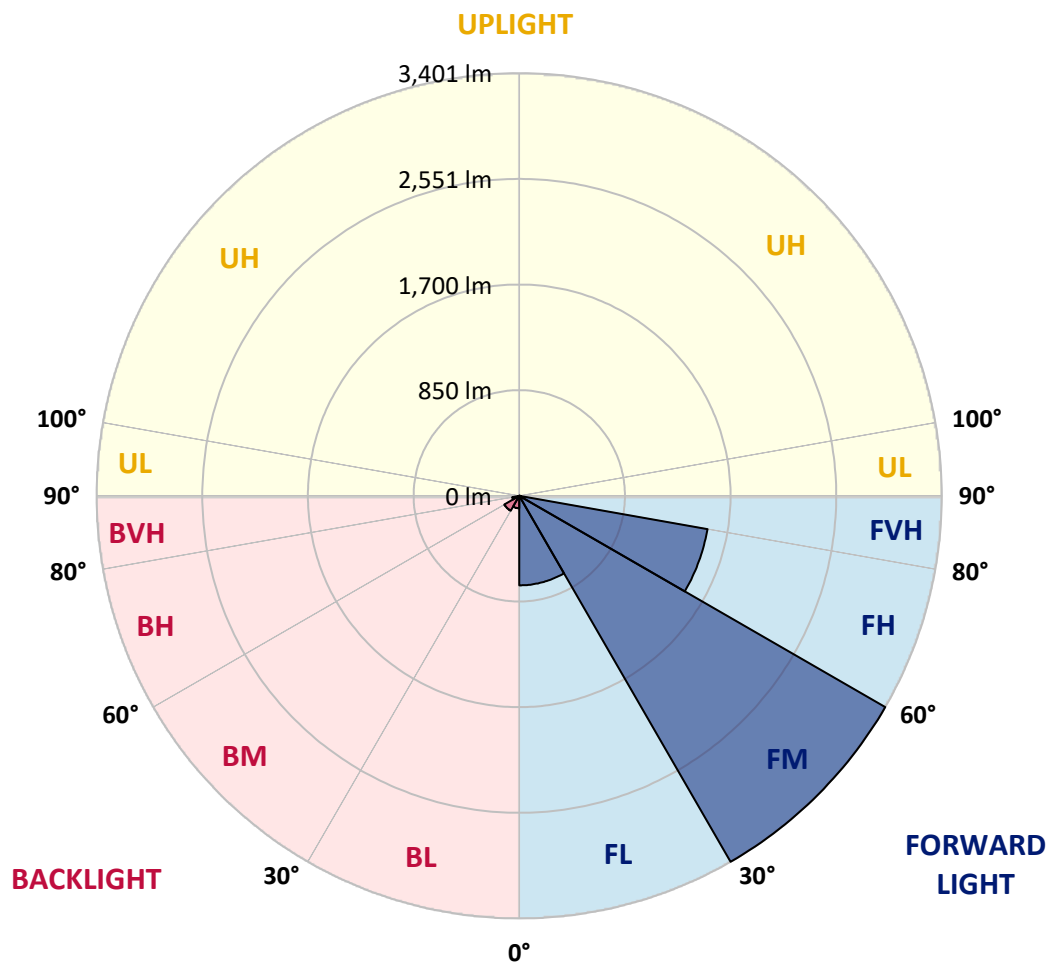
CATALOG NUMBER: GLEON-SA1D-730-U-T2R-HSS

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 720.6  | 12.1      |                         |      |         |
| FM   | (30°-60°)   | 3401.0 | 57.0      |                         |      |         |
| FH   | (60°-80°)   | 1538.7 | 25.8      |                         |      | G1/1800 |
| FVH  | (80°-90°)   | 13.3   | 0.2       |                         |      | G1/100  |
| BL   | (0°-30°)    | 100.0  | 1.7       | B0/110                  |      |         |
| BM   | (30°-60°)   | 138.7  | 2.3       | B0/220                  |      |         |
| BH   | (60°-80°)   | 57.3   | 1.0       | B0/110                  |      | G0/110  |
| BVH  | (80°-90°)   | 0.4    | 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: P321255

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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 75°    | 76°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 506.4  | 506.4  | 506.4  | 506.4  | 506.4  | 506.4  | 506.4  | 506.4  | 506.4  | 506.4  | 506.4  |
| 2.5°  | 756.0  | 739.0  | 742.9  | 731.9  | 712.0  | 671.2  | 636.4  | 603.5  | 565.0  | 563.7  | 532.1  |
| 5°    | 1019.4 | 1005.0 | 1003.2 | 980.9  | 944.8  | 875.5  | 808.0  | 731.1  | 645.3  | 639.1  | 571.8  |
| 7.5°  | 1258.5 | 1247.0 | 1242.8 | 1216.4 | 1149.1 | 1081.7 | 993.8  | 880.8  | 746.6  | 735.1  | 625.5  |
| 10°   | 1442.1 | 1436.6 | 1437.7 | 1418.8 | 1361.3 | 1298.5 | 1183.1 | 1039.0 | 861.4  | 843.6  | 689.8  |
| 12.5° | 1581.3 | 1582.6 | 1592.0 | 1580.5 | 1548.3 | 1501.8 | 1378.6 | 1207.7 | 988.5  | 964.2  | 763.3  |
| 15°   | 1683.6 | 1690.1 | 1707.4 | 1721.8 | 1719.4 | 1679.1 | 1566.1 | 1379.1 | 1123.5 | 1096.6 | 845.2  |
| 17.5° | 1749.7 | 1757.1 | 1782.2 | 1814.1 | 1843.4 | 1834.0 | 1747.1 | 1544.4 | 1260.1 | 1228.9 | 932.8  |
| 20°   | 1807.8 | 1816.4 | 1843.4 | 1885.5 | 1940.2 | 1951.9 | 1894.9 | 1704.8 | 1396.3 | 1358.4 | 1023.3 |
| 22.5° | 1933.6 | 1933.4 | 1949.9 | 1974.4 | 2026.5 | 2056.8 | 2020.7 | 1853.6 | 1531.1 | 1491.6 | 1115.7 |
| 25°   | 2161.2 | 2152.6 | 2146.8 | 2127.5 | 2139.0 | 2157.8 | 2137.7 | 1992.8 | 1666.6 | 1626.5 | 1209.3 |
| 27.5° | 2431.7 | 2436.9 | 2390.4 | 2338.3 | 2298.0 | 2278.7 | 2245.7 | 2121.7 | 1796.8 | 1752.9 | 1300.9 |
| 30°   | 2717.1 | 2718.7 | 2663.7 | 2597.3 | 2508.6 | 2435.1 | 2378.1 | 2244.9 | 1930.8 | 1882.9 | 1389.8 |
| 32.5° | 2974.5 | 2964.3 | 2909.9 | 2819.4 | 2707.4 | 2624.7 | 2506.2 | 2382.5 | 2072.5 | 2026.2 | 1488.7 |
| 35°   | 3178.5 | 3166.5 | 3100.3 | 3017.9 | 2901.8 | 2818.6 | 2676.0 | 2519.9 | 2221.6 | 2176.4 | 1587.8 |
| 37.5° | 3327.6 | 3313.5 | 3245.5 | 3160.7 | 3060.5 | 3012.2 | 2873.0 | 2669.2 | 2384.3 | 2335.7 | 1692.2 |
| 40°   | 3379.4 | 3367.1 | 3324.5 | 3262.5 | 3181.9 | 3170.9 | 3082.0 | 2841.1 | 2561.4 | 2509.6 | 1810.4 |
| 42.5° | 3348.6 | 3336.5 | 3321.3 | 3300.4 | 3266.9 | 3277.4 | 3279.2 | 3037.0 | 2758.2 | 2707.1 | 1941.0 |
| 45°   | 3226.1 | 3215.4 | 3231.1 | 3261.7 | 3303.3 | 3355.1 | 3459.2 | 3247.6 | 2977.9 | 2923.5 | 2091.9 |
| 47.5° | 3045.9 | 3038.1 | 3081.5 | 3157.9 | 3279.5 | 3422.3 | 3623.7 | 3468.9 | 3224.6 | 3174.1 | 2280.2 |
| 50°   | 2789.5 | 2788.2 | 2875.1 | 3014.5 | 3201.5 | 3454.8 | 3793.8 | 3720.5 | 3567.2 | 3514.1 | 2542.1 |
| 52.5° | 2390.4 | 2393.0 | 2563.8 | 2786.9 | 3064.7 | 3432.8 | 3903.1 | 4043.8 | 3965.9 | 3910.7 | 2768.9 |
| 55°   | 2010.3 | 2026.0 | 2147.1 | 2468.8 | 2854.9 | 3351.2 | 3940.8 | 4194.8 | 4185.9 | 4133.6 | 2895.0 |
| 57.5° | 1638.0 | 1666.6 | 1783.2 | 2083.8 | 2548.6 | 3163.1 | 3920.1 | 4260.2 | 4349.6 | 4309.6 | 3061.3 |
| 60°   | 1234.7 | 1247.8 | 1382.2 | 1663.2 | 2155.5 | 2819.9 | 3770.2 | 4295.8 | 4573.6 | 4545.8 | 3302.8 |
| 62.5° | 785.5  | 818.2  | 937.5  | 1208.5 | 1678.3 | 2343.3 | 3517.5 | 4295.2 | 4853.7 | 4868.9 | 3614.3 |
| 65°   | 413.8  | 452.0  | 515.3  | 748.9  | 1153.3 | 1811.0 | 3137.5 | 4254.9 | 5197.4 | 5218.6 | 3857.9 |
| 67.5° | 223.1  | 234.1  | 267.6  | 388.7  | 668.9  | 1226.8 | 2579.0 | 4056.1 | 5396.5 | 5424.5 | 3891.9 |
| 70°   | 163.2  | 169.2  | 181.8  | 215.0  | 336.7  | 712.6  | 1881.8 | 3605.4 | 5139.9 | 5129.4 | 3457.9 |
| 72.5° | 125.3  | 134.7  | 144.1  | 157.5  | 193.6  | 380.3  | 1171.6 | 2823.3 | 4101.1 | 4032.1 | 2584.7 |
| 75°   | 98.9   | 100.4  | 113.8  | 125.8  | 145.2  | 216.6  | 520.3  | 1644.3 | 2503.1 | 2339.6 | 1340.4 |
| 77.5° | 79.0   | 80.0   | 87.9   | 98.4   | 116.7  | 142.3  | 161.1  | 646.9  | 799.1  | 713.1  | 290.9  |
| 80°   | 46.8   | 49.4   | 65.4   | 75.9   | 96.8   | 89.7   | 58.9   | 140.5  | 124.8  | 113.0  | 48.9   |
| 82.5° | 26.2   | 28.3   | 36.9   | 59.9   | 67.5   | 42.9   | 29.3   | 37.9   | 29.3   | 28.5   | 13.9   |
| 85°   | 0.0    | 1.3    | 23.8   | 37.1   | 27.5   | 9.4    | 12.3   | 12.6   | 8.6    | 8.1    | 5.5    |
| 87.5° | 0.0    | 0.0    | 7.3    | 7.1    | 1.0    | 1.6    | 2.9    | 4.2    | 3.4    | 3.4    | 2.9    |
| 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: P321255

CATALOG NUMBER: GLEON-SA1D-730-U-T2R-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°   | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 506.4  | 506.4 | 506.4 | 506.4 | 506.4 | 506.4 | 506.4 | 506.4 | 506.4 | 506.4 | 506.4 |
| 2.5°  | 516.4  | 502.2 | 475.6 | 449.4 | 427.4 | 409.4 | 393.2 | 386.6 | 381.4 | 380.6 | 376.4 |
| 5°    | 539.4  | 510.9 | 459.9 | 418.0 | 390.0 | 370.1 | 353.1 | 342.7 | 334.6 | 331.4 | 328.6 |
| 7.5°  | 574.2  | 531.0 | 457.8 | 409.6 | 376.2 | 342.7 | 311.3 | 277.3 | 256.1 | 248.0 | 243.3 |
| 10°   | 616.6  | 557.7 | 465.6 | 407.3 | 348.7 | 278.1 | 226.0 | 182.8 | 165.3 | 159.6 | 158.0 |
| 12.5° | 666.0  | 590.9 | 479.2 | 392.6 | 290.1 | 197.5 | 155.9 | 141.3 | 137.3 | 135.5 | 135.5 |
| 15°   | 722.8  | 627.3 | 488.9 | 350.3 | 214.5 | 149.4 | 135.0 | 128.2 | 124.0 | 121.6 | 121.9 |
| 17.5° | 780.8  | 662.9 | 484.2 | 288.8 | 158.3 | 132.9 | 122.2 | 114.8 | 109.1 | 106.7 | 106.2 |
| 20°   | 839.4  | 695.8 | 458.0 | 215.0 | 133.9 | 120.6 | 108.6 | 100.4 | 94.7  | 92.3  | 91.8  |
| 22.5° | 900.1  | 723.8 | 412.0 | 157.7 | 120.3 | 107.0 | 95.2  | 87.1  | 81.6  | 79.5  | 78.5  |
| 25°   | 959.2  | 746.6 | 347.6 | 127.7 | 107.5 | 94.2  | 82.9  | 75.3  | 70.4  | 68.3  | 68.0  |
| 27.5° | 1014.4 | 761.0 | 273.1 | 112.7 | 96.3  | 82.7  | 72.5  | 65.7  | 61.5  | 59.9  | 59.6  |
| 30°   | 1064.1 | 762.3 | 201.9 | 101.8 | 86.3  | 72.7  | 63.3  | 57.3  | 53.6  | 52.1  | 51.5  |
| 32.5° | 1114.4 | 751.3 | 147.0 | 91.8  | 77.2  | 64.1  | 54.9  | 50.2  | 47.6  | 46.3  | 46.3  |
| 35°   | 1161.7 | 725.9 | 114.6 | 83.2  | 68.3  | 55.7  | 48.4  | 45.0  | 43.4  | 42.1  | 42.1  |
| 37.5° | 1208.0 | 689.5 | 97.3  | 75.6  | 59.9  | 48.7  | 42.6  | 40.5  | 39.2  | 37.9  | 37.9  |
| 40°   | 1255.1 | 643.8 | 88.4  | 68.5  | 53.1  | 43.2  | 37.9  | 36.1  | 34.8  | 33.7  | 33.5  |
| 42.5° | 1312.9 | 590.9 | 82.7  | 62.0  | 47.1  | 38.2  | 33.5  | 31.4  | 30.3  | 29.3  | 28.8  |
| 45°   | 1379.9 | 545.4 | 78.0  | 55.5  | 42.1  | 34.0  | 29.0  | 26.9  | 25.4  | 24.1  | 23.8  |
| 47.5° | 1476.4 | 512.4 | 71.7  | 48.4  | 37.4  | 29.6  | 25.1  | 22.8  | 20.4  | 19.1  | 18.8  |
| 50°   | 1599.6 | 485.2 | 63.6  | 42.1  | 32.7  | 25.1  | 20.9  | 18.0  | 16.0  | 14.6  | 14.6  |
| 52.5° | 1660.8 | 449.7 | 56.2  | 36.6  | 27.5  | 21.2  | 17.0  | 13.6  | 12.6  | 11.2  | 11.2  |
| 55°   | 1685.4 | 422.5 | 48.9  | 31.1  | 22.8  | 17.5  | 13.3  | 10.5  | 9.7   | 8.9   | 8.6   |
| 57.5° | 1754.5 | 414.6 | 42.6  | 26.4  | 18.8  | 13.9  | 10.2  | 7.8   | 7.3   | 6.3   | 6.3   |
| 60°   | 1865.6 | 418.5 | 36.9  | 22.5  | 15.2  | 10.7  | 7.6   | 6.0   | 5.5   | 4.4   | 4.4   |
| 62.5° | 1985.7 | 413.6 | 31.1  | 19.4  | 11.8  | 7.8   | 5.2   | 4.4   | 4.4   | 2.6   | 2.4   |
| 65°   | 2008.7 | 368.3 | 26.7  | 16.0  | 9.2   | 5.8   | 3.4   | 2.9   | 3.9   | 0.5   | 0.0   |
| 67.5° | 1864.3 | 285.7 | 23.0  | 12.3  | 6.8   | 4.4   | 2.6   | 1.3   | 3.4   | 0.0   | 0.0   |
| 70°   | 1490.8 | 181.5 | 18.6  | 8.9   | 5.2   | 3.7   | 2.1   | 0.5   | 2.6   | 0.0   | 0.0   |
| 72.5° | 1054.2 | 105.4 | 14.6  | 6.3   | 4.4   | 2.9   | 1.6   | 0.0   | 1.6   | 0.0   | 0.0   |
| 75°   | 533.1  | 56.2  | 9.2   | 4.7   | 3.4   | 2.1   | 1.0   | 0.0   | 0.3   | 0.0   | 0.0   |
| 77.5° | 115.4  | 26.2  | 5.8   | 3.4   | 2.4   | 1.3   | 0.5   | 0.0   | 0.0   | 0.0   | 0.0   |
| 80°   | 25.1   | 11.5  | 3.7   | 2.1   | 1.3   | 0.8   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 82.5° | 9.2    | 6.0   | 1.8   | 1.0   | 0.5   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 85°   | 5.0    | 3.1   | 1.0   | 0.5   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 87.5° | 2.6    | 1.0   | 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-79-2008: Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Report Prepared for

Cooper Lighting Solutions

McGRAW-EDISON

Report Number: SP1-1908-441-2-R4

Test Date: 10/03/2019

Luminaire Tested: SA1C-730-U-5WQ

Data in this report applies to families of products SA1C-730-U-5WQ .

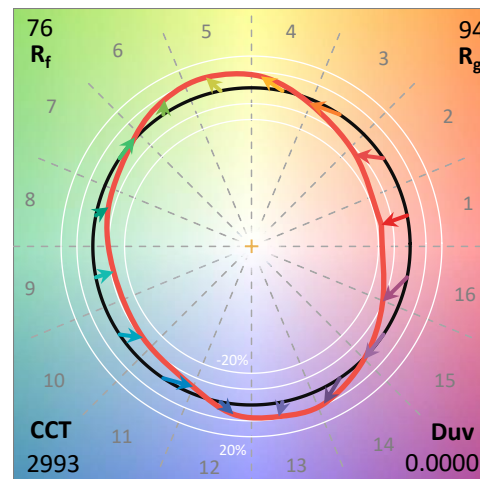
### Test Information

Test Method: LM-79-2008  
 Report Number: SP1-1908-441-2-R4  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry:  $4\pi$   
 Issue Date: 10/28/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: MCGRAW-EDISON  
 Catalog Number: **SA1C-730-U-5WQ**  
 Description: MCGRAW EDISON ROADWAY AND AREA LUMINAIRE

\*\*\*THIS IS A REVISION OF SP1-1908-441-2-R3. TO UPDATE THE CATALOG INFORMATION.\*\*\*TESTED IN SITU. (1) 70 CRI, 3000K, 1050MA LIGHTSQUARE WITH 16 LEDS AND TYPE V WIDE OPTICS.

### Spectral Parameters

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 2993   | CRI (Ra): | 71.8 |      |       |
| CIE u':                   | 0.2508 | R1:       | 67.5 | R9:  | -38.3 |
| CIE v':                   | 0.5215 | R2:       | 82.9 | R10: | 62.5  |
| Duv:                      | 0.0000 | R3:       | 94.7 | R11: | 63.7  |
| CIE x:                    | 0.4374 | R4:       | 67.7 | R12: | 57.8  |
| CIE y:                    | 0.4043 | R5:       | 67.9 | R13: | 70.4  |
| CIE z:                    | 0.1583 | R6:       | 77.6 | R14: | 97.3  |
| Peak Wavelength (nm):     | 593    | R7:       | 76.0 |      |       |
| Dominant Wavelength (nm): | 582    | R8:       | 40.5 |      |       |
| Purity:                   | 53     |           |      |      |       |
| Rf:                       | 75.7   |           |      |      |       |
| Rg:                       | 93.9   |           |      |      |       |



### Test Conditions

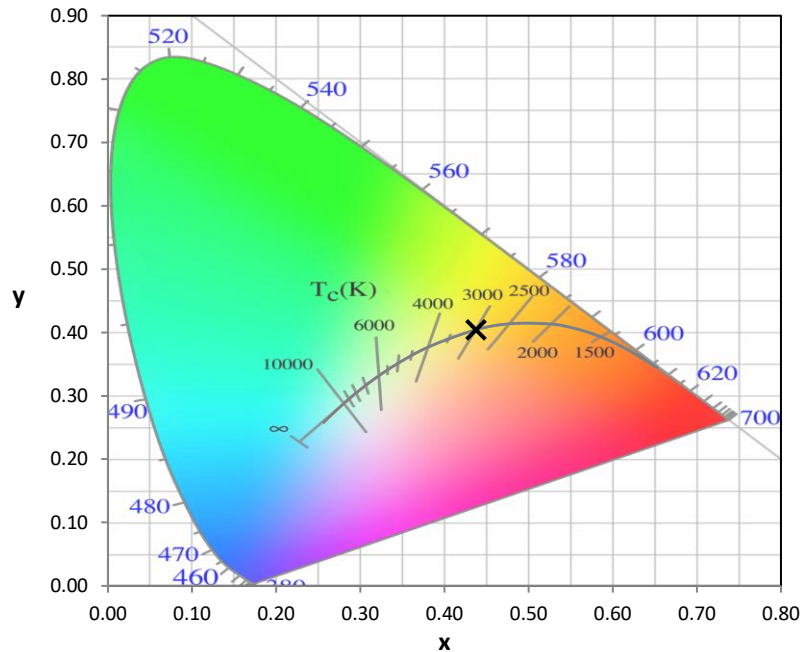
Stabilization Time: 53M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.0./44%  
 Sphere Temperature (°C): 25.7

REPORT NUMBER: SP1-1908-441-2-R4

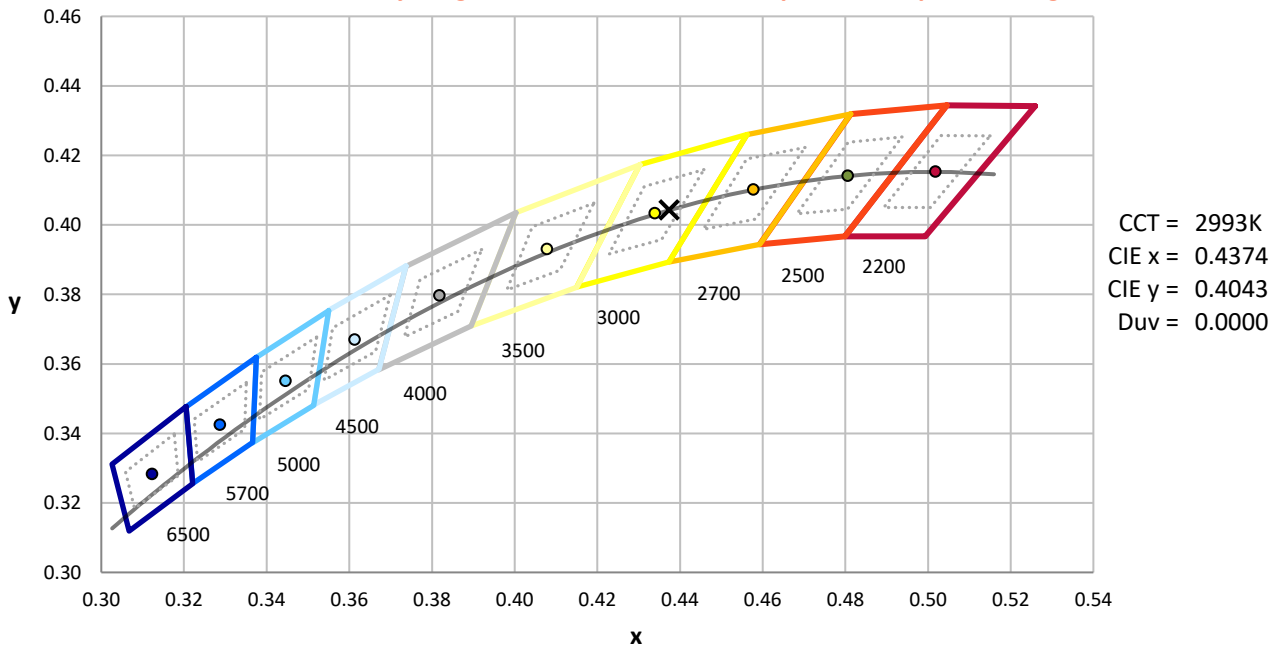
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 6/28/2019        | 12/28/2019           |
| Power Meter                    | IN0071                | 12/5/2018        | 12/5/2019            |
| AC Power Source                | IN0063                | 12/5/2018        | 12/5/2019            |
| DC Power Source                | IN0208                | 12/5/2018        | 12/5/2019            |
| Sphere Thermometer             | IN0085                | 12/5/2018        | 12/5/2019            |
| Room Thermometer               | IN0046                | 12/5/2018        | 12/5/2019            |

REPORT NUMBER: SP1-1908-441-2-R4

CIE 1931 Chromaticity Diagram



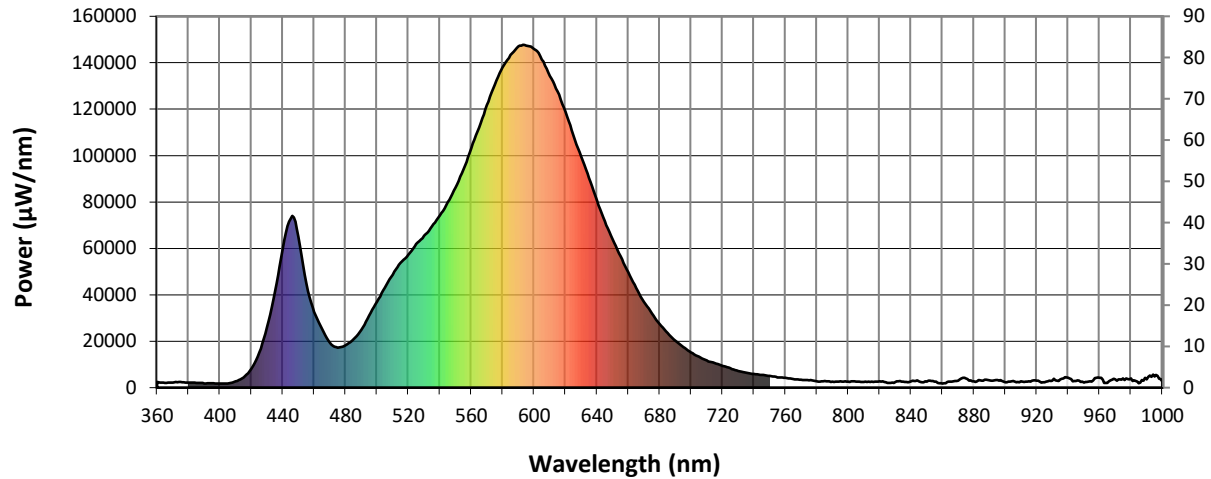
CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies inside the ANSI 3000K 4-step quadrangle

REPORT NUMBER: SP1-1908-441-2-R4

**Photopic Flux vs. Wavelength**

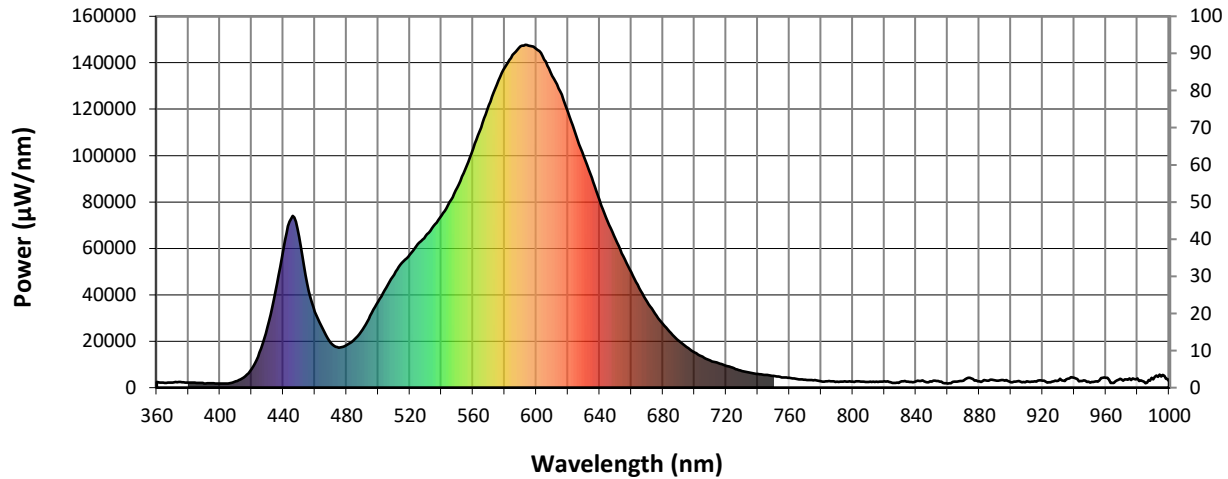


#####

| 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       | 2397             | NR               | 490       | 24908            | NR               | 620       | 118784           | NR               | 750       | 5037             | NR               | 880       | 2677             | NR               |
| 365       | 2084             | NR               | 495       | 30998            | NR               | 625       | 108951           | NR               | 755       | 4413             | NR               | 885       | 2940             | NR               |
| 370       | 2143             | NR               | 500       | 37103            | NR               | 630       | 99573            | NR               | 760       | 4189             | NR               | 890       | 3116             | NR               |
| 375       | 2413             | NR               | 505       | 42987            | NR               | 635       | 90444            | NR               | 765       | 3677             | NR               | 895       | 3345             | NR               |
| 380       | 2172             | NR               | 510       | 48702            | NR               | 640       | 80749            | NR               | 770       | 3366             | NR               | 900       | 2312             | NR               |
| 385       | 1997             | NR               | 515       | 53741            | NR               | 645       | 71664            | NR               | 775       | 3211             | NR               | 905       | 2829             | NR               |
| 390       | 1830             | NR               | 520       | 57283            | NR               | 650       | 63936            | NR               | 780       | 2682             | NR               | 910       | 2783             | NR               |
| 395       | 1861             | NR               | 525       | 61876            | NR               | 655       | 56611            | NR               | 785       | 2804             | NR               | 915       | 2662             | NR               |
| 400       | 1717             | NR               | 530       | 65398            | NR               | 660       | 49763            | NR               | 790       | 2581             | NR               | 920       | 3047             | NR               |
| 405       | 1761             | NR               | 535       | 69597            | NR               | 665       | 42891            | NR               | 795       | 2711             | NR               | 925       | 2256             | NR               |
| 410       | 2680             | NR               | 540       | 74214            | NR               | 670       | 36939            | NR               | 800       | 2609             | NR               | 930       | 2976             | NR               |
| 415       | 4374             | NR               | 545       | 79911            | NR               | 675       | 31946            | NR               | 805       | 2581             | NR               | 935       | 3503             | NR               |
| 420       | 8071             | NR               | 550       | 86153            | NR               | 680       | 27385            | NR               | 810       | 2404             | NR               | 940       | 4226             | NR               |
| 425       | 15169            | NR               | 555       | 93952            | NR               | 685       | 23504            | NR               | 815       | 2556             | NR               | 945       | 2930             | NR               |
| 430       | 26038            | NR               | 560       | 102904           | NR               | 690       | 20210            | NR               | 820       | 2742             | NR               | 950       | 2115             | NR               |
| 435       | 41316            | NR               | 565       | 112009           | NR               | 695       | 17459            | NR               | 825       | 2014             | NR               | 955       | 2634             | NR               |
| 440       | 59674            | NR               | 570       | 121662           | NR               | 700       | 15207            | NR               | 830       | 2488             | NR               | 960       | 4200             | NR               |
| 445       | 72751            | NR               | 575       | 130476           | NR               | 705       | 13322            | NR               | 835       | 2625             | NR               | 965       | 1982             | NR               |
| 450       | 65091            | NR               | 580       | 137926           | NR               | 710       | 11676            | NR               | 840       | 2754             | NR               | 970       | 3613             | NR               |
| 455       | 44894            | NR               | 585       | 143406           | NR               | 715       | 10626            | NR               | 845       | 2708             | NR               | 975       | 4034             | NR               |
| 460       | 32712            | NR               | 590       | 147039           | NR               | 720       | 9416             | NR               | 850       | 2608             | NR               | 980       | 3922             | NR               |
| 465       | 25296            | NR               | 595       | 147365           | NR               | 725       | 8333             | NR               | 855       | 2605             | NR               | 985       | 1909             | NR               |
| 470       | 19318            | NR               | 600       | 145800           | NR               | 730       | 7134             | NR               | 860       | 1765             | NR               | 990       | 3617             | NR               |
| 475       | 17265            | NR               | 605       | 141363           | NR               | 735       | 6437             | NR               | 865       | 2581             | NR               | 995       | 4767             | NR               |
| 480       | 18260            | NR               | 610       | 134199           | NR               | 740       | 5834             | NR               | 870       | 3016             | NR               | 1000      | 2528             | NR               |
| 485       | 20845            | NR               | 615       | 127683           | NR               | 745       | 5500             | NR               | 875       | 3952             | NR               |           |                  |                  |

REPORT NUMBER: SP1-1908-441-2-R4

**Scotopic Flux vs. Wavelength**



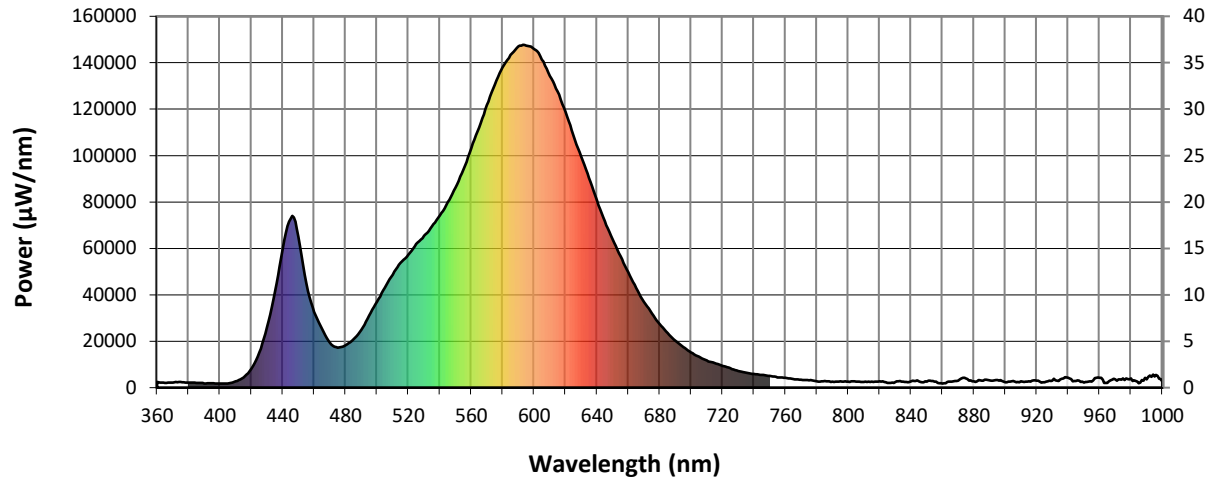
**Scotopic Lumens: 8494.8**

**S/P: 1.23**

| 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       | 2397             | NR               | 490       | 24908            | NR               | 620       | 118784           | NR               | 750       | 5037             | NR               | 880       | 2677             | NR               |
| 365       | 2084             | NR               | 495       | 30998            | NR               | 625       | 108951           | NR               | 755       | 4413             | NR               | 885       | 2940             | NR               |
| 370       | 2143             | NR               | 500       | 37103            | NR               | 630       | 99573            | NR               | 760       | 4189             | NR               | 890       | 3116             | NR               |
| 375       | 2413             | NR               | 505       | 42987            | NR               | 635       | 90444            | NR               | 765       | 3677             | NR               | 895       | 3345             | NR               |
| 380       | 2172             | NR               | 510       | 48702            | NR               | 640       | 80749            | NR               | 770       | 3366             | NR               | 900       | 2312             | NR               |
| 385       | 1997             | NR               | 515       | 53741            | NR               | 645       | 71664            | NR               | 775       | 3211             | NR               | 905       | 2829             | NR               |
| 390       | 1830             | NR               | 520       | 57283            | NR               | 650       | 63936            | NR               | 780       | 2682             | NR               | 910       | 2783             | NR               |
| 395       | 1861             | NR               | 525       | 61876            | NR               | 655       | 56611            | NR               | 785       | 2804             | NR               | 915       | 2662             | NR               |
| 400       | 1717             | NR               | 530       | 65398            | NR               | 660       | 49763            | NR               | 790       | 2581             | NR               | 920       | 3047             | NR               |
| 405       | 1761             | NR               | 535       | 69597            | NR               | 665       | 42891            | NR               | 795       | 2711             | NR               | 925       | 2256             | NR               |
| 410       | 2680             | NR               | 540       | 74214            | NR               | 670       | 36939            | NR               | 800       | 2609             | NR               | 930       | 2976             | NR               |
| 415       | 4374             | NR               | 545       | 79911            | NR               | 675       | 31946            | NR               | 805       | 2581             | NR               | 935       | 3503             | NR               |
| 420       | 8071             | NR               | 550       | 86153            | NR               | 680       | 27385            | NR               | 810       | 2404             | NR               | 940       | 4226             | NR               |
| 425       | 15169            | NR               | 555       | 93952            | NR               | 685       | 23504            | NR               | 815       | 2556             | NR               | 945       | 2930             | NR               |
| 430       | 26038            | NR               | 560       | 102904           | NR               | 690       | 20210            | NR               | 820       | 2742             | NR               | 950       | 2115             | NR               |
| 435       | 41316            | NR               | 565       | 112009           | NR               | 695       | 17459            | NR               | 825       | 2014             | NR               | 955       | 2634             | NR               |
| 440       | 59674            | NR               | 570       | 121662           | NR               | 700       | 15207            | NR               | 830       | 2488             | NR               | 960       | 4200             | NR               |
| 445       | 72751            | NR               | 575       | 130476           | NR               | 705       | 13322            | NR               | 835       | 2625             | NR               | 965       | 1982             | NR               |
| 450       | 65091            | NR               | 580       | 137926           | NR               | 710       | 11676            | NR               | 840       | 2754             | NR               | 970       | 3613             | NR               |
| 455       | 44894            | NR               | 585       | 143406           | NR               | 715       | 10626            | NR               | 845       | 2708             | NR               | 975       | 4034             | NR               |
| 460       | 32712            | NR               | 590       | 147039           | NR               | 720       | 9416             | NR               | 850       | 2608             | NR               | 980       | 3922             | NR               |
| 465       | 25296            | NR               | 595       | 147365           | NR               | 725       | 8333             | NR               | 855       | 2605             | NR               | 985       | 1909             | NR               |
| 470       | 19318            | NR               | 600       | 145800           | NR               | 730       | 7134             | NR               | 860       | 1765             | NR               | 990       | 3617             | NR               |
| 475       | 17265            | NR               | 605       | 141363           | NR               | 735       | 6437             | NR               | 865       | 2581             | NR               | 995       | 4767             | NR               |
| 480       | 18260            | NR               | 610       | 134199           | NR               | 740       | 5834             | NR               | 870       | 3016             | NR               | 1000      | 2528             | NR               |
| 485       | 20845            | NR               | 615       | 127683           | NR               | 745       | 5500             | NR               | 875       | 3952             | NR               |           |                  |                  |

REPORT NUMBER: SP1-1908-441-2-R4

**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 3101.5 M/P: 0.45**

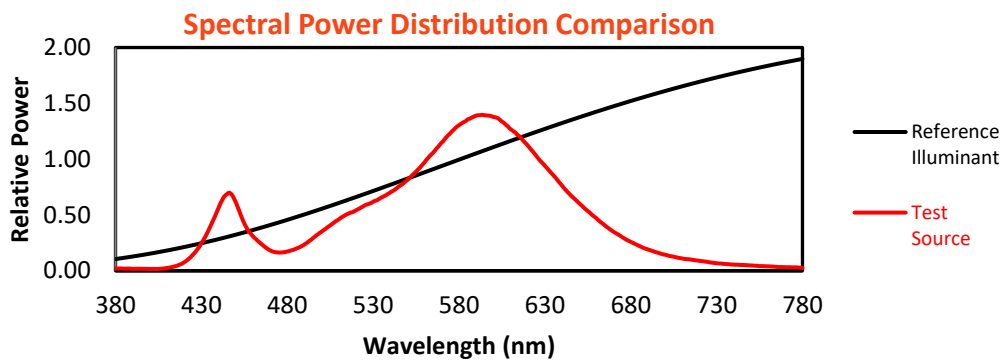
| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 2397             | NR               | 490       | 24908            | NR               | 620       | 118784           | NR               | 750       | 5037             | NR               | 880       | 2677             | NR               |
| 365       | 2084             | NR               | 495       | 30998            | NR               | 625       | 108951           | NR               | 755       | 4413             | NR               | 885       | 2940             | NR               |
| 370       | 2143             | NR               | 500       | 37103            | NR               | 630       | 99573            | NR               | 760       | 4189             | NR               | 890       | 3116             | NR               |
| 375       | 2413             | NR               | 505       | 42987            | NR               | 635       | 90444            | NR               | 765       | 3677             | NR               | 895       | 3345             | NR               |
| 380       | 2172             | NR               | 510       | 48702            | NR               | 640       | 80749            | NR               | 770       | 3366             | NR               | 900       | 2312             | NR               |
| 385       | 1997             | NR               | 515       | 53741            | NR               | 645       | 71664            | NR               | 775       | 3211             | NR               | 905       | 2829             | NR               |
| 390       | 1830             | NR               | 520       | 57283            | NR               | 650       | 63936            | NR               | 780       | 2682             | NR               | 910       | 2783             | NR               |
| 395       | 1861             | NR               | 525       | 61876            | NR               | 655       | 56611            | NR               | 785       | 2804             | NR               | 915       | 2662             | NR               |
| 400       | 1717             | NR               | 530       | 65398            | NR               | 660       | 49763            | NR               | 790       | 2581             | NR               | 920       | 3047             | NR               |
| 405       | 1761             | NR               | 535       | 69597            | NR               | 665       | 42891            | NR               | 795       | 2711             | NR               | 925       | 2256             | NR               |
| 410       | 2680             | NR               | 540       | 74214            | NR               | 670       | 36939            | NR               | 800       | 2609             | NR               | 930       | 2976             | NR               |
| 415       | 4374             | NR               | 545       | 79911            | NR               | 675       | 31946            | NR               | 805       | 2581             | NR               | 935       | 3503             | NR               |
| 420       | 8071             | NR               | 550       | 86153            | NR               | 680       | 27385            | NR               | 810       | 2404             | NR               | 940       | 4226             | NR               |
| 425       | 15169            | NR               | 555       | 93952            | NR               | 685       | 23504            | NR               | 815       | 2556             | NR               | 945       | 2930             | NR               |
| 430       | 26038            | NR               | 560       | 102904           | NR               | 690       | 20210            | NR               | 820       | 2742             | NR               | 950       | 2115             | NR               |
| 435       | 41316            | NR               | 565       | 112009           | NR               | 695       | 17459            | NR               | 825       | 2014             | NR               | 955       | 2634             | NR               |
| 440       | 59674            | NR               | 570       | 121662           | NR               | 700       | 15207            | NR               | 830       | 2488             | NR               | 960       | 4200             | NR               |
| 445       | 72751            | NR               | 575       | 130476           | NR               | 705       | 13322            | NR               | 835       | 2625             | NR               | 965       | 1982             | NR               |
| 450       | 65091            | NR               | 580       | 137926           | NR               | 710       | 11676            | NR               | 840       | 2754             | NR               | 970       | 3613             | NR               |
| 455       | 44894            | NR               | 585       | 143406           | NR               | 715       | 10626            | NR               | 845       | 2708             | NR               | 975       | 4034             | NR               |
| 460       | 32712            | NR               | 590       | 147039           | NR               | 720       | 9416             | NR               | 850       | 2608             | NR               | 980       | 3922             | NR               |
| 465       | 25296            | NR               | 595       | 147365           | NR               | 725       | 8333             | NR               | 855       | 2605             | NR               | 985       | 1909             | NR               |
| 470       | 19318            | NR               | 600       | 145800           | NR               | 730       | 7134             | NR               | 860       | 1765             | NR               | 990       | 3617             | NR               |
| 475       | 17265            | NR               | 605       | 141363           | NR               | 735       | 6437             | NR               | 865       | 2581             | NR               | 995       | 4767             | NR               |
| 480       | 18260            | NR               | 610       | 134199           | NR               | 740       | 5834             | NR               | 870       | 3016             | NR               | 1000      | 2528             | NR               |
| 485       | 20845            | NR               | 615       | 127683           | NR               | 745       | 5500             | NR               | 875       | 3952             | NR               |           |                  |                  |

REPORT NUMBER: SP1-1908-441-2-R4

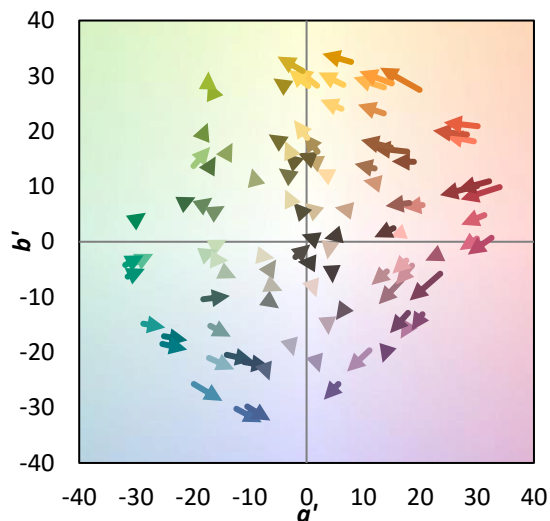
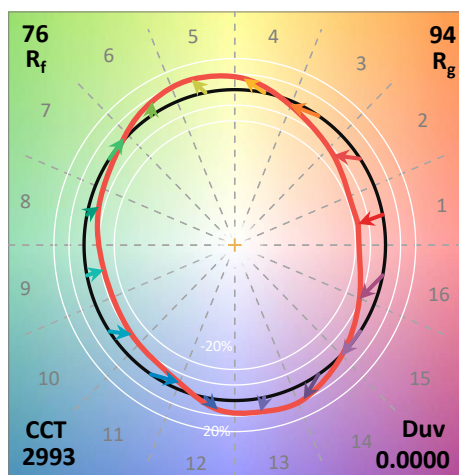
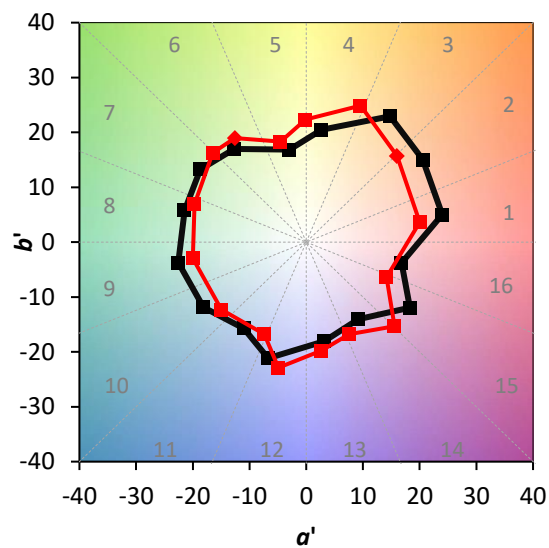
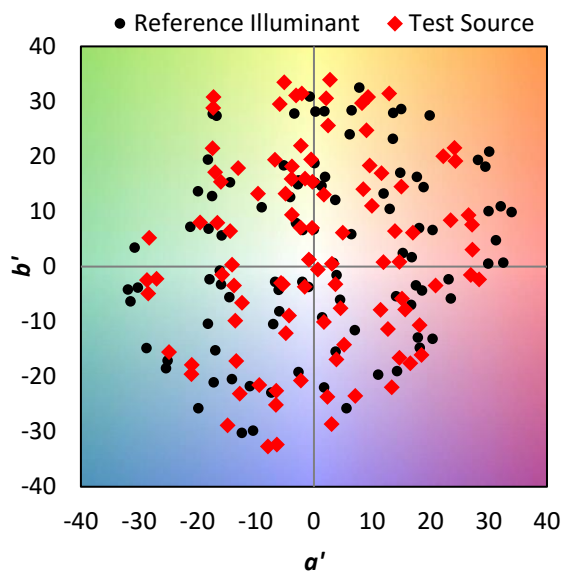
**TM-30-18**

### Summary

$R_f = 75.7$   
 $R_g = 93.9$   
 $CIE R_a = 71.8$   
 $R_g = -38.3$



### Color Vector Graphics



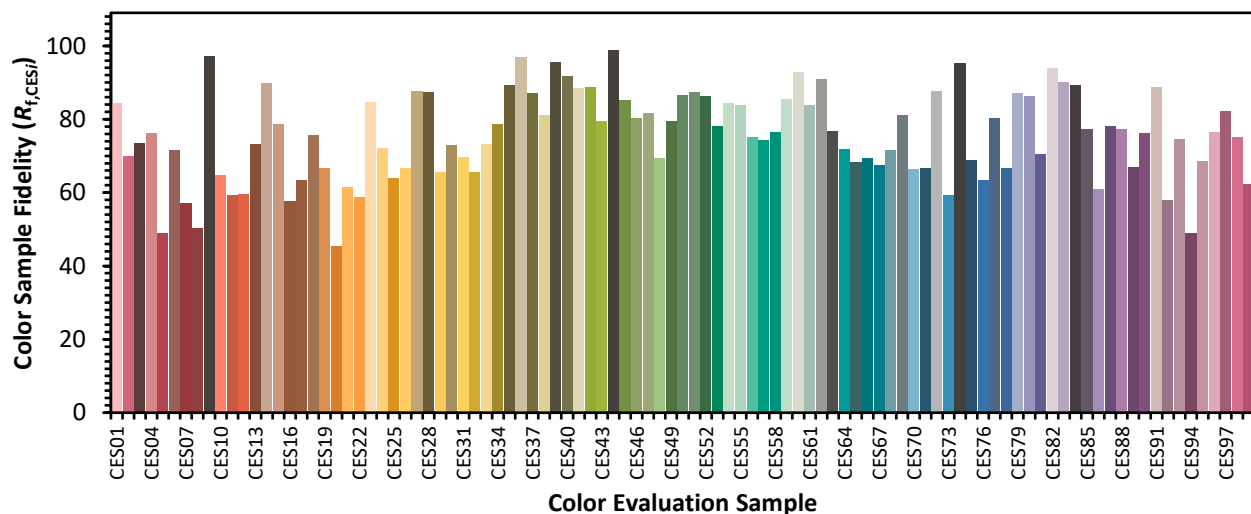


REPORT NUMBER: SP1-1908-441-2-R4

**TM-30-18**

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

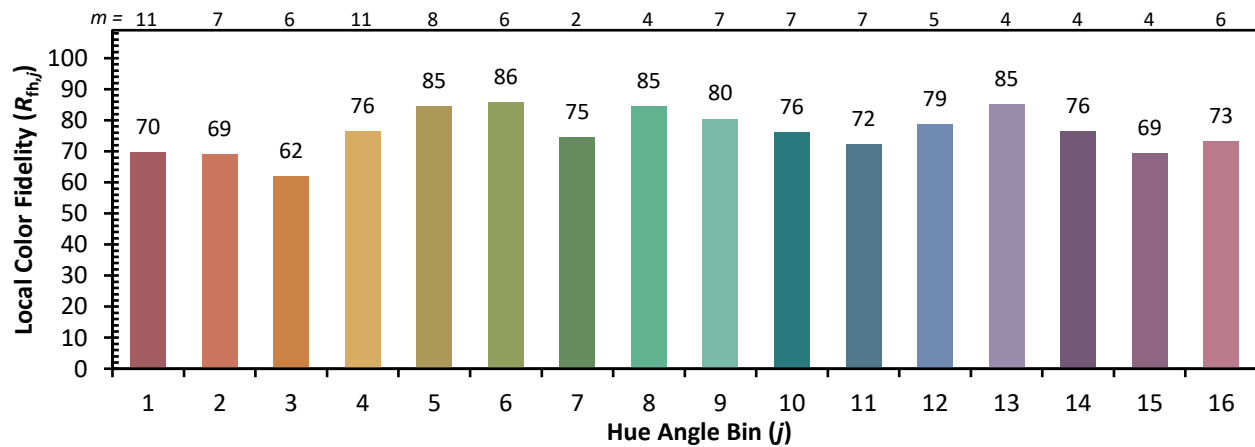
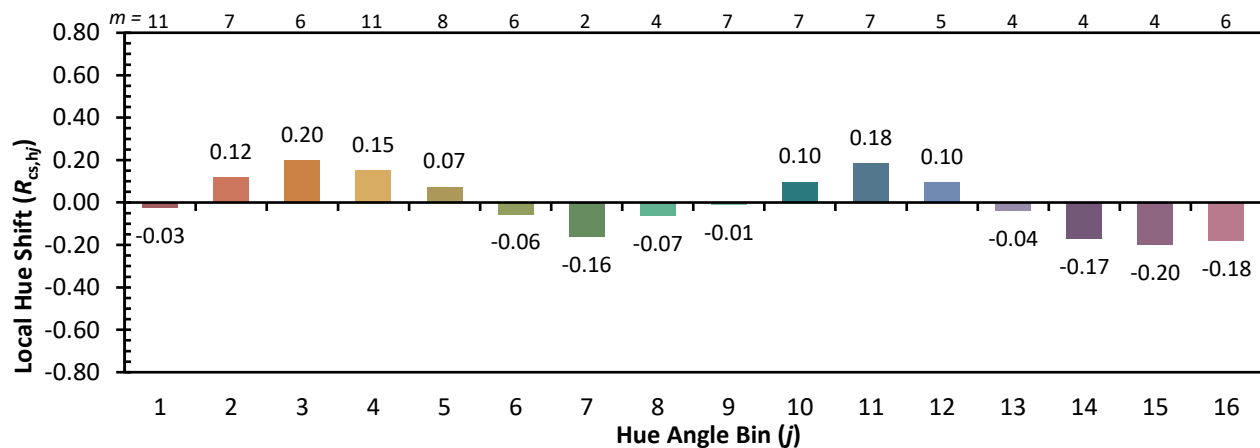
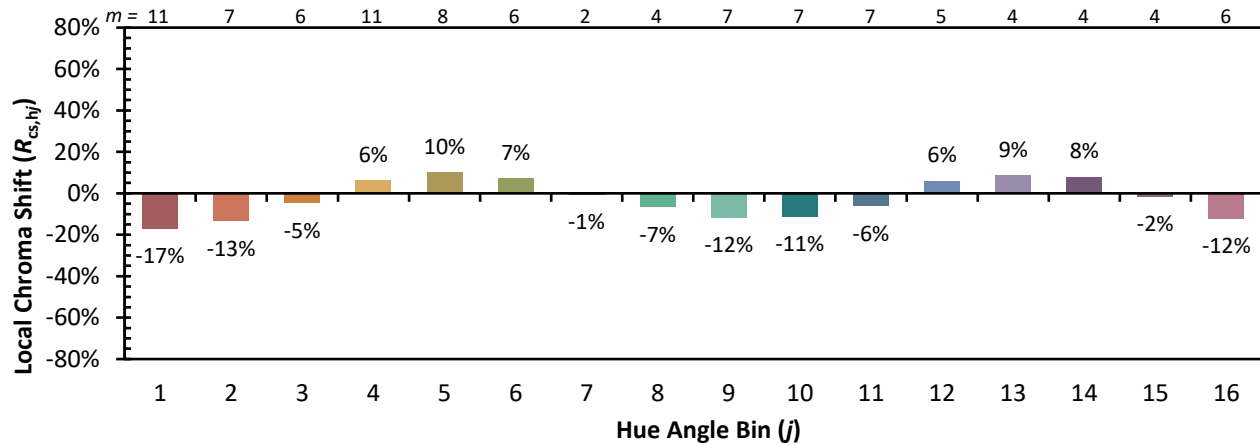
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 67 | CES51 = 87 | CES76 = 63 |
| CES02 = 63 | CES27 = 88 | CES52 = 86 | CES77 = 80 |
| CES03 = 31 | CES28 = 87 | CES53 = 78 | CES78 = 67 |
| CES04 = 71 | CES29 = 66 | CES54 = 84 | CES79 = 87 |
| CES05 = 49 | CES30 = 73 | CES55 = 84 | CES80 = 86 |
| CES06 = 51 | CES31 = 70 | CES56 = 75 | CES81 = 71 |
| CES07 = 41 | CES32 = 65 | CES57 = 74 | CES82 = 94 |
| CES08 = 40 | CES33 = 73 | CES58 = 76 | CES83 = 90 |
| CES09 = 29 | CES34 = 79 | CES59 = 85 | CES84 = 89 |
| CES10 = 76 | CES35 = 89 | CES60 = 93 | CES85 = 77 |
| CES11 = 59 | CES36 = 97 | CES61 = 84 | CES86 = 61 |
| CES12 = 65 | CES37 = 87 | CES62 = 91 | CES87 = 78 |
| CES13 = 43 | CES38 = 81 | CES63 = 77 | CES88 = 77 |
| CES14 = 74 | CES39 = 95 | CES64 = 72 | CES89 = 67 |
| CES15 = 71 | CES40 = 92 | CES65 = 68 | CES90 = 76 |
| CES16 = 47 | CES41 = 88 | CES66 = 69 | CES91 = 89 |
| CES17 = 50 | CES42 = 89 | CES67 = 67 | CES92 = 58 |
| CES18 = 56 | CES43 = 79 | CES68 = 72 | CES93 = 74 |
| CES19 = 73 | CES44 = 99 | CES69 = 81 | CES94 = 49 |
| CES20 = 66 | CES45 = 85 | CES70 = 66 | CES95 = 68 |
| CES21 = 87 | CES46 = 80 | CES71 = 67 | CES96 = 76 |
| CES22 = 79 | CES47 = 82 | CES72 = 88 | CES97 = 82 |
| CES23 = 92 | CES48 = 69 | CES73 = 59 | CES98 = 75 |
| CES24 = 91 | CES49 = 80 | CES74 = 95 | CES99 = 62 |
| CES25 = 73 | CES50 = 87 | CES75 = 69 |            |



REPORT NUMBER: SP1-1908-441-2-R4

**TM-30-18**

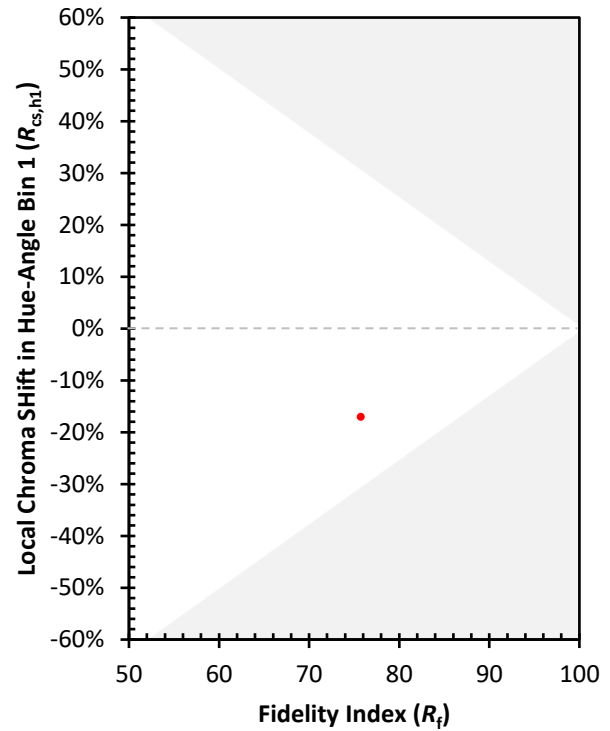
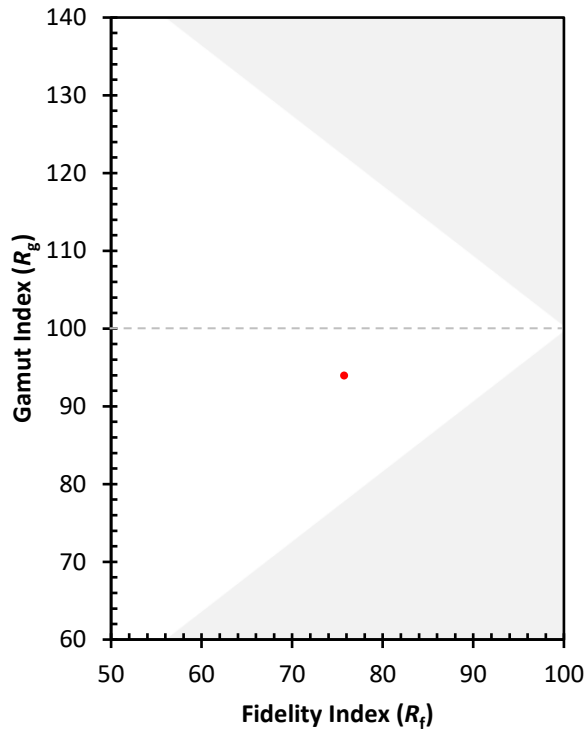
**Color Rendition by Hue-Angle Bin**



REPORT NUMBER: SP1-1908-441-2-R4

**TM-30-18**

**Measure Comparisons**



(END OF REPORT)