

Signify Classified - Internal  
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: P543169

Luminaire Tested: **TT-D8-740-U-T4-PM**

Issue Date: 6/22/2021

#### Test Information

Test Method: LM-79-08  
Report Number: P543169  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-2106-277-4)  
Test Lab: INNOVATION CENTER  
Issue Date: 6/22/2021  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: MCGRAW-EDISON  
Catalog Number: TT-D8-740-U-T4-PM  
Description: TOPTIER LED SITE LUMINAIRE  
4000K, 70 CRI LEDS AND DRIVE LANE DISTRIBUTION  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

#### Summary

Lumens per Lamp: N/A  
Luminaire Lumens: 16195 lumens  
Efficiency: N/A  
Efficacy: 106.1 lumens/watt  
Luminous Opening: Circular (Dia: 1.12' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B3 - U0 - G4

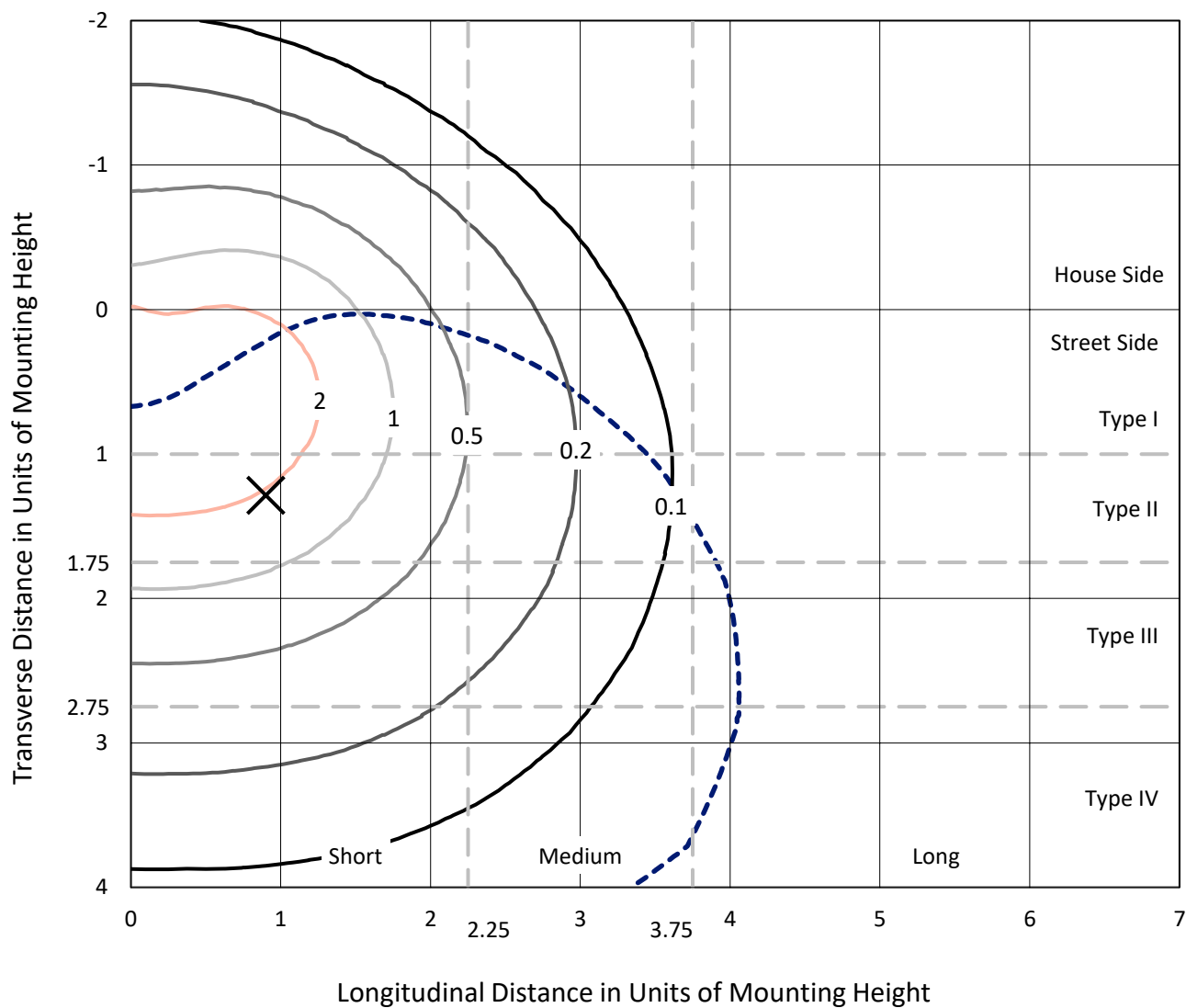
Input Watts (W): 152.6  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT



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## Iso-Footcandle Lines of Horizontal Illumination

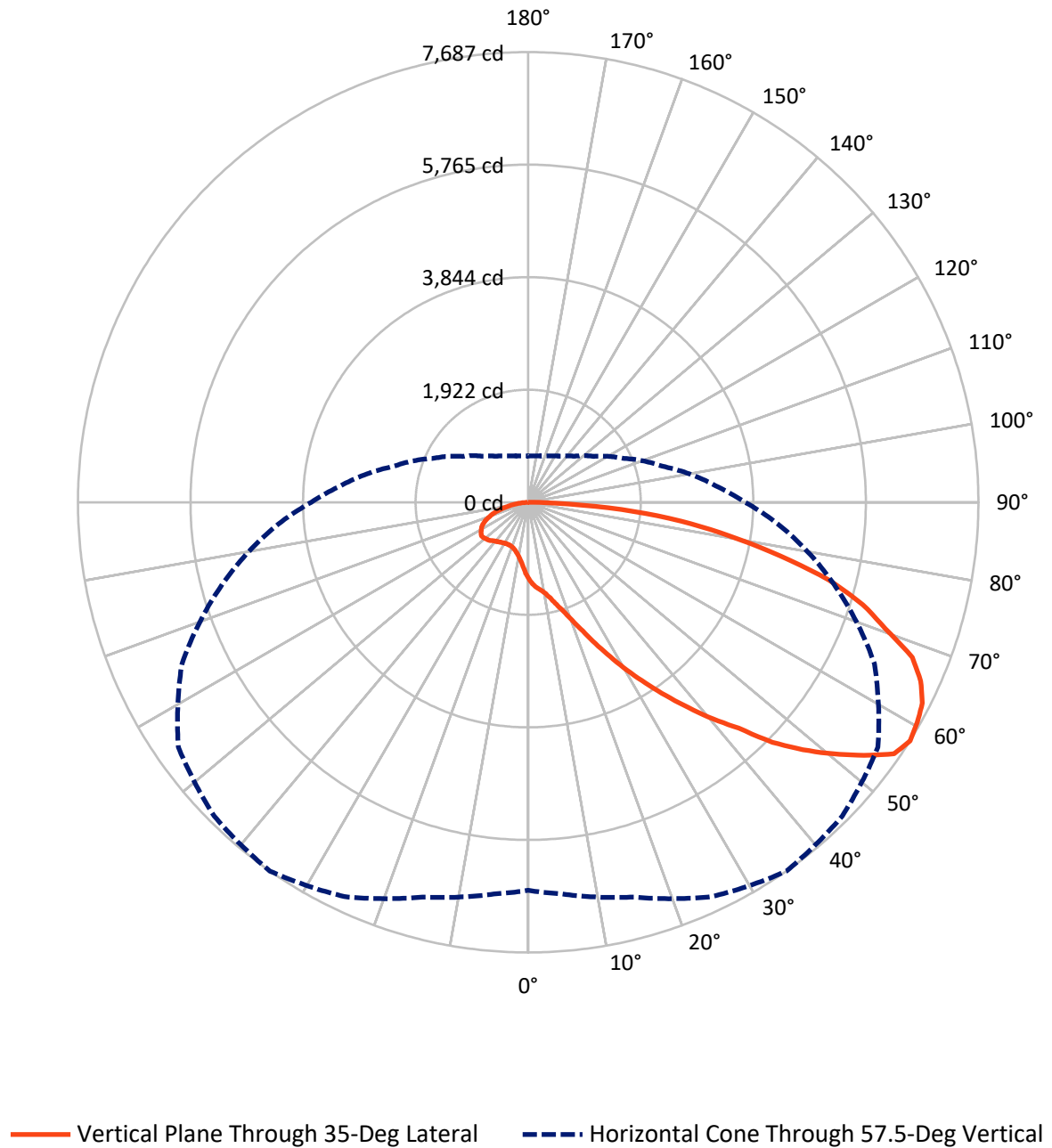
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 3.6 fc  
 Type IV - Short - N/A

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## Luminous Intensity Polar Plot



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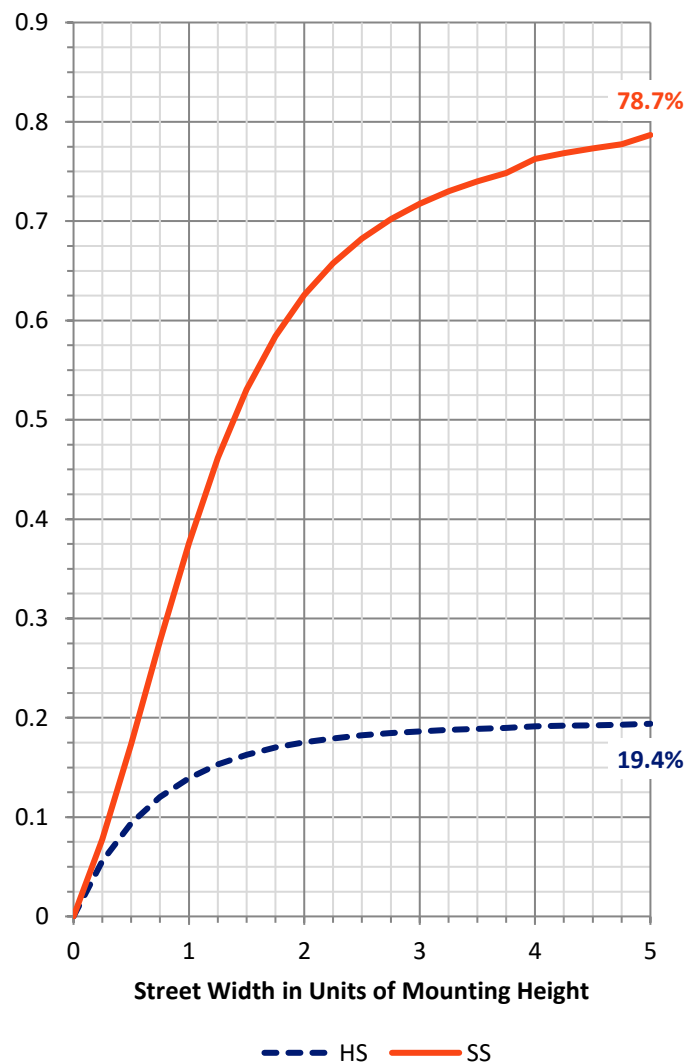
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 3171.3   | 0.0    | 3171.3  |
|                    | % Fixture | 19.6     | 0.0    | 19.6    |
| <b>Street Side</b> | Lumens    | 13023.6  | 0.0    | 13023.6 |
|                    | % Fixture | 80.4     | 0.0    | 80.4    |
| <b>Total</b>       | Lumens    | 16195.0  | 0.0    | 16195.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 121.2   | 0.7       |
| 10°-20°   | 382.1   | 2.4       |
| 20°-30°   | 807.9   | 5.0       |
| 30°-40°   | 1513.8  | 9.3       |
| 40°-50°   | 2519.6  | 15.6      |
| 50°-60°   | 3556.1  | 22.0      |
| 60°-70°   | 3741.3  | 23.1      |
| 70°-80°   | 2740.8  | 16.9      |
| 80°-90°   | 812.1   | 5.0       |
| 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°    | 16195.0 | 100.0     |
| 0°-180°   | 16195.0 | 100.0     |

**Coefficient of Utilization**



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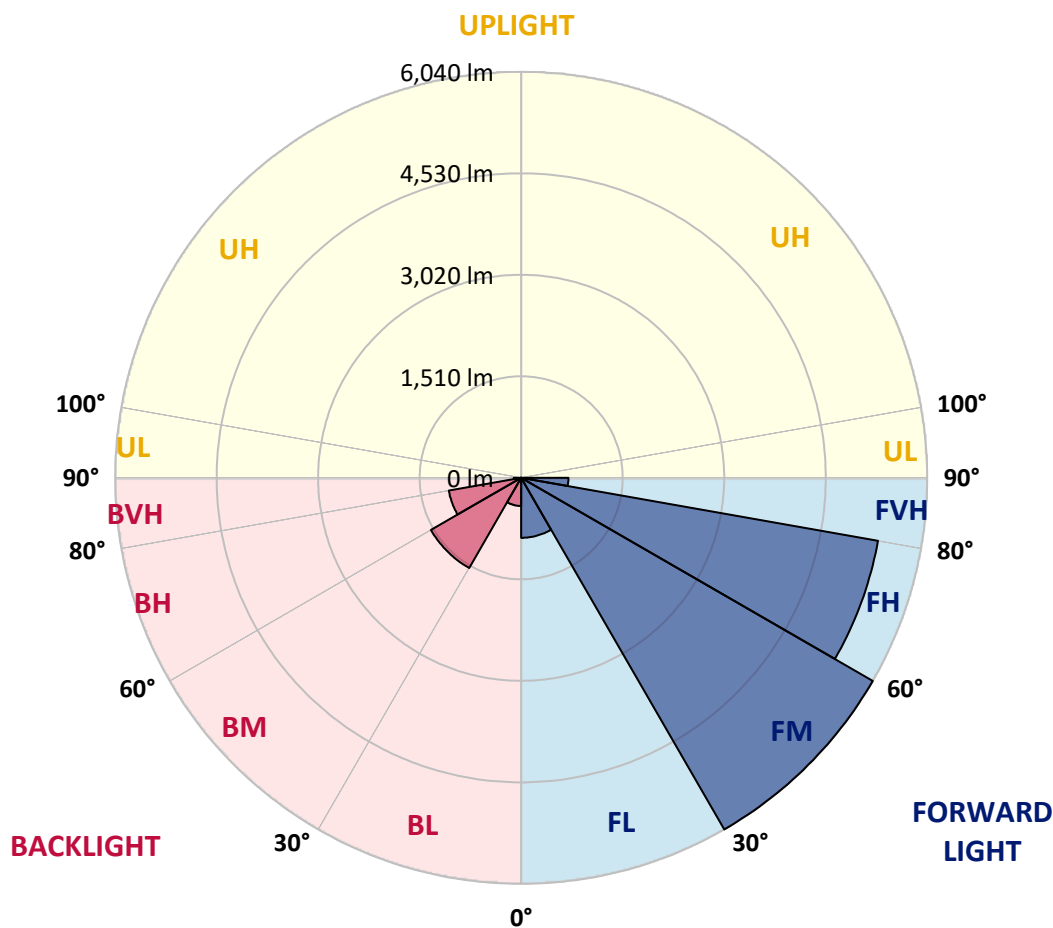
CATALOG NUMBER: TT-D8-740-U-T4-PM

**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 892.2  | 5.5       |                         |      |         |
| FM   | (30°-60°)   | 6039.8 | 37.3      |                         |      |         |
| FH   | (60°-80°)   | 5389.0 | 33.3      |                         |      | G3/7500 |
| FVH  | (80°-90°)   | 702.6  | 4.3       |                         |      | G4/750  |
| BL   | (0°-30°)    | 419.0  | 2.6       | B1/500                  |      |         |
| BM   | (30°-60°)   | 1549.7 | 9.6       | B2/2500                 |      |         |
| BH   | (60°-80°)   | 1093.1 | 6.7       | B3/2500                 |      | G3/2500 |
| BVH  | (80°-90°)   | 109.5  | 0.7       |                         |      | G2/225  |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B3-U0-G4**

Type IV Short



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 75°    | 85°    | 90°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1307.0 | 1307.0 | 1307.0 | 1307.0 | 1307.0 | 1307.0 | 1307.0 | 1307.0 | 1307.0 | 1307.0 | 1307.0 |
| 2.5°  | 1423.0 | 1416.0 | 1410.0 | 1400.0 | 1393.0 | 1391.0 | 1378.0 | 1362.0 | 1340.0 | 1321.0 | 1311.0 |
| 5°    | 1498.0 | 1497.0 | 1494.0 | 1482.0 | 1460.0 | 1429.0 | 1400.0 | 1367.0 | 1331.0 | 1295.0 | 1278.0 |
| 7.5°  | 1569.0 | 1562.0 | 1558.0 | 1541.0 | 1509.0 | 1475.0 | 1431.0 | 1382.0 | 1330.0 | 1279.0 | 1253.0 |
| 10°   | 1658.0 | 1648.0 | 1641.0 | 1608.0 | 1575.0 | 1527.0 | 1469.0 | 1406.0 | 1344.0 | 1280.0 | 1249.0 |
| 12.5° | 1772.0 | 1764.0 | 1735.0 | 1719.0 | 1677.0 | 1622.0 | 1549.0 | 1473.0 | 1393.0 | 1311.0 | 1271.0 |
| 15°   | 1894.0 | 1896.0 | 1885.0 | 1844.0 | 1810.0 | 1744.0 | 1666.0 | 1571.0 | 1463.0 | 1364.0 | 1314.0 |
| 17.5° | 2057.0 | 2054.0 | 2033.0 | 2006.0 | 1954.0 | 1887.0 | 1791.0 | 1690.0 | 1564.0 | 1434.0 | 1377.0 |
| 20°   | 2249.0 | 2239.0 | 2220.0 | 2183.0 | 2152.0 | 2073.0 | 1964.0 | 1838.0 | 1688.0 | 1534.0 | 1457.0 |
| 22.5° | 2493.0 | 2471.0 | 2459.0 | 2426.0 | 2388.0 | 2314.0 | 2198.0 | 2031.0 | 1855.0 | 1664.0 | 1565.0 |
| 25°   | 2732.0 | 2744.0 | 2738.0 | 2719.0 | 2671.0 | 2580.0 | 2457.0 | 2273.0 | 2032.0 | 1809.0 | 1697.0 |
| 27.5° | 3032.0 | 3037.0 | 3039.0 | 3031.0 | 2984.0 | 2901.0 | 2776.0 | 2533.0 | 2264.0 | 1987.0 | 1839.0 |
| 30°   | 3344.1 | 3333.1 | 3347.1 | 3351.1 | 3328.1 | 3232.1 | 3079.0 | 2813.0 | 2491.0 | 2160.0 | 1994.0 |
| 32.5° | 3654.1 | 3666.1 | 3695.1 | 3677.1 | 3681.1 | 3572.1 | 3405.1 | 3092.0 | 2733.0 | 2343.0 | 2168.0 |
| 35°   | 3988.1 | 4004.1 | 4024.1 | 4058.1 | 4056.1 | 3969.1 | 3728.1 | 3414.1 | 2995.0 | 2554.0 | 2327.0 |
| 37.5° | 4330.1 | 4326.1 | 4356.1 | 4434.1 | 4449.1 | 4366.1 | 4114.1 | 3752.1 | 3270.1 | 2767.0 | 2514.0 |
| 40°   | 4654.1 | 4691.1 | 4749.1 | 4802.1 | 4866.1 | 4748.1 | 4503.1 | 4093.1 | 3569.1 | 2988.0 | 2690.0 |
| 42.5° | 5032.1 | 5047.1 | 5133.1 | 5252.1 | 5269.1 | 5178.1 | 4911.1 | 4486.1 | 3866.1 | 3198.1 | 2882.0 |
| 45°   | 5433.1 | 5453.1 | 5534.1 | 5706.1 | 5845.1 | 5786.1 | 5424.1 | 4919.1 | 4234.1 | 3484.1 | 3094.0 |
| 47.5° | 5779.1 | 5838.1 | 5968.1 | 6167.1 | 6315.1 | 6284.1 | 5937.1 | 5344.1 | 4586.1 | 3724.1 | 3299.1 |
| 50°   | 6087.1 | 6158.1 | 6335.1 | 6622.1 | 6754.1 | 6713.1 | 6375.1 | 5764.1 | 4843.1 | 3932.1 | 3448.1 |
| 52.5° | 6399.1 | 6498.1 | 6660.1 | 6974.1 | 7180.1 | 7196.1 | 6819.1 | 6085.1 | 5141.1 | 4150.1 | 3611.1 |
| 55°   | 6568.1 | 6640.1 | 6911.1 | 7292.1 | 7583.1 | 7591.1 | 7165.1 | 6386.1 | 5347.1 | 4246.1 | 3688.1 |
| 57.5° | 6627.1 | 6714.1 | 6978.1 | 7429.1 | 7687.1 | 7580.1 | 7290.1 | 6522.1 | 5405.1 | 4281.1 | 3704.1 |
| 60°   | 6545.1 | 6632.1 | 6933.1 | 7414.1 | 7632.1 | 7684.1 | 7235.1 | 6521.1 | 5376.1 | 4236.1 | 3655.1 |
| 62.5° | 6428.1 | 6539.1 | 6831.1 | 7300.1 | 7552.1 | 7581.1 | 7164.1 | 6447.1 | 5333.1 | 4159.1 | 3583.1 |
| 65°   | 6131.1 | 6198.1 | 6625.1 | 6975.1 | 7364.1 | 7329.1 | 7001.1 | 6189.1 | 5181.1 | 3960.1 | 3407.1 |
| 67.5° | 5835.1 | 5905.1 | 6219.1 | 6699.1 | 7076.1 | 7038.1 | 6715.1 | 5939.1 | 4889.1 | 3775.1 | 3223.1 |
| 70°   | 5336.1 | 5381.1 | 5814.1 | 6187.1 | 6469.1 | 6609.1 | 6192.1 | 5522.1 | 4583.1 | 3465.1 | 2943.0 |
| 72.5° | 4808.1 | 4879.1 | 5189.1 | 5657.1 | 5976.1 | 5931.1 | 5722.1 | 5009.1 | 4084.1 | 3105.0 | 2653.0 |
| 75°   | 4133.1 | 4201.1 | 4544.1 | 4996.1 | 5306.1 | 5270.1 | 5032.1 | 4399.1 | 3630.1 | 2687.0 | 2297.0 |
| 77.5° | 3495.1 | 3474.1 | 3777.1 | 4120.1 | 4402.1 | 4485.1 | 4217.1 | 3720.1 | 2994.0 | 2208.0 | 1870.0 |
| 80°   | 2685.0 | 2765.0 | 2955.0 | 3274.1 | 3487.1 | 3534.1 | 3327.1 | 2944.0 | 2392.0 | 1728.0 | 1434.0 |
| 82.5° | 1891.0 | 1933.0 | 2165.0 | 2366.0 | 2633.0 | 2616.0 | 2473.0 | 2138.0 | 1737.0 | 1213.0 | 988.0  |
| 85°   | 1032.0 | 1041.0 | 1251.0 | 1392.0 | 1598.0 | 1623.0 | 1522.0 | 1293.0 | 994.0  | 690.0  | 509.0  |
| 87.5° | 181.0  | 178.0  | 258.0  | 378.0  | 480.0  | 516.0  | 429.0  | 336.0  | 136.0  | 81.0   | 42.0   |
| 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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CATALOG NUMBER: TT-D8-740-U-T4-PM

**CANDELA DISTRIBUTION (continued):**

|       | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1307.0 | 1307.0 | 1307.0 | 1307.0 | 1307.0 | 1307.0 | 1307.0 | 1307.0 | 1307.0 | 1307.0 |
| 2.5°  | 1300.0 | 1280.0 | 1261.0 | 1243.0 | 1226.0 | 1212.0 | 1206.0 | 1201.0 | 1200.0 | 1191.0 |
| 5°    | 1257.0 | 1225.0 | 1190.0 | 1158.0 | 1129.0 | 1098.0 | 1073.0 | 1065.0 | 1064.0 | 1069.0 |
| 7.5°  | 1229.0 | 1180.0 | 1132.0 | 1094.0 | 1051.0 | 1010.0 | 973.0  | 950.0  | 944.0  | 942.0  |
| 10°   | 1219.0 | 1159.0 | 1101.0 | 1043.0 | 995.0  | 945.0  | 900.0  | 872.0  | 856.0  | 852.0  |
| 12.5° | 1232.0 | 1156.0 | 1084.0 | 1016.0 | 951.0  | 896.0  | 845.0  | 810.0  | 792.0  | 786.0  |
| 15°   | 1267.0 | 1169.0 | 1078.0 | 996.0  | 925.0  | 856.0  | 806.0  | 761.0  | 740.0  | 737.0  |
| 17.5° | 1313.0 | 1198.0 | 1082.0 | 986.0  | 902.0  | 829.0  | 771.0  | 724.0  | 698.0  | 694.0  |
| 20°   | 1379.0 | 1235.0 | 1101.0 | 987.0  | 892.0  | 810.0  | 745.0  | 695.0  | 667.0  | 664.0  |
| 22.5° | 1472.0 | 1294.0 | 1132.0 | 1000.0 | 892.0  | 799.0  | 729.0  | 677.0  | 648.0  | 645.0  |
| 25°   | 1578.0 | 1362.0 | 1174.0 | 1018.0 | 895.0  | 797.0  | 720.0  | 665.0  | 636.0  | 633.0  |
| 27.5° | 1700.0 | 1445.0 | 1219.0 | 1041.0 | 906.0  | 799.0  | 717.0  | 662.0  | 634.0  | 630.0  |
| 30°   | 1837.0 | 1527.0 | 1268.0 | 1066.0 | 920.0  | 803.0  | 718.0  | 661.0  | 634.0  | 630.0  |
| 32.5° | 1974.0 | 1617.0 | 1323.0 | 1099.0 | 936.0  | 814.0  | 724.0  | 668.0  | 640.0  | 637.0  |
| 35°   | 2118.0 | 1716.0 | 1384.0 | 1133.0 | 959.0  | 829.0  | 734.0  | 676.0  | 648.0  | 645.0  |
| 37.5° | 2267.0 | 1816.0 | 1447.0 | 1175.0 | 983.0  | 844.0  | 748.0  | 690.0  | 663.0  | 660.0  |
| 40°   | 2422.0 | 1919.0 | 1514.0 | 1218.0 | 1006.0 | 864.0  | 765.0  | 708.0  | 680.0  | 677.0  |
| 42.5° | 2556.0 | 2012.0 | 1576.0 | 1255.0 | 1036.0 | 883.0  | 787.0  | 727.0  | 701.0  | 698.0  |
| 45°   | 2745.0 | 2118.0 | 1640.0 | 1301.0 | 1072.0 | 917.0  | 813.0  | 757.0  | 733.0  | 727.0  |
| 47.5° | 2903.0 | 2226.0 | 1705.0 | 1345.0 | 1102.0 | 940.0  | 838.0  | 781.0  | 756.0  | 752.0  |
| 50°   | 3032.0 | 2294.0 | 1756.0 | 1368.0 | 1118.0 | 955.0  | 858.0  | 800.0  | 778.0  | 771.0  |
| 52.5° | 3168.1 | 2371.0 | 1783.0 | 1395.0 | 1144.0 | 976.0  | 872.0  | 822.0  | 798.0  | 791.0  |
| 55°   | 3212.1 | 2375.0 | 1803.0 | 1400.0 | 1140.0 | 981.0  | 881.0  | 823.0  | 804.0  | 797.0  |
| 57.5° | 3215.1 | 2374.0 | 1776.0 | 1366.0 | 1112.0 | 959.0  | 872.0  | 817.0  | 795.0  | 789.0  |
| 60°   | 3159.0 | 2315.0 | 1722.0 | 1325.0 | 1082.0 | 928.0  | 847.0  | 794.0  | 777.0  | 771.0  |
| 62.5° | 3089.0 | 2261.0 | 1655.0 | 1269.0 | 1039.0 | 897.0  | 818.0  | 777.0  | 754.0  | 747.0  |
| 65°   | 2912.0 | 2119.0 | 1553.0 | 1193.0 | 977.0  | 850.0  | 772.0  | 732.0  | 714.0  | 709.0  |
| 67.5° | 2755.0 | 1967.0 | 1451.0 | 1114.0 | 907.0  | 792.0  | 721.0  | 686.0  | 672.0  | 669.0  |
| 70°   | 2500.0 | 1802.0 | 1293.0 | 991.0  | 817.0  | 706.0  | 653.0  | 627.0  | 610.0  | 604.0  |
| 72.5° | 2241.0 | 1582.0 | 1140.0 | 873.0  | 708.0  | 635.0  | 582.0  | 554.0  | 545.0  | 540.0  |
| 75°   | 1903.0 | 1330.0 | 961.0  | 740.0  | 608.0  | 531.0  | 494.0  | 473.0  | 462.0  | 461.0  |
| 77.5° | 1557.0 | 1065.0 | 774.0  | 586.0  | 481.0  | 428.0  | 402.0  | 382.0  | 380.0  | 384.0  |
| 80°   | 1193.0 | 804.0  | 575.0  | 439.0  | 356.0  | 323.0  | 309.0  | 296.0  | 294.0  | 291.0  |
| 82.5° | 793.0  | 533.0  | 364.0  | 278.0  | 239.0  | 220.0  | 216.0  | 207.0  | 205.0  | 203.0  |
| 85°   | 387.0  | 256.0  | 176.0  | 138.0  | 127.0  | 118.0  | 117.0  | 121.0  | 120.0  | 117.0  |
| 87.5° | 40.0   | 33.0   | 32.0   | 25.0   | 23.0   | 21.0   | 21.0   | 19.0   | 23.0   | 17.0   |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |



LM-79-08: Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

McGRAW-EDISON

Report Number: SP1-2006-844-6

Luminaire Tested: TT-D2-740-U-RW

Test Date: 06/30/2020

Data applicable to product families TT-x-740 and TTN-x-740

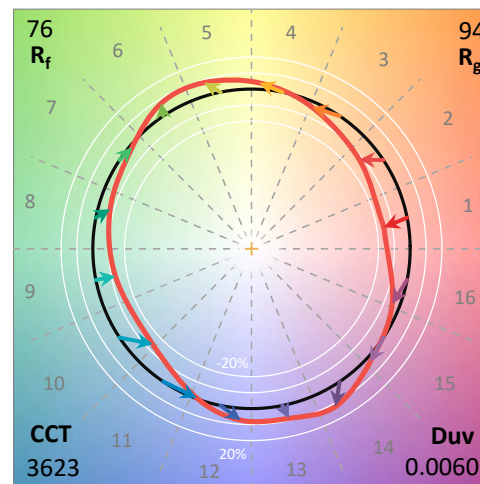
### Test Information

Test Method: LM-79-08  
 Report Number: SP1-2006-844-6  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1  
 Measurement Geometry:  $4\pi$   
 Issue Date: 06/30/2020  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: MCGRAW-EDISON  
 Catalog Number: **TT-D2-740-U-RW**  
 Description: MCGRAW EDISON

### RECTANGULAR DISTRIBUTION

### Spectral Parameters

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 3623   | CRI (Ra): | 72.6 |      |       |
| CIE u':                   | 0.2297 | R1:       | 69.4 | R9:  | -22.4 |
| CIE v':                   | 0.5166 | R2:       | 78.4 | R10: | 49.0  |
| Duv:                      | 0.0060 | R3:       | 86.1 | R11: | 67.4  |
| CIE x:                    | 0.4044 | R4:       | 72.3 | R12: | 39.3  |
| CIE y:                    | 0.4042 | R5:       | 68.2 | R13: | 70.5  |
| CIE z:                    | 0.1914 | R6:       | 69.2 | R14: | 91.9  |
| Peak Wavelength (nm):     | 588    | R7:       | 83.0 |      |       |
| Dominant Wavelength (nm): | 578    | R8:       | 54.2 |      |       |
| Purity:                   | 42.8   |           |      |      |       |
| Rf:                       | 76.2   |           |      |      |       |
| Rg:                       | 94.3   |           |      |      |       |



### Test Conditions

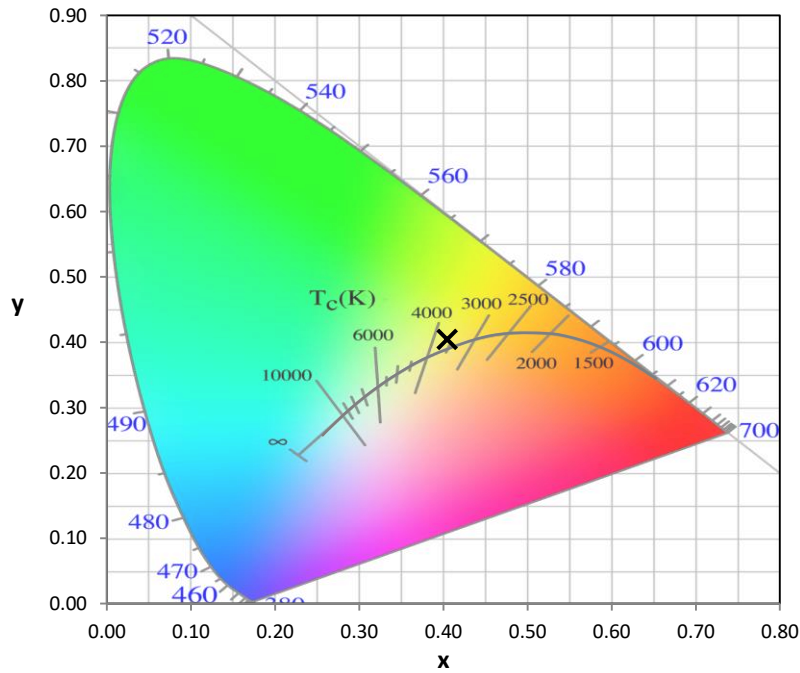
Stabilization Time: 207M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.9/42%  
 Sphere Temperature (°C): 25.8

REPORT NUMBER: SP1-2006-844-6

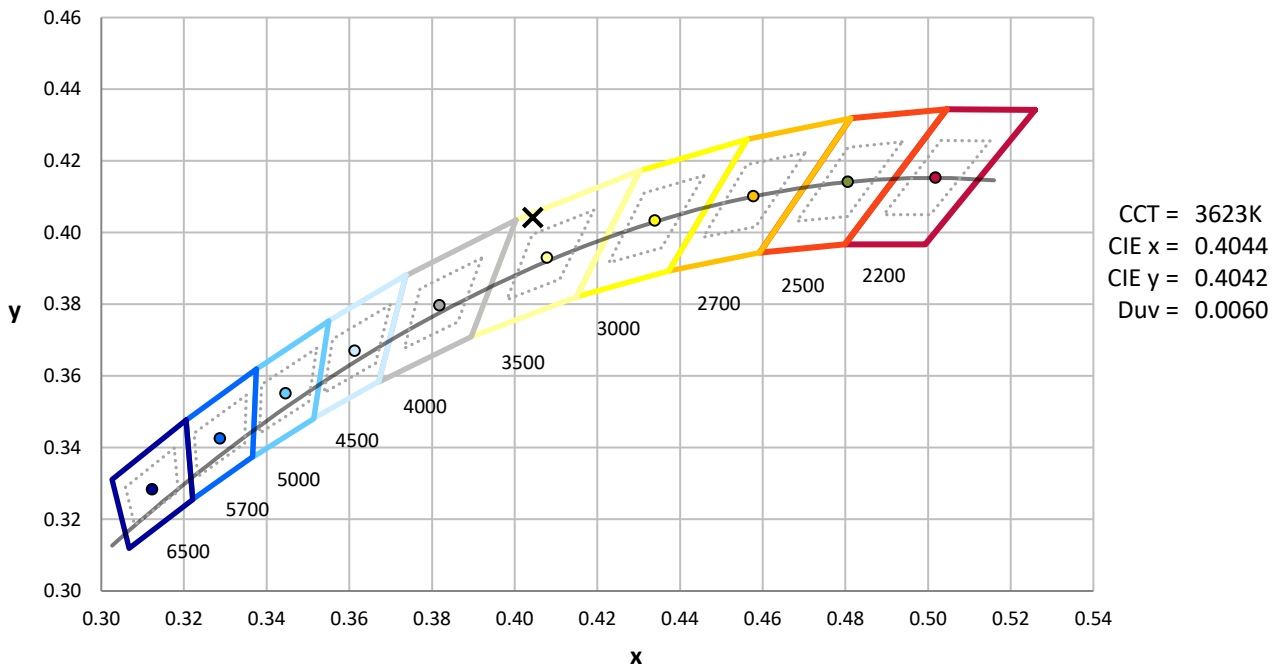
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 7/29/2020        | 1/29/2021            |
| Power Meter                    | IN0071                | 12/3/2019        | 12/3/2020            |
| AC Power Source                | IN0063                | 12/3/2019        | 12/3/2020            |
| DC Power Source                | IN0208                | 12/3/2019        | 12/3/2020            |
| Sphere Thermometer             | IN0085                | 12/3/2019        | 12/3/2020            |
| Room Thermometer               | IN0046                | 12/3/2019        | 12/3/2020            |

REPORT NUMBER: SP1-2006-844-6

**CIE 1931 Chromaticity Diagram**



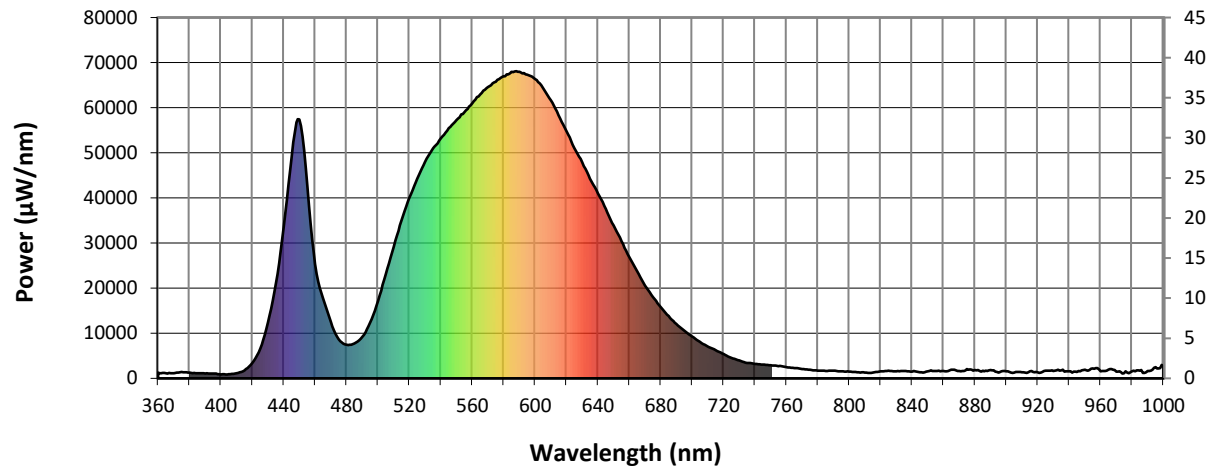
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 3500K 7-step quadrangle

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### Photopic Flux vs. Wavelength

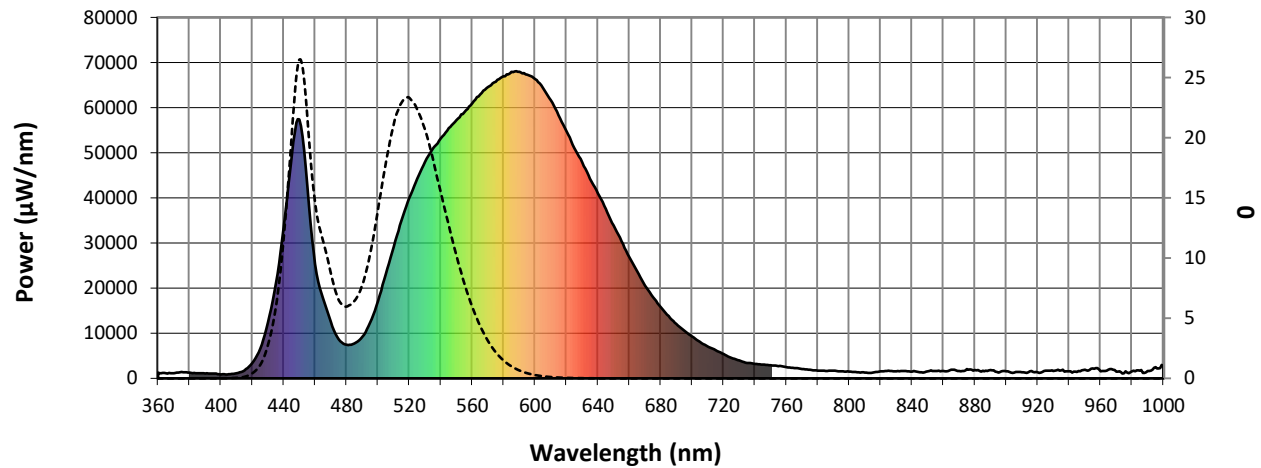


#####

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 1254             | 0.0              | 490       | 9219             | 1.3              | 620       | 54761            | 14.3             | 750       | 2901             | 0.0              | 880       | 1835             | 0.0              |
| 365       | 1158             | 0.0              | 495       | 12322            | 2.2              | 625       | 51064            | 11.3             | 755       | 2733             | 0.0              | 885       | 1690             | 0.0              |
| 370       | 1131             | 0.0              | 500       | 17160            | 3.8              | 630       | 47879            | 8.7              | 760       | 2503             | 0.0              | 890       | 1819             | 0.0              |
| 375       | 1414             | 0.0              | 505       | 23071            | 6.5              | 635       | 44248            | 6.6              | 765       | 2289             | 0.0              | 895       | 1314             | 0.0              |
| 380       | 1275             | 0.0              | 510       | 29162            | 10.0             | 640       | 41034            | 4.9              | 770       | 2078             | 0.0              | 900       | 1547             | 0.0              |
| 385       | 1122             | 0.0              | 515       | 34992            | 14.5             | 645       | 37515            | 3.6              | 775       | 1927             | 0.0              | 905       | 1281             | 0.0              |
| 390       | 1074             | 0.0              | 520       | 40102            | 19.4             | 650       | 33900            | 2.5              | 780       | 1724             | 0.0              | 910       | 1345             | 0.0              |
| 395       | 1058             | 0.0              | 525       | 44194            | 23.7             | 655       | 30384            | 1.7              | 785       | 1617             | 0.0              | 915       | 1561             | 0.0              |
| 400       | 885              | 0.0              | 530       | 48014            | 28.3             | 660       | 26883            | 1.1              | 790       | 1709             | 0.0              | 920       | 1368             | 0.0              |
| 405       | 912              | 0.0              | 535       | 51019            | 31.6             | 665       | 23703            | 0.8              | 795       | 1561             | 0.0              | 925       | 1730             | 0.0              |
| 410       | 1108             | 0.0              | 540       | 53190            | 34.7             | 670       | 20603            | 0.5              | 800       | 1525             | 0.0              | 930       | 1629             | 0.0              |
| 415       | 1763             | 0.0              | 545       | 55452            | 36.9             | 675       | 18039            | 0.3              | 805       | 1332             | 0.0              | 935       | 1796             | 0.0              |
| 420       | 3421             | 0.0              | 550       | 57280            | 38.9             | 680       | 15849            | 0.2              | 810       | 1269             | 0.0              | 940       | 1595             | 0.0              |
| 425       | 6610             | 0.0              | 555       | 59041            | 40.3             | 685       | 13806            | 0.1              | 815       | 1261             | 0.0              | 945       | 1410             | 0.0              |
| 430       | 12444            | 0.1              | 560       | 60976            | 41.4             | 690       | 12093            | 0.1              | 820       | 1551             | 0.0              | 950       | 1937             | 0.0              |
| 435       | 21116            | 0.2              | 565       | 62904            | 41.8             | 695       | 10566            | 0.0              | 825       | 1708             | 0.0              | 955       | 2186             | 0.0              |
| 440       | 33463            | 0.5              | 570       | 64555            | 42.0             | 700       | 9300             | 0.0              | 830       | 1592             | 0.0              | 960       | 1583             | 0.0              |
| 445       | 49089            | 1.0              | 575       | 65785            | 40.9             | 705       | 8110             | 0.0              | 835       | 1642             | 0.0              | 965       | 1953             | 0.0              |
| 450       | 57374            | 1.5              | 580       | 66948            | 39.8             | 710       | 7052             | 0.0              | 840       | 1514             | 0.0              | 970       | 1519             | 0.0              |
| 455       | 42663            | 1.4              | 585       | 67963            | 37.8             | 715       | 6233             | 0.0              | 845       | 1376             | 0.0              | 975       | 1168             | 0.0              |
| 460       | 25334            | 1.0              | 590       | 68001            | 35.2             | 720       | 5362             | 0.0              | 850       | 1592             | 0.0              | 980       | 1593             | 0.0              |
| 465       | 17751            | 0.9              | 595       | 67308            | 31.9             | 725       | 4563             | 0.0              | 855       | 1667             | 0.0              | 985       | 1722             | 0.0              |
| 470       | 12447            | 0.8              | 600       | 66343            | 28.6             | 730       | 3976             | 0.0              | 860       | 1662             | 0.0              | 990       | 1648             | 0.0              |
| 475       | 8641             | 0.7              | 605       | 64393            | 24.9             | 735       | 3424             | 0.0              | 865       | 1916             | 0.0              | 995       | 2495             | 0.0              |
| 480       | 7423             | 0.7              | 610       | 61634            | 21.2             | 740       | 3222             | 0.0              | 870       | 1655             | 0.0              | 1000      | 2643             | 0.0              |
| 485       | 7759             | 0.9              | 615       | 58349            | 17.6             | 745       | 3060             | 0.0              | 875       | 2036             | 0.0              |           |                  |                  |

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### Scotopic Flux vs. Wavelength



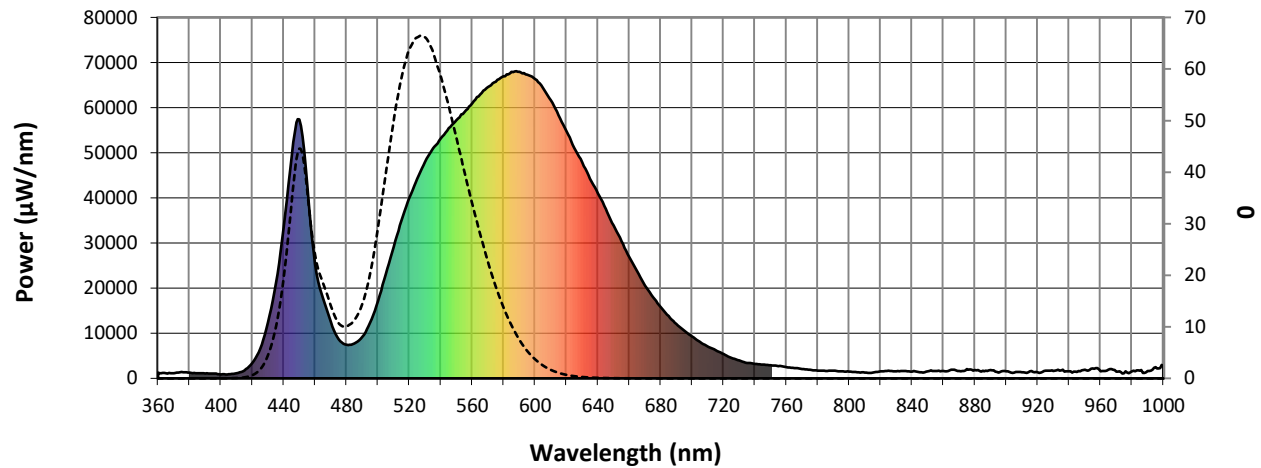
Scotopic Lumens: 1941.7

S/P: 0.51

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 1254             | 0.0              | 490       | 9219             | 14.2             | 620       | 54761            | 0.7              | 750       | 2901             | 0.0              | 880       | 1835             | 0.0              |
| 365       | 1158             | 0.0              | 495       | 12322            | 19.9             | 625       | 51064            | 0.4              | 755       | 2733             | 0.0              | 885       | 1690             | 0.0              |
| 370       | 1131             | 0.0              | 500       | 17160            | 28.7             | 630       | 47879            | 0.3              | 760       | 2503             | 0.0              | 890       | 1819             | 0.0              |
| 375       | 1414             | 0.0              | 505       | 23071            | 39.2             | 635       | 44248            | 0.2              | 765       | 2289             | 0.0              | 895       | 1314             | 0.0              |
| 380       | 1275             | 0.0              | 510       | 29162            | 49.4             | 640       | 41034            | 0.1              | 770       | 2078             | 0.0              | 900       | 1547             | 0.0              |
| 385       | 1122             | 0.0              | 515       | 34992            | 58.0             | 645       | 37515            | 0.1              | 775       | 1927             | 0.0              | 905       | 1281             | 0.0              |
| 390       | 1074             | 0.0              | 520       | 40102            | 63.7             | 650       | 33900            | 0.0              | 780       | 1724             | 0.0              | 910       | 1345             | 0.0              |
| 395       | 1058             | 0.0              | 525       | 44194            | 66.1             | 655       | 30384            | 0.0              | 785       | 1617             | 0.0              | 915       | 1561             | 0.0              |
| 400       | 885              | 0.0              | 530       | 48014            | 66.2             | 660       | 26883            | 0.0              | 790       | 1709             | 0.0              | 920       | 1368             | 0.0              |
| 405       | 912              | 0.0              | 535       | 51019            | 63.6             | 665       | 23703            | 0.0              | 795       | 1561             | 0.0              | 925       | 1730             | 0.0              |
| 410       | 1108             | 0.1              | 540       | 53190            | 58.8             | 670       | 20603            | 0.0              | 800       | 1525             | 0.0              | 930       | 1629             | 0.0              |
| 415       | 1763             | 0.2              | 545       | 55452            | 53.2             | 675       | 18039            | 0.0              | 805       | 1332             | 0.0              | 935       | 1796             | 0.0              |
| 420       | 3421             | 0.6              | 550       | 57280            | 46.8             | 680       | 15849            | 0.0              | 810       | 1269             | 0.0              | 940       | 1595             | 0.0              |
| 425       | 6610             | 1.6              | 555       | 59041            | 40.3             | 685       | 13806            | 0.0              | 815       | 1261             | 0.0              | 945       | 1410             | 0.0              |
| 430       | 12444            | 4.2              | 560       | 60976            | 34.1             | 690       | 12093            | 0.0              | 820       | 1551             | 0.0              | 950       | 1937             | 0.0              |
| 435       | 21116            | 9.4              | 565       | 62904            | 28.2             | 695       | 10566            | 0.0              | 825       | 1708             | 0.0              | 955       | 2186             | 0.0              |
| 440       | 33463            | 18.7             | 570       | 64555            | 22.8             | 700       | 9300             | 0.0              | 830       | 1592             | 0.0              | 960       | 1583             | 0.0              |
| 445       | 49089            | 32.9             | 575       | 65785            | 17.9             | 705       | 8110             | 0.0              | 835       | 1642             | 0.0              | 965       | 1953             | 0.0              |
| 450       | 57374            | 44.5             | 580       | 66948            | 13.8             | 710       | 7052             | 0.0              | 840       | 1514             | 0.0              | 970       | 1519             | 0.0              |
| 455       | 42663            | 37.3             | 585       | 67963            | 10.4             | 715       | 6233             | 0.0              | 845       | 1376             | 0.0              | 975       | 1168             | 0.0              |
| 460       | 25334            | 24.5             | 590       | 68001            | 7.6              | 720       | 5362             | 0.0              | 850       | 1592             | 0.0              | 980       | 1593             | 0.0              |
| 465       | 17751            | 18.7             | 595       | 67308            | 5.4              | 725       | 4563             | 0.0              | 855       | 1667             | 0.0              | 985       | 1722             | 0.0              |
| 470       | 12447            | 14.3             | 600       | 66343            | 3.7              | 730       | 3976             | 0.0              | 860       | 1662             | 0.0              | 990       | 1648             | 0.0              |
| 475       | 8641             | 10.8             | 605       | 64393            | 2.5              | 735       | 3424             | 0.0              | 865       | 1916             | 0.0              | 995       | 2495             | 0.0              |
| 480       | 7423             | 10.0             | 610       | 61634            | 1.7              | 740       | 3222             | 0.0              | 870       | 1655             | 0.0              | 1000      | 2643             | 0.0              |
| 485       | 7759             | 11.2             | 615       | 58349            | 1.1              | 745       | 3060             | 0.0              | 875       | 2036             | 0.0              |           |                  |                  |

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### Melanopic Flux vs. Wavelength

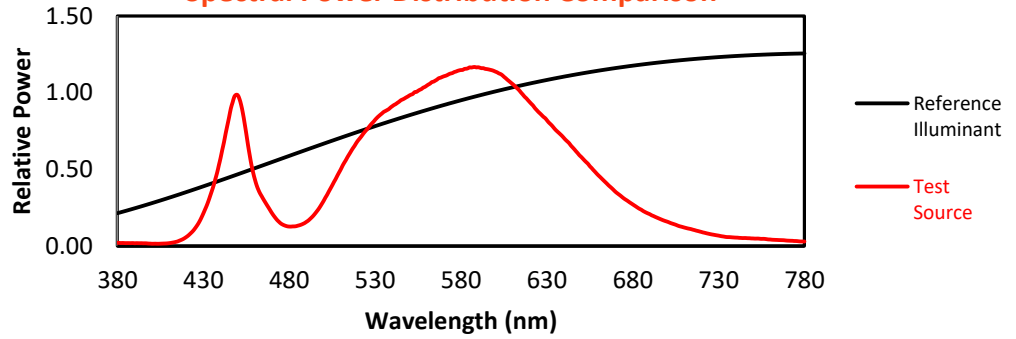

**Melanopic Lumens: 5289.9**
**S/P: 1.39**

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 1254             | 0.0              | 490       | 9219             | 7.7              | 620       | 54761            | 0.0              | 750       | 2901             | 0.0              | 880       | 1835             | 0.0              |
| 365       | 1158             | 0.0              | 495       | 12322            | 10.2             | 625       | 51064            | 0.0              | 755       | 2733             | 0.0              | 885       | 1690             | 0.0              |
| 370       | 1131             | 0.0              | 500       | 17160            | 13.8             | 630       | 47879            | 0.0              | 760       | 2503             | 0.0              | 890       | 1819             | 0.0              |
| 375       | 1414             | 0.0              | 505       | 23071            | 17.7             | 635       | 44248            | 0.0              | 765       | 2289             | 0.0              | 895       | 1314             | 0.0              |
| 380       | 1275             | 0.0              | 510       | 29162            | 20.9             | 640       | 41034            | 0.0              | 770       | 2078             | 0.0              | 900       | 1547             | 0.0              |
| 385       | 1122             | 0.0              | 515       | 34992            | 22.9             | 645       | 37515            | 0.0              | 775       | 1927             | 0.0              | 905       | 1281             | 0.0              |
| 390       | 1074             | 0.0              | 520       | 40102            | 23.3             | 650       | 33900            | 0.0              | 780       | 1724             | 0.0              | 910       | 1345             | 0.0              |
| 395       | 1058             | 0.0              | 525       | 44194            | 22.4             | 655       | 30384            | 0.0              | 785       | 1617             | 0.0              | 915       | 1561             | 0.0              |
| 400       | 885              | 0.0              | 530       | 48014            | 20.7             | 660       | 26883            | 0.0              | 790       | 1709             | 0.0              | 920       | 1368             | 0.0              |
| 405       | 912              | 0.0              | 535       | 51019            | 18.4             | 665       | 23703            | 0.0              | 795       | 1561             | 0.0              | 925       | 1730             | 0.0              |
| 410       | 1108             | 0.0              | 540       | 53190            | 15.6             | 670       | 20603            | 0.0              | 800       | 1525             | 0.0              | 930       | 1629             | 0.0              |
| 415       | 1763             | 0.1              | 545       | 55452            | 12.9             | 675       | 18039            | 0.0              | 805       | 1332             | 0.0              | 935       | 1796             | 0.0              |
| 420       | 3421             | 0.4              | 550       | 57280            | 10.3             | 680       | 15849            | 0.0              | 810       | 1269             | 0.0              | 940       | 1595             | 0.0              |
| 425       | 6610             | 1.0              | 555       | 59041            | 8.0              | 685       | 13806            | 0.0              | 815       | 1261             | 0.0              | 945       | 1410             | 0.0              |
| 430       | 12444            | 2.6              | 560       | 60976            | 6.0              | 690       | 12093            | 0.0              | 820       | 1551             | 0.0              | 950       | 1937             | 0.0              |
| 435       | 21116            | 5.6              | 565       | 62904            | 4.4              | 695       | 10566            | 0.0              | 825       | 1708             | 0.0              | 955       | 2186             | 0.0              |
| 440       | 33463            | 11.2             | 570       | 64555            | 3.2              | 700       | 9300             | 0.0              | 830       | 1592             | 0.0              | 960       | 1583             | 0.0              |
| 445       | 49089            | 19.4             | 575       | 65785            | 2.2              | 705       | 8110             | 0.0              | 835       | 1642             | 0.0              | 965       | 1953             | 0.0              |
| 450       | 57374            | 26.4             | 580       | 66948            | 1.5              | 710       | 7052             | 0.0              | 840       | 1514             | 0.0              | 970       | 1519             | 0.0              |
| 455       | 42663            | 22.4             | 585       | 67963            | 1.0              | 715       | 6233             | 0.0              | 845       | 1376             | 0.0              | 975       | 1168             | 0.0              |
| 460       | 25334            | 14.9             | 590       | 68001            | 0.7              | 720       | 5362             | 0.0              | 850       | 1592             | 0.0              | 980       | 1593             | 0.0              |
| 465       | 17751            | 11.6             | 595       | 67308            | 0.4              | 725       | 4563             | 0.0              | 855       | 1667             | 0.0              | 985       | 1722             | 0.0              |
| 470       | 12447            | 8.9              | 600       | 66343            | 0.3              | 730       | 3976             | 0.0              | 860       | 1662             | 0.0              | 990       | 1648             | 0.0              |
| 475       | 8641             | 6.6              | 605       | 64393            | 0.2              | 735       | 3424             | 0.0              | 865       | 1916             | 0.0              | 995       | 2495             | 0.0              |
| 480       | 7423             | 6.0              | 610       | 61634            | 0.1              | 740       | 3222             | 0.0              | 870       | 1655             | 0.0              | 1000      | 2643             | 0.0              |
| 485       | 7759             | 6.4              | 615       | 58349            | 0.1              | 745       | 3060             | 0.0              | 875       | 2036             | 0.0              |           |                  |                  |

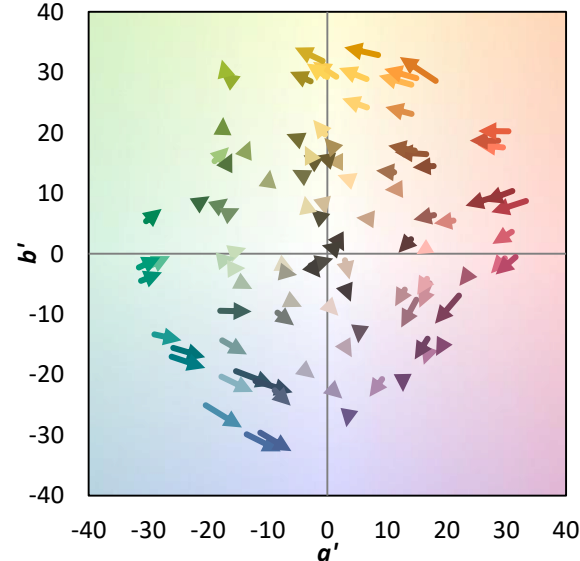
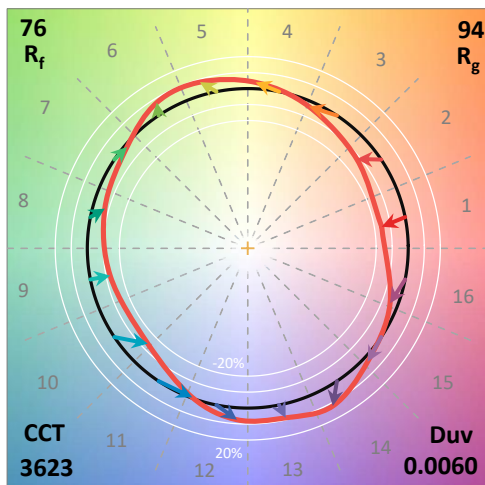
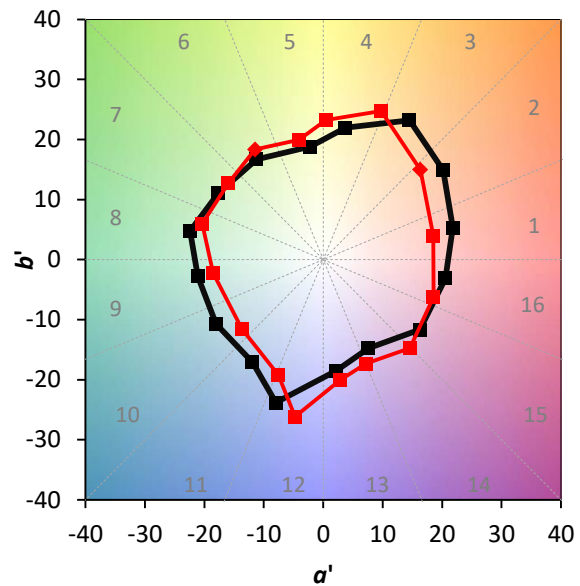
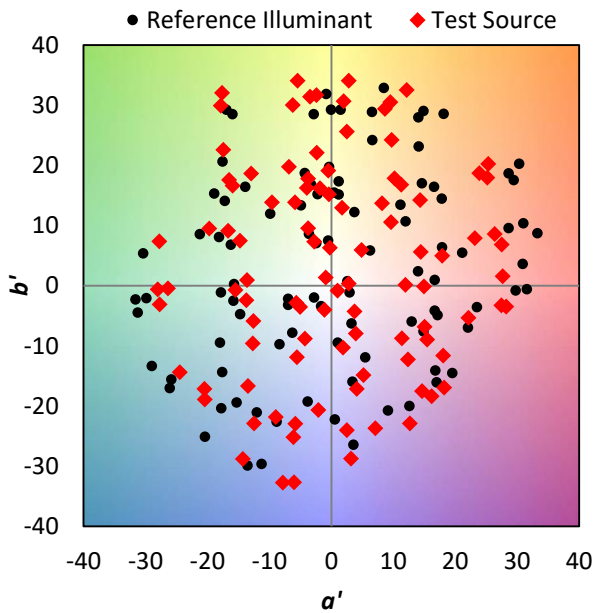
### Summary

$R_f = 76.2$   
 $R_g = 94.3$   
 CIE  $R_a = 72.6$   
 $R_g = -22.4$

### Spectral Power Distribution Comparison



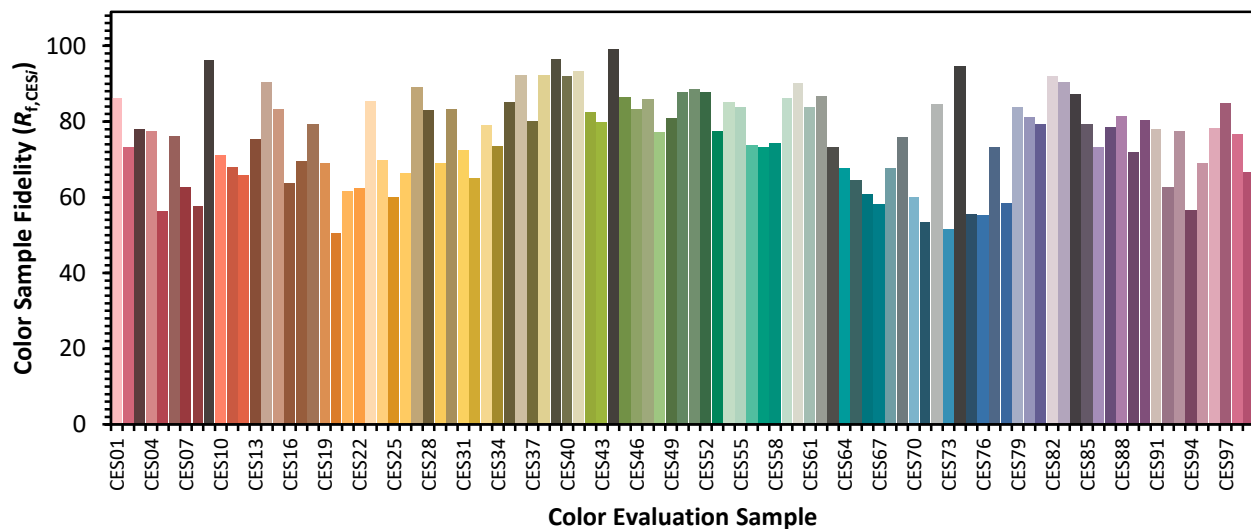
### Color Vector Graphics

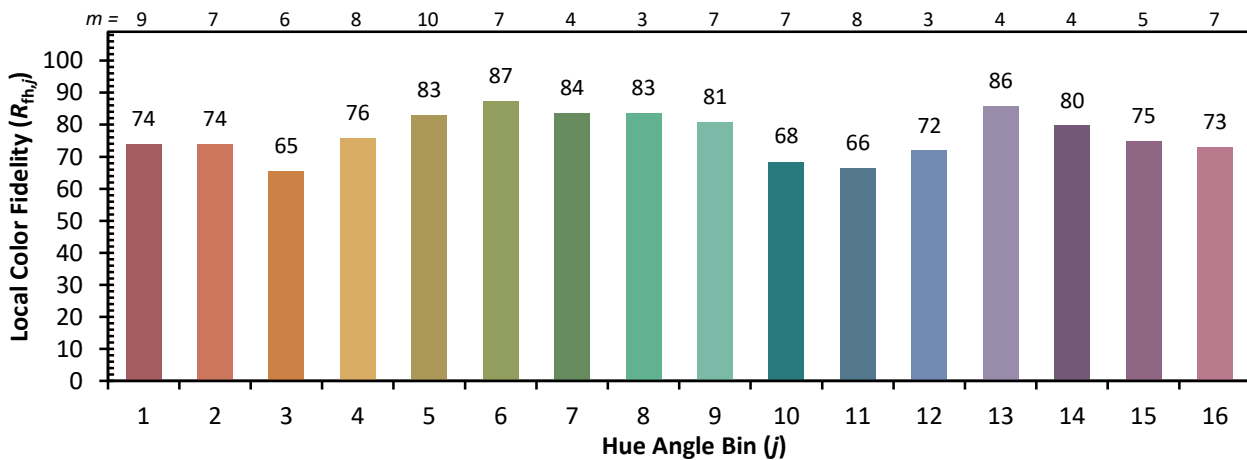
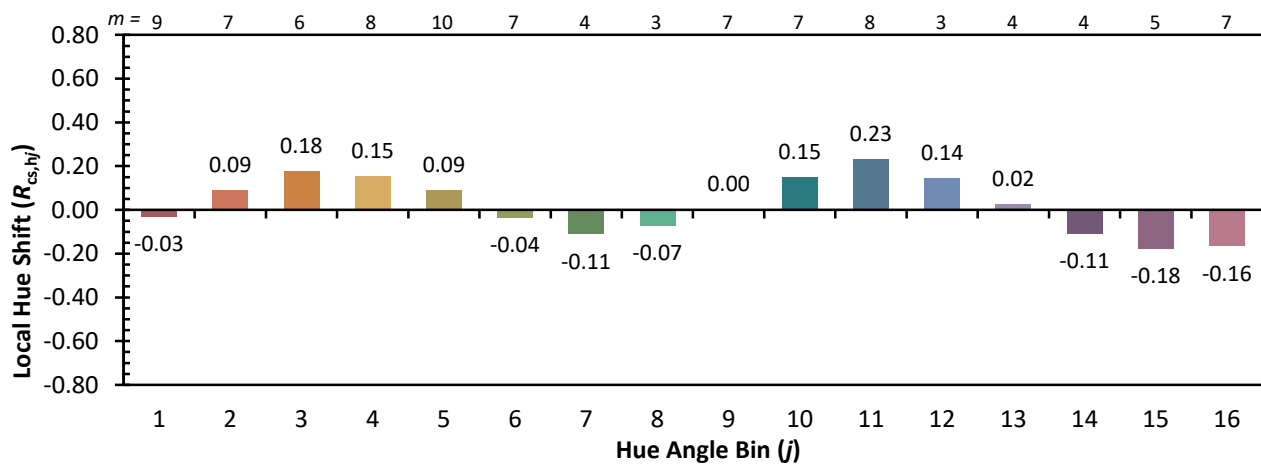
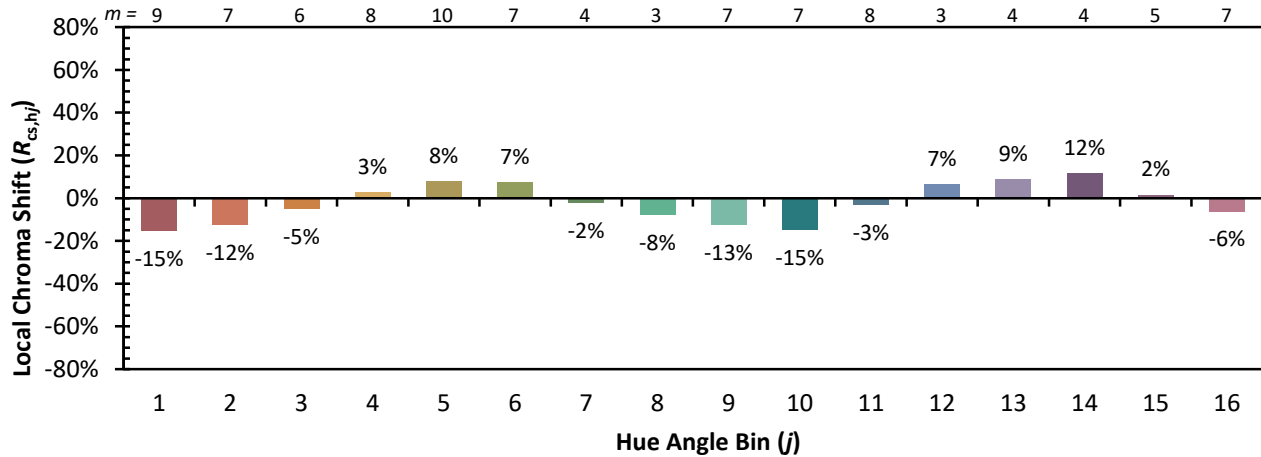




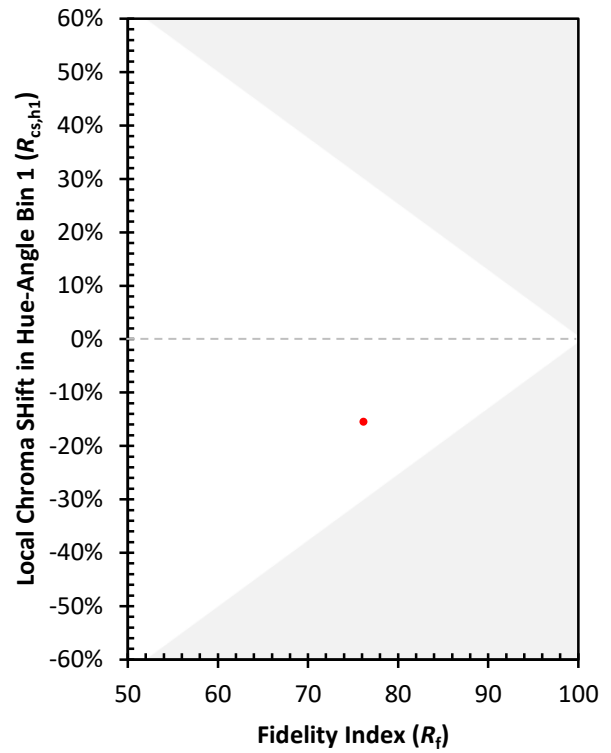
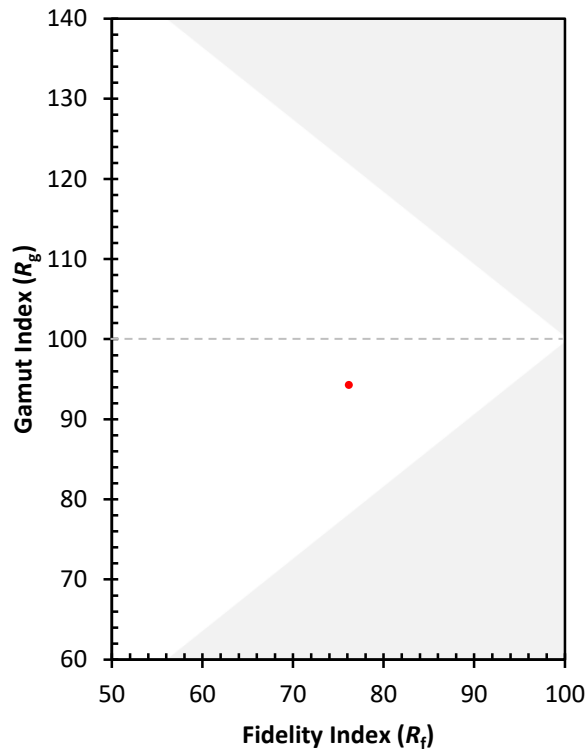
**Individual Sample Fidelity Index ( $R_{f,i}$ )**

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 66 | CES51 = 88 | CES76 = 55 |
| CES02 = 61 | CES27 = 89 | CES52 = 88 | CES77 = 73 |
| CES03 = 31 | CES28 = 83 | CES53 = 78 | CES78 = 59 |
| CES04 = 70 | CES29 = 69 | CES54 = 85 | CES79 = 84 |
| CES05 = 48 | CES30 = 83 | CES55 = 84 | CES80 = 81 |
| CES06 = 51 | CES31 = 73 | CES56 = 74 | CES81 = 79 |
| CES07 = 40 | CES32 = 65 | CES57 = 73 | CES82 = 92 |
| CES08 = 39 | CES33 = 79 | CES58 = 74 | CES83 = 90 |
| CES09 = 29 | CES34 = 74 | CES59 = 86 | CES84 = 87 |
| CES10 = 74 | CES35 = 85 | CES60 = 90 | CES85 = 79 |
| CES11 = 57 | CES36 = 92 | CES61 = 84 | CES86 = 73 |
| CES12 = 63 | CES37 = 80 | CES62 = 87 | CES87 = 78 |
| CES13 = 42 | CES38 = 92 | CES63 = 73 | CES88 = 81 |
| CES14 = 74 | CES39 = 97 | CES64 = 68 | CES89 = 72 |
| CES15 = 71 | CES40 = 92 | CES65 = 65 | CES90 = 80 |
| CES16 = 47 | CES41 = 93 | CES66 = 61 | CES91 = 78 |
| CES17 = 49 | CES42 = 82 | CES67 = 58 | CES92 = 63 |
| CES18 = 56 | CES43 = 80 | CES68 = 68 | CES93 = 77 |
| CES19 = 72 | CES44 = 99 | CES69 = 76 | CES94 = 57 |
| CES20 = 65 | CES45 = 86 | CES70 = 60 | CES95 = 69 |
| CES21 = 86 | CES46 = 83 | CES71 = 54 | CES96 = 78 |
| CES22 = 78 | CES47 = 86 | CES72 = 85 | CES97 = 85 |
| CES23 = 92 | CES48 = 77 | CES73 = 52 | CES98 = 77 |
| CES24 = 91 | CES49 = 81 | CES74 = 95 | CES99 = 67 |
| CES25 = 72 | CES50 = 88 | CES75 = 56 |            |



**Color Rendition by Hue-Angle Bin**


**Measure Comparisons**



(END OF REPORT)