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: P867527

Luminaire Tested: **MEM2-HTN-SA-60-750-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: | P867527 |
| Test Lab: | INNOVATION CENTER(G3) |
| Issue Date: | 08/21/2024 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS (FORMERLY EATON) |
| Product Line: | STREETWORKS |
| Catalog Number: | MEM2-HTN-SA-60-750-U-T2R-HSS |
| Description: | EPIC MODERN TALL HOUSING DISCRETE LED ARRAYS 60W 70CRI 5000K FIXTURE w/ TYPE II ROADWAY DISTRIBUTION OPTIC AND HOUSE SIDE SHIELD |
| Light Source: | (10) 5000K CCT, 70 CRI LEDS |
| Ballast/Driver: | ELECTRONIC DRIVER |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 4410.1 lumens |
| Efficiency: | N/A |
| Efficacy: | 100.2 lumens/watt |
| Luminous Opening: | Rectangular (W 0.33' x L: 0.33' x H: 0') |
| IES Classification: | Type II - Short |
| BUG Rating: | B1 - U0 - G1 |

| | |
|---|---|
| Input Watts (W): | 44 |
| Input Voltage (V): | 120 |
| Input Current (Ain): | NR |
| Voltage Rise (V): | NR |
| Power Factor: | 0.99 |
| Total Harmonic Distortion (THDi): | 6.91% |
| Frequency (hertz): | 60 |
| Stabilization Time: | NR |
| Operation Time: | NR |
| Ambient Temperature (°C): | NR |
| Test Distance: | 24 FT |

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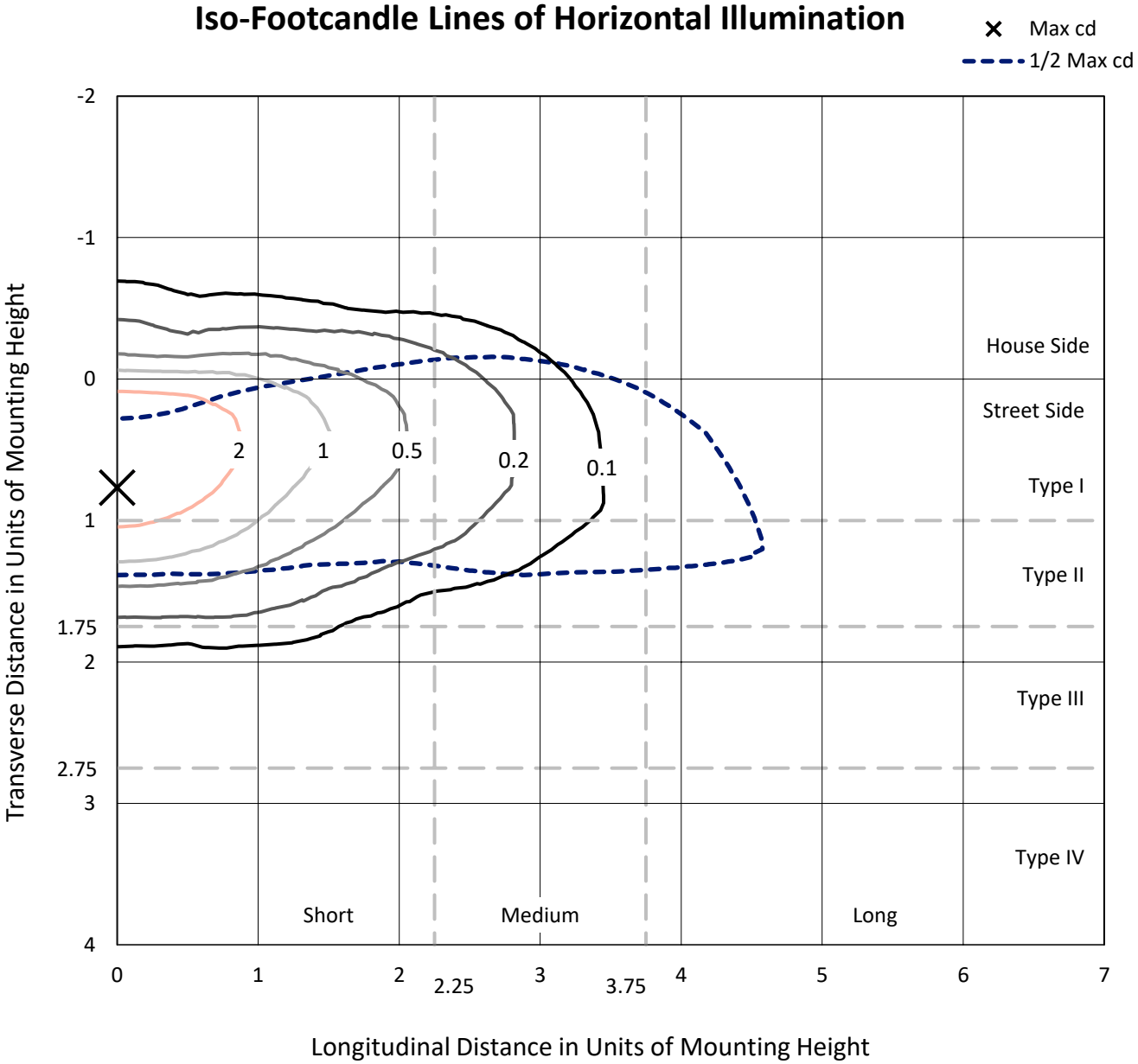
Scaled Data Report

REPORT NUMBER: P867527
CATALOG NUMBER: MEM2-HTN-SA-60-750-U-T2R-HSS

## Iso-Footcandle Lines of Horizontal Illumination




Based on 20 foot mounting height. Maximum calculated value = 3.8 fc
Type II - Short - N/A

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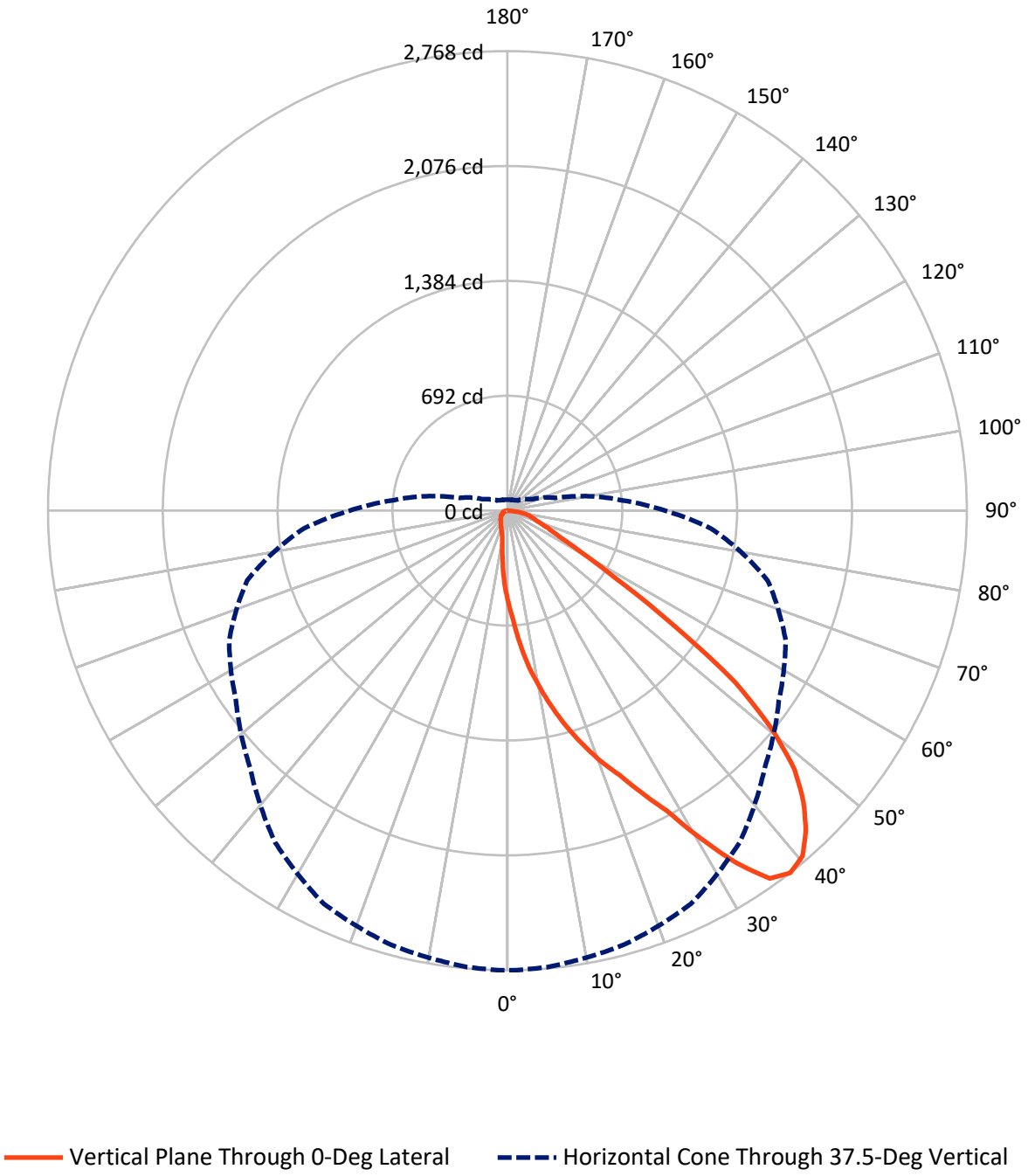
Scaled Data Report

REPORT NUMBER: P867527
CATALOG NUMBER: MEM2-HTN-SA-60-750-U-T2R-HSS

## Luminous Intensity Polar Plot



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Scaled Data Report

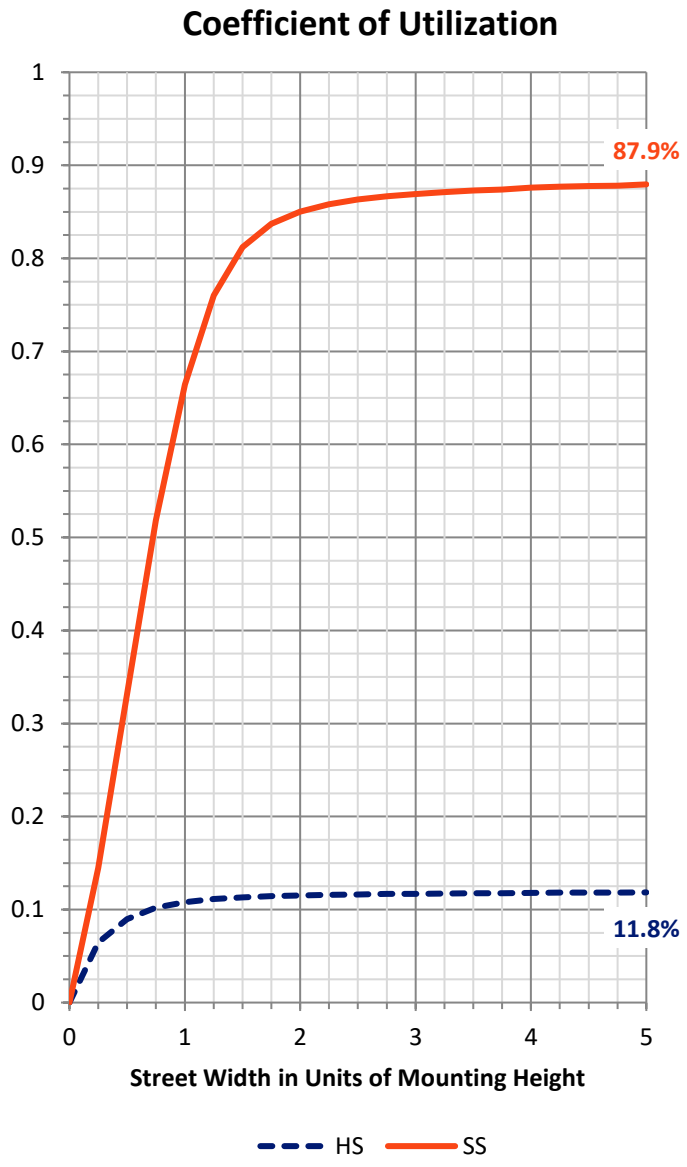
REPORT NUMBER: P867527
CATALOG NUMBER: MEM2-HTN-SA-60-750-U-T2R-HSS

**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 526.0 | 0.0 | 526.0 |
| | % Fixture | 11.9 | 0.0 | 11.9 |
| **Street Side** | Lumens | 3884.1 | 0.0 | 3884.1 |
| | % Fixture | 88.1 | 0.0 | 88.1 |
| **Total** | Lumens | 4410.1 | 0.0 | 4410.1 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 54.8 | 1.2 |
| 10°-20° | 191.6 | 4.3 |
| 20°-30° | 395.4 | 9.0 |
| 30°-40° | 695.7 | 15.8 |
| 40°-50° | 944.6 | 21.4 |
| 50°-60° | 935.9 | 21.2 |
| 60°-70° | 720.5 | 16.3 |
| 70°-80° | 418.2 | 9.5 |
| 80°-90° | 53.2 | 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° | 4410.1 | 100.0 |
| 0°-180° | 4410.1 | 100.0 |



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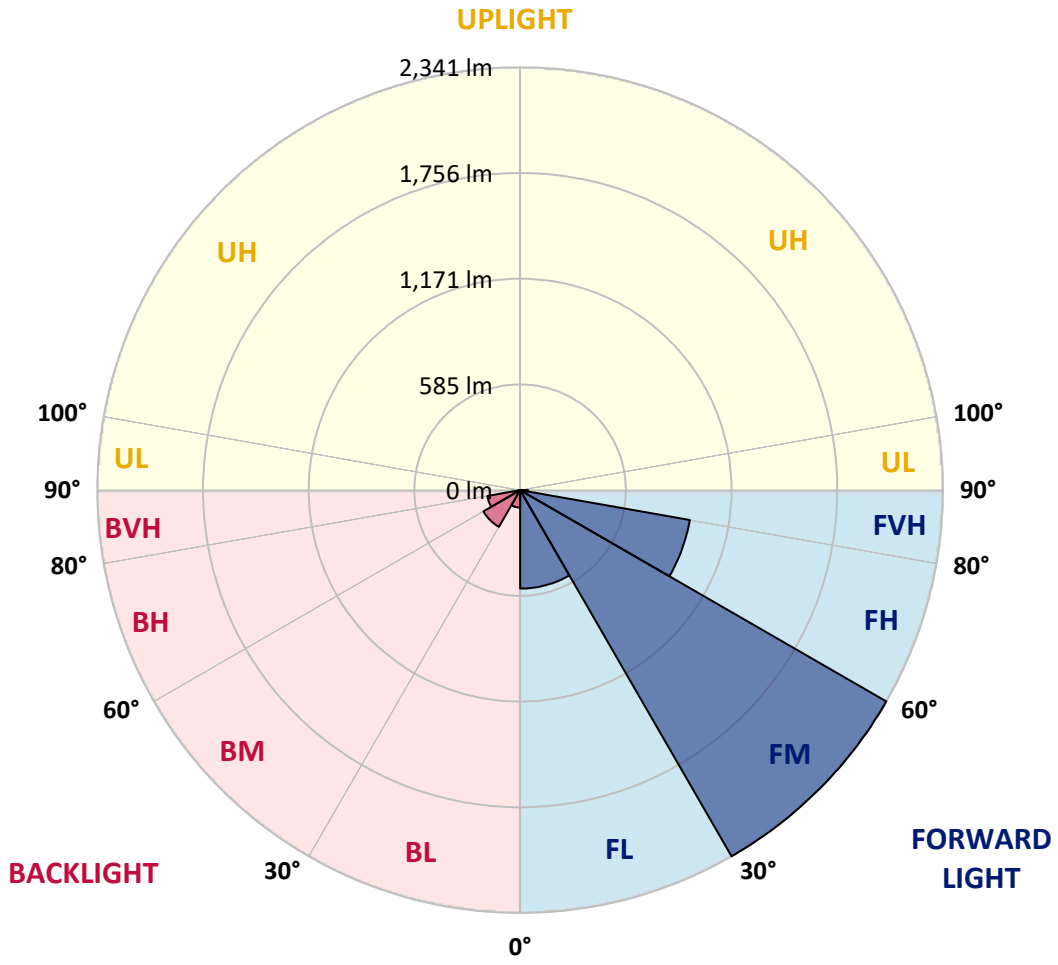
Scaled Data Report

REPORT NUMBER: P867527
CATALOG NUMBER: MEM2-HTN-SA-60-750-U-T2R-HSS

## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 545.2 | 12.4 | | | |
| FM | (30°-60°) | 2341.4 | 53.1 | | | |
| FH | (60°-80°) | 954.2 | 21.6 | | | G1/1800 |
| FVH | (80°-90°) | 43.4 | 1.0 | | | G1/100 |
| BL | (0°-30°) | 96.7 | 2.2 | B0/110 | | |
| BM | (30°-60°) | 234.9 | 5.3 | B1/1000 | | |
| BH | (60°-80°) | 184.5 | 4.2 | B1/500 | | G1/500 |
| BVH | (80°-90°) | 9.8 | 0.2 | | | G0/10 |
| UL | (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH | (100°-180°) | 0.0 | 0.0 | | U0/0 | |

**BUG Rating: B1-U0-G1**
Type II Short



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Scaled Data Report

REPORT NUMBER: P867527
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**CANDELA DISTRIBUTION (FULL):**

| | 0° | 1° | 5° | 15° | 25° | 35° | 45° | 55° | 65° | 75° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 546.5 | 546.5 | 546.5 | 546.5 | 546.5 | 546.5 | 546.5 | 546.5 | 546.5 | 546.5 | 546.5 |
| 2.5° | 658.5 | 668.3 | 660.9 | 654.8 | 646.2 | 637.5 | 625.2 | 611.7 | 594.5 | 573.5 | 555.1 |
| 5° | 807.4 | 812.3 | 809.9 | 806.2 | 779.1 | 753.2 | 727.4 | 695.4 | 651.1 | 611.7 | 569.9 |
| 7.5° | 956.3 | 953.9 | 947.7 | 936.6 | 912.0 | 882.5 | 835.7 | 782.8 | 720.0 | 651.1 | 585.9 |
| 10° | 1086.8 | 1090.5 | 1085.5 | 1068.3 | 1037.5 | 996.9 | 940.3 | 880.0 | 795.1 | 699.1 | 608.0 |
| 12.5° | 1223.4 | 1225.9 | 1225.9 | 1188.9 | 1168.0 | 1105.2 | 1044.9 | 963.7 | 868.9 | 758.2 | 633.9 |
| 15° | 1357.6 | 1352.6 | 1352.6 | 1328.0 | 1291.1 | 1220.9 | 1153.2 | 1054.8 | 947.7 | 813.5 | 663.4 |
| 17.5° | 1485.6 | 1488.0 | 1476.9 | 1449.9 | 1414.2 | 1346.5 | 1262.8 | 1154.5 | 1025.2 | 880.0 | 694.2 |
| 20° | 1612.3 | 1604.9 | 1600.0 | 1572.9 | 1534.8 | 1454.8 | 1374.8 | 1251.7 | 1116.3 | 955.1 | 737.2 |
| 22.5° | 1730.5 | 1734.2 | 1721.9 | 1678.8 | 1643.1 | 1570.5 | 1479.4 | 1366.2 | 1212.3 | 1030.2 | 784.0 |
| 25° | 1883.1 | 1870.8 | 1881.9 | 1830.2 | 1774.8 | 1688.6 | 1585.2 | 1473.2 | 1316.9 | 1122.5 | 841.9 |
| 27.5° | 2045.6 | 2052.9 | 2046.8 | 1990.2 | 1915.1 | 1799.4 | 1691.1 | 1571.7 | 1422.8 | 1209.9 | 907.1 |
| 30° | 2288.0 | 2284.3 | 2285.6 | 2200.6 | 2076.3 | 1938.5 | 1805.6 | 1675.1 | 1528.6 | 1316.9 | 983.4 |
| 32.5° | 2528.0 | 2541.6 | 2508.3 | 2433.3 | 2290.5 | 2082.5 | 1920.0 | 1774.8 | 1630.8 | 1409.2 | 1060.9 |
| 35° | 2721.3 | 2717.6 | 2704.0 | 2620.3 | 2478.8 | 2276.9 | 2050.5 | 1885.6 | 1739.1 | 1522.5 | 1147.1 |
| 37.5° | 2768.0 | 2768.0 | 2759.4 | 2707.7 | 2614.2 | 2439.4 | 2192.0 | 1996.3 | 1849.9 | 1623.4 | 1230.8 |
| 40° | 2737.3 | 2731.1 | 2726.2 | 2691.7 | 2641.3 | 2537.9 | 2340.9 | 2110.8 | 1968.0 | 1753.9 | 1323.1 |
| 42.5° | 2636.3 | 2637.6 | 2631.4 | 2611.7 | 2584.6 | 2545.3 | 2433.3 | 2232.6 | 2083.7 | 1876.9 | 1414.2 |
| 45° | 2500.9 | 2503.4 | 2496.0 | 2493.6 | 2480.0 | 2480.0 | 2454.2 | 2328.6 | 2193.3 | 2002.5 | 1513.9 |
| 47.5° | 2327.4 | 2326.2 | 2322.5 | 2316.3 | 2343.4 | 2372.9 | 2396.3 | 2382.8 | 2290.5 | 2137.9 | 1603.7 |
| 50° | 2062.8 | 2060.3 | 2071.4 | 2102.2 | 2168.6 | 2233.9 | 2302.8 | 2366.8 | 2360.6 | 2263.4 | 1712.0 |
| 52.5° | 1719.4 | 1703.4 | 1715.7 | 1810.5 | 1947.1 | 2092.3 | 2189.6 | 2290.5 | 2396.3 | 2396.3 | 1819.1 |
| 55° | 1202.5 | 1216.0 | 1223.4 | 1362.5 | 1632.0 | 1881.9 | 2052.9 | 2183.4 | 2382.8 | 2502.2 | 1937.3 |
| 57.5° | 765.5 | 770.5 | 792.6 | 942.8 | 1259.1 | 1571.7 | 1874.5 | 2088.6 | 2332.3 | 2590.8 | 2055.4 |
| 60° | 515.7 | 498.5 | 515.7 | 601.9 | 905.9 | 1233.2 | 1612.3 | 1969.3 | 2259.7 | 2654.8 | 2185.9 |
| 62.5° | 364.3 | 363.1 | 368.0 | 418.5 | 646.2 | 926.8 | 1283.7 | 1808.0 | 2201.9 | 2658.5 | 2283.1 |
| 65° | 294.2 | 285.5 | 289.2 | 317.5 | 433.2 | 679.4 | 941.5 | 1516.3 | 2150.2 | 2593.3 | 2331.1 |
| 67.5° | 236.3 | 232.6 | 235.1 | 253.5 | 324.9 | 510.8 | 663.4 | 1153.2 | 2040.6 | 2482.5 | 2304.0 |
| 70° | 193.2 | 194.5 | 195.7 | 214.2 | 258.5 | 386.5 | 473.9 | 791.4 | 1806.8 | 2356.9 | 2182.2 |
| 72.5° | 167.4 | 167.4 | 168.6 | 180.9 | 216.6 | 306.5 | 358.2 | 514.5 | 1462.2 | 2221.6 | 1958.2 |
| 75° | 147.7 | 147.7 | 147.7 | 158.8 | 184.6 | 246.2 | 278.2 | 352.0 | 1049.9 | 1970.5 | 1619.7 |
| 77.5° | 128.0 | 129.2 | 129.2 | 139.1 | 158.8 | 192.0 | 214.2 | 243.7 | 669.5 | 1522.5 | 1225.9 |
| 80° | 98.5 | 98.5 | 99.7 | 110.8 | 135.4 | 150.2 | 157.5 | 172.3 | 352.0 | 956.3 | 777.9 |
| 82.5° | 68.9 | 70.2 | 70.2 | 71.4 | 91.1 | 92.3 | 84.9 | 86.2 | 128.0 | 317.5 | 295.4 |
| 85° | 7.4 | 8.6 | 9.8 | 9.8 | 16.0 | 19.7 | 20.9 | 19.7 | 20.9 | 36.9 | 36.9 |
| 87.5° | 0.0 | 0.0 | 0.0 | 0.0 | 1.2 | 2.5 | 2.5 | 3.7 | 3.7 | 3.7 | 3.7 |
| 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

Scaled Data Report

REPORT NUMBER: P867527
CATALOG NUMBER: MEM2-HTN-SA-60-750-U-T2R-HSS

**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 546.5 | 546.5 | 546.5 | 546.5 | 546.5 | 546.5 | 546.5 | 546.5 | 546.5 | 546.5 | 546.5 |
| 2.5° | 545.2 | 536.6 | 518.2 | 502.2 | 487.4 | 475.1 | 466.5 | 455.4 | 446.8 | 446.8 | 451.7 |
| 5° | 548.9 | 529.2 | 491.1 | 455.4 | 427.1 | 400.0 | 375.4 | 359.4 | 347.1 | 339.7 | 339.7 |
| 7.5° | 553.9 | 524.3 | 466.5 | 412.3 | 368.0 | 324.9 | 286.8 | 268.3 | 249.8 | 243.7 | 244.9 |
| 10° | 563.7 | 521.9 | 444.3 | 374.2 | 307.7 | 253.5 | 216.6 | 196.9 | 187.1 | 182.2 | 182.2 |
| 12.5° | 574.8 | 521.9 | 420.9 | 331.1 | 253.5 | 198.2 | 176.0 | 161.2 | 156.3 | 153.8 | 151.4 |
| 15° | 589.5 | 524.3 | 401.2 | 285.5 | 206.8 | 167.4 | 151.4 | 142.8 | 137.8 | 135.4 | 135.4 |
| 17.5° | 606.8 | 526.8 | 380.3 | 248.6 | 176.0 | 147.7 | 135.4 | 129.2 | 124.3 | 121.8 | 121.8 |
| 20° | 628.9 | 532.9 | 359.4 | 215.4 | 153.8 | 135.4 | 124.3 | 118.2 | 113.2 | 112.0 | 110.8 |
| 22.5° | 656.0 | 542.8 | 338.5 | 188.3 | 139.1 | 123.1 | 113.2 | 108.3 | 104.6 | 102.2 | 102.2 |
| 25° | 688.0 | 555.1 | 322.5 | 168.6 | 128.0 | 114.5 | 105.8 | 99.7 | 96.0 | 94.8 | 94.8 |
| 27.5° | 732.3 | 576.0 | 306.5 | 153.8 | 119.4 | 105.8 | 97.2 | 92.3 | 88.6 | 87.4 | 86.2 |
| 30° | 774.2 | 601.9 | 299.1 | 150.2 | 113.2 | 98.5 | 92.3 | 86.2 | 82.5 | 81.2 | 80.0 |
| 32.5° | 828.3 | 631.4 | 294.2 | 150.2 | 110.8 | 93.5 | 86.2 | 81.2 | 77.5 | 76.3 | 75.1 |
| 35° | 886.2 | 665.9 | 294.2 | 155.1 | 112.0 | 89.8 | 81.2 | 76.3 | 72.6 | 70.2 | 70.2 |
| 37.5° | *948.9* | *700.3* | *296.6* | *162.5* | *115.7* | *87.4* | *76.3* | *71.4* | *67.7* | *66.5* | *66.5* |
| 40° | 1015.4 | 747.1 | 301.5 | 168.6 | 119.4 | 86.2 | 71.4 | 67.7 | 64.0 | 61.5 | 61.5 |
| 42.5° | 1076.9 | 784.0 | 310.2 | 176.0 | 121.8 | 84.9 | 67.7 | 64.0 | 60.3 | 59.1 | 59.1 |
| 45° | 1148.3 | 824.6 | 317.5 | 180.9 | 121.8 | 81.2 | 64.0 | 60.3 | 57.8 | 56.6 | 55.4 |
| 47.5° | 1204.9 | 857.9 | 321.2 | 183.4 | 119.4 | 77.5 | 60.3 | 57.8 | 55.4 | 52.9 | 54.2 |
| 50° | 1273.9 | 893.5 | 327.4 | 184.6 | 114.5 | 72.6 | 57.8 | 54.2 | 51.7 | 50.5 | 50.5 |
| 52.5° | 1340.3 | 929.2 | 332.3 | 182.2 | 108.3 | 66.5 | 54.2 | 51.7 | 49.2 | 46.8 | 46.8 |
| 55° | 1419.1 | 968.6 | 339.7 | 178.5 | 98.5 | 60.3 | 50.5 | 48.0 | 44.3 | 43.1 | 41.8 |
| 57.5° | 1508.9 | 1020.3 | 345.8 | 171.1 | 86.2 | 54.2 | 48.0 | 44.3 | 39.4 | 36.9 | 36.9 |
| 60° | 1591.4 | 1079.4 | 350.8 | 152.6 | 75.1 | 50.5 | 44.3 | 40.6 | 35.7 | 34.5 | 34.5 |
| 62.5° | 1680.0 | 1140.9 | 350.8 | 120.6 | 64.0 | 45.5 | 41.8 | 38.2 | 33.2 | 32.0 | 32.0 |
| 65° | 1741.6 | 1196.3 | 339.7 | 89.8 | 54.2 | 43.1 | 40.6 | 35.7 | 30.8 | 29.5 | 29.5 |
| 67.5° | 1758.8 | 1230.8 | 308.9 | 64.0 | 46.8 | 40.6 | 38.2 | 33.2 | 29.5 | 27.1 | 27.1 |
| 70° | 1703.4 | 1203.7 | 252.3 | 49.2 | 40.6 | 36.9 | 34.5 | 30.8 | 27.1 | 25.8 | 25.8 |
| 72.5° | 1544.6 | 1100.3 | 188.3 | 41.8 | 35.7 | 34.5 | 32.0 | 28.3 | 25.8 | 24.6 | 24.6 |
| 75° | 1293.6 | 914.5 | 132.9 | 36.9 | 33.2 | 30.8 | 28.3 | 25.8 | 23.4 | 23.4 | 23.4 |
| 77.5° | 979.7 | 660.9 | 82.5 | 33.2 | 28.3 | 28.3 | 25.8 | 23.4 | 22.2 | 20.9 | 20.9 |
| 80° | 632.6 | 417.2 | 46.8 | 23.4 | 19.7 | 20.9 | 18.5 | 16.0 | 16.0 | 14.8 | 14.8 |
| 82.5° | 268.3 | 164.9 | 24.6 | 13.5 | 9.8 | 8.6 | 6.2 | 6.2 | 4.9 | 4.9 | 4.9 |
| 85° | 27.1 | 9.8 | 4.9 | 3.7 | 3.7 | 2.5 | 2.5 | 2.5 | 2.5 | 1.2 | 1.2 |
| 87.5° | 3.7 | 3.7 | 3.7 | 2.5 | 2.5 | 2.5 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 |
| 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
1121 Highway 74 South
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-40-750-U-5WQ-2

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

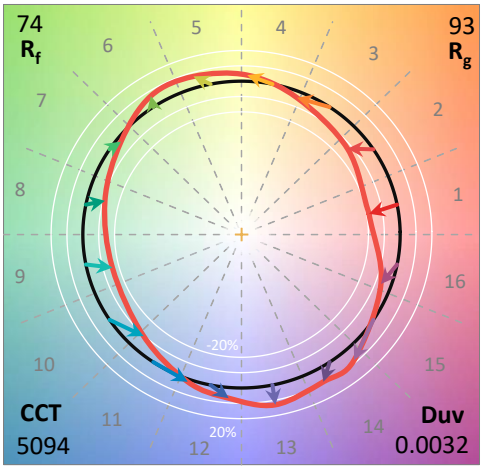
Report Generated By FNC07603 / LDUCLS01DT446
Version: v7.04

## 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 | CRI (Ra): | 72.0 | | |
| CIE u': | 0.2082 | R1: | 68.6 | R9: | -39.6 |
| CIE v': | 0.4867 | R2: | 78.1 | R10: | 47.6 |
| Duv: | 0.0032 | R3: | 84.6 | R11: | 68.2 |
| CIE x: | 0.3430 | R4: | 71.6 | R12: | 41.4 |
| CIE y: | 0.3564 | R5: | 69.6 | R13: | 70.4 |
| CIE z: | 0.3006 | R6: | 69.4 | R14: | 91.4 |
| Peak Wavelength (nm): | 451 | R7: | 80.9 | R15: | 61.4 |
| Dominant Wavelength (nm): | 568 | R8: | 53.1 | | |
| Purity: | 9.86439 | | | | |
| Rf: | 73.7 | | | | |
| Rg: | 93 | | | | |




## Test Conditions

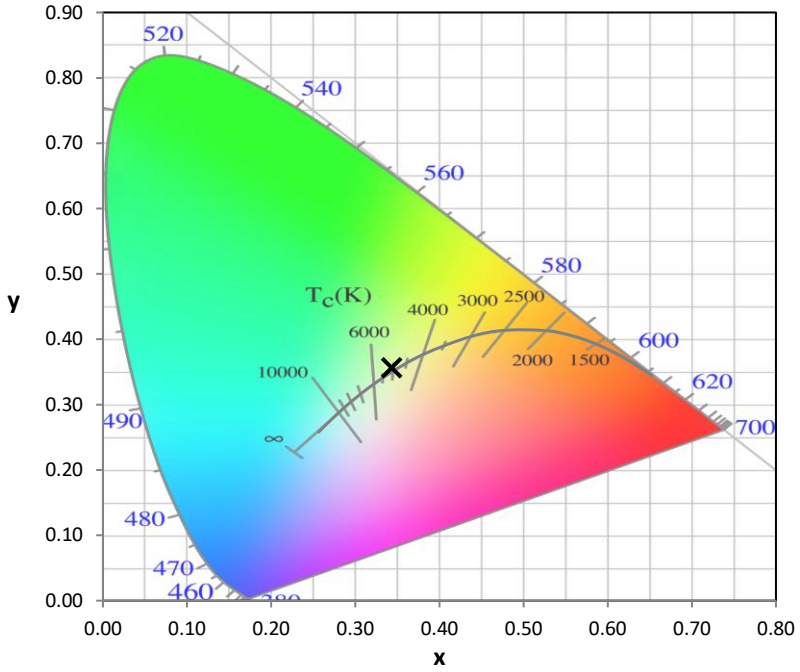
| | |
|---|---|
| Stabilization Time: | 20M |
| Operation Time: | 1H 20M |
| Sphere Temperature (°C): | 24.2 |

REPORT NUMBER: SP1-2407-157-6

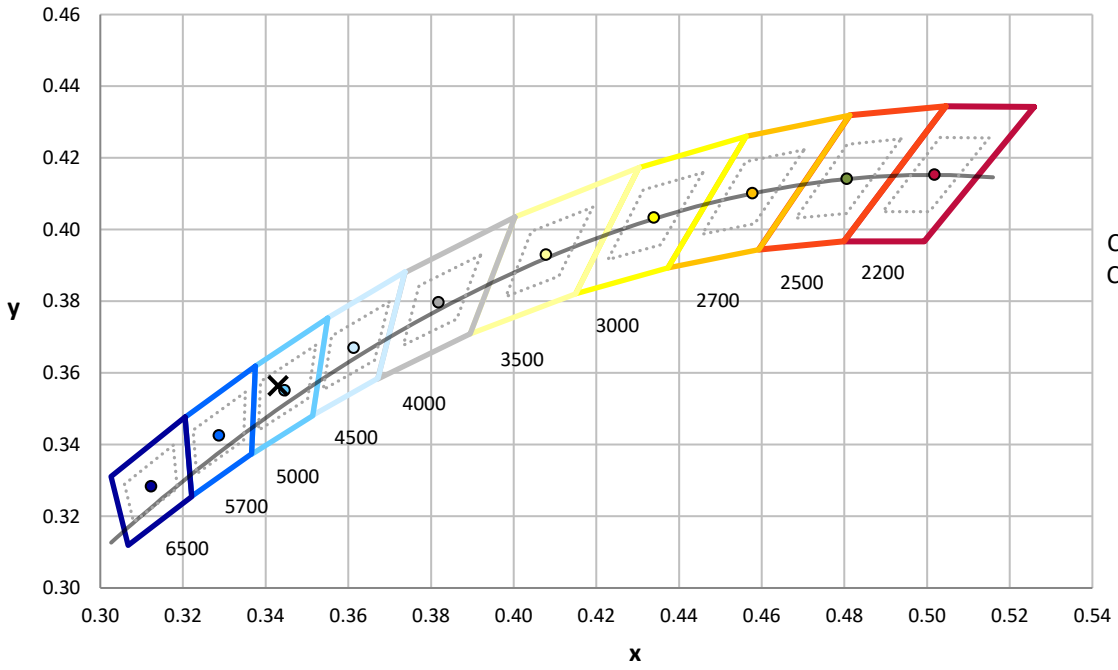
| Measurement and Test Equipment | | | |
|---|---|---|---|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | IN0058 | 6/18/2024 | 12/18/2024 |
| Power Meter | INXT2011004 | 2/8/2024 | 2/8/2025 |
| AC Power Source | IN0063 | 10/24/2023 | 10/24/2024 |
| DC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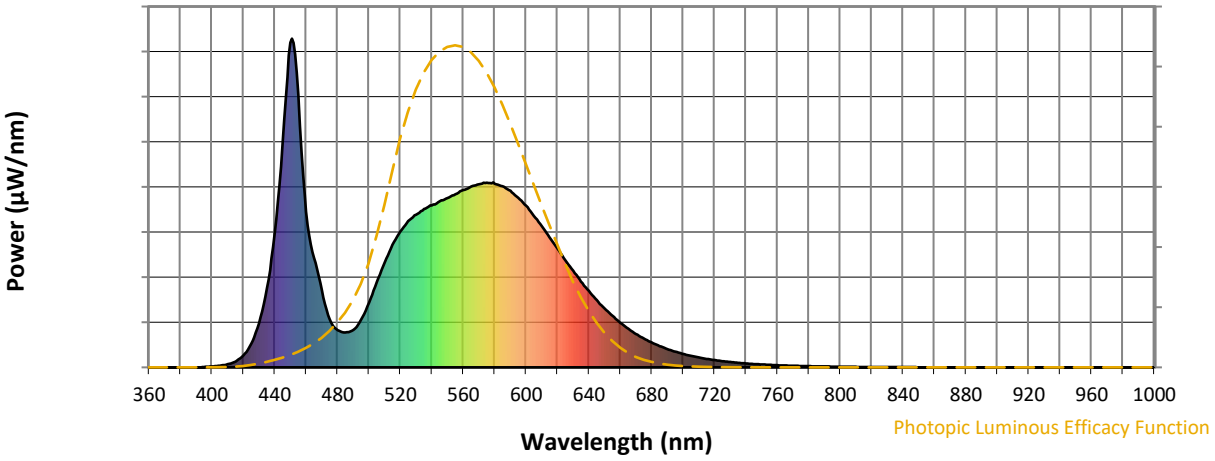
## Photopic Flux vs. Wavelength




## 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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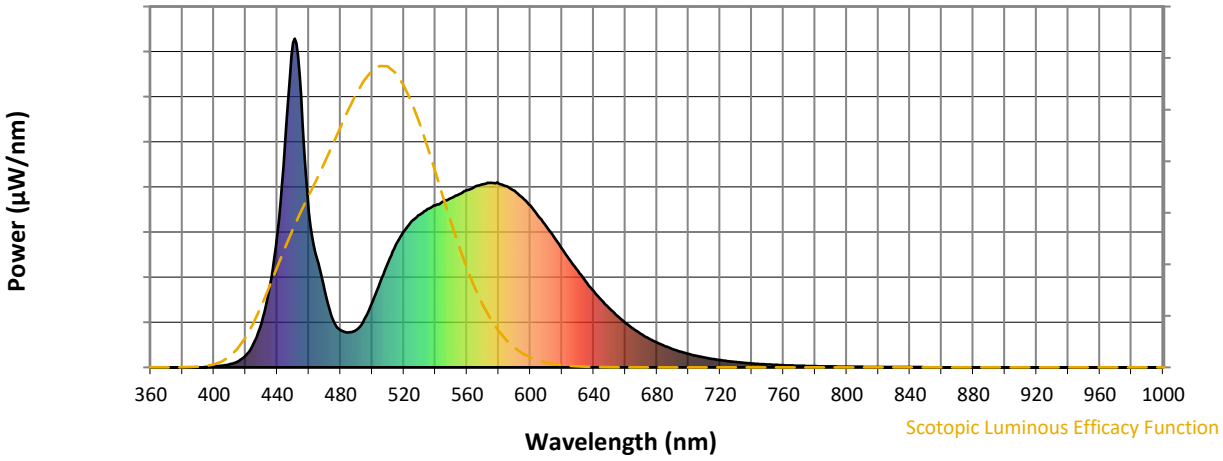
## Scotopic Flux vs. Wavelength




**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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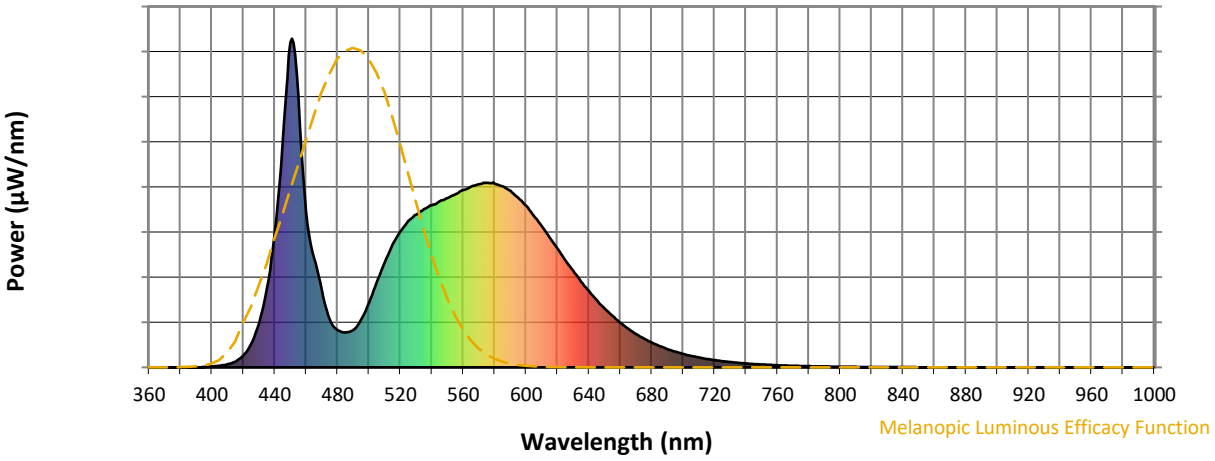
## Melanopic Flux vs. Wavelength




**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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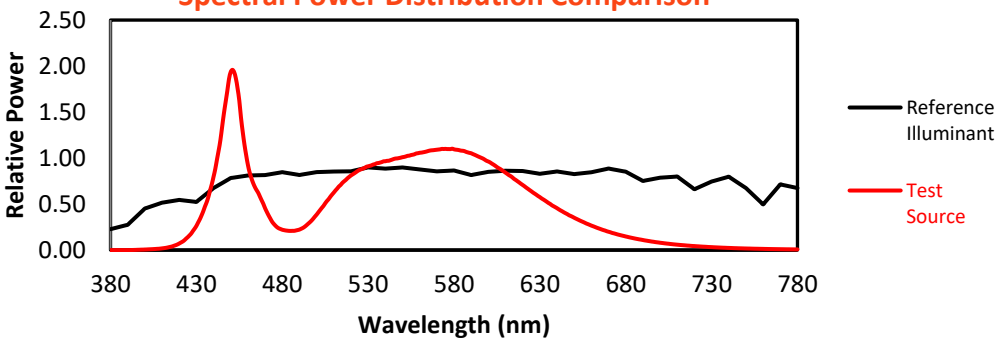
# TM-30-18

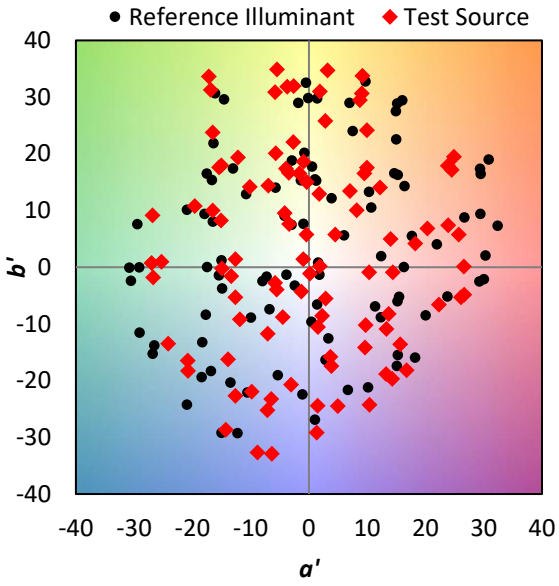
## Summary

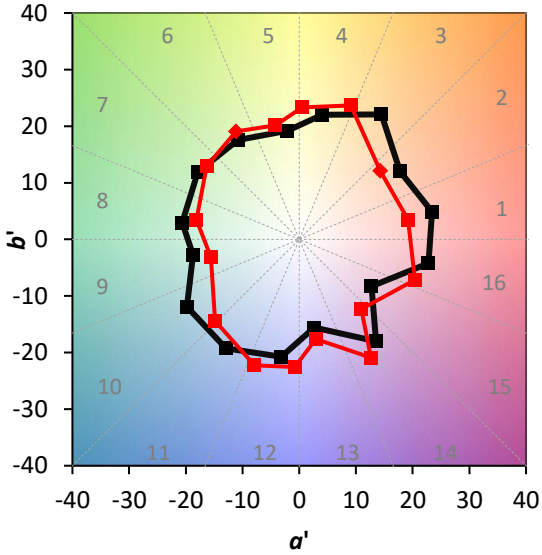
$R_f$ = 73.7
$R_g$ = 93
CIE $R_a$ = 72.0
$R_9$ = -39.6

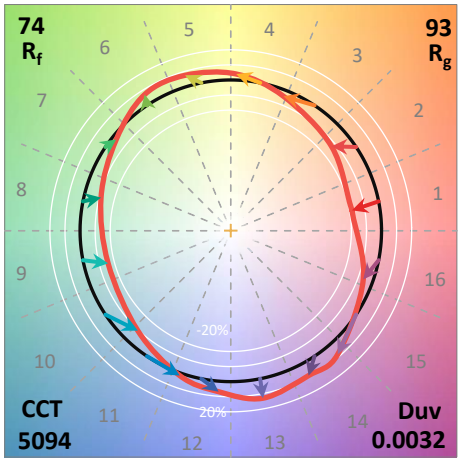
## Spectral Power Distribution Comparison

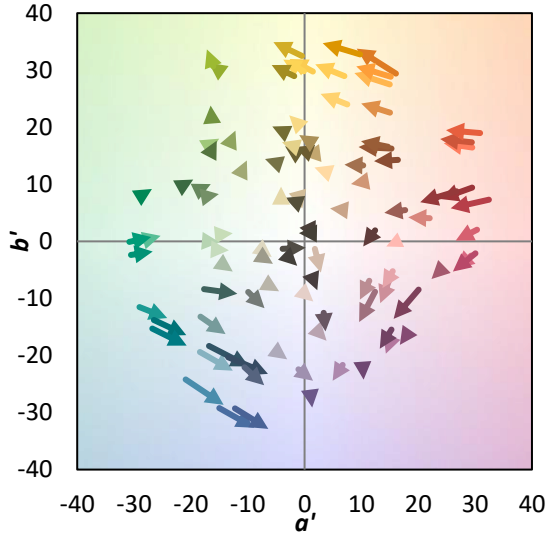



## Color Vector Graphics



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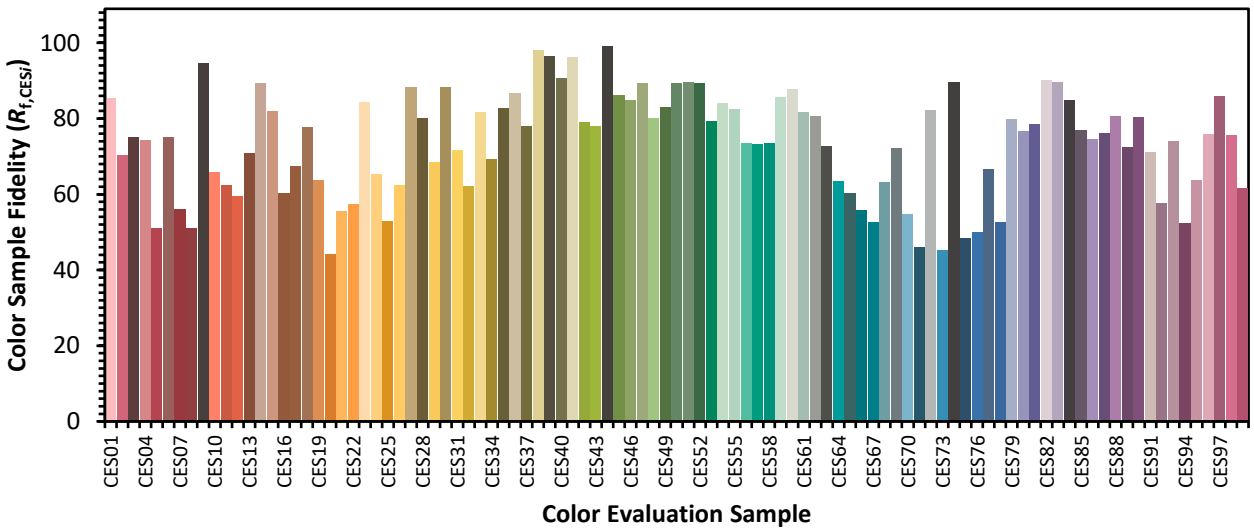
## TM-30-18

**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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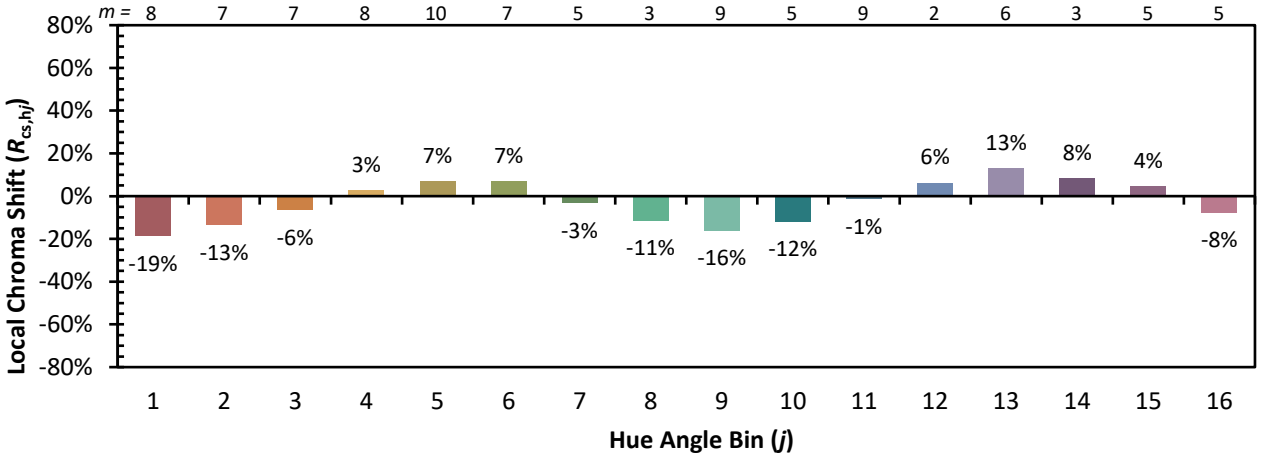
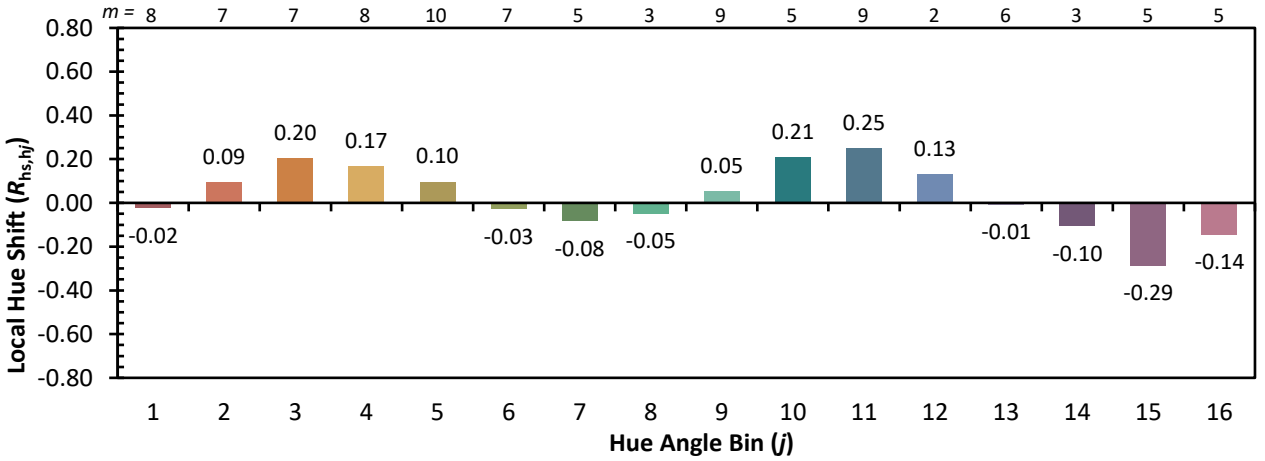
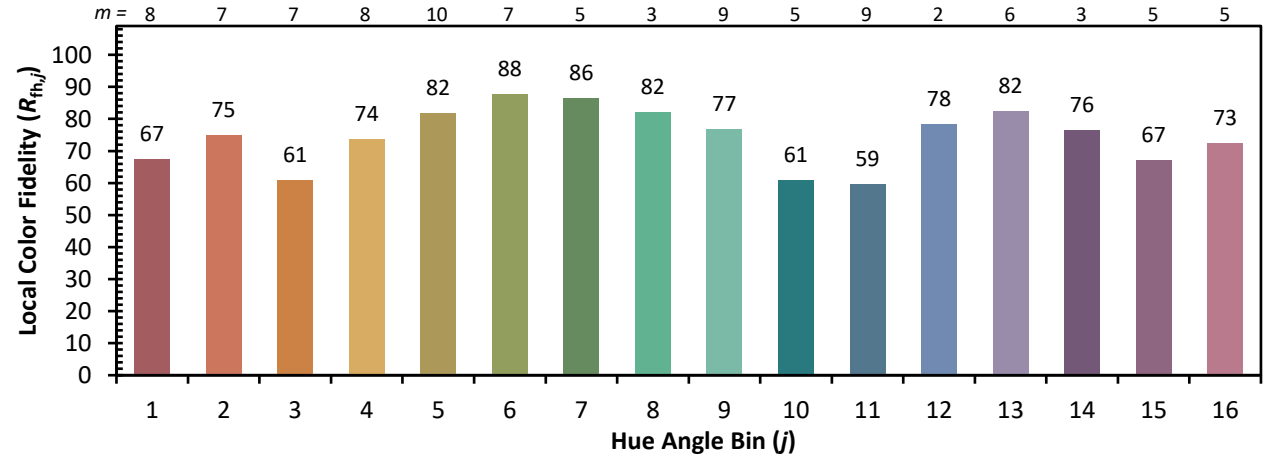
**TM-30-18**

## Color Rendition by Hue-Angle Bin



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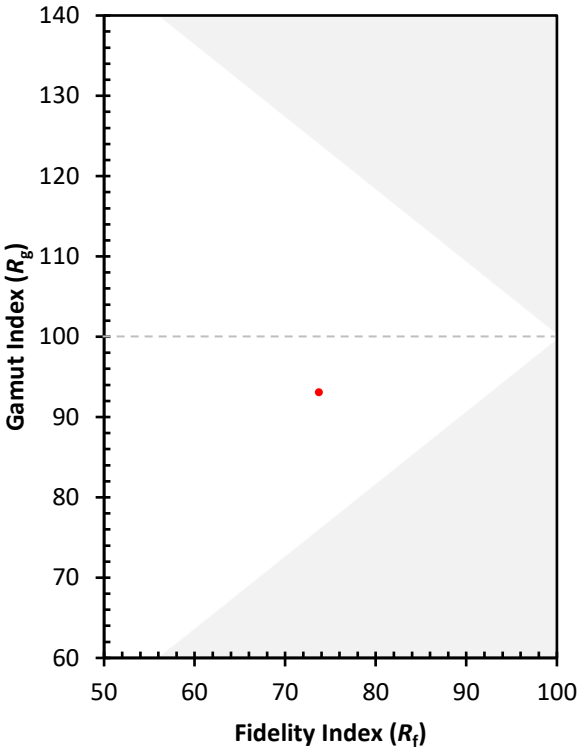
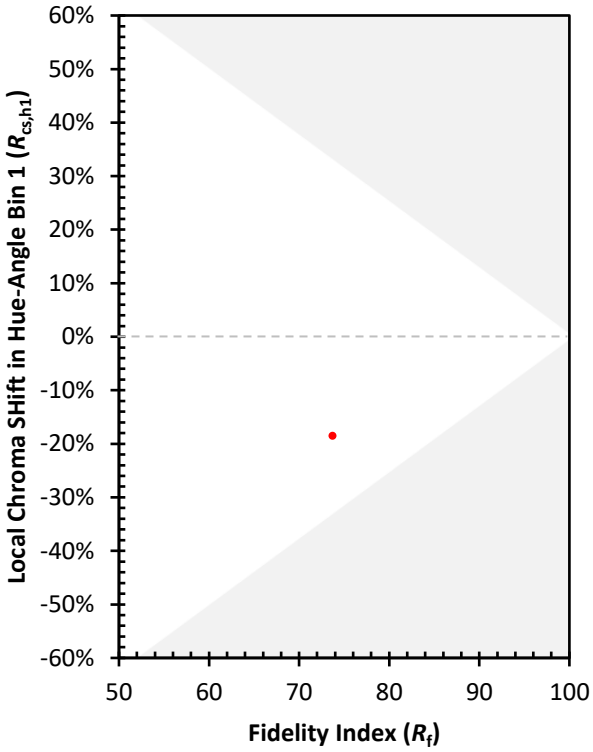
# TM-30-18

## Measure Comparisons

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