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: P324979

Luminaire Tested: **GLEON-SA5D-830-U-AFL-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: | P324979 |
| | TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-30) |
| Test Lab: | INNOVATION CENTER |
| Issue Date: | 3/3/2020 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS (FORMERLY EATON) |
| Product Line: | McGRAW-EDISON |
| Catalog Number: | GLEON-SA5D-830-U-AFL-HSS |
| Description: | GALLEON AREA AND ROADWAY LUMINAIRE |
| | (5) 80 CRI, 3000K, 1200mA LIGHTSQUARES WITH 16 LEDS EACH AND AUTOMOTIVE FRONTLINE OPTICS WITH HOUSE SIDE SHIELD |
| Light Source: | - |
| Ballast/Driver: | ELECTRONIC DRIVER |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 25227 lumens |
| Efficiency: | N/A |
| Efficacy: | 78.8 lumens/watt |
| Luminous Opening: | Rectangular (W 1.5' x L: 1' x H: 0') |
| IES Classification: | Type II - Short |
| BUG Rating: | B2 - U0 - G2 |

| | |
|---|---|
| Input Watts (W): | 320 |
| 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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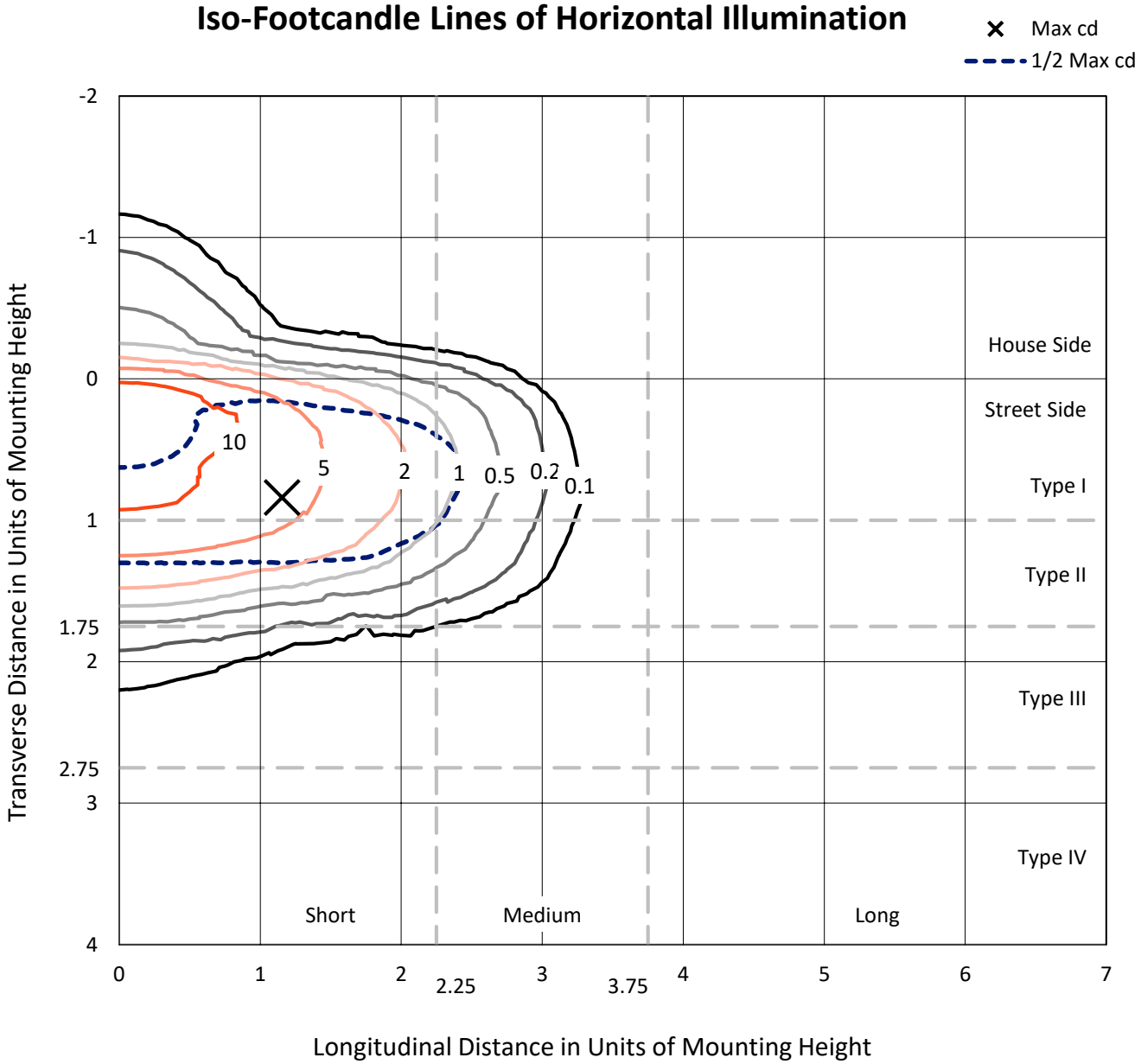
Scaled Data Report

REPORT NUMBER: P324979
CATALOG NUMBER: GLEON-SA5D-830-U-AFL-HSS

## Iso-Footcandle Lines of Horizontal Illumination




Based on 25 foot mounting height. Maximum calculated value = 13.9 fc
Type II - Short - N/A

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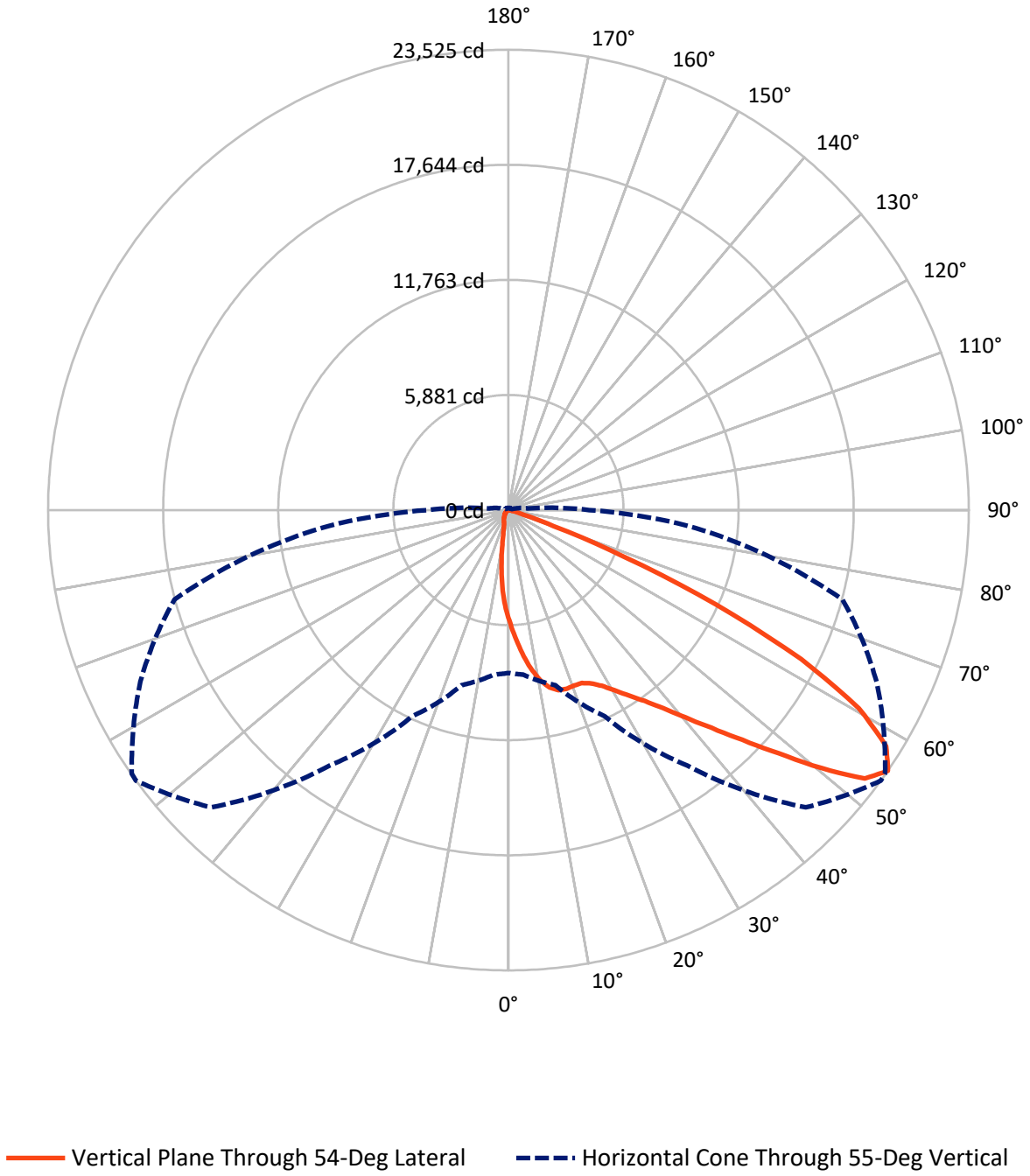
## Luminous Intensity Polar Plot



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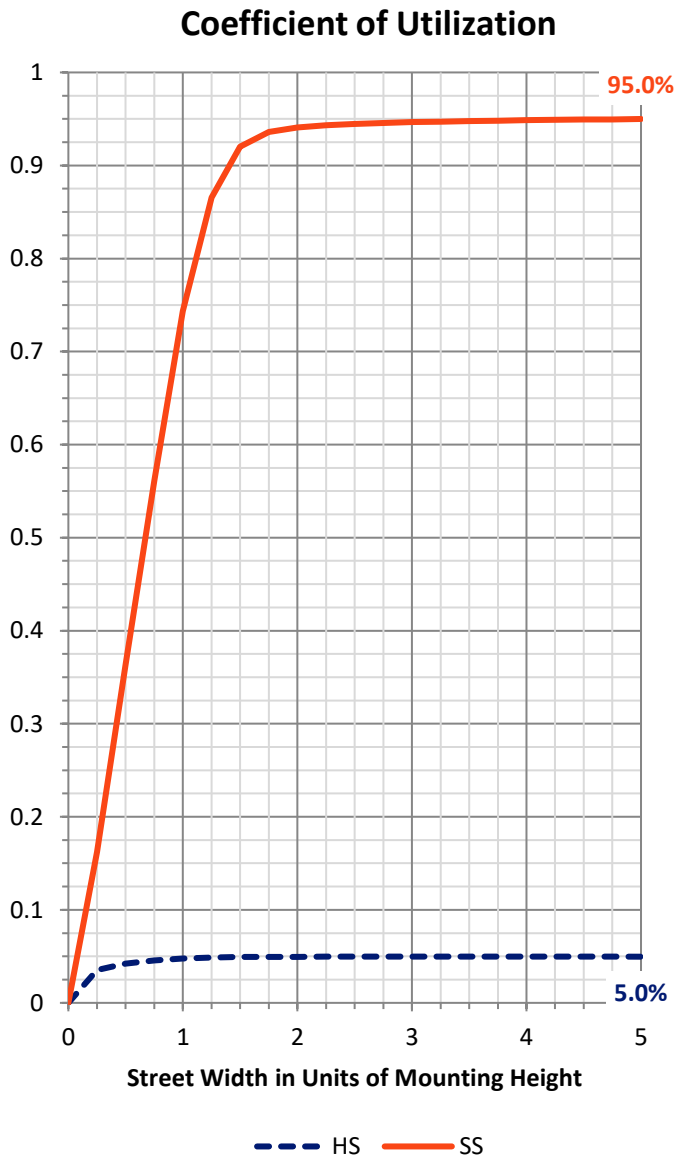
REPORT NUMBER: P324979
CATALOG NUMBER: GLEON-SA5D-830-U-AFL-HSS

**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 1258.6 | 0.0 | 1258.6 |
| | % Fixture | 5.0 | 0.0 | 5.0 |
| **Street Side** | Lumens | 23968.4 | 0.0 | 23968.4 |
| | % Fixture | 95.0 | 0.0 | 95.0 |
| **Total** | Lumens | 25227.0 | 0.0 | 25227.0 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 520.3 | 2.1 |
| 10°-20° | 1426.9 | 5.7 |
| 20°-30° | 2436.2 | 9.7 |
| 30°-40° | 3909.7 | 15.5 |
| 40°-50° | 6247.7 | 24.8 |
| 50°-60° | 6694.5 | 26.5 |
| 60°-70° | 3437.2 | 13.6 |
| 70°-80° | 520.7 | 2.1 |
| 80°-90° | 33.9 | 0.1 |
| 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° | 25227.0 | 100.0 |
| 0°-180° | 25227.0 | 100.0 |



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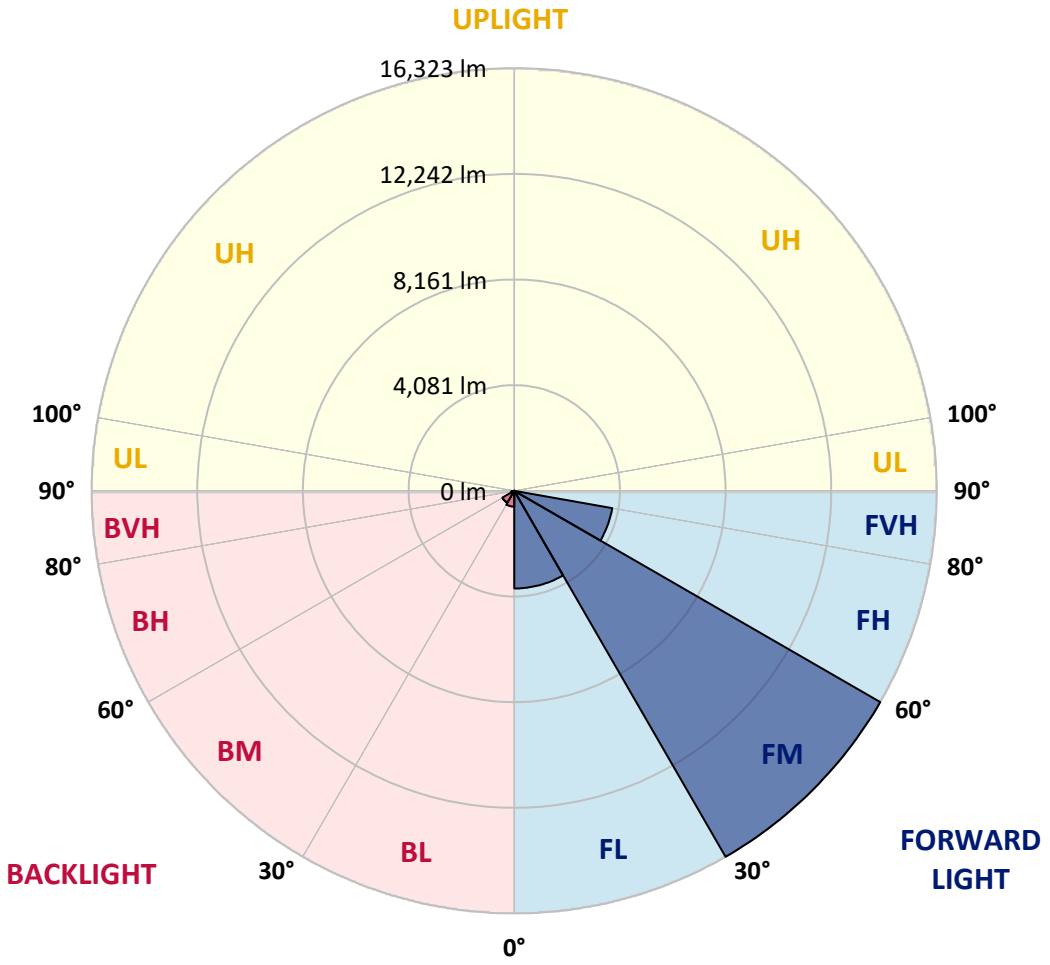
REPORT NUMBER: P324979
CATALOG NUMBER: GLEON-SA5D-830-U-AFL-HSS

## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 3771.0 | 14.9 | | | |
| FM | (30°-60°) | 16323.0 | 64.7 | | | |
| FH | (60°-80°) | 3841.8 | 15.2 | | | G2/5000 |
| FVH | (80°-90°) | 32.5 | 0.1 | | | G1/100 |
| BL | (0°-30°) | 612.4 | 2.4 | B2/1000 | | |
| BM | (30°-60°) | 528.9 | 2.1 | B1/1000 | | |
| BH | (60°-80°) | 116.0 | 0.5 | B1/500 | | G1/500 |
| BVH | (80°-90°) | 1.4 | 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-G2**
Type II Short



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REPORT NUMBER: P324979
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**CANDELA DISTRIBUTION (FULL):**

| | 0° | 5° | 15° | 25° | 35° | 45° | 54° | 55° | 65° | 75° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 5649.8 | 5649.8 | 5649.8 | 5649.8 | 5649.8 | 5649.8 | *5649.8* | 5649.8 | 5649.8 | 5649.8 | 5649.8 |
| 2.5° | 7090.1 | 6984.4 | 6987.7 | 6939.7 | 6764.3 | 6627.1 | *6484.3* | 6450.6 | 6228.3 | 5995.2 | 5770.8 |
| 5° | 8315.7 | 8238.3 | 8219.8 | 8127.2 | 7883.2 | 7625.0 | *7348.3* | 7284.0 | 6849.3 | 6372.1 | 5902.6 |
| 7.5° | 8945.4 | 8946.5 | 8931.2 | 8897.5 | 8744.9 | 8494.4 | *8156.6* | 8089.1 | 7497.5 | 6781.8 | 6039.9 |
| 10° | 8762.4 | 8803.8 | 8888.7 | 9001.0 | 9117.5 | 9085.9 | *8832.1* | 8771.1 | 8128.3 | 7215.4 | 6192.4 |
| 12.5° | 8335.3 | 8340.8 | 8435.5 | 8619.6 | 8955.2 | 9299.5 | *9303.8* | 9283.1 | 8730.8 | 7668.6 | 6360.2 |
| 15° | 8122.9 | 8143.6 | 8178.4 | 8297.2 | 8615.3 | 9166.5 | *9560.9* | 9590.3 | 9283.1 | 8150.1 | 6538.8 |
| 17.5° | 8262.3 | 8291.7 | 8262.3 | 8276.5 | 8460.6 | 8956.3 | *9605.6* | 9680.8 | 9765.7 | 8626.2 | 6707.7 |
| 20° | 8640.3 | 8667.6 | 8615.3 | 8557.6 | 8593.5 | 8895.3 | *9574.0* | 9675.3 | 10143.8 | 9048.9 | 6849.3 |
| 22.5° | 9150.2 | 9161.1 | 9081.6 | 8986.8 | 8960.6 | 9102.3 | *9600.1* | 9704.7 | 10446.6 | 9431.3 | 6938.6 |
| 25° | 9711.3 | 9721.1 | 9621.9 | 9513.0 | 9450.9 | 9508.6 | *9814.8* | 9893.2 | 10713.6 | 9796.2 | 6989.8 |
| 27.5° | 10322.4 | 10331.2 | 10207.0 | 10073.0 | 10001.1 | 10003.2 | *10168.8* | 10252.7 | 10997.9 | 10212.4 | 7031.2 |
| 30° | 10968.5 | 10964.1 | 10849.7 | 10663.4 | 10571.9 | 10569.7 | *10678.7* | 10763.7 | 11409.7 | 10746.2 | 7087.9 |
| 32.5° | 11694.0 | 11685.3 | 11523.0 | 11292.0 | 11188.5 | 11203.8 | *11300.8* | 11349.8 | 11920.7 | 11314.9 | 7189.2 |
| 35° | 12649.5 | 12624.4 | 12379.3 | 12092.8 | 11902.1 | 11896.7 | *11978.4* | 12017.6 | 12572.1 | 12003.4 | 7358.1 |
| 37.5° | 13889.3 | 13866.4 | 13534.1 | 13117.9 | 12849.9 | 12749.7 | *12846.7* | 12896.8 | 13501.4 | 12887.0 | 7629.3 |
| 40° | 15111.6 | 15088.7 | 14891.6 | 14510.3 | 14097.4 | 13856.6 | *13932.8* | 13986.2 | 14661.7 | 13959.0 | 7971.4 |
| 42.5° | 15954.8 | 15974.5 | 16043.1 | 16074.7 | 15687.9 | 15182.4 | *15217.3* | 15272.9 | 15880.8 | 15105.1 | 8362.5 |
| 45° | 16177.1 | 16219.6 | 16607.4 | 17368.9 | 17513.8 | 17119.5 | *16754.5* | 16785.0 | 17119.5 | 16251.2 | 8753.6 |
| 47.5° | 15509.3 | 15587.7 | 16336.2 | 17752.4 | 18979.1 | 19258.0 | *18567.3* | 18527.0 | 18308.0 | 17178.3 | 9031.5 |
| 50° | 13991.7 | 14063.6 | 15033.2 | 17128.2 | 19423.6 | 21299.6 | *20739.7* | 20620.9 | 19350.6 | 17732.8 | 9129.5 |
| 52.5° | 11795.4 | 11882.5 | 12670.2 | 15162.8 | 18585.8 | 22210.4 | *22796.5* | 22697.4 | 20115.4 | 17776.4 | 9145.8 |
| 55° | *8329.9* | *8435.5* | *9269.0* | *11621.1* | *15930.9* | *21485.9* | *23525.4* | *23496.0* | *20750.6* | *17660.9* | *9180.7* |
| 57.5° | 4681.3 | 4757.6 | 5656.4 | 7449.6 | 11667.9 | 18714.4 | *22763.8* | 22958.9 | 21134.0 | 17460.5 | 9233.0 |
| 60° | 2078.7 | 2099.4 | 2564.5 | 3708.5 | 6830.8 | 14302.2 | *20583.9* | 20912.9 | 20805.0 | 17192.5 | 9321.2 |
| 62.5° | 1152.6 | 1135.2 | 1135.2 | 1541.6 | 2968.7 | 8853.9 | *16785.0* | 17328.6 | 19400.7 | 16875.4 | 9325.6 |
| 65° | 903.1 | 886.8 | 840.0 | 846.5 | 1130.8 | 3929.6 | *11623.2* | 12589.6 | 16733.8 | 15946.1 | 9011.8 |
| 67.5° | 765.9 | 751.7 | 704.9 | 686.3 | 702.7 | 1296.4 | *6386.3* | 7389.7 | 12697.4 | 13530.8 | 7805.8 |
| 70° | 647.1 | 637.3 | 613.4 | 590.5 | 549.1 | 640.6 | *2443.6* | 3125.6 | 7824.4 | 9001.0 | 5328.5 |
| 72.5° | 520.8 | 516.4 | 525.1 | 505.5 | 455.4 | 427.1 | *835.6* | 1012.1 | 3514.5 | 4016.8 | 2195.2 |
| 75° | 448.8 | 446.7 | 451.0 | 431.4 | 374.8 | 297.4 | *424.9* | 464.1 | 991.4 | 982.7 | 444.5 |
| 77.5° | 292.0 | 295.2 | 373.7 | 365.0 | 322.5 | 198.3 | *220.1* | 237.5 | 300.7 | 225.5 | 135.1 |
| 80° | 186.3 | 184.1 | 189.6 | 302.9 | 289.8 | 151.4 | *110.0* | 115.5 | 144.9 | 111.1 | 65.4 |
| 82.5° | 113.3 | 111.1 | 124.2 | 141.6 | 146.0 | 105.7 | *67.5* | 68.6 | 90.4 | 71.9 | 34.9 |
| 85° | 9.8 | 13.1 | 75.2 | 69.7 | 50.1 | 32.7 | *32.7* | 34.9 | 47.9 | 42.5 | 19.6 |
| 87.5° | 0.0 | 0.0 | 13.1 | 19.6 | 10.9 | 12.0 | *12.0* | 13.1 | 18.5 | 18.5 | 9.8 |
| 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: P324979
CATALOG NUMBER: GLEON-SA5D-830-U-AFL-HSS

**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 5649.8 | 5649.8 | 5649.8 | 5649.8 | 5649.8 | 5649.8 | 5649.8 | 5649.8 | 5649.8 | 5649.8 | 5649.8 |
| 2.5° | 5654.2 | 5540.9 | 5312.1 | 5092.0 | 4905.7 | 4726.0 | 4521.2 | 4318.5 | 4223.8 | 4185.6 | 4146.4 |
| 5° | 5664.0 | 5430.9 | 4959.1 | 4484.1 | 3991.7 | 3548.3 | 3170.3 | 2782.4 | 2588.5 | 2503.5 | 2464.3 |
| 7.5° | 5677.1 | 5321.9 | 4559.3 | 3761.8 | 2968.7 | 2367.4 | 1842.2 | 1504.5 | 1358.5 | 1335.7 | 1279.0 |
| 10° | 5679.3 | 5190.1 | 4095.2 | 2964.4 | 1990.4 | 1427.2 | 1098.2 | 923.8 | 859.6 | 848.7 | 830.2 |
| 12.5° | 5683.6 | 5034.3 | 3579.9 | 2195.2 | 1326.9 | 954.3 | 794.2 | 736.5 | 719.0 | 717.9 | 717.9 |
| 15° | 5696.7 | 4870.9 | 3045.0 | 1581.9 | 953.3 | 756.1 | 697.2 | 674.4 | 667.8 | 671.1 | 670.0 |
| 17.5° | 5696.7 | 4678.1 | 2519.9 | 1178.8 | 770.2 | 679.8 | 647.1 | 631.9 | 629.7 | 633.0 | 634.1 |
| 20° | 5655.3 | 4443.8 | 2038.3 | 917.3 | 683.1 | 630.8 | 601.4 | 587.2 | 581.8 | 583.9 | 585.0 |
| 22.5° | 5556.1 | 4156.2 | 1646.1 | 759.3 | 625.3 | 586.1 | 554.5 | 532.7 | 524.0 | 525.1 | 525.1 |
| 25° | 5401.4 | 3815.2 | 1287.7 | 656.9 | 578.5 | 538.2 | 501.1 | 476.1 | 470.6 | 469.5 | 471.7 |
| 27.5° | 5203.2 | 3438.3 | 1025.2 | 578.5 | 522.9 | 484.8 | 447.8 | 427.1 | 422.7 | 423.8 | 424.9 |
| 30° | 5008.2 | 3047.2 | 808.4 | 512.0 | 460.8 | 424.9 | 396.6 | 386.8 | 386.8 | 390.0 | 391.1 |
| 32.5° | 4829.5 | 2671.3 | 639.5 | 454.3 | 405.3 | 372.6 | 356.2 | 355.2 | 360.6 | 362.8 | 363.9 |
| 35° | 4675.9 | 2323.8 | 529.5 | 409.6 | 361.7 | 333.4 | 327.9 | 332.3 | 338.8 | 343.2 | 344.3 |
| 37.5° | 4566.9 | 2013.3 | 463.0 | 372.6 | 327.9 | 305.0 | 304.0 | 312.7 | 321.4 | 331.2 | 333.4 |
| 40° | 4521.2 | 1750.7 | 417.3 | 339.9 | 300.7 | 283.3 | 280.0 | 292.0 | 308.3 | 322.5 | 324.7 |
| 42.5° | 4483.0 | 1536.1 | 378.0 | 308.3 | 278.9 | 253.8 | 252.8 | 268.0 | 287.6 | 301.8 | 305.0 |
| 45° | 4450.4 | 1364.0 | 342.1 | 274.5 | 250.6 | 217.9 | 221.2 | 240.8 | 256.0 | 271.3 | 274.5 |
| 47.5° | 4382.8 | 1222.4 | 302.9 | 238.6 | 207.0 | 186.3 | 192.8 | 210.3 | 222.2 | 245.1 | 248.4 |
| 50° | 4261.9 | 1106.9 | 262.6 | 195.0 | 168.9 | 161.2 | 171.0 | 183.0 | 198.3 | 217.9 | 220.1 |
| 52.5° | 4180.2 | 1019.7 | 227.7 | 163.4 | 139.4 | 141.6 | 151.4 | 155.8 | 164.5 | 172.1 | 170.0 |
| 55° | *4133.3* | *971.8* | *199.4* | *141.6* | *118.7* | *125.3* | *127.5* | *122.0* | *117.7* | *110.0* | *106.8* |
| 57.5° | 4127.9 | 928.2 | 177.6 | 123.1 | 104.6 | 107.9 | 100.2 | 81.7 | 66.5 | 57.7 | 55.6 |
| 60° | 4119.2 | 874.8 | 160.1 | 103.5 | 92.6 | 88.2 | 71.9 | 44.7 | 31.6 | 29.4 | 29.4 |
| 62.5° | 4024.4 | 792.0 | 147.1 | 87.2 | 78.4 | 66.5 | 41.4 | 20.7 | 17.4 | 18.5 | 18.5 |
| 65° | 3722.6 | 676.5 | 134.0 | 70.8 | 62.1 | 47.9 | 20.7 | 12.0 | 6.5 | 7.6 | 7.6 |
| 67.5° | 3164.8 | 539.3 | 119.8 | 54.5 | 46.8 | 30.5 | 12.0 | 5.4 | 0.0 | 0.0 | 0.0 |
| 70° | 2119.0 | 334.5 | 101.3 | 38.1 | 30.5 | 18.5 | 8.7 | 1.1 | 0.0 | 0.0 | 0.0 |
| 72.5° | 812.7 | 180.8 | 81.7 | 22.9 | 19.6 | 13.1 | 5.4 | 0.0 | 0.0 | 0.0 | 0.0 |
| 75° | 183.0 | 118.7 | 56.7 | 16.3 | 14.2 | 8.7 | 2.2 | 0.0 | 0.0 | 0.0 | 0.0 |
| 77.5° | 69.7 | 86.1 | 32.7 | 10.9 | 9.8 | 5.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 80° | 33.8 | 51.2 | 15.3 | 6.5 | 5.4 | 2.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 82.5° | 17.4 | 19.6 | 6.5 | 3.3 | 2.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 85° | 9.8 | 9.8 | 3.3 | 2.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 87.5° | 5.4 | 3.3 | 1.1 | 1.1 | 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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# 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

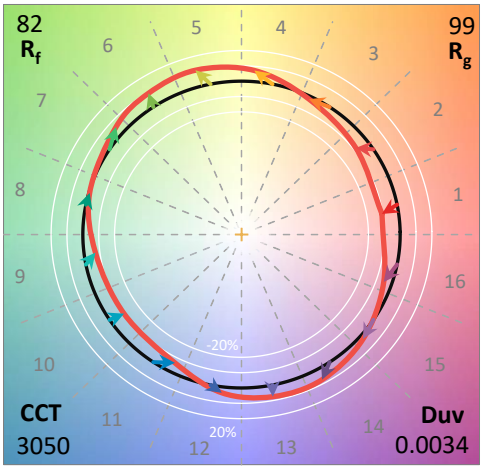
## Test Information

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

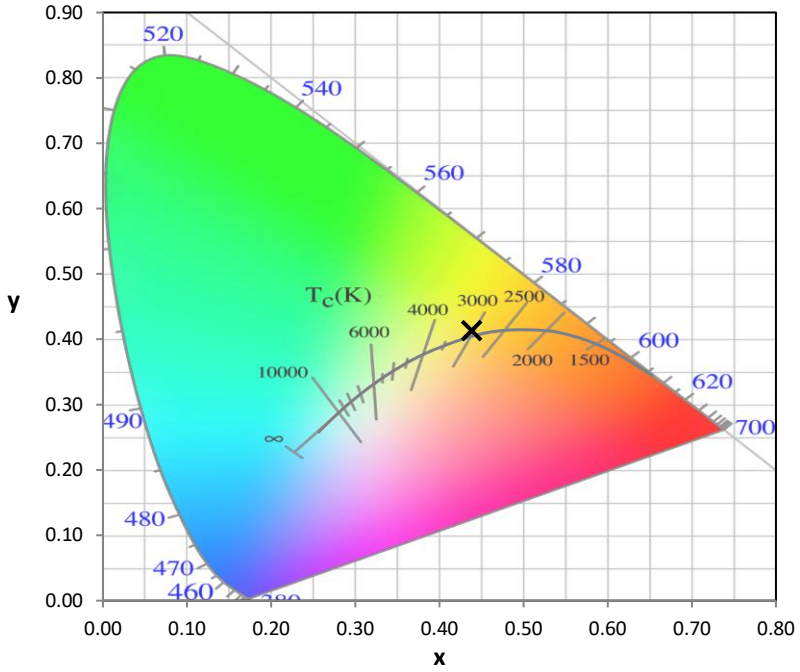
| | |
|---|---|
| Stabilization Time: | 20M |
| Operation Time: | 1H 20M |
| Sphere Temperature (°C): | 24.2 |

REPORT NUMBER: SP1-2408-195-9

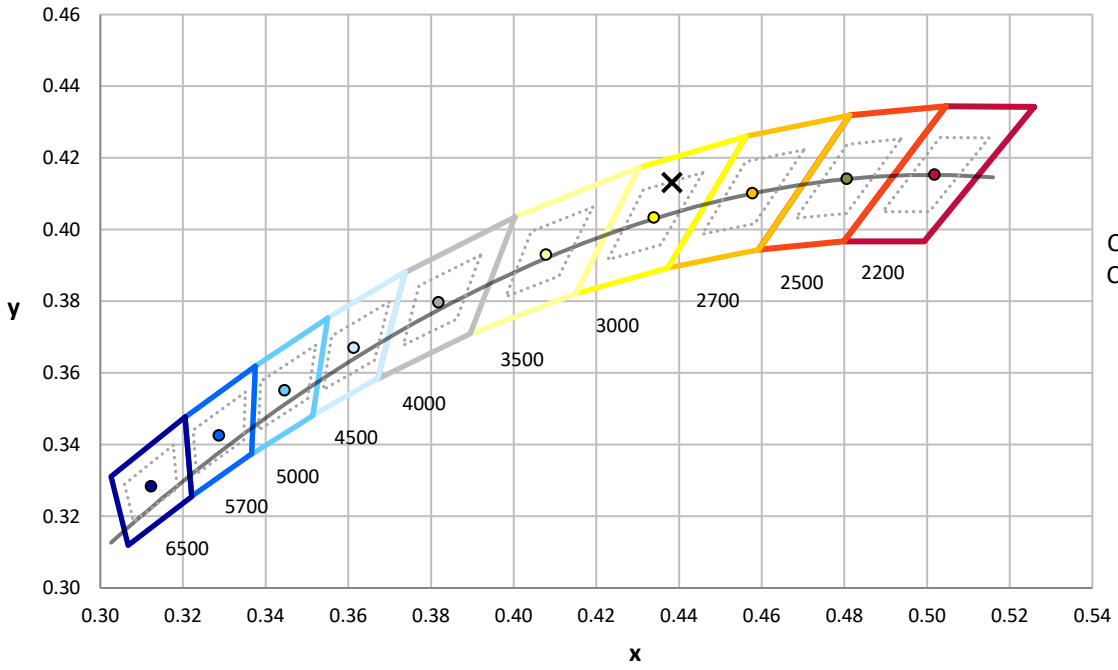
| Measurement and Test Equipment | | | |
|---|---|---|---|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | IN0058 | 6/18/2024 | 12/18/2024 |
| Power Meter | INXT2011004 | 2/8/2024 | 2/8/2025 |
| AC Power Source | IN0063 | 10/24/2023 | 10/24/2024 |
| DC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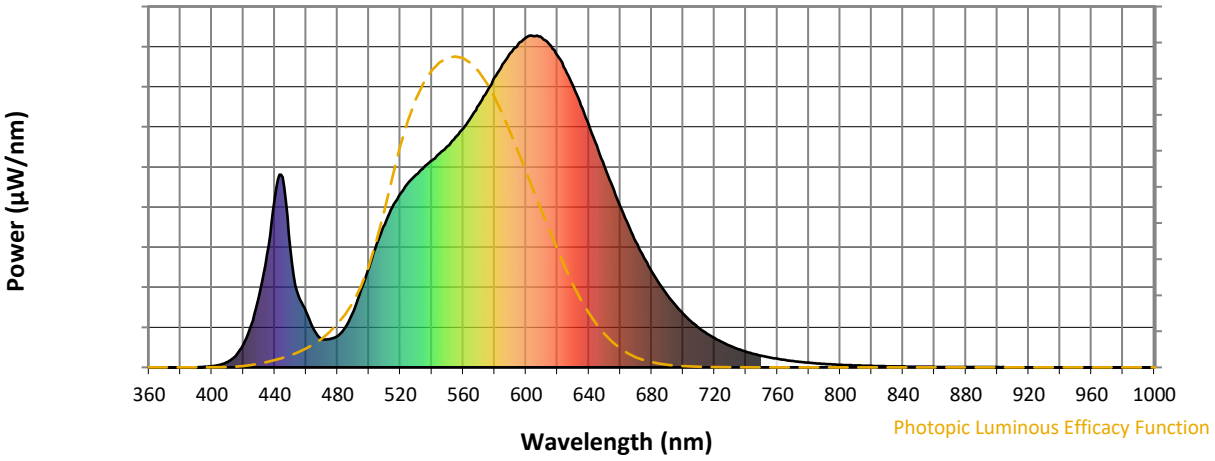
## Photopic Flux vs. Wavelength




## 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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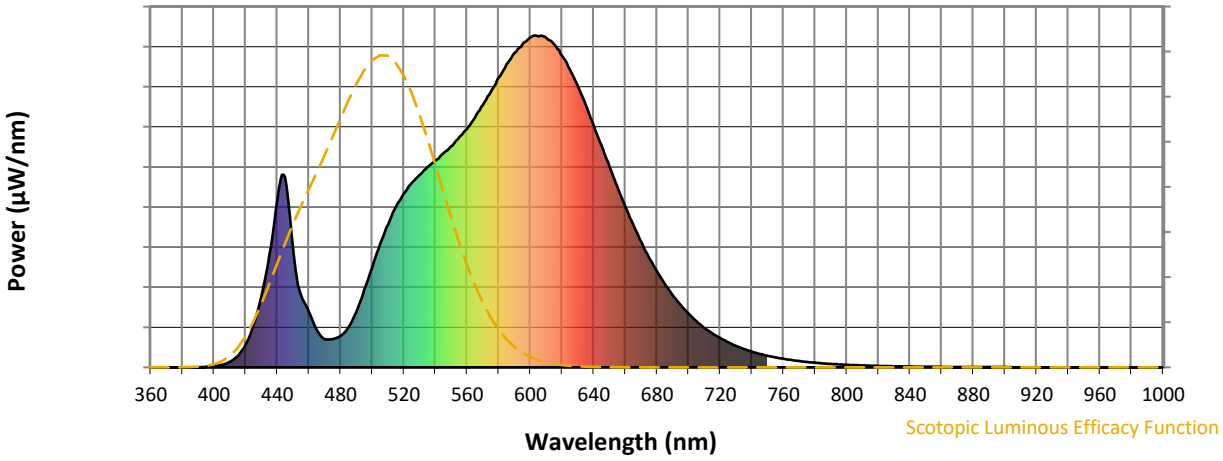
## Scotopic Flux vs. Wavelength




**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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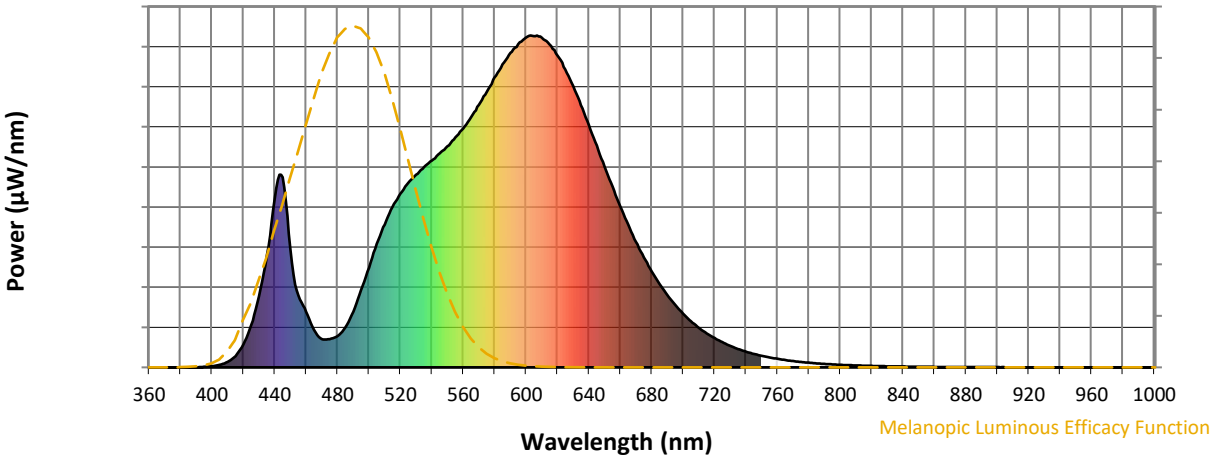
## Melanopic Flux vs. Wavelength




**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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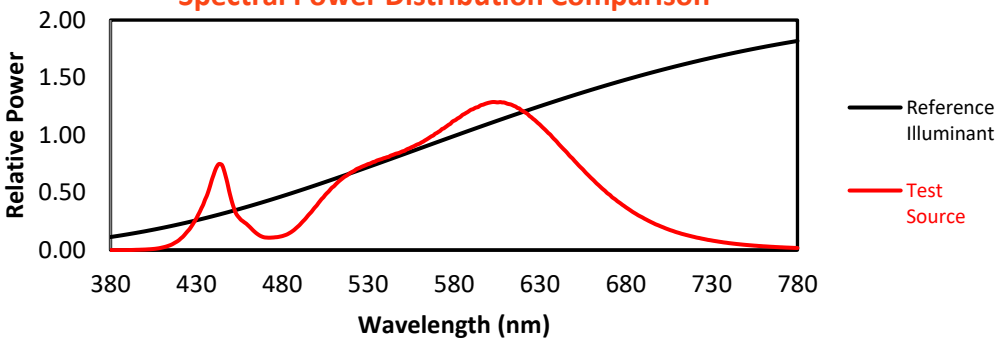
# TM-30-18

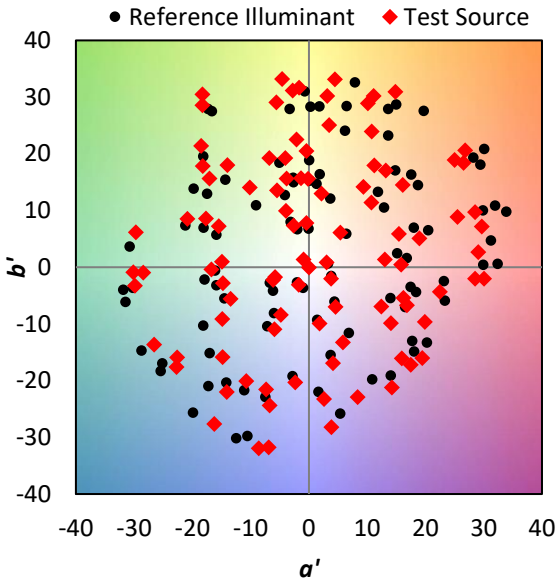
## Summary

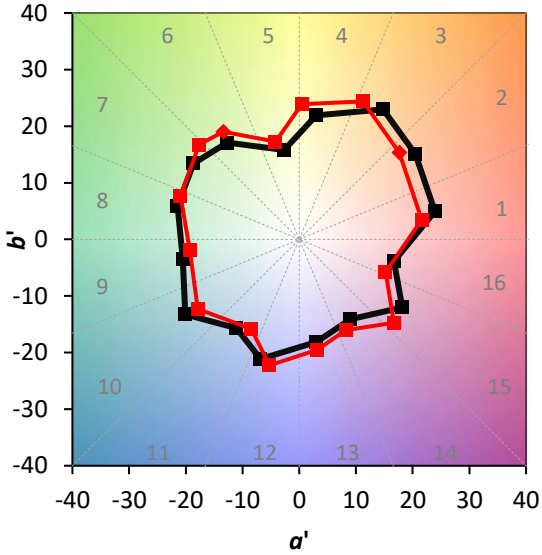
$R_f$ = 81.5
$R_g$ = 99.2
CIE $R_a$ = 81.0
$R_9$ = 7.1

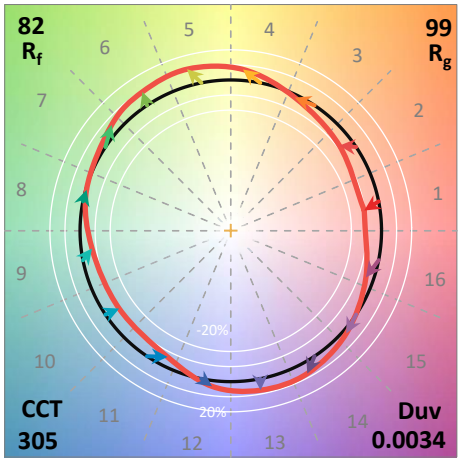
## Spectral Power Distribution Comparison

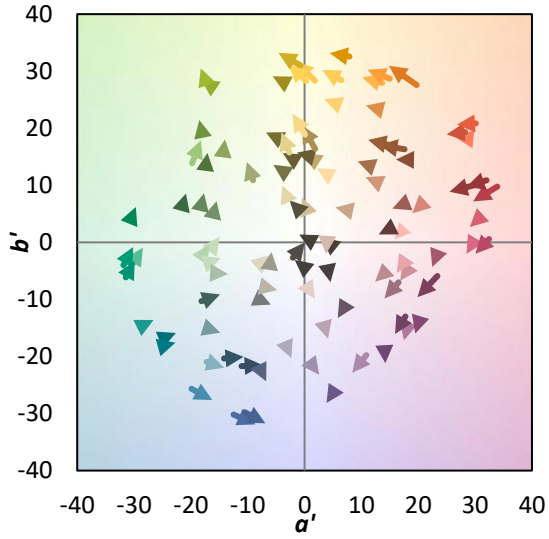



## Color Vector Graphics



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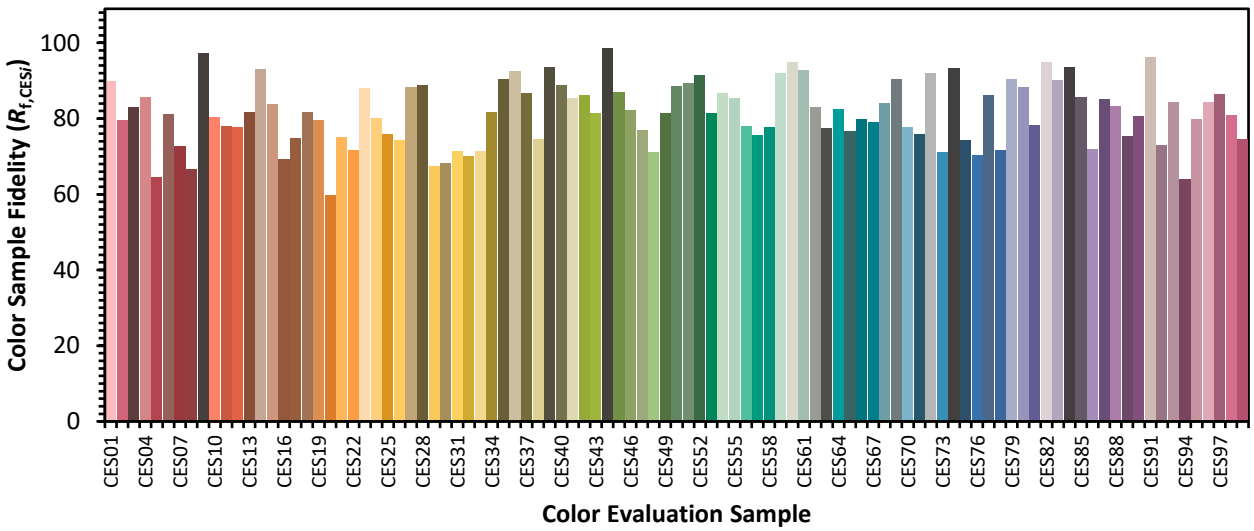
**Individual Sample Fidelity Index ($R_{f,i}$)**

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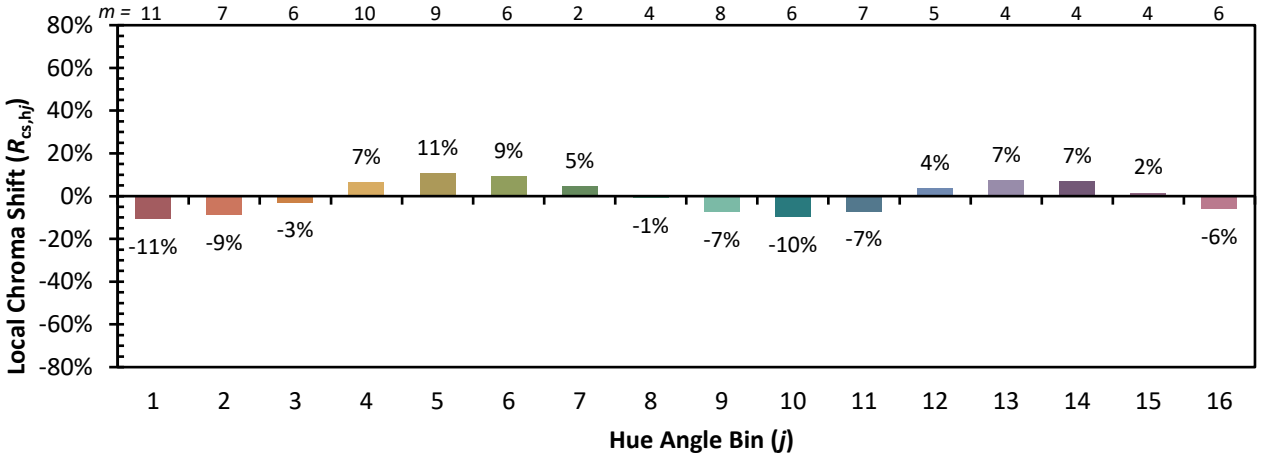
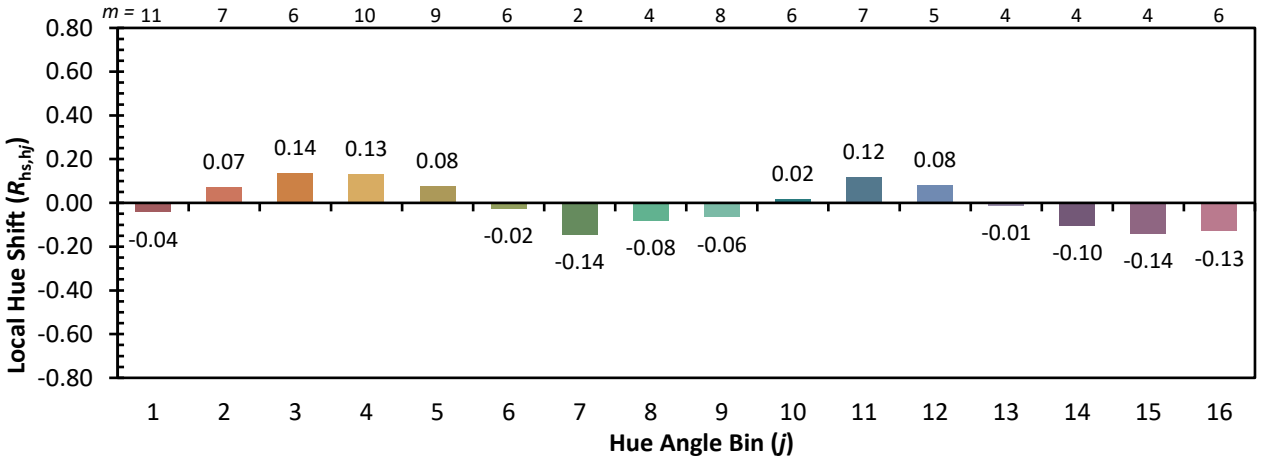
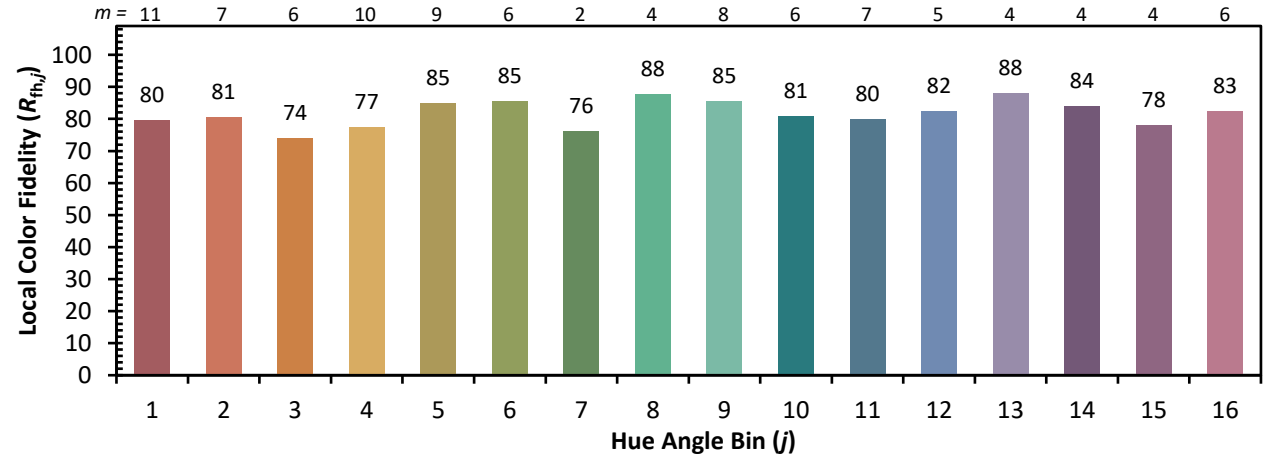
## Color Rendition by Hue-Angle Bin



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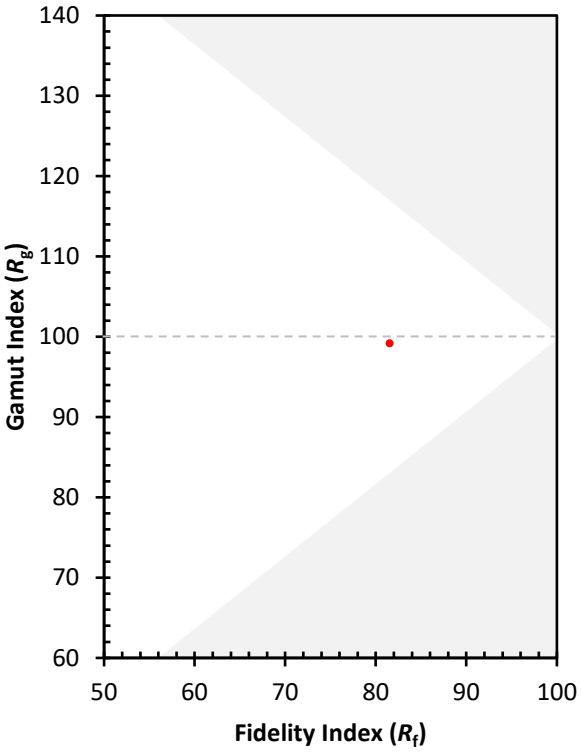
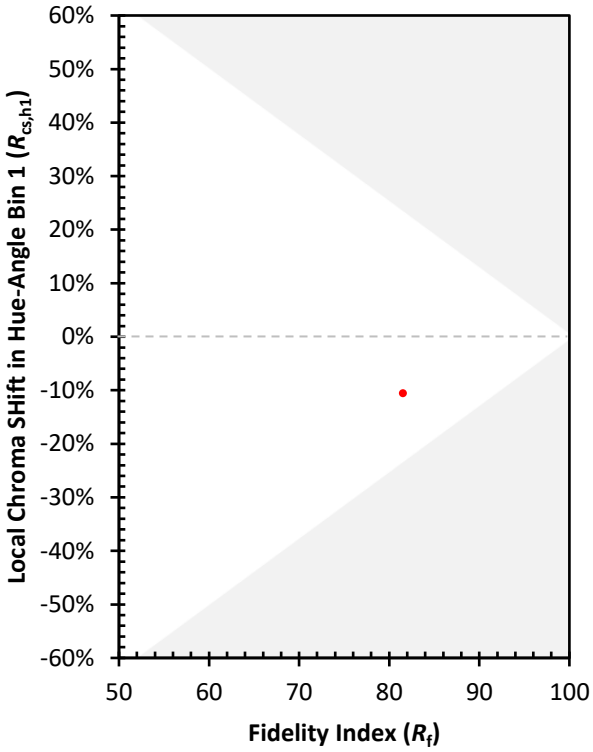
## Measure Comparisons

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