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: P867931

Luminaire Tested: **MEM2-HSN-SA-130-727-U-T2R-HSS**

Issue Date: 08/21/2024

Report Generated By 670245763

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

Scaled Data Report

**Test Information**

| | |
|---|---|
| Test Method: | LM-79-08 |
| Report Number: | P867931 |
| Test Lab: | INNOVATION CENTER(G3) |
| Issue Date: | 08/21/2024 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS (FORMERLY EATON) |
| Product Line: | STREETWORKS |
| Catalog Number: | MEM2-HSN-SA-130-727-U-T2R-HSS |
| Description: | EPIC MODERN SHORT HOUSING DISCRETE LED ARRAYS 130W 70CRI 2700K FIXTURE w/ TYPE II ROADWAY DISTRIBUTION OPTIC AND HOUSE SIDE SHIELD |
| Light Source: | (30) 2700K CCT, 70 CRI LEDS |
| Ballast/Driver: | ELECTRONIC DRIVER |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 12579.2 lumens |
| Efficiency: | N/A |
| Efficacy: | 93.9 lumens/watt |
| Luminous Opening: | Rectangular (W 1' x L: 0.33' x H: 0') |
| IES Classification: | Type II - Short |
| BUG Rating: | B2 - U0 - G2 |

| | |
|---|---|
| Input Watts (W): | 134 |
| Input Voltage (V): | 120 |
| Input Current (Ain): | NR |
| Voltage Rise (V): | NR |
| Power Factor: | 0.99 |
| Total Harmonic Distortion (THDi): | 6.70% |
| Frequency (hertz): | 60 |
| Stabilization Time: | NR |
| Operation Time: | NR |
| Ambient Temperature (°C): | NR |
| Test Distance: | 24 FT |

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REPORT NUMBER: P867931
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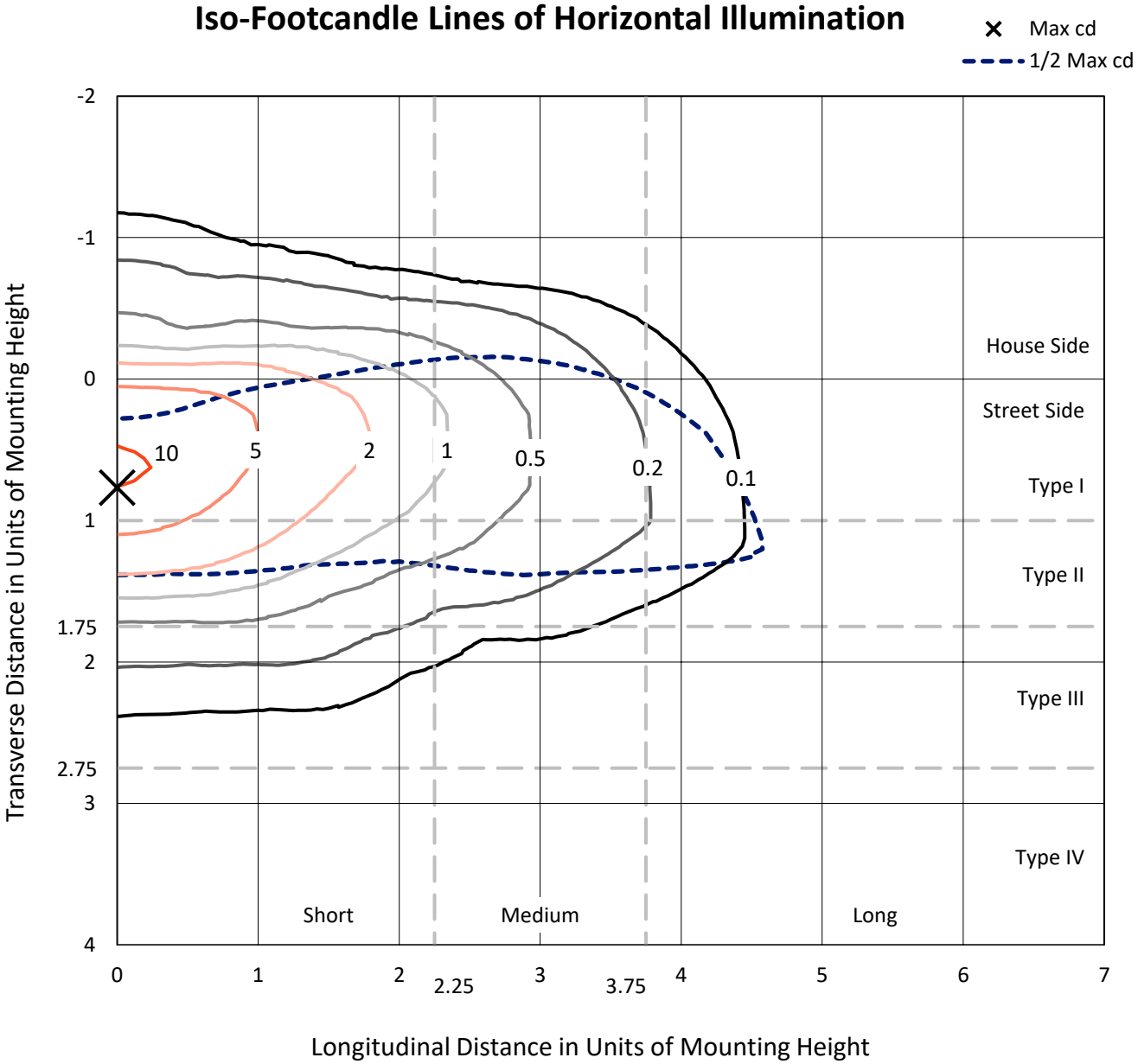
## Iso-Footcandle Lines of Horizontal Illumination




Based on 20 foot mounting height. Maximum calculated value = 10.8 fc
Type II - Short - N/A

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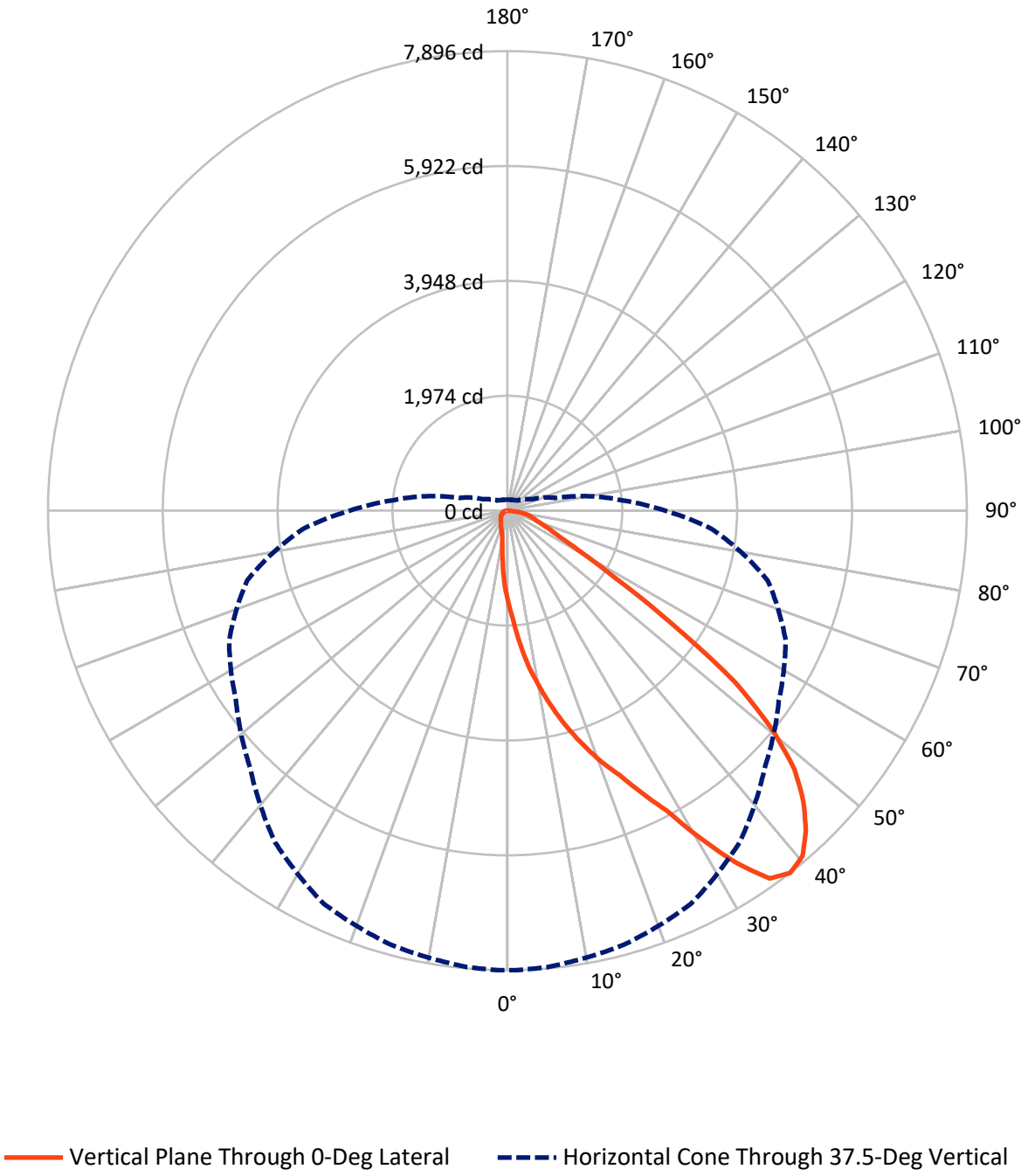
## Luminous Intensity Polar Plot



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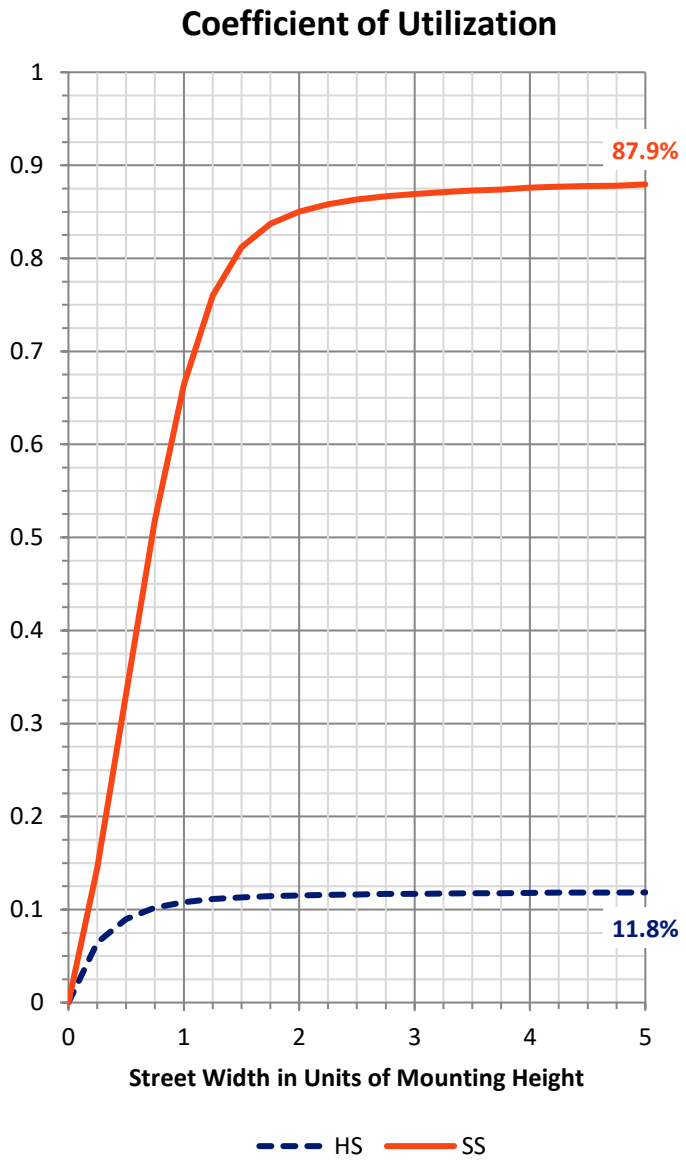
CATALOG NUMBER: MEM2-HSN-SA-130-727-U-T2R-HSS

**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 1500.3 | 0.0 | 1500.3 |
| | % Fixture | 11.9 | 0.0 | 11.9 |
| **Street Side** | Lumens | 11078.9 | 0.0 | 11078.9 |
| | % Fixture | 88.1 | 0.0 | 88.1 |
| **Total** | Lumens | 12579.2 | 0.0 | 12579.2 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 156.4 | 1.2 |
| 10°-20° | 546.6 | 4.3 |
| 20°-30° | 1127.9 | 9.0 |
| 30°-40° | 1984.5 | 15.8 |
| 40°-50° | 2694.5 | 21.4 |
| 50°-60° | 2669.6 | 21.2 |
| 60°-70° | 2055.2 | 16.3 |
| 70°-80° | 1192.8 | 9.5 |
| 80°-90° | 151.7 | 1.2 |
| 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° | 12579.2 | 100.0 |
| 0°-180° | 12579.2 | 100.0 |



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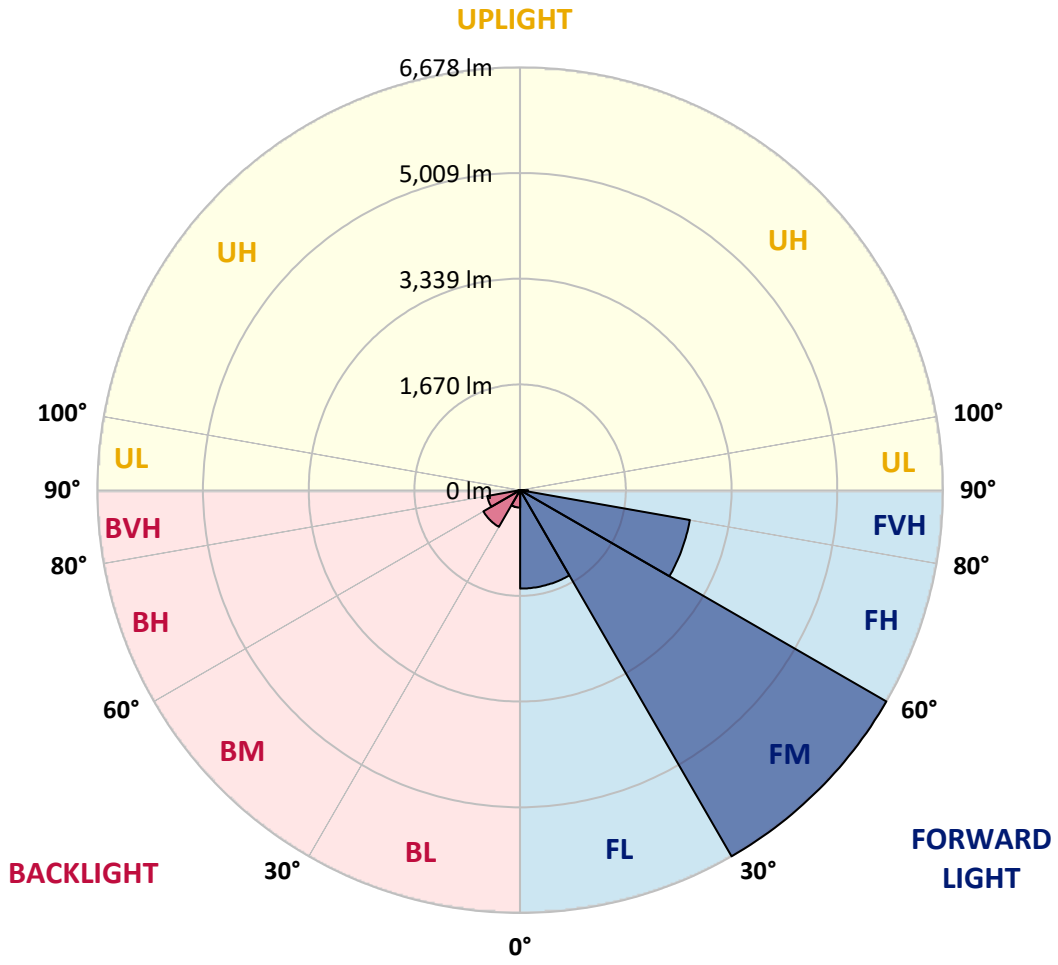
## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 1555.0 | 12.4 | | | |
| FM | (30°-60°) | 6678.5 | 53.1 | | | |
| FH | (60°-80°) | 2721.7 | 21.6 | | | G2/5000 |
| FVH | (80°-90°) | 123.7 | 1.0 | | | G2/225 |
| BL | (0°-30°) | 275.8 | 2.2 | B1/500 | | |
| BM | (30°-60°) | 670.1 | 5.3 | B1/1000 | | |
| BH | (60°-80°) | 526.4 | 4.2 | B2/1000 | | G2/1000 |
| BVH | (80°-90°) | 28.0 | 0.2 | | | G1/100 |
| UL | (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH | (100°-180°) | 0.0 | 0.0 | | U0/0 | |

**BUG Rating: B2-U0-G2**
Type II Short



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**CANDELA DISTRIBUTION (FULL):**

| | 0° | 1° | 5° | 15° | 25° | 35° | 45° | 55° | 65° | 75° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 1558.7 | 1558.7 | 1558.7 | 1558.7 | 1558.7 | 1558.7 | 1558.7 | 1558.7 | 1558.7 | 1558.7 | 1558.7 |
| 2.5° | 1878.2 | 1906.3 | 1885.2 | 1867.7 | 1843.1 | 1818.5 | 1783.4 | 1744.8 | 1695.7 | 1636.0 | 1583.3 |
| 5° | 2303.0 | 2317.0 | 2310.0 | 2299.5 | 2222.3 | 2148.5 | 2074.8 | 1983.5 | 1857.1 | 1744.8 | 1625.4 |
| 7.5° | 2727.8 | 2720.8 | 2703.2 | 2671.6 | 2601.4 | 2517.1 | 2383.7 | 2232.8 | 2053.7 | 1857.1 | 1671.1 |
| 10° | 3099.9 | 3110.4 | 3096.4 | 3047.3 | 2959.5 | 2843.6 | 2682.1 | 2510.1 | 2267.9 | 1994.1 | 1734.3 |
| 12.5° | 3489.6 | 3496.6 | 3496.6 | 3391.3 | 3331.6 | 3152.6 | 2980.6 | 2748.9 | 2478.5 | 2162.6 | 1808.0 |
| 15° | 3872.3 | 3858.2 | 3858.2 | 3788.0 | 3682.7 | 3482.6 | 3289.5 | 3008.6 | 2703.2 | 2320.5 | 1892.2 |
| 17.5° | 4237.4 | 4244.4 | 4212.8 | 4135.6 | 4033.8 | 3840.7 | 3601.9 | 3293.0 | 2924.4 | 2510.1 | 1980.0 |
| 20° | 4599.0 | 4577.9 | 4563.9 | 4486.6 | 4377.8 | 4149.6 | 3921.4 | 3570.3 | 3184.2 | 2724.3 | 2102.9 |
| 22.5° | 4936.0 | 4946.5 | 4911.4 | 4788.5 | 4686.7 | 4479.6 | 4219.8 | 3896.8 | 3458.0 | 2938.4 | 2236.3 |
| 25° | 5371.3 | 5336.2 | 5367.8 | 5220.4 | 5062.4 | 4816.6 | 4521.7 | 4202.3 | 3756.4 | 3201.7 | 2401.3 |
| 27.5° | 5834.7 | 5855.8 | 5838.2 | 5676.7 | 5462.6 | 5132.6 | 4823.7 | 4483.1 | 4058.3 | 3451.0 | 2587.4 |
| 30° | 6526.3 | 6515.8 | 6519.3 | 6277.1 | 5922.5 | 5529.3 | 5150.1 | 4778.0 | 4360.2 | 3756.4 | 2805.0 |
| 32.5° | 7210.9 | 7249.5 | 7154.7 | 6940.6 | 6533.3 | 5940.0 | 5476.6 | 5062.4 | 4651.6 | 4019.7 | 3026.2 |
| 35° | 7762.1 | 7751.5 | 7712.9 | 7474.2 | 7070.5 | 6494.7 | 5848.8 | 5378.3 | 4960.6 | 4342.7 | 3271.9 |
| 37.5° | 7895.5 | 7895.5 | 7870.9 | 7723.5 | 7456.7 | 6958.1 | 6252.5 | 5694.3 | 5276.5 | 4630.6 | 3510.7 |
| 40° | 7807.7 | 7790.2 | 7776.1 | 7677.8 | 7533.9 | 7239.0 | 6677.3 | 6020.8 | 5613.6 | 5002.7 | 3774.0 |
| 42.5° | 7519.8 | 7523.4 | 7505.8 | 7449.6 | 7372.4 | 7260.1 | 6940.6 | 6368.3 | 5943.6 | 5353.8 | 4033.8 |
| 45° | 7133.7 | 7140.7 | 7119.6 | 7112.6 | 7074.0 | 7074.0 | 7000.3 | 6642.2 | 6256.0 | 5711.9 | 4318.1 |
| 47.5° | 6638.7 | 6635.2 | 6624.6 | 6607.1 | 6684.3 | 6768.6 | 6835.3 | 6796.6 | 6533.3 | 6098.0 | 4574.4 |
| 50° | 5883.9 | 5876.9 | 5908.4 | 5996.2 | 6185.8 | 6371.9 | 6568.5 | 6751.0 | 6733.5 | 6456.1 | 4883.3 |
| 52.5° | 4904.4 | 4858.8 | 4893.9 | 5164.2 | 5553.9 | 5968.1 | 6245.5 | 6533.3 | 6835.3 | 6835.3 | 5188.8 |
| 55° | 3429.9 | 3468.5 | 3489.6 | 3886.3 | 4655.1 | 5367.8 | 5855.8 | 6227.9 | 6796.6 | 7137.2 | 5525.8 |
| 57.5° | 2183.6 | 2197.7 | 2260.9 | 2689.2 | 3591.4 | 4483.1 | 5346.7 | 5957.6 | 6652.7 | 7389.9 | 5862.8 |
| 60° | 1471.0 | 1421.8 | 1471.0 | 1716.7 | 2583.8 | 3517.7 | 4599.0 | 5617.1 | 6445.6 | 7572.5 | 6234.9 |
| 62.5° | 1039.2 | 1035.6 | 1049.7 | 1193.6 | 1843.1 | 2643.5 | 3661.6 | 5157.2 | 6280.6 | 7583.0 | 6512.3 |
| 65° | 839.0 | 814.5 | 825.0 | 905.8 | 1235.8 | 1937.9 | 2685.7 | 4325.1 | 6133.1 | 7397.0 | 6649.2 |
| 67.5° | 674.0 | 663.5 | 670.5 | 723.2 | 926.8 | 1456.9 | 1892.2 | 3289.5 | 5820.7 | 7081.0 | 6572.0 |
| 70° | 551.2 | 554.7 | 558.2 | 610.9 | 737.2 | 1102.3 | 1351.6 | 2257.4 | 5153.7 | 6722.9 | 6224.4 |
| 72.5° | 477.5 | 477.5 | 481.0 | 516.1 | 617.9 | 874.2 | 1021.6 | 1467.5 | 4170.7 | 6336.7 | 5585.5 |
| 75° | 421.3 | 421.3 | 421.3 | 452.9 | 526.6 | 702.1 | 793.4 | 1004.0 | 2994.6 | 5620.6 | 4620.0 |
| 77.5° | 365.1 | 368.6 | 368.6 | 396.7 | 452.9 | 547.7 | 610.9 | 695.1 | 1909.8 | 4342.7 | 3496.6 |
| 80° | 280.9 | 280.9 | 284.4 | 316.0 | 386.2 | 428.3 | 449.4 | 491.5 | 1004.0 | 2727.8 | 2218.7 |
| 82.5° | 196.6 | 200.1 | 200.1 | 203.6 | 259.8 | 263.3 | 242.2 | 245.7 | 365.1 | 905.8 | 842.6 |
| 85° | 21.1 | 24.6 | 28.1 | 28.1 | 45.6 | 56.2 | 59.7 | 56.2 | 59.7 | 105.3 | 105.3 |
| 87.5° | 0.0 | 0.0 | 0.0 | 0.0 | 3.5 | 7.0 | 7.0 | 10.5 | 10.5 | 10.5 | 10.5 |
| 90° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

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Scaled Data Report

REPORT NUMBER: P867931
CATALOG NUMBER: MEM2-HSN-SA-130-727-U-T2R-HSS

**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 1558.7 | 1558.7 | 1558.7 | 1558.7 | 1558.7 | 1558.7 | 1558.7 | 1558.7 | 1558.7 | 1558.7 | 1558.7 |
| 2.5° | 1555.2 | 1530.6 | 1478.0 | 1432.4 | 1390.2 | 1355.1 | 1330.5 | 1298.9 | 1274.4 | 1274.4 | 1288.4 |
| 5° | 1565.8 | 1509.6 | 1400.8 | 1298.9 | 1218.2 | 1141.0 | 1070.8 | 1025.1 | 990.0 | 968.9 | 968.9 |
| 7.5° | 1579.8 | 1495.5 | 1330.5 | 1176.1 | 1049.7 | 926.8 | 818.0 | 765.3 | 712.7 | 695.1 | 698.6 |
| 10° | 1607.9 | 1488.5 | 1267.3 | 1067.2 | 877.7 | 723.2 | 617.9 | 561.7 | 533.6 | 519.6 | 519.6 |
| 12.5° | 1639.5 | 1488.5 | 1200.6 | 944.4 | 723.2 | 565.2 | 502.0 | 459.9 | 445.9 | 438.8 | 431.8 |
| 15° | 1681.6 | 1495.5 | 1144.5 | 814.5 | 589.8 | 477.5 | 431.8 | 407.2 | 393.2 | 386.2 | 386.2 |
| 17.5° | 1730.8 | 1502.6 | 1084.8 | 709.2 | 502.0 | 421.3 | 386.2 | 368.6 | 354.6 | 347.6 | 347.6 |
| 20° | 1793.9 | 1520.1 | 1025.1 | 614.4 | 438.8 | 386.2 | 354.6 | 337.0 | 323.0 | 319.5 | 316.0 |
| 22.5° | 1871.2 | 1548.2 | 965.4 | 537.1 | 396.7 | 351.1 | 323.0 | 308.9 | 298.4 | 291.4 | 291.4 |
| 25° | 1962.5 | 1583.3 | 919.8 | 481.0 | 365.1 | 326.5 | 301.9 | 284.4 | 273.8 | 270.3 | 270.3 |
| 27.5° | 2088.8 | 1643.0 | 874.2 | 438.8 | 340.5 | 301.9 | 277.3 | 263.3 | 252.8 | 249.3 | 245.7 |
| 30° | 2208.2 | 1716.7 | 853.1 | 428.3 | 323.0 | 280.9 | 263.3 | 245.7 | 235.2 | 231.7 | 228.2 |
| 32.5° | 2362.7 | 1801.0 | 839.0 | 428.3 | 316.0 | 266.8 | 245.7 | 231.7 | 221.2 | 217.7 | 214.2 |
| 35° | 2527.7 | 1899.3 | 839.0 | 442.3 | 319.5 | 256.3 | 231.7 | 217.7 | 207.1 | 200.1 | 200.1 |
| 37.5° | *2706.7* | *1997.6* | *846.1* | *463.4* | *330.0* | *249.3* | *217.7* | *203.6* | *193.1* | *189.6* | *189.6* |
| 40° | 2896.3 | 2131.0 | 860.1 | 481.0 | 340.5 | 245.7 | 203.6 | 193.1 | 182.6 | 175.5 | 175.5 |
| 42.5° | 3071.8 | 2236.3 | 884.7 | 502.0 | 347.6 | 242.2 | 193.1 | 182.6 | 172.0 | 168.5 | 168.5 |
| 45° | 3275.4 | 2352.1 | 905.8 | 516.1 | 347.6 | 231.7 | 182.6 | 172.0 | 165.0 | 161.5 | 158.0 |
| 47.5° | 3436.9 | 2446.9 | 916.3 | 523.1 | 340.5 | 221.2 | 172.0 | 165.0 | 158.0 | 151.0 | 154.5 |
| 50° | 3633.5 | 2548.7 | 933.8 | 526.6 | 326.5 | 207.1 | 165.0 | 154.5 | 147.4 | 143.9 | 143.9 |
| 52.5° | 3823.1 | 2650.6 | 947.9 | 519.6 | 308.9 | 189.6 | 154.5 | 147.4 | 140.4 | 133.4 | 133.4 |
| 55° | 4047.8 | 2762.9 | 968.9 | 509.0 | 280.9 | 172.0 | 143.9 | 136.9 | 126.4 | 122.9 | 119.4 |
| 57.5° | 4304.1 | 2910.3 | 986.5 | 488.0 | 245.7 | 154.5 | 136.9 | 126.4 | 112.3 | 105.3 | 105.3 |
| 60° | 4539.3 | 3078.9 | 1000.5 | 435.3 | 214.2 | 143.9 | 126.4 | 115.9 | 101.8 | 98.3 | 98.3 |
| 62.5° | 4792.1 | 3254.4 | 1000.5 | 344.0 | 182.6 | 129.9 | 119.4 | 108.8 | 94.8 | 91.3 | 91.3 |
| 65° | 4967.6 | 3412.4 | 968.9 | 256.3 | 154.5 | 122.9 | 115.9 | 101.8 | 87.8 | 84.3 | 84.3 |
| 67.5° | 5016.7 | 3510.7 | 881.2 | 182.6 | 133.4 | 115.9 | 108.8 | 94.8 | 84.3 | 77.2 | 77.2 |
| 70° | 4858.8 | 3433.4 | 719.7 | 140.4 | 115.9 | 105.3 | 98.3 | 87.8 | 77.2 | 73.7 | 73.7 |
| 72.5° | 4405.9 | 3138.5 | 537.1 | 119.4 | 101.8 | 98.3 | 91.3 | 80.7 | 73.7 | 70.2 | 70.2 |
| 75° | 3689.7 | 2608.4 | 379.2 | 105.3 | 94.8 | 87.8 | 80.7 | 73.7 | 66.7 | 66.7 | 66.7 |
| 77.5° | 2794.5 | 1885.2 | 235.2 | 94.8 | 80.7 | 80.7 | 73.7 | 66.7 | 63.2 | 59.7 | 59.7 |
| 80° | 1804.5 | 1190.1 | 133.4 | 66.7 | 56.2 | 59.7 | 52.7 | 45.6 | 45.6 | 42.1 | 42.1 |
| 82.5° | 765.3 | 470.4 | 70.2 | 38.6 | 28.1 | 24.6 | 17.6 | 17.6 | 14.0 | 14.0 | 14.0 |
| 85° | 77.2 | 28.1 | 14.0 | 10.5 | 10.5 | 7.0 | 7.0 | 7.0 | 7.0 | 3.5 | 3.5 |
| 87.5° | 10.5 | 10.5 | 10.5 | 7.0 | 7.0 | 7.0 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| 90° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

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# 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-30-727-U-5WQ-2

Data in this report applies to families of products including MEM2-HTN-SA-30-727-U-5WQ-2

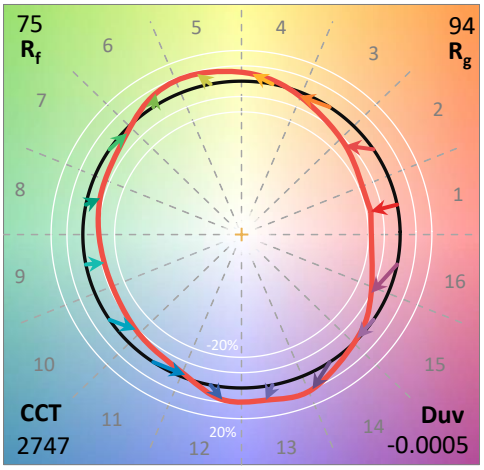
Report Generated By FNC07603 / LDUCLS01DT446
Version: v7.04

## 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-30-727-U-5WQ-2** |
| Description: | Epic Modern Light Square 30W 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

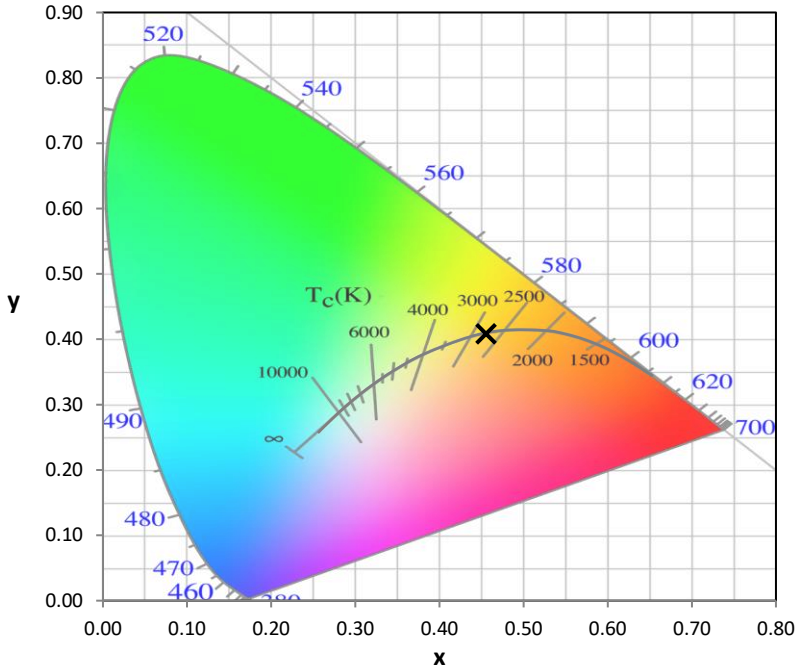
| | |
|---|---|
| Stabilization Time: | 22M |
| Operation Time: | 1H 22M |
| Sphere Temperature (°C): | 24.2 |

REPORT NUMBER: SP1-2407-157-3

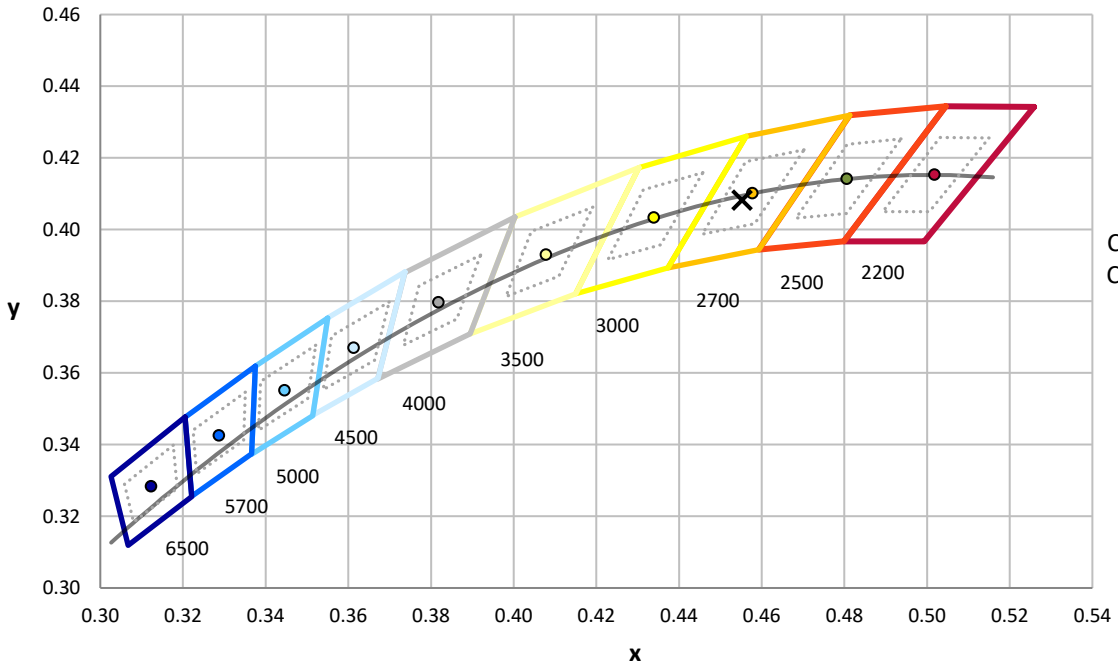
| Measurement and Test Equipment | | | |
|---|---|---|---|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | IN0058 | 6/18/2024 | 12/18/2024 |
| Power Meter | INXT2011004 | 2/8/2024 | 2/8/2025 |
| AC Power Source | IN0063 | 10/24/2023 | 10/24/2024 |
| DC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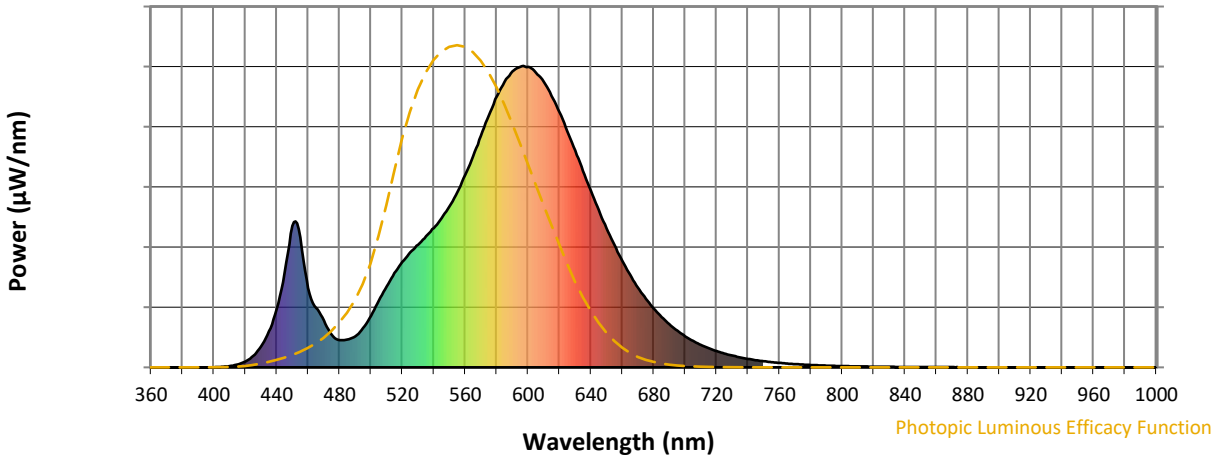
## Photopic Flux vs. Wavelength




## 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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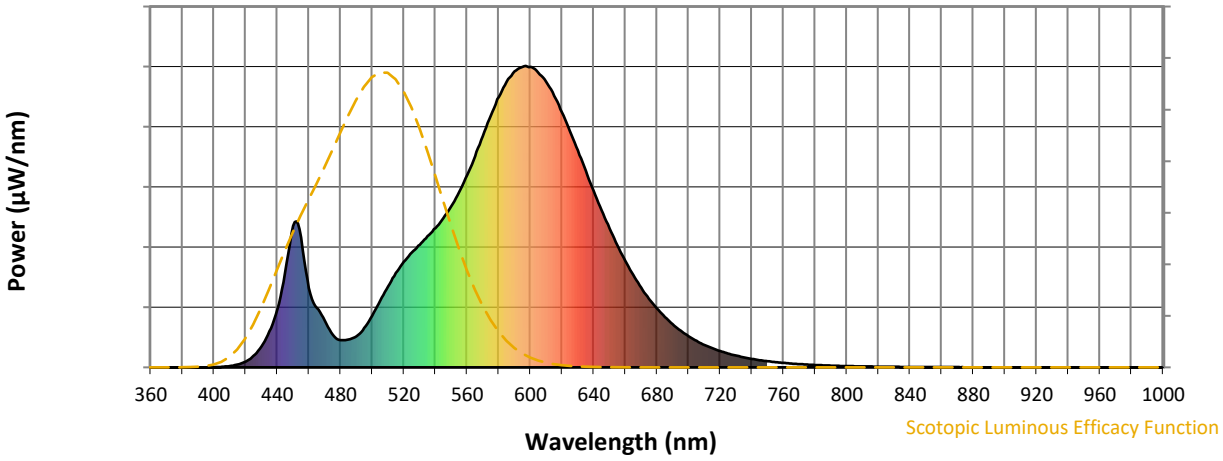
## Scotopic Flux vs. Wavelength




**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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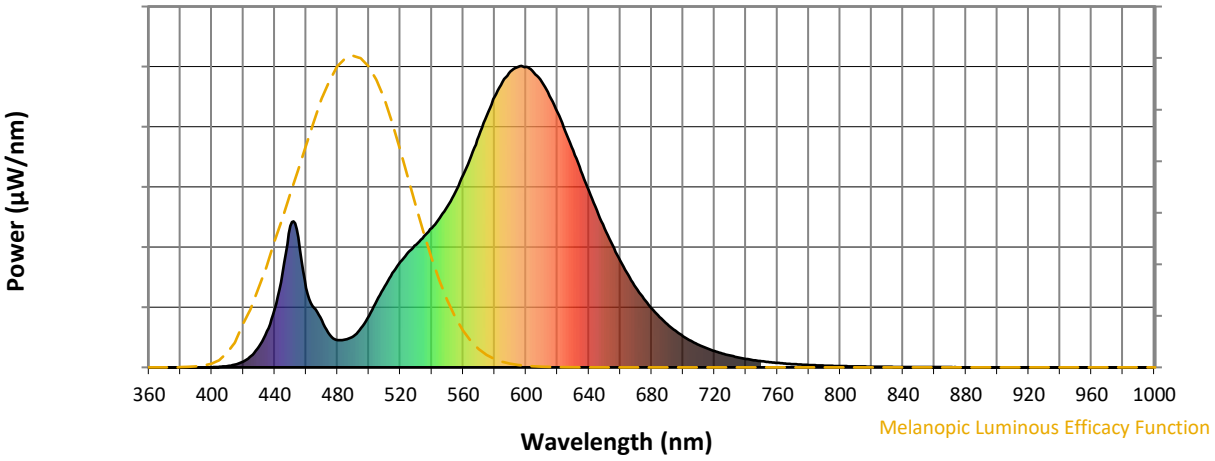
## Melanopic Flux vs. Wavelength




**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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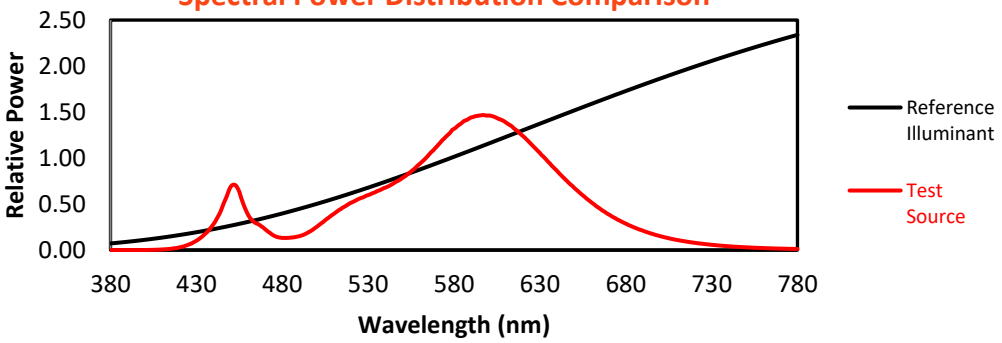
# TM-30-18

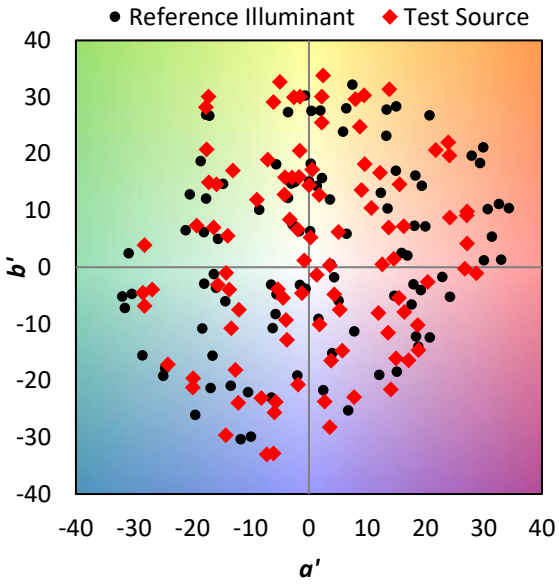
## Summary

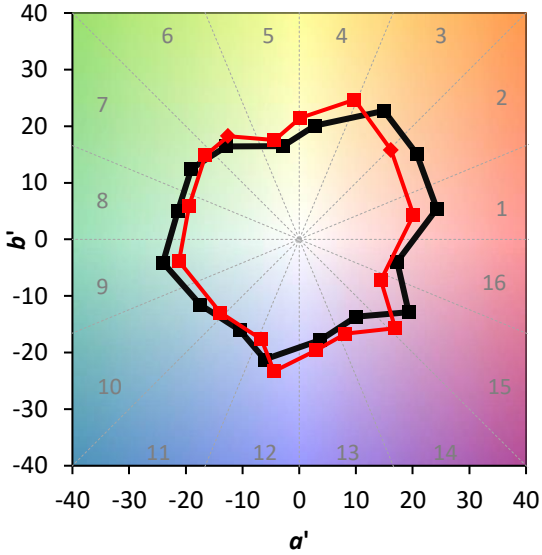
$R_f$ = 75.5
$R_g$ = 93.6
CIE $R_a$ = 71.7
$R_9$ = -35.3

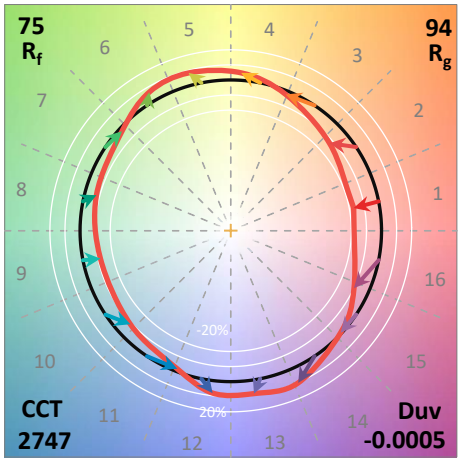
## Spectral Power Distribution Comparison

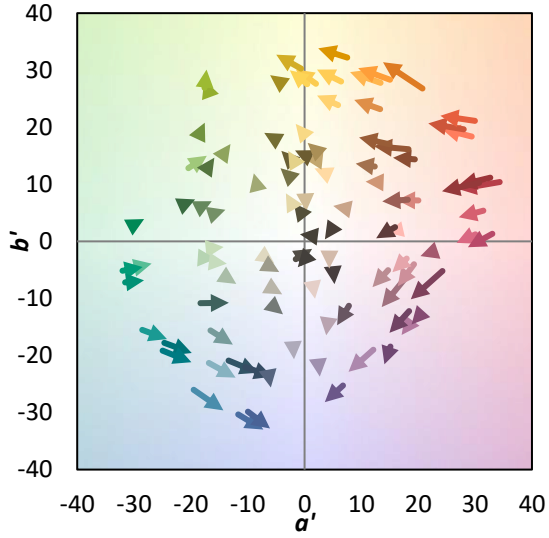



## Color Vector Graphics



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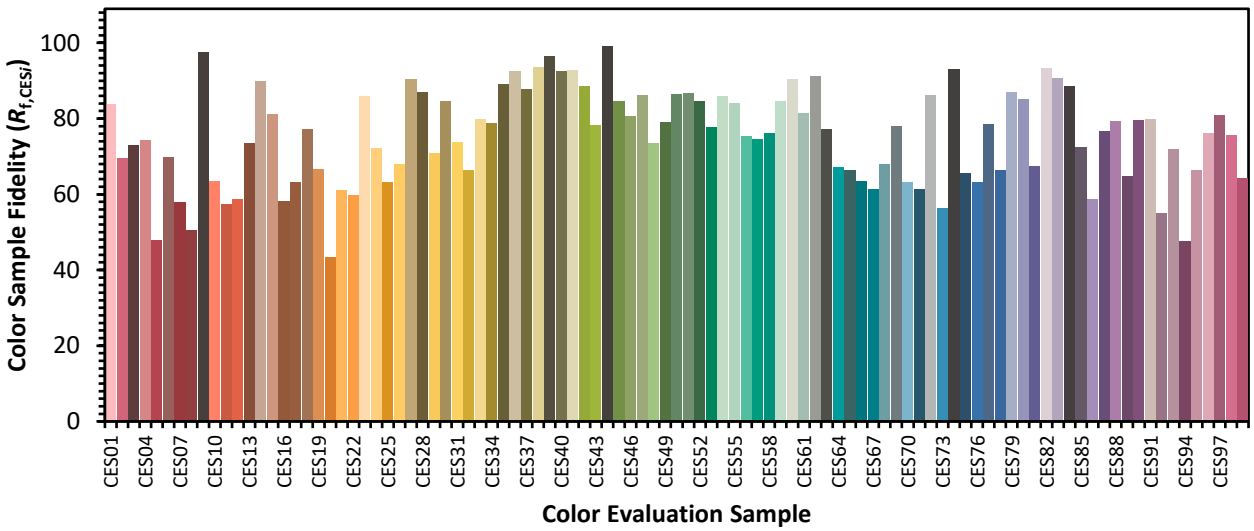
# TM-30-18

**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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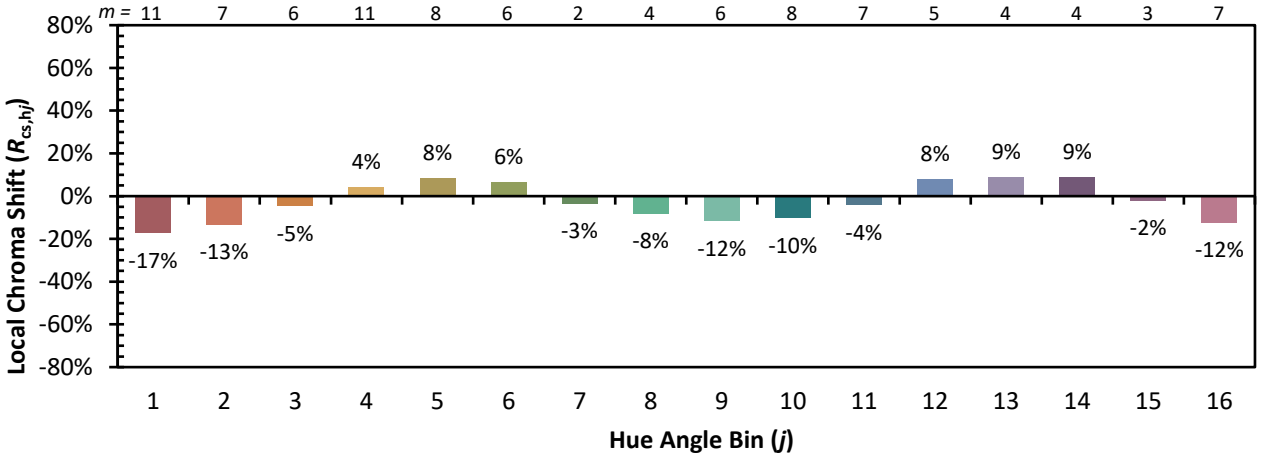
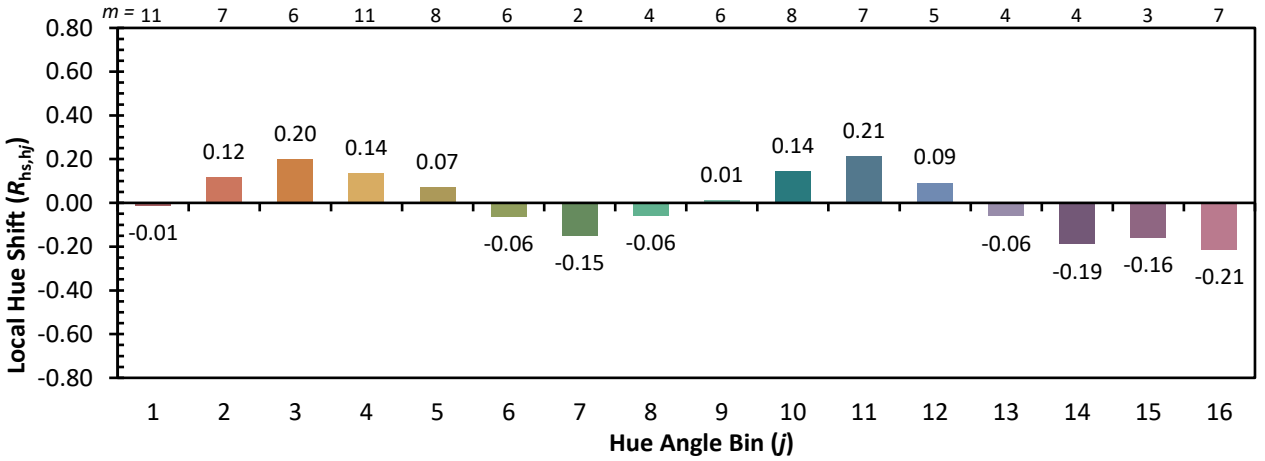
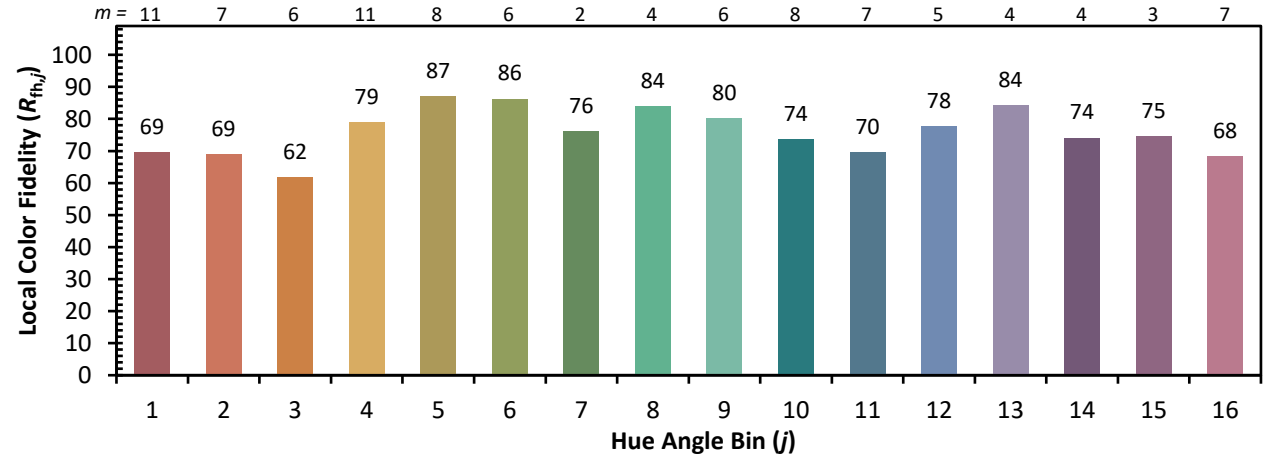
## Color Rendition by Hue-Angle Bin



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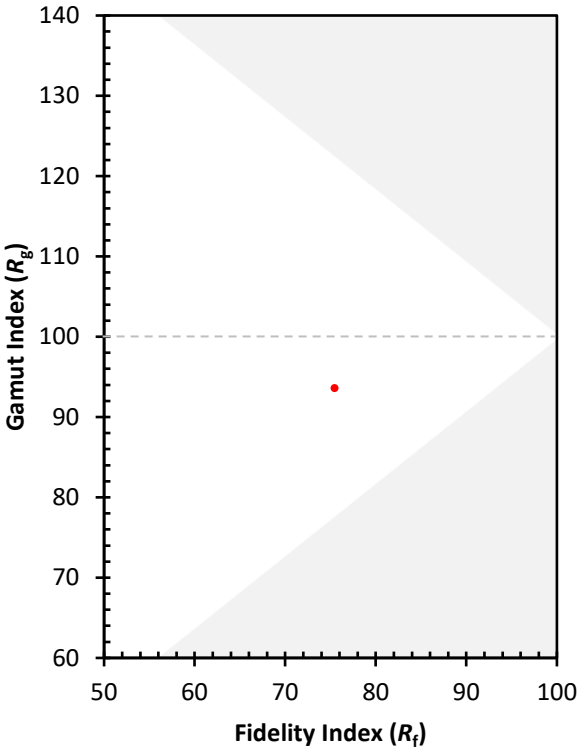
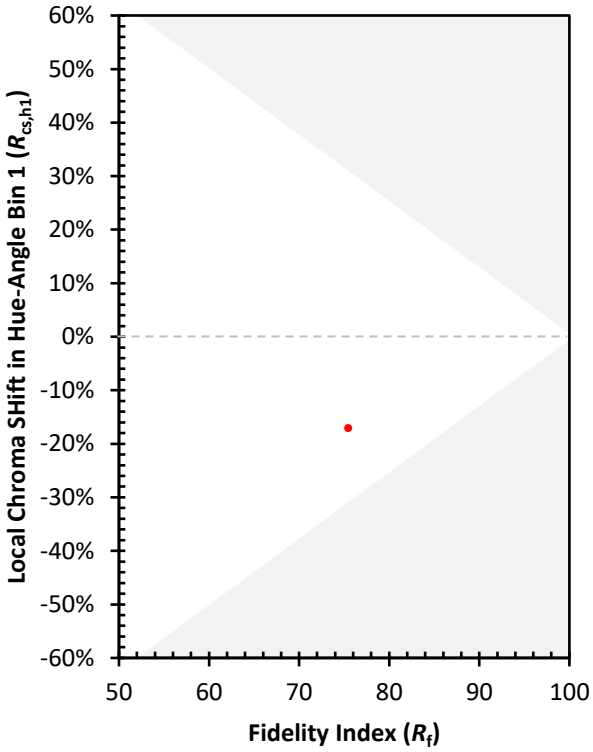
## Measure Comparisons




(END OF REPORT)