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: P867531

Luminaire Tested: **MEM2-HTN-SA-110-750-U-T2R-HSS**

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: | P867531 |
| Test Lab: | INNOVATION CENTER(G3) |
| Issue Date: | 08/21/2024 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS (FORMERLY EATON) |
| Product Line: | STREETWORKS |
| Catalog Number: | MEM2-HTN-SA-110-750-U-T2R-HSS |
| Description: | EPIC MODERN TALL HOUSING DISCRETE LED ARRAYS 110W 70CRI 5000K FIXTURE w/ TYPE II ROADWAY DISTRIBUTION OPTIC AND HOUSE SIDE SHIELD |
| Light Source: | (30) 5000K CCT, 70 CRI LEDS |
| Ballast/Driver: | ELECTRONIC DRIVER |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 11900.5 lumens |
| Efficiency: | N/A |
| Efficacy: | 105.3 lumens/watt |
| Luminous Opening: | Rectangular (W 1' x L: 0.33' x H: 0') |
| IES Classification: | Type II - Short |
| BUG Rating: | B1 - U0 - G2 |

| | |
|---|---|
| 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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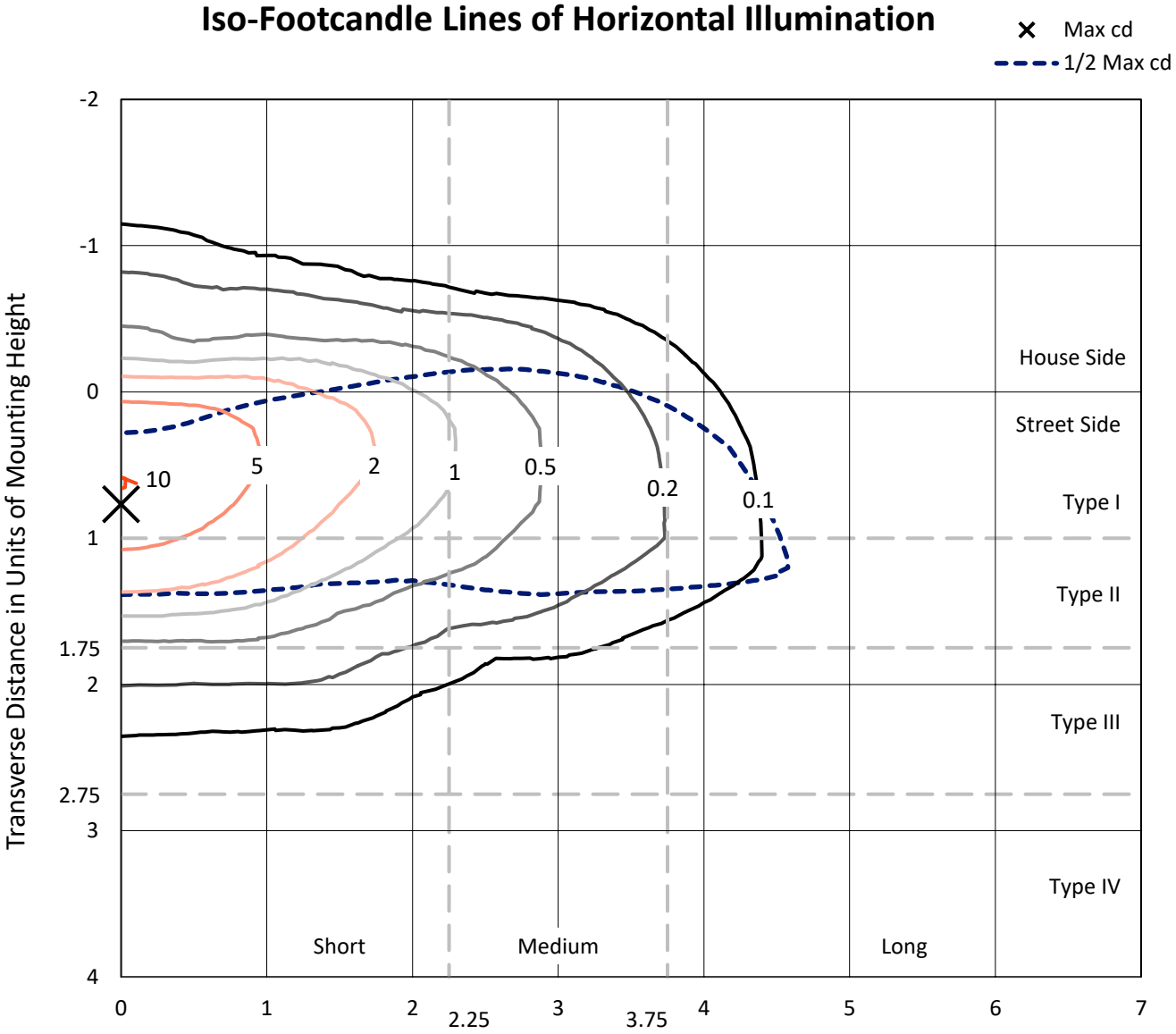
Scaled Data Report

REPORT NUMBER: P867531
CATALOG NUMBER: MEM2-HTN-SA-110-750-U-T2R-HSS

## Iso-Footcandle Lines of Horizontal Illumination




Based on 20 foot mounting height. Maximum calculated value = 10.2 fc
Type II - Short - N/A

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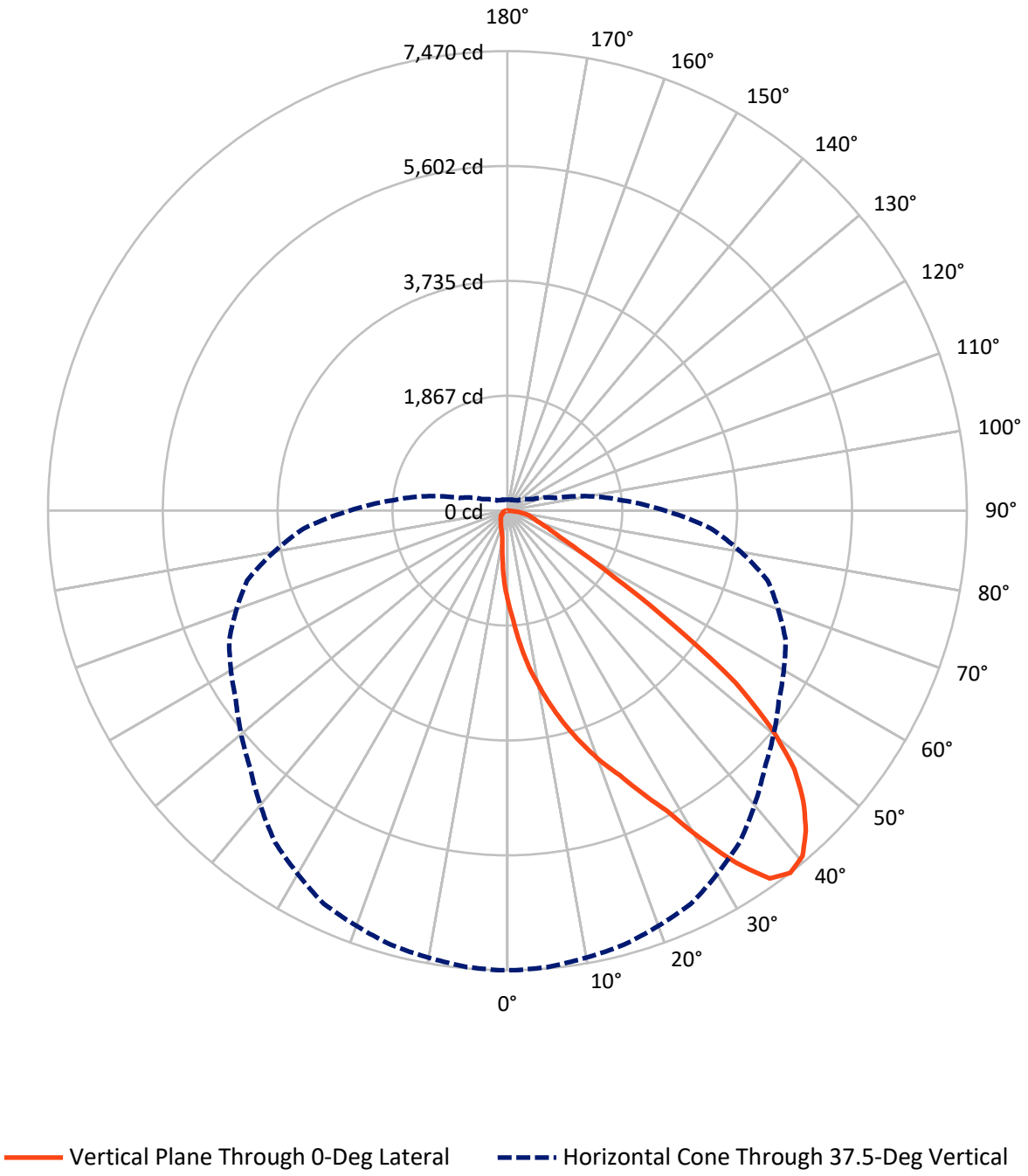
## Luminous Intensity Polar Plot



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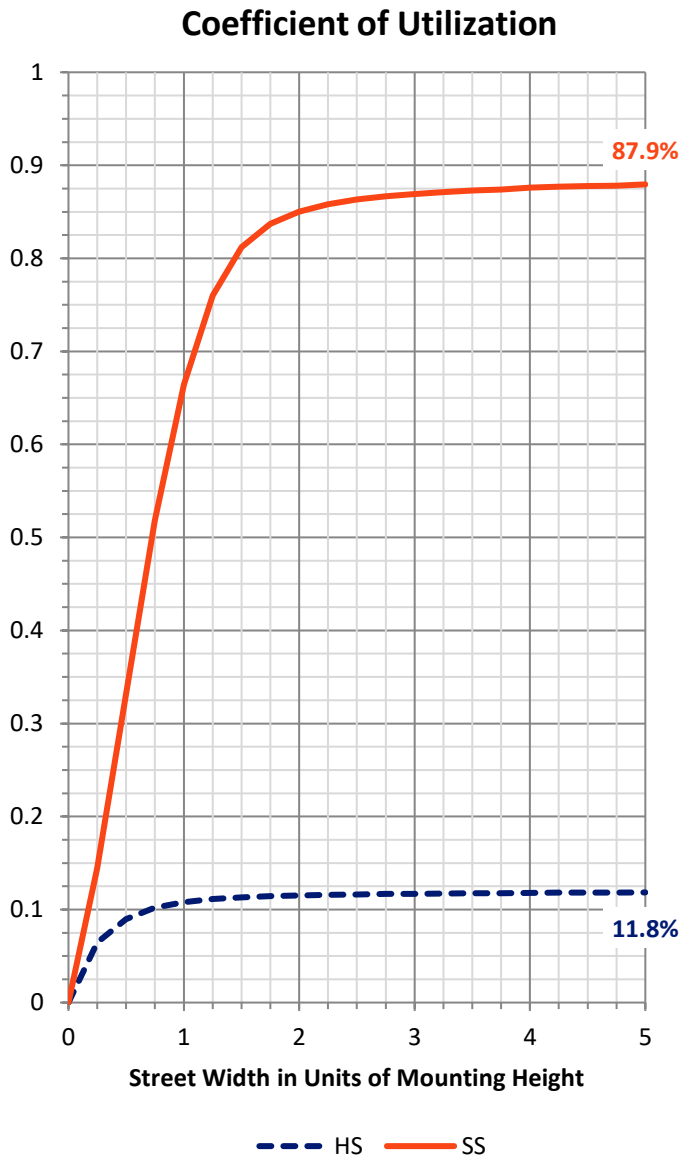
REPORT NUMBER: P867531
CATALOG NUMBER: MEM2-HTN-SA-110-750-U-T2R-HSS

**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 1419.4 | 0.0 | 1419.4 |
| | % Fixture | 11.9 | 0.0 | 11.9 |
| **Street Side** | Lumens | 10481.2 | 0.0 | 10481.2 |
| | % Fixture | 88.1 | 0.0 | 88.1 |
| **Total** | Lumens | 11900.5 | 0.0 | 11900.5 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 147.9 | 1.2 |
| 10°-20° | 517.1 | 4.3 |
| 20°-30° | 1067.0 | 9.0 |
| 30°-40° | 1877.4 | 15.8 |
| 40°-50° | 2549.1 | 21.4 |
| 50°-60° | 2525.6 | 21.2 |
| 60°-70° | 1944.4 | 16.3 |
| 70°-80° | 1128.5 | 9.5 |
| 80°-90° | 143.5 | 1.2 |
| 90°-100° | 0.0 | 0.0 |
| 100°-110° | 0.0 | 0.0 |
| 110°-120° | 0.0 | 0.0 |
| 120°-130° | 0.0 | 0.0 |
| 130°-140° | 0.0 | 0.0 |
| 140°-150° | 0.0 | 0.0 |
| 150°-160° | 0.0 | 0.0 |
| 160°-170° | 0.0 | 0.0 |
| 170°-180° | 0.0 | 0.0 |
| 0°-90° | 11900.5 | 100.0 |
| 0°-180° | 11900.5 | 100.0 |



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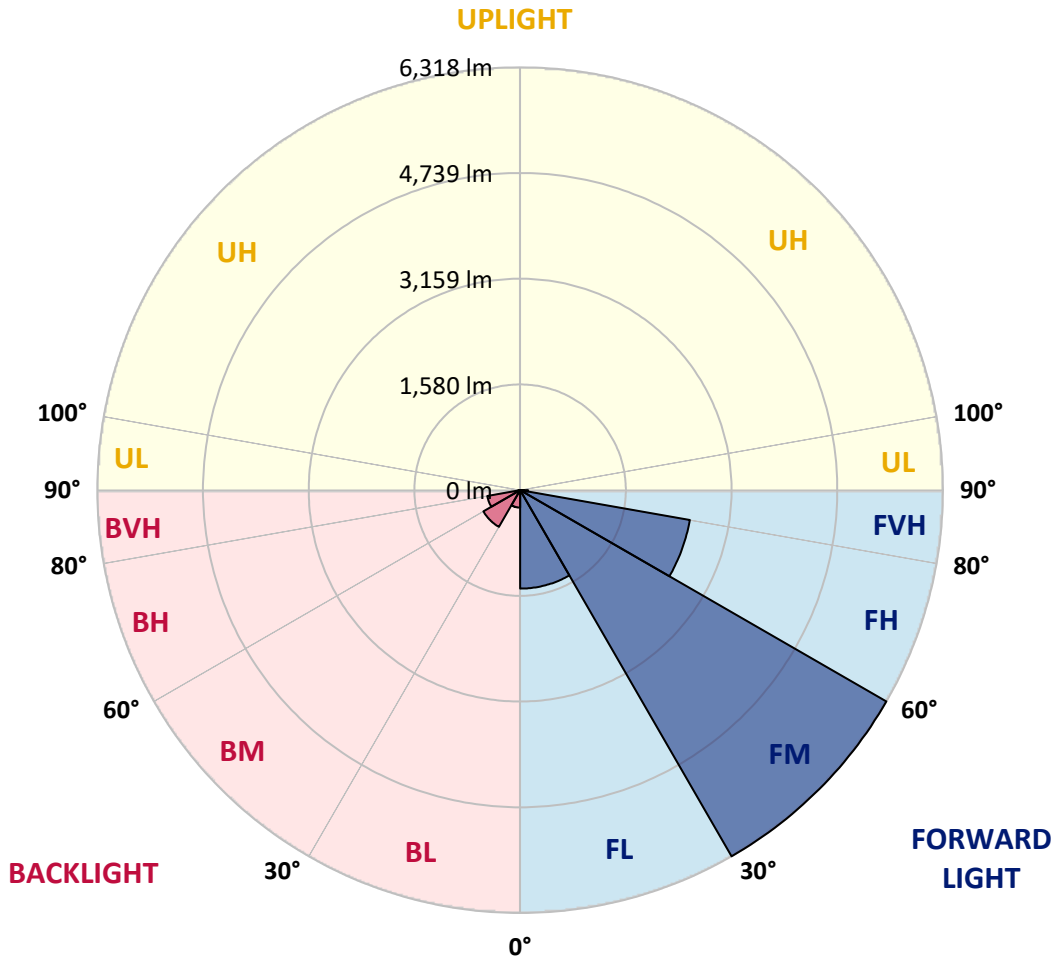
REPORT NUMBER: P867531
CATALOG NUMBER: MEM2-HTN-SA-110-750-U-T2R-HSS

## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 1471.1 | 12.4 | | | |
| FM | (30°-60°) | 6318.2 | 53.1 | | | |
| FH | (60°-80°) | 2574.8 | 21.6 | | | G2/5000 |
| FVH | (80°-90°) | 117.1 | 1.0 | | | G2/225 |
| BL | (0°-30°) | 261.0 | 2.2 | B1/500 | | |
| BM | (30°-60°) | 633.9 | 5.3 | B1/1000 | | |
| BH | (60°-80°) | 498.0 | 4.2 | B1/500 | | G1/500 |
| BVH | (80°-90°) | 26.5 | 0.2 | | | G1/100 |
| UL | (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH | (100°-180°) | 0.0 | 0.0 | | U0/0 | |

**BUG Rating: B1-U0-G2**
Type II Short



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Scaled Data Report

REPORT NUMBER: P867531
CATALOG NUMBER: MEM2-HTN-SA-110-750-U-T2R-HSS

**CANDELA DISTRIBUTION (FULL):**

| | 0° | 1° | 5° | 15° | 25° | 35° | 45° | 55° | 65° | 75° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 1474.6 | 1474.6 | 1474.6 | 1474.6 | 1474.6 | 1474.6 | 1474.6 | 1474.6 | 1474.6 | 1474.6 | 1474.6 |
| 2.5° | 1776.9 | 1803.4 | 1783.5 | 1766.9 | 1743.7 | 1720.4 | 1687.2 | 1650.7 | 1604.2 | 1547.7 | 1497.9 |
| 5° | 2178.7 | 2192.0 | 2185.4 | 2175.4 | 2102.4 | 2032.6 | 1962.9 | 1876.5 | 1756.9 | 1650.7 | 1537.7 |
| 7.5° | 2580.6 | 2574.0 | 2557.4 | 2527.5 | 2461.1 | 2381.3 | 2255.1 | 2112.3 | 1942.9 | 1756.9 | 1580.9 |
| 10° | 2932.7 | 2942.6 | 2929.4 | 2882.9 | 2799.8 | 2690.2 | 2537.4 | 2374.7 | 2145.5 | 1886.5 | 1640.7 |
| 12.5° | 3301.3 | 3308.0 | 3308.0 | 3208.3 | 3151.9 | 2982.5 | 2819.8 | 2600.5 | 2344.8 | 2045.9 | 1710.5 |
| 15° | 3663.4 | 3650.1 | 3650.1 | 3583.6 | 3484.0 | 3294.7 | 3112.0 | 2846.3 | 2557.4 | 2195.4 | 1790.2 |
| 17.5° | 4008.8 | 4015.4 | 3985.5 | 3912.4 | 3816.1 | 3633.5 | 3407.6 | 3115.3 | 2766.6 | 2374.7 | 1873.2 |
| 20° | 4350.9 | 4330.9 | 4317.6 | 4244.6 | 4141.6 | 3925.7 | 3709.9 | 3377.7 | 3012.4 | 2577.3 | 1989.4 |
| 22.5° | 4669.7 | 4679.7 | 4646.4 | 4530.2 | 4433.9 | 4237.9 | 3992.2 | 3686.6 | 3271.4 | 2779.9 | 2115.6 |
| 25° | 5081.5 | 5048.3 | 5078.2 | 4938.7 | 4789.3 | 4556.8 | 4277.8 | 3975.6 | 3553.8 | 3029.0 | 2271.7 |
| 27.5° | 5519.9 | 5539.9 | 5523.3 | 5370.5 | 5167.9 | 4855.7 | 4563.4 | 4241.3 | 3839.4 | 3264.8 | 2447.8 |
| 30° | 6174.2 | 6164.3 | 6167.6 | 5938.4 | 5603.0 | 5231.0 | 4872.3 | 4520.2 | 4125.0 | 3553.8 | 2653.7 |
| 32.5° | 6821.9 | 6858.4 | 6768.7 | 6566.1 | 6180.9 | 5619.6 | 5181.2 | 4789.3 | 4400.7 | 3802.8 | 2862.9 |
| 35° | 7343.3 | 7333.3 | 7296.8 | 7071.0 | 6689.0 | 6144.3 | 5533.2 | 5088.2 | 4692.9 | 4108.4 | 3095.4 |
| 37.5° | 7469.5 | 7469.5 | 7446.3 | 7306.8 | 7054.4 | 6582.7 | 5915.2 | 5387.1 | 4991.9 | 4380.7 | 3321.3 |
| 40° | 7386.5 | 7369.9 | 7356.6 | 7263.6 | 7127.4 | 6848.4 | 6317.0 | 5696.0 | 5310.7 | 4732.8 | 3570.4 |
| 42.5° | 7114.1 | 7117.5 | 7100.9 | 7047.7 | 6974.7 | 6868.4 | 6566.1 | 6024.8 | 5622.9 | 5064.9 | 3816.1 |
| 45° | 6748.8 | 6755.4 | 6735.5 | 6728.9 | 6692.3 | 6692.3 | 6622.6 | 6283.8 | 5918.5 | 5403.7 | 4085.2 |
| 47.5° | 6280.5 | 6277.2 | 6267.2 | 6250.6 | 6323.7 | 6403.4 | 6466.5 | 6430.0 | 6180.9 | 5769.0 | 4327.6 |
| 50° | 5566.4 | 5559.8 | 5589.7 | 5672.7 | 5852.1 | 6028.1 | 6214.1 | 6386.8 | 6370.2 | 6107.8 | 4619.9 |
| 52.5° | 4639.8 | 4596.6 | 4629.8 | 4885.6 | 5254.2 | 5646.1 | 5908.5 | 6180.9 | 6466.5 | 6466.5 | 4908.8 |
| 55° | 3244.9 | 3281.4 | 3301.3 | 3676.6 | 4404.0 | 5078.2 | 5539.9 | 5891.9 | 6430.0 | 6752.1 | 5227.7 |
| 57.5° | 2065.8 | 2079.1 | 2138.9 | 2544.1 | 3397.7 | 4241.3 | 5058.3 | 5636.2 | 6293.8 | 6991.3 | 5546.5 |
| 60° | 1391.6 | 1345.1 | 1391.6 | 1624.1 | 2444.4 | 3327.9 | 4350.9 | 5314.0 | 6097.8 | 7164.0 | 5898.6 |
| 62.5° | 983.1 | 979.8 | 993.1 | 1129.2 | 1743.7 | 2500.9 | 3464.1 | 4878.9 | 5941.7 | 7173.9 | 6160.9 |
| 65° | 793.8 | 770.5 | 780.5 | 856.9 | 1169.1 | 1833.3 | 2540.8 | 4091.8 | 5802.2 | 6997.9 | 6290.5 |
| 67.5° | 637.7 | 627.7 | 634.4 | 684.2 | 876.8 | 1378.3 | 1790.2 | 3112.0 | 5506.7 | 6699.0 | 6217.4 |
| 70° | 521.4 | 524.8 | 528.1 | 577.9 | 697.5 | 1042.9 | 1278.7 | 2135.6 | 4875.6 | 6360.2 | 5888.6 |
| 72.5° | 451.7 | 451.7 | 455.0 | 488.2 | 584.5 | 827.0 | 966.5 | 1388.3 | 3945.7 | 5994.9 | 5284.1 |
| 75° | 398.6 | 398.6 | 398.6 | 428.4 | 498.2 | 664.3 | 750.6 | 949.9 | 2833.0 | 5317.3 | 4370.8 |
| 77.5° | 345.4 | 348.7 | 348.7 | 375.3 | 428.4 | 518.1 | 577.9 | 657.6 | 1806.8 | 4108.4 | 3308.0 |
| 80° | 265.7 | 265.7 | 269.0 | 298.9 | 365.3 | 405.2 | 425.1 | 465.0 | 949.9 | 2580.6 | 2099.0 |
| 82.5° | 186.0 | 189.3 | 189.3 | 192.6 | 245.8 | 249.1 | 229.2 | 232.5 | 345.4 | 856.9 | 797.1 |
| 85° | 19.9 | 23.2 | 26.6 | 26.6 | 43.2 | 53.1 | 56.5 | 53.1 | 56.5 | 99.6 | 99.6 |
| 87.5° | 0.0 | 0.0 | 0.0 | 0.0 | 3.3 | 6.6 | 6.6 | 10.0 | 10.0 | 10.0 | 10.0 |
| 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: P867531
CATALOG NUMBER: MEM2-HTN-SA-110-750-U-T2R-HSS

**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 1474.6 | 1474.6 | 1474.6 | 1474.6 | 1474.6 | 1474.6 | 1474.6 | 1474.6 | 1474.6 | 1474.6 | 1474.6 |
| 2.5° | 1471.3 | 1448.1 | 1398.3 | 1355.1 | 1315.2 | 1282.0 | 1258.8 | 1228.9 | 1205.6 | 1205.6 | 1218.9 |
| 5° | 1481.3 | 1428.1 | 1325.2 | 1228.9 | 1152.5 | 1079.4 | 1013.0 | 969.8 | 936.6 | 916.7 | 916.7 |
| 7.5° | 1494.6 | 1414.9 | 1258.8 | 1112.6 | 993.1 | 876.8 | 773.9 | 724.0 | 674.2 | 657.6 | 660.9 |
| 10° | 1521.1 | 1408.2 | 1199.0 | 1009.7 | 830.3 | 684.2 | 584.5 | 531.4 | 504.8 | 491.5 | 491.5 |
| 12.5° | 1551.0 | 1408.2 | 1135.9 | 893.4 | 684.2 | 534.7 | 474.9 | 435.1 | 421.8 | 415.2 | 408.5 |
| 15° | 1590.9 | 1414.9 | 1082.7 | 770.5 | 558.0 | 451.7 | 408.5 | 385.3 | 372.0 | 365.3 | 365.3 |
| 17.5° | 1637.4 | 1421.5 | 1026.3 | 670.9 | 474.9 | 398.6 | 365.3 | 348.7 | 335.4 | 328.8 | 328.8 |
| 20° | 1697.2 | 1438.1 | 969.8 | 581.2 | 415.2 | 365.3 | 335.4 | 318.8 | 305.6 | 302.2 | 298.9 |
| 22.5° | 1770.2 | 1464.7 | 913.3 | 508.2 | 375.3 | 332.1 | 305.6 | 292.3 | 282.3 | 275.7 | 275.7 |
| 25° | 1856.6 | 1497.9 | 870.2 | 455.0 | 345.4 | 308.9 | 285.6 | 269.0 | 259.1 | 255.7 | 255.7 |
| 27.5° | 1976.2 | 1554.4 | 827.0 | 415.2 | 322.2 | 285.6 | 262.4 | 249.1 | 239.1 | 235.8 | 232.5 |
| 30° | 2089.1 | 1624.1 | 807.1 | 405.2 | 305.6 | 265.7 | 249.1 | 232.5 | 222.5 | 219.2 | 215.9 |
| 32.5° | 2235.2 | 1703.8 | 793.8 | 405.2 | 298.9 | 252.4 | 232.5 | 219.2 | 209.2 | 205.9 | 202.6 |
| 35° | 2391.3 | 1796.8 | 793.8 | 418.5 | 302.2 | 242.5 | 219.2 | 205.9 | 196.0 | 189.3 | 189.3 |
| 37.5° | *2560.7* | *1889.8* | *800.4* | *438.4* | *312.2* | *235.8* | *205.9* | *192.6* | *182.7* | *179.3* | *179.3* |
| 40° | 2740.0 | 2016.0 | 813.7 | 455.0 | 322.2 | 232.5 | 192.6 | 182.7 | 172.7 | 166.1 | 166.1 |
| 42.5° | 2906.1 | 2115.6 | 837.0 | 474.9 | 328.8 | 229.2 | 182.7 | 172.7 | 162.7 | 159.4 | 159.4 |
| 45° | 3098.7 | 2225.2 | 856.9 | 488.2 | 328.8 | 219.2 | 172.7 | 162.7 | 156.1 | 152.8 | 149.5 |
| 47.5° | 3251.5 | 2314.9 | 866.8 | 494.9 | 322.2 | 209.2 | 162.7 | 156.1 | 149.5 | 142.8 | 146.1 |
| 50° | 3437.5 | 2411.2 | 883.5 | 498.2 | 308.9 | 196.0 | 156.1 | 146.1 | 139.5 | 136.2 | 136.2 |
| 52.5° | 3616.9 | 2507.6 | 896.7 | 491.5 | 292.3 | 179.3 | 146.1 | 139.5 | 132.9 | 126.2 | 126.2 |
| 55° | 3829.4 | 2613.8 | 916.7 | 481.6 | 265.7 | 162.7 | 136.2 | 129.5 | 119.6 | 116.2 | 112.9 |
| 57.5° | 4071.9 | 2753.3 | 933.3 | 461.7 | 232.5 | 146.1 | 129.5 | 119.6 | 106.3 | 99.6 | 99.6 |
| 60° | 4294.4 | 2912.7 | 946.6 | 411.8 | 202.6 | 136.2 | 119.6 | 109.6 | 96.3 | 93.0 | 93.0 |
| 62.5° | 4533.5 | 3078.8 | 946.6 | 325.5 | 172.7 | 122.9 | 112.9 | 103.0 | 89.7 | 86.4 | 86.4 |
| 65° | 4699.6 | 3228.3 | 916.7 | 242.5 | 146.1 | 116.2 | 109.6 | 96.3 | 83.0 | 79.7 | 79.7 |
| 67.5° | 4746.1 | 3321.3 | 833.6 | 172.7 | 126.2 | 109.6 | 103.0 | 89.7 | 79.7 | 73.1 | 73.1 |
| 70° | 4596.6 | 3248.2 | 680.9 | 132.9 | 109.6 | 99.6 | 93.0 | 83.0 | 73.1 | 69.7 | 69.7 |
| 72.5° | 4168.2 | 2969.2 | 508.2 | 112.9 | 96.3 | 93.0 | 86.4 | 76.4 | 69.7 | 66.4 | 66.4 |
| 75° | 3490.6 | 2467.7 | 358.7 | 99.6 | 89.7 | 83.0 | 76.4 | 69.7 | 63.1 | 63.1 | 63.1 |
| 77.5° | 2643.7 | 1783.5 | 222.5 | 89.7 | 76.4 | 76.4 | 69.7 | 63.1 | 59.8 | 56.5 | 56.5 |
| 80° | 1707.1 | 1125.9 | 126.2 | 63.1 | 53.1 | 56.5 | 49.8 | 43.2 | 43.2 | 39.9 | 39.9 |
| 82.5° | 724.0 | 445.0 | 66.4 | 36.5 | 26.6 | 23.2 | 16.6 | 16.6 | 13.3 | 13.3 | 13.3 |
| 85° | 73.1 | 26.6 | 13.3 | 10.0 | 10.0 | 6.6 | 6.6 | 6.6 | 6.6 | 3.3 | 3.3 |
| 87.5° | 10.0 | 10.0 | 10.0 | 6.6 | 6.6 | 6.6 | 3.3 | 3.3 | 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 |

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: SP1-2407-157-6

Test Date: 08/07/2024

Luminaire Tested: MEM2-HTN-SA-30-750-U-5WQ-2

Data in this report applies to families of products including MEM2-HTN-SA-30-750-U-5WQ-2

Report Generated By FNC07603 / LDUCLS01DT446
Version: v7.04

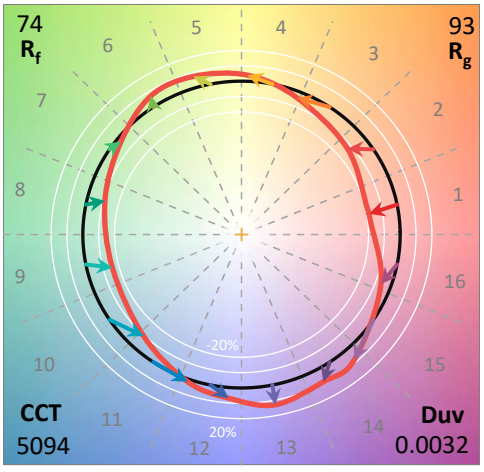
## Test Information

| | |
|---|---|
| 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-30-750-U-5WQ-2** |
| Description: | Epic Modern Light Square 30W 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

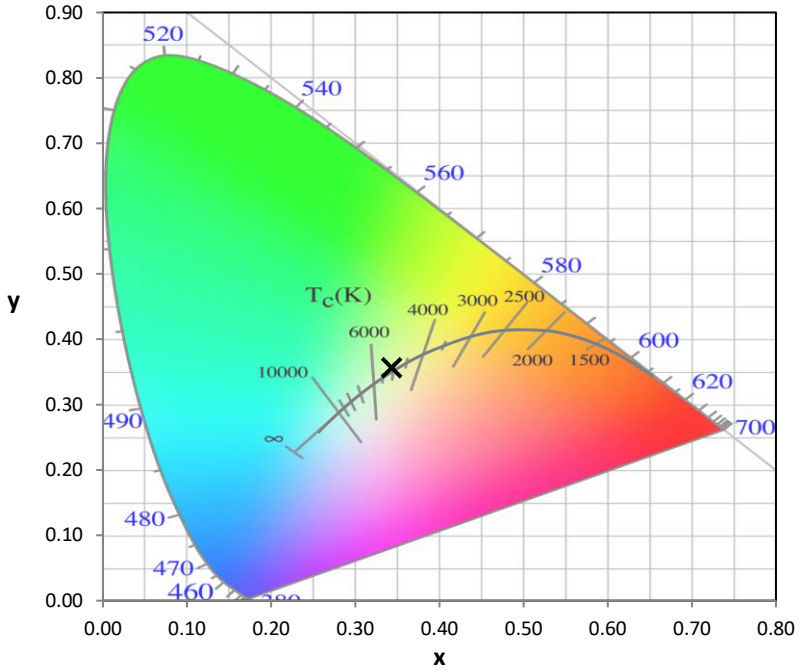
| | |
|---|---|
| Stabilization Time: | 20M |
| Operation Time: | 1H 20M |
| Sphere Temperature (°C): | 24.2 |

REPORT NUMBER: SP1-2407-157-6

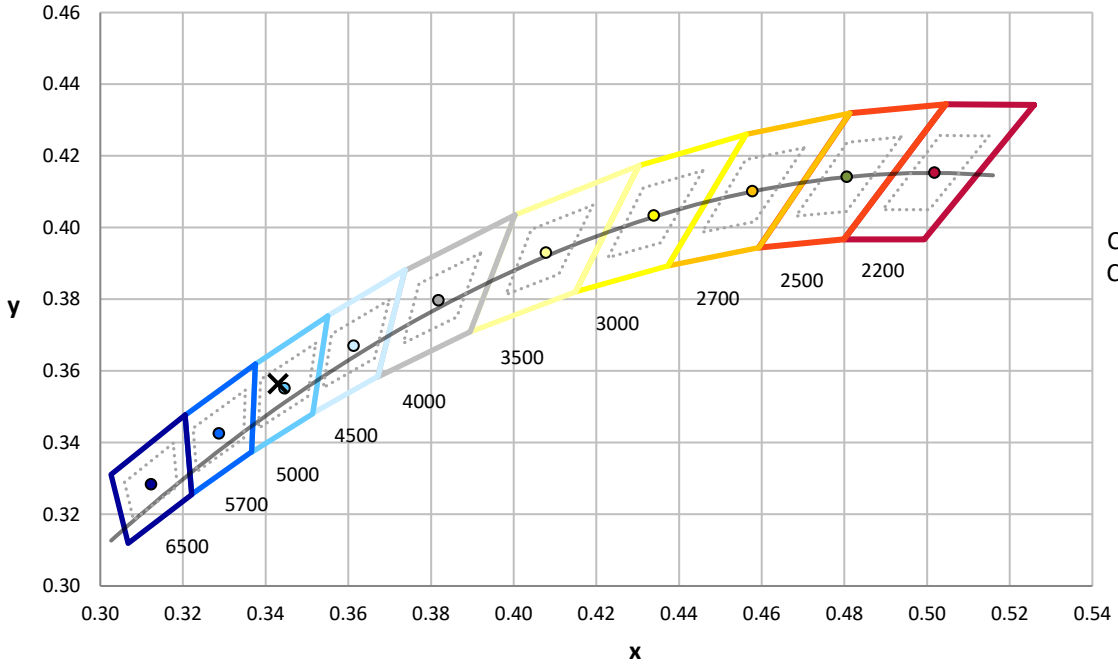
| Measurement and Test Equipment | | | |
|---|---|---|---|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | IN0058 | 6/18/2024 | 12/18/2024 |
| Power Meter | INXT2011004 | 2/8/2024 | 2/8/2025 |
| AC Power Source | IN0063 | 10/24/2023 | 10/24/2024 |
| DC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

REPORT NUMBER: SP1-2407-157-6

## 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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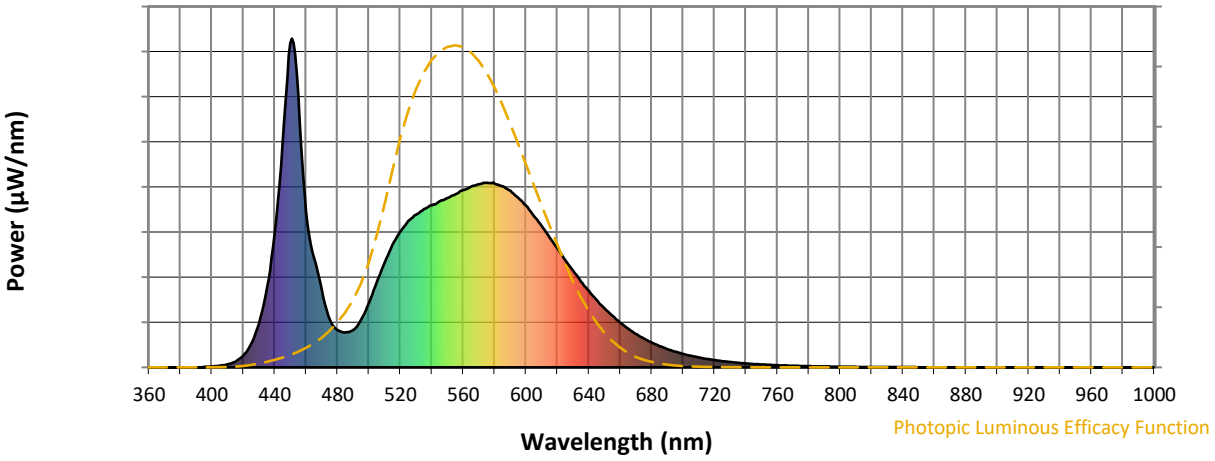
## Photopic Flux vs. Wavelength




## 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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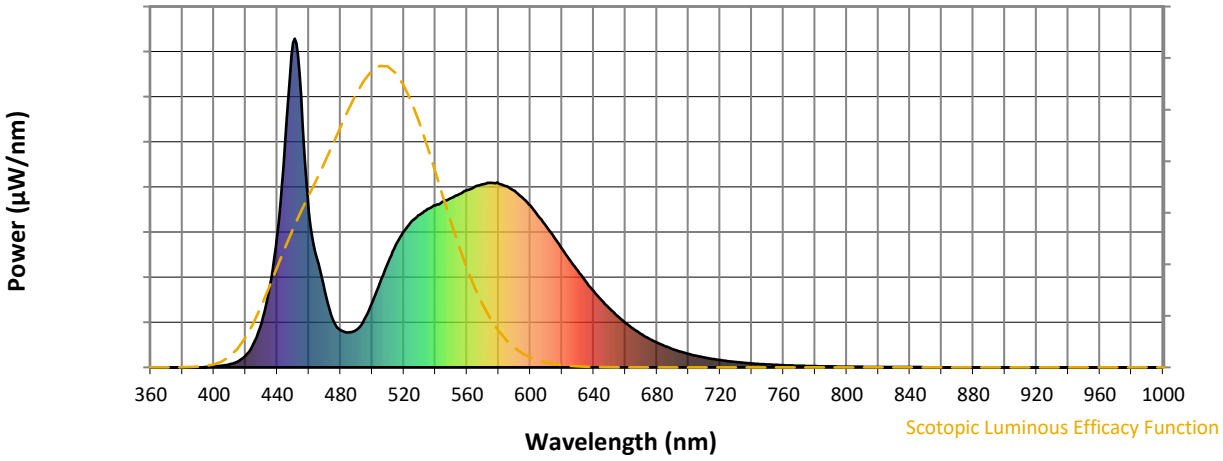
## Scotopic Flux vs. Wavelength




**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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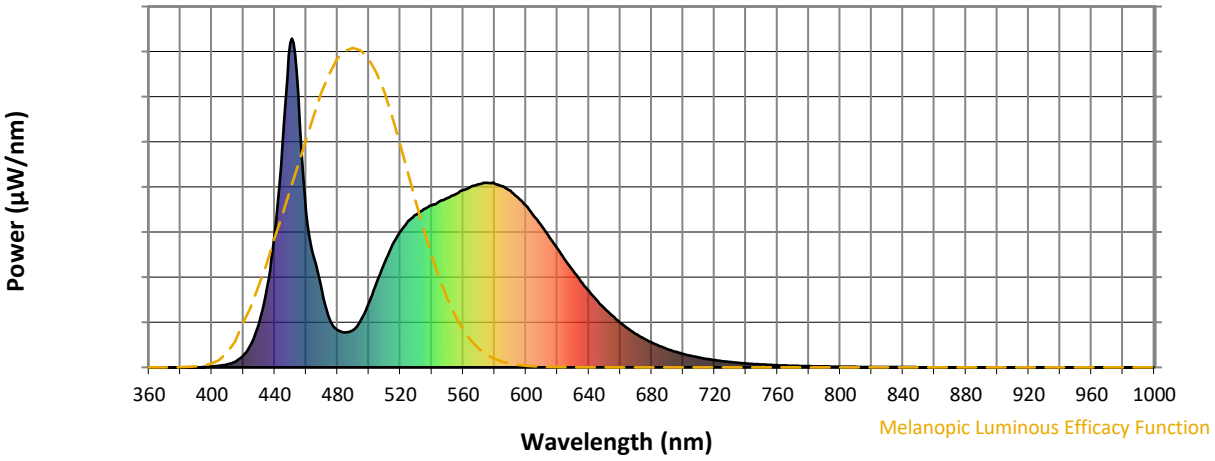
## Melanopic Flux vs. Wavelength




**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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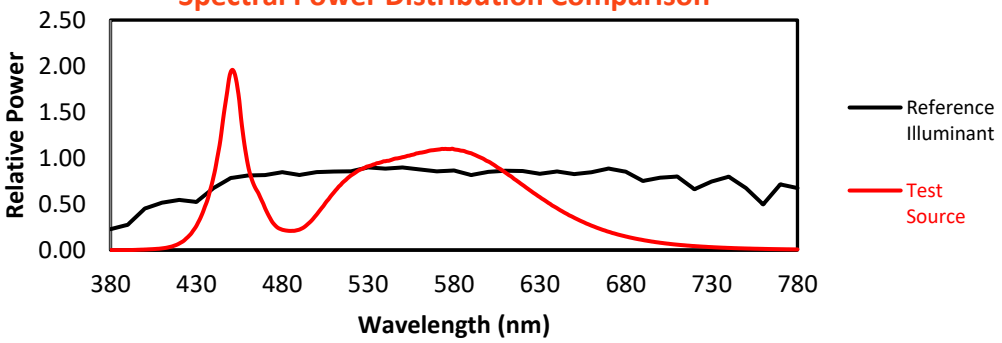
# TM-30-18

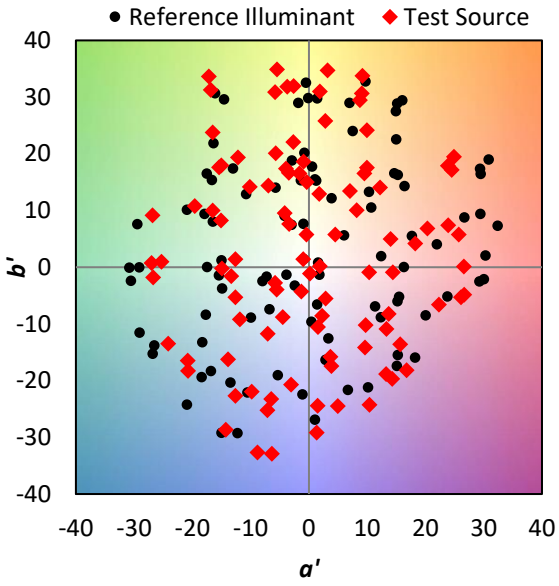
## Summary

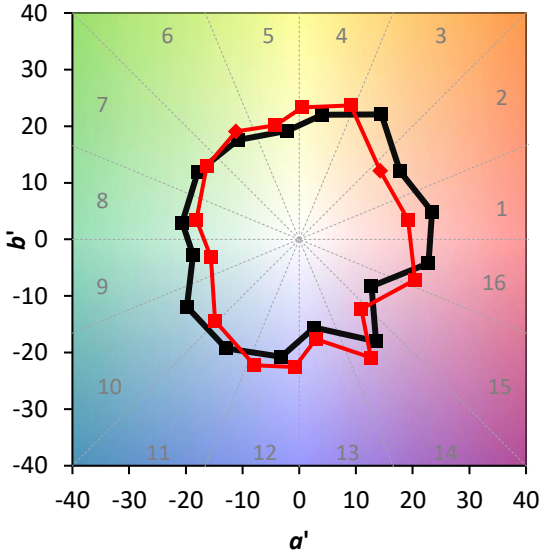
$R_f$ = 73.7
$R_g$ = 93
CIE $R_a$ = 72.0
$R_9$ = -39.6

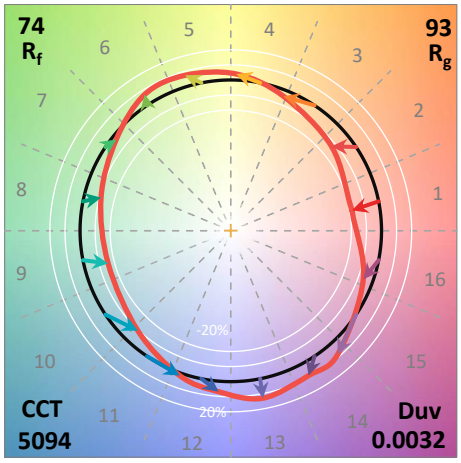
## Spectral Power Distribution Comparison

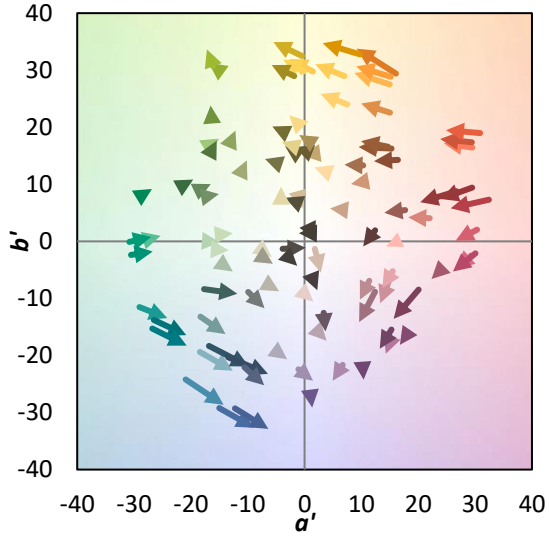



## Color Vector Graphics



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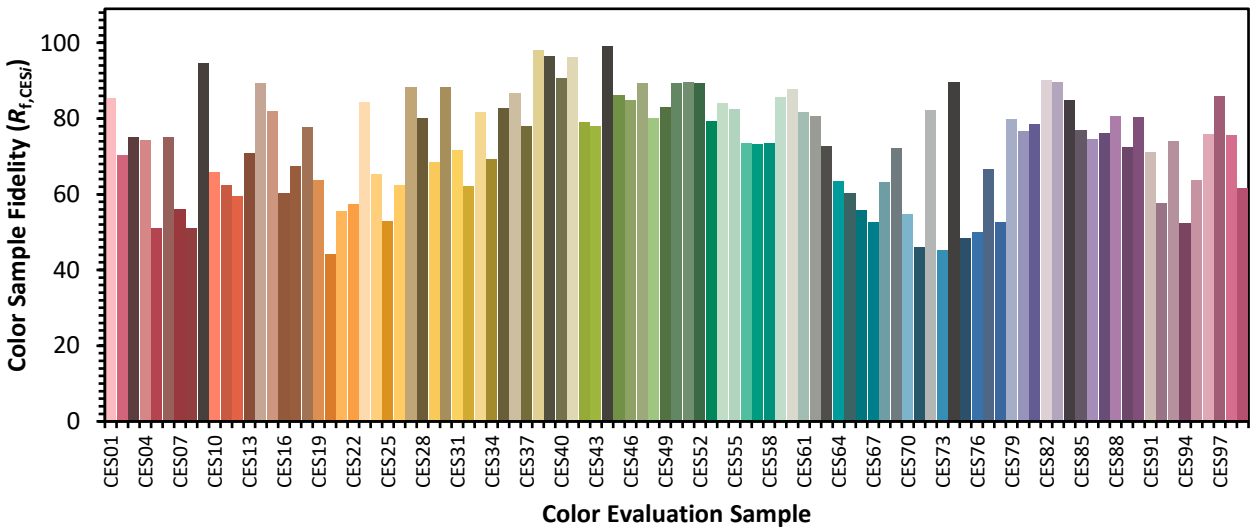
# TM-30-18

**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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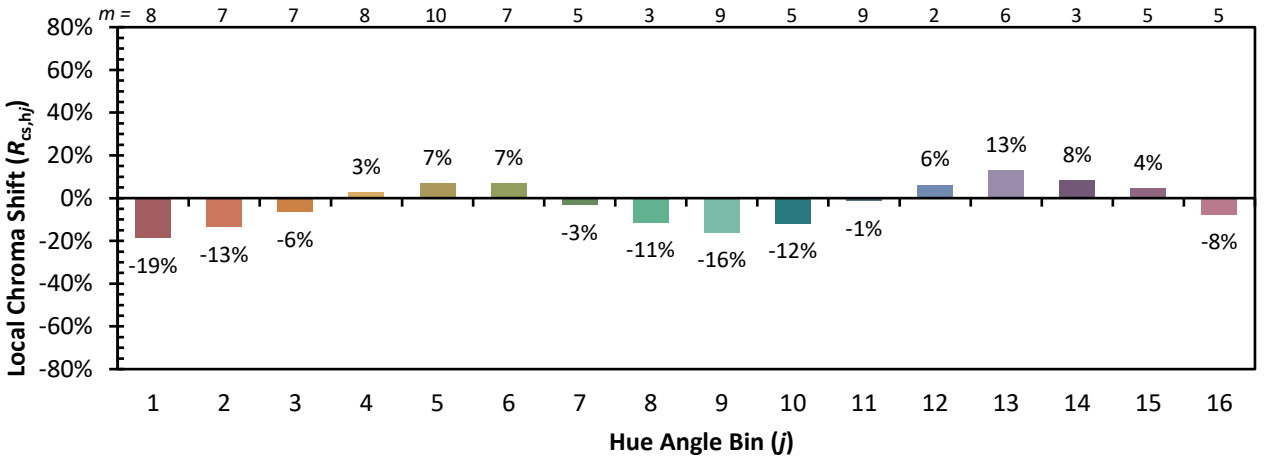
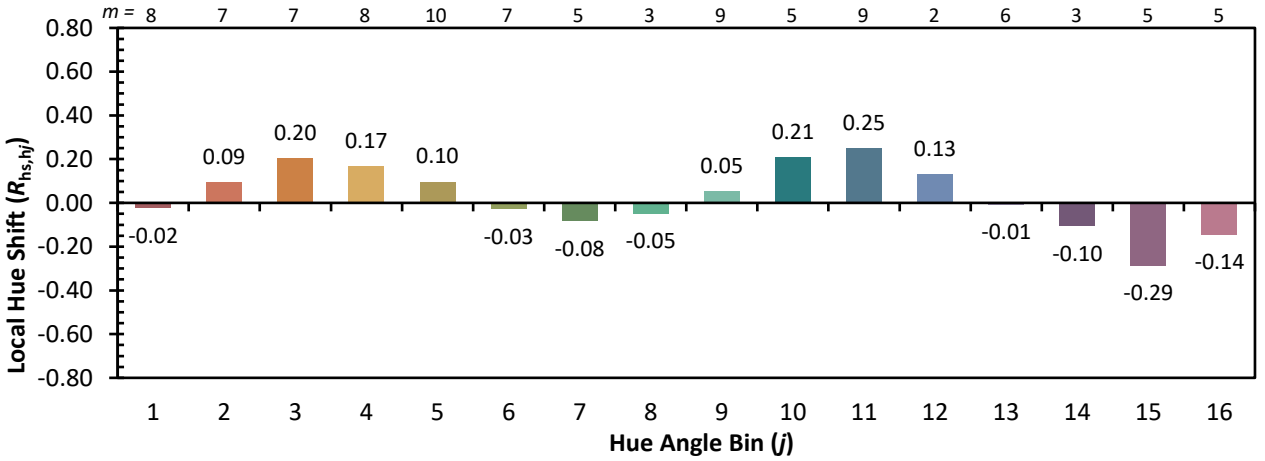
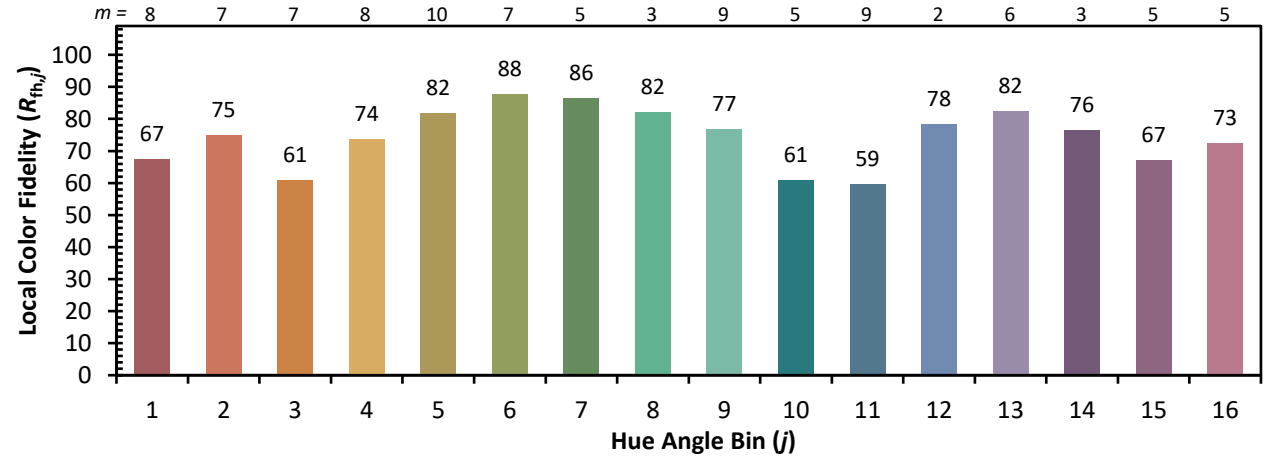
## Color Rendition by Hue-Angle Bin



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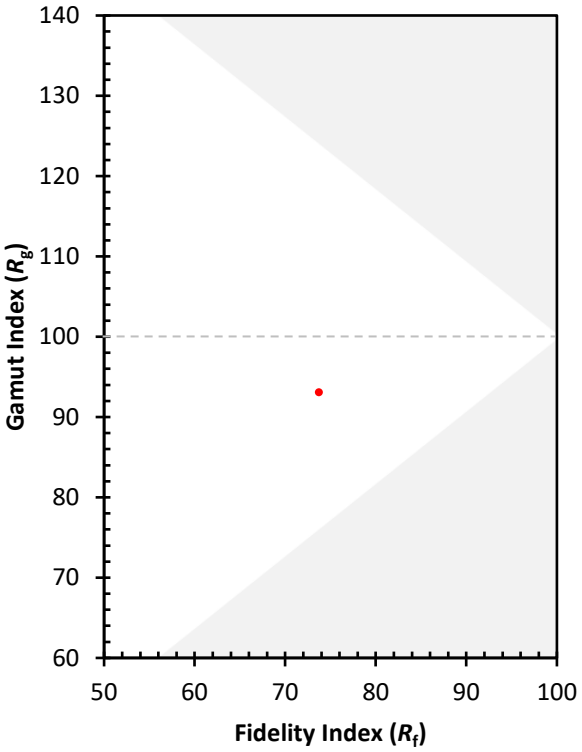
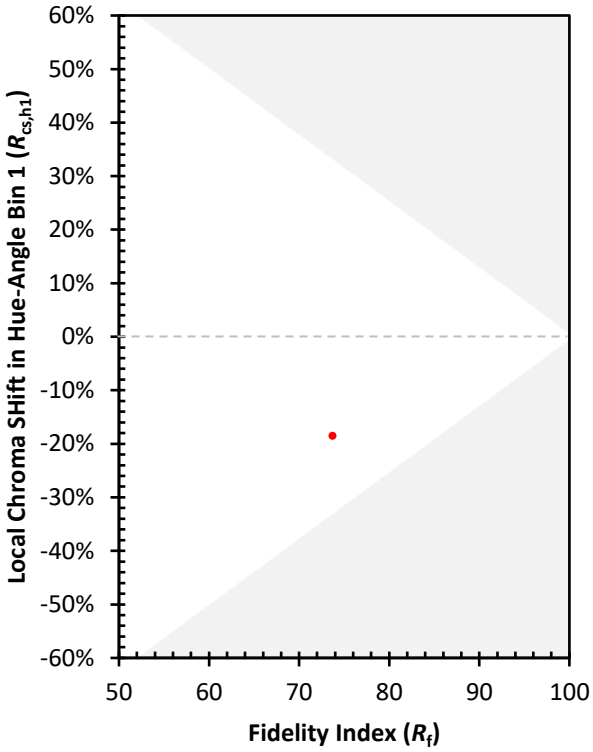
## TM-30-18

### Measure Comparisons

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