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: P640482

Luminaire Tested: GWS-SA5D-830-U-T3R-W-HSS

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: | P640482 |
| | TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-18) |
| Test Lab: | COOPER LIGHTING SOLUTIONS |
| Issue Date: | 1/10/2023 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS |
| Product Line: | McGRAW-EDISON |
| Catalog Number: | GWS-SA5D-830-U-T3R-W-HSS |
| Description: | GALLEON WALL SLIM LUMINAIRE. (5) LIGHTSQUARES WITH 16 LEDS EACH AND TYPE III ROADWAY OPTICS WITH HOUSE SIDE SHIELD |
| Light Source: | (80) 3000K CCT, 80 CRI LEDS |
| Ballast/Driver: | - |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 18681.4 lumens |
| Efficiency: | N/A |
| Efficacy: | 91.3 lumens/watt |
| Luminous Opening: | Rectangular (W 1.5' x L: 1' x H: 0') |
| IES Classification: | Type III - Medium |
| BUG Rating: | B2 - U0 - G3 |

| | |
|---|---|
| Input Watts (W): | 204.6 |
| 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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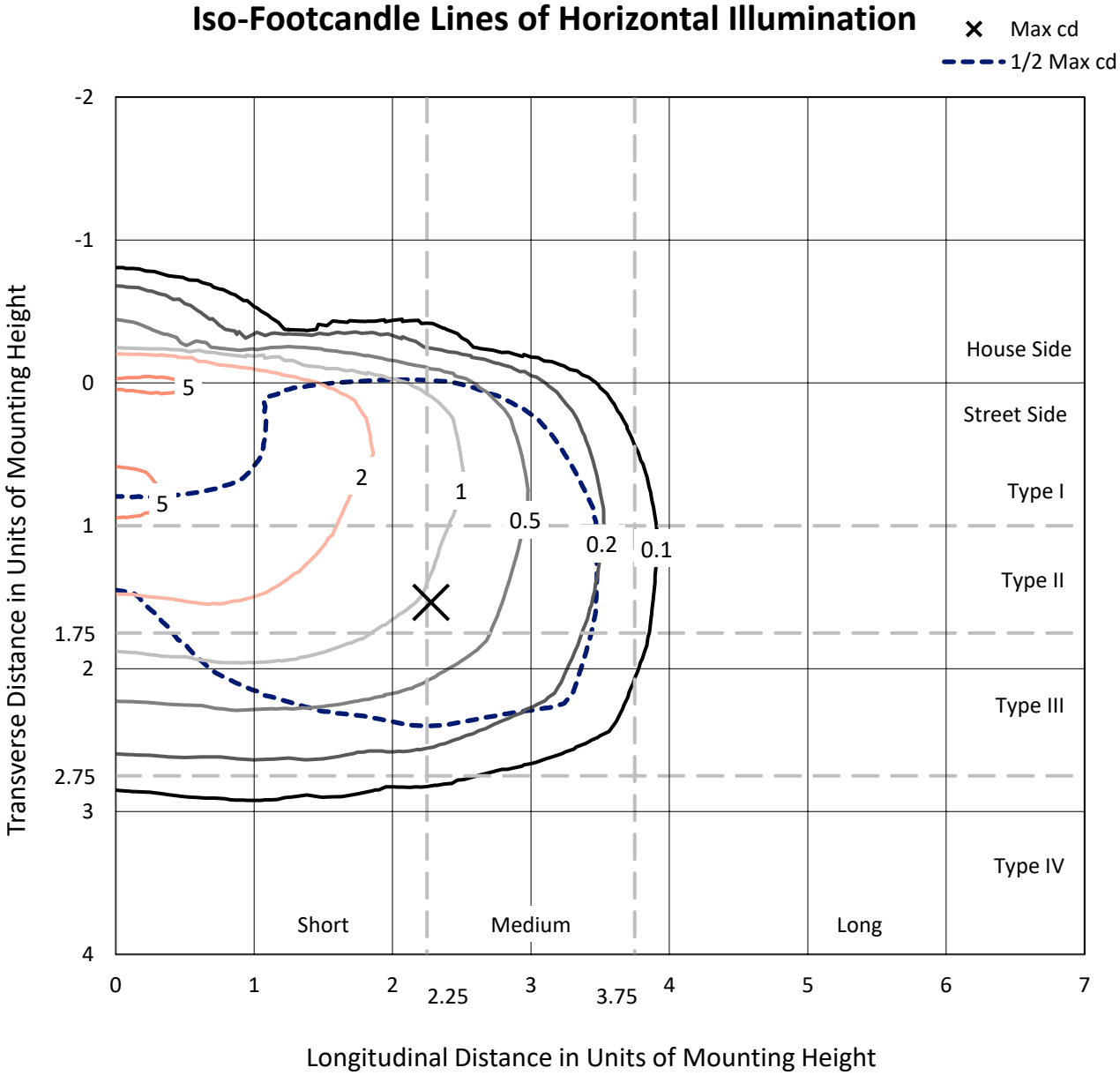
Scaled Data Report

REPORT NUMBER: P640482
CATALOG NUMBER: GWS-SA5D-830-U-T3R-W-HSS

## Iso-Footcandle Lines of Horizontal Illumination




Based on 25 foot mounting height. Maximum calculated value = 5.7 fc
Type III - Medium - N/A

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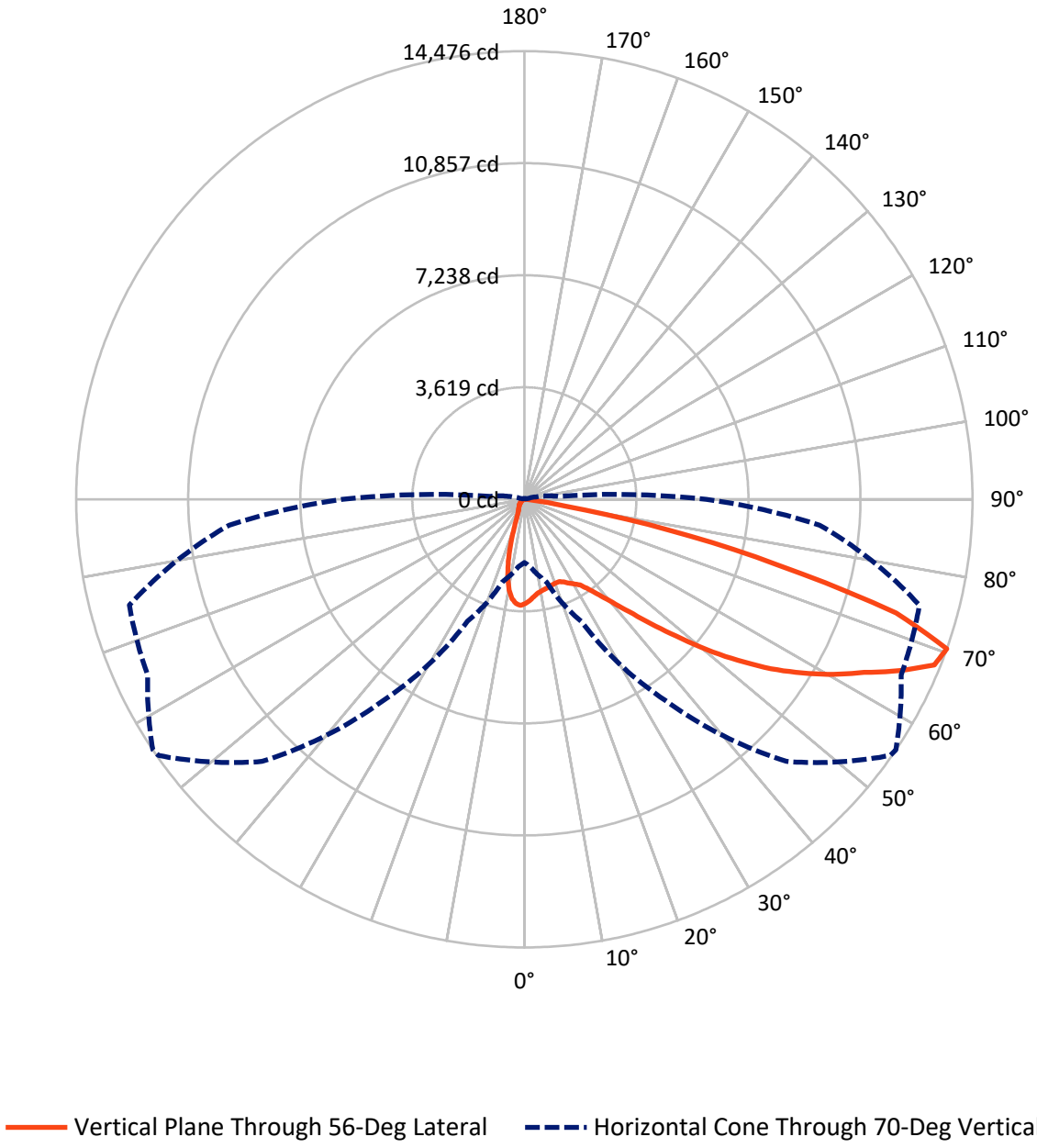
## Luminous Intensity Polar Plot



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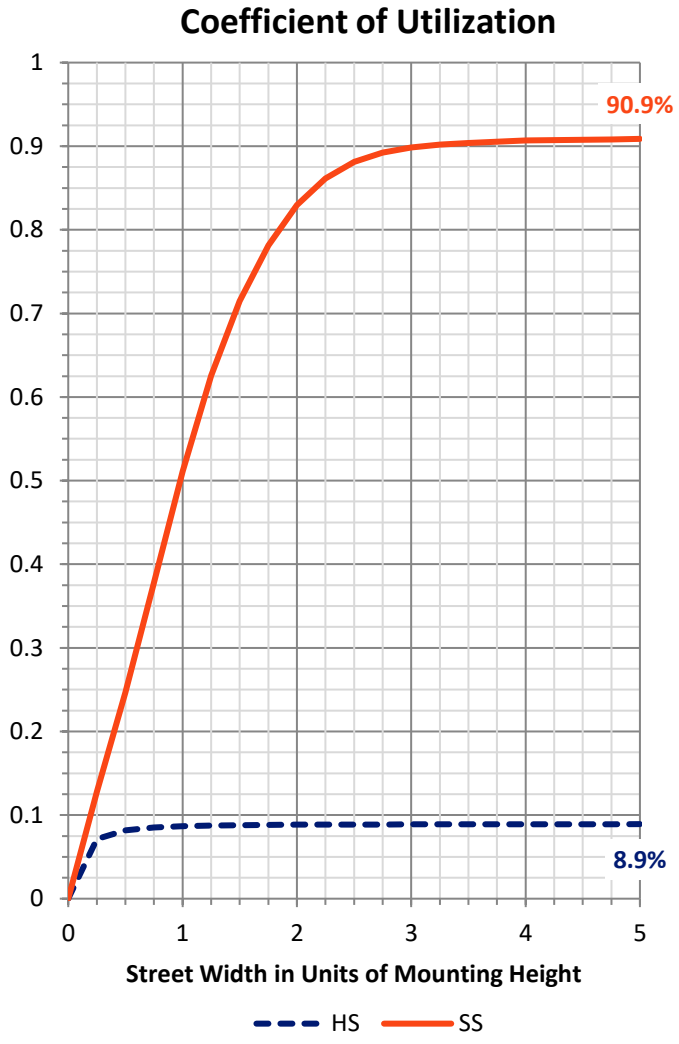
REPORT NUMBER: P640482
CATALOG NUMBER: GWS-SA5D-830-U-T3R-W-HSS

**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 1678.0 | 0.0 | 1678.0 |
| | % Fixture | 9.0 | 0.0 | 9.0 |
| **Street Side** | Lumens | 17003.4 | 0.0 | 17003.4 |
| | % Fixture | 91.0 | 0.0 | 91.0 |
| **Total** | Lumens | 18681.4 | 0.0 | 18681.4 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 289.2 | 1.5 |
| 10°-20° | 650.5 | 3.5 |
| 20°-30° | 1030.3 | 5.5 |
| 30°-40° | 1776.8 | 9.5 |
| 40°-50° | 3000.4 | 16.1 |
| 50°-60° | 4408.6 | 23.6 |
| 60°-70° | 5226.7 | 28.0 |
| 70°-80° | 2228.9 | 11.9 |
| 80°-90° | 70.0 | 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° | 18681.4 | 100.0 |
| 0°-180° | 18681.4 | 100.0 |



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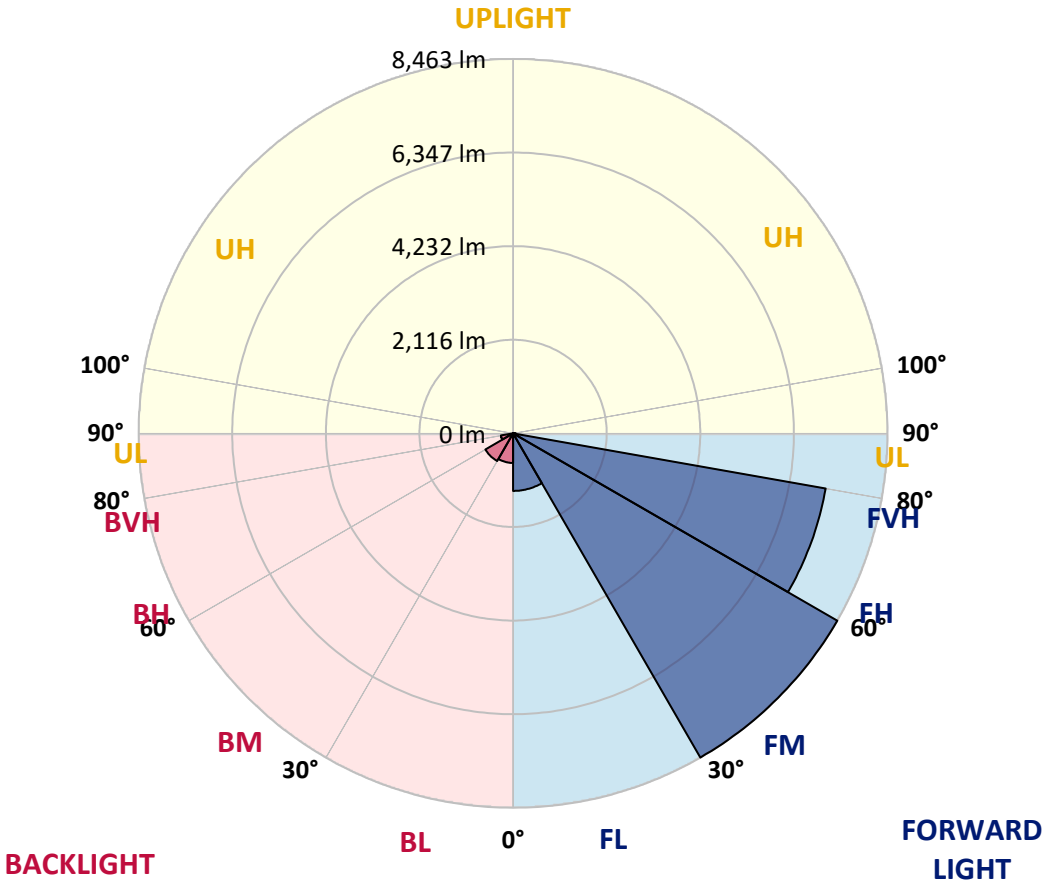
## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 1301.8 | 7.0 | | | |
| FM | (30°-60°) | 8463.2 | 45.3 | | | |
| FH | (60°-80°) | 7175.7 | 38.4 | | | G3/7500 |
| FVH | (80°-90°) | 62.9 | 0.3 | | | G1/100 |
| BL | (0°-30°) | 668.3 | 3.6 | B2/1000 | | |
| BM | (30°-60°) | 722.7 | 3.9 | B1/1000 | | |
| BH | (60°-80°) | 279.9 | 1.5 | B1/500 | | G1/500 |
| BVH | (80°-90°) | 7.1 | 0.0 | | | G0/10 |
| UL | (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH | (100°-180°) | 0.0 | 0.0 | | U0/0 | |

**BUG Rating: B2-U0-G3**
Type III Medium



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**CANDELA DISTRIBUTION (FULL):**

| | 0° | 5° | 15° | 25° | 35° | 45° | 55° | 56° | 65° | 75° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 3368.4 | 3368.4 | 3368.4 | 3368.4 | 3368.4 | 3368.4 | 3368.4 | *3368.4* | 3368.4 | 3368.4 | 3368.4 |
| 2.5° | 3135.8 | 3130.7 | 3134.1 | 3159.7 | 3207.6 | 3229.9 | 3267.5 | *3274.4* | 3305.1 | 3344.5 | 3359.9 |
| 5° | 2932.2 | 2915.1 | 2923.7 | 2959.6 | 3014.3 | 3075.9 | 3146.0 | *3164.9* | 3241.8 | 3329.1 | 3394.1 |
| 7.5° | 2745.7 | 2726.9 | 2747.4 | 2803.9 | 2880.9 | 2947.6 | 3052.0 | *3063.9* | 3187.1 | 3341.1 | 3459.1 |
| 10° | 2453.2 | 2458.3 | 2499.4 | 2598.6 | 2716.7 | 2855.2 | 2995.5 | *3012.6* | 3164.9 | 3380.4 | 3563.5 |
| 12.5° | 2229.1 | 2217.1 | 2261.6 | 2374.5 | 2540.4 | 2742.3 | 2952.7 | *2975.0* | 3166.6 | 3440.3 | 3696.9 |
| 15° | 2124.7 | 2121.3 | 2140.1 | 2222.2 | 2383.1 | 2620.9 | 2913.4 | *2942.5* | 3188.8 | 3495.0 | 3823.5 |
| 17.5° | 2128.2 | 2123.0 | 2121.3 | 2169.2 | 2289.0 | 2530.2 | 2870.6 | *2908.3* | 3207.6 | 3554.9 | 3956.9 |
| 20° | 2277.0 | 2253.0 | 2210.3 | 2188.0 | 2259.9 | 2472.0 | 2841.5 | *2884.3* | 3235.0 | 3618.2 | 4098.9 |
| 22.5° | 2588.3 | 2596.9 | 2482.3 | 2362.5 | 2328.3 | 2478.9 | 2838.1 | *2887.7* | 3294.9 | 3717.4 | 4273.4 |
| 25° | 3211.1 | 3197.4 | 2985.2 | 2716.7 | 2530.2 | 2557.6 | 2898.0 | *2957.9* | 3412.9 | 3859.4 | 4437.7 |
| 27.5° | 3991.2 | 4003.1 | 3712.3 | 3284.6 | 2894.6 | 2720.1 | 3007.5 | *3067.4* | 3549.8 | 3948.4 | 4547.1 |
| 30° | 4841.4 | 4829.4 | 4518.1 | 4044.2 | 3411.2 | 2990.4 | 3117.0 | *3170.0* | 3618.2 | 3996.3 | 4660.1 |
| 32.5° | 5645.4 | 5618.1 | 5310.1 | 4814.0 | 4069.8 | 3416.3 | 3267.5 | *3298.3* | 3708.9 | 4100.6 | 4812.3 |
| 35° | 6331.4 | 6329.7 | 6061.1 | 5532.5 | 4747.3 | 3950.1 | 3525.8 | *3551.5* | 3878.2 | 4266.6 | 5036.4 |
| 37.5° | 7039.7 | 7015.7 | 6714.6 | 6232.2 | 5443.6 | 4535.2 | 3921.0 | *3910.7* | 4145.1 | 4511.2 | 5311.8 |
| 40° | 7621.3 | 7605.9 | 7375.0 | 6911.4 | 6167.2 | 5181.8 | 4400.0 | *4369.2* | 4461.6 | 4849.9 | 5695.0 |
| 42.5° | 8052.4 | 8054.2 | 7982.3 | 7700.0 | 6933.6 | 5929.4 | 5002.2 | *4954.3* | 4952.6 | 5361.5 | 6201.4 |
| 45° | 8379.2 | 8401.4 | 8509.2 | 8466.4 | 7838.6 | 6800.2 | 5773.7 | *5724.1* | 5640.3 | 6025.2 | 6781.4 |
| 47.5° | 8531.5 | 8560.5 | 8885.6 | 9056.7 | 8630.7 | 7664.1 | 6692.4 | *6588.1* | 6423.8 | 6908.0 | 7429.7 |
| 50° | 8516.1 | 8567.4 | 9020.7 | 9540.8 | 9349.2 | 8540.0 | 7693.2 | *7643.6* | 7375.0 | 7842.0 | 8071.3 |
| 52.5° | 8167.1 | 8276.6 | 9029.3 | 9835.0 | 9901.8 | 9347.5 | 8728.2 | *8635.8* | 8505.8 | 8817.1 | 8673.4 |
| 55° | 7219.3 | 7352.8 | 8668.3 | 9929.1 | 10332.9 | 10052.3 | 9740.9 | *9665.7* | 9450.1 | 9737.5 | 9198.6 |
| 57.5° | 6704.4 | 6819.0 | 7908.7 | 9882.9 | 10699.0 | 10704.1 | 10642.5 | *10580.9* | 10403.0 | 10647.6 | 9814.5 |
| 60° | 6394.7 | 6509.4 | 7503.3 | 9713.6 | 11030.8 | 11391.8 | 11489.3 | *11482.5* | 11225.9 | 11682.6 | 10536.4 |
| 62.5° | 5941.4 | 6098.8 | 7080.7 | 9273.9 | 11266.9 | 12069.3 | 12363.5 | *12317.3* | 12031.6 | 12760.4 | 11251.5 |
| 65° | 5026.2 | 5163.0 | 6215.1 | 8548.6 | 11128.4 | 12630.4 | 13311.3 | *13335.2* | 13005.0 | 13774.9 | 11816.1 |
| 67.5° | 3524.1 | 3625.1 | 4670.3 | 7026.0 | 10187.4 | 12815.1 | 14281.2 | *14279.5* | 13716.7 | 14294.9 | 11566.3 |
| 70° | *2042.6* | *2181.2* | *2759.4* | *4343.6* | *7925.9* | *11975.2* | *14426.7* | *14476.3* | *13427.6* | *13208.6* | *9571.6* |
| 72.5° | 790.4 | 905.0 | 1563.6 | 2307.8 | 4133.1 | 9173.0 | 12409.7 | *12555.1* | 11237.8 | 10189.2 | 6661.6 |
| 75° | 236.1 | 263.5 | 735.6 | 1228.3 | 1659.4 | 4430.8 | 8401.4 | *8442.5* | 7708.6 | 6355.4 | 3414.6 |
| 77.5° | 176.2 | 195.0 | 321.6 | 621.0 | 581.7 | 1342.9 | 4347.0 | *4747.3* | 4092.1 | 2270.2 | 940.9 |
| 80° | 119.8 | 142.0 | 229.2 | 302.8 | 215.6 | 357.5 | 1221.5 | *1341.2* | 1248.8 | 509.8 | 236.1 |
| 82.5° | 53.0 | 68.4 | 162.5 | 152.3 | 78.7 | 102.6 | 376.4 | *400.3* | 258.3 | 154.0 | 82.1 |
| 85° | 5.1 | 6.8 | 61.6 | 66.7 | 29.1 | 24.0 | 78.7 | *78.7* | 56.5 | 53.0 | 34.2 |
| 87.5° | 0.0 | 0.0 | 1.7 | 3.4 | 3.4 | 5.1 | 6.8 | *8.6* | 10.3 | 13.7 | 17.1 |
| 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: P640482
CATALOG NUMBER: GWS-SA5D-830-U-T3R-W-HSS

**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 3368.4 | 3368.4 | 3368.4 | 3368.4 | 3368.4 | 3368.4 | 3368.4 | 3368.4 | 3368.4 | 3368.4 | 3368.4 |
| 2.5° | 3399.2 | 3378.7 | 3404.4 | 3424.9 | 3430.0 | 3392.4 | 3370.2 | 3337.7 | 3330.8 | 3332.5 | 3324.0 |
| 5° | 3445.4 | 3435.2 | 3454.0 | 3431.7 | 3373.6 | 3264.1 | 3170.0 | 3065.6 | 3009.2 | 2976.7 | 2973.3 |
| 7.5° | 3531.0 | 3525.8 | 3505.3 | 3404.4 | 3223.0 | 2980.1 | 2745.7 | 2516.5 | 2374.5 | 2323.2 | 2314.6 |
| 10° | 3657.6 | 3647.3 | 3563.5 | 3324.0 | 2937.3 | 2470.3 | 2076.8 | 1748.4 | 1548.2 | 1490.1 | 1418.2 |
| 12.5° | 3803.0 | 3782.4 | 3599.4 | 3151.2 | 2506.2 | 1859.6 | 1368.6 | 1000.8 | 828.0 | 776.7 | 776.7 |
| 15° | 3943.3 | 3898.8 | 3578.9 | 2865.5 | 1975.9 | 1209.5 | 764.7 | 578.2 | 525.2 | 511.5 | 511.5 |
| 17.5° | 4087.0 | 4001.4 | 3498.5 | 2475.4 | 1365.2 | 715.1 | 509.8 | 473.9 | 467.0 | 468.7 | 470.5 |
| 20° | 4222.1 | 4088.7 | 3356.5 | 2006.7 | 870.8 | 499.5 | 456.8 | 448.2 | 444.8 | 448.2 | 446.5 |
| 22.5° | 4369.2 | 4169.1 | 3140.9 | 1495.2 | 566.3 | 449.9 | 434.5 | 427.7 | 424.3 | 429.4 | 429.4 |
| 25° | 4514.6 | 4227.2 | 2855.2 | 1005.9 | 449.9 | 419.1 | 410.6 | 403.7 | 400.3 | 402.0 | 402.0 |
| 27.5° | 4589.9 | 4205.0 | 2480.6 | 641.5 | 403.7 | 388.3 | 379.8 | 371.2 | 366.1 | 364.4 | 366.1 |
| 30° | 4641.2 | 4136.6 | 2022.1 | 456.8 | 366.1 | 347.3 | 338.7 | 331.9 | 318.2 | 309.6 | 313.1 |
| 32.5° | 4721.6 | 4068.1 | 1524.3 | 383.2 | 335.3 | 306.2 | 292.5 | 275.4 | 256.6 | 248.1 | 248.1 |
| 35° | 4817.4 | 3974.0 | 1069.2 | 345.6 | 302.8 | 272.0 | 246.3 | 217.3 | 195.0 | 188.2 | 188.2 |
| 37.5° | 4944.0 | 3885.1 | 711.7 | 319.9 | 275.4 | 242.9 | 207.0 | 172.8 | 148.8 | 145.4 | 143.7 |
| 40° | 5133.9 | 3809.8 | 501.2 | 301.1 | 251.5 | 212.1 | 169.4 | 133.4 | 116.3 | 111.2 | 111.2 |
| 42.5° | 5380.3 | 3732.8 | 396.9 | 282.3 | 230.9 | 183.0 | 135.1 | 106.1 | 92.4 | 89.0 | 87.2 |
| 45° | 5684.8 | 3642.2 | 345.6 | 265.2 | 210.4 | 152.3 | 107.8 | 89.0 | 78.7 | 75.3 | 75.3 |
| 47.5° | 6015.0 | 3519.0 | 321.6 | 242.9 | 186.5 | 123.2 | 90.7 | 77.0 | 71.9 | 70.1 | 68.4 |
| 50° | 6340.0 | 3353.0 | 301.1 | 222.4 | 159.1 | 100.9 | 78.7 | 70.1 | 66.7 | 65.0 | 65.0 |
| 52.5° | 6624.0 | 3159.7 | 275.4 | 198.4 | 130.0 | 87.2 | 70.1 | 65.0 | 61.6 | 58.2 | 56.5 |
| 55° | 6866.9 | 2949.3 | 242.9 | 171.1 | 106.1 | 77.0 | 65.0 | 59.9 | 56.5 | 53.0 | 51.3 |
| 57.5° | 7180.0 | 2829.6 | 195.0 | 138.6 | 87.2 | 68.4 | 59.9 | 54.7 | 51.3 | 46.2 | 46.2 |
| 60° | 7527.3 | 2742.3 | 145.4 | 109.5 | 75.3 | 63.3 | 54.7 | 49.6 | 46.2 | 41.1 | 41.1 |
| 62.5° | 7806.1 | 2612.3 | 114.6 | 89.0 | 65.0 | 56.5 | 49.6 | 44.5 | 41.1 | 35.9 | 35.9 |
| 65° | 7912.2 | 2343.7 | 94.1 | 70.1 | 53.0 | 49.6 | 44.5 | 41.1 | 35.9 | 30.8 | 30.8 |
| 67.5° | 7433.2 | 1806.5 | 78.7 | 56.5 | 44.5 | 42.8 | 39.3 | 37.6 | 30.8 | 27.4 | 25.7 |
| 70° | *5886.7* | *1101.7* | *65.0* | *46.2* | *37.6* | *35.9* | *35.9* | *32.5* | *27.4* | *25.7* | *24.0* |
| 72.5° | 4033.9 | 568.0 | 53.0 | 37.6 | 32.5 | 32.5 | 30.8 | 29.1 | 25.7 | 24.0 | 24.0 |
| 75° | 2095.7 | 189.9 | 41.1 | 29.1 | 25.7 | 27.4 | 27.4 | 25.7 | 24.0 | 24.0 | 22.2 |
| 77.5° | 600.5 | 85.5 | 30.8 | 22.2 | 20.5 | 20.5 | 22.2 | 22.2 | 22.2 | 20.5 | 20.5 |
| 80° | 155.7 | 49.6 | 22.2 | 17.1 | 17.1 | 17.1 | 17.1 | 18.8 | 20.5 | 18.8 | 18.8 |
| 82.5° | 63.3 | 27.4 | 15.4 | 13.7 | 13.7 | 13.7 | 13.7 | 15.4 | 17.1 | 17.1 | 17.1 |
| 85° | 39.3 | 13.7 | 12.0 | 12.0 | 12.0 | 10.3 | 10.3 | 12.0 | 12.0 | 13.7 | 13.7 |
| 87.5° | 24.0 | 10.3 | 10.3 | 10.3 | 10.3 | 8.6 | 8.6 | 8.6 | 8.6 | 8.6 | 8.6 |
| 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

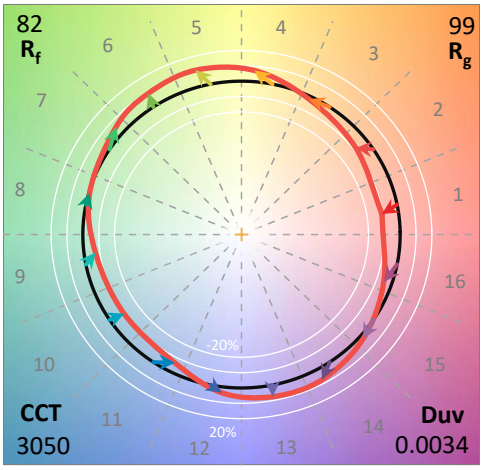
## Test Information

| | |
|---|---|
| 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

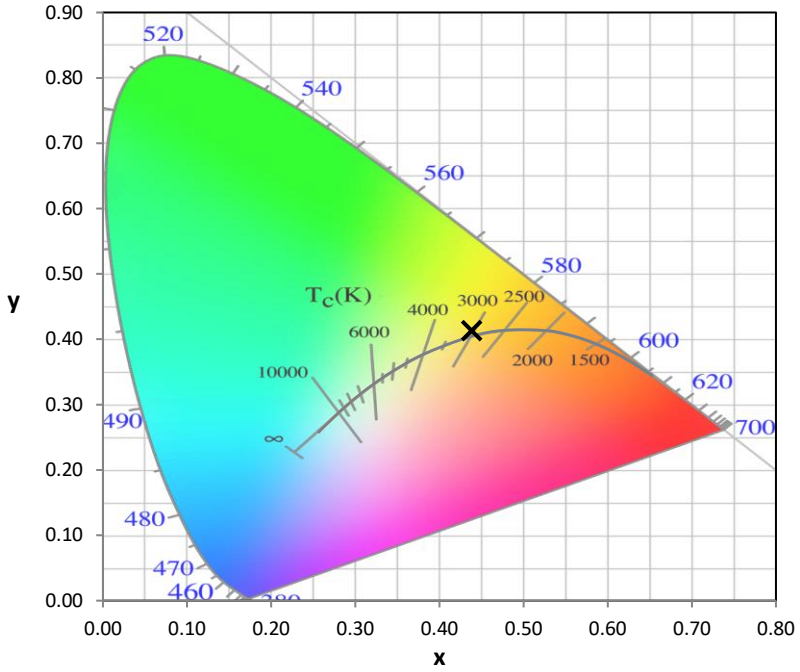
| | |
|---|---|
| Stabilization Time: | 20M |
| Operation Time: | 1H 20M |
| Sphere Temperature (°C): | 24.2 |

REPORT NUMBER: SP1-2408-195-9

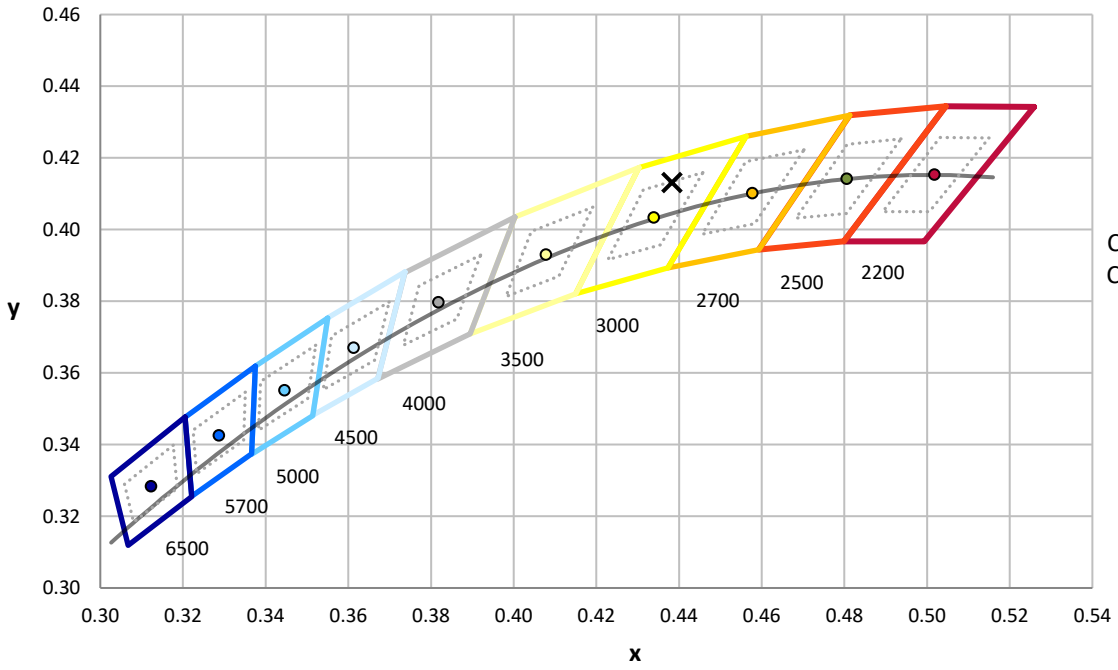
| Measurement and Test Equipment | | | |
|---|---|---|---|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | IN0058 | 6/18/2024 | 12/18/2024 |
| Power Meter | INXT2011004 | 2/8/2024 | 2/8/2025 |
| AC Power Source | IN0063 | 10/24/2023 | 10/24/2024 |
| DC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

REPORT NUMBER: SP1-2408-195-9

## 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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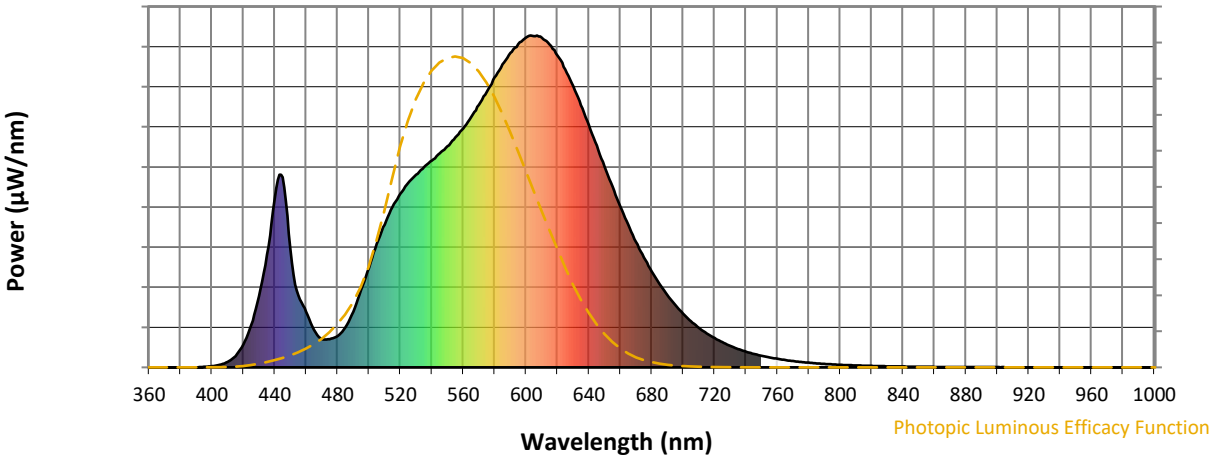
## Photopic Flux vs. Wavelength




## 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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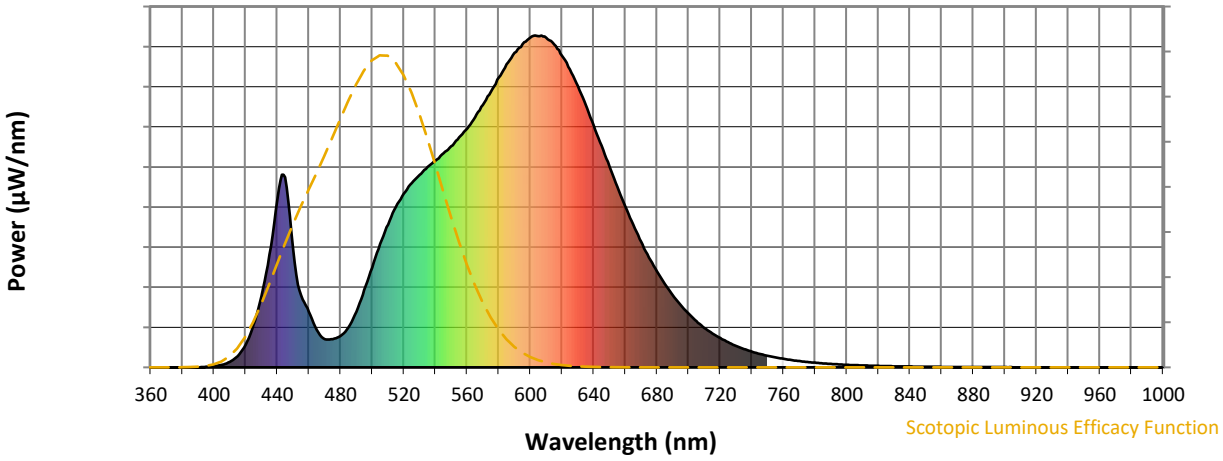
## Scotopic Flux vs. Wavelength




**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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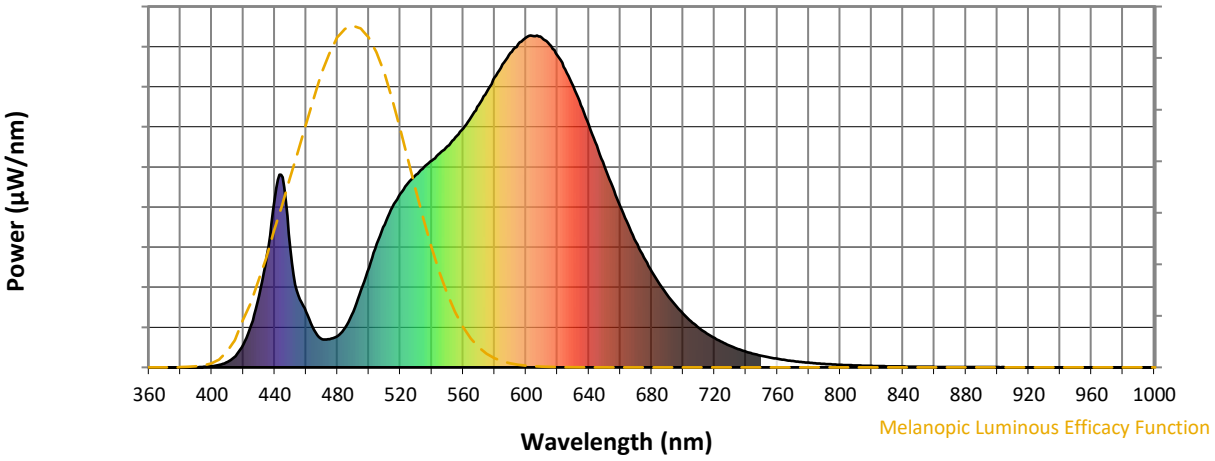
## Melanopic Flux vs. Wavelength




**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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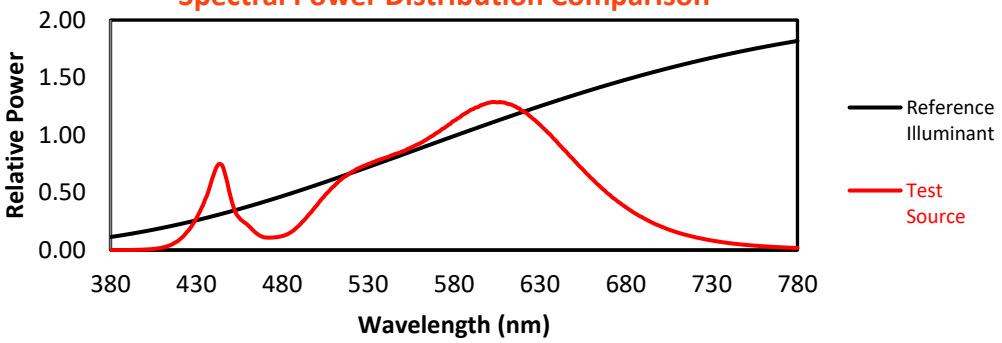
# TM-30-18

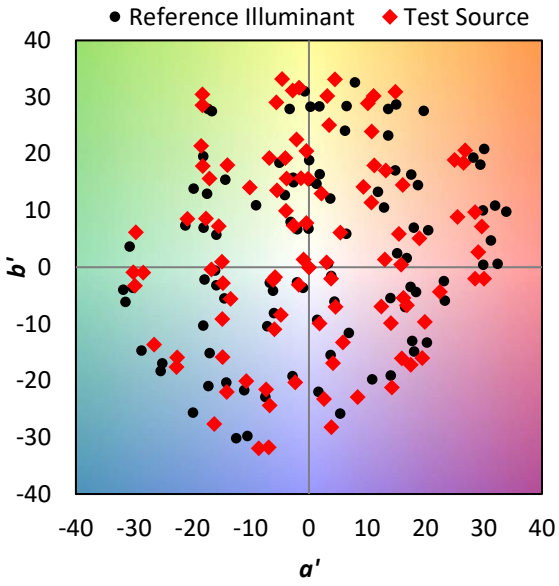
## Summary

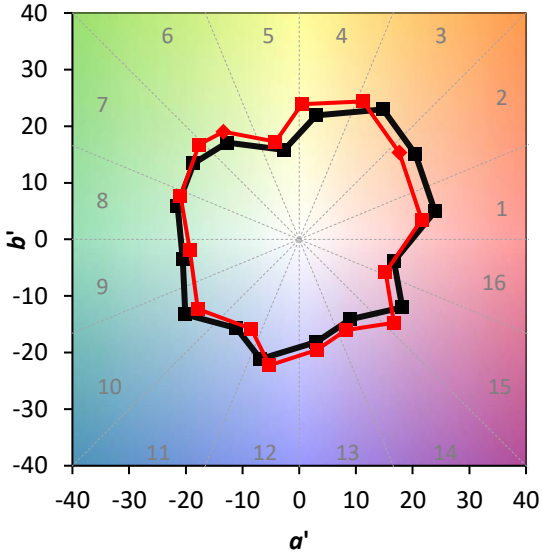
$R_f$ = 81.5
$R_g$ = 99.2
CIE $R_a$ = 81.0
$R_9$ = 7.1

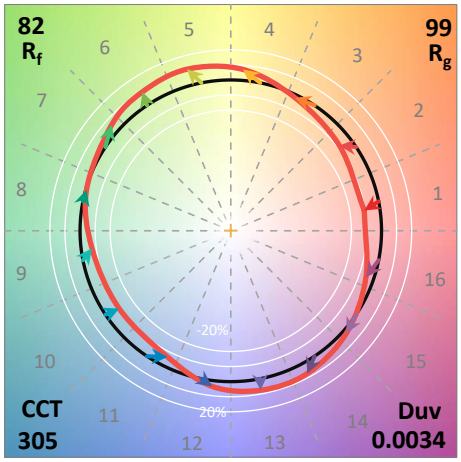
## Spectral Power Distribution Comparison

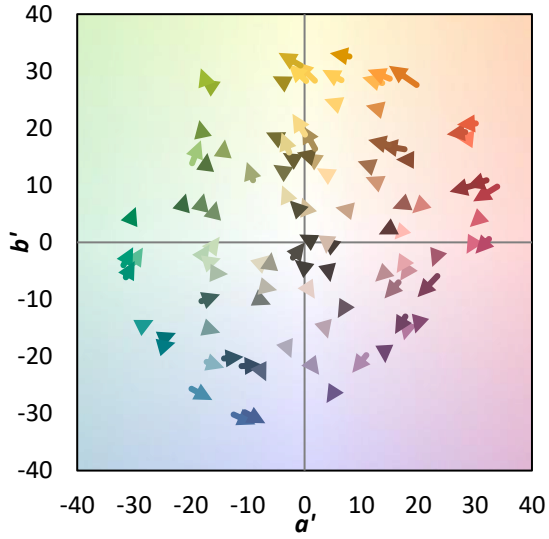



## Color Vector Graphics



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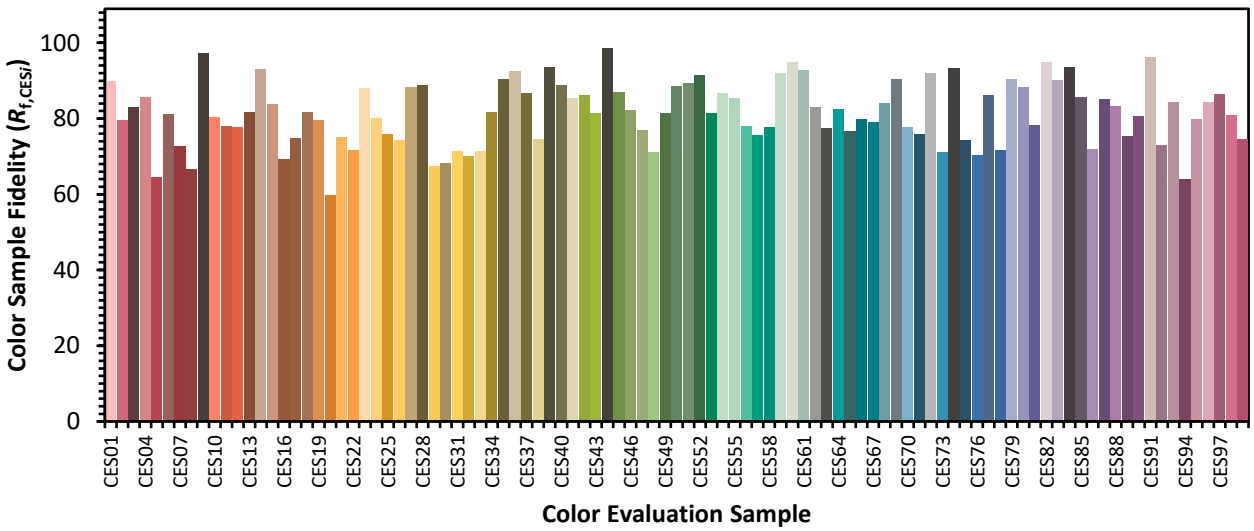
# TM-30-18

**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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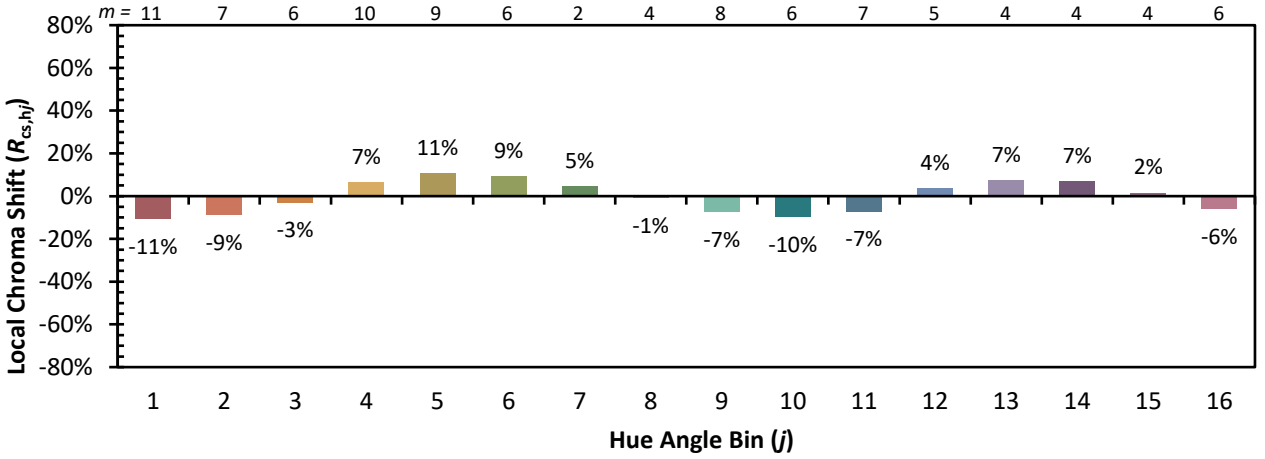
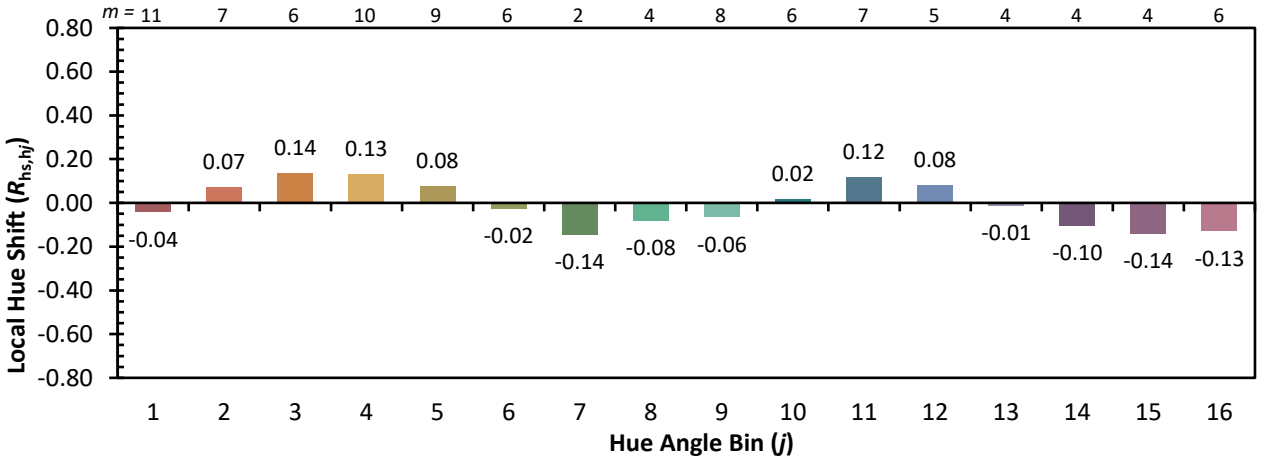
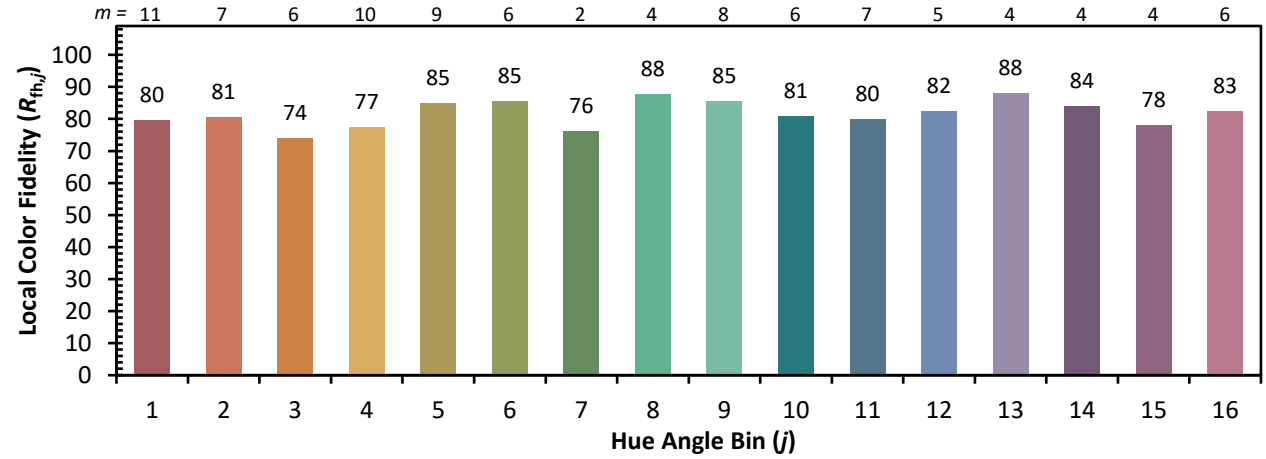
## Color Rendition by Hue-Angle Bin



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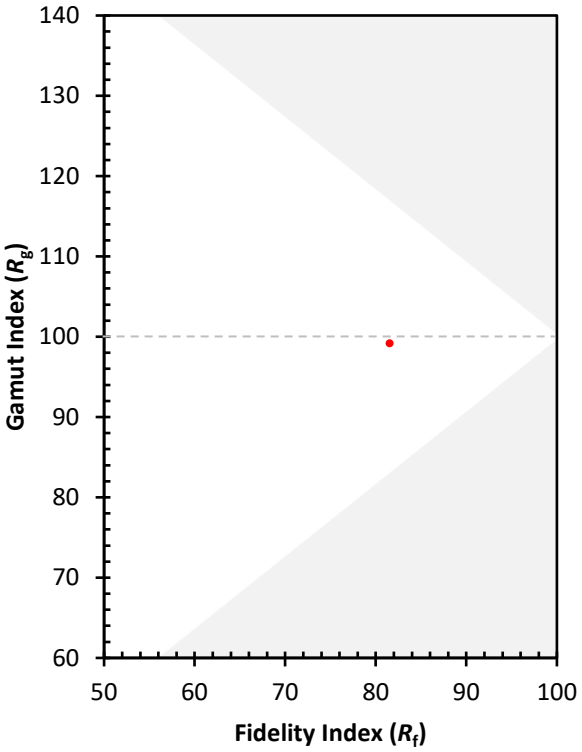
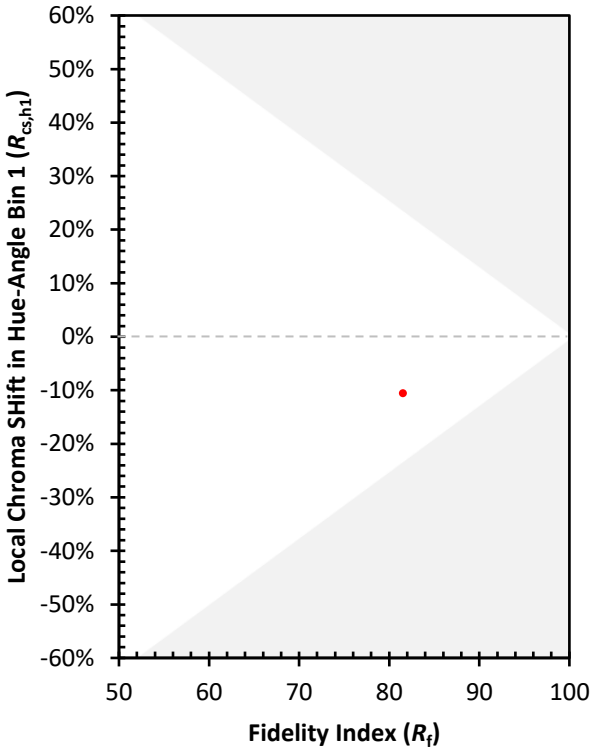
## Measure Comparisons




(END OF REPORT)