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: P641472

Luminaire Tested: GWS-SA5F-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: | P641472 |
| | 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-SA5F-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: | 25955.7 lumens |
| Efficiency: | N/A |
| Efficacy: | 83.6 lumens/watt |
| Luminous Opening: | Rectangular (W 1.5' x L: 1' x H: 0') |
| IES Classification: | Type III - Medium |
| BUG Rating: | B2 - U0 - G4 |

| | |
|---|---|
| Input Watts (W): | 310.3 |
| 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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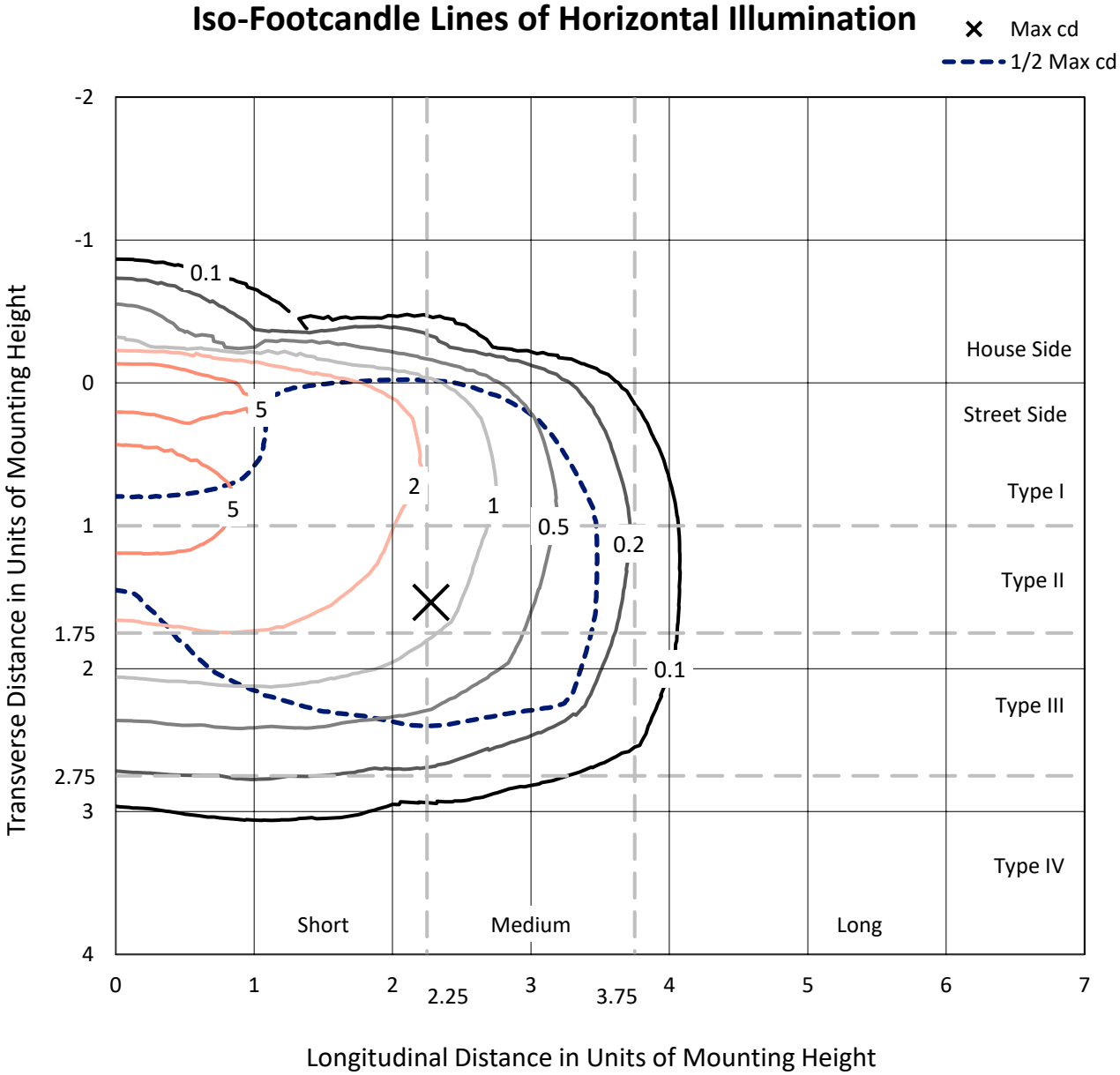
Scaled Data Report

REPORT NUMBER: P641472
CATALOG NUMBER: GWS-SA5F-830-U-T3R-W-HSS

## Iso-Footcandle Lines of Horizontal Illumination




Based on 25 foot mounting height. Maximum calculated value = 7.9 fc
Type III - Medium - N/A

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REPORT NUMBER: P641472
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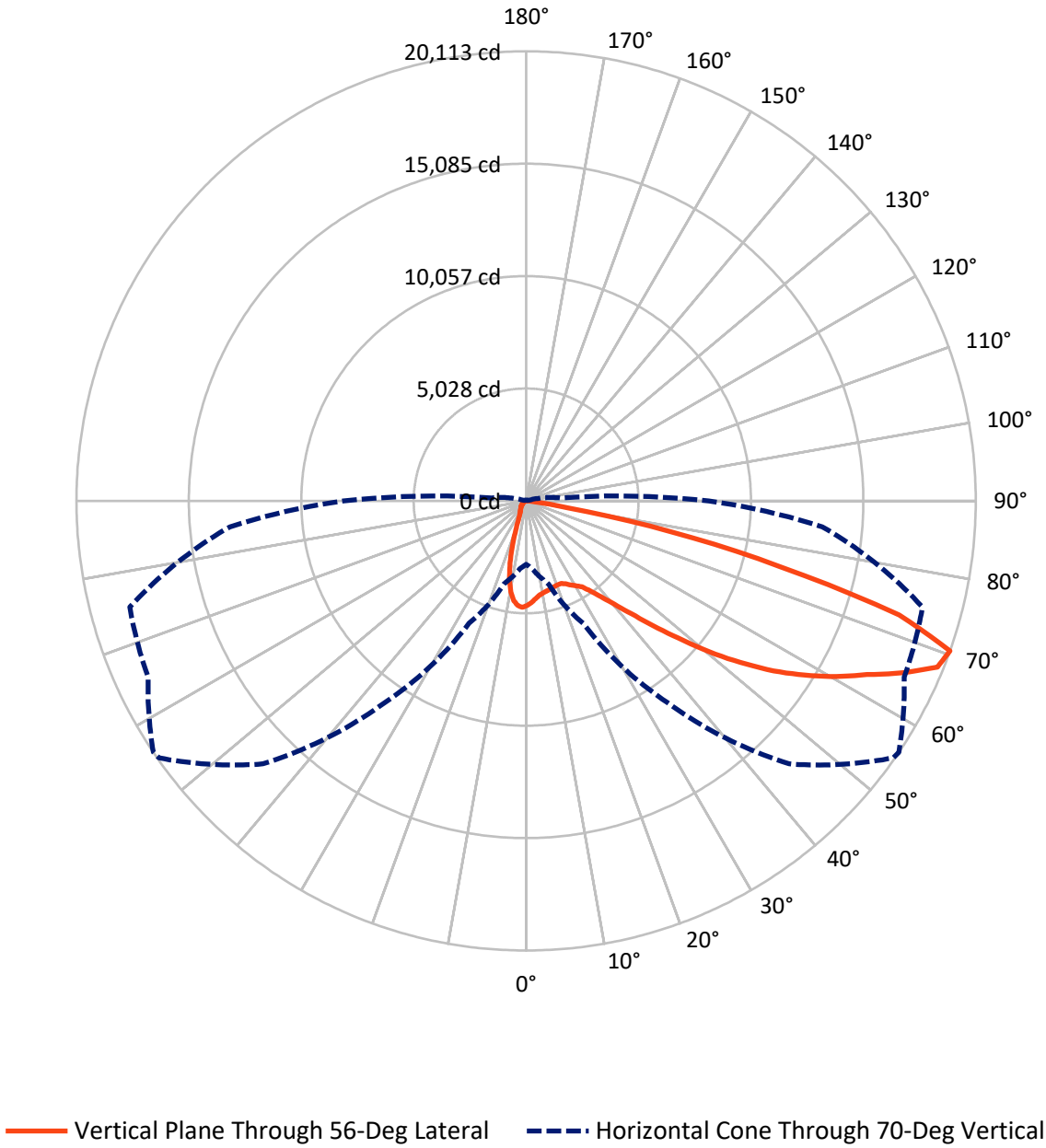
## Luminous Intensity Polar Plot



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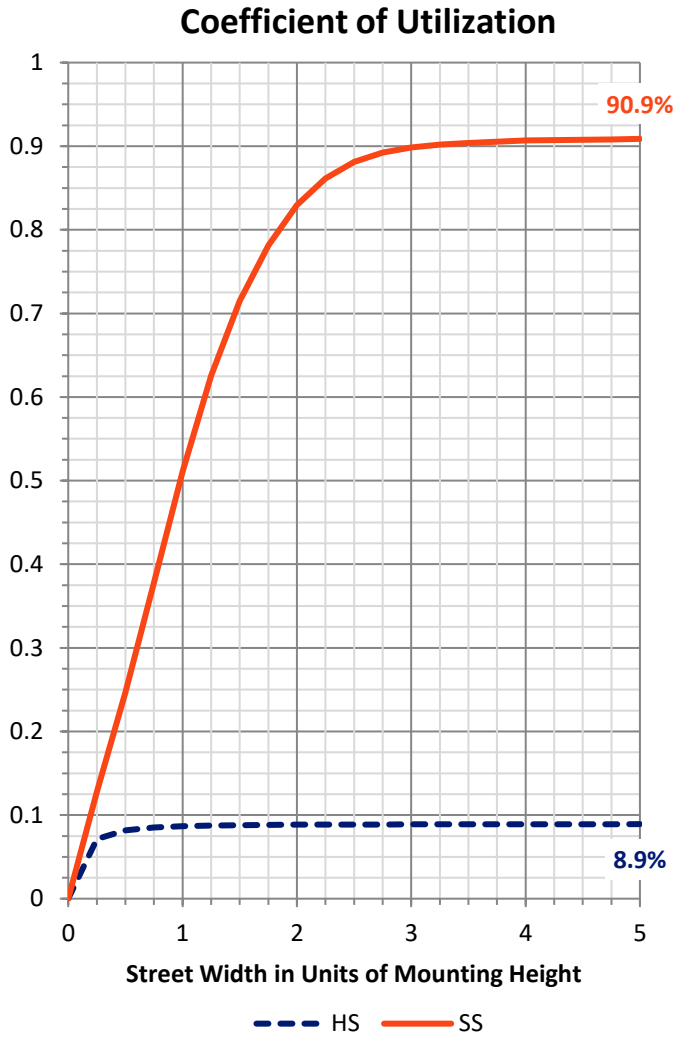
CATALOG NUMBER: GWS-SA5F-830-U-T3R-W-HSS

**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 2331.3 | 0.0 | 2331.3 |
| | % Fixture | 9.0 | 0.0 | 9.0 |
| **Street Side** | Lumens | 23624.4 | 0.0 | 23624.4 |
| | % Fixture | 91.0 | 0.0 | 91.0 |
| **Total** | Lumens | 25955.7 | 0.0 | 25955.7 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 401.8 | 1.5 |
| 10°-20° | 903.7 | 3.5 |
| 20°-30° | 1431.5 | 5.5 |
| 30°-40° | 2468.7 | 9.5 |
| 40°-50° | 4168.8 | 16.1 |
| 50°-60° | 6125.3 | 23.6 |
| 60°-70° | 7261.9 | 28.0 |
| 70°-80° | 3096.7 | 11.9 |
| 80°-90° | 97.2 | 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° | 25955.7 | 100.0 |
| 0°-180° | 25955.7 | 100.0 |



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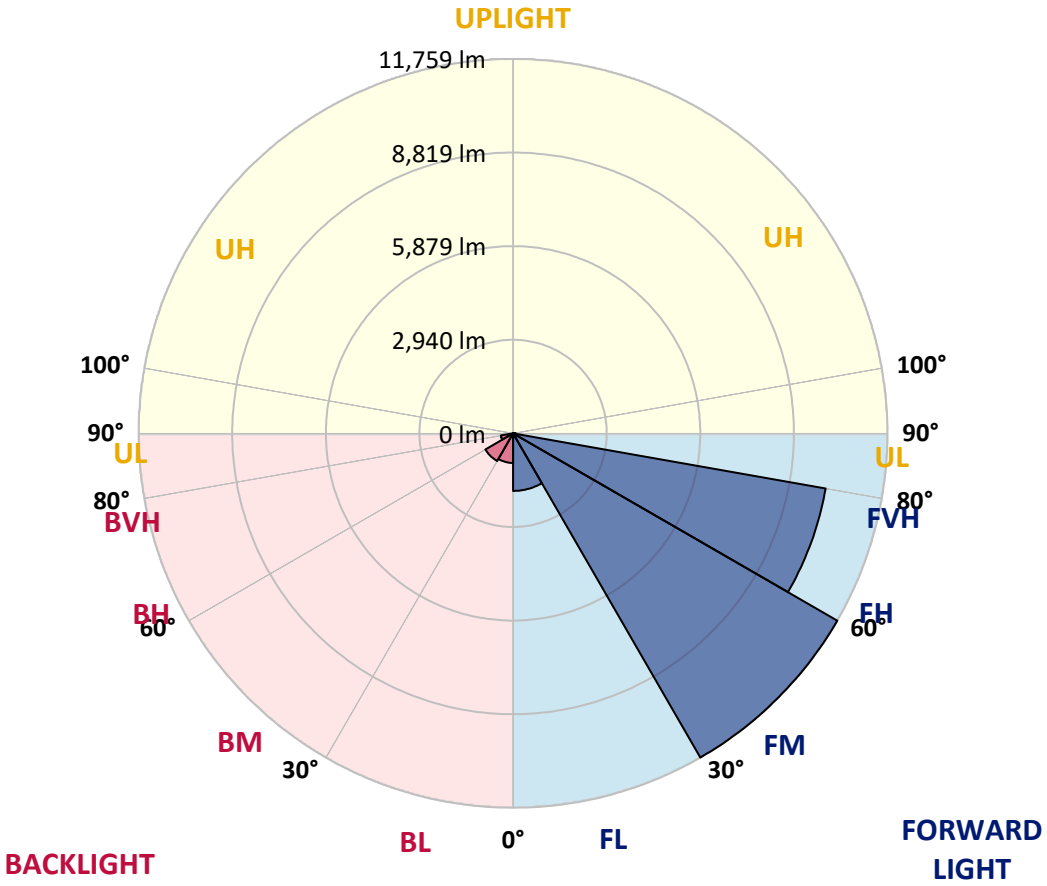
REPORT NUMBER: P641472
CATALOG NUMBER: GWS-SA5F-830-U-T3R-W-HSS

## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 1808.6 | 7.0 | | | |
| FM | (30°-60°) | 11758.6 | 45.3 | | | |
| FH | (60°-80°) | 9969.8 | 38.4 | | | G4/12000 |
| FVH | (80°-90°) | 87.4 | 0.3 | | | G1/100 |
| BL | (0°-30°) | 928.5 | 3.6 | B2/1000 | | |
| BM | (30°-60°) | 1004.1 | 3.9 | B2/2500 | | |
| BH | (60°-80°) | 388.8 | 1.5 | B1/500 | | G1/500 |
| BVH | (80°-90°) | 9.9 | 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-G4**
Type III Medium



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REPORT NUMBER: P641472
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**CANDELA DISTRIBUTION (FULL):**

| | 0° | 5° | 15° | 25° | 35° | 45° | 55° | 56° | 65° | 75° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 4680.1 | 4680.1 | 4680.1 | 4680.1 | 4680.1 | 4680.1 | 4680.1 | *4680.1* | 4680.1 | 4680.1 | 4680.1 |
| 2.5° | 4356.8 | 4349.7 | 4354.4 | 4390.1 | 4456.6 | 4487.5 | 4539.8 | *4549.3* | 4592.1 | 4646.8 | 4668.2 |
| 5° | 4074.0 | 4050.2 | 4062.1 | 4112.0 | 4188.1 | 4273.6 | 4371.1 | *4397.2* | 4504.2 | 4625.4 | 4715.7 |
| 7.5° | 3814.9 | 3788.7 | 3817.3 | 3895.7 | 4002.7 | 4095.4 | 4240.4 | *4257.0* | 4428.1 | 4642.0 | 4806.0 |
| 10° | 3408.4 | 3415.6 | 3472.6 | 3610.5 | 3774.5 | 3967.0 | 4161.9 | *4185.7* | 4397.2 | 4696.7 | 4951.0 |
| 12.5° | 3097.1 | 3080.4 | 3142.2 | 3299.1 | 3529.7 | 3810.1 | 4102.5 | *4133.4* | 4399.6 | 4779.9 | 5136.4 |
| 15° | 2952.1 | 2947.3 | 2973.5 | 3087.6 | 3311.0 | 3641.4 | 4047.8 | *4088.2* | 4430.5 | 4856.0 | 5312.3 |
| 17.5° | 2956.8 | 2949.7 | 2947.3 | 3013.9 | 3180.3 | 3515.4 | 3988.4 | *4040.7* | 4456.6 | 4939.2 | 5497.7 |
| 20° | 3163.6 | 3130.3 | 3070.9 | 3040.0 | 3139.9 | 3434.6 | 3948.0 | *4007.4* | 4494.7 | 5027.1 | 5695.0 |
| 22.5° | 3596.2 | 3608.1 | 3448.9 | 3282.5 | 3234.9 | 3444.1 | 3943.2 | *4012.2* | 4577.9 | 5165.0 | 5937.4 |
| 25° | 4461.4 | 4442.4 | 4147.7 | 3774.5 | 3515.4 | 3553.4 | 4026.4 | *4109.6* | 4741.9 | 5362.2 | 6165.6 |
| 27.5° | 5545.3 | 5561.9 | 5157.8 | 4563.6 | 4021.7 | 3779.2 | 4178.6 | *4261.7* | 4932.0 | 5485.8 | 6317.7 |
| 30° | 6726.6 | 6709.9 | 6277.3 | 5618.9 | 4739.5 | 4154.8 | 4330.7 | *4404.4* | 5027.1 | 5552.4 | 6474.6 |
| 32.5° | 7843.7 | 7805.7 | 7377.8 | 6688.5 | 5654.6 | 4746.6 | 4539.8 | *4582.6* | 5153.1 | 5697.4 | 6686.2 |
| 35° | 8796.8 | 8794.5 | 8421.3 | 7686.8 | 6595.8 | 5488.2 | 4898.7 | *4934.4* | 5388.4 | 5927.9 | 6997.5 |
| 37.5° | 9780.9 | 9747.6 | 9329.2 | 8659.0 | 7563.2 | 6301.1 | 5447.8 | *5433.5* | 5759.2 | 6267.8 | 7380.2 |
| 40° | 10589.0 | 10567.6 | 10246.7 | 9602.6 | 8568.6 | 7199.6 | 6113.3 | *6070.5* | 6198.9 | 6738.5 | 7912.6 |
| 42.5° | 11188.0 | 11190.3 | 11090.5 | 10698.3 | 9633.5 | 8238.3 | 6950.0 | *6883.4* | 6881.1 | 7449.1 | 8616.2 |
| 45° | 11642.0 | 11672.9 | 11822.6 | 11763.2 | 10890.9 | 9448.1 | 8022.0 | *7953.0* | 7836.6 | 8371.4 | 9421.9 |
| 47.5° | 11853.5 | 11893.9 | 12345.5 | 12583.2 | 11991.4 | 10648.4 | 9298.3 | *9153.4* | 8925.2 | 9597.8 | 10322.8 |
| 50° | 11832.1 | 11903.4 | 12533.3 | 13255.9 | 12989.6 | 11865.4 | 10688.8 | *10619.9* | 10246.7 | 10895.6 | 11214.1 |
| 52.5° | 11347.2 | 11499.3 | 12545.2 | 13664.7 | 13757.4 | 12987.3 | 12126.8 | *11998.5* | 11817.8 | 12250.4 | 12050.8 |
| 55° | 10030.4 | 10215.8 | 12043.6 | 13795.4 | 14356.3 | 13966.5 | 13533.9 | *13429.4* | 13129.9 | 13529.2 | 12780.5 |
| 57.5° | 9315.0 | 9474.2 | 10988.3 | 13731.2 | 14865.0 | 14872.1 | 14786.6 | *14701.0* | 14453.8 | 14793.7 | 13636.2 |
| 60° | 8884.8 | 9044.0 | 10425.0 | 13495.9 | 15326.1 | 15827.6 | 15963.1 | *15953.6* | 15597.1 | 16231.7 | 14639.2 |
| 62.5° | 8254.9 | 8473.6 | 9837.9 | 12885.1 | 15654.1 | 16768.9 | 17177.7 | *17113.5* | 16716.6 | 17729.1 | 15632.7 |
| 65° | 6983.3 | 7173.4 | 8635.2 | 11877.3 | 15461.6 | 17548.5 | 18494.5 | *18527.8* | 18069.0 | 19138.6 | 16417.1 |
| 67.5° | 4896.4 | 5036.6 | 6488.9 | 9761.8 | 14154.3 | 17805.2 | 19842.2 | *19839.8* | 19057.8 | 19861.2 | 16070.1 |
| 70° | *2838.0* | *3030.5* | *3833.9* | *6034.9* | *11012.1* | *16638.1* | *20044.2* | *20113.1* | *18656.1* | *18351.9* | *13298.6* |
| 72.5° | 1098.1 | 1257.4 | 2172.5 | 3206.4 | 5742.5 | 12744.8 | 17241.9 | *17443.9* | 15613.7 | 14156.7 | 9255.6 |
| 75° | 328.0 | 366.0 | 1022.1 | 1706.6 | 2305.6 | 6156.1 | 11672.9 | *11729.9* | 10710.2 | 8830.1 | 4744.2 |
| 77.5° | 244.8 | 271.0 | 446.9 | 862.8 | 808.1 | 1865.8 | 6039.6 | *6595.8* | 5685.5 | 3154.1 | 1307.3 |
| 80° | 166.4 | 197.3 | 318.5 | 420.7 | 299.5 | 496.8 | 1697.1 | *1863.5* | 1735.1 | 708.3 | 328.0 |
| 82.5° | 73.7 | 95.1 | 225.8 | 211.5 | 109.3 | 142.6 | 522.9 | *556.2* | 358.9 | 213.9 | 114.1 |
| 85° | 7.1 | 9.5 | 85.6 | 92.7 | 40.4 | 33.3 | 109.3 | *109.3* | 78.4 | 73.7 | 47.5 |
| 87.5° | 0.0 | 0.0 | 2.4 | 4.8 | 4.8 | 7.1 | 9.5 | *11.9* | 14.3 | 19.0 | 23.8 |
| 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: P641472
CATALOG NUMBER: GWS-SA5F-830-U-T3R-W-HSS

**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 4680.1 | 4680.1 | 4680.1 | 4680.1 | 4680.1 | 4680.1 | 4680.1 | 4680.1 | 4680.1 | 4680.1 | 4680.1 |
| 2.5° | 4722.9 | 4694.3 | 4730.0 | 4758.5 | 4765.6 | 4713.4 | 4682.5 | 4637.3 | 4627.8 | 4630.2 | 4618.3 |
| 5° | 4787.0 | 4772.8 | 4798.9 | 4768.0 | 4687.2 | 4535.1 | 4404.4 | 4259.4 | 4180.9 | 4135.8 | 4131.0 |
| 7.5° | 4905.9 | 4898.7 | 4870.2 | 4730.0 | 4478.0 | 4140.5 | 3814.9 | 3496.4 | 3299.1 | 3227.8 | 3215.9 |
| 10° | 5081.8 | 5067.5 | 4951.0 | 4618.3 | 4081.1 | 3432.2 | 2885.5 | 2429.2 | 2151.1 | 2070.3 | 1970.4 |
| 12.5° | 5283.8 | 5255.3 | 5001.0 | 4378.2 | 3482.1 | 2583.7 | 1901.5 | 1390.5 | 1150.4 | 1079.1 | 1079.1 |
| 15° | 5478.7 | 5416.9 | 4972.4 | 3981.3 | 2745.3 | 1680.5 | 1062.5 | 803.4 | 729.7 | 710.7 | 710.7 |
| 17.5° | 5678.4 | 5559.5 | 4860.7 | 3439.3 | 1896.7 | 993.5 | 708.3 | 658.4 | 648.9 | 651.3 | 653.6 |
| 20° | 5866.1 | 5680.7 | 4663.4 | 2788.1 | 1209.8 | 694.0 | 634.6 | 622.7 | 618.0 | 622.7 | 620.4 |
| 22.5° | 6070.5 | 5792.5 | 4363.9 | 2077.4 | 786.7 | 625.1 | 603.7 | 594.2 | 589.5 | 596.6 | 596.6 |
| 25° | 6272.6 | 5873.3 | 3967.0 | 1397.6 | 625.1 | 582.3 | 570.5 | 560.9 | 556.2 | 558.6 | 558.6 |
| 27.5° | 6377.2 | 5842.4 | 3446.5 | 891.3 | 560.9 | 539.6 | 527.7 | 515.8 | 508.7 | 506.3 | 508.7 |
| 30° | 6448.5 | 5747.3 | 2809.5 | 634.6 | 508.7 | 482.5 | 470.6 | 461.1 | 442.1 | 430.2 | 435.0 |
| 32.5° | 6560.2 | 5652.2 | 2117.8 | 532.4 | 465.9 | 425.5 | 406.4 | 382.7 | 356.5 | 344.6 | 344.6 |
| 35° | 6693.3 | 5521.5 | 1485.5 | 480.1 | 420.7 | 377.9 | 342.3 | 301.9 | 271.0 | 261.5 | 261.5 |
| 37.5° | 6869.2 | 5397.9 | 988.8 | 444.5 | 382.7 | 337.5 | 287.6 | 240.1 | 206.8 | 202.0 | 199.7 |
| 40° | 7133.0 | 5293.3 | 696.4 | 418.3 | 349.4 | 294.7 | 235.3 | 185.4 | 161.6 | 154.5 | 154.5 |
| 42.5° | 7475.3 | 5186.3 | 551.4 | 392.2 | 320.9 | 254.3 | 187.8 | 147.4 | 128.4 | 123.6 | 121.2 |
| 45° | 7898.4 | 5060.4 | 480.1 | 368.4 | 292.4 | 211.5 | 149.7 | 123.6 | 109.3 | 104.6 | 104.6 |
| 47.5° | 8357.1 | 4889.2 | 446.9 | 337.5 | 259.1 | 171.1 | 126.0 | 107.0 | 99.8 | 97.5 | 95.1 |
| 50° | 8808.7 | 4658.7 | 418.3 | 309.0 | 221.0 | 140.2 | 109.3 | 97.5 | 92.7 | 90.3 | 90.3 |
| 52.5° | 9203.3 | 4390.1 | 382.7 | 275.7 | 180.6 | 121.2 | 97.5 | 90.3 | 85.6 | 80.8 | 78.4 |
| 55° | 9540.8 | 4097.7 | 337.5 | 237.7 | 147.4 | 107.0 | 90.3 | 83.2 | 78.4 | 73.7 | 71.3 |
| 57.5° | 9975.8 | 3931.4 | 271.0 | 192.5 | 121.2 | 95.1 | 83.2 | 76.1 | 71.3 | 64.2 | 64.2 |
| 60° | 10458.3 | 3810.1 | 202.0 | 152.1 | 104.6 | 87.9 | 76.1 | 68.9 | 64.2 | 57.0 | 57.0 |
| 62.5° | 10845.7 | 3629.5 | 159.3 | 123.6 | 90.3 | 78.4 | 68.9 | 61.8 | 57.0 | 49.9 | 49.9 |
| 65° | 10993.1 | 3256.3 | 130.7 | 97.5 | 73.7 | 68.9 | 61.8 | 57.0 | 49.9 | 42.8 | 42.8 |
| 67.5° | 10327.5 | 2510.0 | 109.3 | 78.4 | 61.8 | 59.4 | 54.7 | 52.3 | 42.8 | 38.0 | 35.7 |
| 70° | *8178.8* | *1530.7* | *90.3* | *64.2* | *52.3* | *49.9* | *49.9* | *45.2* | *38.0* | *35.7* | *33.3* |
| 72.5° | 5604.7 | 789.1 | 73.7 | 52.3 | 45.2 | 45.2 | 42.8 | 40.4 | 35.7 | 33.3 | 33.3 |
| 75° | 2911.7 | 263.8 | 57.0 | 40.4 | 35.7 | 38.0 | 38.0 | 35.7 | 33.3 | 33.3 | 30.9 |
| 77.5° | 834.3 | 118.8 | 42.8 | 30.9 | 28.5 | 28.5 | 30.9 | 30.9 | 30.9 | 28.5 | 28.5 |
| 80° | 216.3 | 68.9 | 30.9 | 23.8 | 23.8 | 23.8 | 23.8 | 26.1 | 28.5 | 26.1 | 26.1 |
| 82.5° | 87.9 | 38.0 | 21.4 | 19.0 | 19.0 | 19.0 | 19.0 | 21.4 | 23.8 | 23.8 | 23.8 |
| 85° | 54.7 | 19.0 | 16.6 | 16.6 | 16.6 | 14.3 | 14.3 | 16.6 | 16.6 | 19.0 | 19.0 |
| 87.5° | 33.3 | 14.3 | 14.3 | 14.3 | 14.3 | 11.9 | 11.9 | 11.9 | 11.9 | 11.9 | 11.9 |
| 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

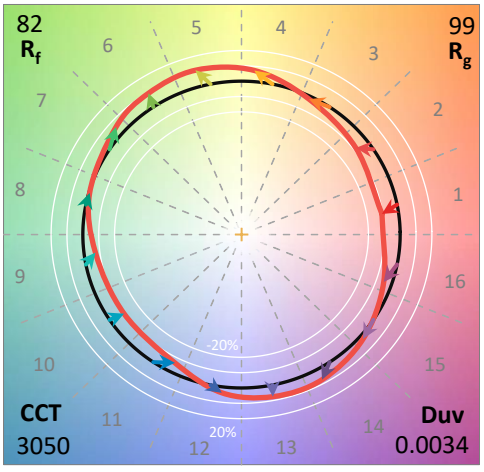
## Test Information

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

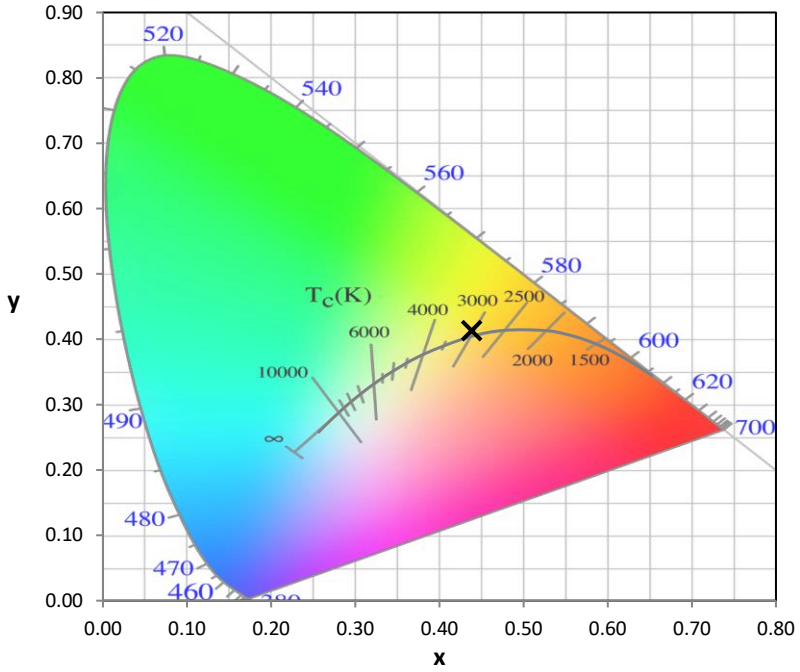
| | |
|---|---|
| Stabilization Time: | 20M |
| Operation Time: | 1H 20M |
| Sphere Temperature (°C): | 24.2 |

REPORT NUMBER: SP1-2408-195-9

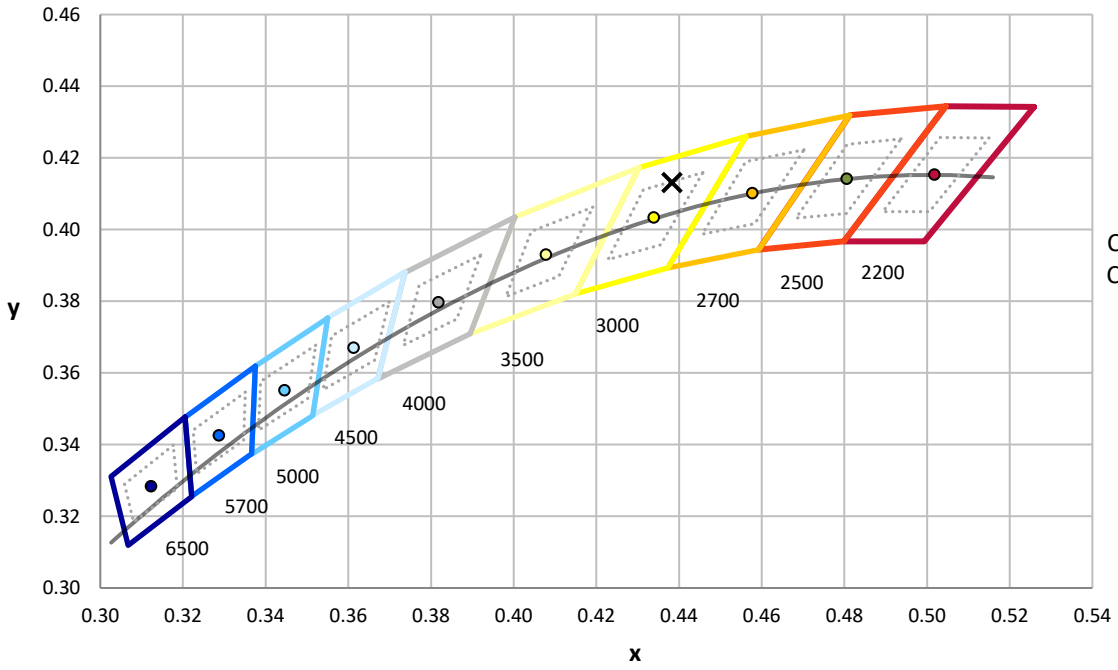
| Measurement and Test Equipment | | | |
|---|---|---|---|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | IN0058 | 6/18/2024 | 12/18/2024 |
| Power Meter | INXT2011004 | 2/8/2024 | 2/8/2025 |
| AC Power Source | IN0063 | 10/24/2023 | 10/24/2024 |
| DC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

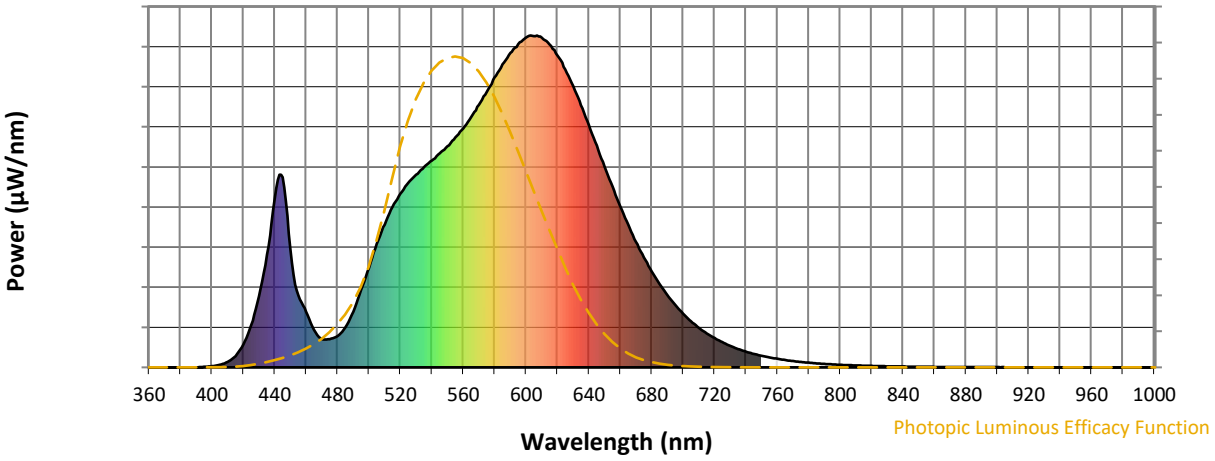



CCT = 3050K
CIE x = 0.4383
CIE y = 0.4131
Duv = 0.0034

Point lies inside the ANSI 3000K 4-step quadrangle

REPORT NUMBER: SP1-2408-195-9

## Photopic Flux vs. Wavelength

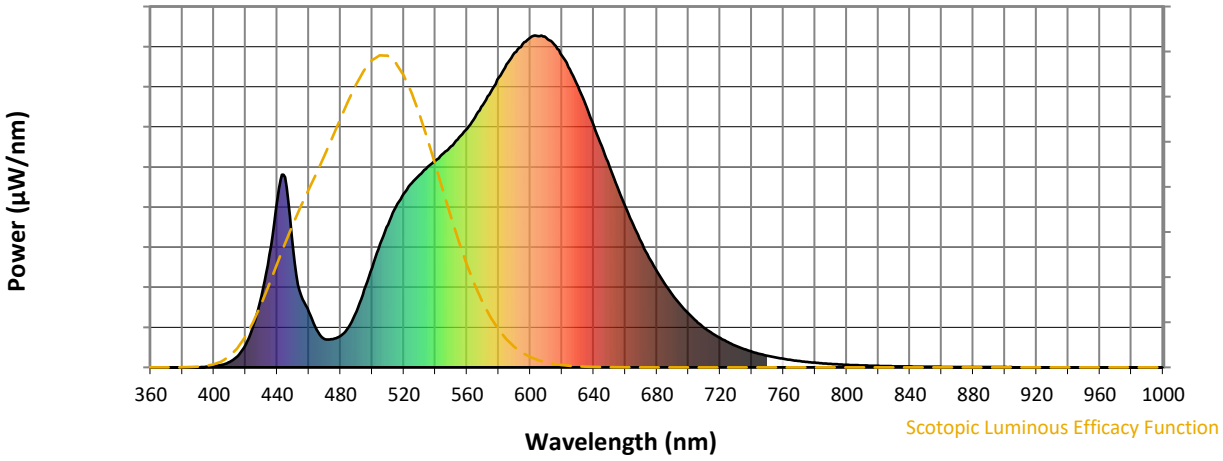



## Photopic Lumens: NR

| 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 | | | |

REPORT NUMBER: SP1-2408-195-9

## Scotopic Flux vs. Wavelength

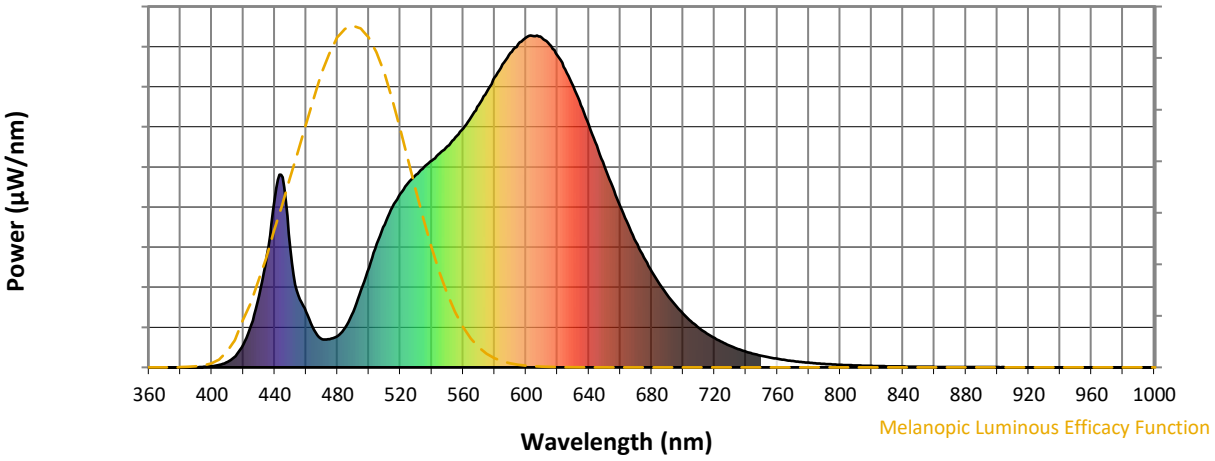



**Scotopic Lumens: NR** **S/P: 1.27**

| 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 | | | |

REPORT NUMBER: SP1-2408-195-9

## 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 | | | |

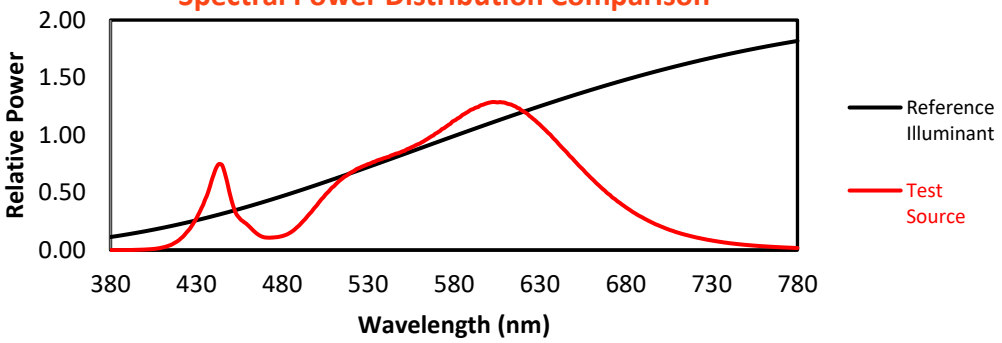
REPORT NUMBER: SP1-2408-195-9

# TM-30-18

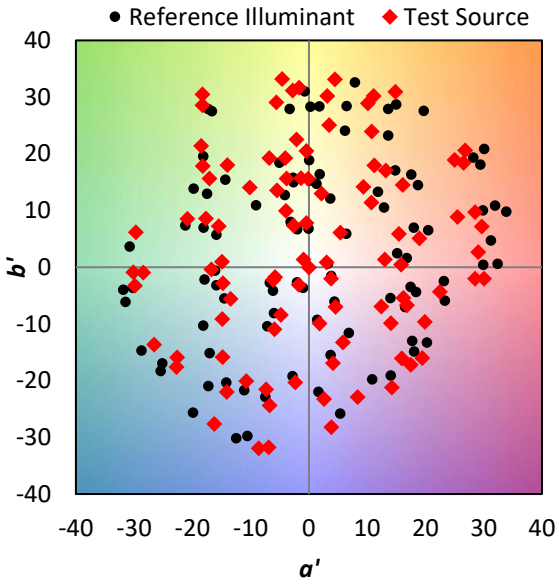
## Summary

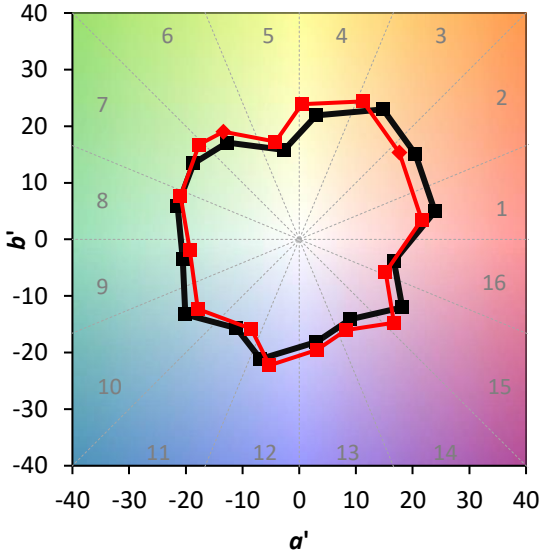
$R_f$ = 81.5
$R_g$ = 99.2
CIE $R_a$ = 81.0
$R_9$ = 7.1

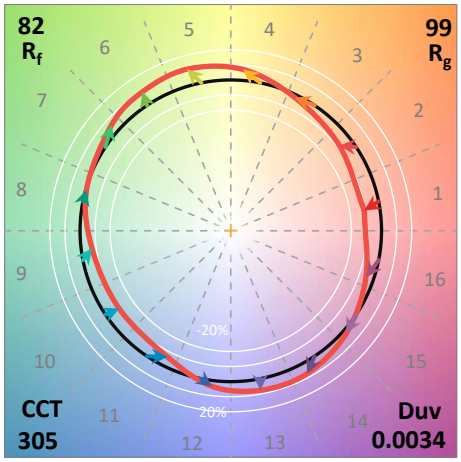
## Spectral Power Distribution Comparison

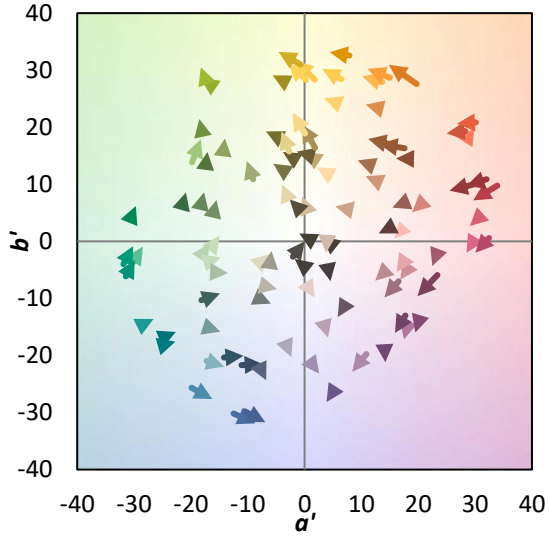



## Color Vector Graphics



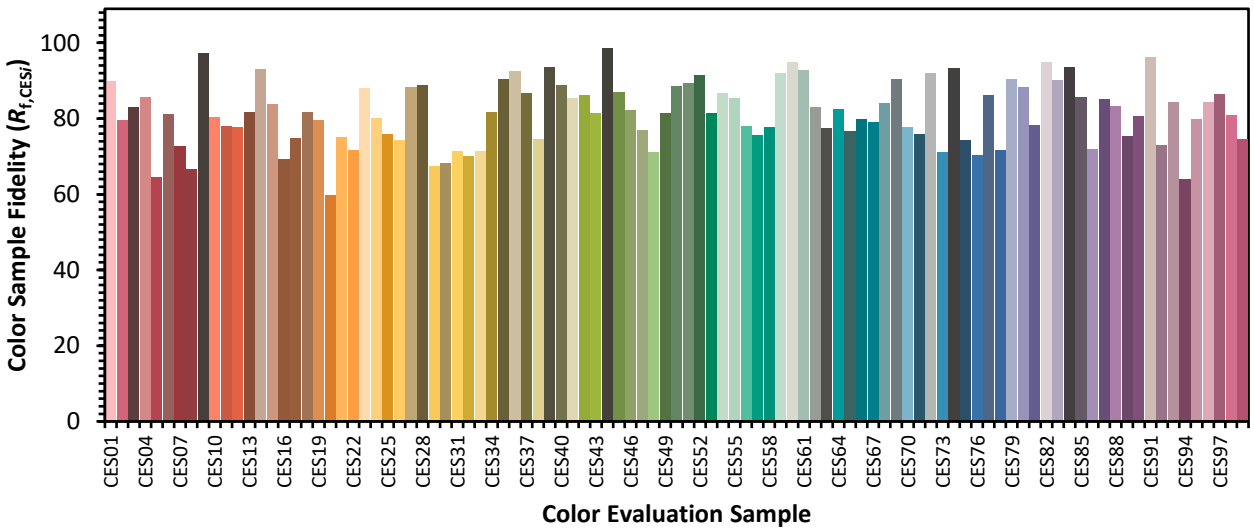



REPORT NUMBER: SP1-2408-195-9

# TM-30-18

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

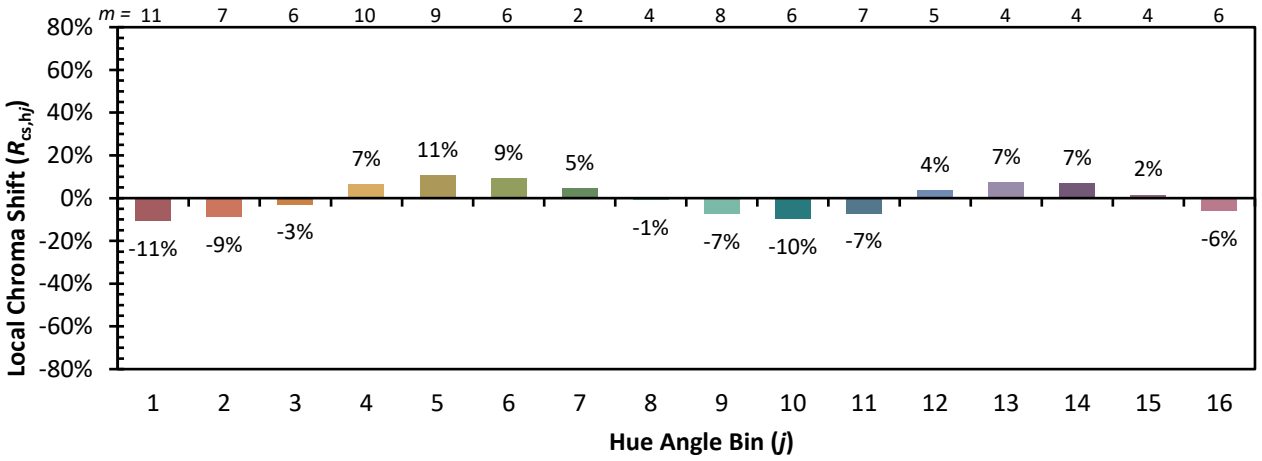
| | | | |
|---|---|---|---|
| CES01 = 86 | CES26 = 74 | CES51 = 89 | CES76 = 70 |
| CES02 = 63 | CES27 = 88 | CES52 = 92 | CES77 = 86 |
| CES03 = 31 | CES28 = 89 | CES53 = 81 | CES78 = 72 |
| CES04 = 70 | CES29 = 67 | CES54 = 87 | CES79 = 90 |
| CES05 = 50 | CES30 = 68 | CES55 = 85 | CES80 = 88 |
| CES06 = 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 | |

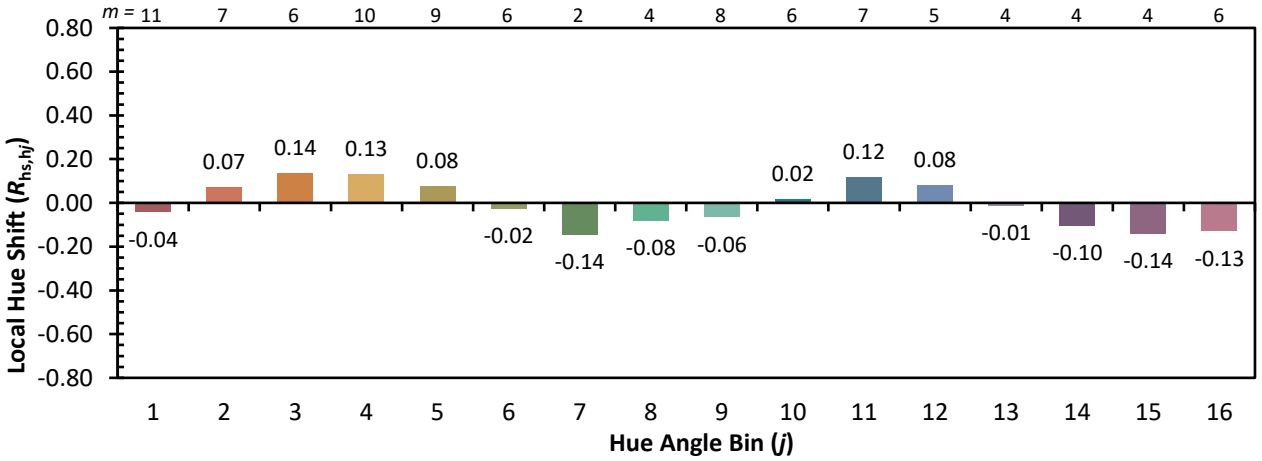


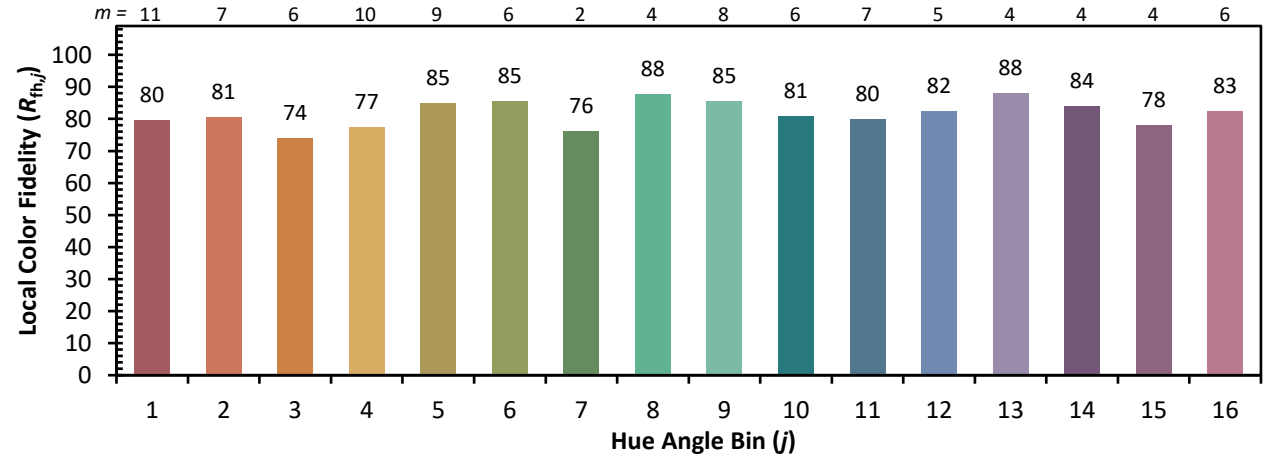
REPORT NUMBER: SP1-2408-195-9

# TM-30-18

## Color Rendition by Hue-Angle Bin



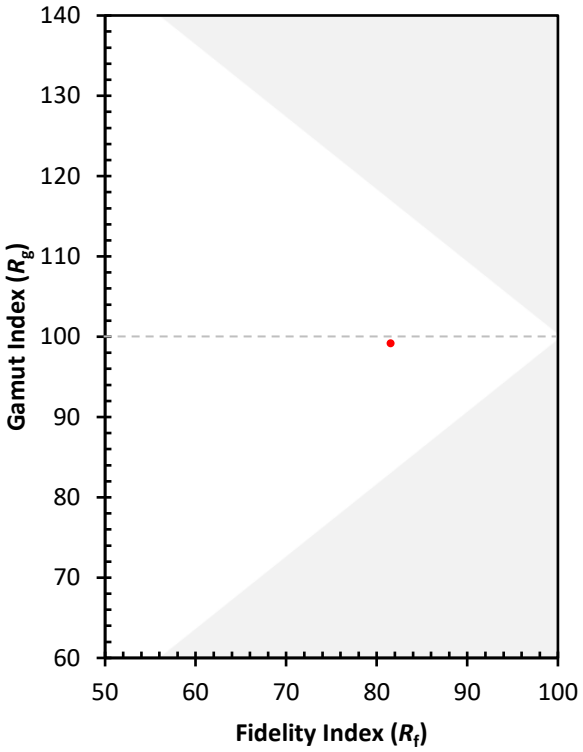



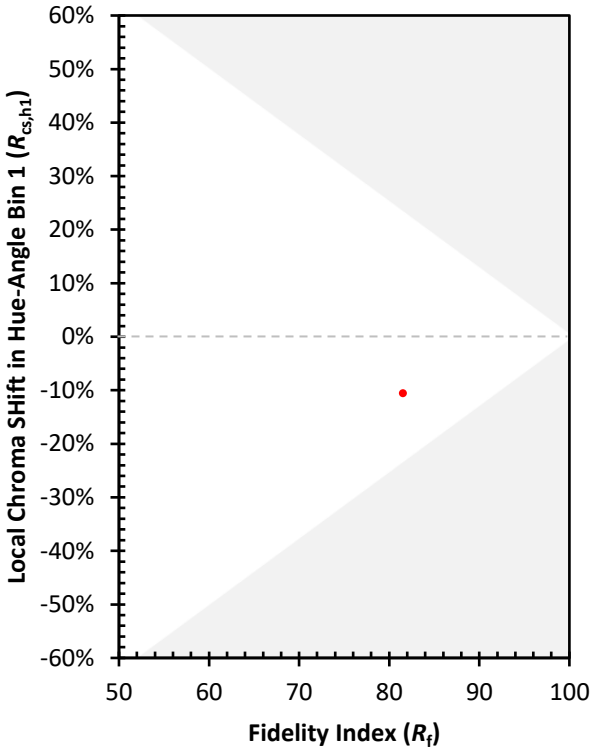



REPORT NUMBER: SP1-2408-195-9

## TM-30-18

### Measure Comparisons




(END OF REPORT)