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: P640477

Luminaire Tested: GWS-SA5D-830-U-T3-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: | P640477 |
| | TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-25) |
| Test Lab: | COOPER LIGHTING SOLUTIONS |
| Issue Date: | 1/10/2023 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS |
| Product Line: | McGRAW-EDISON |
| Catalog Number: | GWS-SA5D-830-U-T3-W-GRSWH |
| Description: | GALLEON WALL SLIM LUMINAIRE. (5) LIGHTSQUARES WITH 16 LEDS EACH AND TYPE III OPTICS W/ FACTORY INSTALLED GLARE SHIELD, WH |
| Light Source: | (80) 3000K CCT, 80 CRI LEDS |
| Ballast/Driver: | - |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 20368.2 lumens |
| Efficiency: | N/A |
| Efficacy: | 99.6 lumens/watt |
| Luminous Opening: | Rectangular (W 1.5' x L: 1' x H: 0') |
| IES Classification: | Type II - Short |
| BUG Rating: | B3 - 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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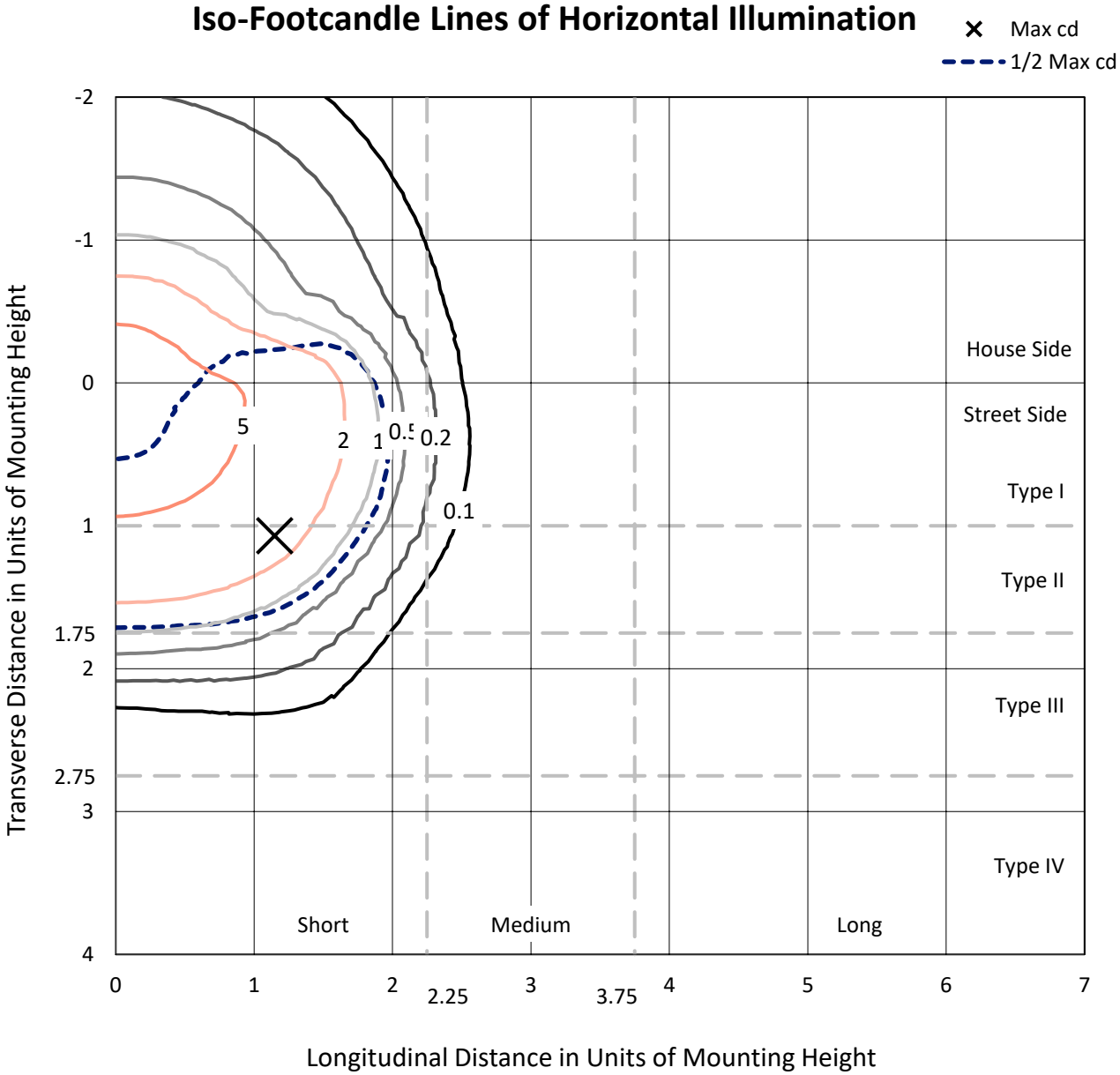
Scaled Data Report

REPORT NUMBER: P640477
CATALOG NUMBER: GWS-SA5D-830-U-T3-W-GRSWH

## Iso-Footcandle Lines of Horizontal Illumination




Based on 25 foot mounting height. Maximum calculated value = 6.7 fc
Type II - Short - N/A

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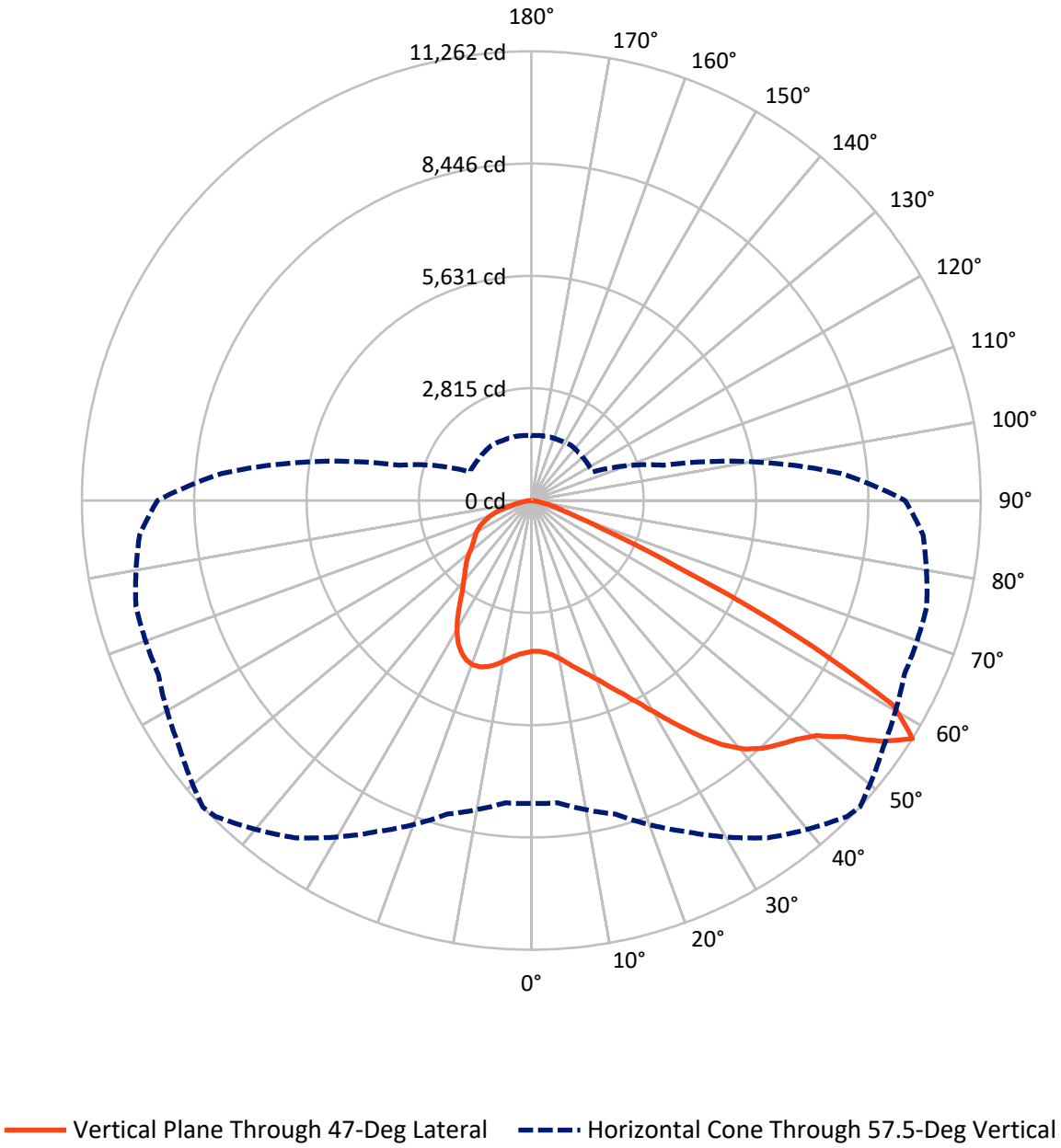
## Luminous Intensity Polar Plot



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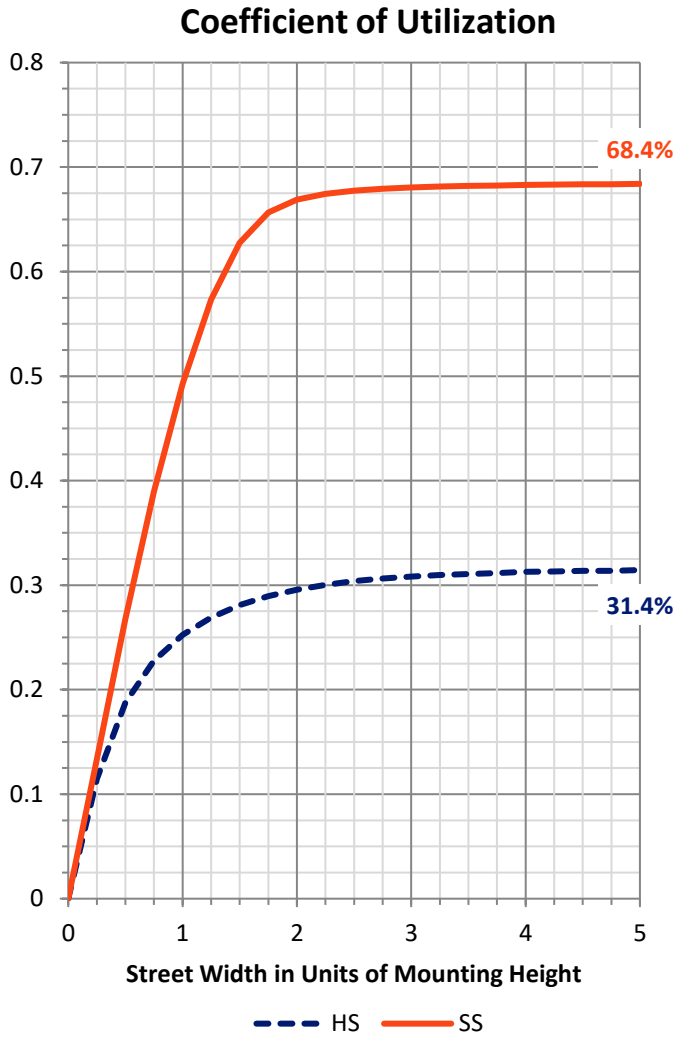
REPORT NUMBER: P640477
CATALOG NUMBER: GWS-SA5D-830-U-T3-W-GRSWH

**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 6446.5 | 0.0 | 6446.5 |
| | % Fixture | 31.6 | 0.0 | 31.6 |
| **Street Side** | Lumens | 13921.7 | 0.0 | 13921.7 |
| | % Fixture | 68.4 | 0.0 | 68.4 |
| **Total** | Lumens | 20368.2 | 0.0 | 20368.2 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 372.6 | 1.8 |
| 10°-20° | 1225.4 | 6.0 |
| 20°-30° | 2206.4 | 10.8 |
| 30°-40° | 3332.6 | 16.4 |
| 40°-50° | 4487.7 | 22.0 |
| 50°-60° | 5392.6 | 26.5 |
| 60°-70° | 2626.3 | 12.9 |
| 70°-80° | 647.0 | 3.2 |
| 80°-90° | 77.8 | 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° | 20368.2 | 100.0 |
| 0°-180° | 20368.2 | 100.0 |



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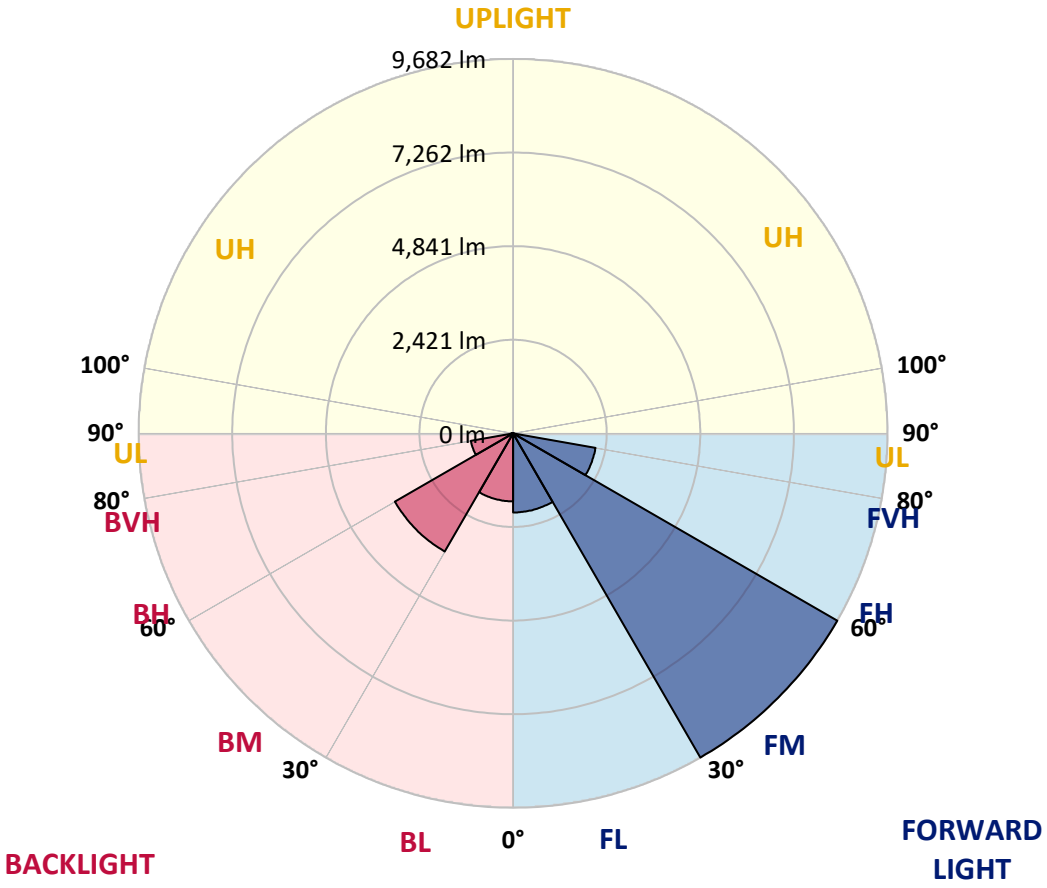
REPORT NUMBER: P640477
CATALOG NUMBER: GWS-SA5D-830-U-T3-W-GRSWH

## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 2045.9 | 10.0 | | | |
| FM | (30°-60°) | 9682.1 | 47.5 | | | |
| FH | (60°-80°) | 2164.5 | 10.6 | | | G2/5000 |
| FVH | (80°-90°) | 29.2 | 0.1 | | | G1/100 |
| BL | (0°-30°) | 1758.5 | 8.6 | B3/2500 | | |
| BM | (30°-60°) | 3530.7 | 17.3 | B3/5000 | | |
| BH | (60°-80°) | 1108.8 | 5.4 | B3/2500 | | G3/2500 |
| BVH | (80°-90°) | 48.5 | 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-G3**
Type II Short



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REPORT NUMBER: P640477
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**CANDELA DISTRIBUTION (FULL):**

| | 0° | 5° | 15° | 25° | 35° | 45° | 47° | 55° | 65° | 75° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 3777.3 | 3777.3 | 3777.3 | 3777.3 | 3777.3 | 3777.3 | *3777.3* | 3777.3 | 3777.3 | 3777.3 | 3777.3 |
| 2.5° | 3770.5 | 3768.8 | 3768.8 | 3779.0 | 3779.0 | 3782.4 | *3787.6* | 3792.7 | 3794.4 | 3785.9 | 3767.0 |
| 5° | 3811.5 | 3811.5 | 3811.5 | 3820.1 | 3820.1 | 3823.5 | *3830.3* | 3832.1 | 3830.3 | 3816.7 | 3797.8 |
| 7.5° | 3876.5 | 3876.5 | 3878.2 | 3888.5 | 3897.1 | 3902.2 | *3914.2* | 3912.5 | 3907.3 | 3885.1 | 3861.1 |
| 10° | 3982.6 | 3987.7 | 3992.9 | 4004.8 | 4021.9 | 4033.9 | *4042.5* | 4042.5 | 4035.6 | 4001.4 | 3970.6 |
| 12.5° | 4133.1 | 4140.0 | 4145.1 | 4155.4 | 4169.1 | 4189.6 | *4208.4* | 4208.4 | 4199.9 | 4157.1 | 4110.9 |
| 15° | 4309.4 | 4316.2 | 4314.5 | 4317.9 | 4343.6 | 4372.6 | *4388.0* | 4398.3 | 4401.7 | 4341.9 | 4270.0 |
| 17.5° | 4511.2 | 4518.1 | 4511.2 | 4501.0 | 4504.4 | 4550.6 | *4577.9* | 4615.6 | 4637.8 | 4557.4 | 4442.8 |
| 20° | 4694.3 | 4687.4 | 4687.4 | 4694.3 | 4704.5 | 4761.0 | *4802.0* | 4863.6 | 4891.0 | 4793.5 | 4615.6 |
| 22.5° | 4887.6 | 4903.0 | 4896.1 | 4896.1 | 4937.2 | 5031.3 | *5080.9* | 5161.3 | 5190.4 | 5063.8 | 4824.3 |
| 25° | 5137.3 | 5151.0 | 5147.6 | 5151.0 | 5198.9 | 5332.4 | *5382.0* | 5530.8 | 5559.9 | 5378.6 | 5055.2 |
| 27.5° | 5411.1 | 5433.3 | 5443.6 | 5440.2 | 5517.1 | 5691.6 | *5753.2* | 5960.2 | 6013.2 | 5731.0 | 5301.6 |
| 30° | 5766.9 | 5790.9 | 5799.4 | 5796.0 | 5886.7 | 6124.4 | *6194.6* | 6430.7 | 6505.9 | 6148.4 | 5614.6 |
| 32.5° | 6179.2 | 6203.1 | 6228.8 | 6239.1 | 6355.4 | 6598.3 | *6699.3* | 6943.9 | 7051.7 | 6630.8 | 5992.7 |
| 35° | 6588.1 | 6608.6 | 6658.2 | 6738.6 | 6897.7 | 7145.8 | *7234.7* | 7475.9 | 7580.3 | 7132.1 | 6449.5 |
| 37.5° | 7039.7 | 7053.4 | 7096.1 | 7207.3 | 7436.6 | 7672.7 | *7761.6* | 7992.6 | 8004.5 | 7616.2 | 6966.1 |
| 40° | 7534.1 | 7534.1 | 7525.5 | 7635.0 | 7874.5 | 8112.3 | *8189.3* | 8322.7 | 8252.6 | 7989.2 | 7469.1 |
| 42.5° | 7953.2 | 7946.4 | 7953.2 | 8055.9 | 8233.8 | 8427.1 | *8493.8* | 8468.2 | 8379.2 | 8274.8 | 7924.1 |
| 45° | 8331.3 | 8336.4 | 8398.0 | 8476.7 | 8569.1 | 8683.7 | *8723.1* | 8577.6 | 8497.2 | 8504.1 | 8288.5 |
| 47.5° | 8587.9 | 8593.0 | 8736.7 | 8868.5 | 8924.9 | 8960.9 | *8943.7* | 8741.9 | 8700.8 | 8777.8 | 8569.1 |
| 50° | 8622.1 | 8649.5 | 8897.6 | 9167.9 | 9308.1 | 9313.3 | *9265.4* | 9019.0 | 9007.0 | 9094.3 | 8719.6 |
| 52.5° | 8629.0 | 8656.3 | 8966.0 | 9453.5 | 9817.9 | 9894.9 | *9840.2* | 9583.6 | 9458.7 | 9371.4 | 8904.4 |
| 55° | 8603.3 | 8634.1 | 8976.2 | 9645.1 | 10343.1 | 10651.1 | *10656.2* | 10293.5 | 9894.9 | 9836.8 | 9431.3 |
| 57.5° | *7595.7* | *7607.7* | *8138.0* | *9157.6* | *10322.6* | *11195.1* | *11261.8* | *10769.1* | *10314.0* | *10259.3* | *9853.9* |
| 60° | 5291.3 | 5339.2 | 5915.7 | 7262.1 | 8671.7 | 10209.7 | *10425.2* | 10281.5 | 9977.0 | 9578.4 | 8454.5 |
| 62.5° | 2649.9 | 2691.0 | 3269.2 | 4542.0 | 5980.7 | 7195.4 | *7426.3* | 7578.6 | 7650.4 | 7222.7 | 5756.6 |
| 65° | 1141.1 | 1171.9 | 1531.1 | 2372.8 | 3385.6 | 3972.3 | *4052.7* | 4235.8 | 4684.0 | 4179.3 | 3101.6 |
| 67.5° | 763.0 | 783.5 | 966.6 | 1447.3 | 1994.7 | 2032.4 | *2020.4* | 2059.7 | 2157.2 | 1780.9 | 1401.1 |
| 70° | 585.1 | 602.2 | 725.4 | 1060.7 | 1433.6 | 1226.6 | *1161.6* | 1053.8 | 1144.5 | 1166.7 | 1135.9 |
| 72.5° | 424.3 | 437.9 | 530.3 | 723.6 | 898.1 | 783.5 | *773.3* | 828.0 | 951.2 | 985.4 | 966.6 |
| 75° | 273.7 | 280.6 | 337.0 | 396.9 | 463.6 | 503.0 | *523.5* | 622.7 | 747.6 | 773.3 | 751.0 |
| 77.5° | 183.0 | 188.2 | 220.7 | 254.9 | 263.5 | 265.2 | *272.0* | 316.5 | 402.0 | 449.9 | 444.8 |
| 80° | 95.8 | 95.8 | 107.8 | 107.8 | 123.2 | 147.1 | *154.0* | 183.0 | 222.4 | 246.3 | 248.1 |
| 82.5° | 37.6 | 39.3 | 46.2 | 51.3 | 61.6 | 75.3 | *80.4* | 95.8 | 116.3 | 133.4 | 148.8 |
| 85° | 15.4 | 17.1 | 18.8 | 22.2 | 27.4 | 34.2 | *35.9* | 41.1 | 54.7 | 68.4 | 77.0 |
| 87.5° | 0.0 | 0.0 | 1.7 | 1.7 | 3.4 | 5.1 | *5.1* | 6.8 | 8.6 | 15.4 | 20.5 |
| 90° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | *0.0* | 0.0 | 0.0 | 0.0 | 0.0 |

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Scaled Data Report

REPORT NUMBER: P640477
CATALOG NUMBER: GWS-SA5D-830-U-T3-W-GRSWH

**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 3777.3 | 3777.3 | 3777.3 | 3777.3 | 3777.3 | 3777.3 | 3777.3 | 3777.3 | 3777.3 | 3777.3 | 3777.3 |
| 2.5° | 3789.3 | 3767.0 | 3789.3 | 3796.1 | 3814.9 | 3821.8 | 3809.8 | 3808.1 | 3808.1 | 3791.0 | 3785.9 |
| 5° | 3814.9 | 3794.4 | 3816.7 | 3826.9 | 3854.3 | 3871.4 | 3874.8 | 3888.5 | 3897.1 | 3890.2 | 3888.5 |
| 7.5° | 3878.2 | 3852.6 | 3876.5 | 3891.9 | 3927.9 | 3955.2 | 3967.2 | 3998.0 | 4020.2 | 4016.8 | 4015.1 |
| 10° | 3989.4 | 3955.2 | 3982.6 | 4008.3 | 4047.6 | 4080.1 | 4081.8 | 4098.9 | 4121.2 | 4114.3 | 4110.9 |
| 12.5° | 4117.7 | 4085.2 | 4116.0 | 4141.7 | 4187.9 | 4201.6 | 4179.3 | 4172.5 | 4175.9 | 4167.4 | 4160.5 |
| 15° | 4275.1 | 4228.9 | 4256.3 | 4285.4 | 4311.1 | 4295.7 | 4247.8 | 4228.9 | 4227.2 | 4215.3 | 4208.4 |
| 17.5° | 4432.5 | 4374.4 | 4394.9 | 4410.3 | 4398.3 | 4350.4 | 4290.5 | 4258.0 | 4242.6 | 4218.7 | 4211.8 |
| 20° | 4588.2 | 4514.6 | 4511.2 | 4499.2 | 4444.5 | 4357.3 | 4276.8 | 4211.8 | 4172.5 | 4140.0 | 4128.0 |
| 22.5° | 4766.1 | 4663.5 | 4612.2 | 4557.4 | 4437.7 | 4295.7 | 4174.2 | 4081.8 | 4018.5 | 3977.5 | 3963.8 |
| 25° | 4957.7 | 4812.3 | 4706.2 | 4596.8 | 4369.2 | 4163.9 | 3994.6 | 3868.0 | 3792.7 | 3748.2 | 3732.8 |
| 27.5° | 5147.6 | 4947.5 | 4788.4 | 4601.9 | 4232.4 | 3974.0 | 3746.5 | 3575.4 | 3500.2 | 3464.2 | 3452.3 |
| 30° | 5404.2 | 5127.1 | 4885.9 | 4535.2 | 4052.7 | 3710.6 | 3426.6 | 3253.8 | 3204.2 | 3178.6 | 3168.3 |
| 32.5° | 5700.2 | 5354.6 | 5015.9 | 4394.9 | 3823.5 | 3402.7 | 3103.3 | 2983.5 | 2949.3 | 2899.7 | 2898.0 |
| 35° | 6090.2 | 5679.7 | 5139.1 | 4187.9 | 3534.4 | 3072.5 | 2855.2 | 2769.7 | 2708.1 | 2629.4 | 2622.6 |
| 37.5° | 6545.3 | 6085.1 | 5205.8 | 3924.4 | 3197.4 | 2800.5 | 2670.5 | 2574.7 | 2475.4 | 2371.1 | 2357.4 |
| 40° | 7015.7 | 6559.0 | 5210.9 | 3613.1 | 2867.2 | 2620.9 | 2511.4 | 2386.5 | 2263.3 | 2147.0 | 2131.6 |
| 42.5° | 7510.1 | 7000.3 | 5120.2 | 3253.8 | 2596.9 | 2465.2 | 2354.0 | 2196.6 | 2058.0 | 1979.3 | 1970.8 |
| 45° | 7951.5 | 7356.2 | 4915.0 | 2875.8 | 2396.7 | 2335.2 | 2193.2 | 2023.8 | 1950.2 | 1893.8 | 1881.8 |
| 47.5° | 8298.8 | 7592.3 | 4637.8 | 2537.0 | 2234.2 | 2201.7 | 2017.0 | 1929.7 | 1873.3 | 1821.9 | 1810.0 |
| 50° | 8469.9 | 7645.3 | 4276.8 | 2261.6 | 2083.7 | 2044.3 | 1917.7 | 1851.0 | 1813.4 | 1772.3 | 1762.1 |
| 52.5° | 8682.0 | 7705.2 | 3965.5 | 2030.6 | 1936.6 | 1883.5 | 1835.6 | 1782.6 | 1755.2 | 1729.6 | 1721.0 |
| 55° | 9169.6 | 7931.0 | 3801.3 | 1845.9 | 1796.3 | 1772.3 | 1765.5 | 1721.0 | 1712.4 | 1695.3 | 1679.9 |
| 57.5° | *9368.0* | *7785.6* | *3412.9* | *1695.3* | *1685.1* | *1688.5* | *1705.6* | *1664.5* | *1656.0* | *1635.5* | *1625.2* |
| 60° | 7534.1 | 5884.9 | 2311.2 | 1565.3 | 1592.7 | 1614.9 | 1632.0 | 1591.0 | 1579.0 | 1575.6 | 1561.9 |
| 62.5° | 4827.7 | 3619.9 | 1613.2 | 1443.9 | 1484.9 | 1512.3 | 1522.6 | 1483.2 | 1474.7 | 1502.0 | 1503.7 |
| 65° | 2513.1 | 1972.5 | 1308.7 | 1313.8 | 1348.1 | 1389.1 | 1409.6 | 1396.0 | 1392.5 | 1421.6 | 1423.3 |
| 67.5° | 1283.1 | 1206.1 | 1141.1 | 1159.9 | 1187.3 | 1240.3 | 1288.2 | 1348.1 | 1368.6 | 1372.0 | 1373.7 |
| 70° | 1093.2 | 1058.9 | 1026.4 | 1038.4 | 1067.5 | 1096.6 | 1142.8 | 1171.9 | 1137.6 | 1129.1 | 1125.7 |
| 72.5° | 930.6 | 905.0 | 889.6 | 903.3 | 918.7 | 913.5 | 899.8 | 913.5 | 918.7 | 920.4 | 922.1 |
| 75° | 723.6 | 704.8 | 692.8 | 694.6 | 694.6 | 675.7 | 650.1 | 634.7 | 617.6 | 603.9 | 603.9 |
| 77.5° | 443.1 | 446.5 | 458.5 | 456.8 | 455.1 | 448.2 | 422.6 | 408.9 | 367.8 | 355.8 | 355.8 |
| 80° | 253.2 | 258.3 | 270.3 | 273.7 | 273.7 | 265.2 | 239.5 | 224.1 | 205.3 | 196.7 | 195.0 |
| 82.5° | 154.0 | 160.8 | 167.7 | 171.1 | 172.8 | 162.5 | 140.3 | 128.3 | 118.0 | 109.5 | 109.5 |
| 85° | 80.4 | 83.8 | 90.7 | 92.4 | 87.2 | 77.0 | 65.0 | 59.9 | 49.6 | 47.9 | 47.9 |
| 87.5° | 22.2 | 24.0 | 27.4 | 22.2 | 20.5 | 15.4 | 8.6 | 6.8 | 3.4 | 1.7 | 1.7 |
| 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

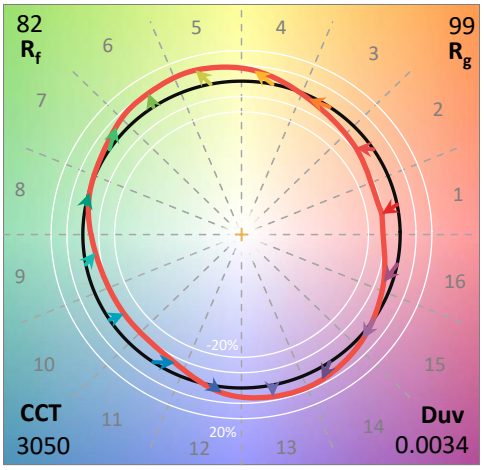
## Test Information

| | |
|---|---|
| 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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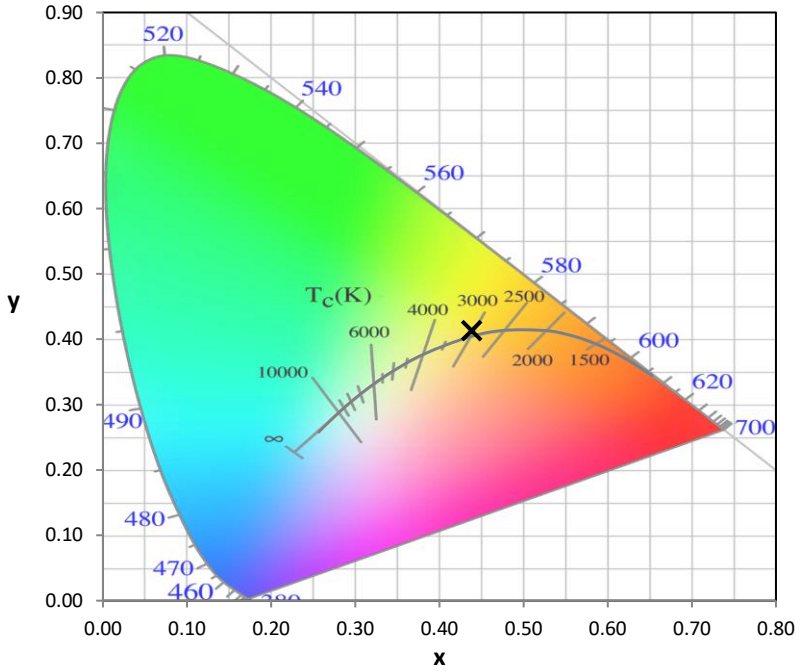
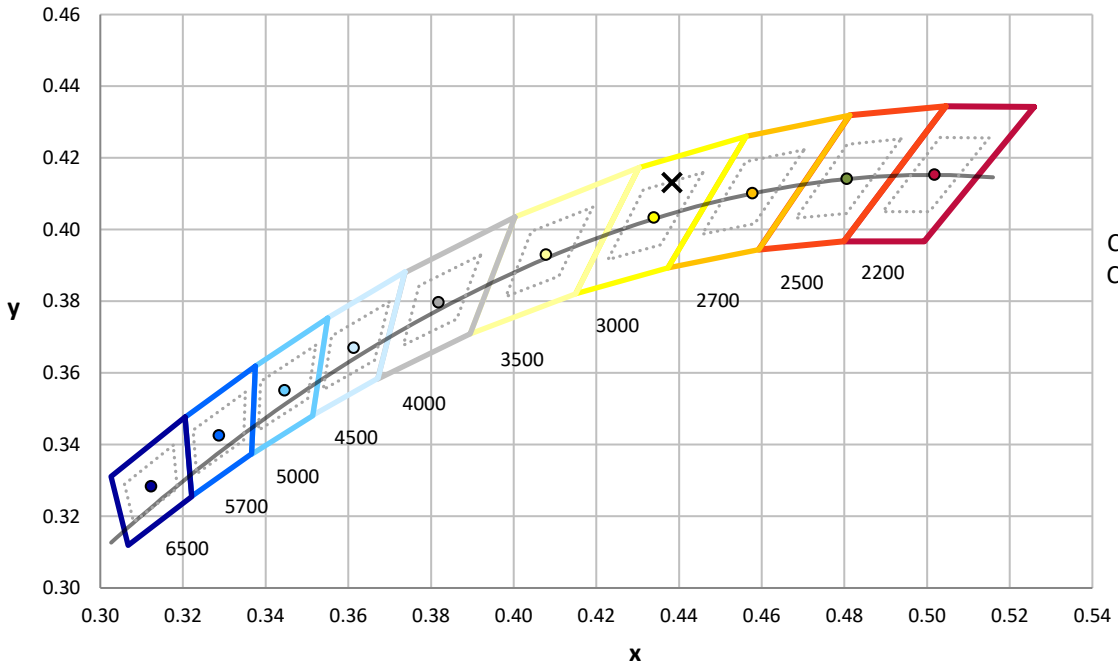
## CIE 1931 Chromaticity Diagram




## 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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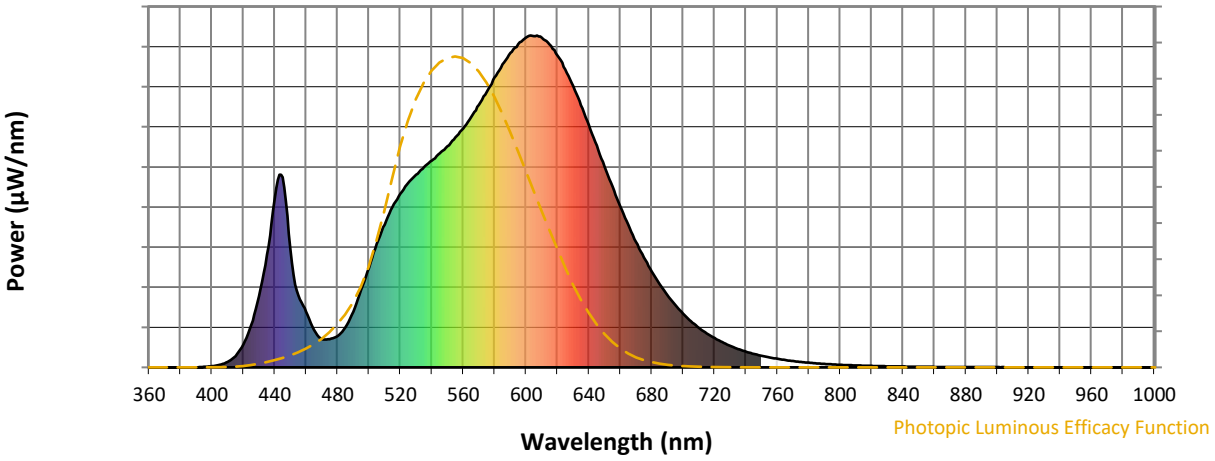
## Photopic Flux vs. Wavelength




## 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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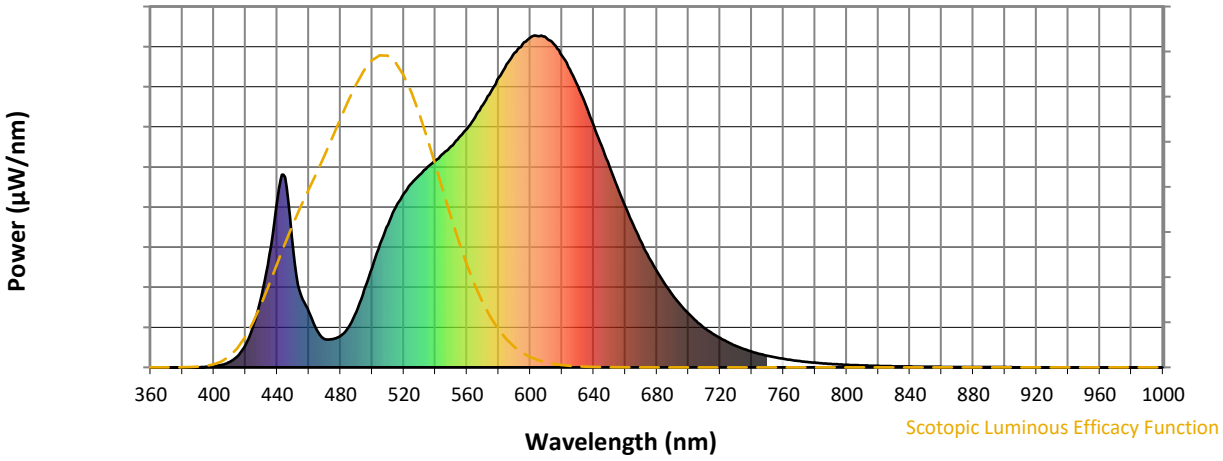
## Scotopic Flux vs. Wavelength




**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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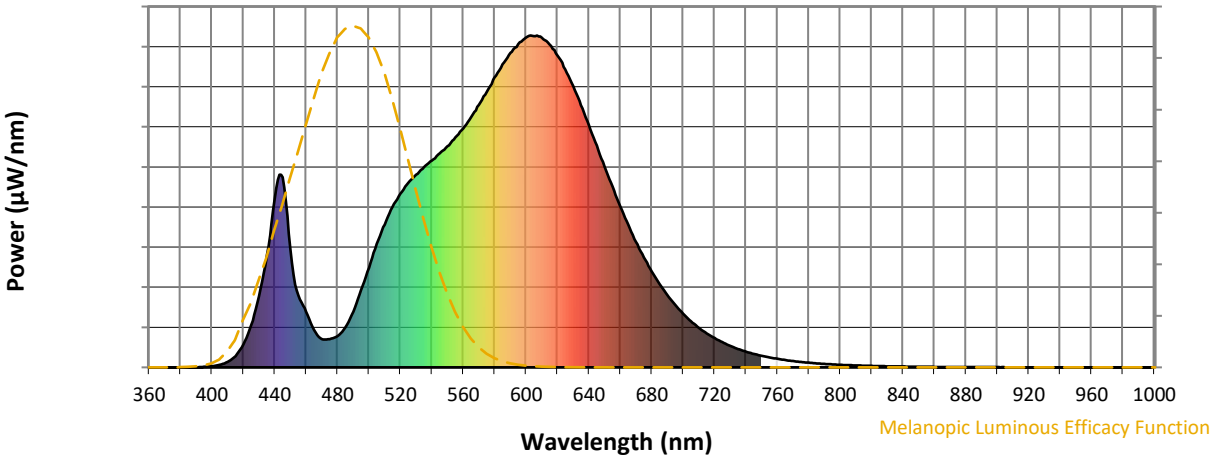
## Melanopic Flux vs. Wavelength




**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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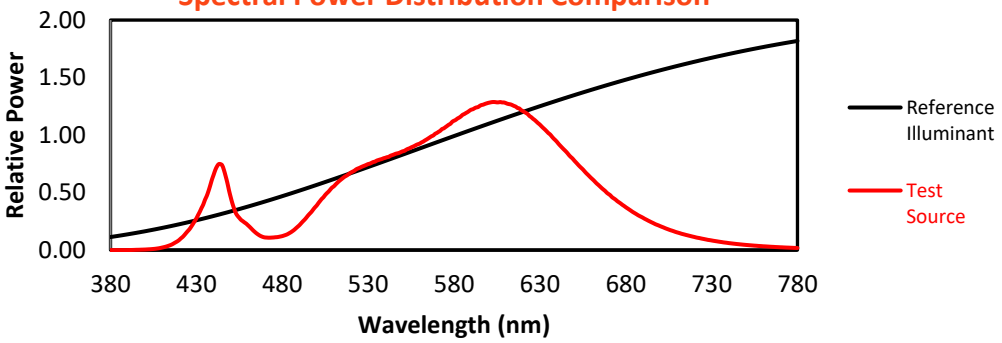
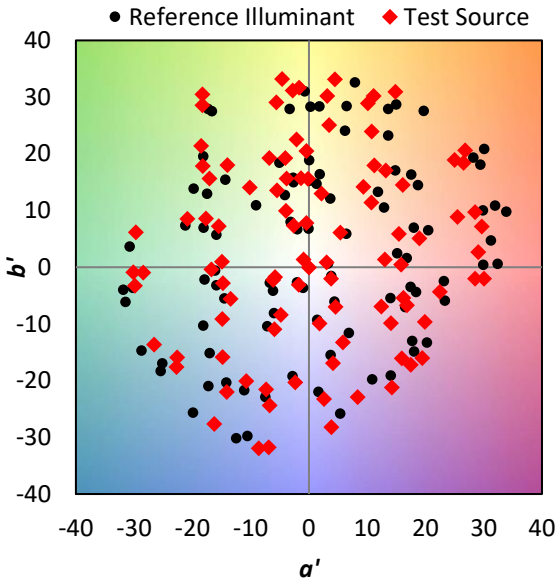
## Summary

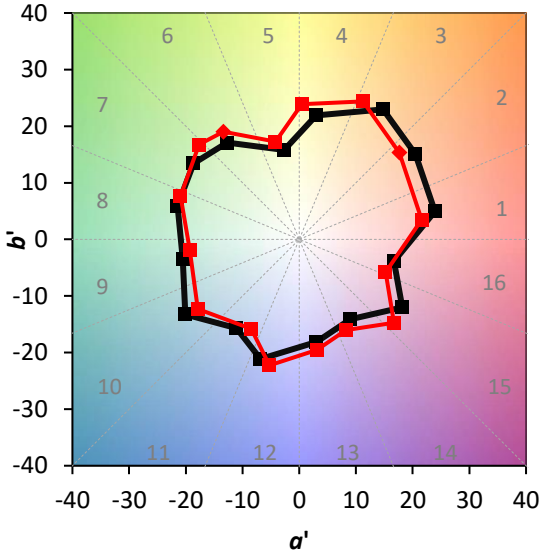
$R_f$ = 81.5
$R_g$ = 99.2
CIE $R_a$ = 81.0
$R_9$ = 7.1

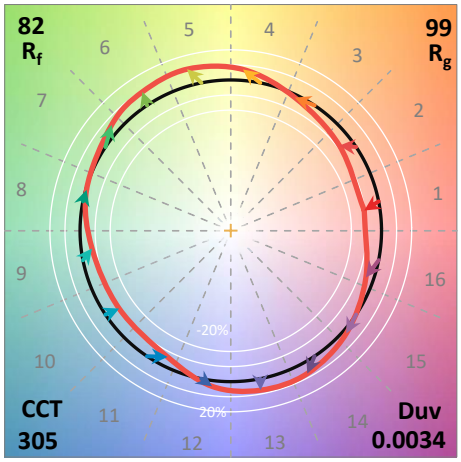
## Spectral Power Distribution Comparison

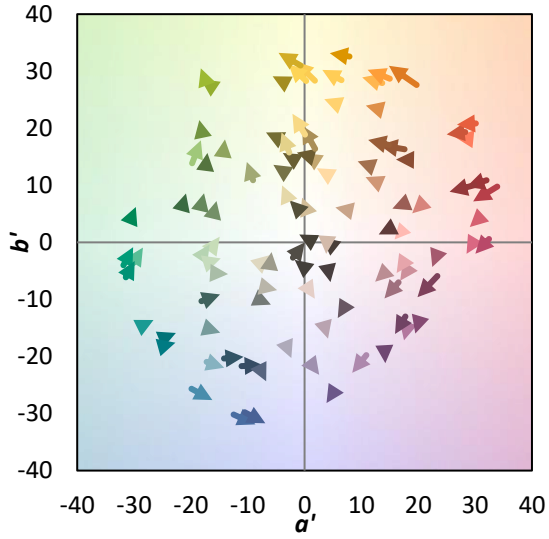



## Color Vector Graphics



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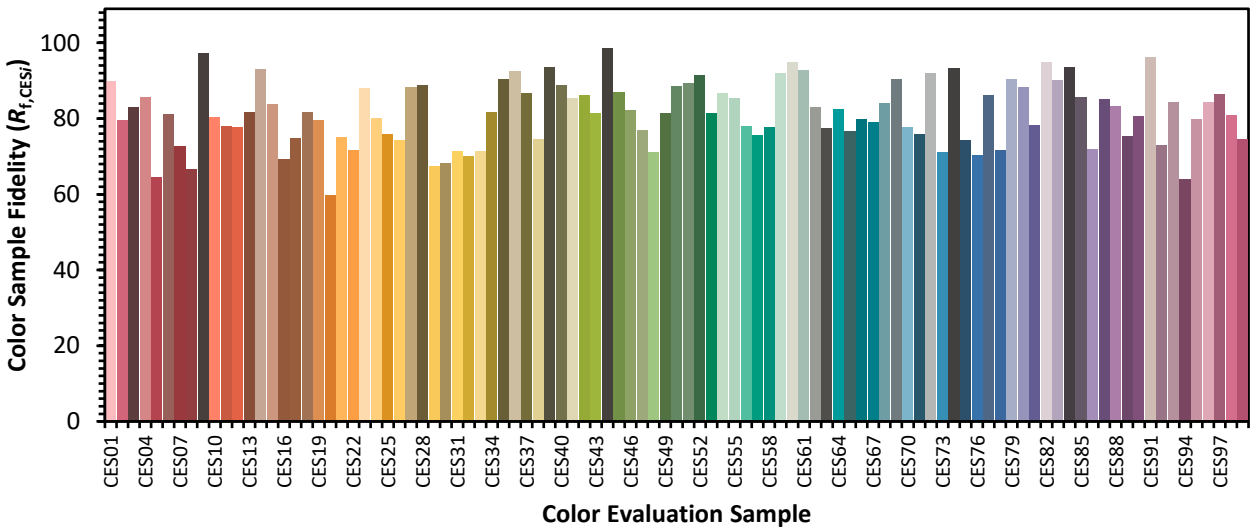
## Individual Sample Fidelity Index ($R_{f,i}$)

| | | | |
|---|---|---|---|
| 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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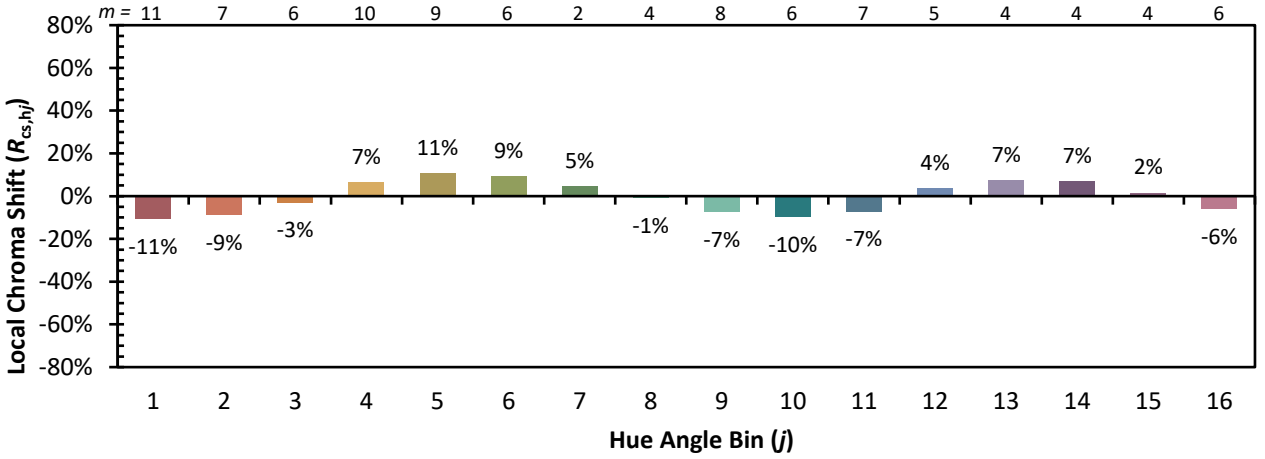
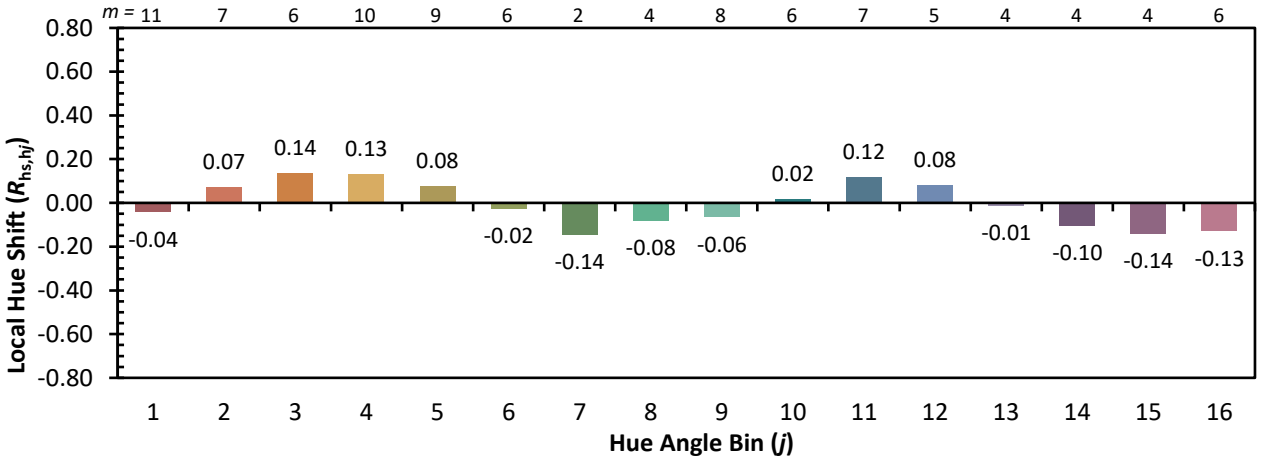
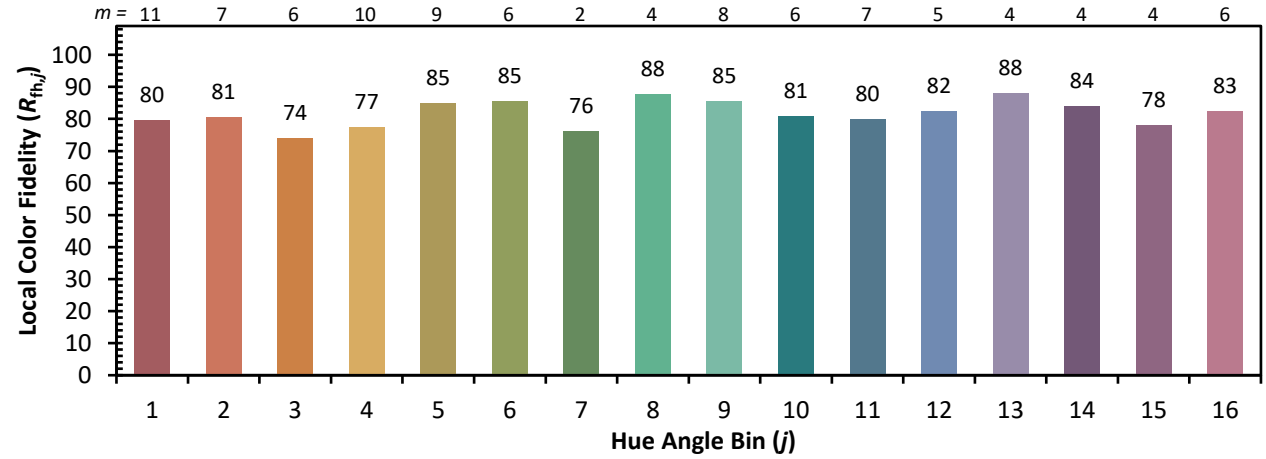
## Color Rendition by Hue-Angle Bin



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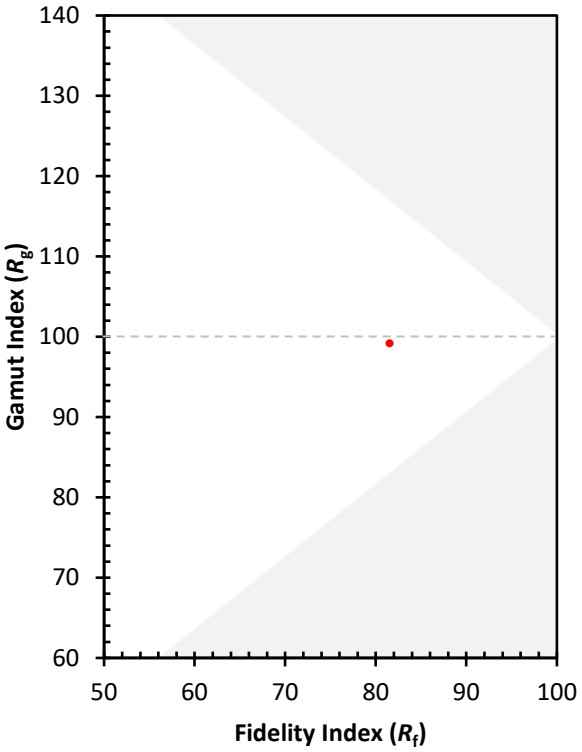
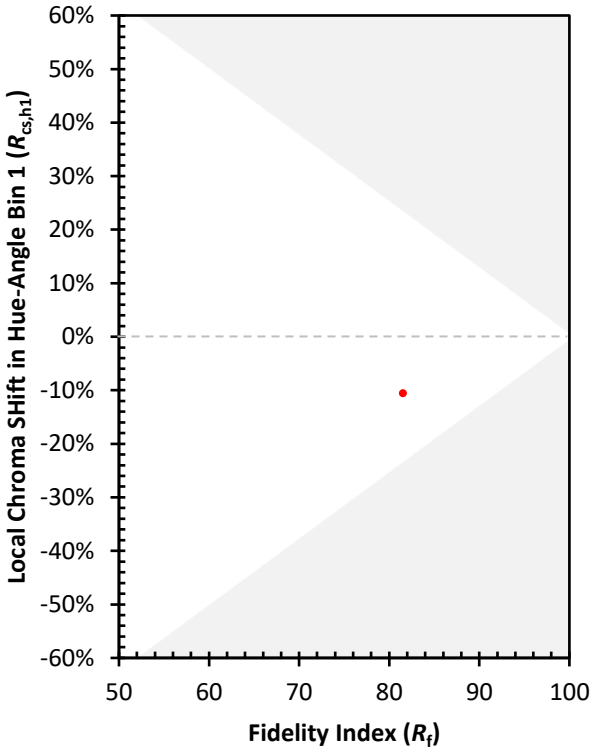
## Measure Comparisons




(END OF REPORT)