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: P641470

Luminaire Tested: GWS-SA5F-830-U-T3R-W-GRSBK

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: | P641470 |
| | TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-16) |
| 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-GRSBK |
| Description: | GALLEON WALL SLIM LUMINAIRE. (5) LIGHTSQUARES WITH 16 LEDS EACH AND TYPE III ROADWAY OPTICS W/ FACTORY INSTALLED GLARE SHIELD, BK |
| Light Source: | (80) 3000K CCT, 80 CRI LEDS |
| Ballast/Driver: | - |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 20795.4 lumens |
| Efficiency: | N/A |
| Efficacy: | 67.0 lumens/watt |
| Luminous Opening: | Rectangular (W 1.5' x L: 1' x H: 0') |
| IES Classification: | Type II - Short |
| BUG Rating: | B3 - U0 - G2 |

| | |
|---|---|
| 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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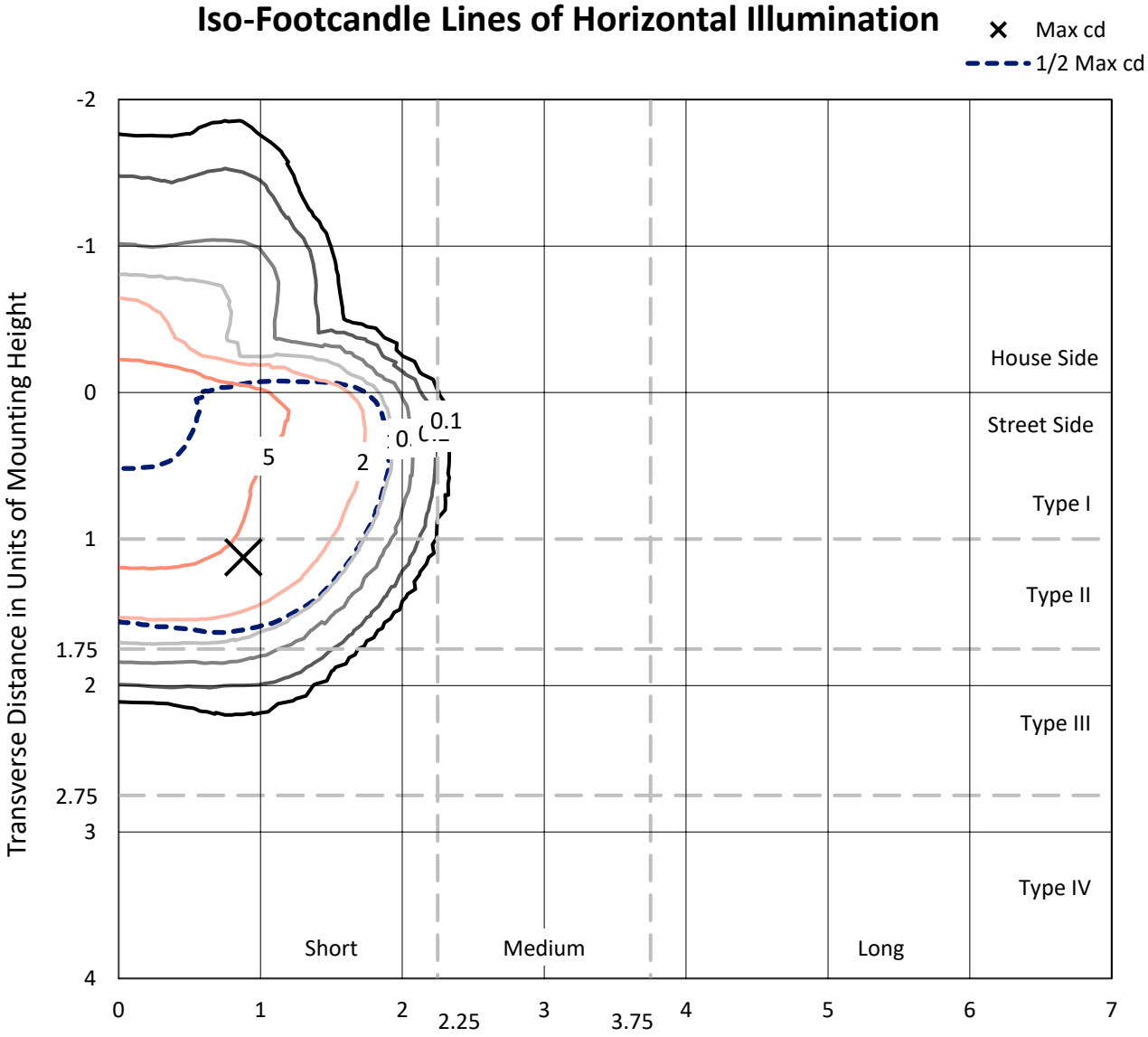
Scaled Data Report

REPORT NUMBER: P641470
CATALOG NUMBER: GWS-SA5F-830-U-T3R-W-GRSBK

## Iso-Footcandle Lines of Horizontal Illumination




Based on 25 foot mounting height. Maximum calculated value = 8.3 fc
Type II - Short - N/A

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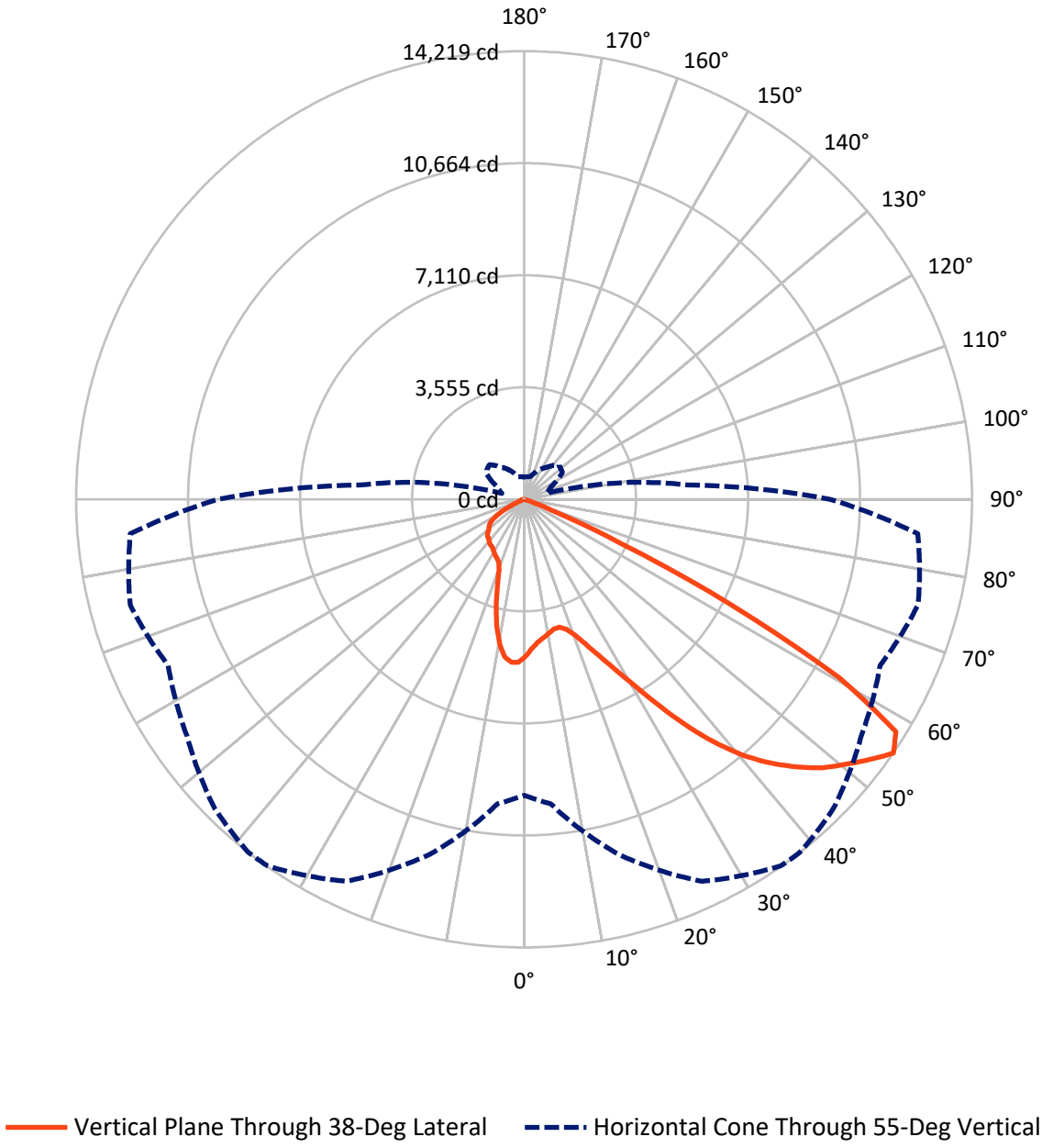
## Luminous Intensity Polar Plot



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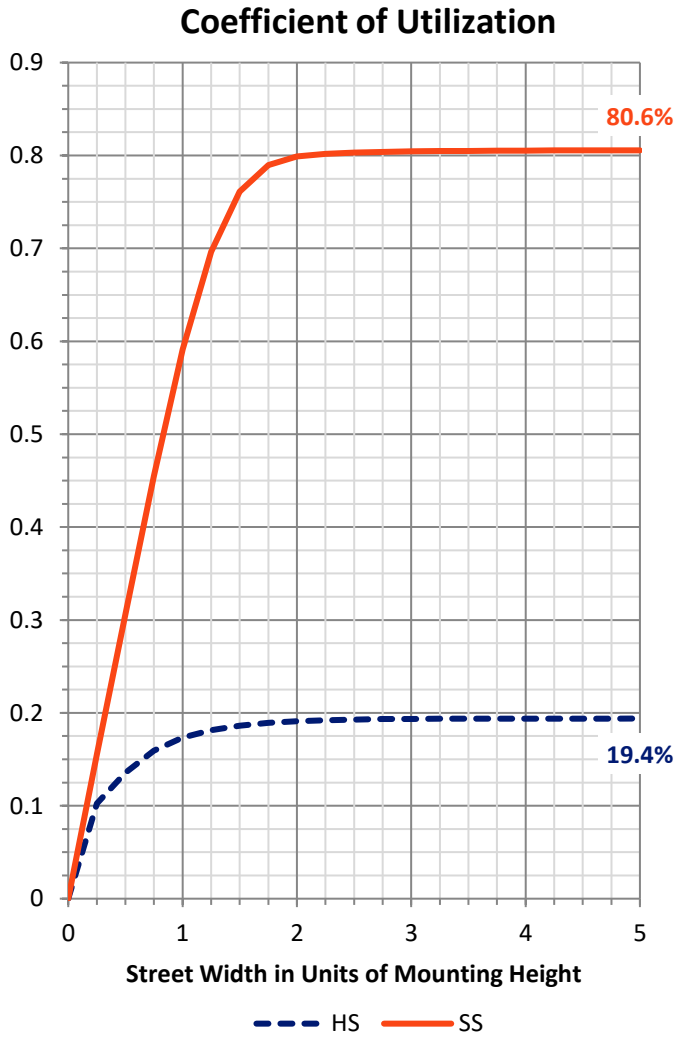
**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 4051.6 | 0.0 | 4051.6 |
| | % Fixture | 19.5 | 0.0 | 19.5 |
| **Street Side** | Lumens | 16743.8 | 0.0 | 16743.8 |
| | % Fixture | 80.5 | 0.0 | 80.5 |
| **Total** | Lumens | 20795.4 | 0.0 | 20795.4 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 461.1 | 2.2 |
| 10°-20° | 1241.4 | 6.0 |
| 20°-30° | 2130.2 | 10.2 |
| 30°-40° | 3533.1 | 17.0 |
| 40°-50° | 5193.9 | 25.0 |
| 50°-60° | 6069.2 | 29.2 |
| 60°-70° | 2057.3 | 9.9 |
| 70°-80° | 105.2 | 0.5 |
| 80°-90° | 4.2 | 0.0 |
| 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° | 20795.4 | 100.0 |
| 0°-180° | 20795.4 | 100.0 |



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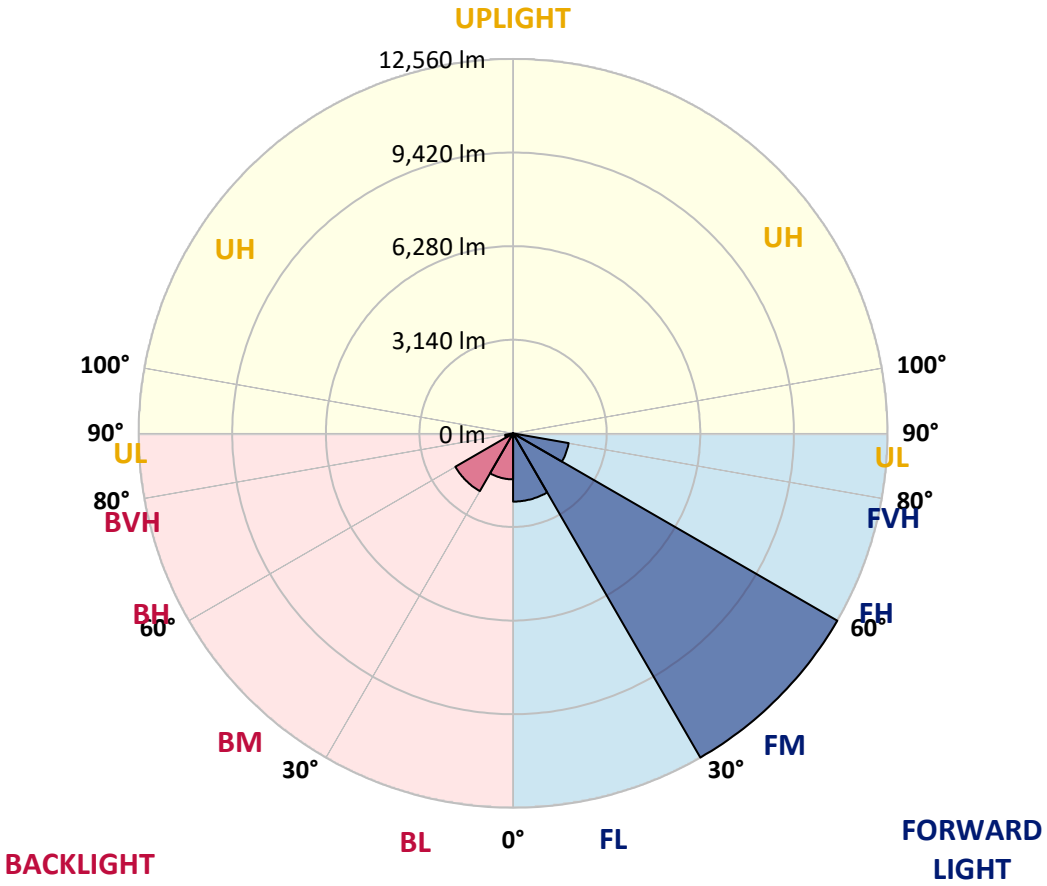
REPORT NUMBER: P641470
CATALOG NUMBER: GWS-SA5F-830-U-T3R-W-GRSBK

## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 2289.1 | 11.0 | | | |
| FM | (30°-60°) | 12559.8 | 60.4 | | | |
| FH | (60°-80°) | 1892.7 | 9.1 | | | G2/5000 |
| FVH | (80°-90°) | 2.2 | 0.0 | | | G0/10 |
| BL | (0°-30°) | 1543.6 | 7.4 | B3/2500 | | |
| BM | (30°-60°) | 2236.3 | 10.8 | B2/2500 | | |
| BH | (60°-80°) | 269.7 | 1.3 | B1/500 | | G1/500 |
| BVH | (80°-90°) | 1.9 | 0.0 | | | G0/10 |
| UL | (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH | (100°-180°) | 0.0 | 0.0 | | U0/0 | |

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



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REPORT NUMBER: P641470
CATALOG NUMBER: GWS-SA5F-830-U-T3R-W-GRSBK

**CANDELA DISTRIBUTION (FULL):**

| | 0° | 5° | 15° | 25° | 35° | 38° | 45° | 55° | 65° | 75° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 4986.9 | 4986.9 | 4986.9 | 4986.9 | 4986.9 | *4986.9* | 4986.9 | 4986.9 | 4986.9 | 4986.9 | 4986.9 |
| 2.5° | 4644.6 | 4635.1 | 4654.1 | 4692.2 | 4727.8 | *4739.7* | 4775.3 | 4825.3 | 4856.2 | 4929.8 | 4989.3 |
| 5° | 4435.4 | 4430.7 | 4449.7 | 4483.0 | 4530.5 | *4547.2* | 4601.8 | 4685.0 | 4768.2 | 4896.6 | 5022.6 |
| 7.5° | 4245.3 | 4242.9 | 4271.4 | 4345.1 | 4414.0 | *4435.4* | 4502.0 | 4604.2 | 4715.9 | 4913.2 | 5098.6 |
| 10° | 3995.7 | 3998.1 | 4052.7 | 4157.3 | 4283.3 | *4326.1* | 4433.1 | 4580.4 | 4725.4 | 4979.8 | 5236.5 |
| 12.5° | 3914.9 | 3919.6 | 3948.2 | 4029.0 | 4166.8 | *4221.5* | 4371.3 | 4594.7 | 4780.1 | 5074.8 | 5414.8 |
| 15° | 4112.2 | 4112.2 | 4088.4 | 4097.9 | 4159.7 | *4209.6* | 4366.5 | 4642.2 | 4872.8 | 5188.9 | 5590.6 |
| 17.5° | 4494.9 | 4480.6 | 4421.2 | 4340.4 | 4319.0 | *4335.6* | 4461.6 | 4744.4 | 5003.5 | 5322.0 | 5790.3 |
| 20° | 5013.0 | 5017.8 | 4901.3 | 4732.6 | 4597.1 | *4594.7* | 4670.8 | 4925.1 | 5191.3 | 5481.3 | 6006.6 |
| 22.5° | 5640.6 | 5621.5 | 5467.0 | 5236.5 | 5001.2 | *4982.1* | 5013.0 | 5200.8 | 5462.3 | 5733.3 | 6272.8 |
| 25° | 6367.9 | 6358.4 | 6139.7 | 5830.7 | 5519.3 | *5474.2* | 5474.2 | 5659.6 | 5849.7 | 6092.2 | 6591.4 |
| 27.5° | 7128.6 | 7128.6 | 6917.0 | 6560.5 | 6146.9 | *6066.0* | 6054.2 | 6272.8 | 6398.8 | 6446.4 | 6860.0 |
| 30° | 7910.6 | 7901.1 | 7691.9 | 7325.8 | 6883.7 | *6800.5* | 6767.3 | 6928.9 | 7019.2 | 6876.6 | 7195.1 |
| 32.5° | 8704.5 | 8721.1 | 8509.6 | 8169.7 | 7775.1 | *7720.4* | 7618.2 | 7618.2 | 7691.9 | 7492.2 | 7722.8 |
| 35° | 9557.8 | 9553.1 | 9386.7 | 9156.1 | 8818.6 | *8756.8* | 8588.0 | 8324.2 | 8435.9 | 8347.9 | 8452.5 |
| 37.5° | 10311.3 | 10347.0 | 10266.2 | 10095.0 | 9821.7 | *9759.9* | 9481.8 | 9004.0 | 9089.6 | 9227.4 | 9320.1 |
| 40° | 11076.7 | 11105.2 | 11186.1 | 11131.4 | 10786.7 | *10672.6* | 10178.2 | 9393.8 | 9488.9 | 9961.9 | 10228.1 |
| 42.5° | 11827.8 | 11842.1 | 12006.1 | 12096.4 | 11635.3 | *11435.6* | 10705.9 | 9631.5 | 9731.3 | 10537.1 | 11003.0 |
| 45° | 12305.6 | 12336.5 | 12607.5 | 12883.2 | 12384.0 | *12110.7* | 11164.7 | 9935.8 | 9978.5 | 10936.5 | 11575.9 |
| 47.5° | 12286.6 | 12357.9 | 12866.6 | 13368.1 | 13028.2 | *12733.5* | 11716.1 | 10423.0 | 10351.7 | 11312.0 | 11953.8 |
| 50° | 11903.9 | 11989.5 | 12719.2 | 13515.5 | 13491.7 | *13218.4* | 12329.4 | 11129.0 | 10905.6 | 11644.8 | 12001.4 |
| 52.5° | 11110.0 | 11357.2 | 12460.1 | 13534.5 | 13864.9 | *13727.0* | 13087.6 | 12079.8 | 11654.3 | 12122.6 | 12077.4 |
| 55° | *9393.8* | *9698.1* | *11673.3* | *13372.9* | *14202.4* | *14219.1* | *13883.9* | *13071.0* | *12467.2* | *12945.0* | *12545.7* |
| 57.5° | 7130.9 | 7373.4 | 8985.0 | 11903.9 | 13643.8 | *13917.2* | 14192.9 | 13593.9 | 12968.8 | 13506.0 | 12655.0 |
| 60° | 4297.6 | 4578.1 | 5626.3 | 8735.4 | 11019.7 | *11485.5* | 12567.1 | 12450.6 | 11697.1 | 11927.7 | 10377.9 |
| 62.5° | 1742.3 | 1889.7 | 2598.0 | 4813.4 | 6936.0 | *7371.0* | 8407.4 | 8583.3 | 8397.9 | 8162.5 | 6294.2 |
| 65° | 637.0 | 696.5 | 1041.1 | 1989.5 | 3189.9 | *3349.2* | 3895.9 | 4207.2 | 4464.0 | 3800.8 | 2341.3 |
| 67.5° | 394.6 | 432.6 | 677.4 | 1022.1 | 1160.0 | *1079.1* | 1098.2 | 1309.7 | 1250.3 | 772.5 | 418.3 |
| 70° | 292.4 | 323.3 | 530.1 | 708.3 | 468.3 | *361.3* | 244.8 | 261.5 | 235.3 | 206.8 | 204.4 |
| 72.5° | 202.0 | 230.6 | 397.0 | 418.3 | 180.7 | *128.4* | 90.3 | 126.0 | 142.6 | 140.2 | 145.0 |
| 75° | 133.1 | 154.5 | 249.6 | 164.0 | 45.2 | *35.7* | 30.9 | 66.6 | 85.6 | 85.6 | 87.9 |
| 77.5° | 78.4 | 90.3 | 87.9 | 33.3 | 9.5 | *9.5* | 7.1 | 11.9 | 19.0 | 21.4 | 26.1 |
| 80° | 9.5 | 7.1 | 4.8 | 4.8 | 4.8 | *4.8* | 4.8 | 4.8 | 7.1 | 7.1 | 7.1 |
| 82.5° | 2.4 | 2.4 | 2.4 | 4.8 | 4.8 | *4.8* | 4.8 | 4.8 | 4.8 | 7.1 | 7.1 |
| 85° | 0.0 | 0.0 | 2.4 | 2.4 | 4.8 | *4.8* | 4.8 | 4.8 | 4.8 | 7.1 | 7.1 |
| 87.5° | 0.0 | 0.0 | 2.4 | 2.4 | 4.8 | *4.8* | 4.8 | 4.8 | 4.8 | 7.1 | 7.1 |
| 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: P641470
CATALOG NUMBER: GWS-SA5F-830-U-T3R-W-GRSBK

**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 4986.9 | 4986.9 | 4986.9 | 4986.9 | 4986.9 | 4986.9 | 4986.9 | 4986.9 | 4986.9 | 4986.9 | 4986.9 |
| 2.5° | 5034.4 | 5017.8 | 5086.7 | 5136.6 | 5177.1 | 5196.1 | 5169.9 | 5167.5 | 5167.5 | 5115.3 | 5101.0 |
| 5° | 5093.9 | 5101.0 | 5198.4 | 5241.2 | 5248.4 | 5224.6 | 5165.2 | 5124.8 | 5101.0 | 5046.3 | 5015.4 |
| 7.5° | 5208.0 | 5231.7 | 5324.4 | 5317.3 | 5253.1 | 5143.8 | 4986.9 | 4865.7 | 4787.2 | 4701.7 | 4649.4 |
| 10° | 5372.0 | 5417.1 | 5474.2 | 5374.3 | 5169.9 | 4891.8 | 4568.5 | 4338.0 | 4200.1 | 4102.7 | 4043.2 |
| 12.5° | 5571.6 | 5616.8 | 5597.8 | 5362.5 | 4937.0 | 4440.2 | 4024.2 | 3691.4 | 3532.2 | 3444.2 | 3382.4 |
| 15° | 5773.7 | 5802.2 | 5678.6 | 5219.8 | 4525.8 | 3857.8 | 3394.3 | 3063.9 | 2869.0 | 2797.7 | 2745.4 |
| 17.5° | 5980.5 | 5973.3 | 5692.9 | 4939.4 | 3976.7 | 3201.8 | 2745.4 | 2519.6 | 2464.9 | 2453.0 | 2448.3 |
| 20° | 6196.8 | 6132.6 | 5635.8 | 4537.6 | 3315.9 | 2552.9 | 2293.8 | 2308.0 | 2407.9 | 2455.4 | 2464.9 |
| 22.5° | 6444.0 | 6282.3 | 5493.2 | 3993.3 | 2640.8 | 2127.4 | 2153.5 | 2293.8 | 2429.3 | 2493.4 | 2503.0 |
| 25° | 6707.8 | 6420.2 | 5255.5 | 3294.5 | 2082.2 | 1956.3 | 2110.8 | 2272.4 | 2417.4 | 2495.8 | 2505.3 |
| 27.5° | 6881.3 | 6453.5 | 4865.7 | 2590.9 | 1787.5 | 1889.7 | 2053.7 | 2208.2 | 2358.0 | 2443.5 | 2455.4 |
| 30° | 7069.1 | 6439.2 | 4335.6 | 1996.7 | 1687.7 | 1832.6 | 1975.3 | 2115.5 | 2253.4 | 2348.5 | 2358.0 |
| 32.5° | 7344.9 | 6429.7 | 3689.1 | 1621.1 | 1647.2 | 1787.5 | 1892.1 | 2008.5 | 2103.6 | 2158.3 | 2151.2 |
| 35° | 7706.2 | 6417.8 | 2935.6 | 1461.8 | 1623.5 | 1751.8 | 1835.0 | 1889.7 | 1785.1 | 1751.8 | 1759.0 |
| 37.5° | 8169.7 | 6446.4 | 2300.9 | 1395.3 | 1616.3 | 1742.3 | 1813.6 | 1656.8 | 1495.1 | 1433.3 | 1423.8 |
| 40° | 8683.1 | 6520.0 | 1754.2 | 1369.1 | 1640.1 | 1766.1 | 1732.8 | 1473.7 | 1274.1 | 1152.8 | 1126.7 |
| 42.5° | 9198.9 | 6600.9 | 1388.2 | 1359.6 | 1680.5 | 1832.6 | 1599.7 | 1340.6 | 1041.1 | 972.2 | 962.7 |
| 45° | 9581.6 | 6586.6 | 1200.4 | 1343.0 | 1716.2 | 1870.7 | 1564.1 | 1150.5 | 929.4 | 898.5 | 900.9 |
| 47.5° | 9774.1 | 6429.7 | 1098.2 | 1305.0 | 1730.4 | 1832.6 | 1476.1 | 1072.0 | 853.3 | 886.6 | 915.1 |
| 50° | 9671.9 | 6023.3 | 1003.1 | 1231.3 | 1699.5 | 1782.7 | 1335.9 | 1012.6 | 815.3 | 953.2 | 1017.3 |
| 52.5° | 9548.3 | 5524.1 | 898.5 | 1117.2 | 1625.9 | 1713.8 | 1281.2 | 996.0 | 791.5 | 919.9 | 967.4 |
| 55° | *9712.3* | *5208.0* | *727.4* | *941.3* | *1480.9* | *1552.2* | *1238.4* | *993.6* | *736.9* | *715.5* | *708.3* |
| 57.5° | 9481.8 | 4578.1 | 520.6 | 677.4 | 1136.2 | 1228.9 | 1207.5 | 976.9 | 653.7 | 651.3 | 660.8 |
| 60° | 7328.2 | 2792.9 | 356.5 | 430.2 | 696.5 | 784.4 | 1095.8 | 934.2 | 563.3 | 518.2 | 520.6 |
| 62.5° | 4164.5 | 1188.5 | 244.8 | 266.2 | 356.5 | 423.1 | 836.7 | 848.6 | 520.6 | 494.4 | 520.6 |
| 65° | 1450.0 | 425.5 | 190.2 | 178.3 | 197.3 | 225.8 | 480.1 | 656.0 | 473.0 | 427.9 | 432.6 |
| 67.5° | 299.5 | 211.6 | 168.8 | 147.4 | 147.4 | 147.4 | 244.8 | 408.8 | 389.8 | 339.9 | 344.7 |
| 70° | 190.2 | 180.7 | 147.4 | 126.0 | 121.2 | 111.7 | 140.2 | 225.8 | 268.6 | 247.2 | 249.6 |
| 72.5° | 140.2 | 137.9 | 116.5 | 102.2 | 90.3 | 80.8 | 87.9 | 111.7 | 137.9 | 142.6 | 145.0 |
| 75° | 85.6 | 87.9 | 76.1 | 64.2 | 57.0 | 49.9 | 52.3 | 52.3 | 52.3 | 47.5 | 52.3 |
| 77.5° | 26.1 | 28.5 | 23.8 | 19.0 | 16.6 | 16.6 | 16.6 | 14.3 | 11.9 | 7.1 | 7.1 |
| 80° | 7.1 | 7.1 | 7.1 | 7.1 | 7.1 | 4.8 | 4.8 | 2.4 | 2.4 | 0.0 | 0.0 |
| 82.5° | 7.1 | 7.1 | 7.1 | 7.1 | 4.8 | 4.8 | 2.4 | 2.4 | 0.0 | 0.0 | 0.0 |
| 85° | 7.1 | 7.1 | 7.1 | 7.1 | 4.8 | 4.8 | 2.4 | 2.4 | 0.0 | 0.0 | 0.0 |
| 87.5° | 7.1 | 7.1 | 7.1 | 7.1 | 4.8 | 4.8 | 2.4 | 2.4 | 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

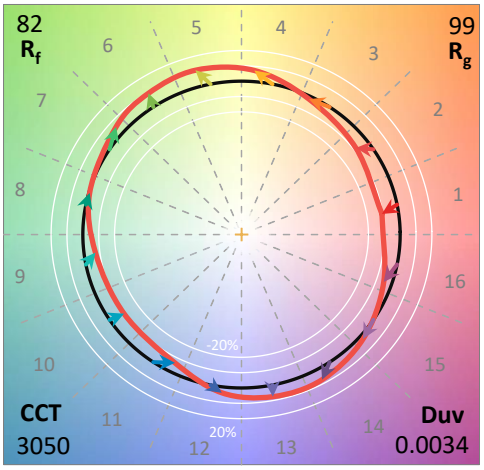
## Test Information

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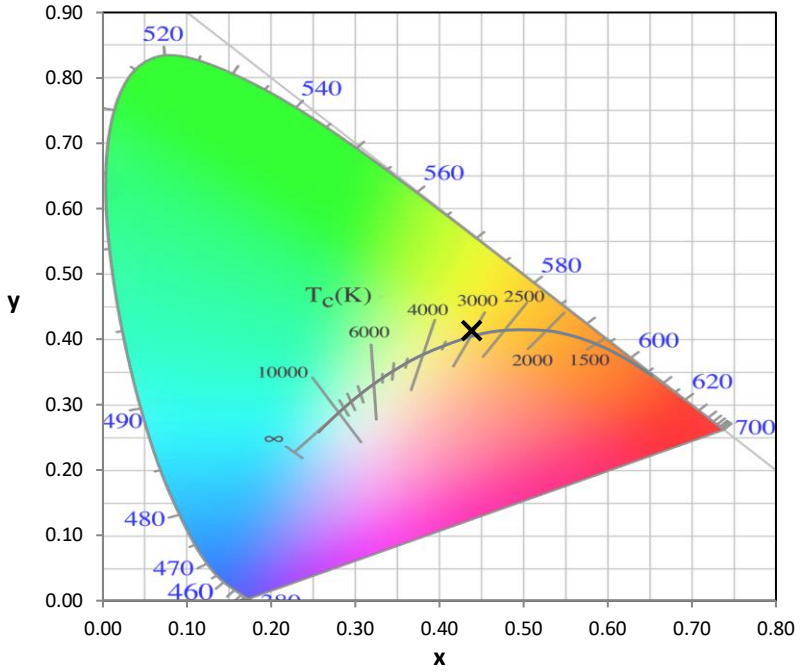
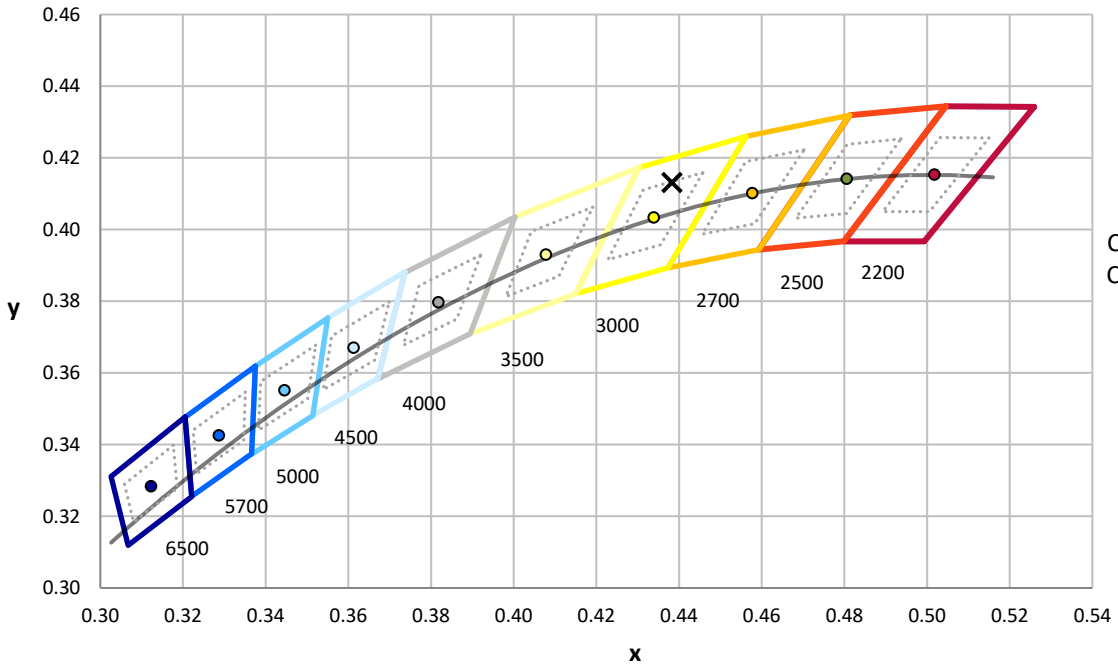
## CIE 1931 Chromaticity Diagram




## 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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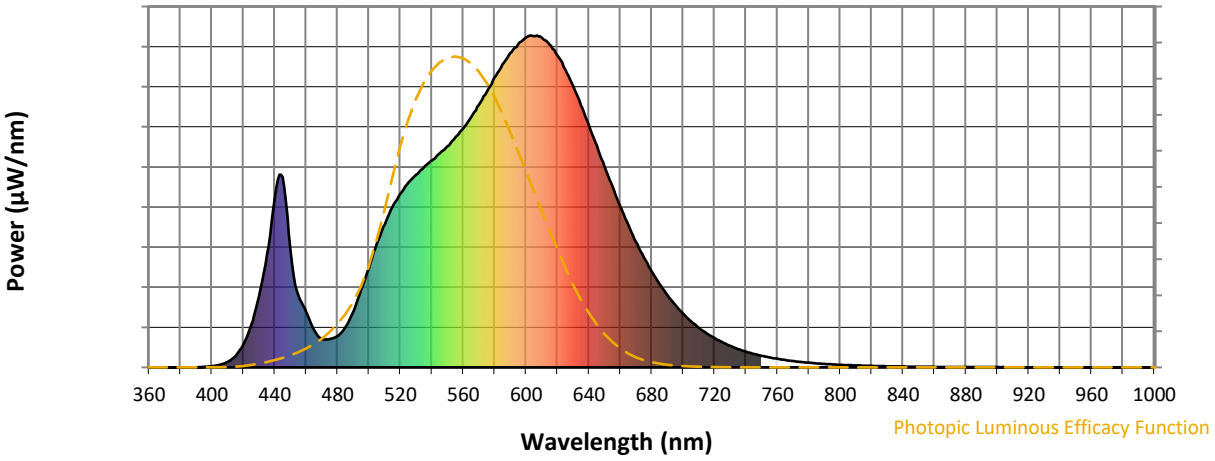
## Photopic Flux vs. Wavelength




## 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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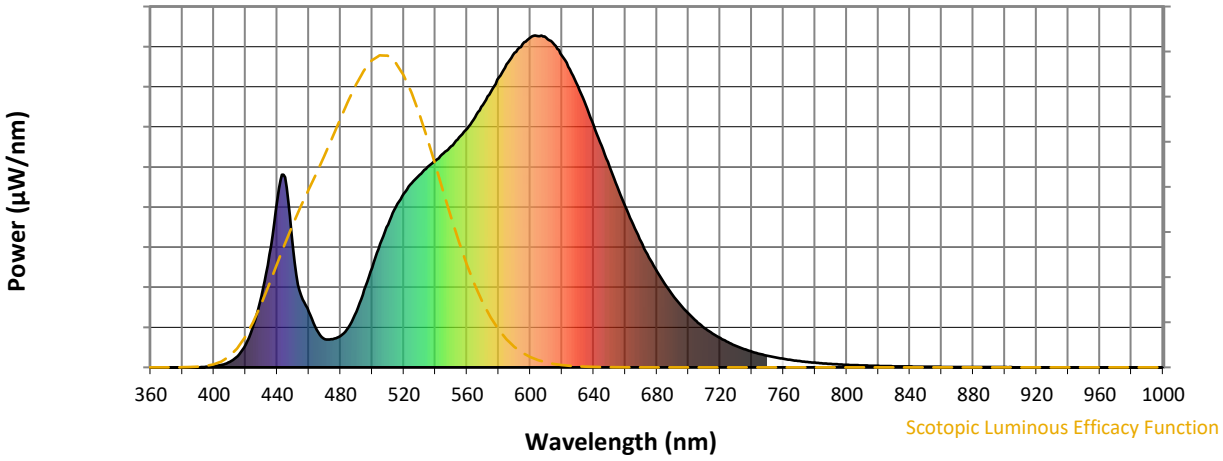
## Scotopic Flux vs. Wavelength




**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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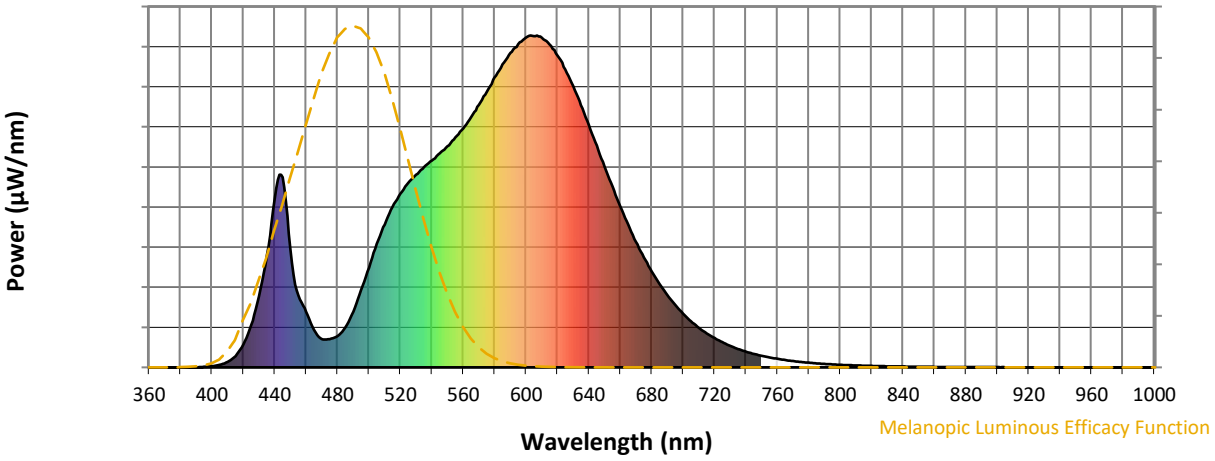
## Melanopic Flux vs. Wavelength




**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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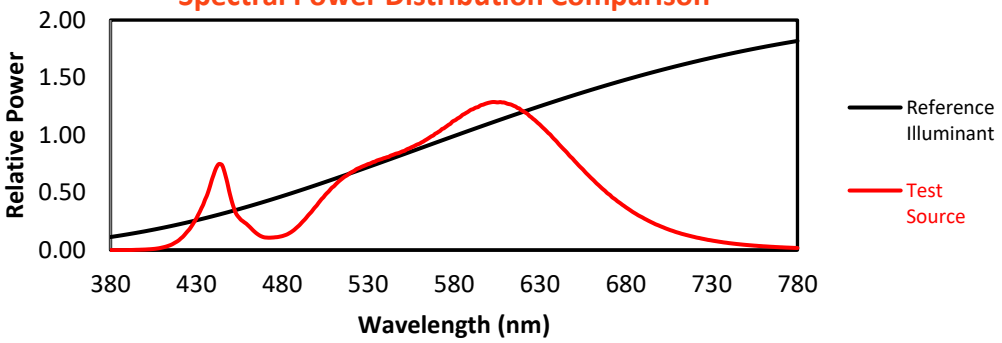
# TM-30-18

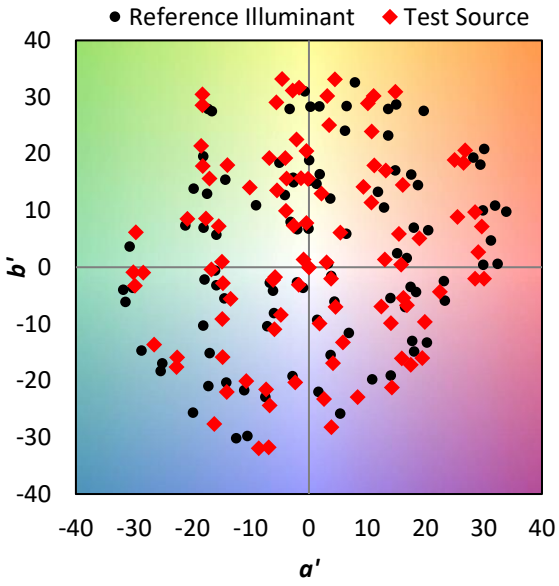
## Summary

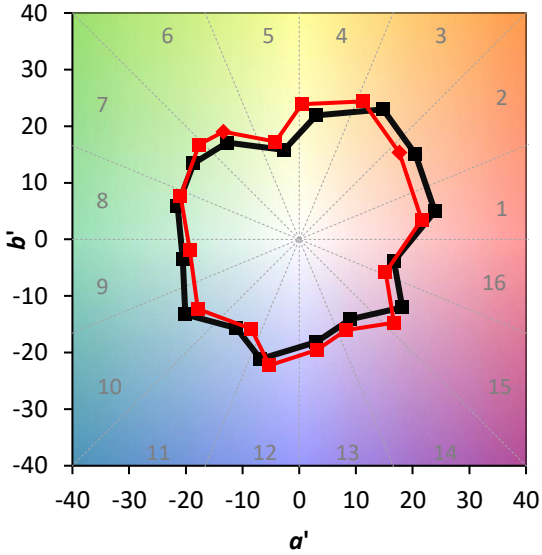
$R_f$ = 81.5
$R_g$ = 99.2
CIE $R_a$ = 81.0
$R_9$ = 7.1

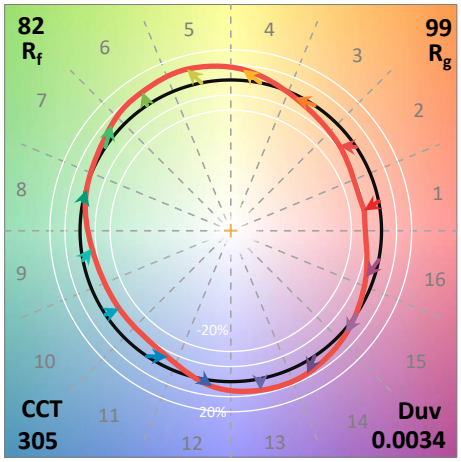
## Spectral Power Distribution Comparison

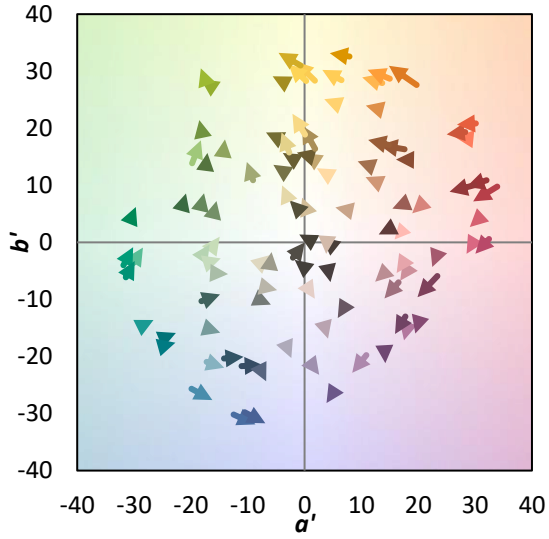



## Color Vector Graphics



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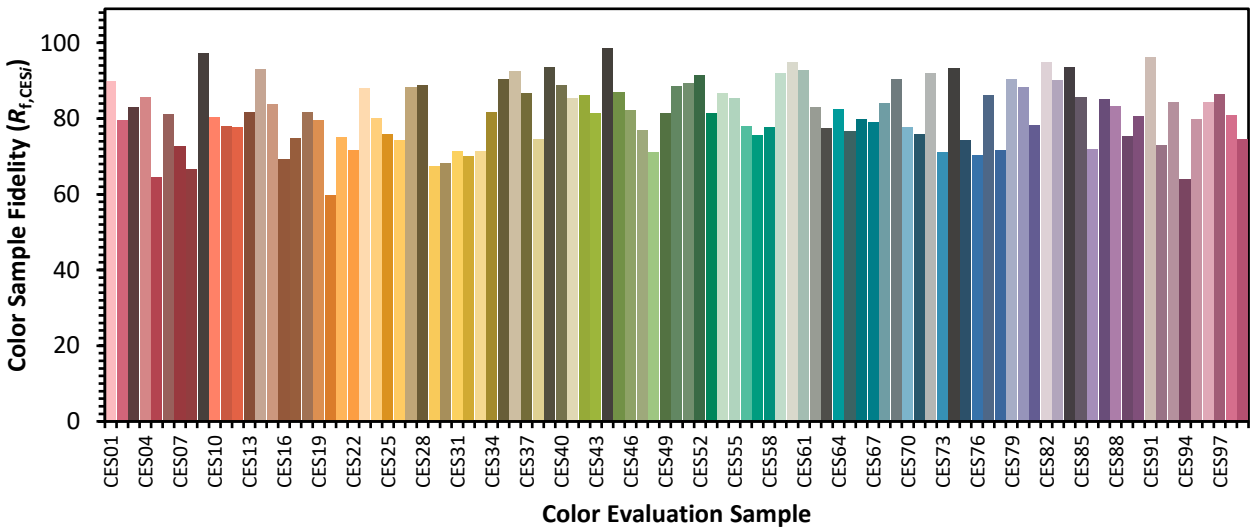
## Individual Sample Fidelity Index ($R_{f,i}$)

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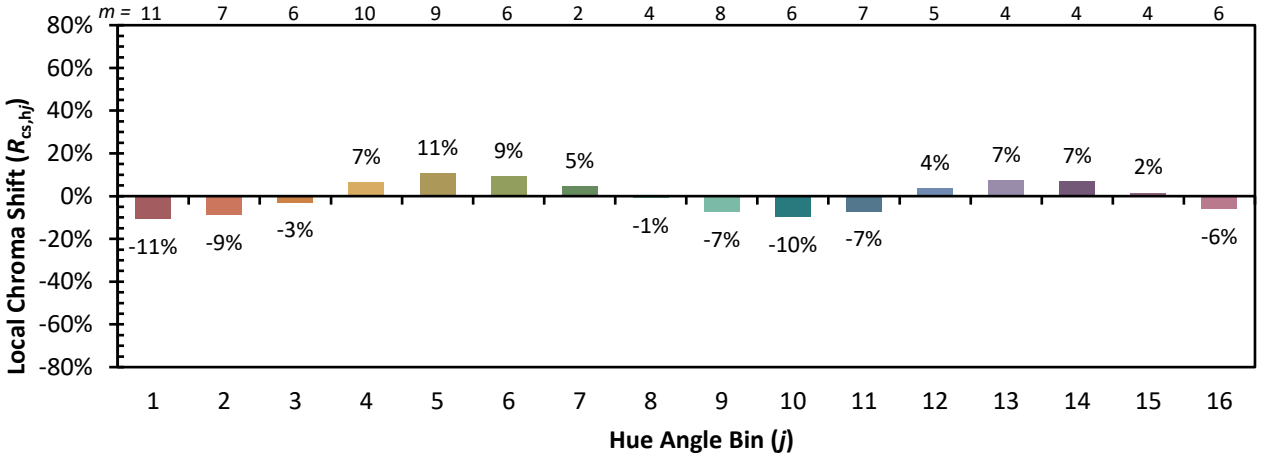
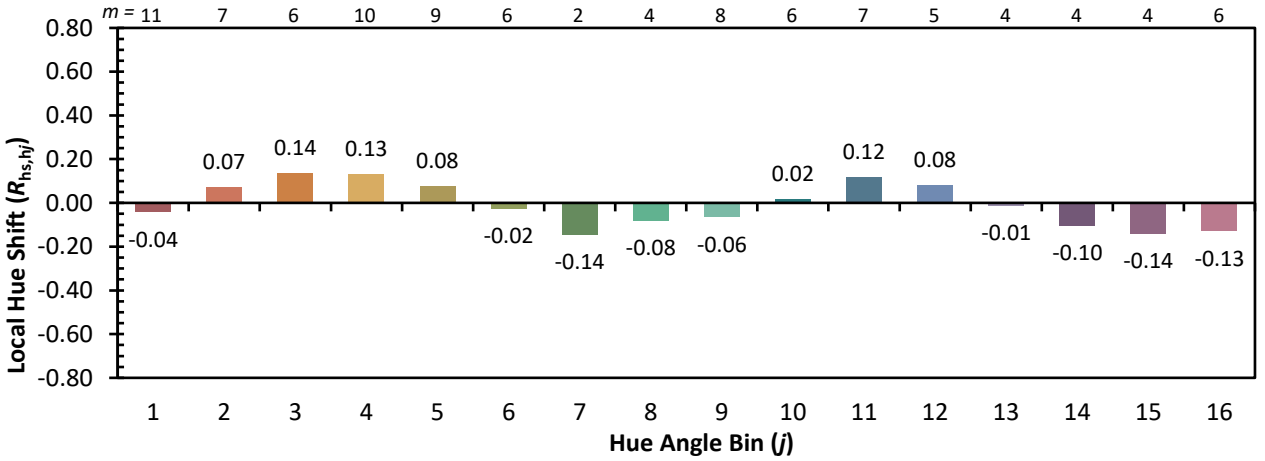
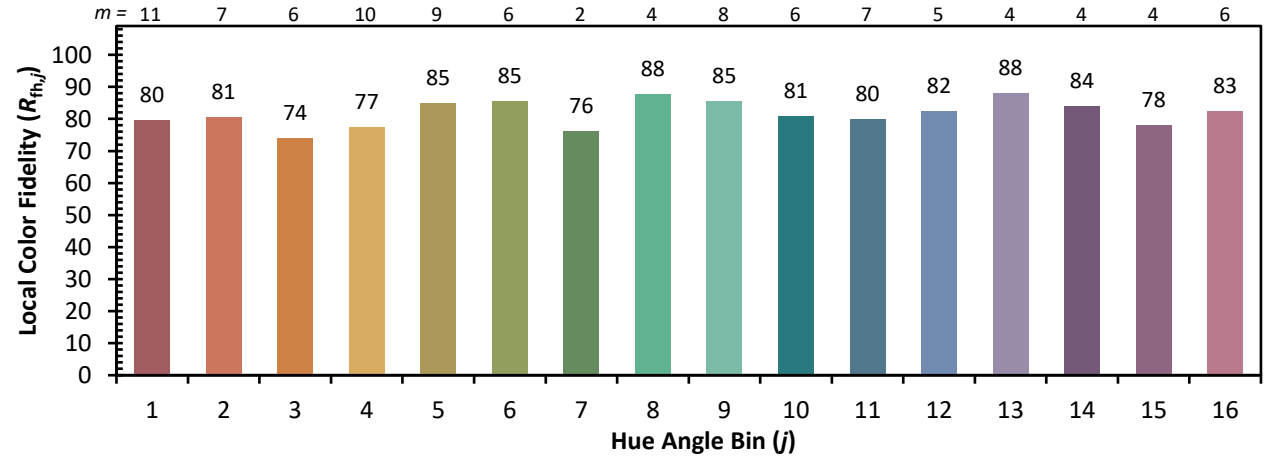
## Color Rendition by Hue-Angle Bin



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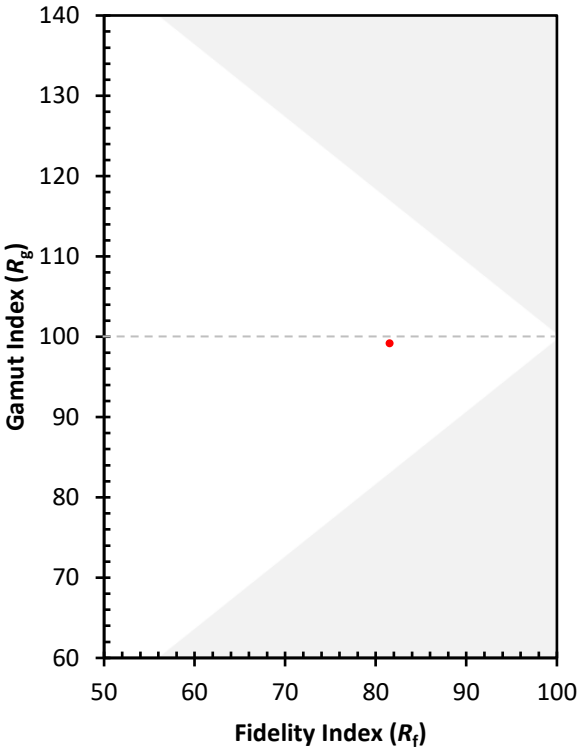
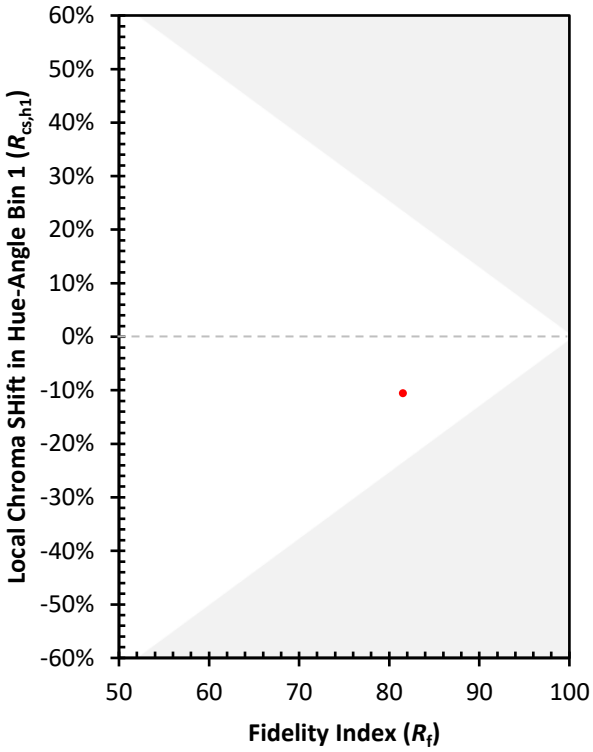
## Measure Comparisons




(END OF REPORT)