Cooper Lighting Solutions Photometric Lab
1121 Highway 74 South
Peachtree City, GA 30269

Scaled data based on original data using

LM-79-08 Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Test Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

Brand: INVUE

Report Number: P868530

Luminaire Tested: **EMM2-HTN-SA1B-730-U-T3**

Issue Date: 08/22/2024

Report Generated By 670245763

Cooper Lighting Solutions Photometric Lab
1121 Highway 74 South
Peachtree City, GA 30269

Scaled Data Report

**Test Information**

| | |
|---|---|
| Test Method: | LM-79-08 |
| Report Number: | P868530 |
| Test Lab: | INNOVATION CENTER(G3) |
| Issue Date: | 08/22/2024 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS (FORMERLY EATON) |
| Product Line: | INVUE |
| Catalog Number: | EMM2-HTN-SA1B-730-U-T3 |
| Description: | EPIC MODERN TALL HOUSING DISCRETE LED ARRAYS 60W 70CRI 3000K FIXTURE w/ TYPE III DISTRIBUTION OPTIC |
| Light Source: | (10) 3000K CCT, 70 CRI LEDS |
| Ballast/Driver: | ELECTRONIC DRIVER |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 5919.4 lumens |
| Efficiency: | N/A |
| Efficacy: | 134.5 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): | 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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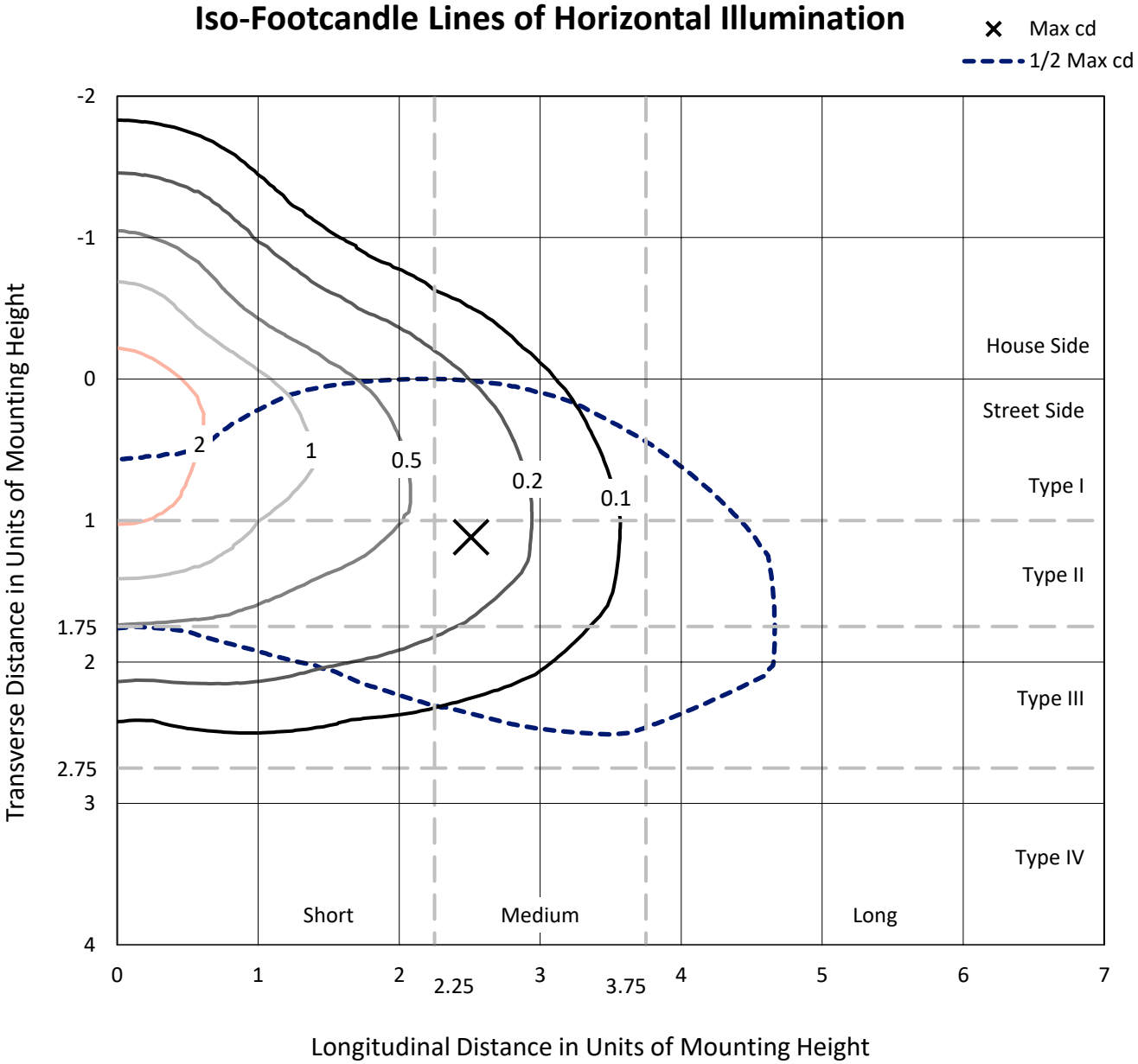
Scaled Data Report

REPORT NUMBER: P868530
CATALOG NUMBER: EMM2-HTN-SA1B-730-U-T3

## Iso-Footcandle Lines of Horizontal Illumination




Based on 20 foot mounting height. Maximum calculated value = 2.7 fc
Type III - Medium - N/A

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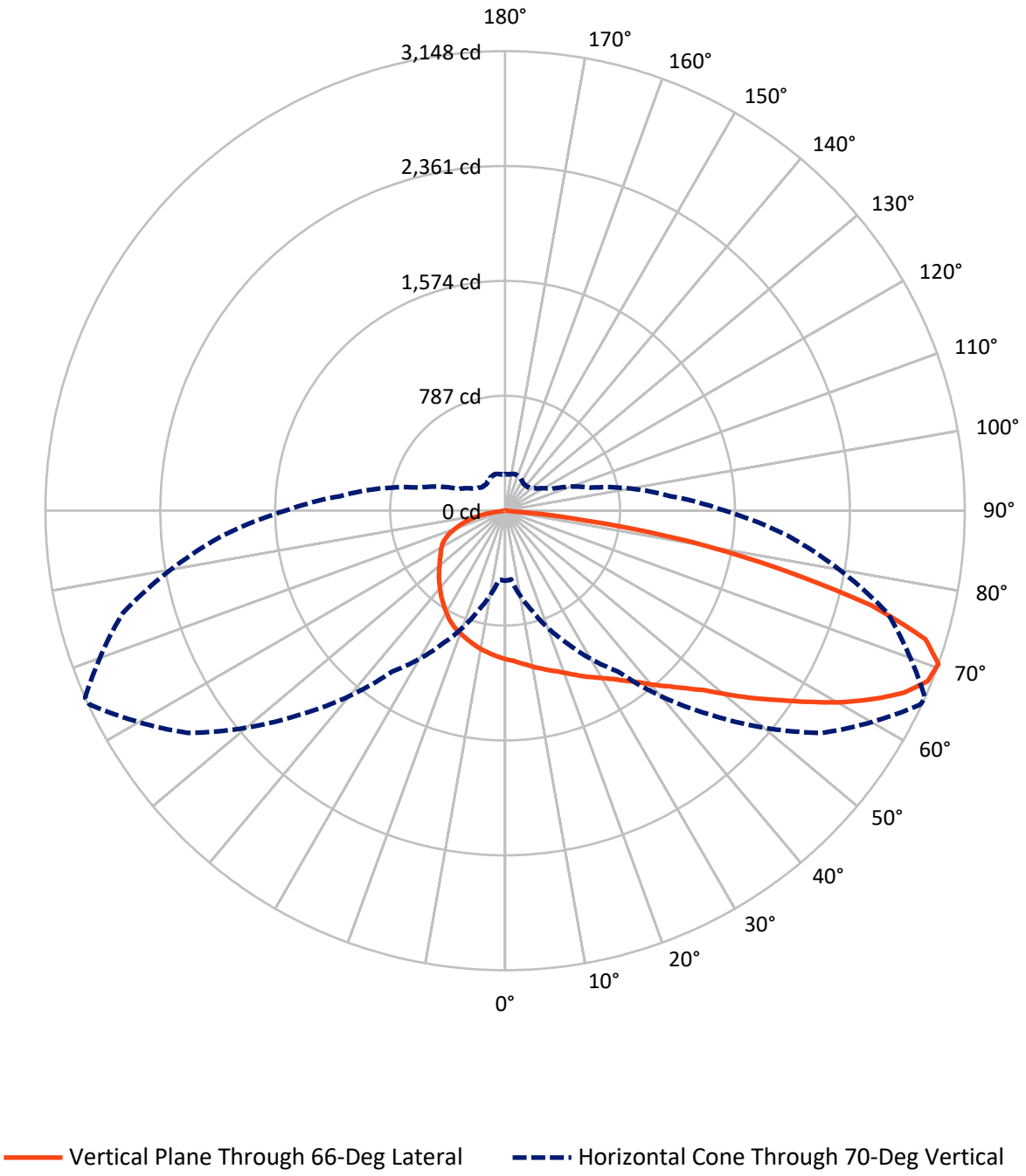
## Luminous Intensity Polar Plot



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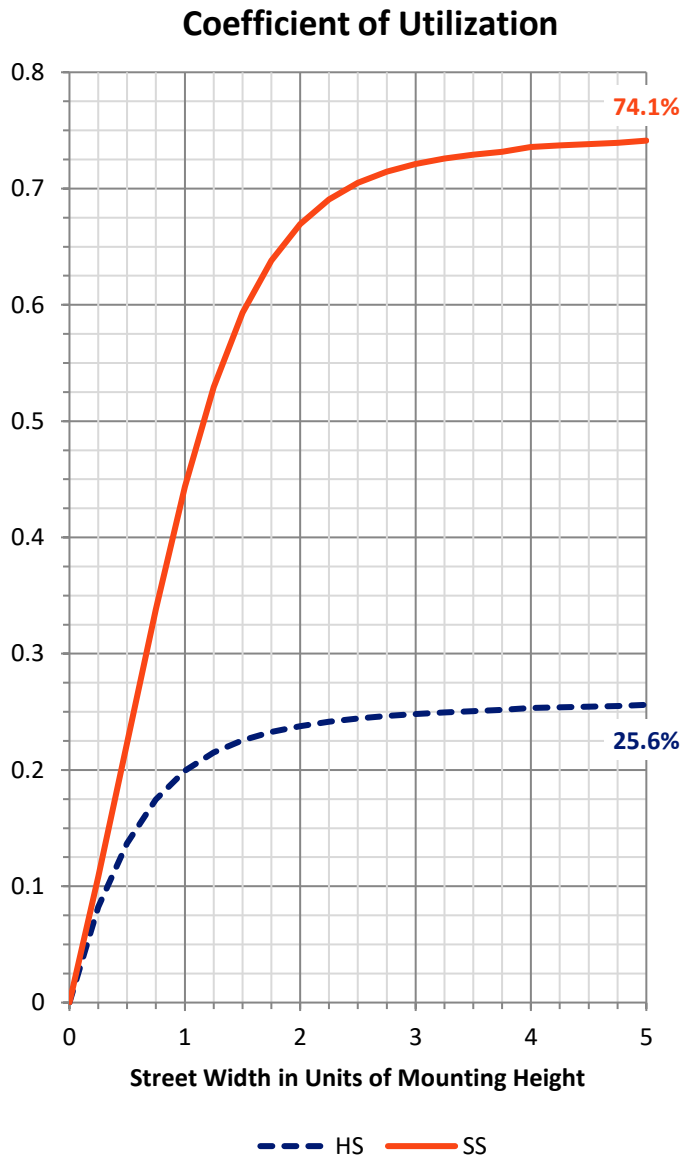
REPORT NUMBER: P868530
CATALOG NUMBER: EMM2-HTN-SA1B-730-U-T3

**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 1525.5 | 0.0 | 1525.5 |
| | % Fixture | 25.8 | 0.0 | 25.8 |
| **Street Side** | Lumens | 4393.9 | 0.0 | 4393.9 |
| | % Fixture | 74.2 | 0.0 | 74.2 |
| **Total** | Lumens | 5919.4 | 0.0 | 5919.4 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 97.5 | 1.6 |
| 10°-20° | 290.3 | 4.9 |
| 20°-30° | 487.6 | 8.2 |
| 30°-40° | 734.6 | 12.4 |
| 40°-50° | 997.4 | 16.8 |
| 50°-60° | 1185.2 | 20.0 |
| 60°-70° | 1209.6 | 20.4 |
| 70°-80° | 809.0 | 13.7 |
| 80°-90° | 108.2 | 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° | 5919.4 | 100.0 |
| 0°-180° | 5919.4 | 100.0 |



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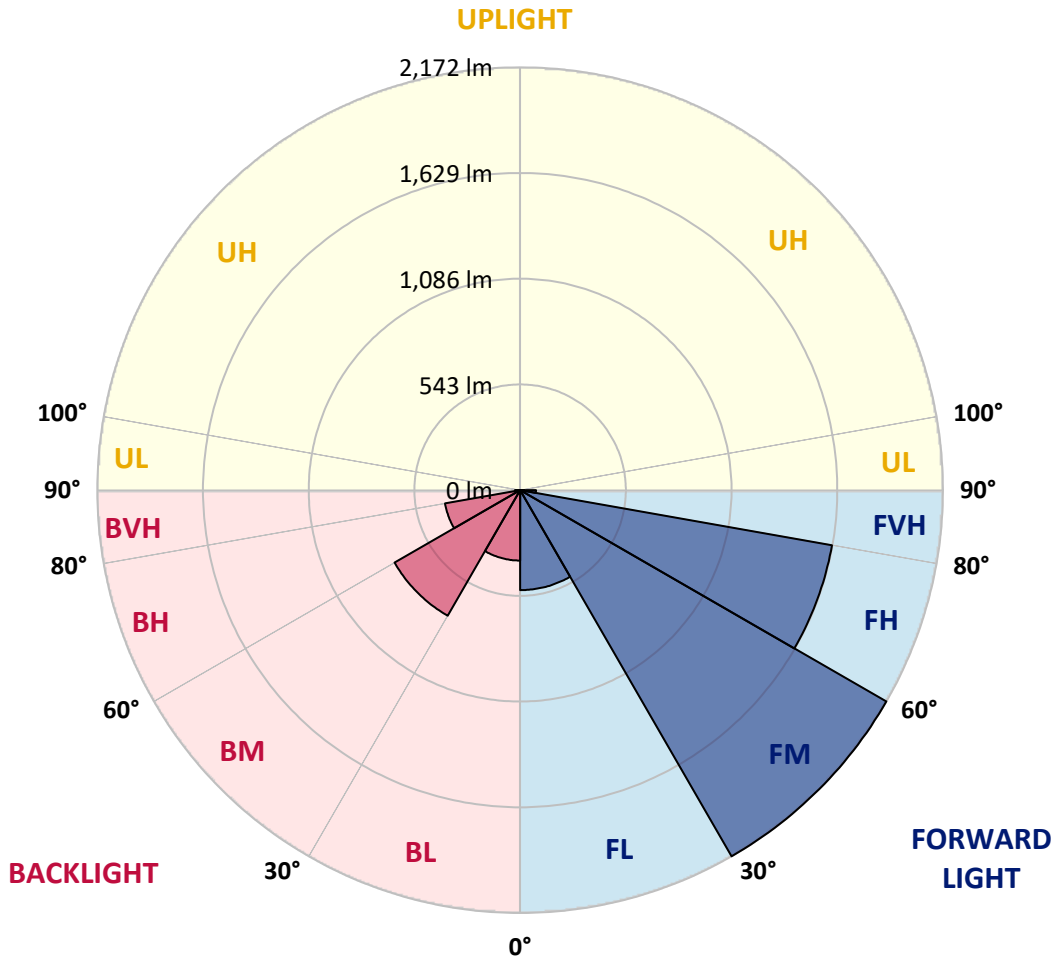
## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 513.7 | 8.7 | | | |
| FM | (30°-60°) | 2172.3 | 36.7 | | | |
| FH | (60°-80°) | 1626.9 | 27.5 | | | G1/1800 |
| FVH | (80°-90°) | 81.1 | 1.4 | | | G1/100 |
| BL | (0°-30°) | 361.7 | 6.1 | B1/500 | | |
| BM | (30°-60°) | 744.9 | 12.6 | B1/1000 | | |
| BH | (60°-80°) | 391.7 | 6.6 | B1/500 | | G1/500 |
| BVH | (80°-90°) | 27.2 | 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: P868530
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**CANDELA DISTRIBUTION (FULL):**

| | 0° | 5° | 15° | 25° | 35° | 45° | 55° | 65° | 66° | 75° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 1018.5 | 1018.5 | 1018.5 | 1018.5 | 1018.5 | 1018.5 | 1018.5 | 1018.5 | *1018.5* | 1018.5 | 1018.5 |
| 2.5° | 1054.9 | 1050.2 | 1046.7 | 1049.0 | 1042.0 | 1044.3 | 1036.1 | 1030.2 | *1029.1* | 1026.7 | 1024.3 |
| 5° | 1087.9 | 1087.9 | 1082.0 | 1082.0 | 1073.7 | 1072.6 | 1060.8 | 1047.9 | *1047.9* | 1039.6 | 1030.2 |
| 7.5° | 1123.1 | 1120.8 | 1113.7 | 1112.6 | 1103.1 | 1100.8 | 1087.9 | 1067.9 | *1066.7* | 1051.4 | 1037.3 |
| 10° | 1147.8 | 1149.0 | 1144.3 | 1144.3 | 1137.2 | 1131.4 | 1112.6 | 1091.4 | *1089.0* | 1069.0 | 1046.7 |
| 12.5° | 1166.6 | 1169.0 | 1167.8 | 1167.8 | 1161.9 | 1161.9 | 1140.8 | 1112.6 | *1110.2* | 1084.3 | 1052.6 |
| 15° | 1186.6 | 1185.5 | 1189.0 | 1190.2 | 1187.8 | 1184.3 | 1169.0 | 1136.1 | *1134.9* | 1100.8 | 1060.8 |
| 17.5° | 1204.3 | 1203.1 | 1204.3 | 1210.2 | 1211.3 | 1211.3 | 1196.1 | 1161.9 | *1157.2* | 1120.8 | 1067.9 |
| 20° | 1214.9 | 1217.2 | 1221.9 | 1229.0 | 1232.5 | 1241.9 | 1229.0 | 1192.5 | *1187.8* | 1142.0 | 1083.1 |
| 22.5° | 1254.9 | 1247.8 | 1251.3 | 1256.0 | 1260.7 | 1273.7 | 1261.9 | 1224.3 | *1220.7* | 1173.7 | 1100.8 |
| 25° | 1323.1 | 1323.1 | 1314.8 | 1306.6 | 1300.7 | 1306.6 | 1297.2 | 1260.7 | *1258.4* | 1201.9 | 1120.8 |
| 27.5° | 1441.8 | 1441.8 | 1424.2 | 1393.6 | 1354.8 | 1344.2 | 1337.2 | 1299.5 | *1292.5* | 1232.5 | 1133.7 |
| 30° | 1592.4 | 1597.1 | 1565.3 | 1513.6 | 1441.8 | 1394.8 | 1377.2 | 1336.0 | *1332.5* | 1263.1 | 1153.7 |
| 32.5° | 1753.5 | 1762.9 | 1739.4 | 1664.1 | 1546.5 | 1454.8 | 1426.6 | 1384.2 | *1376.0* | 1299.5 | 1179.6 |
| 35° | 1898.2 | 1907.6 | 1875.8 | 1805.2 | 1654.7 | 1541.8 | 1485.4 | 1437.1 | *1432.4* | 1346.6 | 1218.4 |
| 37.5° | 2015.8 | 2018.1 | 1998.1 | 1912.3 | 1745.3 | 1614.7 | 1558.3 | 1500.6 | *1491.2* | 1403.0 | 1259.6 |
| 40° | 2140.4 | 2149.8 | 2129.8 | 2024.0 | 1827.6 | 1693.5 | 1631.2 | 1577.1 | *1568.9* | 1461.8 | 1298.4 |
| 42.5° | 2271.0 | 2269.8 | 2269.8 | 2120.4 | 1909.9 | 1759.4 | 1710.0 | 1650.0 | *1645.3* | 1521.8 | 1340.7 |
| 45° | 2350.9 | 2355.6 | 2342.7 | 2178.1 | 2031.1 | 1827.6 | 1786.4 | 1742.9 | *1734.7* | 1605.3 | 1396.0 |
| 47.5° | 2370.9 | 2360.3 | 2301.5 | 2222.7 | 2167.5 | 1898.2 | 1882.9 | 1857.0 | *1838.2* | 1697.1 | 1464.2 |
| 50° | 2343.9 | 2327.4 | 2293.3 | 2242.7 | 2218.0 | 1982.8 | 1980.5 | 1993.4 | *1980.5* | 1808.8 | 1543.0 |
| 52.5° | 2242.7 | 2240.4 | 2234.5 | 2246.3 | 2206.3 | 2049.9 | 2091.0 | 2135.7 | *2133.4* | 1922.9 | 1625.3 |
| 55° | 2029.9 | 2045.2 | 2115.7 | 2189.8 | 2161.6 | 2095.7 | 2214.5 | 2300.4 | *2291.0* | 2056.9 | 1710.0 |
| 57.5° | 1812.3 | 1827.6 | 1918.2 | 2094.6 | 2118.1 | 2145.1 | 2353.3 | 2487.4 | *2472.1* | 2202.8 | 1787.6 |
| 60° | 1623.0 | 1606.5 | 1697.1 | 1951.1 | 2056.9 | 2189.8 | 2490.9 | 2676.7 | *2663.8* | 2348.6 | 1867.6 |
| 62.5° | 1323.1 | 1339.5 | 1484.2 | 1741.7 | 1971.1 | 2218.0 | 2603.8 | 2848.4 | *2840.2* | 2482.7 | 1932.3 |
| 65° | 1046.7 | 1024.3 | 1241.9 | 1521.8 | 1822.9 | 2208.6 | 2701.4 | 3009.5 | *3003.7* | 2614.4 | 1981.7 |
| 67.5° | 711.5 | 696.2 | 983.2 | 1303.1 | 1621.8 | 2133.4 | 2723.7 | 3117.7 | *3120.1* | 2692.0 | 1994.6 |
| 70° | *479.8* | *472.8* | *706.8* | *1002.0* | *1343.1* | *1971.1* | *2654.4* | *3140.1* | *3148.3* | *2712.0* | *1937.0* |
| 72.5° | 354.0 | 352.8 | 517.5 | 715.0 | 999.6 | 1664.1 | 2465.0 | 2994.2 | *3009.5* | 2570.9 | 1767.6 |
| 75° | 278.7 | 282.3 | 369.3 | 508.1 | 666.8 | 1231.3 | 2073.4 | 2567.3 | *2590.9* | 2220.4 | 1467.7 |
| 77.5° | 228.2 | 228.2 | 258.7 | 364.6 | 445.7 | 764.4 | 1491.2 | 1879.3 | *1926.4* | 1713.5 | 1130.2 |
| 80° | 184.6 | 188.2 | 191.7 | 254.0 | 295.2 | 436.3 | 867.9 | 1253.7 | *1287.8* | 1193.7 | 816.2 |
| 82.5° | 101.1 | 108.2 | 104.7 | 131.7 | 148.2 | 202.3 | 344.6 | 506.9 | *558.6* | 497.5 | 370.5 |
| 85° | 7.1 | 4.7 | 8.2 | 10.6 | 12.9 | 20.0 | 27.0 | 37.6 | *35.3* | 50.6 | 25.9 |
| 87.5° | 1.2 | 1.2 | 1.2 | 2.4 | 2.4 | 3.5 | 4.7 | 4.7 | *4.7* | 4.7 | 4.7 |
| 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: P868530
CATALOG NUMBER: EMM2-HTN-SA1B-730-U-T3

**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 1018.5 | 1018.5 | 1018.5 | 1018.5 | 1018.5 | 1018.5 | 1018.5 | 1018.5 | 1018.5 | 1018.5 | 1018.5 |
| 2.5° | 1023.2 | 1017.3 | 1007.9 | 1005.5 | 1002.0 | 997.3 | 992.6 | 985.5 | 983.2 | 985.5 | 987.9 |
| 5° | 1024.3 | 1016.1 | 1000.8 | 991.4 | 982.0 | 973.8 | 964.4 | 955.0 | 949.1 | 950.3 | 955.0 |
| 7.5° | 1027.9 | 1016.1 | 992.6 | 977.3 | 962.0 | 949.1 | 933.8 | 923.2 | 916.1 | 917.3 | 920.9 |
| 10° | 1032.6 | 1016.1 | 987.9 | 962.0 | 940.8 | 922.0 | 906.7 | 893.8 | 886.7 | 885.6 | 886.7 |
| 12.5° | 1033.8 | 1014.9 | 977.3 | 945.6 | 919.7 | 895.0 | 878.5 | 866.8 | 859.7 | 856.2 | 858.5 |
| 15° | 1037.3 | 1011.4 | 966.7 | 927.9 | 896.2 | 870.3 | 850.3 | 836.2 | 831.5 | 829.1 | 827.9 |
| 17.5° | 1042.0 | 1010.2 | 957.3 | 910.3 | 872.6 | 843.2 | 825.6 | 811.5 | 805.6 | 803.2 | 805.6 |
| 20° | 1049.0 | 1011.4 | 946.7 | 892.6 | 851.5 | 822.1 | 802.1 | 788.0 | 783.3 | 782.1 | 780.9 |
| 22.5° | 1058.5 | 1013.8 | 938.5 | 876.2 | 827.9 | 798.5 | 778.6 | 769.1 | 765.6 | 766.8 | 766.8 |
| 25° | 1067.9 | 1016.1 | 926.7 | 853.8 | 803.2 | 772.7 | 758.6 | 751.5 | 753.9 | 758.6 | 758.6 |
| 27.5° | 1076.1 | 1014.9 | 910.3 | 830.3 | 773.8 | 745.6 | 735.0 | 736.2 | 742.1 | 750.3 | 751.5 |
| 30° | 1086.7 | 1014.9 | 892.6 | 800.9 | 740.9 | 713.9 | 711.5 | 720.9 | 730.3 | 738.6 | 738.6 |
| 32.5° | 1103.1 | 1022.0 | 878.5 | 771.5 | 706.8 | 685.6 | 696.2 | 709.2 | 719.7 | 728.0 | 730.3 |
| 35° | 1131.4 | 1037.3 | 869.1 | 742.1 | 673.9 | 658.6 | 678.6 | 699.8 | 706.8 | 712.7 | 713.9 |
| 37.5° | 1158.4 | 1051.4 | 857.3 | 713.9 | 639.8 | 633.9 | 660.9 | 683.3 | 684.5 | 688.0 | 688.0 |
| 40° | 1184.3 | 1062.0 | 842.1 | 683.3 | 606.8 | 606.8 | 638.6 | 657.4 | 655.1 | 651.5 | 652.7 |
| 42.5° | 1212.5 | 1067.9 | 824.4 | 655.1 | 579.8 | 579.8 | 605.7 | 622.1 | 621.0 | 625.7 | 629.2 |
| 45° | 1246.6 | 1079.6 | 800.9 | 629.2 | 551.6 | 546.9 | 568.0 | 582.1 | 599.8 | 621.0 | 626.8 |
| 47.5° | 1293.7 | 1096.1 | 782.1 | 601.0 | 528.0 | 511.6 | 519.8 | 549.2 | 569.2 | 586.9 | 589.2 |
| 50° | 1343.1 | 1119.6 | 765.6 | 571.6 | 499.8 | 470.4 | 477.5 | 510.4 | 522.2 | 529.2 | 532.8 |
| 52.5° | 1396.0 | 1138.4 | 751.5 | 546.9 | 470.4 | 428.1 | 437.5 | 469.2 | 477.5 | 483.4 | 484.5 |
| 55° | 1441.8 | 1153.7 | 733.9 | 523.3 | 438.7 | 388.1 | 399.9 | 430.4 | 438.7 | 445.7 | 445.7 |
| 57.5° | 1490.1 | 1167.8 | 722.1 | 503.4 | 404.6 | 355.2 | 363.4 | 394.0 | 405.7 | 408.1 | 411.6 |
| 60° | 1530.1 | 1180.8 | 711.5 | 484.5 | 372.8 | 325.8 | 331.6 | 358.7 | 372.8 | 374.0 | 376.3 |
| 62.5° | 1558.3 | 1189.0 | 705.6 | 461.0 | 341.1 | 296.4 | 301.1 | 328.1 | 344.6 | 348.1 | 349.3 |
| 65° | 1575.9 | 1193.7 | 695.1 | 430.4 | 314.0 | 271.7 | 271.7 | 298.7 | 315.2 | 323.4 | 325.8 |
| 67.5° | 1567.7 | 1185.5 | 666.8 | 395.2 | 289.3 | 247.0 | 245.8 | 272.8 | 287.0 | 291.7 | 292.8 |
| 70° | *1504.2* | *1137.2* | *609.2* | *351.6* | *263.4* | *224.6* | *222.3* | *247.0* | *259.9* | *249.3* | *250.5* |
| 72.5° | 1374.8 | 1027.9 | 530.4 | 308.1 | 236.4 | 203.5 | 201.1 | 222.3 | 223.5 | 223.5 | 222.3 |
| 75° | 1158.4 | 839.7 | 423.4 | 262.3 | 208.2 | 181.1 | 182.3 | 198.8 | 199.9 | 205.8 | 202.3 |
| 77.5° | 887.9 | 622.1 | 330.5 | 209.3 | 176.4 | 161.1 | 167.0 | 172.9 | 181.1 | 189.3 | 181.1 |
| 80° | 645.7 | 429.3 | 229.3 | 156.4 | 136.4 | 136.4 | 138.8 | 144.7 | 156.4 | 164.6 | 156.4 |
| 82.5° | 276.4 | 189.3 | 105.8 | 77.6 | 67.0 | 65.9 | 67.0 | 67.0 | 82.3 | 84.7 | 74.1 |
| 85° | 21.2 | 17.6 | 12.9 | 12.9 | 10.6 | 5.9 | 5.9 | 4.7 | 3.5 | 3.5 | 3.5 |
| 87.5° | 4.7 | 3.5 | 3.5 | 3.5 | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 |
| 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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# LM-79-2019: Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Report Prepared for

Cooper Lighting Solutions

Streetworks

Report Number: SP1-2407-157-4

Test Date: 08/07/2024

Luminaire Tested: MEM2-HTN-SA-40-730-U-5WQ-2

Data in this report applies to families of products including MEM2-HTN-SA-40-730-U-5WQ-2

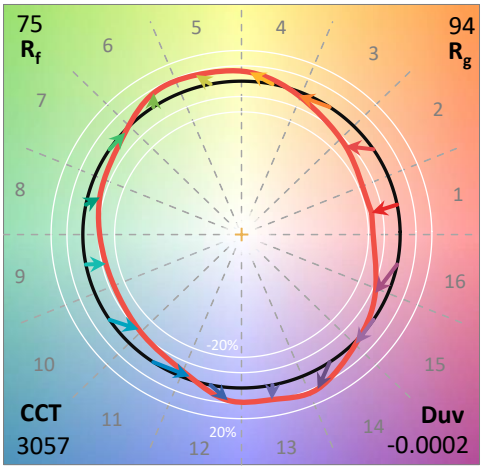
Report Generated By FNC07603 / LDUCLS01DT446
Version: v7.04

## Test Information

| | |
|---|---|
| Test Method: | LM-79-2019 |
| Report Number: | SP1-2407-157-4 |
| 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-40-730-U-5WQ-2** |
| Description: | Epic Modern Light Square 40W 5WQ Optic and Flare Trim |

## Spectral Parameters

| | | | | | |
|---|---|---|---|---|---|
| CCT (K): | 3057 | CRI (Ra): | 71.7 | | |
| CIE u': | 0.2487 | R1: | 68.1 | R9: | -34.8 |
| CIE v': | 0.5199 | R2: | 82.0 | R10: | 58.5 |
| Duv: | -0.0002 | R3: | 93.5 | R11: | 62.5 |
| CIE x: | 0.4326 | R4: | 67.5 | R12: | 47.5 |
| CIE y: | 0.4020 | R5: | 67.2 | R13: | 70.7 |
| CIE z: | 0.1654 | R6: | 74.9 | R14: | 96.4 |
| Peak Wavelength (nm): | 593 | R7: | 77.4 | R15: | 60.0 |
| Dominant Wavelength (nm): | 582 | R8: | 43.1 | | |
| Purity: | 50.50735 | | | | |
| Rf: | 74.6 | | | | |
| Rg: | 94 | | | | |



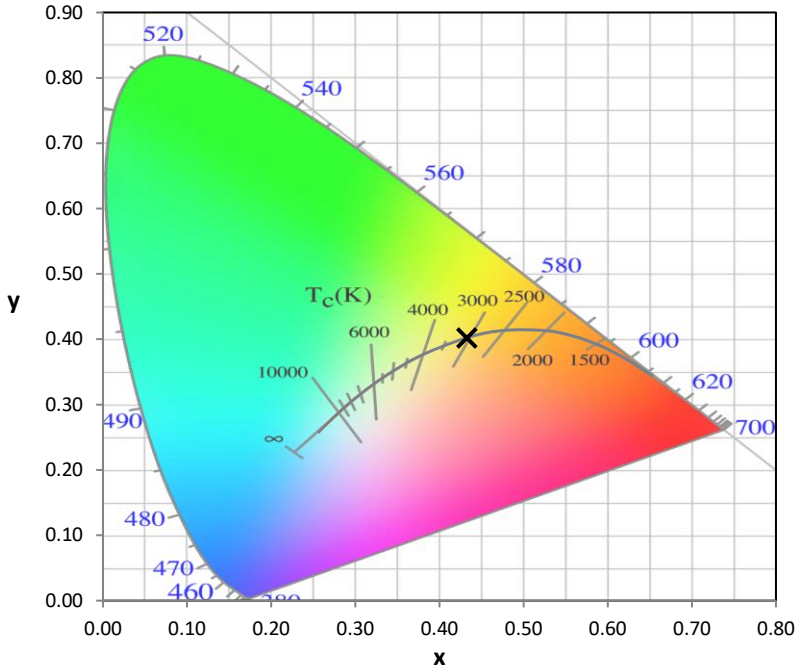

## Test Conditions

| | |
|---|---|
| Stabilization Time: | 21M |
| Operation Time: | 1H 21M |
| Sphere Temperature (°C): | 24.2 |

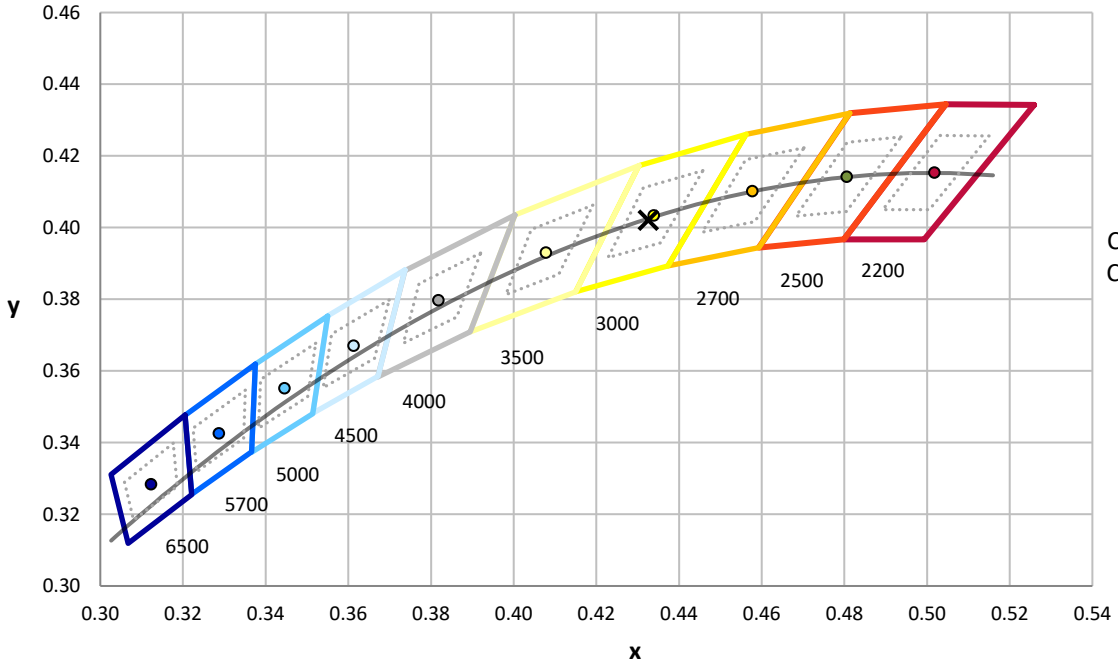
| Measurement and Test Equipment | | | |
|---|---|---|---|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | IN0058 | 6/18/2024 | 12/18/2024 |
| Power Meter | INXT2011004 | 2/8/2024 | 2/8/2025 |
| AC Power Source | IN0063 | 10/24/2023 | 10/24/2024 |
| DC 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: SP1-2407-157-4

## CIE 1931 Chromaticity Diagram




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




CCT = 3057K
CIE x = 0.4326
CIE y = 0.4020
Duv = -0.0002

Point lies inside the ANSI 3000K 4-step quadrangle

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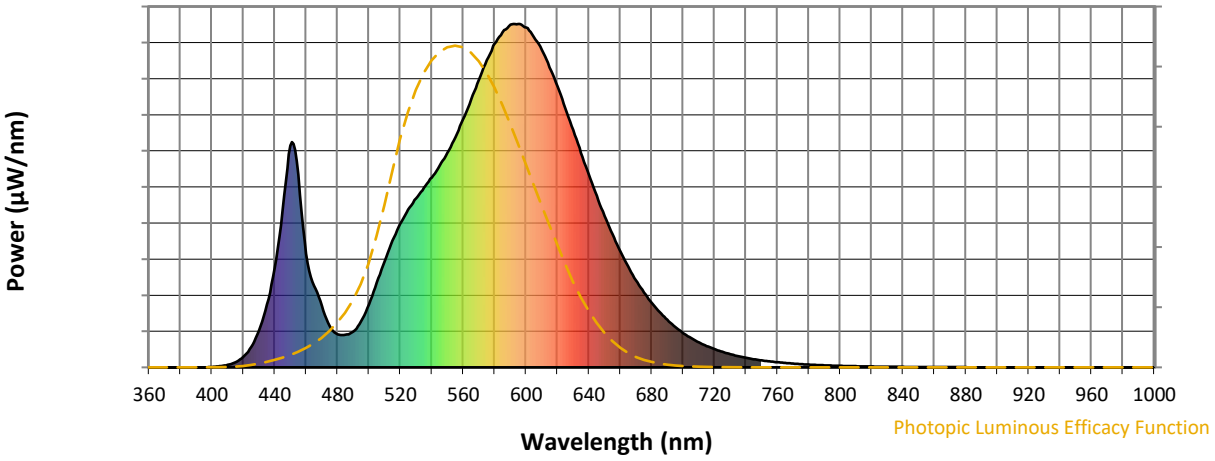
## Photopic Flux vs. Wavelength




## 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 | 104 | NR | 620 | 818 | NR | 750 | 20 | NR | 880 | 1 | NR |
| 365 | 0 | NR | 495 | 135 | NR | 625 | 755 | NR | 755 | 17 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 184 | NR | 630 | 691 | NR | 760 | 15 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 247 | NR | 635 | 625 | NR | 765 | 13 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 309 | NR | 640 | 561 | NR | 770 | 11 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 369 | NR | 645 | 499 | NR | 775 | 9 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 419 | NR | 650 | 441 | NR | 780 | 8 | NR | 910 | 0 | NR |
| 395 | 0 | NR | 525 | 460 | NR | 655 | 388 | NR | 785 | 7 | NR | 915 | 0 | NR |
| 400 | 1 | NR | 530 | 492 | NR | 660 | 338 | NR | 790 | 6 | NR | 920 | 0 | NR |
| 405 | 3 | NR | 535 | 524 | NR | 665 | 294 | NR | 795 | 5 | NR | 925 | 0 | NR |
| 410 | 7 | NR | 540 | 553 | NR | 670 | 253 | NR | 800 | 4 | NR | 930 | 0 | NR |
| 415 | 15 | NR | 545 | 588 | NR | 675 | 218 | NR | 805 | 4 | NR | 935 | 0 | NR |
| 420 | 31 | NR | 550 | 625 | NR | 680 | 188 | NR | 810 | 3 | NR | 940 | 0 | NR |
| 425 | 60 | NR | 555 | 670 | NR | 685 | 161 | NR | 815 | 3 | NR | 945 | 0 | NR |
| 430 | 107 | NR | 560 | 723 | NR | 690 | 139 | NR | 820 | 3 | NR | 950 | 0 | NR |
| 435 | 183 | NR | 565 | 780 | NR | 695 | 118 | NR | 825 | 2 | NR | 955 | 0 | NR |
| 440 | 289 | NR | 570 | 837 | NR | 700 | 100 | NR | 830 | 2 | NR | 960 | 0 | NR |
| 445 | 460 | NR | 575 | 894 | NR | 705 | 85 | NR | 835 | 2 | NR | 965 | 0 | NR |
| 450 | 646 | NR | 580 | 942 | NR | 710 | 73 | NR | 840 | 1 | NR | 970 | 0 | NR |
| 455 | 561 | NR | 585 | 976 | NR | 715 | 62 | NR | 845 | 1 | NR | 975 | 0 | NR |
| 460 | 331 | NR | 590 | 998 | NR | 720 | 53 | NR | 850 | 1 | NR | 980 | 0 | NR |
| 465 | 238 | NR | 595 | 1000 | NR | 725 | 45 | NR | 855 | 1 | NR | 985 | 0 | NR |
| 470 | 178 | NR | 600 | 990 | NR | 730 | 39 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 120 | NR | 605 | 962 | NR | 735 | 33 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 96 | NR | 610 | 925 | NR | 740 | 28 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 95 | NR | 615 | 873 | NR | 745 | 24 | NR | 875 | 1 | NR | | | |

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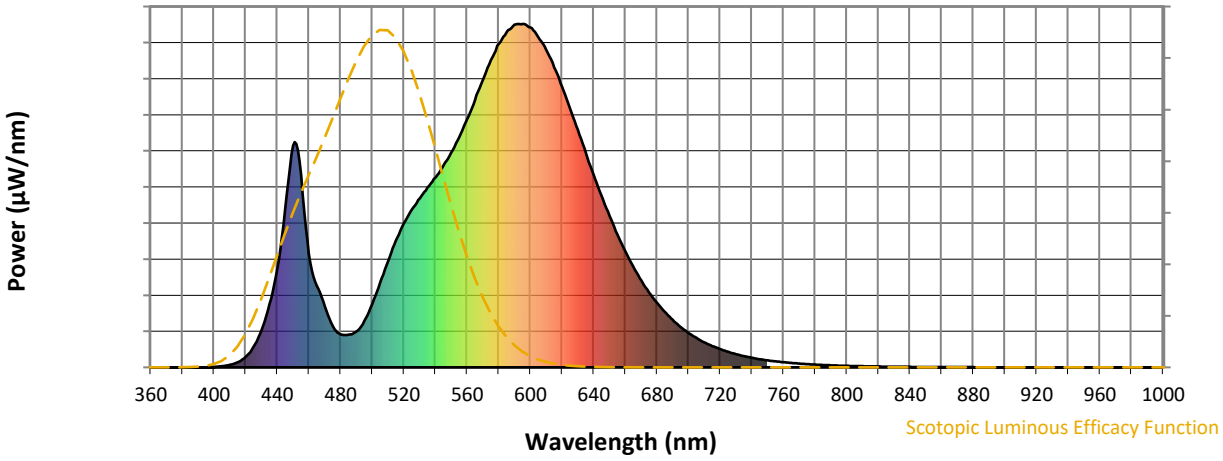
## Scotopic Flux vs. Wavelength




**Scotopic Lumens: NR** **S/P: 1.23**

| 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 | 104 | NR | 620 | 818 | NR | 750 | 20 | NR | 880 | 1 | NR |
| 365 | 0 | NR | 495 | 135 | NR | 625 | 755 | NR | 755 | 17 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 184 | NR | 630 | 691 | NR | 760 | 15 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 247 | NR | 635 | 625 | NR | 765 | 13 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 309 | NR | 640 | 561 | NR | 770 | 11 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 369 | NR | 645 | 499 | NR | 775 | 9 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 419 | NR | 650 | 441 | NR | 780 | 8 | NR | 910 | 0 | NR |
| 395 | 0 | NR | 525 | 460 | NR | 655 | 388 | NR | 785 | 7 | NR | 915 | 0 | NR |
| 400 | 1 | NR | 530 | 492 | NR | 660 | 338 | NR | 790 | 6 | NR | 920 | 0 | NR |
| 405 | 3 | NR | 535 | 524 | NR | 665 | 294 | NR | 795 | 5 | NR | 925 | 0 | NR |
| 410 | 7 | NR | 540 | 553 | NR | 670 | 253 | NR | 800 | 4 | NR | 930 | 0 | NR |
| 415 | 15 | NR | 545 | 588 | NR | 675 | 218 | NR | 805 | 4 | NR | 935 | 0 | NR |
| 420 | 31 | NR | 550 | 625 | NR | 680 | 188 | NR | 810 | 3 | NR | 940 | 0 | NR |
| 425 | 60 | NR | 555 | 670 | NR | 685 | 161 | NR | 815 | 3 | NR | 945 | 0 | NR |
| 430 | 107 | NR | 560 | 723 | NR | 690 | 139 | NR | 820 | 3 | NR | 950 | 0 | NR |
| 435 | 183 | NR | 565 | 780 | NR | 695 | 118 | NR | 825 | 2 | NR | 955 | 0 | NR |
| 440 | 289 | NR | 570 | 837 | NR | 700 | 100 | NR | 830 | 2 | NR | 960 | 0 | NR |
| 445 | 460 | NR | 575 | 894 | NR | 705 | 85 | NR | 835 | 2 | NR | 965 | 0 | NR |
| 450 | 646 | NR | 580 | 942 | NR | 710 | 73 | NR | 840 | 1 | NR | 970 | 0 | NR |
| 455 | 561 | NR | 585 | 976 | NR | 715 | 62 | NR | 845 | 1 | NR | 975 | 0 | NR |
| 460 | 331 | NR | 590 | 998 | NR | 720 | 53 | NR | 850 | 1 | NR | 980 | 0 | NR |
| 465 | 238 | NR | 595 | 1000 | NR | 725 | 45 | NR | 855 | 1 | NR | 985 | 0 | NR |
| 470 | 178 | NR | 600 | 990 | NR | 730 | 39 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 120 | NR | 605 | 962 | NR | 735 | 33 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 96 | NR | 610 | 925 | NR | 740 | 28 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 95 | NR | 615 | 873 | NR | 745 | 24 | NR | 875 | 1 | NR | | | |

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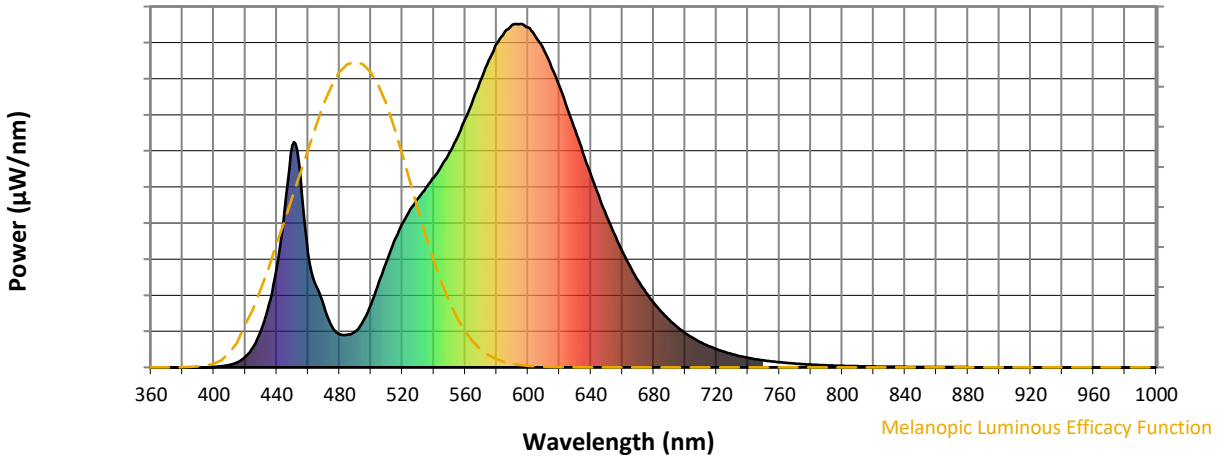
## Melanopic Flux vs. Wavelength




**Melanopic Lumens: NR** **M/P: 2.27**

| 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 | 104 | NR | 620 | 818 | NR | 750 | 20 | NR | 880 | 1 | NR |
| 365 | 0 | NR | 495 | 135 | NR | 625 | 755 | NR | 755 | 17 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 184 | NR | 630 | 691 | NR | 760 | 15 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 247 | NR | 635 | 625 | NR | 765 | 13 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 309 | NR | 640 | 561 | NR | 770 | 11 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 369 | NR | 645 | 499 | NR | 775 | 9 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 419 | NR | 650 | 441 | NR | 780 | 8 | NR | 910 | 0 | NR |
| 395 | 0 | NR | 525 | 460 | NR | 655 | 388 | NR | 785 | 7 | NR | 915 | 0 | NR |
| 400 | 1 | NR | 530 | 492 | NR | 660 | 338 | NR | 790 | 6 | NR | 920 | 0 | NR |
| 405 | 3 | NR | 535 | 524 | NR | 665 | 294 | NR | 795 | 5 | NR | 925 | 0 | NR |
| 410 | 7 | NR | 540 | 553 | NR | 670 | 253 | NR | 800 | 4 | NR | 930 | 0 | NR |
| 415 | 15 | NR | 545 | 588 | NR | 675 | 218 | NR | 805 | 4 | NR | 935 | 0 | NR |
| 420 | 31 | NR | 550 | 625 | NR | 680 | 188 | NR | 810 | 3 | NR | 940 | 0 | NR |
| 425 | 60 | NR | 555 | 670 | NR | 685 | 161 | NR | 815 | 3 | NR | 945 | 0 | NR |
| 430 | 107 | NR | 560 | 723 | NR | 690 | 139 | NR | 820 | 3 | NR | 950 | 0 | NR |
| 435 | 183 | NR | 565 | 780 | NR | 695 | 118 | NR | 825 | 2 | NR | 955 | 0 | NR |
| 440 | 289 | NR | 570 | 837 | NR | 700 | 100 | NR | 830 | 2 | NR | 960 | 0 | NR |
| 445 | 460 | NR | 575 | 894 | NR | 705 | 85 | NR | 835 | 2 | NR | 965 | 0 | NR |
| 450 | 646 | NR | 580 | 942 | NR | 710 | 73 | NR | 840 | 1 | NR | 970 | 0 | NR |
| 455 | 561 | NR | 585 | 976 | NR | 715 | 62 | NR | 845 | 1 | NR | 975 | 0 | NR |
| 460 | 331 | NR | 590 | 998 | NR | 720 | 53 | NR | 850 | 1 | NR | 980 | 0 | NR |
| 465 | 238 | NR | 595 | 1000 | NR | 725 | 45 | NR | 855 | 1 | NR | 985 | 0 | NR |
| 470 | 178 | NR | 600 | 990 | NR | 730 | 39 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 120 | NR | 605 | 962 | NR | 735 | 33 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 96 | NR | 610 | 925 | NR | 740 | 28 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 95 | NR | 615 | 873 | NR | 745 | 24 | NR | 875 | 1 | NR | | | |

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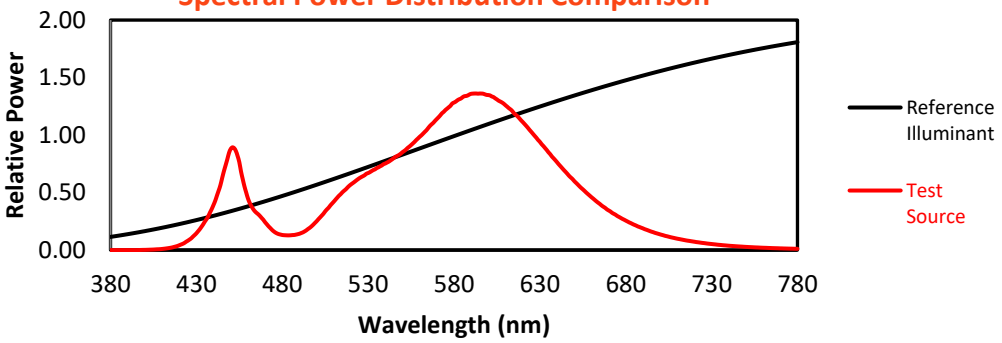
# TM-30-18

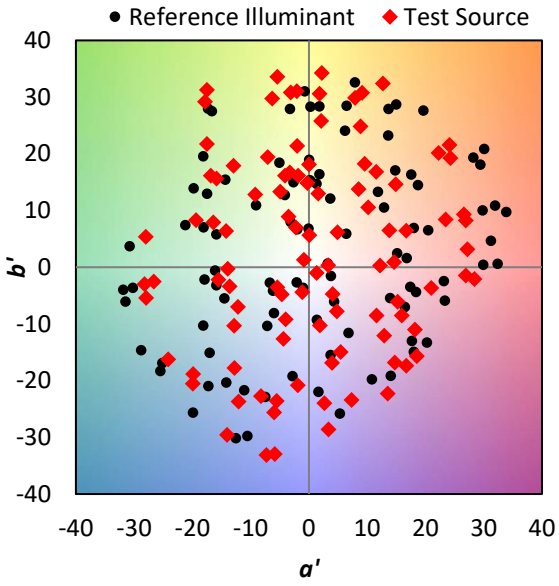
## Summary

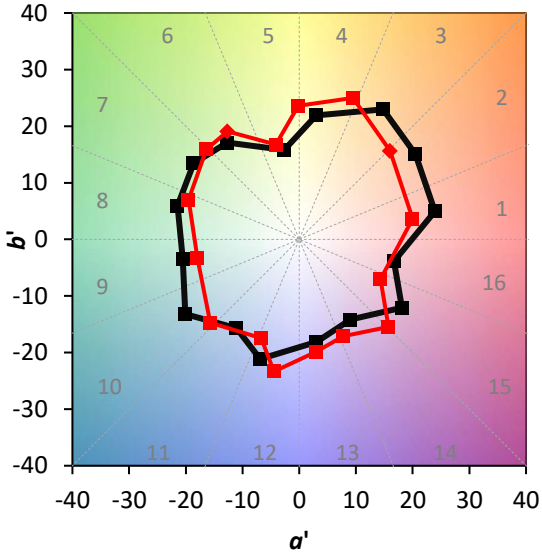
$R_f$ = 74.6
$R_g$ = 94
CIE $R_a$ = 71.7
$R_9$ = -34.8

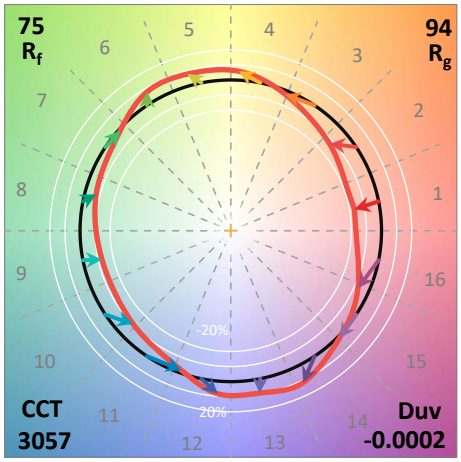
## Spectral Power Distribution Comparison

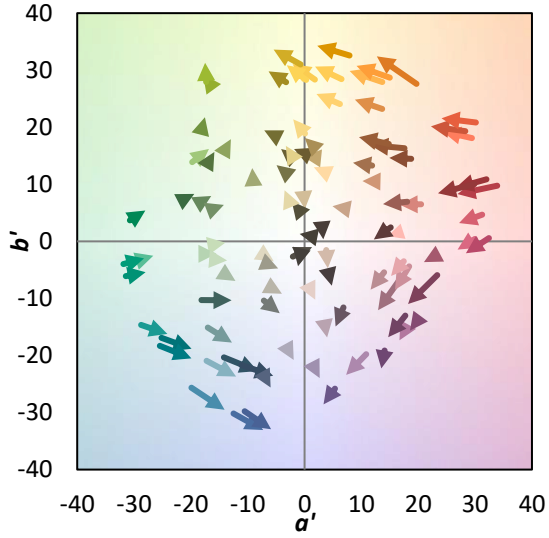



## Color Vector Graphics



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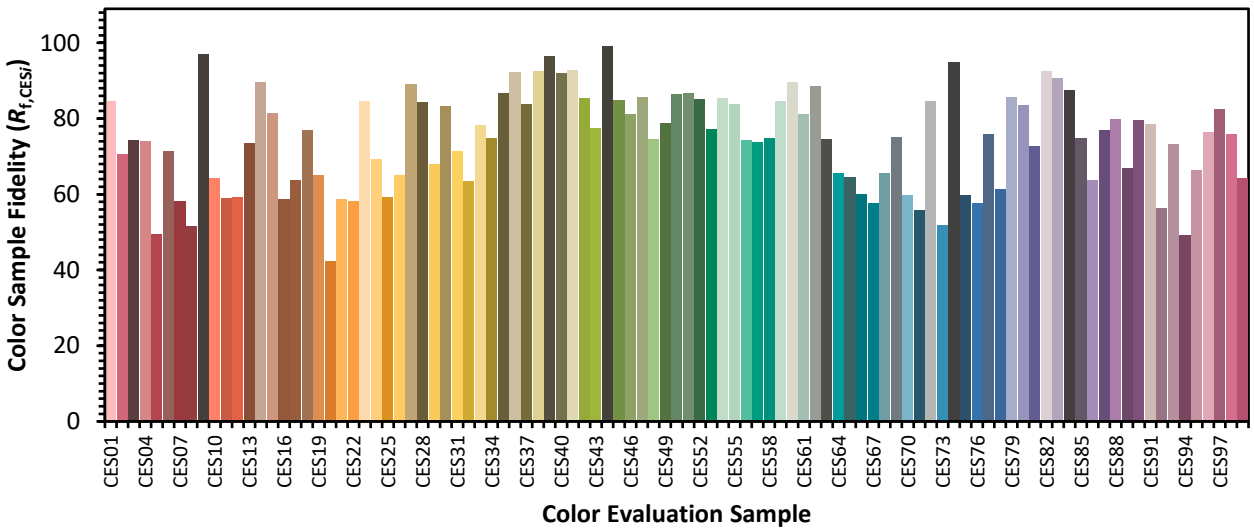
## Individual Sample Fidelity Index ($R_{f,i}$)

| | | | |
|---|---|---|---|
| CES01 = 86 | CES26 = 65 | CES51 = 87 | CES76 = 58 |
| CES02 = 62 | CES27 = 89 | CES52 = 85 | CES77 = 76 |
| CES03 = 31 | CES28 = 84 | CES53 = 77 | CES78 = 61 |
| CES04 = 71 | CES29 = 68 | CES54 = 85 | CES79 = 86 |
| CES05 = 49 | CES30 = 83 | CES55 = 84 | CES80 = 83 |
| CES06 = 51 | CES31 = 71 | CES56 = 74 | CES81 = 73 |
| CES07 = 41 | CES32 = 64 | CES57 = 74 | CES82 = 93 |
| CES08 = 40 | CES33 = 78 | CES58 = 75 | CES83 = 91 |
| CES09 = 29 | CES34 = 75 | CES59 = 85 | CES84 = 88 |
| CES10 = 76 | CES35 = 87 | CES60 = 90 | CES85 = 75 |
| CES11 = 59 | CES36 = 92 | CES61 = 81 | CES86 = 64 |
| CES12 = 65 | CES37 = 84 | CES62 = 89 | CES87 = 77 |
| CES13 = 43 | CES38 = 92 | CES63 = 75 | CES88 = 80 |
| CES14 = 74 | CES39 = 96 | CES64 = 65 | CES89 = 67 |
| CES15 = 71 | CES40 = 92 | CES65 = 64 | CES90 = 80 |
| CES16 = 47 | CES41 = 93 | CES66 = 60 | CES91 = 78 |
| CES17 = 50 | CES42 = 86 | CES67 = 58 | CES92 = 56 |
| CES18 = 56 | CES43 = 77 | CES68 = 66 | CES93 = 73 |
| CES19 = 73 | CES44 = 99 | CES69 = 75 | CES94 = 49 |
| CES20 = 66 | CES45 = 85 | CES70 = 60 | CES95 = 66 |
| CES21 = 87 | CES46 = 81 | CES71 = 56 | CES96 = 76 |
| CES22 = 79 | CES47 = 86 | CES72 = 85 | CES97 = 82 |
| CES23 = 92 | CES48 = 75 | CES73 = 52 | CES98 = 76 |
| CES24 = 91 | CES49 = 79 | CES74 = 95 | CES99 = 64 |
| CES25 = 73 | CES50 = 86 | CES75 = 60 | |



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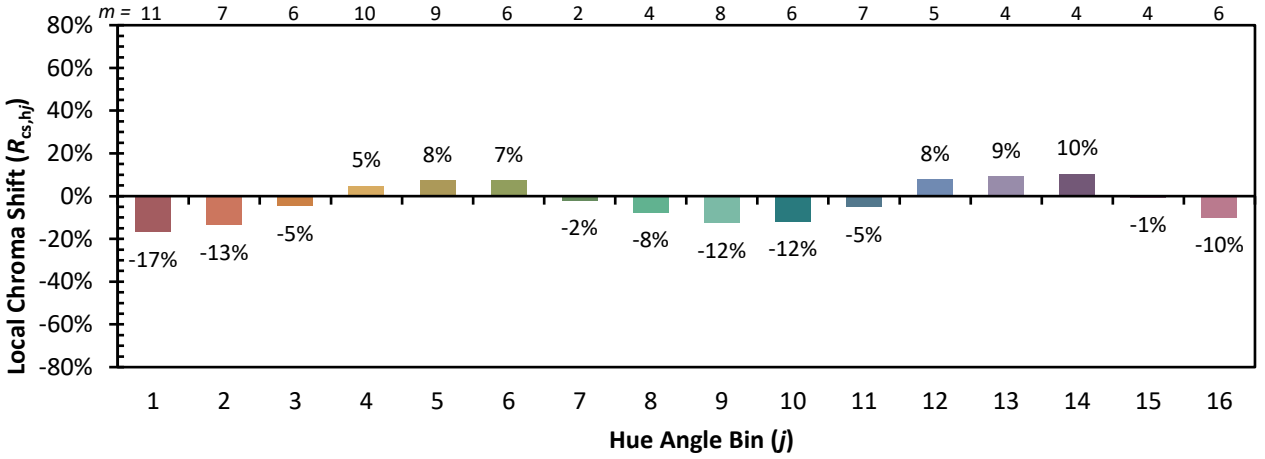
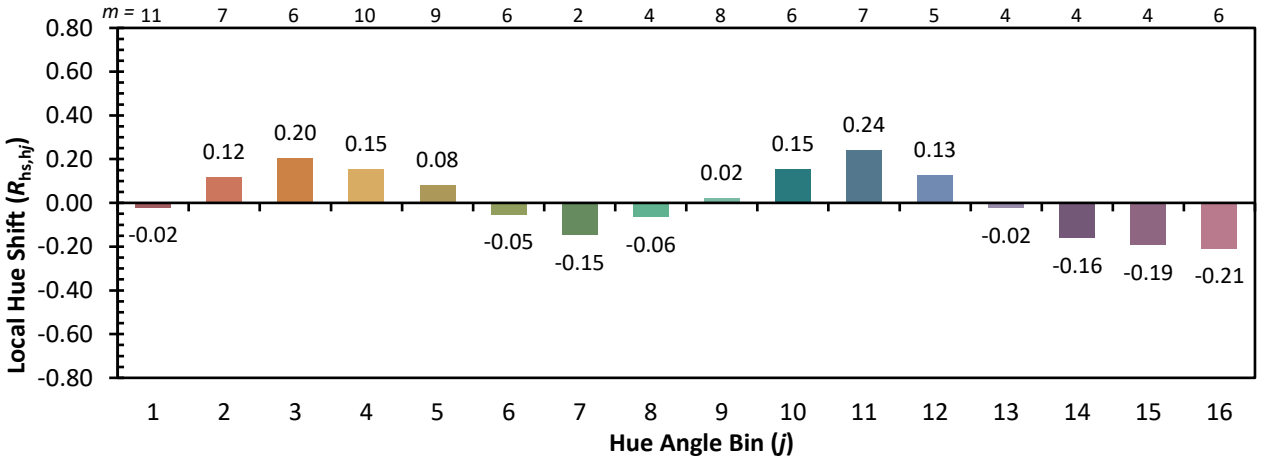
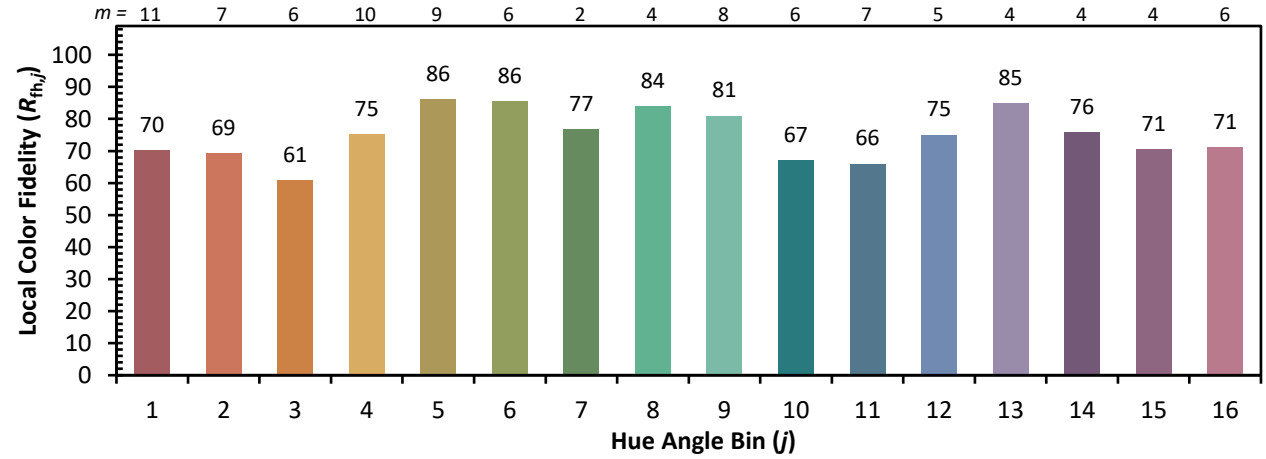
## Color Rendition by Hue-Angle Bin



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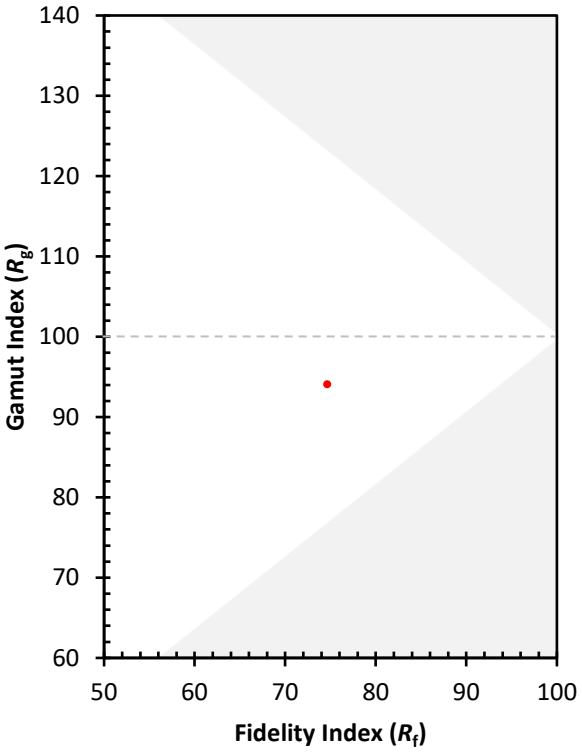
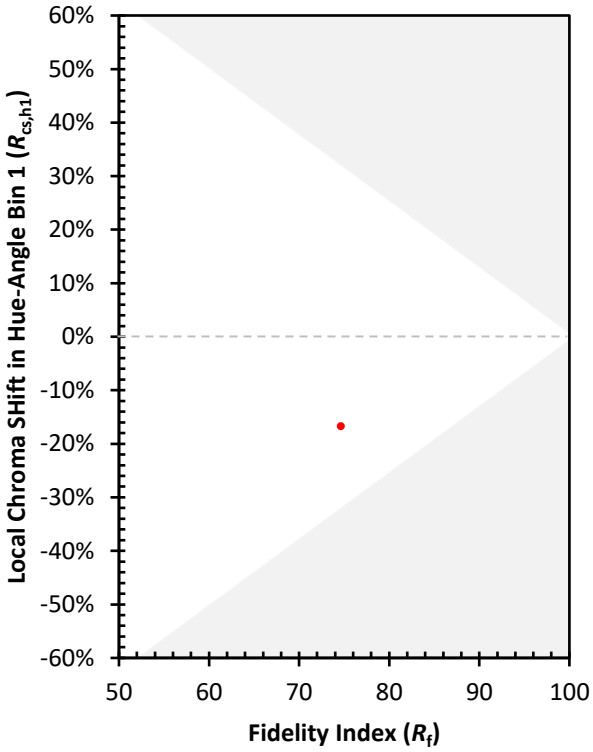
## Measure Comparisons

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