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

Scaled data based on original data using

LM-79-2019 Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Test Report Prepared for

Cooper Lighting Solutions

Brand: McGRAW-EDISON

Report Number: P631047

Luminaire Tested: GWS-SA1E-830-U-SL2-W

Issue Date: 1/10/2023

Report Generated By 670246102 / DESKTOP-G35701P

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

Scaled Data Report

**Test Information**

| | |
|---|---|
| Test Method: | LM-79-2019 |
| Report Number: | P631047 |
| | TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-27) |
| Test Lab: | COOPER LIGHTING SOLUTIONS |
| Issue Date: | 1/10/2023 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS |
| Product Line: | McGRAW-EDISON |
| Catalog Number: | GWS-SA1E-830-U-SL2-W |
| Description: | GALLEON WALL SLIM LUMINAIRE. (1) LIGHTSQUARES WITH 16 LEDS EACH AND TYPE II SPILL LIGHT ELIMINATOR OPTICS |
| Light Source: | (16) 3000K CCT, 80 CRI LEDS |
| Ballast/Driver: | - |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 5915.3 lumens |
| Efficiency: | N/A |
| Efficacy: | 101.3 lumens/watt |
| Luminous Opening: | Rectangular (W 0.5' x L: 0.5' x H: 0') |
| IES Classification: | Type II - Short |
| BUG Rating: | B1 - U0 - G2 |

| | |
|---|---|
| Input Watts (W): | 58.4 |
| Input Voltage (V): | 120 |
| Input Current (Ain): | NR |
| Voltage Rise (V): | NR |
| Power Factor: | NR |
| Total Harmonic Distortion (THDi): | NR |
| Frequency (hertz): | 0 |
| Stabilization Time: | NR |
| Operation Time: | NR |
| Ambient Temperature (°C): | NR |
| Test Distance: | 28.75 FT |

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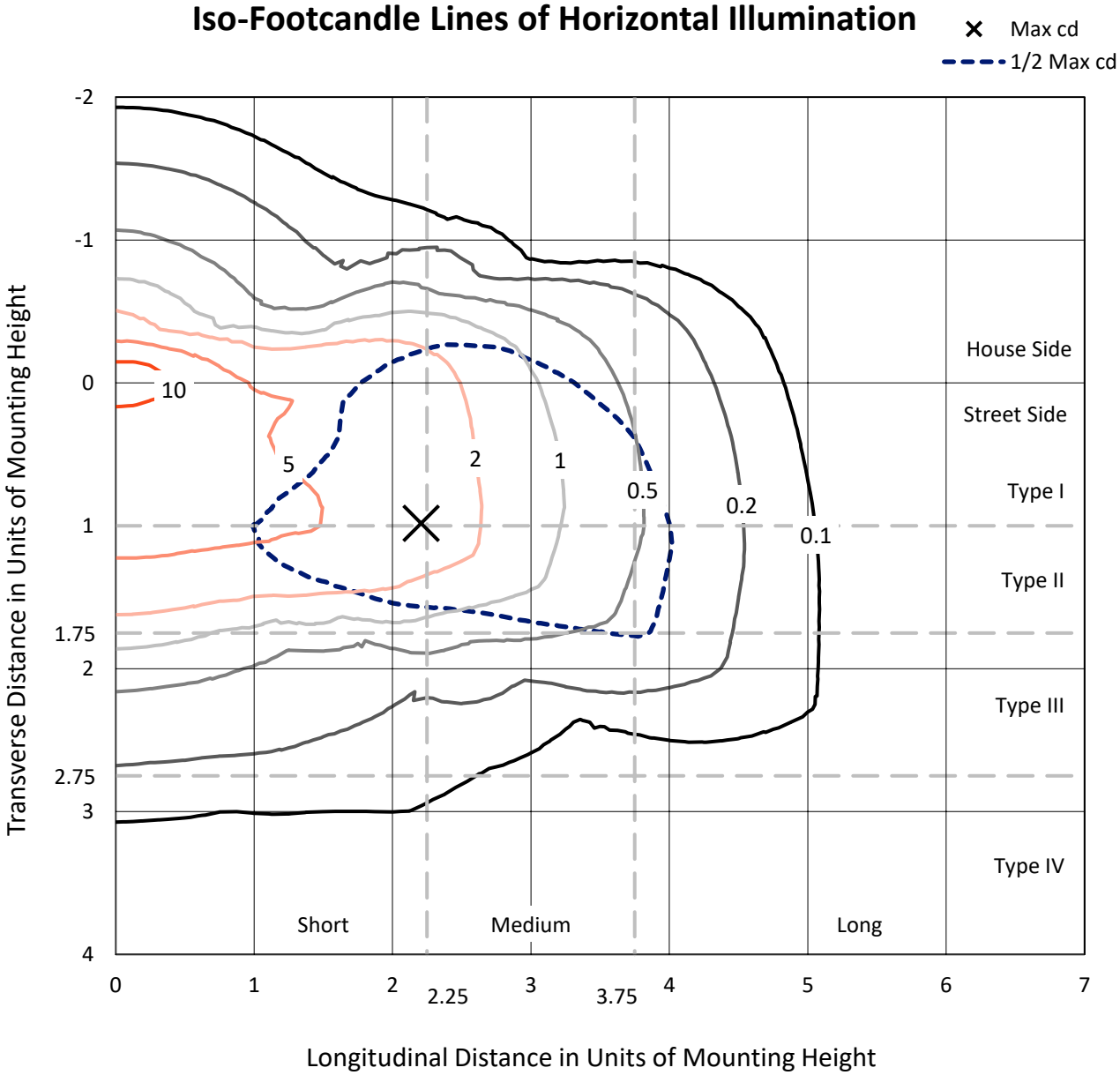
Scaled Data Report

REPORT NUMBER: P631047
CATALOG NUMBER: GWS-SA1E-830-U-SL2-W

## Iso-Footcandle Lines of Horizontal Illumination




Based on 10 foot mounting height. Maximum calculated value = 13.1 fc
Type II - Short - N/A

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REPORT NUMBER: P631047
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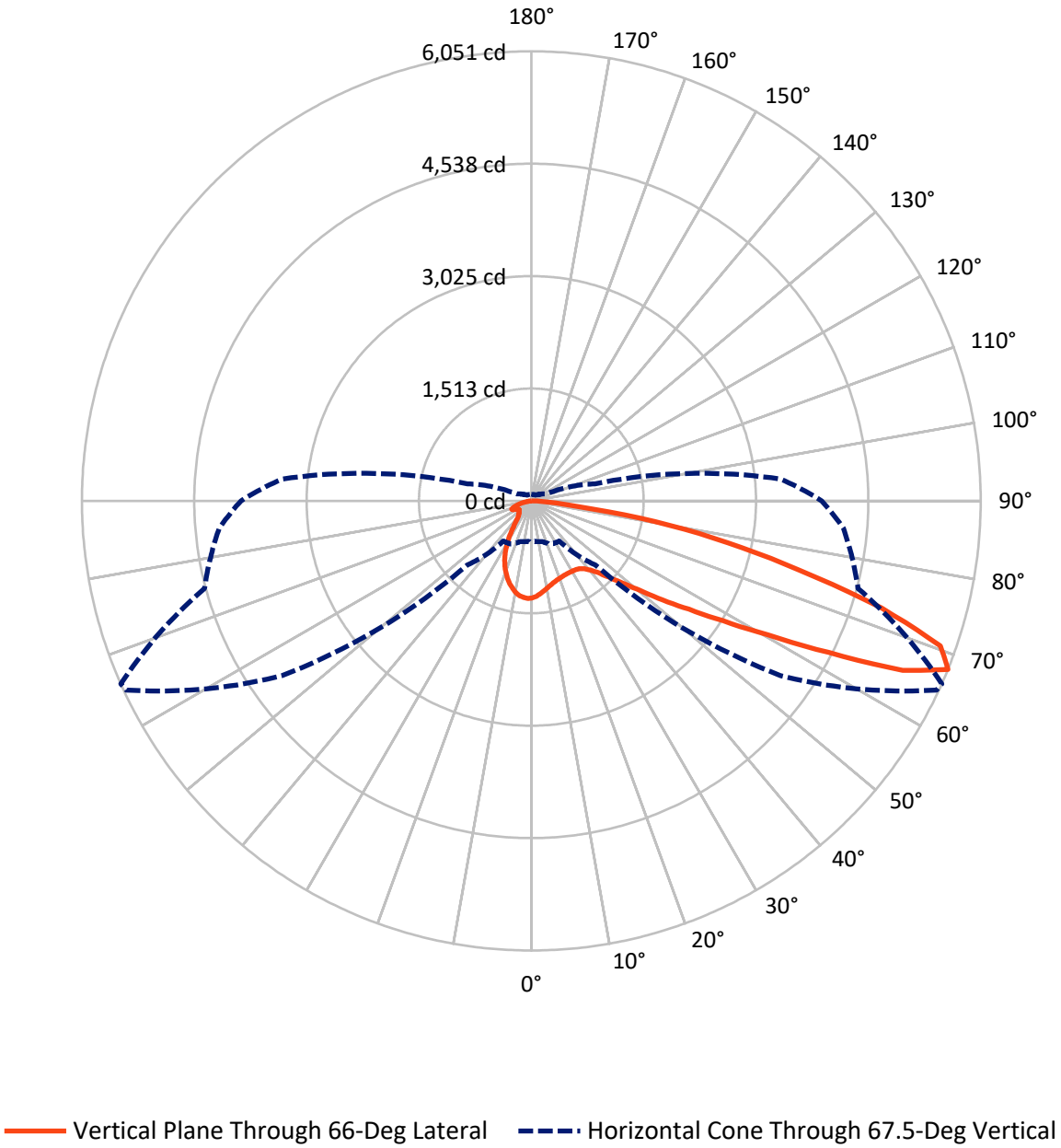
## Luminous Intensity Polar Plot



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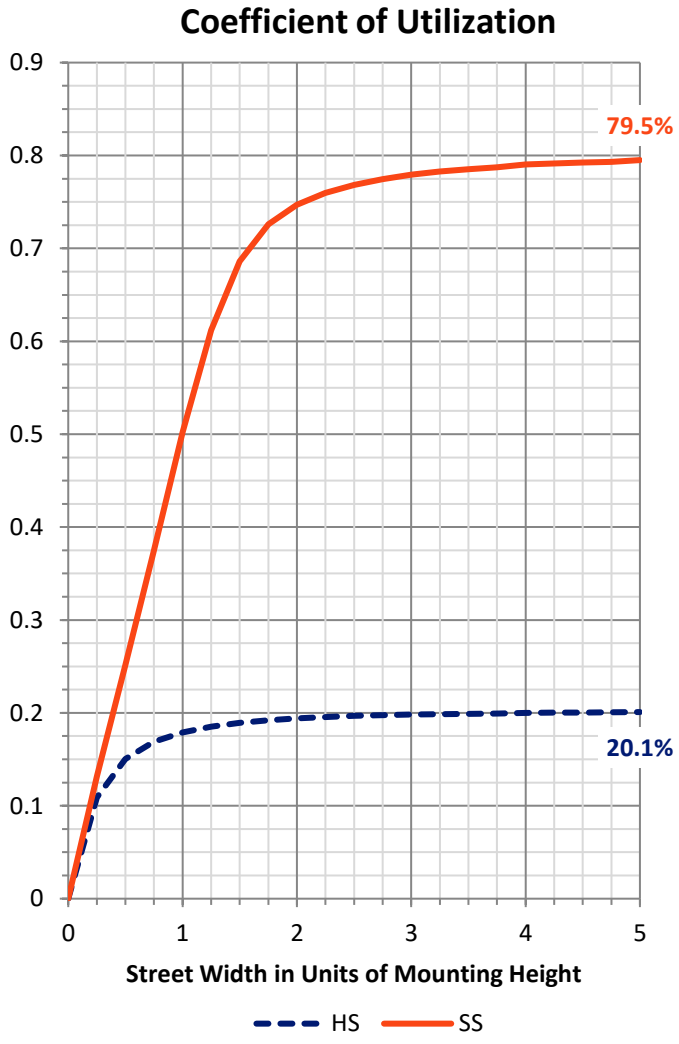
REPORT NUMBER: P631047
CATALOG NUMBER: GWS-SA1E-830-U-SL2-W

**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 1200.4 | 0.0 | 1200.4 |
| | % Fixture | 20.3 | 0.0 | 20.3 |
| **Street Side** | Lumens | 4714.9 | 0.0 | 4714.9 |
| | % Fixture | 79.7 | 0.0 | 79.7 |
| **Total** | Lumens | 5915.3 | 0.0 | 5915.3 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 114.7 | 1.9 |
| 10°-20° | 281.9 | 4.8 |
| 20°-30° | 387.5 | 6.6 |
| 30°-40° | 529.8 | 9.0 |
| 40°-50° | 802.8 | 13.6 |
| 50°-60° | 1248.0 | 21.1 |
| 60°-70° | 1519.4 | 25.7 |
| 70°-80° | 925.5 | 15.6 |
| 80°-90° | 105.7 | 1.8 |
| 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° | 5915.3 | 100.0 |
| 0°-180° | 5915.3 | 100.0 |



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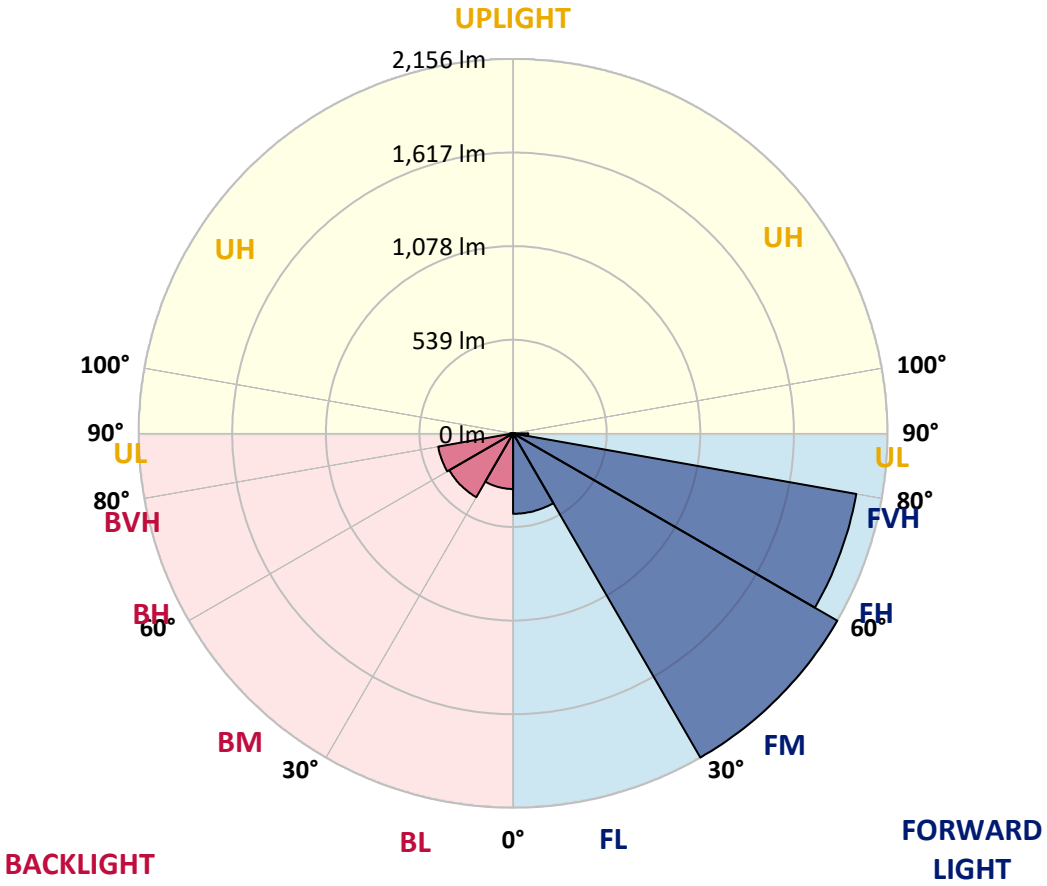
REPORT NUMBER: P631047
CATALOG NUMBER: GWS-SA1E-830-U-SL2-W

## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 463.5 | 7.8 | | | |
| FM | (30°-60°) | 2156.4 | 36.5 | | | |
| FH | (60°-80°) | 2007.2 | 33.9 | | | G2/5000 |
| FVH | (80°-90°) | 87.9 | 1.5 | | | G1/100 |
| BL | (0°-30°) | 320.7 | 5.4 | B1/500 | | |
| BM | (30°-60°) | 424.2 | 7.2 | B1/1000 | | |
| BH | (60°-80°) | 437.7 | 7.4 | B1/500 | | G1/500 |
| BVH | (80°-90°) | 17.8 | 0.3 | | | 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 II Short



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REPORT NUMBER: P631047
CATALOG NUMBER: GWS-SA1E-830-U-SL2-W

**CANDELA DISTRIBUTION (FULL):**

| | 0° | 5° | 15° | 25° | 35° | 45° | 55° | 65° | 66° | 75° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 1307.1 | 1307.1 | 1307.1 | 1307.1 | 1307.1 | 1307.1 | 1307.1 | 1307.1 | *1307.1* | 1307.1 | 1307.1 |
| 2.5° | 1224.3 | 1228.6 | 1226.0 | 1242.4 | 1243.2 | 1264.0 | 1275.6 | 1285.5 | *1286.4* | 1299.3 | 1308.0 |
| 5° | 1140.5 | 1143.1 | 1143.1 | 1158.7 | 1169.0 | 1196.6 | 1223.4 | 1251.9 | *1254.0* | 1285.1 | 1308.8 |
| 7.5° | 1072.8 | 1075.4 | 1073.7 | 1094.4 | 1107.7 | 1138.4 | 1172.5 | 1216.1 | *1220.4* | 1270.4 | 1311.9 |
| 10° | 1019.7 | 1018.8 | 1023.2 | 1042.2 | 1059.4 | 1096.1 | 1134.1 | 1183.7 | *1190.2* | 1253.6 | 1315.3 |
| 12.5° | 983.5 | 984.3 | 986.9 | 1006.8 | 1025.3 | 1061.6 | 1100.8 | 1154.8 | *1161.7* | 1234.2 | 1313.6 |
| 15° | 966.2 | 964.5 | 966.6 | 984.8 | 1002.5 | 1034.4 | 1074.9 | 1130.6 | *1137.5* | 1216.9 | 1314.0 |
| 17.5° | 962.3 | 961.0 | 960.6 | 973.5 | 986.9 | 1016.7 | 1055.5 | 1112.1 | *1119.4* | 1205.7 | 1316.6 |
| 20° | 974.4 | 972.7 | 967.9 | 973.5 | 979.1 | 1004.2 | 1041.7 | 1098.7 | *1106.9* | 1198.4 | 1321.8 |
| 22.5° | 1007.6 | 1004.6 | 997.3 | 990.4 | 983.0 | 998.1 | 1033.1 | 1088.8 | *1097.0* | 1193.6 | 1327.0 |
| 25° | 1058.1 | 1055.5 | 1047.8 | 1032.2 | 1005.5 | 1002.9 | 1031.4 | 1084.4 | *1092.6* | 1190.2 | 1329.1 |
| 27.5° | 1127.6 | 1123.7 | 1115.9 | 1093.5 | 1049.9 | 1020.6 | 1037.8 | 1084.0 | *1091.8* | 1186.3 | 1327.0 |
| 30° | 1210.0 | 1207.4 | 1203.1 | 1175.9 | 1117.7 | 1058.1 | 1052.5 | 1087.5 | *1093.5* | 1184.1 | 1322.6 |
| 32.5° | 1293.7 | 1291.1 | 1294.6 | 1281.7 | 1210.0 | 1120.3 | 1084.4 | 1097.0 | *1101.3* | 1183.7 | 1318.8 |
| 35° | 1367.5 | 1370.5 | 1395.6 | 1397.7 | 1327.4 | 1204.4 | 1134.9 | 1119.0 | *1119.8* | 1192.3 | 1320.5 |
| 37.5° | 1444.8 | 1456.4 | 1489.2 | 1517.3 | 1458.6 | 1315.7 | 1210.0 | 1160.4 | *1159.5* | 1214.3 | 1331.3 |
| 40° | 1547.0 | 1552.2 | 1594.1 | 1646.7 | 1610.0 | 1468.5 | 1316.6 | 1228.1 | *1222.1* | 1259.2 | 1360.2 |
| 42.5° | 1646.7 | 1659.2 | 1726.1 | 1786.5 | 1774.5 | 1640.7 | 1450.8 | 1329.6 | *1318.8* | 1338.6 | 1419.7 |
| 45° | 1773.6 | 1785.7 | 1860.8 | 1938.4 | 1960.5 | 1835.3 | 1622.6 | 1473.7 | *1462.9* | 1458.1 | 1528.9 |
| 47.5° | 1900.5 | 1913.0 | 1980.3 | 2092.5 | 2169.7 | 2078.7 | 1846.1 | 1664.0 | *1646.3* | 1627.7 | 1693.8 |
| 50° | 1985.9 | 2000.6 | 2064.9 | 2199.5 | 2380.8 | 2382.5 | 2111.1 | 1913.4 | *1891.0* | 1861.6 | 1925.9 |
| 52.5° | 1982.9 | 1992.4 | 2053.7 | 2209.0 | 2532.7 | 2731.6 | 2465.8 | 2231.0 | *2212.9* | 2149.0 | 2205.1 |
| 55° | 1827.1 | 1841.4 | 1903.1 | 2097.3 | 2549.1 | 3062.6 | 2987.1 | 2605.6 | *2573.2* | 2458.9 | 2520.6 |
| 57.5° | 1514.2 | 1526.3 | 1588.5 | 1828.0 | 2403.6 | 3232.2 | 3649.0 | 3082.9 | *3038.4* | 2796.3 | 2867.5 |
| 60° | 1143.1 | 1128.5 | 1157.8 | 1367.5 | 2055.8 | 3236.5 | 4233.3 | 3730.2 | *3655.9* | 3157.1 | 3216.6 |
| 62.5° | 857.9 | 843.2 | 849.7 | 908.8 | 1393.9 | 2975.0 | 4566.5 | 4615.7 | *4493.1* | 3564.5 | 3552.8 |
| 65° | 677.9 | 669.7 | 688.3 | 728.9 | 812.6 | 2265.5 | 4569.1 | 5573.2 | *5496.0* | 4036.6 | 3897.6 |
| 67.5° | *552.4* | *547.2* | *566.2* | *641.3* | *659.0* | *1217.4* | *4097.0* | *6020.3* | *6050.5* | *4553.5* | *4217.4* |
| 70° | 444.9 | 437.1 | 466.9 | 565.7 | 612.8 | 736.6 | 2934.9 | 5792.5 | *5841.2* | 4861.7 | 4127.2 |
| 72.5° | 307.3 | 307.7 | 322.8 | 458.3 | 591.6 | 636.1 | 1660.1 | 4823.2 | *4929.0* | 4582.4 | 3628.3 |
| 75° | 207.1 | 208.9 | 213.2 | 302.5 | 545.0 | 617.1 | 884.6 | 3651.6 | *3726.3* | 3787.6 | 2999.2 |
| 77.5° | 125.1 | 126.0 | 135.9 | 183.0 | 375.9 | 576.1 | 599.4 | 2647.0 | *2705.7* | 2496.8 | 1859.0 |
| 80° | 72.5 | 75.5 | 84.6 | 122.6 | 253.7 | 432.8 | 463.9 | 1623.0 | *1689.5* | 1109.9 | 590.8 |
| 82.5° | 31.9 | 34.1 | 46.2 | 71.2 | 148.0 | 368.1 | 362.1 | 641.3 | *631.8* | 309.4 | 205.0 |
| 85° | 5.6 | 6.9 | 9.9 | 22.4 | 54.4 | 194.2 | 280.9 | 283.1 | *266.3* | 117.4 | 85.0 |
| 87.5° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.3 | 42.3 | 75.9 | *75.5* | 33.2 | 29.3 |
| 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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Scaled Data Report

REPORT NUMBER: P631047
CATALOG NUMBER: GWS-SA1E-830-U-SL2-W

**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 1307.1 | 1307.1 | 1307.1 | 1307.1 | 1307.1 | 1307.1 | 1307.1 | 1307.1 | 1307.1 | 1307.1 | 1307.1 |
| 2.5° | 1313.6 | 1301.9 | 1312.3 | 1313.6 | 1311.4 | 1309.7 | 1296.8 | 1285.5 | 1284.2 | 1272.2 | 1272.2 |
| 5° | 1318.3 | 1307.5 | 1312.7 | 1302.8 | 1287.3 | 1271.3 | 1243.7 | 1224.7 | 1216.1 | 1200.5 | 1200.5 |
| 7.5° | 1324.8 | 1313.6 | 1307.5 | 1282.9 | 1246.7 | 1211.7 | 1167.3 | 1130.2 | 1115.1 | 1093.1 | 1092.2 |
| 10° | 1330.8 | 1316.6 | 1295.9 | 1248.0 | 1190.2 | 1134.5 | 1069.8 | 1017.1 | 981.3 | 955.0 | 955.0 |
| 12.5° | 1330.4 | 1311.9 | 1270.9 | 1200.1 | 1120.3 | 1039.6 | 953.3 | 873.9 | 826.4 | 785.4 | 782.8 |
| 15° | 1329.6 | 1304.1 | 1238.9 | 1144.4 | 1038.7 | 926.9 | 809.6 | 706.0 | 635.6 | 595.5 | 592.1 |
| 17.5° | 1328.7 | 1294.2 | 1203.1 | 1081.0 | 939.4 | 787.1 | 632.2 | 520.0 | 461.3 | 436.7 | 437.6 |
| 20° | 1328.7 | 1282.9 | 1164.7 | 1008.1 | 825.1 | 619.7 | 463.9 | 382.3 | 367.7 | 369.0 | 370.3 |
| 22.5° | 1324.8 | 1269.1 | 1122.0 | 928.7 | 697.8 | 455.7 | 342.2 | 314.6 | 322.4 | 334.4 | 336.2 |
| 25° | 1315.7 | 1246.3 | 1072.4 | 840.6 | 546.3 | 331.8 | 279.2 | 274.0 | 288.3 | 303.4 | 307.7 |
| 27.5° | 1301.5 | 1219.9 | 1016.7 | 737.5 | 402.2 | 266.7 | 245.5 | 245.1 | 256.3 | 267.6 | 271.4 |
| 30° | 1286.4 | 1190.6 | 958.0 | 622.7 | 291.3 | 232.2 | 224.0 | 224.0 | 229.6 | 236.5 | 235.6 |
| 32.5° | 1268.7 | 1160.8 | 895.0 | 503.2 | 237.3 | 212.7 | 210.2 | 208.9 | 209.7 | 212.3 | 212.3 |
| 35° | 1253.6 | 1134.5 | 830.3 | 376.7 | 212.7 | 202.0 | 199.4 | 196.3 | 195.1 | 193.3 | 194.2 |
| 37.5° | 1248.0 | 1113.8 | 763.4 | 283.9 | 200.7 | 194.2 | 189.9 | 185.6 | 182.5 | 181.7 | 181.2 |
| 40° | 1257.1 | 1105.2 | 696.5 | 233.9 | 192.0 | 186.0 | 181.2 | 175.6 | 173.0 | 173.0 | 173.0 |
| 42.5° | 1292.4 | 1111.6 | 628.3 | 211.5 | 186.0 | 179.1 | 172.2 | 167.0 | 166.1 | 167.0 | 167.4 |
| 45° | 1357.2 | 1136.7 | 557.5 | 200.2 | 180.8 | 172.2 | 164.0 | 160.1 | 160.1 | 161.0 | 161.0 |
| 47.5° | 1472.8 | 1202.3 | 487.6 | 193.3 | 175.6 | 166.6 | 157.9 | 154.1 | 153.6 | 154.5 | 154.5 |
| 50° | 1673.1 | 1320.5 | 424.6 | 188.6 | 171.8 | 162.3 | 153.6 | 148.4 | 147.2 | 146.7 | 146.7 |
| 52.5° | 1925.5 | 1525.5 | 384.5 | 185.1 | 167.0 | 157.5 | 148.9 | 142.0 | 139.4 | 138.1 | 138.1 |
| 55° | 2230.6 | 1798.6 | 384.5 | 182.5 | 161.0 | 151.9 | 142.0 | 135.1 | 131.2 | 129.5 | 129.5 |
| 57.5° | 2576.3 | 2116.7 | 451.0 | 180.4 | 156.2 | 145.4 | 134.6 | 127.7 | 123.4 | 120.8 | 120.8 |
| 60° | 2928.0 | 2452.8 | 615.4 | 177.4 | 151.9 | 137.2 | 126.4 | 120.0 | 114.4 | 111.3 | 110.9 |
| 62.5° | 3292.6 | 2823.1 | 832.0 | 179.1 | 148.9 | 129.5 | 117.8 | 110.5 | 105.7 | 102.7 | 102.3 |
| 65° | 3626.6 | 3175.7 | 1021.4 | 192.5 | 149.3 | 122.6 | 107.9 | 101.4 | 97.5 | 93.6 | 93.2 |
| 67.5° | *3910.1* | *3370.3* | *888.5* | *219.7* | *158.4* | *114.4* | *98.0* | *91.5* | *88.0* | *85.4* | *85.0* |
| 70° | 3711.6 | 3073.4 | 504.0 | 236.5 | 170.9 | 105.7 | 86.7 | 82.4 | 79.0 | 77.2 | 76.8 |
| 72.5° | 3173.9 | 2602.1 | 337.0 | 208.9 | 155.8 | 94.5 | 76.4 | 72.9 | 70.3 | 68.2 | 67.8 |
| 75° | 2571.1 | 2063.6 | 257.6 | 171.3 | 121.3 | 76.8 | 65.6 | 63.0 | 60.4 | 58.3 | 57.8 |
| 77.5° | 1521.2 | 1192.3 | 189.9 | 135.5 | 85.4 | 60.0 | 54.4 | 52.2 | 49.6 | 47.9 | 47.5 |
| 80° | 485.5 | 414.3 | 120.4 | 93.2 | 56.5 | 46.2 | 41.9 | 40.1 | 37.5 | 35.4 | 35.0 |
| 82.5° | 185.1 | 160.1 | 63.9 | 47.5 | 37.5 | 31.5 | 28.0 | 26.3 | 24.6 | 22.4 | 22.0 |
| 85° | 82.0 | 76.8 | 35.4 | 25.5 | 20.3 | 15.5 | 13.8 | 12.9 | 10.8 | 9.1 | 8.6 |
| 87.5° | 28.9 | 28.9 | 15.1 | 7.3 | 4.3 | 2.2 | 1.3 | 0.4 | 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-79-2019: Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Report Prepared for

Cooper Lighting Solutions

MCGRAW EDISON

Report Number: SP1-2408-195-9

Test Date: 08/07/2024

Luminaire Tested: GALN-SB1A-830-U-5WQ

Data in this report applies to families of products including GALN-SB1A-830-U-5WQ.

Report Generated By FNC07603 / LDUCLS01DT446
Version: v7.04

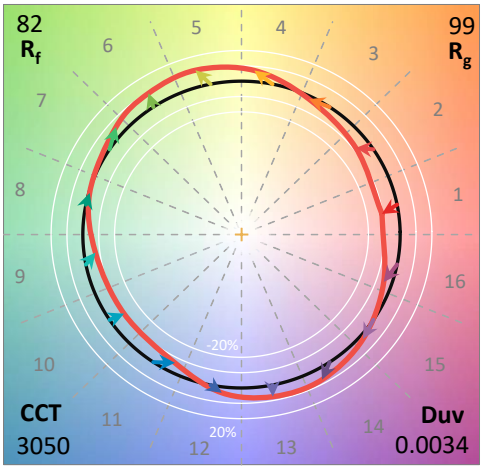
## Test Information

| | |
|---|---|
| Test Method: | LM-79-2019 |
| Report Number: | SP1-2408-195-9 |
| Test Lab: | COOPER LIGHTING SOLUTIONS |
| Photometer: | SP1 - 76IN SPHERE |
| Measurement Geometry: | 4π |
| Issue Date: | 08/07/2024 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS |
| Product Line: | MCGRAW EDISON |
| Catalog Number: | **GALN-SB1A-830-U-5WQ** |
| Description: | GALLEON AREA AND ROADWAY LUMINAIRE. (1) 80 CRI, 3000K, 350MA HIGH DENSITY LIGHTSQUARE WITH 26 LEDS AND TYPE V WIDE OPTICS |

## Spectral Parameters

| | | | | | |
|---|---|---|---|---|---|
| CCT (K): | 3050 | CRI (Ra): | 81.0 | | |
| CIE u': | 0.2476 | R1: | 79.6 | R9: | 7.1 |
| CIE v': | 0.5251 | R2: | 85.6 | R10: | 67.0 |
| Duv: | 0.0034 | R3: | 92.0 | R11: | 82.7 |
| CIE x: | 0.4383 | R4: | 82.6 | R12: | 63.2 |
| CIE y: | 0.4131 | R5: | 78.9 | R13: | 80.3 |
| CIE z: | 0.1487 | R6: | 81.7 | R14: | 95.0 |
| Peak Wavelength (nm): | 603 | R7: | 85.2 | R15: | 71.7 |
| Dominant Wavelength (nm): | 581 | R8: | 62.0 | | |
| Purity: | 55.55201 | | | | |

| | |
|---|---|
| Rf: | 81.5 |
| Rg: | 99.2 |




## Test Conditions

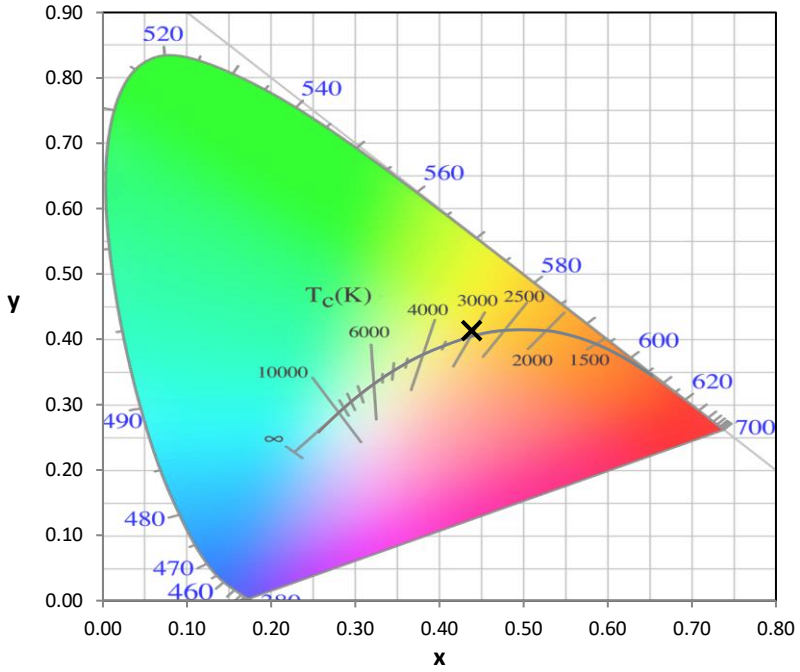
| | |
|---|---|
| Stabilization Time: | 20M |
| Operation Time: | 1H 20M |
| Sphere Temperature (°C): | 24.2 |

REPORT NUMBER: SP1-2408-195-9

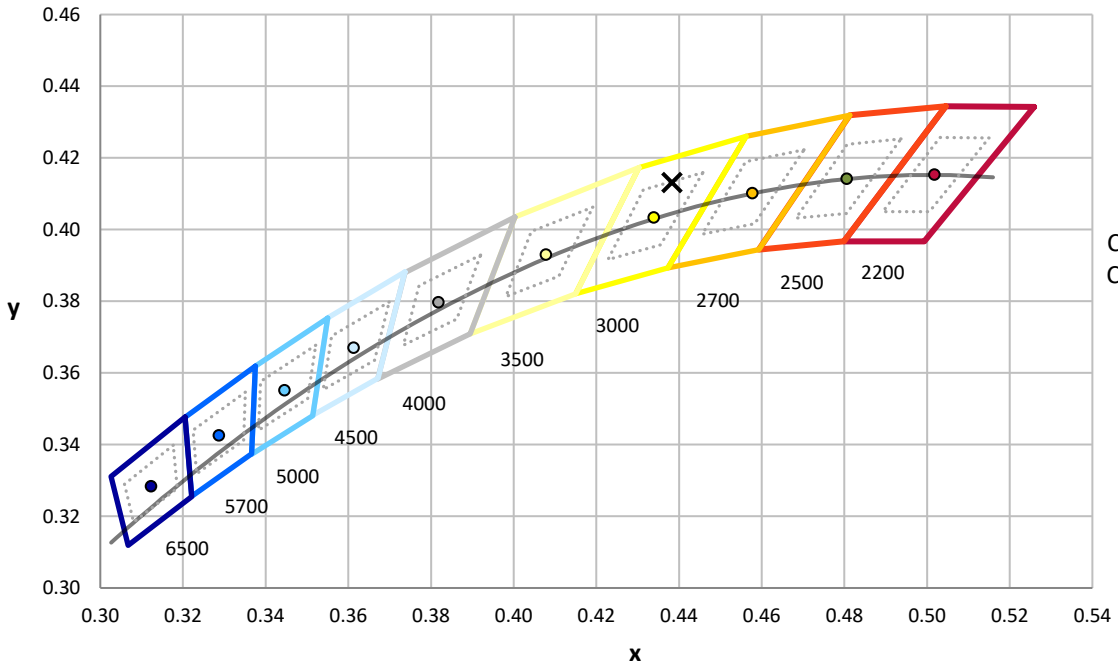
| Measurement and Test Equipment | | | |
|---|---|---|---|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | IN0058 | 6/18/2024 | 12/18/2024 |
| Power Meter | INXT2011004 | 2/8/2024 | 2/8/2025 |
| AC Power Source | IN0063 | 10/24/2023 | 10/24/2024 |
| DC Power Source | IN0208 | 10/24/2023 | 10/24/2024 |
| Sphere Thermometer | IN0085 | 10/24/2023 | 10/24/2024 |
| Room Thermometer | IN0046 | 10/24/2023 | 10/24/2024 |

REPORT NUMBER: SP1-2408-195-9

## CIE 1931 Chromaticity Diagram




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

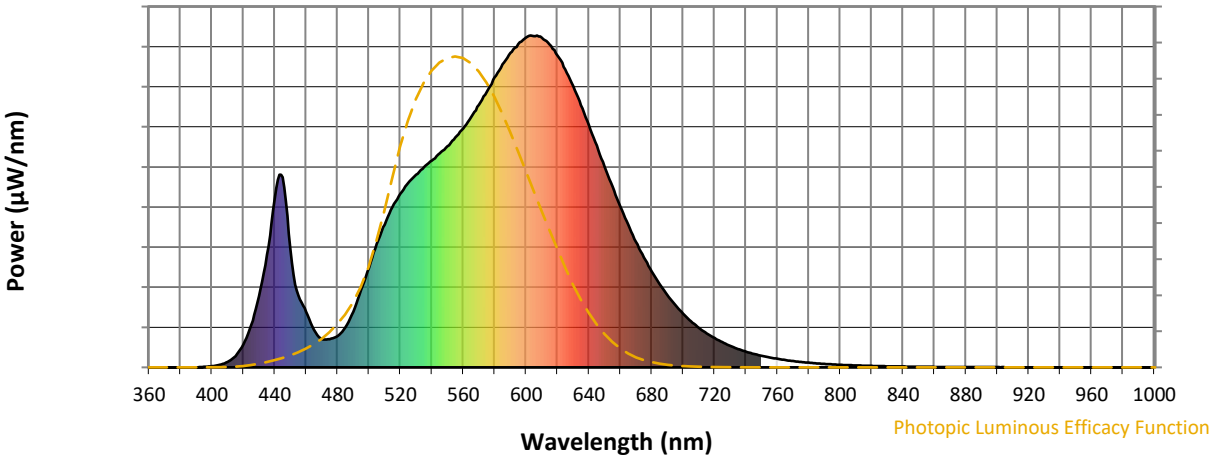



CCT = 3050K
CIE x = 0.4383
CIE y = 0.4131
Duv = 0.0034

Point lies inside the ANSI 3000K 4-step quadrangle

REPORT NUMBER: SP1-2408-195-9

## Photopic Flux vs. Wavelength

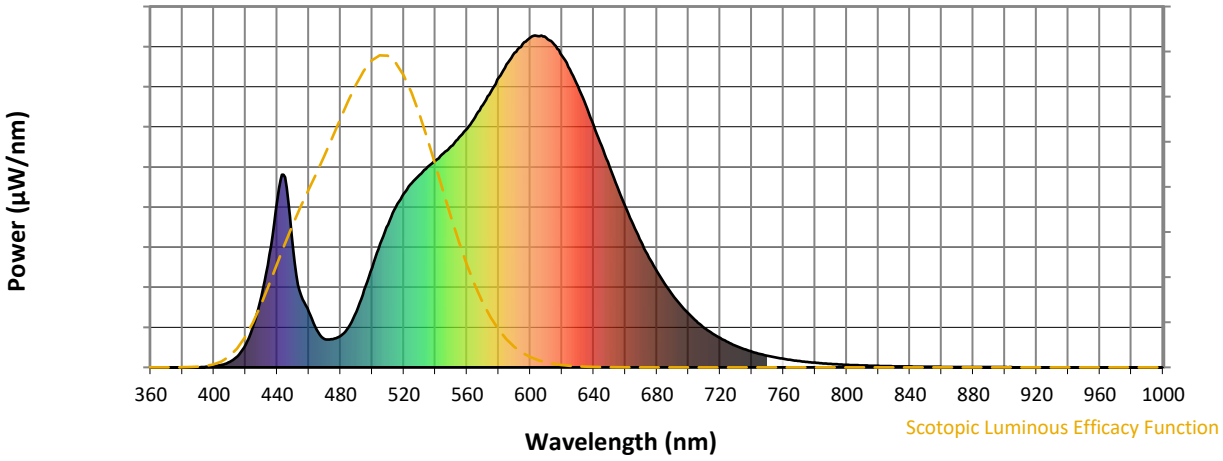



## Photopic Lumens: NR

| λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 360 | 0 | NR | 490 | 168 | NR | 620 | 940 | NR | 750 | 35 | NR | 880 | 1 | NR |
| 365 | 0 | NR | 495 | 233 | NR | 625 | 897 | NR | 755 | 30 | NR | 885 | 1 | NR |
| 370 | 0 | NR | 500 | 300 | NR | 630 | 847 | NR | 760 | 26 | NR | 890 | 1 | NR |
| 375 | 0 | NR | 505 | 372 | NR | 635 | 790 | NR | 765 | 22 | NR | 895 | 1 | NR |
| 380 | 0 | NR | 510 | 430 | NR | 640 | 730 | NR | 770 | 19 | NR | 900 | 1 | NR |
| 385 | 0 | NR | 515 | 483 | NR | 645 | 668 | NR | 775 | 16 | NR | 905 | 1 | NR |
| 390 | 0 | NR | 520 | 524 | NR | 650 | 605 | NR | 780 | 14 | NR | 910 | 0 | NR |
| 395 | 2 | NR | 525 | 555 | NR | 655 | 545 | NR | 785 | 12 | NR | 915 | 0 | NR |
| 400 | 4 | NR | 530 | 581 | NR | 660 | 485 | NR | 790 | 10 | NR | 920 | 0 | NR |
| 405 | 7 | NR | 535 | 604 | NR | 665 | 430 | NR | 795 | 9 | NR | 925 | 0 | NR |
| 410 | 17 | NR | 540 | 623 | NR | 670 | 378 | NR | 800 | 8 | NR | 930 | 0 | NR |
| 415 | 34 | NR | 545 | 645 | NR | 675 | 331 | NR | 805 | 7 | NR | 935 | 0 | NR |
| 420 | 68 | NR | 550 | 667 | NR | 680 | 290 | NR | 810 | 6 | NR | 940 | 0 | NR |
| 425 | 128 | NR | 555 | 693 | NR | 685 | 251 | NR | 815 | 5 | NR | 945 | 0 | NR |
| 430 | 214 | NR | 560 | 719 | NR | 690 | 218 | NR | 820 | 4 | NR | 950 | 0 | NR |
| 435 | 339 | NR | 565 | 754 | NR | 695 | 188 | NR | 825 | 4 | NR | 955 | 0 | NR |
| 440 | 507 | NR | 570 | 791 | NR | 700 | 162 | NR | 830 | 3 | NR | 960 | 0 | NR |
| 445 | 573 | NR | 575 | 830 | NR | 705 | 139 | NR | 835 | 3 | NR | 965 | 0 | NR |
| 450 | 356 | NR | 580 | 873 | NR | 710 | 119 | NR | 840 | 3 | NR | 970 | 0 | NR |
| 455 | 217 | NR | 585 | 913 | NR | 715 | 102 | NR | 845 | 2 | NR | 975 | 0 | NR |
| 460 | 168 | NR | 590 | 948 | NR | 720 | 88 | NR | 850 | 2 | NR | 980 | 0 | NR |
| 465 | 113 | NR | 595 | 974 | NR | 725 | 76 | NR | 855 | 2 | NR | 985 | 0 | NR |
| 470 | 85 | NR | 600 | 994 | NR | 730 | 65 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 85 | NR | 605 | 998 | NR | 735 | 55 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 94 | NR | 610 | 994 | NR | 740 | 47 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 120 | NR | 615 | 973 | NR | 745 | 41 | NR | 875 | 1 | NR | | | |

REPORT NUMBER: SP1-2408-195-9

## Scotopic Flux vs. Wavelength

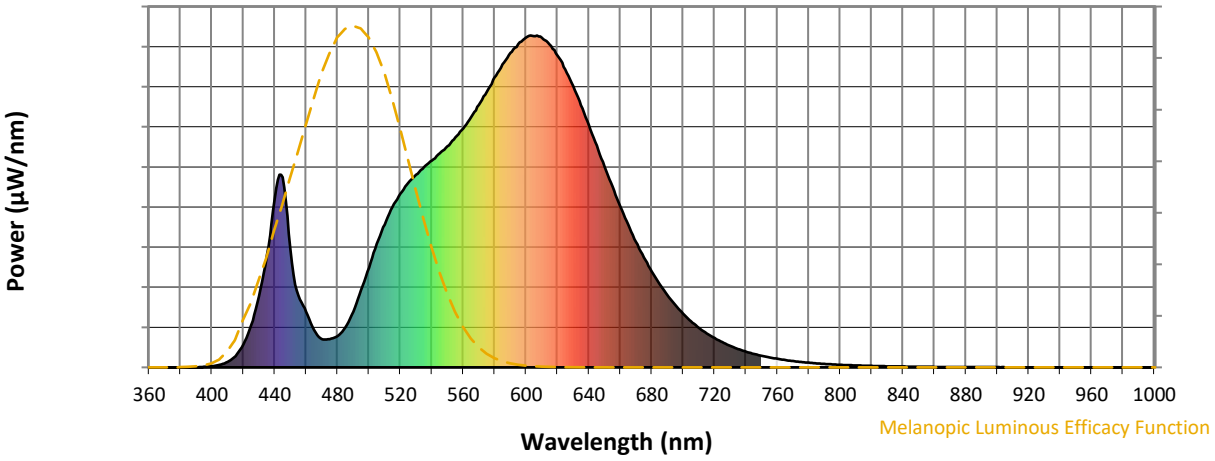



**Scotopic Lumens: NR** **S/P: 1.27**

| λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 360 | 0 | NR | 490 | 168 | NR | 620 | 940 | NR | 750 | 35 | NR | 880 | 1 | NR |
| 365 | 0 | NR | 495 | 233 | NR | 625 | 897 | NR | 755 | 30 | NR | 885 | 1 | NR |
| 370 | 0 | NR | 500 | 300 | NR | 630 | 847 | NR | 760 | 26 | NR | 890 | 1 | NR |
| 375 | 0 | NR | 505 | 372 | NR | 635 | 790 | NR | 765 | 22 | NR | 895 | 1 | NR |
| 380 | 0 | NR | 510 | 430 | NR | 640 | 730 | NR | 770 | 19 | NR | 900 | 1 | NR |
| 385 | 0 | NR | 515 | 483 | NR | 645 | 668 | NR | 775 | 16 | NR | 905 | 1 | NR |
| 390 | 0 | NR | 520 | 524 | NR | 650 | 605 | NR | 780 | 14 | NR | 910 | 0 | NR |
| 395 | 2 | NR | 525 | 555 | NR | 655 | 545 | NR | 785 | 12 | NR | 915 | 0 | NR |
| 400 | 4 | NR | 530 | 581 | NR | 660 | 485 | NR | 790 | 10 | NR | 920 | 0 | NR |
| 405 | 7 | NR | 535 | 604 | NR | 665 | 430 | NR | 795 | 9 | NR | 925 | 0 | NR |
| 410 | 17 | NR | 540 | 623 | NR | 670 | 378 | NR | 800 | 8 | NR | 930 | 0 | NR |
| 415 | 34 | NR | 545 | 645 | NR | 675 | 331 | NR | 805 | 7 | NR | 935 | 0 | NR |
| 420 | 68 | NR | 550 | 667 | NR | 680 | 290 | NR | 810 | 6 | NR | 940 | 0 | NR |
| 425 | 128 | NR | 555 | 693 | NR | 685 | 251 | NR | 815 | 5 | NR | 945 | 0 | NR |
| 430 | 214 | NR | 560 | 719 | NR | 690 | 218 | NR | 820 | 4 | NR | 950 | 0 | NR |
| 435 | 339 | NR | 565 | 754 | NR | 695 | 188 | NR | 825 | 4 | NR | 955 | 0 | NR |
| 440 | 507 | NR | 570 | 791 | NR | 700 | 162 | NR | 830 | 3 | NR | 960 | 0 | NR |
| 445 | 573 | NR | 575 | 830 | NR | 705 | 139 | NR | 835 | 3 | NR | 965 | 0 | NR |
| 450 | 356 | NR | 580 | 873 | NR | 710 | 119 | NR | 840 | 3 | NR | 970 | 0 | NR |
| 455 | 217 | NR | 585 | 913 | NR | 715 | 102 | NR | 845 | 2 | NR | 975 | 0 | NR |
| 460 | 168 | NR | 590 | 948 | NR | 720 | 88 | NR | 850 | 2 | NR | 980 | 0 | NR |
| 465 | 113 | NR | 595 | 974 | NR | 725 | 76 | NR | 855 | 2 | NR | 985 | 0 | NR |
| 470 | 85 | NR | 600 | 994 | NR | 730 | 65 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 85 | NR | 605 | 998 | NR | 735 | 55 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 94 | NR | 610 | 994 | NR | 740 | 47 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 120 | NR | 615 | 973 | NR | 745 | 41 | NR | 875 | 1 | NR | | | |

REPORT NUMBER: SP1-2408-195-9

## Melanopic Flux vs. Wavelength




**Melanopic Lumens: NR** **M/P: 2.32**

| λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 360 | 0 | NR | 490 | 168 | NR | 620 | 940 | NR | 750 | 35 | NR | 880 | 1 | NR |
| 365 | 0 | NR | 495 | 233 | NR | 625 | 897 | NR | 755 | 30 | NR | 885 | 1 | NR |
| 370 | 0 | NR | 500 | 300 | NR | 630 | 847 | NR | 760 | 26 | NR | 890 | 1 | NR |
| 375 | 0 | NR | 505 | 372 | NR | 635 | 790 | NR | 765 | 22 | NR | 895 | 1 | NR |
| 380 | 0 | NR | 510 | 430 | NR | 640 | 730 | NR | 770 | 19 | NR | 900 | 1 | NR |
| 385 | 0 | NR | 515 | 483 | NR | 645 | 668 | NR | 775 | 16 | NR | 905 | 1 | NR |
| 390 | 0 | NR | 520 | 524 | NR | 650 | 605 | NR | 780 | 14 | NR | 910 | 0 | NR |
| 395 | 2 | NR | 525 | 555 | NR | 655 | 545 | NR | 785 | 12 | NR | 915 | 0 | NR |
| 400 | 4 | NR | 530 | 581 | NR | 660 | 485 | NR | 790 | 10 | NR | 920 | 0 | NR |
| 405 | 7 | NR | 535 | 604 | NR | 665 | 430 | NR | 795 | 9 | NR | 925 | 0 | NR |
| 410 | 17 | NR | 540 | 623 | NR | 670 | 378 | NR | 800 | 8 | NR | 930 | 0 | NR |
| 415 | 34 | NR | 545 | 645 | NR | 675 | 331 | NR | 805 | 7 | NR | 935 | 0 | NR |
| 420 | 68 | NR | 550 | 667 | NR | 680 | 290 | NR | 810 | 6 | NR | 940 | 0 | NR |
| 425 | 128 | NR | 555 | 693 | NR | 685 | 251 | NR | 815 | 5 | NR | 945 | 0 | NR |
| 430 | 214 | NR | 560 | 719 | NR | 690 | 218 | NR | 820 | 4 | NR | 950 | 0 | NR |
| 435 | 339 | NR | 565 | 754 | NR | 695 | 188 | NR | 825 | 4 | NR | 955 | 0 | NR |
| 440 | 507 | NR | 570 | 791 | NR | 700 | 162 | NR | 830 | 3 | NR | 960 | 0 | NR |
| 445 | 573 | NR | 575 | 830 | NR | 705 | 139 | NR | 835 | 3 | NR | 965 | 0 | NR |
| 450 | 356 | NR | 580 | 873 | NR | 710 | 119 | NR | 840 | 3 | NR | 970 | 0 | NR |
| 455 | 217 | NR | 585 | 913 | NR | 715 | 102 | NR | 845 | 2 | NR | 975 | 0 | NR |
| 460 | 168 | NR | 590 | 948 | NR | 720 | 88 | NR | 850 | 2 | NR | 980 | 0 | NR |
| 465 | 113 | NR | 595 | 974 | NR | 725 | 76 | NR | 855 | 2 | NR | 985 | 0 | NR |
| 470 | 85 | NR | 600 | 994 | NR | 730 | 65 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 85 | NR | 605 | 998 | NR | 735 | 55 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 94 | NR | 610 | 994 | NR | 740 | 47 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 120 | NR | 615 | 973 | NR | 745 | 41 | NR | 875 | 1 | NR | | | |

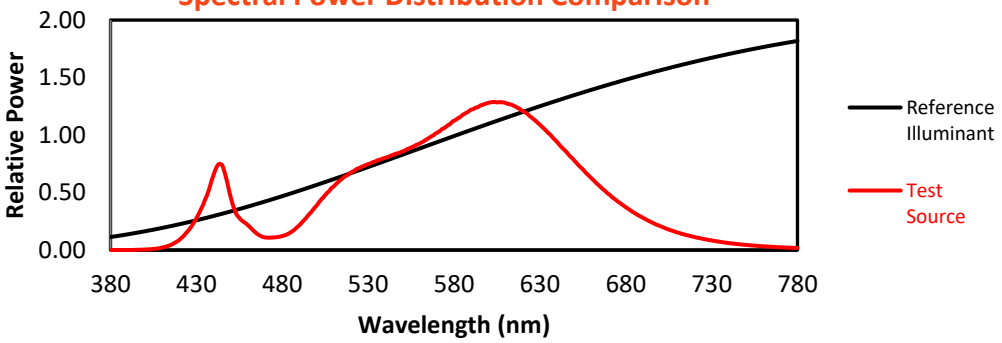
REPORT NUMBER: SP1-2408-195-9

# TM-30-18

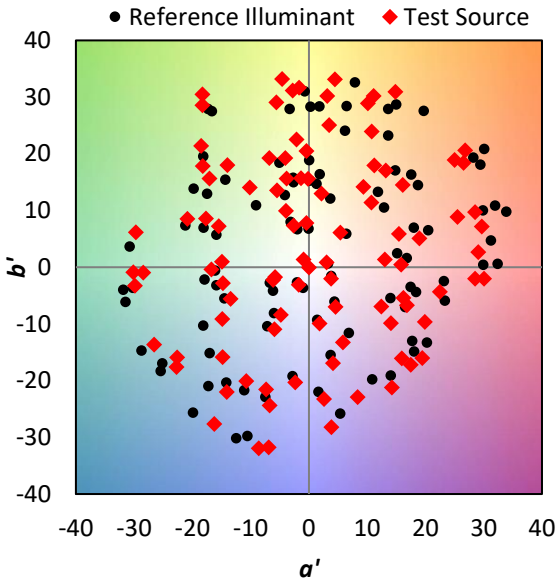
## Summary

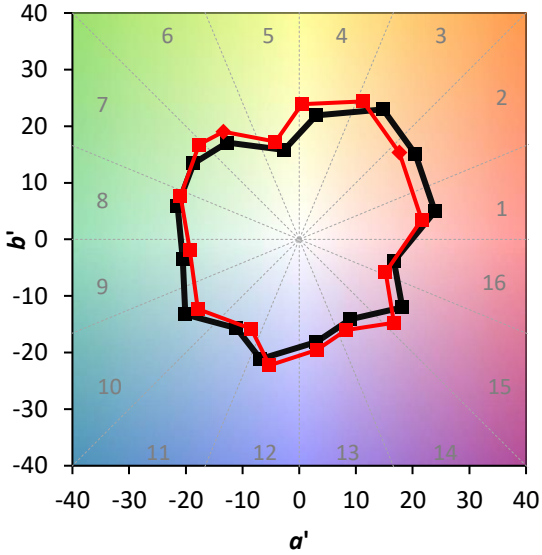
$R_f$ = 81.5
$R_g$ = 99.2
CIE $R_a$ = 81.0
$R_9$ = 7.1

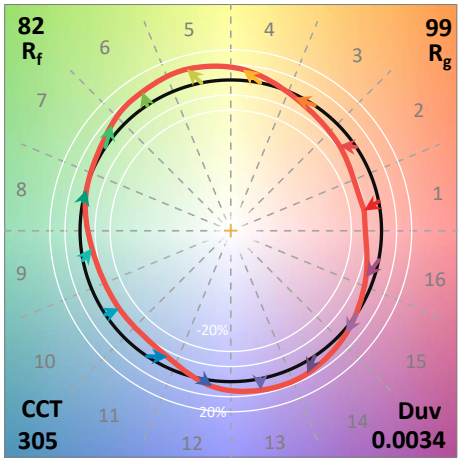
## Spectral Power Distribution Comparison

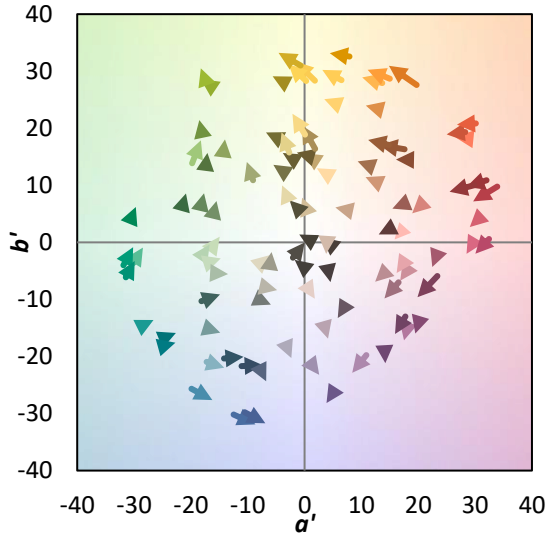



## Color Vector Graphics



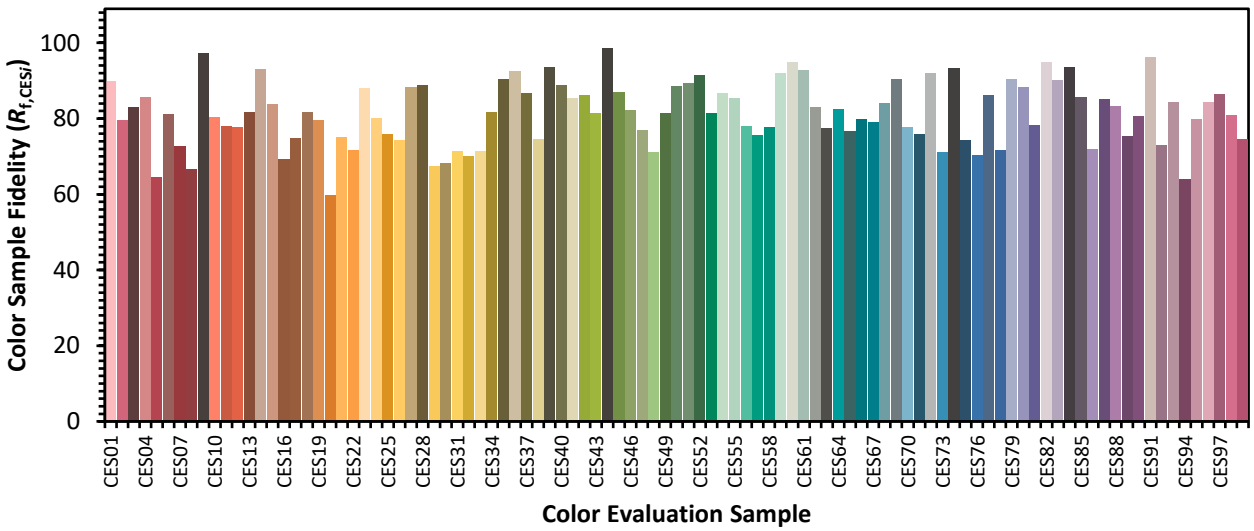



REPORT NUMBER: SP1-2408-195-9

# TM-30-18

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

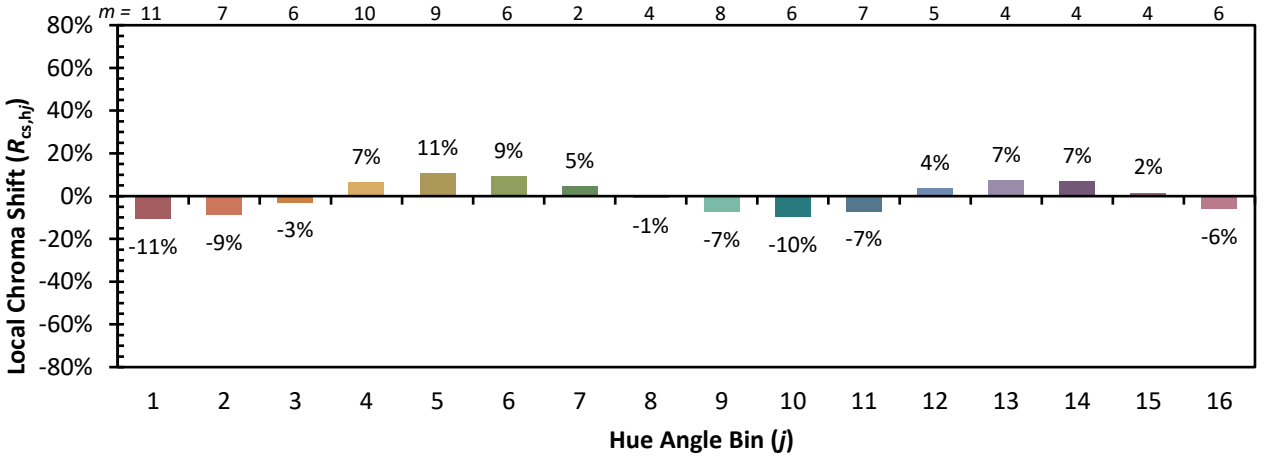
| | | | |
|---|---|---|---|
| CES01 = 86 | CES26 = 74 | CES51 = 89 | CES76 = 70 |
| CES02 = 63 | CES27 = 88 | CES52 = 92 | CES77 = 86 |
| CES03 = 31 | CES28 = 89 | CES53 = 81 | CES78 = 72 |
| CES04 = 70 | CES29 = 67 | CES54 = 87 | CES79 = 90 |
| CES05 = 50 | CES30 = 68 | CES55 = 85 | CES80 = 88 |
| CES06 = 51 | CES31 = 71 | CES56 = 78 | CES81 = 78 |
| CES07 = 42 | CES32 = 70 | CES57 = 76 | CES82 = 95 |
| CES08 = 41 | CES33 = 71 | CES58 = 78 | CES83 = 90 |
| CES09 = 29 | CES34 = 82 | CES59 = 92 | CES84 = 94 |
| CES10 = 76 | CES35 = 90 | CES60 = 95 | CES85 = 86 |
| CES11 = 59 | CES36 = 93 | CES61 = 93 | CES86 = 72 |
| CES12 = 65 | CES37 = 87 | CES62 = 83 | CES87 = 85 |
| CES13 = 43 | CES38 = 75 | CES63 = 77 | CES88 = 83 |
| CES14 = 74 | CES39 = 94 | CES64 = 83 | CES89 = 75 |
| CES15 = 71 | CES40 = 89 | CES65 = 77 | CES90 = 81 |
| CES16 = 47 | CES41 = 85 | CES66 = 80 | CES91 = 96 |
| CES17 = 50 | CES42 = 86 | CES67 = 79 | CES92 = 73 |
| CES18 = 56 | CES43 = 81 | CES68 = 84 | CES93 = 84 |
| CES19 = 72 | CES44 = 99 | CES69 = 91 | CES94 = 64 |
| CES20 = 66 | CES45 = 87 | CES70 = 78 | CES95 = 80 |
| CES21 = 87 | CES46 = 82 | CES71 = 76 | CES96 = 84 |
| CES22 = 79 | CES47 = 77 | CES72 = 92 | CES97 = 87 |
| CES23 = 92 | CES48 = 71 | CES73 = 71 | CES98 = 81 |
| CES24 = 91 | CES49 = 81 | CES74 = 93 | CES99 = 74 |
| CES25 = 72 | CES50 = 89 | CES75 = 74 | |

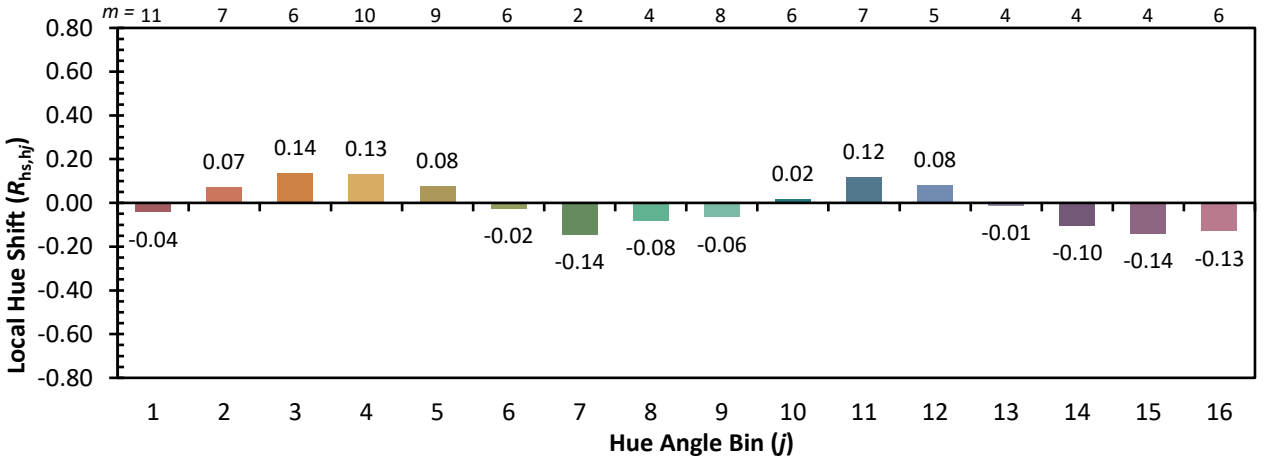


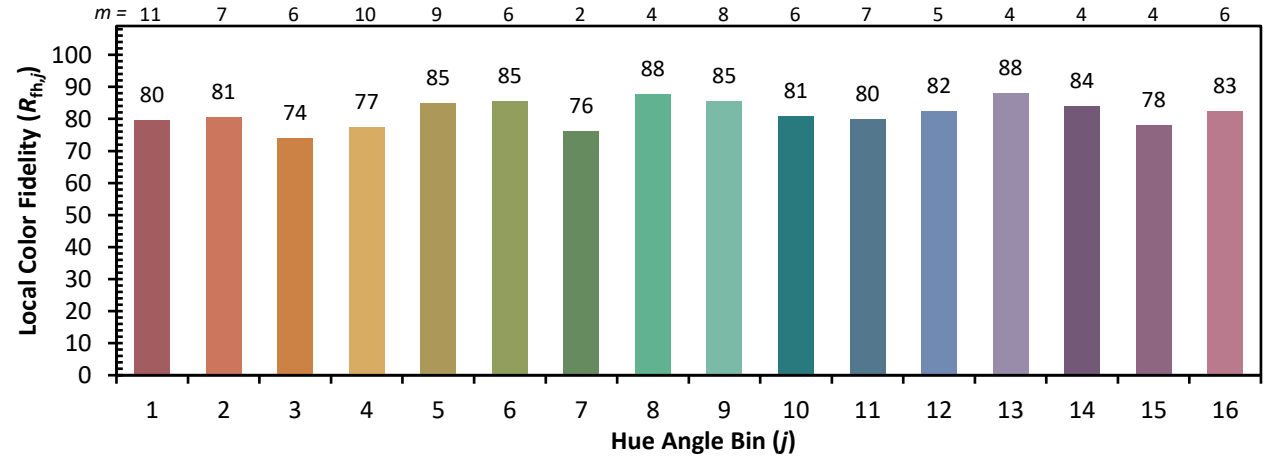
REPORT NUMBER: SP1-2408-195-9

# TM-30-18

## Color Rendition by Hue-Angle Bin



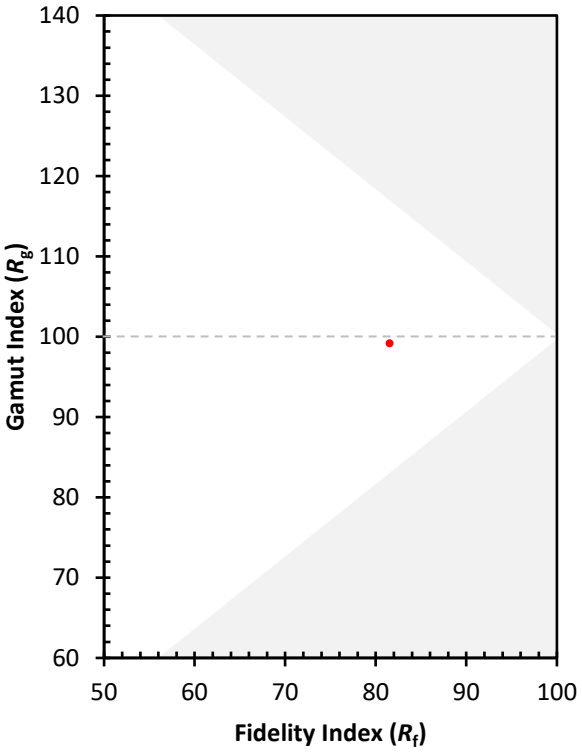



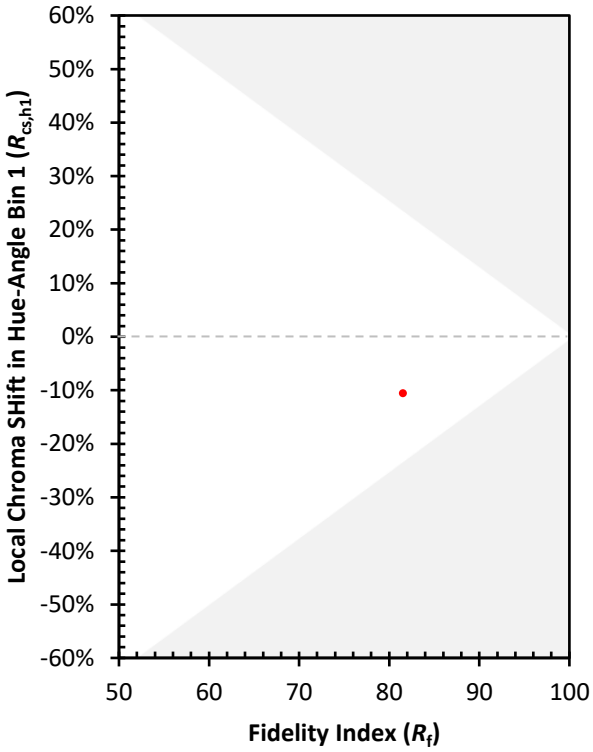



REPORT NUMBER: SP1-2408-195-9

# TM-30-18

## Measure Comparisons

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