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: P867737

Luminaire Tested: **MEM2-HTN-SA-40-750-U-T4W-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: | P867737 |
| 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-T4W-HSS |
| Description: | EPIC MODERN TALL HOUSING DISCRETE LED ARRAYS 40W 70CRI 5000K FIXTURE w/ TYPE IV WIDE 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: | 4366.7 lumens |
| Efficiency: | N/A |
| Efficacy: | 99.2 lumens/watt |
| Luminous Opening: | Rectangular (W 0.33' x L: 0.33' x H: 0') |
| IES Classification: | Type IV - 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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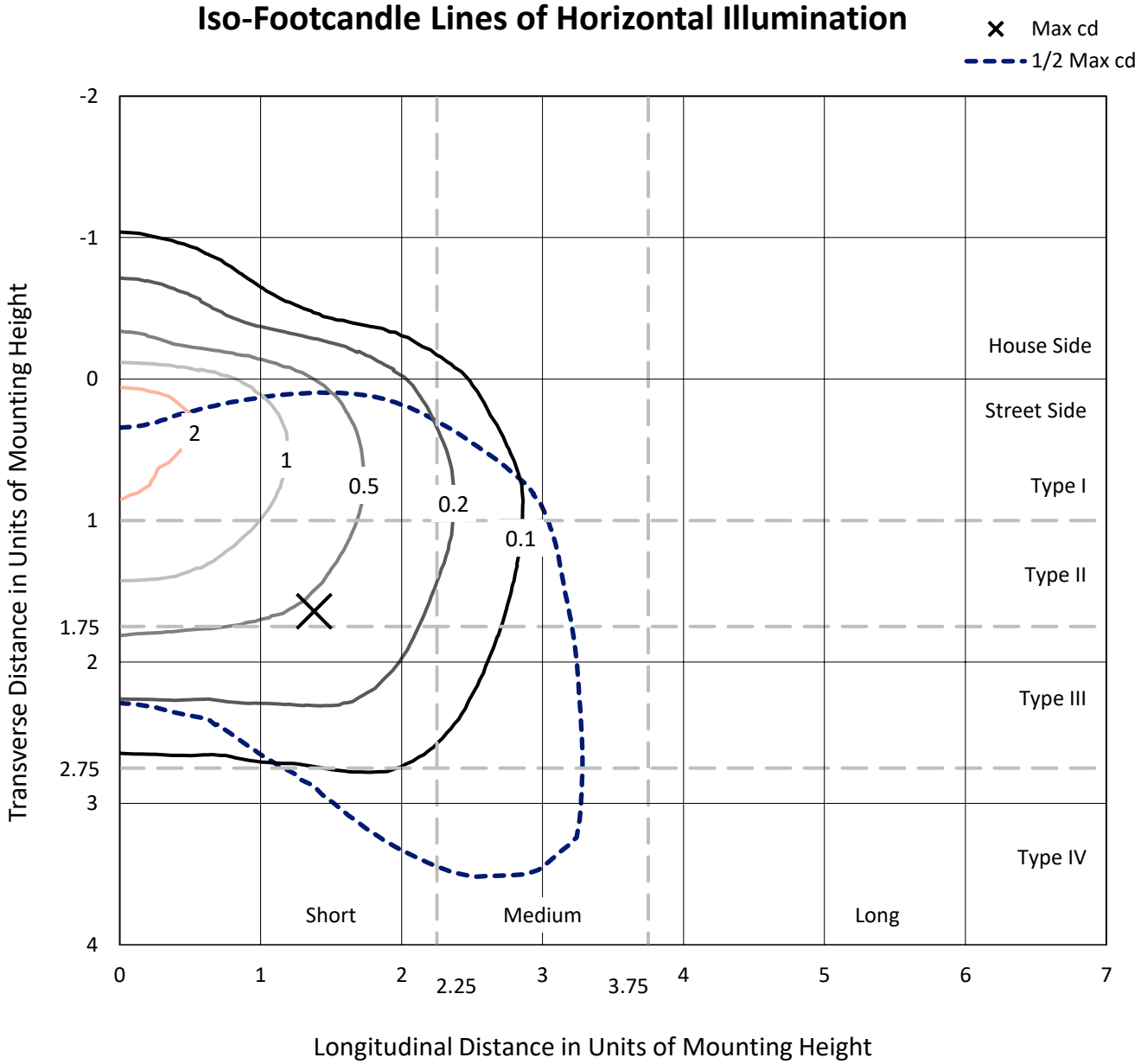
Scaled Data Report

REPORT NUMBER: P867737
CATALOG NUMBER: MEM2-HTN-SA-40-750-U-T4W-HSS

## Iso-Footcandle Lines of Horizontal Illumination




Based on 20 foot mounting height. Maximum calculated value = 2.5 fc
Type IV - Short - N/A

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REPORT NUMBER: P867737
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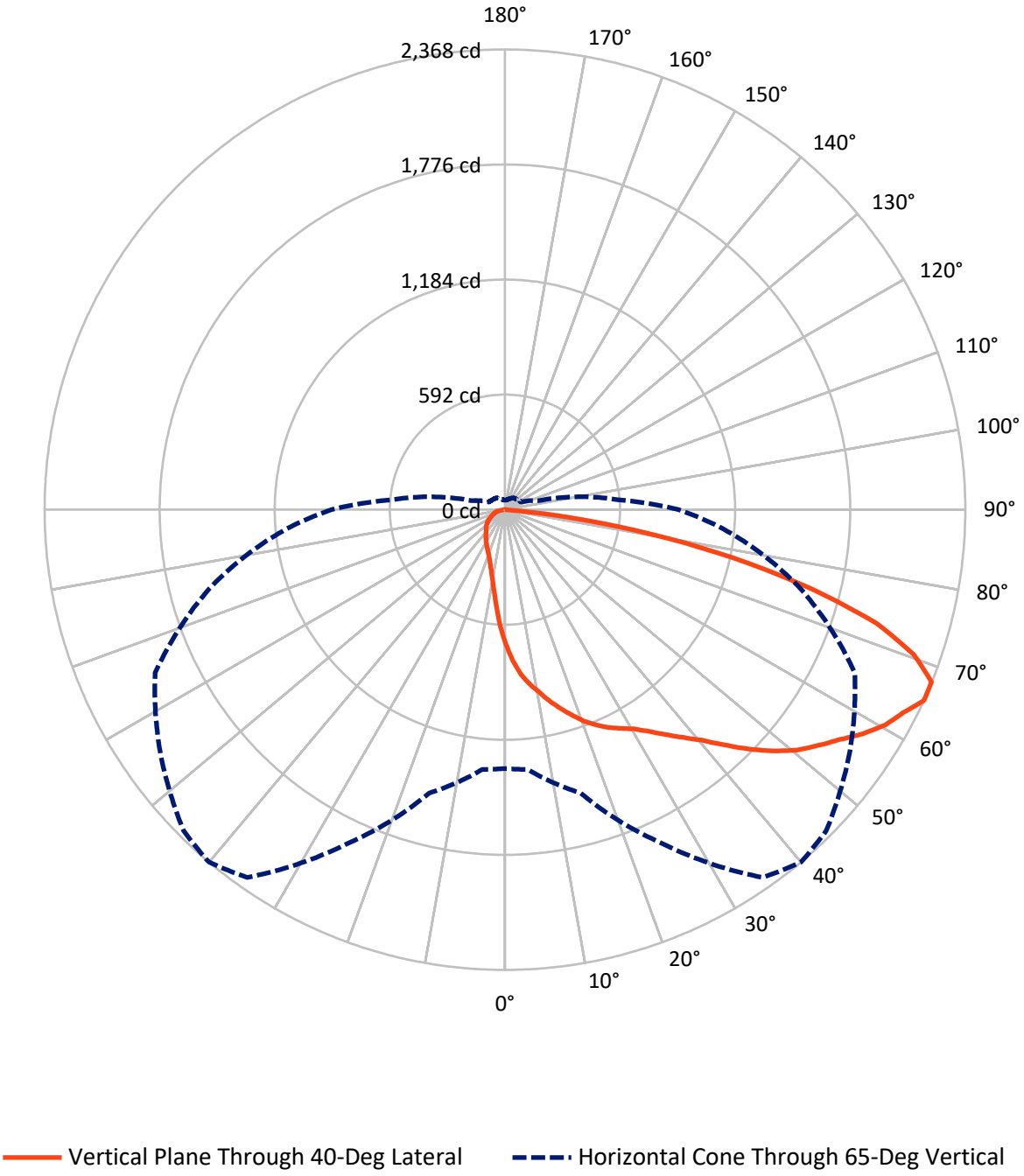
## Luminous Intensity Polar Plot



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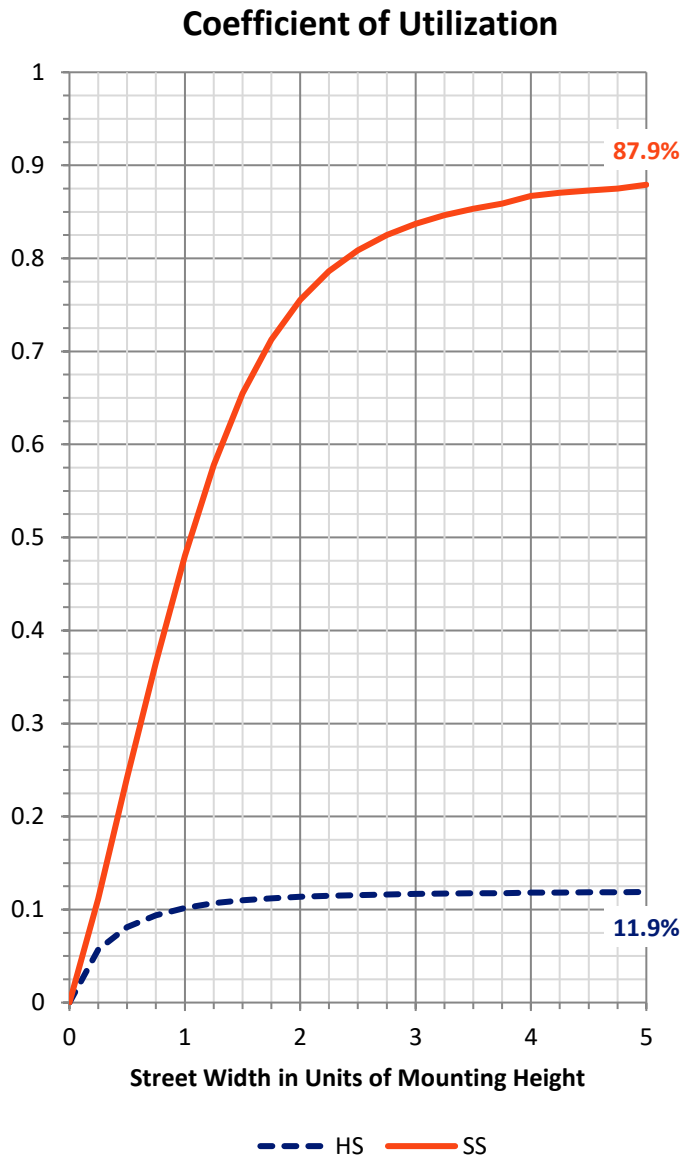
REPORT NUMBER: P867737
CATALOG NUMBER: MEM2-HTN-SA-40-750-U-T4W-HSS

**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 522.8 | 0.0 | 522.8 |
| | % Fixture | 12.0 | 0.0 | 12.0 |
| **Street Side** | Lumens | 3843.9 | 0.0 | 3843.9 |
| | % Fixture | 88.0 | 0.0 | 88.0 |
| **Total** | Lumens | 4366.7 | 0.0 | 4366.7 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 65.0 | 1.5 |
| 10°-20° | 195.4 | 4.5 |
| 20°-30° | 336.1 | 7.7 |
| 30°-40° | 508.0 | 11.6 |
| 40°-50° | 742.9 | 17.0 |
| 50°-60° | 948.8 | 21.7 |
| 60°-70° | 946.9 | 21.7 |
| 70°-80° | 555.3 | 12.7 |
| 80°-90° | 68.4 | 1.6 |
| 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° | 4366.7 | 100.0 |
| 0°-180° | 4366.7 | 100.0 |



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REPORT NUMBER: P867737
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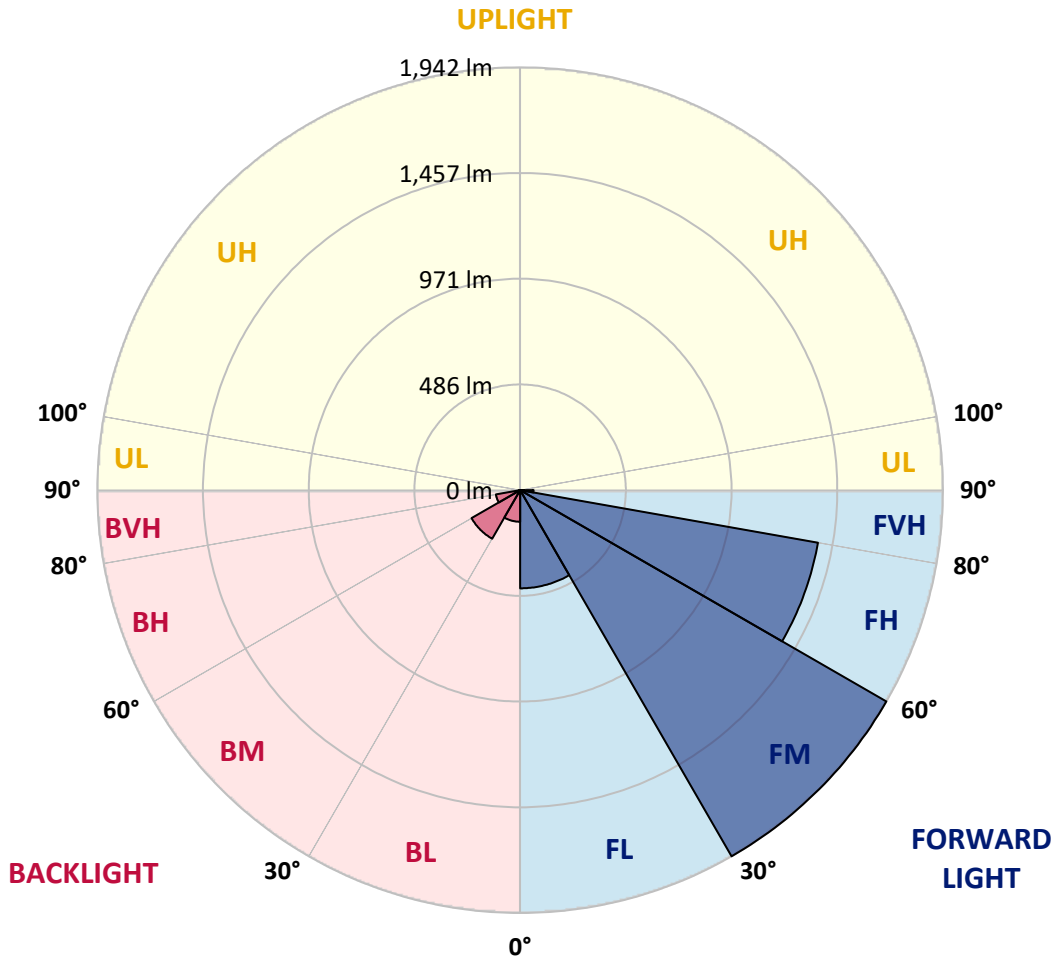
## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 451.0 | 10.3 | | | |
| FM | (30°-60°) | 1942.1 | 44.5 | | | |
| FH | (60°-80°) | 1389.0 | 31.8 | | | G1/1800 |
| FVH | (80°-90°) | 61.8 | 1.4 | | | G1/100 |
| BL | (0°-30°) | 145.4 | 3.3 | B1/500 | | |
| BM | (30°-60°) | 257.6 | 5.9 | B1/1000 | | |
| BH | (60°-80°) | 113.2 | 2.6 | B1/500 | | G1/500 |
| BVH | (80°-90°) | 6.6 | 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 IV Short



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REPORT NUMBER: P867737
CATALOG NUMBER: MEM2-HTN-SA-40-750-U-T4W-HSS

**CANDELA DISTRIBUTION (FULL):**

| | 0° | 5° | 15° | 25° | 35° | 40° | 45° | 55° | 65° | 75° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 694.1 | 694.1 | 694.1 | 694.1 | 694.1 | *694.1* | 694.1 | 694.1 | 694.1 | 694.1 | 694.1 |
| 2.5° | 809.8 | 806.1 | 798.7 | 792.6 | 784.0 | *776.6* | 769.2 | 755.7 | 738.4 | 723.7 | 705.2 |
| 5° | 889.8 | 883.6 | 878.7 | 871.3 | 856.6 | *850.4* | 845.5 | 817.2 | 787.6 | 756.9 | 716.3 |
| 7.5° | 946.4 | 951.3 | 941.5 | 930.4 | 912.0 | *904.6* | 897.2 | 868.9 | 832.0 | 787.6 | 729.8 |
| 10° | 1011.6 | 1012.9 | 1000.6 | 987.0 | 967.3 | *952.6* | 942.7 | 908.3 | 867.6 | 818.4 | 744.6 |
| 12.5° | 1074.4 | 1074.4 | 1067.0 | 1047.3 | 1021.5 | *1007.9* | 990.7 | 951.3 | 902.1 | 844.3 | 761.8 |
| 15° | 1124.9 | 1127.3 | 1121.2 | 1106.4 | 1078.1 | *1059.6* | 1042.4 | 996.9 | 934.1 | 873.8 | 775.3 |
| 17.5° | 1170.4 | 1169.2 | 1165.5 | 1151.9 | 1124.9 | *1110.1* | 1092.9 | 1042.4 | 971.0 | 897.2 | 796.3 |
| 20° | 1201.2 | 1201.2 | 1199.9 | 1192.6 | 1172.9 | *1161.8* | 1140.9 | 1087.9 | 1011.6 | 931.6 | 818.4 |
| 22.5° | 1224.5 | 1223.3 | 1223.3 | 1224.5 | 1213.5 | *1202.4* | 1193.8 | 1140.9 | 1053.5 | 961.2 | 840.6 |
| 25° | 1244.2 | 1243.0 | 1246.7 | 1249.2 | 1244.2 | *1241.8* | 1231.9 | 1191.3 | 1105.2 | 995.6 | 862.7 |
| 27.5° | 1270.1 | 1273.8 | 1272.5 | 1272.5 | 1271.3 | *1273.8* | 1272.5 | 1238.1 | 1155.6 | 1032.6 | 886.1 |
| 30° | 1310.7 | 1316.9 | 1313.2 | 1308.2 | 1308.2 | *1309.5* | 1315.6 | 1293.5 | 1214.7 | 1078.1 | 912.0 |
| 32.5° | 1405.5 | 1399.3 | 1373.5 | 1356.2 | 1358.7 | *1359.9* | 1366.1 | 1353.8 | 1273.8 | 1129.8 | 939.0 |
| 35° | 1513.8 | 1506.4 | 1478.1 | 1438.7 | 1425.2 | *1420.2* | 1419.0 | 1411.6 | 1337.8 | 1185.2 | 971.0 |
| 37.5° | 1654.1 | 1656.5 | 1614.7 | 1558.1 | 1517.5 | *1486.7* | 1480.5 | 1464.5 | 1393.2 | 1235.6 | 1004.3 |
| 40° | 1796.8 | 1787.0 | 1751.3 | 1695.9 | 1615.9 | *1559.3* | 1540.8 | 1518.7 | 1455.9 | 1288.5 | 1036.3 |
| 42.5° | 1934.7 | 1916.2 | 1869.4 | 1809.1 | 1715.6 | *1654.1* | 1612.2 | 1583.9 | 1513.8 | 1346.4 | 1067.0 |
| 45° | 2114.3 | 2061.4 | 1977.7 | 1923.6 | 1806.7 | *1756.2* | 1718.1 | 1655.3 | 1582.7 | 1404.2 | 1103.9 |
| 47.5° | 2255.9 | 2153.7 | 2077.4 | 2054.0 | 1901.4 | *1854.7* | 1820.2 | 1732.8 | 1652.8 | 1469.5 | 1142.1 |
| 50° | 2230.0 | 2167.3 | 2148.8 | 2127.9 | 1972.8 | *1944.5* | 1912.5 | 1821.4 | 1724.2 | 1538.4 | 1179.0 |
| 52.5° | 2163.6 | 2171.0 | 2194.3 | 2158.7 | 2035.6 | *2015.9* | 1995.0 | 1916.2 | 1795.6 | 1595.0 | 1212.2 |
| 55° | 2110.7 | 2125.4 | 2188.2 | 2177.1 | 2110.7 | *2088.5* | 2073.7 | 2009.7 | 1864.5 | 1646.7 | 1240.5 |
| 57.5° | 2014.7 | 2002.4 | 2081.1 | 2209.1 | 2190.7 | *2173.4* | 2158.7 | 2108.2 | 1934.7 | 1683.6 | 1259.0 |
| 60° | 1863.3 | 1817.7 | 1923.6 | 2169.7 | 2246.0 | *2248.5* | 2239.9 | 2182.0 | 1991.3 | 1683.6 | 1249.2 |
| 62.5° | 1650.4 | 1607.3 | 1737.8 | 2038.0 | 2275.6 | *2299.0* | 2294.0 | 2207.9 | 2015.9 | 1646.7 | 1211.0 |
| 65° | *1331.6* | *1341.5* | *1510.1* | *1889.1* | *2310.0* | *2367.9* | *2337.1* | *2166.0* | *1985.1* | *1575.3* | *1124.9* |
| 67.5° | 1063.3 | 1092.9 | 1244.2 | 1695.9 | 2294.0 | *2366.6* | 2323.6 | 2047.9 | 1853.4 | 1475.6 | 993.2 |
| 70° | 839.3 | 859.0 | 984.6 | 1435.0 | 2153.7 | *2230.0* | 2175.9 | 1867.0 | 1630.7 | 1321.8 | 825.8 |
| 72.5° | 656.0 | 674.4 | 781.5 | 1148.2 | 1910.1 | *1998.7* | 1931.0 | 1623.3 | 1352.5 | 1121.2 | 656.0 |
| 75° | 498.4 | 512.0 | 592.0 | 884.9 | 1521.1 | *1631.9* | 1582.7 | 1299.6 | 1055.9 | 887.3 | 502.1 |
| 77.5° | 321.2 | 339.7 | 429.5 | 620.3 | 1074.4 | *1207.3* | 1213.5 | 971.0 | 759.3 | 641.2 | 369.2 |
| 80° | 212.9 | 220.3 | 275.7 | 403.7 | 660.9 | *764.3* | 800.0 | 656.0 | 484.9 | 408.6 | 265.8 |
| 82.5° | 88.6 | 98.5 | 131.7 | 203.1 | 331.1 | *332.3* | 380.3 | 276.9 | 196.9 | 173.5 | 112.0 |
| 85° | 2.5 | 4.9 | 3.7 | 9.8 | 8.6 | *13.5* | 16.0 | 22.2 | 16.0 | 17.2 | 17.2 |
| 87.5° | 0.0 | 0.0 | 1.2 | 1.2 | 2.5 | *2.5* | 2.5 | 2.5 | 2.5 | 3.7 | 2.5 |
| 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

Scaled Data Report

REPORT NUMBER: P867737
CATALOG NUMBER: MEM2-HTN-SA-40-750-U-T4W-HSS

**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 694.1 | 694.1 | 694.1 | 694.1 | 694.1 | 694.1 | 694.1 | 694.1 | 694.1 | 694.1 | 694.1 |
| 2.5° | 696.6 | 685.5 | 663.3 | 646.1 | 627.7 | 614.1 | 601.8 | 588.3 | 579.7 | 580.9 | 572.3 |
| 5° | 696.6 | 675.7 | 631.4 | 592.0 | 556.3 | 530.4 | 502.1 | 480.0 | 464.0 | 461.5 | 468.9 |
| 7.5° | 700.3 | 665.8 | 599.4 | 540.3 | 491.1 | 450.4 | 420.9 | 398.7 | 387.7 | 380.3 | 379.1 |
| 10° | 704.0 | 658.4 | 569.8 | 494.7 | 433.2 | 388.9 | 363.1 | 338.4 | 326.1 | 324.9 | 321.2 |
| 12.5° | 706.4 | 649.8 | 542.7 | 449.2 | 385.2 | 343.4 | 317.5 | 297.8 | 288.0 | 288.0 | 286.8 |
| 15° | 715.0 | 647.3 | 514.4 | 414.7 | 348.3 | 307.7 | 285.5 | 269.5 | 263.4 | 259.7 | 258.4 |
| 17.5° | 722.4 | 642.4 | 489.8 | 380.3 | 315.1 | 279.4 | 258.4 | 247.4 | 241.2 | 238.8 | 237.5 |
| 20° | 733.5 | 640.0 | 466.4 | 352.0 | 290.4 | 256.0 | 240.0 | 230.1 | 226.4 | 224.0 | 224.0 |
| 22.5° | 744.6 | 637.5 | 443.1 | 327.4 | 269.5 | 238.8 | 224.0 | 215.4 | 211.7 | 210.5 | 209.2 |
| 25° | 758.1 | 636.3 | 423.4 | 306.4 | 251.1 | 225.2 | 211.7 | 204.3 | 199.4 | 196.9 | 196.9 |
| 27.5° | 771.7 | 637.5 | 403.7 | 285.5 | 235.1 | 212.9 | 199.4 | 190.8 | 187.1 | 182.1 | 183.4 |
| 30° | 790.1 | 638.7 | 387.7 | 268.3 | 221.5 | 200.6 | 188.3 | 177.2 | 172.3 | 169.8 | 169.8 |
| 32.5° | 808.6 | 643.7 | 371.7 | 252.3 | 208.0 | 190.8 | 176.0 | 166.1 | 160.0 | 158.8 | 157.5 |
| 35° | 828.3 | 647.3 | 356.9 | 238.8 | 196.9 | 179.7 | 164.9 | 155.1 | 150.1 | 148.9 | 148.9 |
| 37.5° | 850.4 | 653.5 | 345.8 | 226.4 | 185.8 | 168.6 | 155.1 | 145.2 | 141.5 | 140.3 | 140.3 |
| 40° | 873.8 | 663.3 | 337.2 | 215.4 | 177.2 | 158.8 | 146.5 | 137.8 | 135.4 | 134.1 | 134.1 |
| 42.5° | 897.2 | 672.0 | 329.8 | 206.8 | 168.6 | 150.1 | 140.3 | 131.7 | 128.0 | 128.0 | 128.0 |
| 45° | 919.3 | 678.1 | 322.4 | 198.1 | 160.0 | 144.0 | 132.9 | 125.5 | 121.8 | 121.8 | 121.8 |
| 47.5° | 939.0 | 684.3 | 311.4 | 189.5 | 151.4 | 135.4 | 126.8 | 119.4 | 115.7 | 115.7 | 115.7 |
| 50° | 959.9 | 688.0 | 299.1 | 178.5 | 142.8 | 129.2 | 120.6 | 112.0 | 109.5 | 108.3 | 108.3 |
| 52.5° | 977.2 | 688.0 | 283.1 | 167.4 | 132.9 | 120.6 | 113.2 | 105.8 | 102.1 | 99.7 | 99.7 |
| 55° | 989.5 | 688.0 | 265.8 | 153.8 | 123.1 | 113.2 | 105.8 | 98.5 | 93.5 | 89.8 | 89.8 |
| 57.5° | 996.9 | 684.3 | 246.1 | 137.8 | 113.2 | 103.4 | 98.5 | 89.8 | 80.0 | 72.6 | 70.2 |
| 60° | 990.7 | 673.2 | 225.2 | 120.6 | 102.1 | 94.8 | 91.1 | 80.0 | 66.5 | 62.8 | 62.8 |
| 62.5° | 964.9 | 647.3 | 204.3 | 105.8 | 93.5 | 86.1 | 82.5 | 70.2 | 60.3 | 56.6 | 56.6 |
| 65° | *892.3* | *584.6* | *178.5* | *92.3* | *83.7* | *78.8* | *73.8* | *62.8* | *54.2* | *49.2* | *49.2* |
| 67.5° | 786.4 | 504.6 | 148.9 | 81.2 | 75.1 | 71.4 | 67.7 | 56.6 | 48.0 | 43.1 | 43.1 |
| 70° | 637.5 | 407.4 | 126.8 | 71.4 | 66.5 | 64.0 | 60.3 | 51.7 | 41.8 | 38.2 | 38.2 |
| 72.5° | 500.9 | 320.0 | 105.8 | 64.0 | 61.5 | 56.6 | 54.2 | 45.5 | 38.2 | 34.5 | 34.5 |
| 75° | 372.9 | 238.8 | 93.5 | 56.6 | 56.6 | 50.5 | 49.2 | 40.6 | 33.2 | 30.8 | 30.8 |
| 77.5° | 274.4 | 177.2 | 81.2 | 49.2 | 49.2 | 44.3 | 41.8 | 35.7 | 30.8 | 28.3 | 28.3 |
| 80° | 185.8 | 120.6 | 60.3 | 36.9 | 36.9 | 35.7 | 33.2 | 30.8 | 25.8 | 23.4 | 22.2 |
| 82.5° | 78.8 | 50.5 | 29.5 | 18.5 | 17.2 | 13.5 | 11.1 | 8.6 | 8.6 | 7.4 | 7.4 |
| 85° | 13.5 | 6.2 | 6.2 | 4.9 | 3.7 | 3.7 | 3.7 | 2.5 | 2.5 | 2.5 | 2.5 |
| 87.5° | 2.5 | 2.5 | 2.5 | 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 |

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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-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

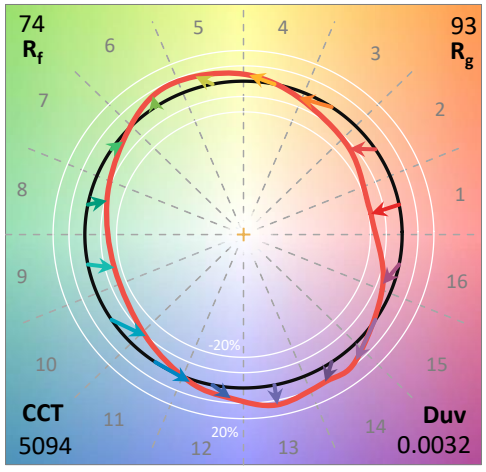
## Test Information

| | |
|---|---|
| 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

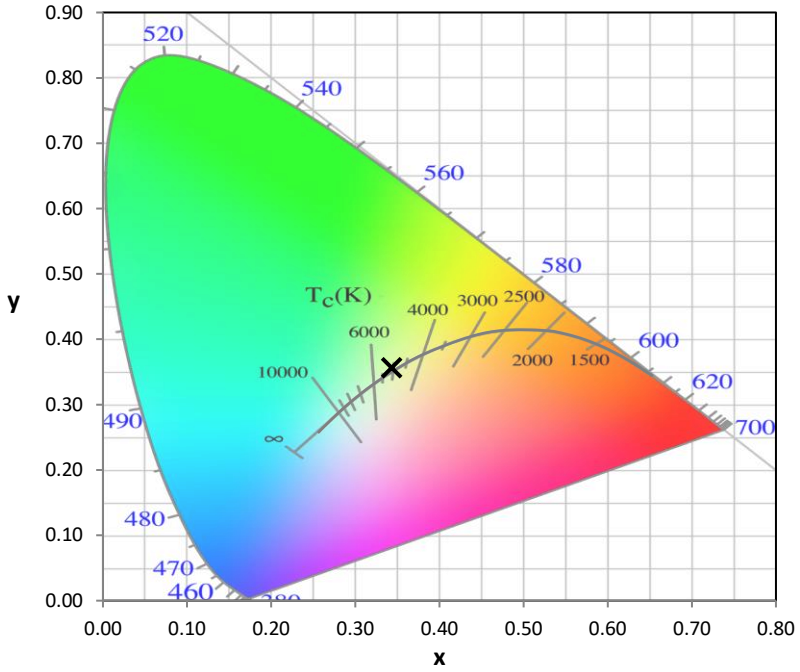
| | |
|---|---|
| Stabilization Time: | 20M |
| Operation Time: | 1H 20M |
| Sphere Temperature (°C): | 24.2 |

REPORT NUMBER: SP1-2407-157-6

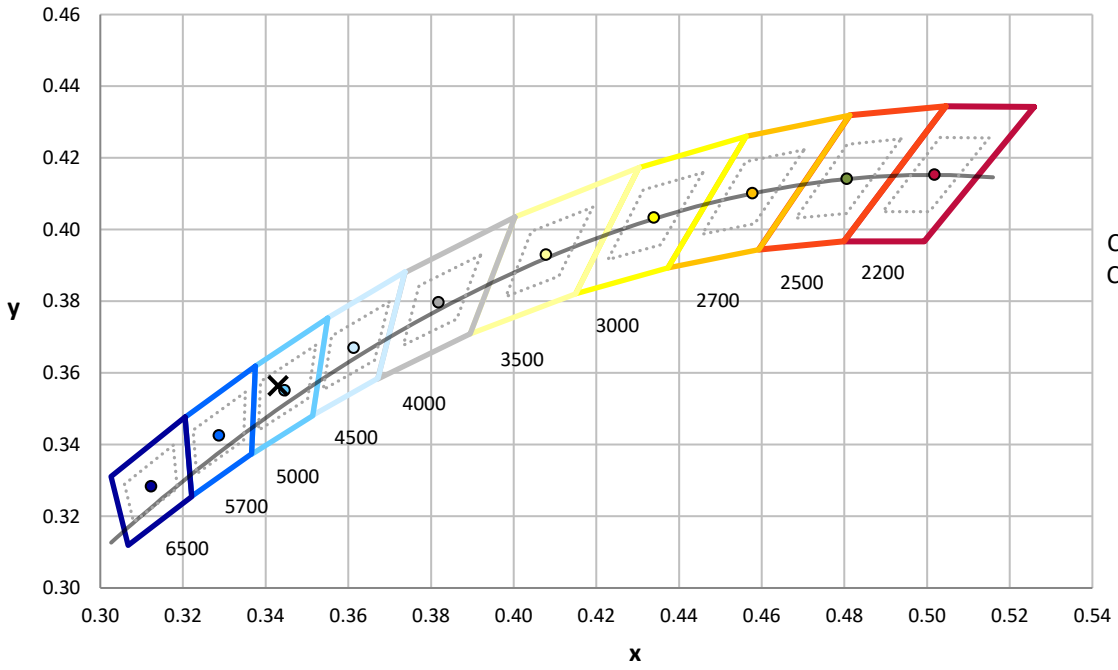
| Measurement and Test Equipment | | | |
|---|---|---|---|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | IN0058 | 6/18/2024 | 12/18/2024 |
| Power Meter | INXT2011004 | 2/8/2024 | 2/8/2025 |
| AC Power Source | IN0063 | 10/24/2023 | 10/24/2024 |
| DC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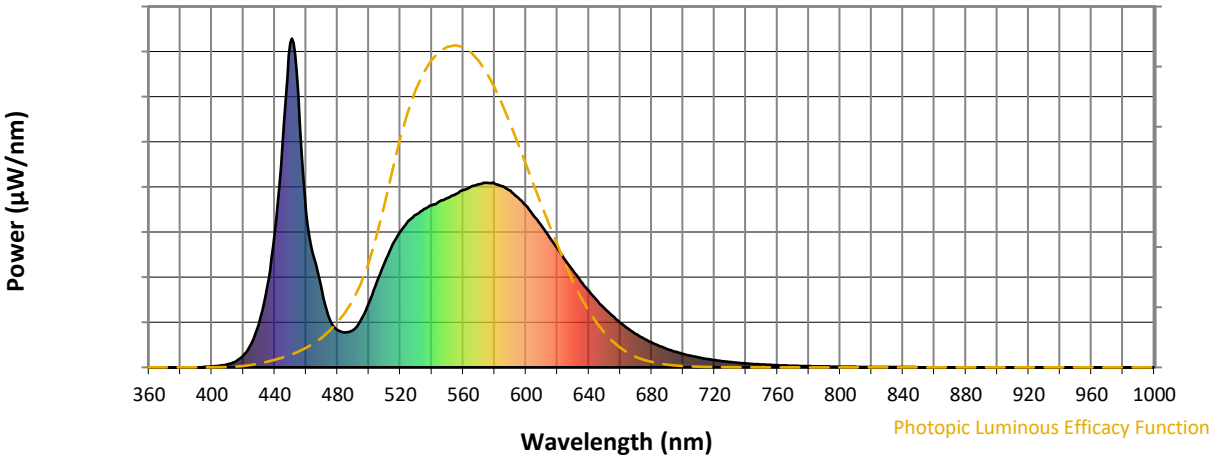
## Photopic Flux vs. Wavelength




## 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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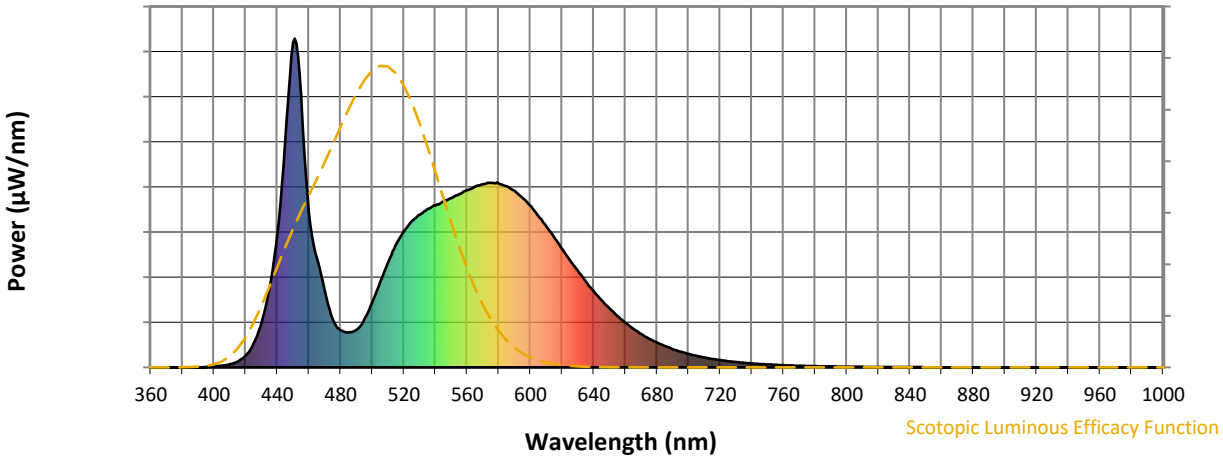
## Scotopic Flux vs. Wavelength




**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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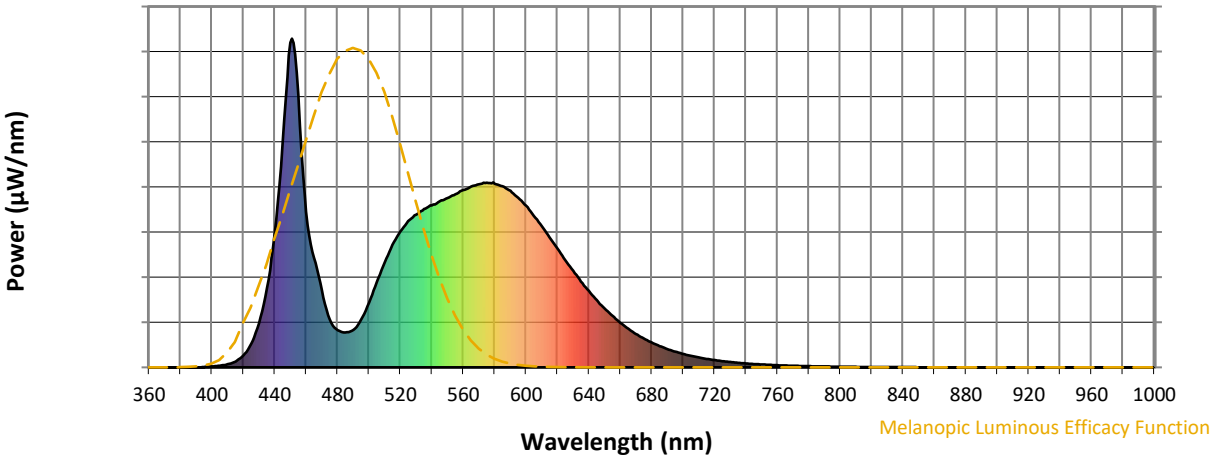
## Melanopic Flux vs. Wavelength




**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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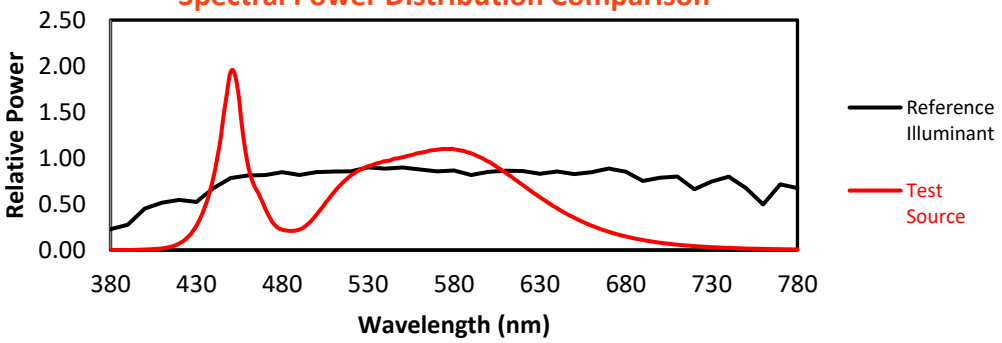
# TM-30-18

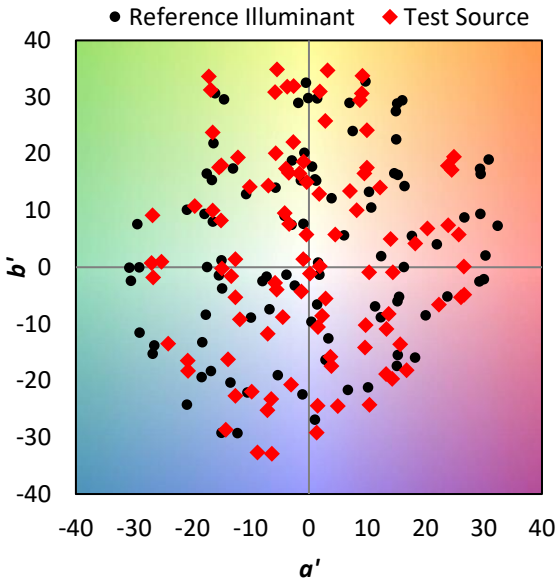
## Summary

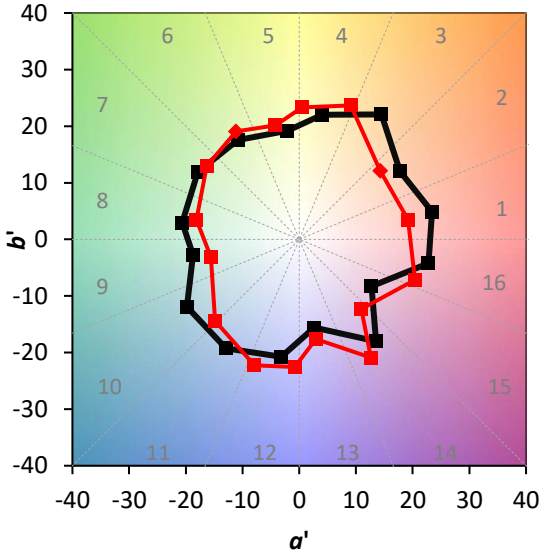
$R_f$ = 73.7
$R_g$ = 93
CIE $R_a$ = 72.0
$R_9$ = -39.6

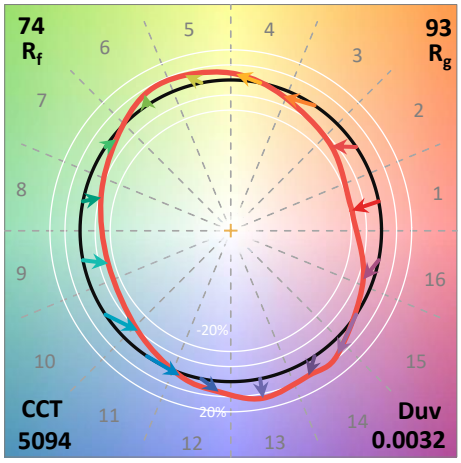
## Spectral Power Distribution Comparison

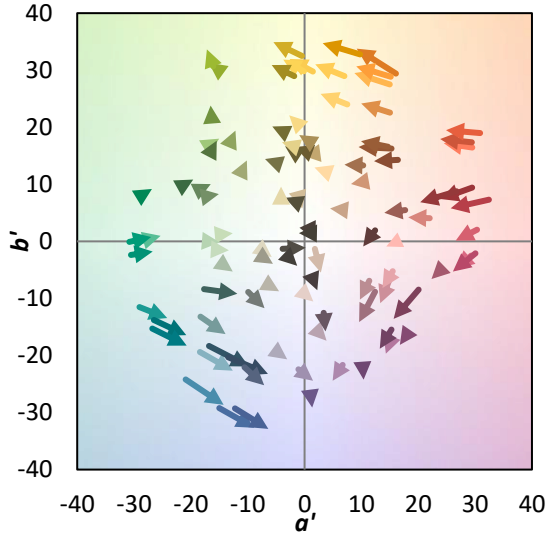



## Color Vector Graphics



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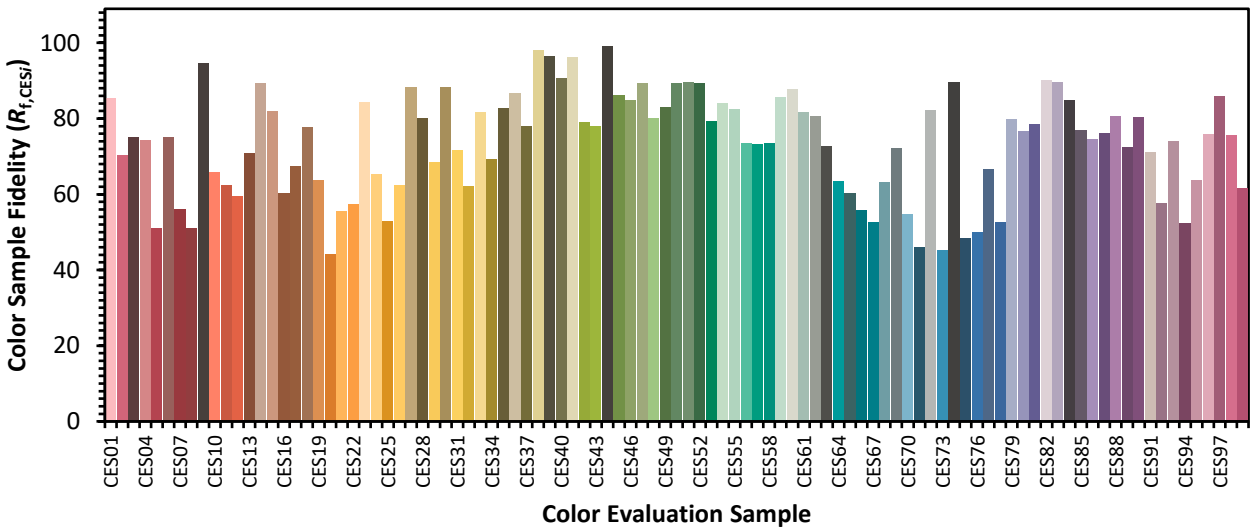
## TM-30-18

**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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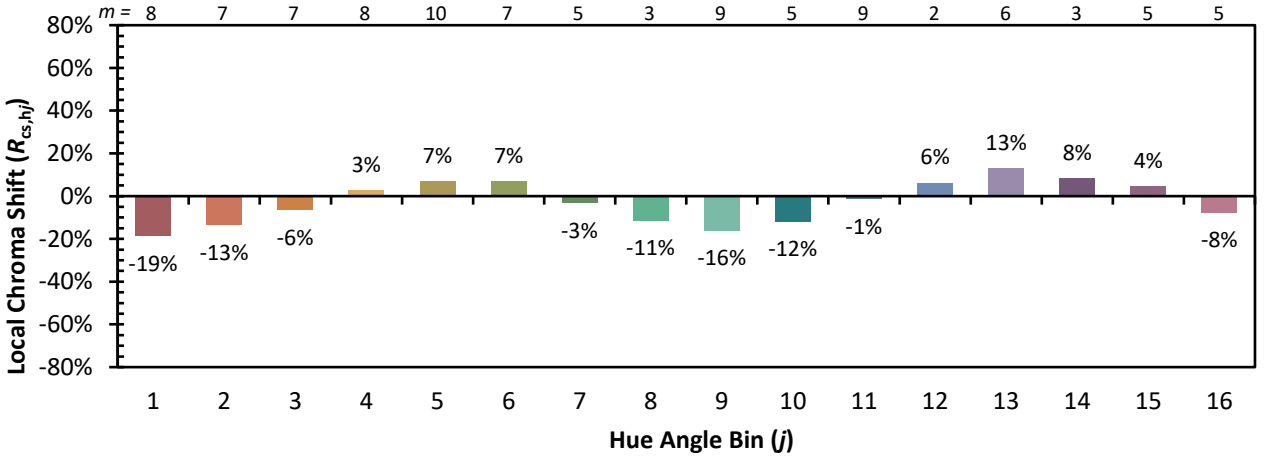
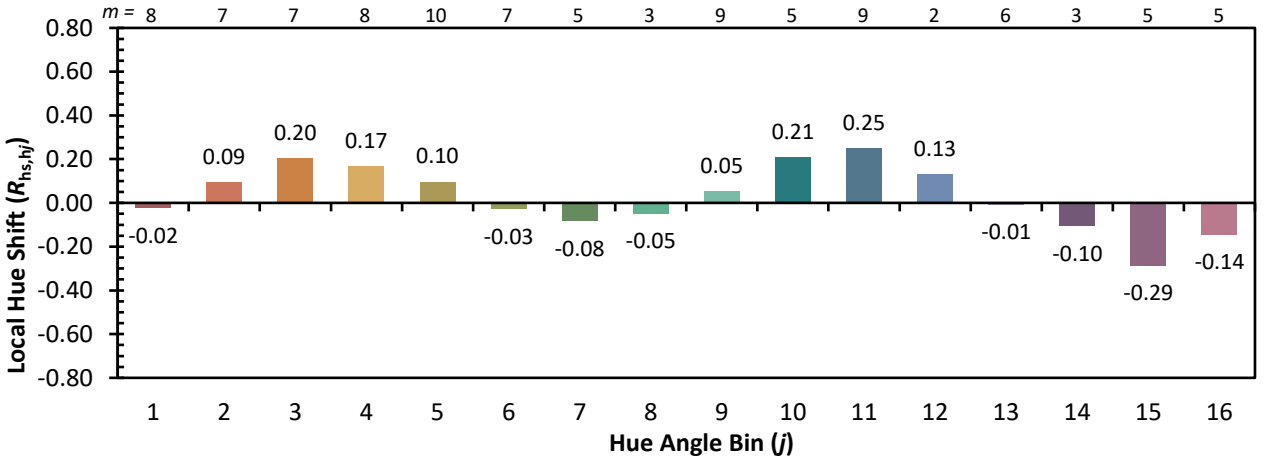
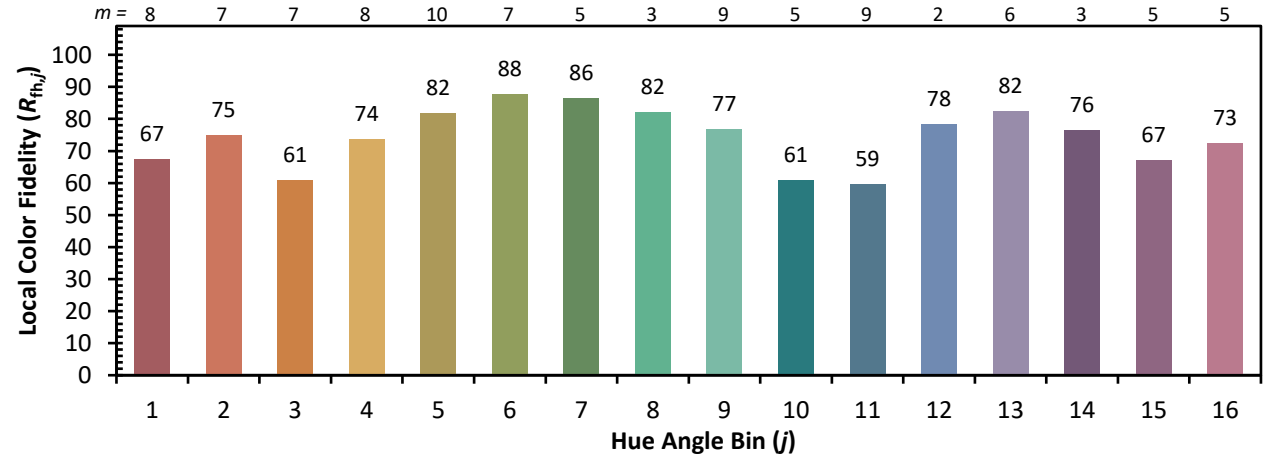
**TM-30-18**

## Color Rendition by Hue-Angle Bin



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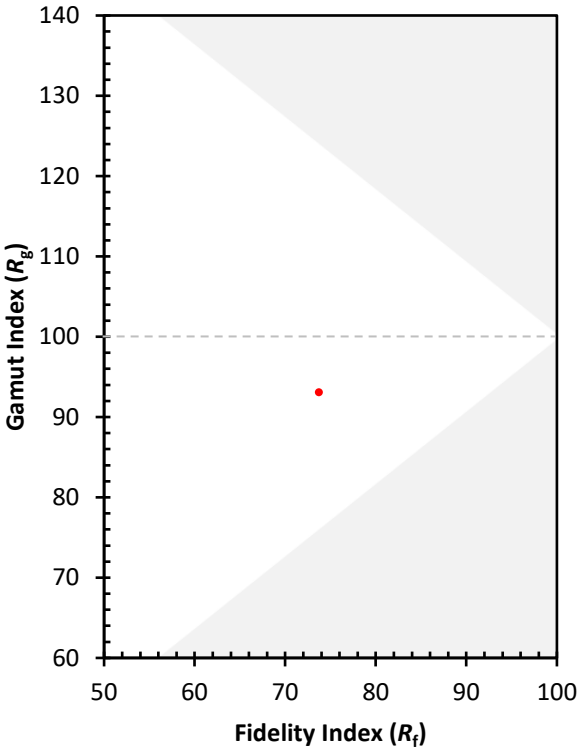
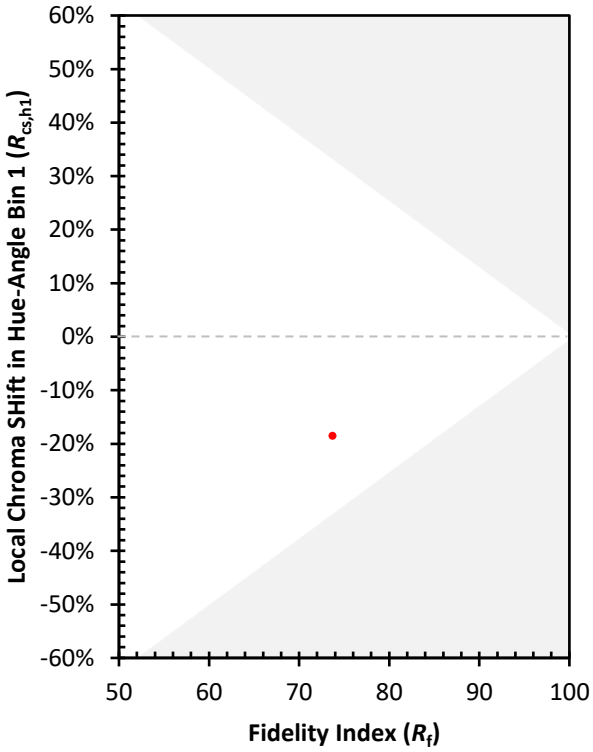
## Measure Comparisons

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