

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: INVUE

Report Number: P871006

Luminaire Tested: **EMM2-HSN-SA1A-840-U-T1**

Issue Date: 09/05/2024



Test Information

Test Method: LM-79-08
Report Number: P871006
Test Lab: INNOVATION CENTER(G3)
Issue Date: 09/05/2024
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: INVUE
Catalog Number: EMM2-HSN-SA1A-840-U-T1
Description: EPIC MODERN SHORT HOUSING DISCRETE LED ARRAYS 40W 80CRI 4000K
FITXURE w/ TYPE 1 DISTRIBUTION OPTIC
Light Source: (10) 4000K CCT, 80 CRI LEDS
Ballast/Driver: ELECTRONIC DRIVER

Summary

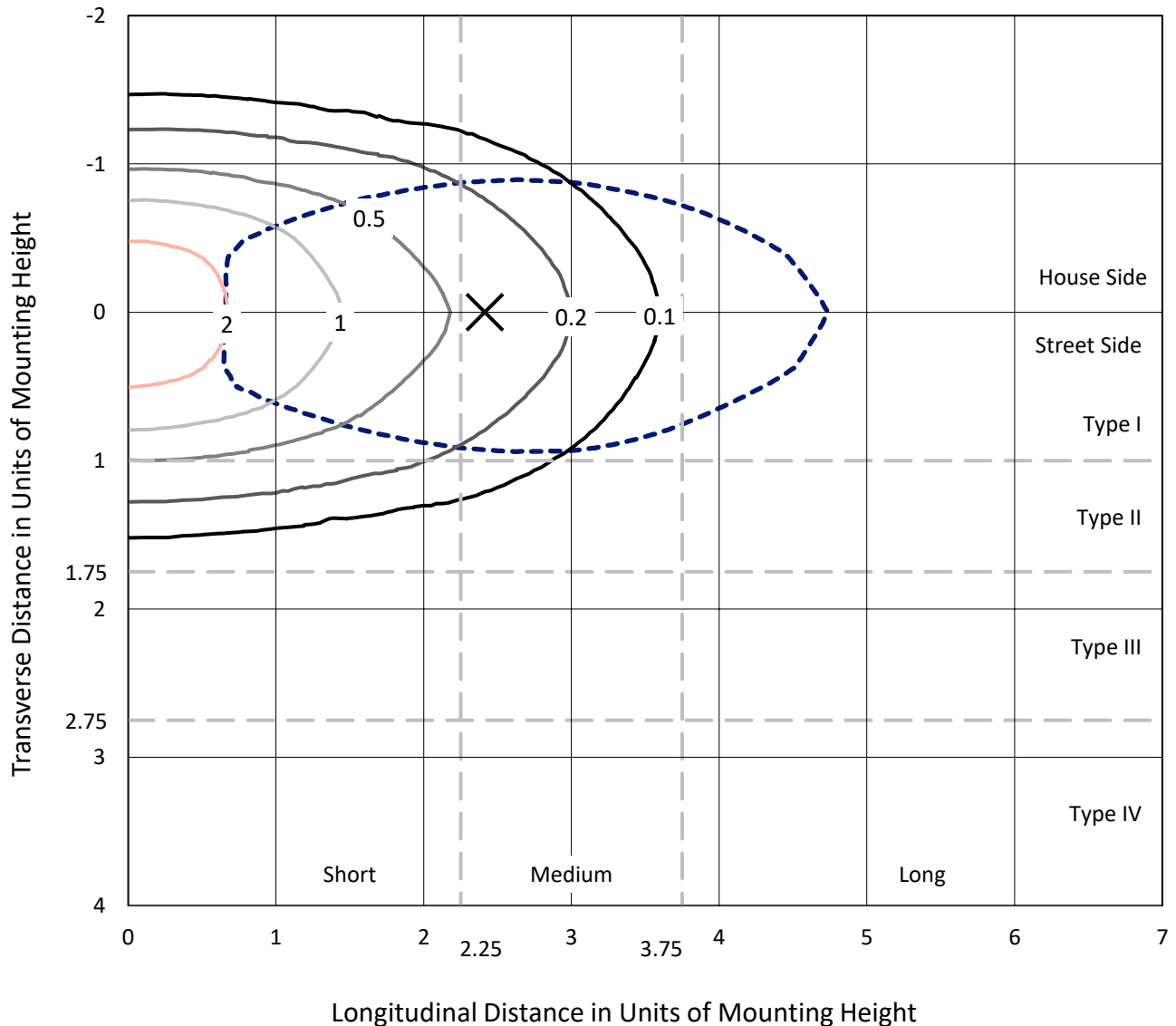
Lumens per Lamp: N/A
Luminaire Lumens: 4885.6 lumens
Efficiency: N/A
Efficacy: 148.9 lumens/watt
Luminous Opening: Rectangular (W 0.33' x L: 0.33' x H: 0')
IES Classification: Type I - Short
BUG Rating: B2 - U0 - G2

Input Watts (W): 32.8
Input Voltage (V): 120
Input Current (A_{in}): NR
Voltage Rise (V): NR
Power Factor: 0.99
Total Harmonic Distortion (THDi): 9.76%
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 24 FT

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Iso-Footcandle Lines of Horizontal Illumination

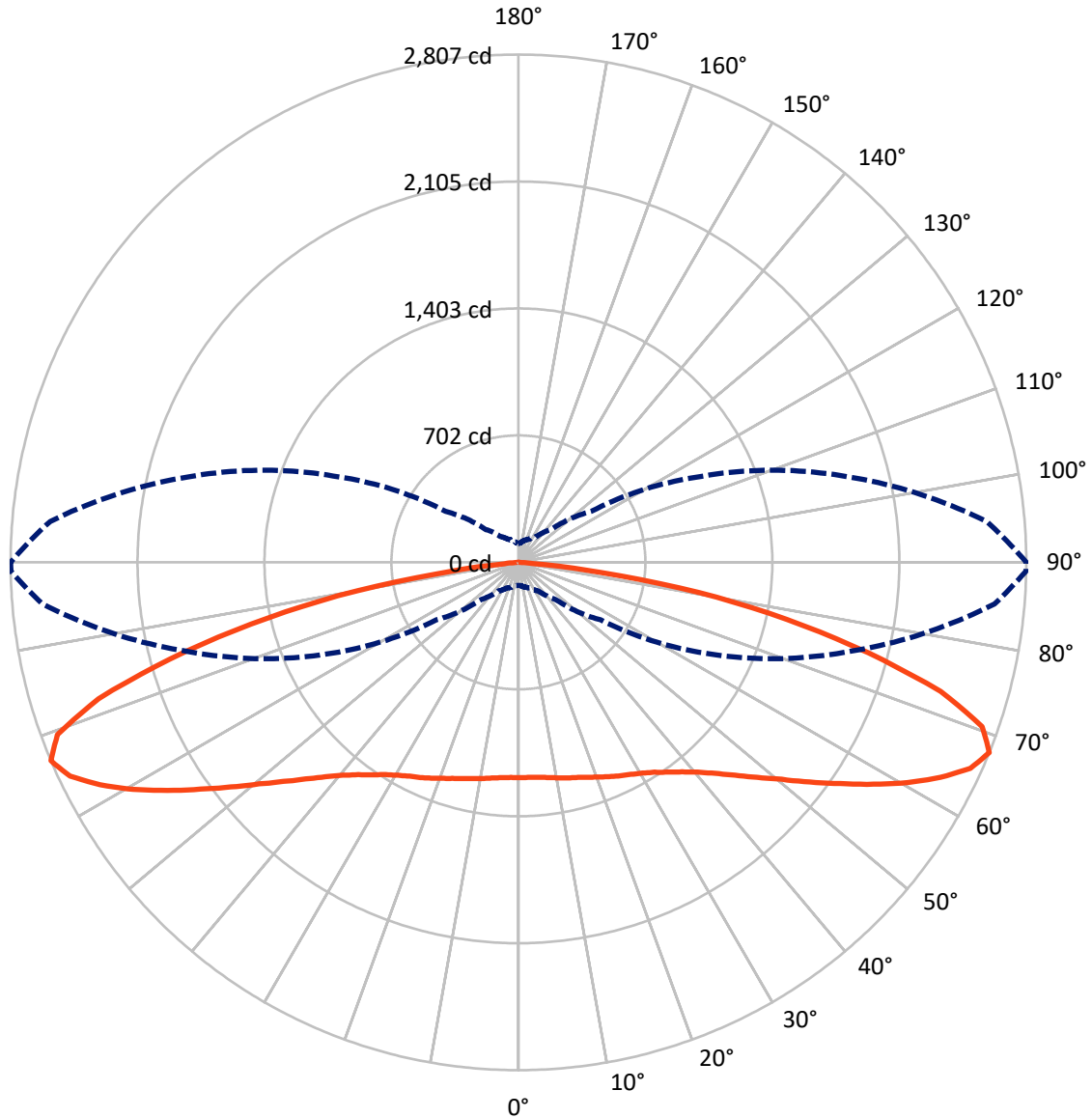
× Max cd
 - - - 1/2 Max cd



Based on 20 foot mounting height. Maximum calculated value = 3 fc
 Type I - Short - N/A

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Luminous Intensity Polar Plot



— Vertical Plane Through 90-Deg Lateral - - - Horizontal Cone Through 67.5-Deg Vertical

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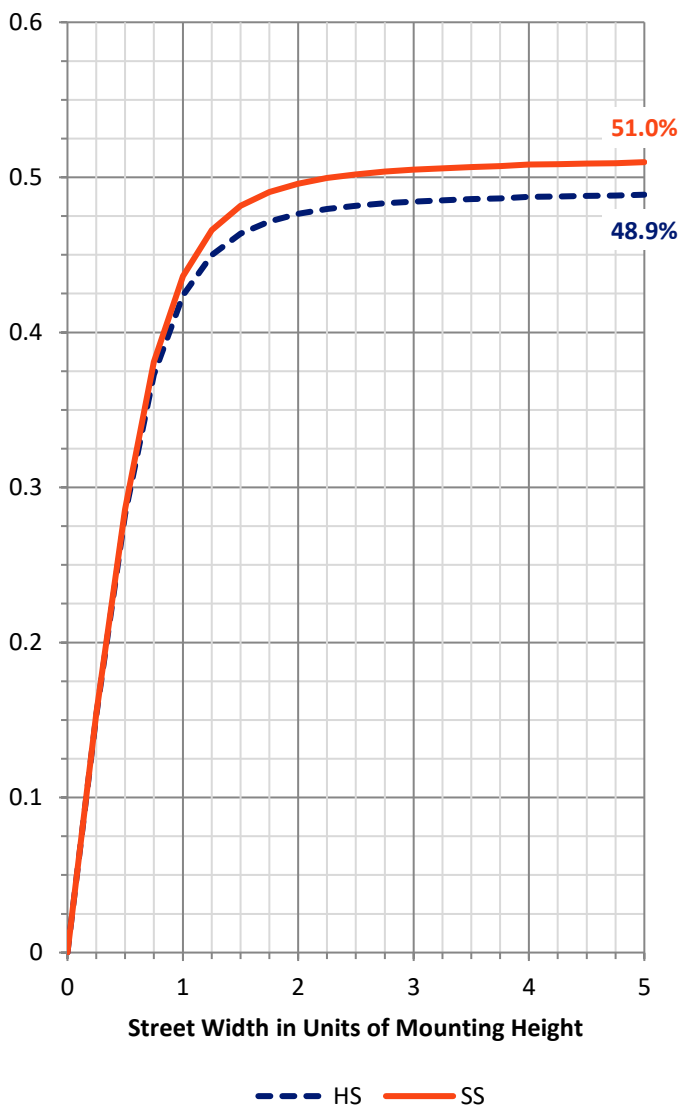
FLUX DISTRIBUTION:

| | | Downward | Upward | Total |
|--------------------|-----------|----------|--------|--------|
| House Side | Lumens | 2399.4 | 0.0 | 2399.4 |
| | % Fixture | 49.1 | 0.0 | 49.1 |
| Street Side | Lumens | 2486.2 | 0.0 | 2486.2 |
| | % Fixture | 50.9 | 0.0 | 50.9 |
| Total | Lumens | 4885.6 | 0.0 | 4885.6 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10° | 114.1 | 2.3 |
| 10°-20° | 342.8 | 7.0 |
| 20°-30° | 567.4 | 11.6 |
| 30°-40° | 752.3 | 15.4 |
| 40°-50° | 848.2 | 17.4 |
| 50°-60° | 869.6 | 17.8 |
| 60°-70° | 821.3 | 16.8 |
| 70°-80° | 503.9 | 10.3 |
| 80°-90° | 65.9 | 1.3 |
| 90°-100° | 0.0 | 0.0 |
| 100°-110° | 0.0 | 0.0 |
| 110°-120° | 0.0 | 0.0 |
| 120°-130° | 0.0 | 0.0 |
| 130°-140° | 0.0 | 0.0 |
| 140°-150° | 0.0 | 0.0 |
| 150°-160° | 0.0 | 0.0 |
| 160°-170° | 0.0 | 0.0 |
| 170°-180° | 0.0 | 0.0 |
| 0°-90° | 4885.6 | 100.0 |
| 0°-180° | 4885.6 | 100.0 |

Coefficient of Utilization



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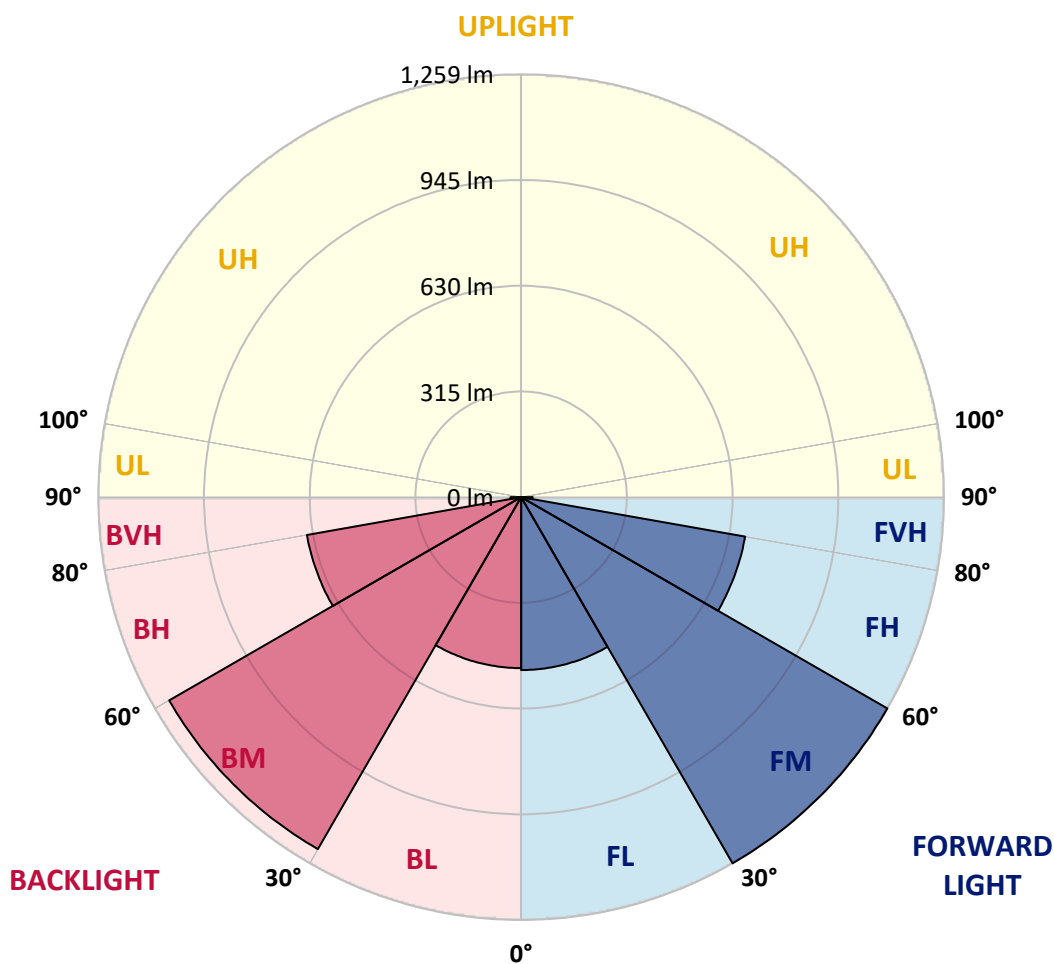
CATALOG NUMBER: EMM2-HSN-SA1A-840-U-T1

LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | Lumens | % Fixture | Zone Rating/Lumen Limit | | |
|----------------|--------|-----------|-------------------------|------|---------|
| | | | B | U | G |
| FL (0°-30°) | 515.1 | 10.5 | | | |
| FM (30°-60°) | 1259.4 | 25.8 | | | |
| FH (60°-80°) | 677.3 | 13.9 | | | G1/1800 |
| FVH (80°-90°) | 34.3 | 0.7 | | | G1/100 |
| BL (0°-30°) | 509.2 | 10.4 | B2/1000 | | |
| BM (30°-60°) | 1210.7 | 24.8 | B2/2500 | | |
| BH (60°-80°) | 647.9 | 13.3 | B2/1000 | | G2/1000 |
| BVH (80°-90°) | 31.6 | 0.6 | | | G1/100 |
| UL (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH (100°-180°) | 0.0 | 0.0 | | U0/0 | |

BUG Rating: B2-U0-G2

Type I Short





REPORT NUMBER: P871006

CATALOG NUMBER: EMM2-HSN-SA1A-840-U-T1

CANDELA DISTRIBUTION (FULL):

| | 0° | 5° | 15° | 25° | 35° | 45° | 55° | 65° | 75° | 85° | 89° |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0° | 1190.4 | 1190.4 | 1190.4 | 1190.4 | 1190.4 | 1190.4 | 1190.4 | 1190.4 | 1190.4 | 1190.4 | 1190.4 |
| 2.5° | 1195.0 | 1195.0 | 1192.2 | 1187.5 | 1186.6 | 1187.5 | 1193.2 | 1190.4 | 1190.4 | 1191.3 | 1190.4 |
| 5° | 1195.0 | 1195.0 | 1193.2 | 1188.5 | 1188.5 | 1188.5 | 1195.0 | 1192.2 | 1193.2 | 1194.1 | 1194.1 |
| 7.5° | 1196.9 | 1196.9 | 1195.0 | 1191.3 | 1191.3 | 1191.3 | 1200.7 | 1198.8 | 1198.8 | 1201.6 | 1199.7 |
| 10° | 1201.6 | 1199.7 | 1197.9 | 1198.8 | 1196.0 | 1200.7 | 1205.4 | 1206.3 | 1210.1 | 1211.9 | 1211.0 |
| 12.5° | 1201.6 | 1199.7 | 1195.0 | 1200.7 | 1200.7 | 1207.2 | 1213.8 | 1217.6 | 1222.3 | 1222.3 | 1222.3 |
| 15° | 1196.0 | 1194.1 | 1190.4 | 1199.7 | 1203.5 | 1211.9 | 1221.3 | 1226.9 | 1235.4 | 1235.4 | 1234.4 |
| 17.5° | 1189.4 | 1186.6 | 1184.7 | 1198.8 | 1207.2 | 1218.5 | 1232.6 | 1240.1 | 1249.5 | 1250.4 | 1248.5 |
| 20° | 1177.2 | 1176.3 | 1177.2 | 1196.0 | 1211.0 | 1226.9 | 1243.8 | 1254.1 | 1266.3 | 1270.1 | 1267.3 |
| 22.5° | 1164.1 | 1164.1 | 1167.8 | 1193.2 | 1216.6 | 1238.2 | 1260.7 | 1273.8 | 1286.0 | 1289.8 | 1286.0 |
| 25° | 1146.3 | 1146.3 | 1153.8 | 1183.8 | 1218.5 | 1250.4 | 1276.7 | 1294.5 | 1305.7 | 1309.5 | 1307.6 |
| 27.5° | 1119.1 | 1119.1 | 1127.5 | 1165.0 | 1212.9 | 1259.8 | 1293.5 | 1314.2 | 1326.4 | 1330.1 | 1328.2 |
| 30° | 1080.6 | 1078.7 | 1090.0 | 1136.9 | 1202.6 | 1270.1 | 1313.2 | 1334.8 | 1350.8 | 1353.6 | 1350.8 |
| 32.5° | 1019.6 | 1022.5 | 1039.3 | 1098.4 | 1185.7 | 1276.7 | 1336.7 | 1362.0 | 1379.8 | 1385.5 | 1383.6 |
| 35° | 945.5 | 950.2 | 973.7 | 1049.7 | 1153.8 | 1275.7 | 1361.1 | 1392.0 | 1415.5 | 1423.0 | 1422.1 |
| 37.5° | 857.4 | 863.9 | 893.0 | 982.1 | 1105.9 | 1261.6 | 1383.6 | 1425.8 | 1456.8 | 1466.1 | 1468.0 |
| 40° | 760.7 | 767.3 | 804.8 | 903.3 | 1041.2 | 1228.8 | 1396.7 | 1464.3 | 1505.5 | 1524.3 | 1527.1 |
| 42.5° | 658.5 | 669.8 | 714.8 | 810.5 | 963.4 | 1176.3 | 1396.7 | 1501.8 | 1552.4 | 1587.1 | 1590.0 |
| 45° | 560.0 | 569.4 | 623.8 | 717.6 | 879.9 | 1108.7 | 1380.8 | 1539.3 | 1616.2 | 1676.3 | 1674.4 |
| 47.5° | 474.6 | 477.5 | 527.2 | 621.9 | 787.0 | 1031.8 | 1347.9 | 1573.1 | 1683.8 | 1763.5 | 1780.4 |
| 50° | 386.5 | 393.0 | 435.2 | 529.0 | 692.3 | 947.4 | 1292.6 | 1594.6 | 1753.2 | 1874.2 | 1895.8 |
| 52.5° | 324.6 | 325.5 | 357.4 | 443.7 | 593.8 | 845.2 | 1226.0 | 1600.3 | 1819.8 | 1994.2 | 2020.5 |
| 55° | 264.5 | 269.2 | 296.4 | 361.1 | 499.0 | 744.8 | 1139.7 | 1591.8 | 1880.7 | 2110.6 | 2159.3 |
| 57.5° | 227.0 | 227.9 | 247.6 | 299.2 | 421.2 | 637.9 | 1044.0 | 1563.7 | 1931.4 | 2239.1 | 2301.0 |
| 60° | 195.1 | 195.1 | 210.1 | 249.5 | 340.5 | 533.7 | 931.5 | 1514.0 | 1959.5 | 2377.0 | 2467.0 |
| 62.5° | 169.8 | 170.7 | 183.9 | 212.9 | 283.3 | 440.9 | 807.6 | 1436.1 | 1969.9 | 2510.2 | 2613.3 |
| 65° | 153.8 | 154.8 | 162.3 | 182.0 | 233.6 | 358.3 | 681.0 | 1341.4 | 1955.8 | 2609.6 | 2743.7 |
| 67.5° | 127.6 | 128.5 | 141.6 | 156.7 | 194.2 | 288.0 | 553.4 | 1210.1 | 1898.6 | 2640.5 | 2804.7 |
| 70° | 97.6 | 100.4 | 118.2 | 134.1 | 161.3 | 229.8 | 424.9 | 1036.5 | 1761.6 | 2535.5 | 2704.3 |
| 72.5° | 81.6 | 82.5 | 95.7 | 113.5 | 135.1 | 180.1 | 322.7 | 816.1 | 1553.4 | 2264.4 | 2452.0 |
| 75° | 71.3 | 72.2 | 79.7 | 95.7 | 112.6 | 144.5 | 224.2 | 563.8 | 1239.1 | 1831.0 | 2002.7 |
| 77.5° | 64.7 | 65.7 | 67.5 | 80.7 | 94.7 | 111.6 | 158.5 | 334.9 | 874.2 | 1399.5 | 1489.6 |
| 80° | 61.9 | 61.9 | 57.2 | 66.6 | 77.9 | 87.2 | 106.0 | 192.3 | 560.9 | 943.7 | 1015.9 |
| 82.5° | 44.1 | 43.1 | 39.4 | 41.3 | 47.8 | 47.8 | 54.4 | 79.7 | 214.8 | 398.7 | 432.4 |
| 85° | 2.8 | 2.8 | 4.7 | 5.6 | 8.4 | 11.3 | 14.1 | 18.8 | 54.4 | 74.1 | 76.9 |
| 87.5° | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 1.9 | 1.9 | 1.9 | 2.8 | 3.8 | 3.8 |
| 90° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |



REPORT NUMBER: P871006

CATALOG NUMBER: EMM2-HSN-SA1A-840-U-T1

CANDELA DISTRIBUTION (continued):

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0° | 1190.4 | 1190.4 | 1190.4 | 1190.4 | 1190.4 | 1190.4 | 1190.4 | 1190.4 | 1190.4 | 1190.4 | 1190.4 |
| 2.5° | 1189.4 | 1190.4 | 1190.4 | 1192.2 | 1194.1 | 1193.2 | 1192.2 | 1194.1 | 1191.3 | 1185.7 | 1184.7 |
| 5° | 1193.2 | 1193.2 | 1192.2 | 1194.1 | 1196.0 | 1194.1 | 1192.2 | 1192.2 | 1190.4 | 1184.7 | 1183.8 |
| 7.5° | 1200.7 | 1199.7 | 1199.7 | 1199.7 | 1199.7 | 1196.9 | 1194.1 | 1192.2 | 1189.4 | 1183.8 | 1181.0 |
| 10° | 1211.0 | 1210.1 | 1209.1 | 1208.2 | 1203.5 | 1200.7 | 1196.0 | 1193.2 | 1189.4 | 1182.9 | 1181.0 |
| 12.5° | 1222.3 | 1220.4 | 1218.5 | 1219.4 | 1210.1 | 1201.6 | 1196.9 | 1190.4 | 1187.5 | 1172.5 | 1169.7 |
| 15° | 1233.5 | 1230.7 | 1229.8 | 1226.0 | 1216.6 | 1204.4 | 1195.0 | 1185.7 | 1176.3 | 1162.2 | 1157.5 |
| 17.5° | 1248.5 | 1246.6 | 1241.0 | 1237.3 | 1224.1 | 1207.2 | 1193.2 | 1180.0 | 1167.8 | 1151.0 | 1148.1 |
| 20° | 1266.3 | 1264.5 | 1258.8 | 1251.3 | 1234.4 | 1213.8 | 1194.1 | 1173.5 | 1158.5 | 1138.8 | 1134.1 |
| 22.5° | 1286.0 | 1283.2 | 1278.5 | 1270.1 | 1248.5 | 1224.1 | 1196.9 | 1169.7 | 1147.2 | 1124.7 | 1121.9 |
| 25° | 1306.7 | 1304.8 | 1300.1 | 1287.9 | 1264.5 | 1234.4 | 1196.9 | 1156.6 | 1128.4 | 1108.7 | 1100.3 |
| 27.5° | 1326.4 | 1325.4 | 1319.8 | 1305.7 | 1281.3 | 1241.9 | 1188.5 | 1135.0 | 1097.5 | 1071.2 | 1065.6 |
| 30° | 1351.7 | 1349.8 | 1343.3 | 1327.3 | 1300.1 | 1246.6 | 1171.6 | 1098.4 | 1051.5 | 1022.5 | 1014.0 |
| 32.5° | 1382.7 | 1380.8 | 1371.4 | 1351.7 | 1322.6 | 1247.6 | 1147.2 | 1051.5 | 989.6 | 958.7 | 948.3 |
| 35° | 1423.9 | 1420.2 | 1408.0 | 1384.5 | 1344.2 | 1238.2 | 1104.1 | 991.5 | 915.5 | 875.2 | 861.1 |
| 37.5° | 1469.0 | 1464.3 | 1448.3 | 1419.2 | 1359.2 | 1212.9 | 1043.1 | 910.8 | 824.5 | 776.7 | 766.4 |
| 40° | 1524.3 | 1517.7 | 1493.3 | 1453.0 | 1364.8 | 1168.8 | 974.6 | 828.3 | 736.4 | 683.8 | 671.6 |
| 42.5° | 1593.7 | 1582.5 | 1543.1 | 1490.5 | 1353.6 | 1108.7 | 893.0 | 742.9 | 637.9 | 589.1 | 586.3 |
| 45° | 1677.2 | 1659.4 | 1600.3 | 1527.1 | 1329.2 | 1033.7 | 806.7 | 647.2 | 546.9 | 499.0 | 486.8 |
| 47.5° | 1775.7 | 1754.1 | 1666.9 | 1555.3 | 1281.3 | 956.8 | 713.8 | 554.4 | 462.4 | 413.7 | 404.3 |
| 50° | 1884.5 | 1863.9 | 1737.2 | 1571.2 | 1229.8 | 866.7 | 622.9 | 471.8 | 379.9 | 339.6 | 339.6 |
| 52.5° | 2016.8 | 1969.9 | 1804.8 | 1573.1 | 1151.0 | 767.3 | 535.6 | 391.2 | 318.9 | 283.3 | 275.8 |
| 55° | 2157.5 | 2102.1 | 1865.7 | 1556.2 | 1069.4 | 676.3 | 441.8 | 325.5 | 261.7 | 236.4 | 229.8 |
| 57.5° | 2314.1 | 2229.7 | 1909.8 | 1522.4 | 966.2 | 576.9 | 368.6 | 268.3 | 220.4 | 199.8 | 197.0 |
| 60° | 2471.7 | 2362.9 | 1936.1 | 1465.2 | 856.4 | 485.0 | 306.7 | 224.2 | 189.5 | 174.5 | 171.7 |
| 62.5° | 2618.0 | 2471.7 | 1938.0 | 1381.7 | 749.5 | 404.3 | 251.4 | 193.2 | 167.9 | 156.7 | 156.7 |
| 65° | 2744.7 | 2562.7 | 1906.1 | 1274.8 | 613.5 | 324.6 | 207.3 | 163.2 | 146.3 | 134.1 | 131.3 |
| 67.5° | 2806.6 | 2597.4 | 1849.8 | 1128.4 | 491.5 | 257.0 | 174.5 | 141.6 | 125.7 | 106.9 | 105.1 |
| 70° | 2719.3 | 2497.0 | 1705.3 | 940.8 | 379.9 | 204.5 | 145.4 | 121.0 | 105.1 | 89.1 | 87.2 |
| 72.5° | 2440.7 | 2229.7 | 1471.8 | 728.8 | 286.1 | 165.1 | 121.0 | 103.2 | 86.3 | 77.9 | 76.0 |
| 75° | 1997.1 | 1854.5 | 1163.2 | 501.8 | 199.8 | 129.4 | 101.3 | 87.2 | 73.2 | 69.4 | 68.5 |
| 77.5° | 1515.9 | 1378.9 | 849.9 | 314.2 | 137.0 | 101.3 | 86.3 | 74.1 | 63.8 | 66.6 | 64.7 |
| 80° | 1012.1 | 949.3 | 564.7 | 178.2 | 91.9 | 74.1 | 65.7 | 54.4 | 48.8 | 56.3 | 54.4 |
| 82.5° | 459.6 | 435.2 | 265.5 | 77.9 | 41.3 | 31.9 | 22.5 | 16.9 | 13.1 | 12.2 | 14.1 |
| 85° | 76.9 | 67.5 | 18.8 | 8.4 | 4.7 | 2.8 | 1.9 | 1.9 | 0.9 | 0.9 | 0.9 |
| 87.5° | 3.8 | 2.8 | 2.8 | 1.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.0 | 0.0 |
| 90° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

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



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

Report Prepared for

Cooper Lighting Solutions

Streetworks

Report Number: SP1-2407-157-8

Test Date: 09/05/2024

Luminaire Tested: MEM2-HTN-SA-40-840-U-5WQ

Data in this report applies to families of products including MEM2-HTN-SA-40-840-U-5WQ

Test Information

Test Method: LM-79-2019
 Report Number: SP1-2407-157-8
 Test Lab: COOPER LIGHTING SOLUTIONS
 Photometer: SP1 - 76IN SPHERE
 Measurement Geometry: 4π
 Issue Date: 09/05/2024
 Manufacturer: COOPER LIGHTING SOLUTIONS
 Product Line: Streetworks
 Catalog Number: **MEM2-HTN-SA-40-840-U-5WQ**
 Description: Epic Modern Light Square 40W 5WQ Optic

Spectral Parameters

CCT (K): 3996
 CIE u': 0.2245
 CIE v': 0.5031
 Duv: 0.0012
 CIE x: 0.3815
 CIE y: 0.3799
 CIE z: 0.2386
 Peak Wavelength (nm): 449
 Dominant Wavelength (nm): 578
 Purity: 28.49233
 Rf: 82.6
 Rg: 95.1

| | | | |
|-----------|------|------|------|
| CRI (Ra): | 80.6 | | |
| R1: | 78.1 | R9: | -5.8 |
| R2: | 87.1 | R10: | 70.3 |
| R3: | 94.5 | R11: | 78.7 |
| R4: | 79.7 | R12: | 60.5 |
| R5: | 78.7 | R13: | 80.2 |
| R6: | 82.7 | R14: | 97.2 |
| R7: | 84.3 | R15: | 70.6 |
| R8: | 59.5 | | |



Test Conditions

Stabilization Time: 29M
 Operation Time: 1H 29M
 Sphere Temperature (°C): 24.3

REPORT NUMBER: SP1-2407-157-8

| 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 |

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CIE 1931 Chromaticity Diagram



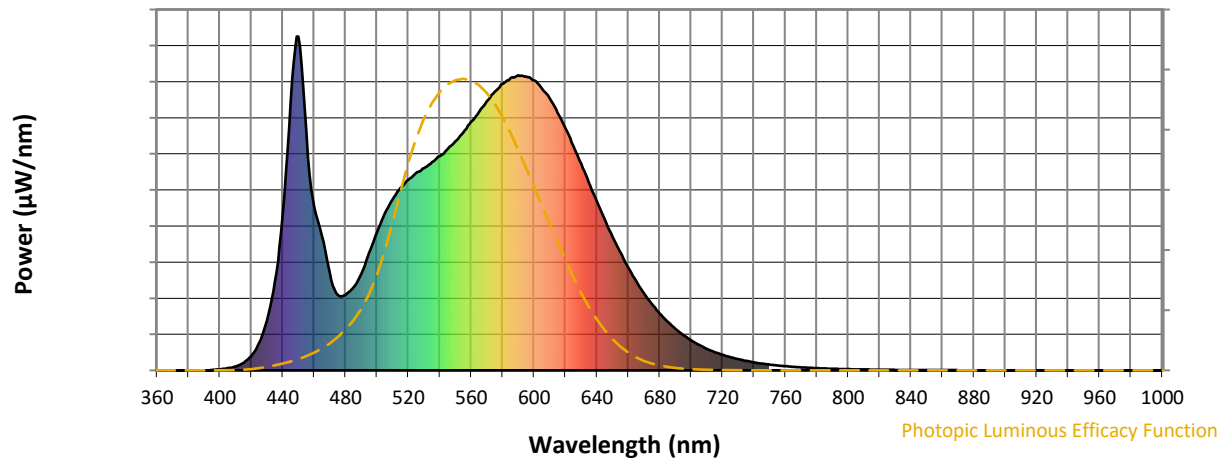
CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies inside the ANSI 4000K 4-step quadrangle

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Photopic Flux vs. Wavelength



Photopic Lumens: NR

| λ (nm) | Power W [^] /nm | Lumens (ϕ /nm) | λ (nm) | Power W [^] /nm | Lumens (ϕ /nm) | λ (nm) | Power W [^] /nm | Lumens (ϕ /nm) | λ (nm) | Power W [^] /nm | Lumens (ϕ /nm) | λ (nm) | Power W [^] /nm | Lumens (ϕ /nm) |
|----------------|--------------------------|----------------------|----------------|--------------------------|----------------------|----------------|--------------------------|----------------------|----------------|--------------------------|----------------------|----------------|--------------------------|----------------------|
| 360 | 0 | NR | 490 | 289 | NR | 620 | 725 | NR | 750 | 17 | NR | 880 | 0 | NR |
| 365 | 0 | NR | 495 | 351 | NR | 625 | 673 | NR | 755 | 15 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 414 | NR | 630 | 619 | NR | 760 | 13 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 470 | NR | 635 | 562 | NR | 765 | 11 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 513 | NR | 640 | 506 | NR | 770 | 9 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 546 | NR | 645 | 452 | NR | 775 | 8 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 571 | NR | 650 | 400 | NR | 780 | 7 | NR | 910 | 0 | NR |
| 395 | 1 | NR | 525 | 592 | NR | 655 | 352 | NR | 785 | 6 | NR | 915 | 0 | NR |
| 400 | 3 | NR | 530 | 606 | NR | 660 | 307 | NR | 790 | 5 | NR | 920 | 0 | NR |
| 405 | 6 | NR | 535 | 624 | NR | 665 | 267 | NR | 795 | 4 | NR | 925 | 0 | NR |
| 410 | 12 | NR | 540 | 642 | NR | 670 | 231 | NR | 800 | 4 | NR | 930 | 0 | NR |
| 415 | 22 | NR | 545 | 663 | NR | 675 | 199 | NR | 805 | 3 | NR | 935 | 0 | NR |
| 420 | 44 | NR | 550 | 686 | NR | 680 | 171 | NR | 810 | 3 | NR | 940 | 0 | NR |
| 425 | 83 | NR | 555 | 713 | NR | 685 | 146 | NR | 815 | 2 | NR | 945 | 0 | NR |
| 430 | 150 | NR | 560 | 745 | NR | 690 | 125 | NR | 820 | 2 | NR | 950 | 0 | NR |
| 435 | 267 | NR | 565 | 774 | NR | 695 | 106 | NR | 825 | 2 | NR | 955 | 0 | NR |
| 440 | 466 | NR | 570 | 806 | NR | 700 | 90 | NR | 830 | 1 | NR | 960 | 0 | NR |
| 445 | 804 | NR | 575 | 835 | NR | 705 | 76 | NR | 835 | 1 | NR | 965 | 0 | NR |
| 450 | 1000 | NR | 580 | 858 | NR | 710 | 65 | NR | 840 | 1 | NR | 970 | 0 | NR |
| 455 | 715 | NR | 585 | 875 | NR | 715 | 55 | NR | 845 | 1 | NR | 975 | 0 | NR |
| 460 | 492 | NR | 590 | 884 | NR | 720 | 47 | NR | 850 | 1 | NR | 980 | 0 | NR |
| 465 | 402 | NR | 595 | 880 | NR | 725 | 40 | NR | 855 | 1 | NR | 985 | 0 | NR |
| 470 | 288 | NR | 600 | 868 | NR | 730 | 34 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 226 | NR | 605 | 844 | NR | 735 | 28 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 227 | NR | 610 | 814 | NR | 740 | 24 | NR | 870 | 0 | NR | 1000 | 0 | NR |
| 485 | 248 | NR | 615 | 771 | NR | 745 | 20 | NR | 875 | 0 | NR | | | |

REPORT NUMBER: SP1-2407-157-8

Scotopic Flux vs. Wavelength



Scotopic Lumens: NR

S/P: 1.66

| 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 | 289 | NR | 620 | 725 | NR | 750 | 17 | NR | 880 | 0 | NR |
| 365 | 0 | NR | 495 | 351 | NR | 625 | 673 | NR | 755 | 15 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 414 | NR | 630 | 619 | NR | 760 | 13 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 470 | NR | 635 | 562 | NR | 765 | 11 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 513 | NR | 640 | 506 | NR | 770 | 9 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 546 | NR | 645 | 452 | NR | 775 | 8 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 571 | NR | 650 | 400 | NR | 780 | 7 | NR | 910 | 0 | NR |
| 395 | 1 | NR | 525 | 592 | NR | 655 | 352 | NR | 785 | 6 | NR | 915 | 0 | NR |
| 400 | 3 | NR | 530 | 606 | NR | 660 | 307 | NR | 790 | 5 | NR | 920 | 0 | NR |
| 405 | 6 | NR | 535 | 624 | NR | 665 | 267 | NR | 795 | 4 | NR | 925 | 0 | NR |
| 410 | 12 | NR | 540 | 642 | NR | 670 | 231 | NR | 800 | 4 | NR | 930 | 0 | NR |
| 415 | 22 | NR | 545 | 663 | NR | 675 | 199 | NR | 805 | 3 | NR | 935 | 0 | NR |
| 420 | 44 | NR | 550 | 686 | NR | 680 | 171 | NR | 810 | 3 | NR | 940 | 0 | NR |
| 425 | 83 | NR | 555 | 713 | NR | 685 | 146 | NR | 815 | 2 | NR | 945 | 0 | NR |
| 430 | 150 | NR | 560 | 745 | NR | 690 | 125 | NR | 820 | 2 | NR | 950 | 0 | NR |
| 435 | 267 | NR | 565 | 774 | NR | 695 | 106 | NR | 825 | 2 | NR | 955 | 0 | NR |
| 440 | 466 | NR | 570 | 806 | NR | 700 | 90 | NR | 830 | 1 | NR | 960 | 0 | NR |
| 445 | 804 | NR | 575 | 835 | NR | 705 | 76 | NR | 835 | 1 | NR | 965 | 0 | NR |
| 450 | 1000 | NR | 580 | 858 | NR | 710 | 65 | NR | 840 | 1 | NR | 970 | 0 | NR |
| 455 | 715 | NR | 585 | 875 | NR | 715 | 55 | NR | 845 | 1 | NR | 975 | 0 | NR |
| 460 | 492 | NR | 590 | 884 | NR | 720 | 47 | NR | 850 | 1 | NR | 980 | 0 | NR |
| 465 | 402 | NR | 595 | 880 | NR | 725 | 40 | NR | 855 | 1 | NR | 985 | 0 | NR |
| 470 | 288 | NR | 600 | 868 | NR | 730 | 34 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 226 | NR | 605 | 844 | NR | 735 | 28 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 227 | NR | 610 | 814 | NR | 740 | 24 | NR | 870 | 0 | NR | 1000 | 0 | NR |
| 485 | 248 | NR | 615 | 771 | NR | 745 | 20 | NR | 875 | 0 | NR | | | |

REPORT NUMBER: SP1-2407-157-8

Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 3.37

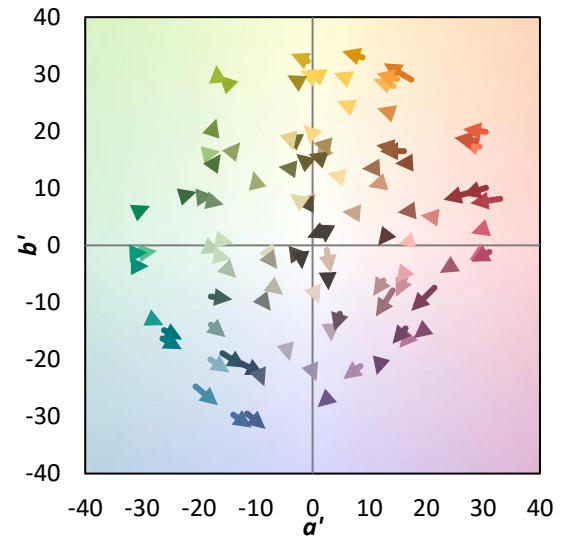
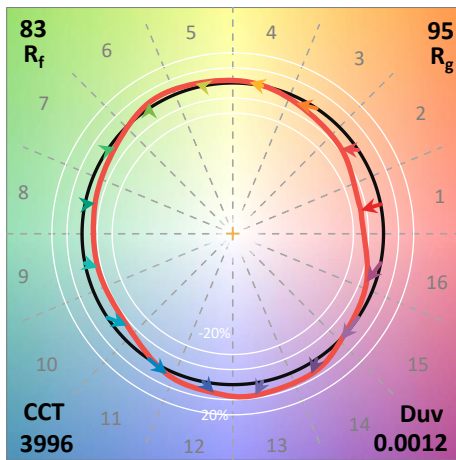
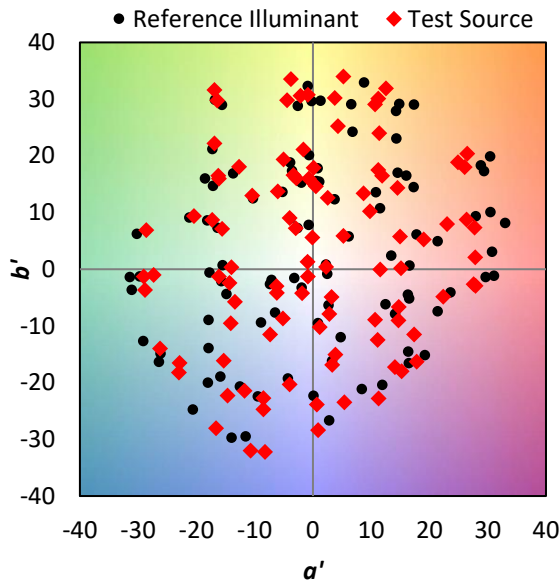
| λ (nm) | Power W [^] /nm | Lumens (φ/nm) | λ (nm) | Power W [^] /nm | Lumens (φ/nm) | λ (nm) | Power W [^] /nm | Lumens (φ/nm) | λ (nm) | Power W [^] /nm | Lumens (φ/nm) | λ (nm) | Power W [^] /nm | Lumens (φ/nm) |
|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|
| 360 | 0 | NR | 490 | 289 | NR | 620 | 725 | NR | 750 | 17 | NR | 880 | 0 | NR |
| 365 | 0 | NR | 495 | 351 | NR | 625 | 673 | NR | 755 | 15 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 414 | NR | 630 | 619 | NR | 760 | 13 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 470 | NR | 635 | 562 | NR | 765 | 11 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 513 | NR | 640 | 506 | NR | 770 | 9 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 546 | NR | 645 | 452 | NR | 775 | 8 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 571 | NR | 650 | 400 | NR | 780 | 7 | NR | 910 | 0 | NR |
| 395 | 1 | NR | 525 | 592 | NR | 655 | 352 | NR | 785 | 6 | NR | 915 | 0 | NR |
| 400 | 3 | NR | 530 | 606 | NR | 660 | 307 | NR | 790 | 5 | NR | 920 | 0 | NR |
| 405 | 6 | NR | 535 | 624 | NR | 665 | 267 | NR | 795 | 4 | NR | 925 | 0 | NR |
| 410 | 12 | NR | 540 | 642 | NR | 670 | 231 | NR | 800 | 4 | NR | 930 | 0 | NR |
| 415 | 22 | NR | 545 | 663 | NR | 675 | 199 | NR | 805 | 3 | NR | 935 | 0 | NR |
| 420 | 44 | NR | 550 | 686 | NR | 680 | 171 | NR | 810 | 3 | NR | 940 | 0 | NR |
| 425 | 83 | NR | 555 | 713 | NR | 685 | 146 | NR | 815 | 2 | NR | 945 | 0 | NR |
| 430 | 150 | NR | 560 | 745 | NR | 690 | 125 | NR | 820 | 2 | NR | 950 | 0 | NR |
| 435 | 267 | NR | 565 | 774 | NR | 695 | 106 | NR | 825 | 2 | NR | 955 | 0 | NR |
| 440 | 466 | NR | 570 | 806 | NR | 700 | 90 | NR | 830 | 1 | NR | 960 | 0 | NR |
| 445 | 804 | NR | 575 | 835 | NR | 705 | 76 | NR | 835 | 1 | NR | 965 | 0 | NR |
| 450 | 1000 | NR | 580 | 858 | NR | 710 | 65 | NR | 840 | 1 | NR | 970 | 0 | NR |
| 455 | 715 | NR | 585 | 875 | NR | 715 | 55 | NR | 845 | 1 | NR | 975 | 0 | NR |
| 460 | 492 | NR | 590 | 884 | NR | 720 | 47 | NR | 850 | 1 | NR | 980 | 0 | NR |
| 465 | 402 | NR | 595 | 880 | NR | 725 | 40 | NR | 855 | 1 | NR | 985 | 0 | NR |
| 470 | 288 | NR | 600 | 868 | NR | 730 | 34 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 226 | NR | 605 | 844 | NR | 735 | 28 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 227 | NR | 610 | 814 | NR | 740 | 24 | NR | 870 | 0 | NR | 1000 | 0 | NR |
| 485 | 248 | NR | 615 | 771 | NR | 745 | 20 | NR | 875 | 0 | NR | | | |

Summary

$R_f = 82.6$
 $R_g = 95.1$
 CIE $R_a = 80.6$
 $R_9 = -5.8$

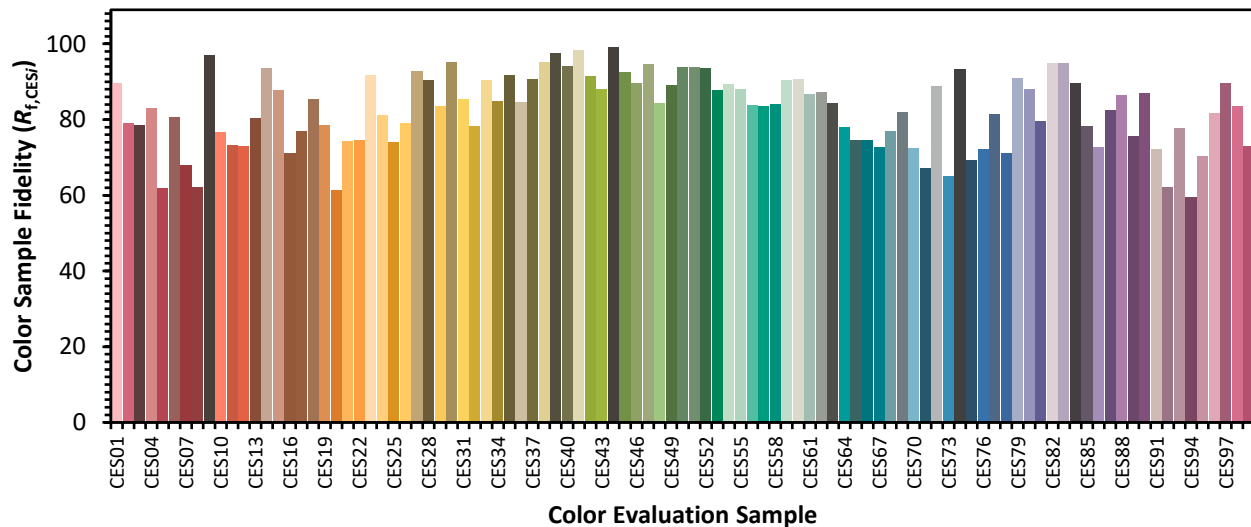


Color Vector Graphics

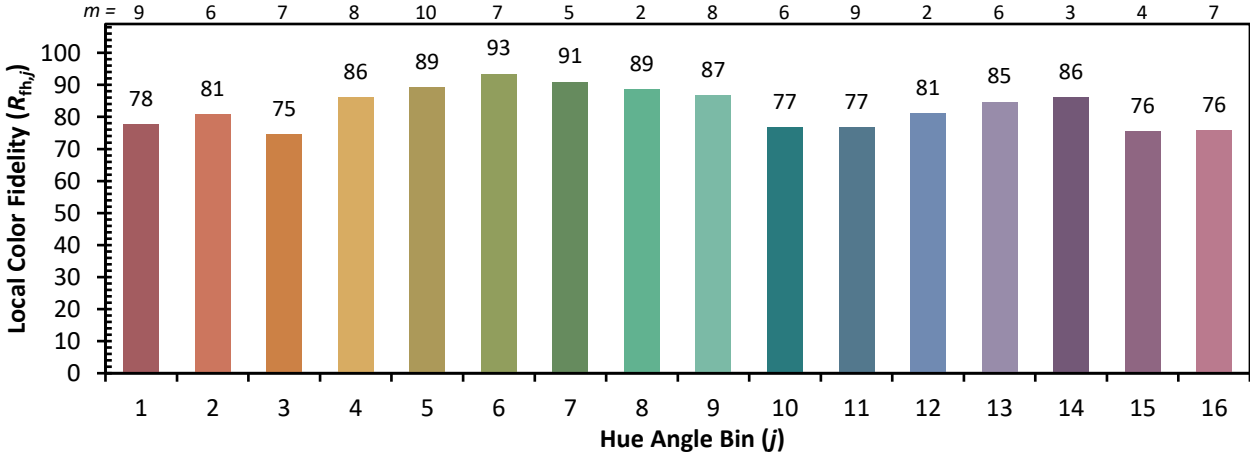


Individual Sample Fidelity Index ($R_{f,i}$)

| | | | |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 79 | CES51 = 94 | CES76 = 72 |
| CES02 = 61 | CES27 = 93 | CES52 = 94 | CES77 = 82 |
| CES03 = 31 | CES28 = 90 | CES53 = 88 | CES78 = 71 |
| CES04 = 69 | CES29 = 83 | CES54 = 89 | CES79 = 91 |
| CES05 = 48 | CES30 = 95 | CES55 = 88 | CES80 = 88 |
| CES06 = 50 | CES31 = 86 | CES56 = 84 | CES81 = 80 |
| CES07 = 40 | CES32 = 78 | CES57 = 84 | CES82 = 95 |
| CES08 = 39 | CES33 = 90 | CES58 = 84 | CES83 = 95 |
| CES09 = 29 | CES34 = 85 | CES59 = 90 | CES84 = 90 |
| CES10 = 74 | CES35 = 92 | CES60 = 91 | CES85 = 78 |
| CES11 = 57 | CES36 = 85 | CES61 = 87 | CES86 = 73 |
| CES12 = 63 | CES37 = 91 | CES62 = 87 | CES87 = 83 |
| CES13 = 42 | CES38 = 95 | CES63 = 84 | CES88 = 86 |
| CES14 = 74 | CES39 = 98 | CES64 = 78 | CES89 = 76 |
| CES15 = 71 | CES40 = 94 | CES65 = 75 | CES90 = 87 |
| CES16 = 46 | CES41 = 98 | CES66 = 75 | CES91 = 72 |
| CES17 = 49 | CES42 = 92 | CES67 = 73 | CES92 = 62 |
| CES18 = 56 | CES43 = 88 | CES68 = 77 | CES93 = 78 |
| CES19 = 71 | CES44 = 99 | CES69 = 82 | CES94 = 60 |
| CES20 = 65 | CES45 = 93 | CES70 = 72 | CES95 = 70 |
| CES21 = 86 | CES46 = 90 | CES71 = 67 | CES96 = 82 |
| CES22 = 78 | CES47 = 95 | CES72 = 89 | CES97 = 90 |
| CES23 = 91 | CES48 = 84 | CES73 = 65 | CES98 = 84 |
| CES24 = 90 | CES49 = 89 | CES74 = 93 | CES99 = 73 |
| CES25 = 71 | CES50 = 94 | CES75 = 69 | |



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)