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: P319843

Luminaire Tested: **GLEON-SA9B-830-U-SL3**

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: | P319843 |
| | TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-22) |
| Test Lab: | INNOVATION CENTER |
| Issue Date: | 3/3/2020 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS (FORMERLY EATON) |
| Product Line: | McGRAW-EDISON |
| Catalog Number: | GLEON-SA9B-830-U-SL3 |
| Description: | GALLEON AREA AND ROADWAY LUMINAIRE |
| | (9) 80 CRI, 3000K, 800mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE III SPILL LIGHT ELIMINATOR OPTICS |
| Light Source: | - |
| Ballast/Driver: | ELECTRONIC DRIVER |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 40600 lumens |
| Efficiency: | N/A |
| Efficacy: | 108.6 lumens/watt |
| Luminous Opening: | Rectangular (W 2.5' x L: 1' x H: 0') |
| IES Classification: | Type III - Medium |
| BUG Rating: | B3 - U0 - G5 |

| | |
|---|---|
| Input Watts (W): | 374 |
| 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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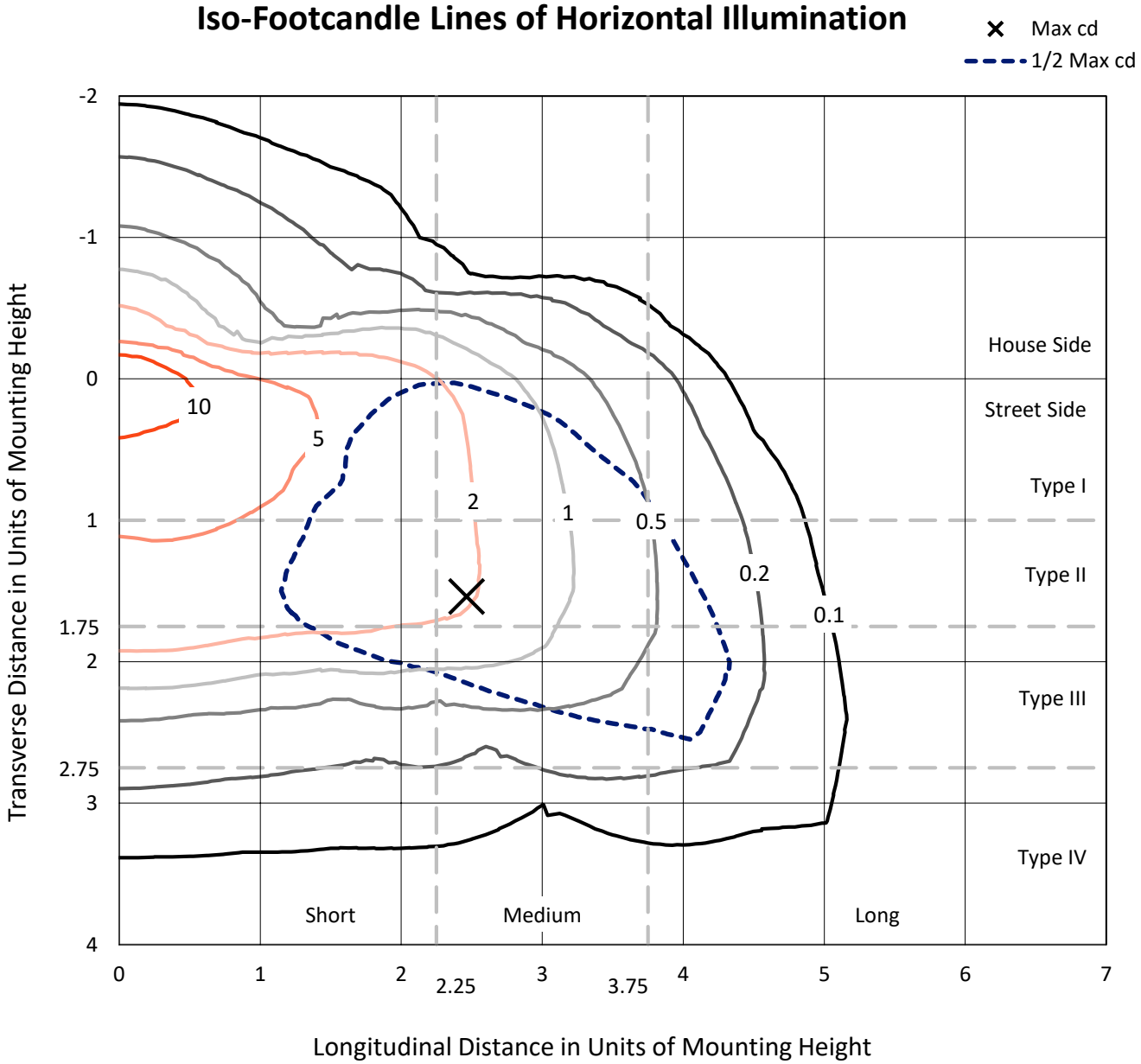
Scaled Data Report

REPORT NUMBER: P319843
CATALOG NUMBER: GLEON-SA9B-830-U-SL3

## Iso-Footcandle Lines of Horizontal Illumination




Based on 25 foot mounting height. Maximum calculated value = 18 fc
Type III - Medium - N/A

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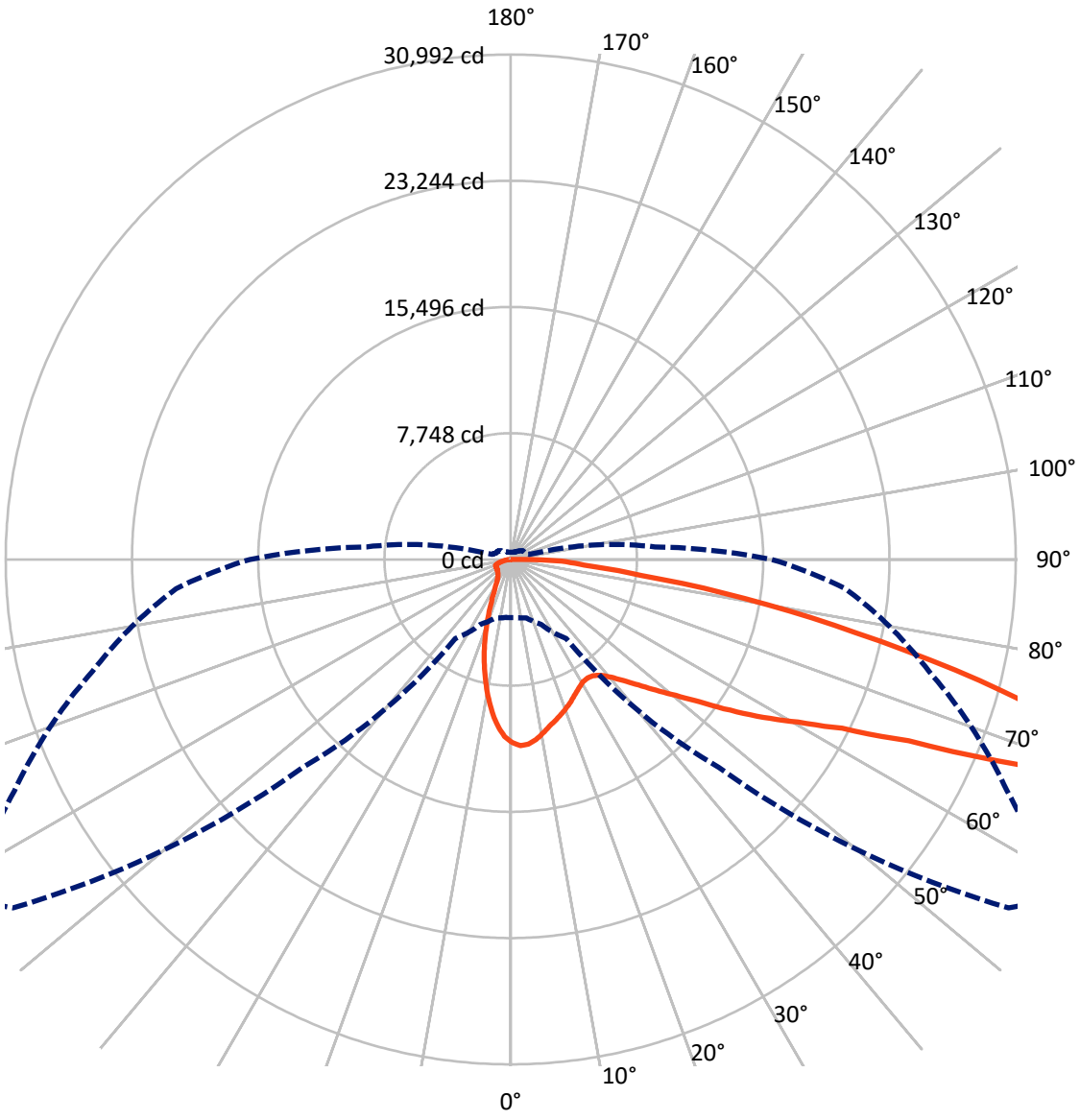
## Luminous Intensity Polar Plot



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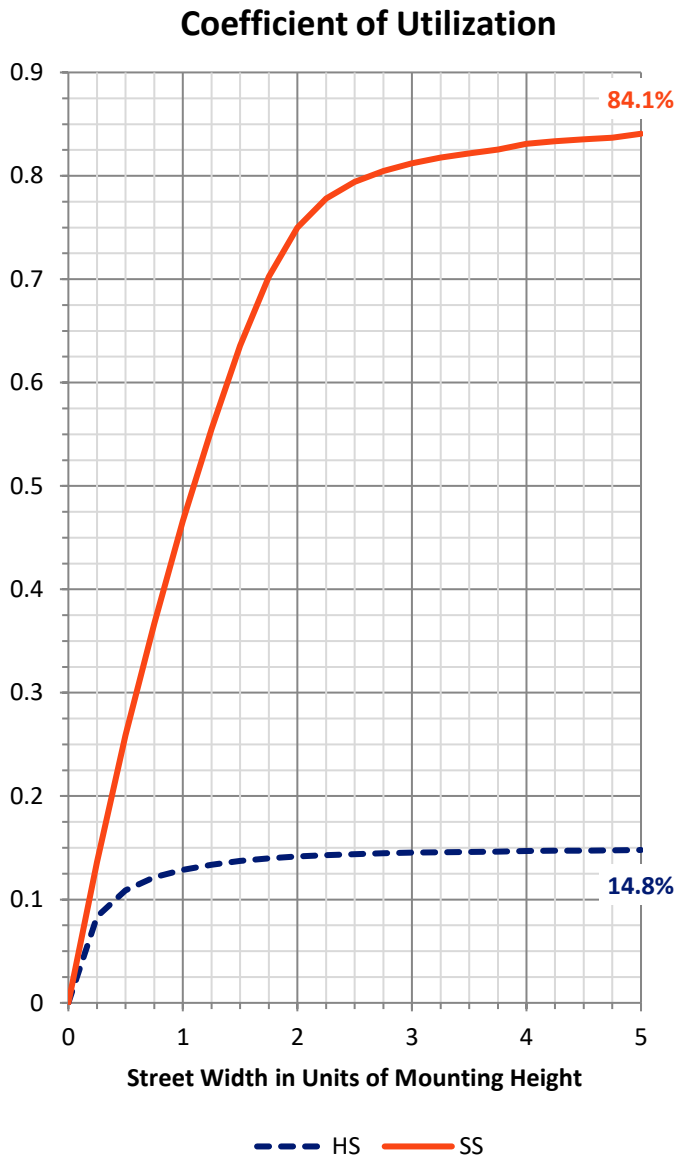
CATALOG NUMBER: GLEON-SA9B-830-U-SL3

**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 6070.0 | 0.0 | 6070.0 |
| | % Fixture | 15.0 | 0.0 | 15.0 |
| **Street Side** | Lumens | 34530.0 | 0.0 | 34530.0 |
| | % Fixture | 85.0 | 0.0 | 85.0 |
| **Total** | Lumens | 40600.0 | 0.0 | 40600.0 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 970.4 | 2.4 |
| 10°-20° | 2157.9 | 5.3 |
| 20°-30° | 2742.5 | 6.8 |
| 30°-40° | 3493.3 | 8.6 |
| 40°-50° | 4953.7 | 12.2 |
| 50°-60° | 7666.1 | 18.9 |
| 60°-70° | 10436.4 | 25.7 |
| 70°-80° | 6962.3 | 17.1 |
| 80°-90° | 1217.3 | 3.0 |
| 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° | 40600.0 | 100.0 |
| 0°-180° | 40600.0 | 100.0 |



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REPORT NUMBER: P319843
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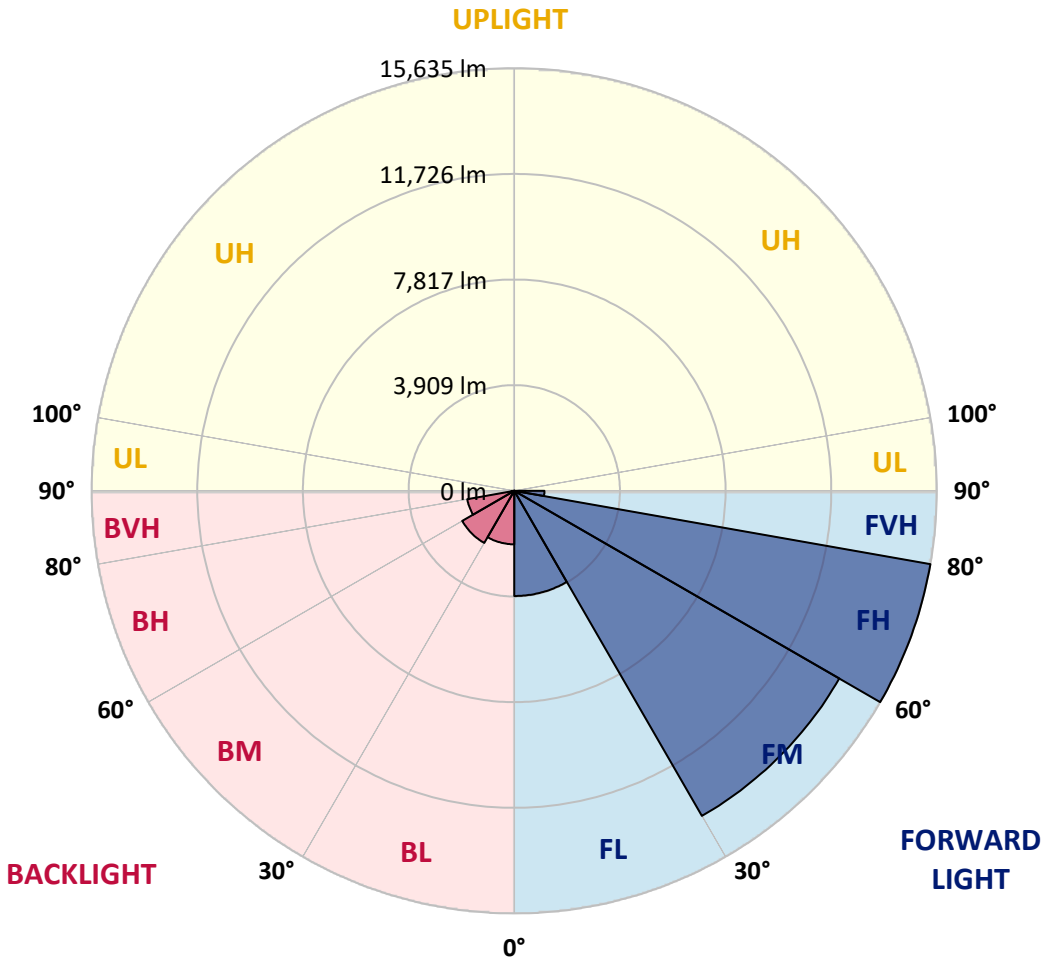
## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 3892.2 | 9.6 | | | |
| FM | (30°-60°) | 13887.2 | 34.2 | | | |
| FH | (60°-80°) | 15634.6 | 38.5 | | | G5 |
| FVH | (80°-90°) | 1116.1 | 2.7 | | | G5 |
| BL | (0°-30°) | 1978.6 | 4.9 | B3/2500 | | |
| BM | (30°-60°) | 2226.0 | 5.5 | B2/2500 | | |
| BH | (60°-80°) | 1764.2 | 4.3 | B3/2500 | | G3/2500 |
| BVH | (80°-90°) | 101.1 | 0.2 | | | G2/225 |
| UL | (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH | (100°-180°) | 0.0 | 0.0 | | U0/0 | |

**BUG Rating: B3-U0-G5**
Type III Medium



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Scaled Data Report

REPORT NUMBER: P319843
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**CANDELA DISTRIBUTION (FULL):**

| | 0° | 5° | 15° | 25° | 35° | 45° | 55° | 58° | 65° | 75° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 11248.9 | 11248.9 | 11248.9 | 11248.9 | 11248.9 | 11248.9 | 11248.9 | *11248.9* | 11248.9 | 11248.9 | 11248.9 |
| 2.5° | 11547.3 | 11531.8 | 11537.4 | 11526.1 | 11499.2 | 11472.4 | 11432.8 | *11439.8* | 11384.7 | 11302.7 | 11200.8 |
| 5° | 11329.5 | 11323.9 | 11366.3 | 11390.3 | 11410.1 | 11394.6 | 11383.3 | *11397.4* | 11316.8 | 11203.7 | 11026.9 |
| 7.5° | 10872.7 | 10810.5 | 10864.2 | 10944.9 | 11021.2 | 11079.2 | 11155.6 | *11165.5* | 11114.6 | 10995.8 | 10763.8 |
| 10° | 10223.6 | 10164.2 | 10243.4 | 10369.3 | 10522.0 | 10660.6 | 10814.7 | *10843.0* | 10852.9 | 10745.4 | 10464.0 |
| 12.5° | 9550.4 | 9505.1 | 9584.3 | 9761.1 | 10014.3 | 10227.8 | 10473.9 | *10516.3* | 10604.0 | 10531.9 | 10186.8 |
| 15° | 8947.9 | 8931.0 | 9027.1 | 9201.1 | 9492.4 | 9819.1 | 10174.1 | *10251.9* | 10400.4 | 10376.3 | 9970.4 |
| 17.5° | 8427.5 | 8423.3 | 8496.8 | 8679.2 | 9001.7 | 9414.6 | 9875.7 | *10007.2* | 10227.8 | 10256.1 | 9792.2 |
| 20° | 8040.0 | 8031.5 | 8082.4 | 8216.8 | 8549.1 | 9017.2 | 9553.2 | *9734.3* | 10052.5 | 10151.5 | 9608.4 |
| 22.5° | 7832.1 | 7830.7 | 7832.1 | 7895.7 | 8167.3 | 8602.9 | 9239.3 | *9459.9* | 9881.3 | 10068.0 | 9404.7 |
| 25° | 7796.7 | 7792.5 | 7761.4 | 7754.3 | 7908.5 | 8256.4 | 8928.1 | *9171.4* | 9718.7 | 10010.0 | 9211.0 |
| 27.5° | 7888.7 | 7894.3 | 7853.3 | 7786.8 | 7818.0 | 8028.7 | 8658.0 | *8918.2* | 9588.6 | 9998.7 | 9076.6 |
| 30° | 8079.6 | 8076.8 | 8041.4 | 7972.1 | 7911.3 | 7943.8 | 8465.7 | *8725.9* | 9500.9 | 10048.2 | 8984.7 |
| 32.5° | 8290.3 | 8305.9 | 8298.8 | 8260.6 | 8170.1 | 8040.0 | 8407.7 | *8662.3* | 9475.4 | 10167.0 | 8945.1 |
| 35° | 8543.5 | 8560.4 | 8611.3 | 8641.0 | 8535.0 | 8325.7 | 8532.1 | *8752.8* | 9549.0 | 10390.5 | 9008.7 |
| 37.5° | 8783.9 | 8827.7 | 8970.6 | 9096.4 | 9005.9 | 8772.6 | 8863.1 | *9020.1* | 9776.7 | 10742.6 | 9179.9 |
| 40° | 9061.1 | 9099.3 | 9332.6 | 9599.9 | 9585.8 | 9343.9 | 9396.3 | *9500.9* | 10178.3 | 11247.5 | 9489.6 |
| 42.5° | 9334.0 | 9410.4 | 9748.4 | 10127.4 | 10236.3 | 10022.8 | 10106.2 | *10161.4* | 10744.0 | 11916.4 | 10029.8 |
| 45° | 9697.5 | 9779.5 | 10249.0 | 10705.8 | 10960.4 | 10840.2 | 10973.1 | *10994.3* | 11455.4 | 12827.2 | 10814.7 |
| 47.5° | 10247.6 | 10341.0 | 10888.3 | 11367.7 | 11756.6 | 11769.4 | 11988.6 | *11980.1* | 12343.5 | 13869.5 | 11803.3 |
| 50° | 11104.7 | 11239.0 | 11687.3 | 12135.6 | 12608.0 | 12871.1 | 13163.8 | *13122.8* | 13408.5 | 14979.7 | 12941.8 |
| 52.5° | 12227.6 | 12289.8 | 12622.1 | 12953.1 | 13540.0 | 14129.7 | 14549.8 | *14513.0* | 14616.2 | 16121.0 | 14234.4 |
| 55° | 13391.5 | 13438.2 | 13575.3 | 13756.4 | 14545.5 | 15507.2 | 16395.4 | *16337.4* | 16075.7 | 17306.1 | 15511.5 |
| 57.5° | 14438.0 | 14532.8 | 14627.5 | 14702.5 | 15558.1 | 16946.9 | 18283.4 | *18287.6* | 17659.7 | 18584.6 | 16830.9 |
| 60° | 14600.7 | 14684.1 | 15310.6 | 15901.8 | 17290.6 | 18867.5 | 20304.3 | *20261.9* | 19298.8 | 19972.0 | 18301.8 |
| 62.5° | 12906.4 | 13094.5 | 14141.0 | 15713.7 | 18959.4 | 22380.4 | 22882.5 | *22830.2* | 21258.9 | 21681.8 | 20014.4 |
| 65° | 9249.2 | 9462.7 | 10725.6 | 13088.8 | 18150.4 | 26251.2 | 27535.4 | *26831.1* | 23931.9 | 23784.8 | 22019.8 |
| 67.5° | 5336.0 | 5386.9 | 5934.2 | 7832.1 | 13820.0 | 26453.5 | 34633.5 | *33647.7* | 28082.7 | 26170.6 | 23001.3 |
| 70° | 3945.7 | 3944.3 | 4074.4 | 4819.8 | 7478.5 | 21589.9 | 38009.3 | *38893.2* | 32452.7 | 26955.5 | 21613.9 |
| 71° | *3568.1* | *3572.4* | *3718.1* | *4387.0* | *5922.9* | *18071.2* | *37292.3* | *39226.9* | *33603.9* | *26568.0* | *20609.8* |
| 72.5° | 3051.9 | 3066.1 | 3268.3 | 3934.4 | 4982.4 | 12462.3 | 34203.5 | *37224.4* | 34149.8 | 25612.0 | 19038.6 |
| 75° | 2315.1 | 2347.6 | 2627.7 | 3316.4 | 4553.9 | 6320.3 | 25102.9 | *29724.6* | 30337.0 | 22599.7 | 14146.7 |
| 77.5° | 1651.8 | 1688.6 | 2005.4 | 2788.9 | 4329.0 | 4763.2 | 16811.1 | *21681.8* | 22325.3 | 14483.3 | 6381.1 |
| 80° | 1043.7 | 1087.6 | 1326.6 | 2219.0 | 4067.4 | 4522.8 | 10564.4 | *14573.8* | 12173.8 | 4634.5 | 1623.6 |
| 82.5° | 612.4 | 646.3 | 823.1 | 1449.6 | 3322.1 | 4355.9 | 6215.6 | *8078.2* | 4737.7 | 1400.1 | 738.2 |
| 85° | 355.0 | 370.5 | 513.4 | 923.5 | 2412.7 | 4111.2 | 4566.6 | *4515.7* | 2056.3 | 684.5 | 349.3 |
| 87.5° | 165.5 | 183.9 | 304.1 | 482.3 | 1339.3 | 2979.8 | 3609.2 | *3118.4* | 1278.5 | 321.0 | 164.1 |
| 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: P319843
CATALOG NUMBER: GLEON-SA9B-830-U-SL3

**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 11248.9 | 11248.9 | 11248.9 | 11248.9 | 11248.9 | 11248.9 | 11248.9 | 11248.9 | 11248.9 | 11248.9 | 11248.9 |
| 2.5° | 11151.3 | 11127.3 | 11026.9 | 10937.8 | 10844.4 | 10722.8 | 10588.5 | 10571.5 | 10489.5 | 10505.0 | 10476.7 |
| 5° | 10930.7 | 10869.9 | 10628.1 | 10408.9 | 10150.0 | 9918.1 | 9666.4 | 9550.4 | 9383.5 | 9372.2 | 9329.8 |
| 7.5° | 10615.3 | 10502.2 | 10127.4 | 9711.6 | 9295.8 | 8899.9 | 8508.1 | 8250.7 | 7987.7 | 7875.9 | 7866.0 |
| 10° | 10260.4 | 10068.0 | 9516.5 | 8901.3 | 8301.6 | 7723.2 | 7163.2 | 6748.8 | 6375.4 | 6198.6 | 6191.6 |
| 12.5° | 9923.8 | 9639.5 | 8882.9 | 8045.6 | 7225.4 | 6475.8 | 5707.9 | 5163.4 | 4695.3 | 4538.3 | 4471.8 |
| 15° | 9638.1 | 9237.9 | 8266.3 | 7195.7 | 6200.1 | 5159.2 | 4285.2 | 3712.4 | 3279.6 | 3129.7 | 3101.4 |
| 17.5° | 9360.9 | 8846.1 | 7634.1 | 6337.2 | 5133.7 | 3989.6 | 3114.2 | 2688.5 | 2458.0 | 2397.1 | 2395.7 |
| 20° | 9085.1 | 8443.0 | 6973.6 | 5459.0 | 4102.7 | 2984.1 | 2394.3 | 2203.4 | 2125.6 | 2118.5 | 2107.2 |
| 22.5° | 8772.6 | 8015.9 | 6279.3 | 4577.9 | 3201.9 | 2346.2 | 2035.1 | 1958.7 | 1948.8 | 1974.3 | 1974.3 |
| 25° | 8479.8 | 7591.7 | 5575.0 | 3715.2 | 2490.5 | 1957.3 | 1817.3 | 1801.7 | 1828.6 | 1873.9 | 1878.1 |
| 27.5° | 8206.9 | 7183.0 | 4887.6 | 2948.7 | 1995.5 | 1724.0 | 1666.0 | 1684.4 | 1732.5 | 1784.8 | 1786.2 |
| 30° | 7982.0 | 6796.9 | 4220.1 | 2323.6 | 1685.8 | 1550.0 | 1540.1 | 1576.9 | 1629.2 | 1670.2 | 1680.1 |
| 32.5° | 7808.1 | 6467.3 | 3575.2 | 1868.2 | 1483.5 | 1419.9 | 1428.4 | 1459.5 | 1492.0 | 1514.7 | 1530.2 |
| 35° | 7727.4 | 6184.5 | 2979.8 | 1575.5 | 1354.8 | 1319.5 | 1330.8 | 1347.8 | 1361.9 | 1378.9 | 1391.6 |
| 37.5° | 7741.6 | 5965.3 | 2448.1 | 1393.0 | 1268.6 | 1250.2 | 1250.2 | 1250.2 | 1250.2 | 1258.7 | 1260.1 |
| 40° | 7873.1 | 5839.4 | 2015.3 | 1277.1 | 1210.6 | 1190.8 | 1175.2 | 1161.1 | 1149.8 | 1155.4 | 1152.6 |
| 42.5° | 8209.7 | 5828.1 | 1698.5 | 1203.5 | 1163.9 | 1131.4 | 1100.3 | 1080.5 | 1066.3 | 1072.0 | 1074.8 |
| 45° | 8781.1 | 5969.5 | 1485.0 | 1151.2 | 1120.1 | 1070.6 | 1031.0 | 1009.8 | 999.9 | 1018.3 | 1021.1 |
| 47.5° | 9520.7 | 6277.8 | 1354.8 | 1113.0 | 1079.1 | 1014.0 | 971.6 | 951.8 | 954.6 | 981.5 | 988.6 |
| 50° | 10473.9 | 6778.5 | 1292.6 | 1089.0 | 1050.8 | 965.9 | 922.1 | 905.1 | 913.6 | 951.8 | 960.3 |
| 52.5° | 11520.4 | 7499.7 | 1299.7 | 1081.9 | 1032.4 | 930.6 | 883.9 | 864.1 | 878.2 | 913.6 | 920.7 |
| 55° | 12728.2 | 8366.7 | 1417.1 | 1091.8 | 1005.5 | 907.9 | 852.8 | 818.8 | 830.2 | 862.7 | 868.3 |
| 57.5° | 14070.3 | 9359.5 | 1653.3 | 1089.0 | 971.6 | 886.7 | 820.3 | 769.3 | 777.8 | 797.6 | 803.3 |
| 60° | 15467.6 | 10558.8 | 2019.5 | 1097.5 | 956.0 | 861.3 | 776.4 | 712.8 | 710.0 | 726.9 | 729.8 |
| 62.5° | 17144.9 | 11946.1 | 2438.2 | 1103.1 | 965.9 | 828.7 | 718.4 | 656.2 | 647.7 | 652.0 | 654.8 |
| 65° | 18873.1 | 12950.3 | 2281.2 | 1080.5 | 997.0 | 801.9 | 667.5 | 601.1 | 585.5 | 582.7 | 584.1 |
| 67.5° | 18926.9 | 11874.0 | 1599.5 | 1035.2 | 1009.8 | 787.7 | 629.3 | 554.4 | 528.9 | 519.0 | 517.6 |
| 70° | 16973.8 | 9646.6 | 1246.0 | 987.1 | 958.9 | 765.1 | 594.0 | 516.2 | 478.0 | 462.5 | 461.0 |
| 71° | *16020.6* | *8880.1* | *1180.9* | *963.1* | *920.7* | *742.5* | *578.4* | *499.2* | *459.6* | *442.7* | *439.8* |
| 72.5° | 14525.7 | 7960.8 | 1101.7 | 924.9 | 847.1 | 684.5 | 548.7 | 475.2 | 434.2 | 414.4 | 410.1 |
| 75° | 10424.4 | 5205.8 | 946.1 | 824.5 | 701.5 | 545.9 | 480.8 | 427.1 | 391.7 | 367.7 | 364.9 |
| 77.5° | 4016.5 | 2071.9 | 715.6 | 685.9 | 537.4 | 427.1 | 396.0 | 369.1 | 343.7 | 319.6 | 318.2 |
| 80° | 1241.7 | 926.3 | 521.9 | 516.2 | 388.9 | 318.2 | 308.3 | 301.2 | 291.3 | 265.9 | 260.2 |
| 82.5° | 663.3 | 531.8 | 359.2 | 333.8 | 254.6 | 212.1 | 223.5 | 226.3 | 227.7 | 200.8 | 198.0 |
| 85° | 316.8 | 281.4 | 202.2 | 189.5 | 148.5 | 118.8 | 137.2 | 148.5 | 149.9 | 123.0 | 114.6 |
| 87.5° | 151.3 | 147.1 | 94.8 | 72.1 | 55.2 | 39.6 | 48.1 | 59.4 | 65.1 | 46.7 | 41.0 |
| 90° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

Cooper Lighting Solutions Photometric Lab
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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

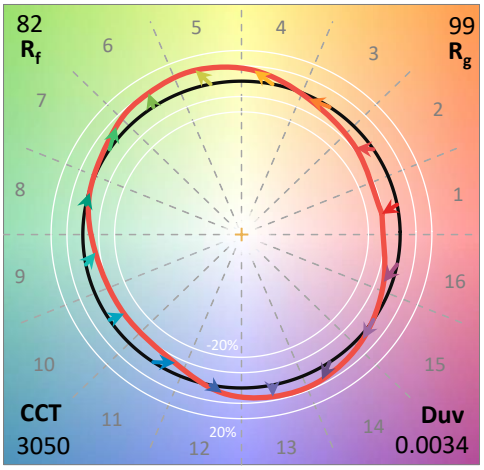
## Test Information

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

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| 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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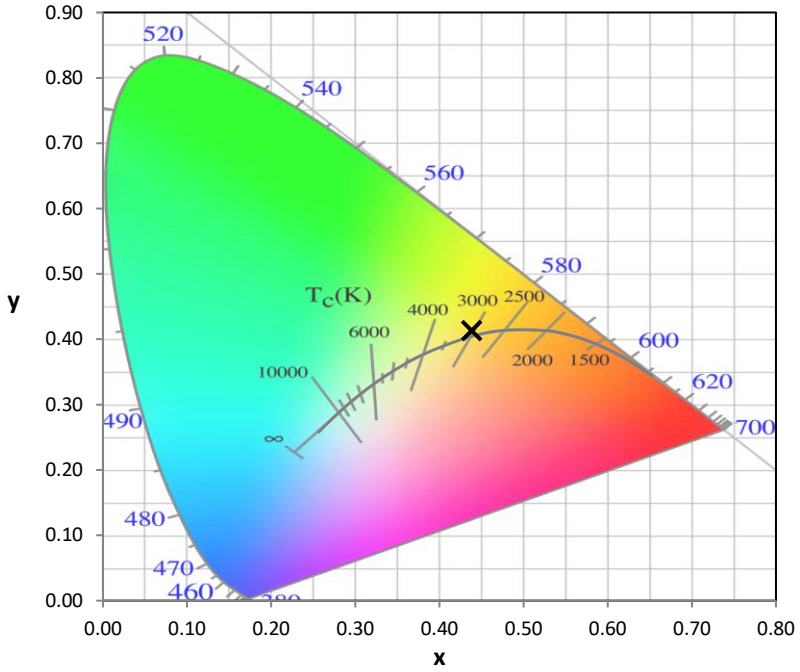
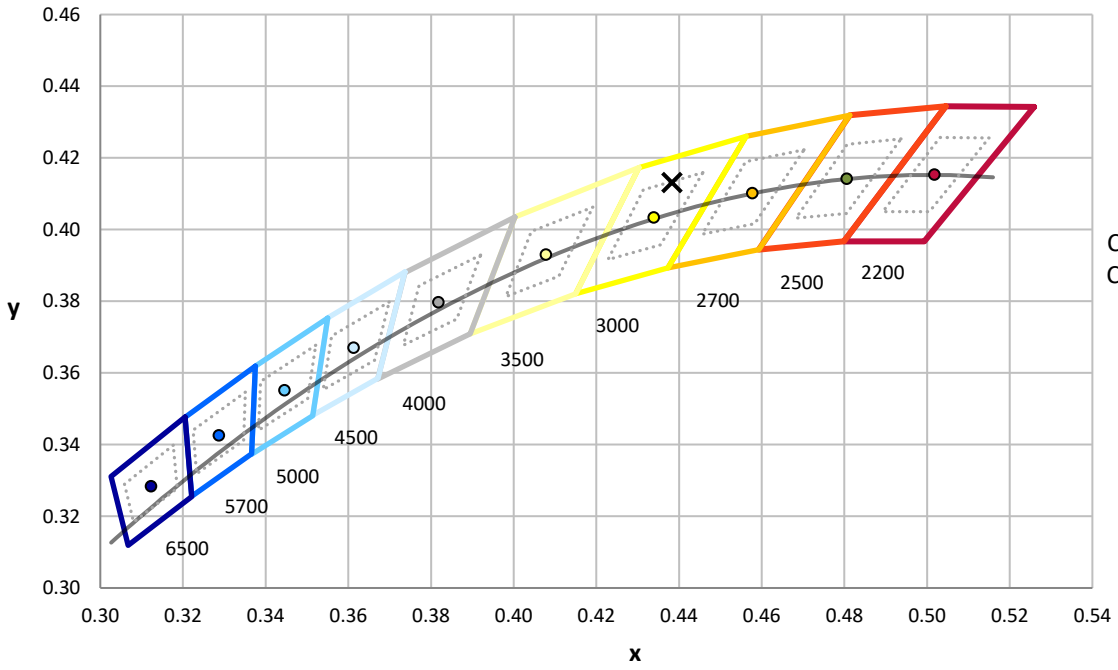
## CIE 1931 Chromaticity Diagram




## 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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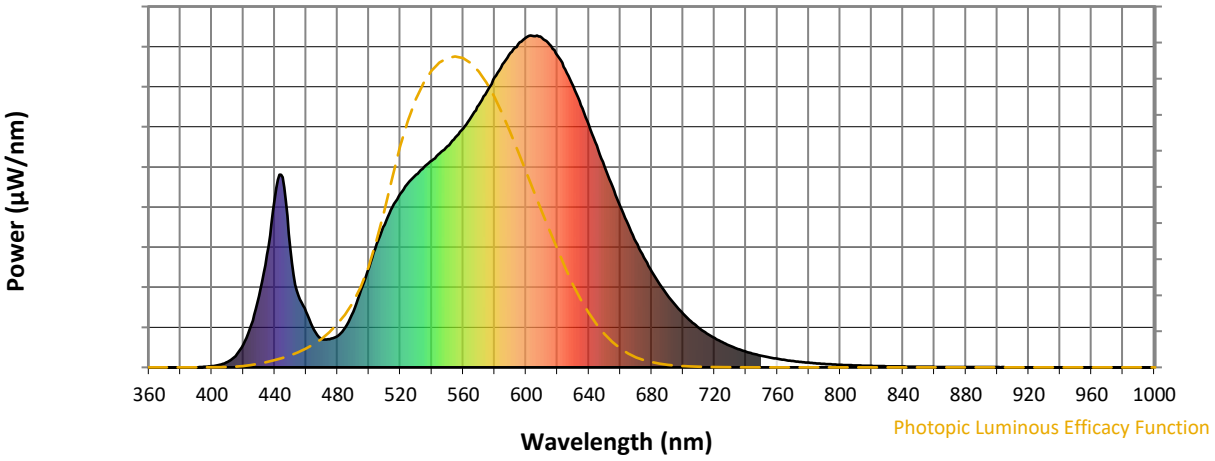
## Photopic Flux vs. Wavelength




## 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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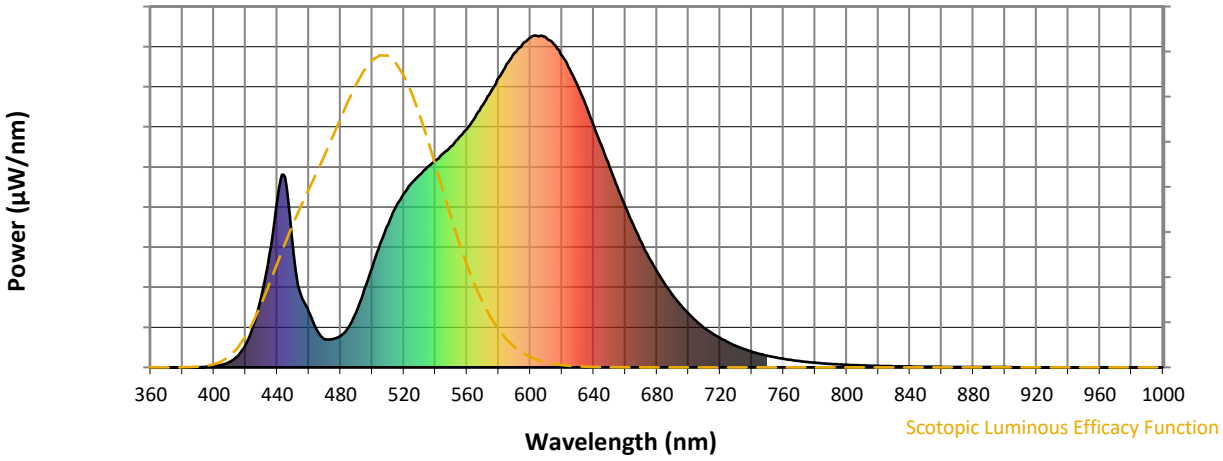
## Scotopic Flux vs. Wavelength




**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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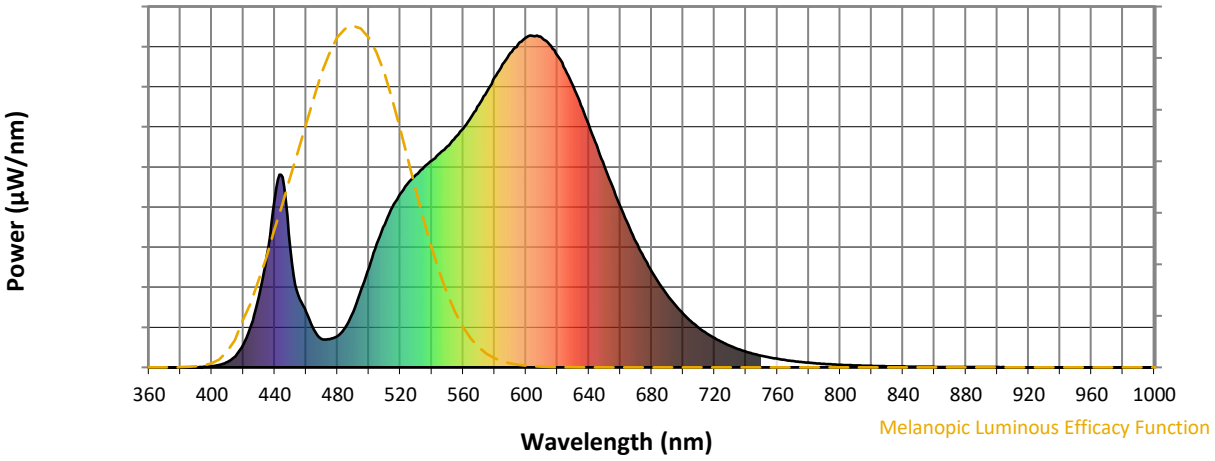
## Melanopic Flux vs. Wavelength




**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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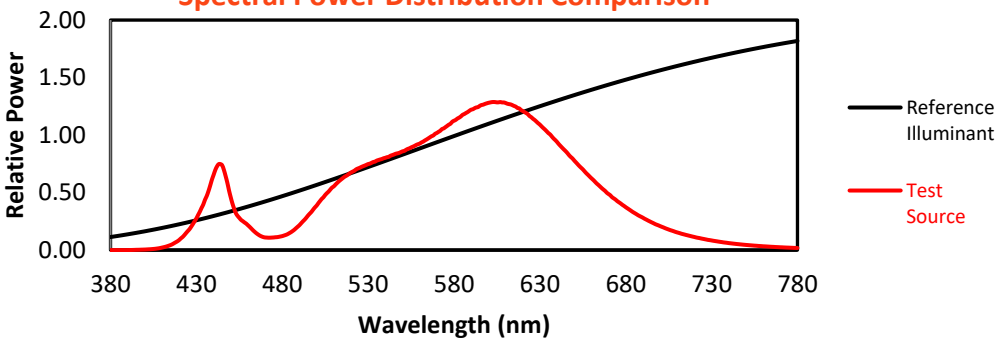
# TM-30-18

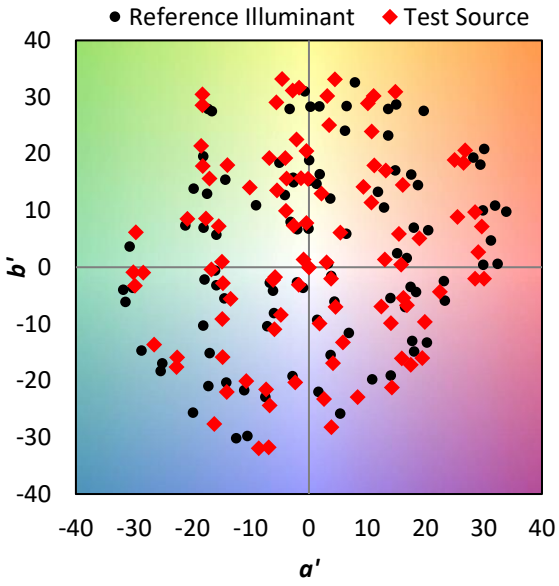
## Summary

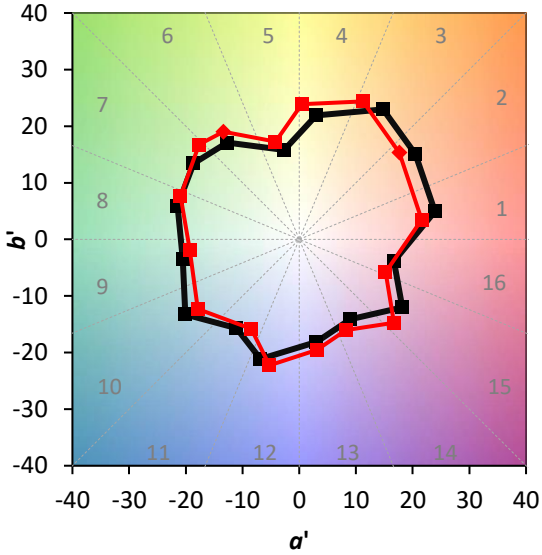
$R_f$ = 81.5
$R_g$ = 99.2
CIE $R_a$ = 81.0
$R_9$ = 7.1

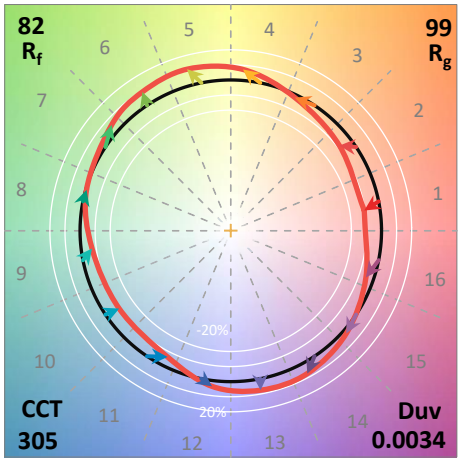
## Spectral Power Distribution Comparison

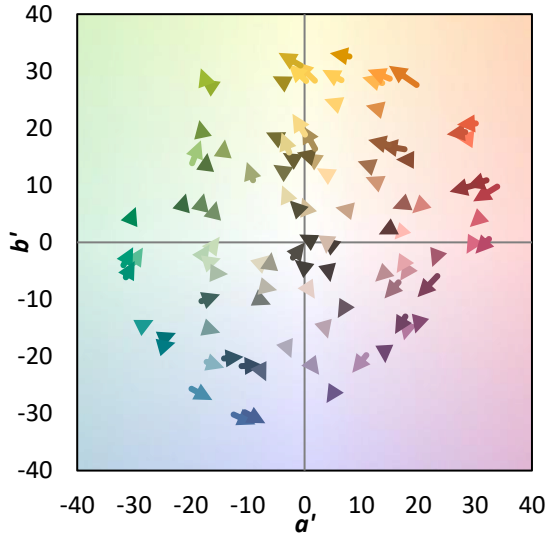



## Color Vector Graphics



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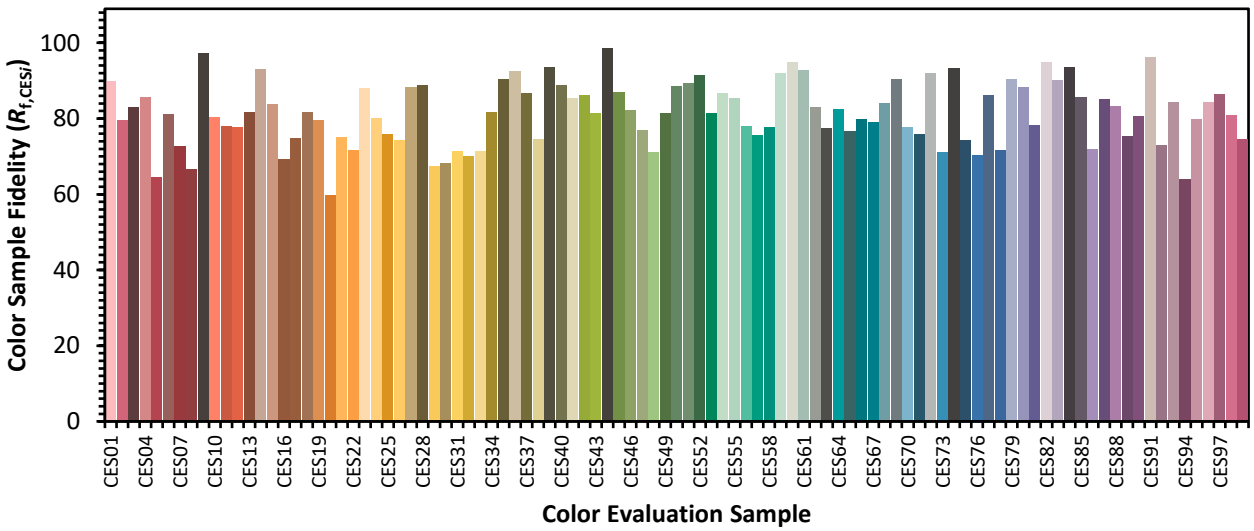
# TM-30-18

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

| | | | |
|---|---|---|---|
| CES01 = 86 | CES26 = 74 | CES51 = 89 | CES76 = 70 |
| CES02 = 63 | CES27 = 88 | CES52 = 92 | CES77 = 86 |
| CES03 = 31 | CES28 = 89 | CES53 = 81 | CES78 = 72 |
| CES04 = 70 | CES29 = 67 | CES54 = 87 | CES79 = 90 |
| CES05 = 50 | CES30 = 68 | CES55 = 85 | CES80 = 88 |
| CES06 = 51 | CES31 = 71 | CES56 = 78 | CES81 = 78 |
| CES07 = 42 | CES32 = 70 | CES57 = 76 | CES82 = 95 |
| CES08 = 41 | CES33 = 71 | CES58 = 78 | CES83 = 90 |
| CES09 = 29 | CES34 = 82 | CES59 = 92 | CES84 = 94 |
| CES10 = 76 | CES35 = 90 | CES60 = 95 | CES85 = 86 |
| CES11 = 59 | CES36 = 93 | CES61 = 93 | CES86 = 72 |
| CES12 = 65 | CES37 = 87 | CES62 = 83 | CES87 = 85 |
| CES13 = 43 | CES38 = 75 | CES63 = 77 | CES88 = 83 |
| CES14 = 74 | CES39 = 94 | CES64 = 83 | CES89 = 75 |
| CES15 = 71 | CES40 = 89 | CES65 = 77 | CES90 = 81 |
| CES16 = 47 | CES41 = 85 | CES66 = 80 | CES91 = 96 |
| CES17 = 50 | CES42 = 86 | CES67 = 79 | CES92 = 73 |
| CES18 = 56 | CES43 = 81 | CES68 = 84 | CES93 = 84 |
| CES19 = 72 | CES44 = 99 | CES69 = 91 | CES94 = 64 |
| CES20 = 66 | CES45 = 87 | CES70 = 78 | CES95 = 80 |
| CES21 = 87 | CES46 = 82 | CES71 = 76 | CES96 = 84 |
| CES22 = 79 | CES47 = 77 | CES72 = 92 | CES97 = 87 |
| CES23 = 92 | CES48 = 71 | CES73 = 71 | CES98 = 81 |
| CES24 = 91 | CES49 = 81 | CES74 = 93 | CES99 = 74 |
| CES25 = 72 | CES50 = 89 | CES75 = 74 | |



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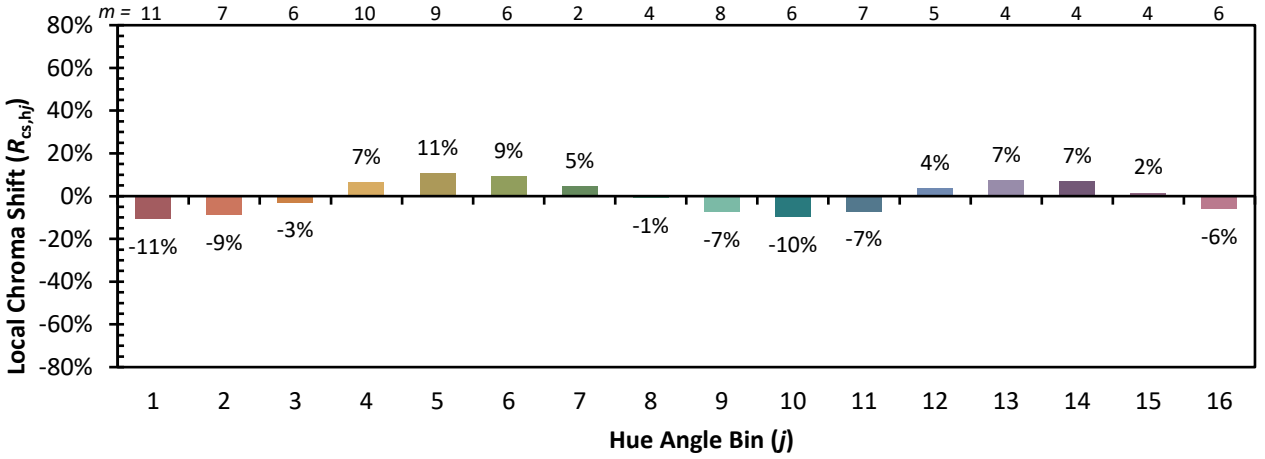
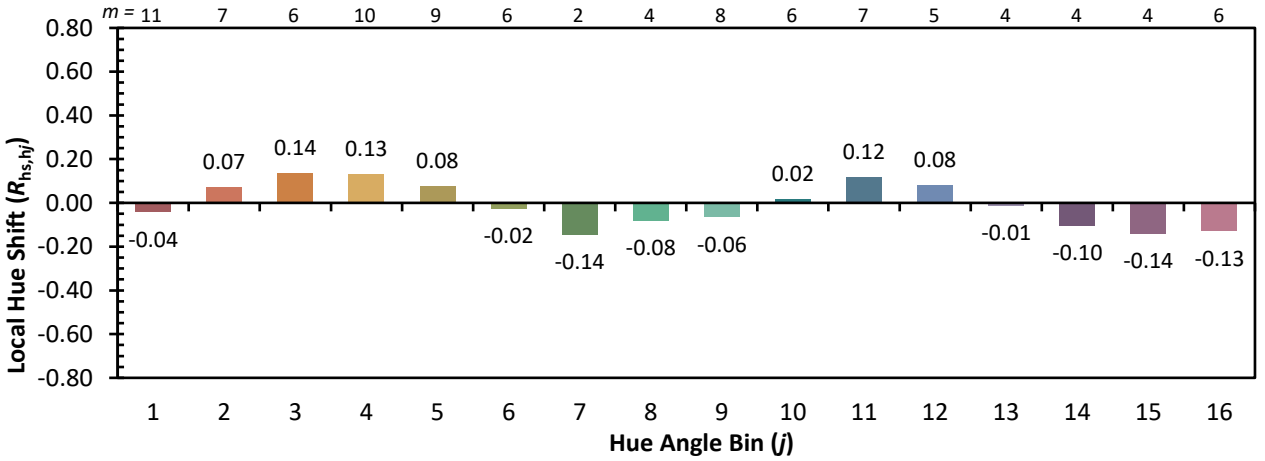
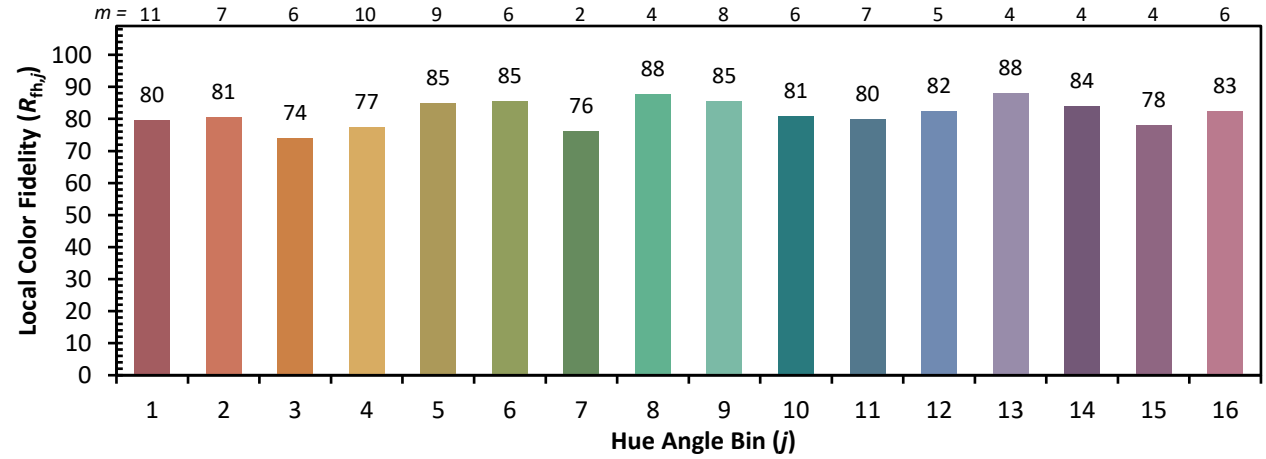
# TM-30-18

## Color Rendition by Hue-Angle Bin



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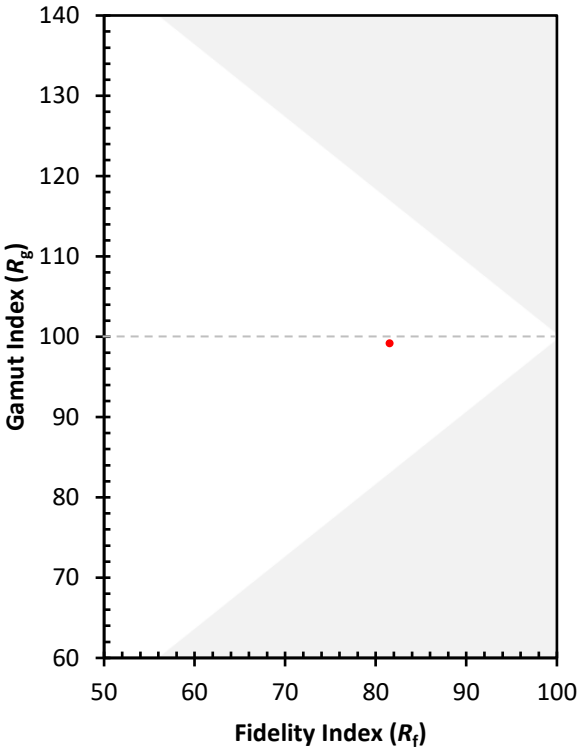
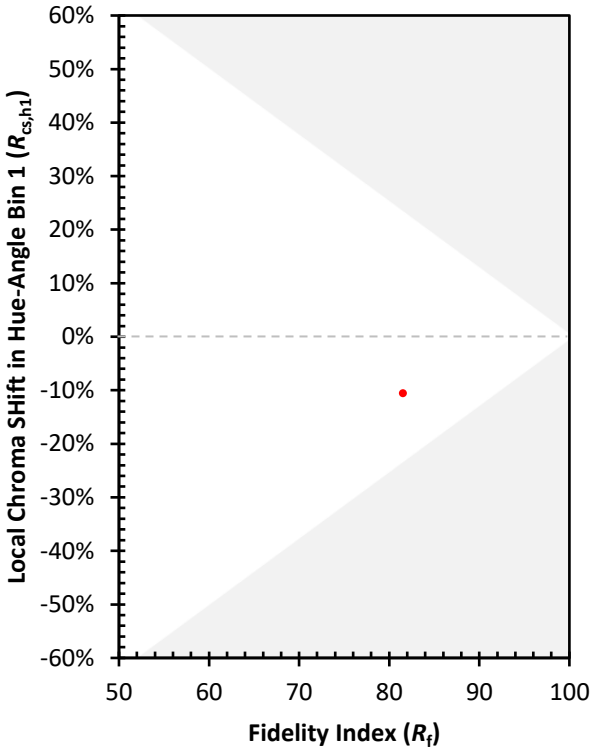
## Measure Comparisons




(END OF REPORT)