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: INVUE

Report Number: P868968

Luminaire Tested: **EMM2-HSN-SA3A-750-U-T3**

Issue Date: 08/22/2024

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: | P868968 |
| Test Lab: | INNOVATION CENTER(G3) |
| Issue Date: | 08/22/2024 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS (FORMERLY EATON) |
| Product Line: | INVUE |
| Catalog Number: | EMM2-HSN-SA3A-750-U-T3 |
| Description: | EPIC MODERN SHORT HOUSING DISCRETE LED ARRAYS 130W 70CRI 5000K FIXTURE w/ TYPE III DISTRIBUTION OPTIC |
| Light Source: | (30) 5000K CCT, 70 CRI LEDS |
| Ballast/Driver: | ELECTRONIC DRIVER |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 16715.4 lumens |
| Efficiency: | N/A |
| Efficacy: | 147.9 lumens/watt |
| Luminous Opening: | Rectangular (W 1' x L: 0.33' x H: 0') |
| IES Classification: | Type III - Medium |
| BUG Rating: | B3 - U0 - G3 |

| | |
|---|---|
| Input Watts (W): | 113 |
| Input Voltage (V): | 120 |
| Input Current (Ain): | NR |
| Voltage Rise (V): | NR |
| Power Factor: | 0.99 |
| Total Harmonic Distortion (THDi): | 7.77% |
| Frequency (hertz): | 60 |
| Stabilization Time: | NR |
| Operation Time: | NR |
| Ambient Temperature (°C): | NR |
| Test Distance: | 24 FT |

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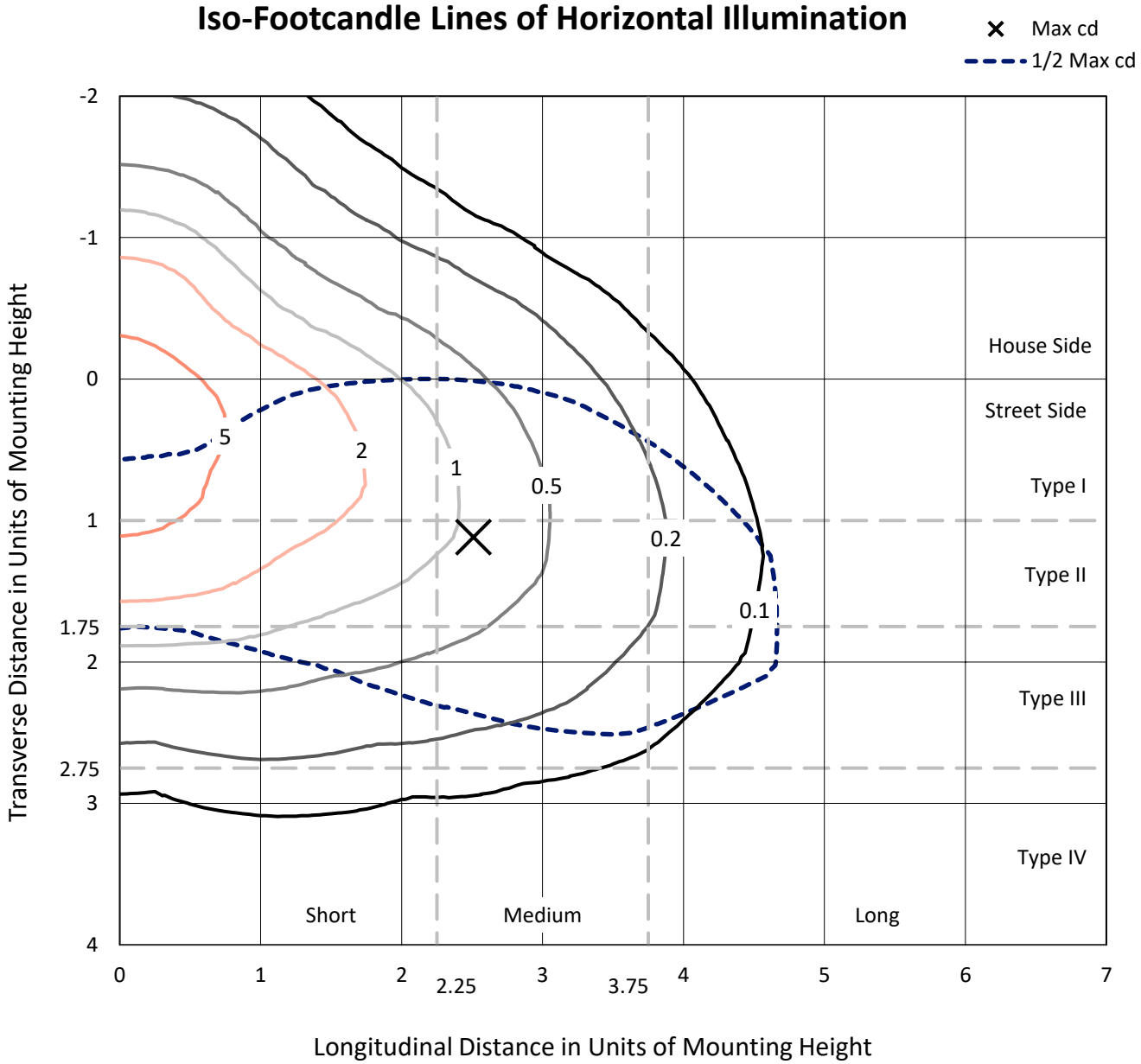
Scaled Data Report

REPORT NUMBER: P868968
CATALOG NUMBER: EMM2-HSN-SA3A-750-U-T3

## Iso-Footcandle Lines of Horizontal Illumination




Based on 20 foot mounting height. Maximum calculated value = 7.7 fc
Type III - Medium - N/A

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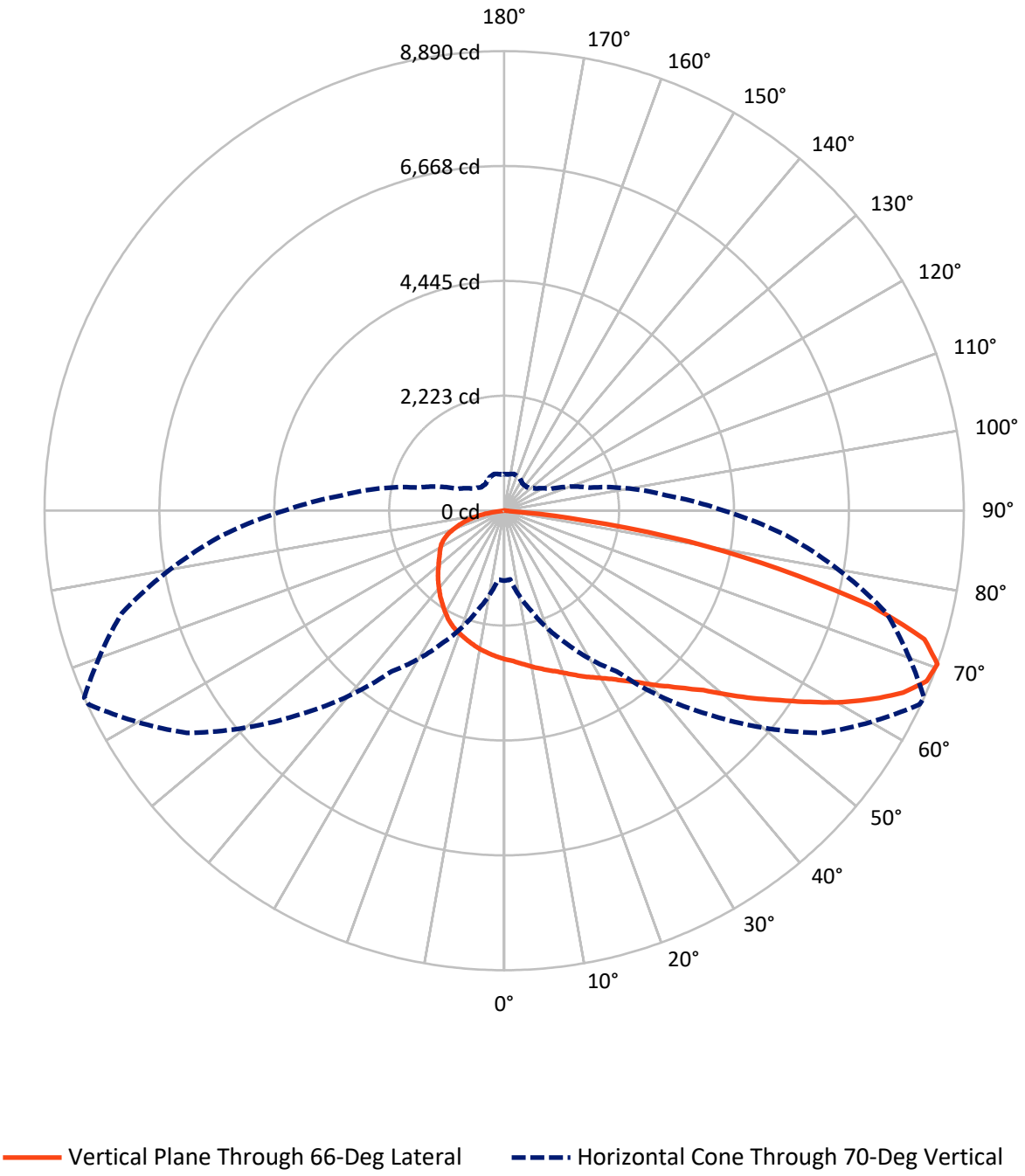
## Luminous Intensity Polar Plot



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REPORT NUMBER: P868968
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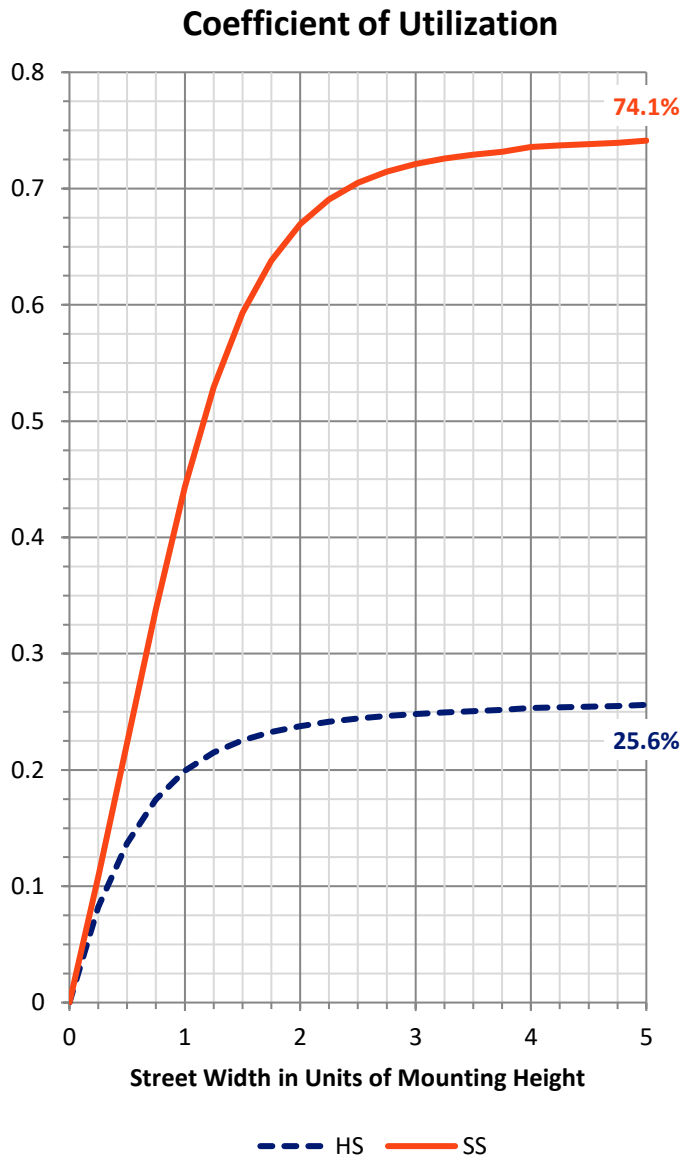
**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 4307.7 | 0.0 | 4307.7 |
| | % Fixture | 25.8 | 0.0 | 25.8 |
| **Street Side** | Lumens | 12407.7 | 0.0 | 12407.7 |
| | % Fixture | 74.2 | 0.0 | 74.2 |
| **Total** | Lumens | 16715.4 | 0.0 | 16715.4 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 275.2 | 1.6 |
| 10°-20° | 819.8 | 4.9 |
| 20°-30° | 1377.0 | 8.2 |
| 30°-40° | 2074.5 | 12.4 |
| 40°-50° | 2816.4 | 16.8 |
| 50°-60° | 3346.8 | 20.0 |
| 60°-70° | 3415.6 | 20.4 |
| 70°-80° | 2284.5 | 13.7 |
| 80°-90° | 305.6 | 1.8 |
| 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° | 16715.4 | 100.0 |
| 0°-180° | 16715.4 | 100.0 |



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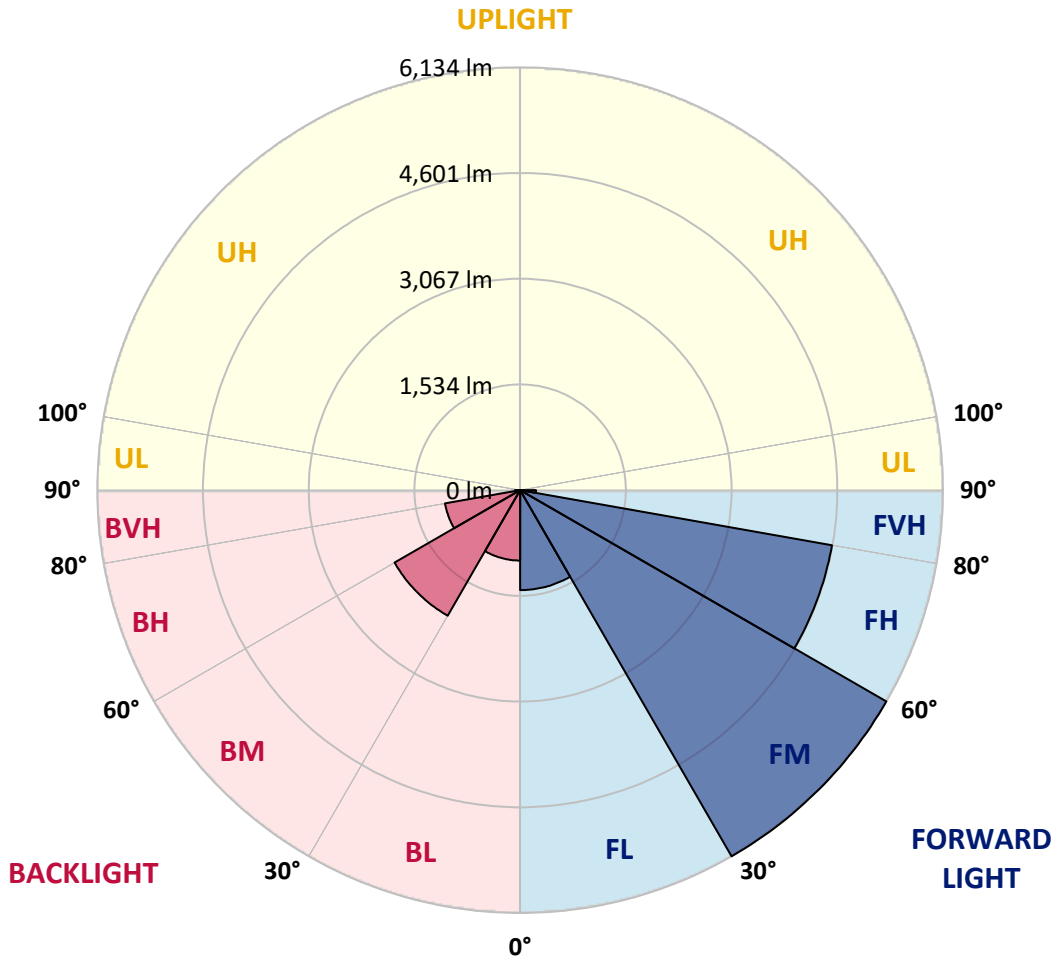
## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 1450.6 | 8.7 | | | |
| FM | (30°-60°) | 6134.2 | 36.7 | | | |
| FH | (60°-80°) | 4594.0 | 27.5 | | | G2/5000 |
| FVH | (80°-90°) | 228.9 | 1.4 | | | G3/500 |
| BL | (0°-30°) | 1021.4 | 6.1 | B3/2500 | | |
| BM | (30°-60°) | 2103.4 | 12.6 | B2/2500 | | |
| BH | (60°-80°) | 1106.1 | 6.6 | B3/2500 | | G3/2500 |
| BVH | (80°-90°) | 76.7 | 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 III Medium



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Scaled Data Report

REPORT NUMBER: P868968
CATALOG NUMBER: EMM2-HSN-SA3A-750-U-T3

**CANDELA DISTRIBUTION (FULL):**

| | 0° | 5° | 15° | 25° | 35° | 45° | 55° | 65° | 66° | 75° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 2876.0 | 2876.0 | 2876.0 | 2876.0 | 2876.0 | 2876.0 | 2876.0 | 2876.0 | *2876.0* | 2876.0 | 2876.0 |
| 2.5° | 2978.9 | 2965.6 | 2955.7 | 2962.3 | 2942.4 | 2949.0 | 2925.8 | 2909.2 | *2905.9* | 2899.2 | 2892.6 |
| 5° | 3071.9 | 3071.9 | 3055.3 | 3055.3 | 3032.1 | 3028.7 | 2995.5 | 2959.0 | *2959.0* | 2935.7 | 2909.2 |
| 7.5° | 3171.5 | 3164.9 | 3145.0 | 3141.6 | 3115.1 | 3108.4 | 3071.9 | 3015.4 | *3012.1* | 2969.0 | 2929.1 |
| 10° | 3241.3 | 3244.6 | 3231.3 | 3231.3 | 3211.4 | 3194.8 | 3141.6 | 3081.9 | *3075.2* | 3018.8 | 2955.7 |
| 12.5° | 3294.4 | 3301.1 | 3297.7 | 3297.7 | 3281.1 | 3281.1 | 3221.4 | 3141.6 | *3135.0* | 3061.9 | 2972.3 |
| 15° | 3350.9 | 3347.5 | 3357.5 | 3360.8 | 3354.2 | 3344.2 | 3301.1 | 3208.1 | *3204.7* | 3108.4 | 2995.5 |
| 17.5° | 3400.7 | 3397.4 | 3400.7 | 3417.3 | 3420.6 | 3420.6 | 3377.4 | 3281.1 | *3267.8* | 3164.9 | 3015.4 |
| 20° | 3430.6 | 3437.2 | 3450.5 | 3470.4 | 3480.4 | 3507.0 | 3470.4 | 3367.5 | *3354.2* | 3224.7 | 3058.6 |
| 22.5° | 3543.5 | 3523.6 | 3533.5 | 3546.8 | 3560.1 | 3596.6 | 3563.4 | 3457.1 | *3447.2* | 3314.3 | 3108.4 |
| 25° | 3736.1 | 3736.1 | 3712.9 | 3689.6 | 3673.0 | 3689.6 | 3663.0 | 3560.1 | *3553.4* | 3394.0 | 3164.9 |
| 27.5° | 4071.5 | 4071.5 | 4021.7 | 3935.4 | 3825.8 | 3795.9 | 3776.0 | 3669.7 | *3649.8* | 3480.4 | 3201.4 |
| 30° | 4496.6 | 4509.9 | 4420.2 | 4274.1 | 4071.5 | 3938.7 | 3888.9 | 3772.6 | *3762.7* | 3566.7 | 3257.9 |
| 32.5° | 4951.6 | 4978.1 | 4911.7 | 4699.2 | 4367.1 | 4108.1 | 4028.3 | 3908.8 | *3885.5* | 3669.7 | 3330.9 |
| 35° | 5360.1 | 5386.6 | 5297.0 | 5097.7 | 4672.6 | 4353.8 | 4194.4 | 4058.2 | *4045.0* | 3802.5 | 3440.5 |
| 37.5° | 5692.2 | 5698.8 | 5642.3 | 5399.9 | 4928.3 | 4559.7 | 4400.3 | 4237.6 | *4211.0* | 3961.9 | 3556.8 |
| 40° | 6044.2 | 6070.8 | 6014.3 | 5715.4 | 5160.8 | 4782.2 | 4606.2 | 4453.4 | *4430.2* | 4128.0 | 3666.4 |
| 42.5° | 6412.8 | 6409.5 | 6409.5 | 5987.7 | 5393.3 | 4968.2 | 4828.7 | 4659.3 | *4646.1* | 4297.3 | 3785.9 |
| 45° | 6638.6 | 6651.9 | 6615.4 | 6150.5 | 5735.3 | 5160.8 | 5044.6 | 4921.7 | *4898.4* | 4533.1 | 3942.0 |
| 47.5° | 6695.1 | 6665.2 | 6499.2 | 6276.7 | 6120.6 | 5360.1 | 5316.9 | 5243.8 | *5190.7* | 4792.2 | 4134.6 |
| 50° | 6618.7 | 6572.2 | 6475.9 | 6333.1 | 6263.4 | 5599.2 | 5592.5 | 5629.1 | *5592.5* | 5107.7 | 4357.1 |
| 52.5° | 6333.1 | 6326.5 | 6309.9 | 6343.1 | 6230.2 | 5788.5 | 5904.7 | 6030.9 | *6024.3* | 5429.8 | 4589.6 |
| 55° | 5732.0 | 5775.2 | 5974.4 | 6183.7 | 6104.0 | 5918.0 | 6253.4 | 6495.8 | *6469.3* | 5808.4 | 4828.7 |
| 57.5° | 5117.6 | 5160.8 | 5416.5 | 5914.7 | 5981.1 | 6057.5 | 6645.3 | 7023.9 | *6980.7* | 6220.2 | 5047.9 |
| 60° | 4583.0 | 4536.5 | 4792.2 | 5509.5 | 5808.4 | 6183.7 | 7033.8 | 7558.6 | *7522.0* | 6632.0 | 5273.7 |
| 62.5° | 3736.1 | 3782.6 | 4191.1 | 4918.4 | 5566.0 | 6263.4 | 7352.6 | 8043.4 | *8020.2* | 7010.6 | 5456.4 |
| 65° | 2955.7 | 2892.6 | 3507.0 | 4297.3 | 5147.5 | 6236.8 | 7628.3 | 8498.4 | *8481.8* | 7382.5 | 5595.9 |
| 67.5° | 2009.2 | 1966.0 | 2776.3 | 3679.6 | 4579.6 | 6024.3 | 7691.4 | 8803.9 | *8810.6* | 7601.7 | 5632.4 |
| 70° | *1355.0* | *1335.0* | *1995.9* | *2829.5* | *3792.6* | *5566.0* | *7495.5* | *8867.0* | *8890.3* | *7658.2* | *5469.7* |
| 72.5° | 999.6 | 996.3 | 1461.2 | 2019.2 | 2822.8 | 4699.2 | 6960.8 | 8455.2 | *8498.4* | 7259.7 | 4991.4 |
| 75° | 787.1 | 797.0 | 1042.8 | 1434.7 | 1883.0 | 3477.1 | 5854.9 | 7249.7 | *7316.1* | 6270.0 | 4144.6 |
| 77.5° | 644.3 | 644.3 | 730.6 | 1029.5 | 1258.7 | 2158.6 | 4211.0 | 5306.9 | *5439.8* | 4838.7 | 3191.5 |
| 80° | 521.4 | 531.4 | 541.3 | 717.3 | 833.6 | 1232.1 | 2450.9 | 3540.2 | *3636.5* | 3370.8 | 2304.8 |
| 82.5° | 285.6 | 305.5 | 295.6 | 371.9 | 418.4 | 571.2 | 973.0 | 1431.3 | *1577.5* | 1404.8 | 1046.1 |
| 85° | 19.9 | 13.3 | 23.2 | 29.9 | 36.5 | 56.5 | 76.4 | 106.3 | *99.6* | 142.8 | 73.1 |
| 87.5° | 3.3 | 3.3 | 3.3 | 6.6 | 6.6 | 10.0 | 13.3 | 13.3 | *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: P868968
CATALOG NUMBER: EMM2-HSN-SA3A-750-U-T3

**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 2876.0 | 2876.0 | 2876.0 | 2876.0 | 2876.0 | 2876.0 | 2876.0 | 2876.0 | 2876.0 | 2876.0 | 2876.0 |
| 2.5° | 2889.3 | 2872.6 | 2846.1 | 2839.4 | 2829.5 | 2816.2 | 2802.9 | 2783.0 | 2776.3 | 2783.0 | 2789.6 |
| 5° | 2892.6 | 2869.3 | 2826.2 | 2799.6 | 2773.0 | 2749.8 | 2723.2 | 2696.6 | 2680.0 | 2683.4 | 2696.6 |
| 7.5° | 2902.5 | 2869.3 | 2802.9 | 2759.7 | 2716.6 | 2680.0 | 2636.9 | 2607.0 | 2587.0 | 2590.4 | 2600.3 |
| 10° | 2915.8 | 2869.3 | 2789.6 | 2716.6 | 2656.8 | 2603.6 | 2560.5 | 2523.9 | 2504.0 | 2500.7 | 2504.0 |
| 12.5° | 2919.1 | 2866.0 | 2759.7 | 2670.1 | 2597.0 | 2527.3 | 2480.8 | 2447.6 | 2427.6 | 2417.7 | 2424.3 |
| 15° | 2929.1 | 2856.0 | 2729.8 | 2620.3 | 2530.6 | 2457.5 | 2401.1 | 2361.2 | 2347.9 | 2341.3 | 2338.0 |
| 17.5° | 2942.4 | 2852.7 | 2703.3 | 2570.4 | 2464.2 | 2381.1 | 2331.3 | 2291.5 | 2274.9 | 2268.2 | 2274.9 |
| 20° | 2962.3 | 2856.0 | 2673.4 | 2520.6 | 2404.4 | 2321.4 | 2264.9 | 2225.1 | 2211.8 | 2208.5 | 2205.1 |
| 22.5° | 2988.9 | 2862.7 | 2650.1 | 2474.1 | 2338.0 | 2254.9 | 2198.5 | 2171.9 | 2162.0 | 2165.3 | 2165.3 |
| 25° | 3015.4 | 2869.3 | 2616.9 | 2411.0 | 2268.2 | 2181.9 | 2142.0 | 2122.1 | 2128.7 | 2142.0 | 2142.0 |
| 27.5° | 3038.7 | 2866.0 | 2570.4 | 2344.6 | 2185.2 | 2105.5 | 2075.6 | 2078.9 | 2095.5 | 2118.8 | 2122.1 |
| 30° | 3068.6 | 2866.0 | 2520.6 | 2261.6 | 2092.2 | 2015.8 | 2009.2 | 2035.8 | 2062.3 | 2085.6 | 2085.6 |
| 32.5° | 3115.1 | 2885.9 | 2480.8 | 2178.6 | 1995.9 | 1936.1 | 1966.0 | 2002.6 | 2032.4 | 2055.7 | 2062.3 |
| 35° | 3194.8 | 2929.1 | 2454.2 | 2095.5 | 1902.9 | 1859.7 | 1916.2 | 1976.0 | 1995.9 | 2012.5 | 2015.8 |
| 37.5° | 3271.2 | 2969.0 | 2421.0 | 2015.8 | 1806.6 | 1790.0 | 1866.4 | 1929.5 | 1932.8 | 1942.8 | 1942.8 |
| 40° | 3344.2 | 2998.8 | 2377.8 | 1929.5 | 1713.6 | 1713.6 | 1803.3 | 1856.4 | 1849.8 | 1839.8 | 1843.1 |
| 42.5° | 3423.9 | 3015.4 | 2328.0 | 1849.8 | 1637.2 | 1637.2 | 1710.3 | 1756.8 | 1753.5 | 1766.8 | 1776.7 |
| 45° | 3520.2 | 3048.7 | 2261.6 | 1776.7 | 1557.5 | 1544.3 | 1604.0 | 1643.9 | 1693.7 | 1753.5 | 1770.1 |
| 47.5° | 3653.1 | 3095.2 | 2208.5 | 1697.0 | 1491.1 | 1444.6 | 1467.9 | 1550.9 | 1607.4 | 1657.2 | 1663.8 |
| 50° | 3792.6 | 3161.6 | 2162.0 | 1614.0 | 1411.4 | 1328.4 | 1348.3 | 1441.3 | 1474.5 | 1494.4 | 1504.4 |
| 52.5° | 3942.0 | 3214.7 | 2122.1 | 1544.3 | 1328.4 | 1208.8 | 1235.4 | 1325.1 | 1348.3 | 1364.9 | 1368.2 |
| 55° | 4071.5 | 3257.9 | 2072.3 | 1477.8 | 1238.7 | 1095.9 | 1129.1 | 1215.5 | 1238.7 | 1258.7 | 1258.7 |
| 57.5° | 4207.7 | 3297.7 | 2039.1 | 1421.4 | 1142.4 | 1002.9 | 1026.2 | 1112.5 | 1145.7 | 1152.4 | 1162.3 |
| 60° | 4320.6 | 3334.3 | 2009.2 | 1368.2 | 1052.8 | 919.9 | 936.5 | 1012.9 | 1052.8 | 1056.1 | 1062.7 |
| 62.5° | 4400.3 | 3357.5 | 1992.6 | 1301.8 | 963.1 | 836.9 | 850.2 | 926.6 | 973.0 | 983.0 | 986.3 |
| 65° | 4450.1 | 3370.8 | 1962.7 | 1215.5 | 886.7 | 767.1 | 767.1 | 843.5 | 890.0 | 913.3 | 919.9 |
| 67.5° | 4426.9 | 3347.5 | 1883.0 | 1115.8 | 817.0 | 697.4 | 694.1 | 770.5 | 810.3 | 823.6 | 826.9 |
| 70° | *4247.5* | *3211.4* | *1720.3* | *993.0* | *743.9* | *634.3* | *627.7* | *697.4* | *733.9* | *704.0* | *707.4* |
| 72.5° | 3882.2 | 2902.5 | 1497.8 | 870.1 | 667.5 | 574.5 | 567.9 | 627.7 | 631.0 | 631.0 | 627.7 |
| 75° | 3271.2 | 2371.2 | 1195.6 | 740.6 | 587.8 | 511.4 | 514.8 | 561.2 | 564.6 | 581.2 | 571.2 |
| 77.5° | 2507.3 | 1756.8 | 933.2 | 591.1 | 498.1 | 455.0 | 471.6 | 488.2 | 511.4 | 534.7 | 511.4 |
| 80° | 1823.2 | 1212.2 | 647.6 | 441.7 | 385.2 | 385.2 | 391.9 | 408.5 | 441.7 | 464.9 | 441.7 |
| 82.5° | 780.4 | 534.7 | 298.9 | 219.2 | 189.3 | 186.0 | 189.3 | 189.3 | 232.5 | 239.1 | 209.2 |
| 85° | 59.8 | 49.8 | 36.5 | 36.5 | 29.9 | 16.6 | 16.6 | 13.3 | 10.0 | 10.0 | 10.0 |
| 87.5° | 13.3 | 10.0 | 10.0 | 10.0 | 6.6 | 6.6 | 6.6 | 6.6 | 6.6 | 6.6 | 6.6 |
| 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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# LM-79-2019: Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Report Prepared for

Cooper Lighting Solutions

Streetworks

Report Number: SP1-2407-157-6

Test Date: 08/07/2024

Luminaire Tested: MEM2-HTN-SA-40-750-U-5WQ-2

Data in this report applies to families of products including MEM2-HTN-SA-40-750-U-5WQ-2

Report Generated By FNC07603 / LDUCLS01DT446
Version: v7.04

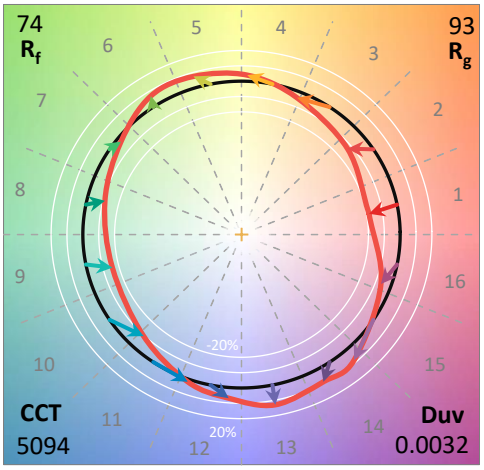
## Test Information

| | |
|---|---|
| Test Method: | LM-79-2019 |
| Report Number: | SP1-2407-157-6 |
| 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-40-750-U-5WQ-2** |
| Description: | Epic Modern Light Square 40W 5WQ Optic and Flare Trim |

## Spectral Parameters

| | |
|---|---|
| CCT (K): | 5094 |
| CIE u': | 0.2082 |
| CIE v': | 0.4867 |
| Duv: | 0.0032 |
| CIE x: | 0.3430 |
| CIE y: | 0.3564 |
| CIE z: | 0.3006 |
| Peak Wavelength (nm): | 451 |
| Dominant Wavelength (nm): | 568 |
| Purity: | 9.86439 |
| Rf: | 73.7 |
| Rg: | 93 |

| | |
|---|---|
| CRI (Ra): | 72.0 |
| R1: | 68.6 |
| R2: | 78.1 |
| R3: | 84.6 |
| R4: | 71.6 |
| R5: | 69.6 |
| R6: | 69.4 |
| R7: | 80.9 |
| R8: | 53.1 |
| R9: | -39.6 |
| R10: | 47.6 |
| R11: | 68.2 |
| R12: | 41.4 |
| R13: | 70.4 |
| R14: | 91.4 |
| R15: | 61.4 |




## Test Conditions

| | |
|---|---|
| Stabilization Time: | 20M |
| Operation Time: | 1H 20M |
| Sphere Temperature (°C): | 24.2 |

REPORT NUMBER: SP1-2407-157-6

| 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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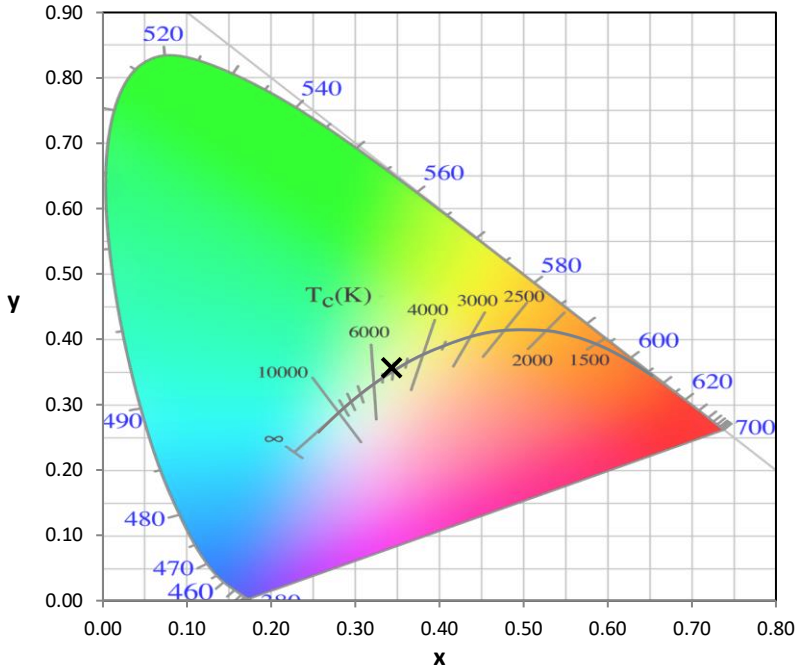
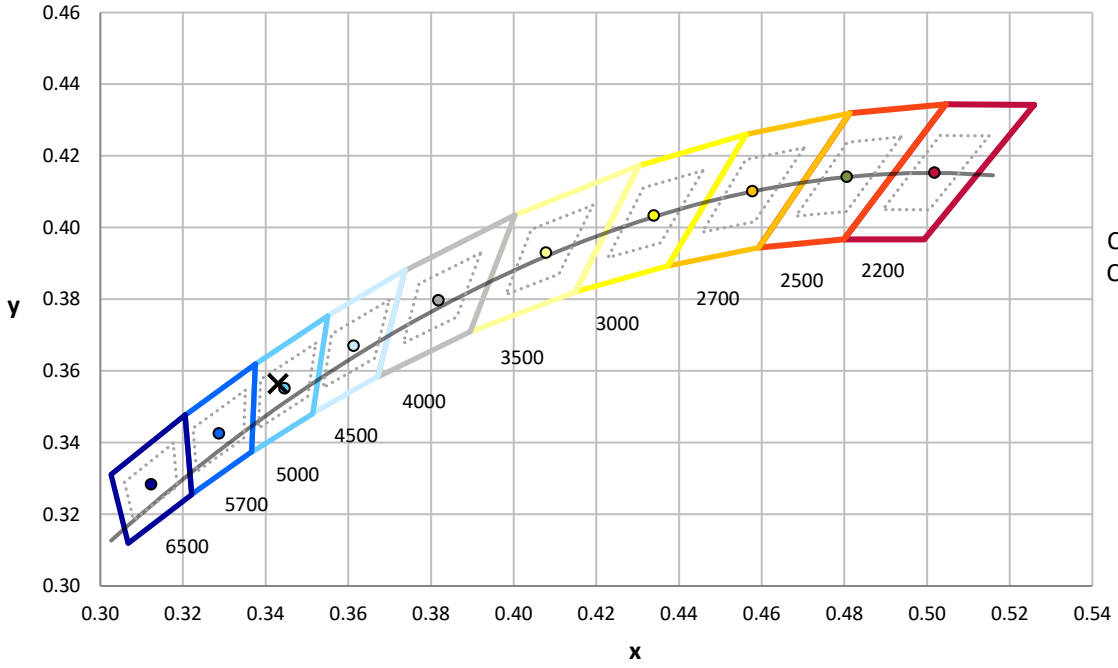
## CIE 1931 Chromaticity Diagram




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




CCT = 5094K
CIE x = 0.3430
CIE y = 0.3564
Duv = 0.0032

Point lies inside the ANSI 5000K 4-step quadrangle

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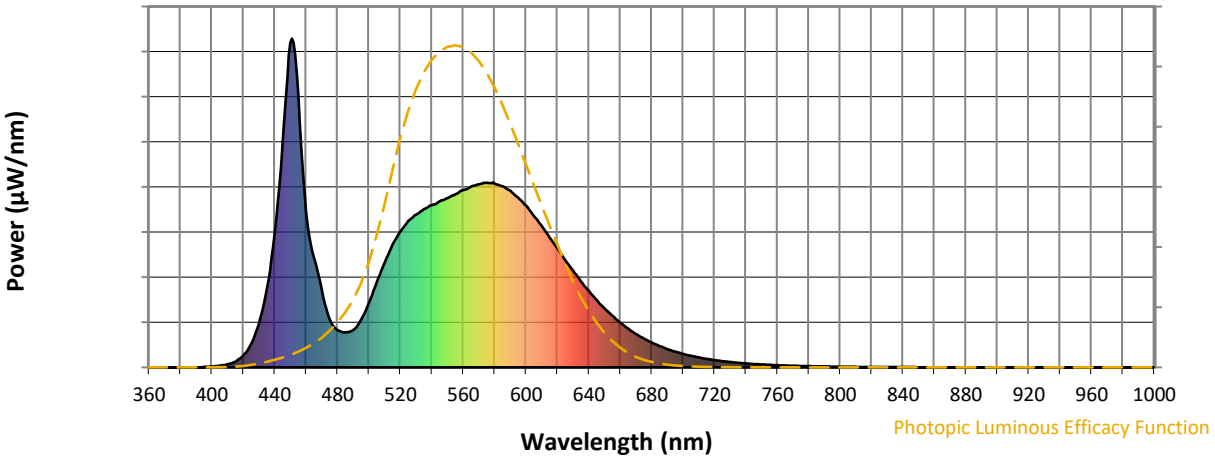
## Photopic Flux vs. Wavelength




## 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 | 114 | NR | 620 | 361 | NR | 750 | 9 | NR | 880 | 0 | NR |
| 365 | 0 | NR | 495 | 145 | NR | 625 | 326 | NR | 755 | 8 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 197 | NR | 630 | 294 | NR | 760 | 7 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 259 | NR | 635 | 261 | NR | 765 | 6 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 319 | NR | 640 | 232 | NR | 770 | 5 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 373 | NR | 645 | 204 | NR | 775 | 4 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 414 | NR | 650 | 179 | NR | 780 | 4 | NR | 910 | 0 | NR |
| 395 | 1 | NR | 525 | 445 | NR | 655 | 157 | NR | 785 | 3 | NR | 915 | 0 | NR |
| 400 | 3 | NR | 530 | 465 | NR | 660 | 136 | NR | 790 | 3 | NR | 920 | 0 | NR |
| 405 | 5 | NR | 535 | 482 | NR | 665 | 118 | NR | 795 | 2 | NR | 925 | 0 | NR |
| 410 | 9 | NR | 540 | 493 | NR | 670 | 102 | NR | 800 | 2 | NR | 930 | 0 | NR |
| 415 | 18 | NR | 545 | 505 | NR | 675 | 87 | NR | 805 | 2 | NR | 935 | 0 | NR |
| 420 | 36 | NR | 550 | 515 | NR | 680 | 75 | NR | 810 | 2 | NR | 940 | 0 | NR |
| 425 | 72 | NR | 555 | 527 | NR | 685 | 65 | NR | 815 | 1 | NR | 945 | 0 | NR |
| 430 | 134 | NR | 560 | 540 | NR | 690 | 56 | NR | 820 | 1 | NR | 950 | 0 | NR |
| 435 | 242 | NR | 565 | 550 | NR | 695 | 48 | NR | 825 | 1 | NR | 955 | 0 | NR |
| 440 | 407 | NR | 570 | 557 | NR | 700 | 41 | NR | 830 | 1 | NR | 960 | 0 | NR |
| 445 | 684 | NR | 575 | 561 | NR | 705 | 35 | NR | 835 | 1 | NR | 965 | 0 | NR |
| 450 | 988 | NR | 580 | 559 | NR | 710 | 30 | NR | 840 | 1 | NR | 970 | 0 | NR |
| 455 | 828 | NR | 585 | 551 | NR | 715 | 26 | NR | 845 | 1 | NR | 975 | 0 | NR |
| 460 | 473 | NR | 590 | 537 | NR | 720 | 22 | NR | 850 | 1 | NR | 980 | 0 | NR |
| 465 | 333 | NR | 595 | 516 | NR | 725 | 19 | NR | 855 | 0 | NR | 985 | 0 | NR |
| 470 | 232 | NR | 600 | 491 | NR | 730 | 16 | NR | 860 | 0 | NR | 990 | 0 | NR |
| 475 | 146 | NR | 605 | 461 | NR | 735 | 14 | NR | 865 | 0 | NR | 995 | 0 | NR |
| 480 | 113 | NR | 610 | 429 | NR | 740 | 12 | NR | 870 | 0 | NR | 1000 | 0 | NR |
| 485 | 106 | NR | 615 | 395 | NR | 745 | 10 | NR | 875 | 0 | NR | | | |

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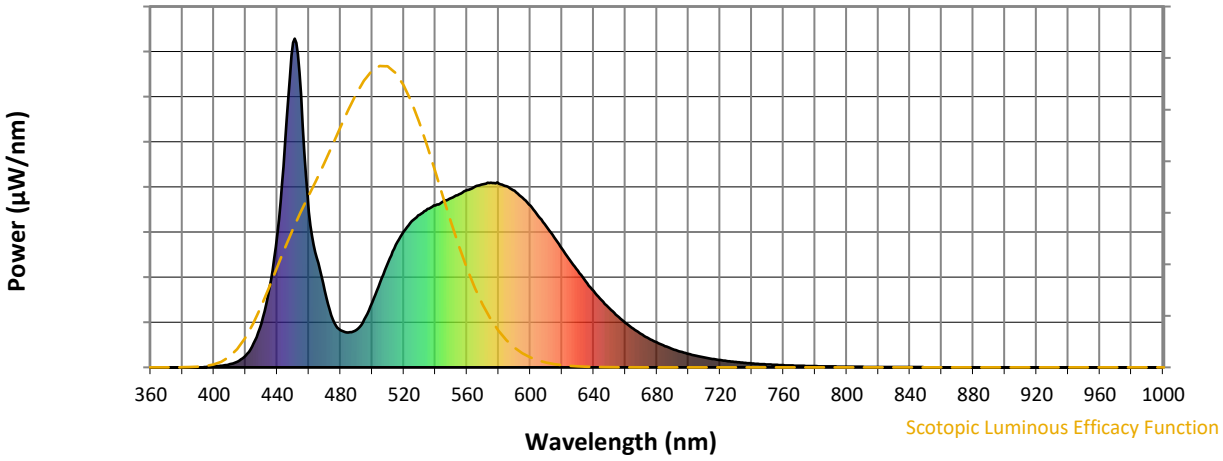
## Scotopic Flux vs. Wavelength




**Scotopic Lumens: NR** **S/P: 1.81**

| 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 | 114 | NR | 620 | 361 | NR | 750 | 9 | NR | 880 | 0 | NR |
| 365 | 0 | NR | 495 | 145 | NR | 625 | 326 | NR | 755 | 8 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 197 | NR | 630 | 294 | NR | 760 | 7 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 259 | NR | 635 | 261 | NR | 765 | 6 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 319 | NR | 640 | 232 | NR | 770 | 5 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 373 | NR | 645 | 204 | NR | 775 | 4 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 414 | NR | 650 | 179 | NR | 780 | 4 | NR | 910 | 0 | NR |
| 395 | 1 | NR | 525 | 445 | NR | 655 | 157 | NR | 785 | 3 | NR | 915 | 0 | NR |
| 400 | 3 | NR | 530 | 465 | NR | 660 | 136 | NR | 790 | 3 | NR | 920 | 0 | NR |
| 405 | 5 | NR | 535 | 482 | NR | 665 | 118 | NR | 795 | 2 | NR | 925 | 0 | NR |
| 410 | 9 | NR | 540 | 493 | NR | 670 | 102 | NR | 800 | 2 | NR | 930 | 0 | NR |
| 415 | 18 | NR | 545 | 505 | NR | 675 | 87 | NR | 805 | 2 | NR | 935 | 0 | NR |
| 420 | 36 | NR | 550 | 515 | NR | 680 | 75 | NR | 810 | 2 | NR | 940 | 0 | NR |
| 425 | 72 | NR | 555 | 527 | NR | 685 | 65 | NR | 815 | 1 | NR | 945 | 0 | NR |
| 430 | 134 | NR | 560 | 540 | NR | 690 | 56 | NR | 820 | 1 | NR | 950 | 0 | NR |
| 435 | 242 | NR | 565 | 550 | NR | 695 | 48 | NR | 825 | 1 | NR | 955 | 0 | NR |
| 440 | 407 | NR | 570 | 557 | NR | 700 | 41 | NR | 830 | 1 | NR | 960 | 0 | NR |
| 445 | 684 | NR | 575 | 561 | NR | 705 | 35 | NR | 835 | 1 | NR | 965 | 0 | NR |
| 450 | 988 | NR | 580 | 559 | NR | 710 | 30 | NR | 840 | 1 | NR | 970 | 0 | NR |
| 455 | 828 | NR | 585 | 551 | NR | 715 | 26 | NR | 845 | 1 | NR | 975 | 0 | NR |
| 460 | 473 | NR | 590 | 537 | NR | 720 | 22 | NR | 850 | 1 | NR | 980 | 0 | NR |
| 465 | 333 | NR | 595 | 516 | NR | 725 | 19 | NR | 855 | 0 | NR | 985 | 0 | NR |
| 470 | 232 | NR | 600 | 491 | NR | 730 | 16 | NR | 860 | 0 | NR | 990 | 0 | NR |
| 475 | 146 | NR | 605 | 461 | NR | 735 | 14 | NR | 865 | 0 | NR | 995 | 0 | NR |
| 480 | 113 | NR | 610 | 429 | NR | 740 | 12 | NR | 870 | 0 | NR | 1000 | 0 | NR |
| 485 | 106 | NR | 615 | 395 | NR | 745 | 10 | NR | 875 | 0 | NR | | | |

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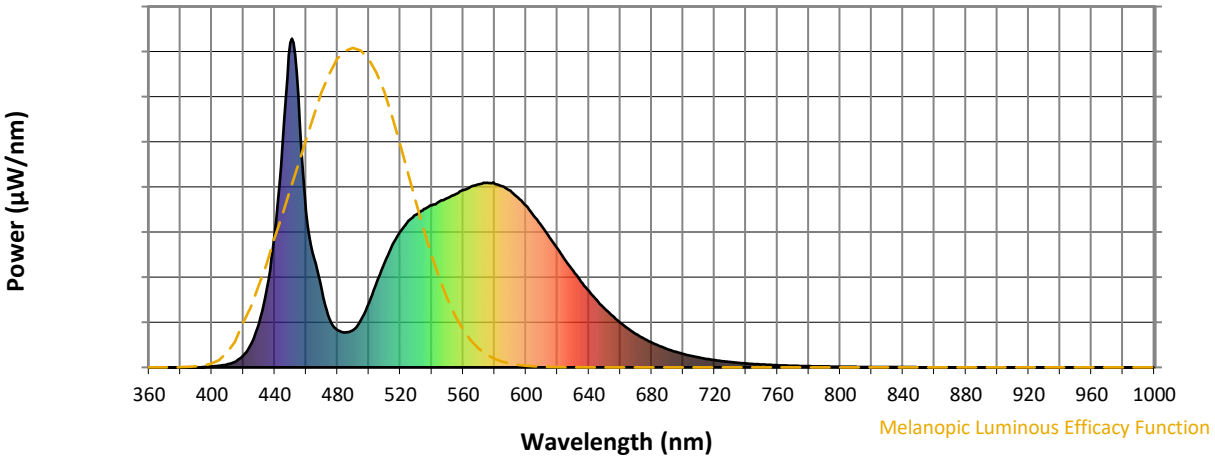
## Melanopic Flux vs. Wavelength




**Melanopic Lumens: NR** **M/P: 3.73**

| 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 | 114 | NR | 620 | 361 | NR | 750 | 9 | NR | 880 | 0 | NR |
| 365 | 0 | NR | 495 | 145 | NR | 625 | 326 | NR | 755 | 8 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 197 | NR | 630 | 294 | NR | 760 | 7 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 259 | NR | 635 | 261 | NR | 765 | 6 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 319 | NR | 640 | 232 | NR | 770 | 5 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 373 | NR | 645 | 204 | NR | 775 | 4 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 414 | NR | 650 | 179 | NR | 780 | 4 | NR | 910 | 0 | NR |
| 395 | 1 | NR | 525 | 445 | NR | 655 | 157 | NR | 785 | 3 | NR | 915 | 0 | NR |
| 400 | 3 | NR | 530 | 465 | NR | 660 | 136 | NR | 790 | 3 | NR | 920 | 0 | NR |
| 405 | 5 | NR | 535 | 482 | NR | 665 | 118 | NR | 795 | 2 | NR | 925 | 0 | NR |
| 410 | 9 | NR | 540 | 493 | NR | 670 | 102 | NR | 800 | 2 | NR | 930 | 0 | NR |
| 415 | 18 | NR | 545 | 505 | NR | 675 | 87 | NR | 805 | 2 | NR | 935 | 0 | NR |
| 420 | 36 | NR | 550 | 515 | NR | 680 | 75 | NR | 810 | 2 | NR | 940 | 0 | NR |
| 425 | 72 | NR | 555 | 527 | NR | 685 | 65 | NR | 815 | 1 | NR | 945 | 0 | NR |
| 430 | 134 | NR | 560 | 540 | NR | 690 | 56 | NR | 820 | 1 | NR | 950 | 0 | NR |
| 435 | 242 | NR | 565 | 550 | NR | 695 | 48 | NR | 825 | 1 | NR | 955 | 0 | NR |
| 440 | 407 | NR | 570 | 557 | NR | 700 | 41 | NR | 830 | 1 | NR | 960 | 0 | NR |
| 445 | 684 | NR | 575 | 561 | NR | 705 | 35 | NR | 835 | 1 | NR | 965 | 0 | NR |
| 450 | 988 | NR | 580 | 559 | NR | 710 | 30 | NR | 840 | 1 | NR | 970 | 0 | NR |
| 455 | 828 | NR | 585 | 551 | NR | 715 | 26 | NR | 845 | 1 | NR | 975 | 0 | NR |
| 460 | 473 | NR | 590 | 537 | NR | 720 | 22 | NR | 850 | 1 | NR | 980 | 0 | NR |
| 465 | 333 | NR | 595 | 516 | NR | 725 | 19 | NR | 855 | 0 | NR | 985 | 0 | NR |
| 470 | 232 | NR | 600 | 491 | NR | 730 | 16 | NR | 860 | 0 | NR | 990 | 0 | NR |
| 475 | 146 | NR | 605 | 461 | NR | 735 | 14 | NR | 865 | 0 | NR | 995 | 0 | NR |
| 480 | 113 | NR | 610 | 429 | NR | 740 | 12 | NR | 870 | 0 | NR | 1000 | 0 | NR |
| 485 | 106 | NR | 615 | 395 | NR | 745 | 10 | NR | 875 | 0 | NR | | | |

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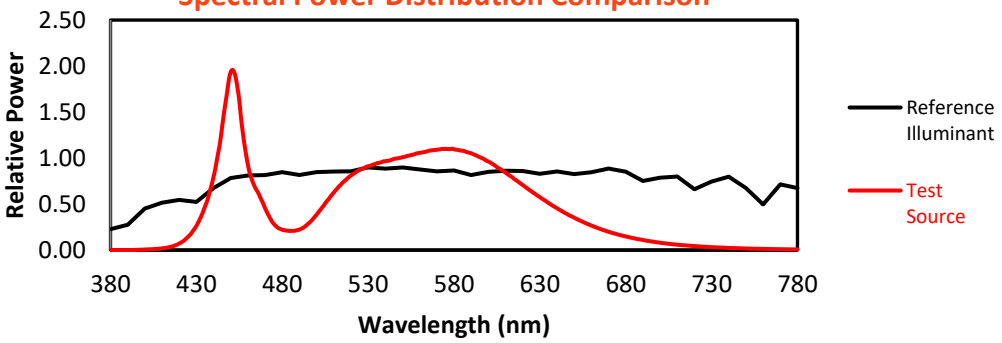
# TM-30-18

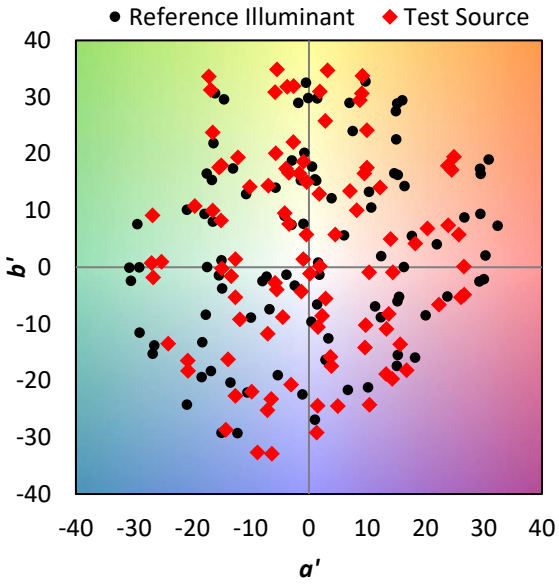
## Summary

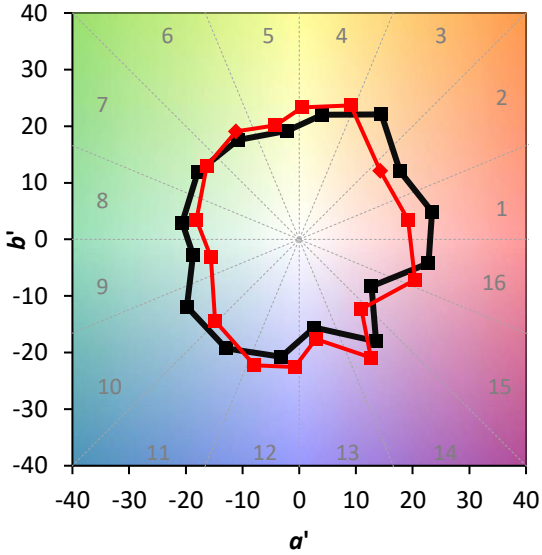
$R_f$ = 73.7
$R_g$ = 93
CIE $R_a$ = 72.0
$R_9$ = -39.6

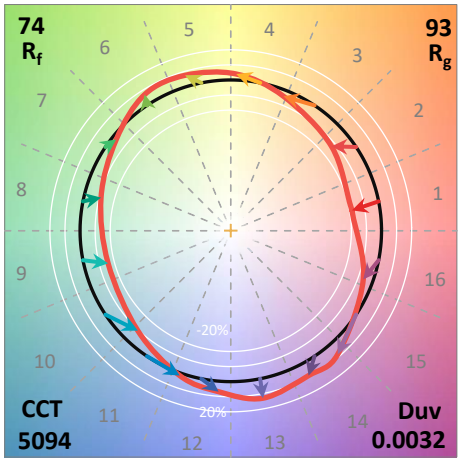
## Spectral Power Distribution Comparison

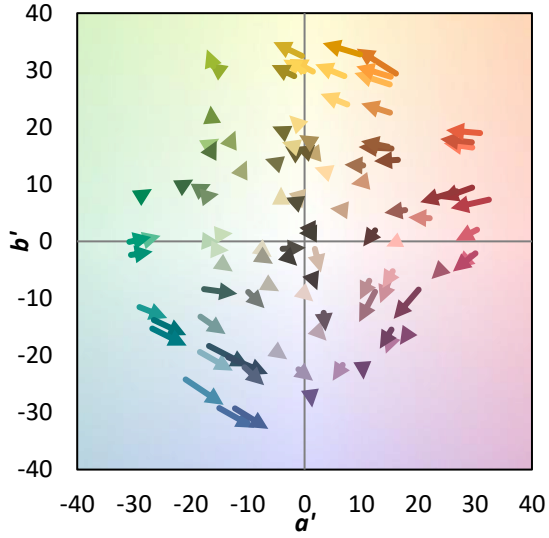



## Color Vector Graphics



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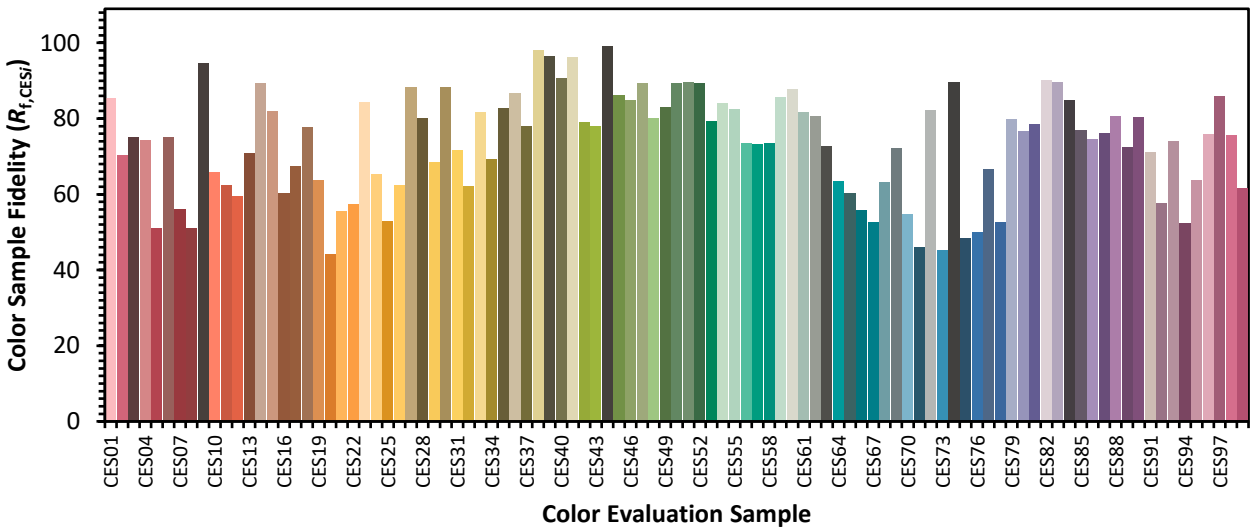
# TM-30-18

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

| | | | |
|---|---|---|---|
| CES01 = 85 | CES26 = 62 | CES51 = 90 | CES76 = 50 |
| CES02 = 59 | CES27 = 88 | CES52 = 89 | CES77 = 67 |
| CES03 = 30 | CES28 = 80 | CES53 = 79 | CES78 = 53 |
| CES04 = 69 | CES29 = 69 | CES54 = 84 | CES79 = 80 |
| CES05 = 46 | CES30 = 88 | CES55 = 83 | CES80 = 77 |
| CES06 = 50 | CES31 = 72 | CES56 = 74 | CES81 = 78 |
| CES07 = 38 | CES32 = 62 | CES57 = 73 | CES82 = 90 |
| CES08 = 38 | CES33 = 82 | CES58 = 73 | CES83 = 90 |
| CES09 = 29 | CES34 = 69 | CES59 = 86 | CES84 = 85 |
| CES10 = 72 | CES35 = 83 | CES60 = 88 | CES85 = 77 |
| CES11 = 56 | CES36 = 87 | CES61 = 82 | CES86 = 75 |
| CES12 = 61 | CES37 = 78 | CES62 = 81 | CES87 = 76 |
| CES13 = 41 | CES38 = 98 | CES63 = 73 | CES88 = 81 |
| CES14 = 74 | CES39 = 96 | CES64 = 63 | CES89 = 72 |
| CES15 = 70 | CES40 = 91 | CES65 = 60 | CES90 = 80 |
| CES16 = 46 | CES41 = 96 | CES66 = 56 | CES91 = 71 |
| CES17 = 49 | CES42 = 79 | CES67 = 53 | CES92 = 58 |
| CES18 = 55 | CES43 = 78 | CES68 = 63 | CES93 = 74 |
| CES19 = 71 | CES44 = 99 | CES69 = 72 | CES94 = 52 |
| CES20 = 63 | CES45 = 86 | CES70 = 55 | CES95 = 64 |
| CES21 = 85 | CES46 = 85 | CES71 = 46 | CES96 = 76 |
| CES22 = 77 | CES47 = 89 | CES72 = 82 | CES97 = 86 |
| CES23 = 91 | CES48 = 80 | CES73 = 45 | CES98 = 76 |
| CES24 = 90 | CES49 = 83 | CES74 = 90 | CES99 = 62 |
| CES25 = 71 | CES50 = 89 | CES75 = 48 | |



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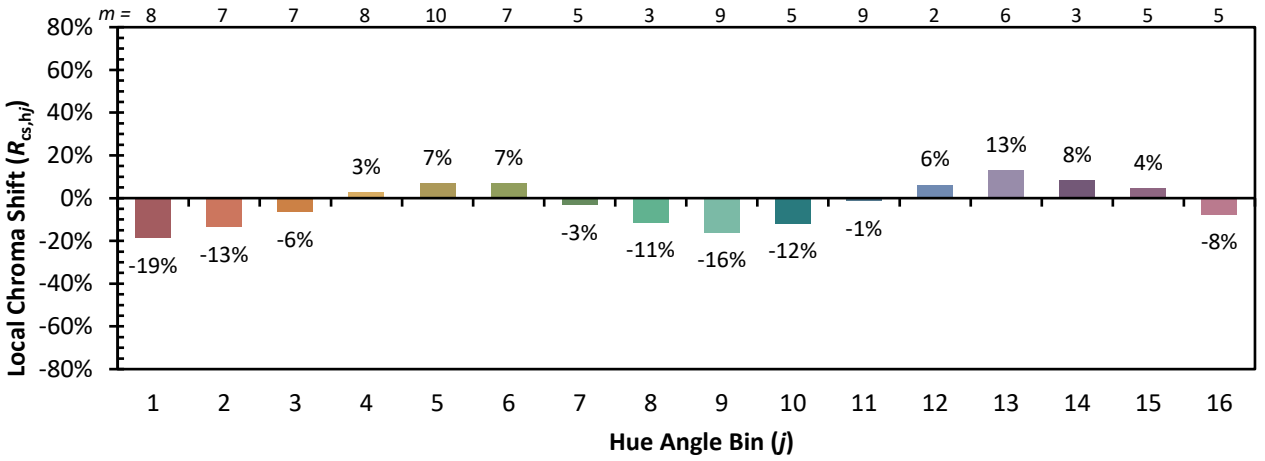
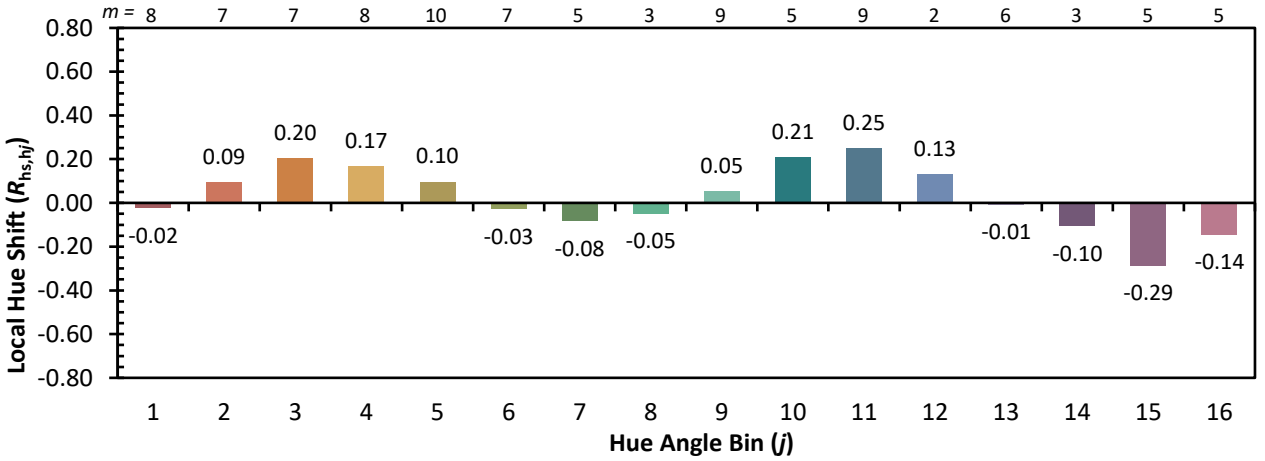
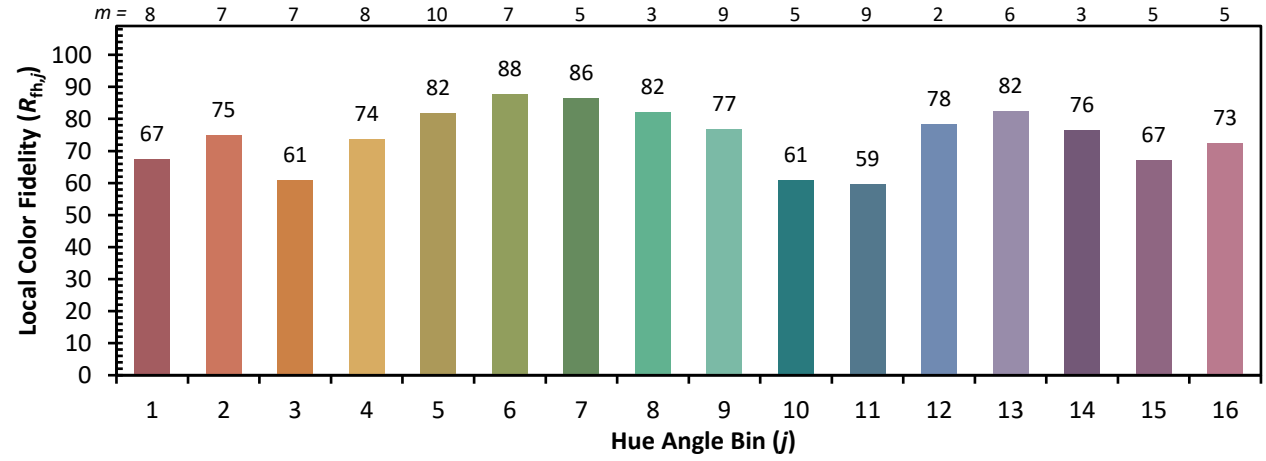
## Color Rendition by Hue-Angle Bin



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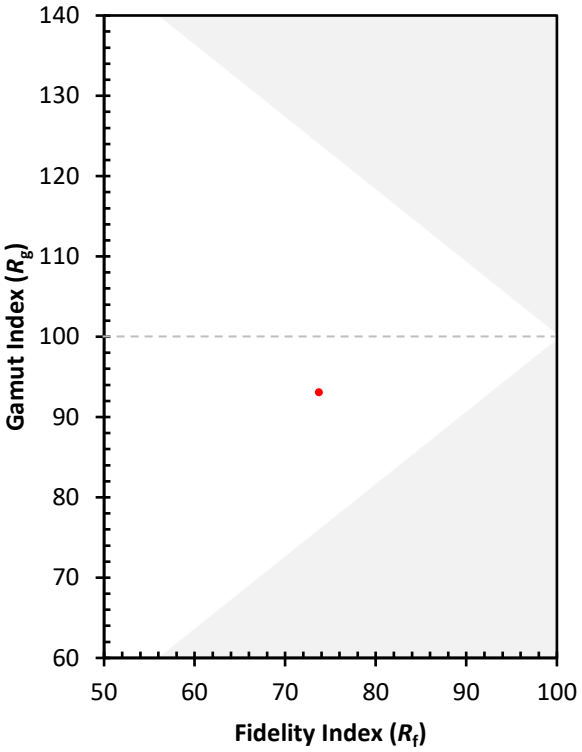
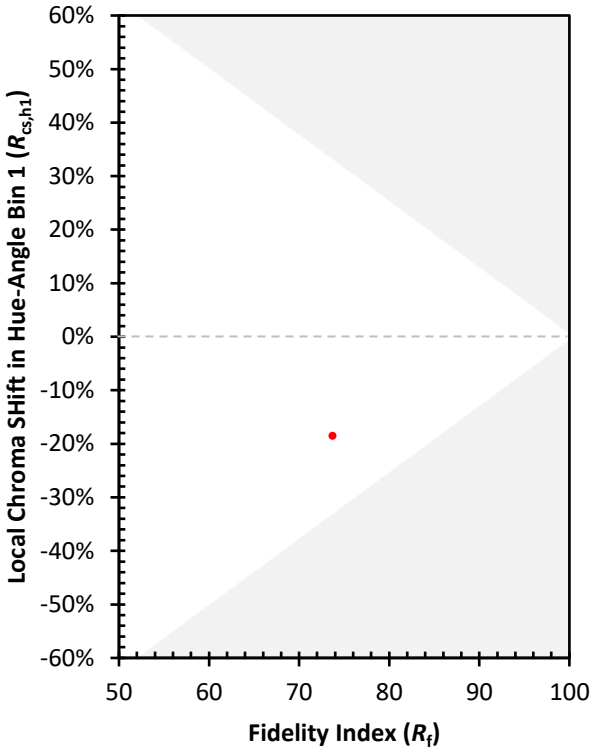
## TM-30-18

### Measure Comparisons




(END OF REPORT)