

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: P868774

Luminaire Tested: **EMM2-HSN-SA1A-730-U-T1**

Issue Date: 08/22/2024



Test Information

Test Method: LM-79-08
Report Number: P868774
Test Lab: INNOVATION CENTER(G3)
Issue Date: 08/22/2024
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: INVUE
Catalog Number: EMM2-HSN-SA1A-730-U-T1
Description: EPIC MODERN SHORT HOUSING DISCRETE LED ARRAYS 40W 70CRI 3000K
FIXTURE w/ TYPE 1 DISTRIBUTION OPTIC
Light Source: (10) 3000K CCT, 70 CRI LEDS
Ballast/Driver: ELECTRONIC DRIVER

Summary

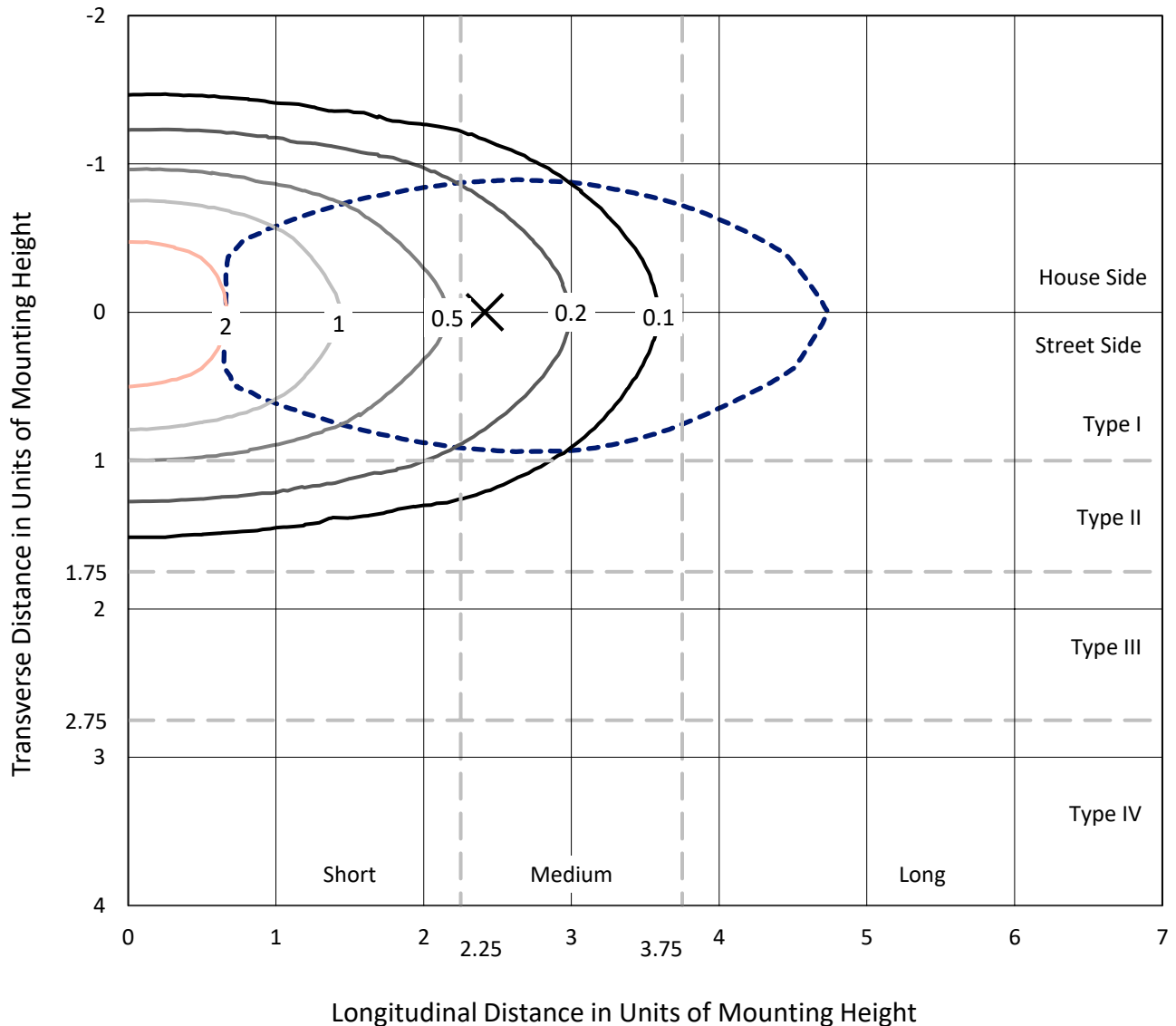
Lumens per Lamp: N/A
Luminaire Lumens: 4853.1 lumens
Efficiency: N/A
Efficacy: 148.0 lumens/watt
Luminous Opening: Rectangular (W 0.33' x L: 0.33' x H: 0')
IES Classification: Type I - Short
BUG Rating: B2 - U0 - G2

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

REPORT NUMBER: P868774
 CATALOG NUMBER: EMM2-HSN-SA1A-730-U-T1

Iso-Footcandle Lines of Horizontal Illumination

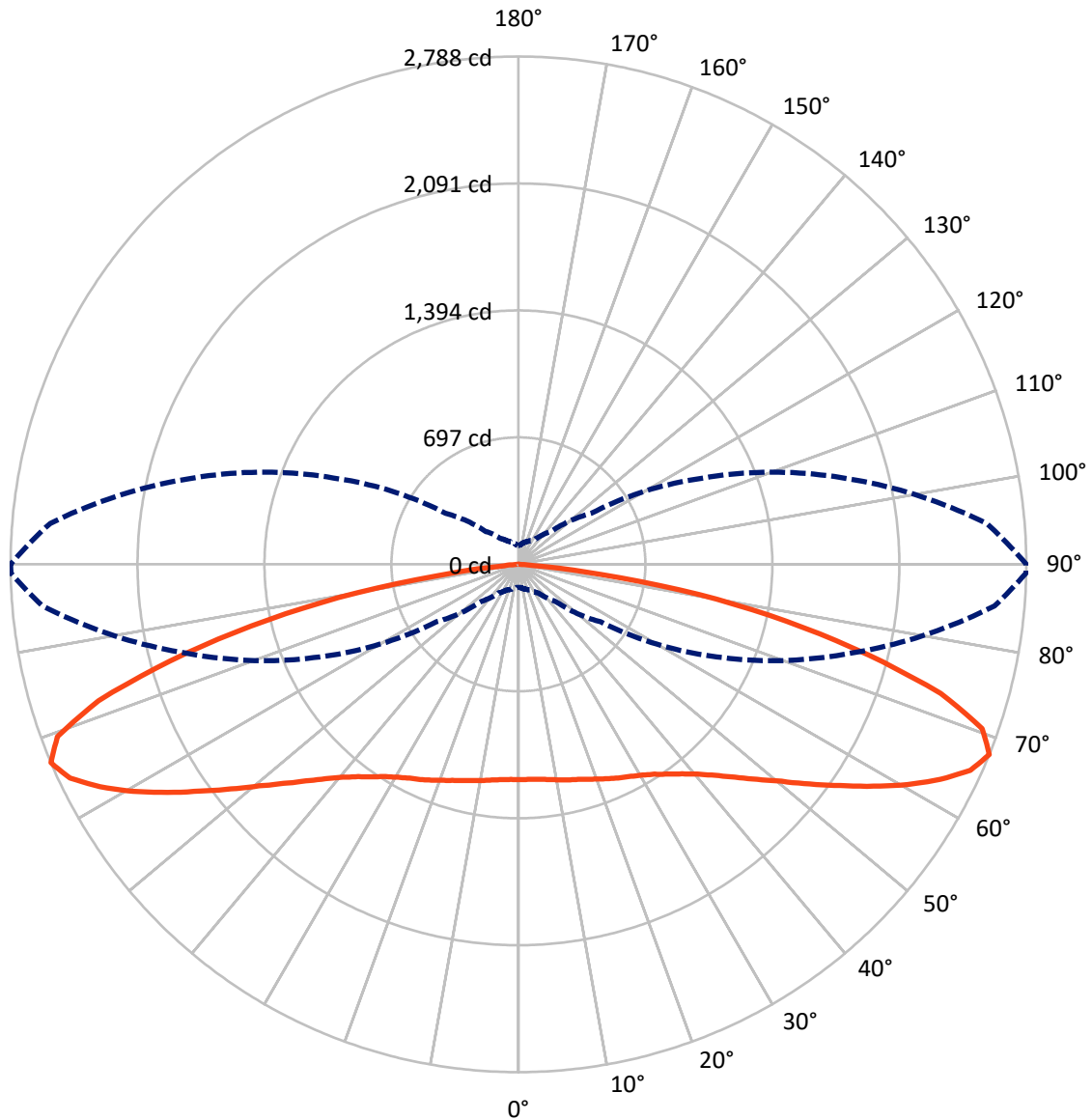
× Max cd
 - - - 1/2 Max cd



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

REPORT NUMBER: P868774
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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 | 2383.5 | 0.0 | 2383.5 |
| | % Fixture | 49.1 | 0.0 | 49.1 |
| Street Side | Lumens | 2469.7 | 0.0 | 2469.7 |
| | % Fixture | 50.9 | 0.0 | 50.9 |
| Total | Lumens | 4853.1 | 0.0 | 4853.1 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10° | 113.3 | 2.3 |
| 10°-20° | 340.6 | 7.0 |
| 20°-30° | 563.6 | 11.6 |
| 30°-40° | 747.3 | 15.4 |
| 40°-50° | 842.6 | 17.4 |
| 50°-60° | 863.8 | 17.8 |
| 60°-70° | 815.8 | 16.8 |
| 70°-80° | 500.6 | 10.3 |
| 80°-90° | 65.5 | 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° | 4853.1 | 100.0 |
| 0°-180° | 4853.1 | 100.0 |

Coefficient of Utilization



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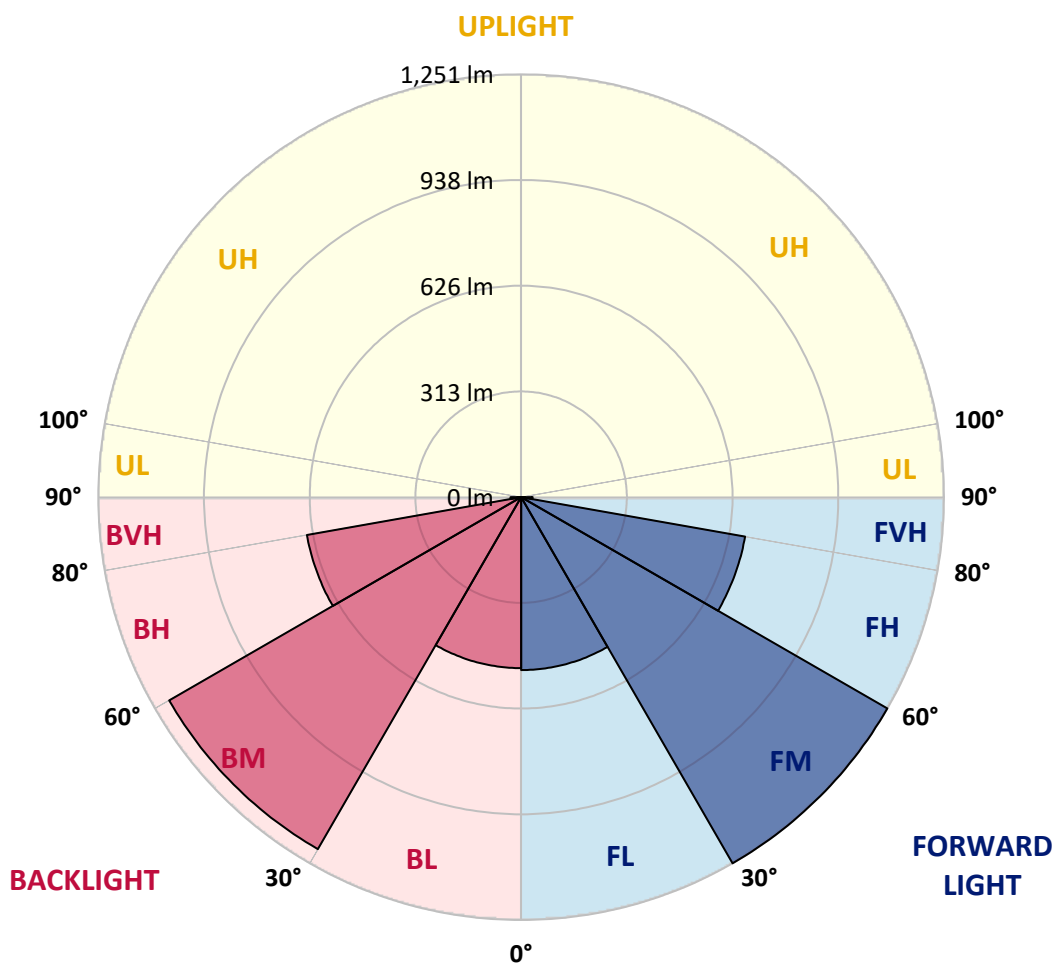
CATALOG NUMBER: EMM2-HSN-SA1A-730-U-T1

LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit | | |
|------|-------------|--------|-----------|-------------------------|------|---------|
| | | | | B | U | G |
| FL | (0°-30°) | 511.7 | 10.5 | | | |
| FM | (30°-60°) | 1251.1 | 25.8 | | | |
| FH | (60°-80°) | 672.8 | 13.9 | | | G1/1800 |
| FVH | (80°-90°) | 34.1 | 0.7 | | | G1/100 |
| BL | (0°-30°) | 505.8 | 10.4 | B2/1000 | | |
| BM | (30°-60°) | 1202.7 | 24.8 | B2/2500 | | |
| BH | (60°-80°) | 643.6 | 13.3 | B2/1000 | | G2/1000 |
| BVH | (80°-90°) | 31.4 | 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





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CANDELA DISTRIBUTION (FULL):

| | 0° | 5° | 15° | 25° | 35° | 45° | 55° | 65° | 75° | 85° | 89° |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0° | 1182.5 | 1182.5 | 1182.5 | 1182.5 | 1182.5 | 1182.5 | 1182.5 | 1182.5 | 1182.5 | 1182.5 | 1182.5 |
| 2.5° | 1187.1 | 1187.1 | 1184.3 | 1179.7 | 1178.7 | 1179.7 | 1185.3 | 1182.5 | 1182.5 | 1183.4 | 1182.5 |
| 5° | 1187.1 | 1187.1 | 1185.3 | 1180.6 | 1180.6 | 1180.6 | 1187.1 | 1184.3 | 1185.3 | 1186.2 | 1186.2 |
| 7.5° | 1189.0 | 1189.0 | 1187.1 | 1183.4 | 1183.4 | 1183.4 | 1192.7 | 1190.8 | 1190.8 | 1193.6 | 1191.8 |
| 10° | 1193.6 | 1191.8 | 1189.9 | 1190.8 | 1188.0 | 1192.7 | 1197.4 | 1198.3 | 1202.0 | 1203.9 | 1203.0 |
| 12.5° | 1193.6 | 1191.8 | 1187.1 | 1192.7 | 1192.7 | 1199.2 | 1205.8 | 1209.5 | 1214.1 | 1214.1 | 1214.1 |
| 15° | 1188.0 | 1186.2 | 1182.5 | 1191.8 | 1195.5 | 1203.9 | 1213.2 | 1218.8 | 1227.2 | 1227.2 | 1226.3 |
| 17.5° | 1181.5 | 1178.7 | 1176.9 | 1190.8 | 1199.2 | 1210.4 | 1224.4 | 1231.8 | 1241.2 | 1242.1 | 1240.2 |
| 20° | 1169.4 | 1168.5 | 1169.4 | 1188.0 | 1203.0 | 1218.8 | 1235.6 | 1245.8 | 1257.9 | 1261.7 | 1258.9 |
| 22.5° | 1156.4 | 1156.4 | 1160.1 | 1185.3 | 1208.5 | 1230.0 | 1252.3 | 1265.4 | 1277.5 | 1281.2 | 1277.5 |
| 25° | 1138.7 | 1138.7 | 1146.1 | 1175.9 | 1210.4 | 1242.1 | 1268.2 | 1285.9 | 1297.1 | 1300.8 | 1298.9 |
| 27.5° | 1111.6 | 1111.6 | 1120.0 | 1157.3 | 1204.8 | 1251.4 | 1285.0 | 1305.5 | 1317.6 | 1321.3 | 1319.4 |
| 30° | 1073.4 | 1071.6 | 1082.8 | 1129.3 | 1194.6 | 1261.7 | 1304.5 | 1326.0 | 1341.8 | 1344.6 | 1341.8 |
| 32.5° | 1012.9 | 1015.7 | 1032.4 | 1091.1 | 1177.8 | 1268.2 | 1327.8 | 1353.0 | 1370.7 | 1376.3 | 1374.4 |
| 35° | 939.3 | 943.9 | 967.2 | 1042.7 | 1146.1 | 1267.3 | 1352.0 | 1382.8 | 1406.1 | 1413.5 | 1412.6 |
| 37.5° | 851.7 | 858.2 | 887.1 | 975.6 | 1098.6 | 1253.3 | 1374.4 | 1416.3 | 1447.1 | 1456.4 | 1458.3 |
| 40° | 755.7 | 762.2 | 799.5 | 897.3 | 1034.3 | 1220.7 | 1387.5 | 1454.5 | 1495.5 | 1514.2 | 1517.0 |
| 42.5° | 654.1 | 665.3 | 710.0 | 805.1 | 957.0 | 1168.5 | 1387.5 | 1491.8 | 1542.1 | 1576.6 | 1579.4 |
| 45° | 556.3 | 565.6 | 619.6 | 712.8 | 874.0 | 1101.4 | 1371.6 | 1529.1 | 1605.5 | 1665.1 | 1663.3 |
| 47.5° | 471.5 | 474.3 | 523.7 | 617.8 | 781.8 | 1025.0 | 1339.0 | 1562.6 | 1672.6 | 1751.8 | 1768.6 |
| 50° | 383.9 | 390.4 | 432.4 | 525.5 | 687.7 | 941.1 | 1284.0 | 1584.1 | 1741.5 | 1861.7 | 1883.2 |
| 52.5° | 322.4 | 323.3 | 355.0 | 440.7 | 589.8 | 839.6 | 1217.9 | 1589.7 | 1807.7 | 1981.0 | 2007.1 |
| 55° | 262.8 | 267.4 | 294.4 | 358.7 | 495.7 | 739.9 | 1132.1 | 1581.3 | 1868.3 | 2096.6 | 2145.0 |
| 57.5° | 225.5 | 226.4 | 246.0 | 297.2 | 418.4 | 633.6 | 1037.1 | 1553.3 | 1918.6 | 2224.2 | 2285.7 |
| 60° | 193.8 | 193.8 | 208.7 | 247.9 | 338.2 | 530.2 | 925.3 | 1503.9 | 1946.5 | 2361.2 | 2450.6 |
| 62.5° | 168.7 | 169.6 | 182.6 | 211.5 | 281.4 | 437.9 | 802.3 | 1426.6 | 1956.8 | 2493.5 | 2596.0 |
| 65° | 152.8 | 153.7 | 161.2 | 180.8 | 232.0 | 355.9 | 676.5 | 1332.5 | 1942.8 | 2592.3 | 2725.5 |
| 67.5° | 126.7 | 127.7 | 140.7 | 155.6 | 192.9 | 286.1 | 549.8 | 1202.0 | 1886.0 | 2623.0 | 2786.1 |
| 70° | 96.9 | 99.7 | 117.4 | 133.2 | 160.3 | 228.3 | 422.1 | 1029.6 | 1749.9 | 2518.7 | 2686.4 |
| 72.5° | 81.1 | 82.0 | 95.0 | 112.7 | 134.2 | 178.9 | 320.5 | 810.7 | 1543.1 | 2249.4 | 2435.7 |
| 75° | 70.8 | 71.7 | 79.2 | 95.0 | 111.8 | 143.5 | 222.7 | 560.0 | 1230.9 | 1818.9 | 1989.4 |
| 77.5° | 64.3 | 65.2 | 67.1 | 80.1 | 94.1 | 110.9 | 157.5 | 332.7 | 868.4 | 1390.3 | 1479.7 |
| 80° | 61.5 | 61.5 | 56.8 | 66.2 | 77.3 | 86.7 | 105.3 | 191.0 | 557.2 | 937.4 | 1009.1 |
| 82.5° | 43.8 | 42.9 | 39.1 | 41.0 | 47.5 | 47.5 | 54.0 | 79.2 | 213.4 | 396.0 | 429.6 |
| 85° | 2.8 | 2.8 | 4.7 | 5.6 | 8.4 | 11.2 | 14.0 | 18.6 | 54.0 | 73.6 | 76.4 |
| 87.5° | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 1.9 | 1.9 | 1.9 | 2.8 | 3.7 | 3.7 |
| 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: P868774

CATALOG NUMBER: EMM2-HSN-SA1A-730-U-T1

CANDELA DISTRIBUTION (continued):

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0° | 1182.5 | 1182.5 | 1182.5 | 1182.5 | 1182.5 | 1182.5 | 1182.5 | 1182.5 | 1182.5 | 1182.5 | 1182.5 |
| 2.5° | 1181.5 | 1182.5 | 1182.5 | 1184.3 | 1186.2 | 1185.3 | 1184.3 | 1186.2 | 1183.4 | 1177.8 | 1176.9 |
| 5° | 1185.3 | 1185.3 | 1184.3 | 1186.2 | 1188.0 | 1186.2 | 1184.3 | 1184.3 | 1182.5 | 1176.9 | 1175.9 |
| 7.5° | 1192.7 | 1191.8 | 1191.8 | 1191.8 | 1191.8 | 1189.0 | 1186.2 | 1184.3 | 1181.5 | 1175.9 | 1173.1 |
| 10° | 1203.0 | 1202.0 | 1201.1 | 1200.2 | 1195.5 | 1192.7 | 1188.0 | 1185.3 | 1181.5 | 1175.0 | 1173.1 |
| 12.5° | 1214.1 | 1212.3 | 1210.4 | 1211.3 | 1202.0 | 1193.6 | 1189.0 | 1182.5 | 1179.7 | 1164.8 | 1162.0 |
| 15° | 1225.3 | 1222.5 | 1221.6 | 1217.9 | 1208.5 | 1196.4 | 1187.1 | 1177.8 | 1168.5 | 1154.5 | 1149.8 |
| 17.5° | 1240.2 | 1238.4 | 1232.8 | 1229.0 | 1216.0 | 1199.2 | 1185.3 | 1172.2 | 1160.1 | 1143.3 | 1140.5 |
| 20° | 1257.9 | 1256.1 | 1250.5 | 1243.0 | 1226.3 | 1205.8 | 1186.2 | 1165.7 | 1150.8 | 1131.2 | 1126.6 |
| 22.5° | 1277.5 | 1274.7 | 1270.0 | 1261.7 | 1240.2 | 1216.0 | 1189.0 | 1162.0 | 1139.6 | 1117.2 | 1114.4 |
| 25° | 1298.0 | 1296.1 | 1291.5 | 1279.4 | 1256.1 | 1226.3 | 1189.0 | 1148.9 | 1121.0 | 1101.4 | 1093.0 |
| 27.5° | 1317.6 | 1316.6 | 1311.0 | 1297.1 | 1272.8 | 1233.7 | 1180.6 | 1127.5 | 1090.2 | 1064.1 | 1058.5 |
| 30° | 1342.7 | 1340.9 | 1334.3 | 1318.5 | 1291.5 | 1238.4 | 1163.8 | 1091.1 | 1044.6 | 1015.7 | 1007.3 |
| 32.5° | 1373.5 | 1371.6 | 1362.3 | 1342.7 | 1313.8 | 1239.3 | 1139.6 | 1044.6 | 983.1 | 952.3 | 942.1 |
| 35° | 1414.5 | 1410.8 | 1398.6 | 1375.3 | 1335.3 | 1230.0 | 1096.7 | 984.9 | 909.4 | 869.4 | 855.4 |
| 37.5° | 1459.2 | 1454.5 | 1438.7 | 1409.8 | 1350.2 | 1204.8 | 1036.2 | 904.8 | 819.1 | 771.5 | 761.3 |
| 40° | 1514.2 | 1507.7 | 1483.4 | 1443.4 | 1355.8 | 1161.0 | 968.1 | 822.8 | 731.5 | 679.3 | 667.2 |
| 42.5° | 1583.1 | 1572.0 | 1532.8 | 1480.6 | 1344.6 | 1101.4 | 887.1 | 738.0 | 633.6 | 585.2 | 582.4 |
| 45° | 1666.1 | 1648.4 | 1589.7 | 1517.0 | 1320.4 | 1026.8 | 801.4 | 642.9 | 543.2 | 495.7 | 483.6 |
| 47.5° | 1763.9 | 1742.5 | 1655.8 | 1544.9 | 1272.8 | 950.4 | 709.1 | 550.7 | 459.4 | 410.9 | 401.6 |
| 50° | 1872.0 | 1851.5 | 1725.7 | 1560.8 | 1221.6 | 861.0 | 618.7 | 468.7 | 377.4 | 337.3 | 337.3 |
| 52.5° | 2003.4 | 1956.8 | 1792.8 | 1562.6 | 1143.3 | 762.2 | 532.1 | 388.6 | 316.8 | 281.4 | 274.0 |
| 55° | 2143.1 | 2088.2 | 1853.4 | 1545.9 | 1062.3 | 671.8 | 438.9 | 323.3 | 260.0 | 234.8 | 228.3 |
| 57.5° | 2298.8 | 2214.9 | 1897.2 | 1512.3 | 959.8 | 573.1 | 366.2 | 266.5 | 219.0 | 198.5 | 195.7 |
| 60° | 2455.3 | 2347.2 | 1923.2 | 1455.5 | 850.7 | 481.7 | 304.7 | 222.7 | 188.2 | 173.3 | 170.5 |
| 62.5° | 2600.7 | 2455.3 | 1925.1 | 1372.5 | 744.5 | 401.6 | 249.7 | 192.0 | 166.8 | 155.6 | 155.6 |
| 65° | 2726.5 | 2545.7 | 1893.4 | 1266.3 | 609.4 | 322.4 | 205.9 | 162.1 | 145.4 | 133.2 | 130.5 |
| 67.5° | 2788.0 | 2580.2 | 1837.5 | 1121.0 | 488.3 | 255.3 | 173.3 | 140.7 | 124.9 | 106.2 | 104.4 |
| 70° | 2701.3 | 2480.5 | 1694.0 | 934.6 | 377.4 | 203.1 | 144.4 | 120.2 | 104.4 | 88.5 | 86.7 |
| 72.5° | 2424.6 | 2214.9 | 1462.0 | 724.0 | 284.2 | 164.0 | 120.2 | 102.5 | 85.7 | 77.3 | 75.5 |
| 75° | 1983.8 | 1842.2 | 1155.4 | 498.5 | 198.5 | 128.6 | 100.6 | 86.7 | 72.7 | 69.0 | 68.0 |
| 77.5° | 1505.8 | 1369.8 | 844.2 | 312.2 | 136.0 | 100.6 | 85.7 | 73.6 | 63.4 | 66.2 | 64.3 |
| 80° | 1005.4 | 943.0 | 560.9 | 177.0 | 91.3 | 73.6 | 65.2 | 54.0 | 48.5 | 55.9 | 54.0 |
| 82.5° | 456.6 | 432.4 | 263.7 | 77.3 | 41.0 | 31.7 | 22.4 | 16.8 | 13.0 | 12.1 | 14.0 |
| 85° | 76.4 | 67.1 | 18.6 | 8.4 | 4.7 | 2.8 | 1.9 | 1.9 | 0.9 | 0.9 | 0.9 |
| 87.5° | 3.7 | 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 |

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

Report Prepared for

Cooper Lighting Solutions

Streetworks

Report Number: SP1-2407-157-4

Test Date: 08/07/2024

Luminaire Tested: MEM2-HTN-SA-40-730-U-5WQ-2

Data in this report applies to families of products including MEM2-HTN-SA-40-730-U-5WQ-2

Test Information

Test Method: LM-79-2019
 Report Number: SP1-2407-157-4
 Test Lab: COOPER LIGHTING SOLUTIONS
 Photometer: SP1 - 76IN SPHERE
 Measurement Geometry: 4π
 Issue Date: 08/20/2024
 Manufacturer: COOPER LIGHTING SOLUTIONS
 Product Line: Streetworks
 Catalog Number: **MEM2-HTN-SA-40-730-U-5WQ-2**
 Description: Epic Modern Light Square 40W 5WQ Optic and Flare Trim

Spectral Parameters

CCT (K): 3057
 CIE u': 0.2487
 CIE v': 0.5199
 Duv: -0.0002
 CIE x: 0.4326
 CIE y: 0.4020
 CIE z: 0.1654
 Peak Wavelength (nm): 593
 Dominant Wavelength (nm): 582
 Purity: 50.50735
 Rf: 74.6
 Rg: 94

| | | | |
|-----------|------|------|-------|
| CRI (Ra): | 71.7 | | |
| R1: | 68.1 | R9: | -34.8 |
| R2: | 82.0 | R10: | 58.5 |
| R3: | 93.5 | R11: | 62.5 |
| R4: | 67.5 | R12: | 47.5 |
| R5: | 67.2 | R13: | 70.7 |
| R6: | 74.9 | R14: | 96.4 |
| R7: | 77.4 | R15: | 60.0 |
| R8: | 43.1 | | |



Test Conditions

Stabilization Time: 21M
 Operation Time: 1H 21M
 Sphere Temperature (°C): 24.2

REPORT NUMBER: SP1-2407-157-4

| 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: SP1-2407-157-4

CIE 1931 Chromaticity Diagram



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



Point lies inside the ANSI 3000K 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 | 104 | NR | 620 | 818 | NR | 750 | 20 | NR | 880 | 1 | NR |
| 365 | 0 | NR | 495 | 135 | NR | 625 | 755 | NR | 755 | 17 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 184 | NR | 630 | 691 | NR | 760 | 15 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 247 | NR | 635 | 625 | NR | 765 | 13 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 309 | NR | 640 | 561 | NR | 770 | 11 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 369 | NR | 645 | 499 | NR | 775 | 9 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 419 | NR | 650 | 441 | NR | 780 | 8 | NR | 910 | 0 | NR |
| 395 | 0 | NR | 525 | 460 | NR | 655 | 388 | NR | 785 | 7 | NR | 915 | 0 | NR |
| 400 | 1 | NR | 530 | 492 | NR | 660 | 338 | NR | 790 | 6 | NR | 920 | 0 | NR |
| 405 | 3 | NR | 535 | 524 | NR | 665 | 294 | NR | 795 | 5 | NR | 925 | 0 | NR |
| 410 | 7 | NR | 540 | 553 | NR | 670 | 253 | NR | 800 | 4 | NR | 930 | 0 | NR |
| 415 | 15 | NR | 545 | 588 | NR | 675 | 218 | NR | 805 | 4 | NR | 935 | 0 | NR |
| 420 | 31 | NR | 550 | 625 | NR | 680 | 188 | NR | 810 | 3 | NR | 940 | 0 | NR |
| 425 | 60 | NR | 555 | 670 | NR | 685 | 161 | NR | 815 | 3 | NR | 945 | 0 | NR |
| 430 | 107 | NR | 560 | 723 | NR | 690 | 139 | NR | 820 | 3 | NR | 950 | 0 | NR |
| 435 | 183 | NR | 565 | 780 | NR | 695 | 118 | NR | 825 | 2 | NR | 955 | 0 | NR |
| 440 | 289 | NR | 570 | 837 | NR | 700 | 100 | NR | 830 | 2 | NR | 960 | 0 | NR |
| 445 | 460 | NR | 575 | 894 | NR | 705 | 85 | NR | 835 | 2 | NR | 965 | 0 | NR |
| 450 | 646 | NR | 580 | 942 | NR | 710 | 73 | NR | 840 | 1 | NR | 970 | 0 | NR |
| 455 | 561 | NR | 585 | 976 | NR | 715 | 62 | NR | 845 | 1 | NR | 975 | 0 | NR |
| 460 | 331 | NR | 590 | 998 | NR | 720 | 53 | NR | 850 | 1 | NR | 980 | 0 | NR |
| 465 | 238 | NR | 595 | 1000 | NR | 725 | 45 | NR | 855 | 1 | NR | 985 | 0 | NR |
| 470 | 178 | NR | 600 | 990 | NR | 730 | 39 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 120 | NR | 605 | 962 | NR | 735 | 33 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 96 | NR | 610 | 925 | NR | 740 | 28 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 95 | NR | 615 | 873 | NR | 745 | 24 | NR | 875 | 1 | NR | | | |

REPORT NUMBER: SP1-2407-157-4

Scotopic Flux vs. Wavelength



Scotopic Lumens: NR

S/P: 1.23

| 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 | 104 | NR | 620 | 818 | NR | 750 | 20 | NR | 880 | 1 | NR |
| 365 | 0 | NR | 495 | 135 | NR | 625 | 755 | NR | 755 | 17 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 184 | NR | 630 | 691 | NR | 760 | 15 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 247 | NR | 635 | 625 | NR | 765 | 13 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 309 | NR | 640 | 561 | NR | 770 | 11 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 369 | NR | 645 | 499 | NR | 775 | 9 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 419 | NR | 650 | 441 | NR | 780 | 8 | NR | 910 | 0 | NR |
| 395 | 0 | NR | 525 | 460 | NR | 655 | 388 | NR | 785 | 7 | NR | 915 | 0 | NR |
| 400 | 1 | NR | 530 | 492 | NR | 660 | 338 | NR | 790 | 6 | NR | 920 | 0 | NR |
| 405 | 3 | NR | 535 | 524 | NR | 665 | 294 | NR | 795 | 5 | NR | 925 | 0 | NR |
| 410 | 7 | NR | 540 | 553 | NR | 670 | 253 | NR | 800 | 4 | NR | 930 | 0 | NR |
| 415 | 15 | NR | 545 | 588 | NR | 675 | 218 | NR | 805 | 4 | NR | 935 | 0 | NR |
| 420 | 31 | NR | 550 | 625 | NR | 680 | 188 | NR | 810 | 3 | NR | 940 | 0 | NR |
| 425 | 60 | NR | 555 | 670 | NR | 685 | 161 | NR | 815 | 3 | NR | 945 | 0 | NR |
| 430 | 107 | NR | 560 | 723 | NR | 690 | 139 | NR | 820 | 3 | NR | 950 | 0 | NR |
| 435 | 183 | NR | 565 | 780 | NR | 695 | 118 | NR | 825 | 2 | NR | 955 | 0 | NR |
| 440 | 289 | NR | 570 | 837 | NR | 700 | 100 | NR | 830 | 2 | NR | 960 | 0 | NR |
| 445 | 460 | NR | 575 | 894 | NR | 705 | 85 | NR | 835 | 2 | NR | 965 | 0 | NR |
| 450 | 646 | NR | 580 | 942 | NR | 710 | 73 | NR | 840 | 1 | NR | 970 | 0 | NR |
| 455 | 561 | NR | 585 | 976 | NR | 715 | 62 | NR | 845 | 1 | NR | 975 | 0 | NR |
| 460 | 331 | NR | 590 | 998 | NR | 720 | 53 | NR | 850 | 1 | NR | 980 | 0 | NR |
| 465 | 238 | NR | 595 | 1000 | NR | 725 | 45 | NR | 855 | 1 | NR | 985 | 0 | NR |
| 470 | 178 | NR | 600 | 990 | NR | 730 | 39 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 120 | NR | 605 | 962 | NR | 735 | 33 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 96 | NR | 610 | 925 | NR | 740 | 28 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 95 | NR | 615 | 873 | NR | 745 | 24 | NR | 875 | 1 | NR | | | |

REPORT NUMBER: SP1-2407-157-4

Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 2.27

| 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 | 104 | NR | 620 | 818 | NR | 750 | 20 | NR | 880 | 1 | NR |
| 365 | 0 | NR | 495 | 135 | NR | 625 | 755 | NR | 755 | 17 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 184 | NR | 630 | 691 | NR | 760 | 15 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 247 | NR | 635 | 625 | NR | 765 | 13 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 309 | NR | 640 | 561 | NR | 770 | 11 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 369 | NR | 645 | 499 | NR | 775 | 9 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 419 | NR | 650 | 441 | NR | 780 | 8 | NR | 910 | 0 | NR |
| 395 | 0 | NR | 525 | 460 | NR | 655 | 388 | NR | 785 | 7 | NR | 915 | 0 | NR |
| 400 | 1 | NR | 530 | 492 | NR | 660 | 338 | NR | 790 | 6 | NR | 920 | 0 | NR |
| 405 | 3 | NR | 535 | 524 | NR | 665 | 294 | NR | 795 | 5 | NR | 925 | 0 | NR |
| 410 | 7 | NR | 540 | 553 | NR | 670 | 253 | NR | 800 | 4 | NR | 930 | 0 | NR |
| 415 | 15 | NR | 545 | 588 | NR | 675 | 218 | NR | 805 | 4 | NR | 935 | 0 | NR |
| 420 | 31 | NR | 550 | 625 | NR | 680 | 188 | NR | 810 | 3 | NR | 940 | 0 | NR |
| 425 | 60 | NR | 555 | 670 | NR | 685 | 161 | NR | 815 | 3 | NR | 945 | 0 | NR |
| 430 | 107 | NR | 560 | 723 | NR | 690 | 139 | NR | 820 | 3 | NR | 950 | 0 | NR |
| 435 | 183 | NR | 565 | 780 | NR | 695 | 118 | NR | 825 | 2 | NR | 955 | 0 | NR |
| 440 | 289 | NR | 570 | 837 | NR | 700 | 100 | NR | 830 | 2 | NR | 960 | 0 | NR |
| 445 | 460 | NR | 575 | 894 | NR | 705 | 85 | NR | 835 | 2 | NR | 965 | 0 | NR |
| 450 | 646 | NR | 580 | 942 | NR | 710 | 73 | NR | 840 | 1 | NR | 970 | 0 | NR |
| 455 | 561 | NR | 585 | 976 | NR | 715 | 62 | NR | 845 | 1 | NR | 975 | 0 | NR |
| 460 | 331 | NR | 590 | 998 | NR | 720 | 53 | NR | 850 | 1 | NR | 980 | 0 | NR |
| 465 | 238 | NR | 595 | 1000 | NR | 725 | 45 | NR | 855 | 1 | NR | 985 | 0 | NR |
| 470 | 178 | NR | 600 | 990 | NR | 730 | 39 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 120 | NR | 605 | 962 | NR | 735 | 33 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 96 | NR | 610 | 925 | NR | 740 | 28 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 95 | NR | 615 | 873 | NR | 745 | 24 | NR | 875 | 1 | NR | | | |

Summary

$R_f = 74.6$
 $R_g = 94$
 $CIE R_a = 71.7$
 $R_9 = -34.8$



Color Vector Graphics



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

| | | | |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 65 | CES51 = 87 | CES76 = 58 |
| CES02 = 62 | CES27 = 89 | CES52 = 85 | CES77 = 76 |
| CES03 = 31 | CES28 = 84 | CES53 = 77 | CES78 = 61 |
| CES04 = 71 | CES29 = 68 | CES54 = 85 | CES79 = 86 |
| CES05 = 49 | CES30 = 83 | CES55 = 84 | CES80 = 83 |
| CES06 = 51 | CES31 = 71 | CES56 = 74 | CES81 = 73 |
| CES07 = 41 | CES32 = 64 | CES57 = 74 | CES82 = 93 |
| CES08 = 40 | CES33 = 78 | CES58 = 75 | CES83 = 91 |
| CES09 = 29 | CES34 = 75 | CES59 = 85 | CES84 = 88 |
| CES10 = 76 | CES35 = 87 | CES60 = 90 | CES85 = 75 |
| CES11 = 59 | CES36 = 92 | CES61 = 81 | CES86 = 64 |
| CES12 = 65 | CES37 = 84 | CES62 = 89 | CES87 = 77 |
| CES13 = 43 | CES38 = 92 | CES63 = 75 | CES88 = 80 |
| CES14 = 74 | CES39 = 96 | CES64 = 65 | CES89 = 67 |
| CES15 = 71 | CES40 = 92 | CES65 = 64 | CES90 = 80 |
| CES16 = 47 | CES41 = 93 | CES66 = 60 | CES91 = 78 |
| CES17 = 50 | CES42 = 86 | CES67 = 58 | CES92 = 56 |
| CES18 = 56 | CES43 = 77 | CES68 = 66 | CES93 = 73 |
| CES19 = 73 | CES44 = 99 | CES69 = 75 | CES94 = 49 |
| CES20 = 66 | CES45 = 85 | CES70 = 60 | CES95 = 66 |
| CES21 = 87 | CES46 = 81 | CES71 = 56 | CES96 = 76 |
| CES22 = 79 | CES47 = 86 | CES72 = 85 | CES97 = 82 |
| CES23 = 92 | CES48 = 75 | CES73 = 52 | CES98 = 76 |
| CES24 = 91 | CES49 = 79 | CES74 = 95 | CES99 = 64 |
| CES25 = 73 | CES50 = 86 | CES75 = 60 | |



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)