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: P870421

Luminaire Tested: **MEM2-HSN-SA-100-840-U-T3-HSS**

Issue Date: 09/05/2024

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: | P870421 |
| Test Lab: | INNOVATION CENTER(G3) |
| Issue Date: | 09/05/2024 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS (FORMERLY EATON) |
| Product Line: | STREETWORKS |
| Catalog Number: | MEM2-HSN-SA-100-840-U-T3-HSS |
| Description: | EPIC MODERN SHORT HOUSING DISCRETE LED ARRAYS 100W 80CRI 4000K FIXTURE w/ TYPE III DISTRIBUTION OPTIC AND HOUSE SIDE SHIELD |
| Light Source: | (20) 4000K CCT, 80 CRI LEDS |
| Ballast/Driver: | ELECTRONIC DRIVER |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 8516.3 lumens |
| Efficiency: | N/A |
| Efficacy: | 94.6 lumens/watt |
| Luminous Opening: | Rectangular (W 0.67' x L: 0.33' x H: 0') |
| IES Classification: | Type III - Short |
| BUG Rating: | B1 - U0 - G2 |

| | |
|---|---|
| Input Watts (W): | 90 |
| Input Voltage (V): | 120 |
| Input Current (Ain): | NR |
| Voltage Rise (V): | NR |
| Power Factor: | 0.99 |
| Total Harmonic Distortion (THDi): | 6.20% |
| Frequency (hertz): | 60 |
| Stabilization Time: | NR |
| Operation Time: | NR |
| Ambient Temperature (°C): | NR |
| Test Distance: | 24 FT |

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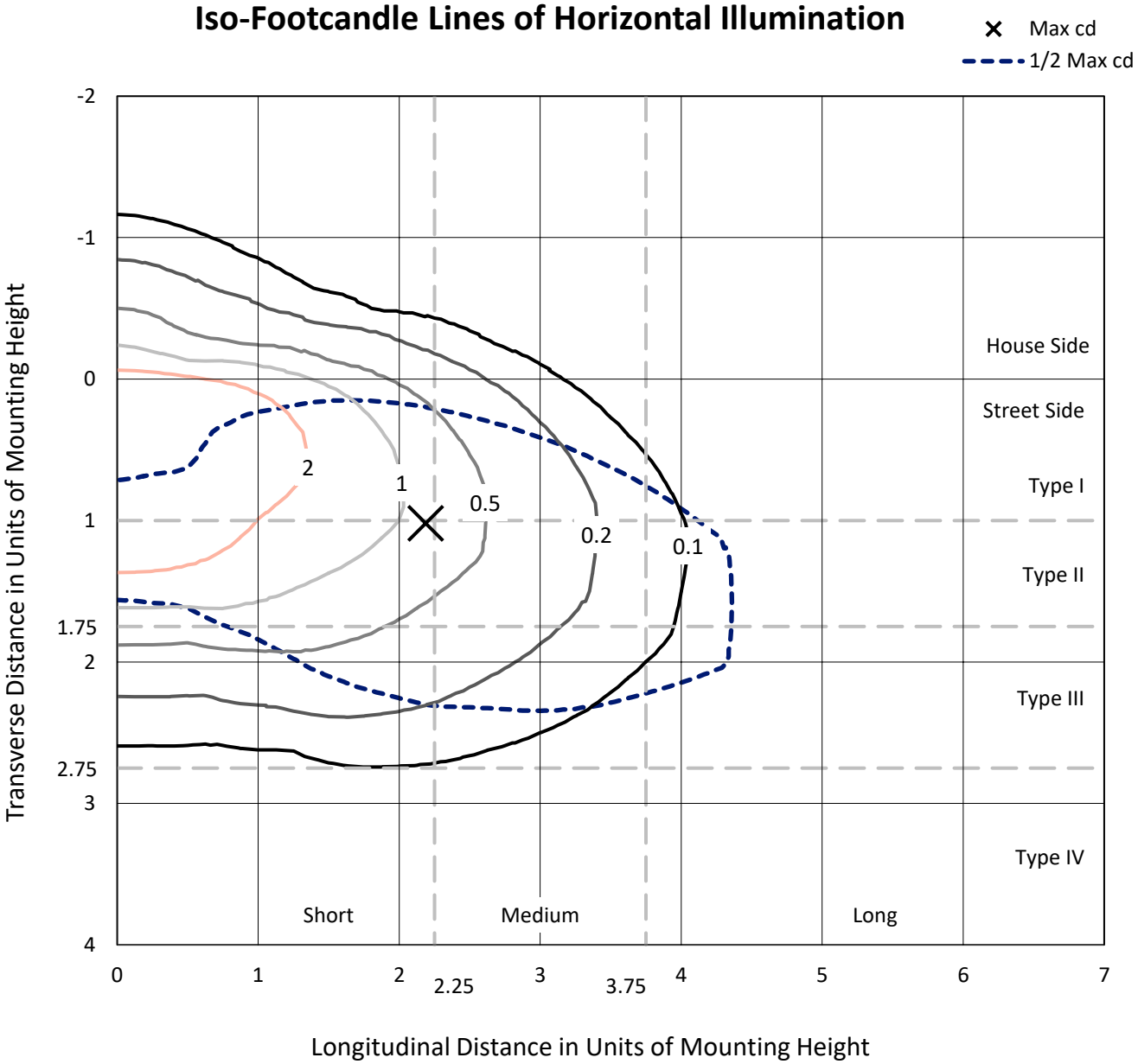
Scaled Data Report

REPORT NUMBER: P870421
CATALOG NUMBER: MEM2-HSN-SA-100-840-U-T3-HSS

## Iso-Footcandle Lines of Horizontal Illumination




Based on 20 foot mounting height. Maximum calculated value = 4.9 fc
Type III - Short - N/A

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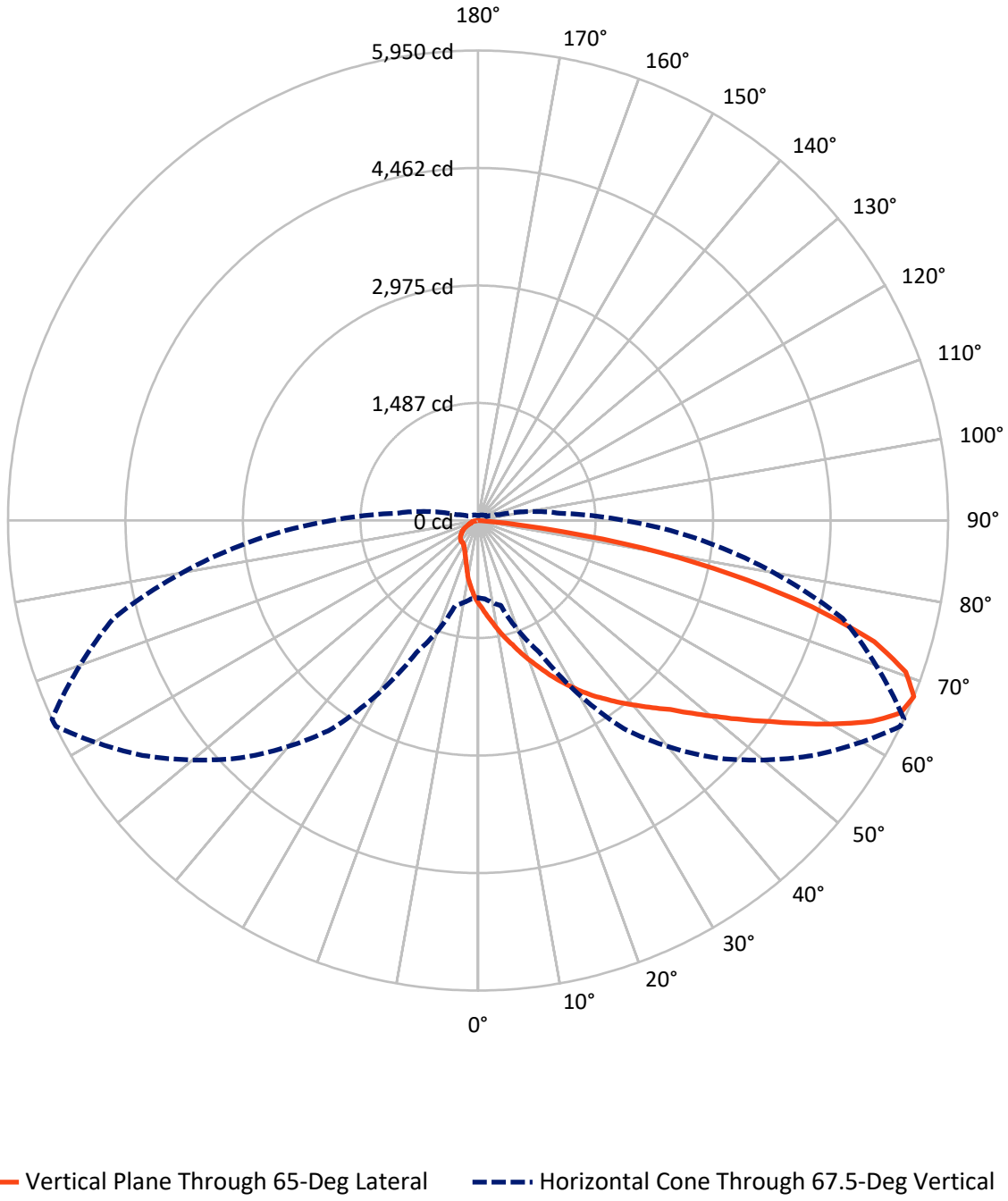
## Luminous Intensity Polar Plot



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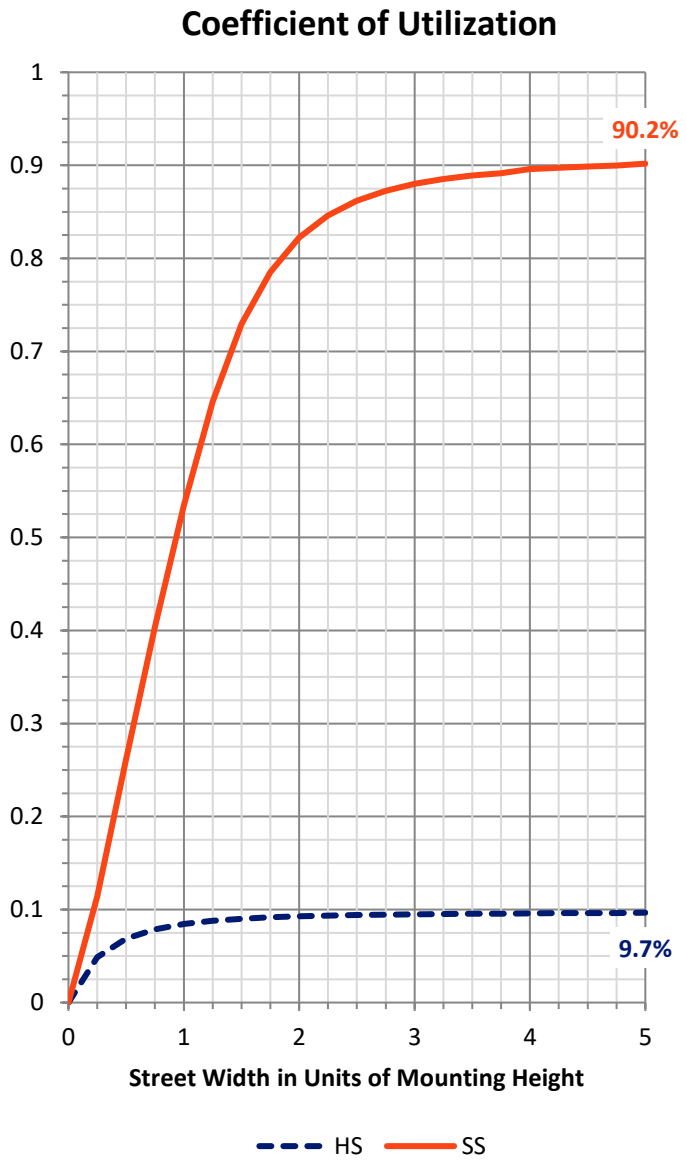
REPORT NUMBER: P870421
CATALOG NUMBER: MEM2-HSN-SA-100-840-U-T3-HSS

**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 828.9 | 0.0 | 828.9 |
| | % Fixture | 9.7 | 0.0 | 9.7 |
| **Street Side** | Lumens | 7687.4 | 0.0 | 7687.4 |
| | % Fixture | 90.3 | 0.0 | 90.3 |
| **Total** | Lumens | 8516.3 | 0.0 | 8516.3 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 103.0 | 1.2 |
| 10°-20° | 341.7 | 4.0 |
| 20°-30° | 622.0 | 7.3 |
| 30°-40° | 962.5 | 11.3 |
| 40°-50° | 1455.0 | 17.1 |
| 50°-60° | 1892.9 | 22.2 |
| 60°-70° | 1867.3 | 21.9 |
| 70°-80° | 1136.7 | 13.3 |
| 80°-90° | 135.1 | 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° | 8516.3 | 100.0 |
| 0°-180° | 8516.3 | 100.0 |



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REPORT NUMBER: P870421
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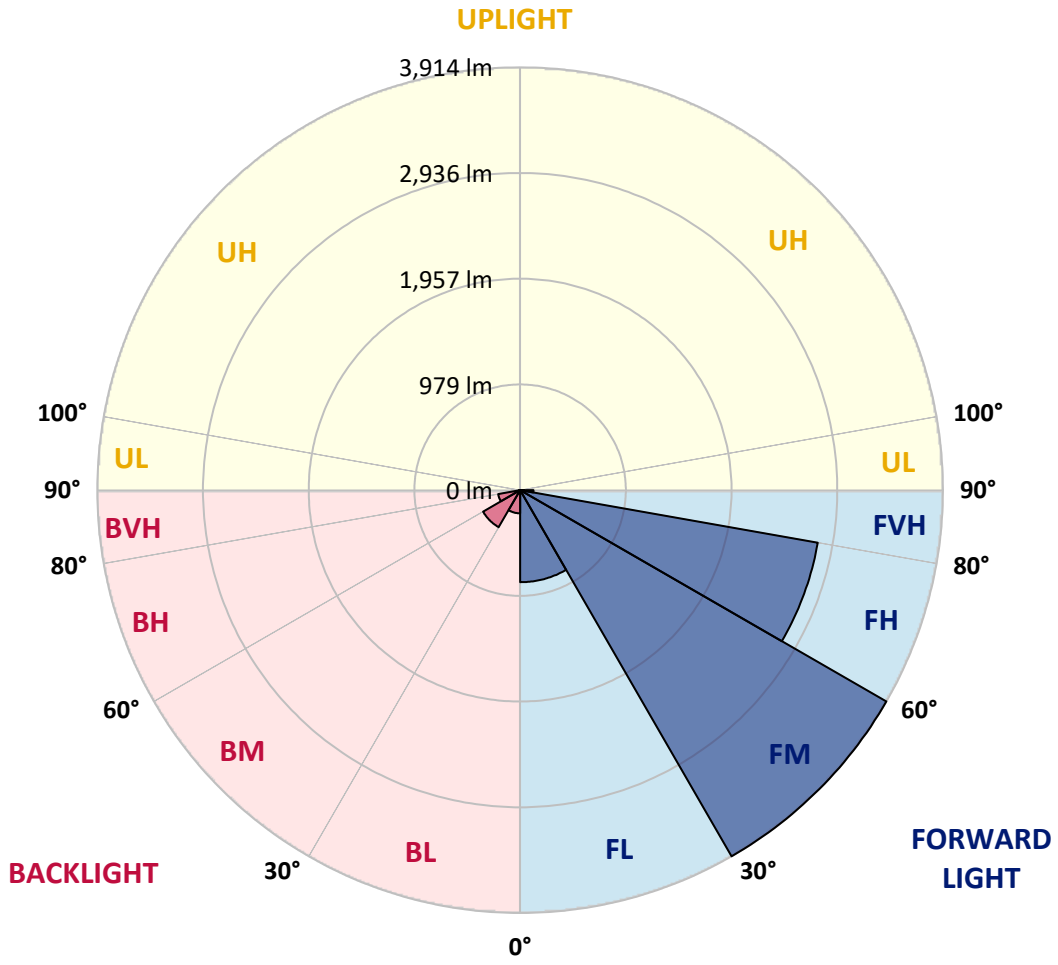
## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 852.2 | 10.0 | | | |
| FM | (30°-60°) | 3914.1 | 46.0 | | | |
| FH | (60°-80°) | 2797.6 | 32.9 | | | G2/5000 |
| FVH | (80°-90°) | 123.5 | 1.5 | | | G2/225 |
| BL | (0°-30°) | 214.5 | 2.5 | B1/500 | | |
| BM | (30°-60°) | 396.4 | 4.7 | B1/1000 | | |
| BH | (60°-80°) | 206.4 | 2.4 | B1/500 | | G1/500 |
| BVH | (80°-90°) | 11.6 | 0.1 | | | G1/100 |
| UL | (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH | (100°-180°) | 0.0 | 0.0 | | U0/0 | |

**BUG Rating: B1-U0-G2**
Type III Short



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**CANDELA DISTRIBUTION (FULL):**

| | 0° | 5° | 15° | 25° | 35° | 45° | 55° | 64° | 65° | 75° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 1052.3 | 1052.3 | 1052.3 | 1052.3 | 1052.3 | 1052.3 | 1052.3 | 1052.3 | *1052.3* | 1052.3 | 1052.3 |
| 2.5° | 1229.7 | 1220.0 | 1227.3 | 1210.3 | 1190.9 | 1176.3 | 1147.1 | 1122.8 | *1120.4* | 1096.1 | 1069.3 |
| 5° | 1465.5 | 1433.9 | 1436.3 | 1402.3 | 1361.0 | 1317.2 | 1271.1 | 1210.3 | *1210.3* | 1152.0 | 1091.2 |
| 7.5° | 1676.9 | 1672.1 | 1650.2 | 1596.7 | 1548.1 | 1480.1 | 1395.0 | 1317.2 | *1300.2* | 1210.3 | 1115.5 |
| 10° | 1881.1 | 1873.8 | 1854.3 | 1813.0 | 1730.4 | 1655.1 | 1548.1 | 1431.5 | *1409.6* | 1280.8 | 1144.7 |
| 12.5° | 2043.9 | 2046.3 | 2024.5 | 1990.4 | 1917.5 | 1827.6 | 1686.7 | 1540.8 | *1521.4* | 1348.8 | 1173.9 |
| 15° | 2187.3 | 2184.9 | 2180.0 | 2150.8 | 2080.4 | 1997.7 | 1832.5 | 1662.3 | *1630.8* | 1421.7 | 1203.0 |
| 17.5° | 2296.7 | 2291.8 | 2282.1 | 2257.8 | 2223.8 | 2143.6 | 1985.6 | 1791.2 | *1764.4* | 1506.8 | 1237.0 |
| 20° | 2328.3 | 2325.8 | 2325.8 | 2342.8 | 2328.3 | 2279.7 | 2138.7 | 1924.8 | *1895.7* | 1596.7 | 1283.2 |
| 22.5° | 2386.6 | 2384.2 | 2381.7 | 2398.7 | 2408.5 | 2403.6 | 2282.1 | 2060.9 | *2034.2* | 1701.2 | 1341.5 |
| 25° | 2461.9 | 2457.1 | 2449.8 | 2466.8 | 2478.9 | 2508.1 | 2425.5 | 2221.3 | *2189.7* | 1822.8 | 1399.9 |
| 27.5° | 2561.6 | 2566.4 | 2556.7 | 2554.3 | 2554.3 | 2571.3 | 2551.9 | 2364.7 | *2335.6* | 1939.4 | 1467.9 |
| 30° | 2692.8 | 2700.1 | 2683.1 | 2670.9 | 2649.1 | 2646.6 | 2651.5 | 2525.1 | *2483.8* | 2065.8 | 1538.4 |
| 32.5° | 2821.6 | 2828.9 | 2819.2 | 2802.2 | 2746.3 | 2724.4 | 2743.8 | 2661.2 | *2634.5* | 2204.3 | 1628.3 |
| 35° | 2926.1 | 2943.1 | 2943.1 | 2909.1 | 2831.3 | 2819.2 | 2850.8 | 2794.9 | *2775.4* | 2367.1 | 1735.3 |
| 37.5° | 3067.1 | 3076.8 | 3067.1 | 3003.9 | 2906.7 | 2921.3 | 2969.9 | 2935.8 | *2923.7* | 2542.1 | 1861.6 |
| 40° | 3368.4 | 3380.6 | 3317.4 | 3166.7 | 3011.2 | 3028.2 | 3113.3 | 3093.8 | *3074.4* | 2714.7 | 1978.3 |
| 42.5° | 3788.9 | 3759.7 | 3747.6 | 3412.2 | 3171.6 | 3161.9 | 3268.8 | 3242.1 | *3239.6* | 2889.7 | 2085.2 |
| 45° | 4066.0 | 4075.7 | 4014.9 | 3696.5 | 3509.4 | 3327.1 | 3441.4 | 3431.6 | *3412.2* | 3067.1 | 2214.0 |
| 47.5° | 4257.9 | 4236.1 | 4085.4 | 3932.3 | 3968.7 | 3543.4 | 3633.4 | 3657.7 | *3645.5* | 3268.8 | 2372.0 |
| 50° | 4338.1 | 4316.3 | 4216.6 | 4114.6 | 4158.3 | 3791.3 | 3830.2 | 3910.4 | *3898.3* | 3472.9 | 2505.7 |
| 52.5° | 4238.5 | 4211.8 | 4219.1 | 4245.8 | 4223.9 | 3985.8 | 4073.2 | 4199.6 | *4185.0* | 3711.1 | 2661.2 |
| 55° | 3604.2 | 3674.7 | 3946.9 | 4219.1 | 4211.8 | 4134.0 | 4333.3 | 4518.0 | *4488.8* | 3959.0 | 2794.9 |
| 57.5° | 2906.7 | 2945.6 | 3290.7 | 4027.1 | 4172.9 | 4257.9 | 4629.8 | 4858.2 | *4848.5* | 4206.9 | 2916.4 |
| 60° | 2311.2 | 2352.6 | 2615.0 | 3628.5 | 4083.0 | 4386.8 | 4933.6 | 5234.9 | *5225.2* | 4457.2 | 3003.9 |
| 62.5° | 1837.3 | 1837.3 | 2070.6 | 3054.9 | 3910.4 | 4462.1 | 5174.2 | 5614.1 | *5597.1* | 4659.0 | 3025.8 |
| 65° | 1322.1 | 1339.1 | 1514.1 | 2457.1 | 3630.9 | 4442.7 | 5290.8 | 5883.8 | *5874.1* | 4773.2 | 2979.6 |
| 67.5° | *977.0* | *996.4* | *1113.1* | *1842.2* | *3217.8* | *4248.2* | *5183.9* | *5944.6* | *5949.5* | *4775.6* | *2828.9* |
| 70° | 763.1 | 768.0 | 855.5 | 1280.8 | 2636.9 | 3815.6 | 4782.9 | 5742.9 | *5742.9* | 4656.5 | 2605.3 |
| 72.5° | 580.9 | 585.7 | 661.1 | 872.5 | 1941.8 | 3154.6 | 4182.6 | 5208.2 | *5244.7* | 4340.6 | 2274.8 |
| 75° | 449.6 | 459.3 | 510.4 | 627.0 | 1217.6 | 2243.2 | 3436.5 | 4265.2 | *4364.9* | 3728.1 | 1873.8 |
| 77.5° | 347.5 | 357.3 | 398.6 | 459.3 | 709.7 | 1382.9 | 2415.8 | 3188.6 | *3278.5* | 2935.8 | 1446.0 |
| 80° | 279.5 | 284.3 | 311.1 | 345.1 | 430.2 | 712.1 | 1475.2 | 2094.9 | *2121.7* | 1995.3 | 957.6 |
| 82.5° | 128.8 | 138.5 | 167.7 | 189.6 | 213.9 | 330.5 | 629.5 | 775.3 | *809.3* | 792.3 | 393.7 |
| 85° | 14.6 | 14.6 | 17.0 | 19.4 | 21.9 | 34.0 | 43.7 | 38.9 | *38.9* | 46.2 | 41.3 |
| 87.5° | 0.0 | 0.0 | 0.0 | 2.4 | 4.9 | 4.9 | 7.3 | 7.3 | *7.3* | 7.3 | 7.3 |
| 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: P870421
CATALOG NUMBER: MEM2-HSN-SA-100-840-U-T3-HSS

**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 1052.3 | 1052.3 | 1052.3 | 1052.3 | 1052.3 | 1052.3 | 1052.3 | 1052.3 | 1052.3 | 1052.3 | 1052.3 |
| 2.5° | 1054.8 | 1037.8 | 1006.2 | 979.4 | 955.1 | 930.8 | 918.7 | 889.5 | 882.2 | 887.1 | 870.1 |
| 5° | 1059.6 | 1025.6 | 960.0 | 899.2 | 848.2 | 799.6 | 758.3 | 714.5 | 704.8 | 690.2 | 682.9 |
| 7.5° | 1066.9 | 1015.9 | 913.8 | 819.0 | 741.3 | 670.8 | 619.7 | 585.7 | 559.0 | 551.7 | 549.3 |
| 10° | 1076.6 | 1003.7 | 862.8 | 743.7 | 636.7 | 563.8 | 517.7 | 493.4 | 483.6 | 476.3 | 478.8 |
| 12.5° | 1083.9 | 991.6 | 814.2 | 658.6 | 554.1 | 488.5 | 466.6 | 447.2 | 442.3 | 439.9 | 439.9 |
| 15° | 1093.7 | 979.4 | 755.8 | 583.3 | 483.6 | 444.8 | 422.9 | 415.6 | 415.6 | 413.2 | 413.2 |
| 17.5° | 1105.8 | 969.7 | 707.2 | 525.0 | 442.3 | 405.9 | 396.1 | 386.4 | 386.4 | 386.4 | 384.0 |
| 20° | 1130.1 | 964.8 | 663.5 | 476.3 | 405.9 | 381.6 | 367.0 | 359.7 | 357.3 | 354.8 | 354.8 |
| 22.5° | 1154.4 | 964.8 | 614.9 | 439.9 | 381.6 | 354.8 | 340.2 | 333.0 | 330.5 | 330.5 | 330.5 |
| 25° | 1188.4 | 962.4 | 576.0 | 408.3 | 359.7 | 328.1 | 313.5 | 306.2 | 301.4 | 301.4 | 298.9 |
| 27.5° | 1227.3 | 962.4 | 542.0 | 384.0 | 335.4 | 303.8 | 286.8 | 279.5 | 272.2 | 272.2 | 269.8 |
| 30° | 1266.2 | 967.3 | 512.8 | 364.6 | 311.1 | 281.9 | 260.0 | 250.3 | 245.5 | 243.0 | 243.0 |
| 32.5° | 1317.2 | 981.9 | 493.4 | 350.0 | 289.2 | 260.0 | 238.2 | 228.5 | 223.6 | 221.2 | 221.2 |
| 35° | 1395.0 | 1018.3 | 495.8 | 342.7 | 274.6 | 240.6 | 218.7 | 206.6 | 204.1 | 204.1 | 201.7 |
| 37.5° | 1477.6 | 1052.3 | 503.1 | 337.8 | 260.0 | 226.0 | 204.1 | 192.0 | 189.6 | 189.6 | 189.6 |
| 40° | 1548.1 | 1081.5 | 512.8 | 335.4 | 247.9 | 211.4 | 192.0 | 182.3 | 177.4 | 177.4 | 177.4 |
| 42.5° | 1618.6 | 1098.5 | 515.2 | 328.1 | 240.6 | 199.3 | 182.3 | 172.6 | 167.7 | 170.1 | 170.1 |
| 45° | 1689.1 | 1110.7 | 507.9 | 318.4 | 233.3 | 189.6 | 172.6 | 162.8 | 158.0 | 158.0 | 158.0 |
| 47.5° | 1774.1 | 1137.4 | 495.8 | 303.8 | 228.5 | 182.3 | 162.8 | 153.1 | 150.7 | 150.7 | 150.7 |
| 50° | 1859.2 | 1159.3 | 486.1 | 286.8 | 216.3 | 172.6 | 155.5 | 143.4 | 141.0 | 141.0 | 141.0 |
| 52.5° | 1929.7 | 1169.0 | 473.9 | 264.9 | 204.1 | 162.8 | 145.8 | 133.7 | 128.8 | 128.8 | 128.8 |
| 55° | 1983.2 | 1171.4 | 456.9 | 247.9 | 187.1 | 153.1 | 136.1 | 123.9 | 119.1 | 116.7 | 116.7 |
| 57.5° | 2026.9 | 1169.0 | 439.9 | 230.9 | 172.6 | 141.0 | 123.9 | 114.2 | 106.9 | 104.5 | 104.5 |
| 60° | 2051.2 | 1161.7 | 415.6 | 209.0 | 153.1 | 128.8 | 114.2 | 102.1 | 97.2 | 94.8 | 94.8 |
| 62.5° | 2036.6 | 1142.3 | 381.6 | 175.0 | 138.5 | 116.7 | 104.5 | 94.8 | 87.5 | 85.1 | 85.1 |
| 65° | 1968.6 | 1103.4 | 337.8 | 143.4 | 123.9 | 104.5 | 94.8 | 85.1 | 75.3 | 72.9 | 72.9 |
| 67.5° | *1849.5* | *1037.8* | *279.5* | *121.5* | *114.2* | *94.8* | *85.1* | *75.3* | *68.0* | *63.2* | *63.2* |
| 70° | 1684.2 | 950.3 | 218.7 | 104.5 | 102.1 | 87.5 | 77.8 | 68.0 | 60.8 | 55.9 | 55.9 |
| 72.5° | 1448.5 | 806.9 | 162.8 | 89.9 | 89.9 | 80.2 | 70.5 | 63.2 | 55.9 | 51.0 | 51.0 |
| 75° | 1171.4 | 610.0 | 123.9 | 82.6 | 80.2 | 72.9 | 63.2 | 55.9 | 51.0 | 46.2 | 46.2 |
| 77.5° | 855.5 | 405.9 | 102.1 | 75.3 | 75.3 | 65.6 | 58.3 | 51.0 | 46.2 | 43.7 | 43.7 |
| 80° | 520.1 | 233.3 | 72.9 | 58.3 | 58.3 | 55.9 | 48.6 | 43.7 | 41.3 | 36.5 | 34.0 |
| 82.5° | 211.4 | 89.9 | 38.9 | 29.2 | 29.2 | 26.7 | 17.0 | 14.6 | 14.6 | 14.6 | 12.2 |
| 85° | 21.9 | 14.6 | 9.7 | 7.3 | 7.3 | 7.3 | 4.9 | 4.9 | 4.9 | 4.9 | 4.9 |
| 87.5° | 7.3 | 7.3 | 4.9 | 4.9 | 4.9 | 4.9 | 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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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: SP1-2407-157-8

Test Date: 09/05/2024

Luminaire Tested: MEM2-HTN-SA-40-840-U-5WQ

Data in this report applies to families of products including MEM2-HTN-SA-40-840-U-5WQ

Report Generated By FNC07603 / LDUCLS01DT446
Version: v7.04

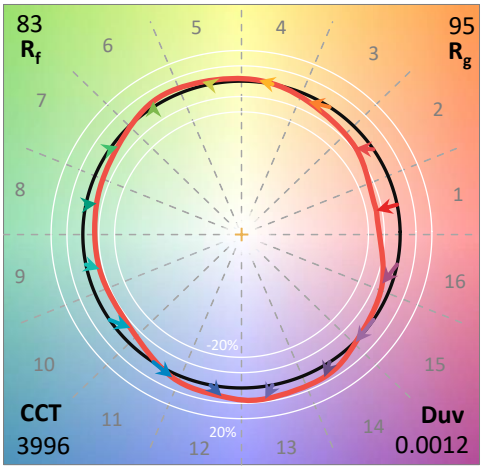
## Test Information

| | |
|---|---|
| Test Method: | LM-79-2019 |
| Report Number: | SP1-2407-157-8 |
| Test Lab: | COOPER LIGHTING SOLUTIONS |
| Photometer: | SP1 - 76IN SPHERE |
| Measurement Geometry: | 4π |
| Issue Date: | 09/05/2024 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS |
| Product Line: | Streetworks |
| Catalog Number: | **MEM2-HTN-SA-40-840-U-5WQ** |
| Description: | Epic Modern Light Square 40W 5WQ Optic |

## Spectral Parameters

| | |
|---|---|
| CCT (K): | 3996 |
| CIE u': | 0.2245 |
| CIE v': | 0.5031 |
| Duv: | 0.0012 |
| CIE x: | 0.3815 |
| CIE y: | 0.3799 |
| CIE z: | 0.2386 |
| Peak Wavelength (nm): | 449 |
| Dominant Wavelength (nm): | 578 |
| Purity: | 28.49233 |
| Rf: | 82.6 |
| Rg: | 95.1 |

| | |
|---|---|
| CRI (Ra): | 80.6 |
| R1: | 78.1 |
| R2: | 87.1 |
| R3: | 94.5 |
| R4: | 79.7 |
| R5: | 78.7 |
| R6: | 82.7 |
| R7: | 84.3 |
| R8: | 59.5 |
| R9: | -5.8 |
| R10: | 70.3 |
| R11: | 78.7 |
| R12: | 60.5 |
| R13: | 80.2 |
| R14: | 97.2 |
| R15: | 70.6 |




## Test Conditions

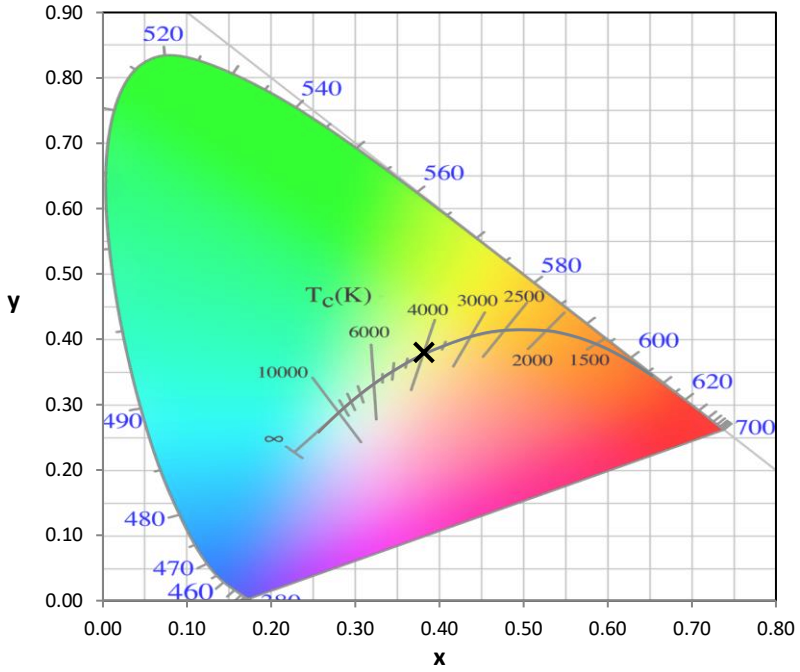
| | |
|---|---|
| Stabilization Time: | 29M |
| Operation Time: | 1H 29M |
| Sphere Temperature (°C): | 24.3 |

REPORT NUMBER: SP1-2407-157-8

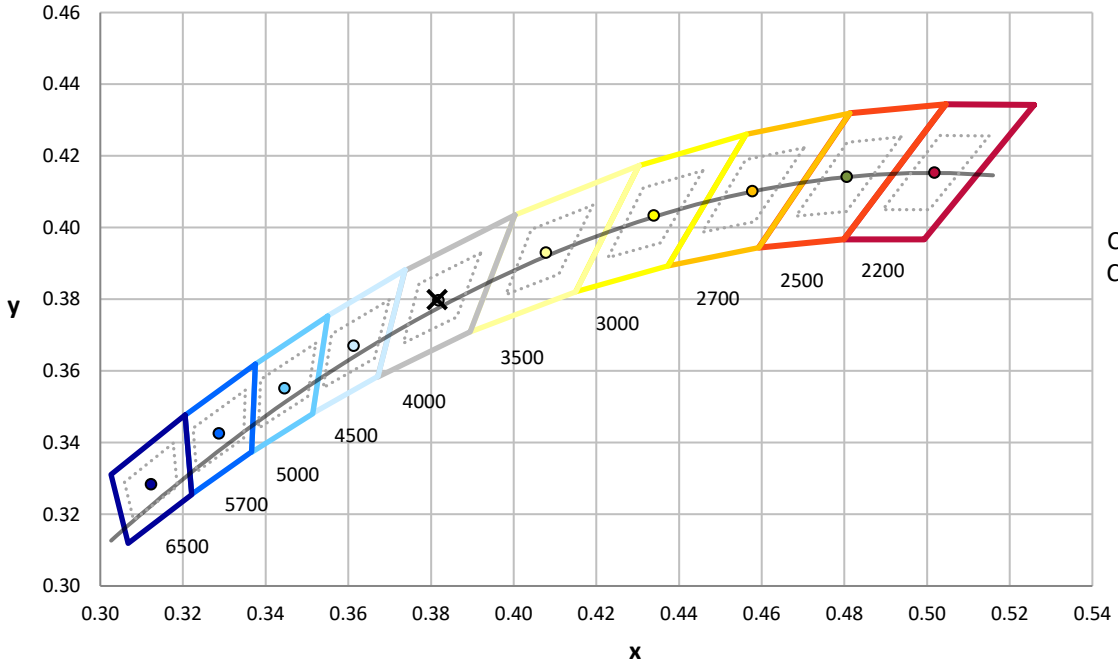
| Measurement and Test Equipment | | | |
|---|---|---|---|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | IN0058 | 6/18/2024 | 12/18/2024 |
| Power Meter | INXT2011004 | 2/8/2024 | 2/8/2025 |
| AC Power Source | IN0063 | 10/24/2023 | 10/24/2024 |
| DC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

## CIE 1931 Chromaticity Diagram




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




CCT = 3996K
CIE x = 0.3815
CIE y = 0.3799
Duv = 0.0012

Point lies inside the ANSI 4000K 4-step quadrangle

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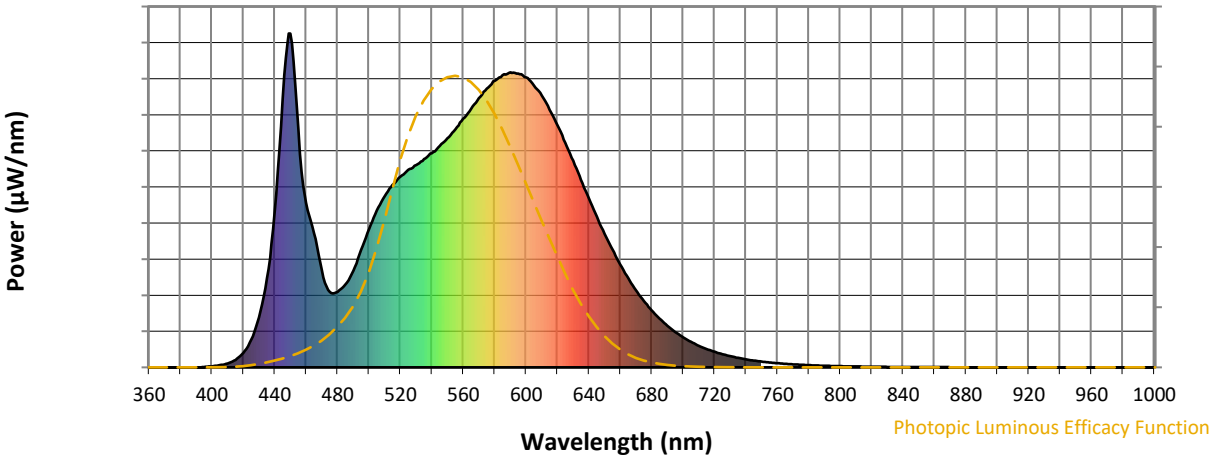
## Photopic Flux vs. Wavelength




## 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 | 289 | NR | 620 | 725 | NR | 750 | 17 | NR | 880 | 0 | NR |
| 365 | 0 | NR | 495 | 351 | NR | 625 | 673 | NR | 755 | 15 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 414 | NR | 630 | 619 | NR | 760 | 13 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 470 | NR | 635 | 562 | NR | 765 | 11 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 513 | NR | 640 | 506 | NR | 770 | 9 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 546 | NR | 645 | 452 | NR | 775 | 8 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 571 | NR | 650 | 400 | NR | 780 | 7 | NR | 910 | 0 | NR |
| 395 | 1 | NR | 525 | 592 | NR | 655 | 352 | NR | 785 | 6 | NR | 915 | 0 | NR |
| 400 | 3 | NR | 530 | 606 | NR | 660 | 307 | NR | 790 | 5 | NR | 920 | 0 | NR |
| 405 | 6 | NR | 535 | 624 | NR | 665 | 267 | NR | 795 | 4 | NR | 925 | 0 | NR |
| 410 | 12 | NR | 540 | 642 | NR | 670 | 231 | NR | 800 | 4 | NR | 930 | 0 | NR |
| 415 | 22 | NR | 545 | 663 | NR | 675 | 199 | NR | 805 | 3 | NR | 935 | 0 | NR |
| 420 | 44 | NR | 550 | 686 | NR | 680 | 171 | NR | 810 | 3 | NR | 940 | 0 | NR |
| 425 | 83 | NR | 555 | 713 | NR | 685 | 146 | NR | 815 | 2 | NR | 945 | 0 | NR |
| 430 | 150 | NR | 560 | 745 | NR | 690 | 125 | NR | 820 | 2 | NR | 950 | 0 | NR |
| 435 | 267 | NR | 565 | 774 | NR | 695 | 106 | NR | 825 | 2 | NR | 955 | 0 | NR |
| 440 | 466 | NR | 570 | 806 | NR | 700 | 90 | NR | 830 | 1 | NR | 960 | 0 | NR |
| 445 | 804 | NR | 575 | 835 | NR | 705 | 76 | NR | 835 | 1 | NR | 965 | 0 | NR |
| 450 | 1000 | NR | 580 | 858 | NR | 710 | 65 | NR | 840 | 1 | NR | 970 | 0 | NR |
| 455 | 715 | NR | 585 | 875 | NR | 715 | 55 | NR | 845 | 1 | NR | 975 | 0 | NR |
| 460 | 492 | NR | 590 | 884 | NR | 720 | 47 | NR | 850 | 1 | NR | 980 | 0 | NR |
| 465 | 402 | NR | 595 | 880 | NR | 725 | 40 | NR | 855 | 1 | NR | 985 | 0 | NR |
| 470 | 288 | NR | 600 | 868 | NR | 730 | 34 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 226 | NR | 605 | 844 | NR | 735 | 28 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 227 | NR | 610 | 814 | NR | 740 | 24 | NR | 870 | 0 | NR | 1000 | 0 | NR |
| 485 | 248 | NR | 615 | 771 | NR | 745 | 20 | NR | 875 | 0 | NR | | | |

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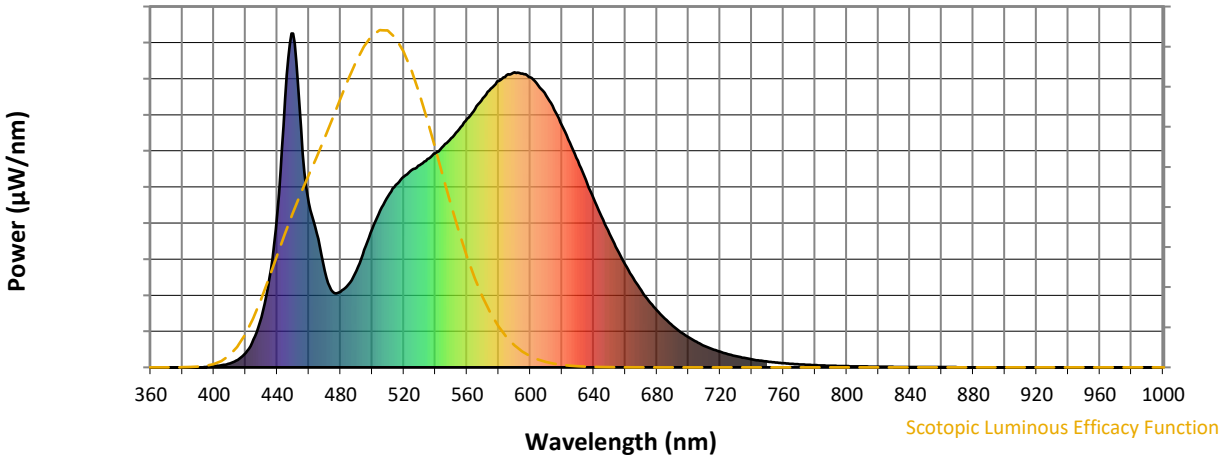
## Scotopic Flux vs. Wavelength




**Scotopic Lumens: NR** **S/P: 1.66**

| 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 | 289 | NR | 620 | 725 | NR | 750 | 17 | NR | 880 | 0 | NR |
| 365 | 0 | NR | 495 | 351 | NR | 625 | 673 | NR | 755 | 15 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 414 | NR | 630 | 619 | NR | 760 | 13 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 470 | NR | 635 | 562 | NR | 765 | 11 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 513 | NR | 640 | 506 | NR | 770 | 9 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 546 | NR | 645 | 452 | NR | 775 | 8 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 571 | NR | 650 | 400 | NR | 780 | 7 | NR | 910 | 0 | NR |
| 395 | 1 | NR | 525 | 592 | NR | 655 | 352 | NR | 785 | 6 | NR | 915 | 0 | NR |
| 400 | 3 | NR | 530 | 606 | NR | 660 | 307 | NR | 790 | 5 | NR | 920 | 0 | NR |
| 405 | 6 | NR | 535 | 624 | NR | 665 | 267 | NR | 795 | 4 | NR | 925 | 0 | NR |
| 410 | 12 | NR | 540 | 642 | NR | 670 | 231 | NR | 800 | 4 | NR | 930 | 0 | NR |
| 415 | 22 | NR | 545 | 663 | NR | 675 | 199 | NR | 805 | 3 | NR | 935 | 0 | NR |
| 420 | 44 | NR | 550 | 686 | NR | 680 | 171 | NR | 810 | 3 | NR | 940 | 0 | NR |
| 425 | 83 | NR | 555 | 713 | NR | 685 | 146 | NR | 815 | 2 | NR | 945 | 0 | NR |
| 430 | 150 | NR | 560 | 745 | NR | 690 | 125 | NR | 820 | 2 | NR | 950 | 0 | NR |
| 435 | 267 | NR | 565 | 774 | NR | 695 | 106 | NR | 825 | 2 | NR | 955 | 0 | NR |
| 440 | 466 | NR | 570 | 806 | NR | 700 | 90 | NR | 830 | 1 | NR | 960 | 0 | NR |
| 445 | 804 | NR | 575 | 835 | NR | 705 | 76 | NR | 835 | 1 | NR | 965 | 0 | NR |
| 450 | 1000 | NR | 580 | 858 | NR | 710 | 65 | NR | 840 | 1 | NR | 970 | 0 | NR |
| 455 | 715 | NR | 585 | 875 | NR | 715 | 55 | NR | 845 | 1 | NR | 975 | 0 | NR |
| 460 | 492 | NR | 590 | 884 | NR | 720 | 47 | NR | 850 | 1 | NR | 980 | 0 | NR |
| 465 | 402 | NR | 595 | 880 | NR | 725 | 40 | NR | 855 | 1 | NR | 985 | 0 | NR |
| 470 | 288 | NR | 600 | 868 | NR | 730 | 34 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 226 | NR | 605 | 844 | NR | 735 | 28 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 227 | NR | 610 | 814 | NR | 740 | 24 | NR | 870 | 0 | NR | 1000 | 0 | NR |
| 485 | 248 | NR | 615 | 771 | NR | 745 | 20 | NR | 875 | 0 | NR | | | |

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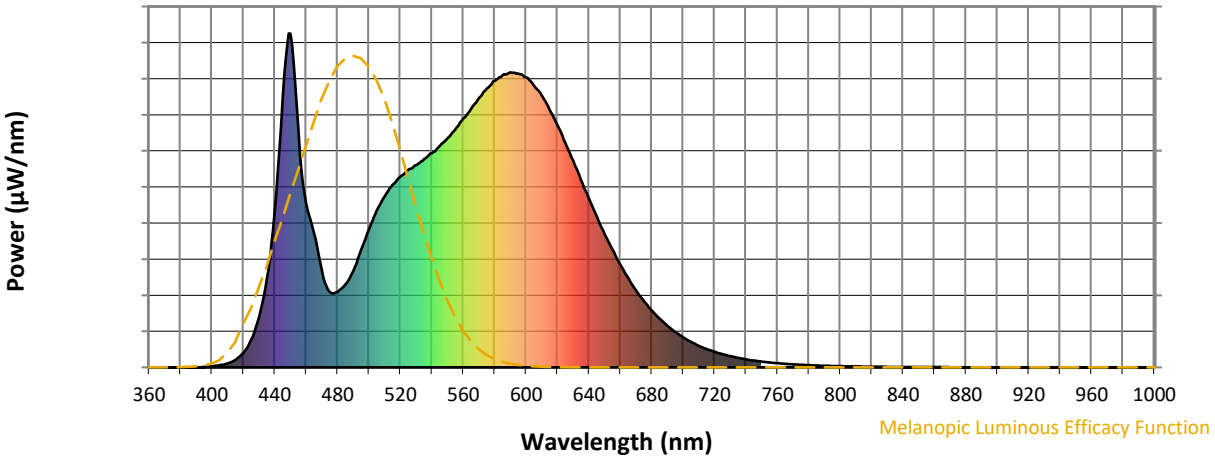
## Melanopic Flux vs. Wavelength




**Melanopic Lumens: NR** **M/P: 3.37**

| 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 | 289 | NR | 620 | 725 | NR | 750 | 17 | NR | 880 | 0 | NR |
| 365 | 0 | NR | 495 | 351 | NR | 625 | 673 | NR | 755 | 15 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 414 | NR | 630 | 619 | NR | 760 | 13 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 470 | NR | 635 | 562 | NR | 765 | 11 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 513 | NR | 640 | 506 | NR | 770 | 9 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 546 | NR | 645 | 452 | NR | 775 | 8 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 571 | NR | 650 | 400 | NR | 780 | 7 | NR | 910 | 0 | NR |
| 395 | 1 | NR | 525 | 592 | NR | 655 | 352 | NR | 785 | 6 | NR | 915 | 0 | NR |
| 400 | 3 | NR | 530 | 606 | NR | 660 | 307 | NR | 790 | 5 | NR | 920 | 0 | NR |
| 405 | 6 | NR | 535 | 624 | NR | 665 | 267 | NR | 795 | 4 | NR | 925 | 0 | NR |
| 410 | 12 | NR | 540 | 642 | NR | 670 | 231 | NR | 800 | 4 | NR | 930 | 0 | NR |
| 415 | 22 | NR | 545 | 663 | NR | 675 | 199 | NR | 805 | 3 | NR | 935 | 0 | NR |
| 420 | 44 | NR | 550 | 686 | NR | 680 | 171 | NR | 810 | 3 | NR | 940 | 0 | NR |
| 425 | 83 | NR | 555 | 713 | NR | 685 | 146 | NR | 815 | 2 | NR | 945 | 0 | NR |
| 430 | 150 | NR | 560 | 745 | NR | 690 | 125 | NR | 820 | 2 | NR | 950 | 0 | NR |
| 435 | 267 | NR | 565 | 774 | NR | 695 | 106 | NR | 825 | 2 | NR | 955 | 0 | NR |
| 440 | 466 | NR | 570 | 806 | NR | 700 | 90 | NR | 830 | 1 | NR | 960 | 0 | NR |
| 445 | 804 | NR | 575 | 835 | NR | 705 | 76 | NR | 835 | 1 | NR | 965 | 0 | NR |
| 450 | 1000 | NR | 580 | 858 | NR | 710 | 65 | NR | 840 | 1 | NR | 970 | 0 | NR |
| 455 | 715 | NR | 585 | 875 | NR | 715 | 55 | NR | 845 | 1 | NR | 975 | 0 | NR |
| 460 | 492 | NR | 590 | 884 | NR | 720 | 47 | NR | 850 | 1 | NR | 980 | 0 | NR |
| 465 | 402 | NR | 595 | 880 | NR | 725 | 40 | NR | 855 | 1 | NR | 985 | 0 | NR |
| 470 | 288 | NR | 600 | 868 | NR | 730 | 34 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 226 | NR | 605 | 844 | NR | 735 | 28 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 227 | NR | 610 | 814 | NR | 740 | 24 | NR | 870 | 0 | NR | 1000 | 0 | NR |
| 485 | 248 | NR | 615 | 771 | NR | 745 | 20 | NR | 875 | 0 | NR | | | |

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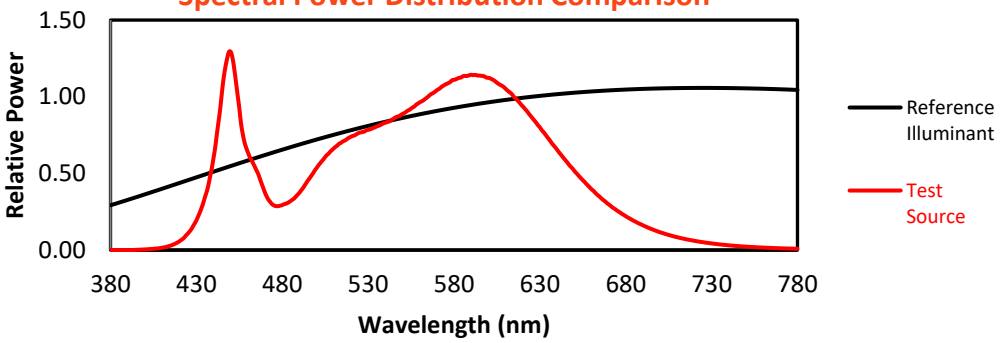
# TM-30-18

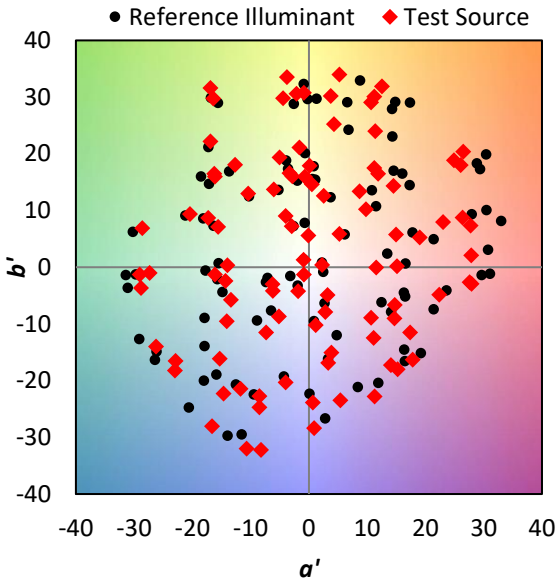
## Summary

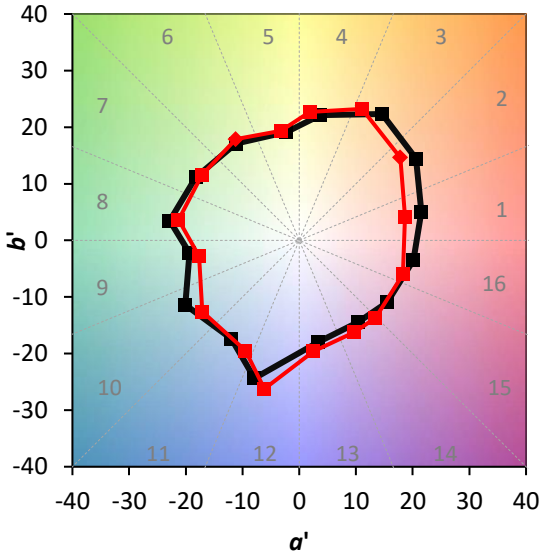
$R_f$ = 82.6
$R_g$ = 95.1
CIE $R_a$ = 80.6
$R_9$ = -5.8

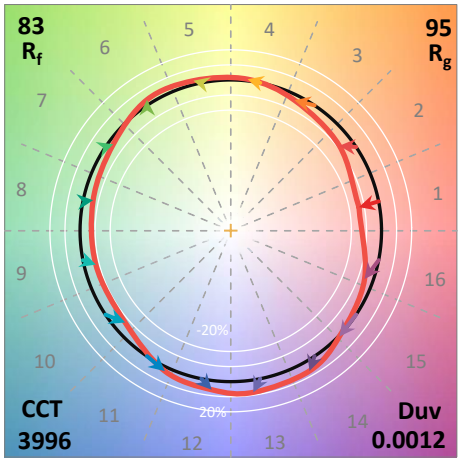
## Spectral Power Distribution Comparison

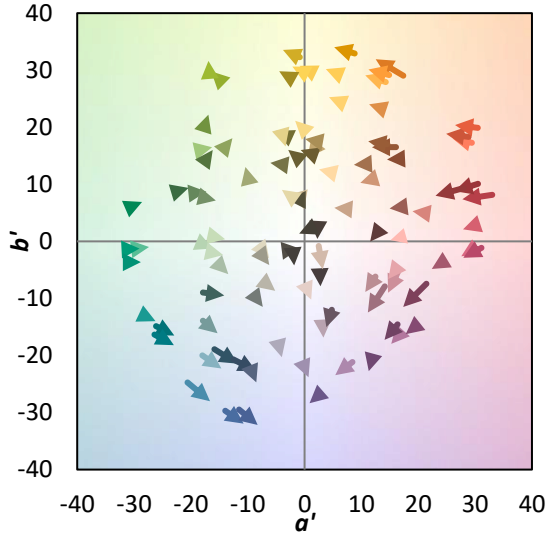



## Color Vector Graphics



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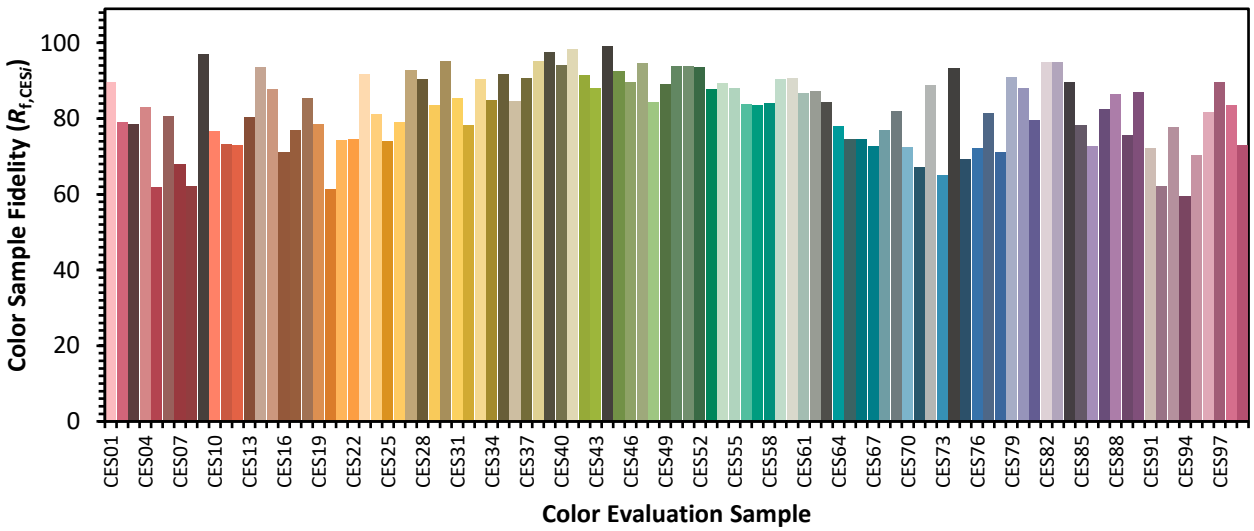
**Individual Sample Fidelity Index ($R_{f,i}$)**

| | | | |
|---|---|---|---|
| CES01 = 85 | CES26 = 79 | CES51 = 94 | CES76 = 72 |
| CES02 = 61 | CES27 = 93 | CES52 = 94 | CES77 = 82 |
| CES03 = 31 | CES28 = 90 | CES53 = 88 | CES78 = 71 |
| CES04 = 69 | CES29 = 83 | CES54 = 89 | CES79 = 91 |
| CES05 = 48 | CES30 = 95 | CES55 = 88 | CES80 = 88 |
| CES06 = 50 | CES31 = 86 | CES56 = 84 | CES81 = 80 |
| CES07 = 40 | CES32 = 78 | CES57 = 84 | CES82 = 95 |
| CES08 = 39 | CES33 = 90 | CES58 = 84 | CES83 = 95 |
| CES09 = 29 | CES34 = 85 | CES59 = 90 | CES84 = 90 |
| CES10 = 74 | CES35 = 92 | CES60 = 91 | CES85 = 78 |
| CES11 = 57 | CES36 = 85 | CES61 = 87 | CES86 = 73 |
| CES12 = 63 | CES37 = 91 | CES62 = 87 | CES87 = 83 |
| CES13 = 42 | CES38 = 95 | CES63 = 84 | CES88 = 86 |
| CES14 = 74 | CES39 = 98 | CES64 = 78 | CES89 = 76 |
| CES15 = 71 | CES40 = 94 | CES65 = 75 | CES90 = 87 |
| CES16 = 46 | CES41 = 98 | CES66 = 75 | CES91 = 72 |
| CES17 = 49 | CES42 = 92 | CES67 = 73 | CES92 = 62 |
| CES18 = 56 | CES43 = 88 | CES68 = 77 | CES93 = 78 |
| CES19 = 71 | CES44 = 99 | CES69 = 82 | CES94 = 60 |
| CES20 = 65 | CES45 = 93 | CES70 = 72 | CES95 = 70 |
| CES21 = 86 | CES46 = 90 | CES71 = 67 | CES96 = 82 |
| CES22 = 78 | CES47 = 95 | CES72 = 89 | CES97 = 90 |
| CES23 = 91 | CES48 = 84 | CES73 = 65 | CES98 = 84 |
| CES24 = 90 | CES49 = 89 | CES74 = 93 | CES99 = 73 |
| CES25 = 71 | CES50 = 94 | CES75 = 69 | |



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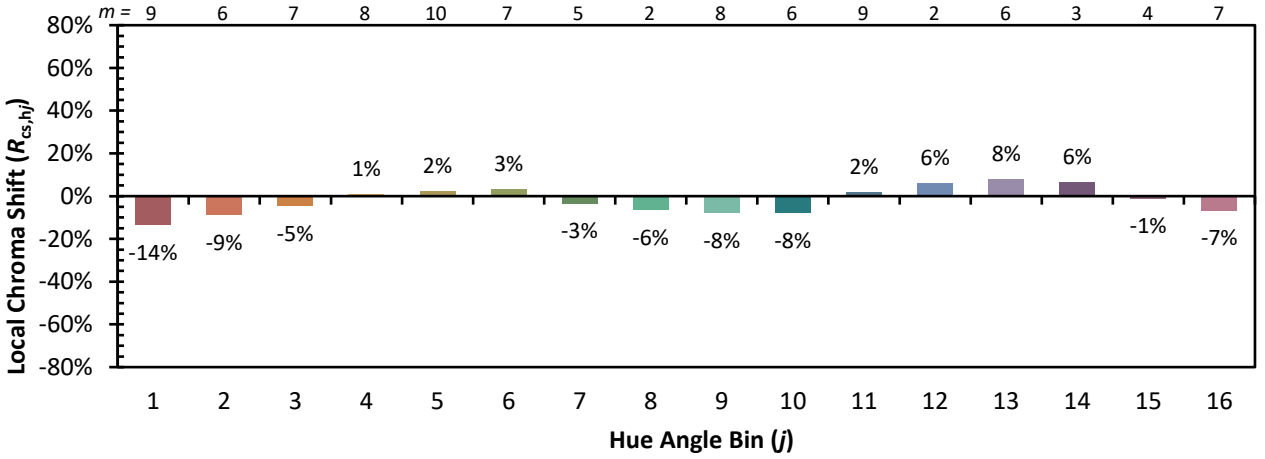
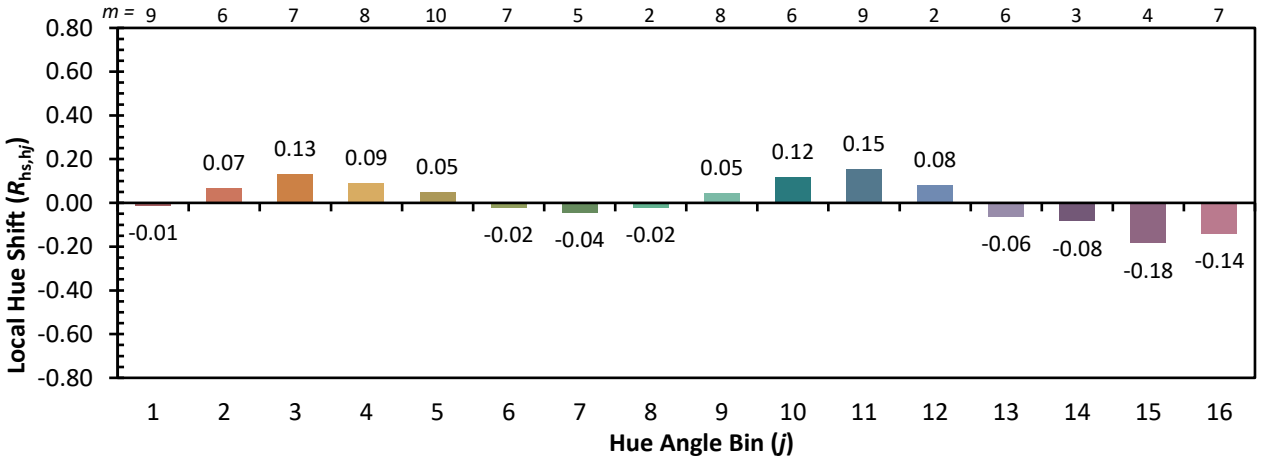
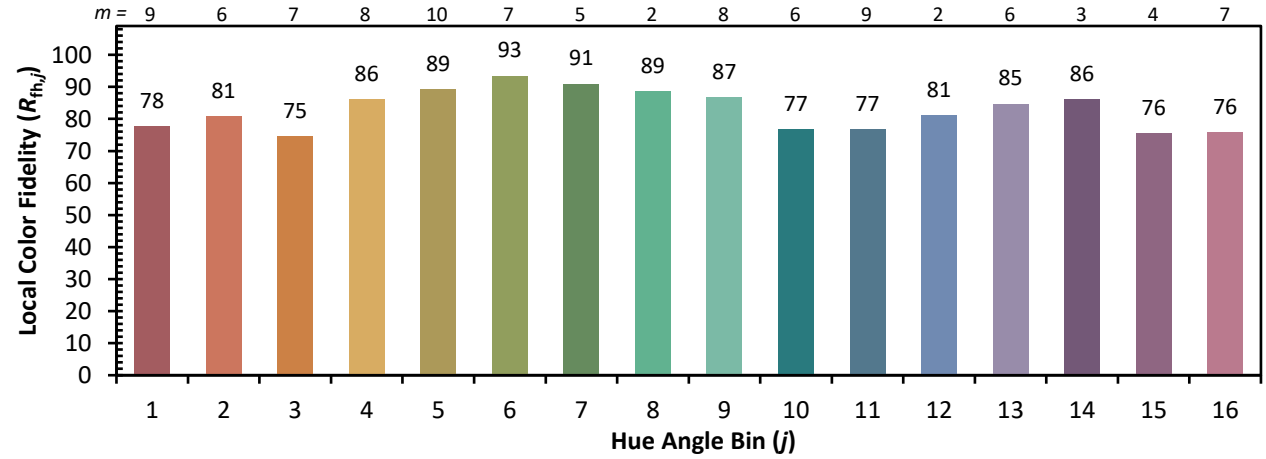
## Color Rendition by Hue-Angle Bin



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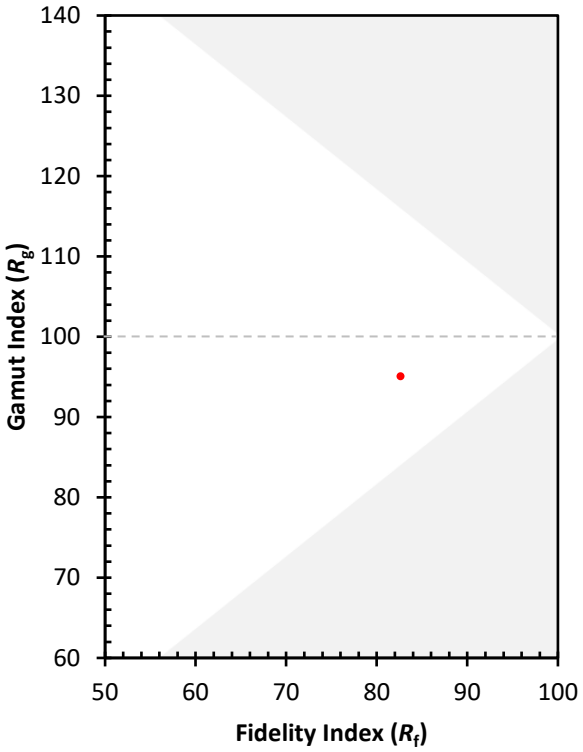
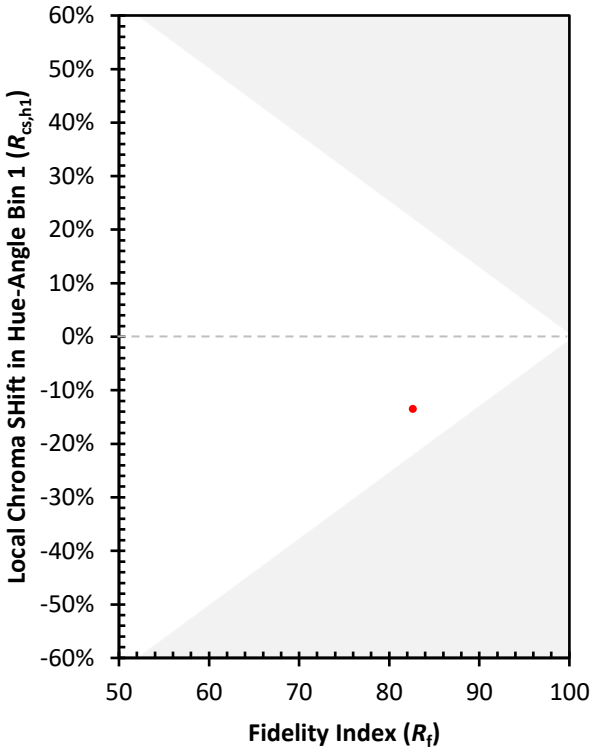
## Measure Comparisons




(END OF REPORT)