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: P879874

Luminaire Tested: **MEM2-HTN-VA-50-740-U-WT4**

Issue Date: 10/01/2024

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: | P879874 |
| Test Lab: | INNOVATION CENTER(G3) |
| Issue Date: | 10/01/2024 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS (FORMERLY EATON) |
| Product Line: | STREETWORKS |
| Catalog Number: | MEM2-HTN-VA-50-740-U-WT4 |
| Description: | EPIC MODERN TALL HOUSING 50W 70CRI 4000K VISUAL COMFORT FIXTURE w/ DRIVE LANE TYPE IV DISTRIBUTION OPTIC |
| Light Source: | (1) 4000K CCT, 70 CRI LEDS |
| Ballast/Driver: | ELECTRONIC DRIVER |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 5267.6 lumens |
| Efficiency: | N/A |
| Efficacy: | 107.5 lumens/watt |
| Luminous Opening: | Circular (Dia: 1.12' x H: 0') |
| IES Classification: | Type IV - Short |
| BUG Rating: | B2 - U0 - G3 |

| | |
|---|---|
| Input Watts (W): | 49 |
| Input Voltage (V): | 120 |
| Input Current (Ain): | NR |
| Voltage Rise (V): | NR |
| Power Factor: | 0.99 |
| Total Harmonic Distortion (THDi): | 6% |
| Frequency (hertz): | 60 |
| Stabilization Time: | NR |
| Operation Time: | NR |
| Ambient Temperature (°C): | NR |
| Test Distance: | 24 FT |

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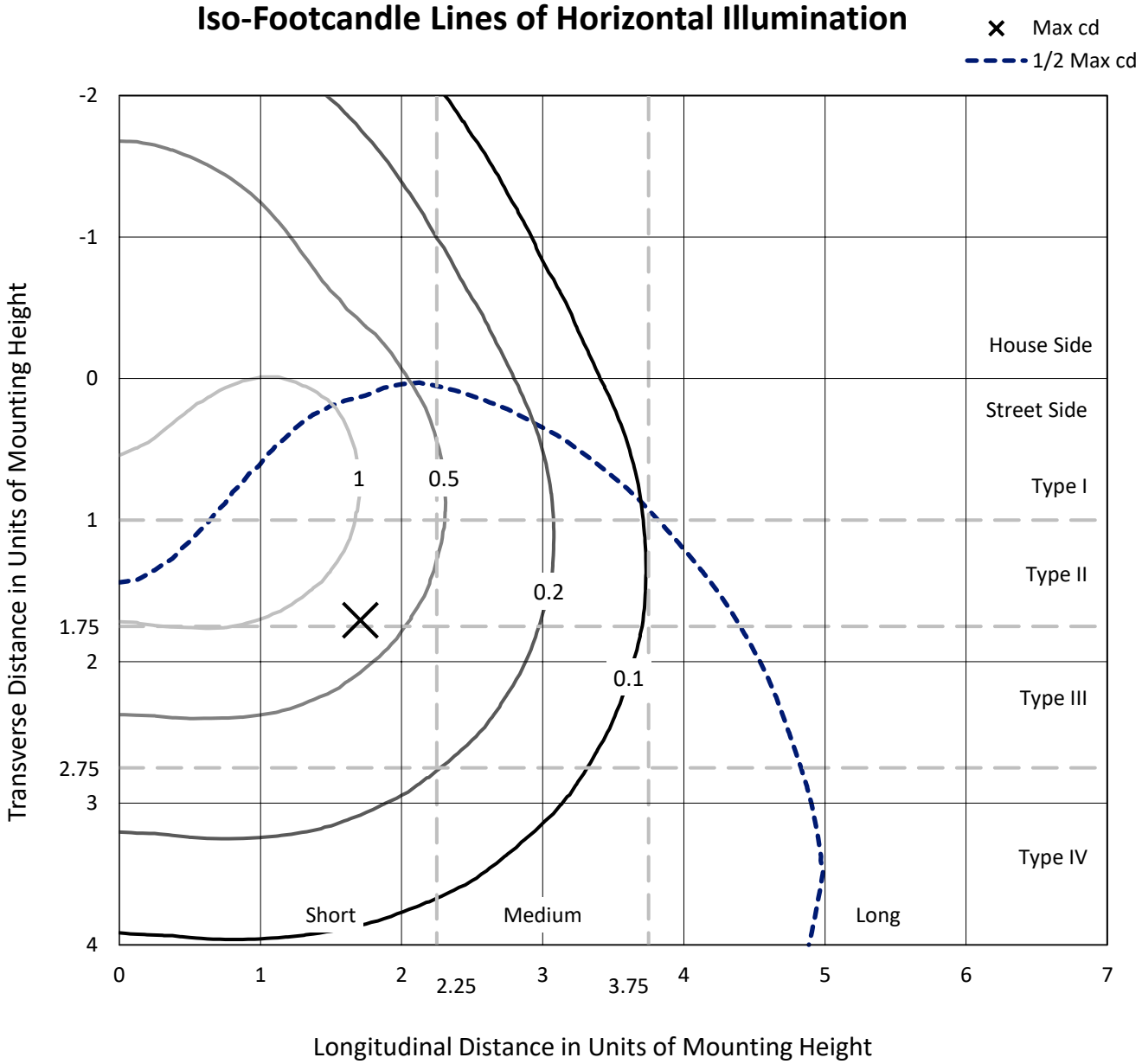
Scaled Data Report

REPORT NUMBER: P879874
CATALOG NUMBER: MEM2-HTN-VA-50-740-U-WT4

## Iso-Footcandle Lines of Horizontal Illumination




Based on 15 foot mounting height. Maximum calculated value = 1.8 fc
Type IV - Short - N/A

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REPORT NUMBER: P879874
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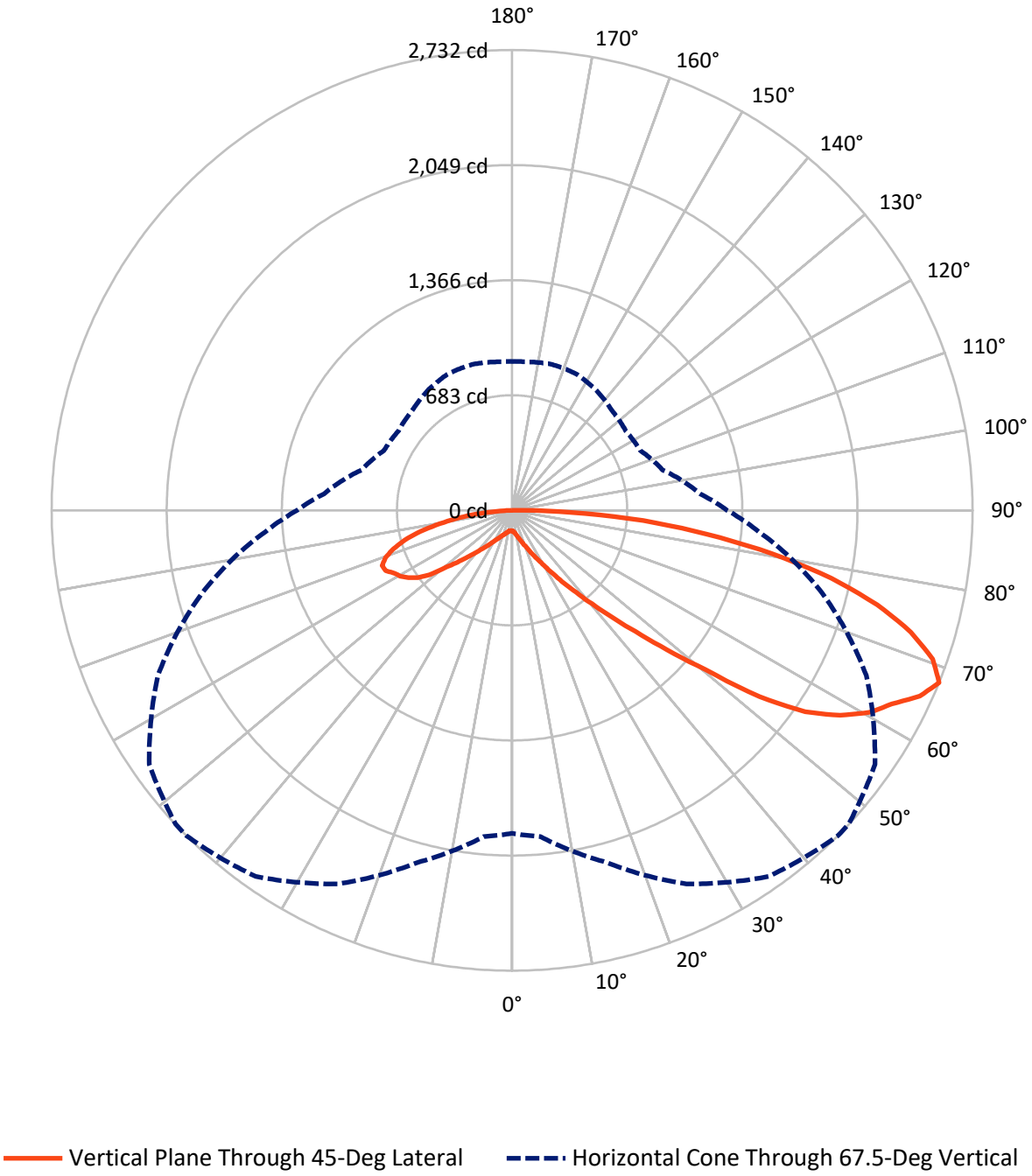
## Luminous Intensity Polar Plot



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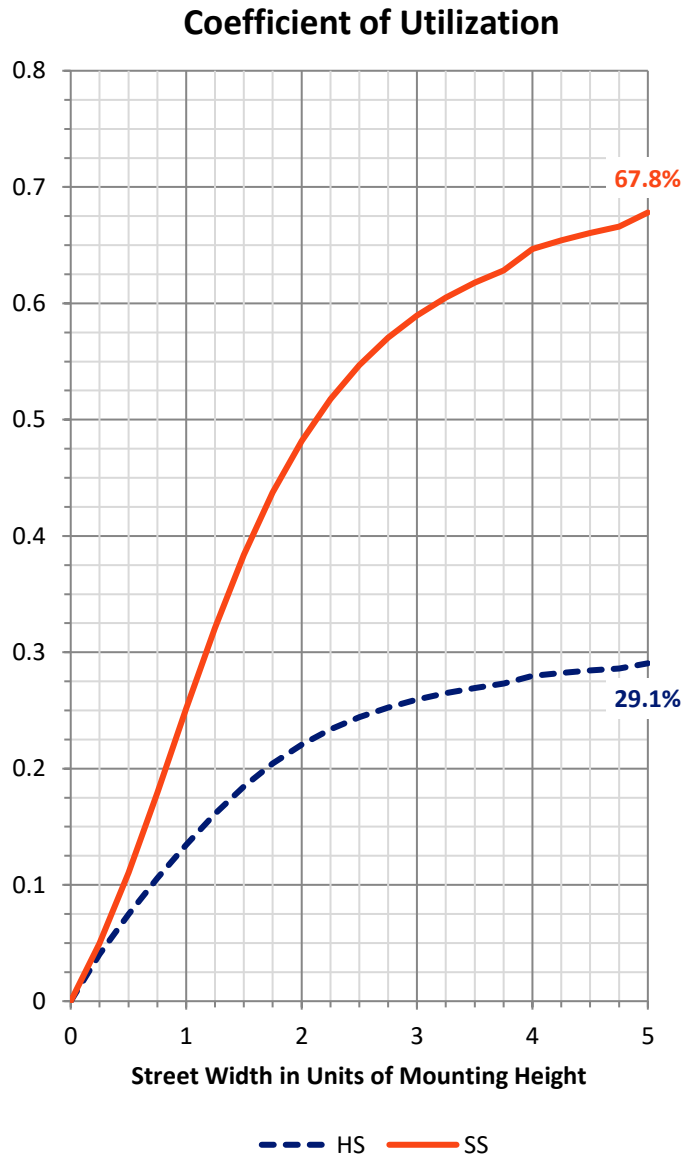
REPORT NUMBER: P879874
CATALOG NUMBER: MEM2-HTN-VA-50-740-U-WT4

**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 1561.1 | 0.0 | 1561.1 |
| | % Fixture | 29.6 | 0.0 | 29.6 |
| **Street Side** | Lumens | 3706.5 | 0.0 | 3706.5 |
| | % Fixture | 70.4 | 0.0 | 70.4 |
| **Total** | Lumens | 5267.6 | 0.0 | 5267.6 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 12.5 | 0.2 |
| 10°-20° | 46.9 | 0.9 |
| 20°-30° | 110.4 | 2.1 |
| 30°-40° | 242.1 | 4.6 |
| 40°-50° | 527.1 | 10.0 |
| 50°-60° | 1083.0 | 20.6 |
| 60°-70° | 1525.8 | 29.0 |
| 70°-80° | 1295.4 | 24.6 |
| 80°-90° | 424.5 | 8.1 |
| 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° | 5267.6 | 100.0 |
| 0°-180° | 5267.6 | 100.0 |



Cooper Lighting Solutions Photometric Lab
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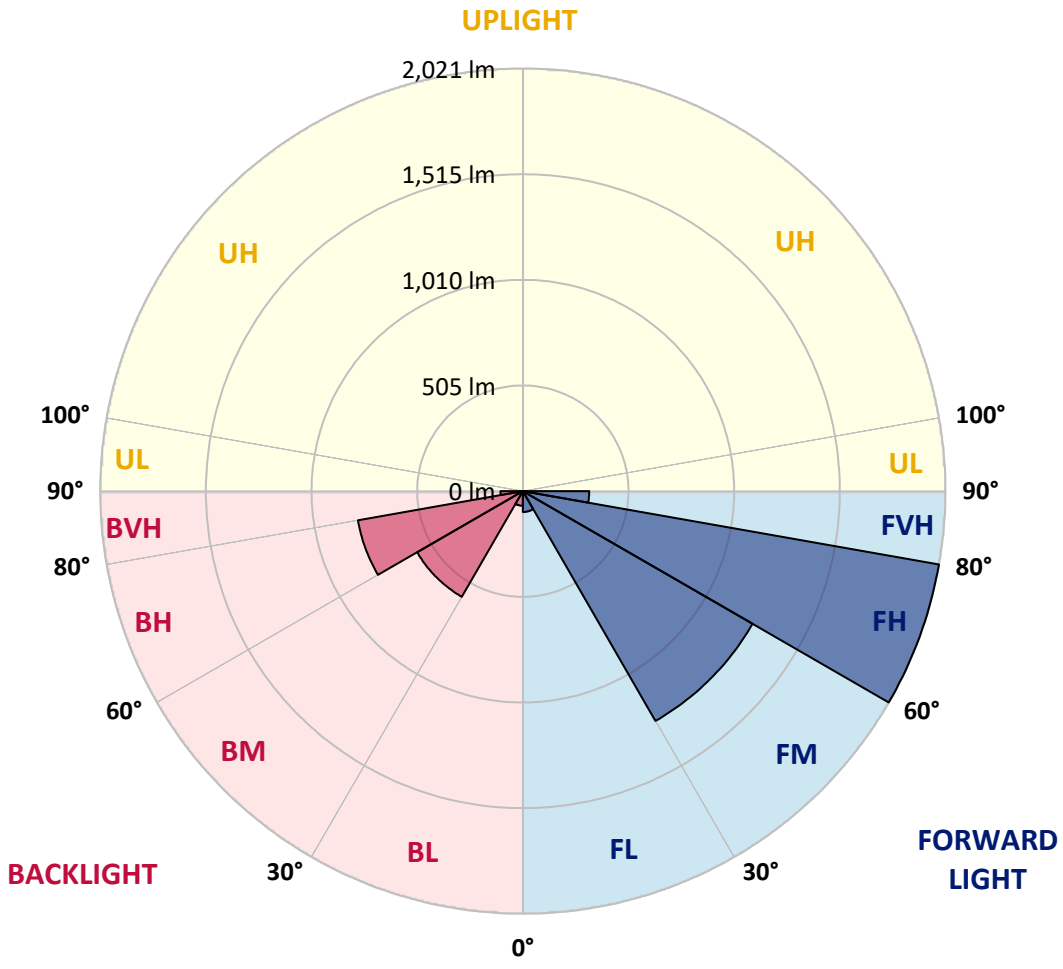
Scaled Data Report

REPORT NUMBER: P879874
CATALOG NUMBER: MEM2-HTN-VA-50-740-U-WT4

## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 99.7 | 1.9 | | | |
| FM | (30°-60°) | 1268.7 | 24.1 | | | |
| FH | (60°-80°) | 2020.6 | 38.4 | | | G2/5000 |
| FVH | (80°-90°) | 317.5 | 6.0 | | | G3/500 |
| BL | (0°-30°) | 70.1 | 1.3 | B0/110 | | |
| BM | (30°-60°) | 583.5 | 11.1 | B1/1000 | | |
| BH | (60°-80°) | 800.5 | 15.2 | B2/1000 | | G2/1000 |
| BVH | (80°-90°) | 107.1 | 2.0 | | | G2/225 |
| UL | (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH | (100°-180°) | 0.0 | 0.0 | | U0/0 | |

**BUG Rating: B2-U0-G3**
Type IV Short



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**CANDELA DISTRIBUTION (FULL):**

| | 0° | 5° | 15° | 25° | 35° | 45° | 47° | 55° | 65° | 75° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 121.6 | 121.6 | 121.6 | 121.6 | 121.6 | *121.6* | 121.6 | 121.6 | 121.6 | 121.6 | 121.6 |
| 2.5° | 125.4 | 124.9 | 125.4 | 125.4 | 125.4 | *124.9* | 124.9 | 124.9 | 124.3 | 123.8 | 123.2 |
| 5° | 132.9 | 132.9 | 132.9 | 132.4 | 132.4 | *131.3* | 131.3 | 130.8 | 129.7 | 128.6 | 127.6 |
| 7.5° | 143.2 | 142.6 | 142.6 | 142.1 | 141.5 | *140.5* | 139.9 | 139.4 | 137.2 | 135.6 | 133.5 |
| 10° | 155.5 | 155.5 | 155.0 | 153.9 | 153.9 | *151.2* | 151.8 | 150.7 | 148.0 | 144.8 | 141.0 |
| 12.5° | 170.6 | 170.6 | 169.5 | 169.5 | 168.5 | *166.3* | 165.8 | 164.1 | 161.5 | 156.1 | 151.8 |
| 15° | 187.3 | 187.3 | 188.4 | 187.3 | 186.2 | *183.5* | 183.5 | 181.4 | 175.5 | 171.1 | 164.7 |
| 17.5° | 208.3 | 205.6 | 207.2 | 206.7 | 206.7 | *205.1* | 203.4 | 200.7 | 195.9 | 188.4 | 180.3 |
| 20° | 229.8 | 230.3 | 228.7 | 230.3 | 230.9 | *228.7* | 228.7 | 225.5 | 218.5 | 209.4 | 196.4 |
| 22.5° | 256.7 | 256.7 | 253.5 | 257.8 | 260.5 | *258.9* | 258.3 | 251.9 | 243.3 | 230.9 | 218.0 |
| 25° | 284.7 | 283.6 | 289.0 | 290.1 | 296.0 | *295.5* | 294.9 | 289.0 | 276.1 | 261.0 | 241.1 |
| 27.5° | 316.5 | 318.1 | 328.3 | 331.0 | 336.9 | *336.4* | 335.8 | 329.4 | 315.4 | 294.9 | 269.1 |
| 30° | 355.7 | 357.9 | 367.6 | 376.7 | 387.0 | *388.0* | 387.0 | 381.6 | 361.1 | 334.2 | 305.2 |
| 32.5° | 401.5 | 407.4 | 417.1 | 432.7 | 445.6 | *451.5* | 452.6 | 442.9 | 419.8 | 384.3 | 346.1 |
| 35° | 463.9 | 459.1 | 472.5 | 498.4 | 519.9 | *531.7* | 531.2 | 518.3 | 493.0 | 447.8 | 393.4 |
| 37.5° | 525.3 | 523.7 | 544.7 | 578.6 | 607.6 | *617.3* | 620.0 | 611.4 | 579.1 | 519.4 | 455.3 |
| 40° | 589.3 | 602.8 | 627.0 | 666.3 | 709.3 | *729.8* | 731.4 | 719.0 | 674.9 | 607.6 | 523.1 |
| 42.5° | 672.7 | 686.2 | 716.9 | 765.3 | 827.7 | *861.7* | 863.8 | 849.8 | 796.5 | 709.3 | 604.9 |
| 45° | 778.2 | 785.8 | 818.1 | 891.8 | 972.0 | *1026.3* | 1041.9 | 1024.7 | 959.1 | 838.0 | 706.7 |
| 47.5° | 891.8 | 891.8 | 944.5 | 1041.9 | 1163.0 | *1234.6* | 1246.5 | 1230.9 | 1132.9 | 987.1 | 820.2 |
| 50° | 1018.3 | 1018.8 | 1102.8 | 1242.2 | 1395.0 | *1484.3* | 1493.5 | 1455.8 | 1337.4 | 1138.8 | 935.9 |
| 52.5° | 1149.6 | 1163.6 | 1286.3 | 1497.3 | 1702.3 | *1839.0* | 1848.2 | 1804.6 | 1646.9 | 1356.3 | 1059.2 |
| 55° | 1330.4 | 1352.5 | 1530.6 | 1789.5 | 2002.6 | *2110.3* | 2110.8 | 2058.6 | 1869.2 | 1567.2 | 1206.6 |
| 57.5° | 1581.2 | 1589.8 | 1756.1 | 2020.4 | 2221.7 | *2295.4* | 2290.0 | 2213.6 | 1995.1 | 1685.1 | 1327.7 |
| 60° | 1788.4 | 1808.3 | 1944.0 | 2189.4 | 2385.8 | *2436.4* | 2430.5 | 2329.3 | 2081.2 | 1754.0 | 1385.9 |
| 62.5° | 1924.6 | 1934.3 | 2074.7 | 2310.5 | 2487.0 | *2529.5* | 2523.1 | 2428.9 | 2186.7 | 1874.0 | 1482.7 |
| 65° | 1957.4 | 1973.6 | 2151.7 | 2391.2 | 2562.4 | *2658.1* | 2653.8 | 2603.3 | 2354.6 | 1962.8 | 1528.5 |
| 67.5° | *1917.6* | *1944.5* | *2163.0* | *2446.6* | *2652.8* | *2732.4* | *2730.3* | *2628.5* | *2318.5* | *1905.8* | *1470.9* |
| 70° | 1836.3 | 1859.5 | 2130.7 | 2440.7 | 2626.4 | *2647.9* | 2631.2 | 2515.0 | 2212.5 | 1811.0 | 1384.8 |
| 72.5° | 1708.2 | 1747.5 | 2012.3 | 2305.6 | 2460.6 | *2474.6* | 2468.7 | 2326.6 | 2053.2 | 1648.0 | 1254.5 |
| 75° | 1540.3 | 1588.2 | 1828.3 | 2065.6 | 2213.1 | *2237.3* | 2226.0 | 2101.7 | 1825.0 | 1444.0 | 1093.1 |
| 77.5° | 1327.7 | 1354.6 | 1537.6 | 1763.1 | 1932.7 | *1937.0* | 1930.5 | 1791.7 | 1537.1 | 1209.3 | 919.8 |
| 80° | 1046.3 | 1062.4 | 1221.2 | 1409.0 | 1549.5 | *1566.7* | 1560.8 | 1467.1 | 1220.6 | 956.9 | 717.4 |
| 82.5° | 775.0 | 764.2 | 870.8 | 1024.7 | 1164.1 | *1165.2* | 1174.9 | 1071.0 | 913.9 | 694.3 | 513.4 |
| 85° | 446.2 | 450.5 | 543.0 | 648.0 | 732.5 | *781.5* | 780.9 | 730.9 | 587.7 | 441.9 | 313.2 |
| 87.5° | 124.3 | 134.0 | 192.7 | 280.4 | 318.6 | *346.6* | 336.4 | 303.5 | 245.4 | 138.9 | 79.7 |
| 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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1121 Highway 74 South
Peachtree City, GA 30269

Scaled Data Report

REPORT NUMBER: P879874
CATALOG NUMBER: MEM2-HTN-VA-50-740-U-WT4

**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 121.6 | 121.6 | 121.6 | 121.6 | 121.6 | 121.6 | 121.6 | 121.6 | 121.6 | 121.6 | 121.6 |
| 2.5° | 123.2 | 122.7 | 122.2 | 121.6 | 120.6 | 120.6 | 120.0 | 120.6 | 120.6 | 120.6 | 120.6 |
| 5° | 126.5 | 125.9 | 124.3 | 123.2 | 121.6 | 120.6 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 |
| 7.5° | 131.9 | 131.3 | 128.6 | 126.5 | 124.3 | 123.2 | 122.2 | 121.6 | 121.1 | 120.6 | 121.1 |
| 10° | 139.9 | 137.8 | 135.1 | 131.9 | 128.6 | 127.0 | 125.4 | 124.9 | 124.3 | 123.8 | 123.8 |
| 12.5° | 149.1 | 147.5 | 142.6 | 138.3 | 135.1 | 132.4 | 130.2 | 129.2 | 128.6 | 128.1 | 128.1 |
| 15° | 161.5 | 158.2 | 151.8 | 146.4 | 141.5 | 138.3 | 136.2 | 135.1 | 134.5 | 134.0 | 134.0 |
| 17.5° | 175.5 | 171.1 | 162.5 | 155.5 | 150.2 | 145.9 | 143.2 | 141.5 | 140.5 | 141.0 | 141.5 |
| 20° | 191.6 | 184.6 | 174.9 | 166.3 | 159.3 | 154.5 | 151.8 | 149.6 | 148.5 | 149.1 | 149.6 |
| 22.5° | 210.4 | 202.9 | 188.9 | 178.7 | 170.1 | 164.1 | 161.5 | 159.8 | 158.8 | 158.2 | 157.2 |
| 25° | 232.0 | 222.3 | 206.1 | 192.1 | 181.9 | 176.0 | 172.8 | 171.7 | 170.6 | 169.5 | 169.5 |
| 27.5° | 257.8 | 246.5 | 224.4 | 209.4 | 197.0 | 191.1 | 187.3 | 185.7 | 185.7 | 184.1 | 184.1 |
| 30° | 287.9 | 272.9 | 246.0 | 226.0 | 213.7 | 206.1 | 201.8 | 201.3 | 200.2 | 201.8 | 201.8 |
| 32.5° | 324.0 | 303.5 | 270.7 | 247.6 | 233.6 | 226.6 | 222.3 | 221.2 | 219.6 | 220.7 | 223.9 |
| 35° | 369.2 | 342.8 | 303.5 | 276.1 | 258.9 | 251.9 | 246.5 | 246.0 | 243.3 | 246.0 | 241.6 |
| 37.5° | 419.8 | 390.7 | 338.5 | 306.2 | 287.4 | 279.3 | 275.6 | 273.9 | 273.4 | 273.4 | 270.2 |
| 40° | 481.7 | 446.7 | 383.2 | 343.4 | 321.8 | 312.2 | 308.4 | 307.8 | 306.8 | 310.5 | 306.8 |
| 42.5° | 558.1 | 504.8 | 429.5 | 384.3 | 362.2 | 352.0 | 347.7 | 346.1 | 348.8 | 350.4 | 349.8 |
| 45° | 643.1 | 585.6 | 488.7 | 436.5 | 411.2 | 401.0 | 395.0 | 393.4 | 394.5 | 394.5 | 399.9 |
| 47.5° | 741.1 | 673.3 | 556.5 | 493.5 | 470.4 | 458.0 | 454.2 | 448.9 | 446.2 | 445.1 | 454.2 |
| 50° | 843.4 | 758.9 | 625.9 | 555.4 | 534.4 | 524.7 | 525.8 | 515.1 | 511.3 | 507.0 | 505.9 |
| 52.5° | 946.1 | 850.3 | 705.0 | 641.5 | 617.3 | 622.2 | 620.0 | 608.7 | 586.6 | 581.3 | 568.3 |
| 55° | 1069.4 | 953.7 | 780.9 | 705.0 | 684.0 | 687.8 | 696.4 | 696.4 | 691.6 | 679.7 | 669.5 |
| 57.5° | 1173.8 | 1039.3 | 838.0 | 743.2 | 724.9 | 734.6 | 751.9 | 764.8 | 776.1 | 784.7 | 784.2 |
| 60° | 1231.9 | 1092.0 | 875.1 | 772.3 | 750.8 | 769.6 | 795.5 | 817.5 | 841.7 | 867.0 | 866.0 |
| 62.5° | 1312.1 | 1165.7 | 941.3 | 824.0 | 786.8 | 792.8 | 822.4 | 860.6 | 882.6 | 903.6 | 909.6 |
| 65° | 1333.1 | 1179.2 | 966.1 | 860.6 | 830.4 | 831.5 | 851.4 | 882.6 | 901.5 | 906.9 | 910.1 |
| 67.5° | *1276.6* | *1120.0* | *925.2* | *839.0* | *822.9* | *838.0* | *870.3* | *895.0* | *897.7* | *884.8* | *883.7* |
| 70° | 1191.6 | 1047.3 | 860.6 | 788.5 | 778.2 | 801.4 | 843.9 | 873.5 | 867.0 | 840.7 | 839.0 |
| 72.5° | 1071.5 | 937.5 | 773.9 | 721.7 | 711.5 | 740.6 | 778.2 | 809.4 | 799.8 | 779.8 | 778.2 |
| 75° | 927.3 | 801.9 | 669.0 | 630.2 | 629.7 | 661.4 | 694.3 | 713.1 | 712.6 | 698.6 | 694.3 |
| 77.5° | 770.7 | 669.0 | 551.1 | 516.1 | 529.0 | 559.2 | 583.4 | 597.4 | 592.6 | 587.7 | 586.1 |
| 80° | 603.3 | 512.9 | 425.2 | 404.2 | 424.1 | 434.3 | 460.2 | 459.1 | 461.8 | 451.5 | 459.1 |
| 82.5° | 429.5 | 369.7 | 304.6 | 295.5 | 298.2 | 318.6 | 332.6 | 331.0 | 324.0 | 316.5 | 313.2 |
| 85° | 260.5 | 227.7 | 195.4 | 182.4 | 191.6 | 190.0 | 198.6 | 191.6 | 187.3 | 183.5 | 186.8 |
| 87.5° | 72.1 | 62.4 | 59.7 | 43.1 | 53.3 | 42.0 | 44.1 | 30.7 | 26.9 | 32.3 | 28.0 |
| 90° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

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

# LM-79-2019: Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Report Prepared for

Cooper Lighting Solutions

Streetworks

Report Number: SP1-2407-176-5

Test Date: 09/24/2024

Luminaire Tested: MEM2-HTN-VA-30-740-U-WQ

Data in this report applies to families of products including MEM2-HTN-VA-30-740-U-WQ

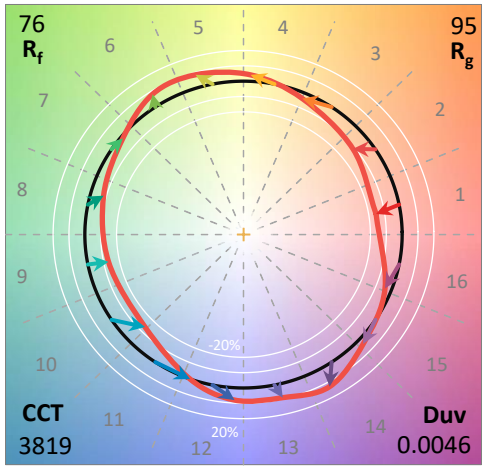
Report Generated By FNC07603 / LDUCLS01DT446
Version: v7.04

## Test Information

| | |
|---|---|
| Test Method: | LM-79-2019 |
| Report Number: | SP1-2407-176-5 |
| Test Lab: | COOPER LIGHTING SOLUTIONS |
| Photometer: | SP1 - 76IN SPHERE |
| Measurement Geometry: | 4π |
| Issue Date: | 09/27/2024 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS |
| Product Line: | Streetworks |
| Catalog Number: | **MEM2-HTN-VA-30-740-U-WQ** |
| Description: | EPIC MODERN VISUAL COMFORT 30W WAVESTREAM WIDE |

## Spectral Parameters

| | | | | | |
|---|---|---|---|---|---|
| CCT (K): | 3819 | CRI (Ra): | 72.9 | | |
| CIE u': | 0.2261 | R1: | 70.1 | R9: | -21.5 |
| CIE v': | 0.5108 | R2: | 78.4 | R10: | 48.5 |
| Duv: | 0.0046 | R3: | 85.0 | R11: | 68.4 |
| CIE x: | 0.3926 | R4: | 72.9 | R12: | 39.0 |
| CIE y: | 0.3942 | R5: | 69.1 | R13: | 71.1 |
| CIE z: | 0.2132 | R6: | 69.2 | R14: | 91.3 |
| Peak Wavelength (nm): | 450 | R7: | 82.8 | R15: | 63.2 |
| Dominant Wavelength (nm): | 577 | R8: | 55.4 | | |
| Purity: | 36.15483 | | | | |
| Rf: | 75.6 | | | | |
| Rg: | 94.8 | | | | |




## Test Conditions

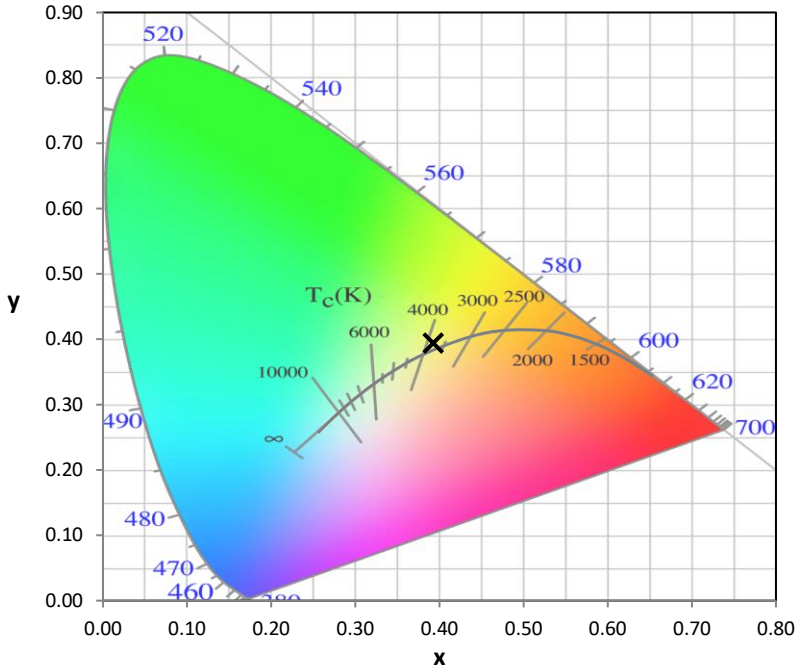
| | |
|---|---|
| Stabilization Time: | 30M |
| Operation Time: | 1H 30M |
| Sphere Temperature (°C): | 25.2 |

REPORT NUMBER: SP1-2407-176-5

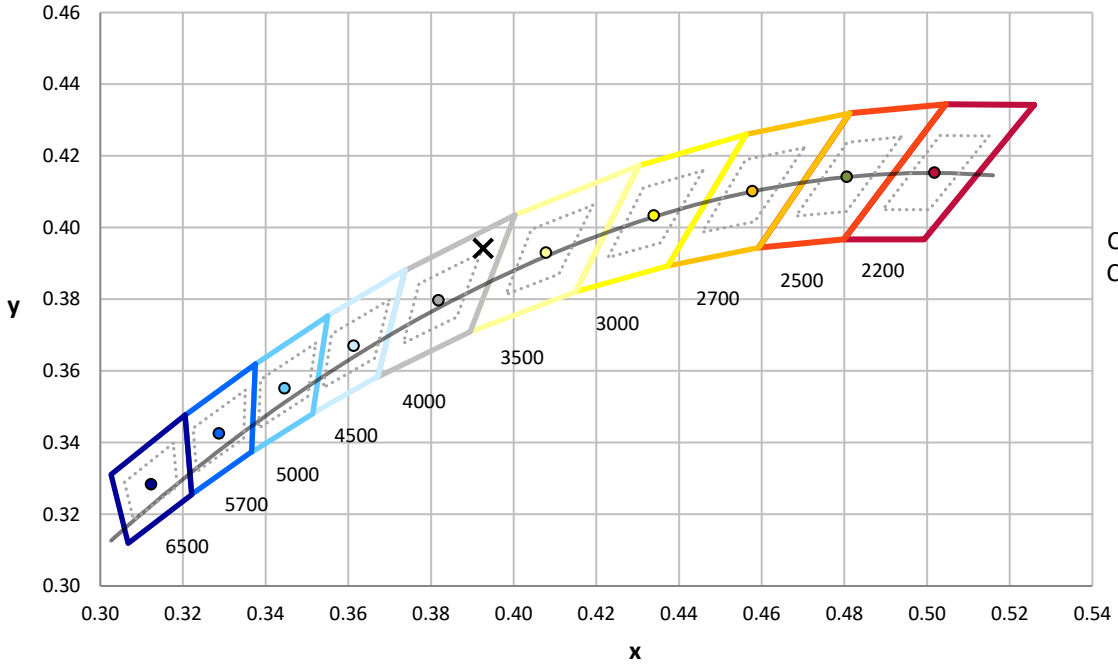
| Measurement and Test Equipment | | | |
|---|---|---|---|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | IN0058 | 6/18/2024 | 12/18/2024 |
| Power Meter | INXT2011004 | 2/8/2024 | 2/8/2025 |
| AC Power Source | IN0063 | 10/24/2023 | 10/24/2024 |
| DC 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: SP1-2407-176-5

## CIE 1931 Chromaticity Diagram




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




CCT = 3819K
CIE x = 0.3926
CIE y = 0.3942
Duv = 0.0046

Point lies inside the ANSI 4000K 7-step quadrangle

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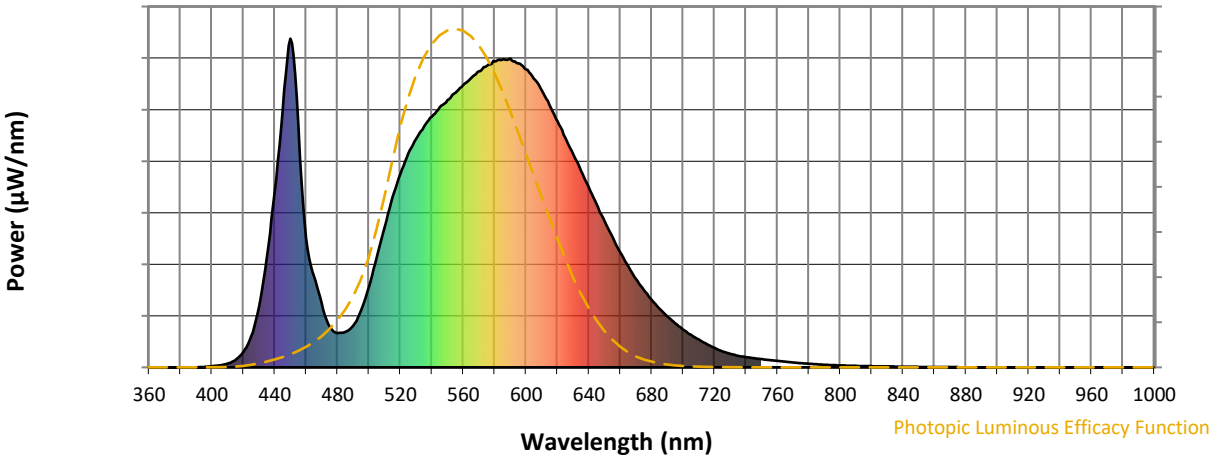
## Photopic Flux vs. Wavelength




## 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 | 127 | NR | 620 | 748 | NR | 750 | 25 | NR | 880 | 0 | NR |
| 365 | 0 | NR | 495 | 173 | NR | 625 | 699 | NR | 755 | 22 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 246 | NR | 630 | 648 | NR | 760 | 20 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 335 | NR | 635 | 599 | NR | 765 | 17 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 427 | NR | 640 | 547 | NR | 770 | 15 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 517 | NR | 645 | 495 | NR | 775 | 13 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 589 | NR | 650 | 445 | NR | 780 | 11 | NR | 910 | 0 | NR |
| 395 | 1 | NR | 525 | 649 | NR | 655 | 396 | NR | 785 | 9 | NR | 915 | 0 | NR |
| 400 | 4 | NR | 530 | 695 | NR | 660 | 349 | NR | 790 | 8 | NR | 920 | 0 | NR |
| 405 | 6 | NR | 535 | 733 | NR | 665 | 308 | NR | 795 | 7 | NR | 925 | 0 | NR |
| 410 | 11 | NR | 540 | 763 | NR | 670 | 269 | NR | 800 | 6 | NR | 930 | 0 | NR |
| 415 | 23 | NR | 545 | 792 | NR | 675 | 235 | NR | 805 | 5 | NR | 935 | 0 | NR |
| 420 | 46 | NR | 550 | 813 | NR | 680 | 205 | NR | 810 | 5 | NR | 940 | 0 | NR |
| 425 | 95 | NR | 555 | 835 | NR | 685 | 178 | NR | 815 | 4 | NR | 945 | 0 | NR |
| 430 | 183 | NR | 560 | 859 | NR | 690 | 155 | NR | 820 | 3 | NR | 950 | 0 | NR |
| 435 | 338 | NR | 565 | 880 | NR | 695 | 134 | NR | 825 | 3 | NR | 955 | 0 | NR |
| 440 | 534 | NR | 570 | 900 | NR | 700 | 115 | NR | 830 | 3 | NR | 960 | 0 | NR |
| 445 | 782 | NR | 575 | 918 | NR | 705 | 99 | NR | 835 | 2 | NR | 965 | 0 | NR |
| 450 | 1000 | NR | 580 | 931 | NR | 710 | 84 | NR | 840 | 2 | NR | 970 | 0 | NR |
| 455 | 739 | NR | 585 | 937 | NR | 715 | 71 | NR | 845 | 2 | NR | 975 | 0 | NR |
| 460 | 393 | NR | 590 | 939 | NR | 720 | 59 | NR | 850 | 1 | NR | 980 | 0 | NR |
| 465 | 276 | NR | 595 | 925 | NR | 725 | 49 | NR | 855 | 1 | NR | 985 | 0 | NR |
| 470 | 190 | NR | 600 | 907 | NR | 730 | 41 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 123 | NR | 605 | 878 | NR | 735 | 35 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 105 | NR | 610 | 842 | NR | 740 | 31 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 108 | NR | 615 | 797 | NR | 745 | 28 | NR | 875 | 1 | NR | | | |

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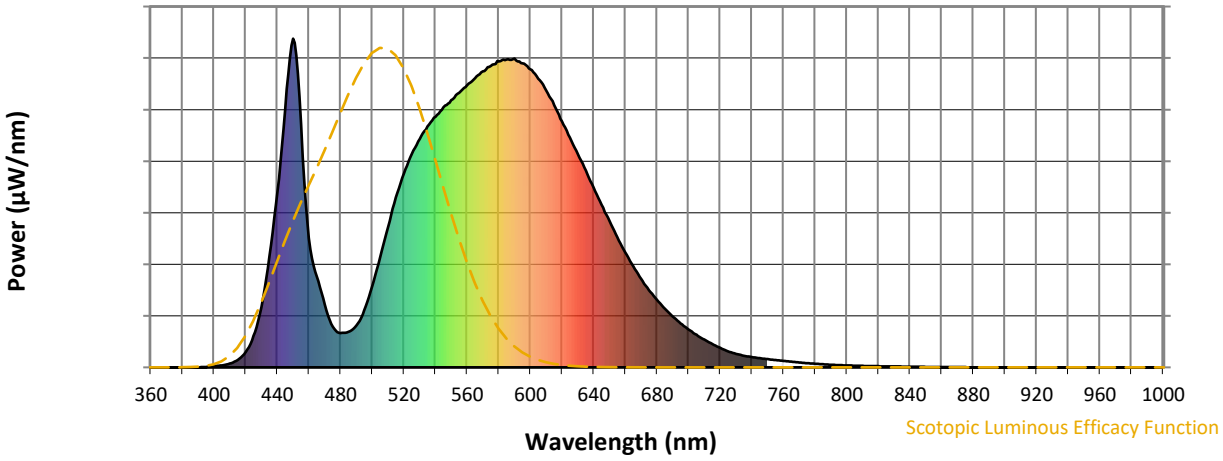
## Scotopic Flux vs. Wavelength




**Scotopic Lumens: NR** **S/P: 1.45**

| 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 | 127 | NR | 620 | 748 | NR | 750 | 25 | NR | 880 | 0 | NR |
| 365 | 0 | NR | 495 | 173 | NR | 625 | 699 | NR | 755 | 22 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 246 | NR | 630 | 648 | NR | 760 | 20 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 335 | NR | 635 | 599 | NR | 765 | 17 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 427 | NR | 640 | 547 | NR | 770 | 15 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 517 | NR | 645 | 495 | NR | 775 | 13 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 589 | NR | 650 | 445 | NR | 780 | 11 | NR | 910 | 0 | NR |
| 395 | 1 | NR | 525 | 649 | NR | 655 | 396 | NR | 785 | 9 | NR | 915 | 0 | NR |
| 400 | 4 | NR | 530 | 695 | NR | 660 | 349 | NR | 790 | 8 | NR | 920 | 0 | NR |
| 405 | 6 | NR | 535 | 733 | NR | 665 | 308 | NR | 795 | 7 | NR | 925 | 0 | NR |
| 410 | 11 | NR | 540 | 763 | NR | 670 | 269 | NR | 800 | 6 | NR | 930 | 0 | NR |
| 415 | 23 | NR | 545 | 792 | NR | 675 | 235 | NR | 805 | 5 | NR | 935 | 0 | NR |
| 420 | 46 | NR | 550 | 813 | NR | 680 | 205 | NR | 810 | 5 | NR | 940 | 0 | NR |
| 425 | 95 | NR | 555 | 835 | NR | 685 | 178 | NR | 815 | 4 | NR | 945 | 0 | NR |
| 430 | 183 | NR | 560 | 859 | NR | 690 | 155 | NR | 820 | 3 | NR | 950 | 0 | NR |
| 435 | 338 | NR | 565 | 880 | NR | 695 | 134 | NR | 825 | 3 | NR | 955 | 0 | NR |
| 440 | 534 | NR | 570 | 900 | NR | 700 | 115 | NR | 830 | 3 | NR | 960 | 0 | NR |
| 445 | 782 | NR | 575 | 918 | NR | 705 | 99 | NR | 835 | 2 | NR | 965 | 0 | NR |
| 450 | 1000 | NR | 580 | 931 | NR | 710 | 84 | NR | 840 | 2 | NR | 970 | 0 | NR |
| 455 | 739 | NR | 585 | 937 | NR | 715 | 71 | NR | 845 | 2 | NR | 975 | 0 | NR |
| 460 | 393 | NR | 590 | 939 | NR | 720 | 59 | NR | 850 | 1 | NR | 980 | 0 | NR |
| 465 | 276 | NR | 595 | 925 | NR | 725 | 49 | NR | 855 | 1 | NR | 985 | 0 | NR |
| 470 | 190 | NR | 600 | 907 | NR | 730 | 41 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 123 | NR | 605 | 878 | NR | 735 | 35 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 105 | NR | 610 | 842 | NR | 740 | 31 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 108 | NR | 615 | 797 | NR | 745 | 28 | NR | 875 | 1 | NR | | | |

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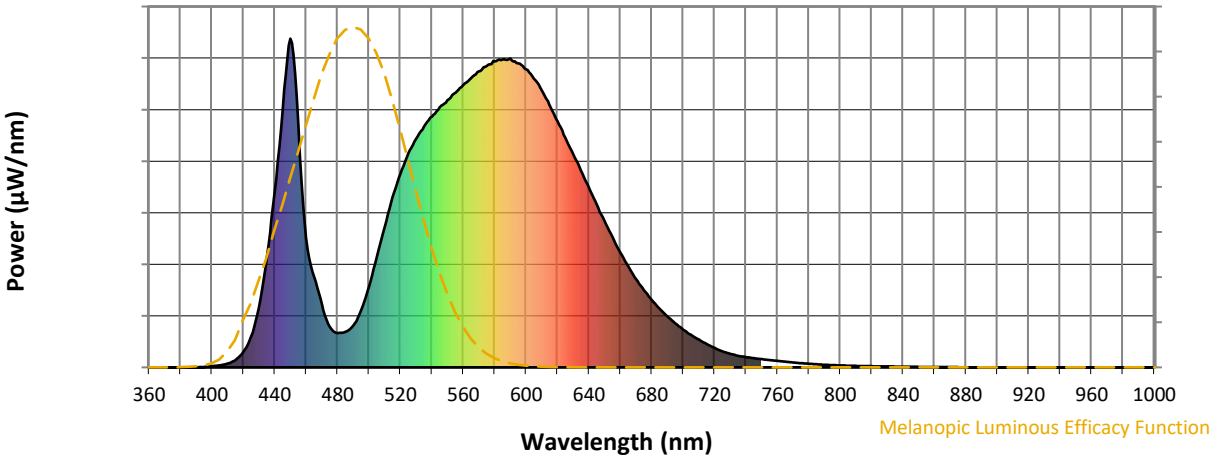
## Melanopic Flux vs. Wavelength




**Melanopic Lumens: NR** **M/P: 2.76**

| 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 | 127 | NR | 620 | 748 | NR | 750 | 25 | NR | 880 | 0 | NR |
| 365 | 0 | NR | 495 | 173 | NR | 625 | 699 | NR | 755 | 22 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 246 | NR | 630 | 648 | NR | 760 | 20 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 335 | NR | 635 | 599 | NR | 765 | 17 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 427 | NR | 640 | 547 | NR | 770 | 15 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 517 | NR | 645 | 495 | NR | 775 | 13 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 589 | NR | 650 | 445 | NR | 780 | 11 | NR | 910 | 0 | NR |
| 395 | 1 | NR | 525 | 649 | NR | 655 | 396 | NR | 785 | 9 | NR | 915 | 0 | NR |
| 400 | 4 | NR | 530 | 695 | NR | 660 | 349 | NR | 790 | 8 | NR | 920 | 0 | NR |
| 405 | 6 | NR | 535 | 733 | NR | 665 | 308 | NR | 795 | 7 | NR | 925 | 0 | NR |
| 410 | 11 | NR | 540 | 763 | NR | 670 | 269 | NR | 800 | 6 | NR | 930 | 0 | NR |
| 415 | 23 | NR | 545 | 792 | NR | 675 | 235 | NR | 805 | 5 | NR | 935 | 0 | NR |
| 420 | 46 | NR | 550 | 813 | NR | 680 | 205 | NR | 810 | 5 | NR | 940 | 0 | NR |
| 425 | 95 | NR | 555 | 835 | NR | 685 | 178 | NR | 815 | 4 | NR | 945 | 0 | NR |
| 430 | 183 | NR | 560 | 859 | NR | 690 | 155 | NR | 820 | 3 | NR | 950 | 0 | NR |
| 435 | 338 | NR | 565 | 880 | NR | 695 | 134 | NR | 825 | 3 | NR | 955 | 0 | NR |
| 440 | 534 | NR | 570 | 900 | NR | 700 | 115 | NR | 830 | 3 | NR | 960 | 0 | NR |
| 445 | 782 | NR | 575 | 918 | NR | 705 | 99 | NR | 835 | 2 | NR | 965 | 0 | NR |
| 450 | 1000 | NR | 580 | 931 | NR | 710 | 84 | NR | 840 | 2 | NR | 970 | 0 | NR |
| 455 | 739 | NR | 585 | 937 | NR | 715 | 71 | NR | 845 | 2 | NR | 975 | 0 | NR |
| 460 | 393 | NR | 590 | 939 | NR | 720 | 59 | NR | 850 | 1 | NR | 980 | 0 | NR |
| 465 | 276 | NR | 595 | 925 | NR | 725 | 49 | NR | 855 | 1 | NR | 985 | 0 | NR |
| 470 | 190 | NR | 600 | 907 | NR | 730 | 41 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 123 | NR | 605 | 878 | NR | 735 | 35 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 105 | NR | 610 | 842 | NR | 740 | 31 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 108 | NR | 615 | 797 | NR | 745 | 28 | NR | 875 | 1 | NR | | | |

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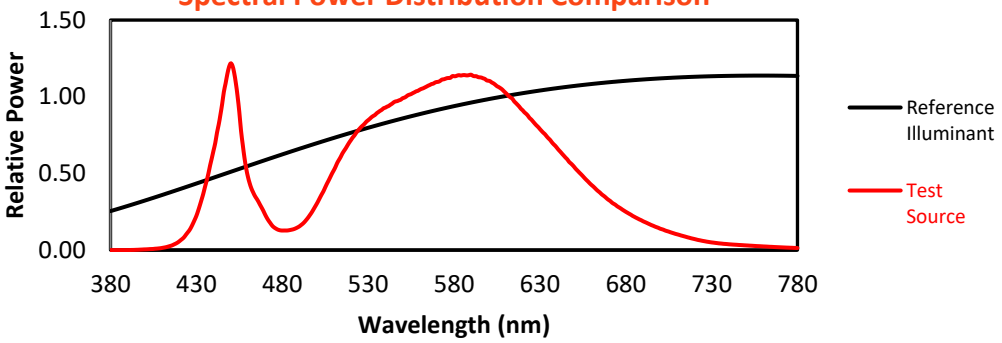
# TM-30-18

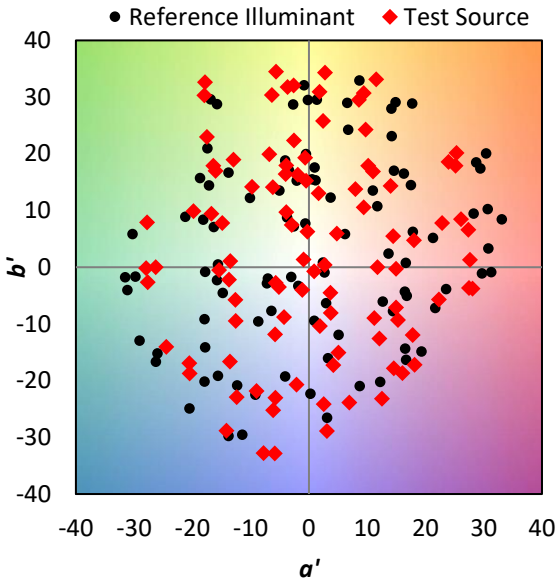
## Summary

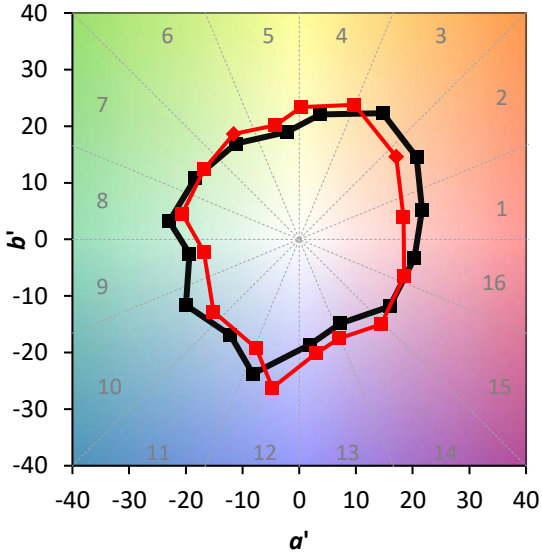
$R_f$ = 75.6
$R_g$ = 94.8
CIE $R_a$ = 72.9
$R_9$ = -21.5

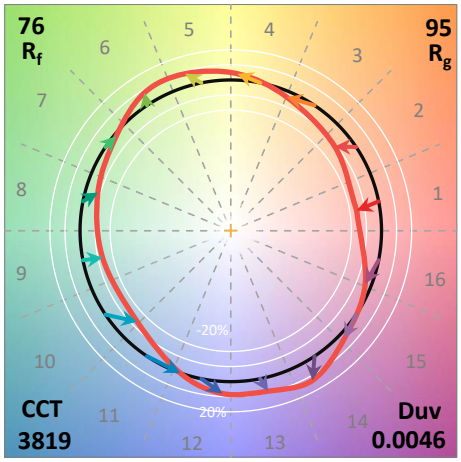
## Spectral Power Distribution Comparison

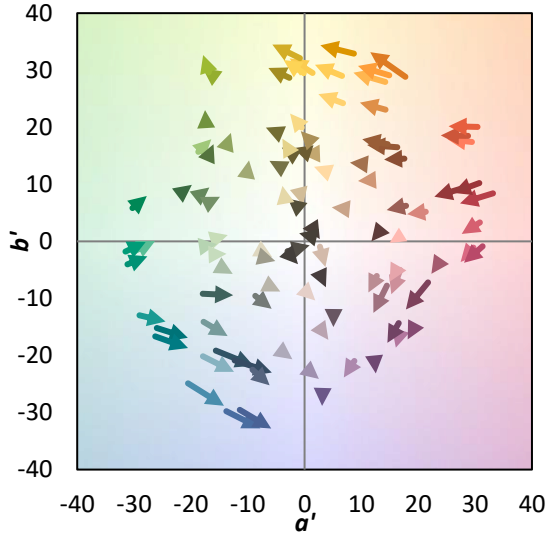



## Color Vector Graphics



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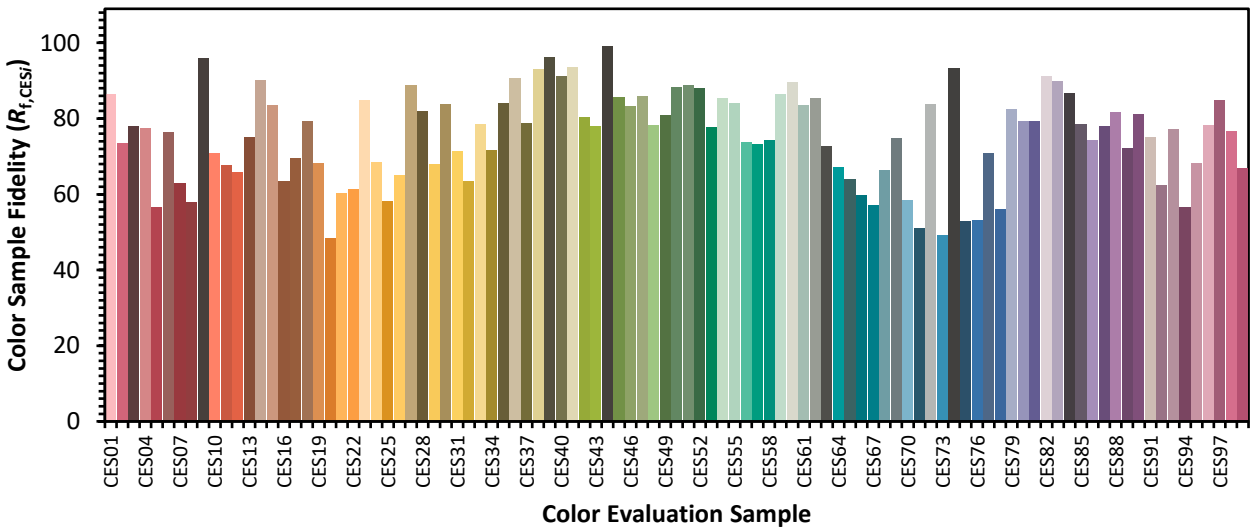
# TM-30-18

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

| | | | |
|---|---|---|---|
| CES01 = 85 | CES26 = 65 | CES51 = 89 | CES76 = 53 |
| CES02 = 61 | CES27 = 89 | CES52 = 88 | CES77 = 71 |
| CES03 = 30 | CES28 = 82 | CES53 = 78 | CES78 = 56 |
| CES04 = 70 | CES29 = 68 | CES54 = 85 | CES79 = 83 |
| CES05 = 48 | CES30 = 84 | CES55 = 84 | CES80 = 79 |
| CES06 = 50 | CES31 = 71 | CES56 = 74 | CES81 = 79 |
| CES07 = 40 | CES32 = 63 | CES57 = 73 | CES82 = 91 |
| CES08 = 39 | CES33 = 79 | CES58 = 74 | CES83 = 90 |
| CES09 = 29 | CES34 = 72 | CES59 = 86 | CES84 = 87 |
| CES10 = 74 | CES35 = 84 | CES60 = 90 | CES85 = 78 |
| CES11 = 57 | CES36 = 91 | CES61 = 84 | CES86 = 74 |
| CES12 = 63 | CES37 = 79 | CES62 = 85 | CES87 = 78 |
| CES13 = 42 | CES38 = 93 | CES63 = 73 | CES88 = 82 |
| CES14 = 74 | CES39 = 96 | CES64 = 67 | CES89 = 72 |
| CES15 = 71 | CES40 = 91 | CES65 = 64 | CES90 = 81 |
| CES16 = 47 | CES41 = 93 | CES66 = 60 | CES91 = 75 |
| CES17 = 49 | CES42 = 80 | CES67 = 57 | CES92 = 62 |
| CES18 = 56 | CES43 = 78 | CES68 = 66 | CES93 = 77 |
| CES19 = 72 | CES44 = 99 | CES69 = 75 | CES94 = 57 |
| CES20 = 65 | CES45 = 86 | CES70 = 58 | CES95 = 68 |
| CES21 = 86 | CES46 = 83 | CES71 = 51 | CES96 = 78 |
| CES22 = 78 | CES47 = 86 | CES72 = 84 | CES97 = 85 |
| CES23 = 92 | CES48 = 78 | CES73 = 49 | CES98 = 77 |
| CES24 = 91 | CES49 = 81 | CES74 = 93 | CES99 = 67 |
| CES25 = 72 | CES50 = 88 | CES75 = 53 | |



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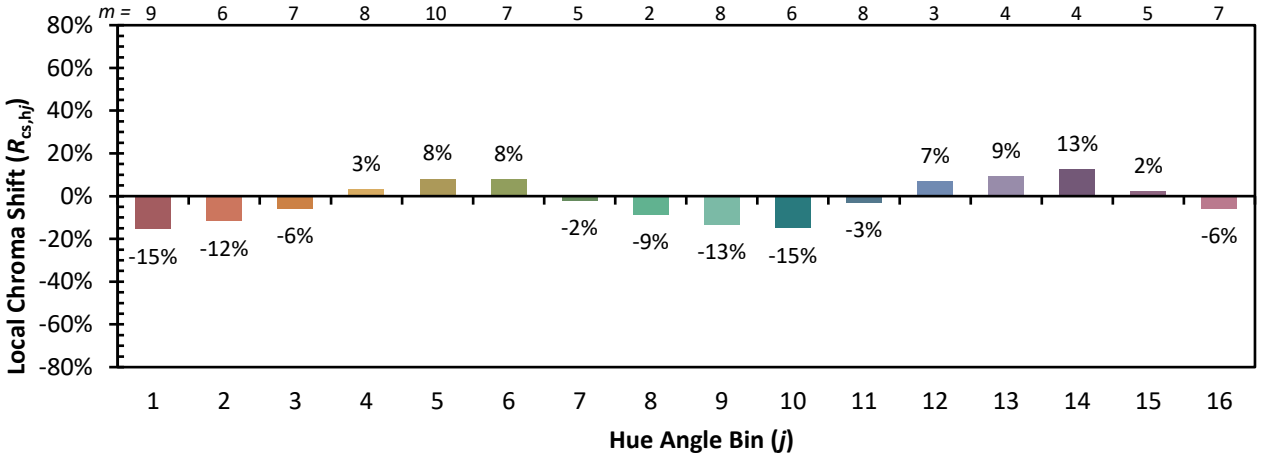
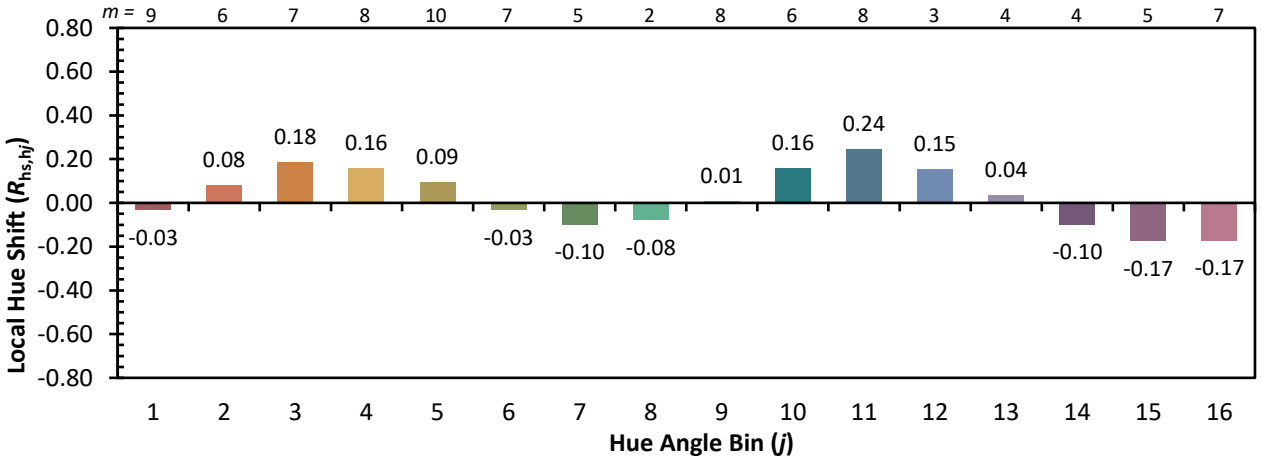
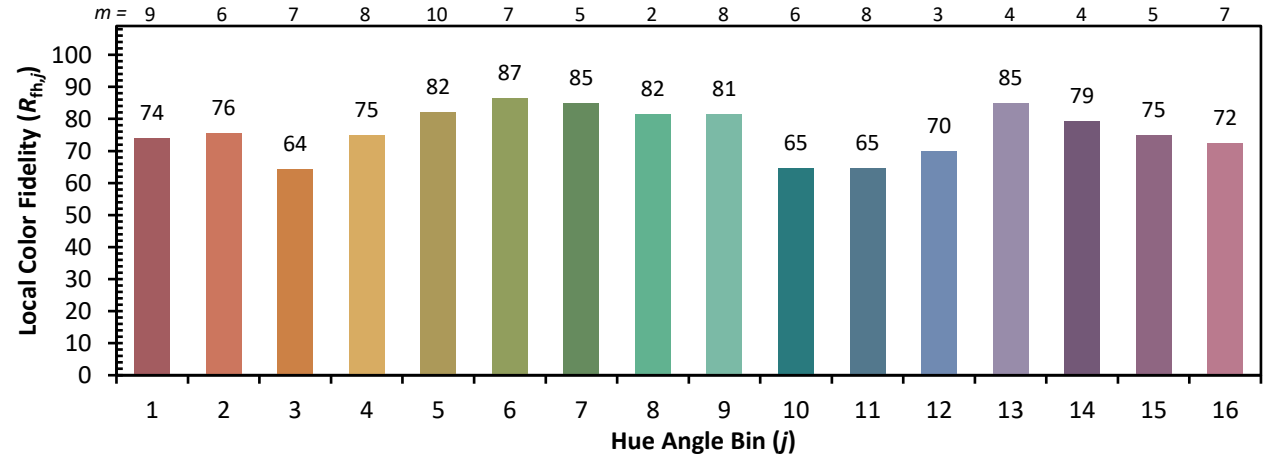
## Color Rendition by Hue-Angle Bin



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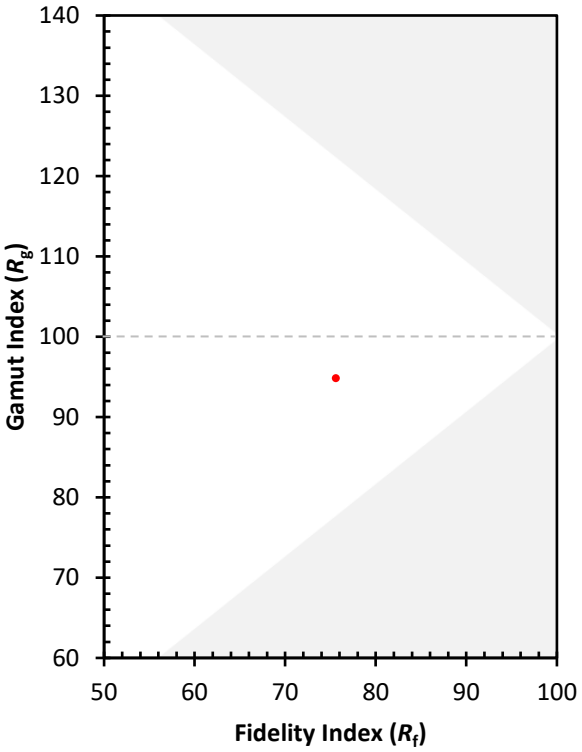
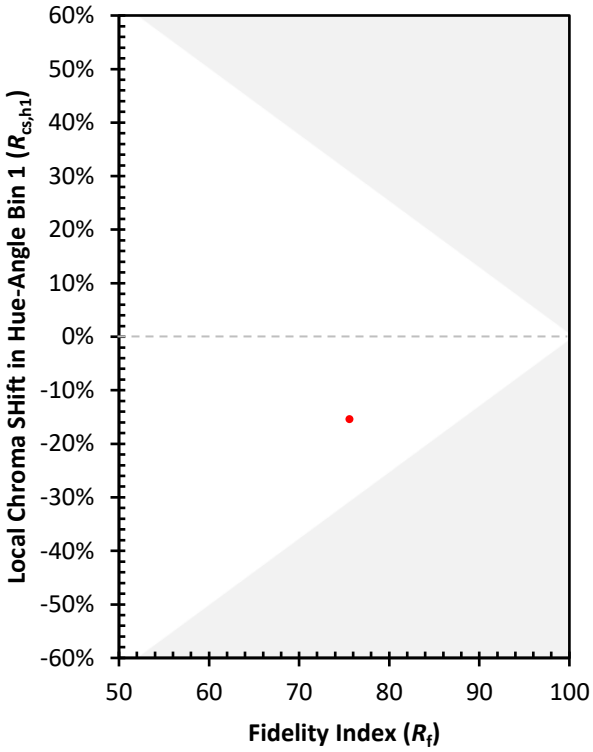
## Measure Comparisons

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