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: P438671

Luminaire Tested: **ISW-SA1E-727-U-T4W**

Issue Date: 12/10/2020

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: | P438671 |
| | TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-2011-074-12) |
| Test Lab: | INNOVATION CENTER |
| Issue Date: | 12/10/2020 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS (FORMERLY EATON) |
| Product Line: | McGRAW-EDISON |
| Catalog Number: | ISW-SA1E-727-U-T4W |
| Description: | IMPACT ELITE LED WEDGE LUMINAIRE |
| | (1) 70 CRI, 2700K, 1050mA LIGHTSQUARE WITH 16 LEDS AND TYPE IV WIDE OPTICS |
| Light Source: | - |
| Ballast/Driver: | ELECTRONIC DRIVER |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 5929 lumens |
| Efficiency: | N/A |
| Efficacy: | 101.9 lumens/watt |
| Luminous Opening: | Rectangular (W 0.5' x L: 0.5' x H: 0') |
| IES Classification: | Type IV - Short |
| BUG Rating: | B1 - U0 - G2 |

| | |
|---|---|
| Input Watts (W): | 58.2 |
| 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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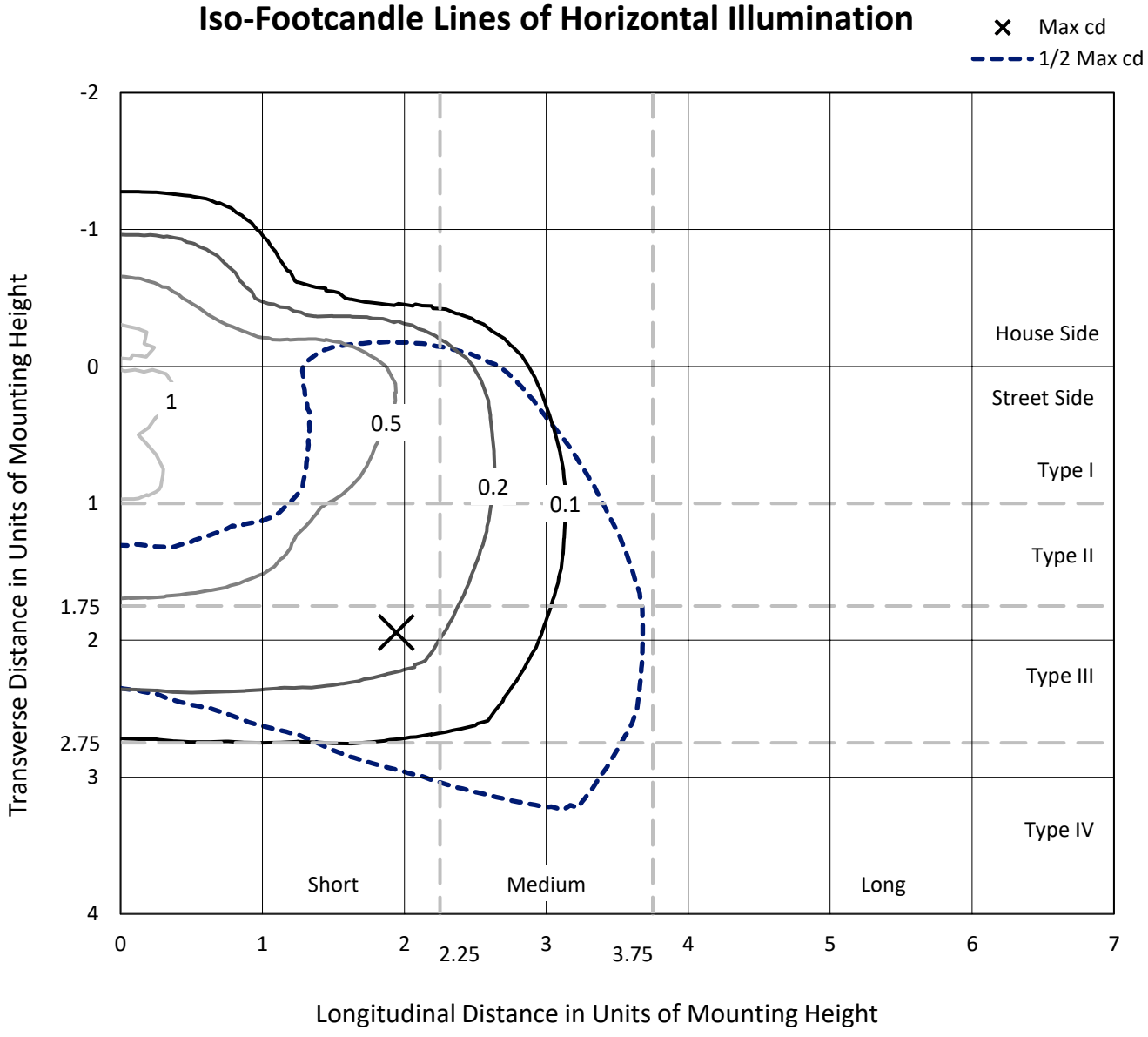
Scaled Data Report

REPORT NUMBER: P438671
CATALOG NUMBER: ISW-SA1E-727-U-T4W

## Iso-Footcandle Lines of Horizontal Illumination




Based on 25 foot mounting height. Maximum calculated value = 1.2 fc
Type IV - Short - N/A

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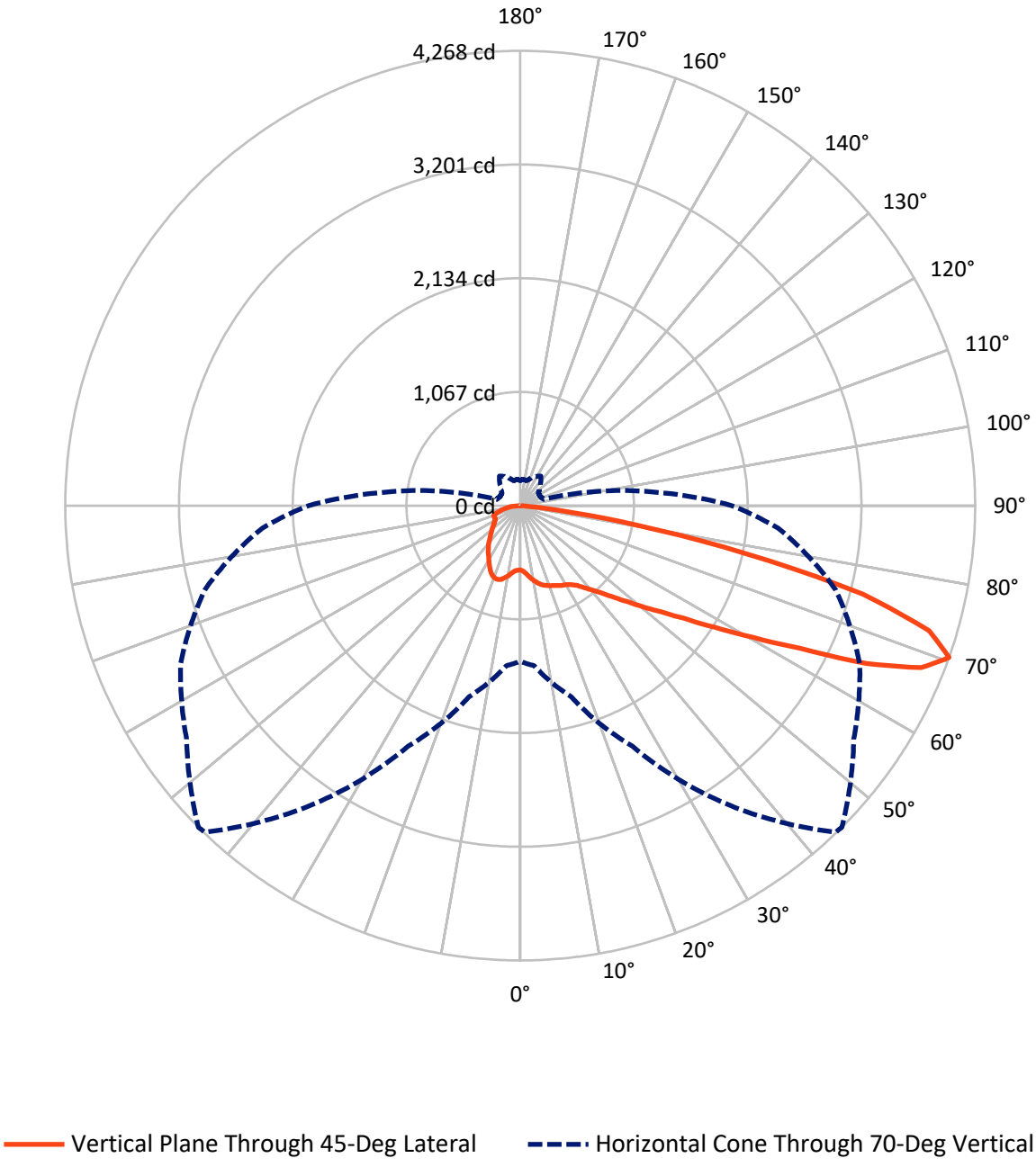
## Luminous Intensity Polar Plot



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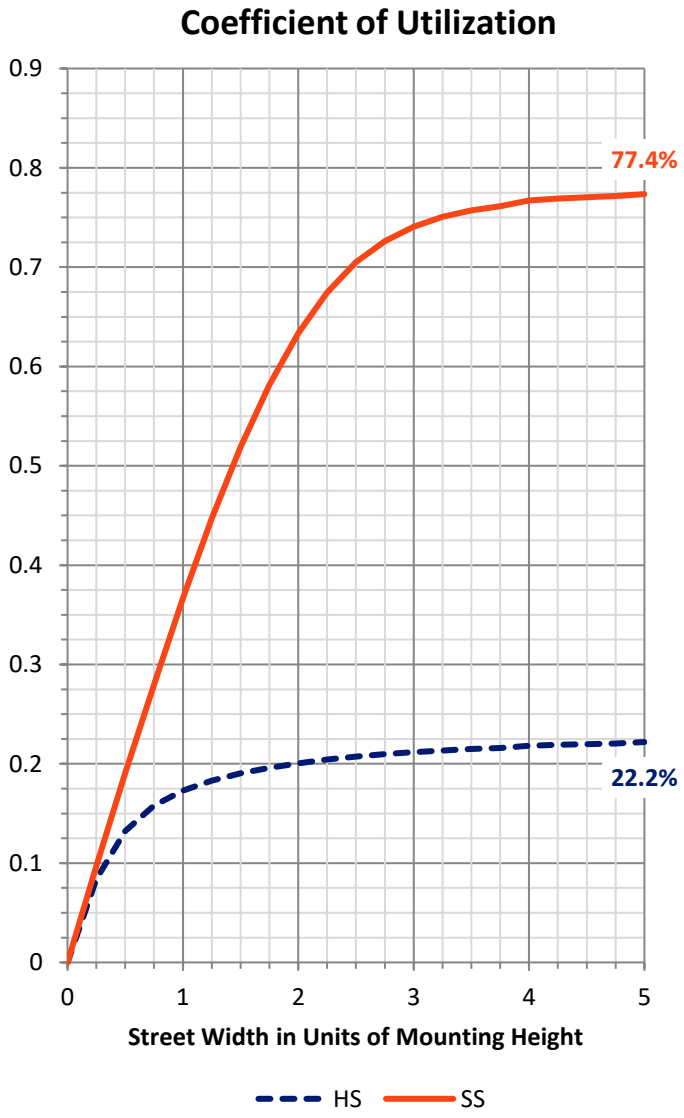
REPORT NUMBER: P438671
CATALOG NUMBER: ISW-SA1E-727-U-T4W

**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 1338.7 | 0.0 | 1338.7 |
| | % Fixture | 22.6 | 0.0 | 22.6 |
| **Street Side** | Lumens | 4590.3 | 0.0 | 4590.3 |
| | % Fixture | 77.4 | 0.0 | 77.4 |
| **Total** | Lumens | 5929.0 | 0.0 | 5929.0 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 62.2 | 1.0 |
| 10°-20° | 208.3 | 3.5 |
| 20°-30° | 352.7 | 5.9 |
| 30°-40° | 509.9 | 8.6 |
| 40°-50° | 735.2 | 12.4 |
| 50°-60° | 1205.8 | 20.3 |
| 60°-70° | 1727.6 | 29.1 |
| 70°-80° | 1026.8 | 17.3 |
| 80°-90° | 100.5 | 1.7 |
| 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° | 5929.0 | 100.0 |
| 0°-180° | 5929.0 | 100.0 |



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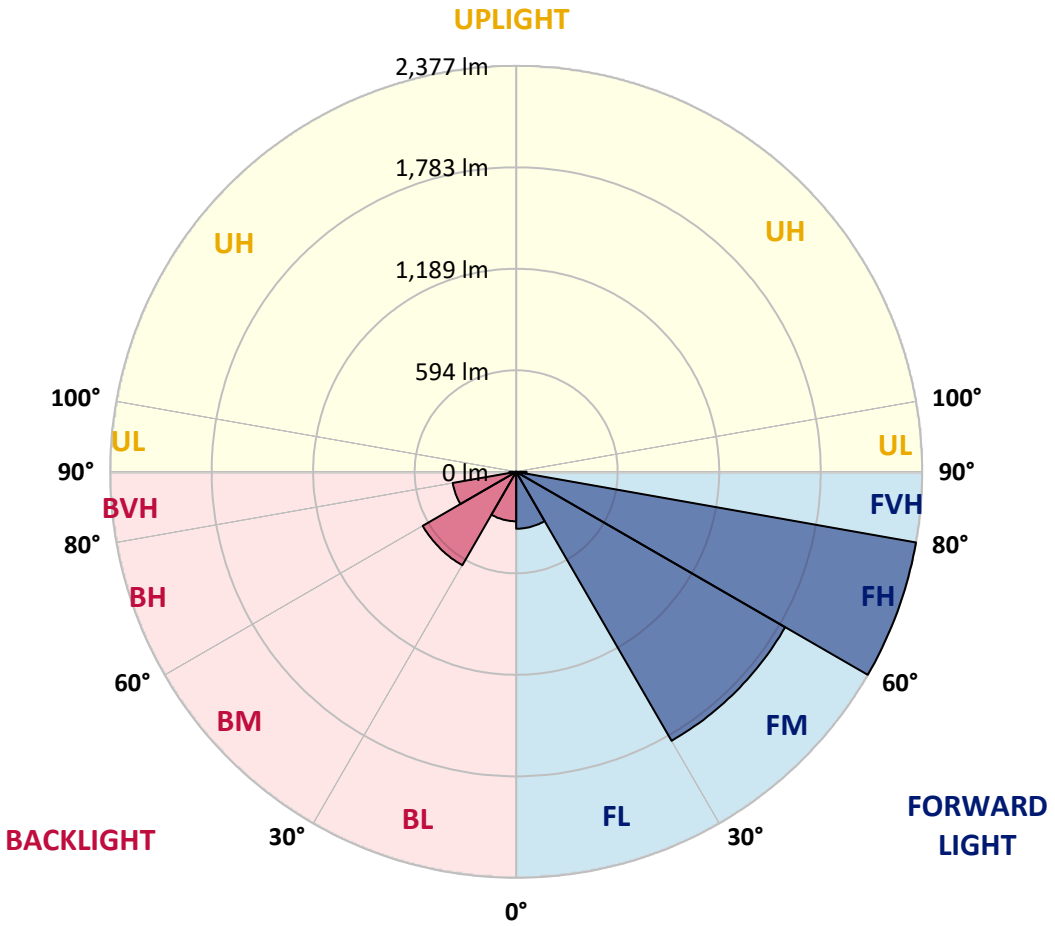
## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 333.4 | 5.6 | | | |
| FM | (30°-60°) | 1819.0 | 30.7 | | | |
| FH | (60°-80°) | 2377.4 | 40.1 | | | G2/5000 |
| FVH | (80°-90°) | 60.5 | 1.0 | | | G1/100 |
| BL | (0°-30°) | 289.7 | 4.9 | B1/500 | | |
| BM | (30°-60°) | 631.9 | 10.7 | B1/1000 | | |
| BH | (60°-80°) | 377.1 | 6.4 | B1/500 | | G1/500 |
| BVH | (80°-90°) | 40.0 | 0.7 | | | 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 IV Short



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REPORT NUMBER: P438671
CATALOG NUMBER: ISW-SA1E-727-U-T4W

**CANDELA DISTRIBUTION (FULL):**

| | 0° | 5° | 15° | 25° | 35° | 44° | 45° | 55° | 65° | 75° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 603.6 | 603.6 | 603.6 | 603.6 | 603.6 | 603.6 | *603.6* | 603.6 | 603.6 | 603.6 | 603.6 |
| 2.5° | 633.4 | 633.4 | 631.3 | 629.1 | 624.9 | 620.6 | *618.5* | 612.1 | 612.1 | 610.0 | 605.7 |
| 5° | 680.3 | 676.1 | 673.9 | 665.4 | 659.0 | 648.3 | *646.2* | 631.3 | 622.8 | 616.4 | 612.1 |
| 7.5° | 729.4 | 731.5 | 723.0 | 712.3 | 697.4 | 682.5 | *682.5* | 665.4 | 650.5 | 635.5 | 622.8 |
| 10° | 776.3 | 776.3 | 765.6 | 752.8 | 737.9 | 718.7 | *714.5* | 695.3 | 678.2 | 659.0 | 644.1 |
| 12.5° | 812.6 | 810.4 | 797.6 | 784.8 | 765.6 | 750.7 | *746.4* | 723.0 | 708.1 | 684.6 | 663.3 |
| 15° | 838.2 | 838.2 | 825.4 | 806.2 | 787.0 | 772.0 | *772.0* | 755.0 | 733.7 | 710.2 | 684.6 |
| 17.5° | 853.1 | 851.0 | 840.3 | 819.0 | 801.9 | 789.1 | *787.0* | 774.2 | 761.4 | 737.9 | 705.9 |
| 20° | 853.1 | 848.8 | 840.3 | 823.2 | 808.3 | 799.8 | *801.9* | 791.2 | 782.7 | 755.0 | 729.4 |
| 22.5° | 851.0 | 848.8 | 833.9 | 821.1 | 816.8 | 814.7 | *812.6* | 808.3 | 793.4 | 772.0 | 750.7 |
| 25° | 870.1 | 868.0 | 851.0 | 833.9 | 825.4 | 825.4 | *829.6* | 821.1 | 812.6 | 791.2 | 772.0 |
| 27.5° | 923.5 | 914.9 | 891.5 | 859.5 | 846.7 | 844.6 | *846.7* | 836.0 | 829.6 | 814.7 | 797.6 |
| 30° | 1013.0 | 1008.8 | 972.5 | 912.8 | 878.7 | 861.6 | *859.5* | 857.4 | 848.8 | 838.2 | 823.2 |
| 32.5° | 1130.3 | 1126.1 | 1070.6 | 993.8 | 921.3 | 882.9 | *885.1* | 874.4 | 874.4 | 859.5 | 846.7 |
| 35° | 1275.4 | 1266.8 | 1211.4 | 1102.6 | 985.3 | 921.3 | *917.1* | 902.1 | 904.3 | 878.7 | 865.9 |
| 37.5° | 1403.3 | 1394.8 | 1341.5 | 1213.5 | 1066.4 | 983.2 | *976.8* | 940.5 | 917.1 | 885.1 | 887.2 |
| 40° | 1512.1 | 1514.2 | 1475.8 | 1347.9 | 1170.9 | 1051.4 | *1040.8* | 970.4 | 942.7 | 914.9 | 927.7 |
| 42.5° | 1623.0 | 1629.4 | 1603.8 | 1467.3 | 1277.5 | 1126.1 | *1121.8* | 1021.6 | 998.1 | 976.8 | 1006.6 |
| 45° | 1731.8 | 1744.6 | 1723.2 | 1595.3 | 1396.9 | 1239.1 | *1222.0* | 1104.7 | 1089.8 | 1077.0 | 1166.6 |
| 47.5° | 1827.7 | 1832.0 | 1829.9 | 1729.6 | 1529.2 | 1367.1 | *1343.6* | 1213.5 | 1232.7 | 1266.8 | 1416.1 |
| 50° | 1947.2 | 1953.6 | 1919.4 | 1864.0 | 1708.3 | 1512.1 | *1490.8* | 1350.0 | 1428.9 | 1539.8 | 1765.9 |
| 52.5° | 2124.2 | 2132.7 | 2036.7 | 2002.6 | 1930.1 | 1687.0 | *1655.0* | 1550.5 | 1721.1 | 1887.4 | 2156.2 |
| 55° | 2226.6 | 2213.8 | 2171.1 | 2175.4 | 2134.8 | 1896.0 | *1868.3* | 1795.7 | 2038.9 | 2237.2 | 2597.6 |
| 57.5° | 2292.7 | 2286.3 | 2311.9 | 2369.4 | 2369.4 | 2164.7 | *2154.0* | 2122.0 | 2380.1 | 2619.0 | 2947.4 |
| 60° | 2399.3 | 2412.1 | 2471.8 | 2587.0 | 2648.8 | 2516.6 | *2510.2* | 2516.6 | 2764.0 | 2885.6 | 3196.9 |
| 62.5° | 2465.4 | 2493.1 | 2644.6 | 2842.9 | 2973.0 | 2987.9 | *2947.4* | 2943.1 | 3062.6 | 3107.4 | 3361.2 |
| 65° | 2348.1 | 2392.9 | 2640.3 | 2962.3 | 3361.2 | 3602.1 | *3572.3* | 3314.2 | 3310.0 | 3307.8 | 3329.2 |
| 67.5° | 2038.9 | 2073.0 | 2431.3 | 2909.0 | 3570.2 | 4073.5 | *4056.4* | 3644.8 | 3544.6 | 3324.9 | 3030.6 |
| 70° | *1460.9* | *1507.8* | *1857.6* | *2491.0* | *3435.8* | *4261.2* | *4267.6* | *3819.7* | *3514.7* | *3064.7* | *2429.2* |
| 72.5° | 904.3 | 906.4 | 1132.5 | 1774.4 | 2909.0 | 3986.0 | *4011.6* | 3646.9 | 3162.8 | 2552.9 | 1716.8 |
| 75° | 279.4 | 302.8 | 479.9 | 929.9 | 1968.5 | 3241.7 | *3320.6* | 3030.6 | 2531.5 | 1765.9 | 940.5 |
| 77.5° | 138.6 | 142.9 | 172.7 | 341.2 | 946.9 | 2098.6 | *2158.3* | 2023.9 | 1599.5 | 855.2 | 394.6 |
| 80° | 78.9 | 83.2 | 106.6 | 151.4 | 362.6 | 1042.9 | *1091.9* | 1066.4 | 648.3 | 309.2 | 168.5 |
| 82.5° | 38.4 | 40.5 | 53.3 | 76.8 | 153.6 | 311.4 | *349.8* | 383.9 | 247.4 | 164.2 | 91.7 |
| 85° | 10.7 | 10.7 | 14.9 | 25.6 | 40.5 | 64.0 | *64.0* | 70.4 | 87.4 | 83.2 | 44.8 |
| 87.5° | 0.0 | 0.0 | 0.0 | 2.1 | 2.1 | 2.1 | *4.3* | 2.1 | 4.3 | 6.4 | 6.4 |
| 90° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | *0.0* | 0.0 | 0.0 | 0.0 | 0.0 |

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Scaled Data Report

REPORT NUMBER: P438671
CATALOG NUMBER: ISW-SA1E-727-U-T4W

**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 603.6 | 603.6 | 603.6 | 603.6 | 603.6 | 603.6 | 603.6 | 603.6 | 603.6 | 603.6 | 603.6 |
| 2.5° | 605.7 | 605.7 | 601.4 | 603.6 | 603.6 | 605.7 | 605.7 | 607.8 | 610.0 | 612.1 | 612.1 |
| 5° | 610.0 | 607.8 | 605.7 | 607.8 | 610.0 | 614.2 | 620.6 | 627.0 | 631.3 | 637.7 | 635.5 |
| 7.5° | 622.8 | 616.4 | 618.5 | 618.5 | 627.0 | 635.5 | 648.3 | 656.9 | 665.4 | 669.7 | 669.7 |
| 10° | 637.7 | 633.4 | 631.3 | 639.8 | 648.3 | 665.4 | 676.1 | 688.9 | 695.3 | 705.9 | 701.7 |
| 12.5° | 659.0 | 648.3 | 650.5 | 661.1 | 678.2 | 691.0 | 699.5 | 710.2 | 716.6 | 725.1 | 723.0 |
| 15° | 676.1 | 669.7 | 671.8 | 688.9 | 705.9 | 714.5 | 718.7 | 723.0 | 725.1 | 731.5 | 733.7 |
| 17.5° | 697.4 | 695.3 | 697.4 | 712.3 | 723.0 | 725.1 | 723.0 | 718.7 | 716.6 | 723.0 | 720.9 |
| 20° | 720.9 | 718.7 | 720.9 | 731.5 | 727.3 | 718.7 | 710.2 | 703.8 | 697.4 | 701.7 | 703.8 |
| 22.5° | 740.1 | 742.2 | 744.3 | 740.1 | 723.0 | 701.7 | 686.7 | 676.1 | 671.8 | 676.1 | 680.3 |
| 25° | 763.5 | 765.6 | 767.8 | 746.4 | 705.9 | 671.8 | 650.5 | 644.1 | 646.2 | 652.6 | 654.7 |
| 27.5° | 793.4 | 799.8 | 793.4 | 744.3 | 682.5 | 633.4 | 616.4 | 614.2 | 616.4 | 622.8 | 629.1 |
| 30° | 825.4 | 833.9 | 812.6 | 733.7 | 650.5 | 595.0 | 580.1 | 580.1 | 586.5 | 590.8 | 597.2 |
| 32.5° | 853.1 | 870.1 | 829.6 | 714.5 | 605.7 | 558.8 | 548.1 | 543.8 | 543.8 | 548.1 | 550.2 |
| 35° | 887.2 | 908.5 | 840.3 | 680.3 | 563.0 | 528.9 | 520.4 | 507.6 | 496.9 | 499.1 | 496.9 |
| 37.5° | 921.3 | 953.3 | 836.0 | 627.0 | 516.1 | 494.8 | 486.3 | 467.1 | 450.0 | 439.3 | 443.6 |
| 40° | 985.3 | 1023.7 | 827.5 | 558.8 | 473.5 | 464.9 | 450.0 | 428.7 | 407.3 | 388.2 | 386.0 |
| 42.5° | 1098.3 | 1100.5 | 808.3 | 496.9 | 432.9 | 428.7 | 415.9 | 396.7 | 371.1 | 345.5 | 345.5 |
| 45° | 1249.8 | 1211.4 | 782.7 | 439.3 | 394.6 | 398.8 | 388.2 | 369.0 | 339.1 | 315.6 | 315.6 |
| 47.5° | 1478.0 | 1343.6 | 733.7 | 388.2 | 362.6 | 371.1 | 364.7 | 345.5 | 313.5 | 292.2 | 292.2 |
| 50° | 1797.9 | 1559.0 | 684.6 | 351.9 | 339.1 | 347.6 | 345.5 | 322.0 | 292.2 | 275.1 | 275.1 |
| 52.5° | 2169.0 | 1840.5 | 650.5 | 324.2 | 311.4 | 326.3 | 326.3 | 305.0 | 277.3 | 264.5 | 262.3 |
| 55° | 2550.7 | 2105.0 | 616.4 | 300.7 | 292.2 | 305.0 | 311.4 | 292.2 | 266.6 | 255.9 | 253.8 |
| 57.5° | 2821.6 | 2237.2 | 569.4 | 281.5 | 270.9 | 287.9 | 296.4 | 283.7 | 260.2 | 249.5 | 247.4 |
| 60° | 2958.1 | 2250.0 | 477.7 | 262.3 | 251.7 | 273.0 | 287.9 | 277.3 | 260.2 | 255.9 | 255.9 |
| 62.5° | 2990.1 | 2196.7 | 381.8 | 245.3 | 238.9 | 264.5 | 290.0 | 285.8 | 273.0 | 277.3 | 279.4 |
| 65° | 2853.6 | 2019.7 | 311.4 | 232.5 | 230.3 | 262.3 | 302.8 | 300.7 | 275.1 | 285.8 | 287.9 |
| 67.5° | 2527.3 | 1712.6 | 264.5 | 219.7 | 217.5 | 266.6 | 326.3 | 300.7 | 260.2 | 270.9 | 266.6 |
| 70° | *1985.6* | *1356.4* | *228.2* | *206.9* | *206.9* | *264.5* | *339.1* | *296.4* | *243.1* | *247.4* | *234.6* |
| 72.5° | 1305.2 | 889.3 | 202.6 | 194.1 | 187.7 | 241.0 | 330.6 | 287.9 | 234.6 | 221.8 | 206.9 |
| 75° | 661.1 | 441.5 | 181.3 | 183.4 | 164.2 | 204.7 | 319.9 | 285.8 | 232.5 | 211.1 | 204.7 |
| 77.5° | 273.0 | 206.9 | 162.1 | 166.4 | 138.6 | 174.9 | 300.7 | 264.5 | 209.0 | 187.7 | 181.3 |
| 80° | 142.9 | 128.0 | 136.5 | 138.6 | 113.0 | 138.6 | 238.9 | 228.2 | 187.7 | 172.7 | 164.2 |
| 82.5° | 83.2 | 81.0 | 104.5 | 106.6 | 78.9 | 113.0 | 211.1 | 198.3 | 157.8 | 140.8 | 136.5 |
| 85° | 38.4 | 44.8 | 70.4 | 64.0 | 49.1 | 74.6 | 128.0 | 98.1 | 70.4 | 61.8 | 59.7 |
| 87.5° | 4.3 | 6.4 | 14.9 | 14.9 | 10.7 | 6.4 | 2.1 | 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-79-2008: Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Report Prepared for

Cooper Lighting Solutions

McGRAW-EDISON

Report Number: SP1-1908-441-1-R4

Test Date: 08/20/2019

Luminaire Tested: SA1C-727-U-5WQ

Report Generated By FNC07603 / LDUCLS01DT446
Version: v6.13

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

## Test Information

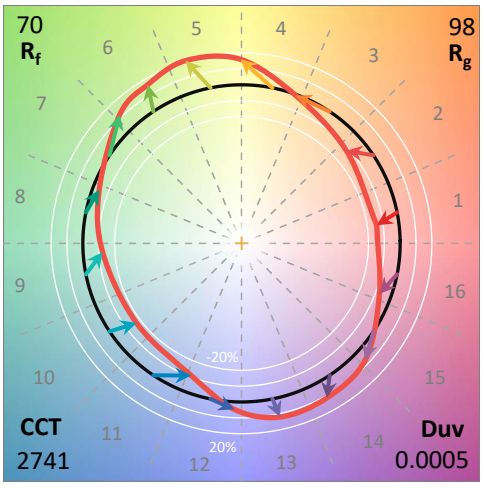
| | |
|---|---|
| Test Method: | LM-79-2008 |
| Report Number: | SP1-1908-441-1-R4 |
| Test Lab: | COOPER LIGHTING SOLUTIONS |
| Photometer: | SP1 - 76IN SPHERE |
| Measurement Geometry: | 4π |
| Issue Date: | 10/28/2024 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS |
| Product Line: | McGRAW-EDISON |
| Catalog Number: | **SA1C-727-U-5WQ** |
| Description: | McGRAW EDISON ROADWAY AND AREA LUMINAIRE |

***THIS IS A REVISION OF SP1-1908-441-1-R3. TO UPDATE THE CATALOG NUMBER.***TESTED IN SITU. (1) 70 CRI, 2700K, 1050MA LIGHTSQUARE WITH 16 LEDS AND TYPE V WIDE OPTICS.

## Spectral Parameters

| | | | | | |
|---|---|---|---|---|---|
| CCT (K): | 2741 | CRI (Ra): | 71.5 | | |
| CIE u': | 0.2605 | R1: | 69.2 | R9: | -16.1 |
| CIE v': | 0.5272 | R2: | 79.4 | R10: | 51.4 |
| Duv: | 0.0005 | R3: | 87.8 | R11: | 63.1 |
| CIE x: | 0.4573 | R4: | 69.4 | R12: | 42.0 |
| CIE y: | 0.4113 | R5: | 66.4 | R13: | 70.2 |
| CIE z: | 0.1313 | R6: | 69.8 | R14: | 92.4 |
| Peak Wavelength (nm): | 602 | R7: | 79.8 | | |
| Dominant Wavelength (nm): | 583 | R8: | 50.1 | | |
| Purity: | 61.2 | | | | |

| | |
|---|---|
| Rf: | 69.9 |
| Rg: | 98.3 |




## Test Conditions

| | |
|---|---|
| Stabilization Time: | 56M |
| Operation Time: | 12H |
| Room Temperature (°C) / RH%: | 25.3./42% |
| Sphere Temperature (°C): | 25.7 |

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

REPORT NUMBER: SP1-1908-441-1-R4

| Measurement and Test Equipment | | | |
|---|---|---|---|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | IN0058 | 6/28/2019 | 12/28/2019 |
| Power Meter | IN0071 | 12/5/2018 | 12/5/2019 |
| AC Power Source | IN0063 | 12/5/2018 | 12/5/2019 |
| DC Power Source | IN0208 | 12/5/2018 | 12/5/2019 |
| Sphere Thermometer | IN0085 | 12/5/2018 | 12/5/2019 |
| Room Thermometer | IN0046 | 12/5/2018 | 12/5/2019 |

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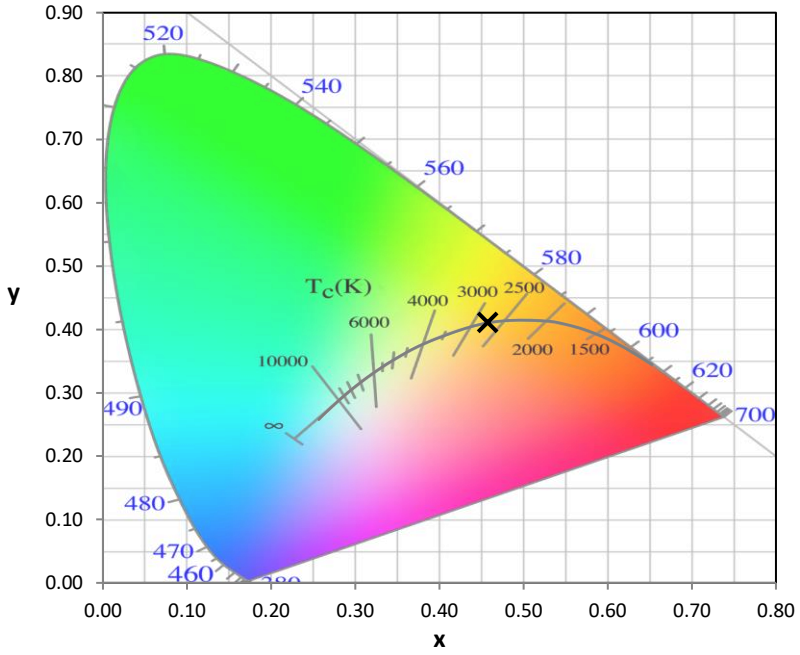
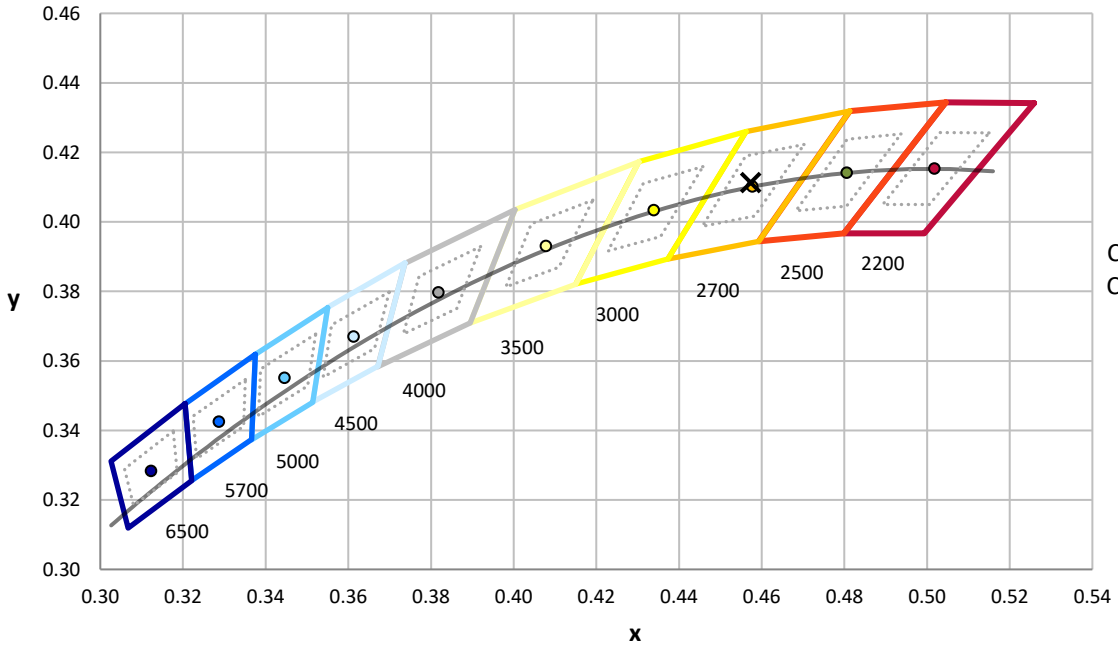
## CIE 1931 Chromaticity Diagram




## CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles




CCT = 2741K
CIE x = 0.4573
CIE y = 0.4113
Duv = 0.0005

Point lies inside the ANSI 2700K 4-step quadrangle

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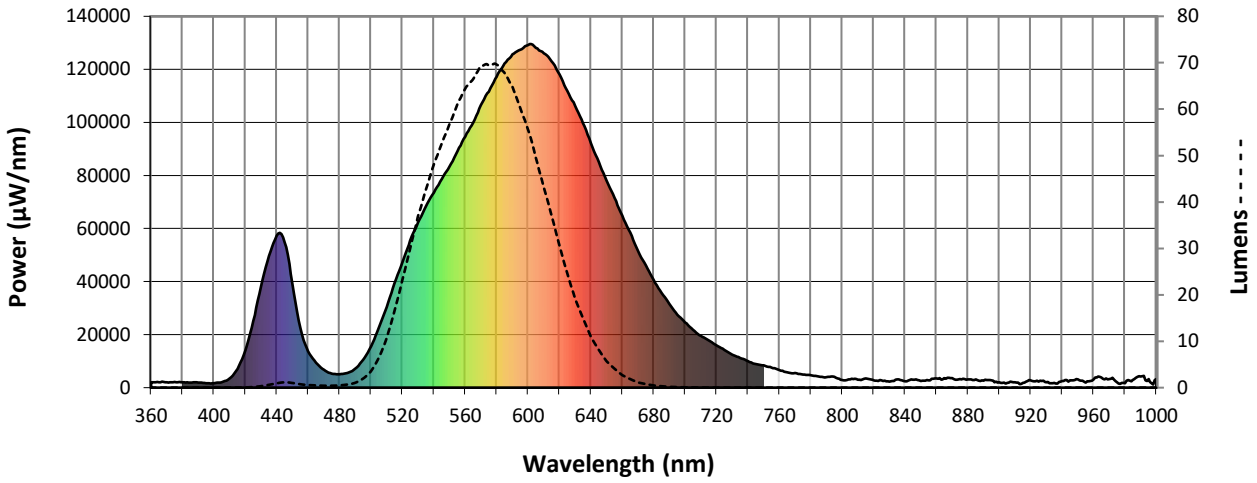
## Photopic Flux vs. Wavelength




**Photopic Lumens: 6211.7**

| λ (nm) | Power (µW/nm) | Lumens (ϕ/nm) | λ (nm) | Power (µW/nm) | Lumens (ϕ/nm) | λ (nm) | Power (µW/nm) | Lumens (ϕ/nm) | λ (nm) | Power (µW/nm) | Lumens (ϕ/nm) | λ (nm) | Power (µW/nm) | Lumens (ϕ/nm) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 360 | 2044 | 0.0 | 490 | 7179 | 1.0 | 620 | 118034 | 30.7 | 750 | 8362 | 0.0 | 880 | 3128 | 0.0 |
| 365 | 2016 | 0.0 | 495 | 10476 | 1.9 | 625 | 111884 | 24.7 | 755 | 7635 | 0.0 | 885 | 3110 | 0.0 |
| 370 | 2020 | 0.0 | 500 | 15549 | 3.4 | 630 | 106119 | 19.2 | 760 | 6582 | 0.0 | 890 | 2632 | 0.0 |
| 375 | 2137 | 0.0 | 505 | 22477 | 6.3 | 635 | 99706 | 15.0 | 765 | 5777 | 0.0 | 895 | 2709 | 0.0 |
| 380 | 2046 | 0.0 | 510 | 30417 | 10.4 | 640 | 92142 | 11.0 | 770 | 5474 | 0.0 | 900 | 2016 | 0.0 |
| 385 | 1925 | 0.0 | 515 | 39274 | 16.3 | 645 | 84987 | 8.2 | 775 | 4977 | 0.0 | 905 | 1748 | 0.0 |
| 390 | 1893 | 0.0 | 520 | 47282 | 22.9 | 650 | 78016 | 5.7 | 780 | 4723 | 0.0 | 910 | 2046 | 0.0 |
| 395 | 1695 | 0.0 | 525 | 55413 | 29.7 | 655 | 71541 | 4.1 | 785 | 4219 | 0.0 | 915 | 1844 | 0.0 |
| 400 | 1633 | 0.0 | 530 | 62377 | 36.7 | 660 | 64863 | 2.7 | 790 | 3969 | 0.0 | 920 | 2734 | 0.0 |
| 405 | 2065 | 0.0 | 535 | 68520 | 42.5 | 665 | 58485 | 1.9 | 795 | 4122 | 0.0 | 925 | 2307 | 0.0 |
| 410 | 3449 | 0.0 | 540 | 73435 | 47.8 | 670 | 51641 | 1.1 | 800 | 2864 | 0.0 | 930 | 2039 | 0.0 |
| 415 | 7117 | 0.0 | 545 | 78677 | 52.4 | 675 | 46030 | 0.8 | 805 | 3151 | 0.0 | 935 | 1784 | 0.0 |
| 420 | 13992 | 0.0 | 550 | 83331 | 56.6 | 680 | 40590 | 0.5 | 810 | 3022 | 0.0 | 940 | 2464 | 0.0 |
| 425 | 25176 | 0.1 | 555 | 89120 | 60.9 | 685 | 35691 | 0.3 | 815 | 3471 | 0.0 | 945 | 2794 | 0.0 |
| 430 | 38151 | 0.3 | 560 | 94613 | 64.3 | 690 | 31631 | 0.2 | 820 | 2749 | 0.0 | 950 | 3090 | 0.0 |
| 435 | 49673 | 0.6 | 565 | 99818 | 66.4 | 695 | 27437 | 0.1 | 825 | 2729 | 0.0 | 955 | 1866 | 0.0 |
| 440 | 57273 | 0.9 | 570 | 106526 | 69.3 | 700 | 24589 | 0.1 | 830 | 2282 | 0.0 | 960 | 3110 | 0.0 |
| 445 | 54802 | 1.1 | 575 | 111610 | 69.4 | 705 | 21832 | 0.0 | 835 | 3140 | 0.0 | 965 | 3880 | 0.0 |
| 450 | 39184 | 1.0 | 580 | 117163 | 69.6 | 710 | 19500 | 0.0 | 840 | 2365 | 0.0 | 970 | 3243 | 0.0 |
| 455 | 22506 | 0.8 | 585 | 122201 | 67.9 | 715 | 17870 | 0.0 | 845 | 3024 | 0.0 | 975 | 2014 | 0.0 |
| 460 | 13692 | 0.6 | 590 | 125662 | 65.0 | 720 | 15924 | 0.0 | 850 | 2510 | 0.0 | 980 | 1688 | 0.0 |
| 465 | 9446 | 0.5 | 595 | 127415 | 60.4 | 725 | 14268 | 0.0 | 855 | 2739 | 0.0 | 985 | 2827 | 0.0 |
| 470 | 6698 | 0.4 | 600 | 129155 | 55.7 | 730 | 12438 | 0.0 | 860 | 3515 | 0.0 | 990 | 4172 | 0.0 |
| 475 | 5328 | 0.4 | 605 | 128057 | 49.6 | 735 | 11255 | 0.0 | 865 | 3600 | 0.0 | 995 | 3177 | 0.0 |
| 480 | 5081 | 0.5 | 610 | 126031 | 43.3 | 740 | 9951 | 0.0 | 870 | 3609 | 0.0 | 1000 | 3241 | 0.0 |
| 485 | 5579 | 0.7 | 615 | 123059 | 37.1 | 745 | 8870 | 0.0 | 875 | 3208 | 0.0 | | | |

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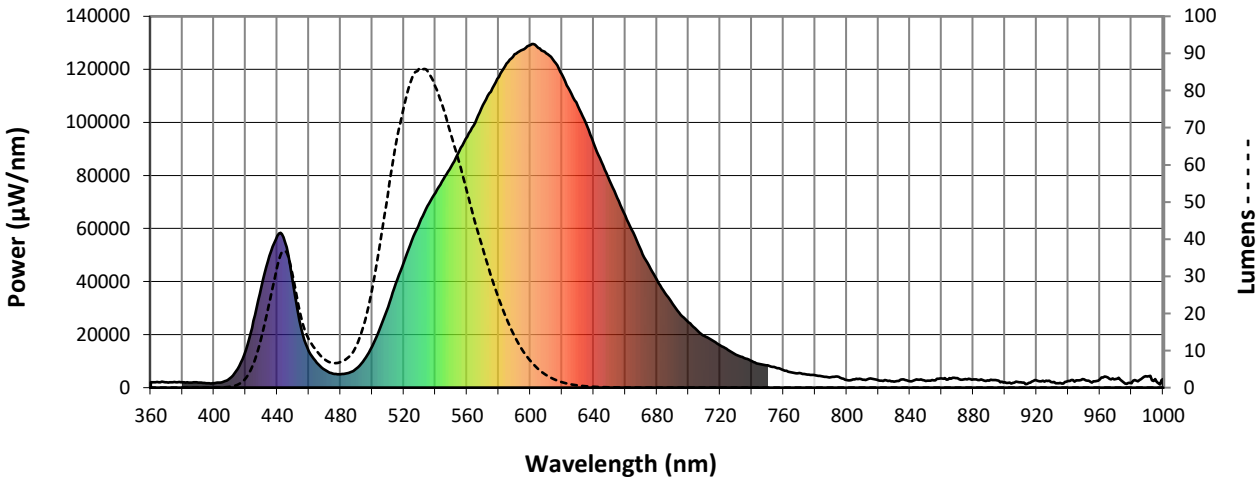
## Scotopic Flux vs. Wavelength




**Scotopic Lumens: 6474.3** **S/P: 1.04**

| λ (nm) | Power (µW/nm) | Lumens (ϕ/nm) | λ (nm) | Power (µW/nm) | Lumens (ϕ/nm) | λ (nm) | Power (µW/nm) | Lumens (ϕ/nm) | λ (nm) | Power (µW/nm) | Lumens (ϕ/nm) | λ (nm) | Power (µW/nm) | Lumens (ϕ/nm) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 360 | 2044 | 0.0 | 490 | 7179 | 6.0 | 620 | 118034 | 0.1 | 750 | 8362 | 0.0 | 880 | 3128 | 0.0 |
| 365 | 2016 | 0.0 | 495 | 10476 | 8.6 | 625 | 111884 | 0.1 | 755 | 7635 | 0.0 | 885 | 3110 | 0.0 |
| 370 | 2020 | 0.0 | 500 | 15549 | 12.5 | 630 | 106119 | 0.0 | 760 | 6582 | 0.0 | 890 | 2632 | 0.0 |
| 375 | 2137 | 0.0 | 505 | 22477 | 17.3 | 635 | 99706 | 0.0 | 765 | 5777 | 0.0 | 895 | 2709 | 0.0 |
| 380 | 2046 | 0.0 | 510 | 30417 | 21.8 | 640 | 92142 | 0.0 | 770 | 5474 | 0.0 | 900 | 2016 | 0.0 |
| 385 | 1925 | 0.0 | 515 | 39274 | 25.7 | 645 | 84987 | 0.0 | 775 | 4977 | 0.0 | 905 | 1748 | 0.0 |
| 390 | 1893 | 0.0 | 520 | 47282 | 27.5 | 650 | 78016 | 0.0 | 780 | 4723 | 0.0 | 910 | 2046 | 0.0 |
| 395 | 1695 | 0.0 | 525 | 55413 | 28.1 | 655 | 71541 | 0.0 | 785 | 4219 | 0.0 | 915 | 1844 | 0.0 |
| 400 | 1633 | 0.0 | 530 | 62377 | 27.0 | 660 | 64863 | 0.0 | 790 | 3969 | 0.0 | 920 | 2734 | 0.0 |
| 405 | 2065 | 0.0 | 535 | 68520 | 24.7 | 665 | 58485 | 0.0 | 795 | 4122 | 0.0 | 925 | 2307 | 0.0 |
| 410 | 3449 | 0.1 | 540 | 73435 | 21.5 | 670 | 51641 | 0.0 | 800 | 2864 | 0.0 | 930 | 2039 | 0.0 |
| 415 | 7117 | 0.5 | 545 | 78677 | 18.3 | 675 | 46030 | 0.0 | 805 | 3151 | 0.0 | 935 | 1784 | 0.0 |
| 420 | 13992 | 1.6 | 550 | 83331 | 15.0 | 680 | 40590 | 0.0 | 810 | 3022 | 0.0 | 940 | 2464 | 0.0 |
| 425 | 25176 | 3.9 | 555 | 89120 | 12.0 | 685 | 35691 | 0.0 | 815 | 3471 | 0.0 | 945 | 2794 | 0.0 |
| 430 | 38151 | 8.1 | 560 | 94613 | 9.3 | 690 | 31631 | 0.0 | 820 | 2749 | 0.0 | 950 | 3090 | 0.0 |
| 435 | 49673 | 13.3 | 565 | 99818 | 7.0 | 695 | 27437 | 0.0 | 825 | 2729 | 0.0 | 955 | 1866 | 0.0 |
| 440 | 57273 | 19.1 | 570 | 106526 | 5.2 | 700 | 24589 | 0.0 | 830 | 2282 | 0.0 | 960 | 3110 | 0.0 |
| 445 | 54802 | 21.6 | 575 | 111610 | 3.7 | 705 | 21832 | 0.0 | 835 | 3140 | 0.0 | 965 | 3880 | 0.0 |
| 450 | 39184 | 18.1 | 580 | 117163 | 2.6 | 710 | 19500 | 0.0 | 840 | 2365 | 0.0 | 970 | 3243 | 0.0 |
| 455 | 22506 | 11.8 | 585 | 122201 | 1.8 | 715 | 17870 | 0.0 | 845 | 3024 | 0.0 | 975 | 2014 | 0.0 |
| 460 | 13692 | 8.1 | 590 | 125662 | 1.2 | 720 | 15924 | 0.0 | 850 | 2510 | 0.0 | 980 | 1688 | 0.0 |
| 465 | 9446 | 6.2 | 595 | 127415 | 0.8 | 725 | 14268 | 0.0 | 855 | 2739 | 0.0 | 985 | 2827 | 0.0 |
| 470 | 6698 | 4.8 | 600 | 129155 | 0.5 | 730 | 12438 | 0.0 | 860 | 3515 | 0.0 | 990 | 4172 | 0.0 |
| 475 | 5328 | 4.1 | 605 | 128057 | 0.4 | 735 | 11255 | 0.0 | 865 | 3600 | 0.0 | 995 | 3177 | 0.0 |
| 480 | 5081 | 4.1 | 610 | 126031 | 0.2 | 740 | 9951 | 0.0 | 870 | 3609 | 0.0 | 1000 | 3241 | 0.0 |
| 485 | 5579 | 4.6 | 615 | 123059 | 0.1 | 745 | 8870 | 0.0 | 875 | 3208 | 0.0 | | | |

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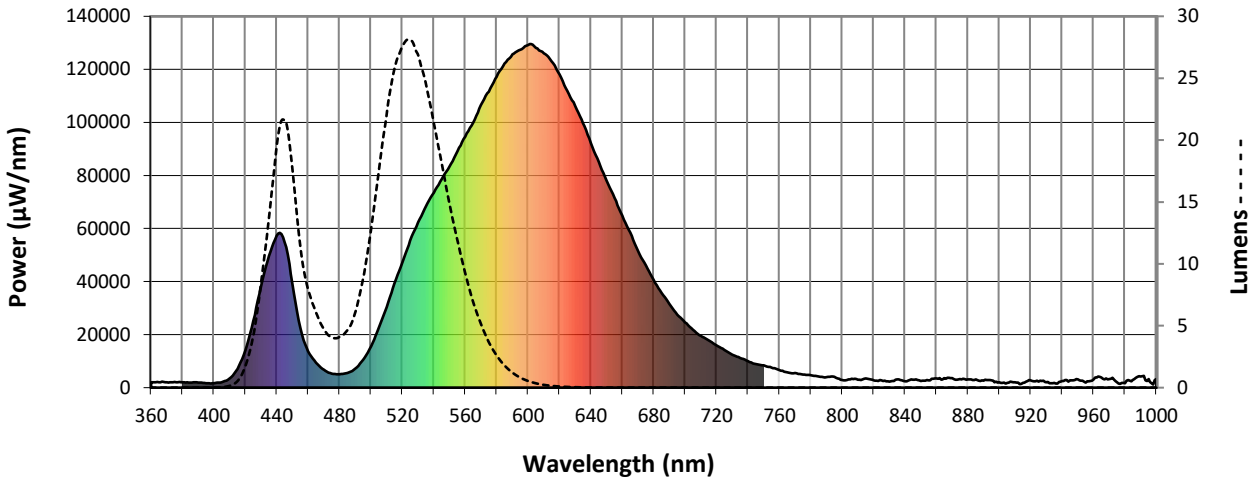
## Melanopic Flux vs. Wavelength




**Melanopic Lumens: 2145.7** **M/P: 0.35**

| λ (nm) | Power (µW/nm) | Lumens (ϕ/nm) | λ (nm) | Power (µW/nm) | Lumens (ϕ/nm) | λ (nm) | Power (µW/nm) | Lumens (ϕ/nm) | λ (nm) | Power (µW/nm) | Lumens (ϕ/nm) | λ (nm) | Power (µW/nm) | Lumens (ϕ/nm) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 360 | 2044 | 0.0 | 490 | 7179 | 11.1 | 620 | 118034 | 1.5 | 750 | 8362 | 0.0 | 880 | 3128 | 0.0 |
| 365 | 2016 | 0.0 | 495 | 10476 | 16.9 | 625 | 111884 | 0.9 | 755 | 7635 | 0.0 | 885 | 3110 | 0.0 |
| 370 | 2020 | 0.0 | 500 | 15549 | 26.0 | 630 | 106119 | 0.6 | 760 | 6582 | 0.0 | 890 | 2632 | 0.0 |
| 375 | 2137 | 0.0 | 505 | 22477 | 38.2 | 635 | 99706 | 0.4 | 765 | 5777 | 0.0 | 895 | 2709 | 0.0 |
| 380 | 2046 | 0.0 | 510 | 30417 | 51.6 | 640 | 92142 | 0.2 | 770 | 5474 | 0.0 | 900 | 2016 | 0.0 |
| 385 | 1925 | 0.0 | 515 | 39274 | 65.1 | 645 | 84987 | 0.1 | 775 | 4977 | 0.0 | 905 | 1748 | 0.0 |
| 390 | 1893 | 0.0 | 520 | 47282 | 75.2 | 650 | 78016 | 0.1 | 780 | 4723 | 0.0 | 910 | 2046 | 0.0 |
| 395 | 1695 | 0.0 | 525 | 55413 | 82.9 | 655 | 71541 | 0.1 | 785 | 4219 | 0.0 | 915 | 1844 | 0.0 |
| 400 | 1633 | 0.0 | 530 | 62377 | 86.0 | 660 | 64863 | 0.0 | 790 | 3969 | 0.0 | 920 | 2734 | 0.0 |
| 405 | 2065 | 0.1 | 535 | 68520 | 85.4 | 665 | 58485 | 0.0 | 795 | 4122 | 0.0 | 925 | 2307 | 0.0 |
| 410 | 3449 | 0.2 | 540 | 73435 | 81.1 | 670 | 51641 | 0.0 | 800 | 2864 | 0.0 | 930 | 2039 | 0.0 |
| 415 | 7117 | 0.7 | 545 | 78677 | 75.4 | 675 | 46030 | 0.0 | 805 | 3151 | 0.0 | 935 | 1784 | 0.0 |
| 420 | 13992 | 2.3 | 550 | 83331 | 68.1 | 680 | 40590 | 0.0 | 810 | 3022 | 0.0 | 940 | 2464 | 0.0 |
| 425 | 25176 | 6.2 | 555 | 89120 | 60.9 | 685 | 35691 | 0.0 | 815 | 3471 | 0.0 | 945 | 2794 | 0.0 |
| 430 | 38151 | 13.0 | 560 | 94613 | 52.9 | 690 | 31631 | 0.0 | 820 | 2749 | 0.0 | 950 | 3090 | 0.0 |
| 435 | 49673 | 22.2 | 565 | 99818 | 44.8 | 695 | 27437 | 0.0 | 825 | 2729 | 0.0 | 955 | 1866 | 0.0 |
| 440 | 57273 | 32.0 | 570 | 106526 | 37.6 | 700 | 24589 | 0.0 | 830 | 2282 | 0.0 | 960 | 3110 | 0.0 |
| 445 | 54802 | 36.7 | 575 | 111610 | 30.4 | 705 | 21832 | 0.0 | 835 | 3140 | 0.0 | 965 | 3880 | 0.0 |
| 450 | 39184 | 30.4 | 580 | 117163 | 24.1 | 710 | 19500 | 0.0 | 840 | 2365 | 0.0 | 970 | 3243 | 0.0 |
| 455 | 22506 | 19.7 | 585 | 122201 | 18.7 | 715 | 17870 | 0.0 | 845 | 3024 | 0.0 | 975 | 2014 | 0.0 |
| 460 | 13692 | 13.2 | 590 | 125662 | 14.0 | 720 | 15924 | 0.0 | 850 | 2510 | 0.0 | 980 | 1688 | 0.0 |
| 465 | 9446 | 10.0 | 595 | 127415 | 10.2 | 725 | 14268 | 0.0 | 855 | 2739 | 0.0 | 985 | 2827 | 0.0 |
| 470 | 6698 | 7.7 | 600 | 129155 | 7.3 | 730 | 12438 | 0.0 | 860 | 3515 | 0.0 | 990 | 4172 | 0.0 |
| 475 | 5328 | 6.7 | 605 | 128057 | 5.0 | 735 | 11255 | 0.0 | 865 | 3600 | 0.0 | 995 | 3177 | 0.0 |
| 480 | 5081 | 6.9 | 610 | 126031 | 3.4 | 740 | 9951 | 0.0 | 870 | 3609 | 0.0 | 1000 | 3241 | 0.0 |
| 485 | 5579 | 8.1 | 615 | 123059 | 2.3 | 745 | 8870 | 0.0 | 875 | 3208 | 0.0 | | | |

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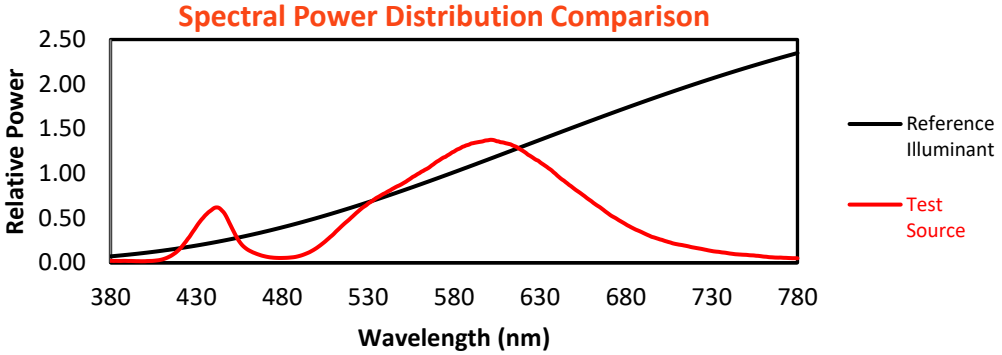
# TM-30-18

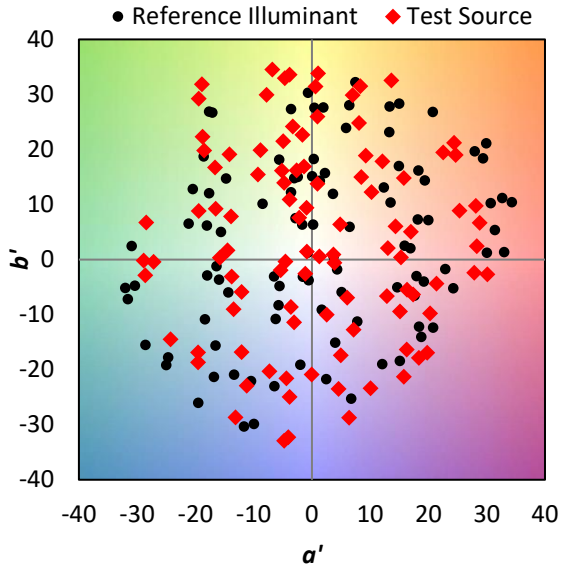
## Summary

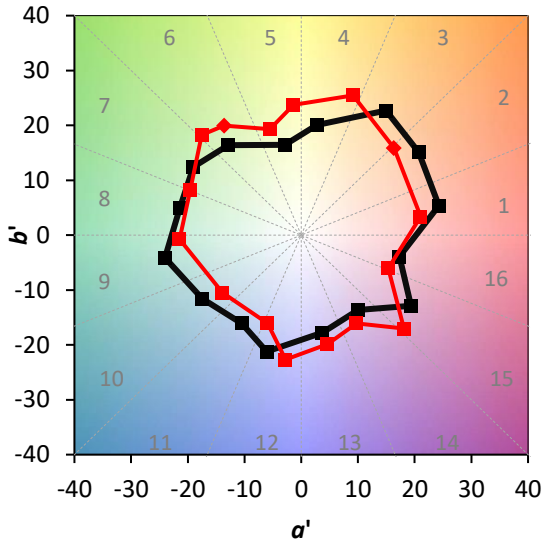
$R_f$ = 69.9
$R_g$ = 98.3
CIE $R_a$ = 71.5
$R_9$ = -16.1

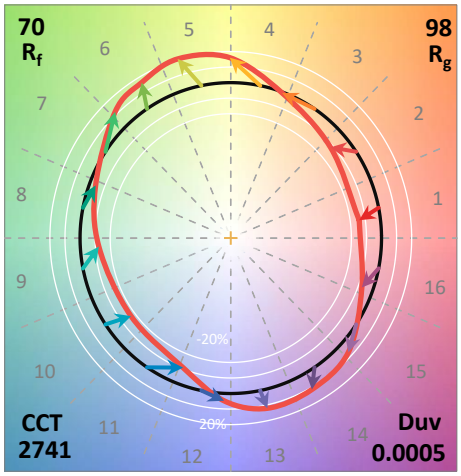
## Spectral Power Distribution Comparison

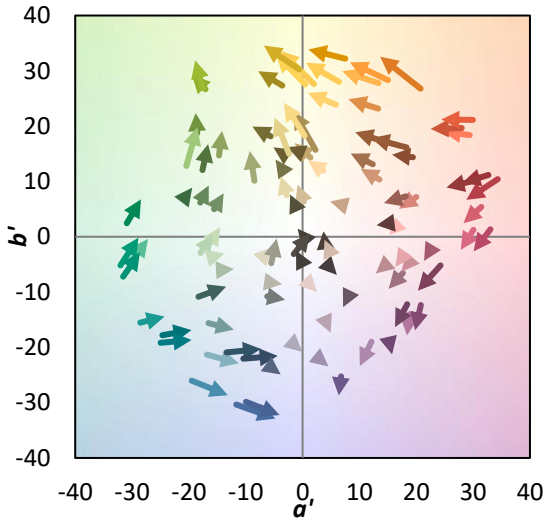



## Color Vector Graphics



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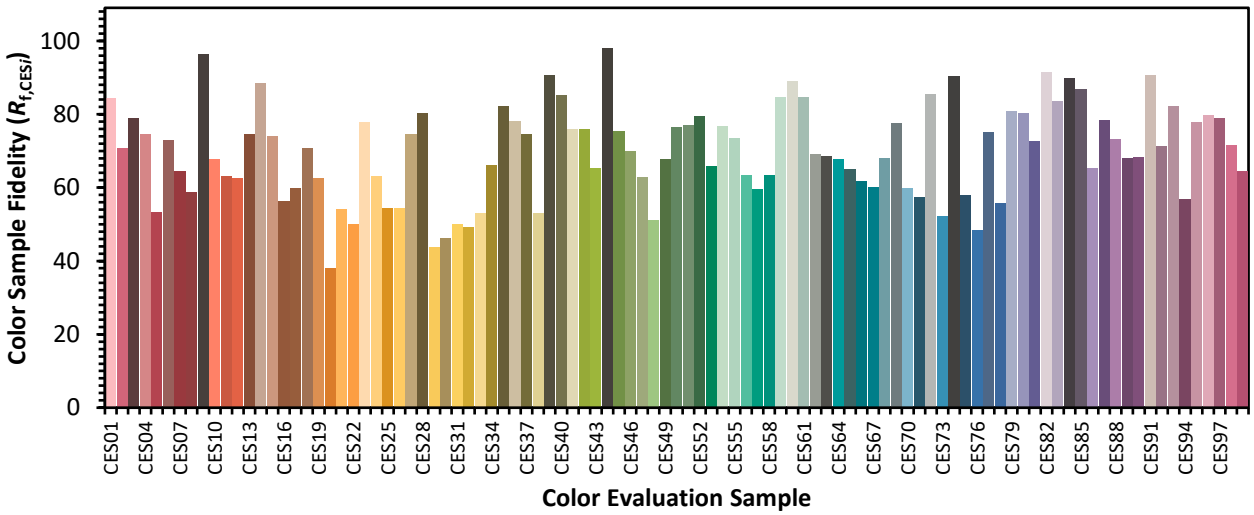
## TM-30-18

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

| | | | |
|---|---|---|---|
| CES01 = 86 | CES26 = 54 | CES51 = 77 | CES76 = 48 |
| CES02 = 63 | CES27 = 74 | CES52 = 80 | CES77 = 75 |
| CES03 = 31 | CES28 = 80 | CES53 = 66 | CES78 = 56 |
| CES04 = 71 | CES29 = 44 | CES54 = 77 | CES79 = 81 |
| CES05 = 50 | CES30 = 46 | CES55 = 74 | CES80 = 80 |
| CES06 = 52 | CES31 = 50 | CES56 = 63 | CES81 = 73 |
| CES07 = 42 | CES32 = 49 | CES57 = 60 | CES82 = 91 |
| CES08 = 41 | CES33 = 53 | CES58 = 63 | CES83 = 84 |
| CES09 = 29 | CES34 = 66 | CES59 = 85 | CES84 = 90 |
| CES10 = 77 | CES35 = 82 | CES60 = 89 | CES85 = 87 |
| CES11 = 60 | CES36 = 78 | CES61 = 85 | CES86 = 65 |
| CES12 = 66 | CES37 = 75 | CES62 = 69 | CES87 = 78 |
| CES13 = 43 | CES38 = 53 | CES63 = 68 | CES88 = 73 |
| CES14 = 74 | CES39 = 91 | CES64 = 68 | CES89 = 68 |
| CES15 = 71 | CES40 = 85 | CES65 = 65 | CES90 = 68 |
| CES16 = 48 | CES41 = 76 | CES66 = 62 | CES91 = 91 |
| CES17 = 50 | CES42 = 76 | CES67 = 60 | CES92 = 71 |
| CES18 = 57 | CES43 = 65 | CES68 = 68 | CES93 = 82 |
| CES19 = 73 | CES44 = 98 | CES69 = 77 | CES94 = 57 |
| CES20 = 67 | CES45 = 75 | CES70 = 60 | CES95 = 78 |
| CES21 = 88 | CES46 = 70 | CES71 = 57 | CES96 = 80 |
| CES22 = 80 | CES47 = 63 | CES72 = 86 | CES97 = 79 |
| CES23 = 92 | CES48 = 51 | CES73 = 52 | CES98 = 71 |
| CES24 = 91 | CES49 = 68 | CES74 = 90 | CES99 = 64 |
| CES25 = 73 | CES50 = 77 | CES75 = 58 | |



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Peachtree City, GA 30269

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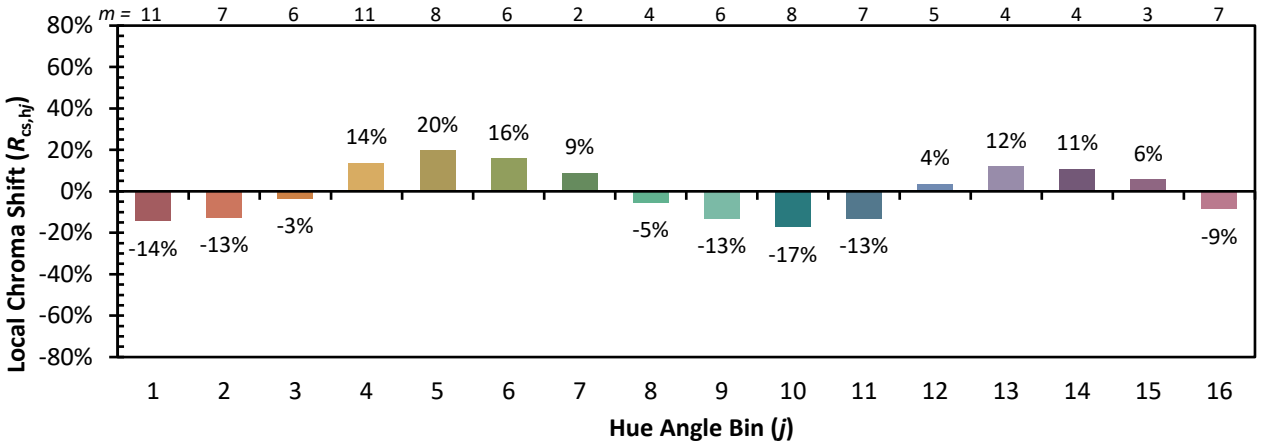
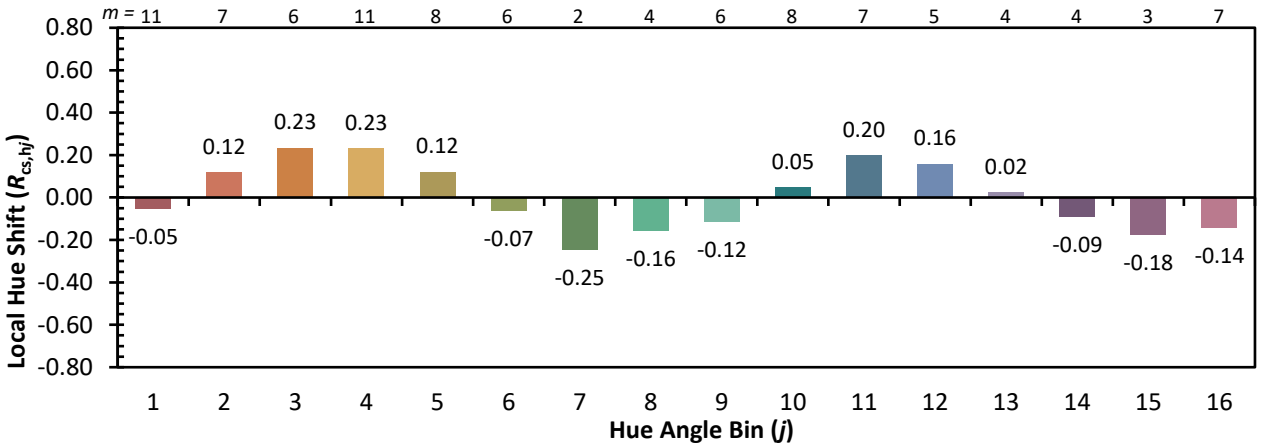
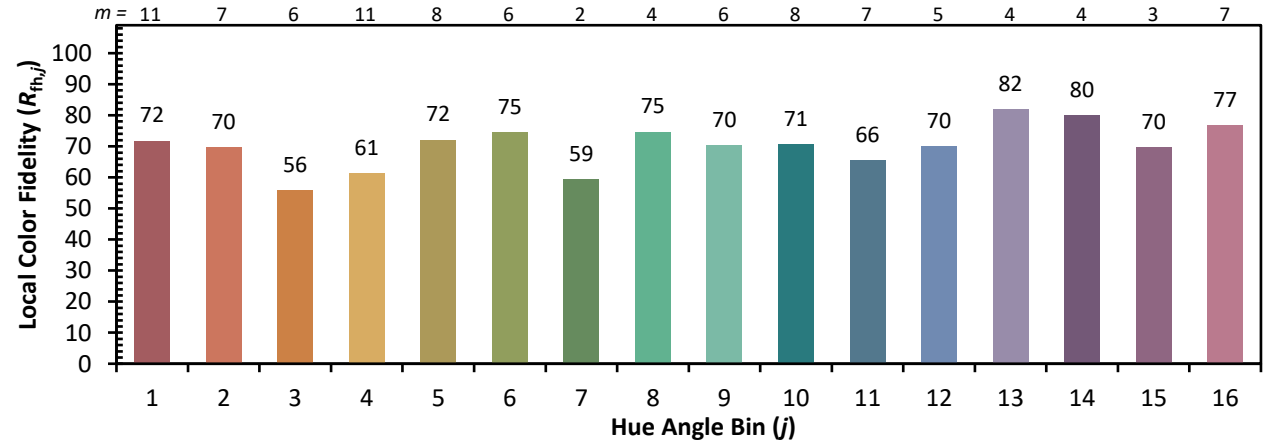
## TM-30-18

### Color Rendition by Hue-Angle Bin



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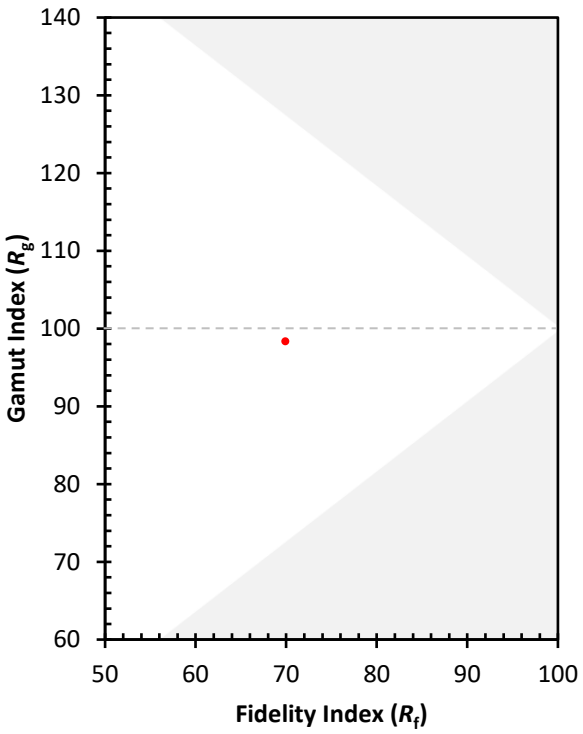
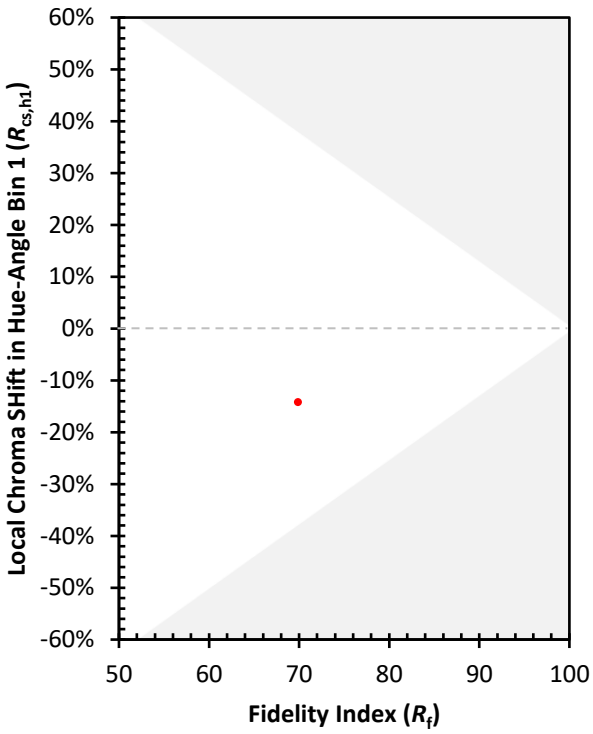
**TM-30-18**

## Measure Comparisons




(END OF REPORT)