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

Scaled data based on original data using

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

Test Report Prepared for

Cooper Lighting Solutions

Brand: McGRAW-EDISON

Report Number: P636521

Luminaire Tested: GWS-SA3F-830-U-T3R-W-GRSWH

Issue Date: 1/10/2023

Report Generated By 670246102 / DESKTOP-G35701P

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

Scaled Data Report

**Test Information**

| | |
|---|---|
| Test Method: | LM-79-2019 |
| Report Number: | P636521 |
| | TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-17) |
| Test Lab: | COOPER LIGHTING SOLUTIONS |
| Issue Date: | 1/10/2023 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS |
| Product Line: | McGRAW-EDISON |
| Catalog Number: | GWS-SA3F-830-U-T3R-W-GRSWH |
| Description: | GALLEON WALL SLIM LUMINAIRE. (3) LIGHTSQUARES WITH 16 LEDS EACH AND TYPE III ROADWAY OPTICS W/ FACTORY INSTALLED GLARE SHIELD, WH |
| Light Source: | (48) 3000K CCT, 80 CRI LEDS |
| Ballast/Driver: | - |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 17029 lumens |
| Efficiency: | N/A |
| Efficacy: | 93.0 lumens/watt |
| Luminous Opening: | Rectangular (W 1.5' x L: 0.5' x H: 0') |
| IES Classification: | Type II - Short |
| BUG Rating: | B3 - U0 - G2 |

| | |
|---|---|
| Input Watts (W): | 183.2 |
| Input Voltage (V): | 120 |
| Input Current (Ain): | NR |
| Voltage Rise (V): | NR |
| Power Factor: | NR |
| Total Harmonic Distortion (THDi): | NR |
| Frequency (hertz): | 0 |
| Stabilization Time: | NR |
| Operation Time: | NR |
| Ambient Temperature (°C): | NR |
| Test Distance: | 28.75 FT |

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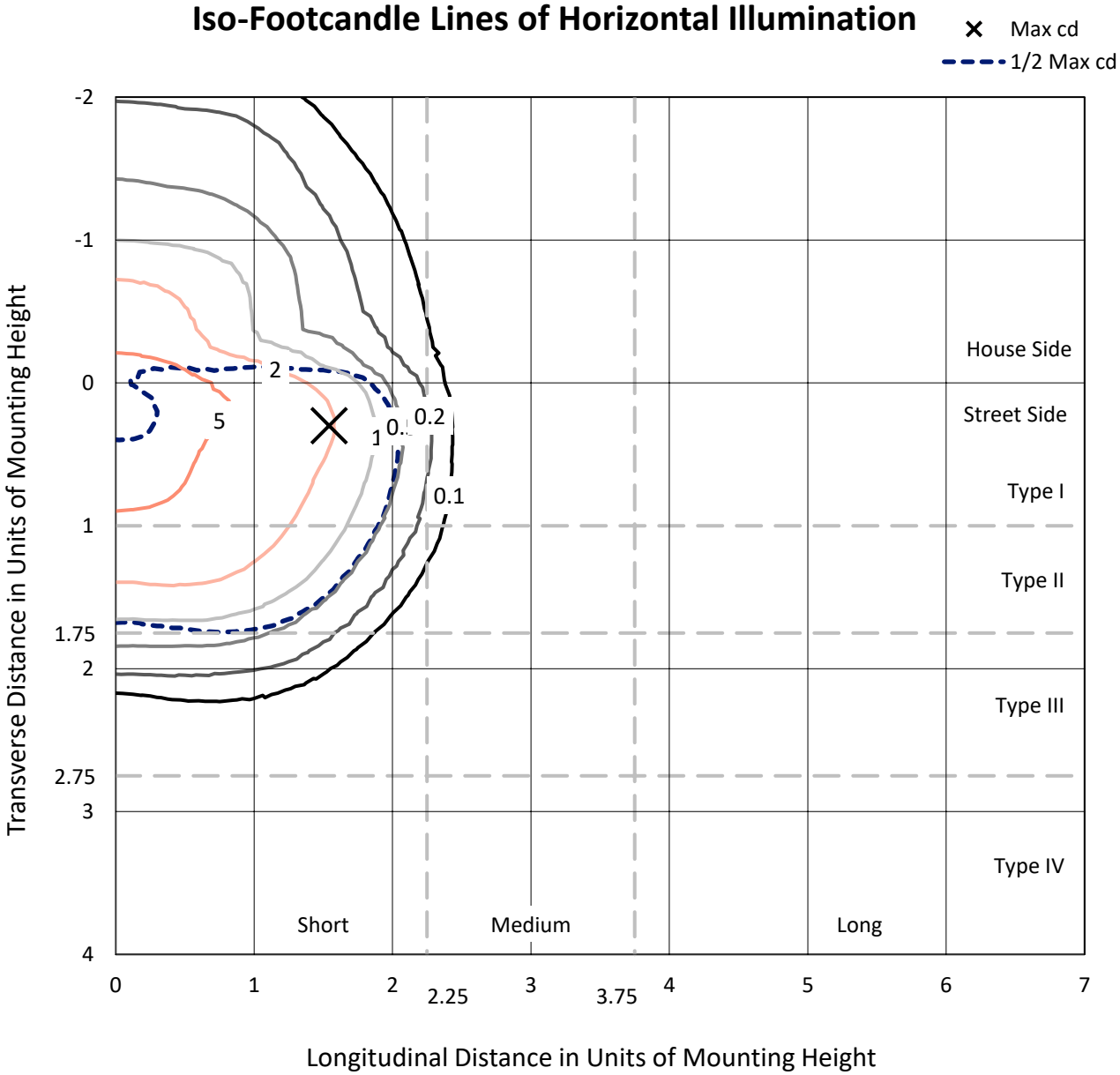
Scaled Data Report

REPORT NUMBER: P636521
CATALOG NUMBER: GWS-SA3F-830-U-T3R-W-GRSWH

## Iso-Footcandle Lines of Horizontal Illumination




Based on 25 foot mounting height. Maximum calculated value = 6.8 fc
Type II - Short - N/A

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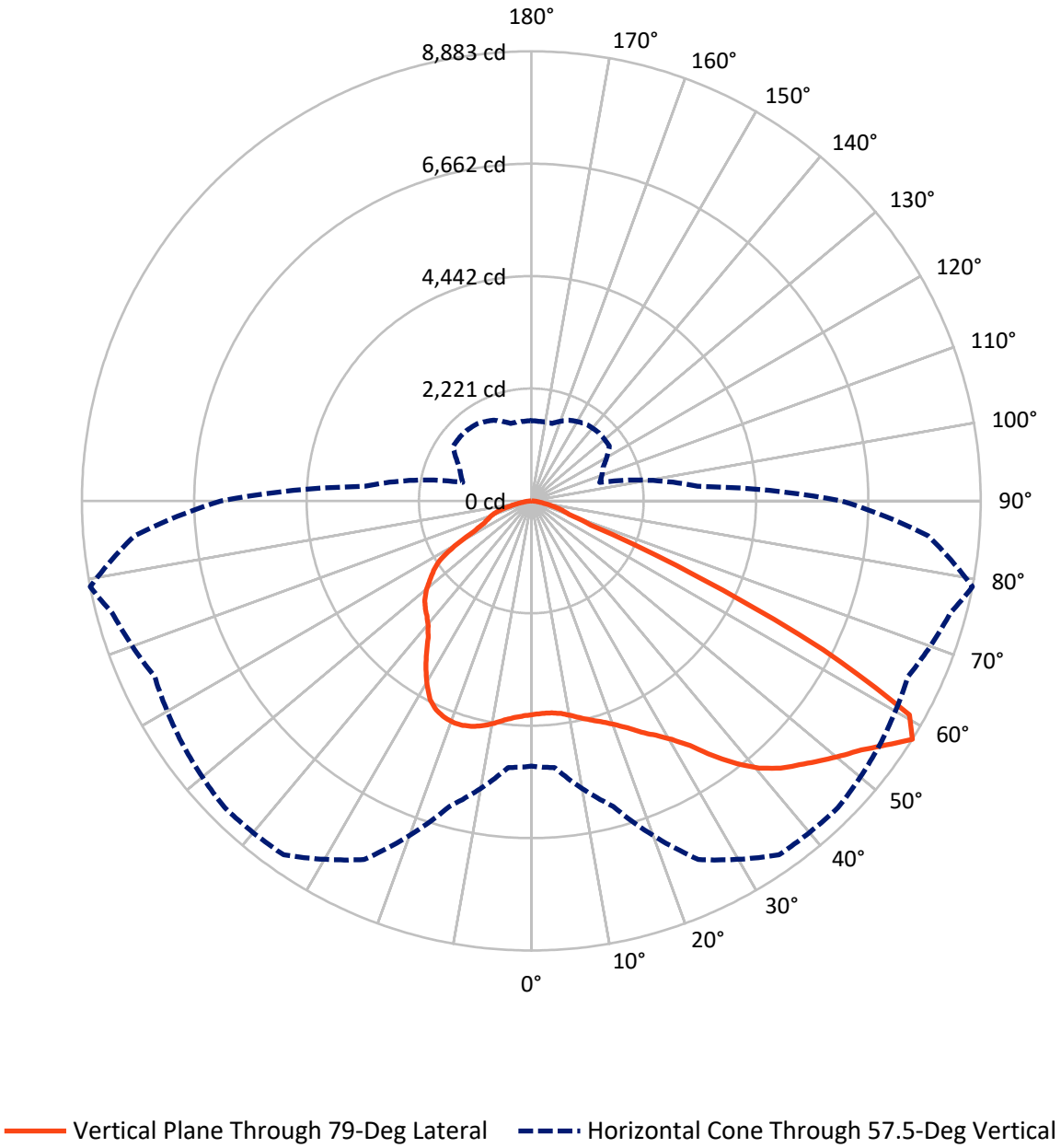
## Luminous Intensity Polar Plot



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REPORT NUMBER: P636521
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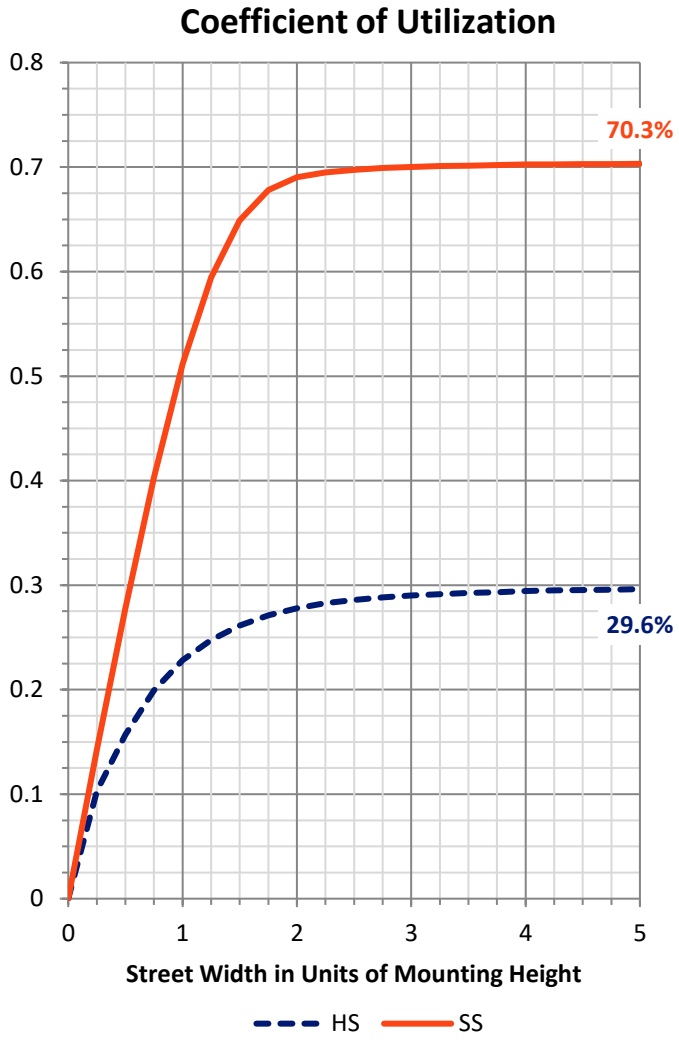
**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 5061.9 | 0.0 | 5061.9 |
| | % Fixture | 29.7 | 0.0 | 29.7 |
| **Street Side** | Lumens | 11967.1 | 0.0 | 11967.1 |
| | % Fixture | 70.3 | 0.0 | 70.3 |
| **Total** | Lumens | 17029.0 | 0.0 | 17029.0 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 390.8 | 2.3 |
| 10°-20° | 1086.1 | 6.4 |
| 20°-30° | 1841.0 | 10.8 |
| 30°-40° | 2817.9 | 16.5 |
| 40°-50° | 3757.4 | 22.1 |
| 50°-60° | 4339.5 | 25.5 |
| 60°-70° | 2254.9 | 13.2 |
| 70°-80° | 479.3 | 2.8 |
| 80°-90° | 62.1 | 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° | 17029.0 | 100.0 |
| 0°-180° | 17029.0 | 100.0 |



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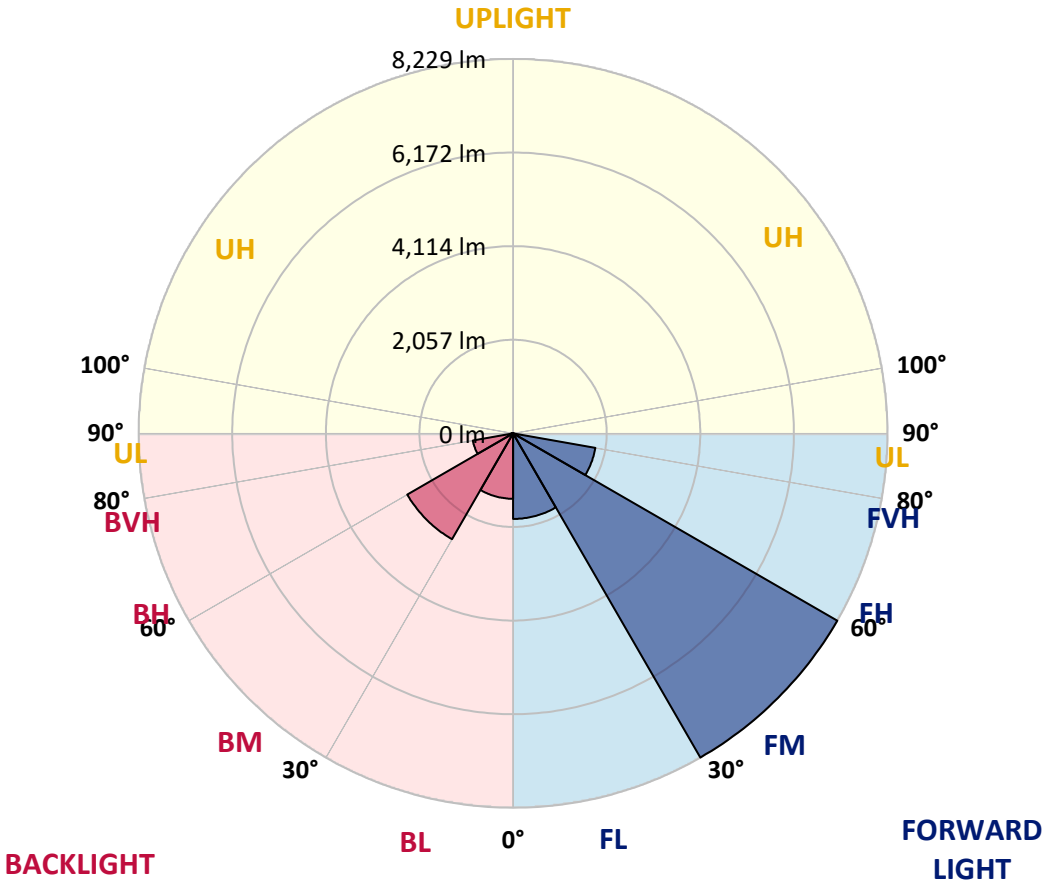
REPORT NUMBER: P636521
CATALOG NUMBER: GWS-SA3F-830-U-T3R-W-GRSWH

## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 1880.4 | 11.0 | | | |
| FM | (30°-60°) | 8228.9 | 48.3 | | | |
| FH | (60°-80°) | 1836.1 | 10.8 | | | G2/5000 |
| FVH | (80°-90°) | 21.6 | 0.1 | | | G1/100 |
| BL | (0°-30°) | 1437.5 | 8.4 | B3/2500 | | |
| BM | (30°-60°) | 2685.8 | 15.8 | B3/5000 | | |
| BH | (60°-80°) | 898.1 | 5.3 | B2/1000 | | G2/1000 |
| BVH | (80°-90°) | 40.4 | 0.2 | | | G1/100 |
| UL | (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH | (100°-180°) | 0.0 | 0.0 | | U0/0 | |

**BUG Rating: B3-U0-G2**
Type II Short



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REPORT NUMBER: P636521
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**CANDELA DISTRIBUTION (FULL):**

| | 0° | 5° | 15° | 25° | 35° | 45° | 55° | 65° | 75° | 79° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 4220.2 | 4220.2 | 4220.2 | 4220.2 | 4220.2 | 4220.2 | 4220.2 | 4220.2 | 4220.2 | *4220.2* | 4220.2 |
| 2.5° | 4028.0 | 4019.7 | 4022.5 | 4033.6 | 4075.4 | 4106.0 | 4138.0 | 4167.3 | 4195.1 | *4203.5* | 4210.4 |
| 5° | 3884.6 | 3869.3 | 3873.5 | 3891.6 | 3940.3 | 3991.8 | 4048.9 | 4118.5 | 4185.4 | *4207.6* | 4236.9 |
| 7.5° | 3783.0 | 3780.2 | 3787.2 | 3815.0 | 3866.5 | 3915.3 | 3989.1 | 4087.9 | 4203.5 | *4241.1* | 4292.6 |
| 10° | 3647.9 | 3642.4 | 3670.2 | 3727.3 | 3812.2 | 3890.2 | 3977.9 | 4094.9 | 4256.4 | *4312.1* | 4391.4 |
| 12.5° | 3540.7 | 3537.9 | 3567.2 | 3646.5 | 3755.1 | 3879.1 | 4000.2 | 4131.1 | 4327.4 | *4404.0* | 4501.4 |
| 15° | 3603.4 | 3590.8 | 3592.2 | 3647.9 | 3745.4 | 3891.6 | 4055.9 | 4196.5 | 4398.4 | *4495.9* | 4621.2 |
| 17.5° | 3785.8 | 3763.5 | 3746.8 | 3756.5 | 3812.2 | 3964.0 | 4140.8 | 4284.2 | 4480.5 | *4594.7* | 4747.9 |
| 20° | 4037.8 | 4025.3 | 3979.3 | 3948.7 | 3961.2 | 4094.9 | 4274.5 | 4408.1 | 4587.8 | *4715.9* | 4880.1 |
| 22.5° | 4376.1 | 4345.5 | 4282.8 | 4234.1 | 4196.5 | 4300.9 | 4466.6 | 4582.2 | 4736.7 | *4870.4* | 5041.7 |
| 25° | 4795.2 | 4750.7 | 4651.8 | 4575.2 | 4494.5 | 4601.7 | 4749.3 | 4837.0 | 4941.4 | *5065.3* | 5228.2 |
| 27.5° | 5222.7 | 5185.1 | 5075.1 | 4972.0 | 4871.8 | 4938.6 | 5114.1 | 5164.2 | 5153.0 | *5243.5* | 5382.8 |
| 30° | 5678.0 | 5630.6 | 5526.2 | 5414.8 | 5285.3 | 5328.5 | 5485.8 | 5510.9 | 5392.5 | *5467.7* | 5562.4 |
| 32.5° | 6158.3 | 6112.4 | 6021.9 | 5892.4 | 5746.2 | 5762.9 | 5806.1 | 5829.7 | 5716.9 | *5760.1* | 5832.5 |
| 35° | 6647.0 | 6603.9 | 6512.0 | 6383.9 | 6276.7 | 6175.0 | 6066.4 | 6161.1 | 6095.7 | *6179.2* | 6173.6 |
| 37.5° | 7094.0 | 7050.8 | 6993.7 | 6894.9 | 6711.1 | 6510.6 | 6260.0 | 6376.9 | 6478.6 | *6584.4* | 6566.3 |
| 40° | 7396.1 | 7366.9 | 7380.8 | 7365.5 | 7128.8 | 6732.0 | 6354.6 | 6482.7 | 6759.8 | *6940.8* | 6931.1 |
| 42.5° | 7656.5 | 7627.2 | 7708.0 | 7766.5 | 7488.0 | 6936.6 | 6400.6 | 6523.1 | 6939.4 | *7222.1* | 7208.1 |
| 45° | 7772.0 | 7763.7 | 7897.3 | 8082.5 | 7816.6 | 7153.8 | 6518.9 | 6606.6 | 7075.9 | *7437.9* | 7385.0 |
| 47.5° | 7634.2 | 7663.4 | 7926.6 | 8239.9 | 8089.5 | 7411.4 | 6761.2 | 6783.5 | 7254.1 | *7671.8* | 7522.8 |
| 50° | 7359.9 | 7424.0 | 7779.0 | 8244.0 | 8288.6 | 7702.4 | 7096.8 | 7041.1 | 7493.6 | *7921.0* | 7595.2 |
| 52.5° | 6960.3 | 7027.1 | 7606.3 | 8212.0 | 8402.8 | 8039.4 | 7543.7 | 7464.3 | 7795.7 | *8170.2* | 7607.7 |
| 55° | 6042.8 | 6133.3 | 7210.9 | 8139.6 | 8514.2 | 8345.7 | 8047.7 | 7886.2 | 8185.6 | *8512.8* | 7731.7 |
| 57.5° | *5242.2* | *5289.5* | *6247.4* | *7818.0* | *8536.4* | *8571.2* | *8406.9* | *8214.8* | *8572.6* | *8883.1* | *7870.9* |
| 60° | 3847.0 | 3858.2 | 4720.0 | 6468.8 | 7852.8 | 8440.4 | 8377.7 | 8092.3 | 8388.8 | *8586.6* | 7233.2 |
| 62.5° | 2173.4 | 2174.8 | 2862.6 | 4317.6 | 5865.9 | 6879.5 | 6918.5 | 6666.5 | 6417.3 | *6475.8* | 5034.7 |
| 65° | 815.9 | 892.5 | 1307.4 | 2121.9 | 3382.0 | 4061.5 | 4223.0 | 4281.4 | 3866.5 | *3608.9* | 2699.7 |
| 67.5° | 545.8 | 563.9 | 763.0 | 1091.6 | 1505.1 | 1737.6 | 1943.7 | 1949.3 | 1425.8 | *1271.2* | 1063.7 |
| 70° | 416.3 | 434.4 | 600.1 | 781.1 | 763.0 | 704.5 | 761.6 | 740.7 | 765.8 | *786.7* | 808.9 |
| 72.5° | 310.5 | 328.6 | 465.0 | 551.4 | 458.1 | 451.1 | 511.0 | 568.1 | 621.0 | *643.3* | 678.1 |
| 75° | 206.1 | 220.0 | 313.3 | 295.2 | 253.4 | 299.4 | 373.1 | 430.2 | 460.9 | *487.3* | 513.8 |
| 77.5° | 130.9 | 140.6 | 167.1 | 135.1 | 140.6 | 175.4 | 217.2 | 268.7 | 298.0 | *324.4* | 338.3 |
| 80° | 59.9 | 58.5 | 57.1 | 64.0 | 79.4 | 103.0 | 130.9 | 161.5 | 183.8 | *194.9* | 203.3 |
| 82.5° | 23.7 | 26.5 | 29.2 | 34.8 | 43.2 | 55.7 | 73.8 | 94.7 | 112.8 | *115.6* | 122.5 |
| 85° | 9.7 | 11.1 | 12.5 | 15.3 | 19.5 | 25.1 | 30.6 | 43.2 | 54.3 | *58.5* | 62.7 |
| 87.5° | 0.0 | 0.0 | 0.0 | 0.0 | 1.4 | 2.8 | 4.2 | 7.0 | 12.5 | *13.9* | 15.3 |
| 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: P636521
CATALOG NUMBER: GWS-SA3F-830-U-T3R-W-GRSWH

**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 4220.2 | 4220.2 | 4220.2 | 4220.2 | 4220.2 | 4220.2 | 4220.2 | 4220.2 | 4220.2 | 4220.2 | 4220.2 |
| 2.5° | 4248.0 | 4229.9 | 4260.6 | 4281.4 | 4300.9 | 4280.1 | 4273.1 | 4255.0 | 4252.2 | 4252.2 | 4262.0 |
| 5° | 4287.0 | 4274.5 | 4306.5 | 4319.0 | 4317.6 | 4271.7 | 4243.8 | 4207.6 | 4189.5 | 4189.5 | 4192.3 |
| 7.5° | 4356.6 | 4349.7 | 4367.8 | 4348.3 | 4303.7 | 4210.4 | 4118.5 | 4042.0 | 3990.4 | 3964.0 | 3972.3 |
| 10° | 4472.2 | 4463.8 | 4448.5 | 4376.1 | 4248.0 | 4054.5 | 3866.5 | 3727.3 | 3643.8 | 3596.4 | 3599.2 |
| 12.5° | 4585.0 | 4571.0 | 4516.7 | 4356.6 | 4093.5 | 3785.8 | 3539.3 | 3383.4 | 3291.5 | 3235.8 | 3223.3 |
| 15° | 4708.9 | 4672.7 | 4555.7 | 4256.4 | 3841.5 | 3457.2 | 3199.6 | 3031.1 | 2932.3 | 2898.9 | 2897.5 |
| 17.5° | 4827.2 | 4763.2 | 4551.6 | 4078.2 | 3539.3 | 3113.3 | 2854.3 | 2749.9 | 2733.2 | 2748.5 | 2752.7 |
| 20° | 4947.0 | 4843.9 | 4505.6 | 3831.7 | 3180.1 | 2770.8 | 2637.1 | 2680.3 | 2742.9 | 2784.7 | 2794.4 |
| 22.5° | 5070.9 | 4910.8 | 4401.2 | 3514.3 | 2801.4 | 2539.6 | 2595.3 | 2690.0 | 2768.0 | 2823.7 | 2829.2 |
| 25° | 5210.1 | 4973.4 | 4245.2 | 3125.8 | 2497.9 | 2475.6 | 2585.6 | 2685.8 | 2769.4 | 2833.4 | 2844.5 |
| 27.5° | 5289.5 | 4974.8 | 4026.6 | 2726.2 | 2358.6 | 2450.5 | 2561.9 | 2656.6 | 2740.1 | 2809.7 | 2822.3 |
| 30° | 5367.5 | 4937.2 | 3680.0 | 2401.8 | 2318.2 | 2421.3 | 2521.5 | 2609.2 | 2688.6 | 2756.8 | 2772.1 |
| 32.5° | 5477.5 | 4902.4 | 3280.4 | 2215.2 | 2294.6 | 2393.4 | 2475.6 | 2553.5 | 2614.8 | 2645.4 | 2653.8 |
| 35° | 5613.9 | 4857.9 | 2855.7 | 2134.5 | 2279.3 | 2371.2 | 2443.6 | 2485.3 | 2406.0 | 2389.3 | 2407.4 |
| 37.5° | 5804.7 | 4816.1 | 2432.4 | 2099.6 | 2269.5 | 2362.8 | 2426.8 | 2319.6 | 2222.2 | 2183.2 | 2197.1 |
| 40° | 6010.7 | 4792.4 | 2145.6 | 2071.8 | 2273.7 | 2371.2 | 2357.2 | 2198.5 | 2057.9 | 1975.7 | 1972.9 |
| 42.5° | 6186.2 | 4756.2 | 1961.8 | 2053.7 | 2284.8 | 2403.2 | 2262.6 | 2091.3 | 1882.4 | 1833.7 | 1835.1 |
| 45° | 6304.5 | 4664.3 | 1864.3 | 2034.2 | 2294.6 | 2410.1 | 2218.0 | 1943.7 | 1794.7 | 1764.1 | 1762.7 |
| 47.5° | 6353.2 | 4497.3 | 1801.7 | 2003.6 | 2293.2 | 2353.1 | 2127.5 | 1882.4 | 1733.5 | 1725.1 | 1730.7 |
| 50° | 6321.2 | 4223.0 | 1737.6 | 1943.7 | 2259.8 | 2293.2 | 2023.1 | 1828.1 | 1691.7 | 1737.6 | 1771.1 |
| 52.5° | 6202.9 | 3867.9 | 1661.1 | 1861.6 | 2199.9 | 2225.0 | 1970.2 | 1794.7 | 1661.1 | 1722.3 | 1748.8 |
| 55° | 6172.2 | 3579.7 | 1563.6 | 1754.3 | 2110.8 | 2103.8 | 1914.5 | 1778.0 | 1640.2 | 1616.5 | 1620.7 |
| 57.5° | *6131.9* | *3298.5* | *1402.1* | *1562.2* | *1885.2* | *1896.4* | *1861.6* | *1758.5* | *1585.9* | *1578.9* | *1585.9* |
| 60° | 5327.1 | 2528.5 | 1250.3 | 1347.8 | 1548.3 | 1608.2 | 1801.7 | 1722.3 | 1498.2 | 1468.9 | 1467.5 |
| 62.5° | 3479.5 | 1531.6 | 1112.5 | 1175.1 | 1261.5 | 1331.1 | 1643.0 | 1617.9 | 1402.1 | 1384.0 | 1396.5 |
| 65° | 1871.3 | 1091.6 | 1012.2 | 1049.8 | 1097.2 | 1150.1 | 1361.7 | 1441.1 | 1267.0 | 1203.0 | 1204.4 |
| 67.5° | 956.5 | 928.7 | 937.0 | 963.5 | 999.7 | 1026.2 | 1098.6 | 1168.2 | 1080.5 | 1026.2 | 1024.8 |
| 70° | 818.7 | 841.0 | 853.5 | 868.8 | 892.5 | 888.3 | 895.3 | 907.8 | 900.8 | 874.4 | 873.0 |
| 72.5° | 697.6 | 732.4 | 735.2 | 737.9 | 746.3 | 726.8 | 714.3 | 693.4 | 694.8 | 699.0 | 700.3 |
| 75° | 530.5 | 563.9 | 572.3 | 568.1 | 576.4 | 551.4 | 534.7 | 513.8 | 488.7 | 484.5 | 487.3 |
| 77.5° | 345.3 | 371.8 | 384.3 | 381.5 | 385.7 | 366.2 | 357.8 | 335.6 | 306.3 | 295.2 | 295.2 |
| 80° | 208.9 | 224.2 | 233.9 | 236.7 | 240.9 | 227.0 | 213.0 | 193.5 | 181.0 | 168.5 | 168.5 |
| 82.5° | 126.7 | 136.4 | 143.4 | 143.4 | 147.6 | 132.3 | 121.1 | 107.2 | 101.6 | 90.5 | 90.5 |
| 85° | 64.0 | 71.0 | 73.8 | 72.4 | 69.6 | 57.1 | 52.9 | 45.9 | 43.2 | 37.6 | 37.6 |
| 87.5° | 15.3 | 19.5 | 19.5 | 13.9 | 13.9 | 7.0 | 4.2 | 1.4 | 0.0 | 0.0 | 0.0 |
| 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

MCGRAW EDISON

Report Number: SP1-2408-195-9

Test Date: 08/07/2024

Luminaire Tested: GALN-SB1A-830-U-5WQ

Data in this report applies to families of products including GALN-SB1A-830-U-5WQ.

Report Generated By FNC07603 / LDUCLS01DT446
Version: v7.04

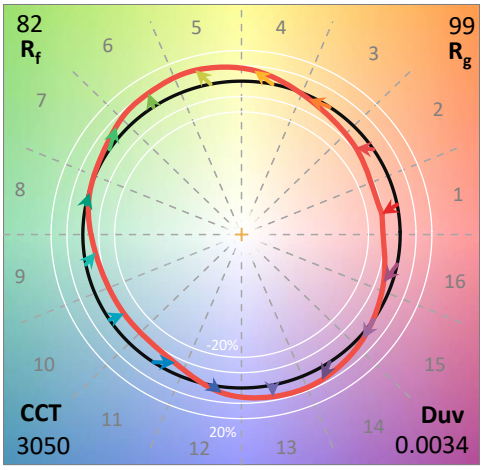
## Test Information

| | |
|---|---|
| Test Method: | LM-79-2019 |
| Report Number: | SP1-2408-195-9 |
| Test Lab: | COOPER LIGHTING SOLUTIONS |
| Photometer: | SP1 - 76IN SPHERE |
| Measurement Geometry: | 4π |
| Issue Date: | 08/07/2024 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS |
| Product Line: | MCGRAW EDISON |
| Catalog Number: | **GALN-SB1A-830-U-5WQ** |
| Description: | GALLEON AREA AND ROADWAY LUMINAIRE. (1) 80 CRI, 3000K, 350MA HIGH DENSITY LIGHTSQUARE WITH 26 LEDS AND TYPE V WIDE OPTICS |

## Spectral Parameters

| | | | | | |
|---|---|---|---|---|---|
| CCT (K): | 3050 | CRI (Ra): | 81.0 | | |
| CIE u': | 0.2476 | R1: | 79.6 | R9: | 7.1 |
| CIE v': | 0.5251 | R2: | 85.6 | R10: | 67.0 |
| Duv: | 0.0034 | R3: | 92.0 | R11: | 82.7 |
| CIE x: | 0.4383 | R4: | 82.6 | R12: | 63.2 |
| CIE y: | 0.4131 | R5: | 78.9 | R13: | 80.3 |
| CIE z: | 0.1487 | R6: | 81.7 | R14: | 95.0 |
| Peak Wavelength (nm): | 603 | R7: | 85.2 | R15: | 71.7 |
| Dominant Wavelength (nm): | 581 | R8: | 62.0 | | |
| Purity: | 55.55201 | | | | |

| | |
|---|---|
| Rf: | 81.5 |
| Rg: | 99.2 |




## Test Conditions

| | |
|---|---|
| Stabilization Time: | 20M |
| Operation Time: | 1H 20M |
| Sphere Temperature (°C): | 24.2 |

REPORT NUMBER: SP1-2408-195-9

| 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 |

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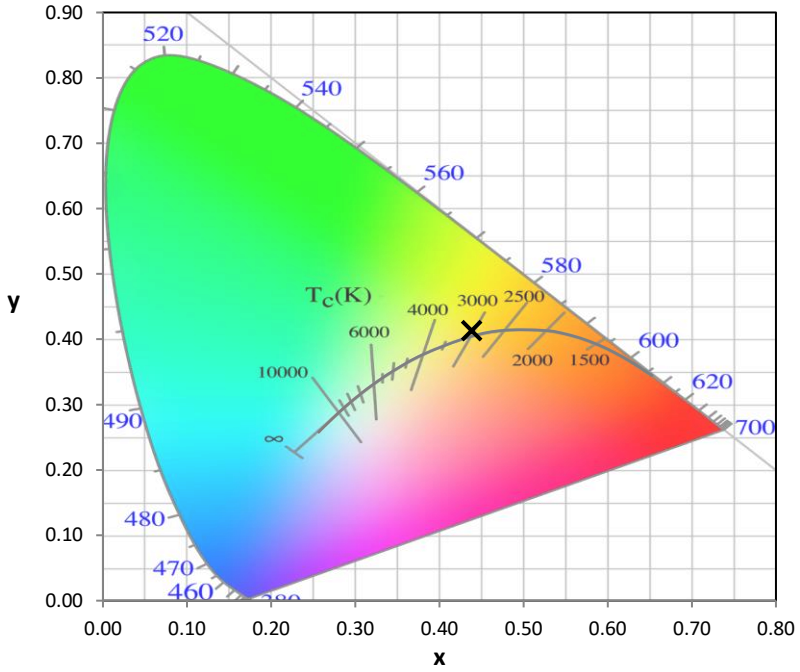
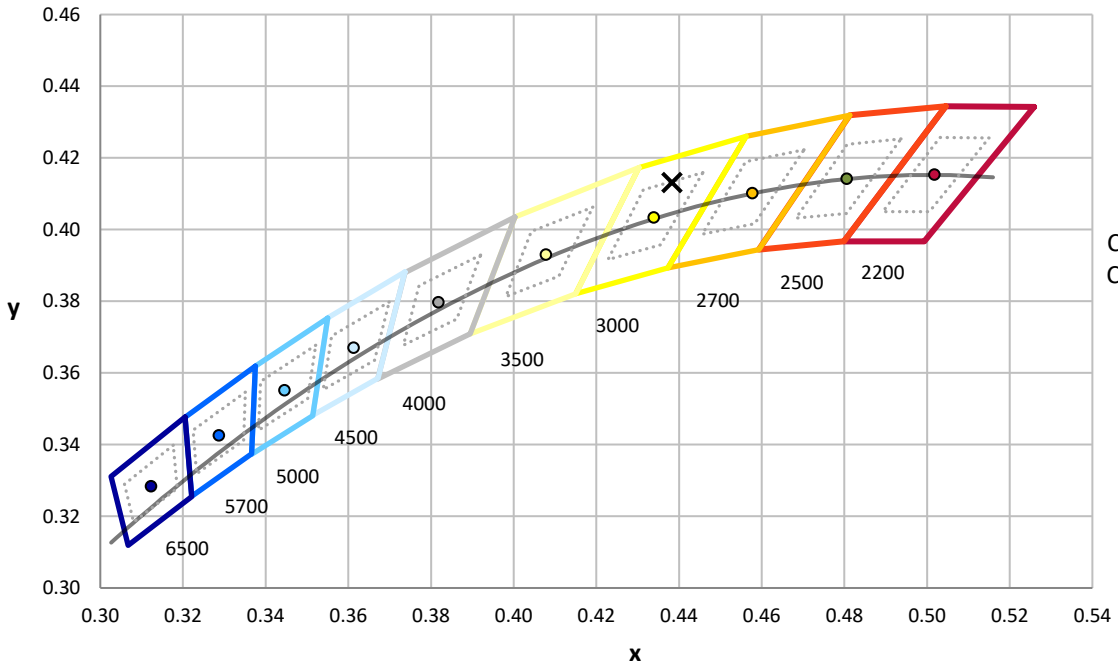
## CIE 1931 Chromaticity Diagram




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




CCT = 3050K
CIE x = 0.4383
CIE y = 0.4131
Duv = 0.0034

Point lies inside the ANSI 3000K 4-step quadrangle

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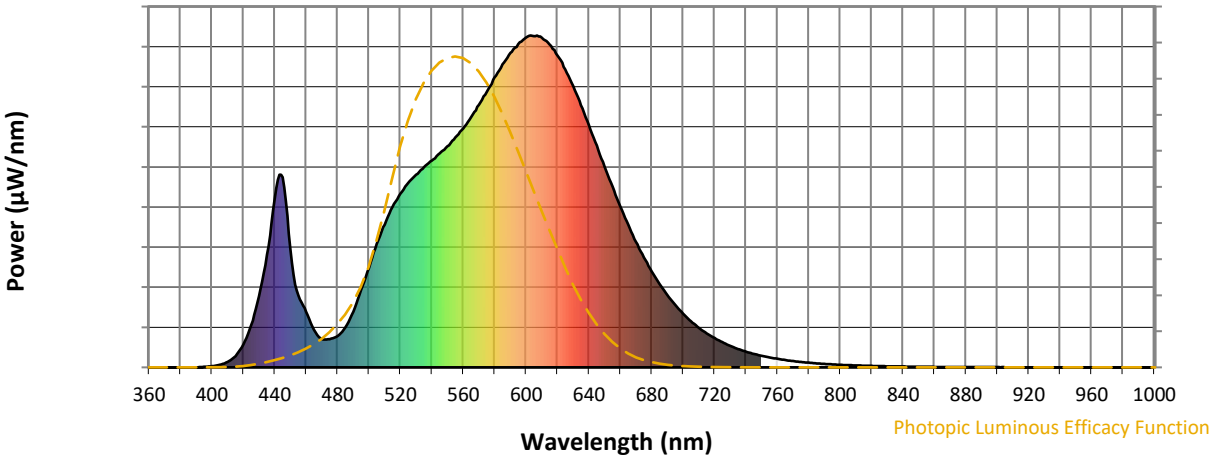
## Photopic Flux vs. Wavelength




## 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 | 168 | NR | 620 | 940 | NR | 750 | 35 | NR | 880 | 1 | NR |
| 365 | 0 | NR | 495 | 233 | NR | 625 | 897 | NR | 755 | 30 | NR | 885 | 1 | NR |
| 370 | 0 | NR | 500 | 300 | NR | 630 | 847 | NR | 760 | 26 | NR | 890 | 1 | NR |
| 375 | 0 | NR | 505 | 372 | NR | 635 | 790 | NR | 765 | 22 | NR | 895 | 1 | NR |
| 380 | 0 | NR | 510 | 430 | NR | 640 | 730 | NR | 770 | 19 | NR | 900 | 1 | NR |
| 385 | 0 | NR | 515 | 483 | NR | 645 | 668 | NR | 775 | 16 | NR | 905 | 1 | NR |
| 390 | 0 | NR | 520 | 524 | NR | 650 | 605 | NR | 780 | 14 | NR | 910 | 0 | NR |
| 395 | 2 | NR | 525 | 555 | NR | 655 | 545 | NR | 785 | 12 | NR | 915 | 0 | NR |
| 400 | 4 | NR | 530 | 581 | NR | 660 | 485 | NR | 790 | 10 | NR | 920 | 0 | NR |
| 405 | 7 | NR | 535 | 604 | NR | 665 | 430 | NR | 795 | 9 | NR | 925 | 0 | NR |
| 410 | 17 | NR | 540 | 623 | NR | 670 | 378 | NR | 800 | 8 | NR | 930 | 0 | NR |
| 415 | 34 | NR | 545 | 645 | NR | 675 | 331 | NR | 805 | 7 | NR | 935 | 0 | NR |
| 420 | 68 | NR | 550 | 667 | NR | 680 | 290 | NR | 810 | 6 | NR | 940 | 0 | NR |
| 425 | 128 | NR | 555 | 693 | NR | 685 | 251 | NR | 815 | 5 | NR | 945 | 0 | NR |
| 430 | 214 | NR | 560 | 719 | NR | 690 | 218 | NR | 820 | 4 | NR | 950 | 0 | NR |
| 435 | 339 | NR | 565 | 754 | NR | 695 | 188 | NR | 825 | 4 | NR | 955 | 0 | NR |
| 440 | 507 | NR | 570 | 791 | NR | 700 | 162 | NR | 830 | 3 | NR | 960 | 0 | NR |
| 445 | 573 | NR | 575 | 830 | NR | 705 | 139 | NR | 835 | 3 | NR | 965 | 0 | NR |
| 450 | 356 | NR | 580 | 873 | NR | 710 | 119 | NR | 840 | 3 | NR | 970 | 0 | NR |
| 455 | 217 | NR | 585 | 913 | NR | 715 | 102 | NR | 845 | 2 | NR | 975 | 0 | NR |
| 460 | 168 | NR | 590 | 948 | NR | 720 | 88 | NR | 850 | 2 | NR | 980 | 0 | NR |
| 465 | 113 | NR | 595 | 974 | NR | 725 | 76 | NR | 855 | 2 | NR | 985 | 0 | NR |
| 470 | 85 | NR | 600 | 994 | NR | 730 | 65 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 85 | NR | 605 | 998 | NR | 735 | 55 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 94 | NR | 610 | 994 | NR | 740 | 47 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 120 | NR | 615 | 973 | NR | 745 | 41 | NR | 875 | 1 | NR | | | |

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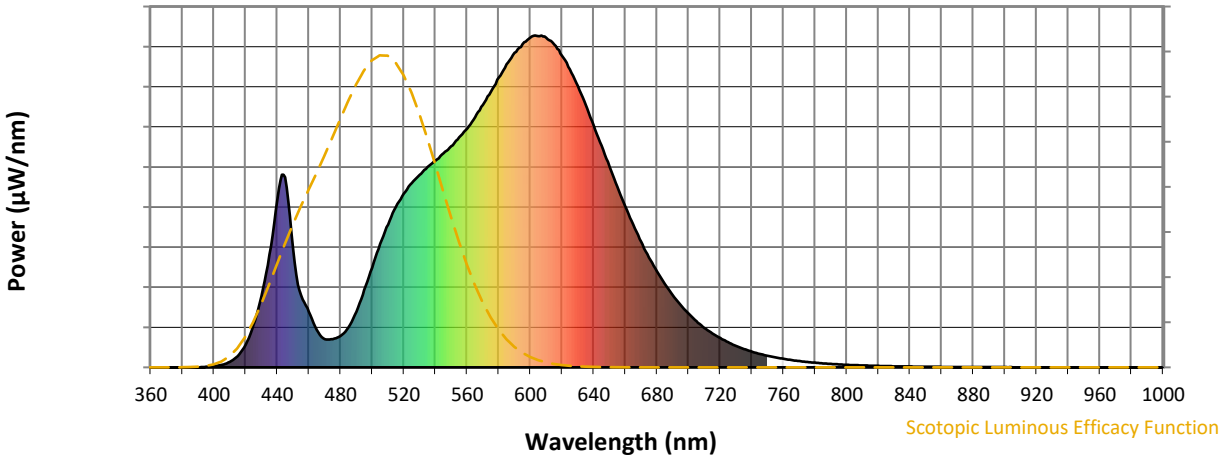
## Scotopic Flux vs. Wavelength




**Scotopic Lumens: NR** **S/P: 1.27**

| 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 | 168 | NR | 620 | 940 | NR | 750 | 35 | NR | 880 | 1 | NR |
| 365 | 0 | NR | 495 | 233 | NR | 625 | 897 | NR | 755 | 30 | NR | 885 | 1 | NR |
| 370 | 0 | NR | 500 | 300 | NR | 630 | 847 | NR | 760 | 26 | NR | 890 | 1 | NR |
| 375 | 0 | NR | 505 | 372 | NR | 635 | 790 | NR | 765 | 22 | NR | 895 | 1 | NR |
| 380 | 0 | NR | 510 | 430 | NR | 640 | 730 | NR | 770 | 19 | NR | 900 | 1 | NR |
| 385 | 0 | NR | 515 | 483 | NR | 645 | 668 | NR | 775 | 16 | NR | 905 | 1 | NR |
| 390 | 0 | NR | 520 | 524 | NR | 650 | 605 | NR | 780 | 14 | NR | 910 | 0 | NR |
| 395 | 2 | NR | 525 | 555 | NR | 655 | 545 | NR | 785 | 12 | NR | 915 | 0 | NR |
| 400 | 4 | NR | 530 | 581 | NR | 660 | 485 | NR | 790 | 10 | NR | 920 | 0 | NR |
| 405 | 7 | NR | 535 | 604 | NR | 665 | 430 | NR | 795 | 9 | NR | 925 | 0 | NR |
| 410 | 17 | NR | 540 | 623 | NR | 670 | 378 | NR | 800 | 8 | NR | 930 | 0 | NR |
| 415 | 34 | NR | 545 | 645 | NR | 675 | 331 | NR | 805 | 7 | NR | 935 | 0 | NR |
| 420 | 68 | NR | 550 | 667 | NR | 680 | 290 | NR | 810 | 6 | NR | 940 | 0 | NR |
| 425 | 128 | NR | 555 | 693 | NR | 685 | 251 | NR | 815 | 5 | NR | 945 | 0 | NR |
| 430 | 214 | NR | 560 | 719 | NR | 690 | 218 | NR | 820 | 4 | NR | 950 | 0 | NR |
| 435 | 339 | NR | 565 | 754 | NR | 695 | 188 | NR | 825 | 4 | NR | 955 | 0 | NR |
| 440 | 507 | NR | 570 | 791 | NR | 700 | 162 | NR | 830 | 3 | NR | 960 | 0 | NR |
| 445 | 573 | NR | 575 | 830 | NR | 705 | 139 | NR | 835 | 3 | NR | 965 | 0 | NR |
| 450 | 356 | NR | 580 | 873 | NR | 710 | 119 | NR | 840 | 3 | NR | 970 | 0 | NR |
| 455 | 217 | NR | 585 | 913 | NR | 715 | 102 | NR | 845 | 2 | NR | 975 | 0 | NR |
| 460 | 168 | NR | 590 | 948 | NR | 720 | 88 | NR | 850 | 2 | NR | 980 | 0 | NR |
| 465 | 113 | NR | 595 | 974 | NR | 725 | 76 | NR | 855 | 2 | NR | 985 | 0 | NR |
| 470 | 85 | NR | 600 | 994 | NR | 730 | 65 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 85 | NR | 605 | 998 | NR | 735 | 55 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 94 | NR | 610 | 994 | NR | 740 | 47 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 120 | NR | 615 | 973 | NR | 745 | 41 | NR | 875 | 1 | NR | | | |

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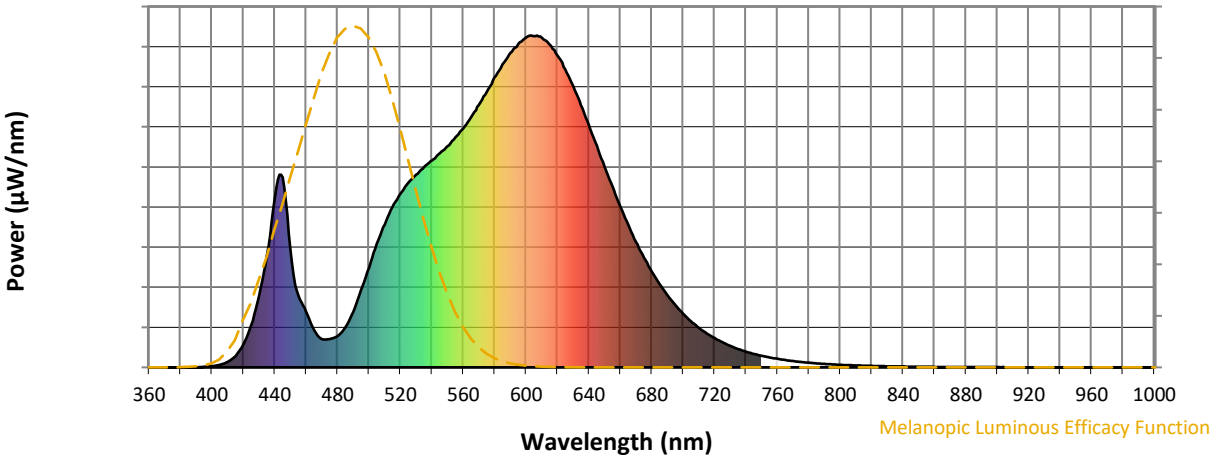
## Melanopic Flux vs. Wavelength




**Melanopic Lumens: NR** **M/P: 2.32**

| 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 | 168 | NR | 620 | 940 | NR | 750 | 35 | NR | 880 | 1 | NR |
| 365 | 0 | NR | 495 | 233 | NR | 625 | 897 | NR | 755 | 30 | NR | 885 | 1 | NR |
| 370 | 0 | NR | 500 | 300 | NR | 630 | 847 | NR | 760 | 26 | NR | 890 | 1 | NR |
| 375 | 0 | NR | 505 | 372 | NR | 635 | 790 | NR | 765 | 22 | NR | 895 | 1 | NR |
| 380 | 0 | NR | 510 | 430 | NR | 640 | 730 | NR | 770 | 19 | NR | 900 | 1 | NR |
| 385 | 0 | NR | 515 | 483 | NR | 645 | 668 | NR | 775 | 16 | NR | 905 | 1 | NR |
| 390 | 0 | NR | 520 | 524 | NR | 650 | 605 | NR | 780 | 14 | NR | 910 | 0 | NR |
| 395 | 2 | NR | 525 | 555 | NR | 655 | 545 | NR | 785 | 12 | NR | 915 | 0 | NR |
| 400 | 4 | NR | 530 | 581 | NR | 660 | 485 | NR | 790 | 10 | NR | 920 | 0 | NR |
| 405 | 7 | NR | 535 | 604 | NR | 665 | 430 | NR | 795 | 9 | NR | 925 | 0 | NR |
| 410 | 17 | NR | 540 | 623 | NR | 670 | 378 | NR | 800 | 8 | NR | 930 | 0 | NR |
| 415 | 34 | NR | 545 | 645 | NR | 675 | 331 | NR | 805 | 7 | NR | 935 | 0 | NR |
| 420 | 68 | NR | 550 | 667 | NR | 680 | 290 | NR | 810 | 6 | NR | 940 | 0 | NR |
| 425 | 128 | NR | 555 | 693 | NR | 685 | 251 | NR | 815 | 5 | NR | 945 | 0 | NR |
| 430 | 214 | NR | 560 | 719 | NR | 690 | 218 | NR | 820 | 4 | NR | 950 | 0 | NR |
| 435 | 339 | NR | 565 | 754 | NR | 695 | 188 | NR | 825 | 4 | NR | 955 | 0 | NR |
| 440 | 507 | NR | 570 | 791 | NR | 700 | 162 | NR | 830 | 3 | NR | 960 | 0 | NR |
| 445 | 573 | NR | 575 | 830 | NR | 705 | 139 | NR | 835 | 3 | NR | 965 | 0 | NR |
| 450 | 356 | NR | 580 | 873 | NR | 710 | 119 | NR | 840 | 3 | NR | 970 | 0 | NR |
| 455 | 217 | NR | 585 | 913 | NR | 715 | 102 | NR | 845 | 2 | NR | 975 | 0 | NR |
| 460 | 168 | NR | 590 | 948 | NR | 720 | 88 | NR | 850 | 2 | NR | 980 | 0 | NR |
| 465 | 113 | NR | 595 | 974 | NR | 725 | 76 | NR | 855 | 2 | NR | 985 | 0 | NR |
| 470 | 85 | NR | 600 | 994 | NR | 730 | 65 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 85 | NR | 605 | 998 | NR | 735 | 55 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 94 | NR | 610 | 994 | NR | 740 | 47 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 120 | NR | 615 | 973 | NR | 745 | 41 | NR | 875 | 1 | NR | | | |

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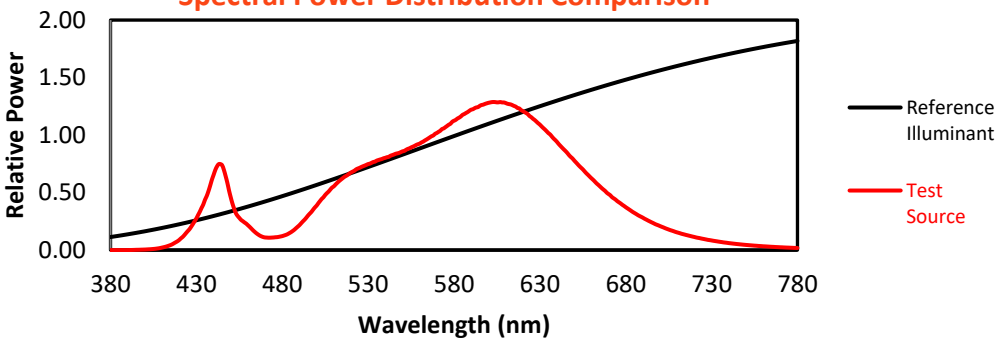
# TM-30-18

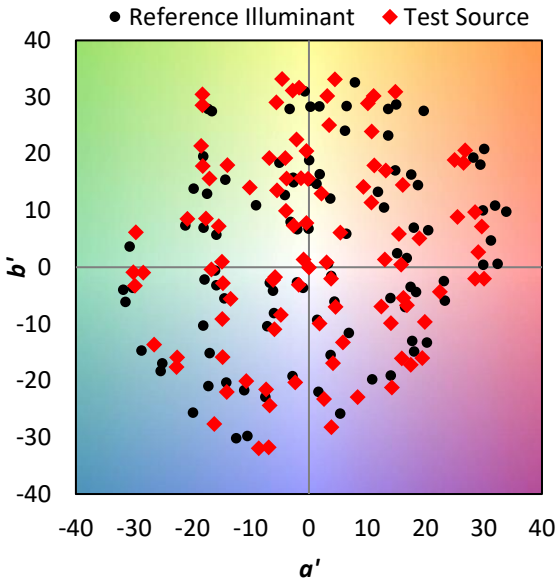
## Summary

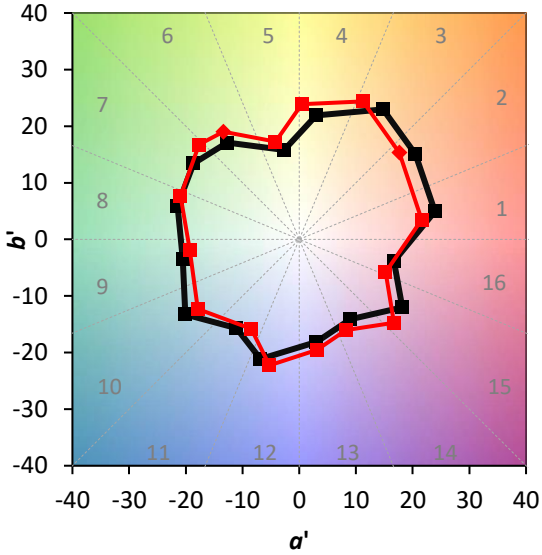
$R_f$ = 81.5
$R_g$ = 99.2
CIE $R_a$ = 81.0
$R_9$ = 7.1

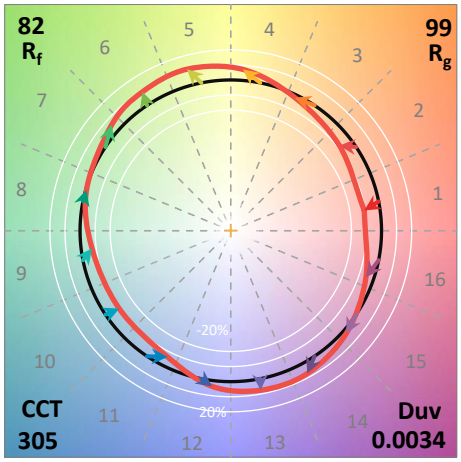
## Spectral Power Distribution Comparison

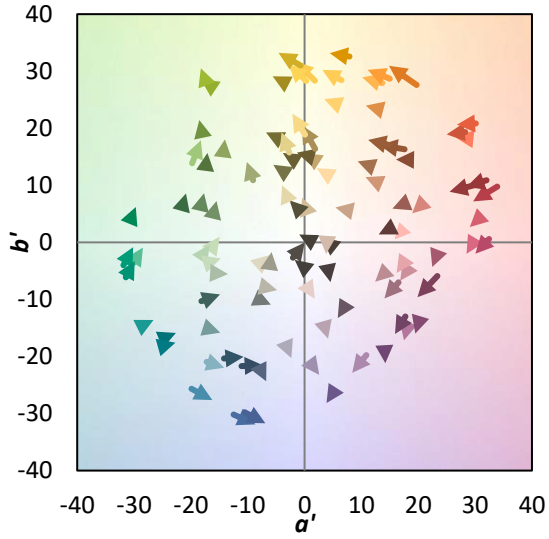



## Color Vector Graphics



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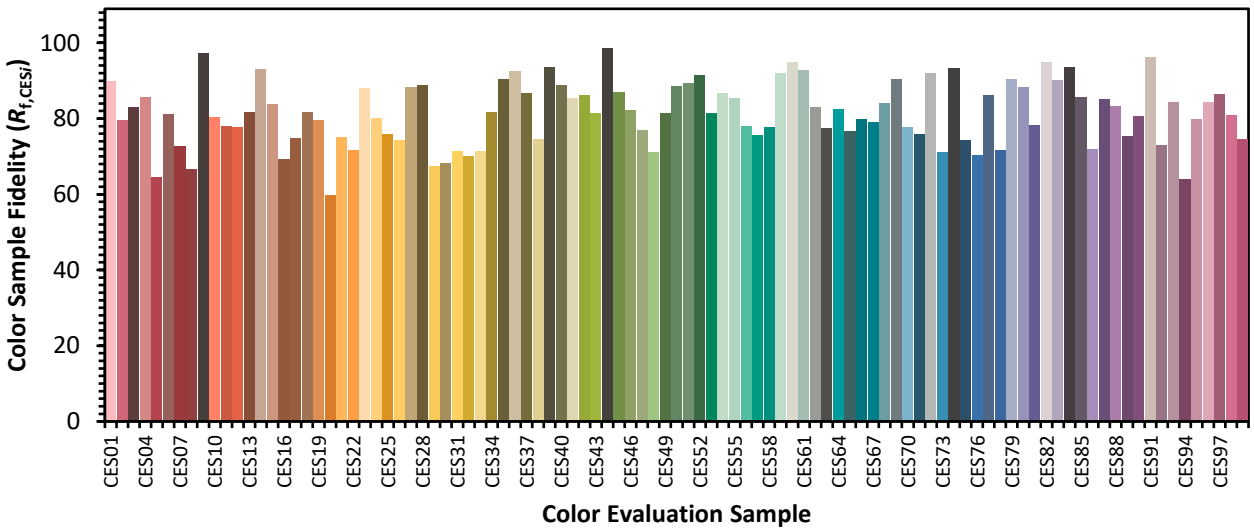
## Individual Sample Fidelity Index ($R_{f,i}$)

| | | | |
|---|---|---|---|
| CES01 = 86 | CES26 = 74 | CES51 = 89 | CES76 = 70 |
| CES02 = 63 | CES27 = 88 | CES52 = 92 | CES77 = 86 |
| CES03 = 31 | CES28 = 89 | CES53 = 81 | CES78 = 72 |
| CES04 = 70 | CES29 = 67 | CES54 = 87 | CES79 = 90 |
| CES05 = 50 | CES30 = 68 | CES55 = 85 | CES80 = 88 |
| CES06 = 51 | CES31 = 71 | CES56 = 78 | CES81 = 78 |
| CES07 = 42 | CES32 = 70 | CES57 = 76 | CES82 = 95 |
| CES08 = 41 | CES33 = 71 | CES58 = 78 | CES83 = 90 |
| CES09 = 29 | CES34 = 82 | CES59 = 92 | CES84 = 94 |
| CES10 = 76 | CES35 = 90 | CES60 = 95 | CES85 = 86 |
| CES11 = 59 | CES36 = 93 | CES61 = 93 | CES86 = 72 |
| CES12 = 65 | CES37 = 87 | CES62 = 83 | CES87 = 85 |
| CES13 = 43 | CES38 = 75 | CES63 = 77 | CES88 = 83 |
| CES14 = 74 | CES39 = 94 | CES64 = 83 | CES89 = 75 |
| CES15 = 71 | CES40 = 89 | CES65 = 77 | CES90 = 81 |
| CES16 = 47 | CES41 = 85 | CES66 = 80 | CES91 = 96 |
| CES17 = 50 | CES42 = 86 | CES67 = 79 | CES92 = 73 |
| CES18 = 56 | CES43 = 81 | CES68 = 84 | CES93 = 84 |
| CES19 = 72 | CES44 = 99 | CES69 = 91 | CES94 = 64 |
| CES20 = 66 | CES45 = 87 | CES70 = 78 | CES95 = 80 |
| CES21 = 87 | CES46 = 82 | CES71 = 76 | CES96 = 84 |
| CES22 = 79 | CES47 = 77 | CES72 = 92 | CES97 = 87 |
| CES23 = 92 | CES48 = 71 | CES73 = 71 | CES98 = 81 |
| CES24 = 91 | CES49 = 81 | CES74 = 93 | CES99 = 74 |
| CES25 = 72 | CES50 = 89 | CES75 = 74 | |



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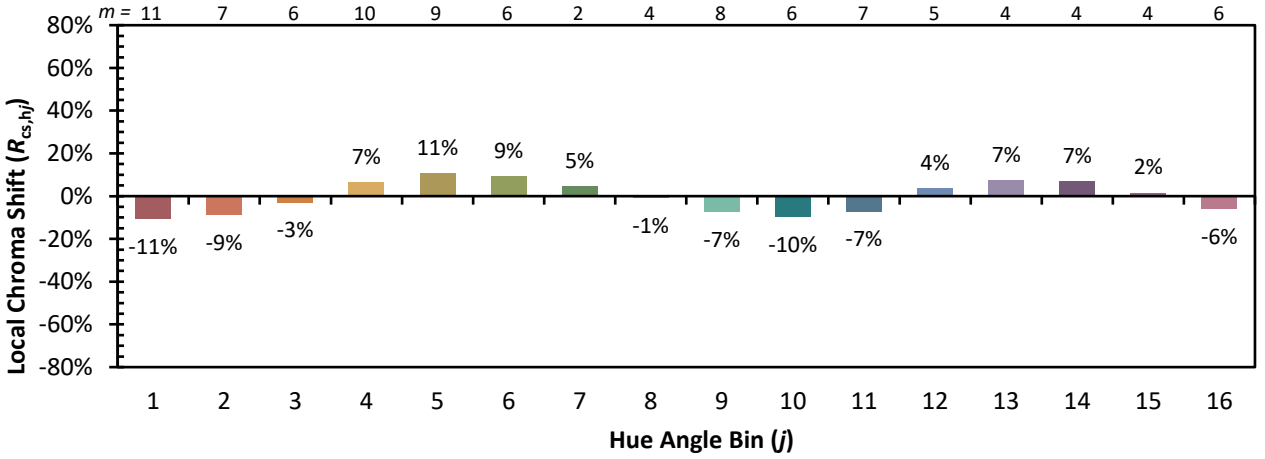
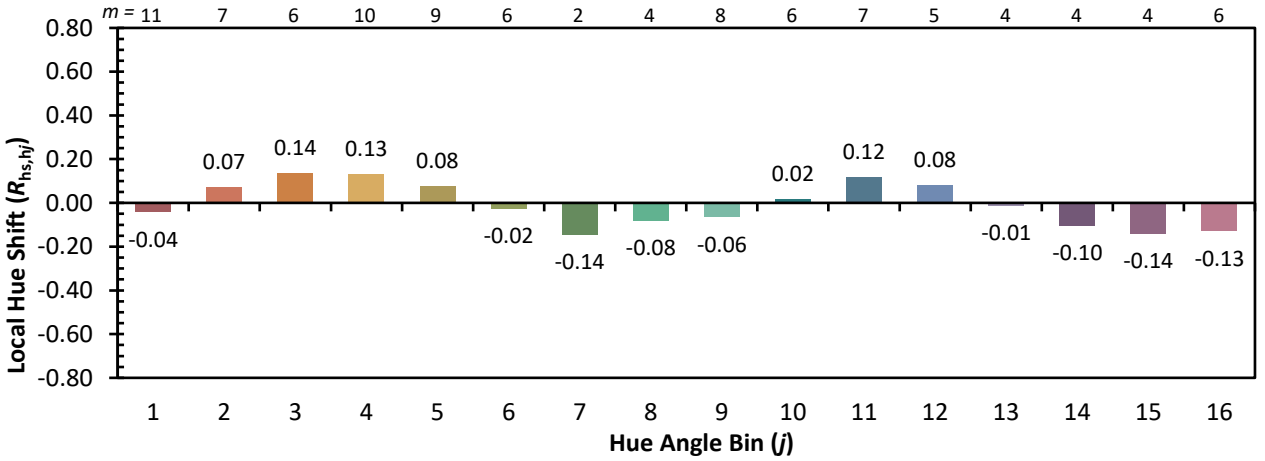
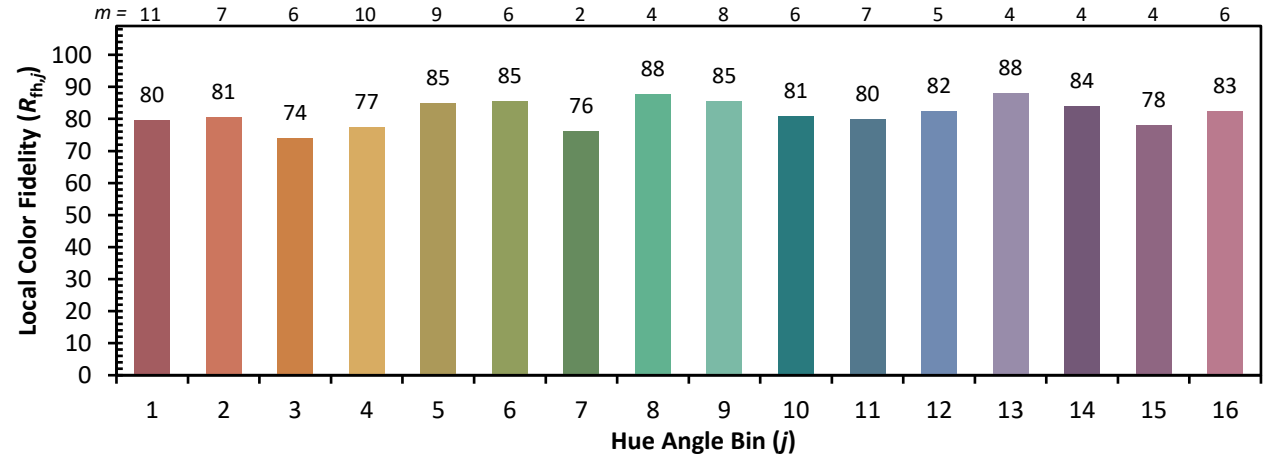
## Color Rendition by Hue-Angle Bin



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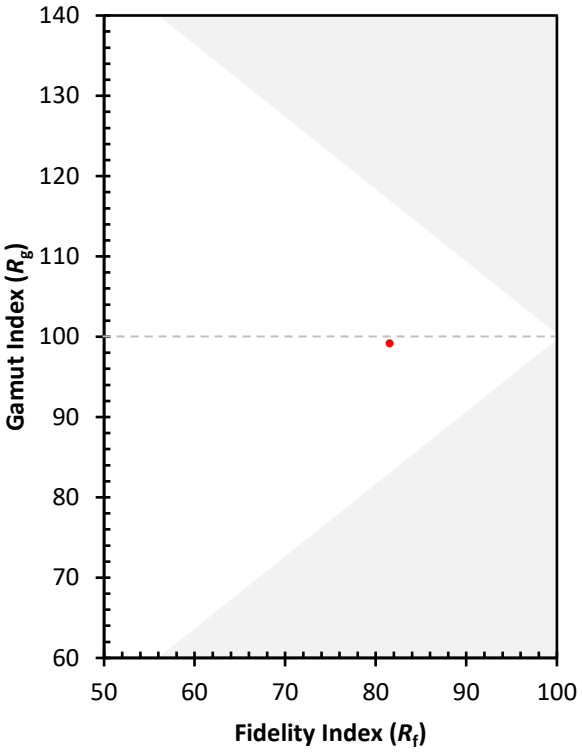
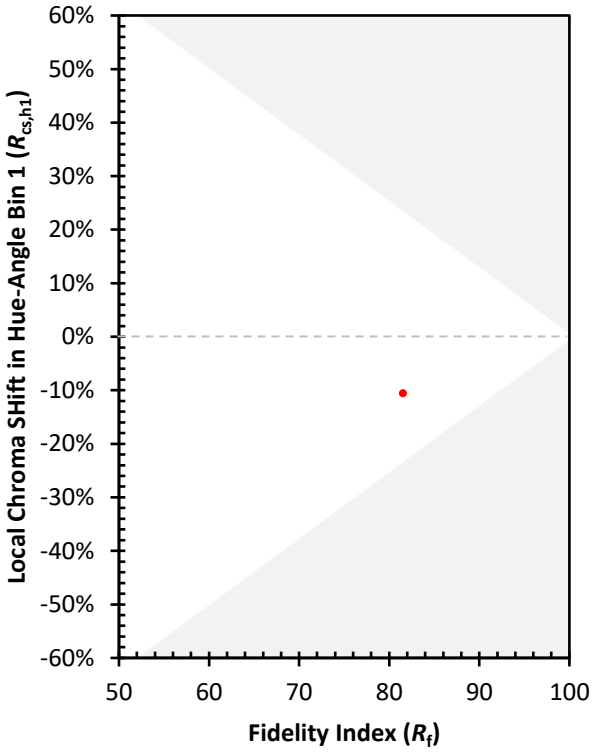
## Measure Comparisons

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