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: P385601

Luminaire Tested: **GPC-SA1A-830-U-SL2**

Issue Date: 3/3/2020

Report Generated By 670245982

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: | P385601 |
| | TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-20) |
| Test Lab: | INNOVATION CENTER |
| Issue Date: | 3/3/2020 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS (FORMERLY EATON) |
| Product Line: | McGRAW-EDISON |
| Catalog Number: | GPC-SA1A-830-U-SL2 |
| Description: | GALLEON PEDESTRIAN LUMINAIRE |
| | (1) 80 CRI, 3000K, 615mA LIGHTSQUARE WITH 16 LEDS AND TYPE II SPILL LIGHT ELIMINATOR OPTICS |
| Light Source: | - |
| Ballast/Driver: | ELECTRONIC DRIVER |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 3873 lumens |
| Efficiency: | N/A |
| Efficacy: | 113.9 lumens/watt |
| Luminous Opening: | Rectangular (W 0.5' x L: 0.5' x H: 0') |
| IES Classification: | Type III - Medium |
| BUG Rating: | B1 - U0 - G2 |

| | |
|---|---|
| Input Watts (W): | 34 |
| 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: | 28.75 FT |

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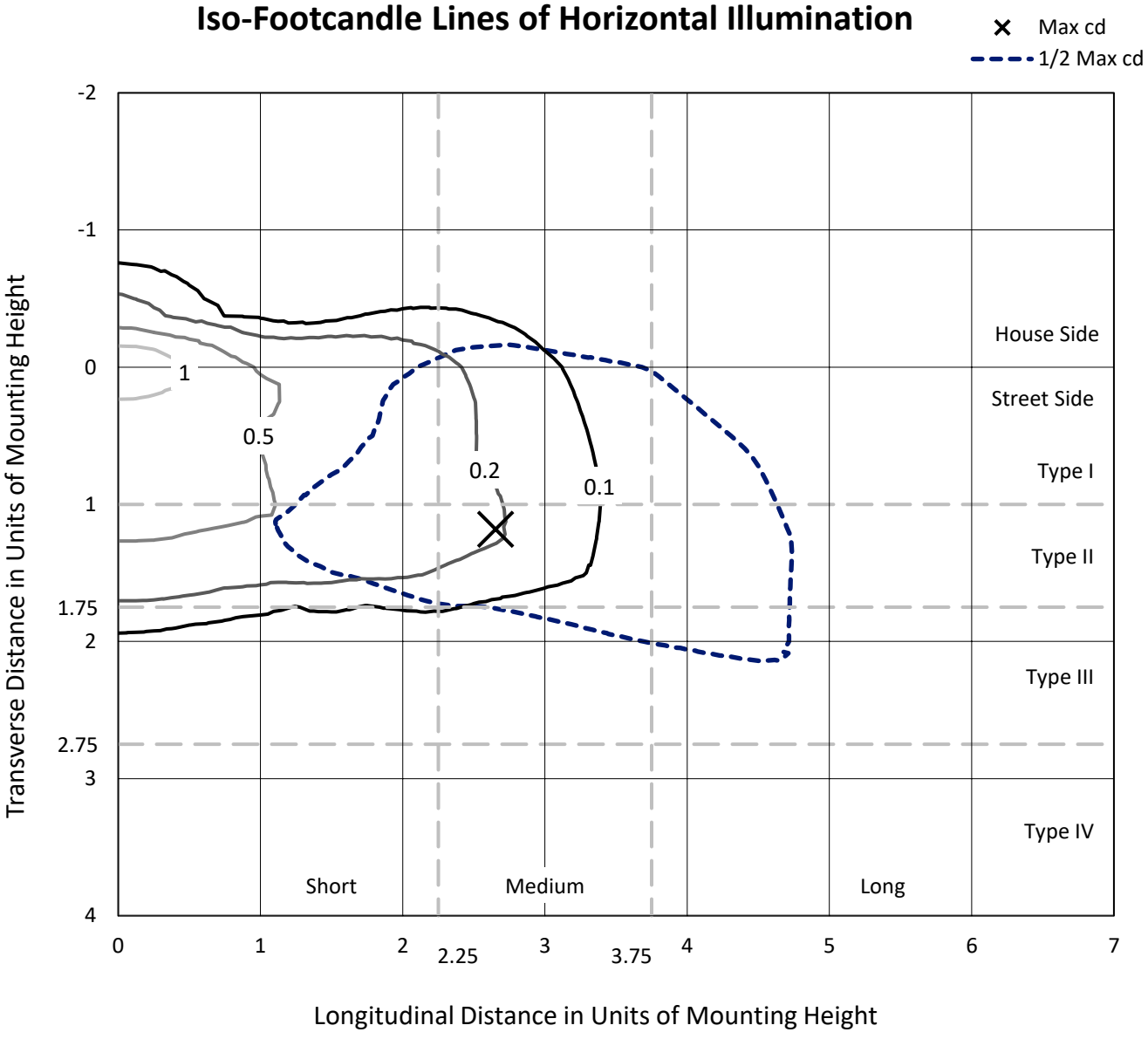
Scaled Data Report

REPORT NUMBER: P385601
CATALOG NUMBER: GPC-SA1A-830-U-SL2

## Iso-Footcandle Lines of Horizontal Illumination




Based on 25 foot mounting height. Maximum calculated value = 1.4 fc
Type III - Medium - N/A

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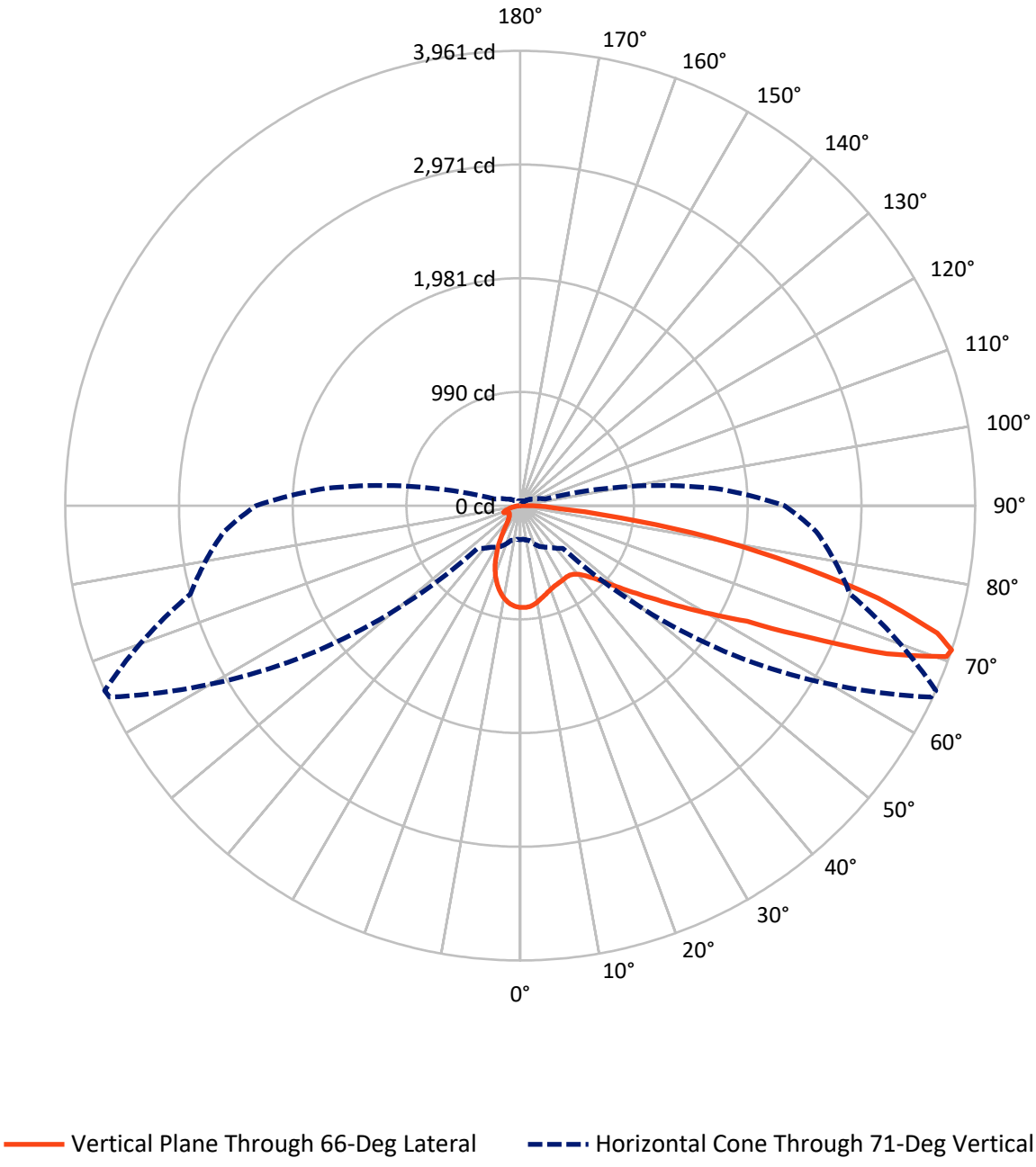
## Luminous Intensity Polar Plot



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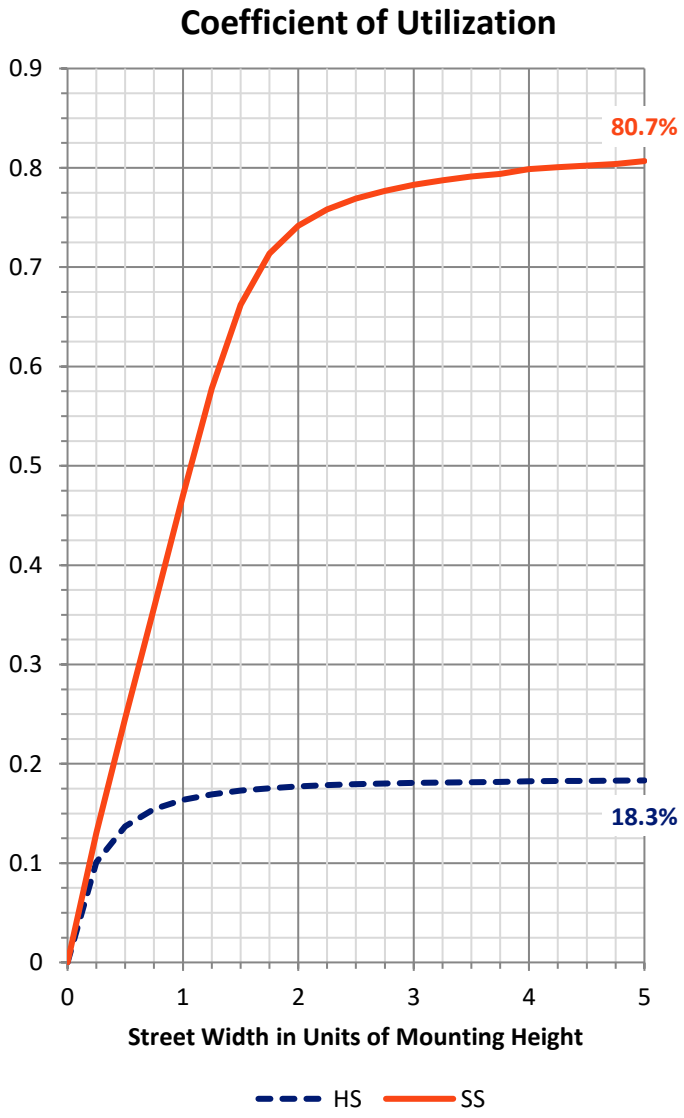
REPORT NUMBER: P385601
CATALOG NUMBER: GPC-SA1A-830-U-SL2

**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 717.8 | 0.0 | 717.8 |
| | % Fixture | 18.5 | 0.0 | 18.5 |
| **Street Side** | Lumens | 3155.2 | 0.0 | 3155.2 |
| | % Fixture | 81.5 | 0.0 | 81.5 |
| **Total** | Lumens | 3873.0 | 0.0 | 3873.0 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 78.1 | 2.0 |
| 10°-20° | 187.3 | 4.8 |
| 20°-30° | 251.6 | 6.5 |
| 30°-40° | 331.0 | 8.5 |
| 40°-50° | 481.5 | 12.4 |
| 50°-60° | 752.1 | 19.4 |
| 60°-70° | 942.2 | 24.3 |
| 70°-80° | 718.7 | 18.6 |
| 80°-90° | 130.5 | 3.4 |
| 90°-100° | 0.0 | 0.0 |
| 100°-110° | 0.0 | 0.0 |
| 110°-120° | 0.0 | 0.0 |
| 120°-130° | 0.0 | 0.0 |
| 130°-140° | 0.0 | 0.0 |
| 140°-150° | 0.0 | 0.0 |
| 150°-160° | 0.0 | 0.0 |
| 160°-170° | 0.0 | 0.0 |
| 170°-180° | 0.0 | 0.0 |
| 0°-90° | 3873.0 | 100.0 |
| 0°-180° | 3873.0 | 100.0 |



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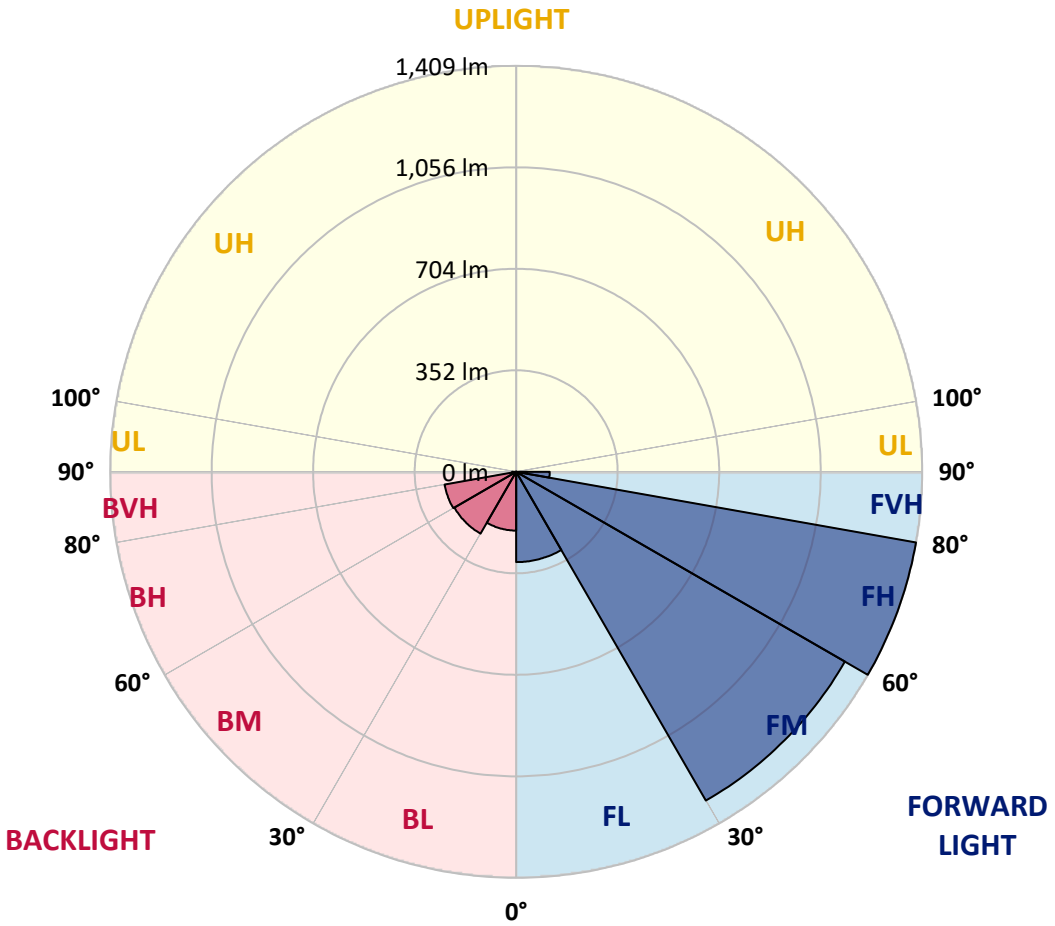
## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 313.2 | 8.1 | | | |
| FM | (30°-60°) | 1317.0 | 34.0 | | | |
| FH | (60°-80°) | 1408.6 | 36.4 | | | G1/1800 |
| FVH | (80°-90°) | 116.4 | 3.0 | | | G2/225 |
| BL | (0°-30°) | 203.8 | 5.3 | B1/500 | | |
| BM | (30°-60°) | 247.6 | 6.4 | B1/1000 | | |
| BH | (60°-80°) | 252.2 | 6.5 | B1/500 | | G1/500 |
| BVH | (80°-90°) | 14.1 | 0.4 | | | G1/100 |
| UL | (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH | (100°-180°) | 0.0 | 0.0 | | U0/0 | |

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



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**CANDELA DISTRIBUTION (FULL):**

| | 0° | 5° | 15° | 25° | 35° | 45° | 55° | 65° | 66° | 75° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 887.2 | 887.2 | 887.2 | 887.2 | 887.2 | 887.2 | 887.2 | 887.2 | *887.2* | 887.2 | 887.2 |
| 2.5° | 870.8 | 869.4 | 873.5 | 877.6 | 879.2 | 881.9 | 885.9 | 888.2 | *888.0* | 888.4 | 887.1 |
| 5° | 813.0 | 811.3 | 819.3 | 825.9 | 838.4 | 852.6 | 869.8 | 882.1 | *882.4* | 889.4 | 891.2 |
| 7.5° | 758.3 | 757.1 | 766.3 | 776.9 | 791.5 | 813.1 | 841.1 | 867.6 | *869.2* | 888.0 | 894.6 |
| 10° | 714.5 | 714.2 | 723.2 | 734.7 | 751.6 | 775.8 | 807.9 | 846.7 | *849.1* | 881.6 | 895.1 |
| 12.5° | 680.2 | 680.8 | 688.5 | 701.6 | 719.5 | 744.8 | 779.6 | 823.3 | *827.2* | 871.5 | 892.0 |
| 15° | 655.0 | 657.1 | 663.4 | 676.6 | 694.3 | 719.9 | 755.6 | 801.6 | *807.5* | 860.1 | 890.3 |
| 17.5° | 640.5 | 642.9 | 647.3 | 658.3 | 674.9 | 699.6 | 733.5 | 783.9 | *789.2* | 851.4 | 890.4 |
| 20° | 636.2 | 638.2 | 640.8 | 647.5 | 661.5 | 684.0 | 715.9 | 767.8 | *773.6* | 844.4 | 891.8 |
| 22.5° | 644.7 | 646.1 | 646.4 | 645.9 | 654.4 | 672.7 | 703.2 | 756.1 | *762.2* | 839.9 | 892.7 |
| 25° | 662.7 | 664.7 | 663.2 | 658.3 | 655.5 | 666.7 | 696.7 | 748.3 | *754.4* | 836.5 | 890.8 |
| 27.5° | 689.9 | 690.1 | 688.9 | 682.5 | 669.3 | 667.4 | 694.7 | 743.7 | *749.6* | 832.7 | 887.0 |
| 30° | 726.8 | 728.5 | 726.4 | 717.7 | 696.0 | 678.1 | 697.1 | 739.3 | *744.7* | 827.7 | 880.7 |
| 32.5° | 770.0 | 774.2 | 774.1 | 765.0 | 734.0 | 702.0 | 707.0 | 736.7 | *740.8* | 822.5 | 873.1 |
| 35° | 814.8 | 820.6 | 831.6 | 827.7 | 789.3 | 739.9 | 726.0 | 740.9 | *743.7* | 821.8 | 867.7 |
| 37.5° | 861.3 | 867.2 | 889.8 | 900.2 | 855.3 | 794.0 | 755.9 | 756.1 | *757.4* | 830.0 | 867.3 |
| 40° | 910.0 | 916.2 | 950.2 | 977.4 | 940.7 | 862.6 | 804.2 | 787.6 | *786.1* | 850.1 | 875.2 |
| 42.5° | 978.2 | 983.8 | 1024.6 | 1059.2 | 1035.5 | 950.5 | 870.9 | 836.3 | *833.2* | 889.4 | 900.5 |
| 45° | 1064.4 | 1069.2 | 1112.5 | 1149.6 | 1137.4 | 1050.8 | 954.8 | 903.3 | *902.7* | 954.9 | 951.7 |
| 47.5° | 1167.0 | 1170.7 | 1209.6 | 1245.5 | 1249.9 | 1166.2 | 1060.1 | 1006.6 | *997.9* | 1044.8 | 1031.0 |
| 50° | 1273.8 | 1278.0 | 1304.4 | 1342.9 | 1375.7 | 1320.6 | 1195.7 | 1133.3 | *1121.6* | 1163.4 | 1143.3 |
| 52.5° | 1344.6 | 1350.0 | 1373.0 | 1421.8 | 1517.2 | 1489.9 | 1356.1 | 1286.8 | *1269.1* | 1307.1 | 1291.7 |
| 55° | 1313.0 | 1325.3 | 1360.5 | 1438.7 | 1630.3 | 1748.5 | 1553.8 | 1465.8 | *1445.9* | 1477.5 | 1468.4 |
| 57.5° | 1169.5 | 1186.4 | 1234.4 | 1355.1 | 1646.2 | 1976.4 | 1852.8 | 1676.7 | *1662.7* | 1653.6 | 1657.7 |
| 60° | 907.3 | 923.5 | 983.0 | 1140.4 | 1535.4 | 2142.7 | 2302.8 | 1936.7 | *1916.3* | 1830.4 | 1834.1 |
| 62.5° | 642.1 | 634.0 | 674.7 | 789.9 | 1247.6 | 2162.2 | 2814.8 | 2284.3 | *2217.5* | 2017.0 | 2000.6 |
| 65° | 489.7 | 487.8 | 506.1 | 542.8 | 755.6 | 1928.6 | 3119.8 | 2868.7 | *2764.3* | 2236.6 | 2197.8 |
| 67.5° | 402.4 | 399.0 | 417.1 | 470.4 | 486.6 | 1244.3 | 3126.5 | 3546.6 | *3444.1* | 2509.9 | 2425.9 |
| 70° | 330.8 | 327.1 | 343.9 | 412.8 | 449.7 | 631.0 | 2631.3 | 3943.7 | *3938.2* | 2856.0 | 2598.2 |
| 71° | *296.6* | *293.9* | *314.1* | *390.6* | *441.8* | *525.9* | *2271.9* | *3944.7* | *3961.2* | *2973.1* | *2588.0* |
| 72.5° | 241.5 | 242.4 | 263.8 | 347.7 | 435.9 | 464.4 | 1669.8 | 3760.9 | *3795.6* | 3084.8 | 2495.6 |
| 75° | 160.5 | 161.3 | 189.3 | 267.4 | 422.7 | 454.4 | 917.7 | 3155.8 | *3219.7* | 3017.9 | 2277.2 |
| 77.5° | 107.8 | 107.5 | 126.6 | 183.5 | 368.3 | 454.4 | 538.1 | 2360.3 | *2430.5* | 2401.3 | 1755.6 |
| 80° | 74.2 | 73.7 | 87.2 | 126.6 | 278.8 | 459.9 | 416.0 | 1654.1 | *1675.4* | 1296.8 | 713.5 |
| 82.5° | 45.5 | 45.9 | 57.0 | 89.5 | 189.7 | 413.9 | 392.7 | 901.9 | *878.8* | 363.7 | 178.2 |
| 85° | 26.1 | 25.9 | 36.4 | 60.6 | 121.8 | 349.3 | 383.0 | 388.2 | *356.1* | 109.5 | 64.5 |
| 87.5° | 9.4 | 10.0 | 19.5 | 33.6 | 69.8 | 243.2 | 324.9 | 201.9 | *182.0* | 49.5 | 29.2 |
| 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: P385601
CATALOG NUMBER: GPC-SA1A-830-U-SL2

**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 887.2 | 887.2 | 887.2 | 887.2 | 887.2 | 887.2 | 887.2 | 887.2 | 887.2 | 887.2 | 887.2 |
| 2.5° | 886.2 | 887.0 | 886.0 | 880.7 | 876.1 | 868.8 | 864.6 | 858.9 | 857.1 | 856.3 | 858.5 |
| 5° | 889.5 | 889.8 | 881.9 | 867.8 | 852.1 | 833.5 | 820.1 | 803.7 | 795.9 | 792.6 | 794.7 |
| 7.5° | 892.6 | 891.4 | 874.1 | 847.2 | 818.1 | 785.7 | 757.0 | 730.6 | 715.3 | 709.0 | 709.5 |
| 10° | 893.0 | 887.9 | 860.2 | 818.6 | 773.4 | 726.0 | 681.8 | 641.2 | 615.5 | 598.8 | 603.9 |
| 12.5° | 888.8 | 880.3 | 839.8 | 781.6 | 718.9 | 654.2 | 594.5 | 533.5 | 496.9 | 479.9 | 480.5 |
| 15° | 885.6 | 870.1 | 814.6 | 738.0 | 653.8 | 568.0 | 486.6 | 414.9 | 375.9 | 358.5 | 350.3 |
| 17.5° | 883.0 | 859.1 | 785.5 | 688.9 | 576.9 | 468.2 | 370.3 | 306.4 | 285.0 | 279.9 | 277.7 |
| 20° | 879.2 | 847.5 | 753.0 | 632.1 | 489.3 | 356.4 | 270.4 | 238.8 | 239.0 | 244.8 | 245.6 |
| 22.5° | 874.0 | 834.3 | 718.3 | 568.3 | 395.3 | 259.5 | 211.9 | 202.9 | 212.1 | 223.3 | 225.3 |
| 25° | 866.2 | 818.6 | 679.8 | 497.8 | 301.4 | 199.5 | 181.1 | 180.7 | 191.9 | 203.7 | 205.4 |
| 27.5° | 855.3 | 798.2 | 637.0 | 422.2 | 222.1 | 169.6 | 162.2 | 165.0 | 173.3 | 181.9 | 182.5 |
| 30° | 840.6 | 774.4 | 589.8 | 342.3 | 174.1 | 151.0 | 150.2 | 152.7 | 157.8 | 163.8 | 164.3 |
| 32.5° | 824.4 | 750.2 | 539.4 | 265.0 | 149.1 | 140.9 | 141.7 | 142.9 | 145.4 | 147.8 | 148.3 |
| 35° | 809.7 | 725.4 | 487.8 | 201.4 | 137.2 | 134.4 | 133.9 | 133.6 | 133.9 | 133.1 | 133.2 |
| 37.5° | 800.2 | 705.0 | 434.1 | 160.3 | 130.4 | 128.6 | 127.0 | 125.0 | 122.8 | 121.4 | 121.7 |
| 40° | 796.7 | 689.7 | 379.6 | 138.5 | 124.8 | 123.6 | 120.5 | 116.2 | 113.5 | 112.7 | 112.7 |
| 42.5° | 806.1 | 681.8 | 327.1 | 127.6 | 120.1 | 118.1 | 113.0 | 108.0 | 106.0 | 105.9 | 105.8 |
| 45° | 834.7 | 685.0 | 277.1 | 121.6 | 115.8 | 111.9 | 105.2 | 101.1 | 99.8 | 100.0 | 99.9 |
| 47.5° | 886.0 | 705.2 | 234.3 | 117.5 | 111.5 | 106.4 | 99.0 | 95.6 | 94.0 | 94.0 | 94.1 |
| 50° | 973.3 | 752.4 | 200.2 | 114.2 | 107.9 | 101.4 | 94.4 | 90.3 | 88.1 | 88.0 | 88.0 |
| 52.5° | 1100.5 | 837.0 | 178.9 | 111.4 | 103.9 | 96.8 | 89.9 | 84.6 | 82.1 | 81.6 | 81.3 |
| 55° | 1259.9 | 958.1 | 173.0 | 109.5 | 98.6 | 91.9 | 84.4 | 79.2 | 76.4 | 75.2 | 75.0 |
| 57.5° | 1438.2 | 1105.5 | 184.7 | 107.2 | 93.1 | 86.0 | 78.4 | 73.4 | 70.5 | 69.0 | 68.9 |
| 60° | 1618.5 | 1266.3 | 232.1 | 104.0 | 88.5 | 79.6 | 72.2 | 67.7 | 64.7 | 63.1 | 62.8 |
| 62.5° | 1799.2 | 1435.9 | 329.1 | 103.8 | 85.3 | 73.4 | 65.9 | 62.0 | 59.2 | 57.5 | 57.1 |
| 65° | 2003.0 | 1621.5 | 439.3 | 110.9 | 84.2 | 67.8 | 59.5 | 56.4 | 54.0 | 52.4 | 52.3 |
| 67.5° | 2237.0 | 1831.0 | 428.7 | 125.4 | 87.9 | 62.7 | 53.5 | 51.1 | 49.3 | 48.0 | 47.9 |
| 70° | 2346.8 | 1798.3 | 266.5 | 135.7 | 92.9 | 57.8 | 47.7 | 46.0 | 44.7 | 43.7 | 43.3 |
| 71° | *2300.8* | *1707.5* | *223.4* | *134.5* | *92.4* | *55.6* | *45.5* | *44.1* | *42.8* | *42.0* | *41.6* |
| 72.5° | 2175.3 | 1557.2 | 186.4 | 125.2 | 86.4 | 51.7 | 42.5 | 41.2 | 40.0 | 39.0 | 38.8 |
| 75° | 1952.0 | 1390.7 | 149.2 | 100.0 | 68.9 | 43.7 | 37.3 | 35.8 | 34.9 | 34.4 | 33.8 |
| 77.5° | 1434.9 | 992.5 | 115.4 | 79.0 | 50.7 | 35.7 | 31.8 | 30.8 | 29.8 | 29.0 | 28.6 |
| 80° | 549.7 | 384.4 | 77.7 | 59.0 | 37.2 | 28.2 | 25.7 | 25.1 | 24.2 | 23.7 | 23.7 |
| 82.5° | 148.0 | 114.9 | 41.5 | 35.7 | 24.9 | 20.6 | 19.7 | 19.4 | 18.6 | 17.5 | 17.7 |
| 85° | 59.9 | 50.7 | 23.3 | 19.7 | 15.2 | 12.2 | 13.2 | 13.4 | 12.4 | 11.1 | 11.2 |
| 87.5° | 26.3 | 21.5 | 13.0 | 8.7 | 6.7 | 4.7 | 6.0 | 6.0 | 5.5 | 4.5 | 4.1 |
| 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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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

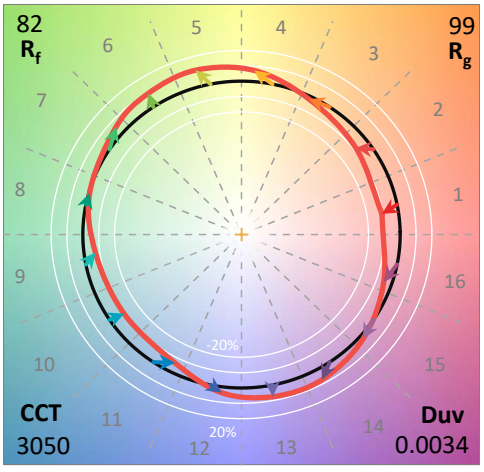
## Test Information

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

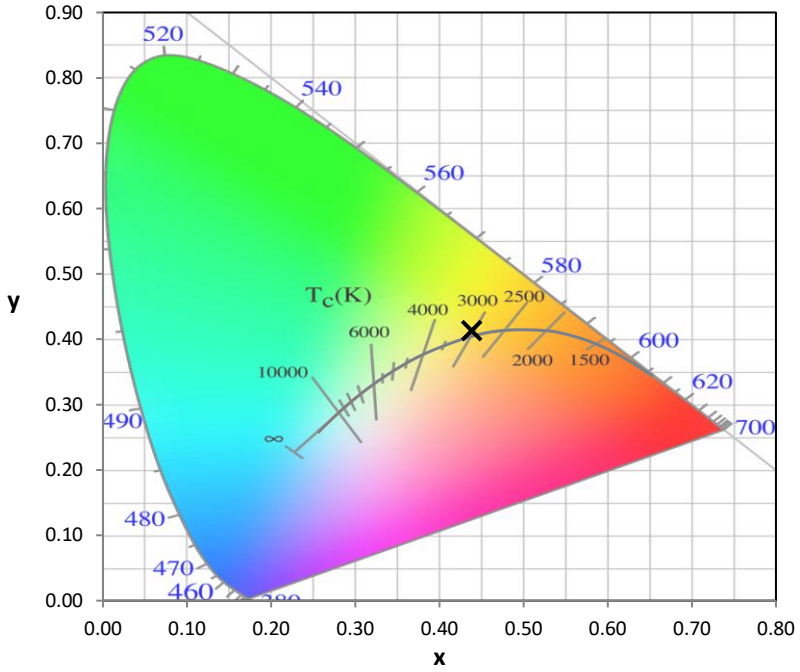
| | |
|---|---|
| Stabilization Time: | 20M |
| Operation Time: | 1H 20M |
| Sphere Temperature (°C): | 24.2 |

REPORT NUMBER: SP1-2408-195-9

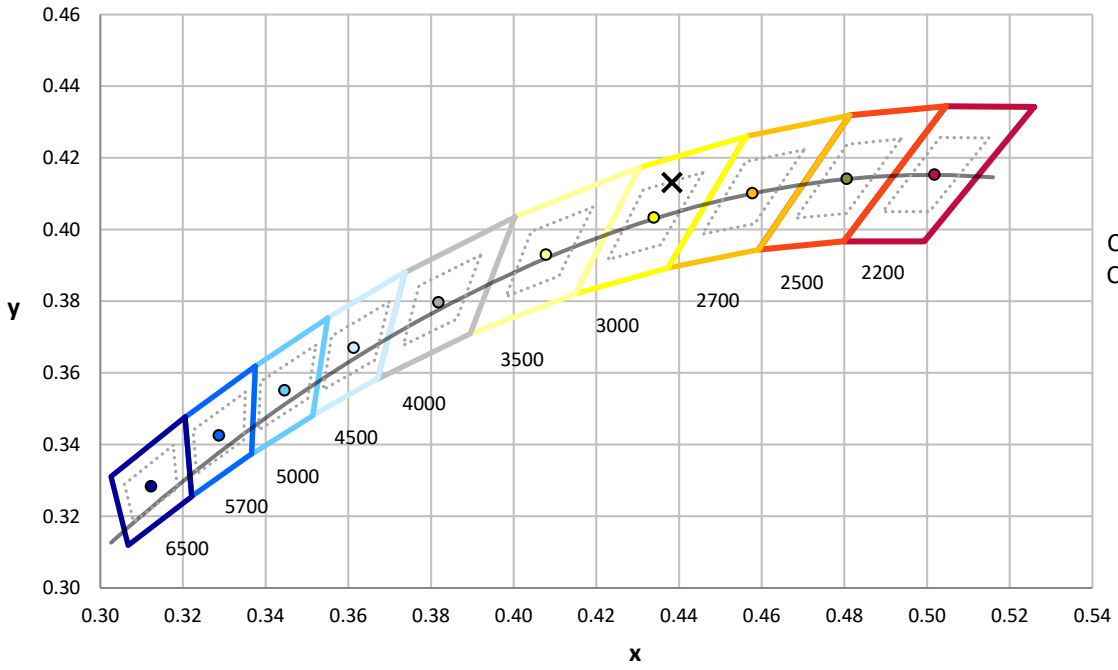
| Measurement and Test Equipment | | | |
|---|---|---|---|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | IN0058 | 6/18/2024 | 12/18/2024 |
| Power Meter | INXT2011004 | 2/8/2024 | 2/8/2025 |
| AC Power Source | IN0063 | 10/24/2023 | 10/24/2024 |
| DC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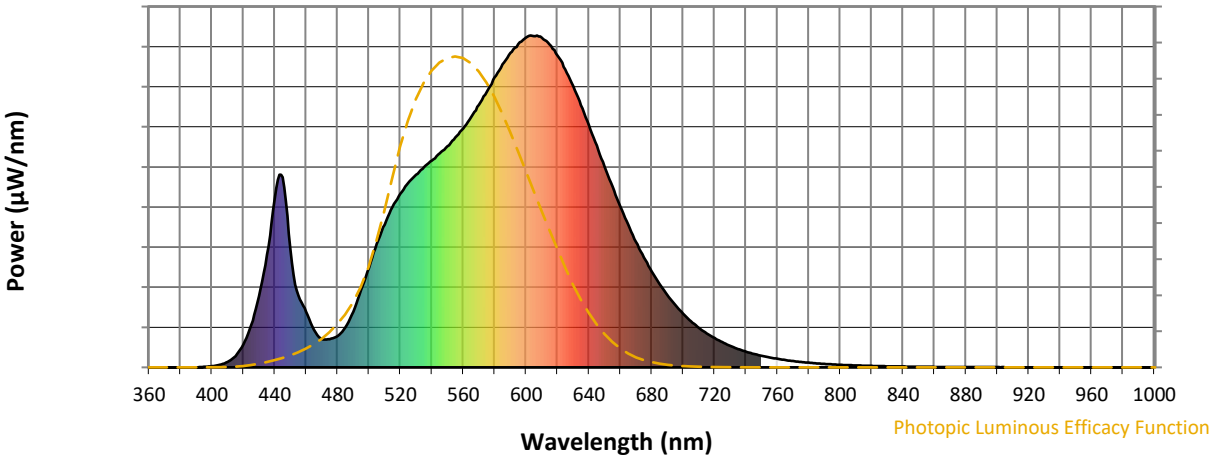
## Photopic Flux vs. Wavelength




## 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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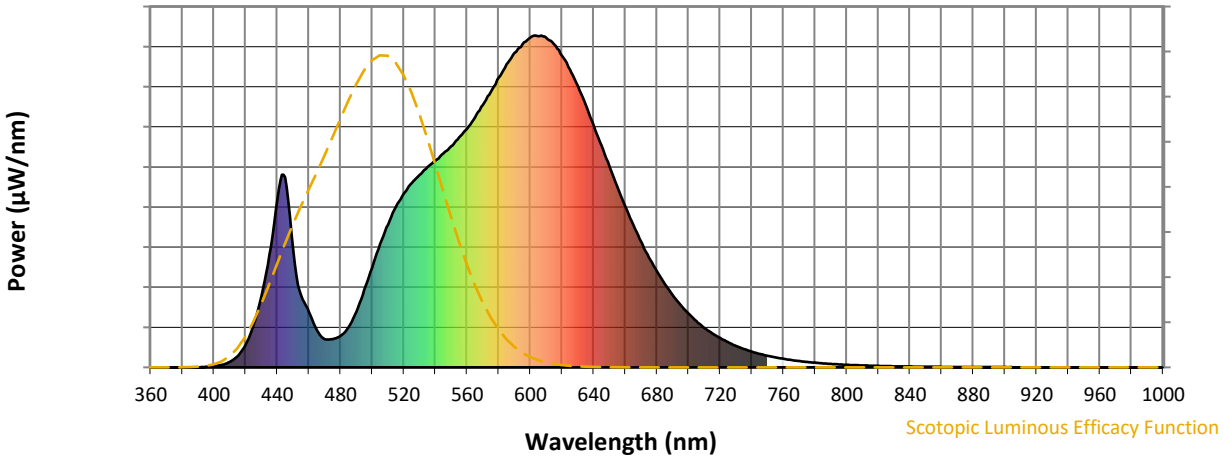
## Scotopic Flux vs. Wavelength




**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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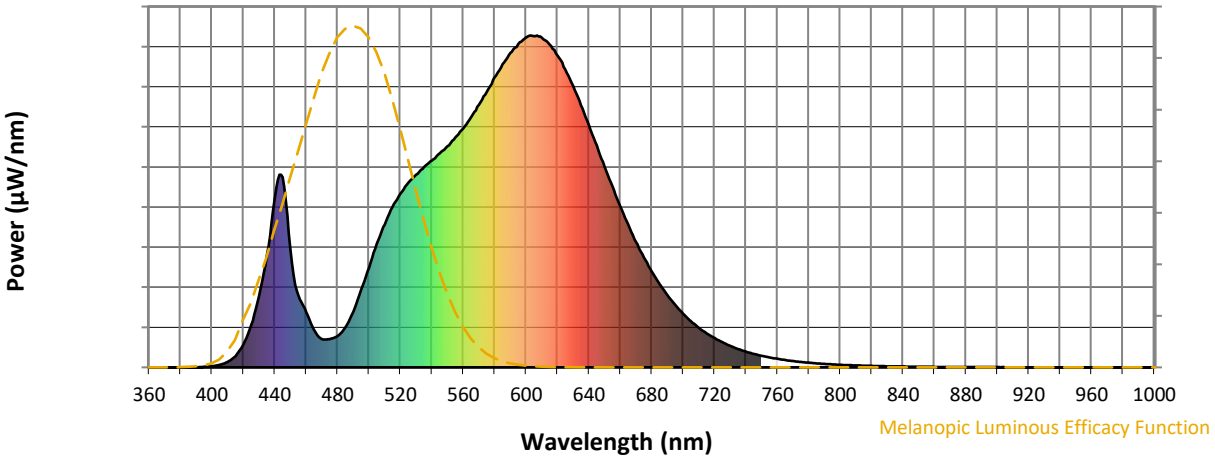
## Melanopic Flux vs. Wavelength




**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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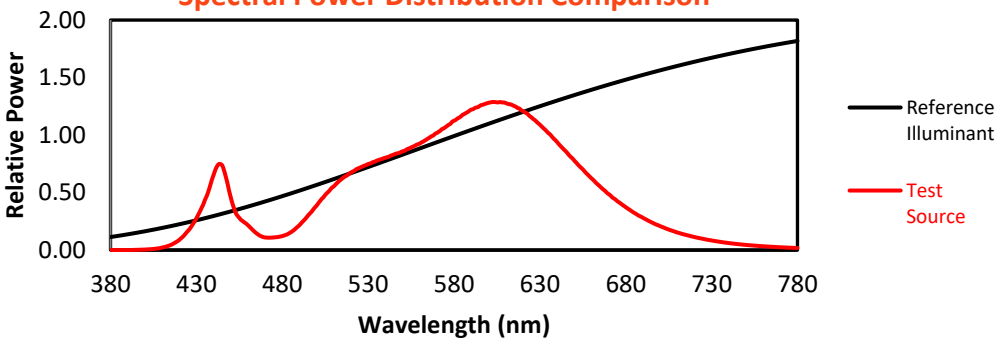
# TM-30-18

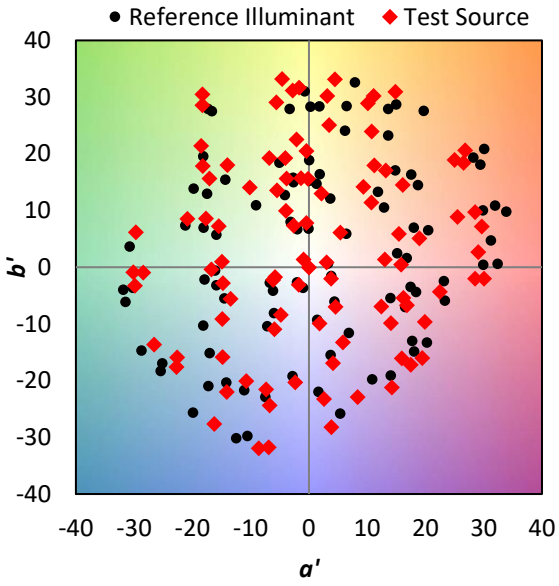
## Summary

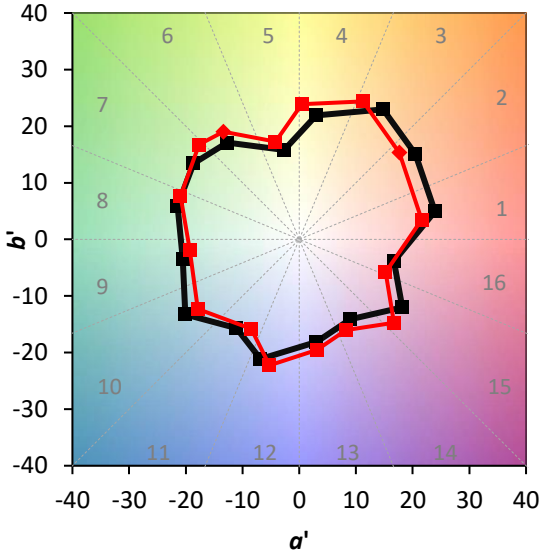
$R_f$ = 81.5
$R_g$ = 99.2
CIE $R_a$ = 81.0
$R_9$ = 7.1

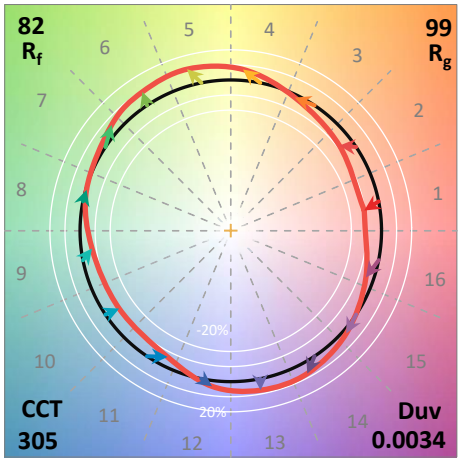
## Spectral Power Distribution Comparison

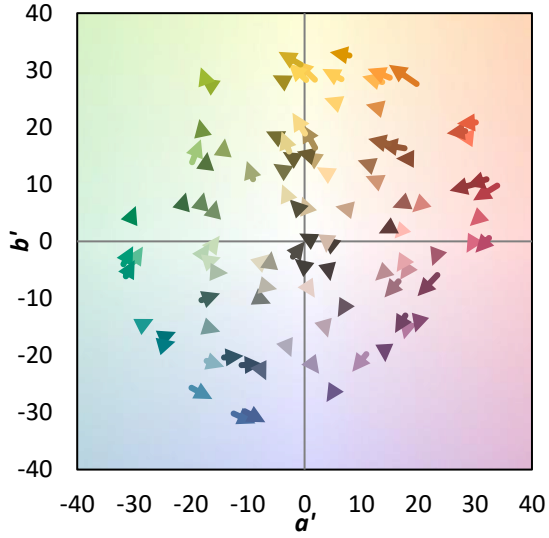



## Color Vector Graphics



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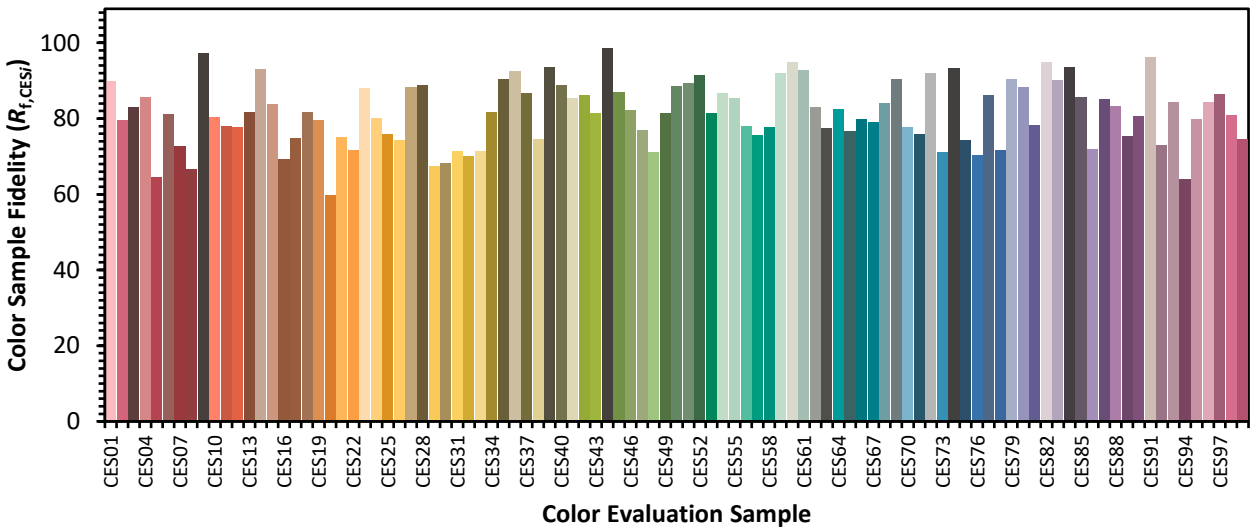
# TM-30-18

**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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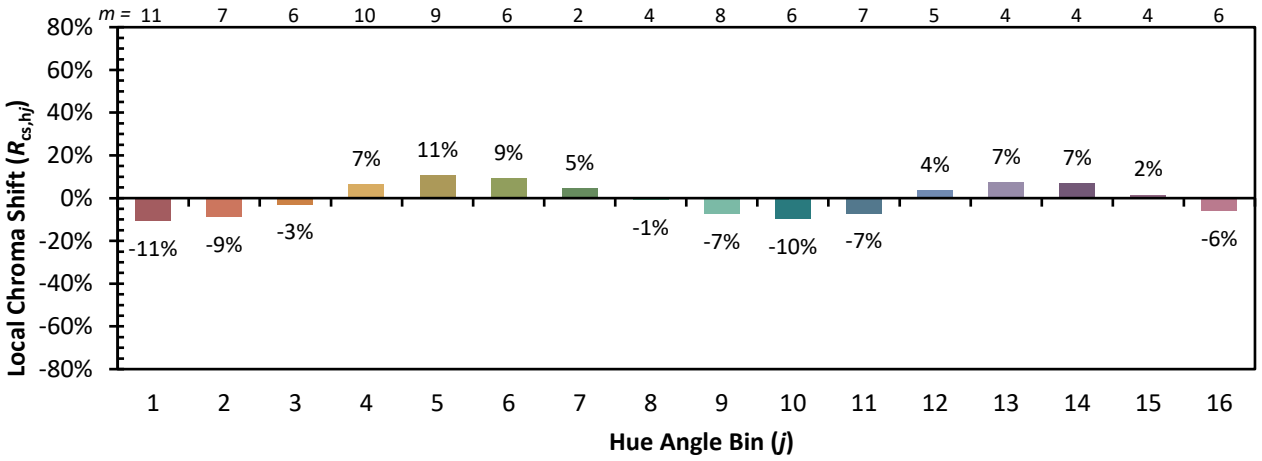
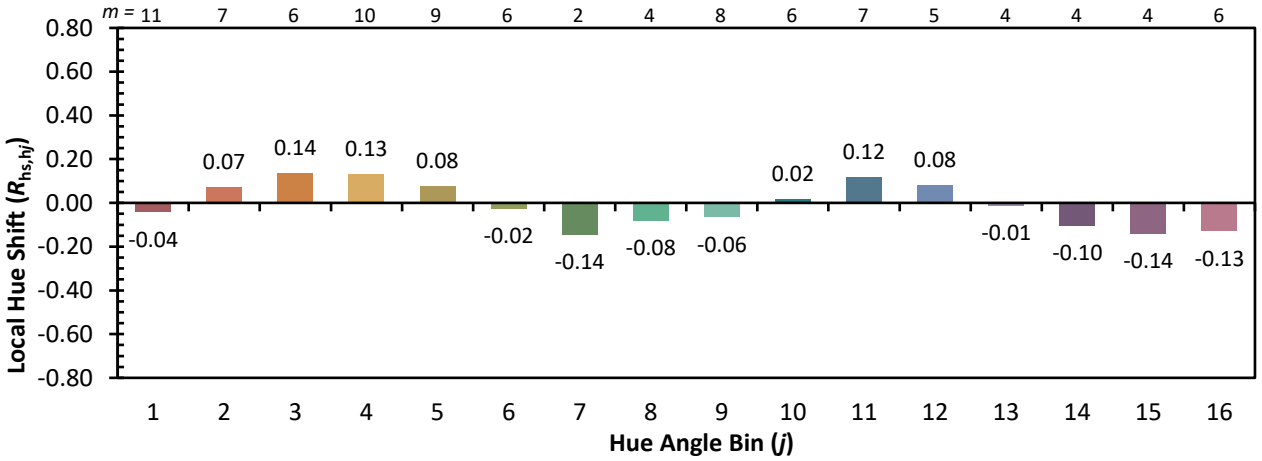
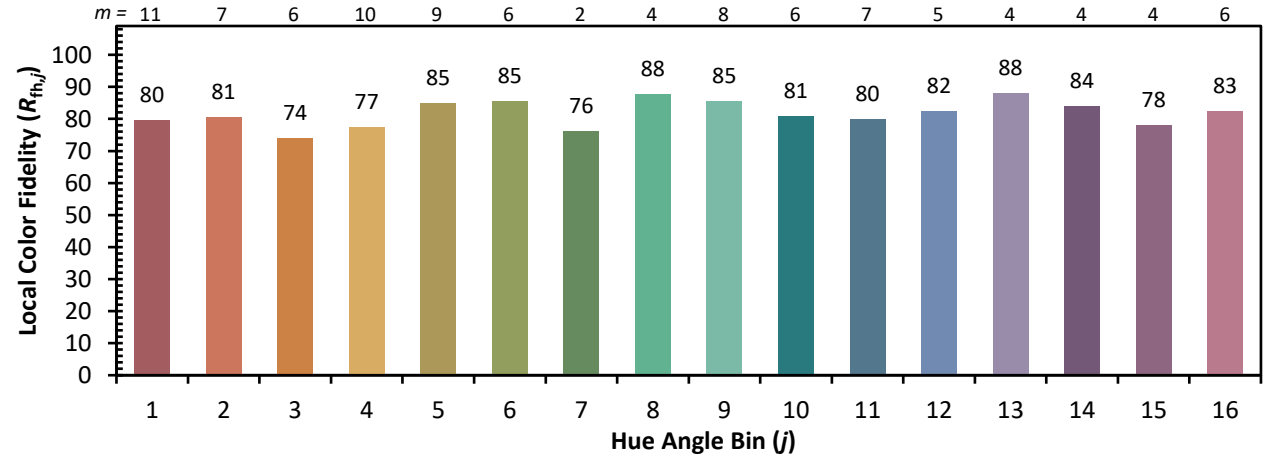
## Color Rendition by Hue-Angle Bin



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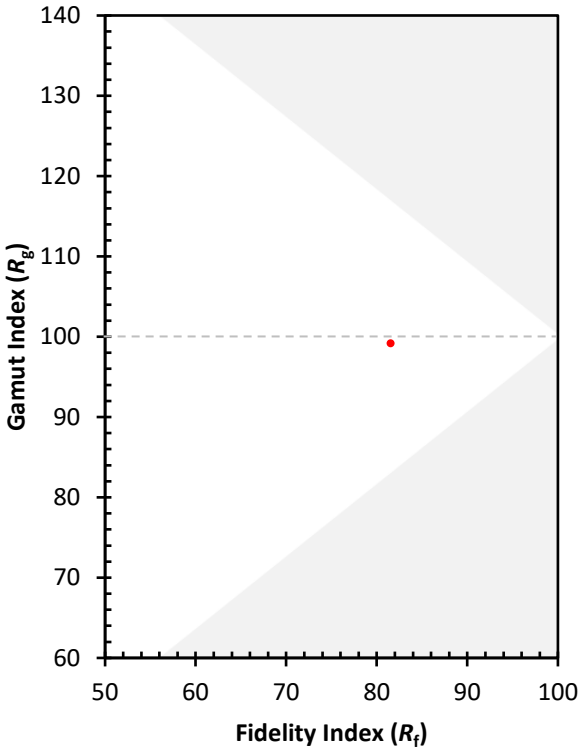
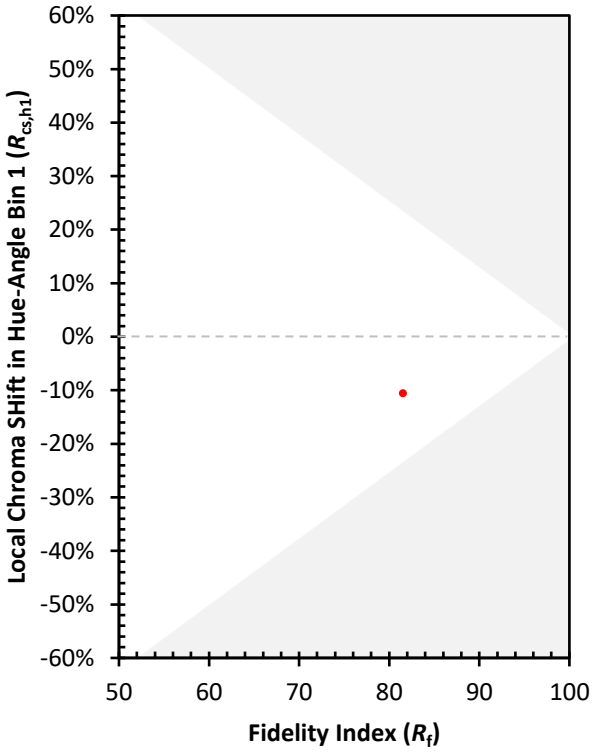
## TM-30-18

### Measure Comparisons




(END OF REPORT)