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: P867610

Luminaire Tested: **MEM2-HTN-SA-40-727-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: | P867610 |
| Test Lab: | INNOVATION CENTER(G3) |
| Issue Date: | 08/21/2024 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS (FORMERLY EATON) |
| Product Line: | STREETWORKS |
| Catalog Number: | MEM2-HTN-SA-40-727-U-T3 |
| Description: | EPIC MODERN TALL HOUSING DISCRETE LED ARRAYS 40W 70CRI 2700K FIXTURE w/ TYPE III DISTRIBUTION OPTIC |
| Light Source: | (10) 2700K CCT, 70 CRI LEDS |
| Ballast/Driver: | ELECTRONIC DRIVER |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 4590.4 lumens |
| Efficiency: | N/A |
| Efficacy: | 140.0 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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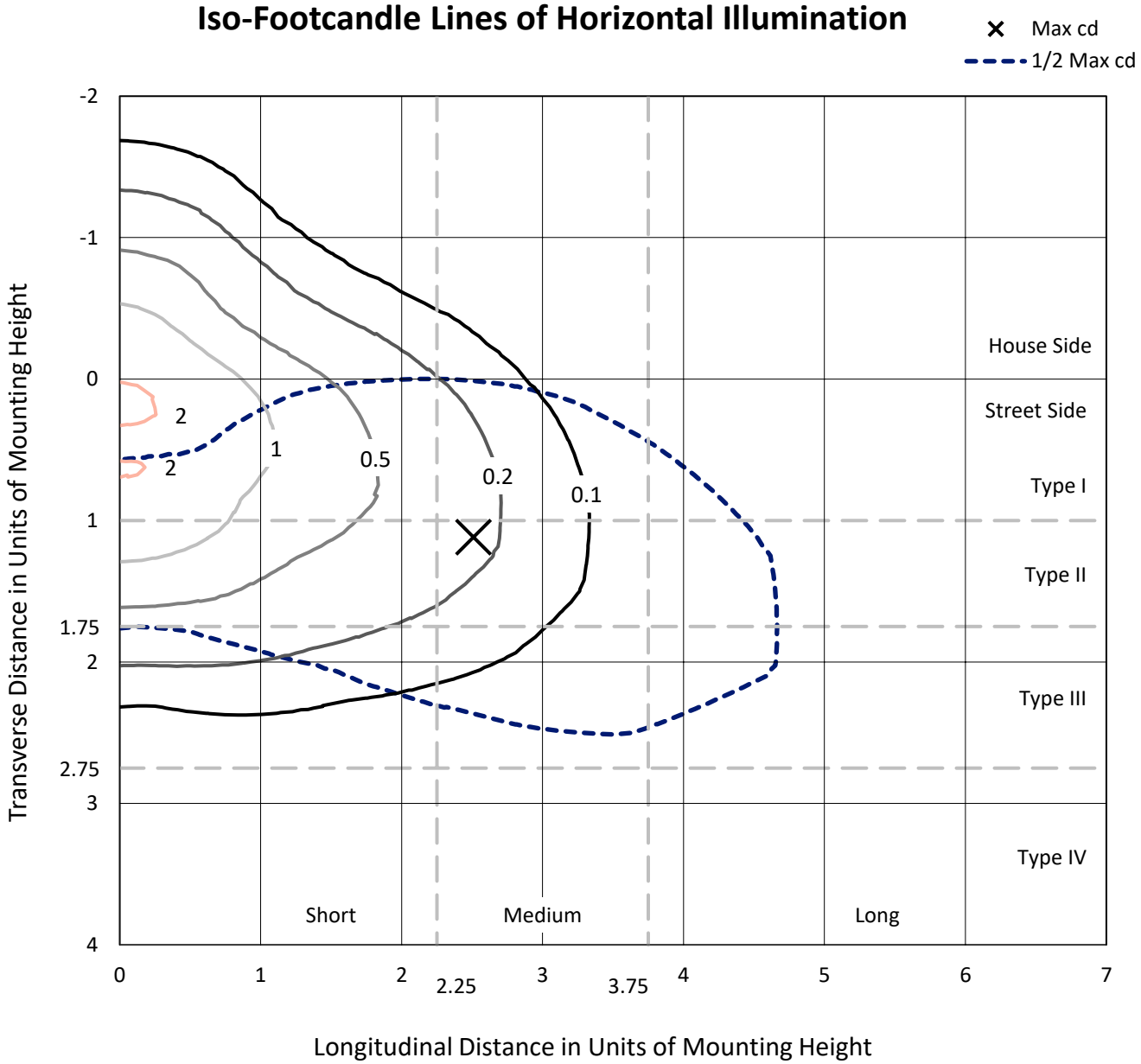
Scaled Data Report

REPORT NUMBER: P867610
CATALOG NUMBER: MEM2-HTN-SA-40-727-U-T3

## Iso-Footcandle Lines of Horizontal Illumination




Based on 20 foot mounting height. Maximum calculated value = 2.1 fc
Type III - Medium - N/A

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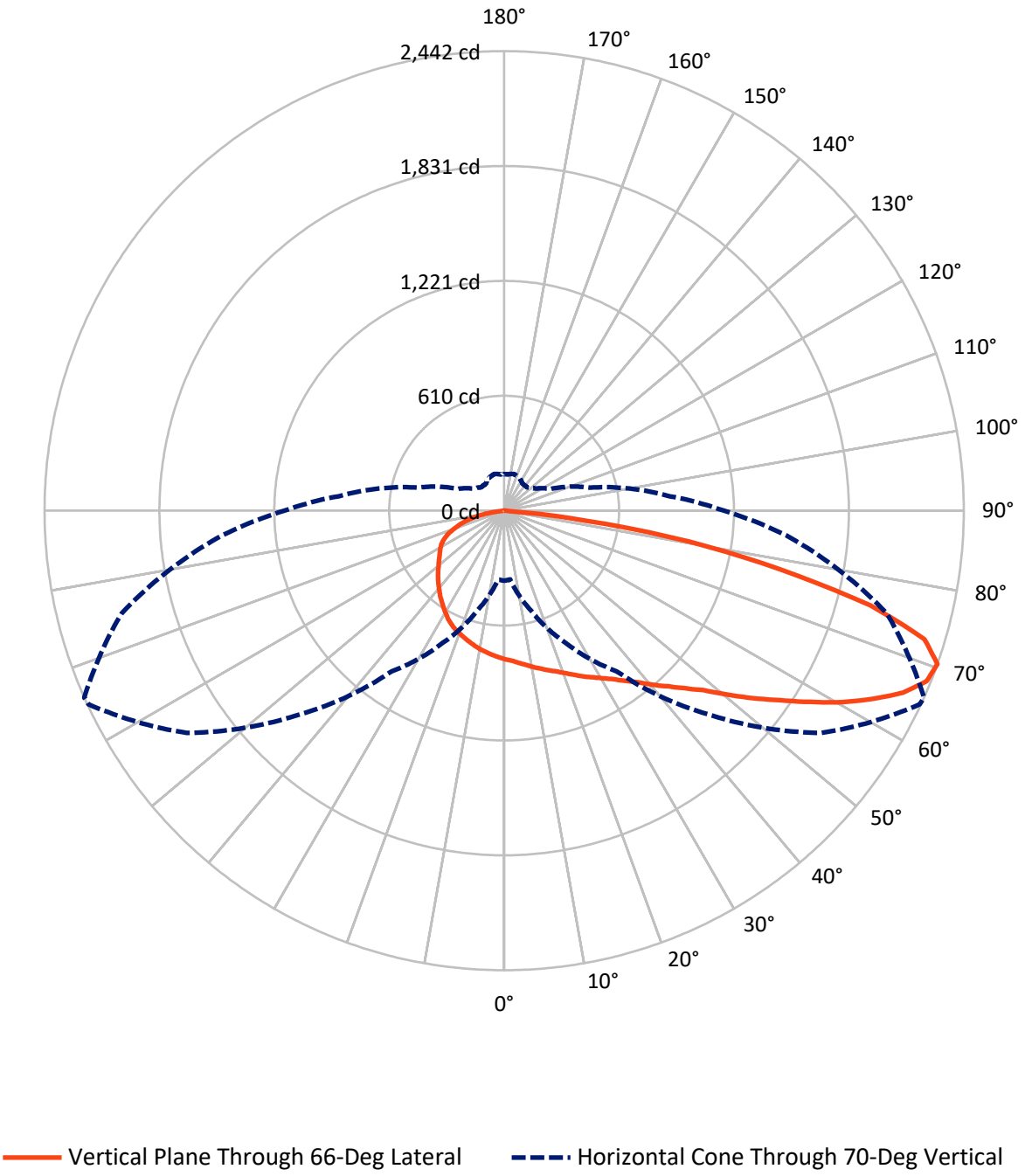
## Luminous Intensity Polar Plot



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Scaled Data Report

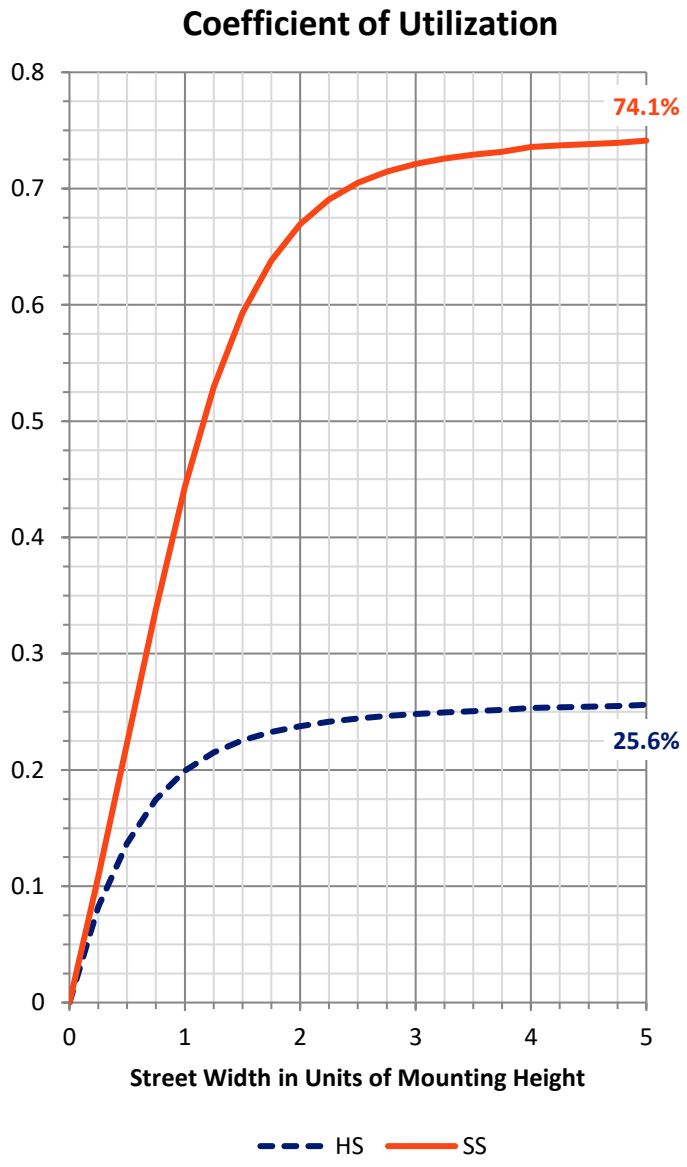
REPORT NUMBER: P867610
CATALOG NUMBER: MEM2-HTN-SA-40-727-U-T3

**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 1183.0 | 0.0 | 1183.0 |
| | % Fixture | 25.8 | 0.0 | 25.8 |
| **Street Side** | Lumens | 3407.5 | 0.0 | 3407.5 |
| | % Fixture | 74.2 | 0.0 | 74.2 |
| **Total** | Lumens | 4590.4 | 0.0 | 4590.4 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 75.6 | 1.6 |
| 10°-20° | 225.1 | 4.9 |
| 20°-30° | 378.2 | 8.2 |
| 30°-40° | 569.7 | 12.4 |
| 40°-50° | 773.4 | 16.8 |
| 50°-60° | 919.1 | 20.0 |
| 60°-70° | 938.0 | 20.4 |
| 70°-80° | 627.4 | 13.7 |
| 80°-90° | 83.9 | 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° | 4590.4 | 100.0 |
| 0°-180° | 4590.4 | 100.0 |



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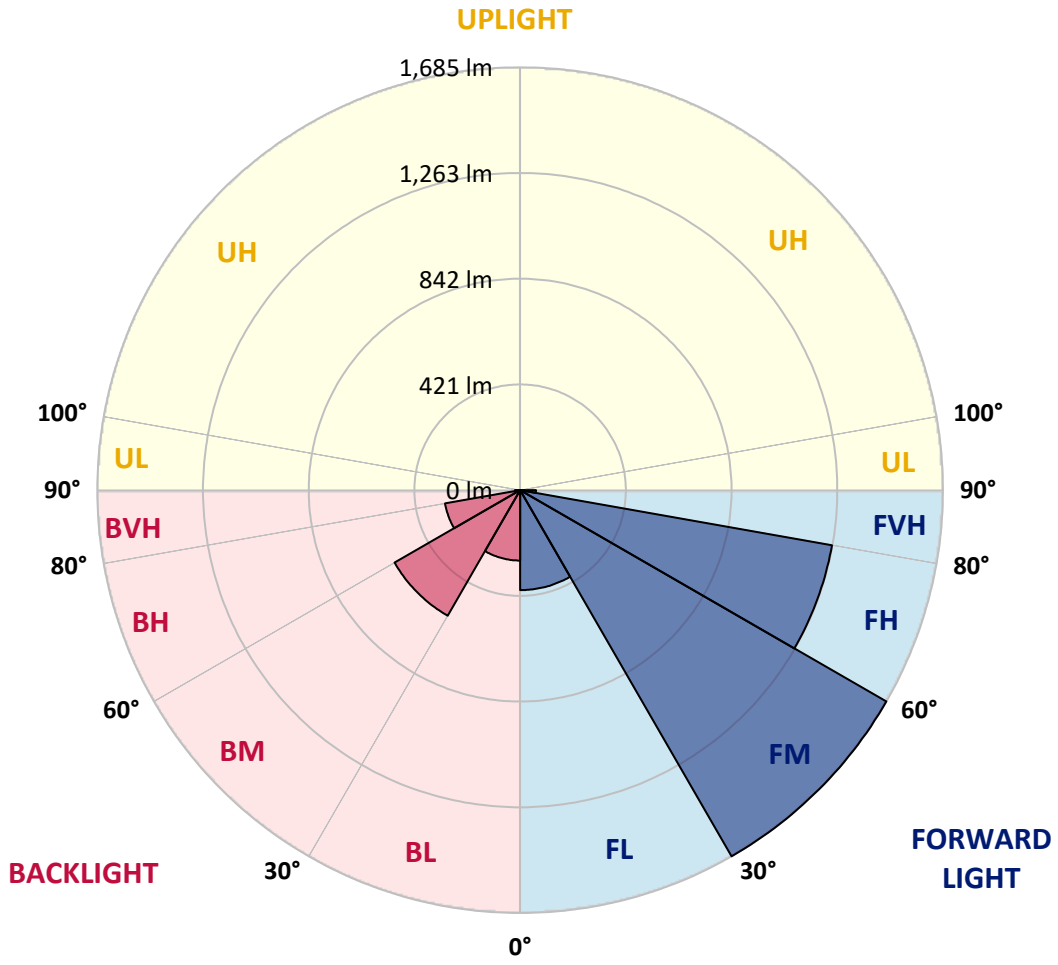
## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 398.4 | 8.7 | | | |
| FM | (30°-60°) | 1684.6 | 36.7 | | | |
| FH | (60°-80°) | 1261.6 | 27.5 | | | G1/1800 |
| FVH | (80°-90°) | 62.9 | 1.4 | | | G1/100 |
| BL | (0°-30°) | 280.5 | 6.1 | B1/500 | | |
| BM | (30°-60°) | 577.7 | 12.6 | B1/1000 | | |
| BH | (60°-80°) | 303.8 | 6.6 | B1/500 | | G1/500 |
| BVH | (80°-90°) | 21.1 | 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: P867610
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**CANDELA DISTRIBUTION (FULL):**

| | 0° | 5° | 15° | 25° | 35° | 45° | 55° | 65° | 66° | 75° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 789.8 | 789.8 | 789.8 | 789.8 | 789.8 | 789.8 | 789.8 | 789.8 | *789.8* | 789.8 | 789.8 |
| 2.5° | 818.1 | 814.4 | 811.7 | 813.5 | 808.1 | 809.9 | 803.5 | 798.9 | *798.0* | 796.2 | 794.4 |
| 5° | 843.6 | 843.6 | 839.1 | 839.1 | 832.7 | 831.8 | 822.6 | 812.6 | *812.6* | 806.2 | 798.9 |
| 7.5° | 871.0 | 869.2 | 863.7 | 862.8 | 855.5 | 853.7 | 843.6 | 828.1 | *827.2* | 815.3 | 804.4 |
| 10° | 890.1 | 891.0 | 887.4 | 887.4 | 881.9 | 877.4 | 862.8 | 846.4 | *844.5* | 829.0 | 811.7 |
| 12.5° | 904.7 | 906.5 | 905.6 | 905.6 | 901.1 | 901.1 | 884.7 | 862.8 | *860.9* | 840.9 | 816.3 |
| 15° | 920.2 | 919.3 | 922.1 | 923.0 | 921.1 | 918.4 | 906.5 | 881.0 | *880.1* | 853.7 | 822.6 |
| 17.5° | 933.9 | 933.0 | 933.9 | 938.5 | 939.4 | 939.4 | 927.5 | 901.1 | *897.4* | 869.2 | 828.1 |
| 20° | 942.1 | 943.9 | 947.6 | 953.1 | 955.8 | 963.1 | 953.1 | 924.8 | *921.1* | 885.6 | 840.0 |
| 22.5° | 973.1 | 967.7 | 970.4 | 974.0 | 977.7 | 987.7 | 978.6 | 949.4 | *946.7* | 910.2 | 853.7 |
| 25° | 1026.0 | 1026.0 | 1019.6 | 1013.3 | 1008.7 | 1013.3 | 1006.0 | 977.7 | *975.9* | 932.1 | 869.2 |
| 27.5° | 1118.1 | 1118.1 | 1104.5 | 1080.7 | 1050.6 | 1042.4 | 1037.0 | 1007.8 | *1002.3* | 955.8 | 879.2 |
| 30° | 1234.9 | 1238.5 | 1213.9 | 1173.8 | 1118.1 | 1081.7 | 1068.0 | 1036.1 | *1033.3* | 979.5 | 894.7 |
| 32.5° | 1359.8 | 1367.1 | 1348.9 | 1290.5 | 1199.3 | 1128.2 | 1106.3 | 1073.4 | *1067.1* | 1007.8 | 914.8 |
| 35° | 1472.0 | 1479.3 | 1454.7 | 1400.0 | 1283.2 | 1195.7 | 1151.9 | 1114.5 | *1110.8* | 1044.3 | 944.9 |
| 37.5° | 1563.2 | 1565.0 | 1549.5 | 1482.9 | 1353.4 | 1252.2 | 1208.4 | 1163.7 | *1156.4* | 1088.0 | 976.8 |
| 40° | 1659.9 | 1667.2 | 1651.7 | 1569.6 | 1417.3 | 1313.3 | 1265.0 | 1223.0 | *1216.6* | 1133.6 | 1006.9 |
| 42.5° | 1761.1 | 1760.2 | 1760.2 | 1644.4 | 1481.1 | 1364.4 | 1326.1 | 1279.6 | *1275.9* | 1180.2 | 1039.7 |
| 45° | 1823.1 | 1826.8 | 1816.7 | 1689.1 | 1575.1 | 1417.3 | 1385.4 | 1351.6 | *1345.2* | 1244.9 | 1082.6 |
| 47.5° | 1838.6 | 1830.4 | 1784.8 | 1723.7 | 1680.9 | 1472.0 | 1460.1 | 1440.1 | *1425.5* | 1316.0 | 1135.5 |
| 50° | 1817.7 | 1804.9 | 1778.4 | 1739.2 | 1720.1 | 1537.7 | 1535.8 | 1545.9 | *1535.8* | 1402.7 | 1196.6 |
| 52.5° | 1739.2 | 1737.4 | 1732.8 | 1742.0 | 1711.0 | 1589.7 | 1621.6 | 1656.2 | *1654.4* | 1491.2 | 1260.4 |
| 55° | 1574.1 | 1586.0 | 1640.7 | 1698.2 | 1676.3 | 1625.2 | 1717.3 | 1783.9 | *1776.6* | 1595.1 | 1326.1 |
| 57.5° | 1405.4 | 1417.3 | 1487.5 | 1624.3 | 1642.6 | 1663.5 | 1825.0 | 1928.9 | *1917.1* | 1708.2 | 1386.3 |
| 60° | 1258.6 | 1245.8 | 1316.0 | 1513.0 | 1595.1 | 1698.2 | 1931.7 | 2075.8 | *2065.7* | 1821.3 | 1448.3 |
| 62.5° | 1026.0 | 1038.8 | 1151.0 | 1350.7 | 1528.5 | 1720.1 | 2019.2 | 2208.9 | *2202.5* | 1925.3 | 1498.5 |
| 65° | 811.7 | 794.4 | 963.1 | 1180.2 | 1413.6 | 1712.8 | 2094.9 | 2333.9 | *2329.3* | 2027.4 | 1536.8 |
| 67.5° | 551.8 | 539.9 | 762.4 | 1010.5 | 1257.7 | 1654.4 | 2112.2 | 2417.8 | *2419.6* | 2087.6 | 1546.8 |
| 70° | *372.1* | *366.6* | *548.1* | *777.0* | *1041.5* | *1528.5* | *2058.4* | *2435.1* | *2441.5* | *2103.1* | *1502.1* |
| 72.5° | 274.5 | 273.6 | 401.3 | 554.5 | 775.2 | 1290.5 | 1911.6 | 2322.0 | *2333.9* | 1993.7 | 1370.8 |
| 75° | 216.1 | 218.9 | 286.4 | 394.0 | 517.1 | 954.9 | 1607.9 | 1990.9 | *2009.2* | 1721.9 | 1138.2 |
| 77.5° | 176.9 | 176.9 | 200.6 | 282.7 | 345.7 | 592.8 | 1156.4 | 1457.4 | *1493.9* | 1328.8 | 876.5 |
| 80° | 143.2 | 145.9 | 148.7 | 197.0 | 228.9 | 338.4 | 673.1 | 972.2 | *998.7* | 925.7 | 632.9 |
| 82.5° | 78.4 | 83.9 | 81.2 | 102.1 | 114.9 | 156.9 | 267.2 | 393.1 | *433.2* | 385.8 | 287.3 |
| 85° | 5.5 | 3.6 | 6.4 | 8.2 | 10.0 | 15.5 | 21.0 | 29.2 | *27.4* | 39.2 | 20.1 |
| 87.5° | 0.9 | 0.9 | 0.9 | 1.8 | 1.8 | 2.7 | 3.6 | 3.6 | *3.6* | 3.6 | 3.6 |
| 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: P867610
CATALOG NUMBER: MEM2-HTN-SA-40-727-U-T3

**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 789.8 | 789.8 | 789.8 | 789.8 | 789.8 | 789.8 | 789.8 | 789.8 | 789.8 | 789.8 | 789.8 |
| 2.5° | 793.5 | 788.9 | 781.6 | 779.8 | 777.0 | 773.4 | 769.7 | 764.3 | 762.4 | 764.3 | 766.1 |
| 5° | 794.4 | 788.0 | 776.1 | 768.8 | 761.5 | 755.2 | 747.9 | 740.6 | 736.0 | 736.9 | 740.6 |
| 7.5° | 797.1 | 788.0 | 769.7 | 757.9 | 746.0 | 736.0 | 724.1 | 715.9 | 710.5 | 711.4 | 714.1 |
| 10° | 800.8 | 788.0 | 766.1 | 746.0 | 729.6 | 715.0 | 703.2 | 693.1 | 687.7 | 686.8 | 687.7 |
| 12.5° | 801.7 | 787.1 | 757.9 | 733.3 | 713.2 | 694.0 | 681.3 | 672.2 | 666.7 | 664.0 | 665.8 |
| 15° | 804.4 | 784.3 | 749.7 | 719.6 | 695.0 | 674.9 | 659.4 | 648.4 | 644.8 | 643.0 | 642.1 |
| 17.5° | 808.1 | 783.4 | 742.4 | 705.9 | 676.7 | 653.9 | 640.2 | 629.3 | 624.7 | 622.9 | 624.7 |
| 20° | 813.5 | 784.3 | 734.2 | 692.2 | 660.3 | 637.5 | 622.0 | 611.1 | 607.4 | 606.5 | 605.6 |
| 22.5° | 820.8 | 786.2 | 727.8 | 679.5 | 642.1 | 619.3 | 603.8 | 596.5 | 593.7 | 594.6 | 594.6 |
| 25° | 828.1 | 788.0 | 718.7 | 662.1 | 622.9 | 599.2 | 588.3 | 582.8 | 584.6 | 588.3 | 588.3 |
| 27.5° | 834.5 | 787.1 | 705.9 | 643.9 | 600.1 | 578.2 | 570.0 | 570.9 | 575.5 | 581.9 | 582.8 |
| 30° | 842.7 | 787.1 | 692.2 | 621.1 | 574.6 | 553.6 | 551.8 | 559.1 | 566.4 | 572.7 | 572.7 |
| 32.5° | 855.5 | 792.5 | 681.3 | 598.3 | 548.1 | 531.7 | 539.9 | 549.9 | 558.2 | 564.5 | 566.4 |
| 35° | 877.4 | 804.4 | 674.0 | 575.5 | 522.6 | 510.7 | 526.2 | 542.7 | 548.1 | 552.7 | 553.6 |
| 37.5° | 898.3 | 815.3 | 664.9 | 553.6 | 496.1 | 491.6 | 512.6 | 529.9 | 530.8 | 533.5 | 533.5 |
| 40° | 918.4 | 823.6 | 653.0 | 529.9 | 470.6 | 470.6 | 495.2 | 509.8 | 508.0 | 505.3 | 506.2 |
| 42.5° | 940.3 | 828.1 | 639.3 | 508.0 | 449.6 | 449.6 | 469.7 | 482.5 | 481.5 | 485.2 | 487.9 |
| 45° | 966.7 | 837.2 | 621.1 | 487.9 | 427.7 | 424.1 | 440.5 | 451.5 | 465.1 | 481.5 | 486.1 |
| 47.5° | 1003.2 | 850.0 | 606.5 | 466.0 | 409.5 | 396.7 | 403.1 | 425.9 | 441.4 | 455.1 | 456.9 |
| 50° | 1041.5 | 868.2 | 593.7 | 443.2 | 387.6 | 364.8 | 370.3 | 395.8 | 404.9 | 410.4 | 413.1 |
| 52.5° | 1082.6 | 882.8 | 582.8 | 424.1 | 364.8 | 332.0 | 339.3 | 363.9 | 370.3 | 374.8 | 375.8 |
| 55° | 1118.1 | 894.7 | 569.1 | 405.8 | 340.2 | 301.0 | 310.1 | 333.8 | 340.2 | 345.7 | 345.7 |
| 57.5° | 1155.5 | 905.6 | 560.0 | 390.3 | 313.7 | 275.4 | 281.8 | 305.5 | 314.6 | 316.5 | 319.2 |
| 60° | 1186.5 | 915.7 | 551.8 | 375.8 | 289.1 | 252.6 | 257.2 | 278.2 | 289.1 | 290.0 | 291.8 |
| 62.5° | 1208.4 | 922.1 | 547.2 | 357.5 | 264.5 | 229.8 | 233.5 | 254.5 | 267.2 | 270.0 | 270.9 |
| 65° | 1222.1 | 925.7 | 539.0 | 333.8 | 243.5 | 210.7 | 210.7 | 231.7 | 244.4 | 250.8 | 252.6 |
| 67.5° | 1215.7 | 919.3 | 517.1 | 306.4 | 224.4 | 191.5 | 190.6 | 211.6 | 222.5 | 226.2 | 227.1 |
| 70° | *1166.5* | *881.9* | *472.4* | *272.7* | *204.3* | *174.2* | *172.4* | *191.5* | *201.6* | *193.3* | *194.3* |
| 72.5° | 1066.2 | 797.1 | 411.3 | 238.9 | 183.3 | 157.8 | 156.0 | 172.4 | 173.3 | 173.3 | 172.4 |
| 75° | 898.3 | 651.2 | 328.3 | 203.4 | 161.4 | 140.5 | 141.4 | 154.1 | 155.0 | 159.6 | 156.9 |
| 77.5° | 688.6 | 482.5 | 256.3 | 162.3 | 136.8 | 124.9 | 129.5 | 134.1 | 140.5 | 146.8 | 140.5 |
| 80° | 500.7 | 332.9 | 177.8 | 121.3 | 105.8 | 105.8 | 107.6 | 112.2 | 121.3 | 127.7 | 121.3 |
| 82.5° | 214.3 | 146.8 | 82.1 | 60.2 | 52.0 | 51.1 | 52.0 | 52.0 | 63.8 | 65.7 | 57.5 |
| 85° | 16.4 | 13.7 | 10.0 | 10.0 | 8.2 | 4.6 | 4.6 | 3.6 | 2.7 | 2.7 | 2.7 |
| 87.5° | 3.6 | 2.7 | 2.7 | 2.7 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 |
| 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: SP1-2407-157-3

Test Date: 08/07/2024

Luminaire Tested: MEM2-HTN-SA-40-727-U-5WQ-2

Data in this report applies to families of products including MEM2-HTN-SA-40-727-U-5WQ-2

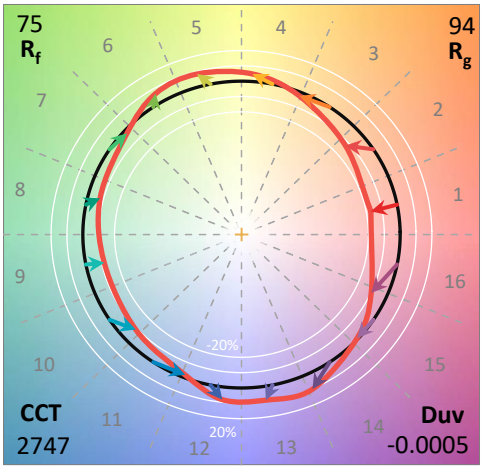
Report Generated By FNC07603 / LDUCLS01DT446
Version: v7.04

## Test Information

| | |
|---|---|
| Test Method: | LM-79-2019 |
| Report Number: | SP1-2407-157-3 |
| 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-40-727-U-5WQ-2** |
| Description: | Epic Modern Light Square 40W 5WQ Optic and Flare Trim |

## Spectral Parameters

| | | | | | |
|---|---|---|---|---|---|
| CCT (K): | 2747 | CRI (Ra): | 71.7 | | |
| CIE u': | 0.2606 | R1: | 68.1 | R9: | -35.3 |
| CIE v': | 0.5257 | R2: | 83.9 | R10: | 64.2 |
| Duv: | -0.0005 | R3: | 94.7 | R11: | 61.7 |
| CIE x: | 0.4552 | R4: | 66.3 | R12: | 53.9 |
| CIE y: | 0.4082 | R5: | 67.4 | R13: | 71.2 |
| CIE z: | 0.1366 | R6: | 78.7 | R14: | 97.6 |
| Peak Wavelength (nm): | 597 | R7: | 75.0 | R15: | 59.3 |
| Dominant Wavelength (nm): | 584 | R8: | 39.4 | | |
| Purity: | 59.16856 | | | | |
| Rf: | 75.5 | | | | |
| Rg: | 93.6 | | | | |




## Test Conditions

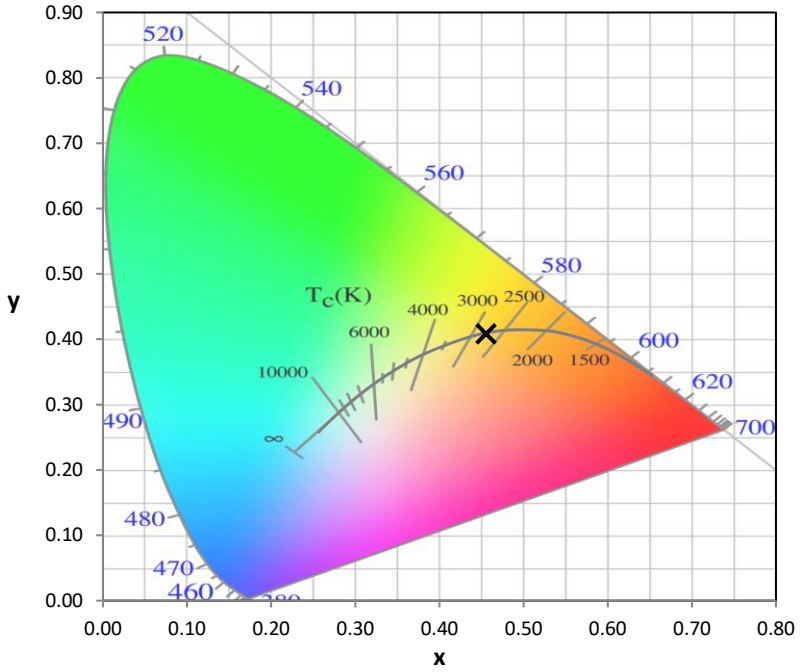
| | |
|---|---|
| Stabilization Time: | 22M |
| Operation Time: | 1H 22M |
| Sphere Temperature (°C): | 24.2 |

REPORT NUMBER: SP1-2407-157-3

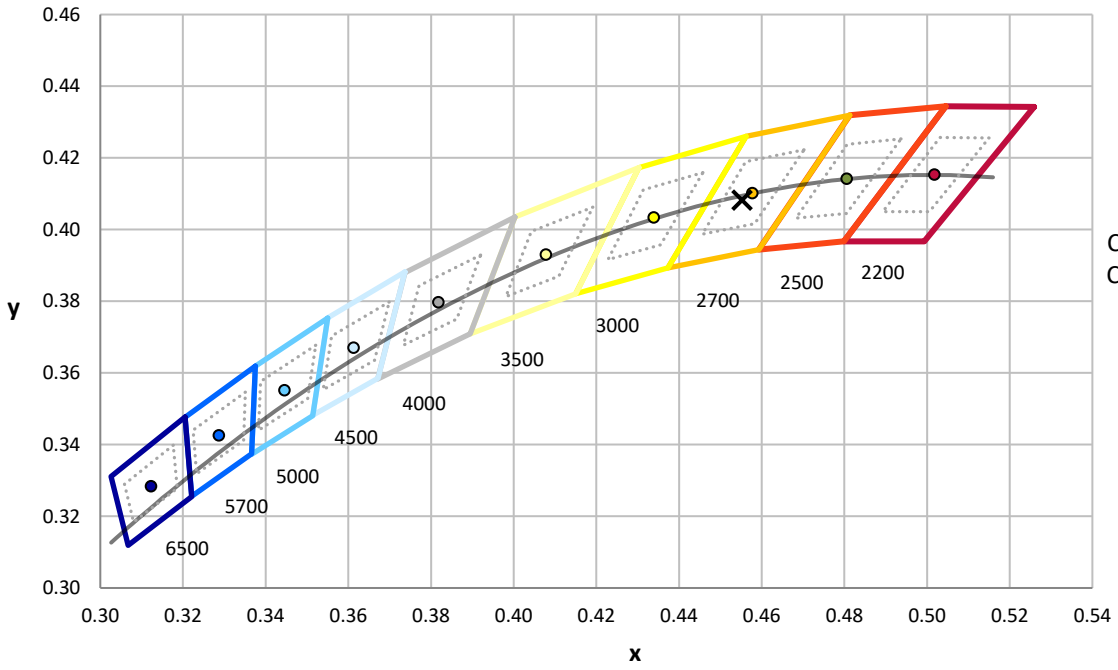
| Measurement and Test Equipment | | | |
|---|---|---|---|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | IN0058 | 6/18/2024 | 12/18/2024 |
| Power Meter | INXT2011004 | 2/8/2024 | 2/8/2025 |
| AC Power Source | IN0063 | 10/24/2023 | 10/24/2024 |
| DC 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: SP1-2407-157-3

**CIE 1931 Chromaticity Diagram**




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




CCT = 2747K
CIE x = 0.4552
CIE y = 0.4082
Duv = -0.0005

Point lies inside the ANSI 2700K 4-step quadrangle

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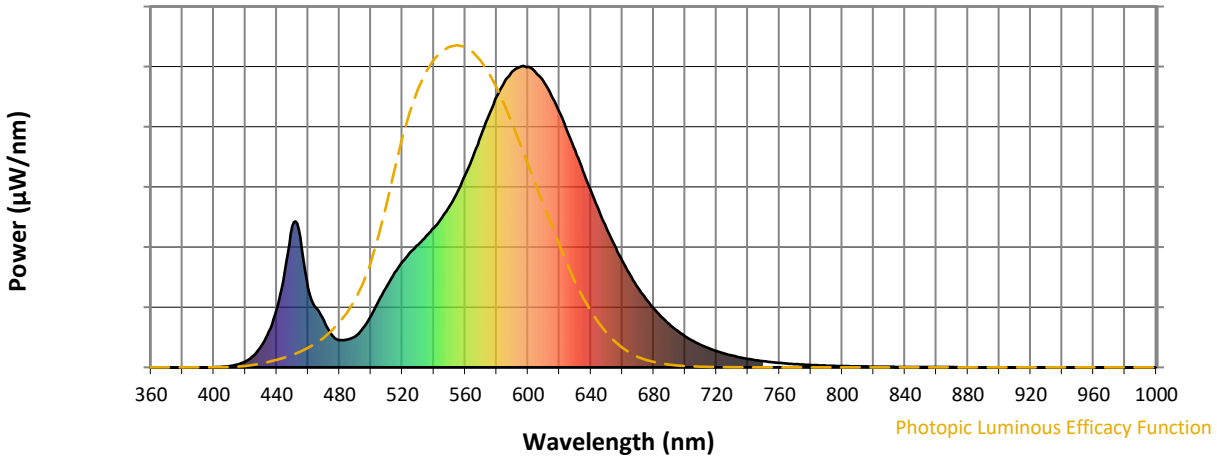
## Photopic Flux vs. Wavelength




## 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 | 103 | NR | 620 | 846 | NR | 750 | 20 | NR | 880 | 0 | NR |
| 365 | 0 | NR | 495 | 130 | NR | 625 | 784 | NR | 755 | 17 | NR | 885 | 1 | NR |
| 370 | 0 | NR | 500 | 171 | NR | 630 | 720 | NR | 760 | 15 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 221 | NR | 635 | 652 | NR | 765 | 13 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 268 | NR | 640 | 587 | NR | 770 | 11 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 313 | NR | 645 | 521 | NR | 775 | 9 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 350 | NR | 650 | 461 | NR | 780 | 8 | NR | 910 | 0 | NR |
| 395 | 0 | NR | 525 | 381 | NR | 655 | 406 | NR | 785 | 7 | NR | 915 | 0 | NR |
| 400 | 0 | NR | 530 | 407 | NR | 660 | 353 | NR | 790 | 6 | NR | 920 | 0 | NR |
| 405 | 2 | NR | 535 | 435 | NR | 665 | 307 | NR | 795 | 5 | NR | 925 | 0 | NR |
| 410 | 4 | NR | 540 | 462 | NR | 670 | 264 | NR | 800 | 4 | NR | 930 | 0 | NR |
| 415 | 9 | NR | 545 | 496 | NR | 675 | 227 | NR | 805 | 4 | NR | 935 | 0 | NR |
| 420 | 20 | NR | 550 | 534 | NR | 680 | 196 | NR | 810 | 3 | NR | 940 | 0 | NR |
| 425 | 38 | NR | 555 | 582 | NR | 685 | 167 | NR | 815 | 3 | NR | 945 | 0 | NR |
| 430 | 69 | NR | 560 | 638 | NR | 690 | 144 | NR | 820 | 2 | NR | 950 | 0 | NR |
| 435 | 120 | NR | 565 | 700 | NR | 695 | 122 | NR | 825 | 2 | NR | 955 | 0 | NR |
| 440 | 193 | NR | 570 | 767 | NR | 700 | 103 | NR | 830 | 2 | NR | 960 | 0 | NR |
| 445 | 316 | NR | 575 | 836 | NR | 705 | 88 | NR | 835 | 2 | NR | 965 | 0 | NR |
| 450 | 469 | NR | 580 | 898 | NR | 710 | 74 | NR | 840 | 1 | NR | 970 | 0 | NR |
| 455 | 431 | NR | 585 | 947 | NR | 715 | 63 | NR | 845 | 1 | NR | 975 | 0 | NR |
| 460 | 264 | NR | 590 | 982 | NR | 720 | 54 | NR | 850 | 1 | NR | 980 | 0 | NR |
| 465 | 197 | NR | 595 | 997 | NR | 725 | 46 | NR | 855 | 1 | NR | 985 | 0 | NR |
| 470 | 155 | NR | 600 | 997 | NR | 730 | 39 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 108 | NR | 605 | 978 | NR | 735 | 33 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 90 | NR | 610 | 947 | NR | 740 | 28 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 92 | NR | 615 | 900 | NR | 745 | 24 | NR | 875 | 1 | NR | | | |

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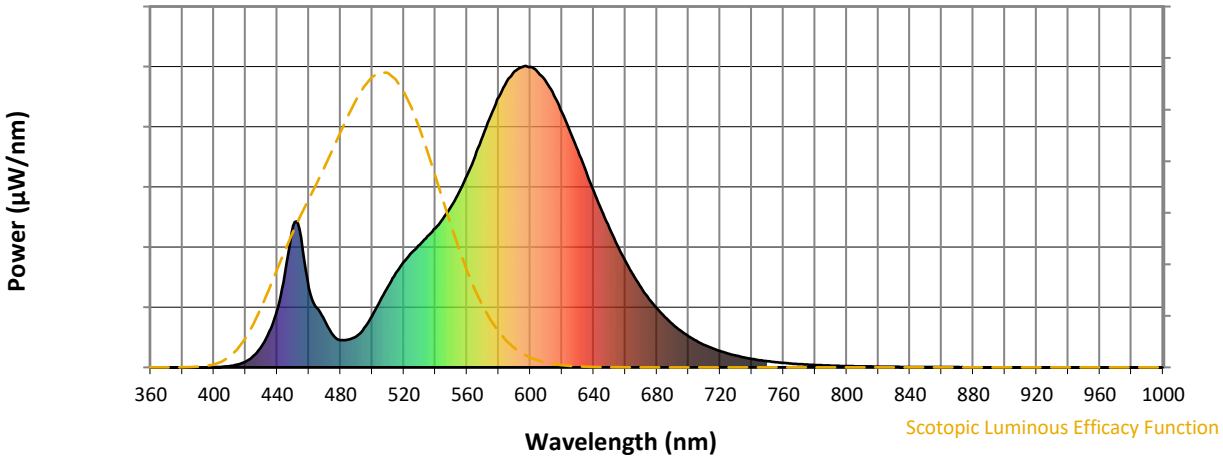
## Scotopic Flux vs. Wavelength




**Scotopic Lumens: NR** **S/P: 1.13**

| 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 | 103 | NR | 620 | 846 | NR | 750 | 20 | NR | 880 | 0 | NR |
| 365 | 0 | NR | 495 | 130 | NR | 625 | 784 | NR | 755 | 17 | NR | 885 | 1 | NR |
| 370 | 0 | NR | 500 | 171 | NR | 630 | 720 | NR | 760 | 15 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 221 | NR | 635 | 652 | NR | 765 | 13 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 268 | NR | 640 | 587 | NR | 770 | 11 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 313 | NR | 645 | 521 | NR | 775 | 9 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 350 | NR | 650 | 461 | NR | 780 | 8 | NR | 910 | 0 | NR |
| 395 | 0 | NR | 525 | 381 | NR | 655 | 406 | NR | 785 | 7 | NR | 915 | 0 | NR |
| 400 | 0 | NR | 530 | 407 | NR | 660 | 353 | NR | 790 | 6 | NR | 920 | 0 | NR |
| 405 | 2 | NR | 535 | 435 | NR | 665 | 307 | NR | 795 | 5 | NR | 925 | 0 | NR |
| 410 | 4 | NR | 540 | 462 | NR | 670 | 264 | NR | 800 | 4 | NR | 930 | 0 | NR |
| 415 | 9 | NR | 545 | 496 | NR | 675 | 227 | NR | 805 | 4 | NR | 935 | 0 | NR |
| 420 | 20 | NR | 550 | 534 | NR | 680 | 196 | NR | 810 | 3 | NR | 940 | 0 | NR |
| 425 | 38 | NR | 555 | 582 | NR | 685 | 167 | NR | 815 | 3 | NR | 945 | 0 | NR |
| 430 | 69 | NR | 560 | 638 | NR | 690 | 144 | NR | 820 | 2 | NR | 950 | 0 | NR |
| 435 | 120 | NR | 565 | 700 | NR | 695 | 122 | NR | 825 | 2 | NR | 955 | 0 | NR |
| 440 | 193 | NR | 570 | 767 | NR | 700 | 103 | NR | 830 | 2 | NR | 960 | 0 | NR |
| 445 | 316 | NR | 575 | 836 | NR | 705 | 88 | NR | 835 | 2 | NR | 965 | 0 | NR |
| 450 | 469 | NR | 580 | 898 | NR | 710 | 74 | NR | 840 | 1 | NR | 970 | 0 | NR |
| 455 | 431 | NR | 585 | 947 | NR | 715 | 63 | NR | 845 | 1 | NR | 975 | 0 | NR |
| 460 | 264 | NR | 590 | 982 | NR | 720 | 54 | NR | 850 | 1 | NR | 980 | 0 | NR |
| 465 | 197 | NR | 595 | 997 | NR | 725 | 46 | NR | 855 | 1 | NR | 985 | 0 | NR |
| 470 | 155 | NR | 600 | 997 | NR | 730 | 39 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 108 | NR | 605 | 978 | NR | 735 | 33 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 90 | NR | 610 | 947 | NR | 740 | 28 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 92 | NR | 615 | 900 | NR | 745 | 24 | NR | 875 | 1 | NR | | | |

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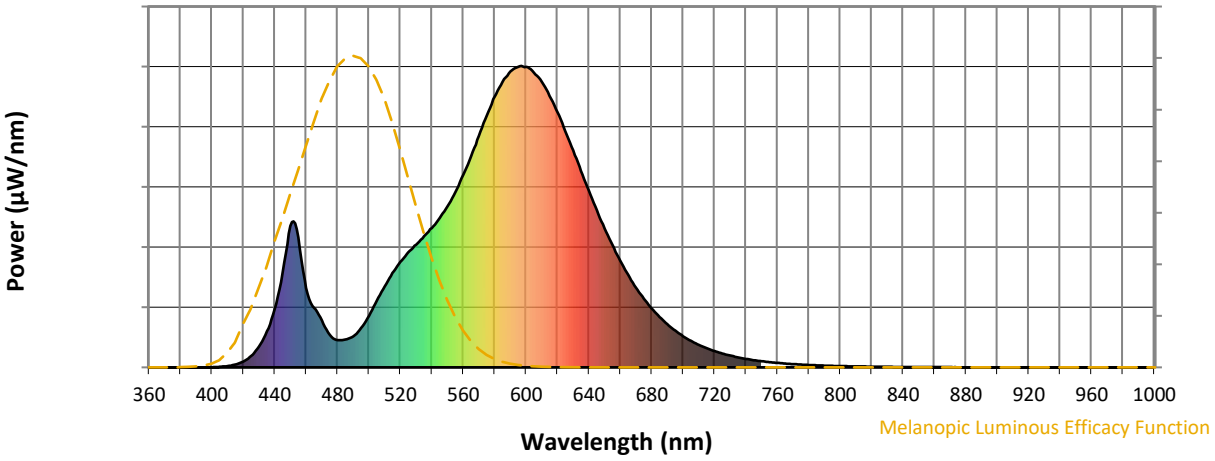
## Melanopic Flux vs. Wavelength




**Melanopic Lumens: NR** **M/P: 2.04**

| 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 | 103 | NR | 620 | 846 | NR | 750 | 20 | NR | 880 | 0 | NR |
| 365 | 0 | NR | 495 | 130 | NR | 625 | 784 | NR | 755 | 17 | NR | 885 | 1 | NR |
| 370 | 0 | NR | 500 | 171 | NR | 630 | 720 | NR | 760 | 15 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 221 | NR | 635 | 652 | NR | 765 | 13 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 268 | NR | 640 | 587 | NR | 770 | 11 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 313 | NR | 645 | 521 | NR | 775 | 9 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 350 | NR | 650 | 461 | NR | 780 | 8 | NR | 910 | 0 | NR |
| 395 | 0 | NR | 525 | 381 | NR | 655 | 406 | NR | 785 | 7 | NR | 915 | 0 | NR |
| 400 | 0 | NR | 530 | 407 | NR | 660 | 353 | NR | 790 | 6 | NR | 920 | 0 | NR |
| 405 | 2 | NR | 535 | 435 | NR | 665 | 307 | NR | 795 | 5 | NR | 925 | 0 | NR |
| 410 | 4 | NR | 540 | 462 | NR | 670 | 264 | NR | 800 | 4 | NR | 930 | 0 | NR |
| 415 | 9 | NR | 545 | 496 | NR | 675 | 227 | NR | 805 | 4 | NR | 935 | 0 | NR |
| 420 | 20 | NR | 550 | 534 | NR | 680 | 196 | NR | 810 | 3 | NR | 940 | 0 | NR |
| 425 | 38 | NR | 555 | 582 | NR | 685 | 167 | NR | 815 | 3 | NR | 945 | 0 | NR |
| 430 | 69 | NR | 560 | 638 | NR | 690 | 144 | NR | 820 | 2 | NR | 950 | 0 | NR |
| 435 | 120 | NR | 565 | 700 | NR | 695 | 122 | NR | 825 | 2 | NR | 955 | 0 | NR |
| 440 | 193 | NR | 570 | 767 | NR | 700 | 103 | NR | 830 | 2 | NR | 960 | 0 | NR |
| 445 | 316 | NR | 575 | 836 | NR | 705 | 88 | NR | 835 | 2 | NR | 965 | 0 | NR |
| 450 | 469 | NR | 580 | 898 | NR | 710 | 74 | NR | 840 | 1 | NR | 970 | 0 | NR |
| 455 | 431 | NR | 585 | 947 | NR | 715 | 63 | NR | 845 | 1 | NR | 975 | 0 | NR |
| 460 | 264 | NR | 590 | 982 | NR | 720 | 54 | NR | 850 | 1 | NR | 980 | 0 | NR |
| 465 | 197 | NR | 595 | 997 | NR | 725 | 46 | NR | 855 | 1 | NR | 985 | 0 | NR |
| 470 | 155 | NR | 600 | 997 | NR | 730 | 39 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 108 | NR | 605 | 978 | NR | 735 | 33 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 90 | NR | 610 | 947 | NR | 740 | 28 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 92 | NR | 615 | 900 | NR | 745 | 24 | NR | 875 | 1 | NR | | | |

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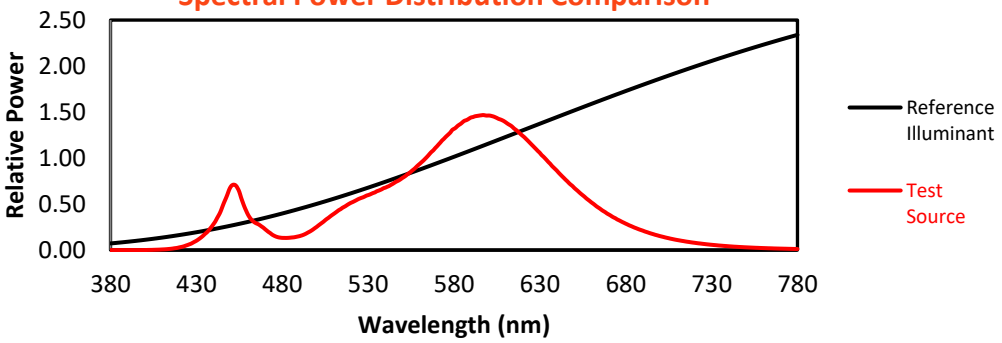
# TM-30-18

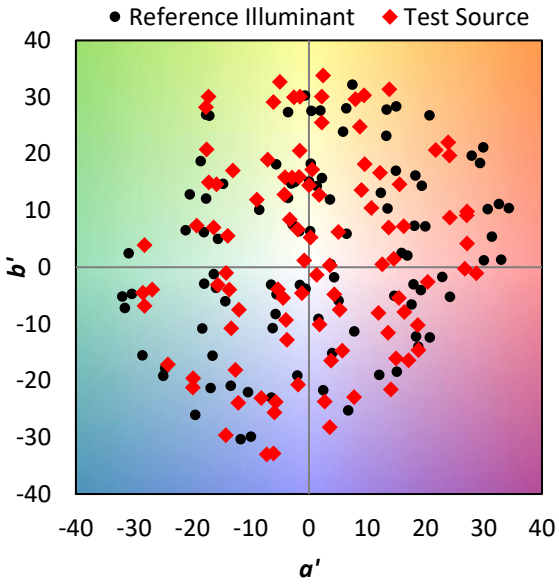
## Summary

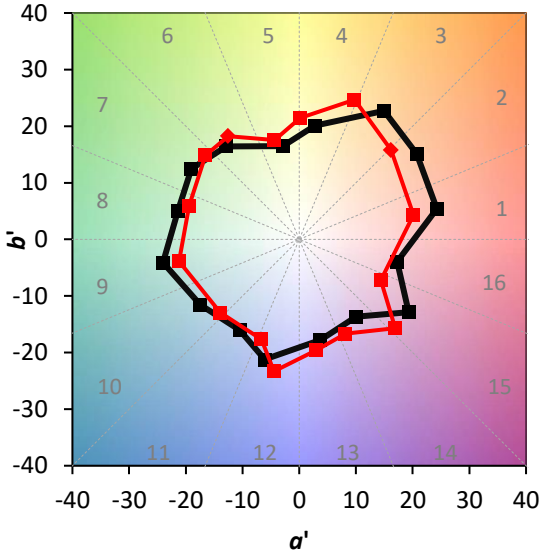
$R_f$ = 75.5
$R_g$ = 93.6
CIE $R_a$ = 71.7
$R_9$ = -35.3

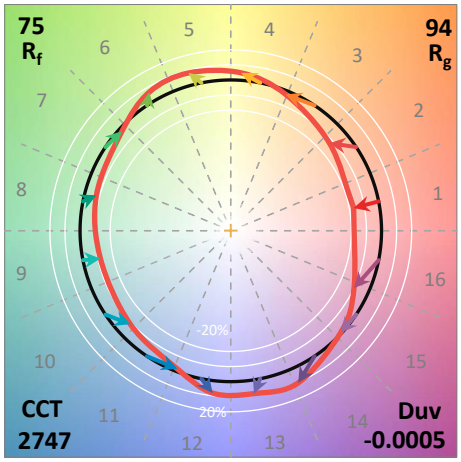
## Spectral Power Distribution Comparison

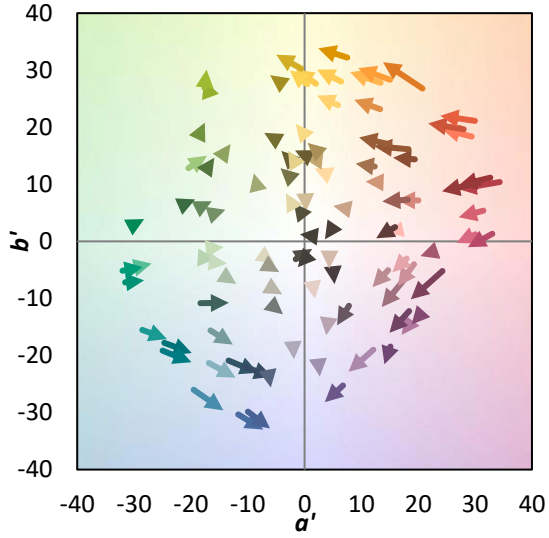



## Color Vector Graphics



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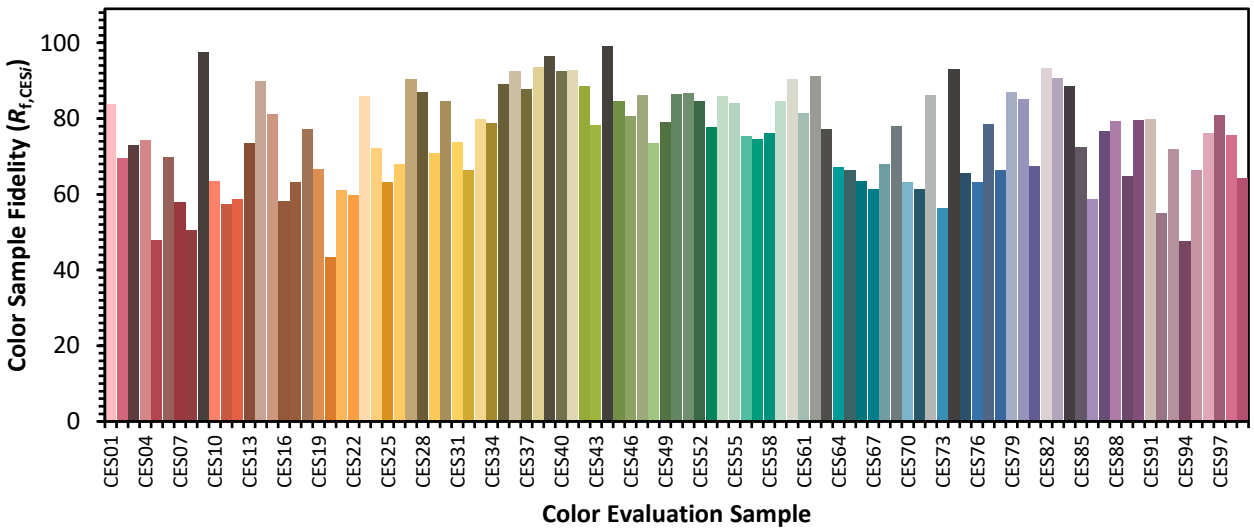
# TM-30-18

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

| | | | |
|---|---|---|---|
| CES01 = 86 | CES26 = 68 | CES51 = 87 | CES76 = 63 |
| CES02 = 63 | CES27 = 90 | CES52 = 85 | CES77 = 79 |
| CES03 = 31 | CES28 = 87 | CES53 = 78 | CES78 = 66 |
| CES04 = 71 | CES29 = 71 | CES54 = 86 | CES79 = 87 |
| CES05 = 50 | CES30 = 85 | CES55 = 84 | CES80 = 85 |
| CES06 = 52 | CES31 = 74 | CES56 = 75 | CES81 = 67 |
| CES07 = 42 | CES32 = 66 | CES57 = 75 | CES82 = 93 |
| CES08 = 41 | CES33 = 80 | CES58 = 76 | CES83 = 91 |
| CES09 = 29 | CES34 = 79 | CES59 = 85 | CES84 = 89 |
| CES10 = 77 | CES35 = 89 | CES60 = 90 | CES85 = 72 |
| CES11 = 60 | CES36 = 93 | CES61 = 81 | CES86 = 59 |
| CES12 = 66 | CES37 = 88 | CES62 = 91 | CES87 = 77 |
| CES13 = 43 | CES38 = 93 | CES63 = 77 | CES88 = 79 |
| CES14 = 74 | CES39 = 97 | CES64 = 67 | CES89 = 65 |
| CES15 = 72 | CES40 = 93 | CES65 = 66 | CES90 = 80 |
| CES16 = 48 | CES41 = 93 | CES66 = 63 | CES91 = 80 |
| CES17 = 51 | CES42 = 89 | CES67 = 61 | CES92 = 55 |
| CES18 = 57 | CES43 = 78 | CES68 = 68 | CES93 = 72 |
| CES19 = 73 | CES44 = 99 | CES69 = 78 | CES94 = 48 |
| CES20 = 67 | CES45 = 85 | CES70 = 63 | CES95 = 66 |
| CES21 = 88 | CES46 = 81 | CES71 = 61 | CES96 = 76 |
| CES22 = 80 | CES47 = 86 | CES72 = 86 | CES97 = 81 |
| CES23 = 92 | CES48 = 74 | CES73 = 56 | CES98 = 76 |
| CES24 = 91 | CES49 = 79 | CES74 = 93 | CES99 = 64 |
| CES25 = 73 | CES50 = 86 | CES75 = 66 | |



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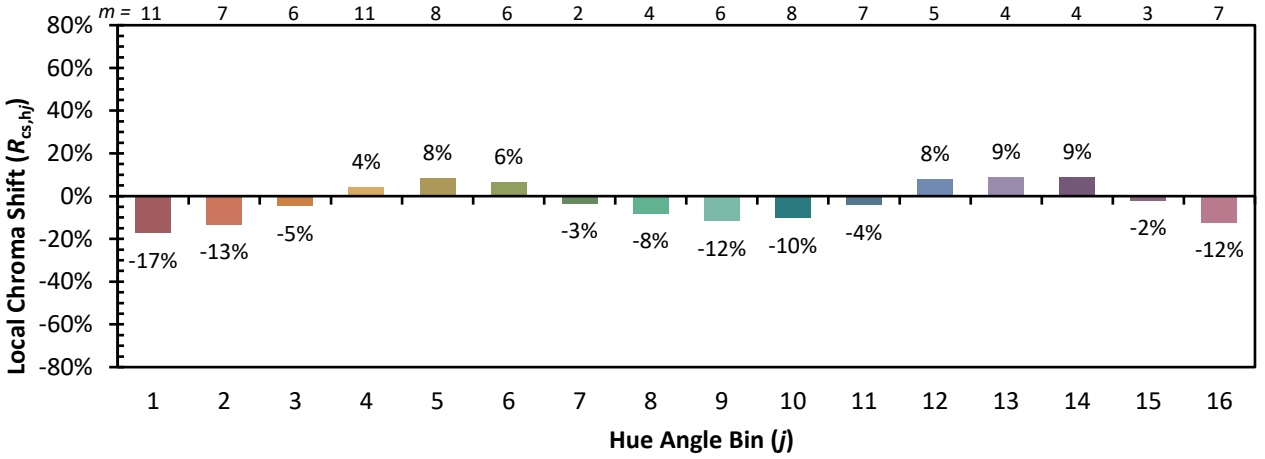
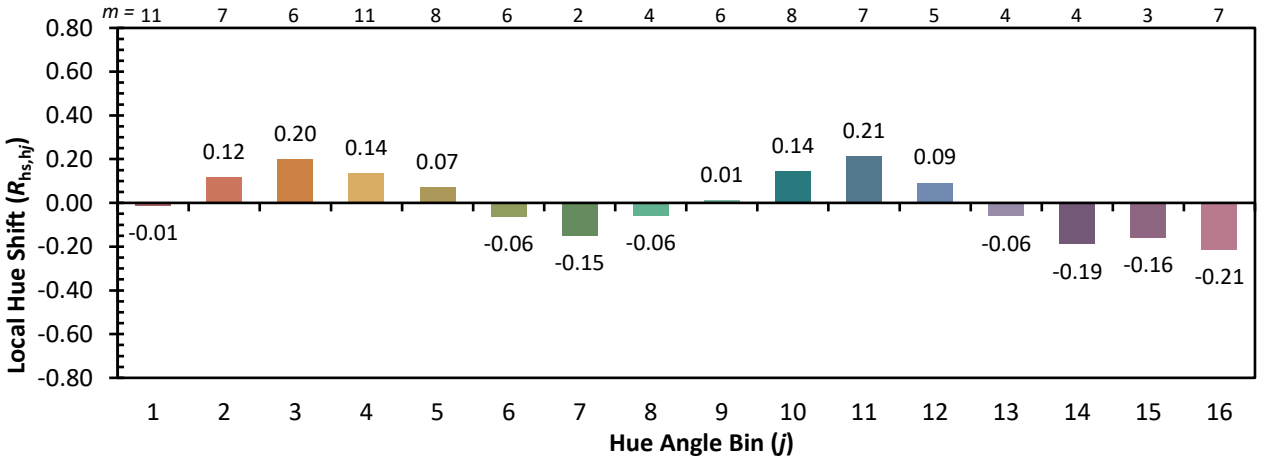
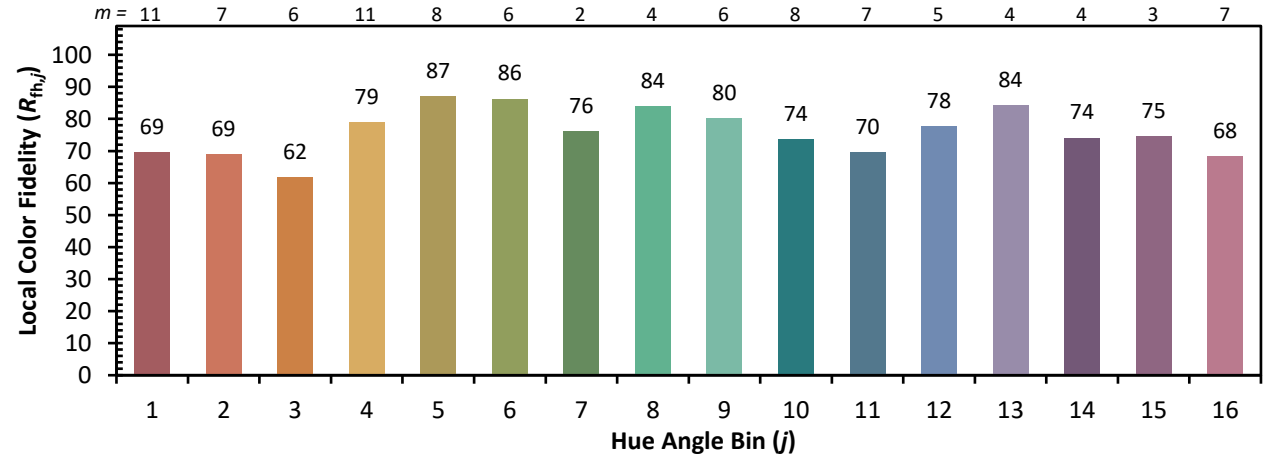
**TM-30-18**

## Color Rendition by Hue-Angle Bin



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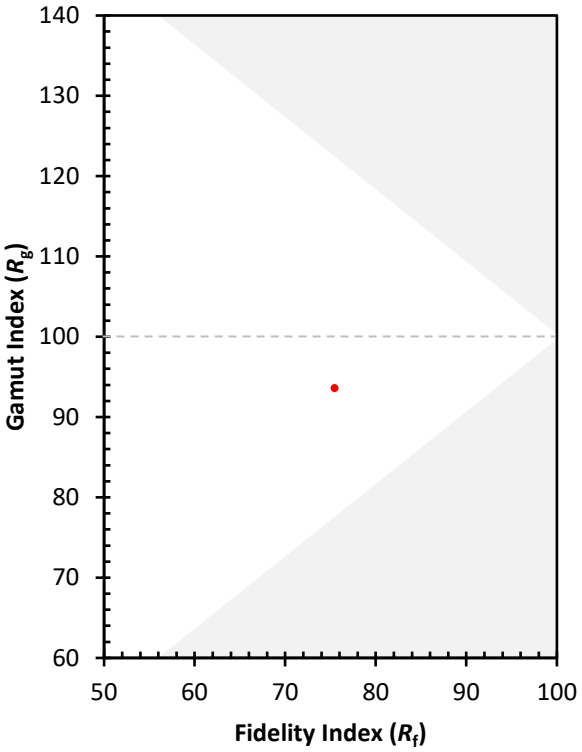
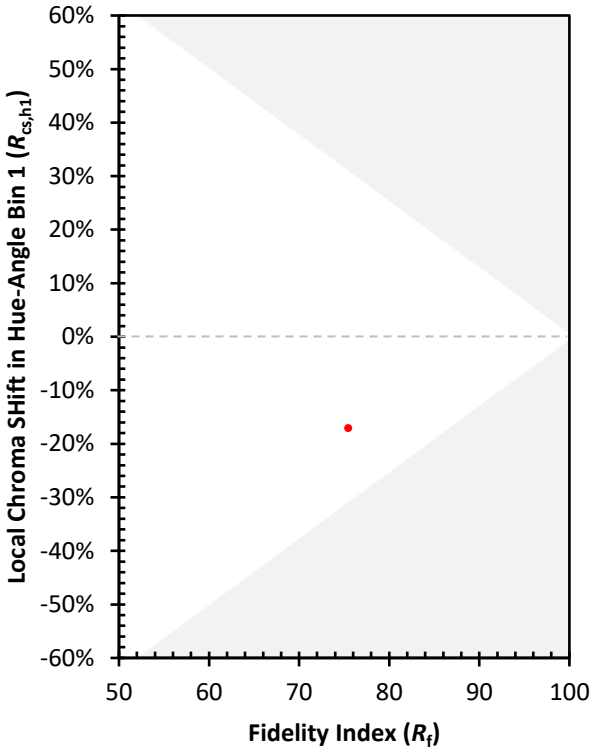
## Measure Comparisons




(END OF REPORT)