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: P867631

Luminaire Tested: **MEM2-HTN-SA-40-750-U-T3**

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: | P867631 |
| Test Lab: | INNOVATION CENTER(G3) |
| Issue Date: | 08/21/2024 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS (FORMERLY EATON) |
| Product Line: | STREETWORKS |
| Catalog Number: | MEM2-HTN-SA-40-750-U-T3 |
| Description: | EPIC MODERN TALL HOUSING DISCRETE LED ARRAYS 40W 70CRI 5000K FIXTURE w/ TYPE III DISTRIBUTION OPTIC |
| Light Source: | (10) 5000K CCT, 70 CRI LEDS |
| Ballast/Driver: | ELECTRONIC DRIVER |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 4907.7 lumens |
| Efficiency: | N/A |
| Efficacy: | 149.6 lumens/watt |
| Luminous Opening: | Rectangular (W 0.33' x L: 0.33' x H: 0') |
| IES Classification: | Type III - Medium |
| BUG Rating: | B1 - U0 - G1 |

| | |
|---|---|
| Input Watts (W): | 32.8 |
| Input Voltage (V): | 120 |
| Input Current (Ain): | NR |
| Voltage Rise (V): | NR |
| Power Factor: | 0.99 |
| Total Harmonic Distortion (THDi): | 9.76% |
| Frequency (hertz): | 60 |
| Stabilization Time: | NR |
| Operation Time: | NR |
| Ambient Temperature (°C): | NR |
| Test Distance: | 24 FT |

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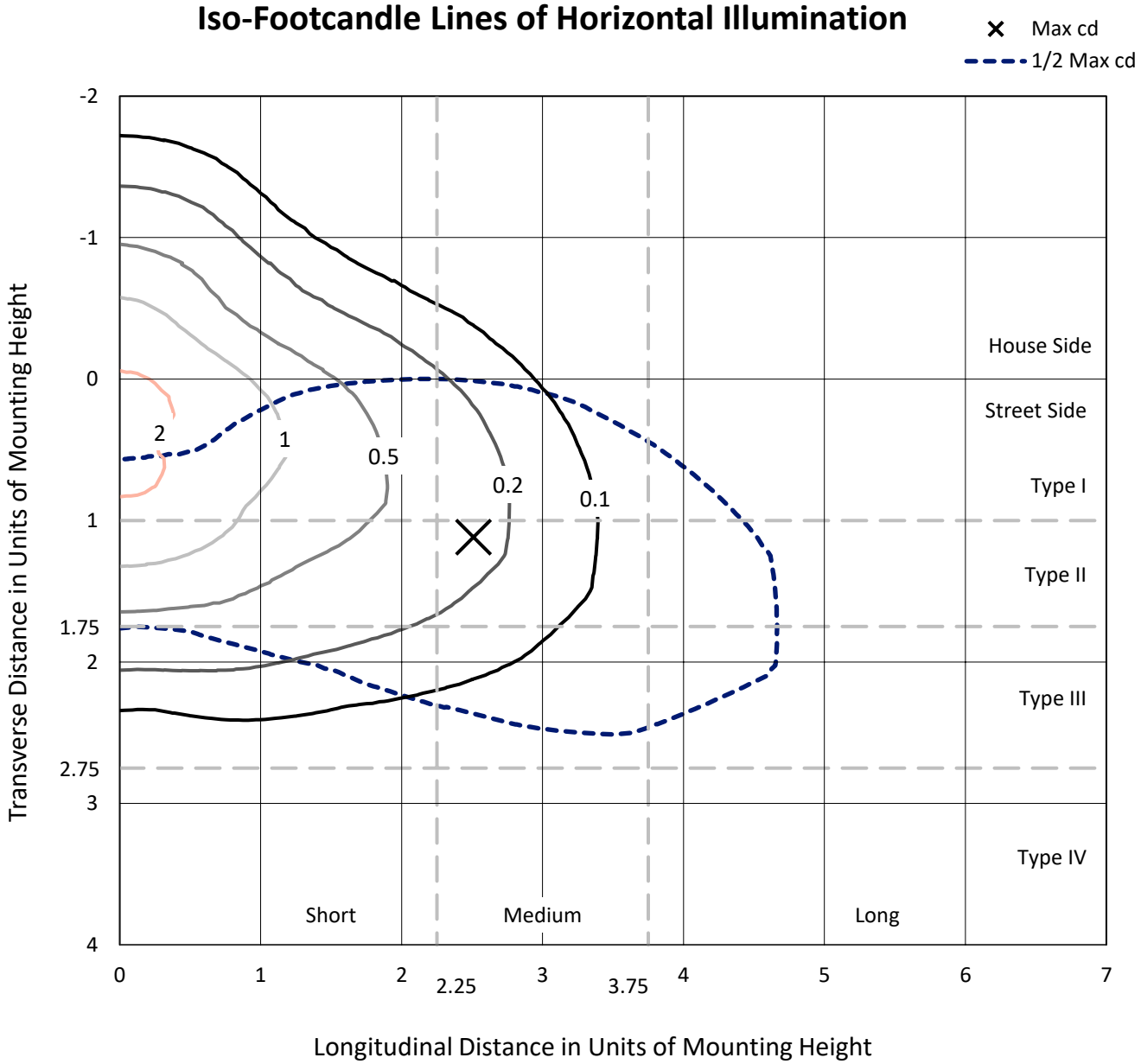
Peachtree City, GA 30269

Scaled Data Report

REPORT NUMBER: P867631
CATALOG NUMBER: MEM2-HTN-SA-40-750-U-T3

## Iso-Footcandle Lines of Horizontal Illumination




Based on 20 foot mounting height. Maximum calculated value = 2.3 fc
Type III - Medium - N/A

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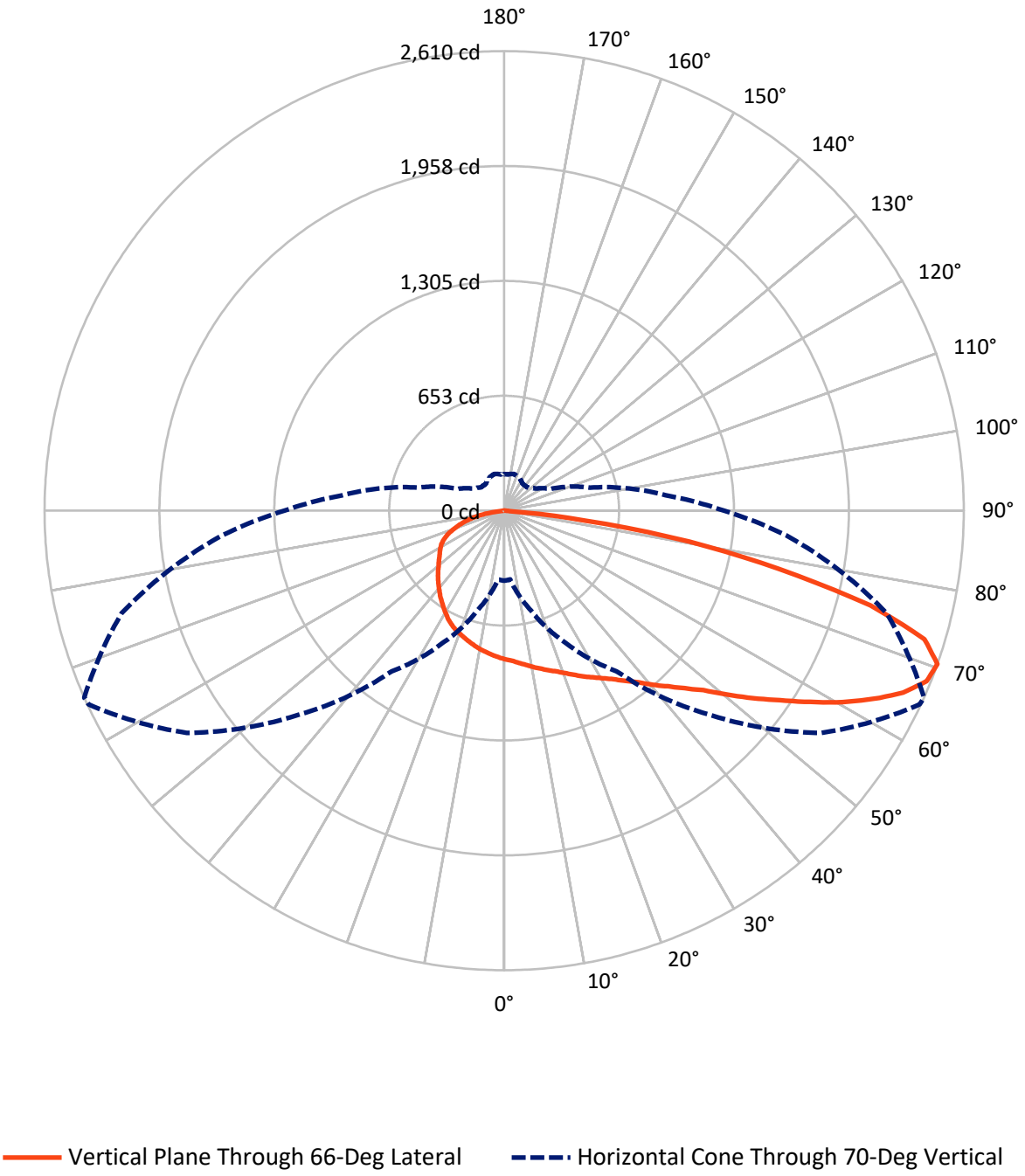
## Luminous Intensity Polar Plot



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Scaled Data Report

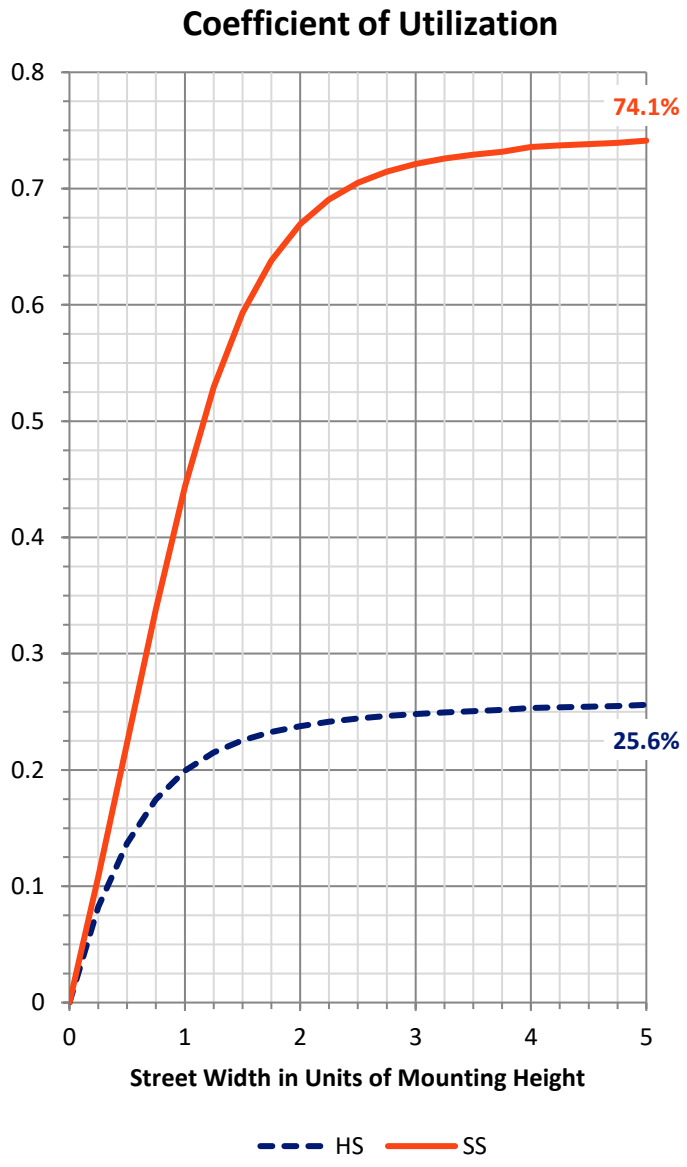
REPORT NUMBER: P867631
CATALOG NUMBER: MEM2-HTN-SA-40-750-U-T3

**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 1264.8 | 0.0 | 1264.8 |
| | % Fixture | 25.8 | 0.0 | 25.8 |
| **Street Side** | Lumens | 3643.0 | 0.0 | 3643.0 |
| | % Fixture | 74.2 | 0.0 | 74.2 |
| **Total** | Lumens | 4907.7 | 0.0 | 4907.7 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 80.8 | 1.6 |
| 10°-20° | 240.7 | 4.9 |
| 20°-30° | 404.3 | 8.2 |
| 30°-40° | 609.1 | 12.4 |
| 40°-50° | 826.9 | 16.8 |
| 50°-60° | 982.6 | 20.0 |
| 60°-70° | 1002.8 | 20.4 |
| 70°-80° | 670.7 | 13.7 |
| 80°-90° | 89.7 | 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° | 4907.7 | 100.0 |
| 0°-180° | 4907.7 | 100.0 |



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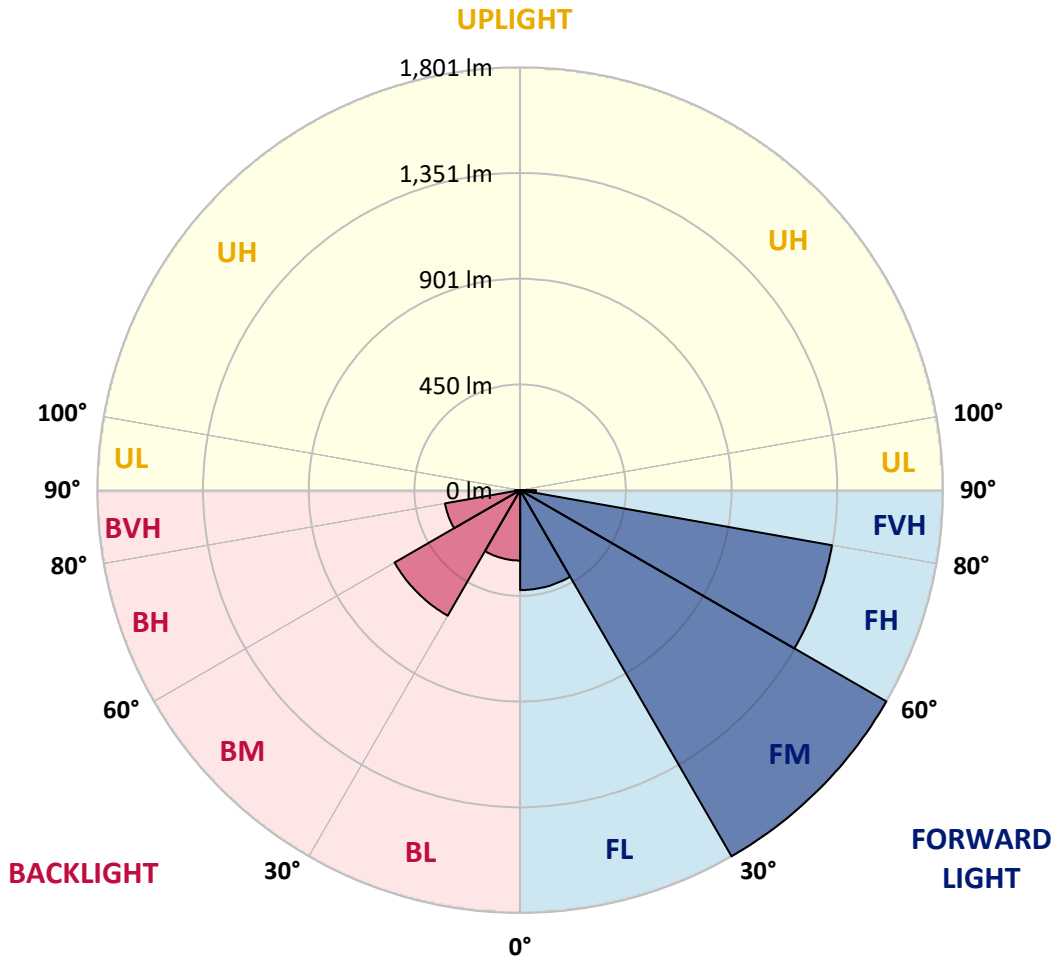
## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 425.9 | 8.7 | | | |
| FM | (30°-60°) | 1801.0 | 36.7 | | | |
| FH | (60°-80°) | 1348.8 | 27.5 | | | G1/1800 |
| FVH | (80°-90°) | 67.2 | 1.4 | | | G1/100 |
| BL | (0°-30°) | 299.9 | 6.1 | B1/500 | | |
| BM | (30°-60°) | 617.6 | 12.6 | B1/1000 | | |
| BH | (60°-80°) | 324.8 | 6.6 | B1/500 | | G1/500 |
| BVH | (80°-90°) | 22.5 | 0.5 | | | G1/100 |
| UL | (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH | (100°-180°) | 0.0 | 0.0 | | U0/0 | |

**BUG Rating: B1-U0-G1**
Type III Medium



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REPORT NUMBER: P867631
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**CANDELA DISTRIBUTION (FULL):**

| | 0° | 5° | 15° | 25° | 35° | 45° | 55° | 65° | 66° | 75° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 844.4 | 844.4 | 844.4 | 844.4 | 844.4 | 844.4 | 844.4 | 844.4 | *844.4* | 844.4 | 844.4 |
| 2.5° | 874.6 | 870.7 | 867.8 | 869.7 | 863.9 | 865.8 | 859.0 | 854.1 | *853.2* | 851.2 | 849.3 |
| 5° | 901.9 | 901.9 | 897.1 | 897.1 | 890.2 | 889.3 | 879.5 | 868.8 | *868.8* | 861.9 | 854.1 |
| 7.5° | 931.2 | 929.2 | 923.4 | 922.4 | 914.6 | 912.7 | 901.9 | 885.4 | *884.4* | 871.7 | 860.0 |
| 10° | 951.7 | 952.6 | 948.7 | 948.7 | 942.9 | 938.0 | 922.4 | 904.9 | *902.9* | 886.3 | 867.8 |
| 12.5° | 967.3 | 969.2 | 968.2 | 968.2 | 963.4 | 963.4 | 945.8 | 922.4 | *920.5* | 899.0 | 872.7 |
| 15° | 983.8 | 982.9 | 985.8 | 986.8 | 984.8 | 981.9 | 969.2 | 941.9 | *940.9* | 912.7 | 879.5 |
| 17.5° | 998.5 | 997.5 | 998.5 | 1003.3 | 1004.3 | 1004.3 | 991.6 | 963.4 | *959.5* | 929.2 | 885.4 |
| 20° | 1007.2 | 1009.2 | 1013.1 | 1018.9 | 1021.9 | 1029.7 | 1018.9 | 988.7 | *984.8* | 946.8 | 898.0 |
| 22.5° | 1040.4 | 1034.5 | 1037.5 | 1041.4 | 1045.3 | 1056.0 | 1046.2 | 1015.0 | *1012.1* | 973.1 | 912.7 |
| 25° | 1096.9 | 1096.9 | 1090.1 | 1083.3 | 1078.4 | 1083.3 | 1075.5 | 1045.3 | *1043.3* | 996.5 | 929.2 |
| 27.5° | 1195.4 | 1195.4 | 1180.8 | 1155.4 | 1123.3 | 1114.5 | 1108.6 | 1077.4 | *1071.6* | 1021.9 | 940.0 |
| 30° | 1320.2 | 1324.1 | 1297.8 | 1254.9 | 1195.4 | 1156.4 | 1141.8 | 1107.7 | *1104.7* | 1047.2 | 956.5 |
| 32.5° | 1453.8 | 1461.6 | 1442.1 | 1379.7 | 1282.2 | 1206.1 | 1182.7 | 1147.6 | *1140.8* | 1077.4 | 978.0 |
| 35° | 1573.7 | 1581.5 | 1555.2 | 1496.7 | 1371.9 | 1278.3 | 1231.5 | 1191.5 | *1187.6* | 1116.4 | 1010.2 |
| 37.5° | 1671.2 | 1673.2 | 1656.6 | 1585.4 | 1447.0 | 1338.8 | 1291.9 | 1244.2 | *1236.4* | 1163.2 | 1044.3 |
| 40° | 1774.6 | 1782.4 | 1765.8 | 1678.1 | 1515.2 | 1404.1 | 1352.4 | 1307.5 | *1300.7* | 1212.0 | 1076.5 |
| 42.5° | 1882.8 | 1881.9 | 1881.9 | 1758.0 | 1583.5 | 1458.7 | 1417.7 | 1368.0 | *1364.1* | 1261.7 | 1111.6 |
| 45° | 1949.1 | 1953.0 | 1942.3 | 1805.8 | 1683.9 | 1515.2 | 1481.1 | 1445.0 | *1438.2* | 1331.0 | 1157.4 |
| 47.5° | 1965.7 | 1956.9 | 1908.2 | 1842.9 | 1797.0 | 1573.7 | 1561.1 | 1539.6 | *1524.0* | 1407.0 | 1213.9 |
| 50° | 1943.3 | 1929.6 | 1901.4 | 1859.4 | 1839.0 | 1643.9 | 1642.0 | 1652.7 | *1642.0* | 1499.6 | 1279.3 |
| 52.5° | 1859.4 | 1857.5 | 1852.6 | 1862.4 | 1829.2 | 1699.5 | 1733.6 | 1770.7 | *1768.8* | 1594.2 | 1347.5 |
| 55° | 1682.9 | 1695.6 | 1754.1 | 1815.6 | 1792.2 | 1737.5 | 1836.0 | 1907.2 | *1899.4* | 1705.4 | 1417.7 |
| 57.5° | 1502.6 | 1515.2 | 1590.3 | 1736.6 | 1756.1 | 1778.5 | 1951.1 | 2062.2 | *2049.6* | 1826.3 | 1482.1 |
| 60° | 1345.6 | 1331.9 | 1407.0 | 1617.6 | 1705.4 | 1815.6 | 2065.2 | 2219.2 | *2208.5* | 1947.2 | 1548.4 |
| 62.5° | 1096.9 | 1110.6 | 1230.5 | 1444.1 | 1634.2 | 1839.0 | 2158.8 | 2361.6 | *2354.8* | 2058.3 | 1602.0 |
| 65° | 867.8 | 849.3 | 1029.7 | 1261.7 | 1511.3 | 1831.2 | 2239.7 | 2495.2 | *2490.3* | 2167.5 | 1643.0 |
| 67.5° | 589.9 | 577.2 | 815.1 | 1080.4 | 1344.6 | 1768.8 | 2258.2 | 2584.9 | *2586.8* | 2231.9 | 1653.7 |
| 70° | *397.8* | *392.0* | *586.0* | *830.7* | *1113.5* | *1634.2* | *2200.7* | *2603.4* | *2610.2* | *2248.5* | *1605.9* |
| 72.5° | 293.5 | 292.5 | 429.0 | 592.8 | 828.8 | 1379.7 | 2043.7 | 2482.5 | *2495.2* | 2131.5 | 1465.5 |
| 75° | 231.1 | 234.0 | 306.2 | 421.2 | 552.9 | 1020.9 | 1719.0 | 2128.5 | *2148.0* | 1840.9 | 1216.9 |
| 77.5° | 189.2 | 189.2 | 214.5 | 302.3 | 369.5 | 633.8 | 1236.4 | 1558.1 | *1597.1* | 1420.7 | 937.0 |
| 80° | 153.1 | 156.0 | 158.9 | 210.6 | 244.7 | 361.7 | 719.6 | 1039.4 | *1067.7* | 989.7 | 676.7 |
| 82.5° | 83.9 | 89.7 | 86.8 | 109.2 | 122.9 | 167.7 | 285.7 | 420.2 | *463.2* | 412.4 | 307.1 |
| 85° | 5.9 | 3.9 | 6.8 | 8.8 | 10.7 | 16.6 | 22.4 | 31.2 | *29.3* | 41.9 | 21.5 |
| 87.5° | 1.0 | 1.0 | 1.0 | 2.0 | 2.0 | 2.9 | 3.9 | 3.9 | *3.9* | 3.9 | 3.9 |
| 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: P867631
CATALOG NUMBER: MEM2-HTN-SA-40-750-U-T3

**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 844.4 | 844.4 | 844.4 | 844.4 | 844.4 | 844.4 | 844.4 | 844.4 | 844.4 | 844.4 | 844.4 |
| 2.5° | 848.3 | 843.4 | 835.6 | 833.7 | 830.7 | 826.8 | 822.9 | 817.1 | 815.1 | 817.1 | 819.0 |
| 5° | 849.3 | 842.4 | 829.8 | 822.0 | 814.2 | 807.3 | 799.5 | 791.7 | 786.9 | 787.8 | 791.7 |
| 7.5° | 852.2 | 842.4 | 822.9 | 810.3 | 797.6 | 786.9 | 774.2 | 765.4 | 759.6 | 760.5 | 763.5 |
| 10° | 856.1 | 842.4 | 819.0 | 797.6 | 780.0 | 764.4 | 751.8 | 741.0 | 735.2 | 734.2 | 735.2 |
| 12.5° | 857.1 | 841.5 | 810.3 | 783.9 | 762.5 | 742.0 | 728.4 | 718.6 | 712.8 | 709.8 | 711.8 |
| 15° | 860.0 | 838.5 | 801.5 | 769.3 | 743.0 | 721.5 | 705.0 | 693.3 | 689.4 | 687.4 | 686.4 |
| 17.5° | 863.9 | 837.6 | 793.7 | 754.7 | 723.5 | 699.1 | 684.5 | 672.8 | 667.9 | 666.0 | 667.9 |
| 20° | 869.7 | 838.5 | 784.9 | 740.1 | 705.9 | 681.6 | 665.0 | 653.3 | 649.4 | 648.4 | 647.4 |
| 22.5° | 877.6 | 840.5 | 778.1 | 726.4 | 686.4 | 662.1 | 645.5 | 637.7 | 634.8 | 635.7 | 635.7 |
| 25° | 885.4 | 842.4 | 768.3 | 707.9 | 666.0 | 640.6 | 628.9 | 623.1 | 625.0 | 628.9 | 628.9 |
| 27.5° | 892.2 | 841.5 | 754.7 | 688.4 | 641.6 | 618.2 | 609.4 | 610.4 | 615.3 | 622.1 | 623.1 |
| 30° | 901.0 | 841.5 | 740.1 | 664.0 | 614.3 | 591.9 | 589.9 | 597.7 | 605.5 | 612.3 | 612.3 |
| 32.5° | 914.6 | 847.3 | 728.4 | 639.6 | 586.0 | 568.5 | 577.2 | 588.0 | 596.7 | 603.6 | 605.5 |
| 35° | 938.0 | 860.0 | 720.6 | 615.3 | 558.7 | 546.0 | 562.6 | 580.2 | 586.0 | 590.9 | 591.9 |
| 37.5° | 960.4 | 871.7 | 710.8 | 591.9 | 530.4 | 525.6 | 548.0 | 566.5 | 567.5 | 570.4 | 570.4 |
| 40° | 981.9 | 880.5 | 698.1 | 566.5 | 503.1 | 503.1 | 529.5 | 545.1 | 543.1 | 540.2 | 541.2 |
| 42.5° | 1005.3 | 885.4 | 683.5 | 543.1 | 480.7 | 480.7 | 502.2 | 515.8 | 514.8 | 518.7 | 521.7 |
| 45° | 1033.6 | 895.1 | 664.0 | 521.7 | 457.3 | 453.4 | 471.0 | 482.7 | 497.3 | 514.8 | 519.7 |
| 47.5° | 1072.6 | 908.8 | 648.4 | 498.3 | 437.8 | 424.1 | 431.0 | 455.4 | 471.9 | 486.6 | 488.5 |
| 50° | 1113.5 | 928.3 | 634.8 | 473.9 | 414.4 | 390.0 | 395.9 | 423.2 | 432.9 | 438.8 | 441.7 |
| 52.5° | 1157.4 | 943.9 | 623.1 | 453.4 | 390.0 | 354.9 | 362.7 | 389.0 | 395.9 | 400.7 | 401.7 |
| 55° | 1195.4 | 956.5 | 608.4 | 433.9 | 363.7 | 321.8 | 331.5 | 356.9 | 363.7 | 369.5 | 369.5 |
| 57.5° | 1235.4 | 968.2 | 598.7 | 417.3 | 335.4 | 294.5 | 301.3 | 326.6 | 336.4 | 338.3 | 341.3 |
| 60° | 1268.5 | 979.0 | 589.9 | 401.7 | 309.1 | 270.1 | 275.0 | 297.4 | 309.1 | 310.1 | 312.0 |
| 62.5° | 1291.9 | 985.8 | 585.0 | 382.2 | 282.8 | 245.7 | 249.6 | 272.0 | 285.7 | 288.6 | 289.6 |
| 65° | 1306.6 | 989.7 | 576.3 | 356.9 | 260.3 | 225.2 | 225.2 | 247.7 | 261.3 | 268.1 | 270.1 |
| 67.5° | 1299.7 | 982.9 | 552.9 | 327.6 | 239.9 | 204.8 | 203.8 | 226.2 | 237.9 | 241.8 | 242.8 |
| 70° | *1247.1* | *942.9* | *505.1* | *291.5* | *218.4* | *186.2* | *184.3* | *204.8* | *215.5* | *206.7* | *207.7* |
| 72.5° | 1139.8 | 852.2 | 439.8 | 255.5 | 196.0 | 168.7 | 166.7 | 184.3 | 185.3 | 185.3 | 184.3 |
| 75° | 960.4 | 696.2 | 351.0 | 217.4 | 172.6 | 150.2 | 151.1 | 164.8 | 165.8 | 170.6 | 167.7 |
| 77.5° | 736.2 | 515.8 | 274.0 | 173.6 | 146.3 | 133.6 | 138.5 | 143.3 | 150.2 | 157.0 | 150.2 |
| 80° | 535.3 | 355.9 | 190.1 | 129.7 | 113.1 | 113.1 | 115.1 | 119.9 | 129.7 | 136.5 | 129.7 |
| 82.5° | 229.1 | 157.0 | 87.8 | 64.4 | 55.6 | 54.6 | 55.6 | 55.6 | 68.3 | 70.2 | 61.4 |
| 85° | 17.6 | 14.6 | 10.7 | 10.7 | 8.8 | 4.9 | 4.9 | 3.9 | 2.9 | 2.9 | 2.9 |
| 87.5° | 3.9 | 2.9 | 2.9 | 2.9 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| 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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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

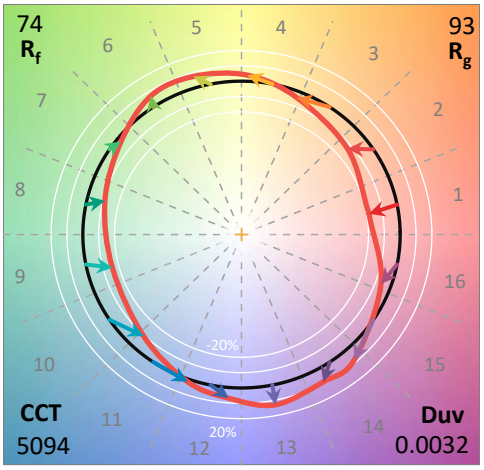
Report Generated By FNC07603 / LDUCLS01DT446
Version: v7.04

## 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

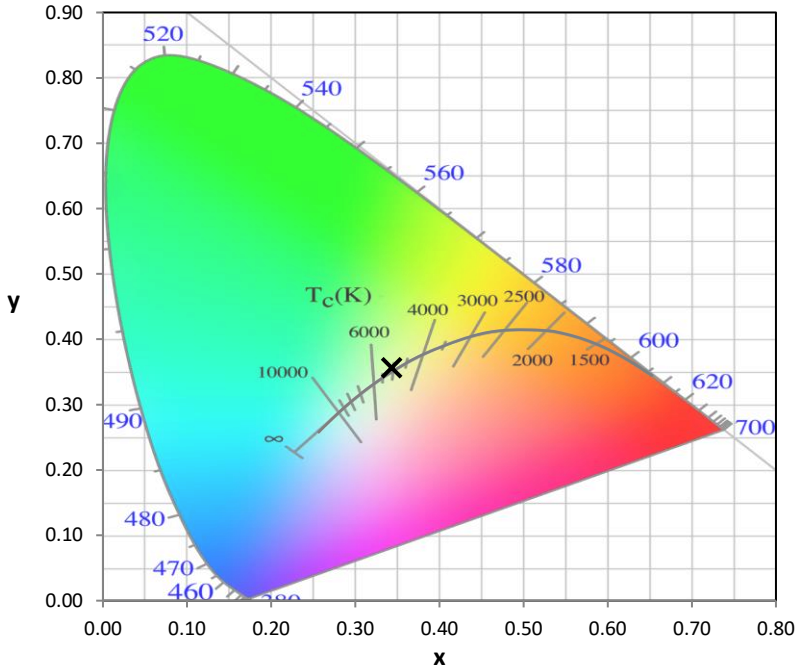
| | |
|---|---|
| Stabilization Time: | 20M |
| Operation Time: | 1H 20M |
| Sphere Temperature (°C): | 24.2 |

REPORT NUMBER: SP1-2407-157-6

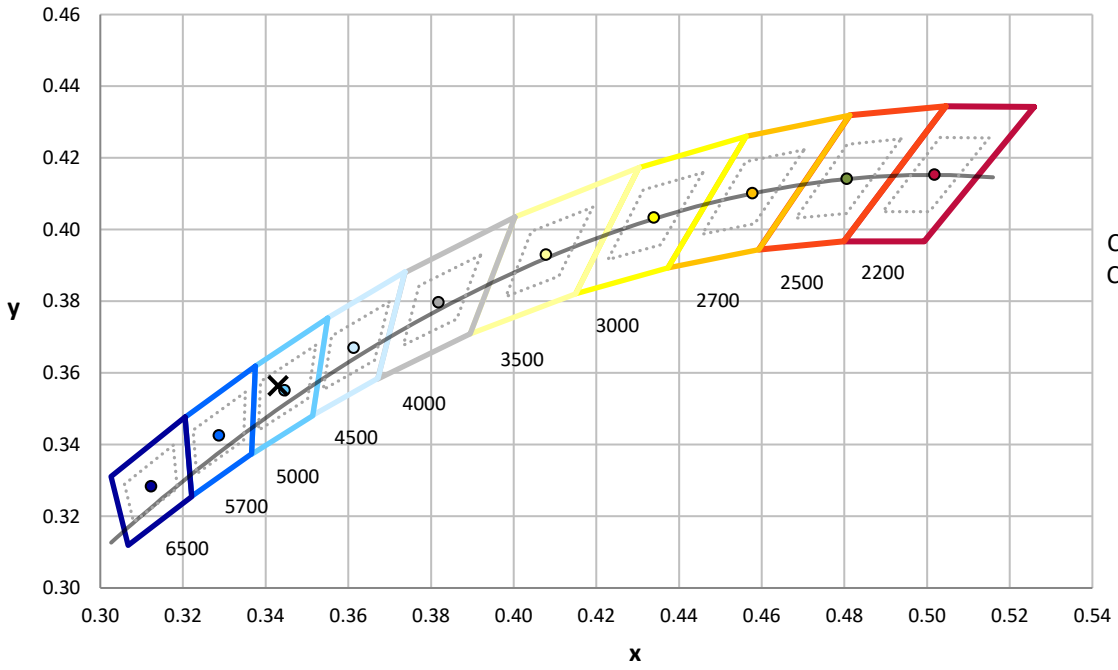
| Measurement and Test Equipment | | | |
|---|---|---|---|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | IN0058 | 6/18/2024 | 12/18/2024 |
| Power Meter | INXT2011004 | 2/8/2024 | 2/8/2025 |
| AC Power Source | IN0063 | 10/24/2023 | 10/24/2024 |
| DC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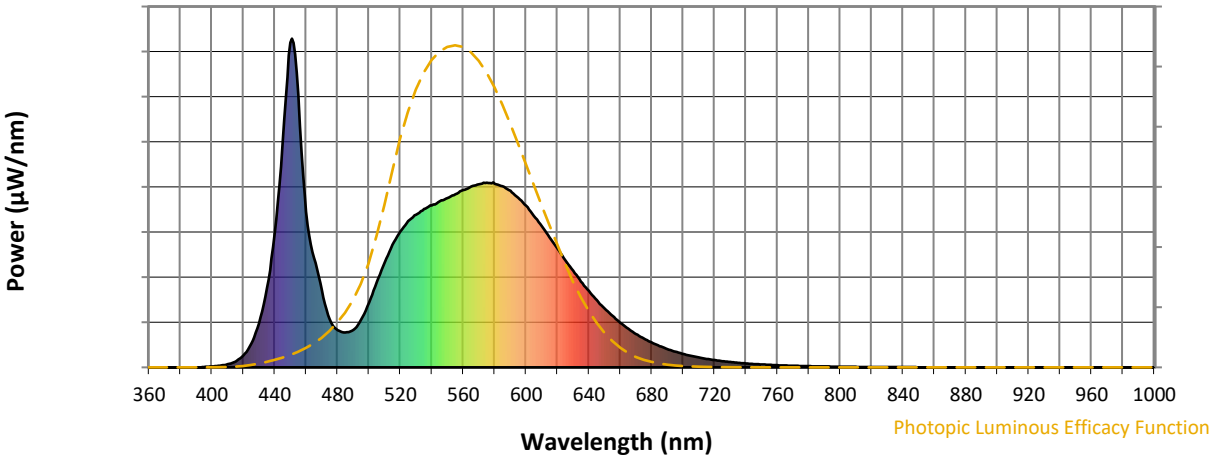
## Photopic Flux vs. Wavelength




## 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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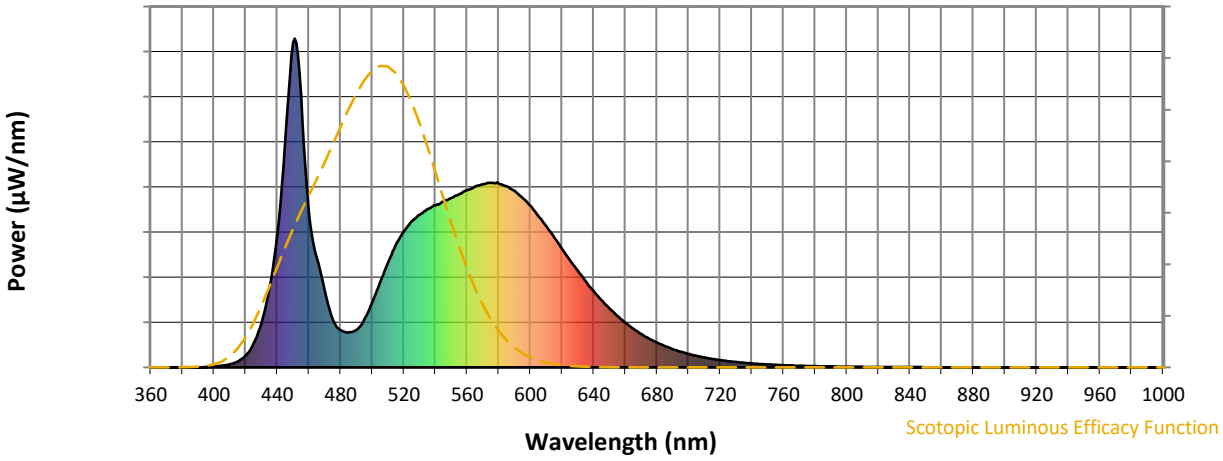
## Scotopic Flux vs. Wavelength




**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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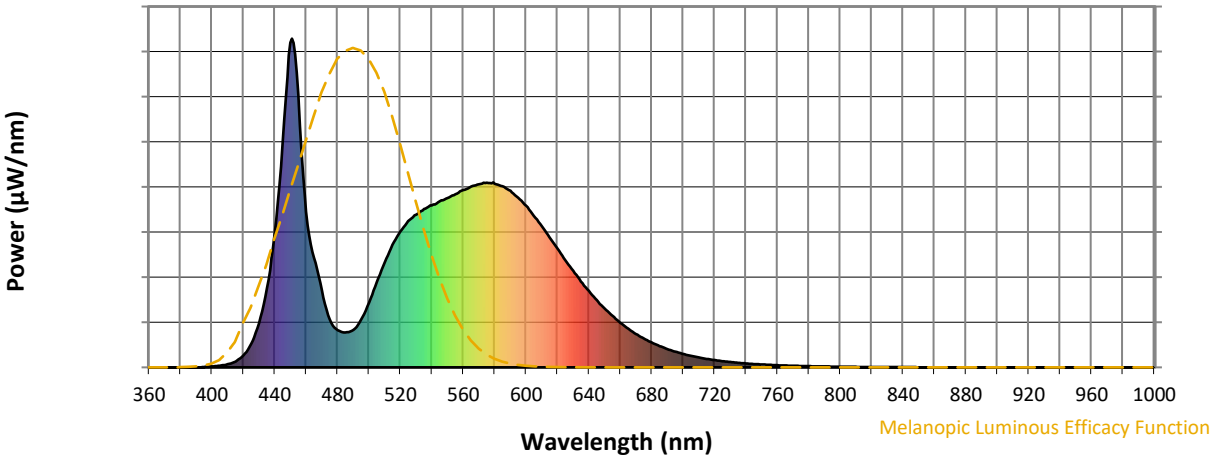
## Melanopic Flux vs. Wavelength




**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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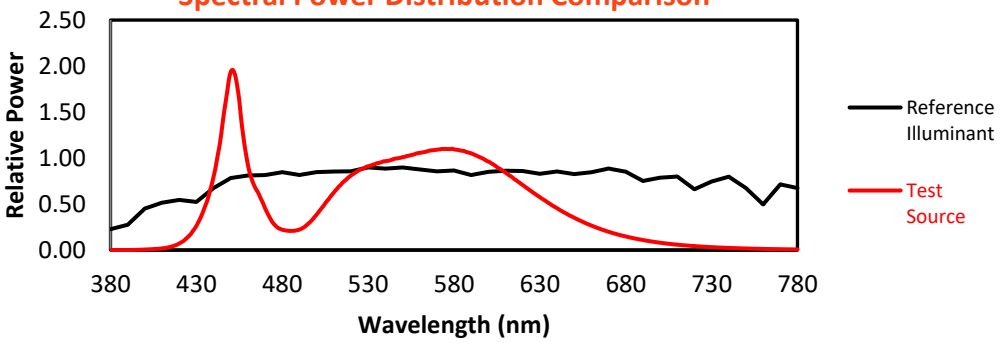
# TM-30-18

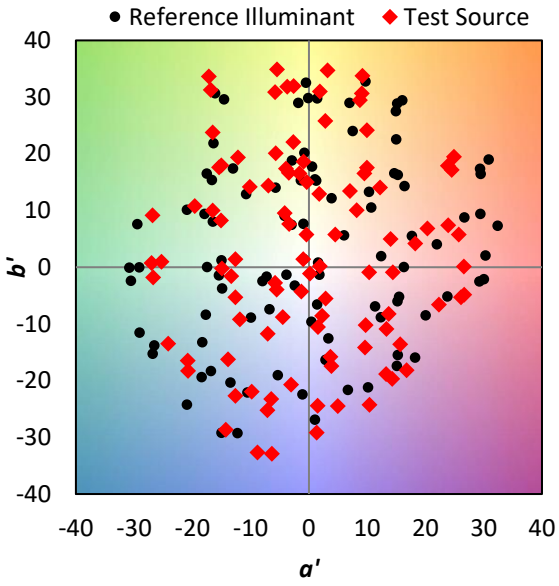
## Summary

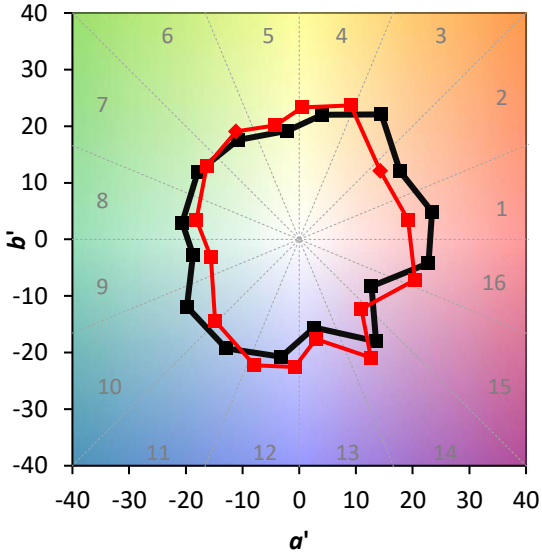
$R_f$ = 73.7
$R_g$ = 93
CIE $R_a$ = 72.0
$R_9$ = -39.6

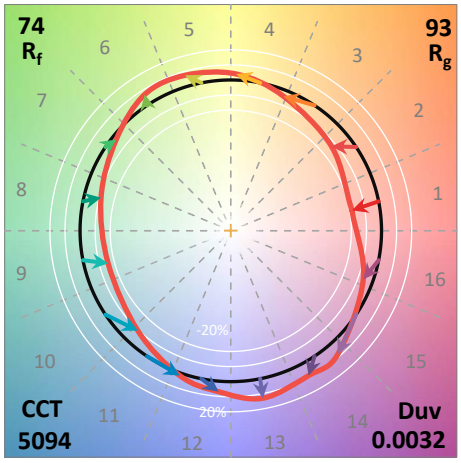
## Spectral Power Distribution Comparison

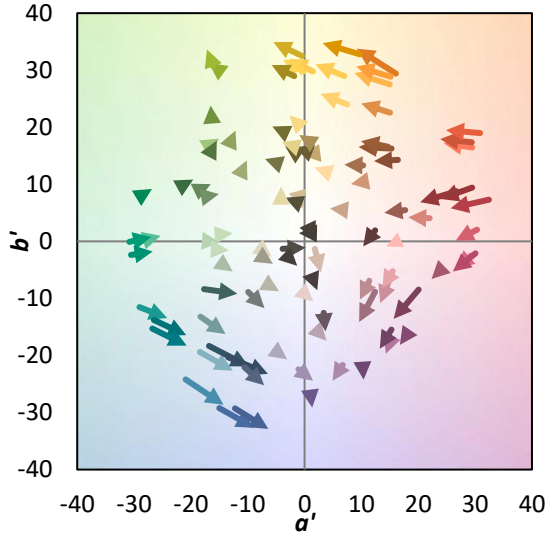



## Color Vector Graphics



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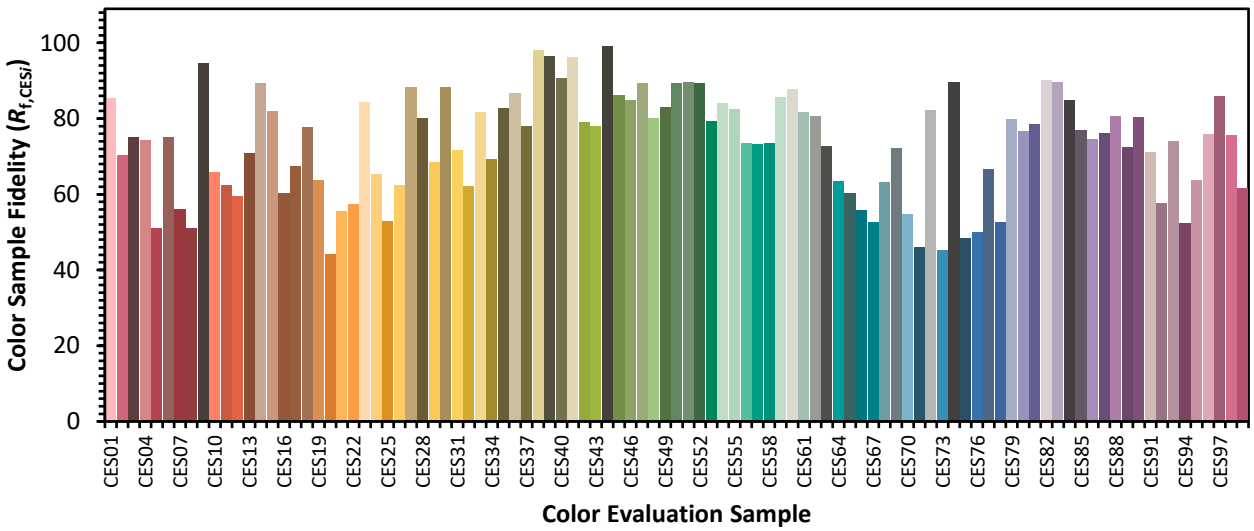
## TM-30-18

**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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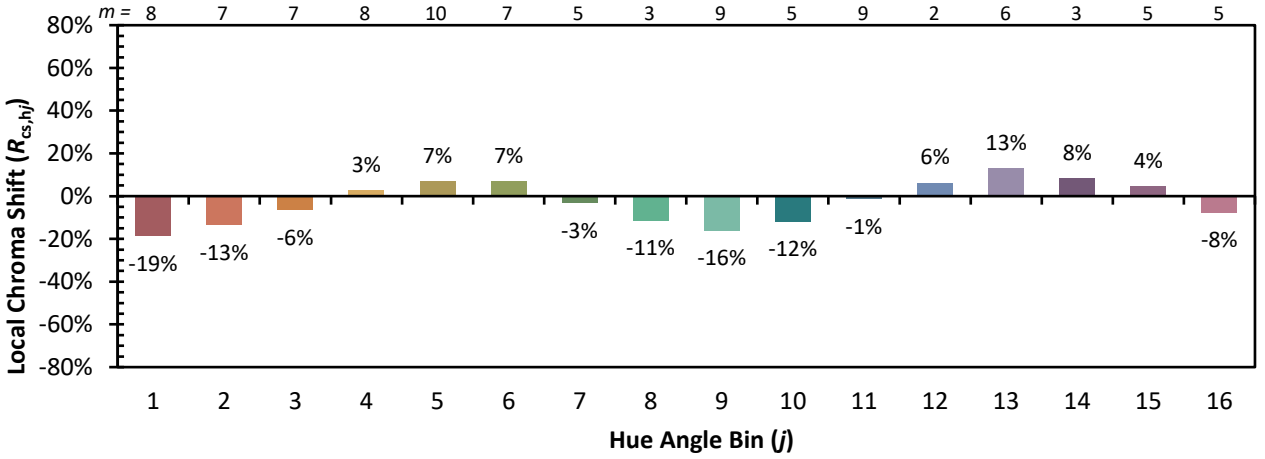
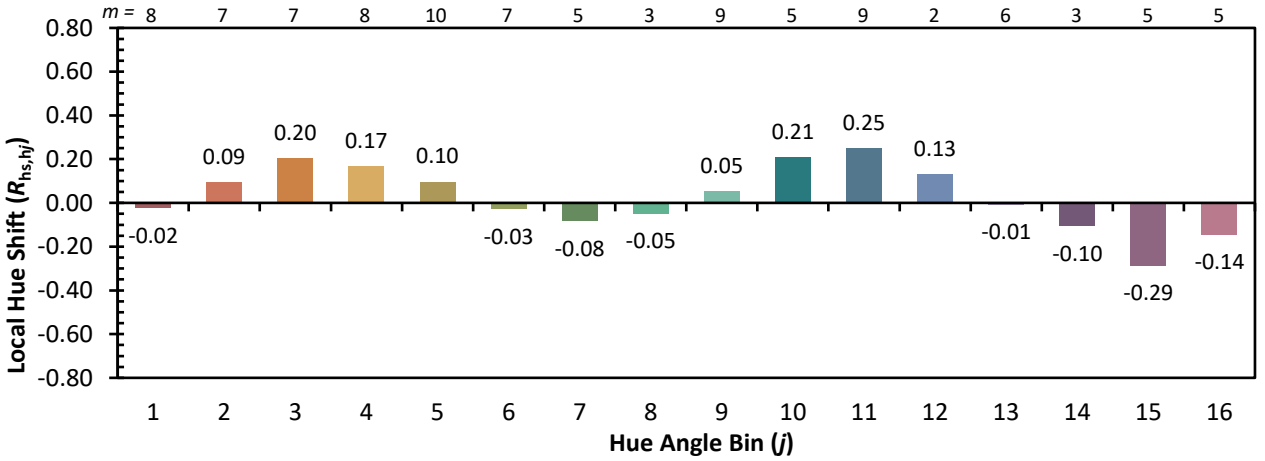
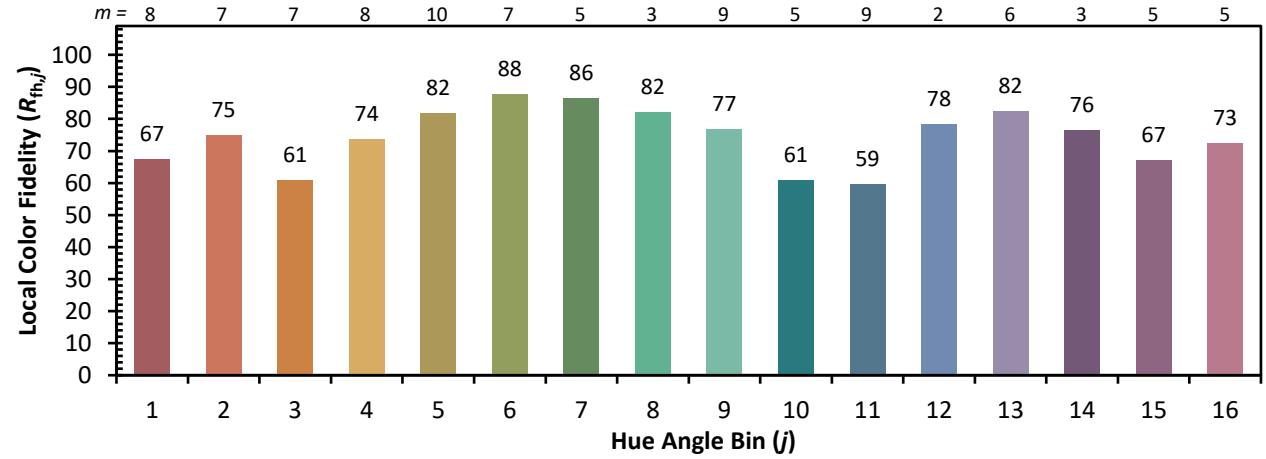
## Color Rendition by Hue-Angle Bin



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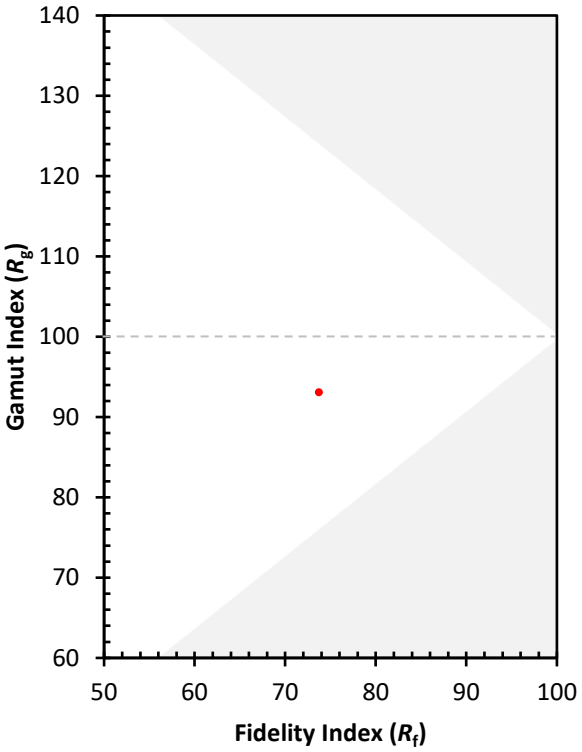
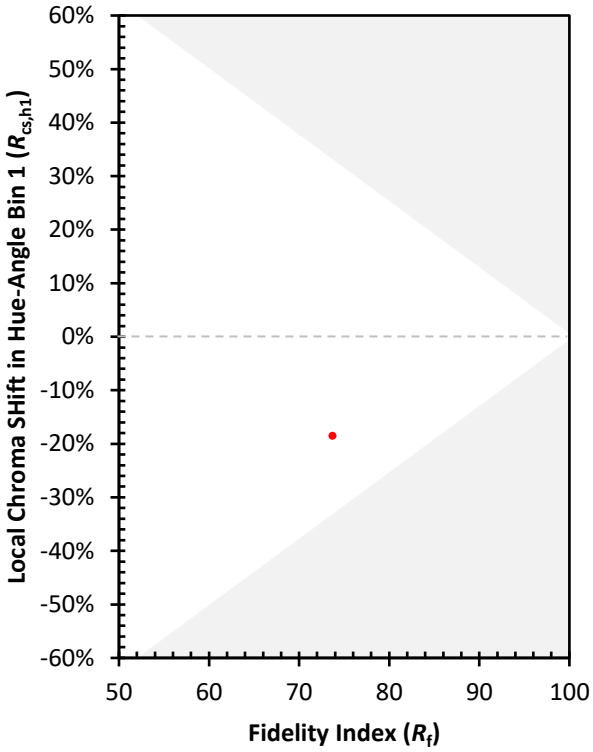
## Measure Comparisons

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