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

Scaled data based on original data using

LM-79-08 Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Test Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

Brand: McGRAW-EDISON

Report Number: P321437

Luminaire Tested: **GLEON-SA3B-830-U-T2R-HSS**

Issue Date: 3/3/2020

Report Generated By E0585644

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

Scaled Data Report

**Test Information**

| | |
|---|---|
| Test Method: | LM-79-08 |
| Report Number: | P321437 |
| | TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-9) |
| Test Lab: | INNOVATION CENTER |
| Issue Date: | 3/3/2020 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS (FORMERLY EATON) |
| Product Line: | McGRAW-EDISON |
| Catalog Number: | GLEON-SA3B-830-U-T2R-HSS |
| Description: | GALLEON AREA AND ROADWAY LUMINAIRE |
| | (3) 80 CRI, 3000K, 800mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE II ROADWAY OPTICS WITH HOUSE SIDE SHIELD |
| Light Source: | - |
| Ballast/Driver: | ELECTRONIC DRIVER |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 11190 lumens |
| Efficiency: | N/A |
| Efficacy: | 90.2 lumens/watt |
| Luminous Opening: | Rectangular (W 1' x L: 1' x H: 0') |
| IES Classification: | Type II - Medium |
| BUG Rating: | B1 - U0 - G2 |

| | |
|---|---|
| Input Watts (W): | 124 |
| Input Voltage (V): | NR |
| Input Current (Ain): | NR |
| Voltage Rise (V): | NR |
| Power Factor: | NR |
| Total Harmonic Distortion (THDi): | NR |
| Frequency (hertz): | 60 |
| Stabilization Time: | NR |
| Operation Time: | NR |
| Ambient Temperature (°C): | NR |
| Test Distance: | 24 FT |

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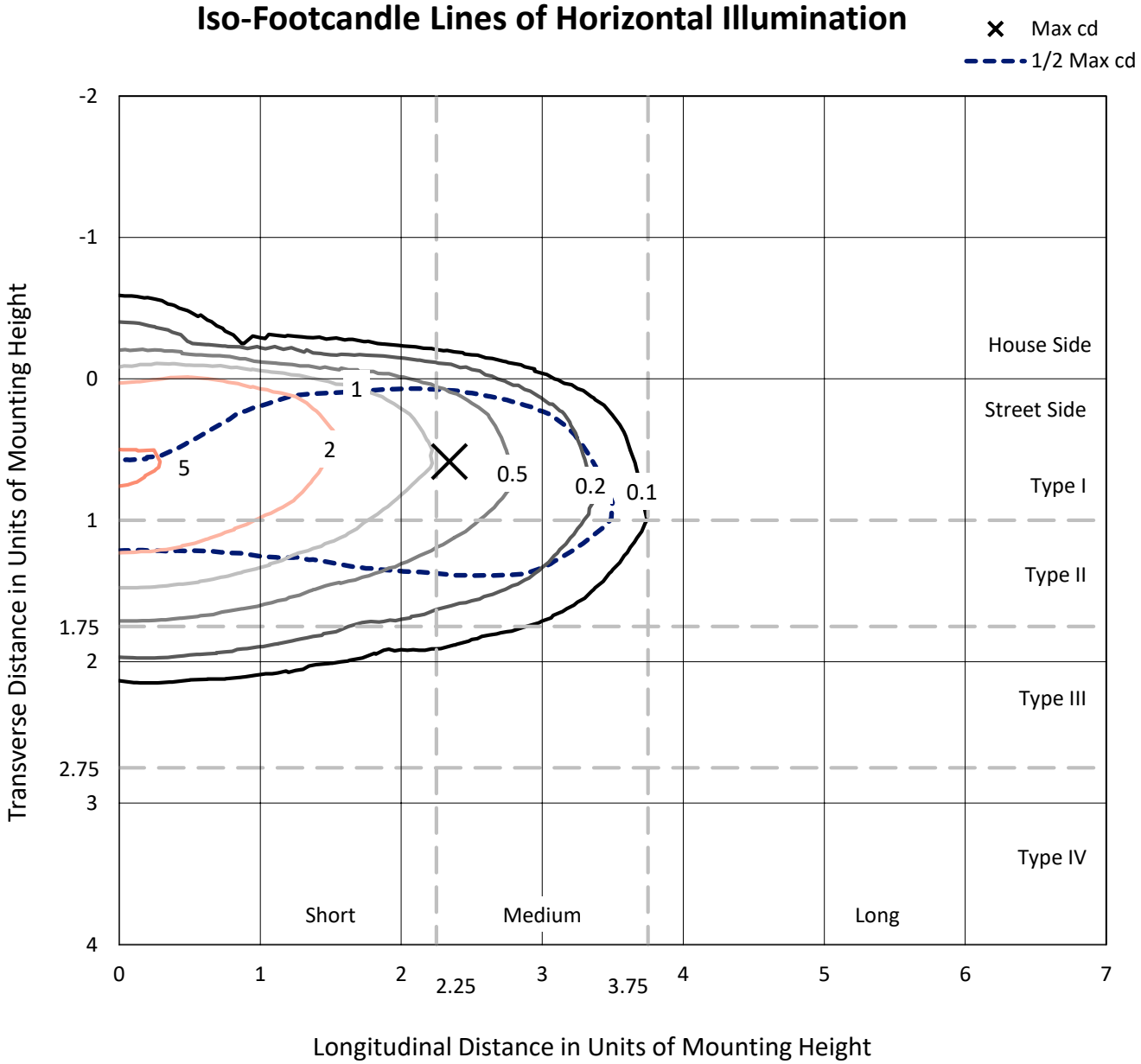
Scaled Data Report

REPORT NUMBER: P321437
CATALOG NUMBER: GLEON-SA3B-830-U-T2R-HSS

## Iso-Footcandle Lines of Horizontal Illumination




Based on 25 foot mounting height. Maximum calculated value = 5.3 fc
Type II - Medium - N/A

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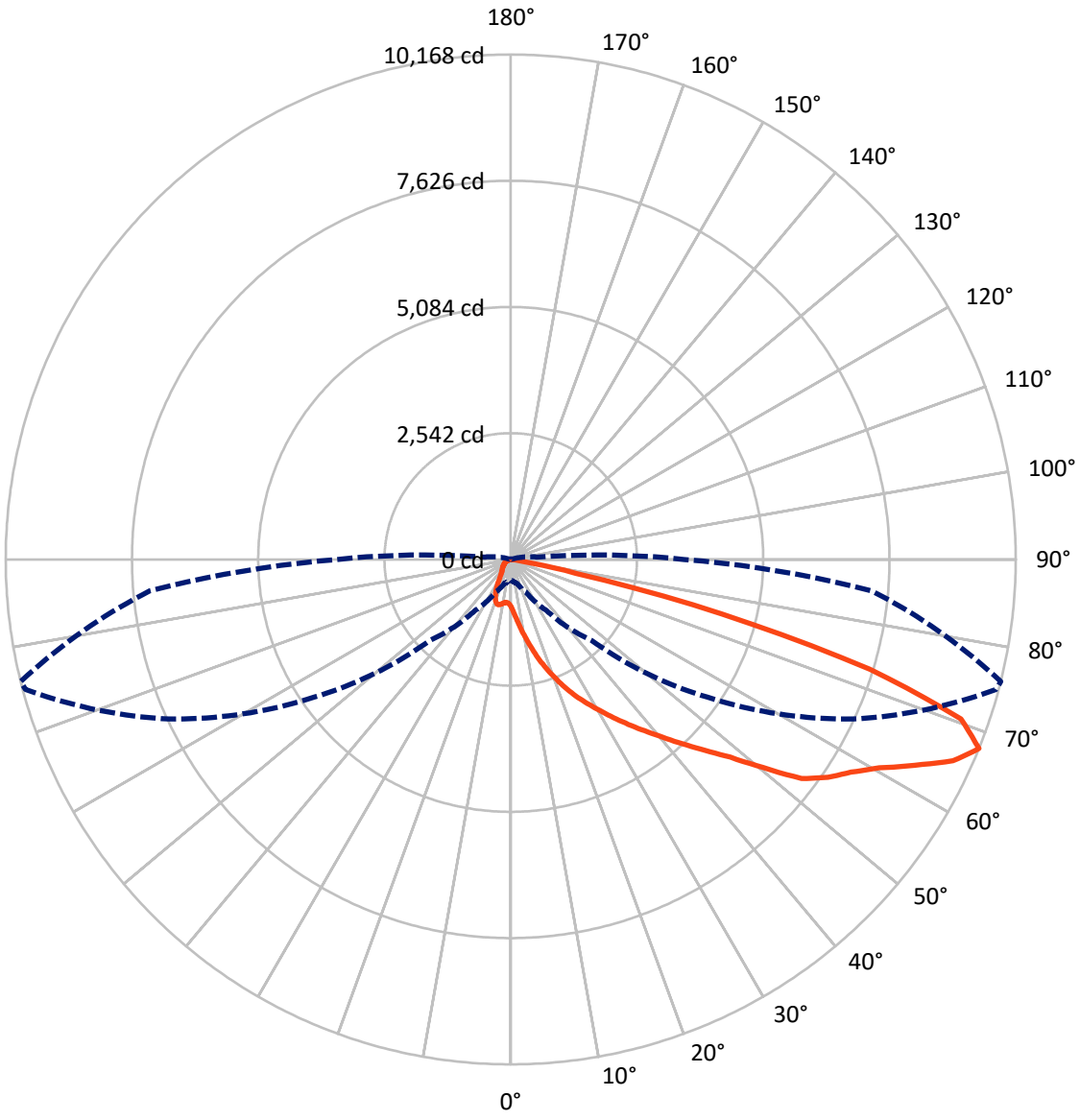
## Luminous Intensity Polar Plot



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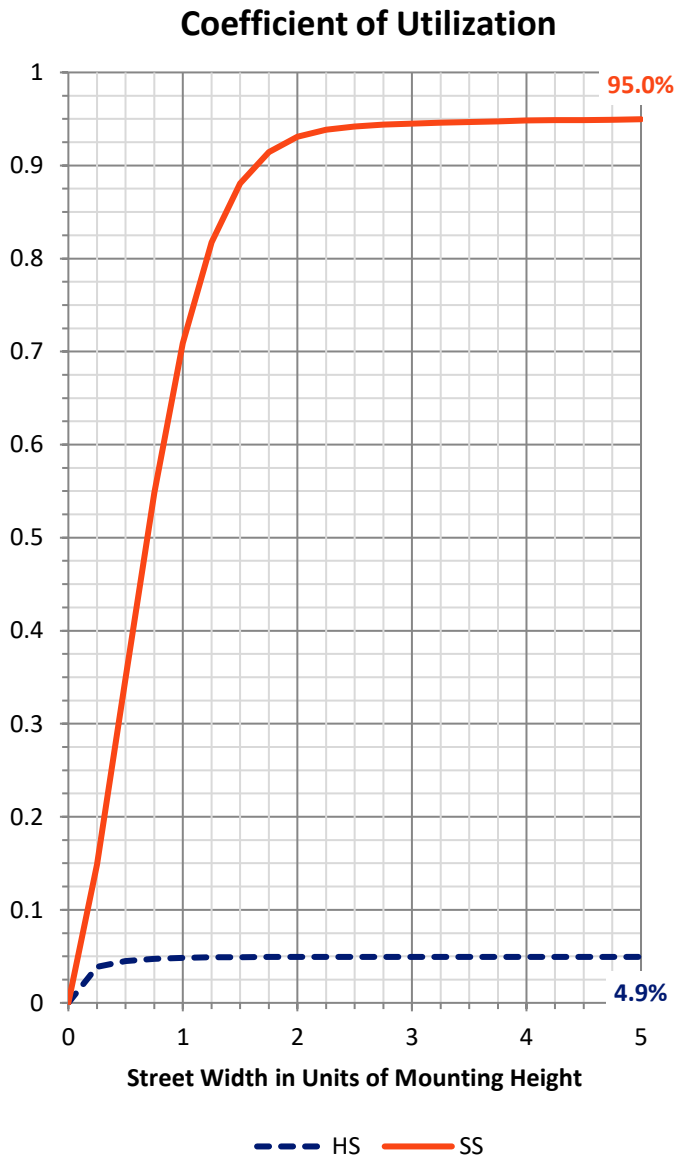
REPORT NUMBER: P321437
CATALOG NUMBER: GLEON-SA3B-830-U-T2R-HSS

**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 555.7 | 0.0 | 555.7 |
| | % Fixture | 5.0 | 0.0 | 5.0 |
| **Street Side** | Lumens | 10634.3 | 0.0 | 10634.3 |
| | % Fixture | 95.0 | 0.0 | 95.0 |
| **Total** | Lumens | 11190.0 | 0.0 | 11190.0 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 118.0 | 1.1 |
| 10°-20° | 467.9 | 4.2 |
| 20°-30° | 952.0 | 8.5 |
| 30°-40° | 1652.4 | 14.8 |
| 40°-50° | 2334.7 | 20.9 |
| 50°-60° | 2647.6 | 23.7 |
| 60°-70° | 2196.0 | 19.6 |
| 70°-80° | 795.4 | 7.1 |
| 80°-90° | 25.8 | 0.2 |
| 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° | 11190.0 | 100.0 |
| 0°-180° | 11190.0 | 100.0 |



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Scaled Data Report

REPORT NUMBER: P321437
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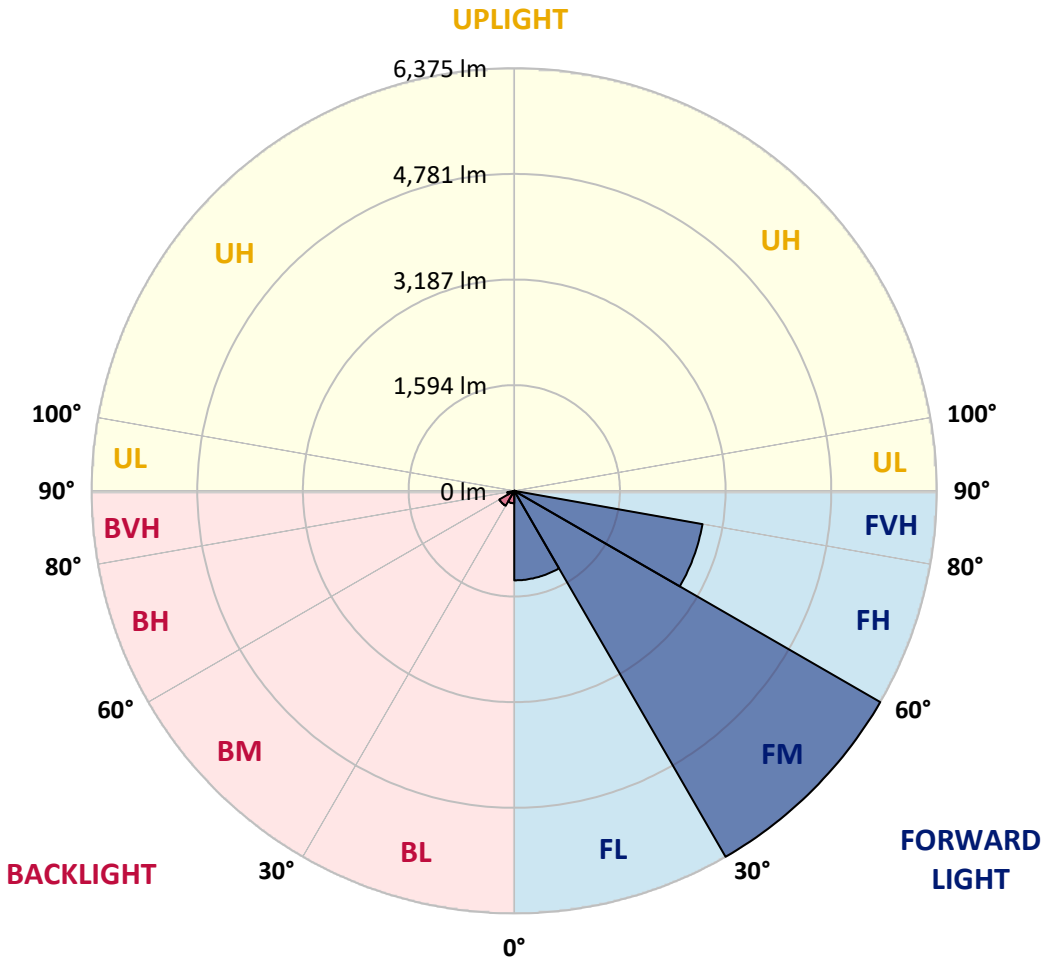
## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 1350.6 | 12.1 | | | |
| FM | (30°-60°) | 6374.7 | 57.0 | | | |
| FH | (60°-80°) | 2884.0 | 25.8 | | | G2/5000 |
| FVH | (80°-90°) | 25.0 | 0.2 | | | G1/100 |
| BL | (0°-30°) | 187.4 | 1.7 | B1/500 | | |
| BM | (30°-60°) | 260.1 | 2.3 | B1/1000 | | |
| BH | (60°-80°) | 107.4 | 1.0 | B0/110 | | G0/110 |
| BVH | (80°-90°) | 0.8 | 0.0 | | | G0/10 |
| UL | (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH | (100°-180°) | 0.0 | 0.0 | | U0/0 | |

**BUG Rating: B1-U0-G2**
Type II Medium



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REPORT NUMBER: P321437
CATALOG NUMBER: GLEON-SA3B-830-U-T2R-HSS

**CANDELA DISTRIBUTION (FULL):**

| | 0° | 5° | 15° | 25° | 35° | 45° | 55° | 65° | 75° | 76° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 949.2 | 949.2 | 949.2 | 949.2 | 949.2 | 949.2 | 949.2 | 949.2 | 949.2 | *949.2* | 949.2 |
| 2.5° | 1417.0 | 1385.1 | 1392.5 | 1371.9 | 1334.6 | 1258.1 | 1192.9 | 1131.1 | 1059.1 | *1056.6* | 997.3 |
| 5° | 1910.7 | 1883.8 | 1880.3 | 1838.7 | 1771.0 | 1641.1 | 1514.6 | 1370.4 | 1209.6 | *1197.8* | 1071.8 |
| 7.5° | 2358.9 | 2337.3 | 2329.5 | 2279.9 | 2153.9 | 2027.4 | 1862.7 | 1650.9 | 1399.3 | *1377.8* | 1172.3 |
| 10° | 2703.1 | 2692.8 | 2694.7 | 2659.4 | 2551.6 | 2433.9 | 2217.7 | 1947.5 | 1614.6 | *1581.2* | 1292.9 |
| 12.5° | 2963.9 | 2966.4 | 2984.0 | 2962.4 | 2902.1 | 2814.9 | 2583.9 | 2263.8 | 1852.9 | *1807.3* | 1430.7 |
| 15° | 3155.6 | 3167.9 | 3200.2 | 3227.2 | 3222.8 | 3147.3 | 2935.5 | 2584.9 | 2105.9 | *2055.4* | 1584.2 |
| 17.5° | 3279.7 | 3293.4 | 3340.5 | 3400.3 | 3455.2 | 3437.5 | 3274.8 | 2894.8 | 2361.8 | *2303.5* | 1748.4 |
| 20° | 3388.5 | 3404.7 | 3455.2 | 3534.1 | 3636.6 | 3658.7 | 3551.8 | 3195.3 | 2617.3 | *2546.2* | 1918.1 |
| 22.5° | 3624.4 | 3623.9 | 3654.8 | 3700.8 | 3798.4 | 3855.3 | 3787.6 | 3474.3 | 2869.8 | *2795.7* | 2091.2 |
| 25° | 4050.9 | 4034.7 | 4024.0 | 3987.7 | 4009.2 | 4044.5 | 4006.8 | 3735.2 | 3123.8 | *3048.7* | 2266.7 |
| 27.5° | 4557.9 | 4567.7 | 4480.4 | 4382.9 | 4307.4 | 4271.1 | 4209.3 | 3976.9 | 3367.9 | *3285.6* | 2438.3 |
| 30° | 5092.8 | 5095.8 | 4992.8 | 4868.3 | 4702.1 | 4564.3 | 4457.4 | 4207.8 | 3619.0 | *3529.2* | 2605.0 |
| 32.5° | 5575.3 | 5556.2 | 5454.2 | 5284.5 | 5074.7 | 4919.7 | 4697.6 | 4465.7 | 3884.7 | *3797.9* | 2790.3 |
| 35° | 5957.7 | 5935.2 | 5811.1 | 5656.7 | 5439.0 | 5283.1 | 5015.8 | 4723.1 | 4164.2 | *4079.4* | 2976.2 |
| 37.5° | 6237.2 | 6210.7 | 6083.3 | 5924.4 | 5736.6 | 5645.9 | 5385.1 | 5003.1 | 4469.2 | *4378.0* | 3171.8 |
| 40° | 6334.3 | 6311.2 | 6231.3 | 6115.1 | 5964.1 | 5943.5 | 5776.8 | 5325.2 | 4801.1 | *4704.0* | 3393.4 |
| 42.5° | 6276.4 | 6253.9 | 6225.4 | 6186.2 | 6123.5 | 6143.1 | 6146.5 | 5692.5 | 5169.8 | *5074.2* | 3638.1 |
| 45° | 6047.0 | 6026.9 | 6056.3 | 6113.6 | 6191.6 | 6288.7 | 6483.8 | 6087.2 | 5581.7 | *5479.7* | 3921.0 |
| 47.5° | 5709.1 | 5694.4 | 5775.8 | 5919.0 | 6147.0 | 6414.7 | 6792.2 | 6502.0 | 6044.0 | *5949.4* | 4274.0 |
| 50° | 5228.6 | 5226.2 | 5389.0 | 5650.3 | 6000.9 | 6475.5 | 7110.9 | 6973.6 | 6686.3 | *6586.8* | 4764.8 |
| 52.5° | 4480.4 | 4485.3 | 4805.5 | 5223.7 | 5744.4 | 6434.3 | 7315.9 | 7579.7 | 7433.6 | *7330.1* | 5189.9 |
| 55° | 3768.0 | 3797.4 | 4024.4 | 4627.5 | 5351.2 | 6281.3 | 7386.5 | 7862.6 | 7845.9 | *7747.8* | 5426.2 |
| 57.5° | 3070.3 | 3123.8 | 3342.4 | 3905.8 | 4777.1 | 5928.8 | 7347.8 | 7985.2 | 8152.8 | *8077.8* | 5738.1 |
| 60° | 2314.3 | 2338.8 | 2590.8 | 3117.4 | 4040.1 | 5285.5 | 7066.8 | 8051.8 | 8572.5 | *8520.6* | 6190.6 |
| 62.5° | 1472.4 | 1533.7 | 1757.3 | 2265.2 | 3145.8 | 4392.2 | 6593.2 | 8050.9 | 9097.7 | *9126.1* | 6774.6 |
| 65° | 775.7 | 847.3 | 965.9 | 1403.8 | 2161.8 | 3394.4 | 5880.8 | 7975.3 | 9741.9 | *9781.6* | 7231.1 |
| 67.5° | *418.2* | *438.8* | *501.6* | *728.6* | *1253.7* | *2299.5* | *4833.9* | *7602.7* | *10115.1* | *10167.5* | *7294.8* |
| 70° | 306.0 | 317.2 | 340.8 | 403.0 | 631.0 | 1335.6 | 3527.3 | 6757.9 | 9634.1 | *9614.4* | 6481.4 |
| 72.5° | 234.9 | 252.5 | 270.2 | 295.2 | 362.8 | 712.9 | 2196.1 | 5291.9 | 7687.0 | *7557.6* | 4844.7 |
| 75° | 185.3 | 188.3 | 213.3 | 235.8 | 272.1 | 406.0 | 975.2 | 3082.1 | 4691.8 | *4385.3* | 2512.3 |
| 77.5° | 148.1 | 150.0 | 164.7 | 184.4 | 218.7 | 266.7 | 302.0 | 1212.5 | 1497.9 | *1336.6* | 545.2 |
| 80° | 87.8 | 92.7 | 122.6 | 142.2 | 181.4 | 168.2 | 110.3 | 263.3 | 233.9 | *211.8* | 91.7 |
| 82.5° | 49.0 | 53.0 | 69.1 | 112.3 | 126.5 | 80.4 | 54.9 | 71.1 | 54.9 | *53.4* | 26.0 |
| 85° | 0.0 | 2.5 | 44.6 | 69.6 | 51.5 | 17.7 | 23.0 | 23.5 | 16.2 | *15.2* | 10.3 |
| 87.5° | 0.0 | 0.0 | 13.7 | 13.2 | 2.0 | 2.9 | 5.4 | 7.8 | 6.4 | *6.4* | 5.4 |
| 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: P321437
CATALOG NUMBER: GLEON-SA3B-830-U-T2R-HSS

**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 949.2 | 949.2 | 949.2 | 949.2 | 949.2 | 949.2 | 949.2 | 949.2 | 949.2 | 949.2 | 949.2 |
| 2.5° | 967.9 | 941.4 | 891.4 | 842.3 | 801.2 | 767.3 | 736.9 | 724.7 | 714.9 | 713.4 | 705.6 |
| 5° | 1011.0 | 957.6 | 862.0 | 783.5 | 731.0 | 693.8 | 661.9 | 642.3 | 627.1 | 621.2 | 615.8 |
| 7.5° | 1076.2 | 995.3 | 858.0 | 767.8 | 705.1 | 642.3 | 583.5 | 519.7 | 480.0 | 464.8 | 456.0 |
| 10° | 1155.7 | 1045.3 | 872.7 | 763.4 | 653.6 | 521.2 | 423.6 | 342.7 | 309.9 | 299.1 | 296.1 |
| 12.5° | 1248.3 | 1107.6 | 898.2 | 736.0 | 543.8 | 370.2 | 292.2 | 264.8 | 257.4 | 254.0 | 254.0 |
| 15° | 1354.7 | 1175.8 | 916.4 | 656.5 | 402.1 | 280.0 | 253.0 | 240.3 | 232.4 | 228.0 | 228.5 |
| 17.5° | 1463.6 | 1242.4 | 907.6 | 541.3 | 296.6 | 249.1 | 229.0 | 215.2 | 204.5 | 200.0 | 199.1 |
| 20° | 1573.4 | 1304.2 | 858.5 | 403.0 | 251.0 | 226.0 | 203.5 | 188.3 | 177.5 | 173.1 | 172.1 |
| 22.5° | 1687.1 | 1356.7 | 772.2 | 295.7 | 225.5 | 200.5 | 178.5 | 163.3 | 153.0 | 149.1 | 147.1 |
| 25° | 1798.0 | 1399.3 | 651.6 | 239.3 | 201.5 | 176.5 | 155.4 | 141.2 | 131.9 | 128.0 | 127.5 |
| 27.5° | 1901.4 | 1426.3 | 511.9 | 211.3 | 180.4 | 154.9 | 135.8 | 123.1 | 115.2 | 112.3 | 111.8 |
| 30° | 1994.6 | 1428.8 | 378.5 | 190.7 | 161.8 | 136.3 | 118.7 | 107.4 | 100.5 | 97.6 | 96.6 |
| 32.5° | 2088.7 | 1408.2 | 275.6 | 172.1 | 144.6 | 120.1 | 103.0 | 94.1 | 89.2 | 86.8 | 86.8 |
| 35° | 2177.5 | 1360.6 | 214.8 | 155.9 | 128.0 | 104.4 | 90.7 | 84.3 | 81.4 | 78.9 | 78.9 |
| 37.5° | 2264.2 | 1292.5 | 182.4 | 141.7 | 112.3 | 91.2 | 79.9 | 76.0 | 73.5 | 71.1 | 71.1 |
| 40° | 2352.5 | 1206.6 | 165.7 | 128.5 | 99.5 | 80.9 | 71.1 | 67.7 | 65.2 | 63.2 | 62.8 |
| 42.5° | 2460.9 | 1107.6 | 154.9 | 116.2 | 88.3 | 71.6 | 62.8 | 58.8 | 56.9 | 54.9 | 53.9 |
| 45° | 2586.4 | 1022.3 | 146.1 | 103.9 | 78.9 | 63.7 | 54.4 | 50.5 | 47.6 | 45.1 | 44.6 |
| 47.5° | 2767.3 | 960.5 | 134.3 | 90.7 | 70.1 | 55.4 | 47.1 | 42.7 | 38.2 | 35.8 | 35.3 |
| 50° | 2998.2 | 909.5 | 119.1 | 78.9 | 61.3 | 47.1 | 39.2 | 33.8 | 29.9 | 27.5 | 27.5 |
| 52.5° | 3113.0 | 842.8 | 105.4 | 68.6 | 51.5 | 39.7 | 31.9 | 25.5 | 23.5 | 21.1 | 21.1 |
| 55° | 3159.1 | 791.8 | 91.7 | 58.3 | 42.7 | 32.9 | 25.0 | 19.6 | 18.1 | 16.7 | 16.2 |
| 57.5° | 3288.5 | 777.1 | 79.9 | 49.5 | 35.3 | 26.0 | 19.1 | 14.7 | 13.7 | 11.8 | 11.8 |
| 60° | 3496.9 | 784.5 | 69.1 | 42.2 | 28.4 | 20.1 | 14.2 | 11.3 | 10.3 | 8.3 | 8.3 |
| 62.5° | 3721.9 | 775.2 | 58.3 | 36.3 | 22.1 | 14.7 | 9.8 | 8.3 | 8.3 | 4.9 | 4.4 |
| 65° | 3765.1 | 690.4 | 50.0 | 29.9 | 17.2 | 10.8 | 6.4 | 5.4 | 7.4 | 1.0 | 0.0 |
| 67.5° | *3494.4* | *535.4* | *43.1* | *23.0* | *12.7* | *8.3* | *4.9* | *2.5* | *6.4* | *0.0* | *0.0* |
| 70° | 2794.3 | 340.3 | 34.8 | 16.7 | 9.8 | 6.9 | 3.9 | 1.0 | 4.9 | 0.0 | 0.0 |
| 72.5° | 1975.9 | 197.6 | 27.5 | 11.8 | 8.3 | 5.4 | 2.9 | 0.0 | 2.9 | 0.0 | 0.0 |
| 75° | 999.2 | 105.4 | 17.2 | 8.8 | 6.4 | 3.9 | 2.0 | 0.0 | 0.5 | 0.0 | 0.0 |
| 77.5° | 216.2 | 49.0 | 10.8 | 6.4 | 4.4 | 2.5 | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 80° | 47.1 | 21.6 | 6.9 | 3.9 | 2.5 | 1.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 82.5° | 17.2 | 11.3 | 3.4 | 2.0 | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 85° | 9.3 | 5.9 | 2.0 | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 87.5° | 4.9 | 2.0 | 0.5 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 | 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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Peachtree City, GA 30269

# 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

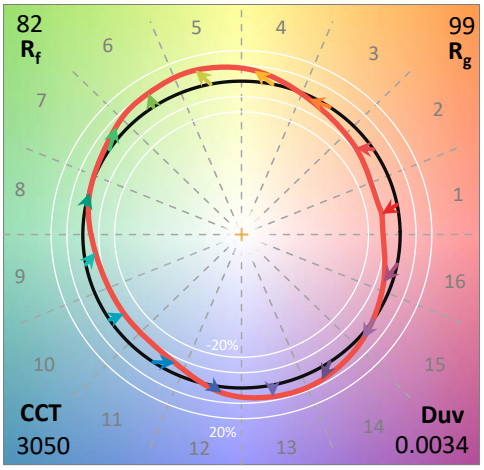
## Test Information

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

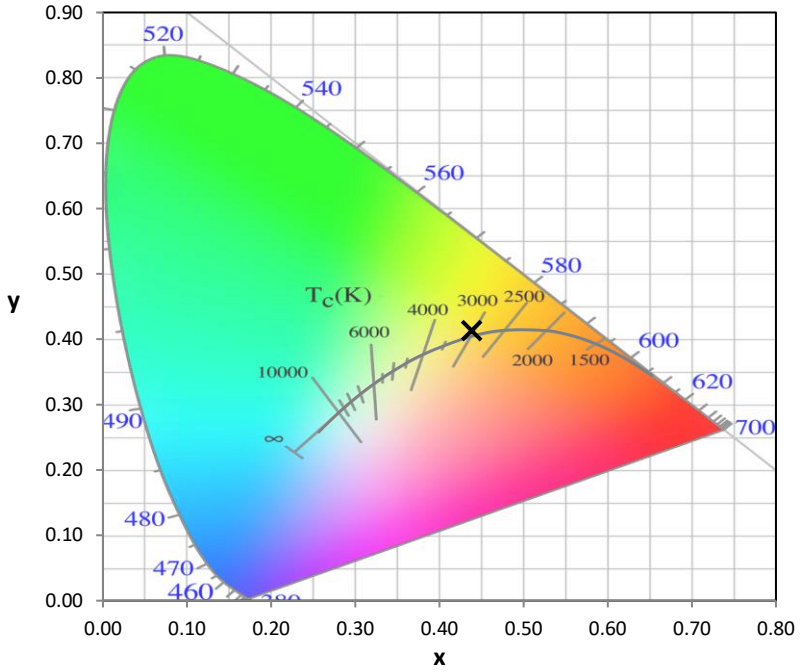
| | |
|---|---|
| Stabilization Time: | 20M |
| Operation Time: | 1H 20M |
| Sphere Temperature (°C): | 24.2 |

REPORT NUMBER: SP1-2408-195-9

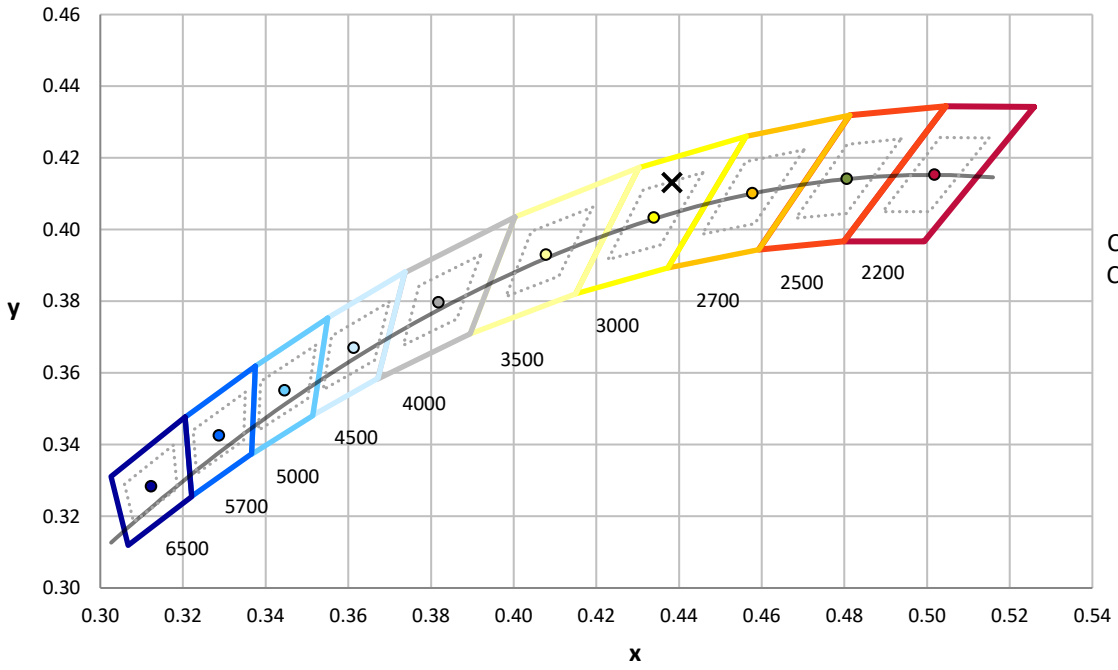
| Measurement and Test Equipment | | | |
|---|---|---|---|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | IN0058 | 6/18/2024 | 12/18/2024 |
| Power Meter | INXT2011004 | 2/8/2024 | 2/8/2025 |
| AC Power Source | IN0063 | 10/24/2023 | 10/24/2024 |
| DC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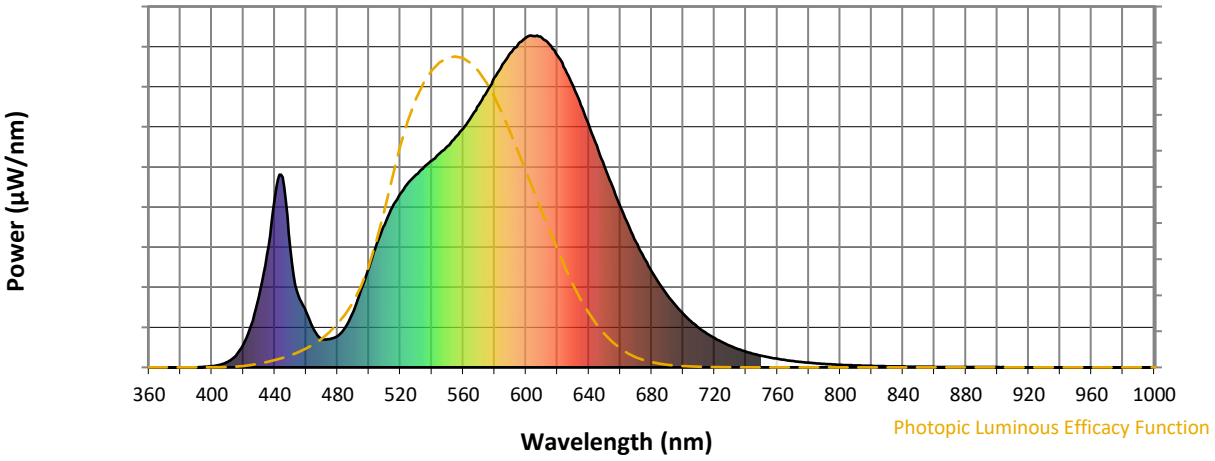
## Photopic Flux vs. Wavelength




## 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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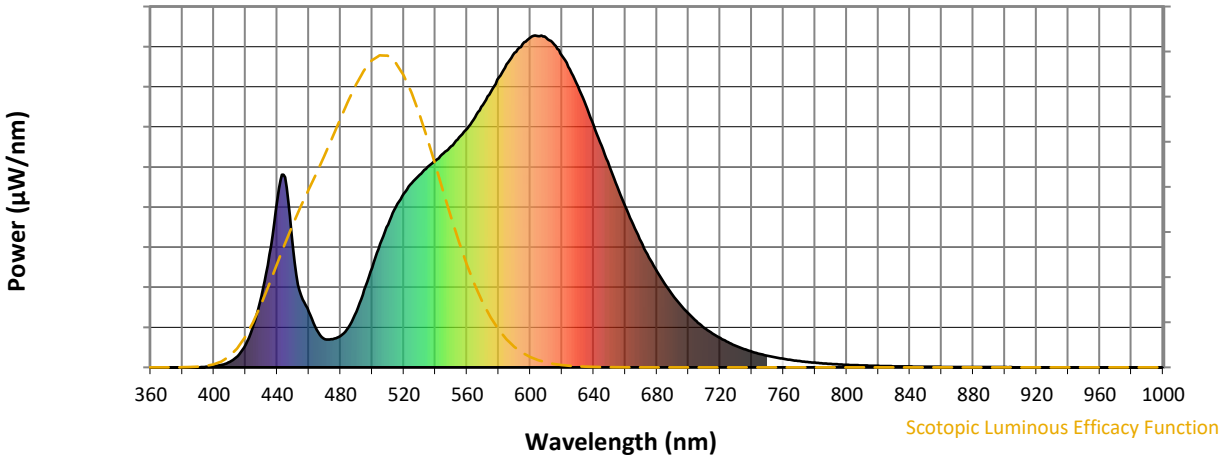
## Scotopic Flux vs. Wavelength




**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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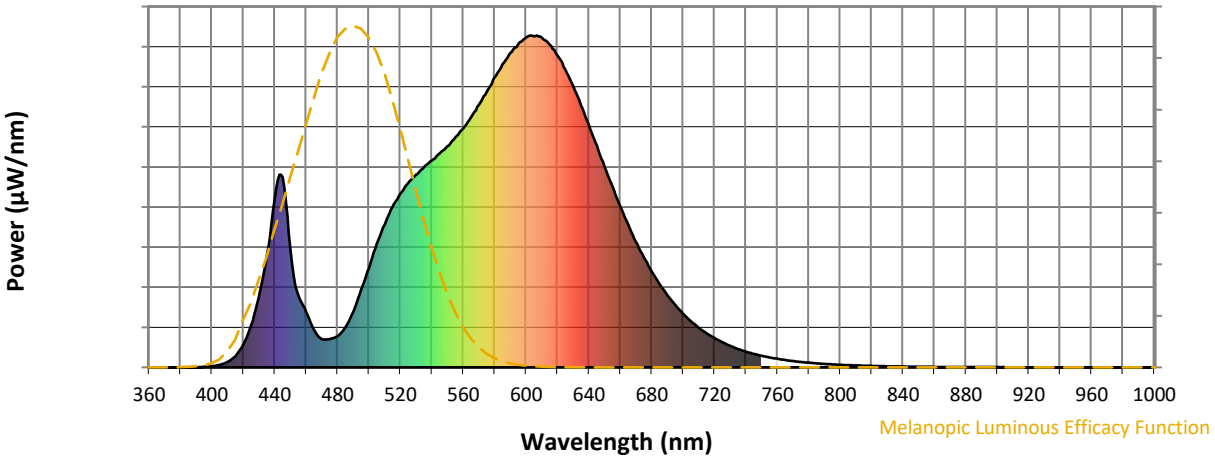
## Melanopic Flux vs. Wavelength




**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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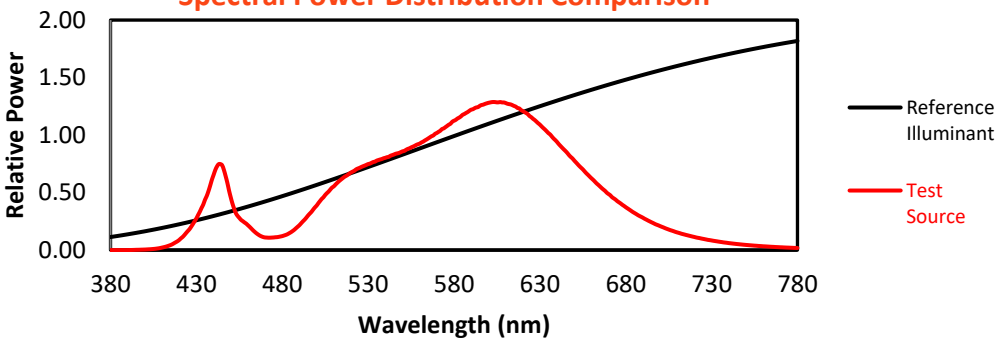
# TM-30-18

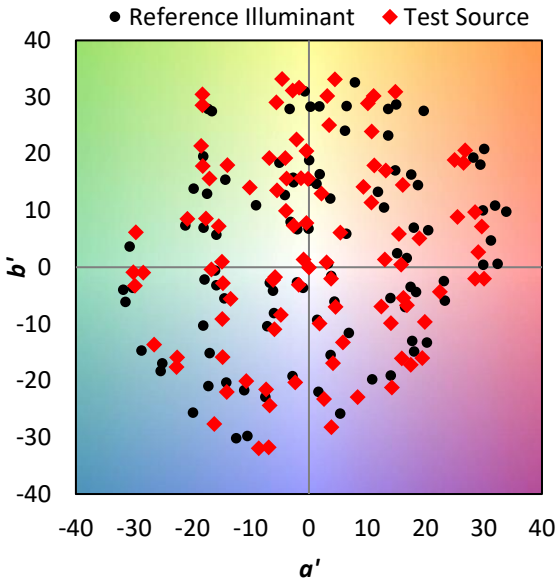
## Summary

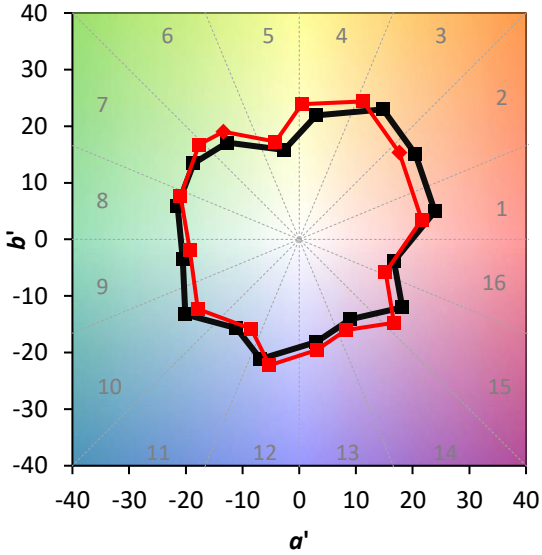
$R_f$ = 81.5
$R_g$ = 99.2
CIE $R_a$ = 81.0
$R_9$ = 7.1

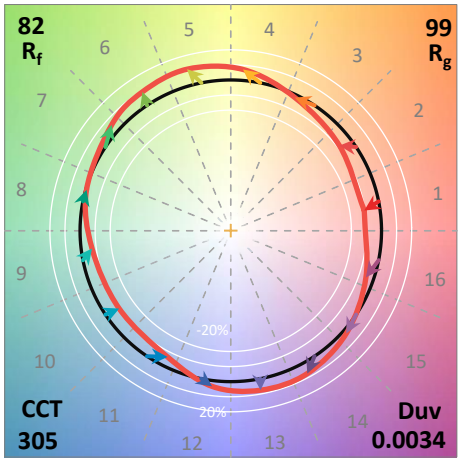
## Spectral Power Distribution Comparison

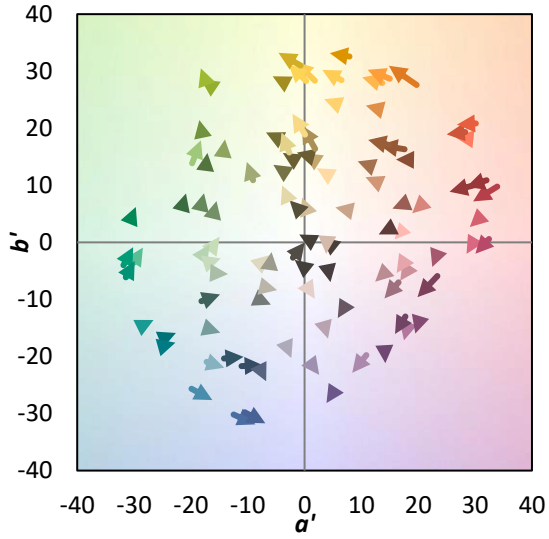



## Color Vector Graphics



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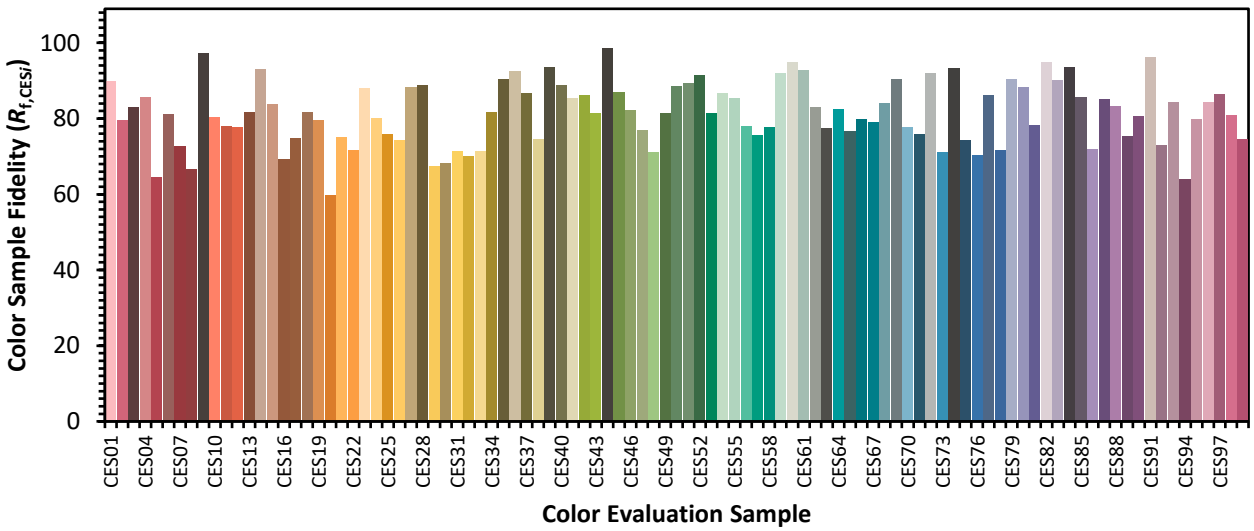
**Individual Sample Fidelity Index ($R_{f,i}$)**

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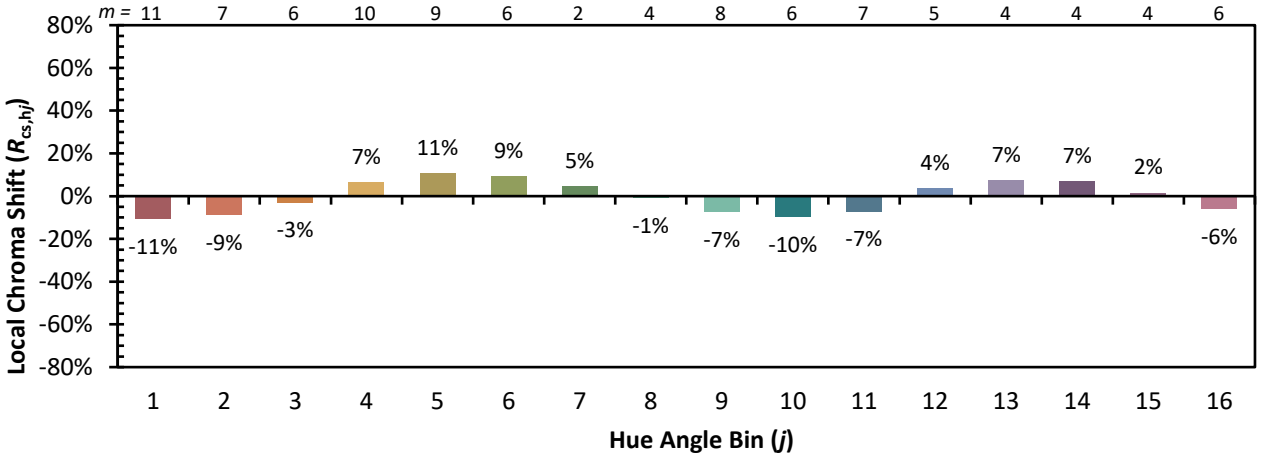
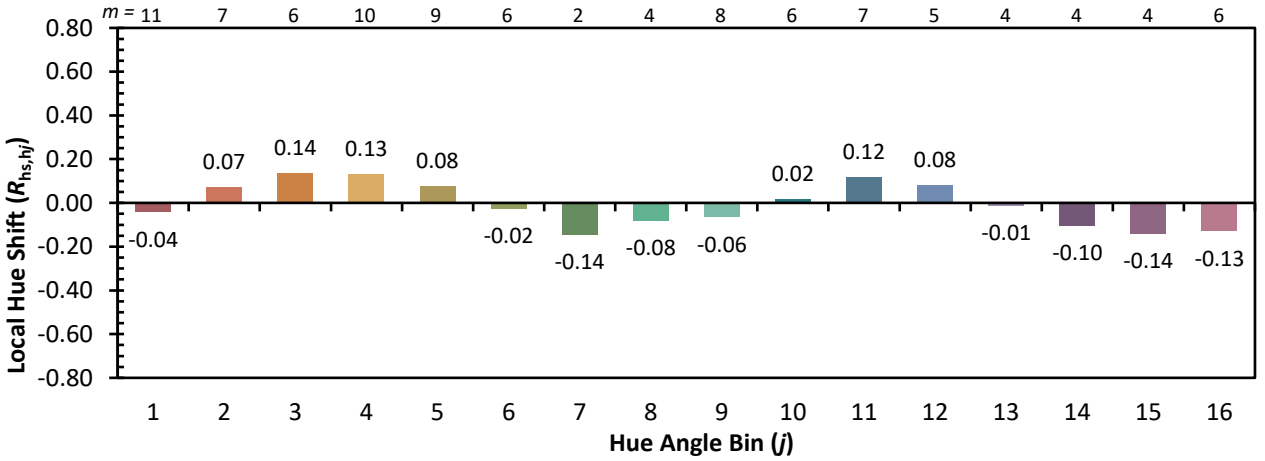
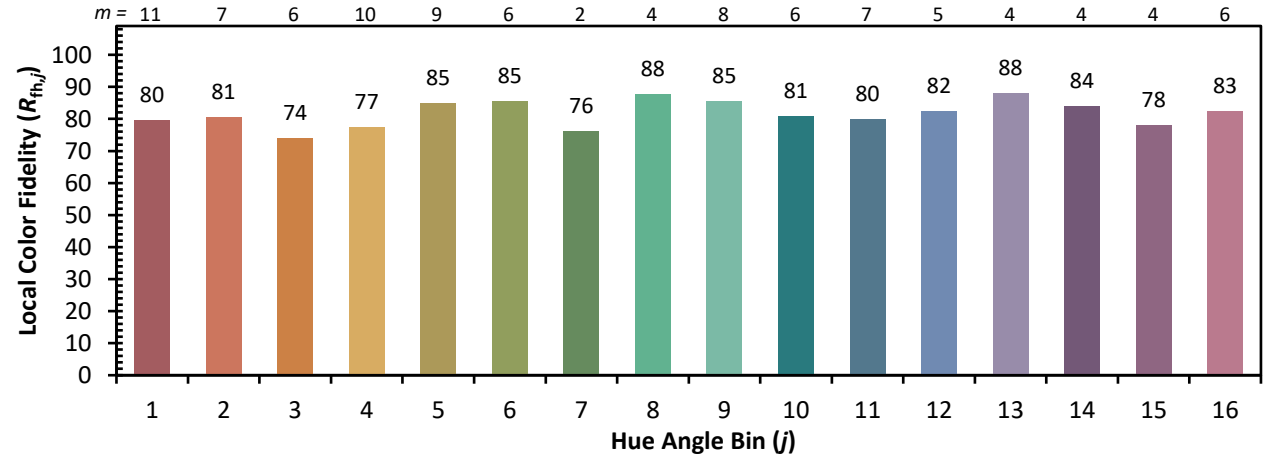
## Color Rendition by Hue-Angle Bin



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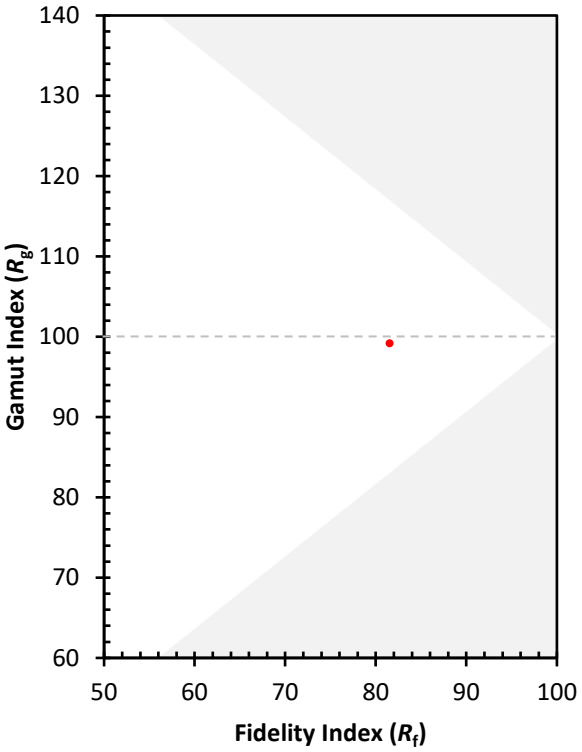
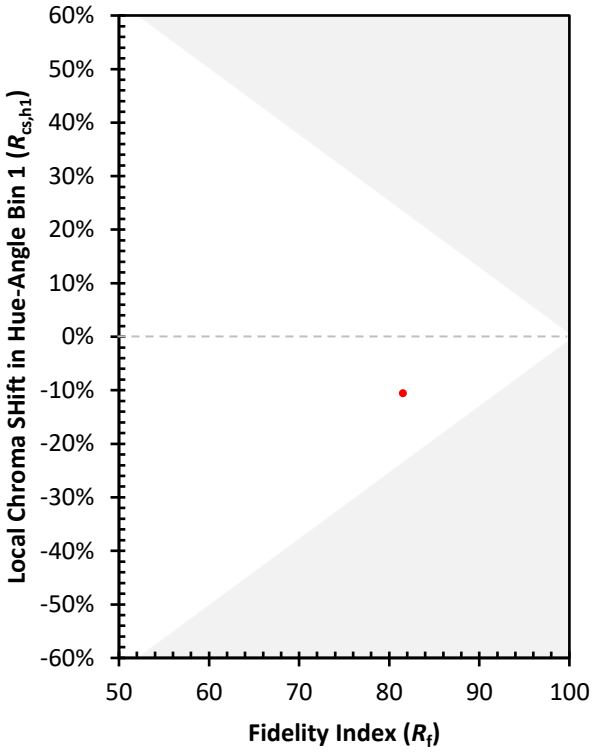
## Measure Comparisons




(END OF REPORT)