Cooper Lighting Solutions Photometric Lab
1121 Highway 74 South
Peachtree City, GA 30269

Scaled data based on original data using

LM-79-2019 Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Test Report Prepared for

Cooper Lighting Solutions

Brand: McGRAW-EDISON

Report Number: P639275

Luminaire Tested: GWS-SA5B-740-U-T4FT-W

Issue Date: 1/10/2023

Report Generated By 670246102 / DESKTOP-G35701P

Cooper Lighting Solutions Photometric Lab
1121 Highway 74 South
Peachtree City, GA 30269

Scaled Data Report

**Test Information**

| | |
|---|---|
| Test Method: | LM-79-2019 |
| Report Number: | P639275 |
| | TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-54) |
| Test Lab: | COOPER LIGHTING SOLUTIONS |
| Issue Date: | 1/10/2023 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS |
| Product Line: | McGRAW-EDISON |
| Catalog Number: | GWS-SA5B-740-U-T4FT-W |
| Description: | GALLEON WALL SLIM LUMINAIRE. (5) LIGHTSQUARES WITH 16 LEDS EACH AND TYPE IV FORWARD THROW OPTICS |
| Light Source: | (80) 4000K CCT, 70 CRI LEDS |
| Ballast/Driver: | - |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 17150.6 lumens |
| Efficiency: | N/A |
| Efficacy: | 148.2 lumens/watt |
| Luminous Opening: | Rectangular (W 1.5' x L: 1' x H: 0') |
| IES Classification: | Type IV - Short |
| BUG Rating: | B3 - U0 - G3 |

| | |
|---|---|
| Input Watts (W): | 115.7 |
| Input Voltage (V): | 120 |
| Input Current (Ain): | NR |
| Voltage Rise (V): | NR |
| Power Factor: | NR |
| Total Harmonic Distortion (THDi): | NR |
| Frequency (hertz): | 0 |
| Stabilization Time: | NR |
| Operation Time: | NR |
| Ambient Temperature (°C): | NR |
| Test Distance: | 28.75 FT |

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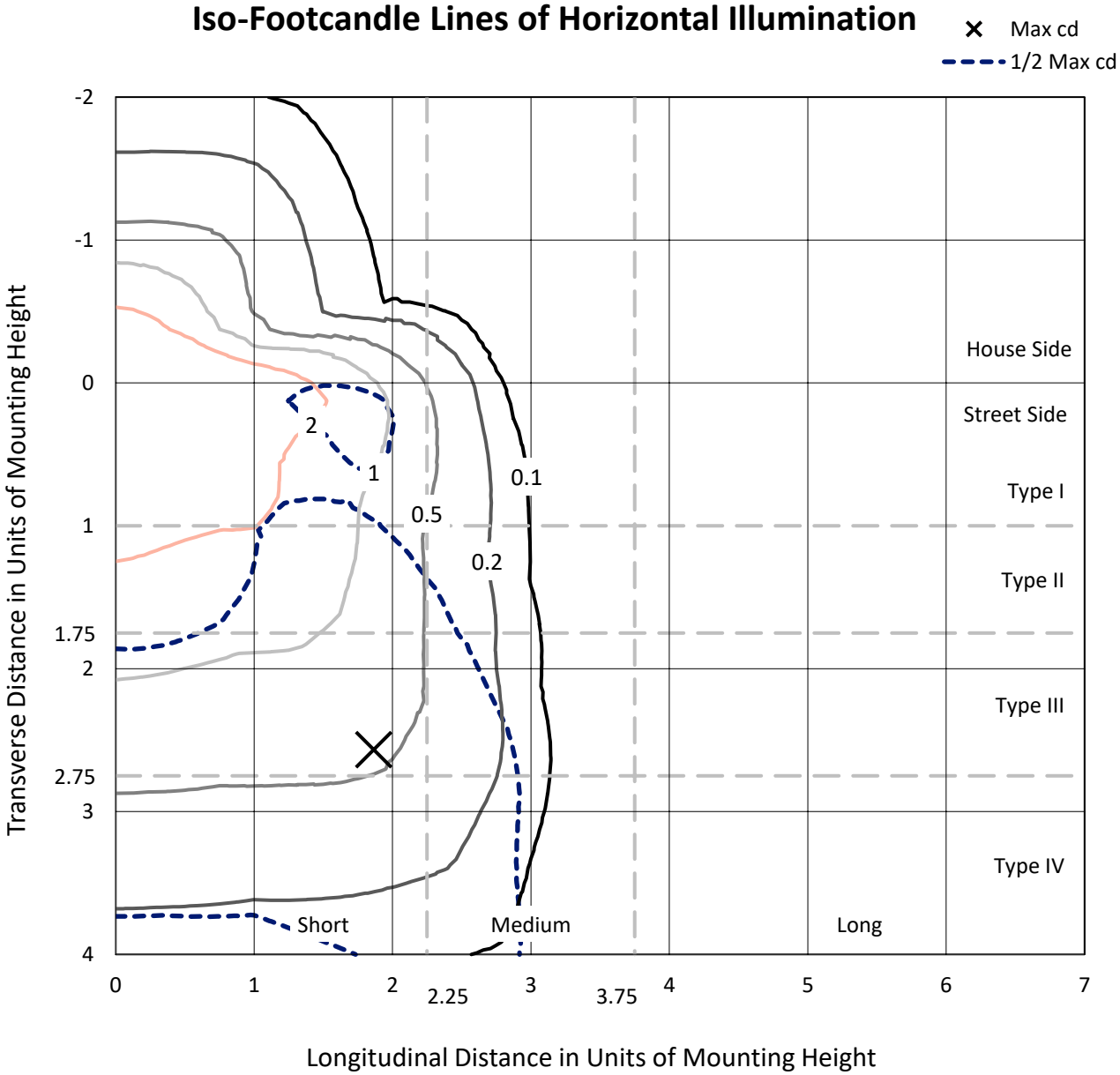
Scaled Data Report

REPORT NUMBER: P639275
CATALOG NUMBER: GWS-SA5B-740-U-T4FT-W

## Iso-Footcandle Lines of Horizontal Illumination




Based on 25 foot mounting height. Maximum calculated value = 4.3 fc
Type IV - Short - N/A

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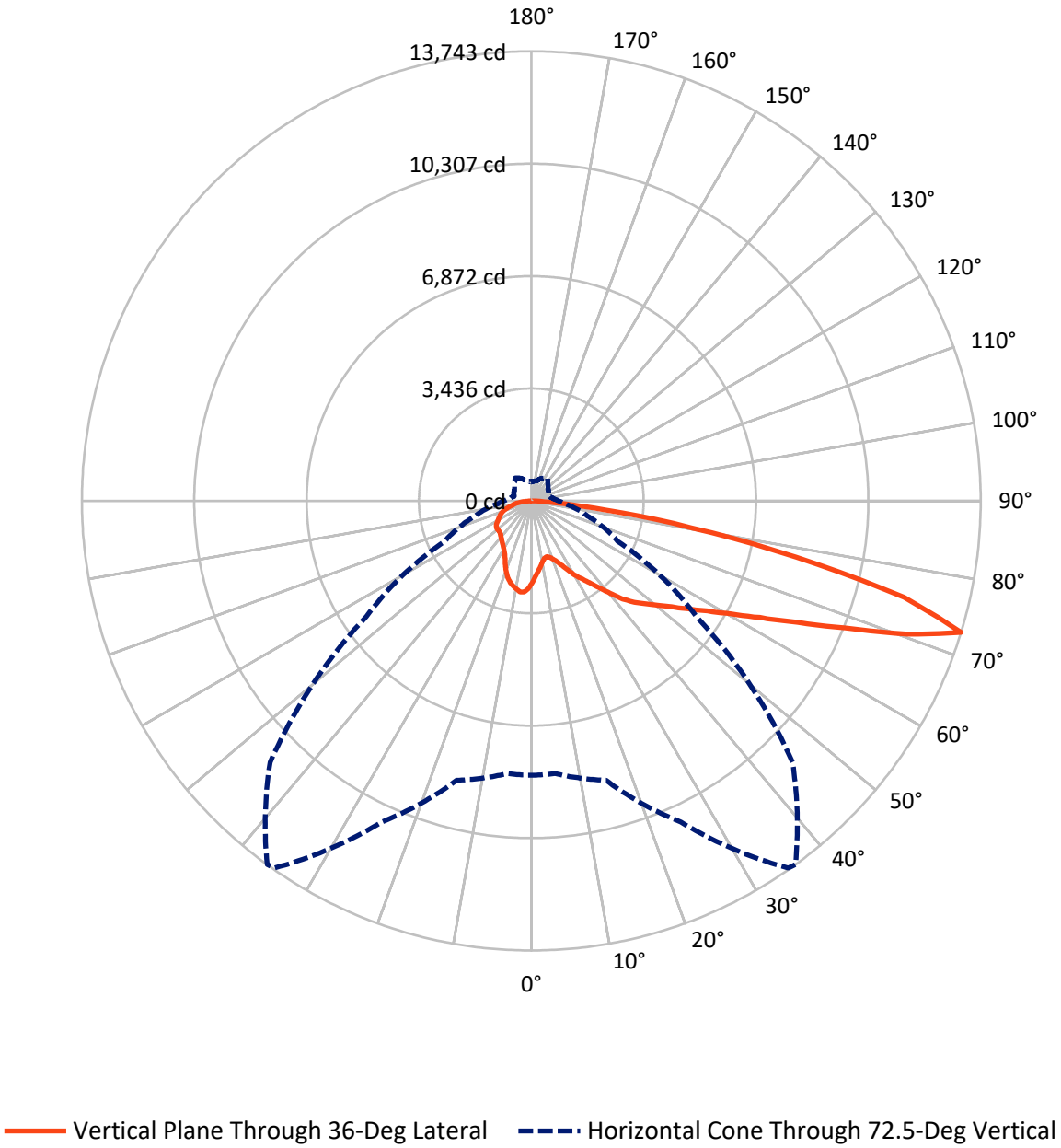
## Luminous Intensity Polar Plot



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REPORT NUMBER: P639275
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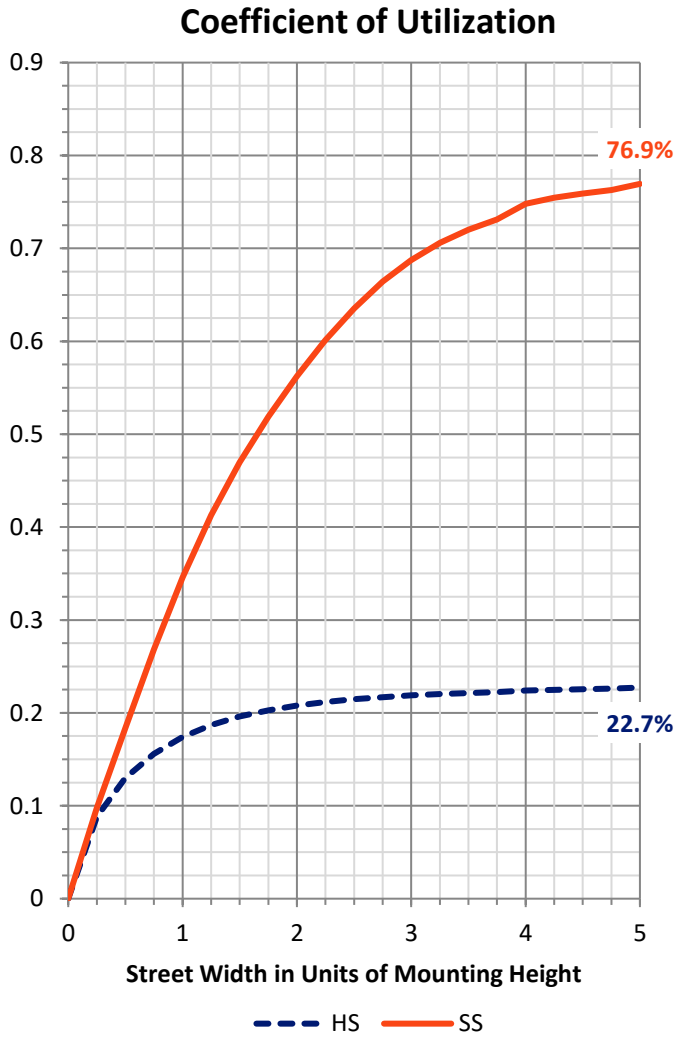
**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 3954.0 | 0.0 | 3954.0 |
| | % Fixture | 23.1 | 0.0 | 23.1 |
| **Street Side** | Lumens | 13196.6 | 0.0 | 13196.6 |
| | % Fixture | 76.9 | 0.0 | 76.9 |
| **Total** | Lumens | 17150.6 | 0.0 | 17150.6 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 234.6 | 1.4 |
| 10°-20° | 662.0 | 3.9 |
| 20°-30° | 1096.3 | 6.4 |
| 30°-40° | 1641.8 | 9.6 |
| 40°-50° | 2395.2 | 14.0 |
| 50°-60° | 3409.2 | 19.9 |
| 60°-70° | 4307.2 | 25.1 |
| 70°-80° | 3069.3 | 17.9 |
| 80°-90° | 335.1 | 2.0 |
| 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° | 17150.6 | 100.0 |
| 0°-180° | 17150.6 | 100.0 |



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REPORT NUMBER: P639275
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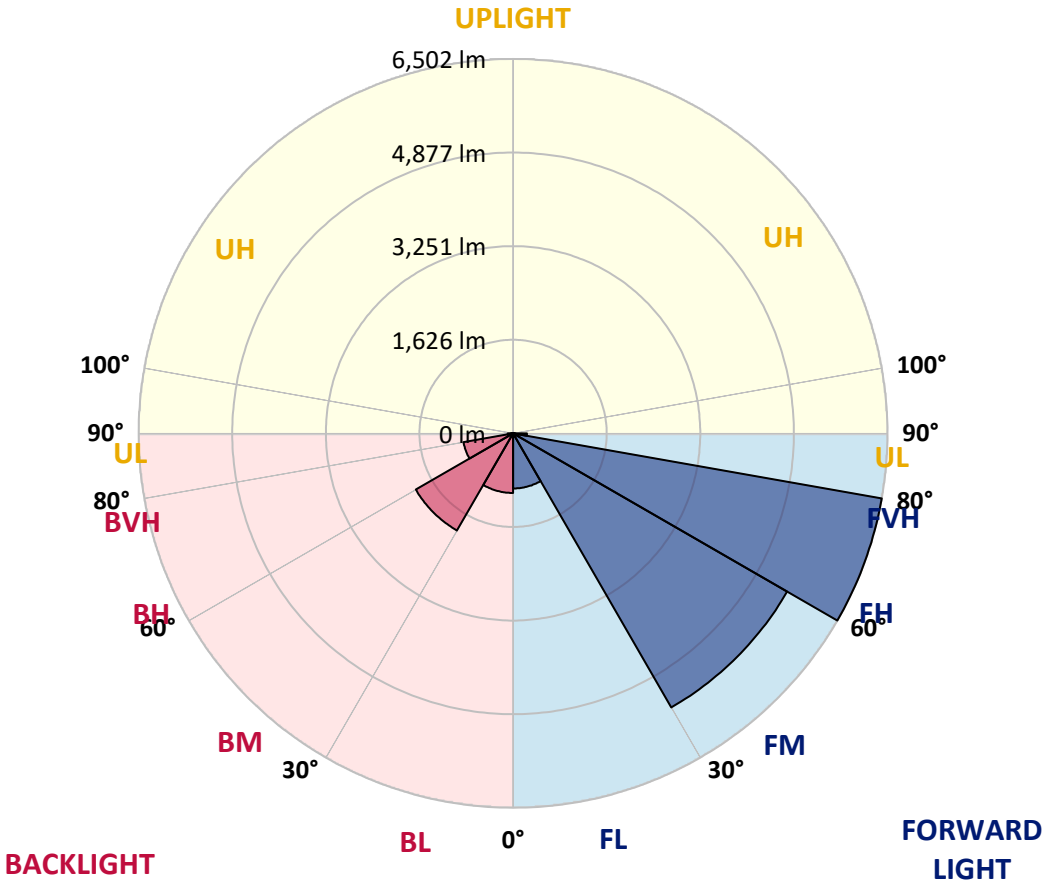
## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 957.5 | 5.6 | | | |
| FM | (30°-60°) | 5496.3 | 32.0 | | | |
| FH | (60°-80°) | 6502.4 | 37.9 | | | G3/7500 |
| FVH | (80°-90°) | 240.5 | 1.4 | | | G3/500 |
| BL | (0°-30°) | 1035.4 | 6.0 | B3/2500 | | |
| BM | (30°-60°) | 1949.9 | 11.4 | B2/2500 | | |
| BH | (60°-80°) | 874.1 | 5.1 | B2/1000 | | G2/1000 |
| BVH | (80°-90°) | 94.6 | 0.6 | | | G1/100 |
| UL | (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH | (100°-180°) | 0.0 | 0.0 | | U0/0 | |

**BUG Rating: B3-U0-G3**
Type IV Short



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Scaled Data Report

REPORT NUMBER: P639275
CATALOG NUMBER: GWS-SA5B-740-U-T4FT-W

**CANDELA DISTRIBUTION (FULL):**

| | 0° | 5° | 15° | 25° | 35° | 36° | 45° | 55° | 65° | 75° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 2510.1 | 2510.1 | 2510.1 | 2510.1 | 2510.1 | 2510.1 | 2510.1 | 2510.1 | 2510.1 | 2510.1 | 2510.1 |
| 2.5° | 2289.9 | 2286.0 | 2278.4 | 2301.3 | 2324.2 | 2321.7 | 2353.5 | 2384.1 | 2417.1 | 2451.5 | 2497.3 |
| 5° | 2106.6 | 2104.0 | 2097.7 | 2132.0 | 2166.4 | 2165.1 | 2217.3 | 2267.0 | 2334.4 | 2408.2 | 2499.9 |
| 7.5° | 1923.3 | 1916.9 | 1925.8 | 1969.1 | 2017.5 | 2022.6 | 2093.8 | 2175.3 | 2273.3 | 2384.1 | 2513.9 |
| 10° | 1761.6 | 1760.4 | 1764.2 | 1812.5 | 1885.1 | 1890.2 | 1981.8 | 2095.1 | 2224.9 | 2372.6 | 2545.7 |
| 12.5° | 1719.6 | 1717.1 | 1706.9 | 1731.1 | 1785.8 | 1793.5 | 1894.0 | 2032.7 | 2191.9 | 2379.0 | 2589.0 |
| 15° | 1788.4 | 1782.0 | 1746.4 | 1734.9 | 1761.6 | 1768.0 | 1853.3 | 1995.8 | 2172.8 | 2390.4 | 2643.7 |
| 17.5° | 1906.7 | 1902.9 | 1835.5 | 1788.4 | 1806.2 | 1811.3 | 1874.9 | 1989.5 | 2167.7 | 2413.3 | 2711.2 |
| 20° | 2079.8 | 2063.3 | 1957.6 | 1886.4 | 1886.4 | 1894.0 | 1932.2 | 2017.5 | 2174.0 | 2441.3 | 2787.5 |
| 22.5° | 2309.0 | 2275.9 | 2126.9 | 2030.2 | 2004.7 | 2014.9 | 2031.5 | 2087.5 | 2200.8 | 2488.4 | 2883.0 |
| 25° | 2566.1 | 2535.5 | 2358.6 | 2222.4 | 2186.8 | 2190.6 | 2176.6 | 2186.8 | 2259.3 | 2553.3 | 3001.4 |
| 27.5° | 2839.7 | 2819.4 | 2631.0 | 2457.9 | 2401.9 | 2401.9 | 2352.2 | 2328.0 | 2340.8 | 2627.2 | 3133.8 |
| 30° | 3084.1 | 3056.1 | 2897.0 | 2707.4 | 2633.5 | 2633.5 | 2539.3 | 2487.2 | 2456.6 | 2717.5 | 3310.7 |
| 32.5° | 3212.7 | 3196.1 | 3090.5 | 2945.4 | 2855.0 | 2841.0 | 2759.5 | 2698.4 | 2627.2 | 2851.2 | 3550.0 |
| 35° | 3380.7 | 3376.9 | 3313.2 | 3200.0 | 3085.4 | 3065.0 | 3009.0 | 2960.7 | 2837.2 | 3017.9 | 3868.2 |
| 37.5° | 3592.0 | 3585.6 | 3575.4 | 3508.0 | 3370.5 | 3366.7 | 3317.1 | 3258.5 | 3098.1 | 3258.5 | 4253.9 |
| 40° | 3828.7 | 3817.3 | 3804.6 | 3803.3 | 3720.6 | 3706.5 | 3702.7 | 3636.5 | 3412.5 | 3548.7 | 4656.1 |
| 42.5° | 4154.6 | 4115.1 | 3995.5 | 4048.9 | 4110.0 | 4097.3 | 4145.7 | 4046.4 | 3804.6 | 3893.7 | 5036.7 |
| 45° | 4555.5 | 4458.8 | 4222.1 | 4237.3 | 4391.3 | 4416.8 | 4584.8 | 4560.6 | 4236.1 | 4292.1 | 5437.6 |
| 47.5° | 4796.1 | 4712.1 | 4491.9 | 4479.2 | 4671.4 | 4703.2 | 5068.5 | 5114.3 | 4700.6 | 4771.9 | 5932.8 |
| 50° | 4993.4 | 4934.9 | 4754.1 | 4771.9 | 4975.6 | 5007.4 | 5548.4 | 5646.4 | 5138.5 | 5263.2 | 6508.1 |
| 52.5° | 5231.4 | 5147.4 | 5007.4 | 5091.4 | 5340.9 | 5379.1 | 6081.7 | 6187.3 | 5533.1 | 5802.9 | 7103.8 |
| 55° | 5365.1 | 5330.7 | 5333.3 | 5461.8 | 5774.9 | 5827.1 | 6640.5 | 6622.7 | 5894.6 | 6265.0 | 7551.8 |
| 57.5° | 5673.1 | 5660.4 | 5777.5 | 5825.9 | 6281.5 | 6349.0 | 7199.3 | 7046.5 | 6223.0 | 6622.7 | 7767.0 |
| 60° | 6216.6 | 6184.8 | 6286.6 | 6360.4 | 6907.8 | 7003.2 | 7823.0 | 7461.5 | 6445.7 | 6888.7 | 7694.4 |
| 62.5° | 6980.3 | 6940.9 | 6944.7 | 7061.8 | 7746.6 | 7847.1 | 8516.7 | 7807.7 | 6514.5 | 6929.4 | 7234.9 |
| 65° | 7929.9 | 7872.6 | 7807.7 | 7966.8 | 8860.3 | 8944.3 | 9271.5 | 8059.7 | 6350.3 | 6537.4 | 6275.2 |
| 67.5° | 8931.6 | 8884.5 | 8808.1 | 9141.6 | 10302.5 | 10353.4 | 10117.9 | 8038.1 | 5829.7 | 5488.5 | 4401.5 |
| 70° | 8990.2 | 9001.6 | 9363.1 | 10569.8 | 12185.0 | 12197.8 | 10918.5 | 7602.8 | 4721.0 | 3557.6 | 2193.1 |
| 72.5° | 8386.8 | 8367.7 | 8838.7 | 10830.7 | 13699.7 | 13743.0 | 11296.6 | 6159.3 | 2917.4 | 1774.4 | 1028.5 |
| 75° | 6812.3 | 6845.4 | 7340.5 | 9476.4 | 11742.1 | 11780.3 | 9209.1 | 3631.5 | 1386.1 | 868.1 | 658.1 |
| 77.5° | 2932.7 | 3117.2 | 4093.5 | 6676.1 | 8409.7 | 8291.4 | 4746.5 | 1471.4 | 739.5 | 618.6 | 504.0 |
| 80° | 846.4 | 919.0 | 1458.7 | 3174.5 | 5039.2 | 4950.1 | 1878.7 | 551.1 | 515.5 | 464.6 | 361.5 |
| 82.5° | 273.7 | 302.9 | 534.6 | 1263.9 | 2258.0 | 2255.5 | 712.8 | 325.9 | 337.3 | 315.7 | 232.9 |
| 85° | 76.4 | 87.8 | 164.2 | 383.1 | 698.8 | 684.8 | 206.2 | 154.0 | 179.5 | 182.0 | 115.8 |
| 87.5° | 0.0 | 0.0 | 1.3 | 2.5 | 2.5 | 2.5 | 5.1 | 22.9 | 52.2 | 66.2 | 47.1 |
| 90° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

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Scaled Data Report

REPORT NUMBER: P639275
CATALOG NUMBER: GWS-SA5B-740-U-T4FT-W

**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 2510.1 | 2510.1 | 2510.1 | 2510.1 | 2510.1 | 2510.1 | 2510.1 | 2510.1 | 2510.1 | 2510.1 | 2510.1 |
| 2.5° | 2525.3 | 2521.5 | 2573.7 | 2614.4 | 2652.6 | 2678.1 | 2685.7 | 2690.8 | 2701.0 | 2706.1 | 2701.0 |
| 5° | 2543.2 | 2562.3 | 2648.8 | 2712.5 | 2763.4 | 2793.9 | 2795.2 | 2792.6 | 2800.3 | 2793.9 | 2790.1 |
| 7.5° | 2581.3 | 2618.3 | 2727.7 | 2795.2 | 2828.3 | 2829.6 | 2799.0 | 2763.4 | 2745.5 | 2730.3 | 2725.2 |
| 10° | 2632.3 | 2687.0 | 2806.6 | 2851.2 | 2841.0 | 2793.9 | 2726.5 | 2670.4 | 2638.6 | 2615.7 | 2610.6 |
| 12.5° | 2702.3 | 2763.4 | 2876.6 | 2875.4 | 2811.7 | 2727.7 | 2648.8 | 2581.3 | 2535.5 | 2508.8 | 2499.9 |
| 15° | 2768.5 | 2846.1 | 2927.6 | 2867.7 | 2767.2 | 2665.4 | 2563.5 | 2473.2 | 2412.1 | 2370.1 | 2362.4 |
| 17.5° | 2849.9 | 2932.7 | 2964.5 | 2843.6 | 2711.2 | 2580.1 | 2443.9 | 2325.5 | 2242.8 | 2193.1 | 2189.3 |
| 20° | 2944.1 | 3017.9 | 2982.3 | 2801.6 | 2638.6 | 2466.8 | 2282.2 | 2149.8 | 2060.7 | 2012.4 | 2016.2 |
| 22.5° | 3053.6 | 3107.0 | 2987.4 | 2744.3 | 2538.1 | 2306.4 | 2100.2 | 1972.9 | 1913.1 | 1887.6 | 1888.9 |
| 25° | 3170.7 | 3205.0 | 2978.5 | 2666.6 | 2384.1 | 2110.4 | 1913.1 | 1854.5 | 1849.5 | 1843.1 | 1845.6 |
| 27.5° | 3309.4 | 3301.8 | 2951.7 | 2557.2 | 2176.6 | 1882.6 | 1782.0 | 1797.3 | 1817.6 | 1815.1 | 1817.6 |
| 30° | 3495.3 | 3422.7 | 2917.4 | 2405.7 | 1929.6 | 1691.6 | 1704.4 | 1747.6 | 1774.4 | 1776.9 | 1784.5 |
| 32.5° | 3707.8 | 3556.4 | 2862.6 | 2199.5 | 1694.2 | 1584.7 | 1631.8 | 1684.0 | 1715.8 | 1722.2 | 1732.4 |
| 35° | 3961.1 | 3709.1 | 2765.9 | 1942.4 | 1524.9 | 1521.1 | 1564.3 | 1600.0 | 1634.3 | 1636.9 | 1636.9 |
| 37.5° | 4252.6 | 3861.8 | 2611.9 | 1658.5 | 1420.5 | 1466.3 | 1507.1 | 1514.7 | 1523.6 | 1516.0 | 1519.8 |
| 40° | 4519.9 | 4009.5 | 2393.0 | 1400.1 | 1335.2 | 1418.0 | 1452.3 | 1426.9 | 1398.9 | 1379.8 | 1383.6 |
| 42.5° | 4743.9 | 4110.0 | 2102.8 | 1219.4 | 1248.7 | 1374.7 | 1401.4 | 1349.2 | 1294.5 | 1258.9 | 1263.9 |
| 45° | 4996.0 | 4203.0 | 1761.6 | 1097.2 | 1174.8 | 1344.1 | 1362.0 | 1294.5 | 1224.5 | 1171.0 | 1163.4 |
| 47.5° | 5343.4 | 4392.6 | 1458.7 | 1011.9 | 1122.7 | 1327.6 | 1356.9 | 1265.2 | 1173.6 | 1093.4 | 1084.5 |
| 50° | 5772.4 | 4661.2 | 1205.4 | 955.9 | 1098.5 | 1318.7 | 1355.6 | 1233.4 | 1123.9 | 1029.7 | 1023.4 |
| 52.5° | 6240.8 | 4923.4 | 1018.3 | 912.6 | 1074.3 | 1291.9 | 1349.2 | 1197.8 | 1071.7 | 969.9 | 962.3 |
| 55° | 6552.6 | 5026.5 | 892.3 | 871.9 | 1034.8 | 1249.9 | 1323.8 | 1163.4 | 992.8 | 899.9 | 888.5 |
| 57.5° | 6644.3 | 4894.1 | 804.4 | 835.0 | 983.9 | 1191.4 | 1275.4 | 1090.8 | 944.5 | 870.6 | 861.7 |
| 60° | 6486.5 | 4560.6 | 749.7 | 804.4 | 927.9 | 1116.3 | 1191.4 | 1048.8 | 906.3 | 840.1 | 833.7 |
| 62.5° | 6041.0 | 4046.4 | 707.7 | 772.6 | 870.6 | 1037.4 | 1137.9 | 997.9 | 864.3 | 812.1 | 803.2 |
| 65° | 5144.9 | 3318.3 | 673.3 | 739.5 | 815.9 | 962.3 | 1079.4 | 947.0 | 818.4 | 779.0 | 768.8 |
| 67.5° | 3598.4 | 2330.6 | 636.4 | 700.1 | 761.2 | 889.7 | 1018.3 | 899.9 | 771.3 | 742.1 | 731.9 |
| 70° | 1759.1 | 1235.9 | 591.9 | 654.2 | 702.6 | 815.9 | 957.2 | 842.6 | 709.0 | 692.4 | 678.4 |
| 72.5° | *837.5* | *691.2* | *539.7* | *591.9* | *622.4* | *717.9* | *855.4* | *759.9* | *635.2* | *599.5* | *575.3* |
| 75° | 561.3 | 491.3 | 471.0 | 518.1 | 525.7 | 602.1 | 733.2 | 655.5 | 560.1 | 519.3 | 499.0 |
| 77.5° | 425.1 | 375.5 | 395.9 | 437.9 | 422.6 | 495.1 | 603.3 | 584.2 | 505.3 | 468.4 | 458.2 |
| 80° | 299.1 | 273.7 | 314.4 | 339.9 | 328.4 | 421.3 | 543.5 | 500.2 | 416.2 | 375.5 | 367.9 |
| 82.5° | 188.4 | 183.3 | 231.7 | 235.5 | 239.3 | 333.5 | 446.8 | 393.3 | 323.3 | 266.0 | 246.9 |
| 85° | 94.2 | 104.4 | 138.7 | 138.7 | 137.5 | 171.8 | 254.6 | 221.5 | 174.4 | 138.7 | 134.9 |
| 87.5° | 31.8 | 44.5 | 59.8 | 48.4 | 36.9 | 29.3 | 33.1 | 40.7 | 43.3 | 42.0 | 42.0 |
| 90° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

Cooper Lighting Solutions Photometric Lab
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Peachtree City, GA 30269

# 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 LUMINIAIRES UTIZLIZING SA LIGHT ENGINES

Report Number: SP1-2101-121-2

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

Test Date: 03/05/2021

Report Generated By controller / USPTCWHP6086842

## Test Information

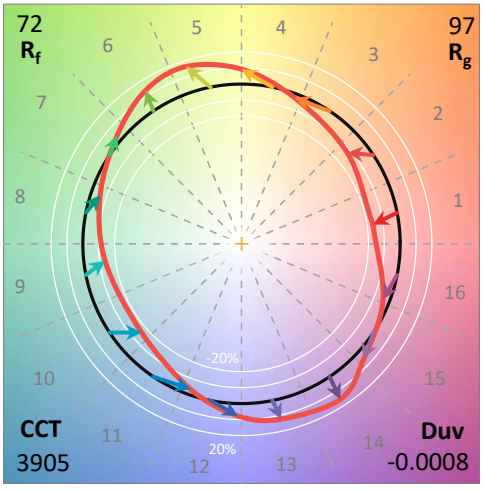
| | |
|---|---|
| Test Method: | LM-79-08 |
| Report Number: | SP1-2101-121-2 |
| Test Lab: | COOPER LIGHTING SOLUTIONS |
| Photometer: | SP1 |
| Measurement Geometry: | 4π |
| Issue Date: | 03/05/2021 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS (FORMERLY EATON) |
| Product Line: | STREETWORKS |
|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

SHIELD, DRIVER PROGRAMMED @ 615mA.

## Spectral Parameters

| | | | | | |
|---|---|---|---|---|---|
| CCT (K): | 3905 | CRI (Ra): | 71.2 | | |
| 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 |

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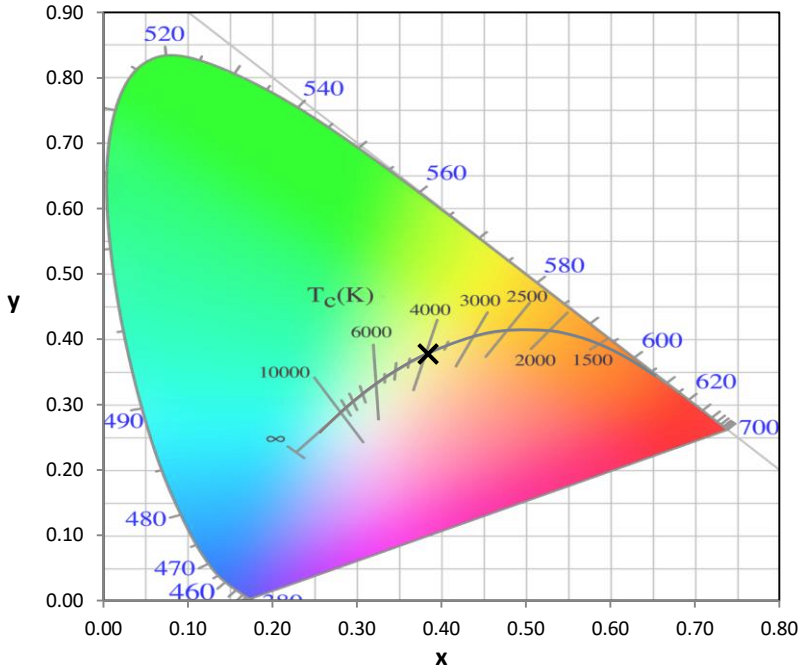
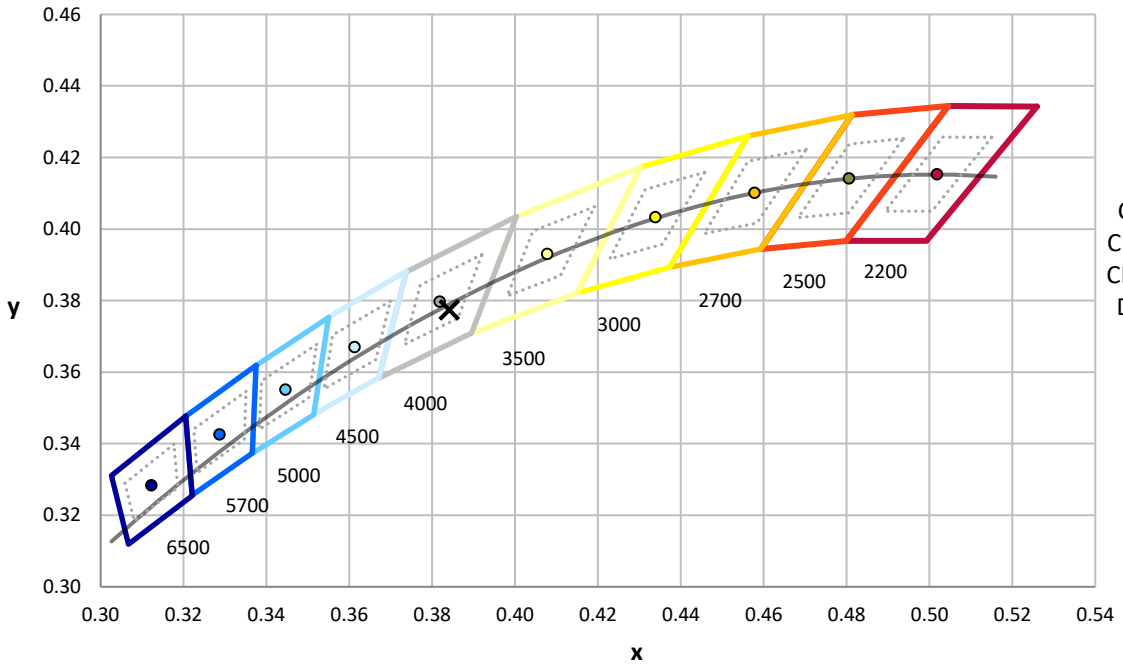
## CIE 1931 Chromaticity Diagram




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




CCT = 3905K
CIE x = 0.3841
CIE y = 0.3774
Duv = -0.0008

Point lies inside the ANSI 4000K 4-step quadrangle

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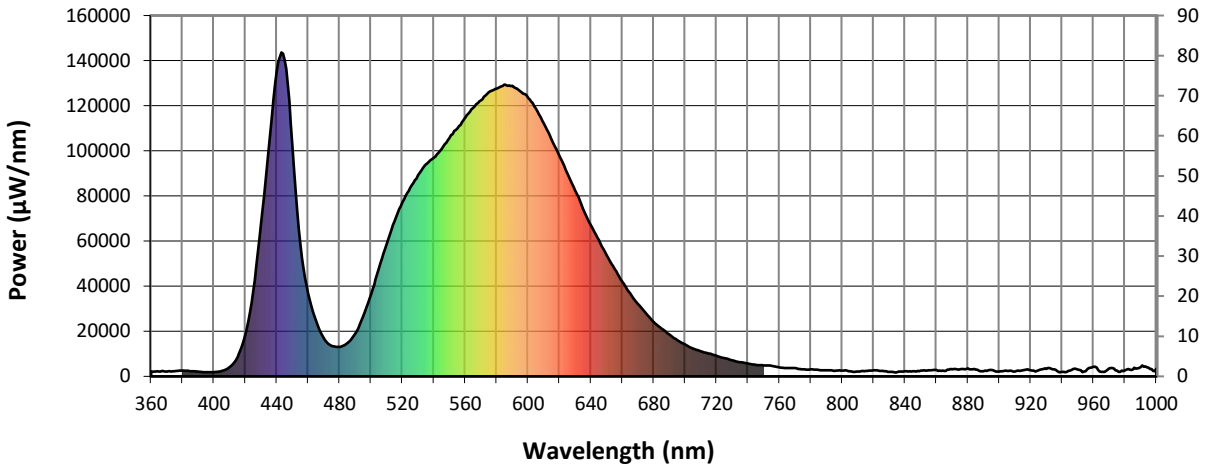
## Photopic Flux vs. Wavelength




######

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

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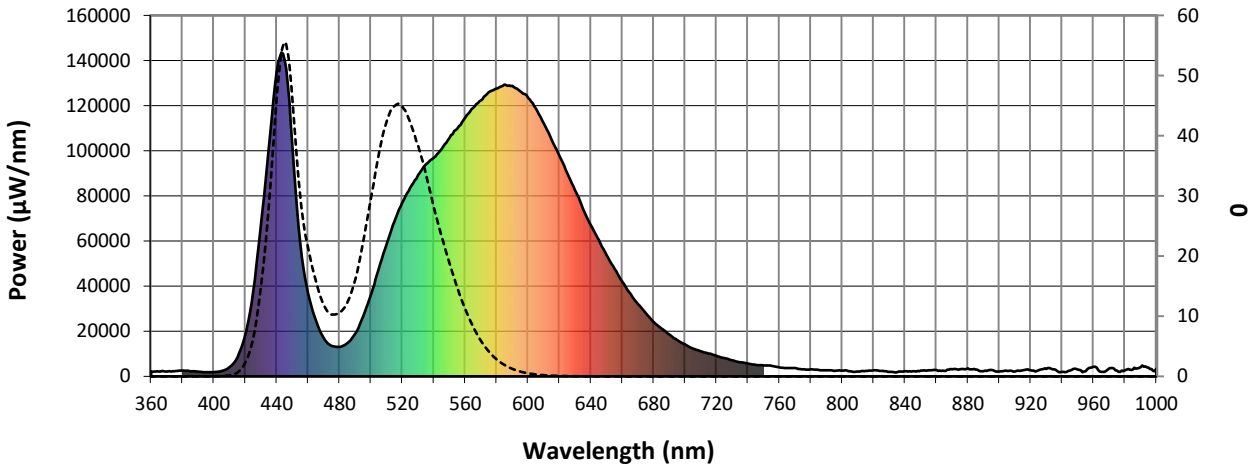
## Scotopic Flux vs. Wavelength




**Scotopic Lumens: 10425.8** **S/P: 1.47**

| λ (nm) | Power (µW/nm) | Lumens (ϕ/nm) | λ (nm) | Power (µW/nm) | Lumens (ϕ/nm) | λ (nm) | Power (µW/nm) | Lumens (ϕ/nm) | λ (nm) | Power (µW/nm) | Lumens (ϕ/nm) | λ (nm) | Power (µW/nm) | Lumens (ϕ/nm) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 360 | 2304 | 0.0 | 490 | 19043 | 29.3 | 620 | 97577 | 1.2 | 750 | 4830 | 0.0 | 880 | 3505 | 0.0 |
| 365 | 2150 | 0.0 | 495 | 26606 | 43.0 | 625 | 90158 | 0.8 | 755 | 4664 | 0.0 | 885 | 2991 | 0.0 |
| 370 | 2146 | 0.0 | 500 | 36376 | 60.8 | 630 | 82240 | 0.5 | 760 | 4006 | 0.0 | 890 | 2327 | 0.0 |
| 375 | 2332 | 0.0 | 505 | 47714 | 81.1 | 635 | 74361 | 0.3 | 765 | 3715 | 0.0 | 895 | 2775 | 0.0 |
| 380 | 2527 | 0.0 | 510 | 58741 | 99.6 | 640 | 66994 | 0.2 | 770 | 3696 | 0.0 | 900 | 2141 | 0.0 |
| 385 | 2304 | 0.0 | 515 | 68716 | 113.9 | 645 | 60405 | 0.1 | 775 | 3117 | 0.0 | 905 | 2421 | 0.0 |
| 390 | 2064 | 0.0 | 520 | 77136 | 122.6 | 650 | 53806 | 0.1 | 780 | 3062 | 0.0 | 910 | 2200 | 0.0 |
| 395 | 1856 | 0.0 | 525 | 83567 | 125.0 | 655 | 47610 | 0.0 | 785 | 2907 | 0.0 | 915 | 2716 | 0.0 |
| 400 | 1856 | 0.0 | 530 | 89283 | 123.1 | 660 | 42018 | 0.0 | 790 | 2655 | 0.0 | 920 | 2656 | 0.0 |
| 405 | 2374 | 0.1 | 535 | 94097 | 117.3 | 665 | 36742 | 0.0 | 795 | 2467 | 0.0 | 925 | 2671 | 0.0 |
| 410 | 4084 | 0.2 | 540 | 96845 | 107.0 | 670 | 32105 | 0.0 | 800 | 2609 | 0.0 | 930 | 3292 | 0.0 |
| 415 | 8543 | 0.9 | 545 | 100829 | 96.7 | 675 | 27946 | 0.0 | 805 | 2293 | 0.0 | 935 | 3188 | 0.0 |
| 420 | 18394 | 3.0 | 550 | 105648 | 86.4 | 680 | 24146 | 0.0 | 810 | 2188 | 0.0 | 940 | 1997 | 0.0 |
| 425 | 37987 | 9.3 | 555 | 110017 | 75.2 | 685 | 21191 | 0.0 | 815 | 2386 | 0.0 | 945 | 2623 | 0.0 |
| 430 | 67605 | 23.0 | 560 | 114586 | 64.0 | 690 | 18544 | 0.0 | 820 | 2712 | 0.0 | 950 | 2969 | 0.0 |
| 435 | 102160 | 45.7 | 565 | 118987 | 53.4 | 695 | 16058 | 0.0 | 825 | 2473 | 0.0 | 955 | 2277 | 0.0 |
| 440 | 135103 | 75.5 | 570 | 122326 | 43.2 | 700 | 14133 | 0.0 | 830 | 1969 | 0.0 | 960 | 4267 | 0.0 |
| 445 | 140126 | 93.8 | 575 | 125968 | 34.3 | 705 | 12309 | 0.0 | 835 | 1917 | 0.0 | 965 | 2034 | 0.0 |
| 450 | 102339 | 79.3 | 580 | 127613 | 26.3 | 710 | 11142 | 0.0 | 840 | 2248 | 0.0 | 970 | 3586 | 0.0 |
| 455 | 58751 | 51.3 | 585 | 129466 | 19.8 | 715 | 10143 | 0.0 | 845 | 2266 | 0.0 | 975 | 2505 | 0.0 |
| 460 | 36892 | 35.6 | 590 | 128813 | 14.3 | 720 | 9072 | 0.0 | 850 | 2558 | 0.0 | 980 | 2666 | 0.0 |
| 465 | 24637 | 26.0 | 595 | 126387 | 10.1 | 725 | 8130 | 0.0 | 855 | 2767 | 0.0 | 985 | 2934 | 0.0 |
| 470 | 16738 | 19.3 | 600 | 123477 | 7.0 | 730 | 7149 | 0.0 | 860 | 2826 | 0.0 | 990 | 4120 | 0.0 |
| 475 | 13456 | 16.8 | 605 | 118718 | 4.7 | 735 | 6311 | 0.0 | 865 | 2385 | 0.0 | 995 | 3858 | 0.0 |
| 480 | 13081 | 17.7 | 610 | 112091 | 3.0 | 740 | 5711 | 0.0 | 870 | 3194 | 0.0 | 1000 | 3405 | 0.0 |
| 485 | 14734 | 21.4 | 615 | 105039 | 1.9 | 745 | 5111 | 0.0 | 875 | 3189 | 0.0 | | | |

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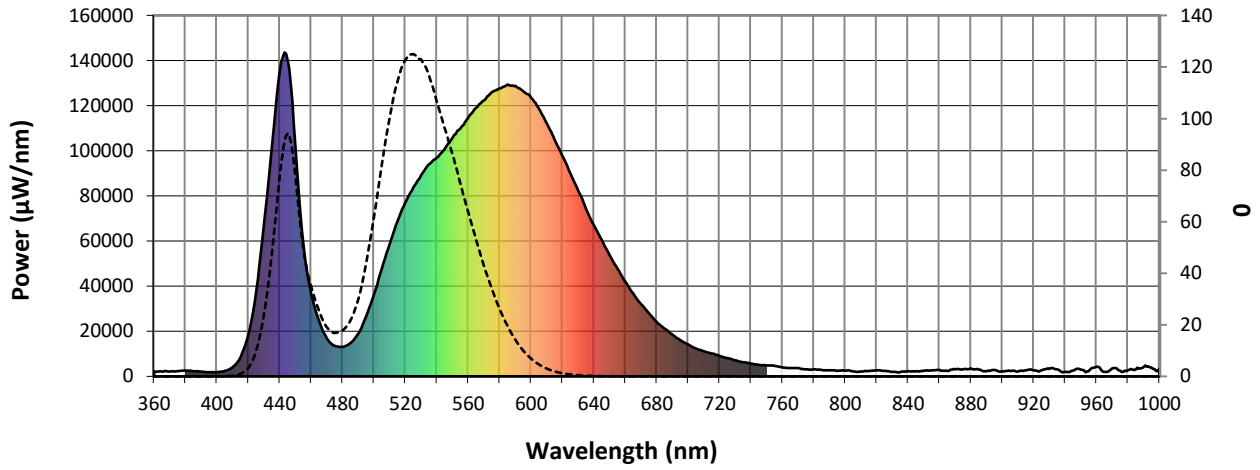
## Melanopic Flux vs. Wavelength




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

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

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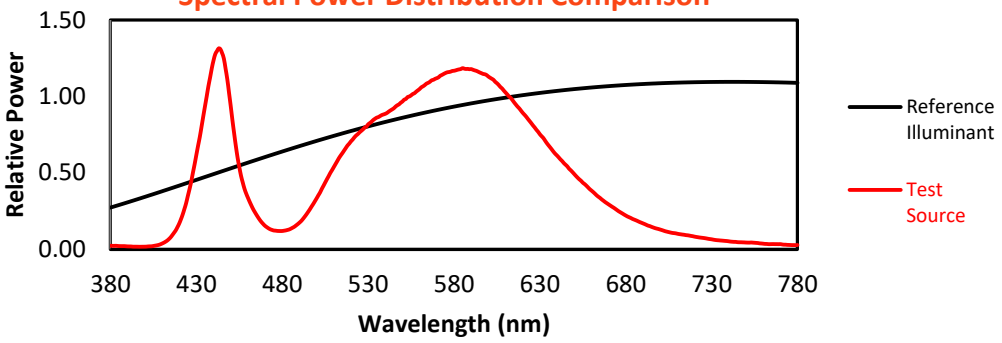
# TM-30-18

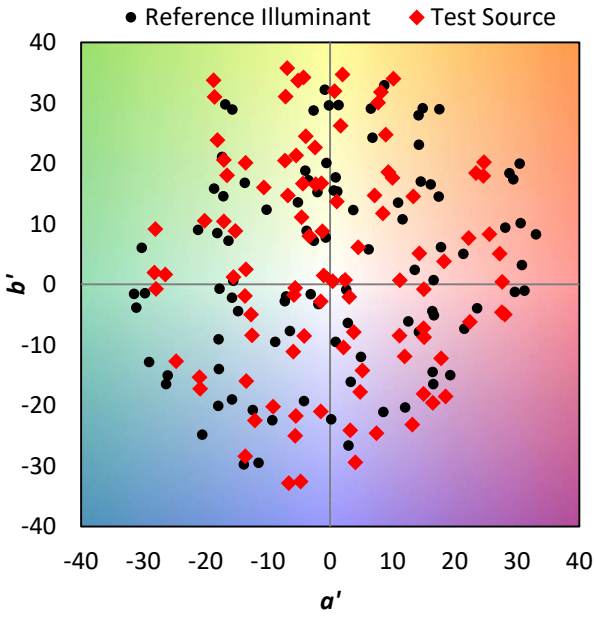
## Summary

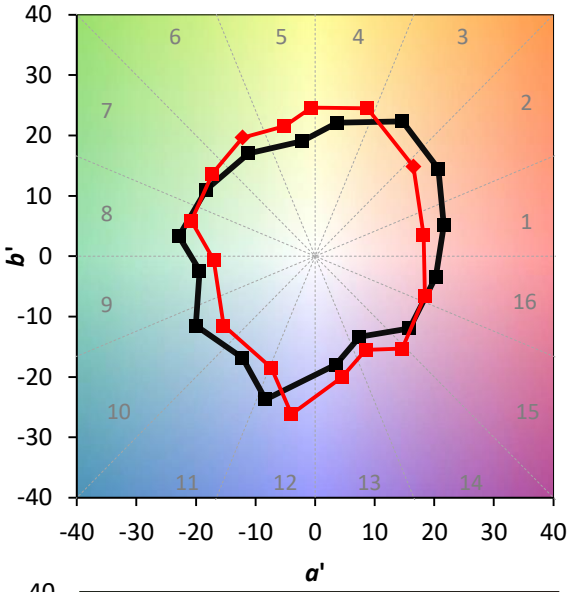
$R_f$ = 71.7
$R_g$ = 96.9
CIE $R_a$ = 71.2
$R_9$ = -29.7

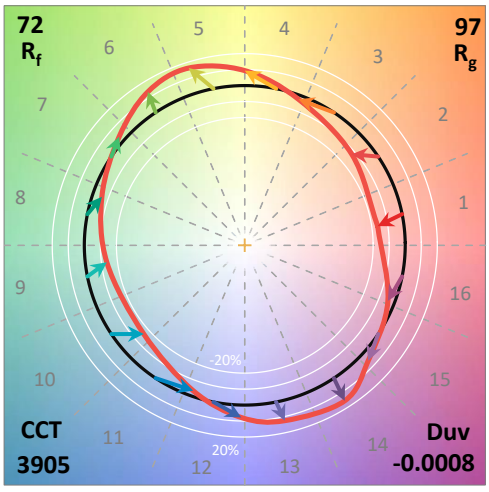
## Spectral Power Distribution Comparison

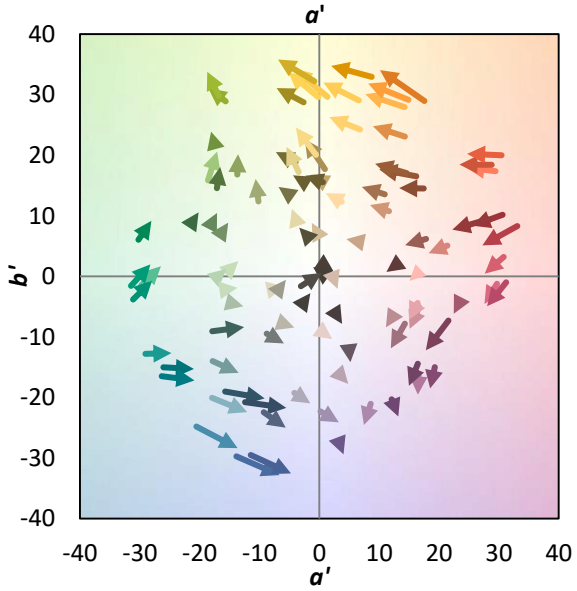



## Color Vector Graphics



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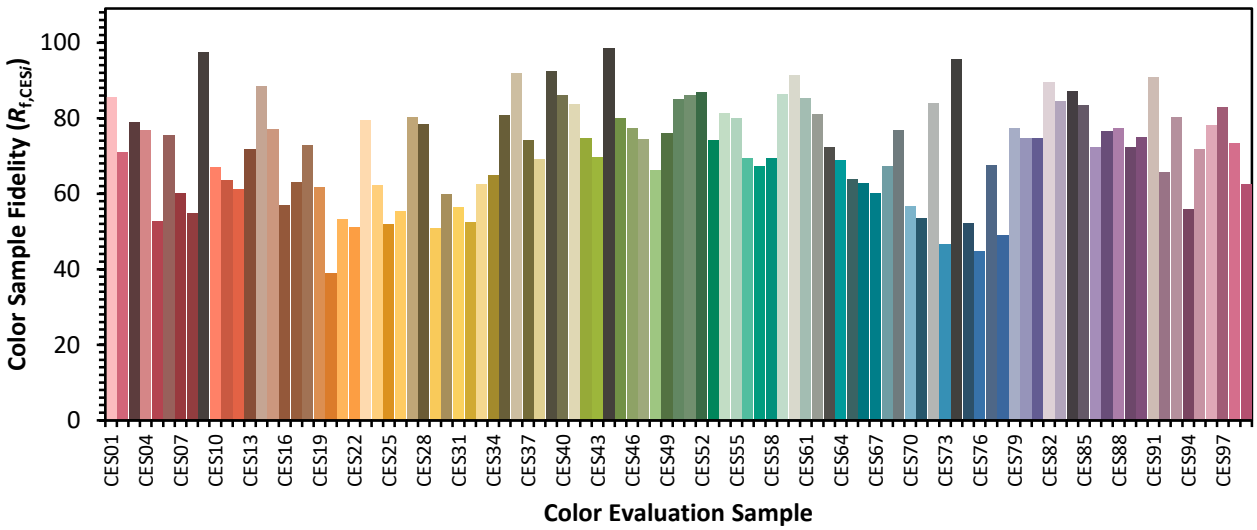
# TM-30-18

## 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 | |



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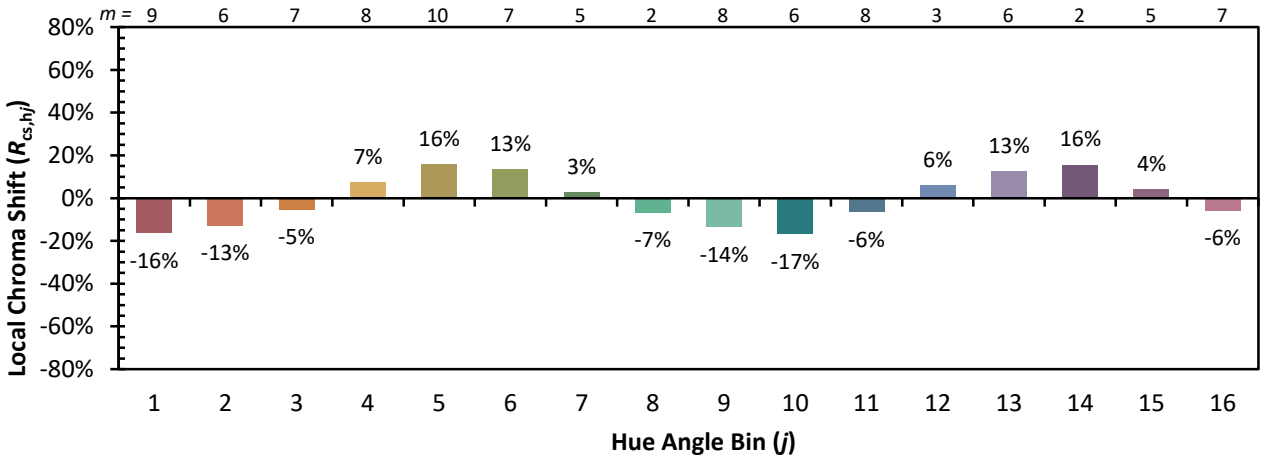
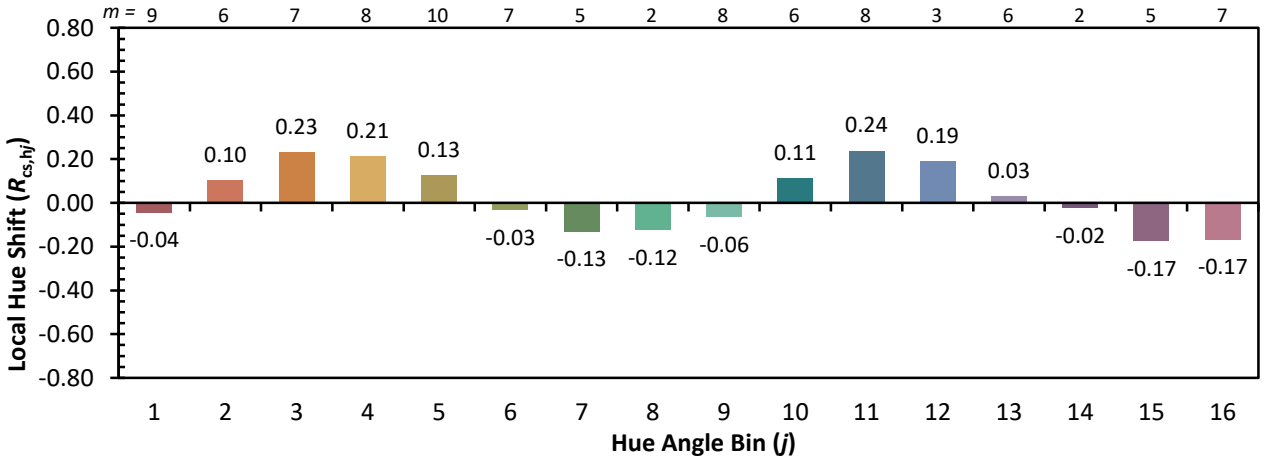
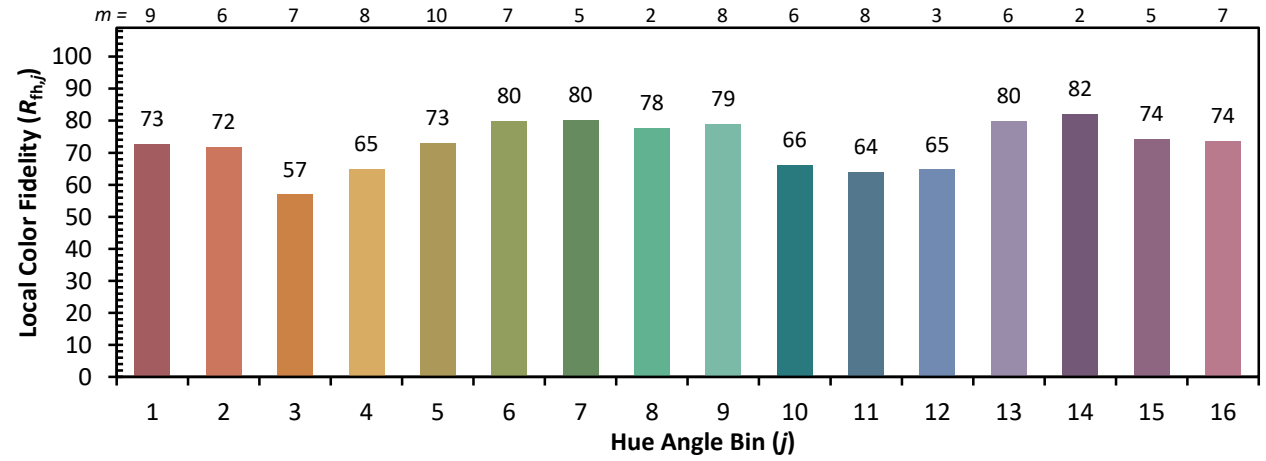
## Color Rendition by Hue-Angle Bin



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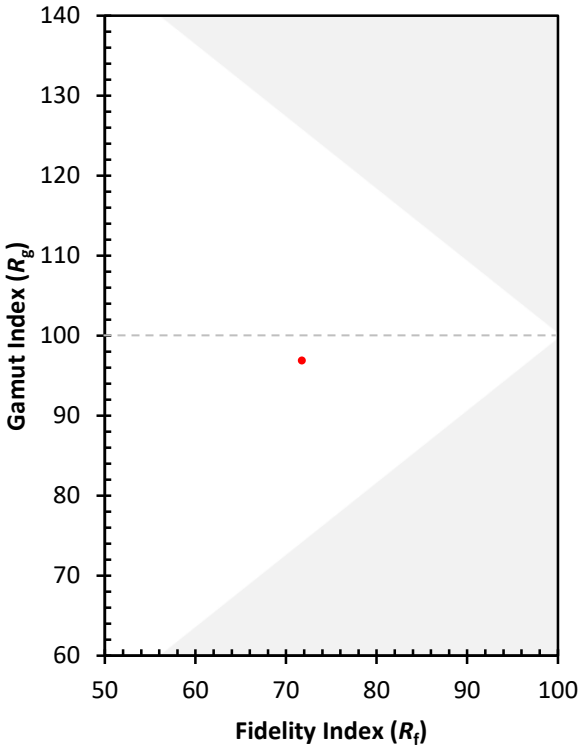
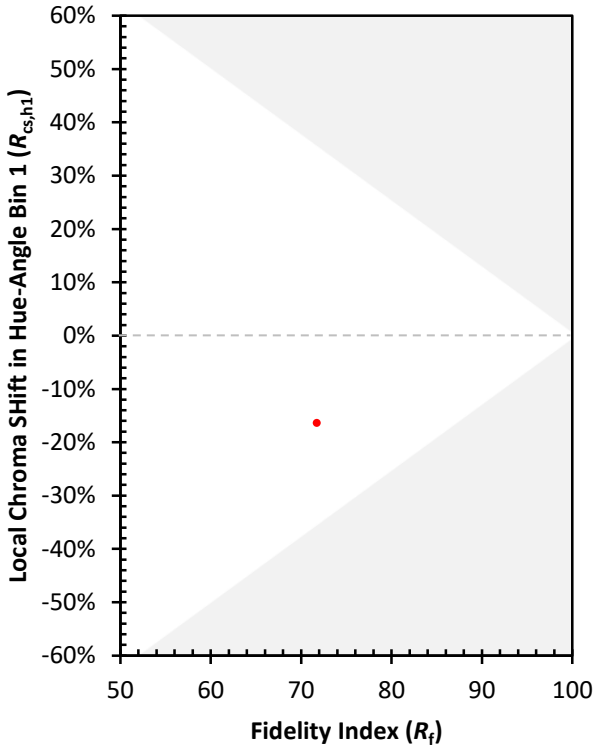
## TM-30-18

### Measure Comparisons

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