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: McGRAW-EDISON

Report Number: P510523

Luminaire Tested: **CTN-CA10-630-722-U-T5N**

Issue Date: 4/6/2021

Report Generated By 670246102

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: | P510523 |
| | TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-2102-151-13) |
| Test Lab: | COOPER LIGHTING SOLUTIONS |
| Issue Date: | 4/6/2021 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS (FORMERLY EATON) |
| Product Line: | McGRAW-EDISON |
| Catalog Number: | CTN-CA10-630-722-U-T5N |
| Description: | CELESTEON HIGH MAST LUMINAIRE |
| Light Source: | (10) 2200K CCT, 70 CRI LEDS |
| Ballast/Driver: | ELECTRONIC DRIVER |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 80144 lumens |
| Efficiency: | N/A |
| Efficacy: | 126.9 lumens/watt |
| Luminous Opening: | Circular (Dia: 2.08' x H: 0') |
| IES Classification: | Type V - Short |
| BUG Rating: | B5 - U0 - G5 |

| | |
|---|---|
| Input Watts (W): | 631.4 |
| Input Voltage (V): | 120 |
| Input Current (Ain): | NR |
| Voltage Rise (V): | NR |
| Power Factor: | NR |
| Total Harmonic Distortion (THDi): | NR |
| Frequency (hertz): | 60 |
| Stabilization Time: | NR |
| Operation Time: | NR |
| Ambient Temperature (°C): | NR |
| Test Distance: | 28.75 FT |

Cooper Lighting Solutions Photometric Lab
1121 Highway 74 South
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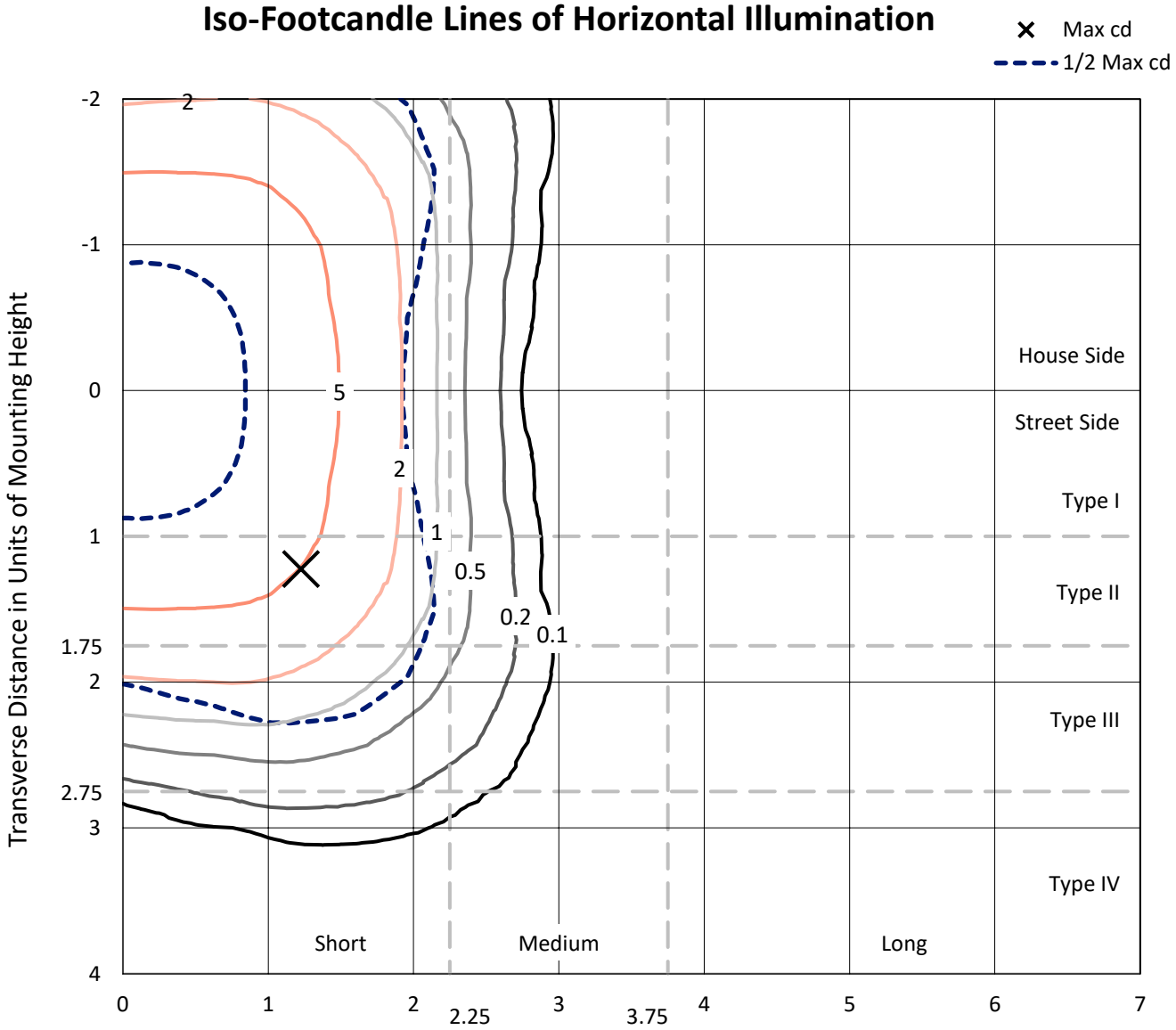
Scaled Data Report

REPORT NUMBER: P510523
CATALOG NUMBER: CTN-CA10-630-722-U-T5N

## Iso-Footcandle Lines of Horizontal Illumination




Based on 30 foot mounting height. Maximum calculated value = 8.9 fc
Type V - Short - N/A

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REPORT NUMBER: P510523
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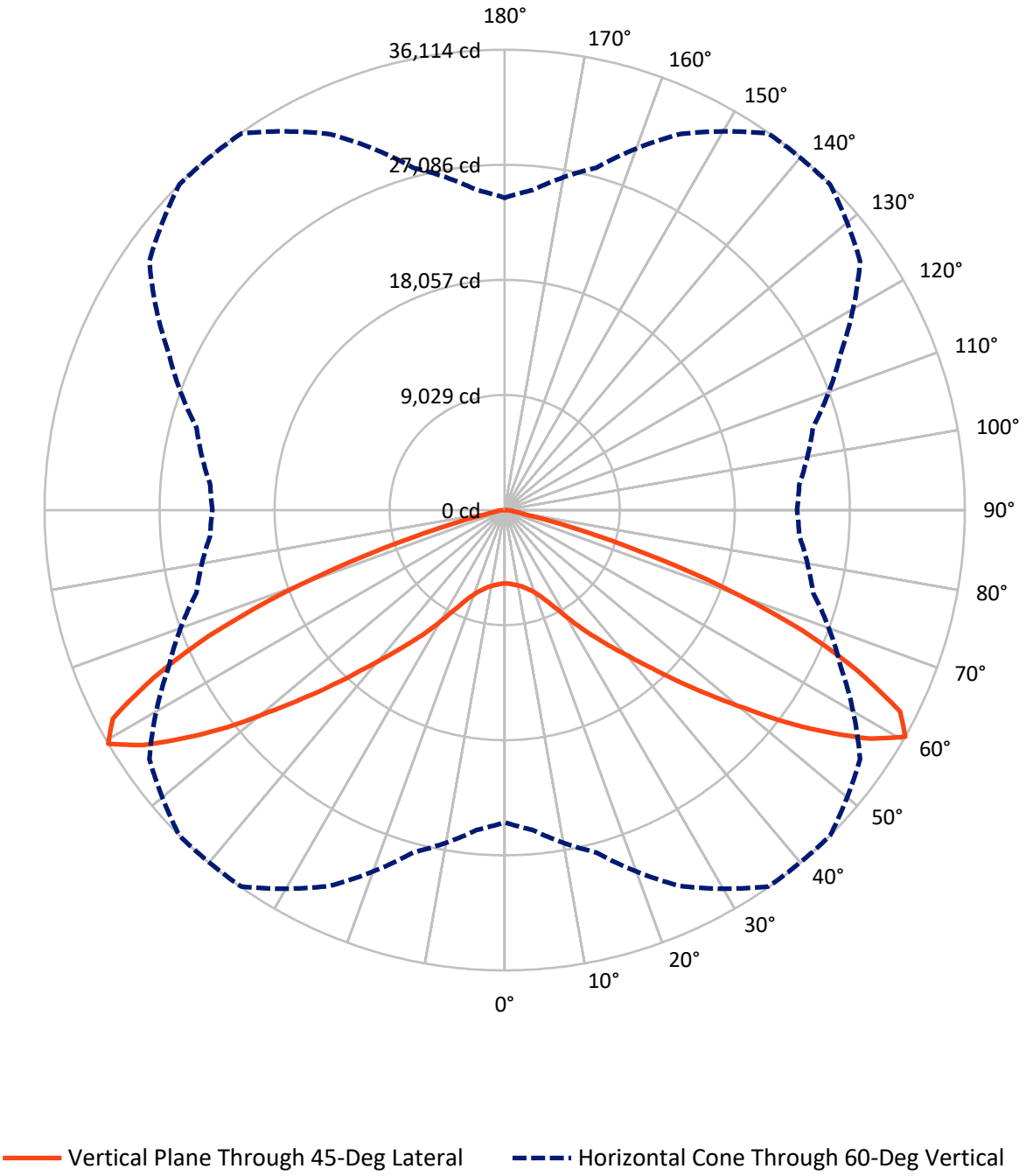
## Luminous Intensity Polar Plot



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Scaled Data Report

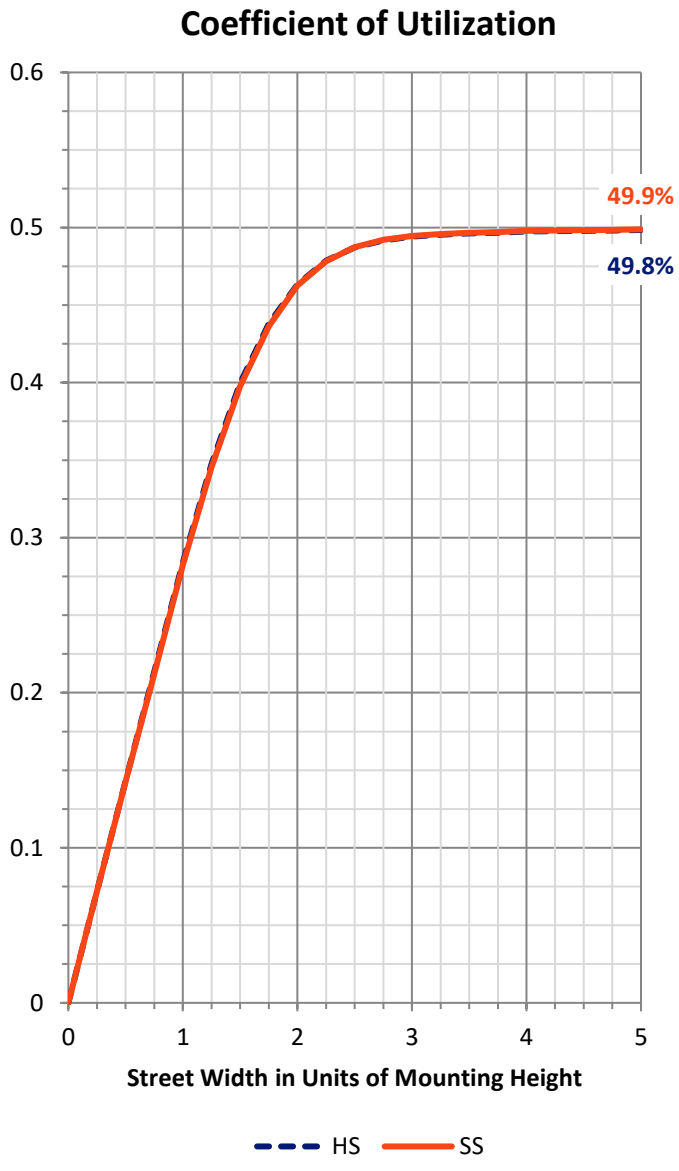
REPORT NUMBER: P510523
CATALOG NUMBER: CTN-CA10-630-722-U-T5N

**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 40072.0 | 0.0 | 40072.0 |
| | % Fixture | 50.0 | 0.0 | 50.0 |
| **Street Side** | Lumens | 40072.0 | 0.0 | 40072.0 |
| | % Fixture | 50.0 | 0.0 | 50.0 |
| **Total** | Lumens | 80144.0 | 0.0 | 80144.0 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 563.2 | 0.7 |
| 10°-20° | 1836.0 | 2.3 |
| 20°-30° | 3899.4 | 4.9 |
| 30°-40° | 8268.1 | 10.3 |
| 40°-50° | 15723.6 | 19.6 |
| 50°-60° | 24944.6 | 31.1 |
| 60°-70° | 21084.8 | 26.3 |
| 70°-80° | 3468.8 | 4.3 |
| 80°-90° | 355.7 | 0.4 |
| 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° | 80144.0 | 100.0 |
| 0°-180° | 80144.0 | 100.0 |



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

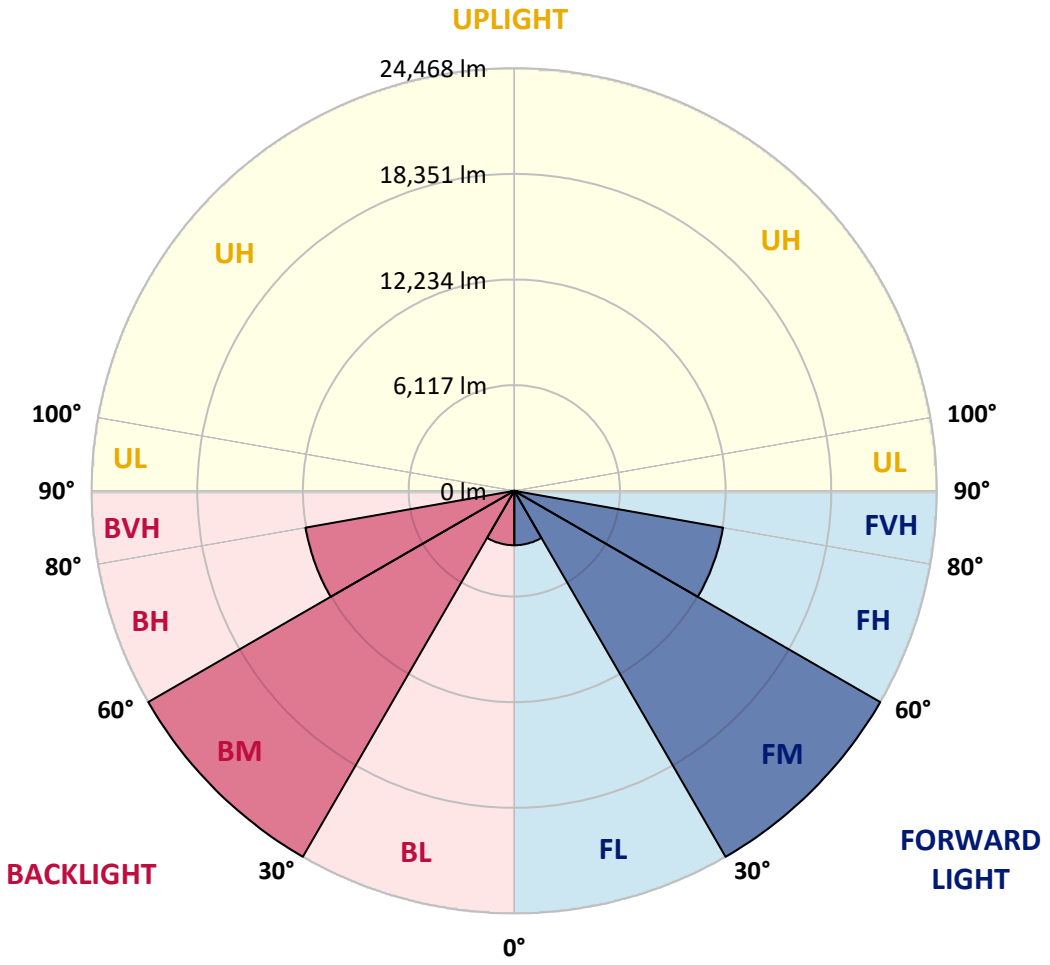
Scaled Data Report

REPORT NUMBER: P510523
CATALOG NUMBER: CTN-CA10-630-722-U-T5N

## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 3149.3 | 3.9 | | | |
| FM | (30°-60°) | 24468.1 | 30.5 | | | |
| FH | (60°-80°) | 12276.8 | 15.3 | | | G5 |
| FVH | (80°-90°) | 177.8 | 0.2 | | | G2/225 |
| BL | (0°-30°) | 3149.3 | 3.9 | B4/5000 | | |
| BM | (30°-60°) | 24468.1 | 30.5 | B5 | | |
| BH | (60°-80°) | 12276.8 | 15.3 | B5 | | G5 |
| BVH | (80°-90°) | 177.8 | 0.2 | | | G2/225 |
| UL | (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH | (100°-180°) | 0.0 | 0.0 | | U0/0 | |

**BUG Rating: B5-U0-G5**
Type V Short



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Peachtree City, GA 30269

Scaled Data Report

REPORT NUMBER: P510523
CATALOG NUMBER: CTN-CA10-630-722-U-T5N

**CANDELA DISTRIBUTION (FULL):**

| | 0° | 5° | 15° | 25° | 35° | 45° | 55° | 65° | 75° | 85° | 90° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 5754.1 | 5754.1 | 5754.1 | 5754.1 | 5754.1 | 5754.1 | 5754.1 | 5754.1 | 5754.1 | 5754.1 | 5754.1 |
| 2.5° | 5795.6 | 5781.2 | 5776.7 | 5770.7 | 5773.7 | 5775.2 | 5783.5 | 5784.3 | 5784.3 | 5791.8 | 5804.7 |
| 5° | 5860.6 | 5841.7 | 5834.9 | 5827.3 | 5831.1 | 5834.9 | 5842.4 | 5847.0 | 5846.2 | 5850.7 | 5862.1 |
| 7.5° | 5930.8 | 5924.0 | 5915.7 | 5911.2 | 5911.2 | 5921.7 | 5916.4 | 5924.8 | 5924.0 | 5929.3 | 5936.1 |
| 10° | 6035.0 | 6019.9 | 6019.2 | 6010.9 | 6014.6 | 6023.7 | 6025.2 | 6023.7 | 6025.2 | 6028.2 | 6044.1 |
| 12.5° | 6167.2 | 6163.4 | 6165.7 | 6158.9 | 6156.6 | 6166.5 | 6168.7 | 6178.5 | 6181.6 | 6190.6 | 6200.5 |
| 15° | 6380.2 | 6356.0 | 6353.0 | 6352.3 | 6356.8 | 6371.9 | 6376.4 | 6394.6 | 6402.9 | 6415.7 | 6437.6 |
| 17.5° | 6621.2 | 6629.5 | 6614.4 | 6612.9 | 6612.1 | 6624.2 | 6636.3 | 6676.3 | 6689.1 | 6718.6 | 6737.5 |
| 20° | 7005.6 | 6990.5 | 6981.5 | 6945.2 | 6936.1 | 6957.3 | 7001.1 | 7054.0 | 7078.9 | 7125.7 | 7161.2 |
| 22.5° | 7519.2 | 7493.6 | 7431.6 | 7388.6 | 7370.4 | 7406.7 | 7454.3 | 7538.9 | 7639.3 | 7697.5 | 7713.4 |
| 25° | 8261.7 | 8160.5 | 8083.5 | 8007.2 | 7980.0 | 8033.6 | 8110.7 | 8245.1 | 8371.3 | 8487.6 | 8541.2 |
| 27.5° | 9165.9 | 9101.6 | 8948.3 | 8828.2 | 8780.6 | 8826.0 | 8986.1 | 9175.7 | 9406.8 | 9527.7 | 9545.8 |
| 30° | 10313.9 | 10280.7 | 10085.1 | 9860.0 | 9775.4 | 9854.0 | 10042.8 | 10301.1 | 10622.9 | 10871.4 | 10915.2 |
| 32.5° | 11735.5 | 11567.0 | 11295.1 | 11037.5 | 10946.9 | 11042.8 | 11232.4 | 11603.3 | 12036.8 | 12311.8 | 12405.4 |
| 35° | 13365.5 | 13175.1 | 12766.5 | 12370.7 | 12253.6 | 12265.7 | 12569.3 | 13092.0 | 13685.0 | 14068.7 | 14173.6 |
| 37.5° | 15163.1 | 14969.0 | 14487.1 | 13873.0 | 13601.9 | 13622.3 | 14019.6 | 14699.4 | 15512.1 | 15930.5 | 16069.5 |
| 40° | 17081.6 | 16880.7 | 16383.7 | 15691.8 | 15246.2 | 15155.6 | 15686.6 | 16514.4 | 17340.0 | 17844.5 | 17898.1 |
| 42.5° | 18957.1 | 18719.2 | 18319.6 | 17627.7 | 17221.4 | 16978.2 | 17619.4 | 18369.5 | 19201.8 | 19656.5 | 19692.0 |
| 45° | 20632.4 | 20586.3 | 20265.3 | 19763.8 | 19429.2 | 19213.9 | 19671.6 | 20416.4 | 20998.0 | 21285.8 | 21390.8 |
| 47.5° | 22251.8 | 22223.1 | 22120.4 | 21945.2 | 22028.3 | 21670.2 | 21890.0 | 22227.7 | 22547.2 | 22758.7 | 22840.2 |
| 50° | 23671.1 | 23701.3 | 23903.0 | 24201.3 | 24802.6 | 24440.0 | 24371.3 | 24008.0 | 24017.0 | 24033.6 | 24118.2 |
| 52.5° | 24843.3 | 25003.5 | 25511.1 | 26411.4 | 27709.8 | 27701.5 | 26661.4 | 25702.2 | 25268.6 | 25076.0 | 25093.4 |
| 55° | 25865.3 | 26139.5 | 26977.9 | 28836.7 | 30694.8 | 30787.7 | 29373.0 | 27248.3 | 26435.6 | 26024.7 | 26078.3 |
| 57.5° | 26429.5 | 26847.2 | 28266.5 | 31088.4 | 33736.5 | 33848.3 | 32272.7 | 28960.6 | 27099.5 | 26059.4 | 26104.0 |
| 60° | 24492.9 | 25196.1 | 27812.5 | 32540.8 | 36062.9 | 36114.3 | 34045.5 | 29095.1 | 25046.5 | 23205.8 | 22936.2 |
| 62.5° | 20043.3 | 21017.6 | 24708.9 | 31415.4 | 34985.1 | 34825.7 | 32935.9 | 26576.1 | 20575.0 | 18342.3 | 18115.7 |
| 65° | 15055.9 | 15972.1 | 19837.1 | 26899.3 | 30697.1 | 30487.1 | 28562.6 | 21004.0 | 15084.6 | 12714.4 | 12435.6 |
| 67.5° | 8148.4 | 9532.2 | 13148.7 | 20547.8 | 24471.0 | 25183.2 | 22517.0 | 14639.7 | 8778.4 | 6364.4 | 6119.6 |
| 70° | 2814.3 | 3636.9 | 6704.3 | 12898.7 | 17650.4 | 18364.9 | 15355.0 | 7851.6 | 3841.6 | 2401.9 | 2156.4 |
| 72.5° | 999.3 | 1151.9 | 2520.5 | 6229.2 | 10048.8 | 11134.2 | 8285.1 | 3158.0 | 1224.4 | 892.0 | 873.9 |
| 75° | 705.5 | 728.1 | 895.8 | 2031.1 | 4350.7 | 5328.8 | 3266.8 | 1048.4 | 763.6 | 713.8 | 709.2 |
| 77.5° | 629.9 | 642.8 | 725.9 | 827.1 | 1329.4 | 1701.7 | 1005.3 | 760.6 | 663.2 | 635.2 | 625.4 |
| 80° | 599.0 | 608.8 | 633.0 | 678.3 | 753.8 | 784.0 | 678.3 | 650.3 | 603.5 | 591.4 | 587.6 |
| 82.5° | 523.4 | 521.2 | 528.0 | 546.9 | 580.8 | 588.4 | 544.6 | 509.8 | 510.6 | 496.2 | 489.4 |
| 85° | 354.2 | 375.4 | 359.5 | 339.9 | 421.5 | 423.7 | 395.0 | 296.1 | 336.1 | 329.3 | 301.4 |
| 87.5° | 107.3 | 120.9 | 95.9 | 66.5 | 91.4 | 71.0 | 64.2 | 66.5 | 63.4 | 55.1 | 49.9 |
| 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

Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

STREETWORKS

Report Number: SP1-2104-215-4

Luminaire Tested: CST-CA10-630-722-U-T3

Test Date: 04/20/2021

Report Generated By controller / USPTCWHP6086842

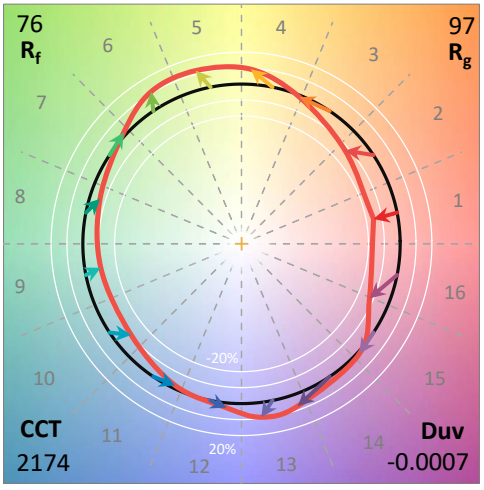
## Test Information

| | |
|---|---|
| Test Method: | LM-79-08 |
| Report Number: | SP1-2104-215-4 |
| Test Lab: | COOPER LIGHTING SOLUTIONS |
| Photometer: | SP1 |
| Measurement Geometry: | 4π |
| Issue Date: | 04/20/2021 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS (FORMERLY EATON) |
| Product Line: | STREETWORKS |
| Catalog Number: | **CST-CA10-630-722-U-T3** |
| Description: | STREETWORKS HIGH MAST LUMINAIRE |

## Spectral Parameters

| | | | | | |
|---|---|---|---|---|---|
| CCT (K): | 2174 | CRI (Ra): | 72.8 | | |
| CIE u': | 0.2919 | R1: | 70.2 | R9: | -23.3 |
| CIE v': | 0.5354 | R2: | 86.8 | R10: | 71.8 |
| Duv: | -0.0007 | R3: | 92.8 | R11: | 63.6 |
| CIE x: | 0.5067 | R4: | 66.8 | R12: | 66.0 |
| CIE y: | 0.4131 | R5: | 69.1 | R13: | 73.5 |
| CIE z: | 0.0802 | R6: | 84.7 | R14: | 96.9 |
| Peak Wavelength (nm): | 608 | R7: | 73.2 | | |
| Dominant Wavelength (nm): | 587 | R8: | 39.0 | | |
| Purity: | 76.7 | | | | |

| | |
|---|---|
| Rf: | 75.7 |
| Rg: | 96.7 |




## Test Conditions

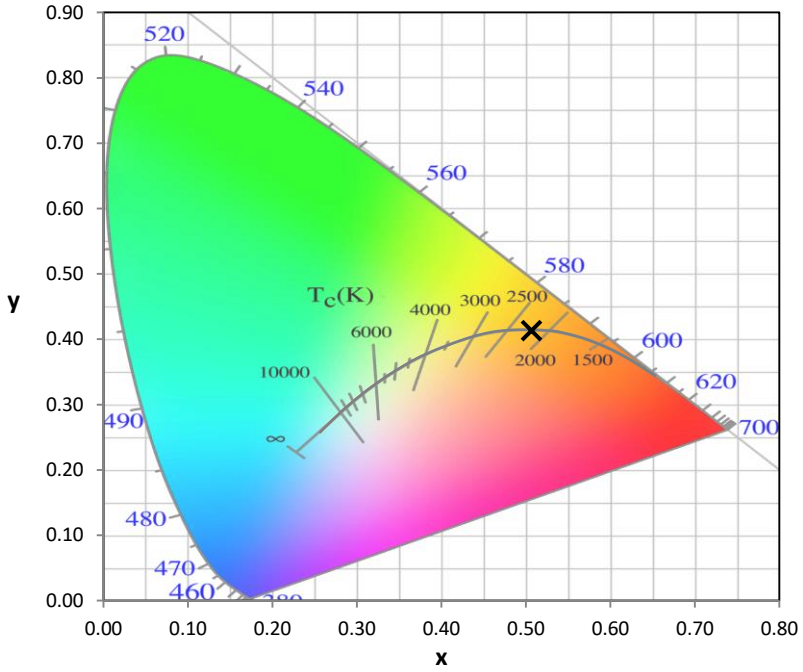
| | |
|---|---|
| Stabilization Time: | 79M |
| Operation Time: | 12H |
| Room Temperature (°C) / RH%: | 25.7/32% |
| Sphere Temperature (°C): | 24.8 |

REPORT NUMBER: SP1-2104-215-4

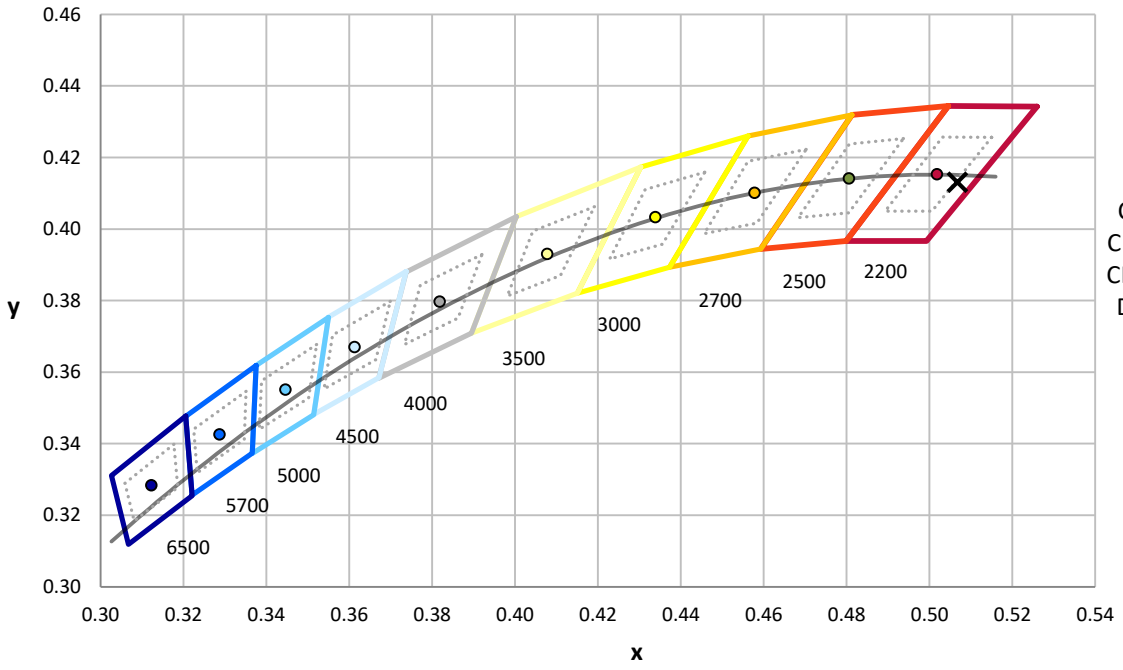
| Measurement and Test Equipment | | | |
|---|---|---|---|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | IN0058 | 1/31/2021 | 7/31/2021 |
| Power Meter | IN0071 | 12/1/2020 | 12/1/2021 |
| AC Power Source | IN0063 | 12/1/2020 | 12/1/2021 |
| DC Power Source | IN0208 | 12/1/2020 | 12/1/2021 |
| Sphere Thermometer | IN0085 | 12/1/2020 | 12/1/2021 |
| Room Thermometer | IN0046 | 12/1/2020 | 12/1/2021 |

REPORT NUMBER: SP1-2104-215-4

## CIE 1931 Chromaticity Diagram




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

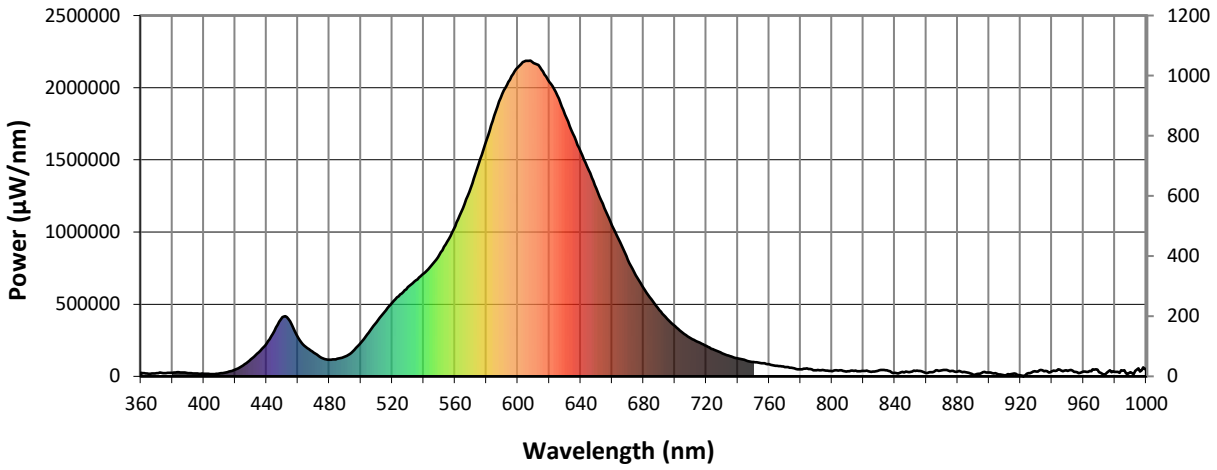



CCT = 2174K
CIE x = 0.5067
CIE y = 0.4131
Duv = -0.0007

Point lies inside the ANSI 2200K 7-step quadrangle

REPORT NUMBER: SP1-2104-215-4

## Photopic Flux vs. Wavelength

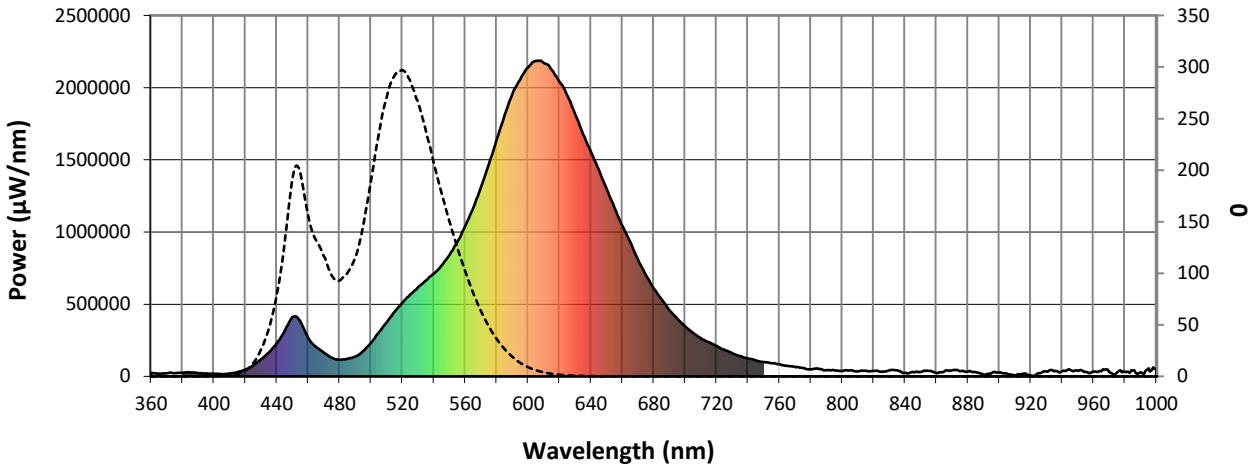



######

| λ (nm) | Power (µW/nm) | Lumens (ϕ/nm) | λ (nm) | Power (µW/nm) | Lumens (ϕ/nm) | λ (nm) | Power (µW/nm) | Lumens (ϕ/nm) | λ (nm) | Power (µW/nm) | Lumens (ϕ/nm) | λ (nm) | Power (µW/nm) | Lumens (ϕ/nm) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 360 | 23398 | 0.0 | 490 | 137099 | 19.5 | 620 | 2038916 | 530.6 | 750 | 99721 | 0.0 | 880 | 32326 | 0.0 |
| 365 | 18626 | 0.0 | 495 | 174286 | 31.6 | 625 | 1946743 | 429.5 | 755 | 91432 | 0.0 | 885 | 29783 | 0.0 |
| 370 | 21702 | 0.0 | 500 | 232711 | 51.3 | 630 | 1814508 | 328.4 | 760 | 83300 | 0.0 | 890 | 12135 | 0.0 |
| 375 | 22606 | 0.0 | 505 | 303528 | 84.9 | 635 | 1681061 | 252.6 | 765 | 72172 | 0.0 | 895 | 22953 | 0.0 |
| 380 | 25296 | 0.0 | 510 | 374456 | 128.6 | 640 | 1557170 | 186.1 | 770 | 65008 | 0.0 | 900 | 27214 | 0.0 |
| 385 | 27032 | 0.0 | 515 | 445274 | 184.5 | 645 | 1430182 | 137.7 | 775 | 56809 | 0.0 | 905 | 17038 | 0.0 |
| 390 | 22156 | 0.0 | 520 | 510296 | 247.5 | 650 | 1300435 | 95.0 | 780 | 49368 | 0.0 | 910 | 6896 | 0.0 |
| 395 | 20190 | 0.0 | 525 | 566771 | 304.3 | 655 | 1165554 | 66.9 | 785 | 51733 | 0.0 | 915 | 17142 | 0.0 |
| 400 | 18423 | 0.0 | 530 | 617892 | 363.8 | 660 | 1044122 | 43.5 | 790 | 41796 | 0.0 | 920 | 7675 | 0.0 |
| 405 | 16139 | 0.0 | 535 | 664903 | 412.3 | 665 | 932131 | 29.6 | 795 | 42601 | 0.0 | 925 | 21587 | 0.0 |
| 410 | 19812 | 0.0 | 540 | 711603 | 463.7 | 670 | 808971 | 17.7 | 800 | 36382 | 0.0 | 930 | 32992 | 0.0 |
| 415 | 29121 | 0.1 | 545 | 768835 | 511.7 | 675 | 701208 | 11.7 | 805 | 41419 | 0.0 | 935 | 35464 | 0.0 |
| 420 | 46007 | 0.1 | 550 | 841179 | 571.6 | 680 | 610741 | 7.1 | 810 | 35865 | 0.0 | 940 | 34460 | 0.0 |
| 425 | 76329 | 0.4 | 555 | 932641 | 637.0 | 685 | 533825 | 4.6 | 815 | 39722 | 0.0 | 945 | 46305 | 0.0 |
| 430 | 117696 | 0.9 | 560 | 1040487 | 707.1 | 690 | 459427 | 2.6 | 820 | 37236 | 0.0 | 950 | 38353 | 0.0 |
| 435 | 166890 | 2.0 | 565 | 1164360 | 774.2 | 695 | 399973 | 1.7 | 825 | 31566 | 0.0 | 955 | 30772 | 0.0 |
| 440 | 227762 | 3.6 | 570 | 1307677 | 850.3 | 700 | 347460 | 1.0 | 830 | 42647 | 0.0 | 960 | 32413 | 0.0 |
| 445 | 315427 | 6.6 | 575 | 1470810 | 915.2 | 705 | 302187 | 0.6 | 835 | 41433 | 0.0 | 965 | 35310 | 0.0 |
| 450 | 409560 | 10.6 | 580 | 1637734 | 973.2 | 710 | 262909 | 0.4 | 840 | 24213 | 0.0 | 970 | 28048 | 0.0 |
| 455 | 381103 | 12.8 | 585 | 1807622 | 1004.4 | 715 | 236689 | 0.3 | 845 | 31358 | 0.0 | 975 | 26258 | 0.0 |
| 460 | 269221 | 11.0 | 590 | 1958195 | 1012.4 | 720 | 209675 | 0.1 | 850 | 30957 | 0.0 | 980 | 31067 | 0.0 |
| 465 | 203513 | 10.5 | 595 | 2055425 | 974.3 | 725 | 184999 | 0.1 | 855 | 38865 | 0.0 | 985 | 40288 | 0.0 |
| 470 | 163989 | 10.2 | 600 | 2141598 | 923.0 | 730 | 160261 | 0.1 | 860 | 23238 | 0.0 | 990 | 29366 | 0.0 |
| 475 | 129159 | 10.1 | 605 | 2185430 | 846.3 | 735 | 140736 | 0.0 | 865 | 32686 | 0.0 | 995 | 54854 | 0.0 |
| 480 | 115440 | 11.0 | 610 | 2170089 | 745.5 | 740 | 125207 | 0.0 | 870 | 41855 | 0.0 | 1000 | 50994 | 0.0 |
| 485 | 120959 | 14.3 | 615 | 2123505 | 641.1 | 745 | 110736 | 0.0 | 875 | 35838 | 0.0 | | | |

REPORT NUMBER: SP1-2104-215-4

## Scotopic Flux vs. Wavelength




**Scotopic Lumens: 72942.9** **S/P: 0.88**

| λ (nm) | Power (µW/nm) | Lumens (ϕ/nm) | λ (nm) | Power (µW/nm) | Lumens (ϕ/nm) | λ (nm) | Power (µW/nm) | Lumens (ϕ/nm) | λ (nm) | Power (µW/nm) | Lumens (ϕ/nm) | λ (nm) | Power (µW/nm) | Lumens (ϕ/nm) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 360 | 23398 | 0.0 | 490 | 137099 | 211.1 | 620 | 2038916 | 25.5 | 750 | 99721 | 0.0 | 880 | 32326 | 0.0 |
| 365 | 18626 | 0.0 | 495 | 174286 | 281.7 | 625 | 1946743 | 16.4 | 755 | 91432 | 0.0 | 885 | 29783 | 0.0 |
| 370 | 21702 | 0.0 | 500 | 232711 | 389.3 | 630 | 1814508 | 10.3 | 760 | 83300 | 0.0 | 890 | 12135 | 0.0 |
| 375 | 22606 | 0.0 | 505 | 303528 | 516.0 | 635 | 1681061 | 6.4 | 765 | 72172 | 0.0 | 895 | 22953 | 0.0 |
| 380 | 25296 | 0.0 | 510 | 374456 | 634.7 | 640 | 1557170 | 4.0 | 770 | 65008 | 0.0 | 900 | 27214 | 0.0 |
| 385 | 27032 | 0.1 | 515 | 445274 | 738.0 | 645 | 1430182 | 2.4 | 775 | 56809 | 0.0 | 905 | 17038 | 0.0 |
| 390 | 22156 | 0.1 | 520 | 510296 | 811.1 | 650 | 1300435 | 1.5 | 780 | 49368 | 0.0 | 910 | 6896 | 0.0 |
| 395 | 20190 | 0.2 | 525 | 566771 | 847.9 | 655 | 1165554 | 0.9 | 785 | 51733 | 0.0 | 915 | 17142 | 0.0 |
| 400 | 18423 | 0.3 | 530 | 617892 | 851.9 | 660 | 1044122 | 0.6 | 790 | 41796 | 0.0 | 920 | 7675 | 0.0 |
| 405 | 16139 | 0.5 | 535 | 664903 | 828.5 | 665 | 932131 | 0.3 | 795 | 42601 | 0.0 | 925 | 21587 | 0.0 |
| 410 | 19812 | 1.2 | 540 | 711603 | 786.3 | 670 | 808971 | 0.2 | 800 | 36382 | 0.0 | 930 | 32992 | 0.0 |
| 415 | 29121 | 3.0 | 545 | 768835 | 737.2 | 675 | 701208 | 0.1 | 805 | 41419 | 0.0 | 935 | 35464 | 0.0 |
| 420 | 46007 | 7.6 | 550 | 841179 | 687.8 | 680 | 610741 | 0.1 | 810 | 35865 | 0.0 | 940 | 34460 | 0.0 |
| 425 | 76329 | 18.7 | 555 | 932641 | 637.4 | 685 | 533825 | 0.0 | 815 | 39722 | 0.0 | 945 | 46305 | 0.0 |
| 430 | 117696 | 40.1 | 560 | 1040487 | 581.6 | 690 | 459427 | 0.0 | 820 | 37236 | 0.0 | 950 | 38353 | 0.0 |
| 435 | 166890 | 74.6 | 565 | 1164360 | 522.4 | 695 | 399973 | 0.0 | 825 | 31566 | 0.0 | 955 | 30772 | 0.0 |
| 440 | 227762 | 127.3 | 570 | 1307677 | 461.5 | 700 | 347460 | 0.0 | 830 | 42647 | 0.0 | 960 | 32413 | 0.0 |
| 445 | 315427 | 211.2 | 575 | 1470810 | 400.6 | 705 | 302187 | 0.0 | 835 | 41433 | 0.0 | 965 | 35310 | 0.0 |
| 450 | 409560 | 317.4 | 580 | 1637734 | 337.4 | 710 | 262909 | 0.0 | 840 | 24213 | 0.0 | 970 | 28048 | 0.0 |
| 455 | 381103 | 333.0 | 585 | 1807622 | 276.3 | 715 | 236689 | 0.0 | 845 | 31358 | 0.0 | 975 | 26258 | 0.0 |
| 460 | 269221 | 260.0 | 590 | 1958195 | 218.0 | 720 | 209675 | 0.0 | 850 | 30957 | 0.0 | 980 | 31067 | 0.0 |
| 465 | 203513 | 214.9 | 595 | 2055425 | 163.9 | 725 | 184999 | 0.0 | 855 | 38865 | 0.0 | 985 | 40288 | 0.0 |
| 470 | 163989 | 188.8 | 600 | 2141598 | 120.7 | 730 | 160261 | 0.0 | 860 | 23238 | 0.0 | 990 | 29366 | 0.0 |
| 475 | 129159 | 161.5 | 605 | 2185430 | 85.9 | 735 | 140736 | 0.0 | 865 | 32686 | 0.0 | 995 | 54854 | 0.0 |
| 480 | 115440 | 155.9 | 610 | 2170089 | 58.8 | 740 | 125207 | 0.0 | 870 | 41855 | 0.0 | 1000 | 50994 | 0.0 |
| 485 | 120959 | 175.3 | 615 | 2123505 | 39.3 | 745 | 110736 | 0.0 | 875 | 35838 | 0.0 | | | |

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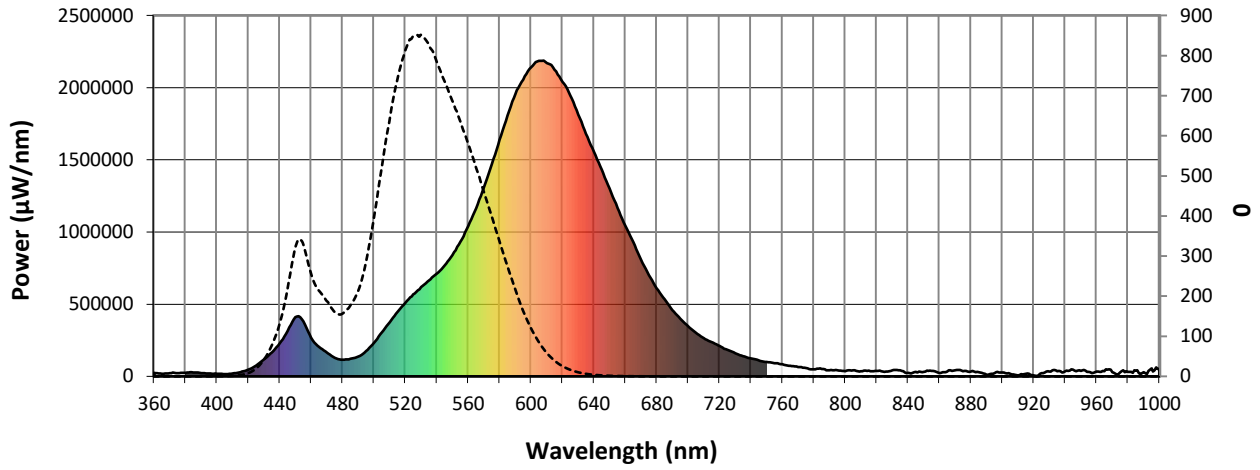
## Melanopic Flux vs. Wavelength




**Melanopic Lumens: 23955.7** **M/P: 0.29**

| λ (nm) | Power (µW/nm) | Lumens (ϕ/nm) | λ (nm) | Power (µW/nm) | Lumens (ϕ/nm) | λ (nm) | Power (µW/nm) | Lumens (ϕ/nm) | λ (nm) | Power (µW/nm) | Lumens (ϕ/nm) | λ (nm) | Power (µW/nm) | Lumens (ϕ/nm) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 360 | 23398 | 0.0 | 490 | 137099 | 114.1 | 620 | 2038916 | 1.6 | 750 | 99721 | 0.0 | 880 | 32326 | 0.0 |
| 365 | 18626 | 0.0 | 495 | 174286 | 143.9 | 625 | 1946743 | 1.0 | 755 | 91432 | 0.0 | 885 | 29783 | 0.0 |
| 370 | 21702 | 0.0 | 500 | 232711 | 187.1 | 630 | 1814508 | 0.6 | 760 | 83300 | 0.0 | 890 | 12135 | 0.0 |
| 375 | 22606 | 0.0 | 505 | 303528 | 232.9 | 635 | 1681061 | 0.4 | 765 | 72172 | 0.0 | 895 | 22953 | 0.0 |
| 380 | 25296 | 0.0 | 510 | 374456 | 268.9 | 640 | 1557170 | 0.2 | 770 | 65008 | 0.0 | 900 | 27214 | 0.0 |
| 385 | 27032 | 0.0 | 515 | 445274 | 290.9 | 645 | 1430182 | 0.2 | 775 | 56809 | 0.0 | 905 | 17038 | 0.0 |
| 390 | 22156 | 0.1 | 520 | 510296 | 297.1 | 650 | 1300435 | 0.1 | 780 | 49368 | 0.0 | 910 | 6896 | 0.0 |
| 395 | 20190 | 0.1 | 525 | 566771 | 287.4 | 655 | 1165554 | 0.1 | 785 | 51733 | 0.0 | 915 | 17142 | 0.0 |
| 400 | 18423 | 0.2 | 530 | 617892 | 267.0 | 660 | 1044122 | 0.0 | 790 | 41796 | 0.0 | 920 | 7675 | 0.0 |
| 405 | 16139 | 0.3 | 535 | 664903 | 239.3 | 665 | 932131 | 0.0 | 795 | 42601 | 0.0 | 925 | 21587 | 0.0 |
| 410 | 19812 | 0.8 | 540 | 711603 | 208.3 | 670 | 808971 | 0.0 | 800 | 36382 | 0.0 | 930 | 32992 | 0.0 |
| 415 | 29121 | 1.9 | 545 | 768835 | 178.6 | 675 | 701208 | 0.0 | 805 | 41419 | 0.0 | 935 | 35464 | 0.0 |
| 420 | 46007 | 5.3 | 550 | 841179 | 151.0 | 680 | 610741 | 0.0 | 810 | 35865 | 0.0 | 940 | 34460 | 0.0 |
| 425 | 76329 | 11.9 | 555 | 932641 | 125.8 | 685 | 533825 | 0.0 | 815 | 39722 | 0.0 | 945 | 46305 | 0.0 |
| 430 | 117696 | 24.9 | 560 | 1040487 | 102.6 | 690 | 459427 | 0.0 | 820 | 37236 | 0.0 | 950 | 38353 | 0.0 |
| 435 | 166890 | 44.5 | 565 | 1164360 | 81.7 | 695 | 399973 | 0.0 | 825 | 31566 | 0.0 | 955 | 30772 | 0.0 |
| 440 | 227762 | 76.1 | 570 | 1307677 | 63.9 | 700 | 347460 | 0.0 | 830 | 42647 | 0.0 | 960 | 32413 | 0.0 |
| 445 | 315427 | 124.4 | 575 | 1470810 | 49.0 | 705 | 302187 | 0.0 | 835 | 41433 | 0.0 | 965 | 35310 | 0.0 |
| 450 | 409560 | 188.7 | 580 | 1637734 | 36.6 | 710 | 262909 | 0.0 | 840 | 24213 | 0.0 | 970 | 28048 | 0.0 |
| 455 | 381103 | 199.7 | 585 | 1807622 | 26.9 | 715 | 236689 | 0.0 | 845 | 31358 | 0.0 | 975 | 26258 | 0.0 |
| 460 | 269221 | 158.6 | 590 | 1958195 | 19.2 | 720 | 209675 | 0.0 | 850 | 30957 | 0.0 | 980 | 31067 | 0.0 |
| 465 | 203513 | 133.0 | 595 | 2055425 | 13.2 | 725 | 184999 | 0.0 | 855 | 38865 | 0.0 | 985 | 40288 | 0.0 |
| 470 | 163989 | 117.4 | 600 | 2141598 | 9.0 | 730 | 160261 | 0.0 | 860 | 23238 | 0.0 | 990 | 29366 | 0.0 |
| 475 | 129159 | 98.6 | 605 | 2185430 | 6.0 | 735 | 140736 | 0.0 | 865 | 32686 | 0.0 | 995 | 54854 | 0.0 |
| 480 | 115440 | 92.8 | 610 | 2170089 | 3.9 | 740 | 125207 | 0.0 | 870 | 41855 | 0.0 | 1000 | 50994 | 0.0 |
| 485 | 120959 | 99.7 | 615 | 2123505 | 2.5 | 745 | 110736 | 0.0 | 875 | 35838 | 0.0 | | | |

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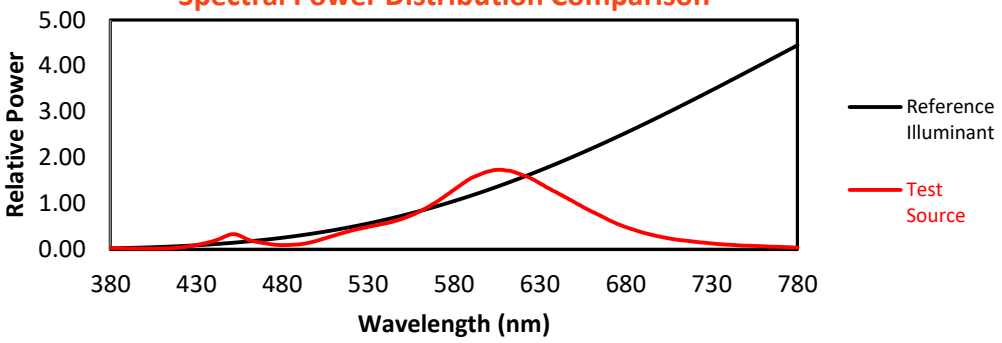
# TM-30-18

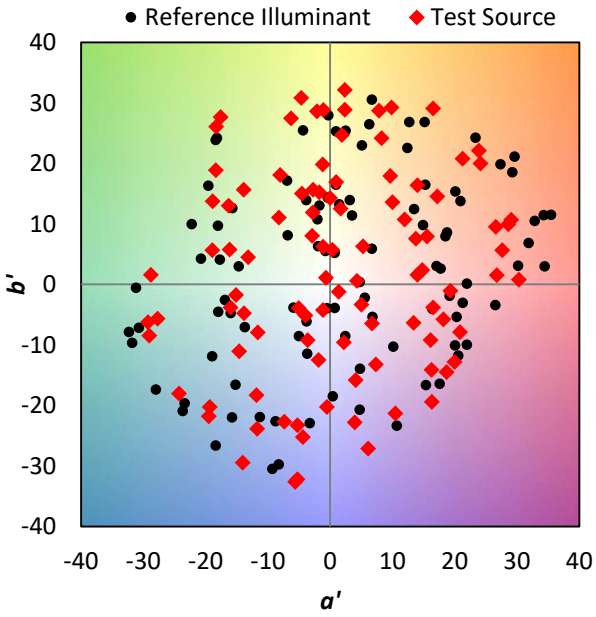
## Summary

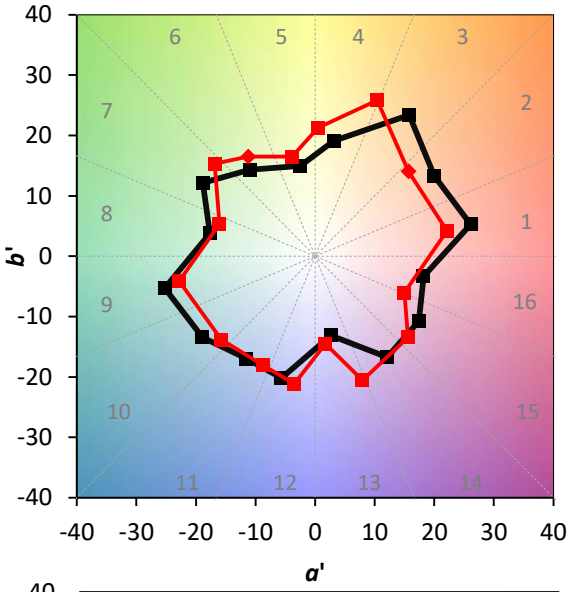
$R_f$ = 75.7
$R_g$ = 96.7
CIE $R_a$ = 72.8
$R_9$ = -23.3

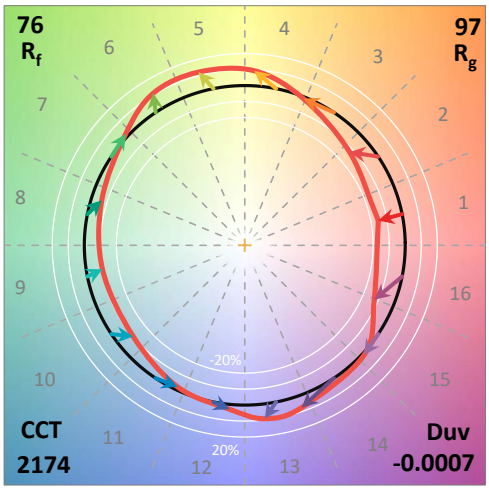
## Spectral Power Distribution Comparison

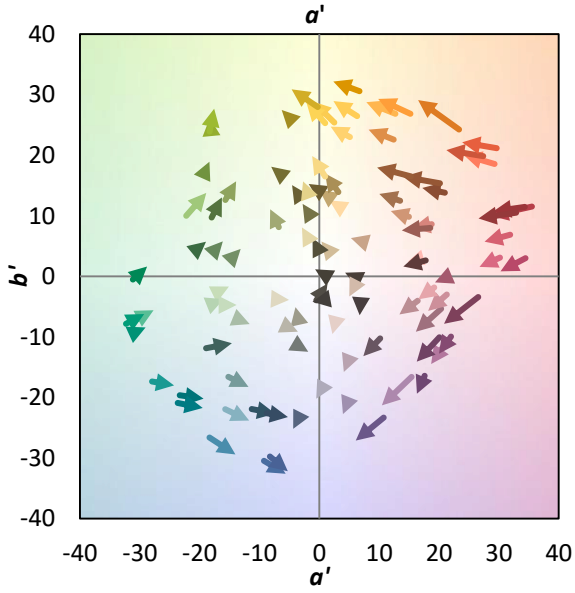



## Color Vector Graphics



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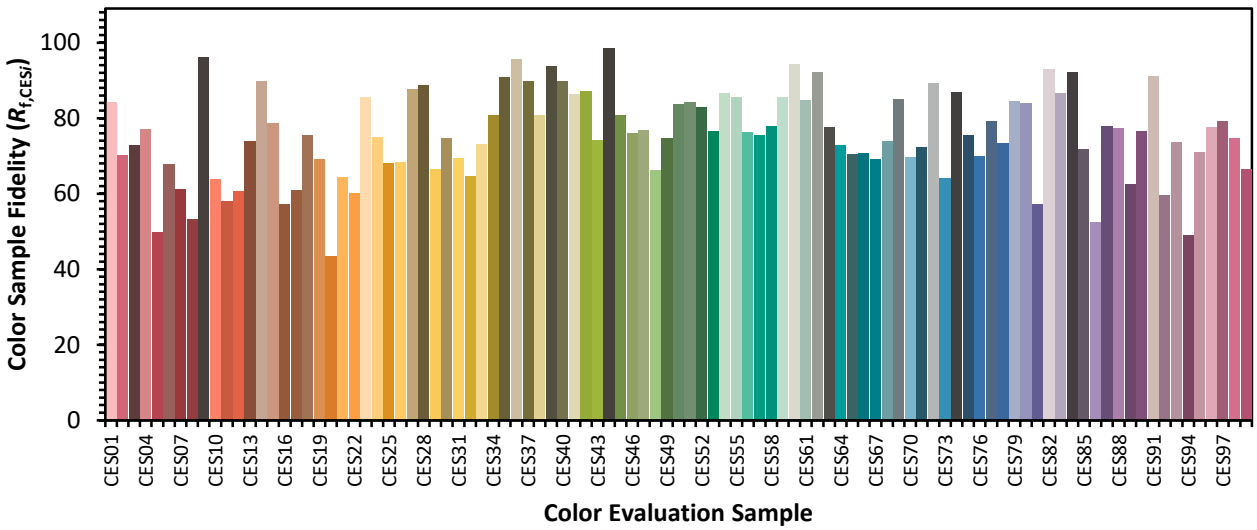
**Individual Sample Fidelity Index ($R_{f,i}$)**

| | | | |
|---|---|---|---|
| CES01 = 87 | CES26 = 68 | CES51 = 84 | CES76 = 70 |
| CES02 = 65 | CES27 = 88 | CES52 = 83 | CES77 = 79 |
| CES03 = 32 | CES28 = 89 | CES53 = 77 | CES78 = 73 |
| CES04 = 72 | CES29 = 66 | CES54 = 87 | CES79 = 85 |
| CES05 = 52 | CES30 = 75 | CES55 = 85 | CES80 = 84 |
| CES06 = 53 | CES31 = 69 | CES56 = 76 | CES81 = 57 |
| CES07 = 44 | CES32 = 65 | CES57 = 75 | CES82 = 93 |
| CES08 = 43 | CES33 = 73 | CES58 = 78 | CES83 = 87 |
| CES09 = 29 | CES34 = 81 | CES59 = 86 | CES84 = 92 |
| CES10 = 79 | CES35 = 91 | CES60 = 94 | CES85 = 72 |
| CES11 = 62 | CES36 = 96 | CES61 = 85 | CES86 = 52 |
| CES12 = 68 | CES37 = 90 | CES62 = 92 | CES87 = 78 |
| CES13 = 45 | CES38 = 81 | CES63 = 78 | CES88 = 77 |
| CES14 = 75 | CES39 = 94 | CES64 = 73 | CES89 = 62 |
| CES15 = 72 | CES40 = 90 | CES65 = 71 | CES90 = 77 |
| CES16 = 49 | CES41 = 86 | CES66 = 71 | CES91 = 91 |
| CES17 = 51 | CES42 = 87 | CES67 = 69 | CES92 = 60 |
| CES18 = 57 | CES43 = 74 | CES68 = 74 | CES93 = 74 |
| CES19 = 74 | CES44 = 99 | CES69 = 85 | CES94 = 49 |
| CES20 = 69 | CES45 = 81 | CES70 = 70 | CES95 = 71 |
| CES21 = 89 | CES46 = 76 | CES71 = 72 | CES96 = 77 |
| CES22 = 81 | CES47 = 77 | CES72 = 89 | CES97 = 79 |
| CES23 = 92 | CES48 = 66 | CES73 = 64 | CES98 = 75 |
| CES24 = 92 | CES49 = 75 | CES74 = 87 | CES99 = 67 |
| CES25 = 74 | CES50 = 84 | CES75 = 75 | |



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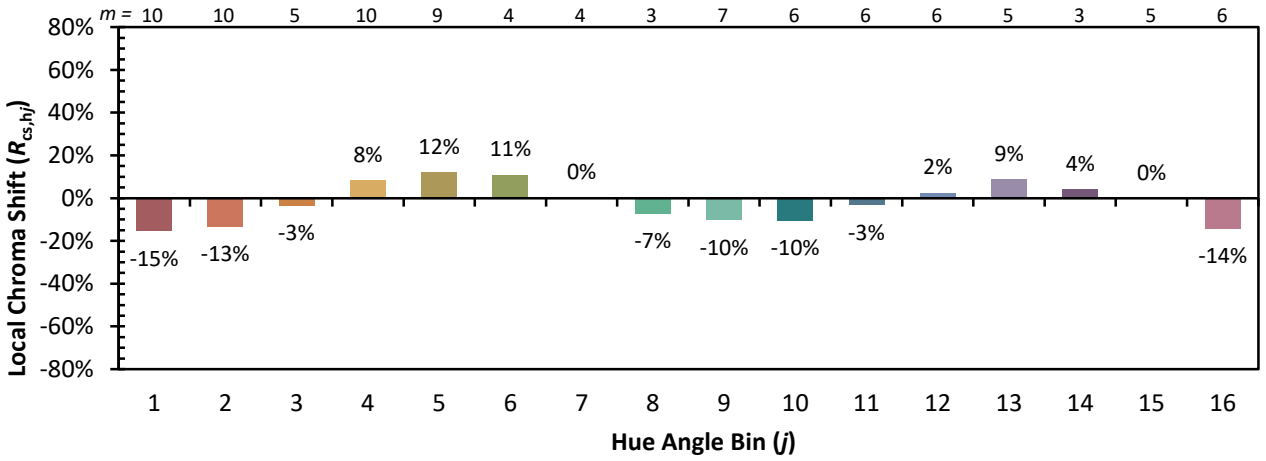
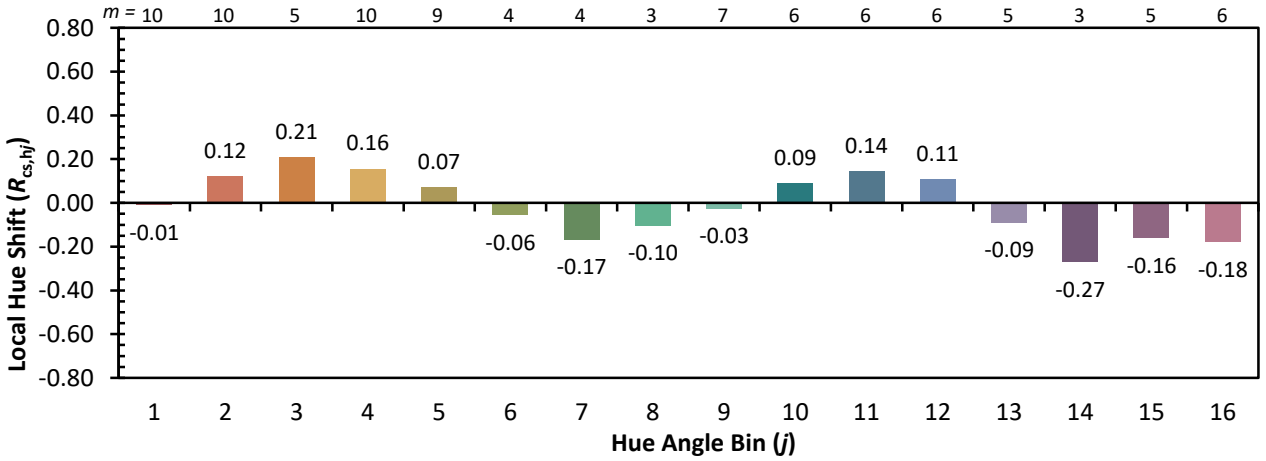
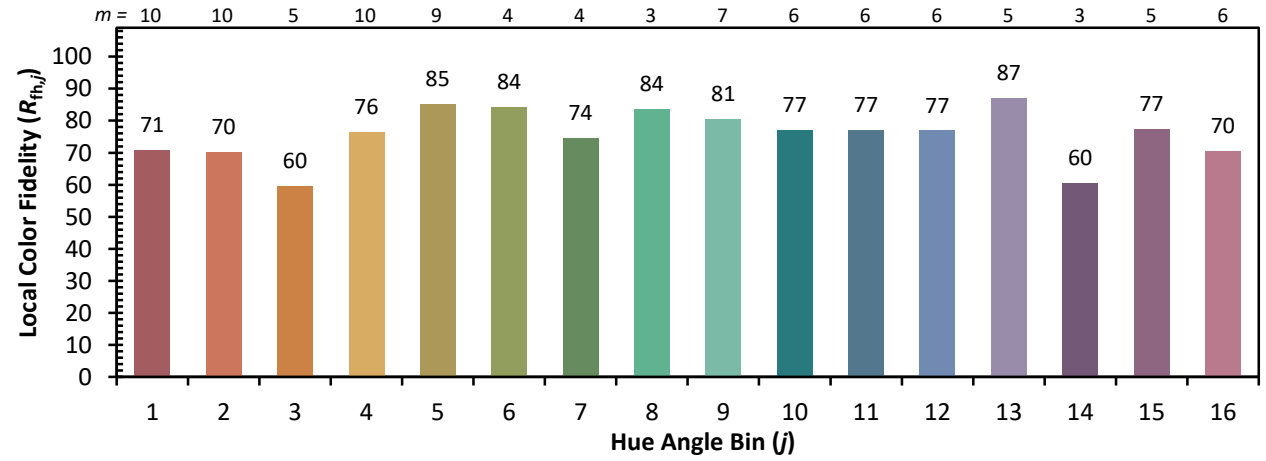
## Color Rendition by Hue-Angle Bin



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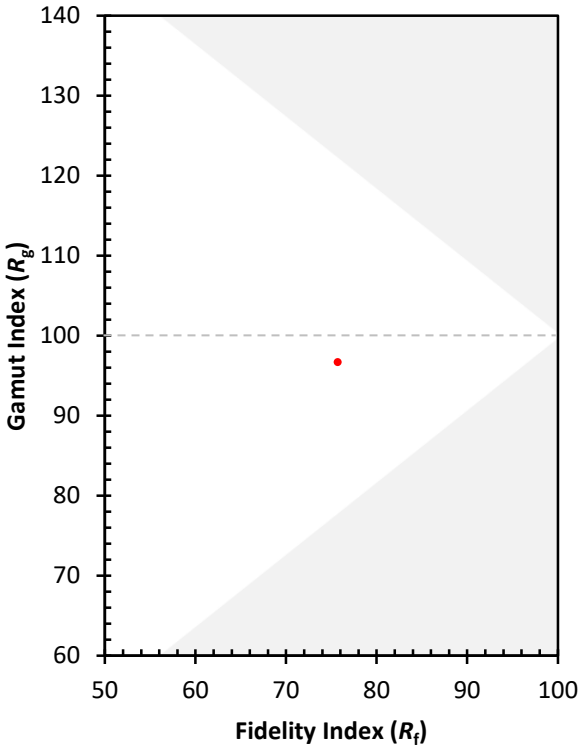
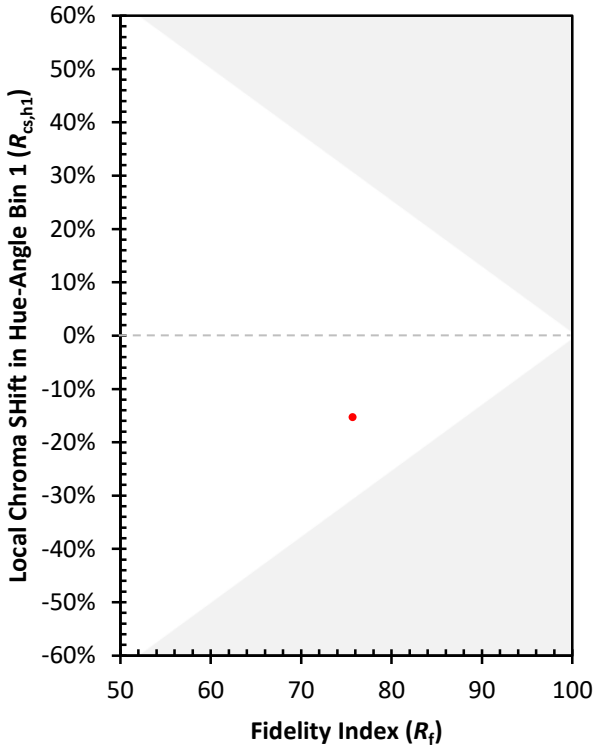
## Measure Comparisons




(END OF REPORT)