

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: P385713

Luminaire Tested: **GWC-SA1B-735-U-SL2**

Issue Date: 3/3/2020

### Test Information

Test Method: LM-79-08  
Report Number: P385713  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-20)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: MCGRAW-EDISON  
Catalog Number: GWC-SA1B-735-U-SL2  
Description: GALLEON WALL LUMINAIRE  
(1) 70 CRI, 3500K, 800mA LIGHTSQUARE WITH 16 LEDS AND TYPE II SPILL LIGHT  
ELIMINATOR OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

### Summary

Lumens per Lamp: N/A  
Luminaire Lumens: 5616.6 lumens  
Efficiency: N/A  
Efficacy: 127.7 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 0.5' x H: 0')  
IES Classification: Type III - Medium  
BUG Rating: B1 - U0 - G2

Input Watts (W): 44  
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

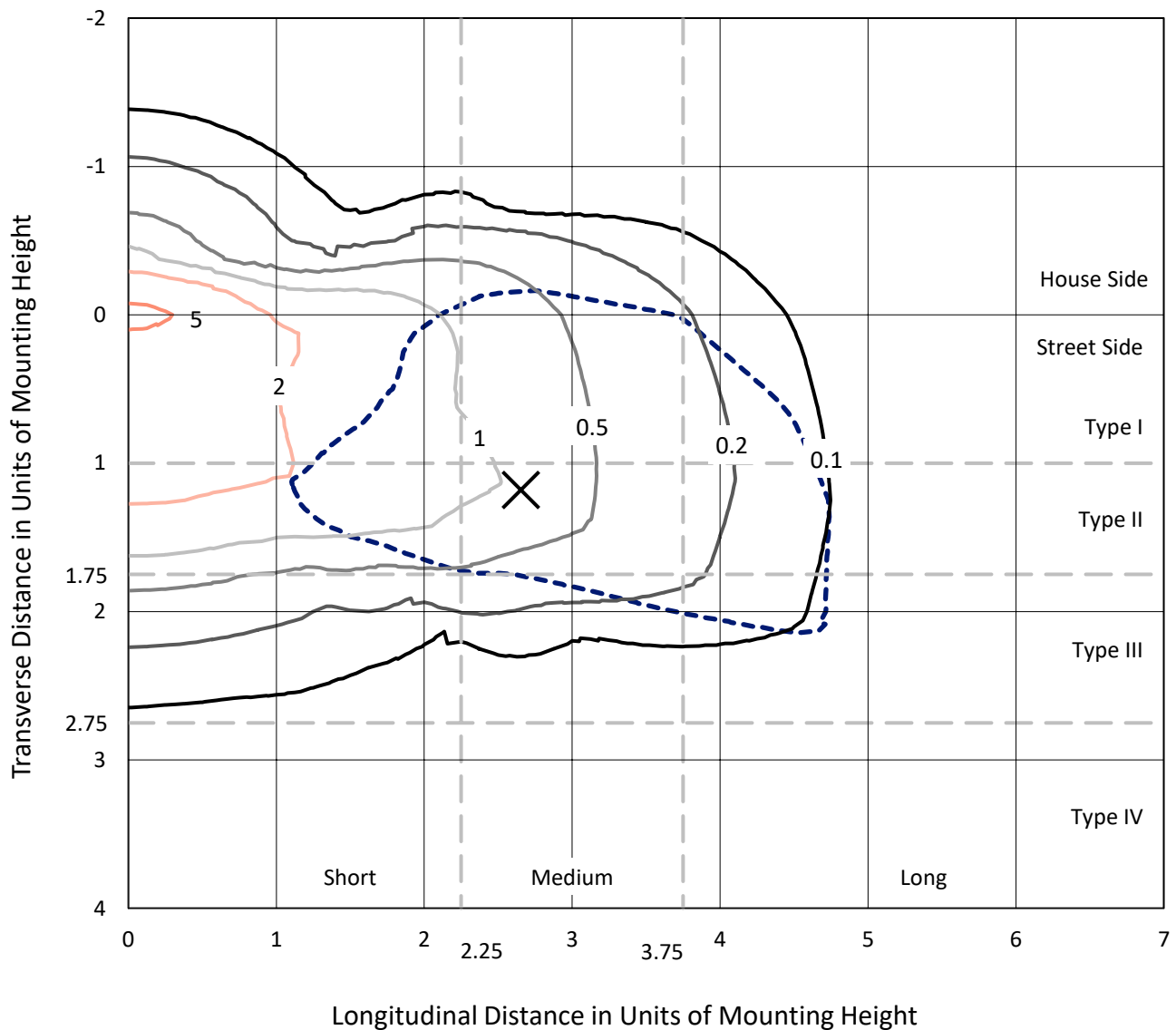


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## Iso-Footcandle Lines of Horizontal Illumination

× Max cd  
 - - - 1/2 Max cd

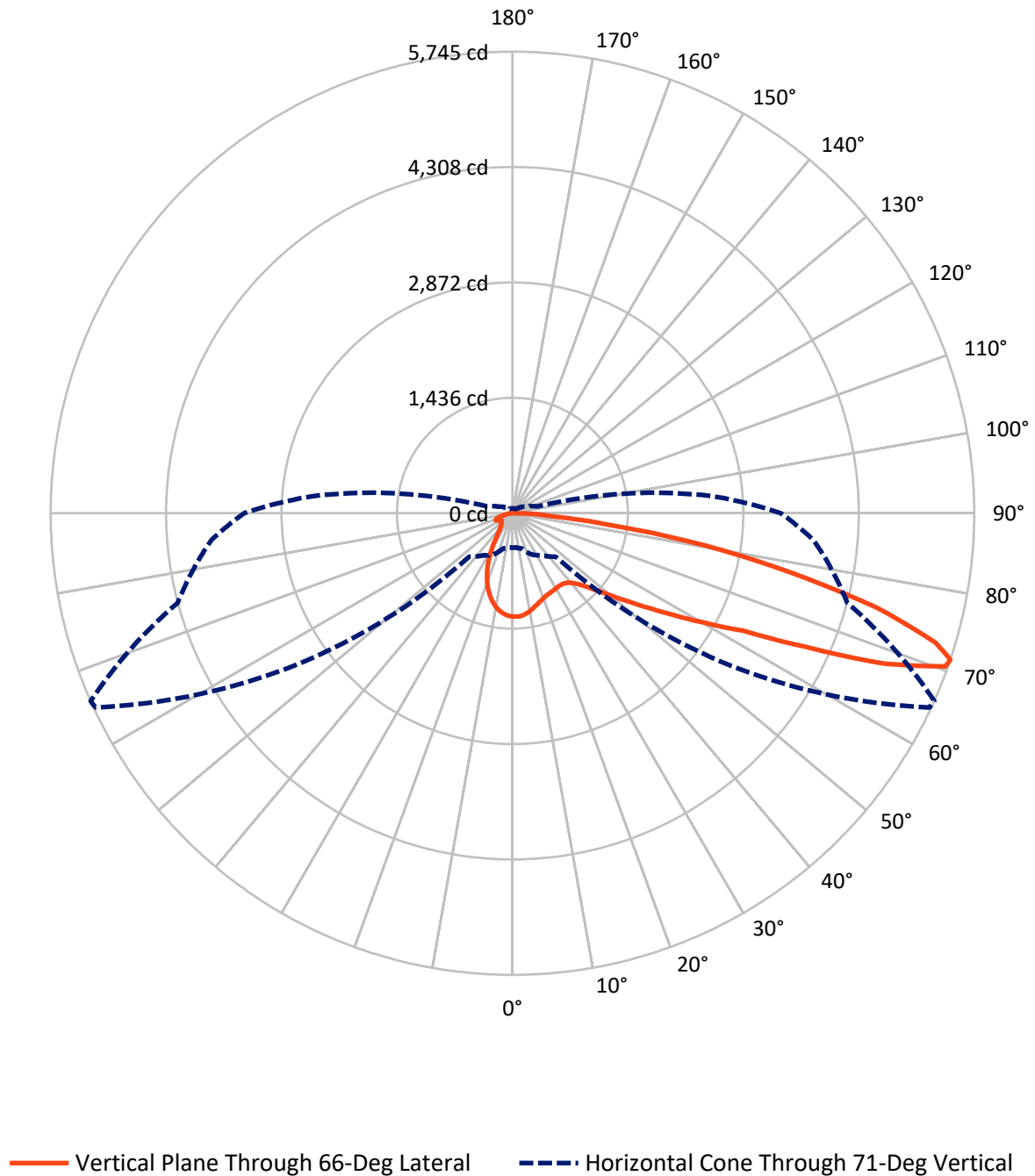


Based on 15 foot mounting height. Maximum calculated value = 5.7 fc  
 Type III - Medium - N/A

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## Luminous Intensity Polar Plot



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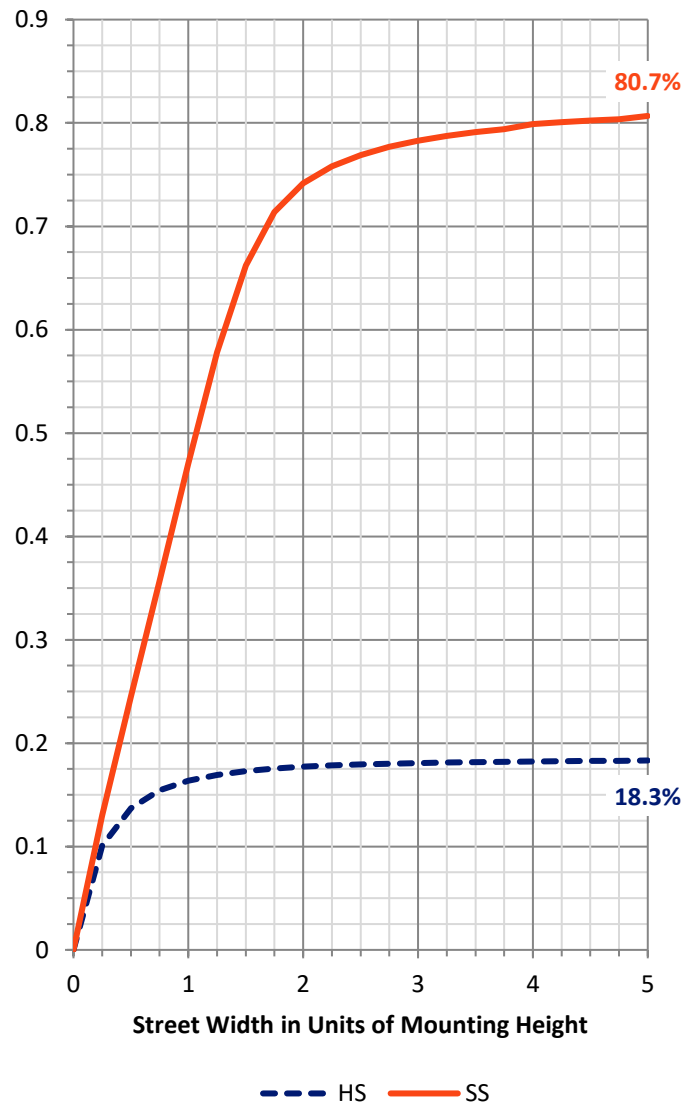
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 1040.9   | 0.0    | 1040.9 |
|                    | % Fixture | 18.5     | 0.0    | 18.5   |
| <b>Street Side</b> | Lumens    | 4575.7   | 0.0    | 4575.7 |
|                    | % Fixture | 81.5     | 0.0    | 81.5   |
| <b>Total</b>       | Lumens    | 5616.6   | 0.0    | 5616.6 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 113.3  | 2.0       |
| 10°-20°   | 271.6  | 4.8       |
| 20°-30°   | 364.9  | 6.5       |
| 30°-40°   | 480.0  | 8.5       |
| 40°-50°   | 698.3  | 12.4      |
| 50°-60°   | 1090.8 | 19.4      |
| 60°-70°   | 1366.4 | 24.3      |
| 70°-80°   | 1042.2 | 18.6      |
| 80°-90°   | 189.3  | 3.4       |
| 90°-100°  | 0.0    | 0.0       |
| 100°-110° | 0.0    | 0.0       |
| 110°-120° | 0.0    | 0.0       |
| 120°-130° | 0.0    | 0.0       |
| 130°-140° | 0.0    | 0.0       |
| 140°-150° | 0.0    | 0.0       |
| 150°-160° | 0.0    | 0.0       |
| 160°-170° | 0.0    | 0.0       |
| 170°-180° | 0.0    | 0.0       |
| 0°-90°    | 5616.6 | 100.0     |
| 0°-180°   | 5616.6 | 100.0     |

**Coefficient of Utilization**



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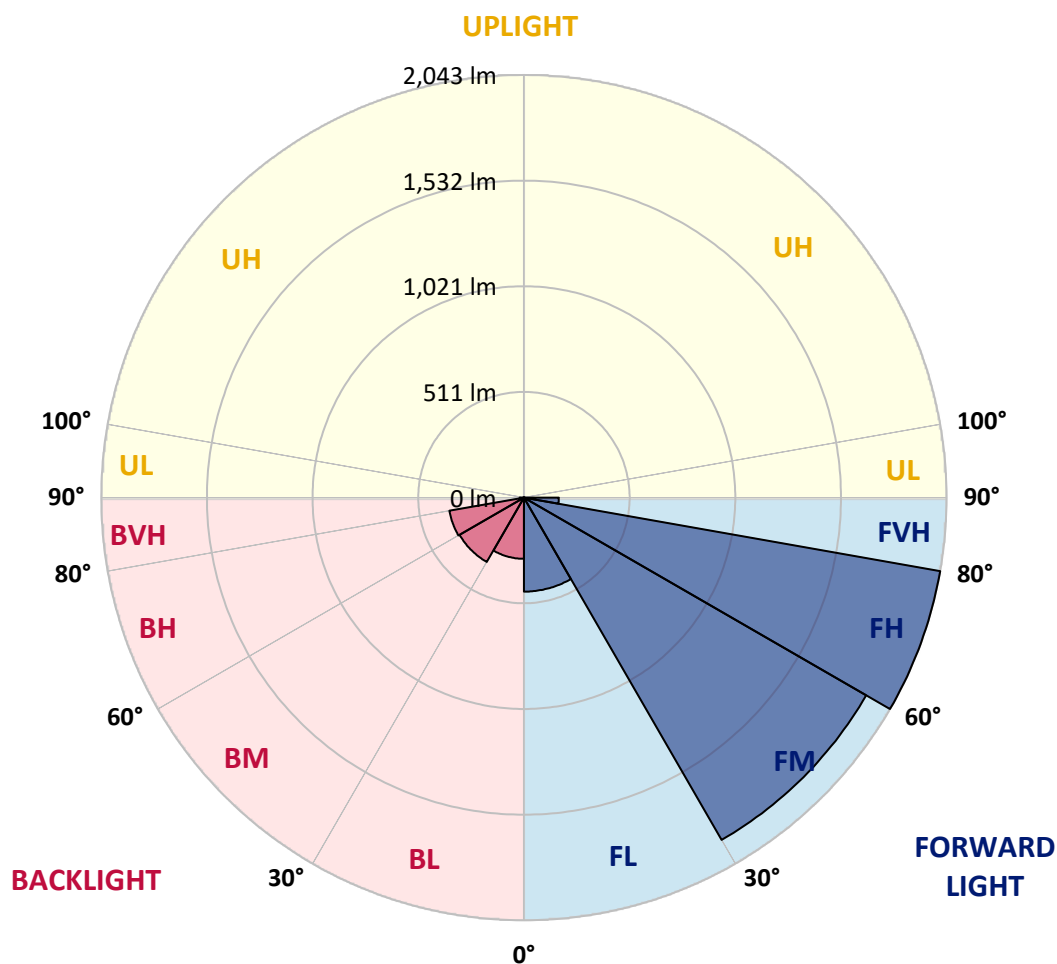
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**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 454.2  | 8.1       |                         |      |         |
| FM   | (30°-60°)   | 1909.9 | 34.0      |                         |      |         |
| FH   | (60°-80°)   | 2042.8 | 36.4      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 168.8  | 3.0       |                         |      | G2/225  |
| BL   | (0°-30°)    | 295.6  | 5.3       | B1/500                  |      |         |
| BM   | (30°-60°)   | 359.1  | 6.4       | B1/1000                 |      |         |
| BH   | (60°-80°)   | 365.8  | 6.5       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 20.5   | 0.4       |                         |      | G1/100  |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B1-U0-G2**

Type III Medium



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 66°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1286.7 | 1286.7 | 1286.7 | 1286.7 | 1286.7 | 1286.7 | 1286.7 | 1286.7 | 1286.7 | 1286.7 | 1286.7 |
| 2.5°  | 1262.8 | 1260.9 | 1266.7 | 1272.7 | 1275.0 | 1278.9 | 1284.7 | 1288.0 | 1287.8 | 1288.4 | 1286.5 |
| 5°    | 1179.0 | 1176.5 | 1188.1 | 1197.6 | 1215.9 | 1236.4 | 1261.4 | 1279.3 | 1279.6 | 1289.8 | 1292.5 |
| 7.5°  | 1099.7 | 1098.0 | 1111.4 | 1126.7 | 1147.8 | 1179.2 | 1219.8 | 1258.1 | 1260.5 | 1287.8 | 1297.3 |
| 10°   | 1036.2 | 1035.8 | 1048.7 | 1065.4 | 1090.1 | 1125.1 | 1171.7 | 1227.9 | 1231.4 | 1278.5 | 1298.1 |
| 12.5° | 986.5  | 987.2  | 998.5  | 1017.5 | 1043.5 | 1080.1 | 1130.6 | 1194.0 | 1199.6 | 1263.8 | 1293.6 |
| 15°   | 949.8  | 952.9  | 962.0  | 981.2  | 1006.8 | 1044.0 | 1095.8 | 1162.6 | 1171.0 | 1247.3 | 1291.1 |
| 17.5° | 928.9  | 932.3  | 938.7  | 954.7  | 978.8  | 1014.5 | 1063.7 | 1136.8 | 1144.6 | 1234.6 | 1291.3 |
| 20°   | 922.7  | 925.6  | 929.2  | 938.9  | 959.3  | 991.9  | 1038.2 | 1113.5 | 1121.8 | 1224.6 | 1293.3 |
| 22.5° | 934.9  | 937.0  | 937.4  | 936.7  | 949.1  | 975.7  | 1019.8 | 1096.5 | 1105.4 | 1218.0 | 1294.6 |
| 25°   | 961.1  | 964.0  | 961.8  | 954.7  | 950.6  | 966.9  | 1010.3 | 1085.2 | 1094.1 | 1213.1 | 1291.9 |
| 27.5° | 1000.5 | 1000.8 | 999.0  | 989.7  | 970.6  | 967.9  | 1007.4 | 1078.6 | 1087.2 | 1207.5 | 1286.3 |
| 30°   | 1054.0 | 1056.4 | 1053.3 | 1040.8 | 1009.4 | 983.4  | 1010.9 | 1072.2 | 1079.9 | 1200.4 | 1277.2 |
| 32.5° | 1116.6 | 1122.8 | 1122.6 | 1109.4 | 1064.4 | 1018.1 | 1025.3 | 1068.3 | 1074.3 | 1192.8 | 1266.1 |
| 35°   | 1181.6 | 1190.1 | 1206.0 | 1200.4 | 1144.7 | 1073.0 | 1052.8 | 1074.5 | 1078.6 | 1191.8 | 1258.3 |
| 37.5° | 1249.0 | 1257.6 | 1290.4 | 1305.5 | 1240.3 | 1151.5 | 1096.3 | 1096.5 | 1098.3 | 1203.6 | 1257.8 |
| 40°   | 1319.7 | 1328.8 | 1378.0 | 1417.4 | 1364.2 | 1251.0 | 1166.3 | 1142.2 | 1140.0 | 1232.8 | 1269.2 |
| 42.5° | 1418.5 | 1426.7 | 1485.8 | 1536.0 | 1501.7 | 1378.4 | 1263.0 | 1212.8 | 1208.3 | 1289.8 | 1305.9 |
| 45°   | 1543.6 | 1550.6 | 1613.4 | 1667.1 | 1649.5 | 1523.8 | 1384.6 | 1309.9 | 1309.1 | 1384.8 | 1380.2 |
| 47.5° | 1692.3 | 1697.8 | 1754.2 | 1806.2 | 1812.6 | 1691.2 | 1537.4 | 1459.8 | 1447.2 | 1515.1 | 1495.1 |
| 50°   | 1847.3 | 1853.3 | 1891.7 | 1947.6 | 1995.1 | 1915.1 | 1734.0 | 1643.5 | 1626.6 | 1687.2 | 1658.0 |
| 52.5° | 1949.9 | 1957.8 | 1991.1 | 2062.0 | 2200.2 | 2160.7 | 1966.5 | 1866.1 | 1840.5 | 1895.6 | 1873.2 |
| 55°   | 1904.2 | 1921.9 | 1972.9 | 2086.4 | 2364.3 | 2535.7 | 2253.3 | 2125.8 | 2096.8 | 2142.7 | 2129.4 |
| 57.5° | 1696.1 | 1720.5 | 1790.1 | 1965.2 | 2387.4 | 2866.2 | 2686.9 | 2431.5 | 2411.2 | 2398.0 | 2404.0 |
| 60°   | 1315.7 | 1339.2 | 1425.5 | 1653.7 | 2226.6 | 3107.4 | 3339.5 | 2808.5 | 2779.1 | 2654.4 | 2659.8 |
| 62.5° | 931.2  | 919.4  | 978.6  | 1145.5 | 1809.3 | 3135.7 | 4082.0 | 3312.8 | 3215.8 | 2925.1 | 2901.2 |
| 65°   | 710.2  | 707.5  | 733.9  | 787.1  | 1095.8 | 2797.0 | 4524.4 | 4160.2 | 4008.8 | 3243.5 | 3187.3 |
| 67.5° | 583.6  | 578.7  | 604.9  | 682.2  | 705.7  | 1804.4 | 4534.1 | 5143.4 | 4994.7 | 3639.9 | 3518.1 |
| 70°   | 479.7  | 474.3  | 498.7  | 598.7  | 652.1  | 915.2  | 3816.0 | 5719.1 | 5711.1 | 4141.8 | 3767.9 |
| 71°   | 430.1  | 426.2  | 455.5  | 566.5  | 640.7  | 762.7  | 3294.7 | 5720.6 | 5744.5 | 4311.6 | 3753.2 |
| 72.5° | 350.2  | 351.6  | 382.6  | 504.2  | 632.2  | 673.5  | 2421.5 | 5454.0 | 5504.5 | 4473.6 | 3619.1 |
| 75°   | 232.7  | 233.9  | 274.6  | 387.9  | 613.0  | 659.0  | 1330.8 | 4576.5 | 4669.3 | 4376.6 | 3302.4 |
| 77.5° | 156.3  | 155.9  | 183.7  | 266.0  | 534.0  | 659.0  | 780.4  | 3422.9 | 3524.7 | 3482.4 | 2545.9 |
| 80°   | 107.7  | 106.8  | 126.4  | 183.7  | 404.3  | 666.9  | 603.3  | 2398.8 | 2429.6 | 1880.7 | 1034.7 |
| 82.5° | 65.9   | 66.5   | 82.6   | 129.7  | 275.1  | 600.2  | 569.6  | 1308.0 | 1274.5 | 527.5  | 258.5  |
| 85°   | 37.9   | 37.6   | 52.7   | 87.8   | 176.7  | 506.5  | 555.4  | 563.0  | 516.4  | 158.9  | 93.5   |
| 87.5° | 13.6   | 14.6   | 28.3   | 48.7   | 101.3  | 352.7  | 471.2  | 292.8  | 264.0  | 71.8   | 42.3   |
| 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: GWC-SA1B-735-U-SL2

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1286.7 | 1286.7 | 1286.7 | 1286.7 | 1286.7 | 1286.7 | 1286.7 | 1286.7 | 1286.7 | 1286.7 | 1286.7 |
| 2.5°  | 1285.1 | 1286.3 | 1284.9 | 1277.2 | 1270.5 | 1259.9 | 1253.9 | 1245.5 | 1243.0 | 1241.9 | 1245.0 |
| 5°    | 1290.0 | 1290.4 | 1278.9 | 1258.5 | 1235.7 | 1208.7 | 1189.3 | 1165.5 | 1154.2 | 1149.3 | 1152.4 |
| 7.5°  | 1294.4 | 1292.7 | 1267.6 | 1228.7 | 1186.4 | 1139.5 | 1097.8 | 1059.5 | 1037.3 | 1028.2 | 1028.9 |
| 10°   | 1295.0 | 1287.6 | 1247.5 | 1187.2 | 1121.6 | 1052.8 | 988.8  | 929.8  | 892.6  | 868.4  | 875.7  |
| 12.5° | 1289.0 | 1276.5 | 1217.8 | 1133.5 | 1042.5 | 948.7  | 862.2  | 773.8  | 720.6  | 696.0  | 696.7  |
| 15°   | 1284.3 | 1261.8 | 1181.4 | 1070.3 | 948.0  | 823.8  | 705.7  | 601.8  | 545.1  | 519.9  | 508.1  |
| 17.5° | 1280.5 | 1245.9 | 1139.1 | 999.0  | 836.5  | 678.9  | 537.0  | 444.2  | 413.2  | 405.9  | 402.8  |
| 20°   | 1275.0 | 1229.1 | 1092.0 | 916.7  | 709.5  | 516.8  | 392.1  | 346.4  | 346.5  | 355.1  | 356.2  |
| 22.5° | 1267.4 | 1209.8 | 1041.8 | 824.1  | 573.2  | 376.4  | 307.4  | 294.2  | 307.6  | 323.8  | 326.7  |
| 25°   | 1256.3 | 1187.2 | 985.9  | 721.9  | 437.1  | 289.3  | 262.6  | 262.0  | 278.2  | 295.3  | 297.9  |
| 27.5° | 1240.3 | 1157.5 | 923.8  | 612.2  | 322.1  | 245.9  | 235.2  | 239.3  | 251.3  | 263.7  | 264.7  |
| 30°   | 1219.0 | 1123.0 | 855.4  | 496.5  | 252.5  | 219.0  | 217.8  | 221.4  | 228.8  | 237.6  | 238.3  |
| 32.5° | 1195.6 | 1087.9 | 782.2  | 384.3  | 216.2  | 204.4  | 205.5  | 207.3  | 210.8  | 214.3  | 215.0  |
| 35°   | 1174.1 | 1052.0 | 707.5  | 292.1  | 199.0  | 194.9  | 194.1  | 193.7  | 194.1  | 193.0  | 193.1  |
| 37.5° | 1160.4 | 1022.3 | 629.5  | 232.5  | 189.1  | 186.6  | 184.2  | 181.3  | 178.0  | 176.0  | 176.5  |
| 40°   | 1155.4 | 1000.3 | 550.6  | 200.9  | 180.9  | 179.1  | 174.7  | 168.5  | 164.7  | 163.5  | 163.5  |
| 42.5° | 1169.0 | 988.8  | 474.3  | 185.0  | 174.2  | 171.3  | 163.8  | 156.7  | 153.8  | 153.6  | 153.4  |
| 45°   | 1210.4 | 993.4  | 401.8  | 176.2  | 168.0  | 162.3  | 152.7  | 146.6  | 144.7  | 145.0  | 144.9  |
| 47.5° | 1284.9 | 1022.7 | 339.8  | 170.5  | 161.8  | 154.3  | 143.5  | 138.7  | 136.3  | 136.3  | 136.5  |
| 50°   | 1411.5 | 1091.2 | 290.3  | 165.6  | 156.5  | 147.0  | 136.9  | 130.9  | 127.8  | 127.6  | 127.6  |
| 52.5° | 1595.9 | 1213.8 | 259.5  | 161.6  | 150.7  | 140.4  | 130.3  | 122.8  | 119.0  | 118.3  | 117.9  |
| 55°   | 1827.1 | 1389.5 | 250.9  | 158.9  | 142.9  | 133.2  | 122.4  | 114.8  | 110.8  | 109.0  | 108.8  |
| 57.5° | 2085.6 | 1603.2 | 267.8  | 155.6  | 135.0  | 124.7  | 113.7  | 106.4  | 102.2  | 100.0  | 99.9   |
| 60°   | 2347.2 | 1836.4 | 336.7  | 150.9  | 128.4  | 115.4  | 104.7  | 98.2   | 93.8   | 91.5   | 91.1   |
| 62.5° | 2609.2 | 2082.4 | 477.2  | 150.5  | 123.7  | 106.4  | 95.6   | 90.0   | 85.9   | 83.4   | 82.8   |
| 65°   | 2904.7 | 2351.5 | 637.0  | 160.7  | 122.2  | 98.4   | 86.3   | 81.8   | 78.3   | 76.0   | 75.8   |
| 67.5° | 3244.1 | 2655.4 | 621.7  | 181.9  | 127.4  | 90.9   | 77.6   | 74.1   | 71.6   | 69.6   | 69.4   |
| 70°   | 3403.3 | 2607.9 | 386.5  | 196.8  | 134.8  | 83.8   | 69.2   | 66.7   | 64.7   | 63.4   | 62.8   |
| 71°   | 3336.6 | 2476.1 | 324.0  | 195.1  | 134.0  | 80.7   | 65.9   | 64.0   | 62.1   | 60.9   | 60.3   |
| 72.5° | 3154.7 | 2258.2 | 270.4  | 181.5  | 125.3  | 75.1   | 61.6   | 59.7   | 58.0   | 56.6   | 56.3   |
| 75°   | 2830.9 | 2016.8 | 216.4  | 145.0  | 99.9   | 63.4   | 54.1   | 51.9   | 50.6   | 49.9   | 49.0   |
| 77.5° | 2080.9 | 1439.2 | 167.4  | 114.6  | 73.5   | 51.8   | 46.1   | 44.6   | 43.2   | 42.1   | 41.5   |
| 80°   | 797.2  | 557.5  | 112.6  | 85.5   | 53.9   | 41.0   | 37.2   | 36.4   | 35.1   | 34.3   | 34.3   |
| 82.5° | 214.7  | 166.6  | 60.1   | 51.8   | 36.1   | 29.9   | 28.5   | 28.1   | 27.0   | 25.4   | 25.6   |
| 85°   | 86.9   | 73.5   | 33.7   | 28.5   | 22.1   | 17.7   | 19.2   | 19.4   | 18.0   | 16.1   | 16.3   |
| 87.5° | 38.2   | 31.2   | 18.8   | 12.6   | 9.7    | 6.8    | 8.7    | 8.7    | 8.0    | 6.6    | 6.0    |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |



Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

INVUE

Report Number: SP1-2104-224-2

Luminaire Tested: CCW-SA-2A-735-U-SL4

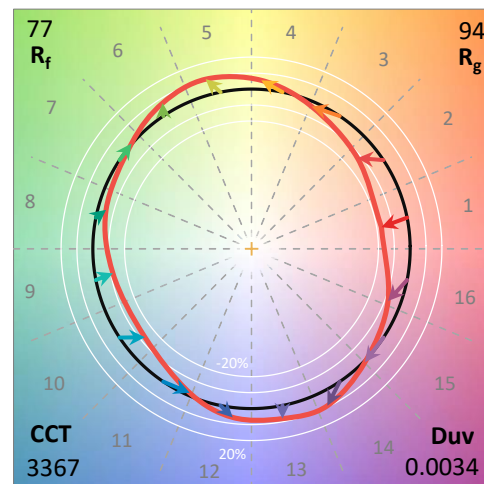
Test Date: 04/26/2021

### Test Information

Test Method: LM-79-08  
 Report Number: SP1-2104-224-2  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1  
 Measurement Geometry:  $4\pi$   
 Issue Date: 04/26/2021  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: INVUE  
 Catalog Number: **CCW-SA-2A-735-U-SL4**  
 Description: INVUE WALL PACK ClearCurve Light Square

### Spectral Parameters

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 3367   | CRI (Ra): | 73.3 |      |       |
| CIE u':                   | 0.2376 | R1:       | 69.1 | R9:  | -34.3 |
| CIE v':                   | 0.5184 | R2:       | 81.3 | R10: | 58.3  |
| Duv:                      | 0.0034 | R3:       | 93.4 | R11: | 69.1  |
| CIE x:                    | 0.4168 | R4:       | 71.8 | R12: | 54.2  |
| CIE y:                    | 0.4041 | R5:       | 69.6 | R13: | 71.1  |
| CIE z:                    | 0.1791 | R6:       | 75.4 | R14: | 96.4  |
| Peak Wavelength (nm):     | 590    | R7:       | 79.5 |      |       |
| Dominant Wavelength (nm): | 580    | R8:       | 46.4 |      |       |
| Purity:                   | 46.5   |           |      |      |       |
| Rf:                       | 77.2   |           |      |      |       |
| Rg:                       | 94.4   |           |      |      |       |



### Test Conditions

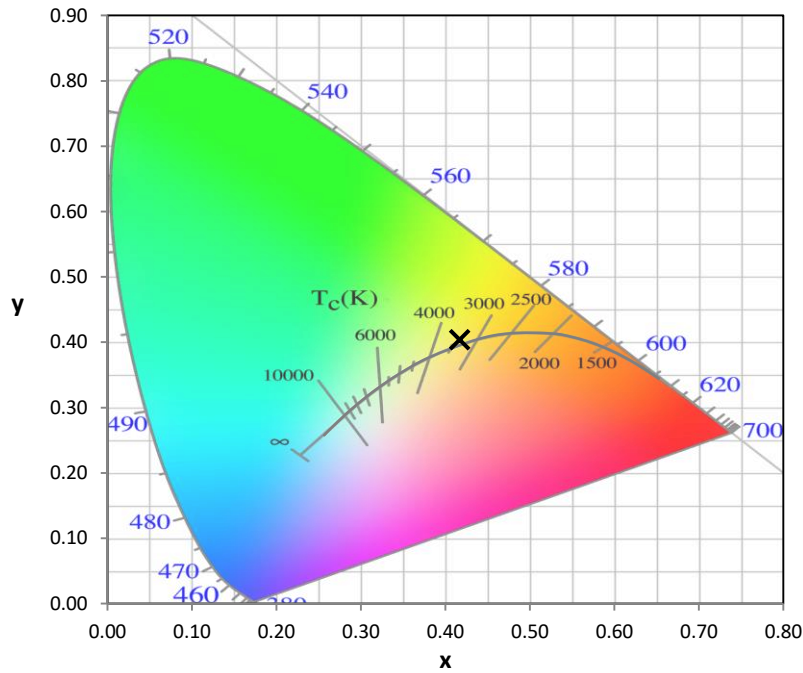
Stabilization Time: 71M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.9/38%  
 Sphere Temperature (°C): 24.2

REPORT NUMBER: SP1-2104-224-2

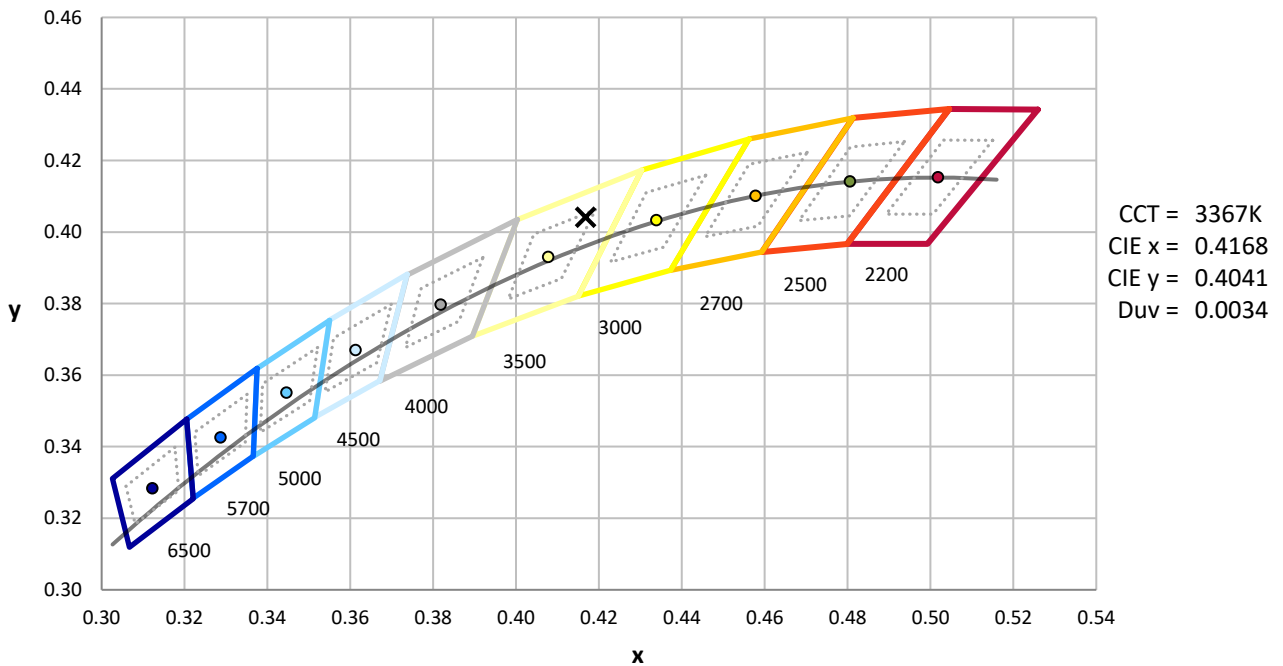
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 1/31/2021        | 7/31/2021            |
| Power Meter                    | IN0071                | 12/1/2020        | 12/1/2021            |
| AC Power Source                | IN0063                | 12/1/2020        | 12/1/2021            |
| DC Power Source                | IN0208                | 12/1/2020        | 12/1/2021            |
| Sphere Thermometer             | IN0085                | 12/1/2020        | 12/1/2021            |
| Room Thermometer               | IN0046                | 12/1/2020        | 12/1/2021            |

REPORT NUMBER: SP1-2104-224-2

**CIE 1931 Chromaticity Diagram**



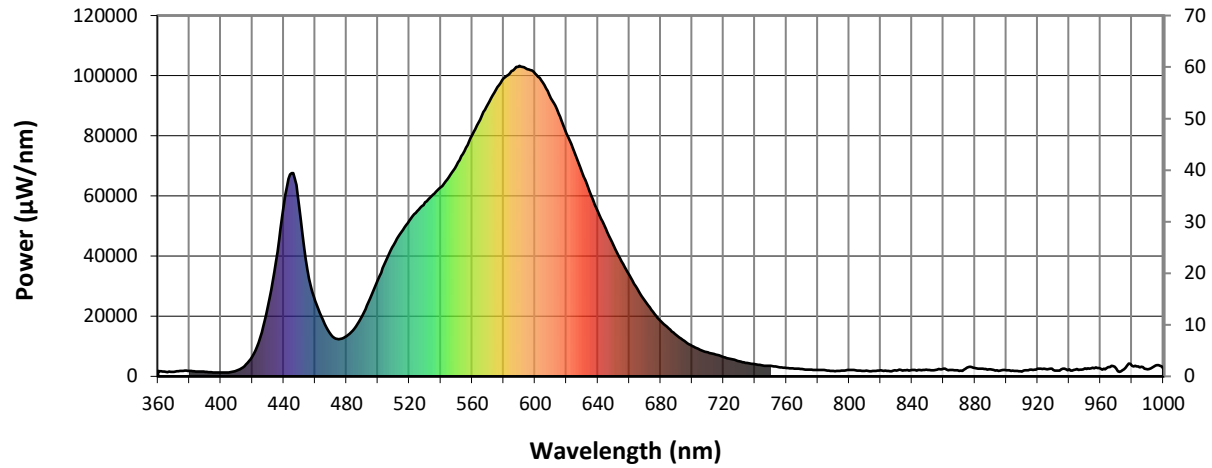
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 3500K 4-step quadrangle

REPORT NUMBER: SP1-2104-224-2

### Photopic Flux vs. Wavelength

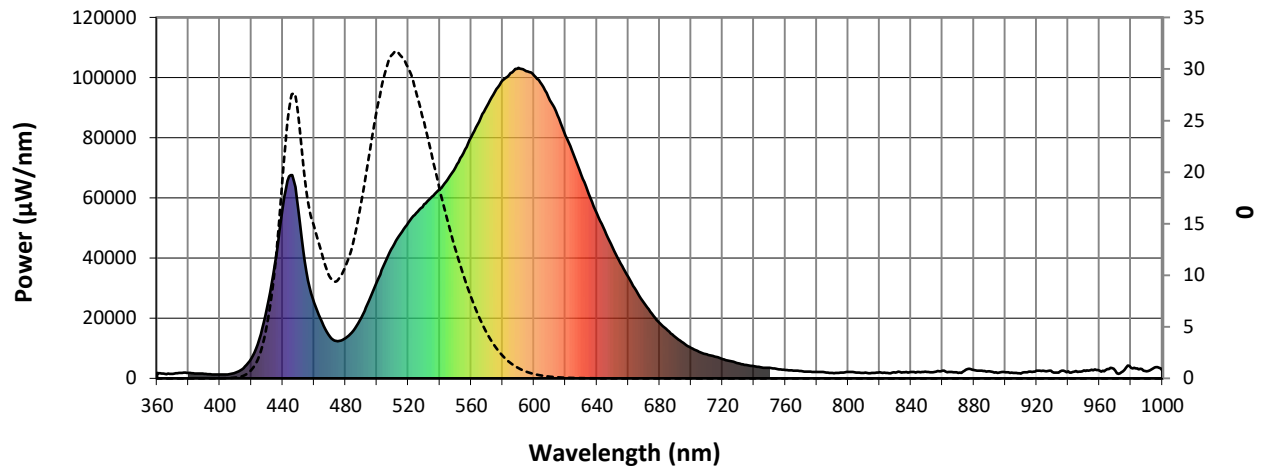


#####

| 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       | 1840             | 0.0              | 490       | 20271            | 2.9              | 620       | 80709            | 21.0             | 750       | 3465             | 0.0              | 880       | 2800             | 0.0              |
| 365       | 1514             | 0.0              | 495       | 25910            | 4.7              | 625       | 74695            | 16.5             | 755       | 3075             | 0.0              | 885       | 2582             | 0.0              |
| 370       | 1514             | 0.0              | 500       | 32216            | 7.1              | 630       | 67709            | 12.3             | 760       | 2794             | 0.0              | 890       | 2353             | 0.0              |
| 375       | 1843             | 0.0              | 505       | 38336            | 10.7             | 635       | 61156            | 9.2              | 765       | 2593             | 0.0              | 895       | 1819             | 0.0              |
| 380       | 1796             | 0.0              | 510       | 43738            | 15.0             | 640       | 54795            | 6.5              | 770       | 2401             | 0.0              | 900       | 2024             | 0.0              |
| 385       | 1575             | 0.0              | 515       | 47977            | 19.9             | 645       | 49111            | 4.7              | 775       | 2233             | 0.0              | 905       | 1851             | 0.0              |
| 390       | 1527             | 0.0              | 520       | 51818            | 25.1             | 650       | 43533            | 3.2              | 780       | 2166             | 0.0              | 910       | 1602             | 0.0              |
| 395       | 1326             | 0.0              | 525       | 54890            | 29.5             | 655       | 38234            | 2.2              | 785       | 2051             | 0.0              | 915       | 2200             | 0.0              |
| 400       | 1233             | 0.0              | 530       | 57872            | 34.1             | 660       | 33754            | 1.4              | 790       | 1765             | 0.0              | 920       | 2530             | 0.0              |
| 405       | 1329             | 0.0              | 535       | 60410            | 37.5             | 665       | 29162            | 0.9              | 795       | 1903             | 0.0              | 925       | 2487             | 0.0              |
| 410       | 1902             | 0.0              | 540       | 62857            | 41.0             | 670       | 25117            | 0.5              | 800       | 2127             | 0.0              | 930       | 2089             | 0.0              |
| 415       | 3436             | 0.0              | 545       | 66165            | 44.0             | 675       | 21511            | 0.4              | 805       | 1867             | 0.0              | 935       | 2293             | 0.0              |
| 420       | 6571             | 0.0              | 550       | 70124            | 47.7             | 680       | 18435            | 0.2              | 810       | 1775             | 0.0              | 940       | 2315             | 0.0              |
| 425       | 12957            | 0.1              | 555       | 74973            | 51.2             | 685       | 16004            | 0.1              | 815       | 1812             | 0.0              | 945       | 2481             | 0.0              |
| 430       | 23376            | 0.2              | 560       | 80227            | 54.5             | 690       | 13701            | 0.1              | 820       | 1973             | 0.0              | 950       | 2701             | 0.0              |
| 435       | 38205            | 0.5              | 565       | 85358            | 56.8             | 695       | 11765            | 0.0              | 825       | 1773             | 0.0              | 955       | 2892             | 0.0              |
| 440       | 56691            | 0.9              | 570       | 90422            | 58.8             | 700       | 10145            | 0.0              | 830       | 1925             | 0.0              | 960       | 2609             | 0.0              |
| 445       | 67585            | 1.4              | 575       | 95259            | 59.3             | 705       | 8865             | 0.0              | 835       | 2001             | 0.0              | 965       | 3066             | 0.0              |
| 450       | 55963            | 1.5              | 580       | 99033            | 58.8             | 710       | 7954             | 0.0              | 840       | 2142             | 0.0              | 970       | 2566             | 0.0              |
| 455       | 35549            | 1.2              | 585       | 101572           | 56.4             | 715       | 7285             | 0.0              | 845       | 2101             | 0.0              | 975       | 2375             | 0.0              |
| 460       | 25268            | 1.0              | 590       | 103264           | 53.4             | 720       | 6412             | 0.0              | 850       | 2097             | 0.0              | 980       | 3526             | 0.0              |
| 465       | 18712            | 1.0              | 595       | 102194           | 48.4             | 725       | 5721             | 0.0              | 855       | 2090             | 0.0              | 985       | 2982             | 0.0              |
| 470       | 13835            | 0.9              | 600       | 100645           | 43.4             | 730       | 5017             | 0.0              | 860       | 2535             | 0.0              | 990       | 2305             | 0.0              |
| 475       | 12398            | 1.0              | 605       | 97644            | 37.8             | 735       | 4459             | 0.0              | 865       | 2101             | 0.0              | 995       | 3671             | 0.0              |
| 480       | 13406            | 1.3              | 610       | 92487            | 31.8             | 740       | 4062             | 0.0              | 870       | 1798             | 0.0              | 1000      | 2560             | 0.0              |
| 485       | 15865            | 1.9              | 615       | 87436            | 26.4             | 745       | 3636             | 0.0              | 875       | 2857             | 0.0              |           |                  |                  |

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### Scotopic Flux vs. Wavelength



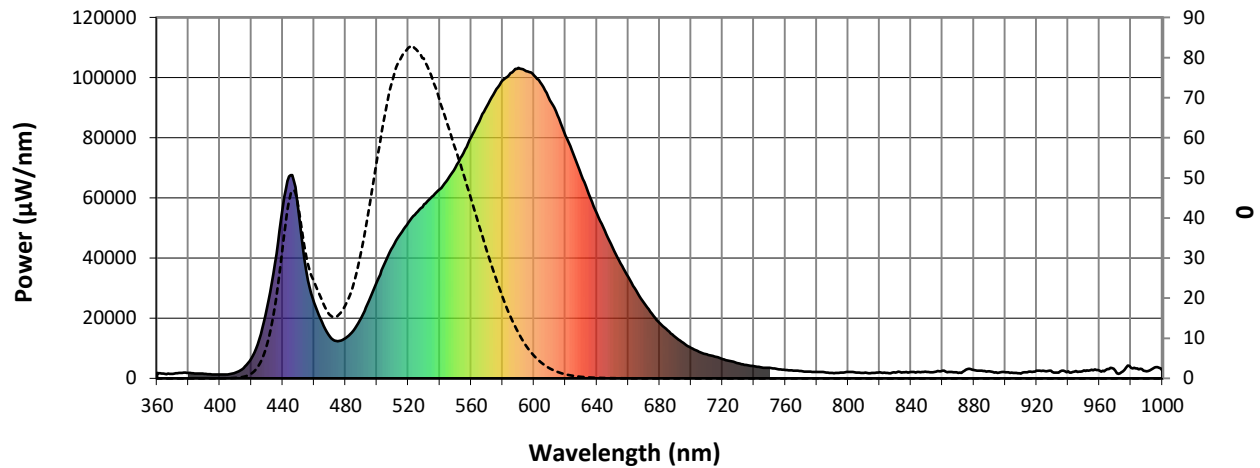
Scotopic Lumens: 7088.7

S/P: 1.35

| 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    | 1840          | 0.0           | 490    | 20271         | 31.2          | 620    | 80709         | 1.0           | 750    | 3465          | 0.0           | 880    | 2800          | 0.0           |
| 365    | 1514          | 0.0           | 495    | 25910         | 41.9          | 625    | 74695         | 0.6           | 755    | 3075          | 0.0           | 885    | 2582          | 0.0           |
| 370    | 1514          | 0.0           | 500    | 32216         | 53.9          | 630    | 67709         | 0.4           | 760    | 2794          | 0.0           | 890    | 2353          | 0.0           |
| 375    | 1843          | 0.0           | 505    | 38336         | 65.2          | 635    | 61156         | 0.2           | 765    | 2593          | 0.0           | 895    | 1819          | 0.0           |
| 380    | 1796          | 0.0           | 510    | 43738         | 74.1          | 640    | 54795         | 0.1           | 770    | 2401          | 0.0           | 900    | 2024          | 0.0           |
| 385    | 1575          | 0.0           | 515    | 47977         | 79.5          | 645    | 49111         | 0.1           | 775    | 2233          | 0.0           | 905    | 1851          | 0.0           |
| 390    | 1527          | 0.0           | 520    | 51818         | 82.4          | 650    | 43533         | 0.1           | 780    | 2166          | 0.0           | 910    | 1602          | 0.0           |
| 395    | 1326          | 0.0           | 525    | 54890         | 82.1          | 655    | 38234         | 0.0           | 785    | 2051          | 0.0           | 915    | 2200          | 0.0           |
| 400    | 1233          | 0.0           | 530    | 57872         | 79.8          | 660    | 33754         | 0.0           | 790    | 1765          | 0.0           | 920    | 2530          | 0.0           |
| 405    | 1329          | 0.0           | 535    | 60410         | 75.3          | 665    | 29162         | 0.0           | 795    | 1903          | 0.0           | 925    | 2487          | 0.0           |
| 410    | 1902          | 0.1           | 540    | 62857         | 69.5          | 670    | 25117         | 0.0           | 800    | 2127          | 0.0           | 930    | 2089          | 0.0           |
| 415    | 3436          | 0.4           | 545    | 66165         | 63.4          | 675    | 21511         | 0.0           | 805    | 1867          | 0.0           | 935    | 2293          | 0.0           |
| 420    | 6571          | 1.1           | 550    | 70124         | 57.3          | 680    | 18435         | 0.0           | 810    | 1775          | 0.0           | 940    | 2315          | 0.0           |
| 425    | 12957         | 3.2           | 555    | 74973         | 51.2          | 685    | 16004         | 0.0           | 815    | 1812          | 0.0           | 945    | 2481          | 0.0           |
| 430    | 23376         | 8.0           | 560    | 80227         | 44.8          | 690    | 13701         | 0.0           | 820    | 1973          | 0.0           | 950    | 2701          | 0.0           |
| 435    | 38205         | 17.1          | 565    | 85358         | 38.3          | 695    | 11765         | 0.0           | 825    | 1773          | 0.0           | 955    | 2892          | 0.0           |
| 440    | 56691         | 31.7          | 570    | 90422         | 31.9          | 700    | 10145         | 0.0           | 830    | 1925          | 0.0           | 960    | 2609          | 0.0           |
| 445    | 67585         | 45.3          | 575    | 95259         | 25.9          | 705    | 8865          | 0.0           | 835    | 2001          | 0.0           | 965    | 3066          | 0.0           |
| 450    | 55963         | 43.4          | 580    | 99033         | 20.4          | 710    | 7954          | 0.0           | 840    | 2142          | 0.0           | 970    | 2566          | 0.0           |
| 455    | 35549         | 31.1          | 585    | 101572        | 15.5          | 715    | 7285          | 0.0           | 845    | 2101          | 0.0           | 975    | 2375          | 0.0           |
| 460    | 25268         | 24.4          | 590    | 103264        | 11.5          | 720    | 6412          | 0.0           | 850    | 2097          | 0.0           | 980    | 3526          | 0.0           |
| 465    | 18712         | 19.8          | 595    | 102194        | 8.1           | 725    | 5721          | 0.0           | 855    | 2090          | 0.0           | 985    | 2982          | 0.0           |
| 470    | 13835         | 15.9          | 600    | 100645        | 5.7           | 730    | 5017          | 0.0           | 860    | 2535          | 0.0           | 990    | 2305          | 0.0           |
| 475    | 12398         | 15.5          | 605    | 97644         | 3.8           | 735    | 4459          | 0.0           | 865    | 2101          | 0.0           | 995    | 3671          | 0.0           |
| 480    | 13406         | 18.1          | 610    | 92487         | 2.5           | 740    | 4062          | 0.0           | 870    | 1798          | 0.0           | 1000   | 2560          | 0.0           |
| 485    | 15865         | 23.0          | 615    | 87436         | 1.6           | 745    | 3636          | 0.0           | 875    | 2857          | 0.0           |        |               |               |

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### Melanopic Flux vs. Wavelength



Melanopic Lumens: 2621

M/P: 0.5

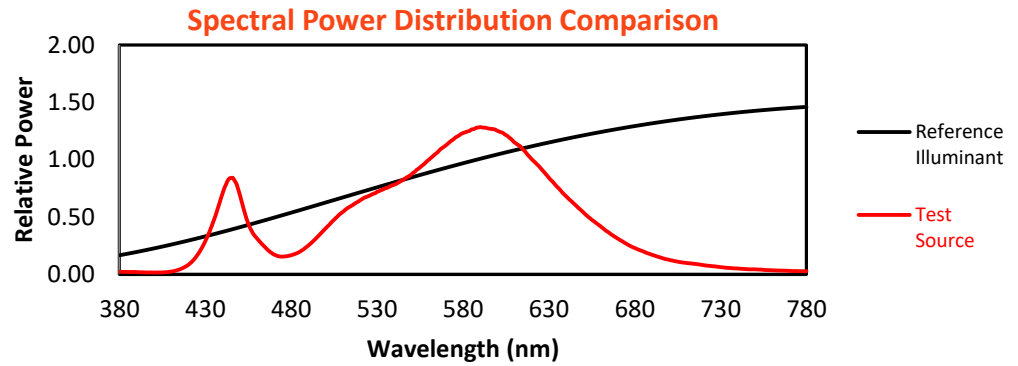
| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 1840             | 0.0              | 490       | 20271            | 16.9             | 620       | 80709            | 0.1              | 750       | 3465             | 0.0              | 880       | 2800             | 0.0              |
| 365       | 1514             | 0.0              | 495       | 25910            | 21.4             | 625       | 74695            | 0.0              | 755       | 3075             | 0.0              | 885       | 2582             | 0.0              |
| 370       | 1514             | 0.0              | 500       | 32216            | 25.9             | 630       | 67709            | 0.0              | 760       | 2794             | 0.0              | 890       | 2353             | 0.0              |
| 375       | 1843             | 0.0              | 505       | 38336            | 29.4             | 635       | 61156            | 0.0              | 765       | 2593             | 0.0              | 895       | 1819             | 0.0              |
| 380       | 1796             | 0.0              | 510       | 43738            | 31.4             | 640       | 54795            | 0.0              | 770       | 2401             | 0.0              | 900       | 2024             | 0.0              |
| 385       | 1575             | 0.0              | 515       | 47977            | 31.3             | 645       | 49111            | 0.0              | 775       | 2233             | 0.0              | 905       | 1851             | 0.0              |
| 390       | 1527             | 0.0              | 520       | 51818            | 30.2             | 650       | 43533            | 0.0              | 780       | 2166             | 0.0              | 910       | 1602             | 0.0              |
| 395       | 1326             | 0.0              | 525       | 54890            | 27.8             | 655       | 38234            | 0.0              | 785       | 2051             | 0.0              | 915       | 2200             | 0.0              |
| 400       | 1233             | 0.0              | 530       | 57872            | 25.0             | 660       | 33754            | 0.0              | 790       | 1765             | 0.0              | 920       | 2530             | 0.0              |
| 405       | 1329             | 0.0              | 535       | 60410            | 21.7             | 665       | 29162            | 0.0              | 795       | 1903             | 0.0              | 925       | 2487             | 0.0              |
| 410       | 1902             | 0.1              | 540       | 62857            | 18.4             | 670       | 25117            | 0.0              | 800       | 2127             | 0.0              | 930       | 2089             | 0.0              |
| 415       | 3436             | 0.2              | 545       | 66165            | 15.4             | 675       | 21511            | 0.0              | 805       | 1867             | 0.0              | 935       | 2293             | 0.0              |
| 420       | 6571             | 0.8              | 550       | 70124            | 12.6             | 680       | 18435            | 0.0              | 810       | 1775             | 0.0              | 940       | 2315             | 0.0              |
| 425       | 12957            | 2.0              | 555       | 74973            | 10.1             | 685       | 16004            | 0.0              | 815       | 1812             | 0.0              | 945       | 2481             | 0.0              |
| 430       | 23376            | 4.9              | 560       | 80227            | 7.9              | 690       | 13701            | 0.0              | 820       | 1973             | 0.0              | 950       | 2701             | 0.0              |
| 435       | 38205            | 10.2             | 565       | 85358            | 6.0              | 695       | 11765            | 0.0              | 825       | 1773             | 0.0              | 955       | 2892             | 0.0              |
| 440       | 56691            | 18.9             | 570       | 90422            | 4.4              | 700       | 10145            | 0.0              | 830       | 1925             | 0.0              | 960       | 2609             | 0.0              |
| 445       | 67585            | 26.7             | 575       | 95259            | 3.2              | 705       | 8865             | 0.0              | 835       | 2001             | 0.0              | 965       | 3066             | 0.0              |
| 450       | 55963            | 25.8             | 580       | 99033            | 2.2              | 710       | 7954             | 0.0              | 840       | 2142             | 0.0              | 970       | 2566             | 0.0              |
| 455       | 35549            | 18.6             | 585       | 101572           | 1.5              | 715       | 7285             | 0.0              | 845       | 2101             | 0.0              | 975       | 2375             | 0.0              |
| 460       | 25268            | 14.9             | 590       | 103264           | 1.0              | 720       | 6412             | 0.0              | 850       | 2097             | 0.0              | 980       | 3526             | 0.0              |
| 465       | 18712            | 12.2             | 595       | 102194           | 0.7              | 725       | 5721             | 0.0              | 855       | 2090             | 0.0              | 985       | 2982             | 0.0              |
| 470       | 13835            | 9.9              | 600       | 100645           | 0.4              | 730       | 5017             | 0.0              | 860       | 2535             | 0.0              | 990       | 2305             | 0.0              |
| 475       | 12398            | 9.5              | 605       | 97644            | 0.3              | 735       | 4459             | 0.0              | 865       | 2101             | 0.0              | 995       | 3671             | 0.0              |
| 480       | 13406            | 10.8             | 610       | 92487            | 0.2              | 740       | 4062             | 0.0              | 870       | 1798             | 0.0              | 1000      | 2560             | 0.0              |
| 485       | 15865            | 13.1             | 615       | 87436            | 0.1              | 745       | 3636             | 0.0              | 875       | 2857             | 0.0              |           |                  |                  |

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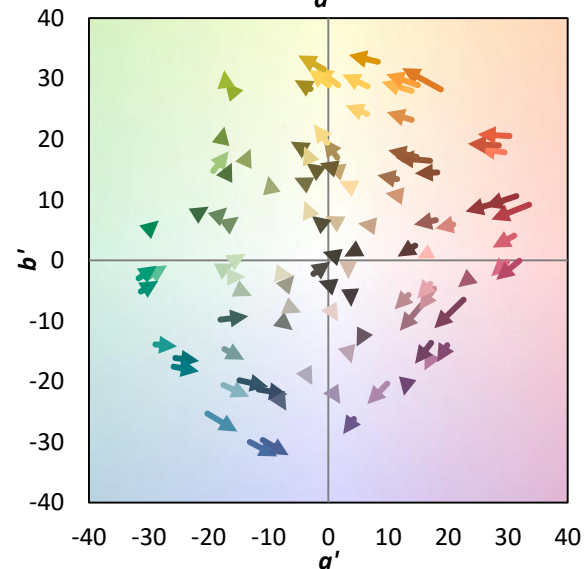
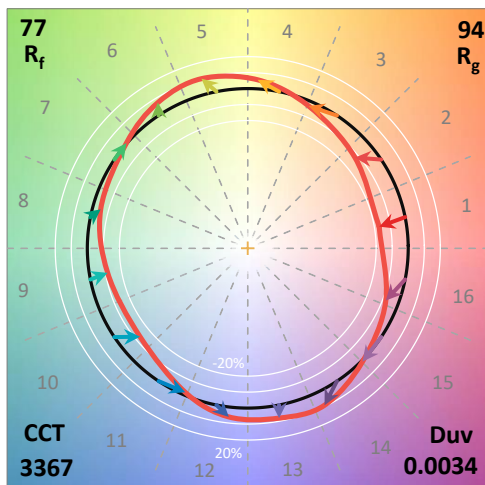
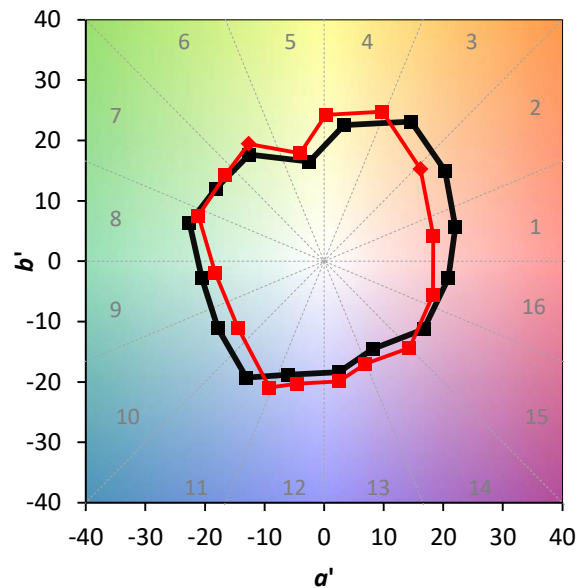
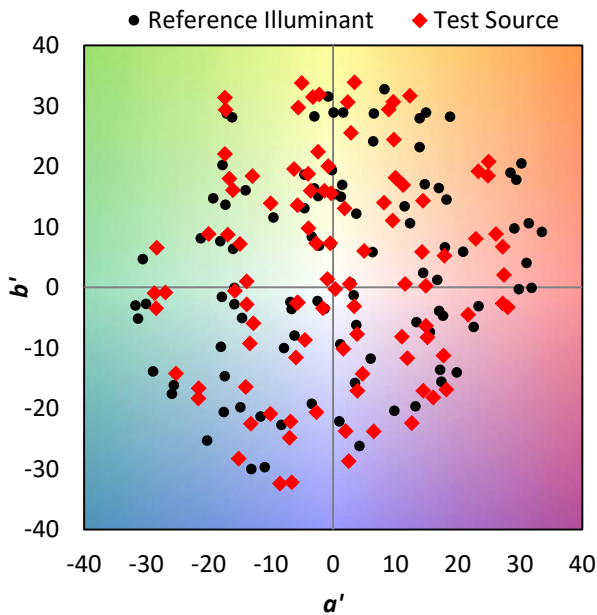
TM-30-18

### Summary

$R_f = 77.2$   
 $R_g = 94.4$   
 CIE  $R_a = 73.3$   
 $R_g = -34.3$



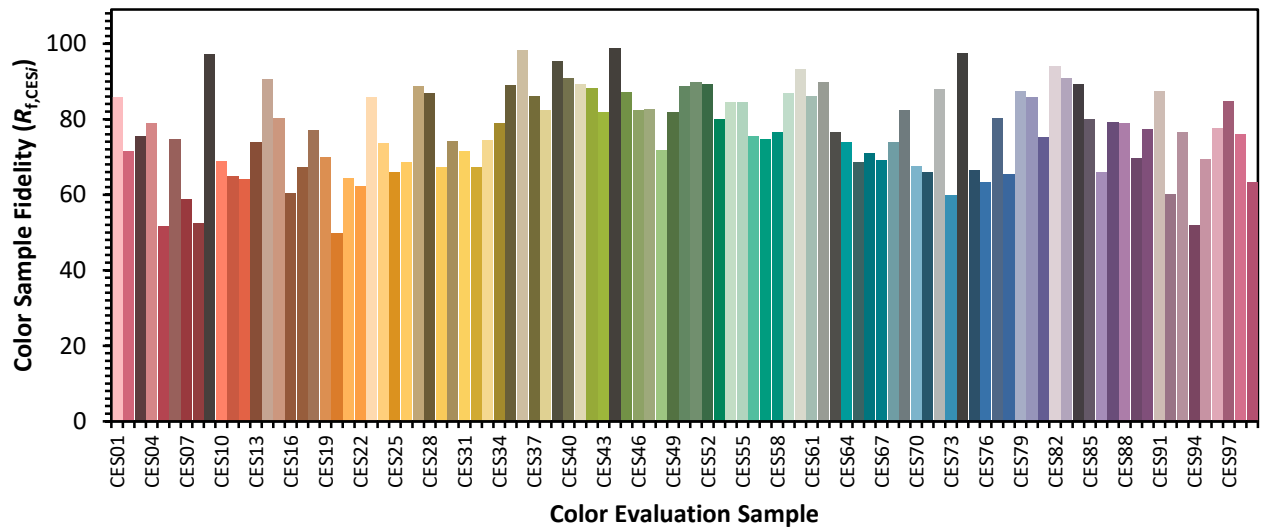
### Color Vector Graphics



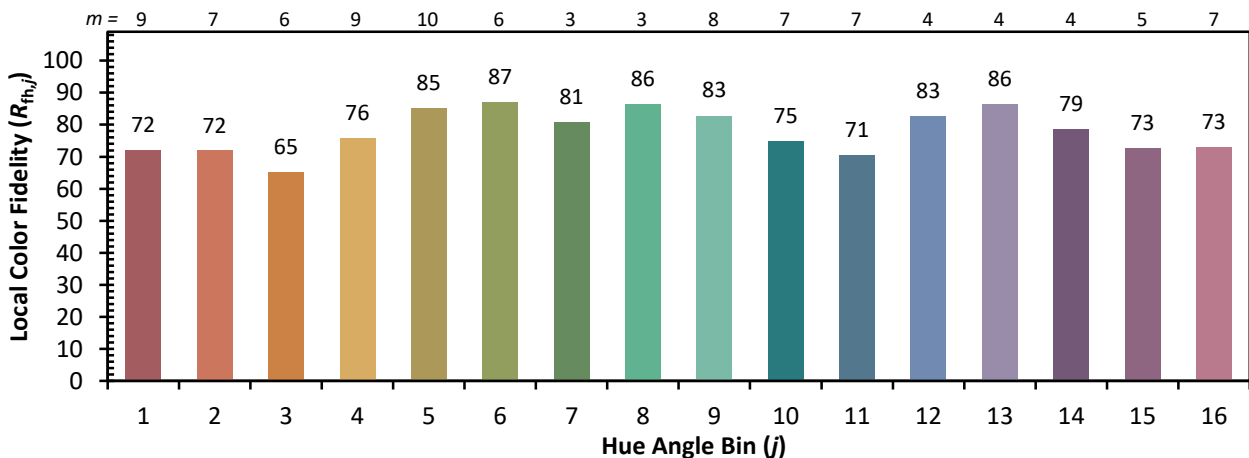
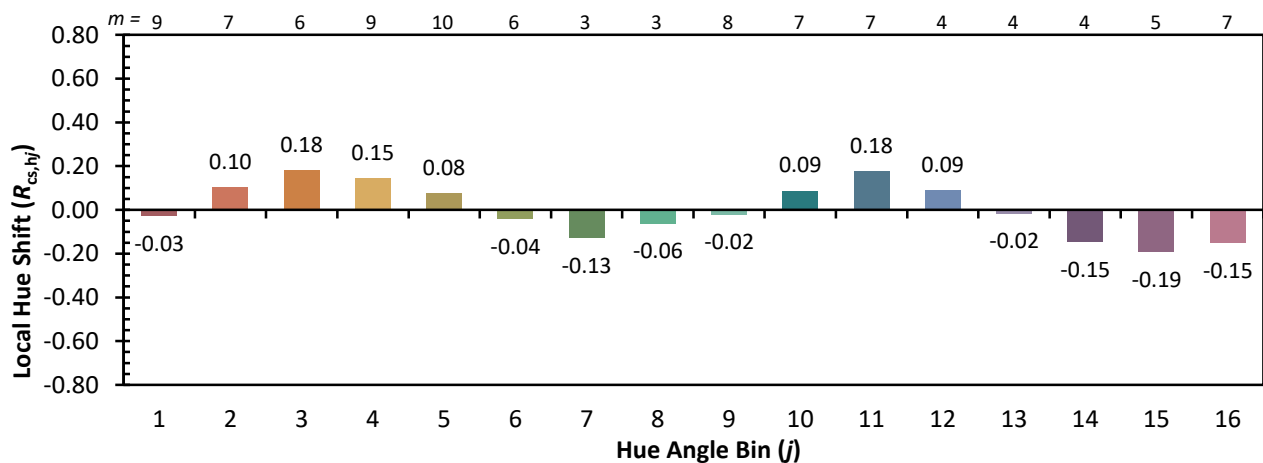
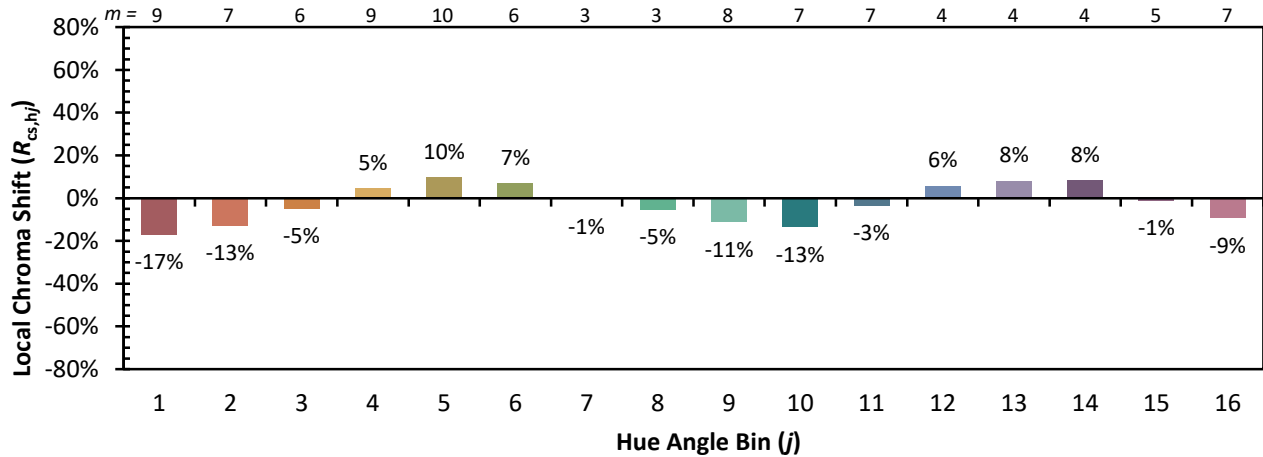


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

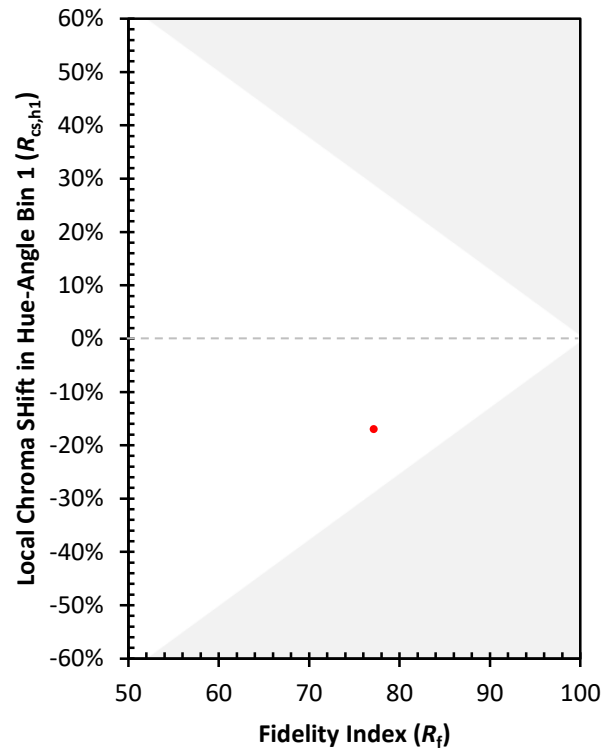
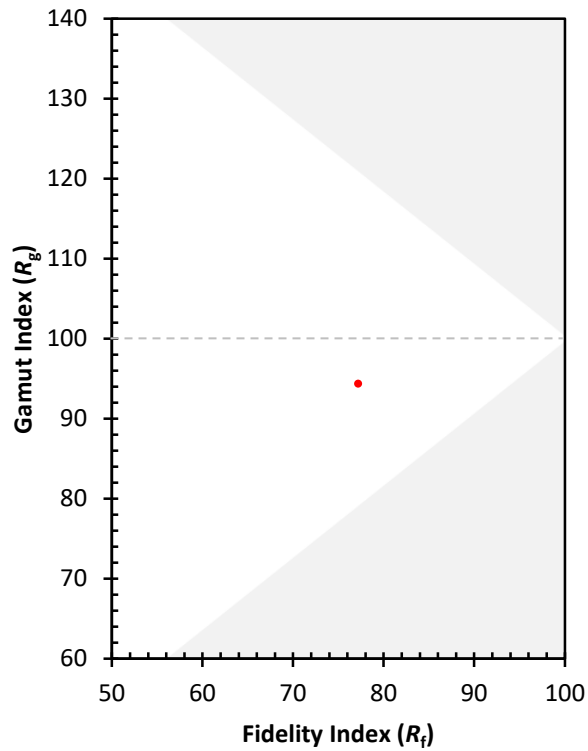
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 69 | CES51 = 90 | CES76 = 63 |
| CES02 = 62 | CES27 = 89 | CES52 = 89 | CES77 = 80 |
| CES03 = 31 | CES28 = 87 | CES53 = 80 | CES78 = 65 |
| CES04 = 70 | CES29 = 67 | CES54 = 85 | CES79 = 87 |
| CES05 = 48 | CES30 = 74 | CES55 = 84 | CES80 = 86 |
| CES06 = 51 | CES31 = 71 | CES56 = 76 | CES81 = 75 |
| CES07 = 41 | CES32 = 67 | CES57 = 75 | CES82 = 94 |
| CES08 = 39 | CES33 = 75 | CES58 = 77 | CES83 = 91 |
| CES09 = 29 | CES34 = 79 | CES59 = 87 | CES84 = 89 |
| CES10 = 75 | CES35 = 89 | CES60 = 93 | CES85 = 80 |
| CES11 = 58 | CES36 = 98 | CES61 = 86 | CES86 = 66 |
| CES12 = 64 | CES37 = 86 | CES62 = 90 | CES87 = 79 |
| CES13 = 43 | CES38 = 82 | CES63 = 77 | CES88 = 79 |
| CES14 = 74 | CES39 = 95 | CES64 = 74 | CES89 = 70 |
| CES15 = 71 | CES40 = 91 | CES65 = 69 | CES90 = 77 |
| CES16 = 47 | CES41 = 89 | CES66 = 71 | CES91 = 87 |
| CES17 = 50 | CES42 = 88 | CES67 = 69 | CES92 = 60 |
| CES18 = 56 | CES43 = 82 | CES68 = 74 | CES93 = 76 |
| CES19 = 72 | CES44 = 99 | CES69 = 82 | CES94 = 52 |
| CES20 = 65 | CES45 = 87 | CES70 = 67 | CES95 = 69 |
| CES21 = 86 | CES46 = 82 | CES71 = 66 | CES96 = 78 |
| CES22 = 79 | CES47 = 83 | CES72 = 88 | CES97 = 85 |
| CES23 = 92 | CES48 = 72 | CES73 = 60 | CES98 = 76 |
| CES24 = 91 | CES49 = 82 | CES74 = 97 | CES99 = 63 |
| CES25 = 72 | CES50 = 89 | CES75 = 67 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)