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: STREETWORKS

Report Number: P869843

Luminaire Tested: **MEM2-HTN-SA-130-830-U-T2R**

Issue Date: 08/21/2024

Report Generated By 670245763

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

Scaled Data Report

**Test Information**

| | |
|---|---|
| Test Method: | LM-79-08 |
| Report Number: | P869843 |
| Test Lab: | INNOVATION CENTER(G3) |
| Issue Date: | 08/21/2024 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS (FORMERLY EATON) |
| Product Line: | STREETWORKS |
| Catalog Number: | MEM2-HTN-SA-130-830-U-T2R |
| Description: | EPIC MODERN TALL HOUSING DISCRETE LED ARRAYS 130W 80CRI 3000K FIXTURE w/ TYPE II ROADWAY DISTRIBUTION OPTIC |
| Light Source: | (30) 3000K CCT, 80 CRI LEDS |
| Ballast/Driver: | ELECTRONIC DRIVER |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 16751.3 lumens |
| Efficiency: | N/A |
| Efficacy: | 125.0 lumens/watt |
| Luminous Opening: | Rectangular (W 1' x L: 0.33' x H: 0') |
| IES Classification: | Type II - Medium |
| BUG Rating: | B3 - U0 - G3 |

| | |
|---|---|
| Input Watts (W): | 134 |
| Input Voltage (V): | 120 |
| Input Current (Ain): | NR |
| Voltage Rise (V): | NR |
| Power Factor: | 0.99 |
| Total Harmonic Distortion (THDi): | 6.70% |
| Frequency (hertz): | 60 |
| Stabilization Time: | NR |
| Operation Time: | NR |
| Ambient Temperature (°C): | NR |
| Test Distance: | 24 FT |

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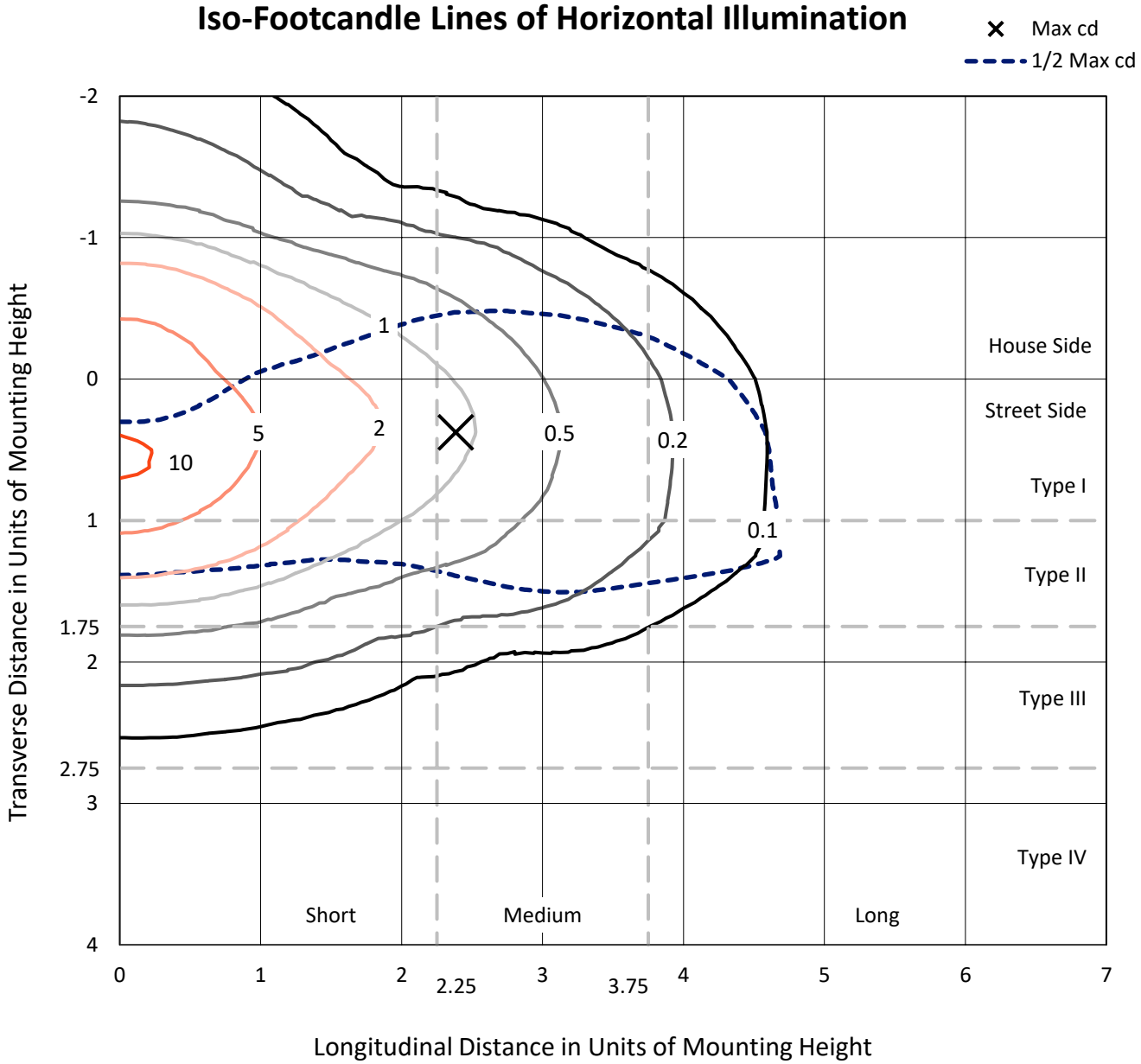
Scaled Data Report

REPORT NUMBER: P869843
CATALOG NUMBER: MEM2-HTN-SA-130-830-U-T2R

## Iso-Footcandle Lines of Horizontal Illumination




Based on 20 foot mounting height. Maximum calculated value = 10.7 fc
Type II - Medium - N/A

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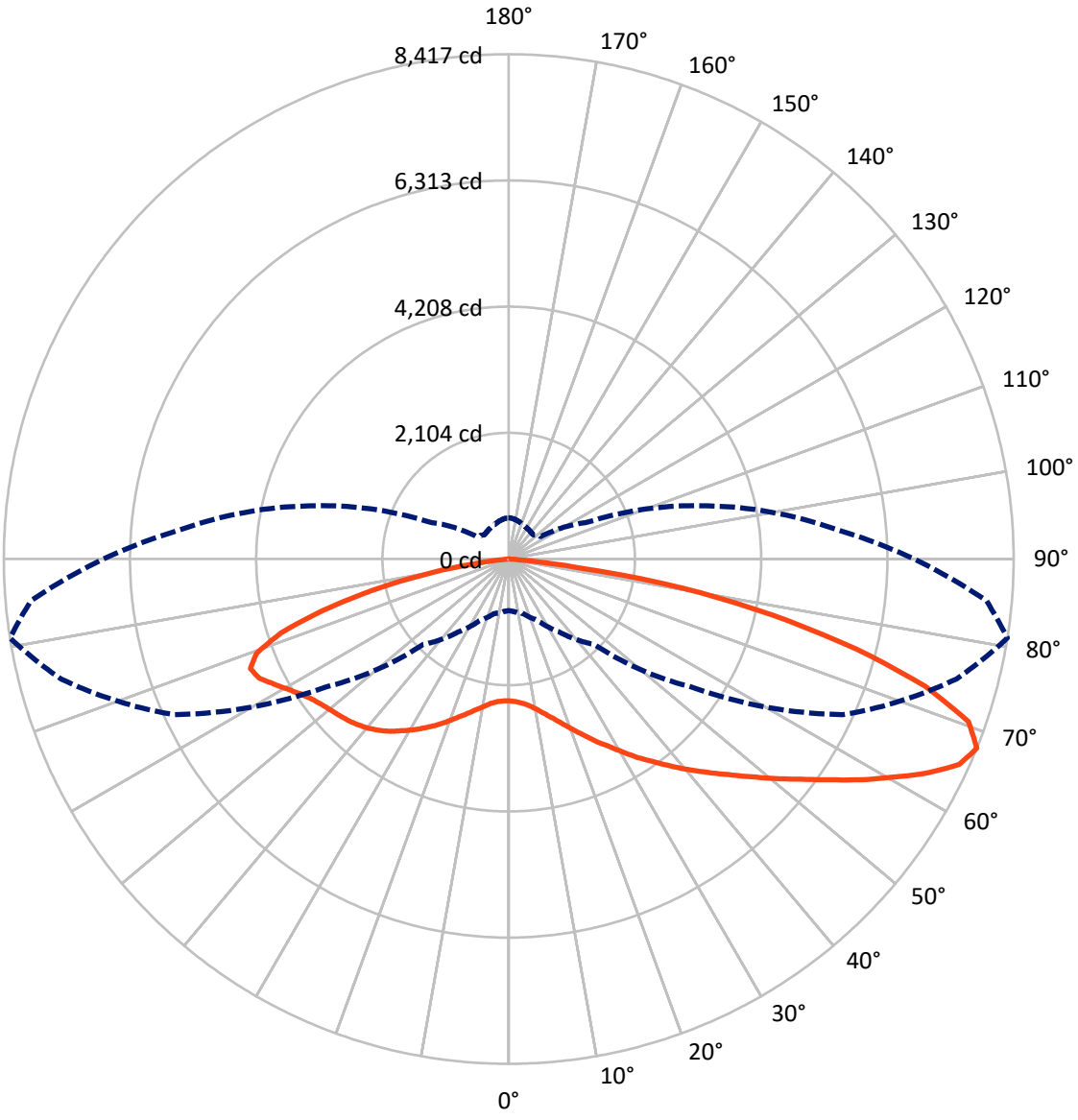
## Luminous Intensity Polar Plot



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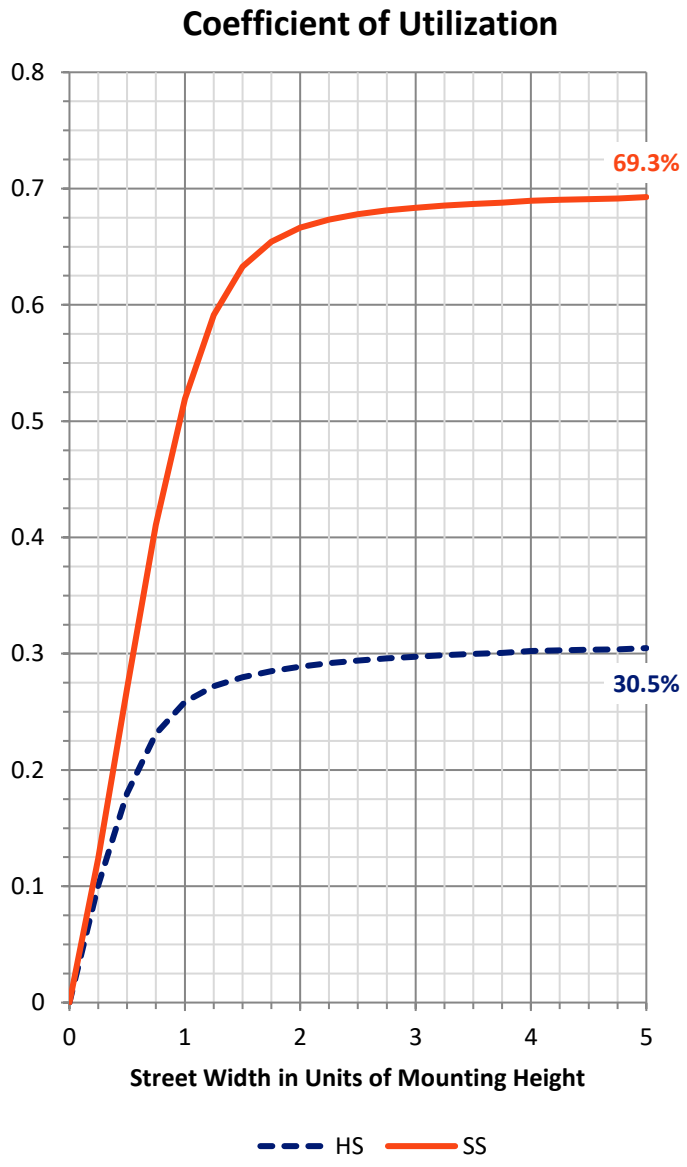
REPORT NUMBER: P869843
CATALOG NUMBER: MEM2-HTN-SA-130-830-U-T2R

**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 5133.0 | 0.0 | 5133.0 |
| | % Fixture | 30.6 | 0.0 | 30.6 |
| **Street Side** | Lumens | 11618.3 | 0.0 | 11618.3 |
| | % Fixture | 69.4 | 0.0 | 69.4 |
| **Total** | Lumens | 16751.3 | 0.0 | 16751.3 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 241.1 | 1.4 |
| 10°-20° | 856.1 | 5.1 |
| 20°-30° | 1705.1 | 10.2 |
| 30°-40° | 2678.7 | 16.0 |
| 40°-50° | 3322.1 | 19.8 |
| 50°-60° | 3247.5 | 19.4 |
| 60°-70° | 2731.0 | 16.3 |
| 70°-80° | 1735.3 | 10.4 |
| 80°-90° | 234.2 | 1.4 |
| 90°-100° | 0.0 | 0.0 |
| 100°-110° | 0.0 | 0.0 |
| 110°-120° | 0.0 | 0.0 |
| 120°-130° | 0.0 | 0.0 |
| 130°-140° | 0.0 | 0.0 |
| 140°-150° | 0.0 | 0.0 |
| 150°-160° | 0.0 | 0.0 |
| 160°-170° | 0.0 | 0.0 |
| 170°-180° | 0.0 | 0.0 |
| 0°-90° | 16751.3 | 100.0 |
| 0°-180° | 16751.3 | 100.0 |



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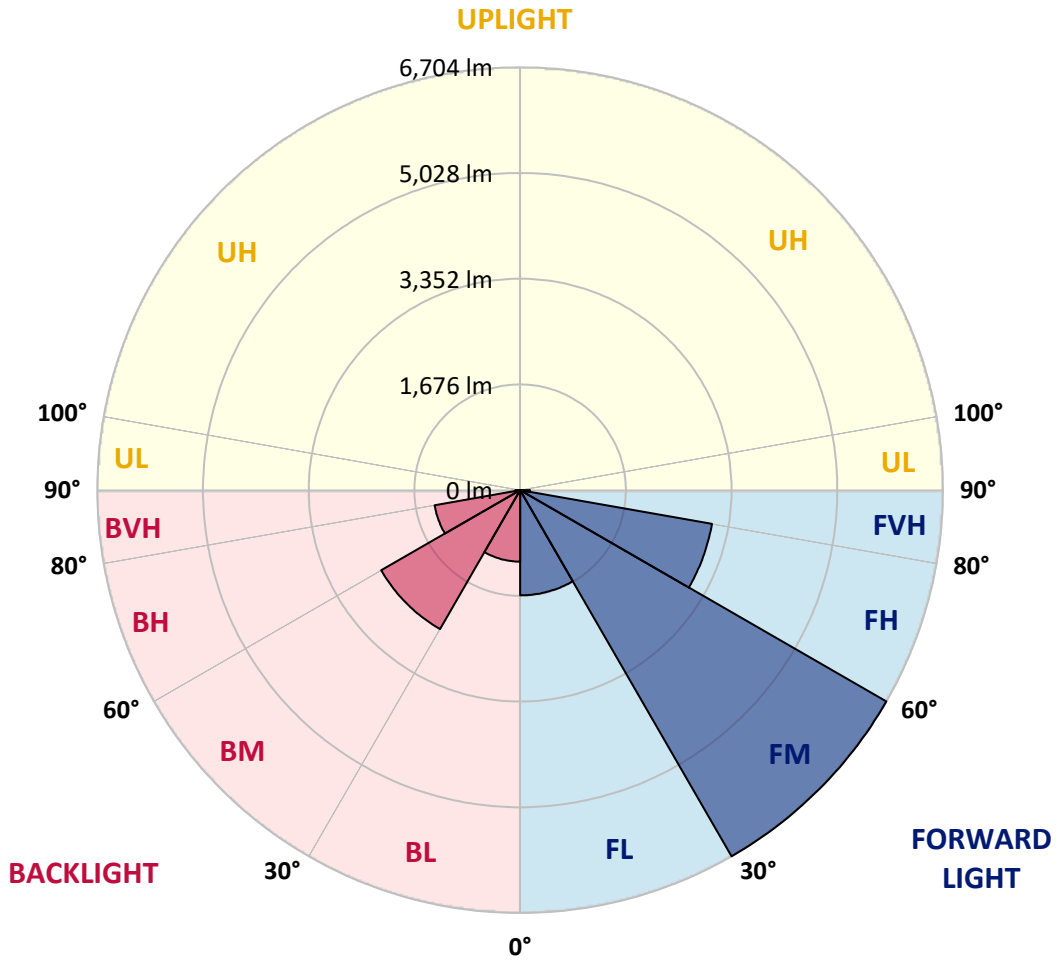
## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 1668.5 | 10.0 | | | |
| FM | (30°-60°) | 6704.4 | 40.0 | | | |
| FH | (60°-80°) | 3088.4 | 18.4 | | | G2/5000 |
| FVH | (80°-90°) | 156.9 | 0.9 | | | G2/225 |
| BL | (0°-30°) | 1133.8 | 6.8 | B3/2500 | | |
| BM | (30°-60°) | 2544.0 | 15.2 | B3/5000 | | |
| BH | (60°-80°) | 1377.9 | 8.2 | B3/2500 | | G3/2500 |
| BVH | (80°-90°) | 77.3 | 0.5 | | | 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 II Medium



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REPORT NUMBER: P869843
CATALOG NUMBER: MEM2-HTN-SA-130-830-U-T2R

**CANDELA DISTRIBUTION (FULL):**

| | 0° | 5° | 15° | 25° | 35° | 45° | 55° | 65° | 75° | 81° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 2365.0 | 2365.0 | 2365.0 | 2365.0 | 2365.0 | 2365.0 | 2365.0 | 2365.0 | 2365.0 | *2365.0* | 2365.0 |
| 2.5° | 2448.0 | 2444.7 | 2444.7 | 2418.1 | 2418.1 | 2411.5 | 2414.8 | 2394.9 | 2384.9 | *2381.6* | 2378.3 |
| 5° | 2624.1 | 2624.1 | 2604.1 | 2587.5 | 2554.3 | 2524.4 | 2497.8 | 2458.0 | 2428.1 | *2414.8* | 2404.8 |
| 7.5° | 2889.8 | 2869.9 | 2863.2 | 2813.4 | 2743.6 | 2683.9 | 2630.7 | 2544.3 | 2487.9 | *2468.0* | 2454.7 |
| 10° | 3215.3 | 3188.7 | 3138.9 | 3082.4 | 2992.8 | 2903.1 | 2796.8 | 2680.5 | 2587.5 | *2547.7* | 2531.1 |
| 12.5° | 3550.8 | 3514.3 | 3444.5 | 3391.4 | 3275.1 | 3138.9 | 2989.4 | 2830.0 | 2700.5 | *2644.0* | 2614.1 |
| 15° | 3919.5 | 3899.6 | 3816.5 | 3710.2 | 3574.0 | 3381.4 | 3195.4 | 2999.4 | 2833.3 | *2753.6* | 2703.8 |
| 17.5° | 4318.1 | 4288.2 | 4198.5 | 4069.0 | 3876.3 | 3647.1 | 3431.2 | 3178.8 | 2986.1 | *2883.2* | 2826.7 |
| 20° | 4710.0 | 4703.4 | 4570.5 | 4447.6 | 4221.8 | 3936.1 | 3657.1 | 3391.4 | 3148.9 | *3029.3* | 2956.2 |
| 22.5° | 5148.5 | 5105.3 | 4989.0 | 4816.3 | 4547.3 | 4284.9 | 3956.0 | 3610.6 | 3324.9 | *3185.4* | 3102.4 |
| 25° | 5603.5 | 5600.2 | 5457.4 | 5244.8 | 4929.3 | 4597.1 | 4241.7 | 3859.7 | 3534.2 | *3364.8* | 3255.2 |
| 27.5° | 6168.2 | 6125.0 | 5942.4 | 5699.9 | 5334.5 | 4952.5 | 4540.6 | 4118.8 | 3733.5 | *3530.9* | 3398.0 |
| 30° | 6663.1 | 6649.9 | 6443.9 | 6171.5 | 5763.0 | 5307.9 | 4862.8 | 4411.1 | 3969.3 | *3730.2* | 3584.0 |
| 32.5° | 7065.1 | 7048.4 | 6872.4 | 6600.0 | 6161.6 | 5689.9 | 5178.4 | 4686.8 | 4205.2 | *3946.1* | 3753.4 |
| 35° | 7400.5 | 7374.0 | 7191.3 | 6918.9 | 6540.2 | 6061.9 | 5517.2 | 4975.8 | 4464.2 | *4148.7* | 3966.0 |
| 37.5° | 7533.4 | 7510.1 | 7360.7 | 7134.8 | 6786.0 | 6347.6 | 5822.8 | 5294.6 | 4723.3 | *4377.9* | 4171.9 |
| 40° | 7483.6 | 7470.3 | 7364.0 | 7207.9 | 6942.2 | 6576.8 | 6115.1 | 5626.8 | 5015.6 | *4620.4* | 4374.6 |
| 42.5° | 7247.7 | 7247.7 | 7181.3 | 7101.6 | 6968.7 | 6706.3 | 6374.2 | 5945.7 | 5298.0 | *4862.8* | 4567.2 |
| 45° | 6915.6 | 6902.3 | 6879.0 | 6849.1 | 6829.2 | 6729.6 | 6543.6 | 6221.4 | 5610.2 | *5128.6* | 4799.7 |
| 47.5° | 6473.8 | 6483.8 | 6467.2 | 6480.5 | 6563.5 | 6626.6 | 6616.6 | 6477.1 | 5929.1 | *5420.9* | 5028.9 |
| 50° | 5779.6 | 5826.1 | 5879.2 | 6035.4 | 6204.8 | 6380.8 | 6543.6 | 6659.8 | 6304.4 | *5753.0* | 5294.6 |
| 52.5° | 4919.3 | 4939.2 | 5082.1 | 5450.8 | 5812.8 | 6045.3 | 6354.2 | 6742.9 | 6636.6 | *6098.5* | 5606.9 |
| 55° | 3859.7 | 3896.2 | 4112.1 | 4633.6 | 5278.0 | 5723.1 | 6085.2 | 6706.3 | 6975.4 | *6493.7* | 5972.2 |
| 57.5° | 2766.9 | 2790.1 | 3135.6 | 3673.7 | 4514.1 | 5261.4 | 5779.6 | 6560.2 | 7247.7 | *6942.2* | 6347.6 |
| 60° | 1966.4 | 2009.6 | 2232.1 | 2756.9 | 3564.1 | 4623.7 | 5500.6 | 6347.6 | 7500.2 | *7380.6* | 6839.2 |
| 62.5° | 1451.5 | 1474.8 | 1630.9 | 2012.9 | 2677.2 | 3753.4 | 5138.5 | 6191.5 | 7666.3 | *7852.3* | 7330.8 |
| 65° | 1092.8 | 1102.8 | 1209.1 | 1471.5 | 2002.9 | 2766.9 | 4567.2 | 6161.6 | 7759.3 | *8254.2* | 7765.9 |
| 67.5° | *860.3* | *876.9* | *943.3* | *1122.7* | *1491.4* | *2012.9* | *3720.2* | *6141.6* | *7726.1* | *8416.9* | *7995.1* |
| 70° | 724.1 | 727.4 | 777.3 | 876.9 | 1116.1 | 1448.2 | 2780.2 | 5842.7 | 7540.0 | *8131.3* | 7782.5 |
| 72.5° | 627.8 | 627.8 | 651.0 | 730.8 | 896.8 | 1096.1 | 1893.3 | 5128.6 | 7068.4 | *7264.3* | 7045.1 |
| 75° | 508.2 | 504.9 | 544.7 | 621.1 | 720.8 | 843.7 | 1272.2 | 3883.0 | 6078.5 | *5978.9* | 5799.5 |
| 77.5° | 441.8 | 438.5 | 471.7 | 538.1 | 594.6 | 674.3 | 870.3 | 2521.1 | 4783.1 | *4484.2* | 4371.2 |
| 80° | 378.7 | 368.7 | 395.3 | 458.4 | 488.3 | 524.8 | 601.2 | 1468.1 | 3125.6 | *2939.6* | 2803.4 |
| 82.5° | 285.7 | 262.4 | 255.8 | 308.9 | 328.8 | 305.6 | 305.6 | 514.8 | 1136.0 | *1146.0* | 1059.6 |
| 85° | 23.3 | 26.6 | 33.2 | 39.9 | 56.5 | 63.1 | 66.4 | 109.6 | 169.4 | *162.8* | 166.1 |
| 87.5° | 3.3 | 3.3 | 3.3 | 6.6 | 6.6 | 10.0 | 10.0 | 10.0 | 13.3 | *13.3* | 13.3 |
| 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: P869843
CATALOG NUMBER: MEM2-HTN-SA-130-830-U-T2R

**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 2365.0 | 2365.0 | 2365.0 | 2365.0 | 2365.0 | 2365.0 | 2365.0 | 2365.0 | 2365.0 | 2365.0 | 2365.0 |
| 2.5° | 2374.9 | 2368.3 | 2361.7 | 2361.7 | 2361.7 | 2355.0 | 2351.7 | 2351.7 | 2348.4 | 2338.4 | 2335.1 |
| 5° | 2398.2 | 2388.2 | 2378.3 | 2378.3 | 2378.3 | 2374.9 | 2371.6 | 2374.9 | 2371.6 | 2361.7 | 2358.3 |
| 7.5° | 2444.7 | 2431.4 | 2418.1 | 2418.1 | 2424.8 | 2421.4 | 2421.4 | 2424.8 | 2421.4 | 2411.5 | 2408.2 |
| 10° | 2511.1 | 2491.2 | 2484.6 | 2484.6 | 2491.2 | 2487.9 | 2484.6 | 2484.6 | 2481.2 | 2464.6 | 2471.3 |
| 12.5° | 2584.2 | 2564.3 | 2557.6 | 2561.0 | 2557.6 | 2551.0 | 2554.3 | 2544.3 | 2541.0 | 2514.5 | 2511.1 |
| 15° | 2677.2 | 2654.0 | 2640.7 | 2644.0 | 2634.0 | 2620.7 | 2607.5 | 2600.8 | 2587.5 | 2564.3 | 2557.6 |
| 17.5° | 2783.5 | 2747.0 | 2730.4 | 2730.4 | 2710.4 | 2683.9 | 2663.9 | 2644.0 | 2624.1 | 2597.5 | 2590.9 |
| 20° | 2886.5 | 2853.3 | 2826.7 | 2820.0 | 2780.2 | 2737.0 | 2700.5 | 2667.2 | 2644.0 | 2614.1 | 2607.5 |
| 22.5° | 3016.0 | 2969.5 | 2933.0 | 2903.1 | 2843.3 | 2773.5 | 2717.1 | 2670.6 | 2637.4 | 2604.1 | 2594.2 |
| 25° | 3152.2 | 3085.8 | 3026.0 | 2969.5 | 2886.5 | 2786.8 | 2707.1 | 2640.7 | 2597.5 | 2561.0 | 2554.3 |
| 27.5° | 3288.4 | 3202.0 | 3115.7 | 3026.0 | 2899.8 | 2770.2 | 2657.3 | 2577.6 | 2521.1 | 2474.6 | 2468.0 |
| 30° | 3434.5 | 3328.2 | 3192.1 | 3062.5 | 2896.4 | 2727.0 | 2584.2 | 2471.3 | 2404.8 | 2351.7 | 2345.1 |
| 32.5° | 3584.0 | 3451.1 | 3265.1 | 3089.1 | 2879.8 | 2663.9 | 2477.9 | 2358.3 | 2275.3 | 2215.5 | 2198.9 |
| 35° | 3750.1 | 3587.3 | 3331.6 | 3099.1 | 2833.3 | 2570.9 | 2365.0 | 2215.5 | 2119.2 | 2059.4 | 2046.1 |
| 37.5° | 3919.5 | 3713.6 | 3374.8 | 3092.4 | 2766.9 | 2461.3 | 2218.8 | 2066.0 | 1953.1 | 1870.1 | 1856.8 |
| 40° | 4092.2 | 3829.8 | 3401.3 | 3059.2 | 2673.9 | 2325.1 | 2082.6 | 1896.6 | 1733.9 | 1657.5 | 1620.9 |
| 42.5° | 4251.7 | 3936.1 | 3414.6 | 3012.7 | 2570.9 | 2182.3 | 1903.3 | 1660.8 | 1508.0 | 1425.0 | 1441.6 |
| 45° | 4417.7 | 4035.7 | 3417.9 | 2956.2 | 2434.7 | 1999.6 | 1677.4 | 1451.5 | 1298.7 | 1235.6 | 1229.0 |
| 47.5° | 4560.6 | 4118.8 | 3411.3 | 2876.5 | 2281.9 | 1790.3 | 1441.6 | 1225.7 | 1112.7 | 1052.9 | 1046.3 |
| 50° | 4749.9 | 4211.8 | 3401.3 | 2783.5 | 2082.6 | 1551.2 | 1222.4 | 1046.3 | 943.3 | 896.8 | 893.5 |
| 52.5° | 4939.2 | 4314.8 | 3394.7 | 2654.0 | 1873.4 | 1325.3 | 1023.1 | 883.5 | 813.8 | 790.5 | 783.9 |
| 55° | 5188.3 | 4441.0 | 3398.0 | 2504.5 | 1634.2 | 1092.8 | 866.9 | 770.6 | 734.1 | 724.1 | 724.1 |
| 57.5° | 5474.0 | 4603.7 | 3417.9 | 2338.4 | 1385.1 | 903.5 | 754.0 | 710.8 | 707.5 | 714.1 | 717.5 |
| 60° | 5819.5 | 4819.6 | 3457.8 | 2165.7 | 1155.9 | 764.0 | 687.6 | 684.3 | 694.2 | 717.5 | 724.1 |
| 62.5° | 6208.1 | 5055.5 | 3507.6 | 1939.8 | 936.7 | 671.0 | 651.0 | 664.3 | 677.6 | 704.2 | 707.5 |
| 65° | 6550.2 | 5321.2 | 3537.5 | 1723.9 | 783.9 | 617.8 | 627.8 | 634.4 | 667.6 | 704.2 | 704.2 |
| 67.5° | *6756.1* | *5513.9* | *3424.6* | *1451.5* | *654.4* | *571.3* | *591.2* | *611.2* | *647.7* | *680.9* | *687.6* |
| 70° | 6686.4 | 5450.8 | 3039.3 | 1126.0 | 554.7 | 528.1 | 551.4 | 581.3 | 617.8 | 657.7 | 677.6 |
| 72.5° | 6201.4 | 5002.3 | 2468.0 | 820.4 | 481.6 | 488.3 | 518.2 | 558.0 | 591.2 | 634.4 | 661.0 |
| 75° | 5185.0 | 4175.3 | 1780.4 | 591.2 | 421.8 | 448.4 | 494.9 | 528.1 | 551.4 | 561.4 | 564.7 |
| 77.5° | 3936.1 | 3069.2 | 1212.4 | 441.8 | 365.4 | 401.9 | 451.7 | 488.3 | 494.9 | 501.6 | 508.2 |
| 80° | 2570.9 | 1953.1 | 684.3 | 308.9 | 279.0 | 328.8 | 368.7 | 408.6 | 395.3 | 415.2 | 421.8 |
| 82.5° | 1086.2 | 853.7 | 312.2 | 152.8 | 129.5 | 139.5 | 149.5 | 132.9 | 122.9 | 122.9 | 106.3 |
| 85° | 142.8 | 109.6 | 46.5 | 19.9 | 16.6 | 10.0 | 10.0 | 10.0 | 6.6 | 6.6 | 6.6 |
| 87.5° | 13.3 | 13.3 | 10.0 | 10.0 | 6.6 | 6.6 | 3.3 | 6.6 | 3.3 | 3.3 | 3.3 |
| 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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# LM-79-2019: Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Report Prepared for

Cooper Lighting Solutions

Streetworks

Report Number: SP1-2407-157-7

Test Date: 09/05/2024

Luminaire Tested: MEM2-HTN-SA-30-830-U-5WQ

Data in this report applies to families of products including MEM2-HTN-SA-30-830-U-5WQ

Report Generated By FNC07603 / LDUCLS01DT446
Version: v7.04

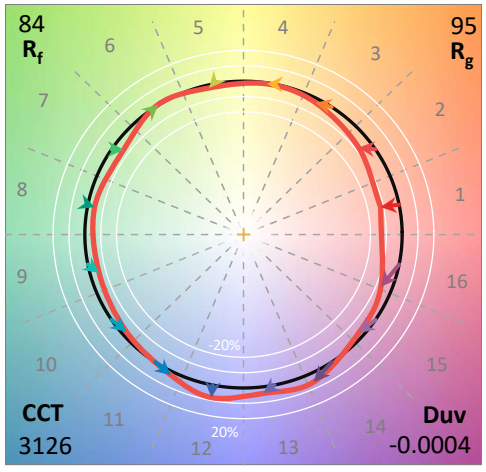
## Test Information

| | |
|---|---|
| Test Method: | LM-79-2019 |
| Report Number: | SP1-2407-157-7 |
| Test Lab: | COOPER LIGHTING SOLUTIONS |
| Photometer: | SP1 - 76IN SPHERE |
| Measurement Geometry: | 4π |
| Issue Date: | 09/05/2024 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS |
| Product Line: | Streetworks |
| Catalog Number: | **MEM2-HTN-SA-30-830-U-5WQ** |
| Description: | Epic Modern Light Square 30W 5WQ Optic |

## Spectral Parameters

| | |
|---|---|
| CCT (K): | 3126 |
| CIE u': | 0.2465 |
| CIE v': | 0.5182 |
| Duv: | -0.0004 |
| CIE x: | 0.4277 |
| CIE y: | 0.3997 |
| CIE z: | 0.1727 |
| Peak Wavelength (nm): | 601 |
| Dominant Wavelength (nm): | 582 |
| Purity: | 48.31913 |
| Rf: | 84.4 |
| Rg: | 94.7 |

| | |
|---|---|
| CRI (Ra): | 82.6 |
| R1: | 81.4 |
| R2: | 92.2 |
| R3: | 94.9 |
| R4: | 80.1 |
| R5: | 81.8 |
| R6: | 90.5 |
| R7: | 81.8 |
| R8: | 58.0 |
| R9: | 5.1 |
| R10: | 82.2 |
| R11: | 79.8 |
| R12: | 70.4 |
| R13: | 84.2 |
| R14: | 97.9 |
| R15: | 73.6 |




## Test Conditions

| | |
|---|---|
| Stabilization Time: | 22M |
| Operation Time: | 1H 22M |
| Sphere Temperature (°C): | 24.3 |

| Measurement and Test Equipment | | | |
|---|---|---|---|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | IN0058 | 6/18/2024 | 12/18/2024 |
| Power Meter | INXT2011004 | 2/8/2024 | 2/8/2025 |
| AC Power Source | IN0063 | 10/24/2023 | 10/24/2024 |
| DC Power Source | IN0208 | 10/24/2023 | 10/24/2024 |
| Sphere Thermometer | IN0085 | 10/24/2023 | 10/24/2024 |
| Room Thermometer | IN0046 | 10/24/2023 | 10/24/2024 |

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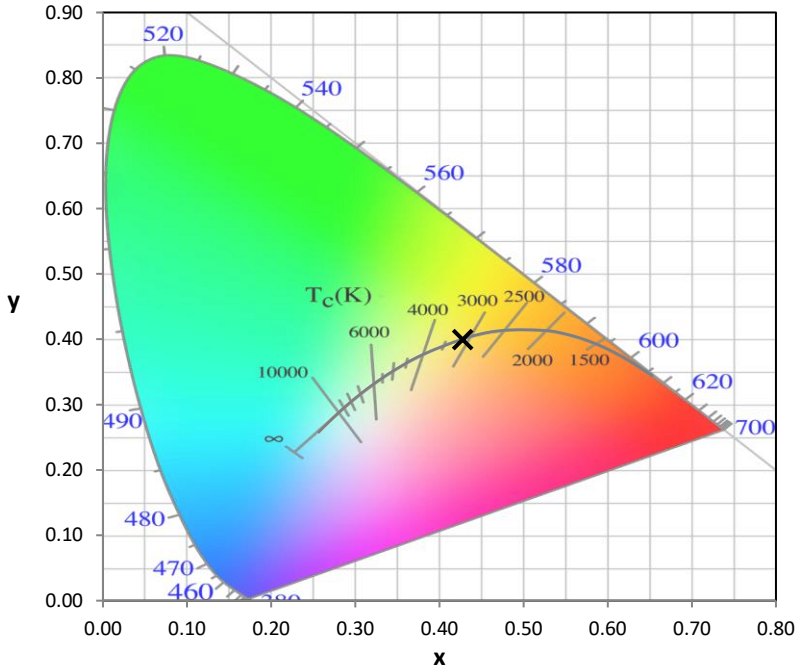
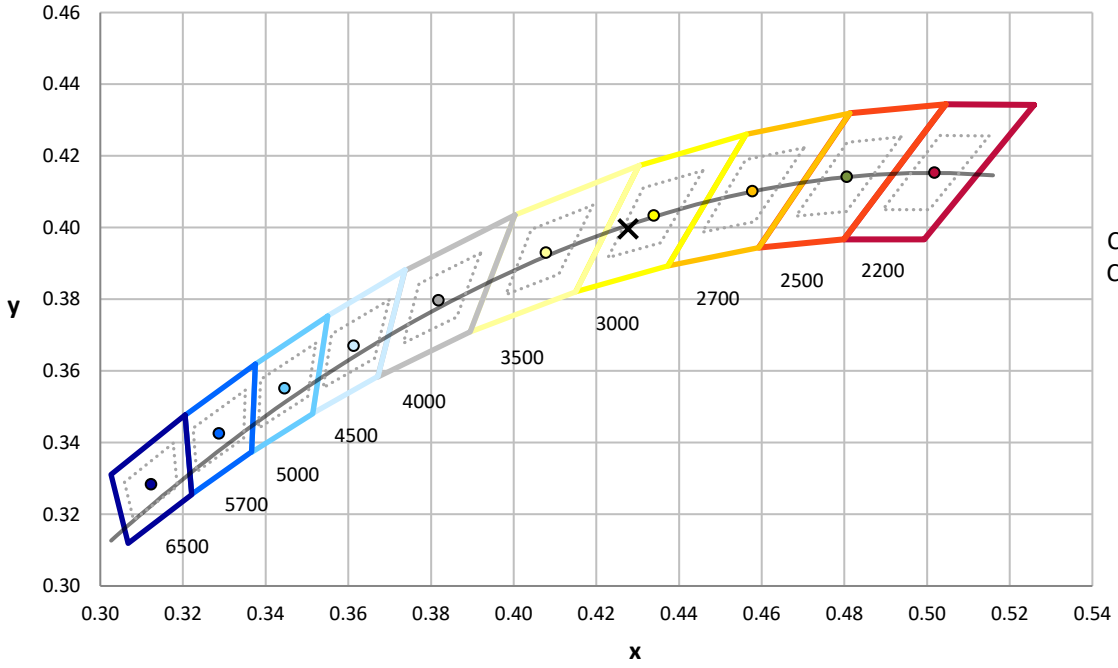
## CIE 1931 Chromaticity Diagram




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




CCT = 3126K
CIE x = 0.4277
CIE y = 0.3997
Duv = -0.0004

Point lies inside the ANSI 3000K 4-step quadrangle

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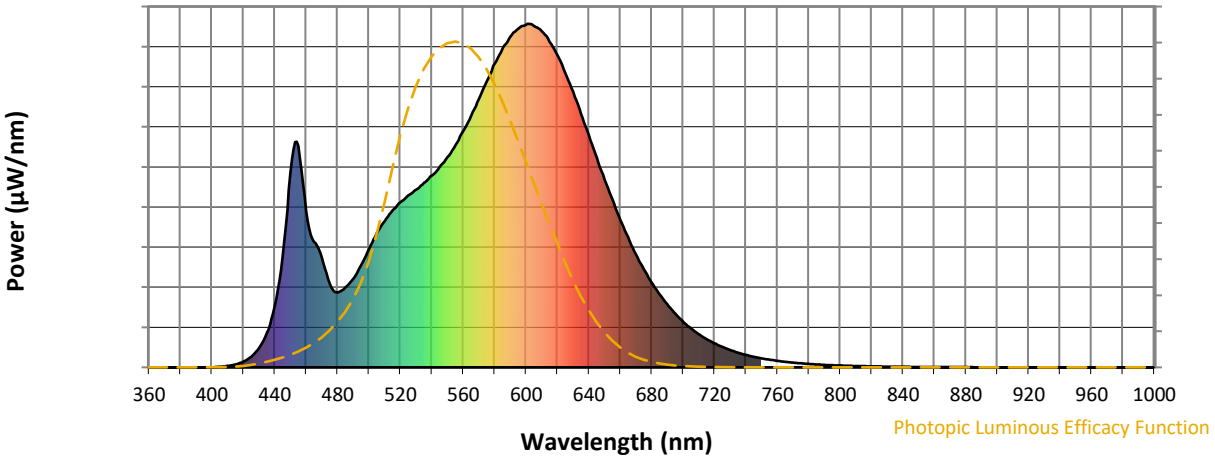
## Photopic Flux vs. Wavelength




## Photopic Lumens: NR

| λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 360 | 0 | NR | 490 | 258 | NR | 620 | 908 | NR | 750 | 26 | NR | 880 | 1 | NR |
| 365 | 0 | NR | 495 | 297 | NR | 625 | 857 | NR | 755 | 22 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 345 | NR | 630 | 801 | NR | 760 | 19 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 391 | NR | 635 | 738 | NR | 765 | 16 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 426 | NR | 640 | 675 | NR | 770 | 14 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 456 | NR | 645 | 610 | NR | 775 | 12 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 480 | NR | 650 | 547 | NR | 780 | 10 | NR | 910 | 0 | NR |
| 395 | 0 | NR | 525 | 500 | NR | 655 | 488 | NR | 785 | 9 | NR | 915 | 0 | NR |
| 400 | 0 | NR | 530 | 517 | NR | 660 | 429 | NR | 790 | 7 | NR | 920 | 0 | NR |
| 405 | 2 | NR | 535 | 538 | NR | 665 | 378 | NR | 795 | 6 | NR | 925 | 0 | NR |
| 410 | 4 | NR | 540 | 558 | NR | 670 | 328 | NR | 800 | 5 | NR | 930 | 0 | NR |
| 415 | 9 | NR | 545 | 584 | NR | 675 | 285 | NR | 805 | 5 | NR | 935 | 0 | NR |
| 420 | 16 | NR | 550 | 611 | NR | 680 | 247 | NR | 810 | 4 | NR | 940 | 0 | NR |
| 425 | 31 | NR | 555 | 646 | NR | 685 | 212 | NR | 815 | 3 | NR | 945 | 0 | NR |
| 430 | 56 | NR | 560 | 687 | NR | 690 | 183 | NR | 820 | 3 | NR | 950 | 0 | NR |
| 435 | 101 | NR | 565 | 731 | NR | 695 | 156 | NR | 825 | 3 | NR | 955 | 0 | NR |
| 440 | 178 | NR | 570 | 780 | NR | 700 | 133 | NR | 830 | 2 | NR | 960 | 0 | NR |
| 445 | 323 | NR | 575 | 832 | NR | 705 | 114 | NR | 835 | 2 | NR | 965 | 0 | NR |
| 450 | 566 | NR | 580 | 883 | NR | 710 | 96 | NR | 840 | 2 | NR | 970 | 0 | NR |
| 455 | 645 | NR | 585 | 927 | NR | 715 | 82 | NR | 845 | 1 | NR | 975 | 0 | NR |
| 460 | 457 | NR | 590 | 963 | NR | 720 | 70 | NR | 850 | 1 | NR | 980 | 0 | NR |
| 465 | 365 | NR | 595 | 985 | NR | 725 | 59 | NR | 855 | 1 | NR | 985 | 0 | NR |
| 470 | 317 | NR | 600 | 998 | NR | 730 | 50 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 244 | NR | 605 | 994 | NR | 735 | 43 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 218 | NR | 610 | 978 | NR | 740 | 36 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 233 | NR | 615 | 947 | NR | 745 | 31 | NR | 875 | 1 | NR | | | |

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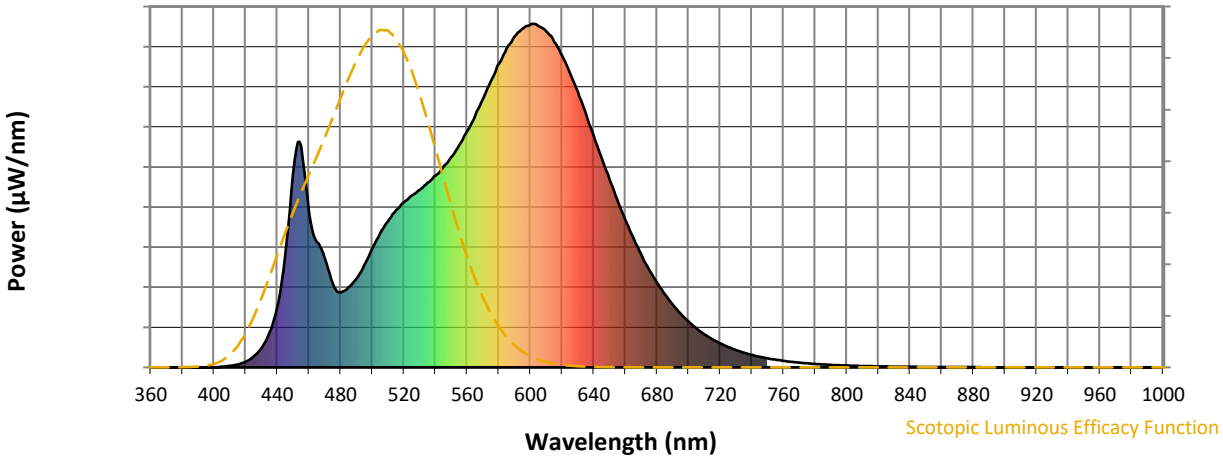
## Scotopic Flux vs. Wavelength




**Scotopic Lumens: NR** **S/P: 1.42**

| λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 360 | 0 | NR | 490 | 258 | NR | 620 | 908 | NR | 750 | 26 | NR | 880 | 1 | NR |
| 365 | 0 | NR | 495 | 297 | NR | 625 | 857 | NR | 755 | 22 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 345 | NR | 630 | 801 | NR | 760 | 19 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 391 | NR | 635 | 738 | NR | 765 | 16 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 426 | NR | 640 | 675 | NR | 770 | 14 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 456 | NR | 645 | 610 | NR | 775 | 12 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 480 | NR | 650 | 547 | NR | 780 | 10 | NR | 910 | 0 | NR |
| 395 | 0 | NR | 525 | 500 | NR | 655 | 488 | NR | 785 | 9 | NR | 915 | 0 | NR |
| 400 | 0 | NR | 530 | 517 | NR | 660 | 429 | NR | 790 | 7 | NR | 920 | 0 | NR |
| 405 | 2 | NR | 535 | 538 | NR | 665 | 378 | NR | 795 | 6 | NR | 925 | 0 | NR |
| 410 | 4 | NR | 540 | 558 | NR | 670 | 328 | NR | 800 | 5 | NR | 930 | 0 | NR |
| 415 | 9 | NR | 545 | 584 | NR | 675 | 285 | NR | 805 | 5 | NR | 935 | 0 | NR |
| 420 | 16 | NR | 550 | 611 | NR | 680 | 247 | NR | 810 | 4 | NR | 940 | 0 | NR |
| 425 | 31 | NR | 555 | 646 | NR | 685 | 212 | NR | 815 | 3 | NR | 945 | 0 | NR |
| 430 | 56 | NR | 560 | 687 | NR | 690 | 183 | NR | 820 | 3 | NR | 950 | 0 | NR |
| 435 | 101 | NR | 565 | 731 | NR | 695 | 156 | NR | 825 | 3 | NR | 955 | 0 | NR |
| 440 | 178 | NR | 570 | 780 | NR | 700 | 133 | NR | 830 | 2 | NR | 960 | 0 | NR |
| 445 | 323 | NR | 575 | 832 | NR | 705 | 114 | NR | 835 | 2 | NR | 965 | 0 | NR |
| 450 | 566 | NR | 580 | 883 | NR | 710 | 96 | NR | 840 | 2 | NR | 970 | 0 | NR |
| 455 | 645 | NR | 585 | 927 | NR | 715 | 82 | NR | 845 | 1 | NR | 975 | 0 | NR |
| 460 | 457 | NR | 590 | 963 | NR | 720 | 70 | NR | 850 | 1 | NR | 980 | 0 | NR |
| 465 | 365 | NR | 595 | 985 | NR | 725 | 59 | NR | 855 | 1 | NR | 985 | 0 | NR |
| 470 | 317 | NR | 600 | 998 | NR | 730 | 50 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 244 | NR | 605 | 994 | NR | 735 | 43 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 218 | NR | 610 | 978 | NR | 740 | 36 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 233 | NR | 615 | 947 | NR | 745 | 31 | NR | 875 | 1 | NR | | | |

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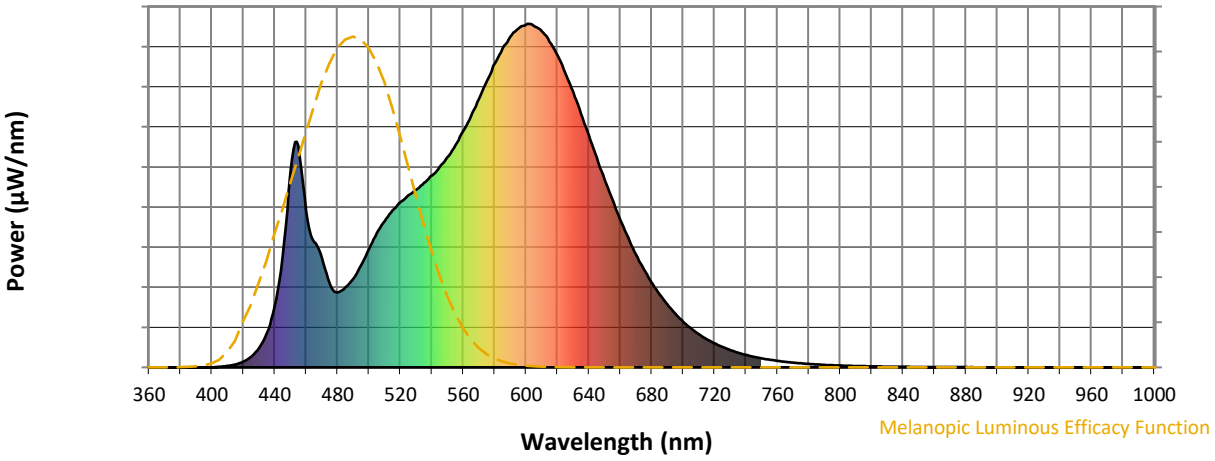
## Melanopic Flux vs. Wavelength




**Melanopic Lumens: NR** **M/P: 2.79**

| λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 360 | 0 | NR | 490 | 258 | NR | 620 | 908 | NR | 750 | 26 | NR | 880 | 1 | NR |
| 365 | 0 | NR | 495 | 297 | NR | 625 | 857 | NR | 755 | 22 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 345 | NR | 630 | 801 | NR | 760 | 19 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 391 | NR | 635 | 738 | NR | 765 | 16 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 426 | NR | 640 | 675 | NR | 770 | 14 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 456 | NR | 645 | 610 | NR | 775 | 12 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 480 | NR | 650 | 547 | NR | 780 | 10 | NR | 910 | 0 | NR |
| 395 | 0 | NR | 525 | 500 | NR | 655 | 488 | NR | 785 | 9 | NR | 915 | 0 | NR |
| 400 | 0 | NR | 530 | 517 | NR | 660 | 429 | NR | 790 | 7 | NR | 920 | 0 | NR |
| 405 | 2 | NR | 535 | 538 | NR | 665 | 378 | NR | 795 | 6 | NR | 925 | 0 | NR |
| 410 | 4 | NR | 540 | 558 | NR | 670 | 328 | NR | 800 | 5 | NR | 930 | 0 | NR |
| 415 | 9 | NR | 545 | 584 | NR | 675 | 285 | NR | 805 | 5 | NR | 935 | 0 | NR |
| 420 | 16 | NR | 550 | 611 | NR | 680 | 247 | NR | 810 | 4 | NR | 940 | 0 | NR |
| 425 | 31 | NR | 555 | 646 | NR | 685 | 212 | NR | 815 | 3 | NR | 945 | 0 | NR |
| 430 | 56 | NR | 560 | 687 | NR | 690 | 183 | NR | 820 | 3 | NR | 950 | 0 | NR |
| 435 | 101 | NR | 565 | 731 | NR | 695 | 156 | NR | 825 | 3 | NR | 955 | 0 | NR |
| 440 | 178 | NR | 570 | 780 | NR | 700 | 133 | NR | 830 | 2 | NR | 960 | 0 | NR |
| 445 | 323 | NR | 575 | 832 | NR | 705 | 114 | NR | 835 | 2 | NR | 965 | 0 | NR |
| 450 | 566 | NR | 580 | 883 | NR | 710 | 96 | NR | 840 | 2 | NR | 970 | 0 | NR |
| 455 | 645 | NR | 585 | 927 | NR | 715 | 82 | NR | 845 | 1 | NR | 975 | 0 | NR |
| 460 | 457 | NR | 590 | 963 | NR | 720 | 70 | NR | 850 | 1 | NR | 980 | 0 | NR |
| 465 | 365 | NR | 595 | 985 | NR | 725 | 59 | NR | 855 | 1 | NR | 985 | 0 | NR |
| 470 | 317 | NR | 600 | 998 | NR | 730 | 50 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 244 | NR | 605 | 994 | NR | 735 | 43 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 218 | NR | 610 | 978 | NR | 740 | 36 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 233 | NR | 615 | 947 | NR | 745 | 31 | NR | 875 | 1 | NR | | | |

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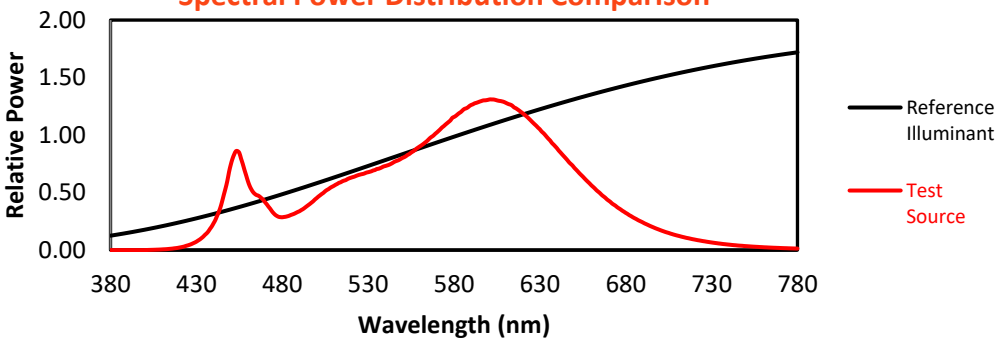
# TM-30-18

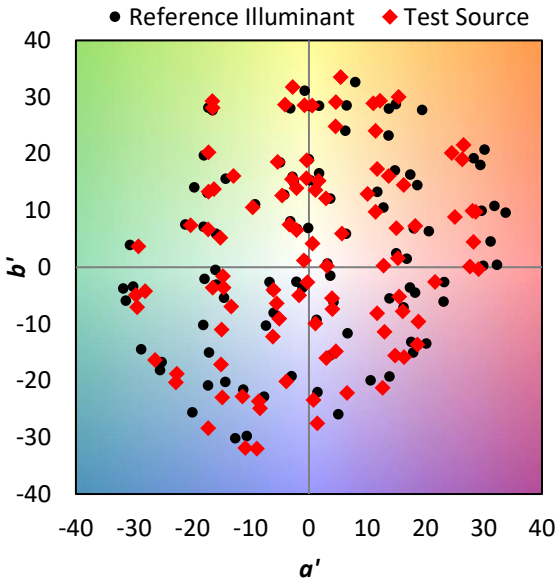
## Summary

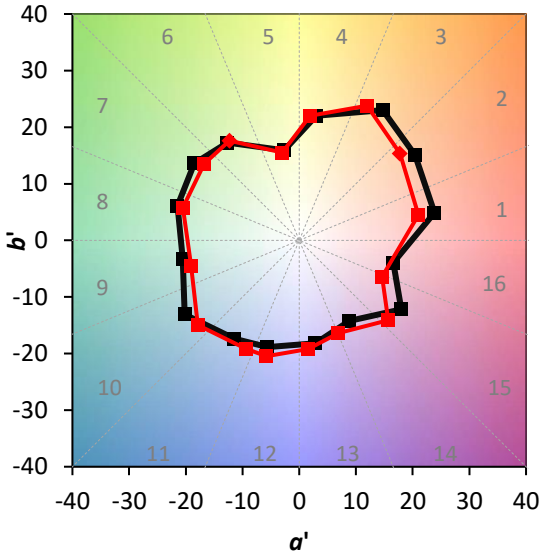
$R_f$ = 84.4
$R_g$ = 94.7
CIE $R_a$ = 82.6
$R_9$ = 5.1

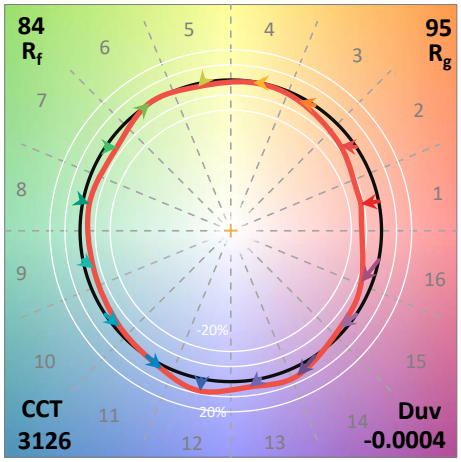
## Spectral Power Distribution Comparison

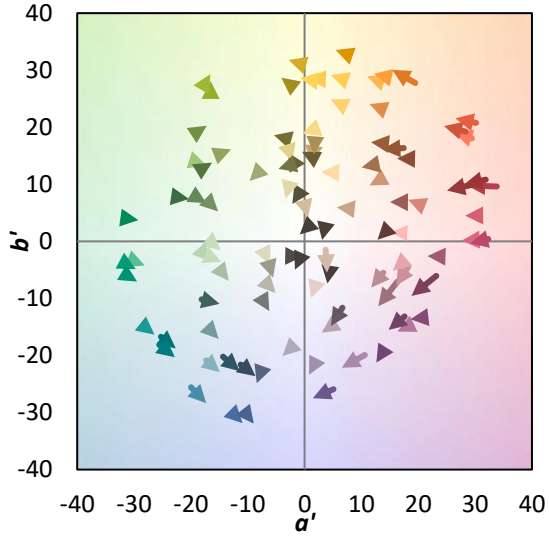



## Color Vector Graphics



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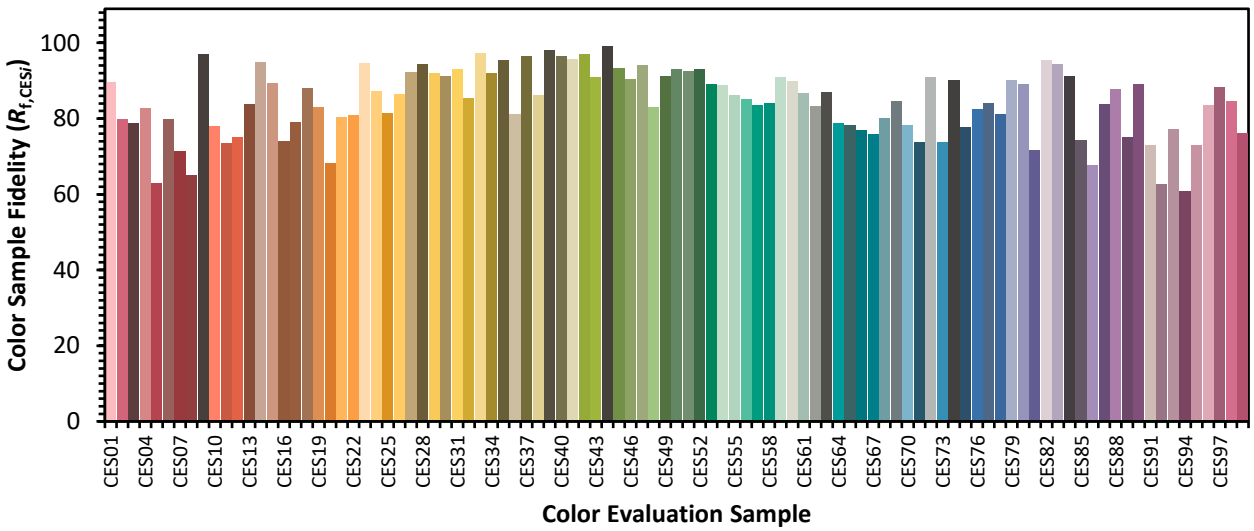
**Individual Sample Fidelity Index ($R_{f,i}$)**

| | | | |
|---|---|---|---|
| CES01 = 86 | CES26 = 86 | CES51 = 93 | CES76 = 82 |
| CES02 = 63 | CES27 = 92 | CES52 = 93 | CES77 = 84 |
| CES03 = 31 | CES28 = 94 | CES53 = 89 | CES78 = 81 |
| CES04 = 70 | CES29 = 92 | CES54 = 89 | CES79 = 90 |
| CES05 = 49 | CES30 = 91 | CES55 = 86 | CES80 = 89 |
| CES06 = 51 | CES31 = 93 | CES56 = 85 | CES81 = 72 |
| CES07 = 42 | CES32 = 85 | CES57 = 83 | CES82 = 95 |
| CES08 = 41 | CES33 = 97 | CES58 = 84 | CES83 = 94 |
| CES09 = 29 | CES34 = 92 | CES59 = 91 | CES84 = 91 |
| CES10 = 76 | CES35 = 96 | CES60 = 90 | CES85 = 74 |
| CES11 = 59 | CES36 = 81 | CES61 = 87 | CES86 = 68 |
| CES12 = 65 | CES37 = 96 | CES62 = 83 | CES87 = 84 |
| CES13 = 43 | CES38 = 86 | CES63 = 87 | CES88 = 88 |
| CES14 = 74 | CES39 = 98 | CES64 = 79 | CES89 = 75 |
| CES15 = 71 | CES40 = 96 | CES65 = 78 | CES90 = 89 |
| CES16 = 47 | CES41 = 96 | CES66 = 77 | CES91 = 73 |
| CES17 = 50 | CES42 = 97 | CES67 = 76 | CES92 = 63 |
| CES18 = 56 | CES43 = 91 | CES68 = 80 | CES93 = 77 |
| CES19 = 72 | CES44 = 99 | CES69 = 85 | CES94 = 61 |
| CES20 = 66 | CES45 = 93 | CES70 = 78 | CES95 = 73 |
| CES21 = 87 | CES46 = 90 | CES71 = 74 | CES96 = 84 |
| CES22 = 79 | CES47 = 94 | CES72 = 91 | CES97 = 88 |
| CES23 = 92 | CES48 = 83 | CES73 = 74 | CES98 = 85 |
| CES24 = 91 | CES49 = 91 | CES74 = 90 | CES99 = 76 |
| CES25 = 72 | CES50 = 93 | CES75 = 78 | |



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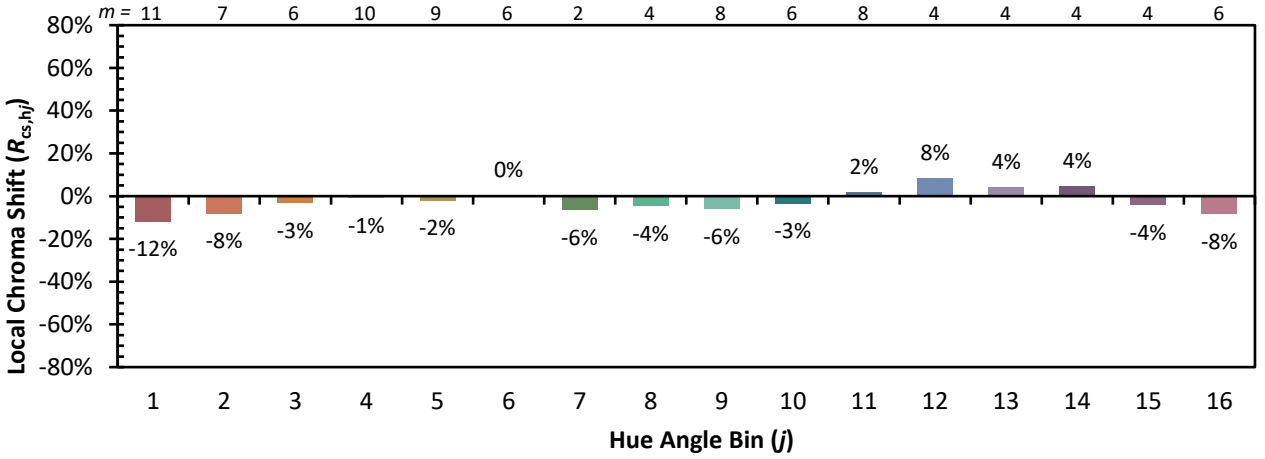
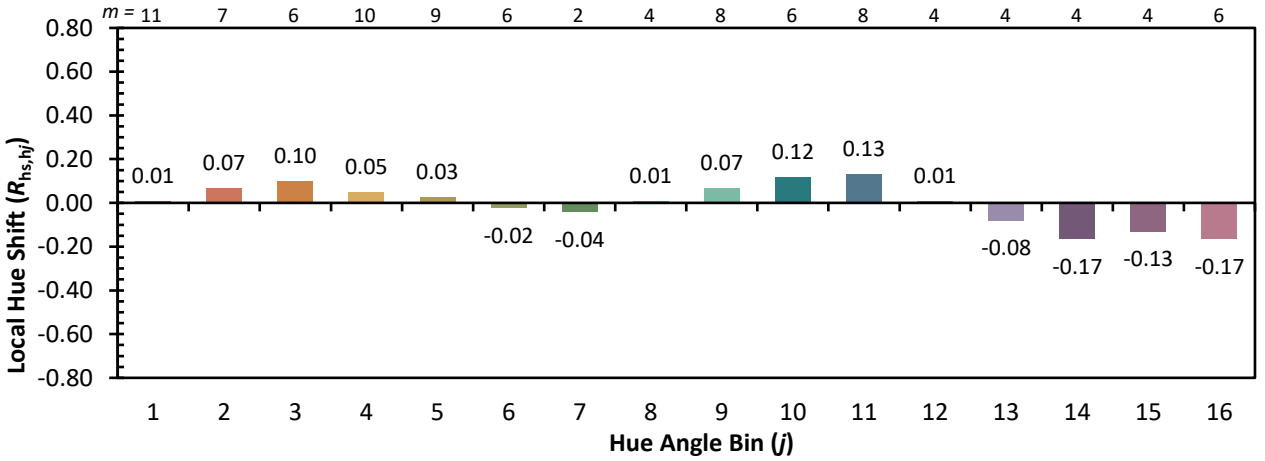
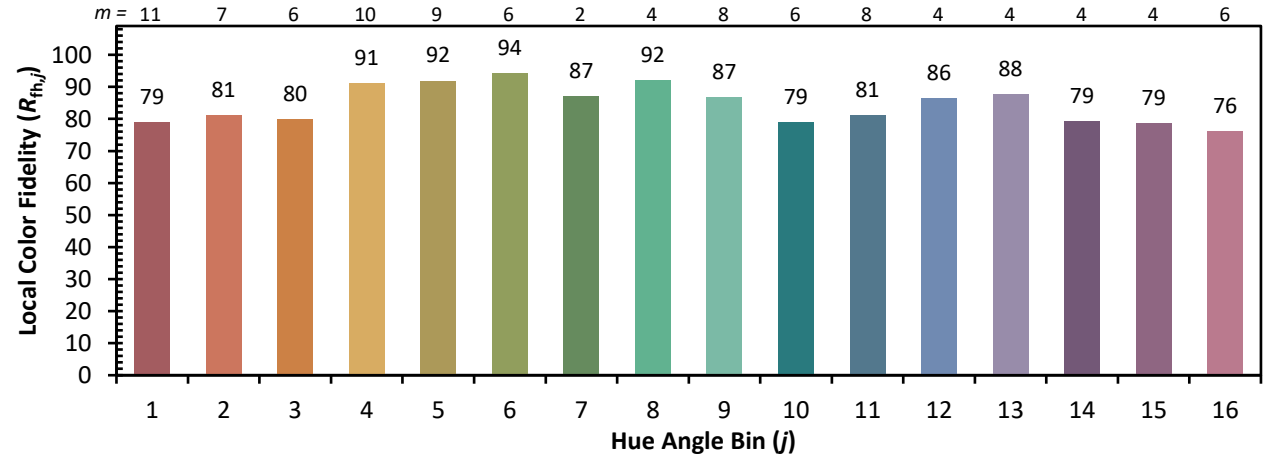
## Color Rendition by Hue-Angle Bin



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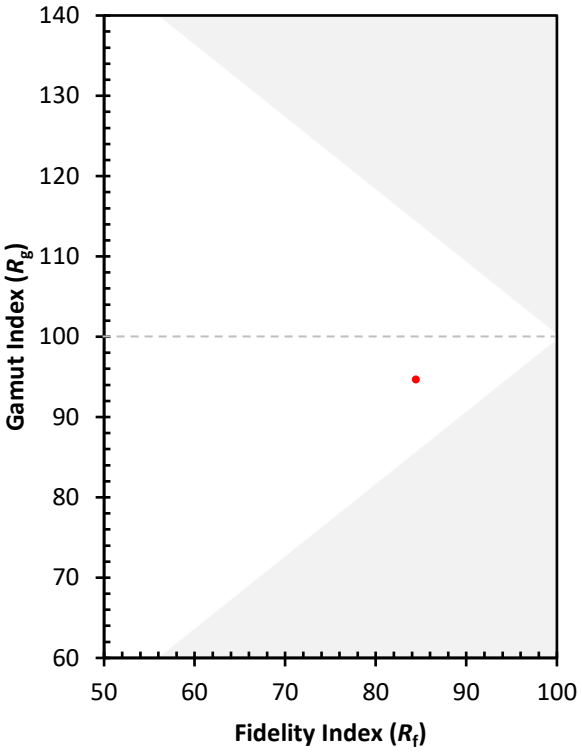
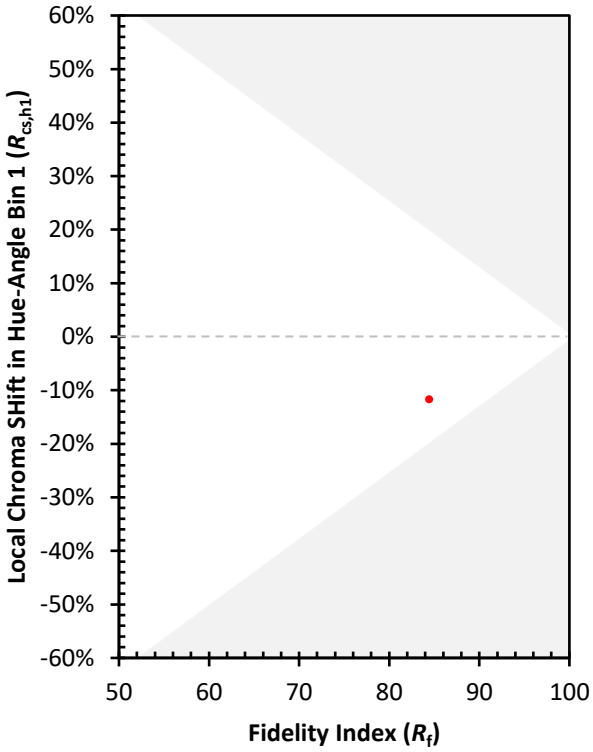
## Measure Comparisons




(END OF REPORT)