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: P437261

Luminaire Tested: **ISC-SA1B-830-U-T3**

Issue Date: 12/9/2020

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: | P437261 |
| | TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-2011-074-8) |
| Test Lab: | INNOVATION CENTER |
| Issue Date: | 12/9/2020 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS (FORMERLY EATON) |
| Product Line: | McGRAW-EDISON |
| Catalog Number: | ISC-SA1B-830-U-T3 |
| Description: | IMPACT ELITE LED CYLINDER LUMINAIRE |
| | (1) 80 CRI, 3000K, 450mA LIGHTSQUARE WITH 16 LEDS AND TYPE III OPTICS |
| Light Source: | - |
| Ballast/Driver: | ELECTRONIC DRIVER |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 2757 lumens |
| Efficiency: | N/A |
| Efficacy: | 108.5 lumens/watt |
| Luminous Opening: | Rectangular (W 0.5' x L: 0.5' x H: 0') |
| IES Classification: | Type III - Medium |
| BUG Rating: | B1 - U0 - G1 |

| | |
|---|---|
| Input Watts (W): | 25.4 |
| 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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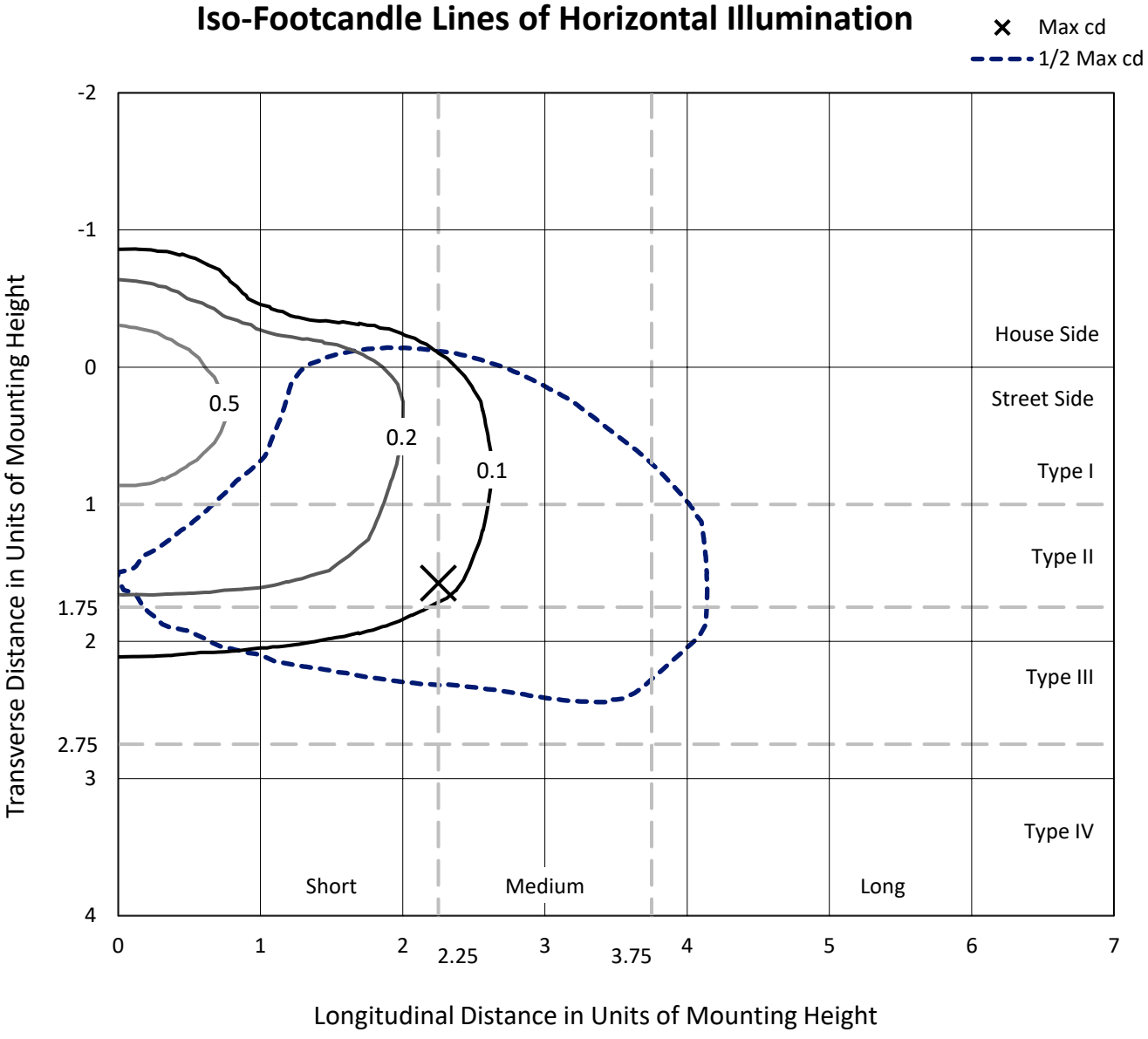
Scaled Data Report

REPORT NUMBER: P437261
CATALOG NUMBER: ISC-SA1B-830-U-T3

## Iso-Footcandle Lines of Horizontal Illumination




Based on 25 foot mounting height. Maximum calculated value = 0.7 fc
Type III - Medium - N/A

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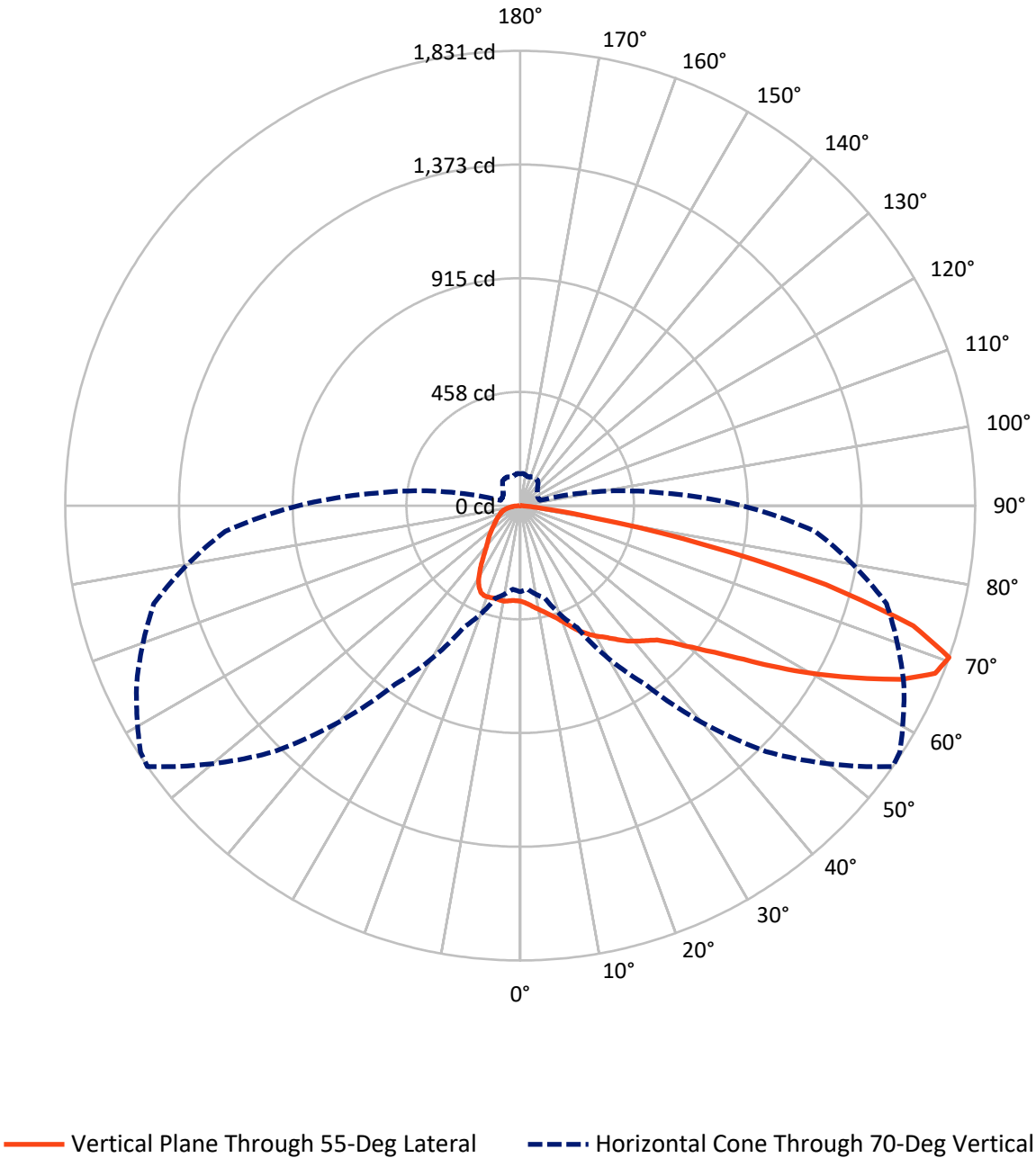
CATALOG NUMBER: ISC-SA1B-830-U-T3

## Luminous Intensity Polar Plot



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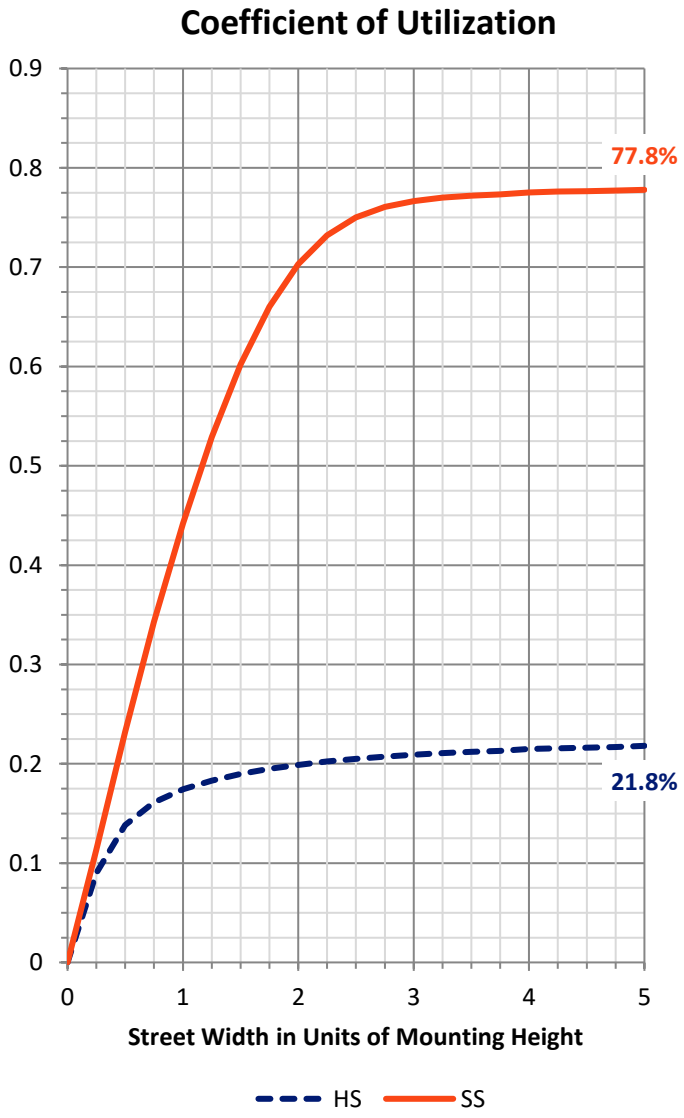
**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 609.8 | 0.0 | 609.8 |
| | % Fixture | 22.1 | 0.0 | 22.1 |
| **Street Side** | Lumens | 2147.2 | 0.0 | 2147.2 |
| | % Fixture | 77.9 | 0.0 | 77.9 |
| **Total** | Lumens | 2757.0 | 0.0 | 2757.0 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 37.9 | 1.4 |
| 10°-20° | 120.7 | 4.4 |
| 20°-30° | 209.9 | 7.6 |
| 30°-40° | 295.9 | 10.7 |
| 40°-50° | 392.1 | 14.2 |
| 50°-60° | 571.3 | 20.7 |
| 60°-70° | 712.9 | 25.9 |
| 70°-80° | 379.7 | 13.8 |
| 80°-90° | 36.6 | 1.3 |
| 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° | 2757.0 | 100.0 |
| 0°-180° | 2757.0 | 100.0 |



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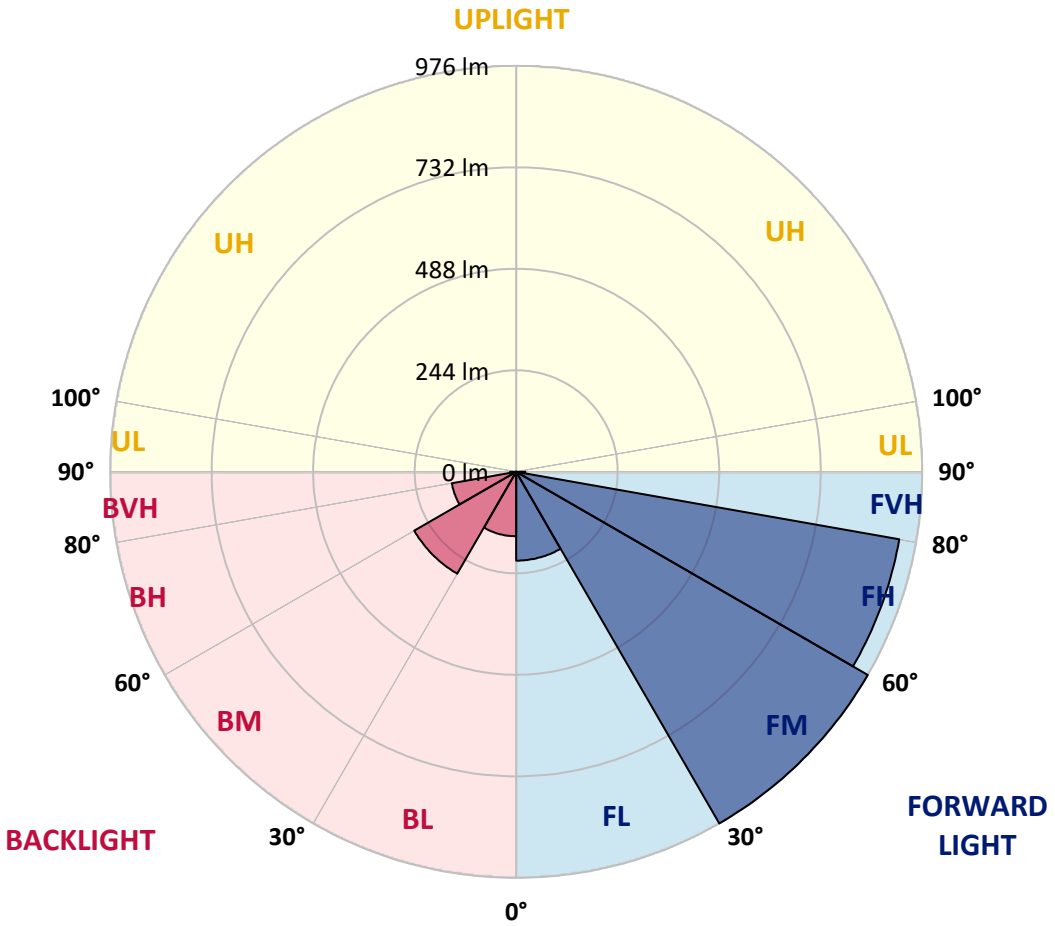
CATALOG NUMBER: ISC-SA1B-830-U-T3

## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 213.6 | 7.7 | | | |
| FM | (30°-60°) | 976.3 | 35.4 | | | |
| FH | (60°-80°) | 935.4 | 33.9 | | | G1/1800 |
| FVH | (80°-90°) | 21.8 | 0.8 | | | G1/100 |
| BL | (0°-30°) | 155.0 | 5.6 | B1/500 | | |
| BM | (30°-60°) | 283.0 | 10.3 | B1/1000 | | |
| BH | (60°-80°) | 157.1 | 5.7 | B1/500 | | G1/500 |
| BVH | (80°-90°) | 14.7 | 0.5 | | | G1/100 |
| UL | (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH | (100°-180°) | 0.0 | 0.0 | | U0/0 | |

**BUG Rating: B1-U0-G1**
Type III Medium



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CATALOG NUMBER: ISC-SA1B-830-U-T3

**CANDELA DISTRIBUTION (FULL):**

| | 0° | 5° | 15° | 25° | 35° | 45° | 55° | 57° | 65° | 75° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 385.0 | 385.0 | 385.0 | 385.0 | 385.0 | 385.0 | *385.0* | 385.0 | 385.0 | 385.0 | 385.0 |
| 2.5° | 397.9 | 396.9 | 396.9 | 395.9 | 394.9 | 394.0 | *392.0* | 390.0 | 390.0 | 388.0 | 388.0 |
| 5° | 407.8 | 405.9 | 406.9 | 405.9 | 405.9 | 403.9 | *400.9* | 400.9 | 399.9 | 394.9 | 391.0 |
| 7.5° | 417.8 | 416.8 | 416.8 | 417.8 | 416.8 | 414.8 | *413.8* | 412.8 | 408.8 | 402.9 | 396.9 |
| 10° | 431.7 | 431.7 | 431.7 | 430.7 | 430.7 | 428.7 | *425.7* | 425.7 | 420.8 | 413.8 | 406.9 |
| 12.5° | 452.5 | 451.5 | 450.5 | 450.5 | 447.5 | 443.6 | *440.6* | 440.6 | 437.6 | 426.7 | 417.8 |
| 15° | 476.3 | 473.3 | 471.4 | 471.4 | 467.4 | 460.4 | *457.5* | 458.5 | 455.5 | 442.6 | 429.7 |
| 17.5° | 500.1 | 500.1 | 498.2 | 493.2 | 488.2 | 483.3 | *476.3* | 478.3 | 475.3 | 462.4 | 445.6 |
| 20° | 522.0 | 520.0 | 520.0 | 517.0 | 510.1 | 504.1 | *500.1* | 499.1 | 497.2 | 483.3 | 463.4 |
| 22.5° | 545.8 | 544.8 | 541.8 | 539.8 | 534.9 | 531.9 | *529.9* | 529.9 | 522.0 | 503.1 | 477.3 |
| 25° | 574.6 | 573.6 | 573.6 | 565.6 | 561.7 | 556.7 | *559.7* | 556.7 | 552.7 | 524.9 | 492.2 |
| 27.5° | 603.3 | 603.3 | 602.3 | 598.4 | 587.5 | 584.5 | *586.5* | 584.5 | 583.5 | 545.8 | 506.1 |
| 30° | 634.1 | 633.1 | 630.1 | 629.1 | 618.2 | 610.3 | *609.3* | 605.3 | 605.3 | 564.6 | 516.0 |
| 32.5° | 659.9 | 658.9 | 660.9 | 656.9 | 650.0 | 639.1 | *632.1* | 632.1 | 625.2 | 583.5 | 527.9 |
| 35° | 683.7 | 685.7 | 685.7 | 683.7 | 677.8 | 666.8 | *659.9* | 661.9 | 652.0 | 600.4 | 542.8 |
| 37.5° | 710.5 | 708.5 | 705.6 | 703.6 | 695.6 | 690.7 | *690.7* | 692.6 | 677.8 | 618.2 | 562.7 |
| 40° | 716.5 | 721.4 | 728.4 | 720.4 | 716.5 | 715.5 | *717.5* | 712.5 | 697.6 | 646.0 | 596.4 |
| 42.5° | 728.4 | 732.3 | 745.2 | 742.3 | 739.3 | 742.3 | *742.3* | 735.3 | 728.4 | 683.7 | 642.0 |
| 45° | 758.1 | 765.1 | 775.0 | 776.0 | 775.0 | 780.0 | *771.0* | 770.1 | 769.1 | 738.3 | 703.6 |
| 47.5° | 790.9 | 798.8 | 821.7 | 818.7 | 829.6 | 839.5 | *823.6* | 822.6 | 825.6 | 810.7 | 782.0 |
| 50° | 829.6 | 837.5 | 866.3 | 877.2 | 907.0 | 924.9 | *896.1* | 883.2 | 904.0 | 903.0 | 881.2 |
| 52.5° | 874.2 | 884.2 | 904.0 | 941.7 | 992.3 | 1011.2 | *980.4* | 969.5 | 994.3 | 1006.2 | 986.4 |
| 55° | 905.0 | 912.9 | 943.7 | 1002.3 | 1084.6 | 1109.4 | *1091.6* | 1081.6 | 1108.4 | 1118.4 | 1097.5 |
| 57.5° | 915.9 | 917.9 | 963.6 | 1055.8 | 1170.0 | 1233.5 | *1230.5* | 1223.5 | 1212.6 | 1237.4 | 1231.5 |
| 60° | 897.1 | 908.0 | 966.5 | 1079.7 | 1246.4 | 1366.4 | *1377.4* | 1361.5 | 1347.6 | 1353.5 | 1333.7 |
| 62.5° | 872.3 | 881.2 | 942.7 | 1082.6 | 1298.0 | 1486.5 | *1527.2* | 1509.3 | 1474.6 | 1458.7 | 1412.1 |
| 65° | 784.9 | 784.9 | 845.5 | 1022.1 | 1289.0 | 1584.8 | *1685.0* | 1654.2 | 1590.7 | 1534.1 | 1409.1 |
| 67.5° | 600.4 | 597.4 | 655.9 | 839.5 | 1163.0 | 1594.7 | *1801.1* | 1785.2 | 1683.0 | 1562.9 | 1353.5 |
| 70° | *346.3* | *337.4* | *386.0* | *541.8* | *878.2* | *1400.2* | *1830.9* | *1821.9* | *1703.8* | *1526.2* | *1191.8* |
| 72.5° | 120.1 | 128.0 | 159.8 | 230.2 | 483.3 | 1008.2 | *1654.2* | 1673.1 | 1604.6 | 1386.3 | 957.6 |
| 75° | 62.5 | 62.5 | 73.4 | 100.2 | 204.4 | 520.0 | *1271.2* | 1329.7 | 1344.6 | 1160.0 | 683.7 |
| 77.5° | 45.6 | 46.6 | 52.6 | 64.5 | 97.2 | 199.5 | *763.1* | 818.7 | 930.8 | 798.8 | 394.9 |
| 80° | 30.8 | 31.8 | 37.7 | 42.7 | 59.5 | 77.4 | *304.6* | 334.4 | 461.4 | 357.2 | 152.8 |
| 82.5° | 22.8 | 23.8 | 23.8 | 24.8 | 32.7 | 35.7 | *80.4* | 99.2 | 158.8 | 106.2 | 54.6 |
| 85° | 5.0 | 5.0 | 9.9 | 9.9 | 9.9 | 9.9 | *17.9* | 19.8 | 29.8 | 31.8 | 17.9 |
| 87.5° | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 | 1.0 | *2.0* | 2.0 | 2.0 | 3.0 | 3.0 |
| 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

Scaled Data Report

REPORT NUMBER: P437261
CATALOG NUMBER: ISC-SA1B-830-U-T3

**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 385.0 | 385.0 | 385.0 | 385.0 | 385.0 | 385.0 | 385.0 | 385.0 | 385.0 | 385.0 | 385.0 |
| 2.5° | 387.0 | 386.0 | 385.0 | 384.0 | 383.0 | 382.0 | 381.1 | 382.0 | 382.0 | 384.0 | 385.0 |
| 5° | 390.0 | 387.0 | 386.0 | 384.0 | 383.0 | 383.0 | 383.0 | 384.0 | 385.0 | 386.0 | 387.0 |
| 7.5° | 394.9 | 394.0 | 391.0 | 387.0 | 386.0 | 386.0 | 384.0 | 384.0 | 384.0 | 386.0 | 386.0 |
| 10° | 403.9 | 400.9 | 396.9 | 393.0 | 390.0 | 384.0 | 379.1 | 375.1 | 377.1 | 380.1 | 380.1 |
| 12.5° | 413.8 | 408.8 | 403.9 | 396.9 | 389.0 | 379.1 | 374.1 | 375.1 | 375.1 | 378.1 | 379.1 |
| 15° | 426.7 | 422.7 | 411.8 | 399.9 | 386.0 | 378.1 | 376.1 | 374.1 | 374.1 | 376.1 | 378.1 |
| 17.5° | 440.6 | 433.7 | 419.8 | 401.9 | 388.0 | 379.1 | 375.1 | 367.2 | 363.2 | 362.2 | 364.2 |
| 20° | 453.5 | 445.6 | 426.7 | 403.9 | 390.0 | 378.1 | 364.2 | 351.3 | 341.4 | 339.4 | 337.4 |
| 22.5° | 464.4 | 454.5 | 431.7 | 407.8 | 390.0 | 368.2 | 344.3 | 325.5 | 311.6 | 307.6 | 309.6 |
| 25° | 476.3 | 461.4 | 437.6 | 411.8 | 383.0 | 348.3 | 315.6 | 292.7 | 278.8 | 272.9 | 272.9 |
| 27.5° | 486.2 | 471.4 | 443.6 | 408.8 | 365.2 | 321.5 | 283.8 | 261.0 | 250.1 | 244.1 | 243.1 |
| 30° | 495.2 | 479.3 | 455.5 | 399.9 | 339.4 | 284.8 | 252.1 | 236.2 | 229.2 | 222.3 | 223.3 |
| 32.5° | 507.1 | 493.2 | 464.4 | 381.1 | 304.6 | 251.1 | 226.3 | 218.3 | 211.4 | 206.4 | 208.4 |
| 35° | 524.0 | 516.0 | 467.4 | 357.2 | 268.9 | 227.2 | 210.4 | 201.4 | 195.5 | 188.5 | 188.5 |
| 37.5° | 547.8 | 540.8 | 457.5 | 321.5 | 237.2 | 209.4 | 197.5 | 185.6 | 175.6 | 167.7 | 165.7 |
| 40° | 576.5 | 566.6 | 440.6 | 281.8 | 212.4 | 197.5 | 186.6 | 171.7 | 157.8 | 146.9 | 144.9 |
| 42.5° | 622.2 | 593.4 | 415.8 | 241.1 | 194.5 | 187.6 | 172.7 | 153.8 | 139.9 | 132.0 | 130.0 |
| 45° | 670.8 | 624.2 | 380.1 | 206.4 | 180.6 | 175.6 | 158.8 | 139.9 | 130.0 | 124.0 | 123.0 |
| 47.5° | 732.3 | 657.9 | 346.3 | 180.6 | 164.7 | 163.7 | 143.9 | 132.0 | 124.0 | 120.1 | 119.1 |
| 50° | 813.7 | 700.6 | 312.6 | 160.8 | 150.8 | 147.9 | 136.9 | 127.0 | 121.1 | 118.1 | 117.1 |
| 52.5° | 908.0 | 750.2 | 285.8 | 145.9 | 137.9 | 135.9 | 133.0 | 125.0 | 121.1 | 118.1 | 117.1 |
| 55° | 997.3 | 801.8 | 257.0 | 132.0 | 127.0 | 129.0 | 131.0 | 125.0 | 122.1 | 120.1 | 118.1 |
| 57.5° | 1095.5 | 845.5 | 224.3 | 121.1 | 118.1 | 123.0 | 129.0 | 126.0 | 124.0 | 121.1 | 120.1 |
| 60° | 1156.1 | 876.2 | 180.6 | 111.1 | 111.1 | 118.1 | 126.0 | 124.0 | 120.1 | 120.1 | 120.1 |
| 62.5° | 1182.9 | 871.3 | 142.9 | 101.2 | 103.2 | 112.1 | 121.1 | 119.1 | 116.1 | 121.1 | 121.1 |
| 65° | 1148.1 | 814.7 | 116.1 | 92.3 | 95.3 | 104.2 | 116.1 | 116.1 | 116.1 | 124.0 | 124.0 |
| 67.5° | 1057.8 | 729.4 | 95.3 | 84.3 | 87.3 | 98.2 | 116.1 | 123.0 | 122.1 | 131.0 | 131.0 |
| 70° | *893.1* | *578.5* | *82.4* | *78.4* | *82.4* | *98.2* | *123.0* | *127.0* | *120.1* | *130.0* | *128.0* |
| 72.5° | 680.7 | 403.9 | 73.4 | 72.4 | 77.4 | 95.3 | 124.0 | 122.1 | 113.1 | 116.1 | 113.1 |
| 75° | 447.5 | 245.1 | 64.5 | 66.5 | 68.5 | 84.3 | 118.1 | 114.1 | 103.2 | 101.2 | 99.2 |
| 77.5° | 246.1 | 123.0 | 56.6 | 59.5 | 59.5 | 71.4 | 107.2 | 98.2 | 89.3 | 84.3 | 82.4 |
| 80° | 98.2 | 62.5 | 49.6 | 52.6 | 48.6 | 57.6 | 80.4 | 76.4 | 68.5 | 64.5 | 62.5 |
| 82.5° | 44.7 | 34.7 | 41.7 | 43.7 | 36.7 | 42.7 | 59.5 | 57.6 | 51.6 | 44.7 | 42.7 |
| 85° | 16.9 | 19.8 | 31.8 | 29.8 | 25.8 | 24.8 | 33.7 | 30.8 | 24.8 | 19.8 | 19.8 |
| 87.5° | 2.0 | 4.0 | 7.9 | 10.9 | 6.0 | 4.0 | 2.0 | 1.0 | 1.0 | 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 |

Cooper Lighting Solutions Photometric Lab
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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

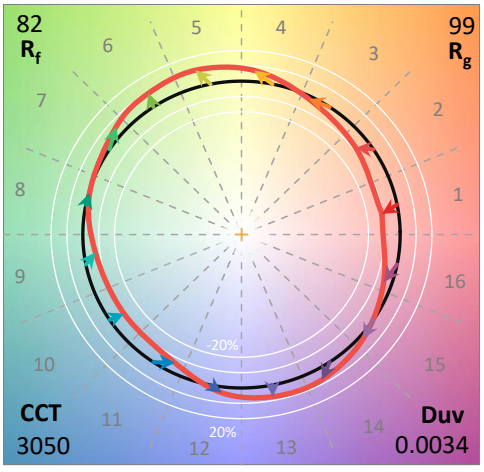
## Test Information

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

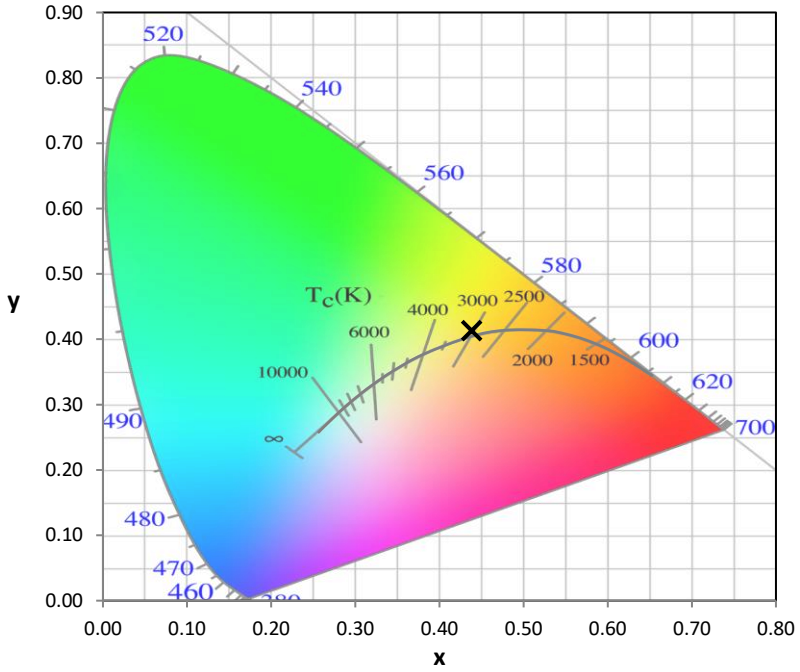
| | |
|---|---|
| Stabilization Time: | 20M |
| Operation Time: | 1H 20M |
| Sphere Temperature (°C): | 24.2 |

REPORT NUMBER: SP1-2408-195-9

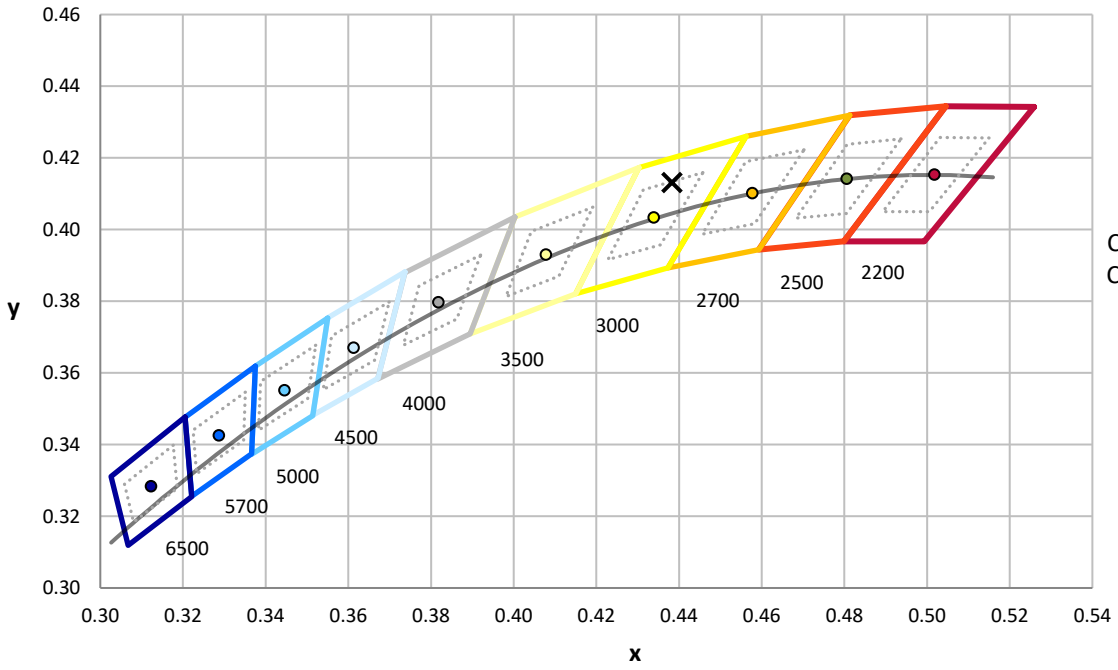
| Measurement and Test Equipment | | | |
|---|---|---|---|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | IN0058 | 6/18/2024 | 12/18/2024 |
| Power Meter | INXT2011004 | 2/8/2024 | 2/8/2025 |
| AC Power Source | IN0063 | 10/24/2023 | 10/24/2024 |
| DC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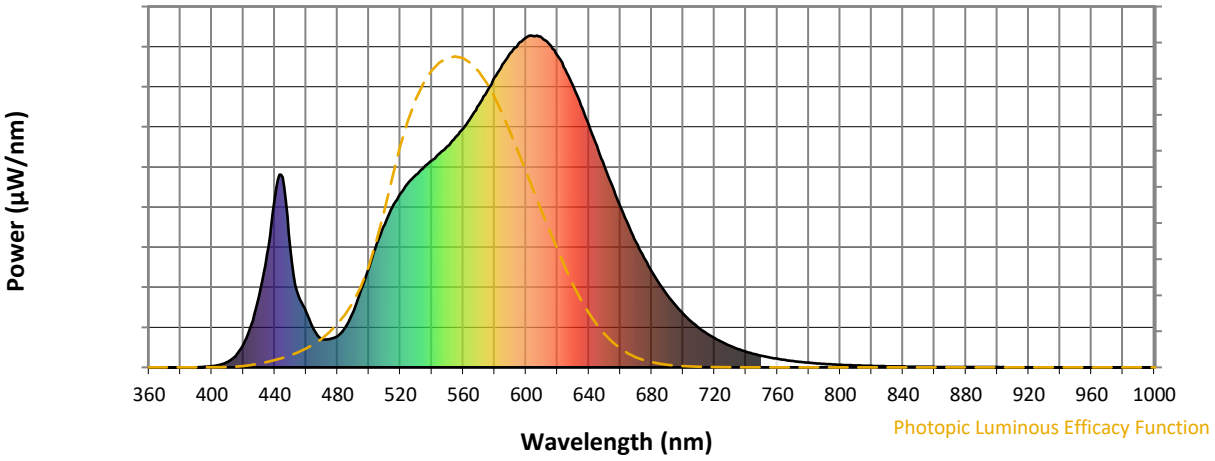
## Photopic Flux vs. Wavelength




## 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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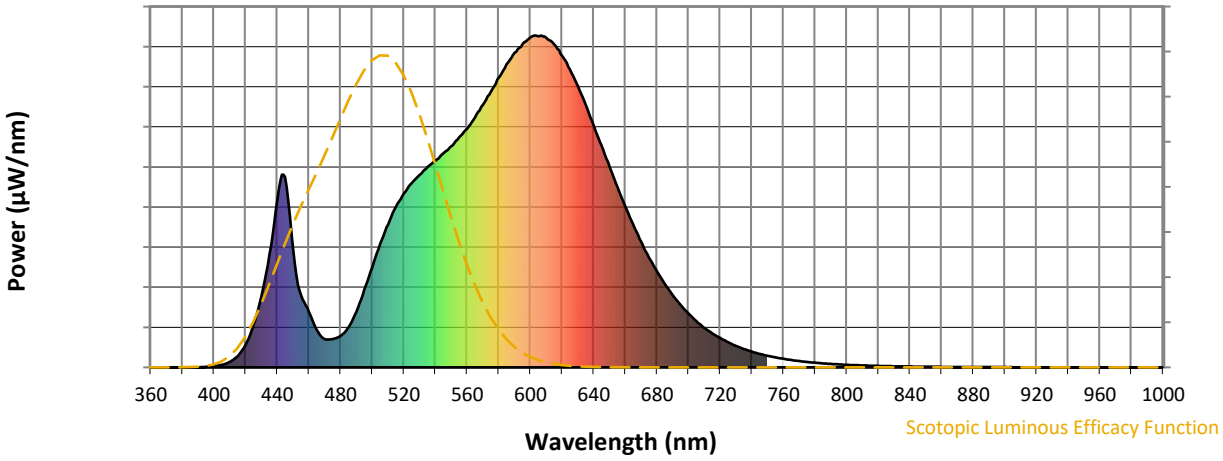
## Scotopic Flux vs. Wavelength




**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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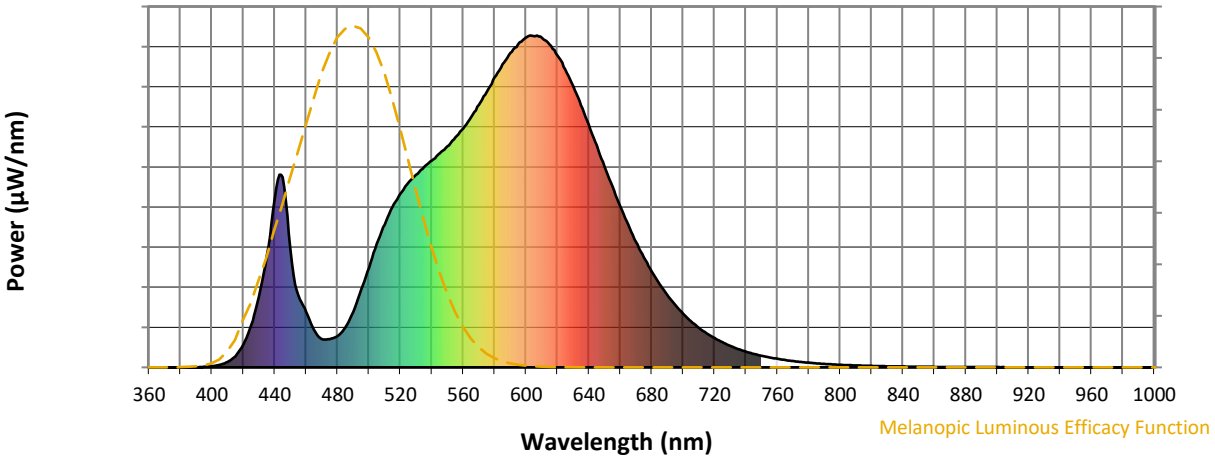
## Melanopic Flux vs. Wavelength




**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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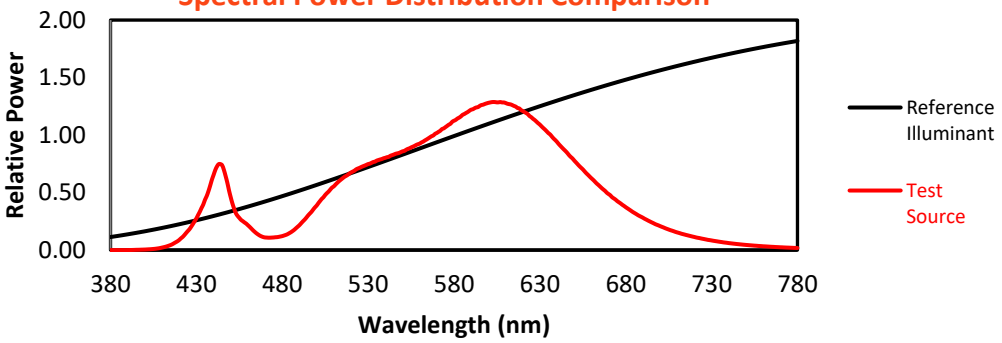
# TM-30-18

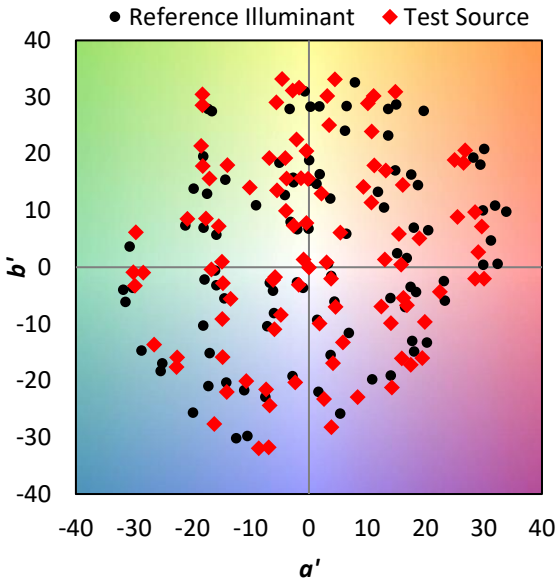
## Summary

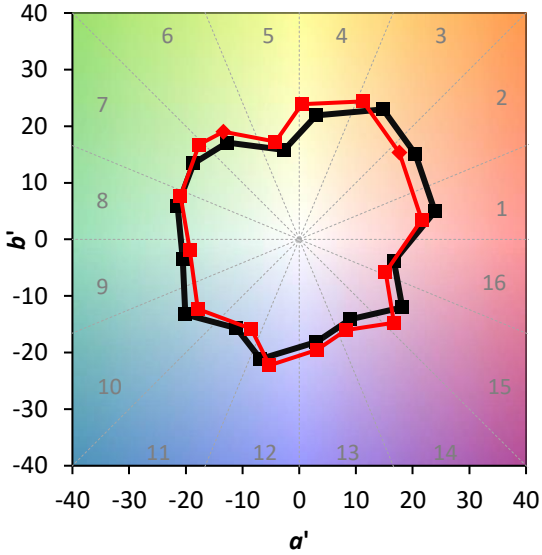
$R_f$ = 81.5
$R_g$ = 99.2
CIE $R_a$ = 81.0
$R_9$ = 7.1

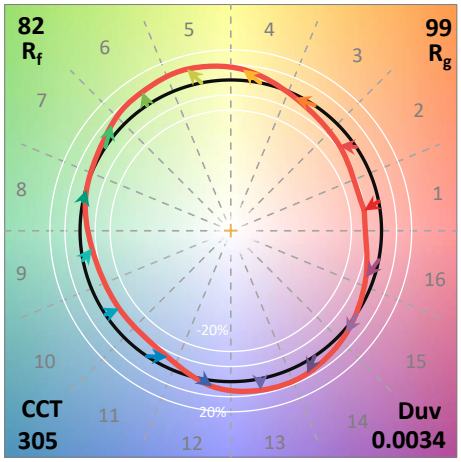
## Spectral Power Distribution Comparison

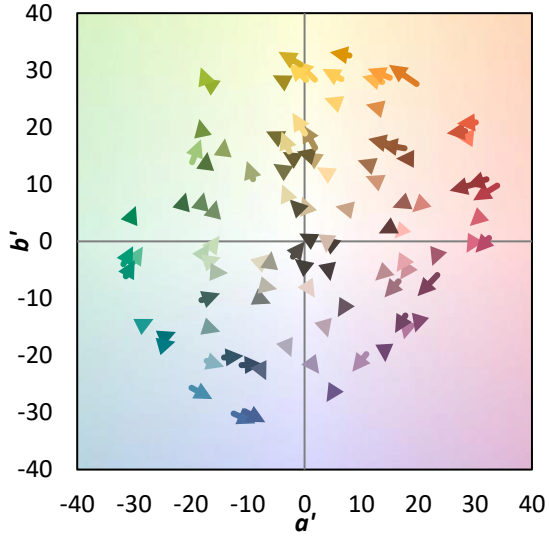



## Color Vector Graphics



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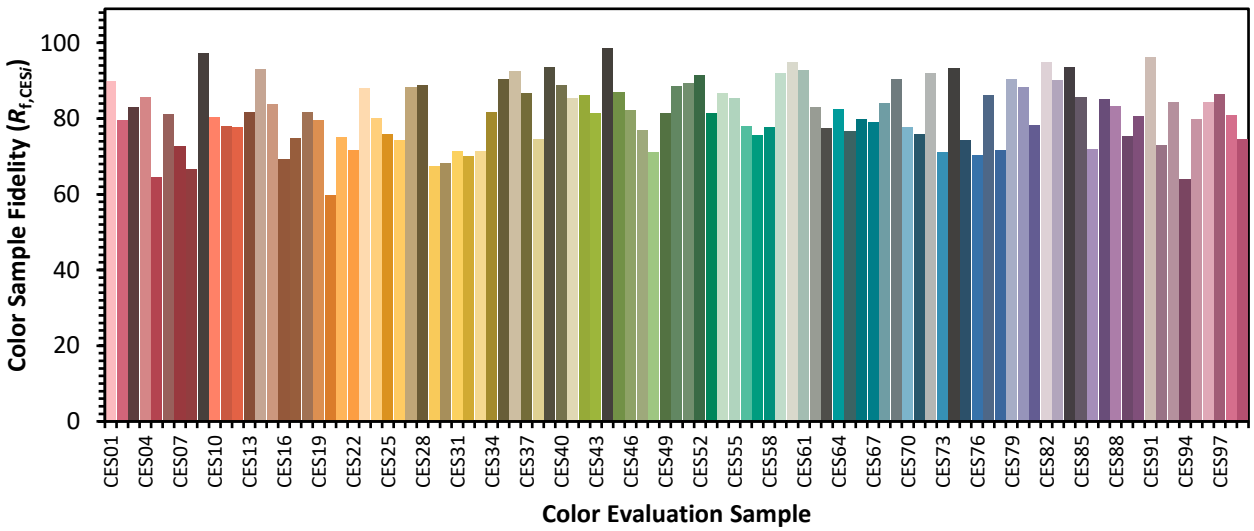
# TM-30-18

**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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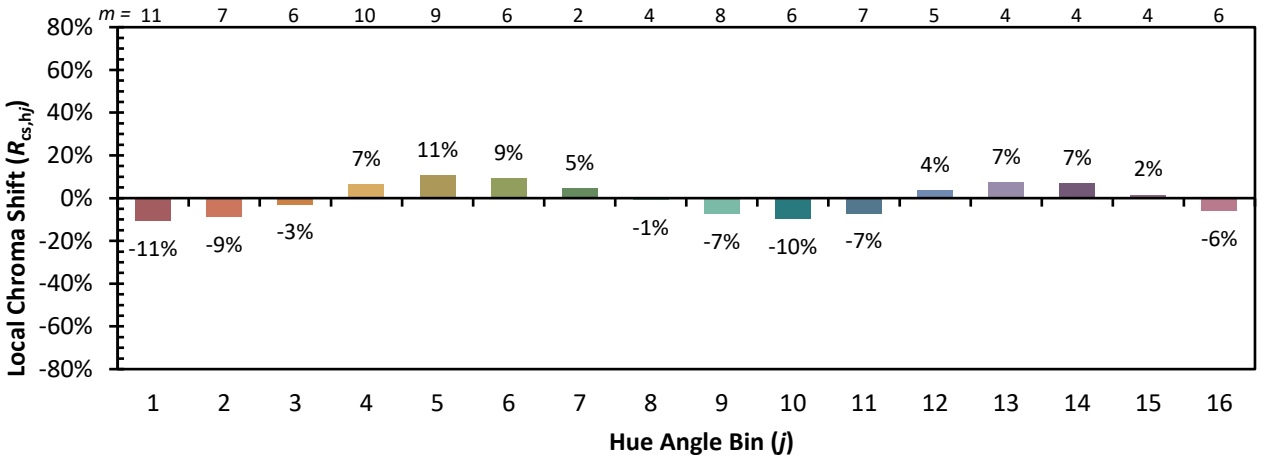
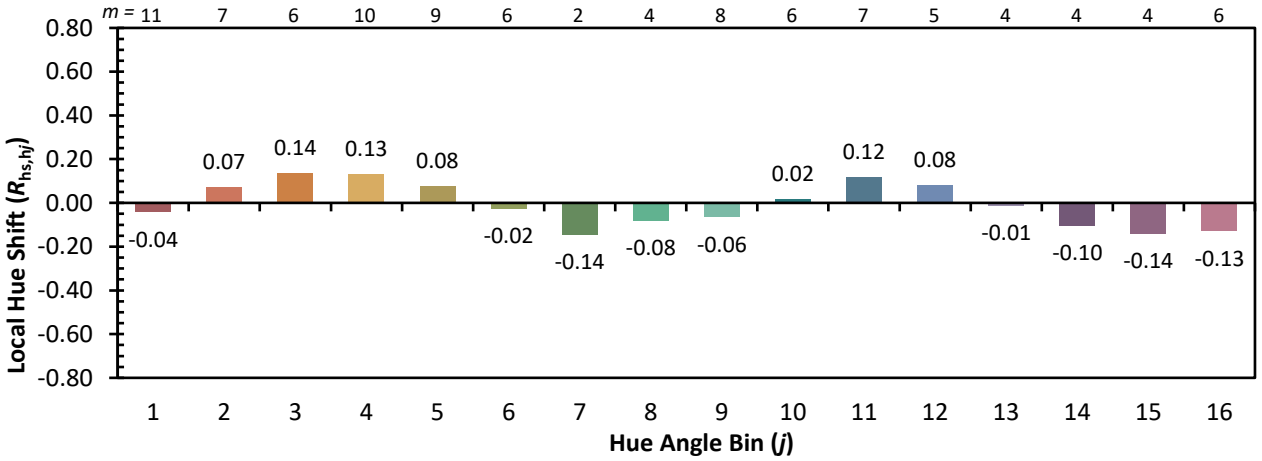
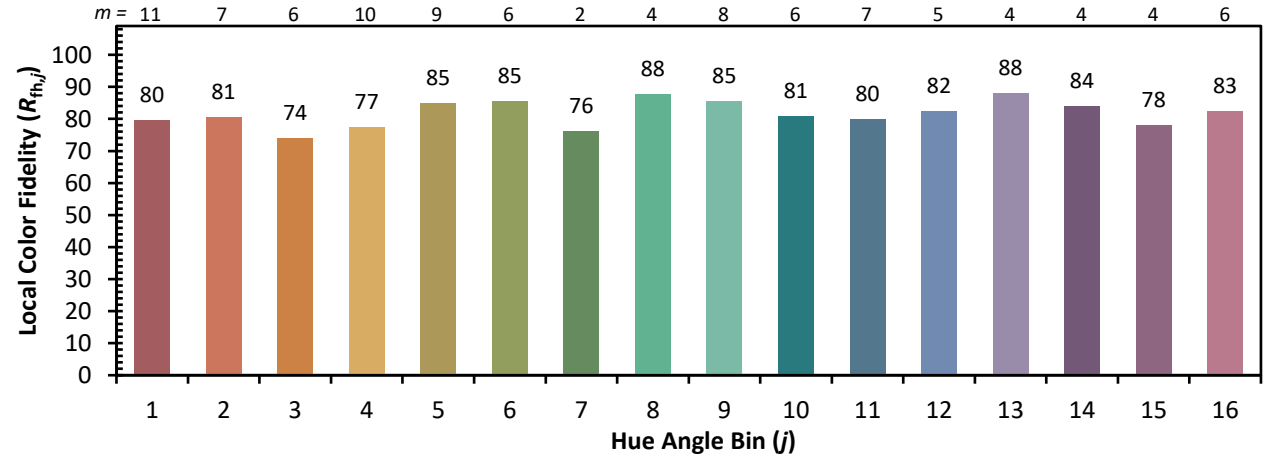
# TM-30-18

## Color Rendition by Hue-Angle Bin



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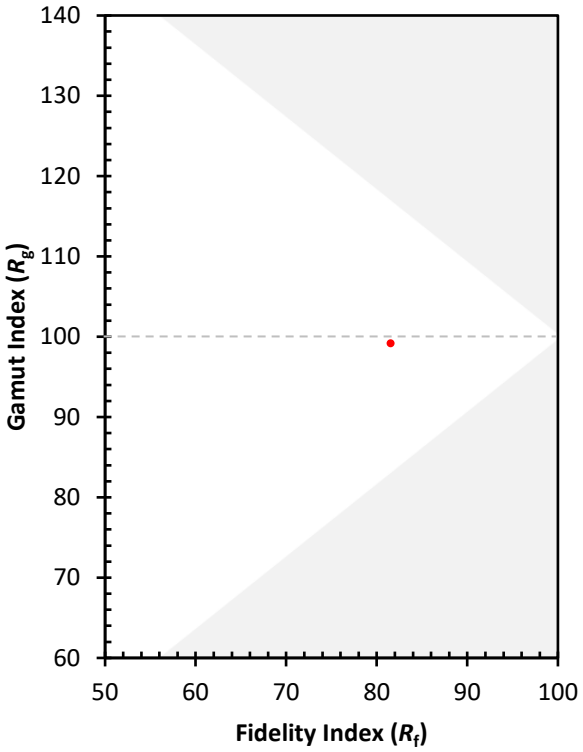
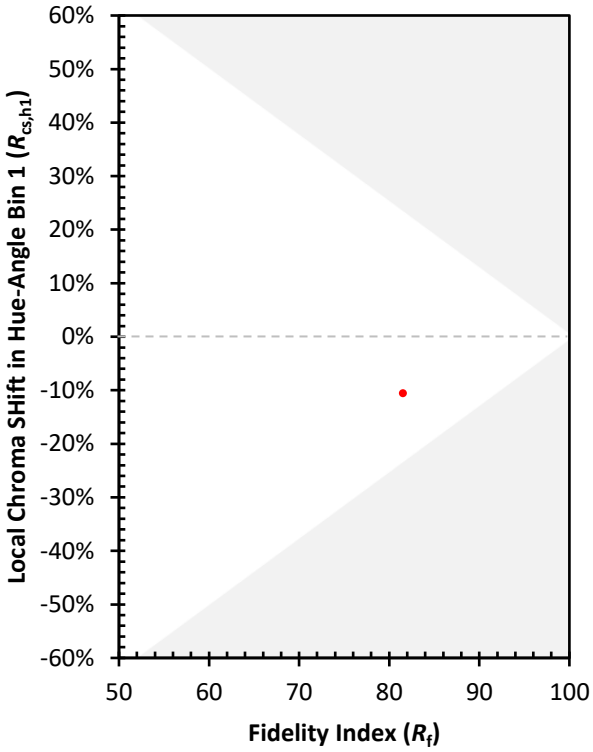
## TM-30-18

### Measure Comparisons




(END OF REPORT)