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: P867693

Luminaire Tested: **MEM2-HTN-SA-130-730-U-T4W**

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: | P867693 |
| Test Lab: | INNOVATION CENTER(G3) |
| Issue Date: | 08/21/2024 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS (FORMERLY EATON) |
| Product Line: | STREETWORKS |
| Catalog Number: | MEM2-HTN-SA-130-730-U-T4W |
| Description: | EPIC MODERN TALL HOUSING DISCRETE LED ARRAYS 130W 70CRI 3000K FIXTURE w/ TYPE IV WIDE DISTRIBUTION OPTIC |
| Light Source: | (30) 3000K CCT, 70 CRI LEDS |
| Ballast/Driver: | ELECTRONIC DRIVER |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 17726 lumens |
| Efficiency: | N/A |
| Efficacy: | 132.3 lumens/watt |
| Luminous Opening: | Rectangular (W 1' x L: 0.33' x H: 0') |
| IES Classification: | Type IV - Short |
| 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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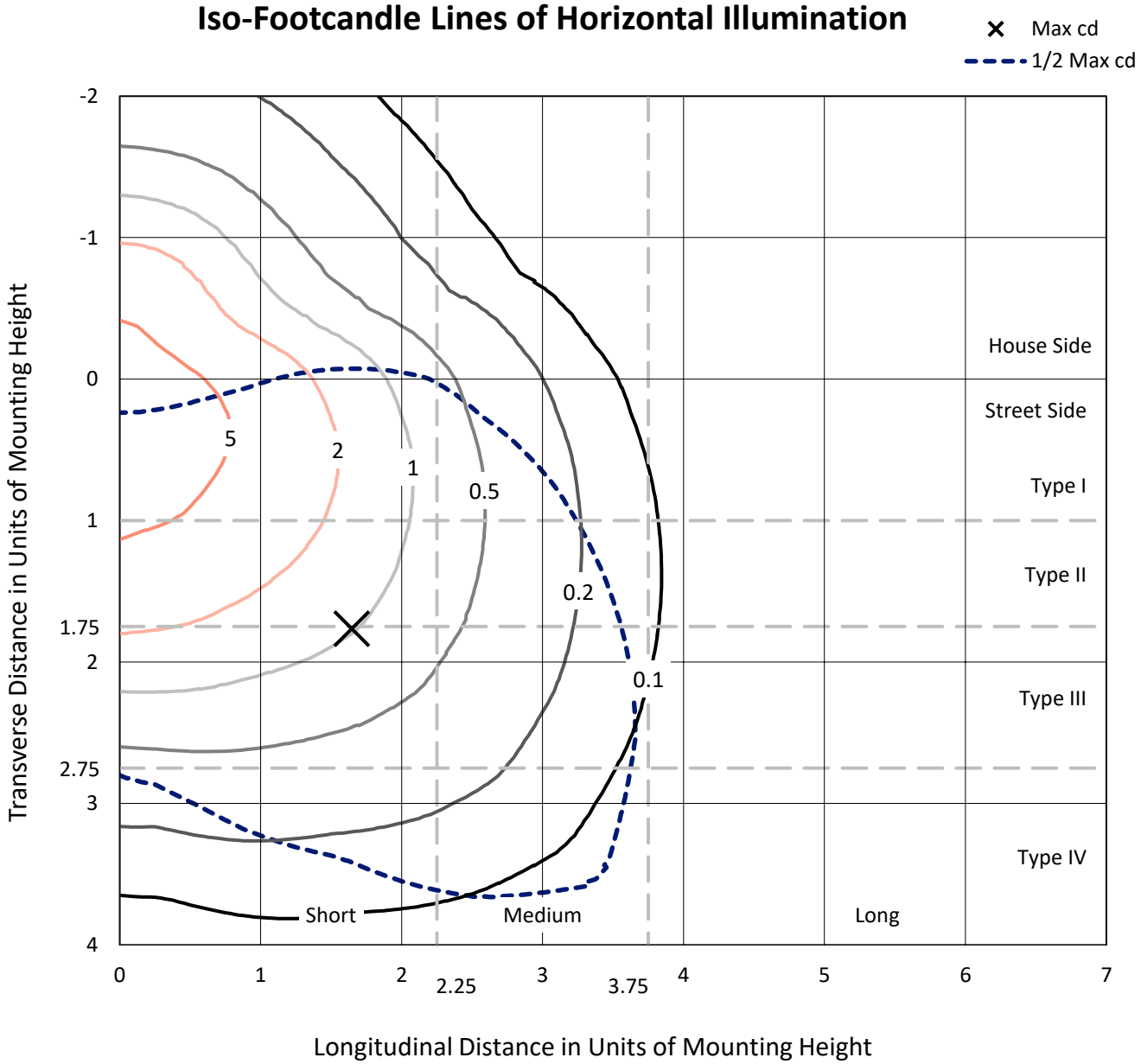
Scaled Data Report

REPORT NUMBER: P867693
CATALOG NUMBER: MEM2-HTN-SA-130-730-U-T4W

## Iso-Footcandle Lines of Horizontal Illumination




Based on 20 foot mounting height. Maximum calculated value = 8.5 fc
Type IV - Short - N/A

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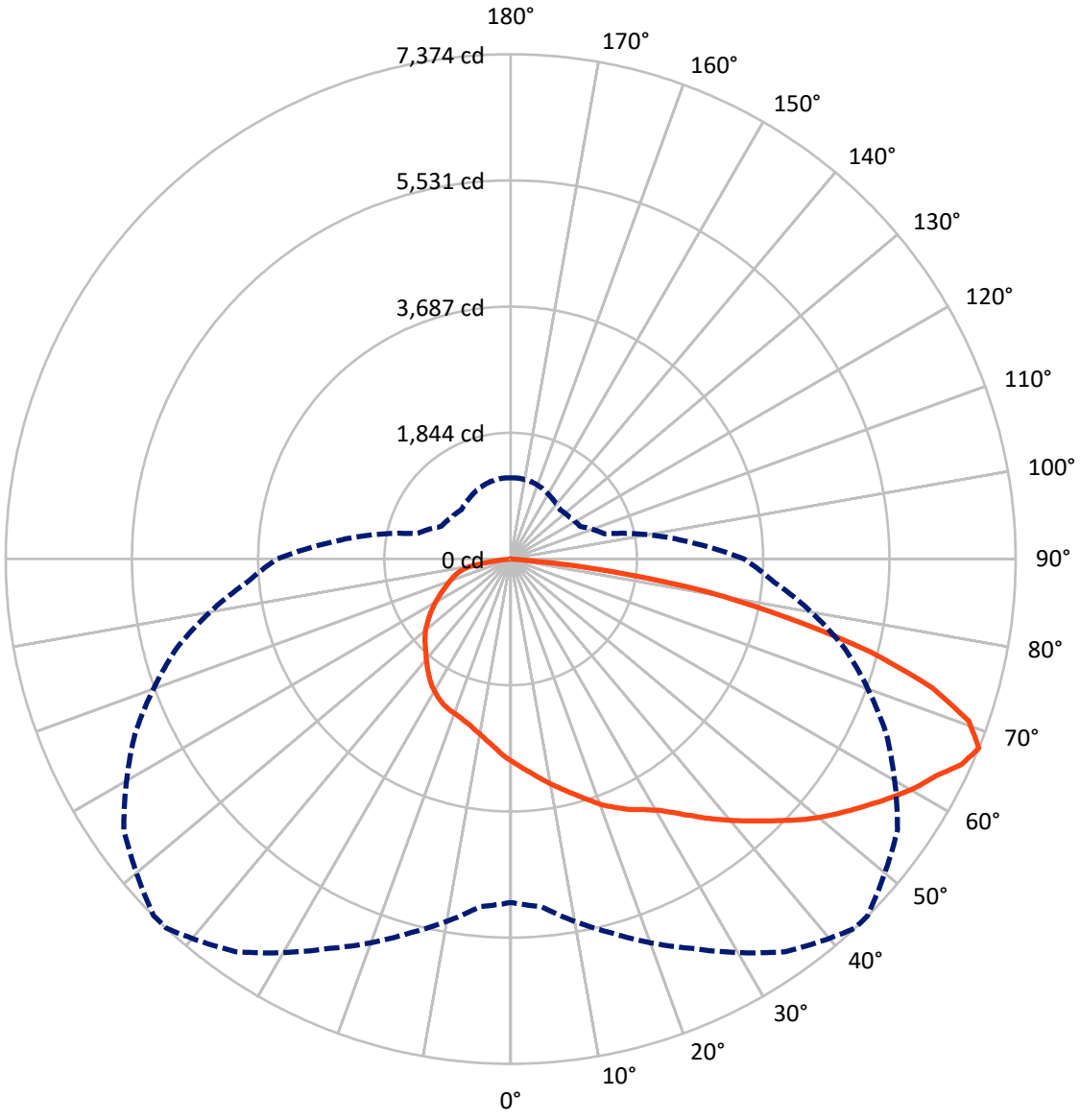
## Luminous Intensity Polar Plot



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REPORT NUMBER: P867693
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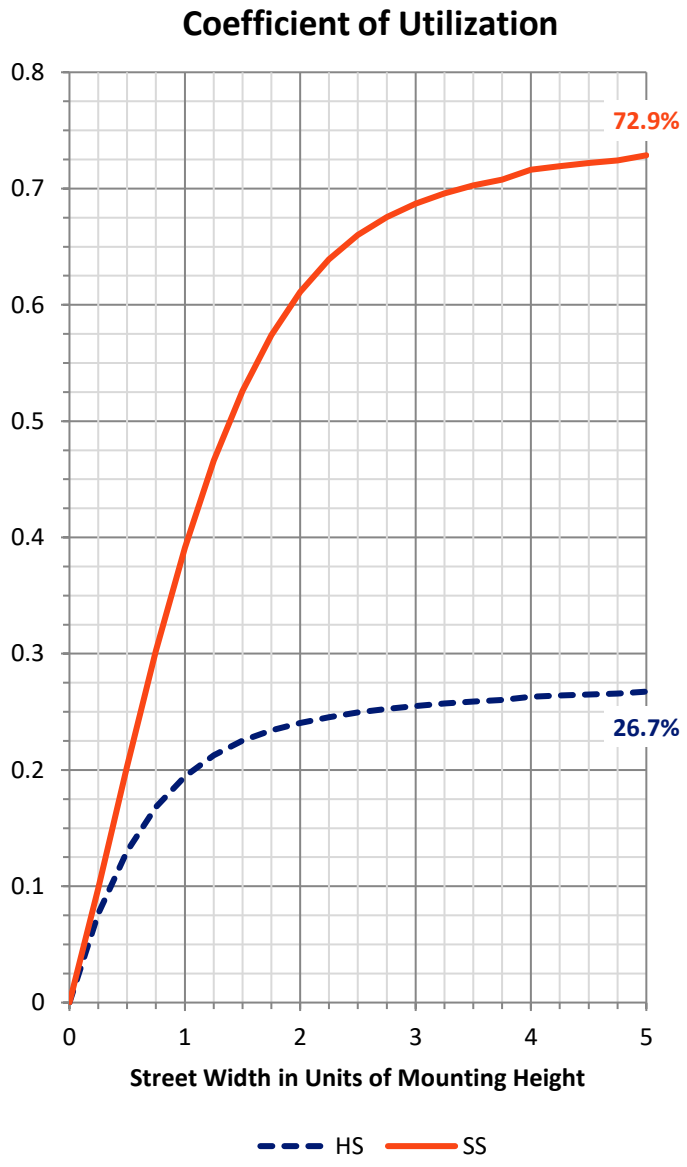
**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 4768.4 | 0.0 | 4768.4 |
| | % Fixture | 26.9 | 0.0 | 26.9 |
| **Street Side** | Lumens | 12957.6 | 0.0 | 12957.6 |
| | % Fixture | 73.1 | 0.0 | 73.1 |
| **Total** | Lumens | 17726.0 | 0.0 | 17726.0 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 283.2 | 1.6 |
| 10°-20° | 864.8 | 4.9 |
| 20°-30° | 1475.5 | 8.3 |
| 30°-40° | 2151.9 | 12.1 |
| 40°-50° | 2890.9 | 16.3 |
| 50°-60° | 3538.9 | 20.0 |
| 60°-70° | 3724.5 | 21.0 |
| 70°-80° | 2431.6 | 13.7 |
| 80°-90° | 364.8 | 2.1 |
| 90°-100° | 0.0 | 0.0 |
| 100°-110° | 0.0 | 0.0 |
| 110°-120° | 0.0 | 0.0 |
| 120°-130° | 0.0 | 0.0 |
| 130°-140° | 0.0 | 0.0 |
| 140°-150° | 0.0 | 0.0 |
| 150°-160° | 0.0 | 0.0 |
| 160°-170° | 0.0 | 0.0 |
| 170°-180° | 0.0 | 0.0 |
| 0°-90° | 17726.0 | 100.0 |
| 0°-180° | 17726.0 | 100.0 |



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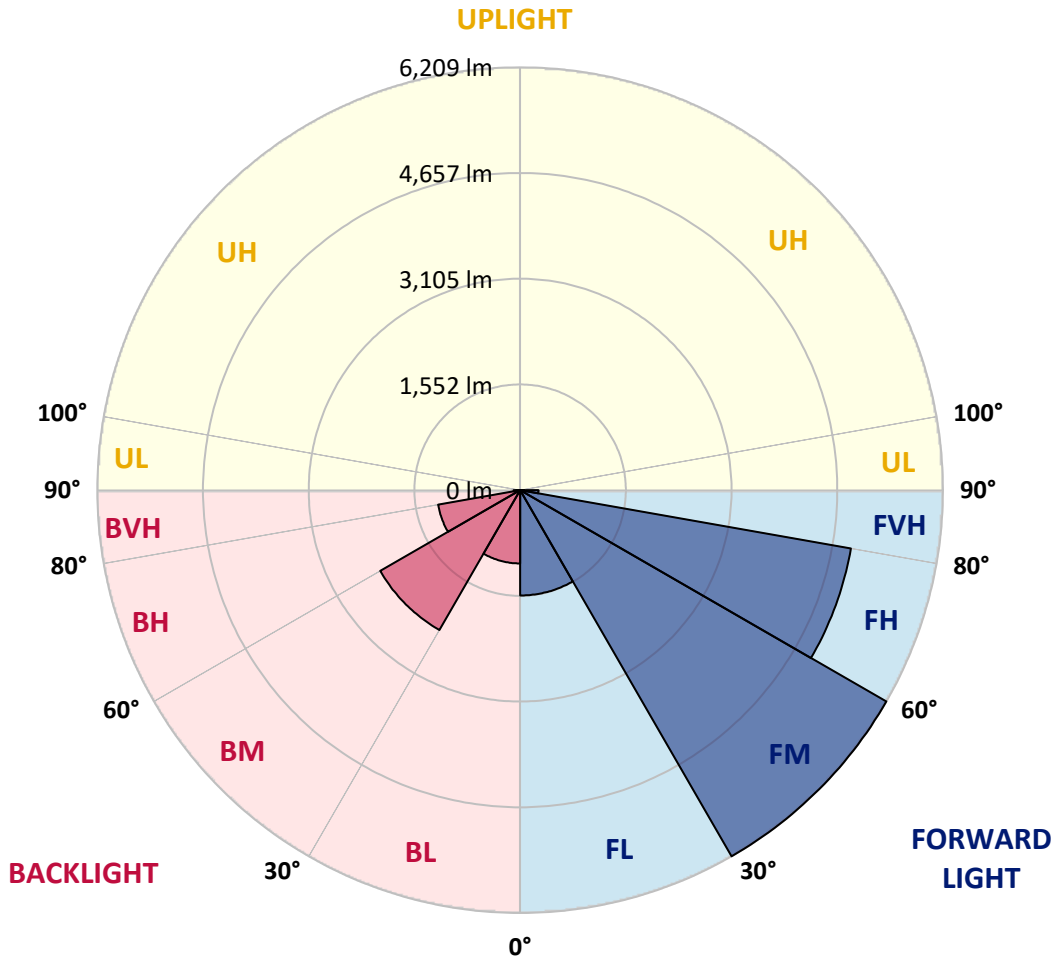
## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 1546.9 | 8.7 | | | |
| FM | (30°-60°) | 6209.3 | 35.0 | | | |
| FH | (60°-80°) | 4932.3 | 27.8 | | | G2/5000 |
| FVH | (80°-90°) | 269.1 | 1.5 | | | G3/500 |
| BL | (0°-30°) | 1076.5 | 6.1 | B3/2500 | | |
| BM | (30°-60°) | 2372.5 | 13.4 | B2/2500 | | |
| BH | (60°-80°) | 1223.7 | 6.9 | B3/2500 | | G3/2500 |
| BVH | (80°-90°) | 95.6 | 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 IV Short



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Scaled Data Report

REPORT NUMBER: P867693
CATALOG NUMBER: MEM2-HTN-SA-130-730-U-T4W

**CANDELA DISTRIBUTION (FULL):**

| | 0° | 5° | 15° | 25° | 35° | 43° | 45° | 55° | 65° | 75° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 2959.0 | 2959.0 | 2959.0 | 2959.0 | 2959.0 | *2959.0* | 2959.0 | 2959.0 | 2959.0 | 2959.0 | 2959.0 |
| 2.5° | 3095.3 | 3091.7 | 3080.9 | 3073.8 | 3052.2 | *3048.7* | 3048.7 | 3027.1 | 3002.0 | 2987.7 | 2973.3 |
| 5° | 3235.2 | 3217.2 | 3210.1 | 3195.7 | 3159.8 | *3138.3* | 3145.5 | 3106.0 | 3055.8 | 3020.0 | 2980.5 |
| 7.5° | 3360.7 | 3353.5 | 3328.4 | 3310.5 | 3267.4 | *3245.9* | 3238.8 | 3177.8 | 3113.2 | 3059.4 | 2994.9 |
| 10° | 3511.3 | 3493.4 | 3479.1 | 3443.2 | 3385.8 | *3353.5* | 3342.8 | 3263.9 | 3181.4 | 3109.6 | 3023.6 |
| 12.5° | 3647.6 | 3626.1 | 3608.2 | 3572.3 | 3514.9 | *3461.1* | 3446.8 | 3357.1 | 3253.1 | 3156.3 | 3048.7 |
| 15° | 3751.6 | 3755.2 | 3737.3 | 3705.0 | 3640.5 | *3575.9* | 3565.1 | 3446.8 | 3321.2 | 3202.9 | 3073.8 |
| 17.5° | 3848.5 | 3862.8 | 3852.1 | 3830.6 | 3766.0 | *3701.4* | 3690.7 | 3558.0 | 3407.3 | 3256.7 | 3102.5 |
| 20° | 3941.7 | 3941.7 | 3938.2 | 3923.8 | 3877.2 | *3834.1* | 3812.6 | 3679.9 | 3489.8 | 3314.1 | 3141.9 |
| 22.5° | 3995.5 | 4009.9 | 4009.9 | 4009.9 | 3981.2 | *3945.3* | 3938.2 | 3809.0 | 3601.0 | 3385.8 | 3177.8 |
| 25° | 4078.0 | 4096.0 | 4096.0 | 4088.8 | 4063.7 | *4052.9* | 4042.2 | 3920.2 | 3708.6 | 3468.3 | 3217.2 |
| 27.5° | 4253.8 | 4250.2 | 4221.5 | 4185.6 | 4149.8 | *4146.2* | 4131.8 | 4045.8 | 3834.1 | 3558.0 | 3271.0 |
| 30° | 4497.7 | 4504.8 | 4469.0 | 4357.8 | 4275.3 | *4257.4* | 4261.0 | 4185.6 | 3981.2 | 3662.0 | 3332.0 |
| 32.5° | 4870.7 | 4870.7 | 4730.8 | 4587.3 | 4469.0 | *4422.4* | 4411.6 | 4347.0 | 4131.8 | 3776.8 | 3400.2 |
| 35° | 5150.4 | 5139.7 | 5060.8 | 4892.2 | 4745.2 | *4612.4* | 4594.5 | 4508.4 | 4300.4 | 3905.9 | 3475.5 |
| 37.5° | 5362.1 | 5383.6 | 5322.6 | 5193.5 | 5050.0 | *4820.5* | 4784.6 | 4662.7 | 4454.6 | 4031.4 | 3550.8 |
| 40° | 5770.9 | 5717.1 | 5570.1 | 5451.7 | 5279.6 | *5024.9* | 4992.6 | 4842.0 | 4612.4 | 4171.3 | 3644.0 |
| 42.5° | 6068.6 | 5993.3 | 5824.7 | 5666.9 | 5451.7 | *5229.4* | 5200.7 | 5035.7 | 4795.4 | 4329.1 | 3740.9 |
| 45° | 6495.4 | 6326.9 | 6093.7 | 5953.9 | 5649.0 | *5451.7* | 5415.9 | 5236.5 | 4985.5 | 4497.7 | 3862.8 |
| 47.5° | 6907.9 | 6613.8 | 6366.3 | 6301.8 | 5864.2 | *5692.0* | 5663.3 | 5455.3 | 5189.9 | 4680.6 | 3981.2 |
| 50° | 6854.1 | 6660.4 | 6577.9 | 6517.0 | 6050.7 | *5918.0* | 5889.3 | 5677.7 | 5397.9 | 4874.3 | 4099.6 |
| 52.5° | 6717.8 | 6735.7 | 6739.3 | 6592.3 | 6226.4 | *6129.6* | 6100.9 | 5918.0 | 5613.1 | 5042.8 | 4214.3 |
| 55° | 6861.3 | 6882.8 | 6879.2 | 6656.8 | 6430.9 | *6341.2* | 6323.3 | 6161.9 | 5821.1 | 5200.7 | 4296.8 |
| 57.5° | 7080.1 | 7008.3 | 6997.6 | 6818.2 | 6649.7 | *6567.2* | 6545.7 | 6405.8 | 5996.9 | 5315.4 | 4361.4 |
| 60° | 7119.5 | 6976.1 | 7022.7 | 6854.1 | 6814.7 | *6789.5* | 6782.4 | 6617.4 | 6161.9 | 5408.7 | 4386.5 |
| 62.5° | 6678.4 | 6653.3 | 6836.2 | 6768.0 | 6900.7 | *6972.5* | 6976.1 | 6768.0 | 6251.5 | 5444.5 | 4361.4 |
| 65° | 5925.2 | 6025.6 | 6420.1 | 6617.4 | 7029.9 | *7234.3* | 7227.1 | 6857.7 | 6240.8 | 5340.5 | 4207.2 |
| 67.5° | *5017.7* | *5096.6* | *5652.6* | *6276.7* | *7001.2* | *7374.2* | *7370.6* | *6897.1* | *6054.3* | *5053.6* | *3859.2* |
| 70° | 3805.4 | 4052.9 | 4842.0 | 5663.3 | 6613.8 | *7098.0* | 7159.0 | 6674.8 | 5627.5 | 4530.0 | 3332.0 |
| 72.5° | 2894.4 | 2933.9 | 3887.9 | 4748.7 | 5921.6 | *6441.6* | 6430.9 | 5964.6 | 4913.7 | 3816.2 | 2776.1 |
| 75° | 2055.2 | 2141.2 | 2926.7 | 3679.9 | 4852.8 | *5430.2* | 5405.1 | 4892.2 | 3920.2 | 2969.8 | 2123.3 |
| 77.5° | 1531.5 | 1563.8 | 2141.2 | 2729.4 | 3629.7 | *4149.8* | 4139.0 | 3615.4 | 2883.7 | 2180.7 | 1581.7 |
| 80° | 1119.0 | 1172.8 | 1542.3 | 1904.5 | 2460.4 | *2908.8* | 2894.4 | 2399.5 | 1850.7 | 1524.3 | 1154.9 |
| 82.5° | 627.7 | 667.1 | 896.7 | 1151.3 | 1298.4 | *1438.3* | 1377.3 | 1151.3 | 842.9 | 656.4 | 566.7 |
| 85° | 17.9 | 21.5 | 32.3 | 39.5 | 68.1 | *114.8* | 125.5 | 111.2 | 132.7 | 82.5 | 89.7 |
| 87.5° | 7.2 | 7.2 | 7.2 | 7.2 | 7.2 | *10.8* | 10.8 | 10.8 | 10.8 | 10.8 | 10.8 |
| 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: P867693
CATALOG NUMBER: MEM2-HTN-SA-130-730-U-T4W

**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 2959.0 | 2959.0 | 2959.0 | 2959.0 | 2959.0 | 2959.0 | 2959.0 | 2959.0 | 2959.0 | 2959.0 | 2959.0 |
| 2.5° | 2966.2 | 2951.8 | 2923.1 | 2905.2 | 2894.4 | 2880.1 | 2858.6 | 2844.2 | 2833.5 | 2847.8 | 2844.2 |
| 5° | 2962.6 | 2933.9 | 2883.7 | 2847.8 | 2811.9 | 2783.2 | 2751.0 | 2725.9 | 2711.5 | 2718.7 | 2715.1 |
| 7.5° | 2962.6 | 2926.7 | 2847.8 | 2790.4 | 2736.6 | 2693.6 | 2657.7 | 2625.4 | 2611.1 | 2614.7 | 2611.1 |
| 10° | 2976.9 | 2926.7 | 2822.7 | 2740.2 | 2668.5 | 2618.3 | 2578.8 | 2550.1 | 2539.4 | 2550.1 | 2553.7 |
| 12.5° | 2991.3 | 2926.7 | 2801.2 | 2697.2 | 2603.9 | 2550.1 | 2514.2 | 2496.3 | 2503.5 | 2507.1 | 2510.7 |
| 15° | 2998.4 | 2923.1 | 2779.7 | 2647.0 | 2542.9 | 2485.6 | 2464.0 | 2460.4 | 2478.4 | 2496.3 | 2499.9 |
| 17.5° | 3016.4 | 2919.5 | 2747.4 | 2596.7 | 2489.1 | 2442.5 | 2431.8 | 2446.1 | 2482.0 | 2507.1 | 2514.2 |
| 20° | 3037.9 | 2926.7 | 2711.5 | 2535.8 | 2435.3 | 2399.5 | 2417.4 | 2449.7 | 2492.7 | 2528.6 | 2535.8 |
| 22.5° | 3059.4 | 2930.3 | 2679.2 | 2482.0 | 2378.0 | 2370.8 | 2410.2 | 2456.9 | 2507.1 | 2542.9 | 2550.1 |
| 25° | 3084.5 | 2930.3 | 2636.2 | 2413.8 | 2320.6 | 2331.3 | 2392.3 | 2453.3 | 2499.9 | 2546.5 | 2553.7 |
| 27.5° | 3109.6 | 2937.5 | 2589.6 | 2338.5 | 2248.8 | 2281.1 | 2356.4 | 2431.8 | 2482.0 | 2528.6 | 2539.4 |
| 30° | 3152.7 | 2951.8 | 2550.1 | 2273.9 | 2177.1 | 2220.1 | 2309.8 | 2395.9 | 2449.7 | 2499.9 | 2510.7 |
| 32.5° | 3195.7 | 2973.3 | 2517.8 | 2205.8 | 2105.4 | 2155.6 | 2256.0 | 2352.8 | 2410.2 | 2456.9 | 2464.0 |
| 35° | 3253.1 | 3002.0 | 2492.7 | 2137.6 | 2033.6 | 2073.1 | 2180.7 | 2288.3 | 2352.8 | 2388.7 | 2406.6 |
| 37.5° | 3314.1 | 3041.5 | 2471.2 | 2076.7 | 1954.7 | 1990.6 | 2105.4 | 2220.1 | 2288.3 | 2324.2 | 2331.3 |
| 40° | 3389.4 | 3095.3 | 2456.9 | 2019.3 | 1879.4 | 1908.1 | 2022.9 | 2148.4 | 2213.0 | 2238.1 | 2252.4 |
| 42.5° | 3471.9 | 3152.7 | 2446.1 | 1961.9 | 1796.9 | 1825.6 | 1947.6 | 2069.5 | 2134.1 | 2155.6 | 2166.3 |
| 45° | 3575.9 | 3228.0 | 2438.9 | 1900.9 | 1728.8 | 1753.9 | 1875.8 | 1997.8 | 2051.6 | 2080.3 | 2091.0 |
| 47.5° | 3672.7 | 3303.3 | 2417.4 | 1829.2 | 1653.5 | 1689.3 | 1800.5 | 1908.1 | 1969.1 | 1987.0 | 1997.8 |
| 50° | 3769.6 | 3367.9 | 2374.4 | 1750.3 | 1585.3 | 1617.6 | 1718.0 | 1796.9 | 1843.5 | 1865.1 | 1872.2 |
| 52.5° | 3862.8 | 3414.5 | 2306.2 | 1667.8 | 1513.6 | 1535.1 | 1617.6 | 1692.9 | 1725.2 | 1732.4 | 1753.9 |
| 55° | 3923.8 | 3439.6 | 2209.4 | 1571.0 | 1441.8 | 1449.0 | 1510.0 | 1578.1 | 1596.1 | 1599.7 | 1599.7 |
| 57.5° | 3966.8 | 3425.3 | 2094.6 | 1474.1 | 1370.1 | 1370.1 | 1406.0 | 1459.8 | 1466.9 | 1470.5 | 1477.7 |
| 60° | 3974.0 | 3375.0 | 1947.6 | 1384.5 | 1291.2 | 1280.4 | 1316.3 | 1348.6 | 1352.2 | 1359.3 | 1366.5 |
| 62.5° | 3920.2 | 3263.9 | 1789.7 | 1298.4 | 1215.9 | 1190.8 | 1223.1 | 1255.3 | 1273.3 | 1284.0 | 1291.2 |
| 65° | 3755.2 | 3037.9 | 1610.4 | 1212.3 | 1144.1 | 1101.1 | 1140.6 | 1194.4 | 1230.2 | 1233.8 | 1233.8 |
| 67.5° | *3410.9* | *2672.1* | *1420.3* | *1122.6* | *1058.1* | *1018.6* | *1068.8* | *1126.2* | *1169.3* | *1187.2* | *1183.6* |
| 70° | 2890.8 | 2266.8 | 1244.6 | 1029.4 | 972.0 | 946.9 | 1000.7 | 1065.2 | 1101.1 | 1115.5 | 1122.6 |
| 72.5° | 2327.7 | 1814.8 | 1090.3 | 936.1 | 896.7 | 882.3 | 936.1 | 1000.7 | 1050.9 | 1072.4 | 1076.0 |
| 75° | 1811.3 | 1427.5 | 961.2 | 839.3 | 807.0 | 810.6 | 868.0 | 932.5 | 986.3 | 997.1 | 964.8 |
| 77.5° | 1406.0 | 1137.0 | 839.3 | 724.5 | 706.6 | 731.7 | 789.1 | 857.2 | 889.5 | 900.3 | 878.7 |
| 80° | 1015.0 | 871.6 | 677.9 | 570.3 | 570.3 | 609.7 | 659.9 | 738.9 | 749.6 | 735.3 | 742.4 |
| 82.5° | 480.6 | 423.2 | 333.6 | 276.2 | 258.2 | 286.9 | 304.9 | 330.0 | 358.7 | 365.8 | 347.9 |
| 85° | 64.6 | 43.0 | 32.3 | 35.9 | 32.3 | 21.5 | 14.3 | 14.3 | 14.3 | 10.8 | 10.8 |
| 87.5° | 10.8 | 10.8 | 7.2 | 7.2 | 7.2 | 7.2 | 7.2 | 7.2 | 3.6 | 3.6 | 3.6 |
| 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-79-2019: Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Report Prepared for

Cooper Lighting Solutions

Streetworks

Report Number: SP1-2407-157-4

Test Date: 08/07/2024

Luminaire Tested: MEM2-HTN-SA-30-730-U-5WQ-2

Data in this report applies to families of products including MEM2-HTN-SA-30-730-U-5WQ-2

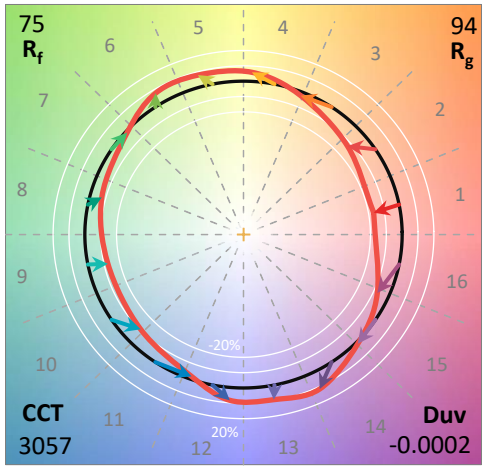
Report Generated By FNC07603 / LDUCLS01DT446
Version: v7.04

## Test Information

| | |
|---|---|
| Test Method: | LM-79-2019 |
| Report Number: | SP1-2407-157-4 |
| Test Lab: | COOPER LIGHTING SOLUTIONS |
| Photometer: | SP1 - 76IN SPHERE |
| Measurement Geometry: | 4π |
| Issue Date: | 08/20/2024 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS |
| Product Line: | Streetworks |
| Catalog Number: | **MEM2-HTN-SA-30-730-U-5WQ-2** |
| Description: | Epic Modern Light Square 30W 5WQ Optic and Flare Trim |

## Spectral Parameters

| | | | | | |
|---|---|---|---|---|---|
| CCT (K): | 3057 | CRI (Ra): | 71.7 | | |
| CIE u': | 0.2487 | R1: | 68.1 | R9: | -34.8 |
| CIE v': | 0.5199 | R2: | 82.0 | R10: | 58.5 |
| Duv: | -0.0002 | R3: | 93.5 | R11: | 62.5 |
| CIE x: | 0.4326 | R4: | 67.5 | R12: | 47.5 |
| CIE y: | 0.4020 | R5: | 67.2 | R13: | 70.7 |
| CIE z: | 0.1654 | R6: | 74.9 | R14: | 96.4 |
| Peak Wavelength (nm): | 593 | R7: | 77.4 | R15: | 60.0 |
| Dominant Wavelength (nm): | 582 | R8: | 43.1 | | |
| Purity: | 50.50735 | | | | |
| Rf: | 74.6 | | | | |
| Rg: | 94 | | | | |




## Test Conditions

| | |
|---|---|
| Stabilization Time: | 21M |
| Operation Time: | 1H 21M |
| Sphere Temperature (°C): | 24.2 |

REPORT NUMBER: SP1-2407-157-4

| 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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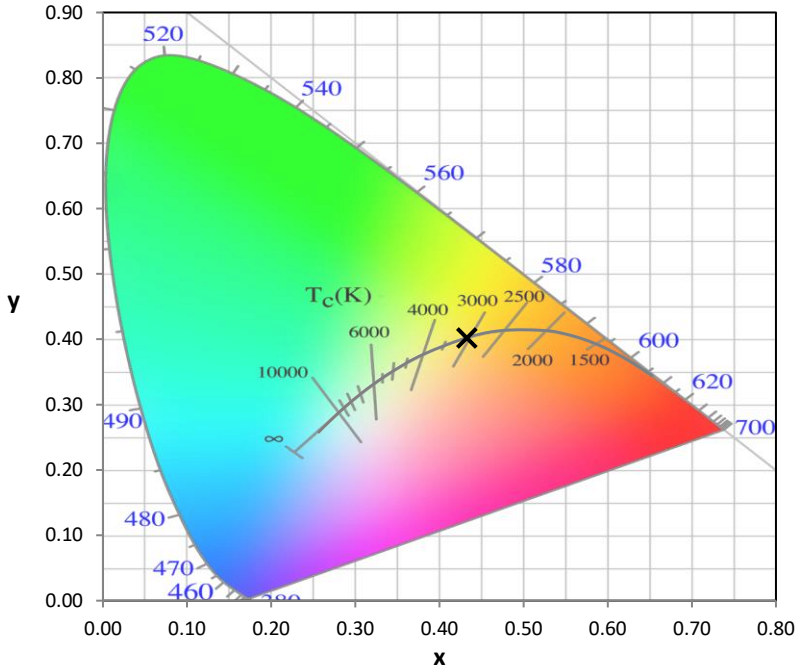
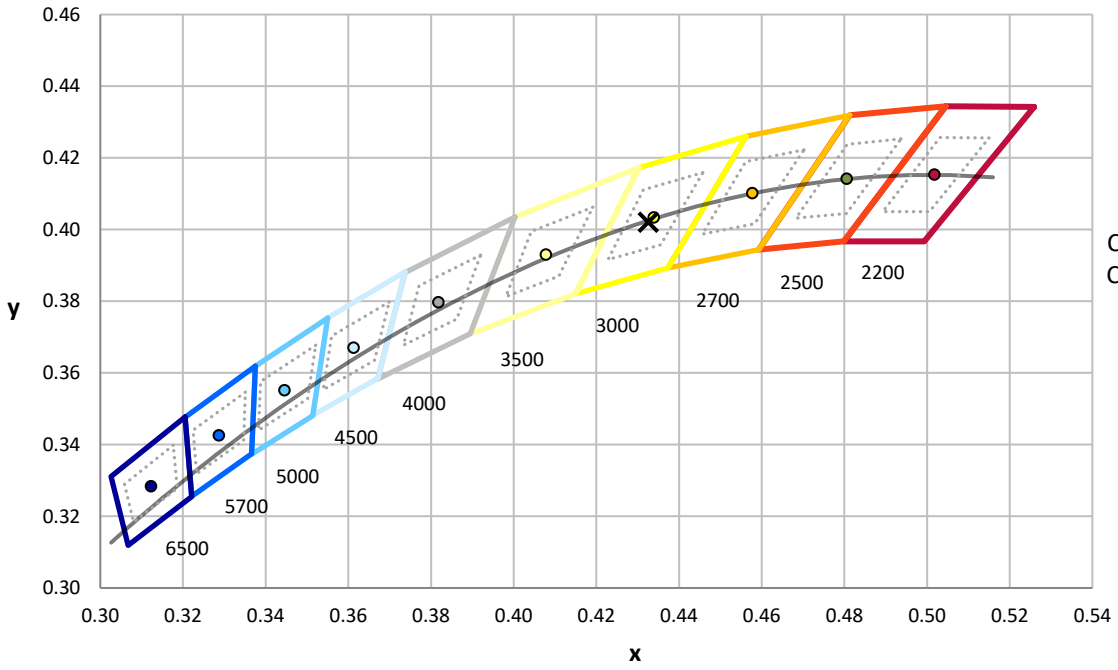
## CIE 1931 Chromaticity Diagram




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




CCT = 3057K
CIE x = 0.4326
CIE y = 0.4020
Duv = -0.0002

Point lies inside the ANSI 3000K 4-step quadrangle

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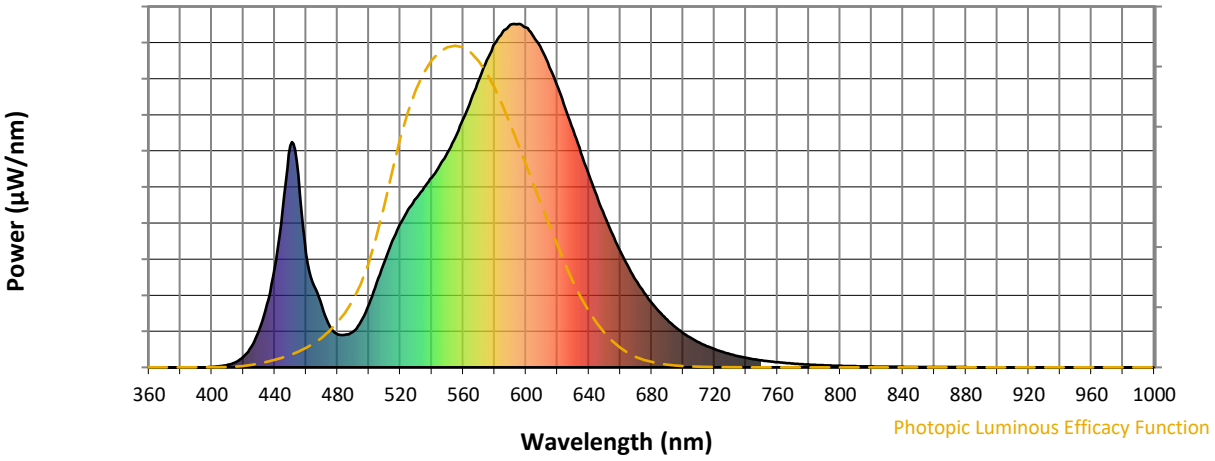
## Photopic Flux vs. Wavelength




## 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 | 104 | NR | 620 | 818 | NR | 750 | 20 | NR | 880 | 1 | NR |
| 365 | 0 | NR | 495 | 135 | NR | 625 | 755 | NR | 755 | 17 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 184 | NR | 630 | 691 | NR | 760 | 15 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 247 | NR | 635 | 625 | NR | 765 | 13 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 309 | NR | 640 | 561 | NR | 770 | 11 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 369 | NR | 645 | 499 | NR | 775 | 9 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 419 | NR | 650 | 441 | NR | 780 | 8 | NR | 910 | 0 | NR |
| 395 | 0 | NR | 525 | 460 | NR | 655 | 388 | NR | 785 | 7 | NR | 915 | 0 | NR |
| 400 | 1 | NR | 530 | 492 | NR | 660 | 338 | NR | 790 | 6 | NR | 920 | 0 | NR |
| 405 | 3 | NR | 535 | 524 | NR | 665 | 294 | NR | 795 | 5 | NR | 925 | 0 | NR |
| 410 | 7 | NR | 540 | 553 | NR | 670 | 253 | NR | 800 | 4 | NR | 930 | 0 | NR |
| 415 | 15 | NR | 545 | 588 | NR | 675 | 218 | NR | 805 | 4 | NR | 935 | 0 | NR |
| 420 | 31 | NR | 550 | 625 | NR | 680 | 188 | NR | 810 | 3 | NR | 940 | 0 | NR |
| 425 | 60 | NR | 555 | 670 | NR | 685 | 161 | NR | 815 | 3 | NR | 945 | 0 | NR |
| 430 | 107 | NR | 560 | 723 | NR | 690 | 139 | NR | 820 | 3 | NR | 950 | 0 | NR |
| 435 | 183 | NR | 565 | 780 | NR | 695 | 118 | NR | 825 | 2 | NR | 955 | 0 | NR |
| 440 | 289 | NR | 570 | 837 | NR | 700 | 100 | NR | 830 | 2 | NR | 960 | 0 | NR |
| 445 | 460 | NR | 575 | 894 | NR | 705 | 85 | NR | 835 | 2 | NR | 965 | 0 | NR |
| 450 | 646 | NR | 580 | 942 | NR | 710 | 73 | NR | 840 | 1 | NR | 970 | 0 | NR |
| 455 | 561 | NR | 585 | 976 | NR | 715 | 62 | NR | 845 | 1 | NR | 975 | 0 | NR |
| 460 | 331 | NR | 590 | 998 | NR | 720 | 53 | NR | 850 | 1 | NR | 980 | 0 | NR |
| 465 | 238 | NR | 595 | 1000 | NR | 725 | 45 | NR | 855 | 1 | NR | 985 | 0 | NR |
| 470 | 178 | NR | 600 | 990 | NR | 730 | 39 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 120 | NR | 605 | 962 | NR | 735 | 33 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 96 | NR | 610 | 925 | NR | 740 | 28 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 95 | NR | 615 | 873 | NR | 745 | 24 | NR | 875 | 1 | NR | | | |

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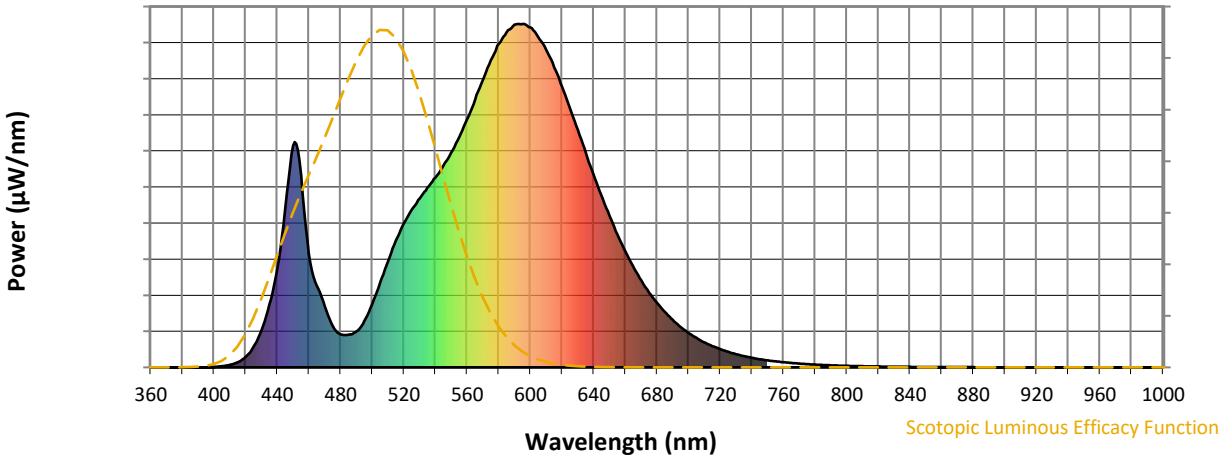
## Scotopic Flux vs. Wavelength




**Scotopic Lumens: NR** **S/P: 1.23**

| 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 | 104 | NR | 620 | 818 | NR | 750 | 20 | NR | 880 | 1 | NR |
| 365 | 0 | NR | 495 | 135 | NR | 625 | 755 | NR | 755 | 17 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 184 | NR | 630 | 691 | NR | 760 | 15 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 247 | NR | 635 | 625 | NR | 765 | 13 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 309 | NR | 640 | 561 | NR | 770 | 11 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 369 | NR | 645 | 499 | NR | 775 | 9 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 419 | NR | 650 | 441 | NR | 780 | 8 | NR | 910 | 0 | NR |
| 395 | 0 | NR | 525 | 460 | NR | 655 | 388 | NR | 785 | 7 | NR | 915 | 0 | NR |
| 400 | 1 | NR | 530 | 492 | NR | 660 | 338 | NR | 790 | 6 | NR | 920 | 0 | NR |
| 405 | 3 | NR | 535 | 524 | NR | 665 | 294 | NR | 795 | 5 | NR | 925 | 0 | NR |
| 410 | 7 | NR | 540 | 553 | NR | 670 | 253 | NR | 800 | 4 | NR | 930 | 0 | NR |
| 415 | 15 | NR | 545 | 588 | NR | 675 | 218 | NR | 805 | 4 | NR | 935 | 0 | NR |
| 420 | 31 | NR | 550 | 625 | NR | 680 | 188 | NR | 810 | 3 | NR | 940 | 0 | NR |
| 425 | 60 | NR | 555 | 670 | NR | 685 | 161 | NR | 815 | 3 | NR | 945 | 0 | NR |
| 430 | 107 | NR | 560 | 723 | NR | 690 | 139 | NR | 820 | 3 | NR | 950 | 0 | NR |
| 435 | 183 | NR | 565 | 780 | NR | 695 | 118 | NR | 825 | 2 | NR | 955 | 0 | NR |
| 440 | 289 | NR | 570 | 837 | NR | 700 | 100 | NR | 830 | 2 | NR | 960 | 0 | NR |
| 445 | 460 | NR | 575 | 894 | NR | 705 | 85 | NR | 835 | 2 | NR | 965 | 0 | NR |
| 450 | 646 | NR | 580 | 942 | NR | 710 | 73 | NR | 840 | 1 | NR | 970 | 0 | NR |
| 455 | 561 | NR | 585 | 976 | NR | 715 | 62 | NR | 845 | 1 | NR | 975 | 0 | NR |
| 460 | 331 | NR | 590 | 998 | NR | 720 | 53 | NR | 850 | 1 | NR | 980 | 0 | NR |
| 465 | 238 | NR | 595 | 1000 | NR | 725 | 45 | NR | 855 | 1 | NR | 985 | 0 | NR |
| 470 | 178 | NR | 600 | 990 | NR | 730 | 39 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 120 | NR | 605 | 962 | NR | 735 | 33 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 96 | NR | 610 | 925 | NR | 740 | 28 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 95 | NR | 615 | 873 | NR | 745 | 24 | NR | 875 | 1 | NR | | | |

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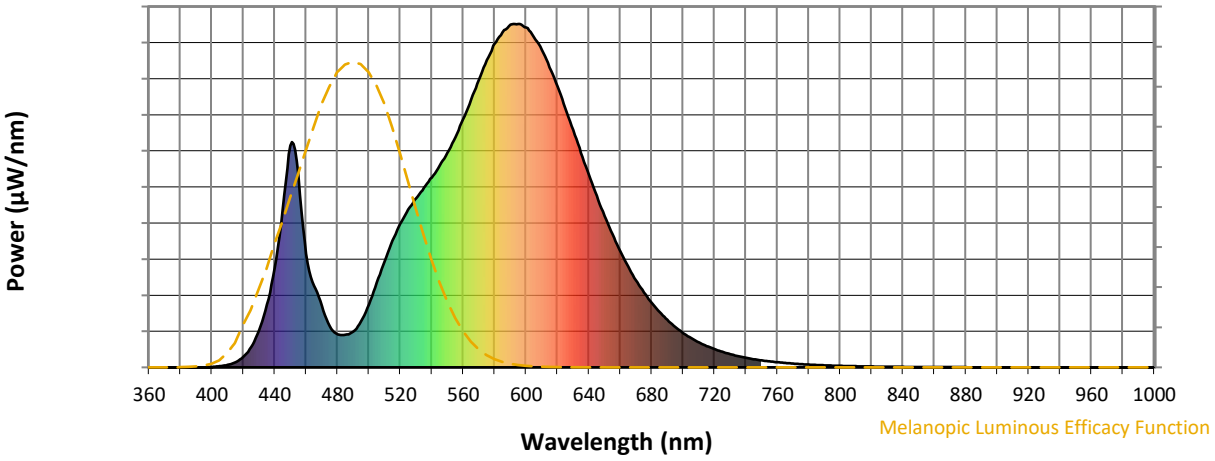
## Melanopic Flux vs. Wavelength




**Melanopic Lumens: NR** **M/P: 2.27**

| 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 | 104 | NR | 620 | 818 | NR | 750 | 20 | NR | 880 | 1 | NR |
| 365 | 0 | NR | 495 | 135 | NR | 625 | 755 | NR | 755 | 17 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 184 | NR | 630 | 691 | NR | 760 | 15 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 247 | NR | 635 | 625 | NR | 765 | 13 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 309 | NR | 640 | 561 | NR | 770 | 11 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 369 | NR | 645 | 499 | NR | 775 | 9 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 419 | NR | 650 | 441 | NR | 780 | 8 | NR | 910 | 0 | NR |
| 395 | 0 | NR | 525 | 460 | NR | 655 | 388 | NR | 785 | 7 | NR | 915 | 0 | NR |
| 400 | 1 | NR | 530 | 492 | NR | 660 | 338 | NR | 790 | 6 | NR | 920 | 0 | NR |
| 405 | 3 | NR | 535 | 524 | NR | 665 | 294 | NR | 795 | 5 | NR | 925 | 0 | NR |
| 410 | 7 | NR | 540 | 553 | NR | 670 | 253 | NR | 800 | 4 | NR | 930 | 0 | NR |
| 415 | 15 | NR | 545 | 588 | NR | 675 | 218 | NR | 805 | 4 | NR | 935 | 0 | NR |
| 420 | 31 | NR | 550 | 625 | NR | 680 | 188 | NR | 810 | 3 | NR | 940 | 0 | NR |
| 425 | 60 | NR | 555 | 670 | NR | 685 | 161 | NR | 815 | 3 | NR | 945 | 0 | NR |
| 430 | 107 | NR | 560 | 723 | NR | 690 | 139 | NR | 820 | 3 | NR | 950 | 0 | NR |
| 435 | 183 | NR | 565 | 780 | NR | 695 | 118 | NR | 825 | 2 | NR | 955 | 0 | NR |
| 440 | 289 | NR | 570 | 837 | NR | 700 | 100 | NR | 830 | 2 | NR | 960 | 0 | NR |
| 445 | 460 | NR | 575 | 894 | NR | 705 | 85 | NR | 835 | 2 | NR | 965 | 0 | NR |
| 450 | 646 | NR | 580 | 942 | NR | 710 | 73 | NR | 840 | 1 | NR | 970 | 0 | NR |
| 455 | 561 | NR | 585 | 976 | NR | 715 | 62 | NR | 845 | 1 | NR | 975 | 0 | NR |
| 460 | 331 | NR | 590 | 998 | NR | 720 | 53 | NR | 850 | 1 | NR | 980 | 0 | NR |
| 465 | 238 | NR | 595 | 1000 | NR | 725 | 45 | NR | 855 | 1 | NR | 985 | 0 | NR |
| 470 | 178 | NR | 600 | 990 | NR | 730 | 39 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 120 | NR | 605 | 962 | NR | 735 | 33 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 96 | NR | 610 | 925 | NR | 740 | 28 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 95 | NR | 615 | 873 | NR | 745 | 24 | NR | 875 | 1 | NR | | | |

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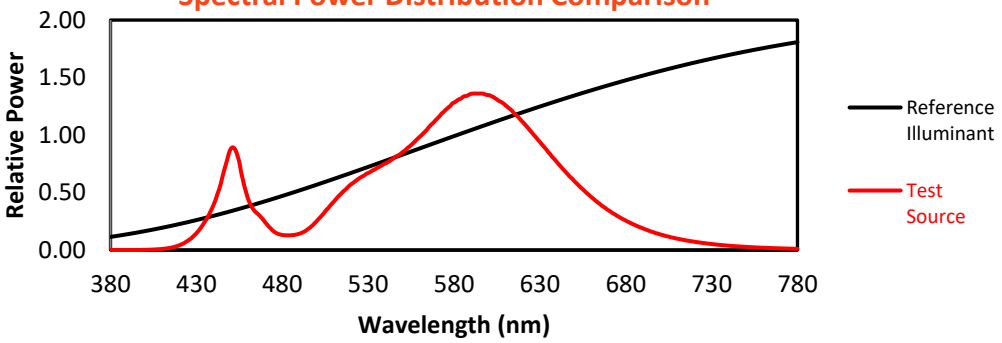
# TM-30-18

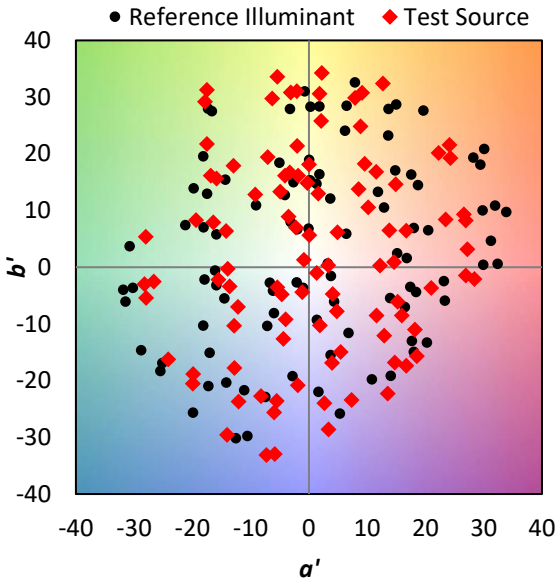
## Summary

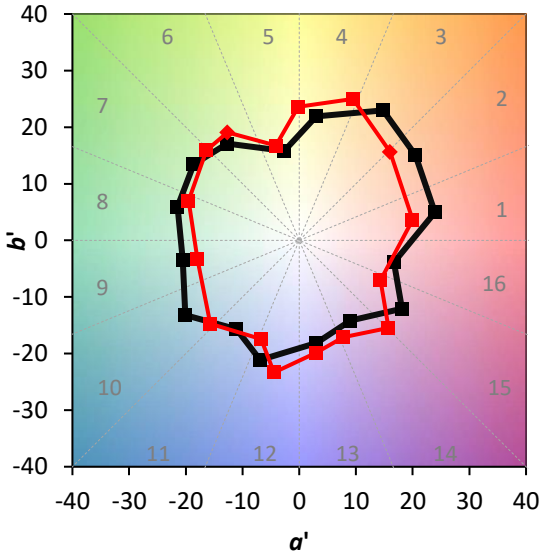
$R_f$ = 74.6
$R_g$ = 94
CIE $R_a$ = 71.7
$R_9$ = -34.8

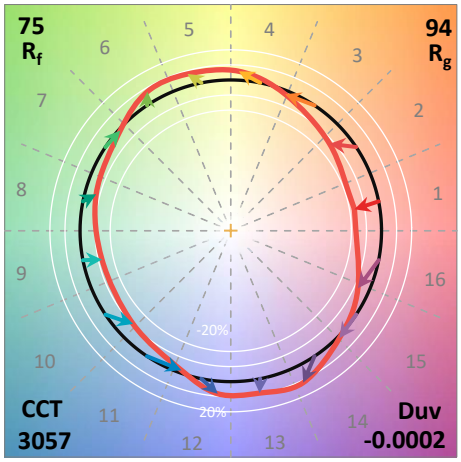
## Spectral Power Distribution Comparison

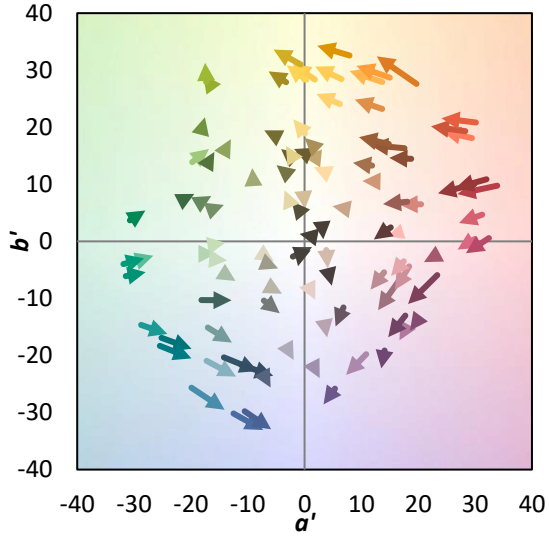



## Color Vector Graphics



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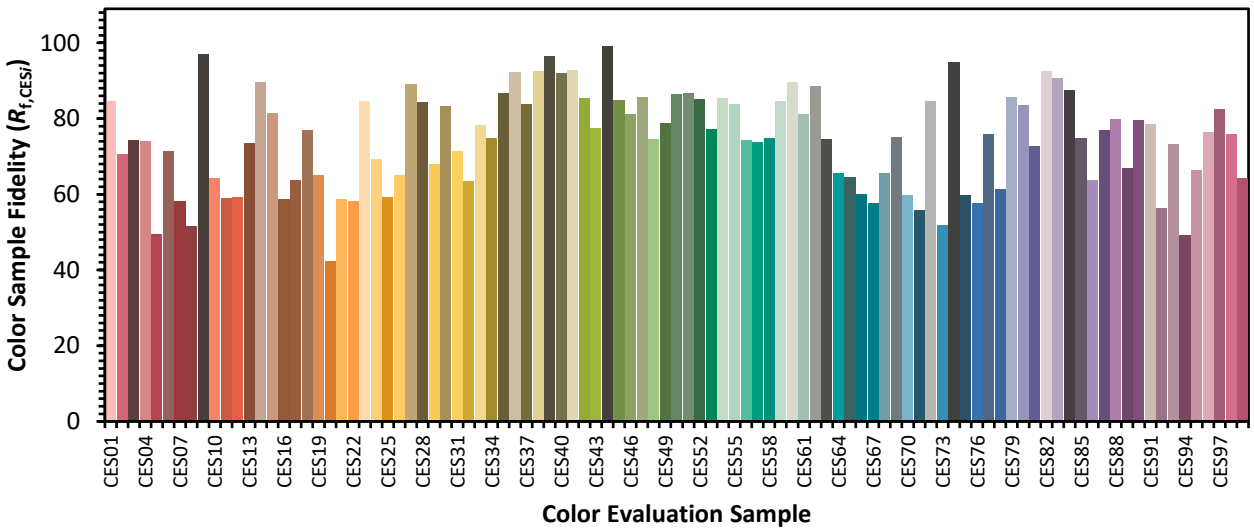
# TM-30-18

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

| | | | |
|---|---|---|---|
| CES01 = 86 | CES26 = 65 | CES51 = 87 | CES76 = 58 |
| CES02 = 62 | CES27 = 89 | CES52 = 85 | CES77 = 76 |
| CES03 = 31 | CES28 = 84 | CES53 = 77 | CES78 = 61 |
| CES04 = 71 | CES29 = 68 | CES54 = 85 | CES79 = 86 |
| CES05 = 49 | CES30 = 83 | CES55 = 84 | CES80 = 83 |
| CES06 = 51 | CES31 = 71 | CES56 = 74 | CES81 = 73 |
| CES07 = 41 | CES32 = 64 | CES57 = 74 | CES82 = 93 |
| CES08 = 40 | CES33 = 78 | CES58 = 75 | CES83 = 91 |
| CES09 = 29 | CES34 = 75 | CES59 = 85 | CES84 = 88 |
| CES10 = 76 | CES35 = 87 | CES60 = 90 | CES85 = 75 |
| CES11 = 59 | CES36 = 92 | CES61 = 81 | CES86 = 64 |
| CES12 = 65 | CES37 = 84 | CES62 = 89 | CES87 = 77 |
| CES13 = 43 | CES38 = 92 | CES63 = 75 | CES88 = 80 |
| CES14 = 74 | CES39 = 96 | CES64 = 65 | CES89 = 67 |
| CES15 = 71 | CES40 = 92 | CES65 = 64 | CES90 = 80 |
| CES16 = 47 | CES41 = 93 | CES66 = 60 | CES91 = 78 |
| CES17 = 50 | CES42 = 86 | CES67 = 58 | CES92 = 56 |
| CES18 = 56 | CES43 = 77 | CES68 = 66 | CES93 = 73 |
| CES19 = 73 | CES44 = 99 | CES69 = 75 | CES94 = 49 |
| CES20 = 66 | CES45 = 85 | CES70 = 60 | CES95 = 66 |
| CES21 = 87 | CES46 = 81 | CES71 = 56 | CES96 = 76 |
| CES22 = 79 | CES47 = 86 | CES72 = 85 | CES97 = 82 |
| CES23 = 92 | CES48 = 75 | CES73 = 52 | CES98 = 76 |
| CES24 = 91 | CES49 = 79 | CES74 = 95 | CES99 = 64 |
| CES25 = 73 | CES50 = 86 | CES75 = 60 | |



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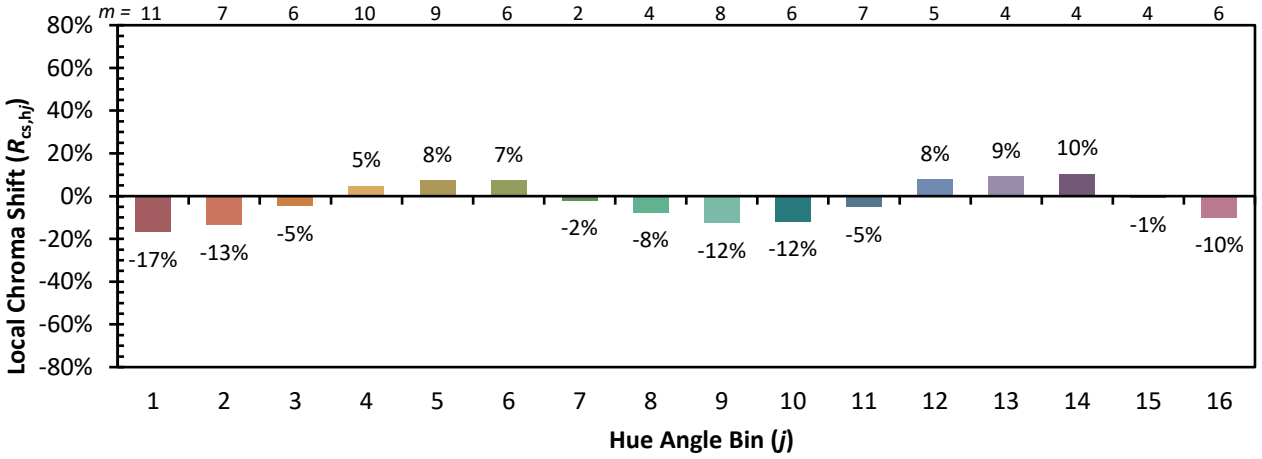
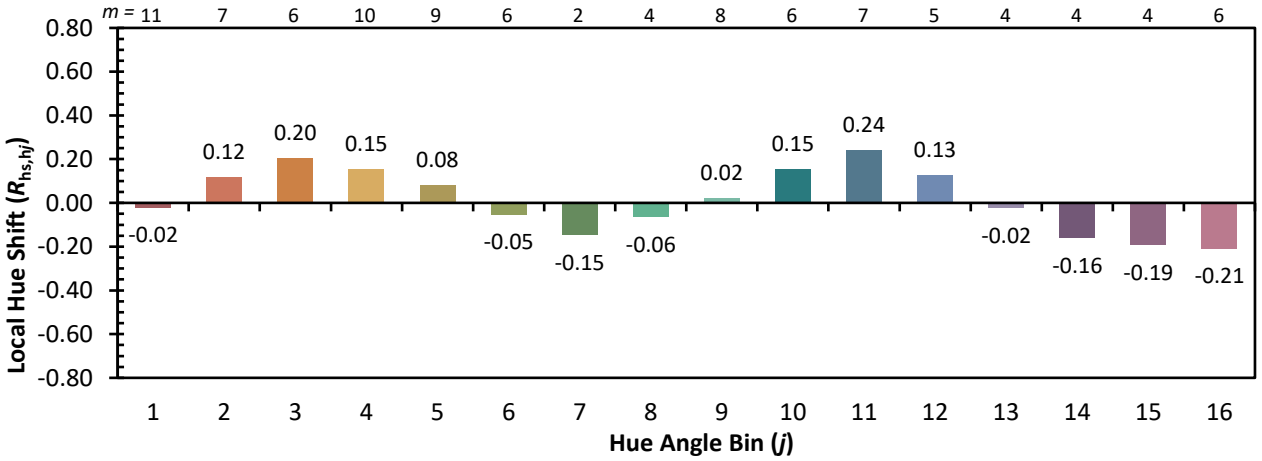
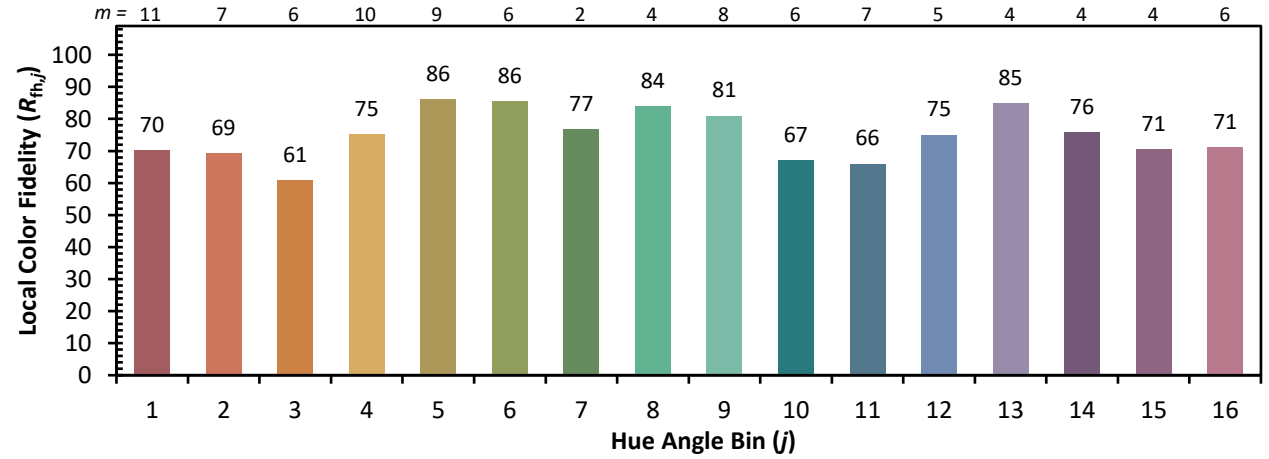
## Color Rendition by Hue-Angle Bin



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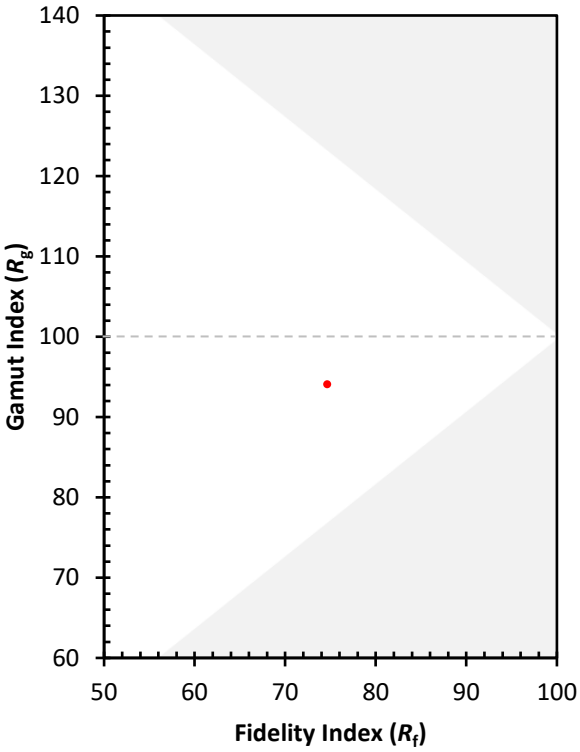
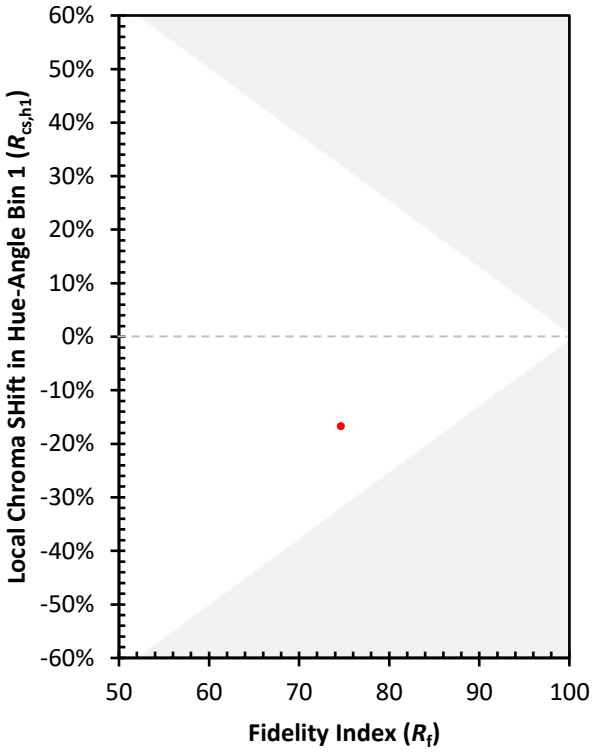
## TM-30-18

### Measure Comparisons




(END OF REPORT)