

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: STREETWORKS

Report Number: P867534

Luminaire Tested: **MEM2-HTN-SA-60-722-U-T2U**

Issue Date: 08/21/2024



**Test Information**

Test Method: LM-79-08  
Report Number: P867534  
Test Lab: INNOVATION CENTER(G3)  
Issue Date: 08/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: STREETWORKS  
Catalog Number: MEM2-HTN-SA-60-722-U-T2U  
Description: EPIC MODERN TALL HOUSING DISCRETE LED ARRAYS 60W 70CRI 2200K  
FIXTURE w/ TYPE II URBAN DISTRIBUTION OPTIC  
Light Source: (10) 2200K CCT, 70 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

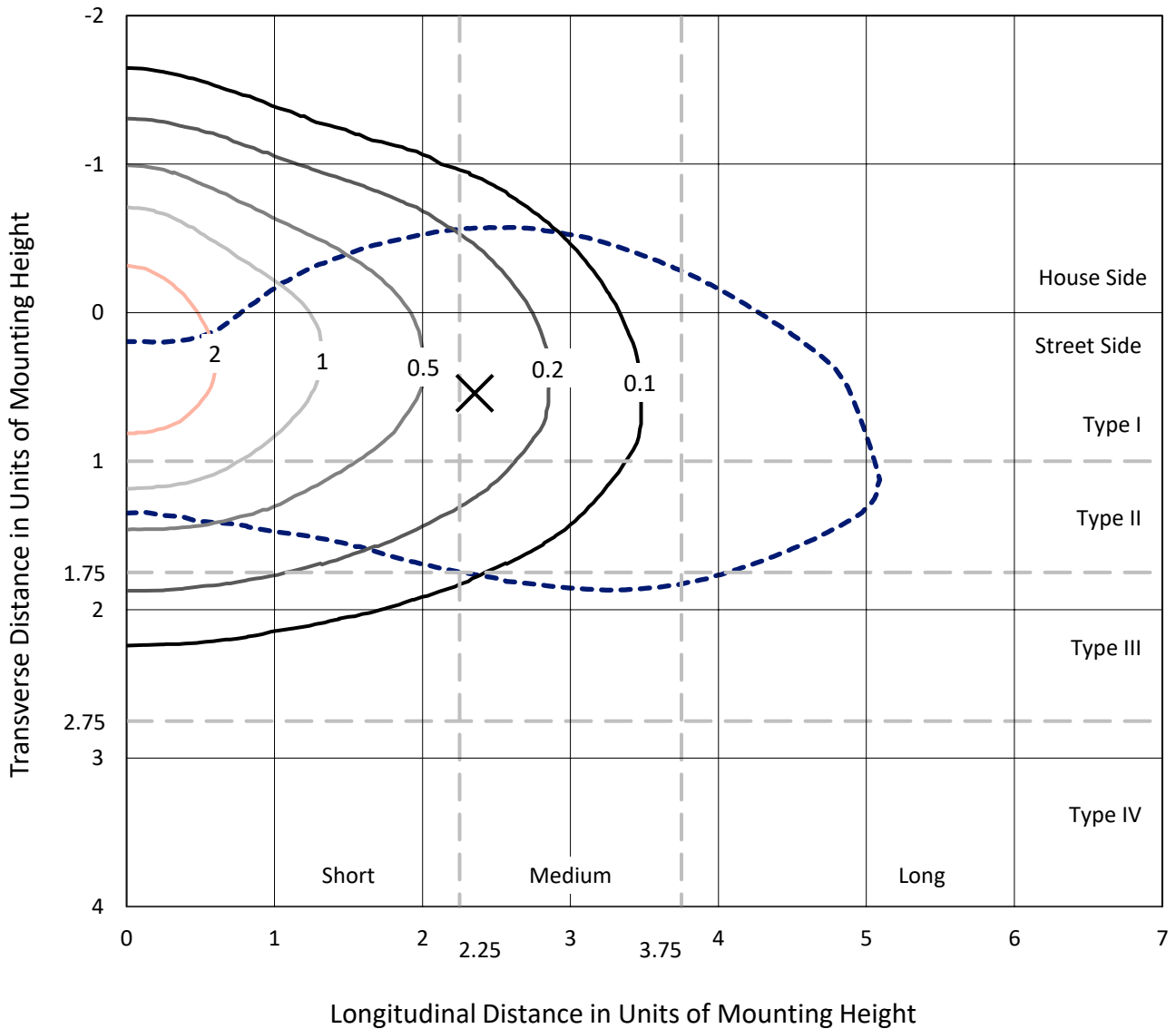
Lumens per Lamp: N/A  
Luminaire Lumens: 5424.1 lumens  
Efficiency: N/A  
Efficacy: 123.3 lumens/watt  
Luminous Opening: Rectangular (W 0.33' x L: 0.33' x H: 0')  
IES Classification: Type III - Medium  
BUG Rating: B1 - U0 - G1

Input Watts (W): 44  
Input Voltage (V): 120  
Input Current (A<sub>in</sub>): NR  
Voltage Rise (V): NR  
Power Factor: 0.99  
Total Harmonic Distortion (THDi): 6.91%  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

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 CATALOG NUMBER: MEM2-HTN-SA-60-722-U-T2U

### Iso-Footcandle Lines of Horizontal Illumination

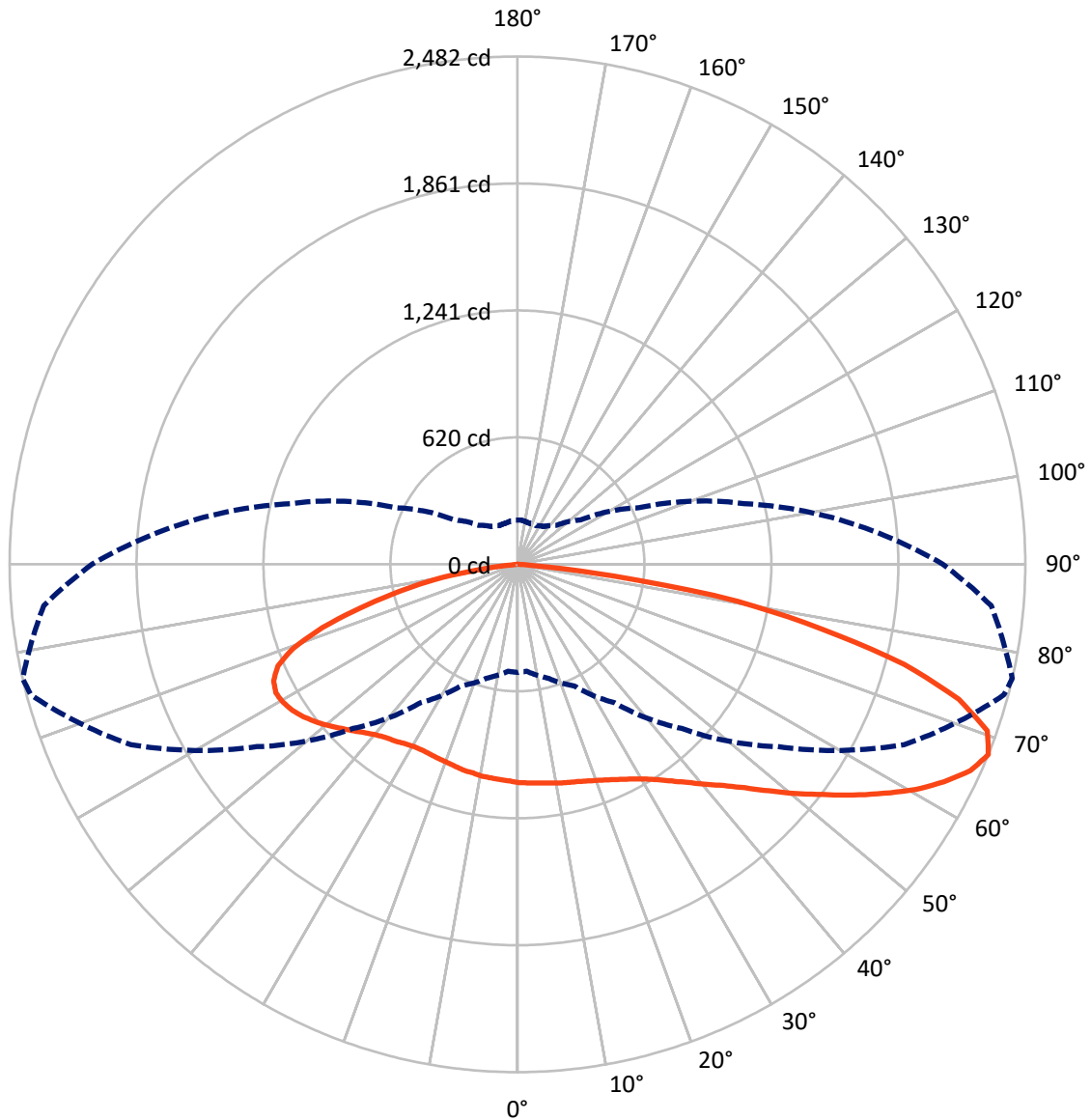
× Max cd  
 - - - 1/2 Max cd



Based on 20 foot mounting height. Maximum calculated value = 2.9 fc  
 Type III - Medium - N/A

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### Luminous Intensity Polar Plot



— Vertical Plane Through 77-Deg Lateral      - - - Horizontal Cone Through 67.5-Deg Vertical

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**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 1803.7   | 0.0    | 1803.7 |
|                    | % Fixture | 33.3     | 0.0    | 33.3   |
| <b>Street Side</b> | Lumens    | 3620.4   | 0.0    | 3620.4 |
|                    | % Fixture | 66.7     | 0.0    | 66.7   |
| <b>Total</b>       | Lumens    | 5424.1   | 0.0    | 5424.1 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 102.5  | 1.9       |
| 10°-20°   | 310.9  | 5.7       |
| 20°-30°   | 524.1  | 9.7       |
| 30°-40°   | 743.7  | 13.7      |
| 40°-50°   | 940.9  | 17.3      |
| 50°-60°   | 1030.8 | 19.0      |
| 60°-70°   | 996.4  | 18.4      |
| 70°-80°   | 670.1  | 12.4      |
| 80°-90°   | 104.7  | 1.9       |
| 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°    | 5424.1 | 100.0     |
| 0°-180°   | 5424.1 | 100.0     |

**Coefficient of Utilization**



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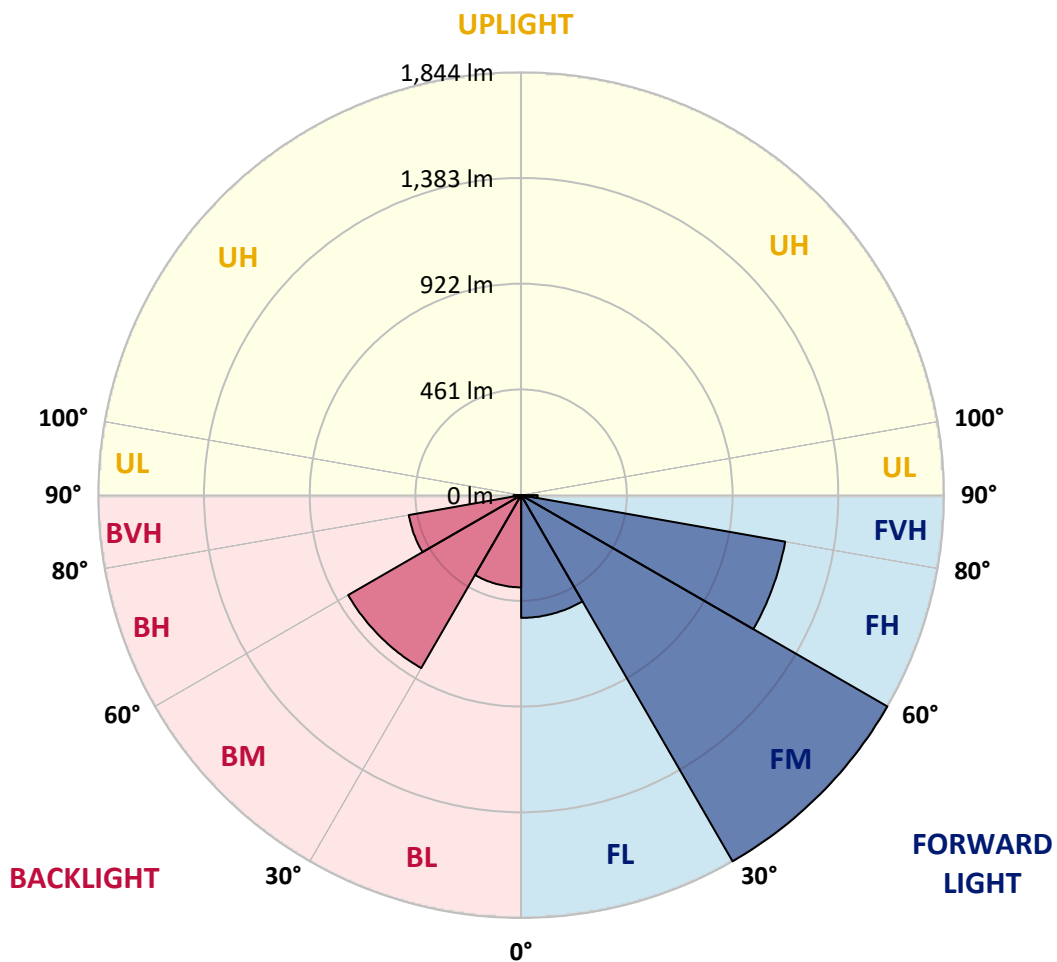
CATALOG NUMBER: MEM2-HTN-SA-60-722-U-T2U

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 535.4  | 9.9       |                         |      |         |
| FM   | (30°-60°)   | 1844.3 | 34.0      |                         |      |         |
| FH   | (60°-80°)   | 1169.1 | 21.6      |                         |      | G1/1800 |
| FVH  | (80°-90°)   | 71.7   | 1.3       |                         |      | G1/100  |
| BL   | (0°-30°)    | 402.1  | 7.4       | B1/500                  |      |         |
| BM   | (30°-60°)   | 871.1  | 16.1      | B1/1000                 |      |         |
| BH   | (60°-80°)   | 497.5  | 9.2       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 33.0   | 0.6       |                         |      | G1/100  |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B1-U0-G1**

Type III Medium





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 75°    | 77°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1066.4 | 1066.4 | 1066.4 | 1066.4 | 1066.4 | 1066.4 | 1066.4 | 1066.4 | 1066.4 | 1066.4 | 1066.4 |
| 2.5°  | 1090.0 | 1089.0 | 1083.6 | 1085.7 | 1079.3 | 1083.6 | 1077.2 | 1071.8 | 1070.7 | 1069.7 | 1070.7 |
| 5°    | 1124.4 | 1119.0 | 1113.6 | 1110.4 | 1105.1 | 1102.9 | 1092.2 | 1081.5 | 1075.0 | 1073.9 | 1071.8 |
| 7.5°  | 1164.1 | 1161.9 | 1154.4 | 1150.1 | 1135.1 | 1127.6 | 1112.6 | 1093.3 | 1083.6 | 1079.3 | 1073.9 |
| 10°   | 1204.8 | 1210.2 | 1200.5 | 1192.0 | 1174.8 | 1158.7 | 1133.0 | 1108.3 | 1089.0 | 1086.8 | 1075.0 |
| 12.5° | 1255.3 | 1254.2 | 1247.8 | 1232.7 | 1212.3 | 1189.8 | 1158.7 | 1124.4 | 1098.6 | 1094.3 | 1077.2 |
| 15°   | 1300.3 | 1299.2 | 1290.7 | 1276.7 | 1249.9 | 1222.0 | 1180.2 | 1140.5 | 1108.3 | 1101.8 | 1081.5 |
| 17.5° | 1342.2 | 1340.0 | 1334.7 | 1319.6 | 1286.4 | 1252.0 | 1211.3 | 1158.7 | 1120.1 | 1112.6 | 1084.7 |
| 20°   | 1378.6 | 1380.8 | 1374.3 | 1359.3 | 1328.2 | 1291.7 | 1240.2 | 1182.3 | 1135.1 | 1126.5 | 1094.3 |
| 22.5° | 1418.3 | 1419.4 | 1416.2 | 1410.8 | 1371.1 | 1332.5 | 1276.7 | 1209.1 | 1152.3 | 1143.7 | 1105.1 |
| 25°   | 1460.2 | 1461.3 | 1463.4 | 1460.2 | 1415.1 | 1373.3 | 1314.3 | 1242.4 | 1175.9 | 1164.1 | 1120.1 |
| 27.5° | 1508.5 | 1509.5 | 1513.8 | 1507.4 | 1459.1 | 1415.1 | 1356.1 | 1277.8 | 1200.5 | 1187.7 | 1133.0 |
| 30°   | 1563.2 | 1567.5 | 1564.2 | 1562.1 | 1506.3 | 1463.4 | 1398.0 | 1314.3 | 1232.7 | 1216.6 | 1155.5 |
| 32.5° | 1628.6 | 1627.5 | 1621.1 | 1614.7 | 1557.8 | 1512.7 | 1445.2 | 1361.5 | 1272.4 | 1254.2 | 1192.0 |
| 35°   | 1675.8 | 1675.8 | 1666.2 | 1663.0 | 1610.4 | 1563.2 | 1496.7 | 1414.0 | 1317.5 | 1300.3 | 1230.6 |
| 37.5° | 1704.8 | 1709.1 | 1701.6 | 1703.7 | 1653.3 | 1609.3 | 1548.2 | 1467.7 | 1366.8 | 1351.8 | 1277.8 |
| 40°   | 1715.5 | 1726.3 | 1732.7 | 1741.3 | 1690.8 | 1653.3 | 1602.9 | 1525.6 | 1430.1 | 1413.0 | 1334.7 |
| 42.5° | 1717.7 | 1733.8 | 1756.3 | 1774.5 | 1717.7 | 1686.6 | 1655.4 | 1584.6 | 1492.4 | 1477.3 | 1396.9 |
| 45°   | 1706.9 | 1699.4 | 1754.1 | 1756.3 | 1732.7 | 1713.4 | 1701.6 | 1655.4 | 1582.5 | 1557.8 | 1474.1 |
| 47.5° | 1625.4 | 1616.8 | 1631.8 | 1700.5 | 1714.4 | 1725.2 | 1748.8 | 1738.1 | 1672.6 | 1653.3 | 1563.2 |
| 50°   | 1493.4 | 1489.1 | 1549.2 | 1623.3 | 1669.4 | 1724.1 | 1787.4 | 1817.4 | 1772.4 | 1760.6 | 1675.8 |
| 52.5° | 1275.6 | 1263.8 | 1386.2 | 1529.9 | 1610.4 | 1713.4 | 1814.2 | 1899.0 | 1885.0 | 1867.9 | 1772.4 |
| 55°   | 1137.2 | 1137.2 | 1219.9 | 1399.0 | 1535.3 | 1674.8 | 1831.4 | 1984.8 | 2009.5 | 1990.2 | 1882.9 |
| 57.5° | 989.2  | 1001.0 | 1086.8 | 1210.2 | 1426.9 | 1603.9 | 1829.2 | 2056.7 | 2129.7 | 2111.4 | 1999.8 |
| 60°   | 862.6  | 872.2  | 921.6  | 1046.1 | 1299.2 | 1510.6 | 1805.6 | 2115.7 | 2241.2 | 2234.8 | 2102.8 |
| 62.5° | 733.8  | 745.6  | 785.3  | 902.3  | 1130.8 | 1403.3 | 1756.3 | 2147.9 | 2346.4 | 2339.9 | 2206.9 |
| 65°   | 630.8  | 631.9  | 671.6  | 769.2  | 962.4  | 1273.5 | 1669.4 | 2141.5 | 2427.9 | 2432.2 | 2294.9 |
| 67.5° | 527.9  | 524.6  | 576.1  | 655.5  | 825.0  | 1134.0 | 1553.5 | 2084.6 | 2462.2 | 2481.6 | 2323.8 |
| 70°   | 388.4  | 392.7  | 464.6  | 552.5  | 697.4  | 973.1  | 1391.5 | 1974.1 | 2406.5 | 2436.5 | 2257.3 |
| 72.5° | 291.8  | 300.4  | 370.1  | 461.3  | 582.6  | 812.2  | 1214.5 | 1782.0 | 2250.9 | 2255.2 | 2054.5 |
| 75°   | 237.1  | 239.3  | 301.5  | 383.0  | 477.4  | 651.2  | 975.2  | 1488.1 | 1903.3 | 1952.6 | 1745.6 |
| 77.5° | 201.7  | 199.6  | 229.6  | 309.0  | 385.2  | 520.3  | 734.9  | 1131.9 | 1494.5 | 1517.0 | 1366.8 |
| 80°   | 171.7  | 170.6  | 181.3  | 250.0  | 301.5  | 371.2  | 503.2  | 788.6  | 1066.4 | 1091.1 | 970.9  |
| 82.5° | 90.1   | 96.6   | 94.4   | 154.5  | 170.6  | 195.3  | 241.4  | 358.3  | 465.6  | 472.1  | 446.3  |
| 85°   | 4.3    | 4.3    | 4.3    | 6.4    | 10.7   | 17.2   | 33.3   | 33.3   | 36.5   | 69.7   | 79.4   |
| 87.5° | 1.1    | 1.1    | 2.1    | 2.1    | 2.1    | 3.2    | 3.2    | 4.3    | 4.3    | 4.3    | 4.3    |
| 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: P867534

CATALOG NUMBER: MEM2-HTN-SA-60-722-U-T2U

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1066.4 | 1066.4 | 1066.4 | 1066.4 | 1066.4 | 1066.4 | 1066.4 | 1066.4 | 1066.4 | 1066.4 | 1066.4 |
| 2.5°  | 1068.6 | 1064.3 | 1057.9 | 1058.9 | 1057.9 | 1057.9 | 1052.5 | 1048.2 | 1047.1 | 1049.3 | 1053.6 |
| 5°    | 1069.7 | 1063.2 | 1053.6 | 1050.3 | 1047.1 | 1045.0 | 1036.4 | 1030.0 | 1026.7 | 1028.9 | 1030.0 |
| 7.5°  | 1069.7 | 1060.0 | 1049.3 | 1042.8 | 1034.2 | 1027.8 | 1018.2 | 1009.6 | 1005.3 | 1006.4 | 1008.5 |
| 10°   | 1067.5 | 1056.8 | 1048.2 | 1035.3 | 1021.4 | 1013.9 | 998.8  | 988.1  | 982.8  | 983.8  | 978.5  |
| 12.5° | 1067.5 | 1055.7 | 1038.5 | 1026.7 | 1007.4 | 991.3  | 979.5  | 967.7  | 963.4  | 959.1  | 957.0  |
| 15°   | 1068.6 | 1053.6 | 1036.4 | 1011.7 | 989.2  | 972.0  | 957.0  | 949.5  | 943.1  | 940.9  | 942.0  |
| 17.5° | 1068.6 | 1053.6 | 1027.8 | 998.8  | 973.1  | 951.6  | 938.8  | 930.2  | 928.0  | 925.9  | 925.9  |
| 20°   | 1073.9 | 1054.6 | 1020.3 | 986.0  | 953.8  | 931.3  | 919.5  | 914.1  | 914.1  | 910.9  | 910.9  |
| 22.5° | 1082.5 | 1056.8 | 1016.0 | 975.2  | 937.7  | 913.0  | 900.1  | 893.7  | 896.9  | 894.8  | 893.7  |
| 25°   | 1092.2 | 1064.3 | 1010.6 | 960.2  | 916.2  | 890.5  | 877.6  | 873.3  | 872.2  | 866.9  | 874.4  |
| 27.5° | 1099.7 | 1069.7 | 1007.4 | 945.2  | 896.9  | 866.9  | 850.8  | 843.3  | 837.9  | 840.1  | 837.9  |
| 30°   | 1120.1 | 1084.7 | 1008.5 | 932.3  | 875.5  | 839.0  | 819.7  | 811.1  | 808.9  | 808.9  | 808.9  |
| 32.5° | 1148.0 | 1104.0 | 1016.0 | 927.0  | 855.1  | 812.2  | 788.6  | 780.0  | 777.8  | 773.5  | 775.7  |
| 35°   | 1183.4 | 1133.0 | 1027.8 | 918.4  | 839.0  | 781.1  | 755.3  | 743.5  | 740.3  | 736.0  | 736.0  |
| 37.5° | 1223.1 | 1161.9 | 1036.4 | 914.1  | 817.5  | 748.9  | 719.9  | 704.9  | 702.7  | 698.4  | 700.6  |
| 40°   | 1273.5 | 1201.6 | 1050.3 | 905.5  | 792.9  | 719.9  | 681.3  | 656.6  | 662.0  | 664.1  | 668.4  |
| 42.5° | 1330.4 | 1252.0 | 1071.8 | 896.9  | 773.5  | 689.9  | 633.0  | 608.3  | 614.8  | 612.6  | 616.9  |
| 45°   | 1407.6 | 1311.0 | 1098.6 | 893.7  | 749.9  | 653.4  | 583.6  | 555.7  | 553.6  | 550.4  | 552.5  |
| 47.5° | 1488.1 | 1381.9 | 1124.4 | 887.3  | 724.2  | 608.3  | 527.9  | 492.4  | 483.9  | 479.6  | 475.3  |
| 50°   | 1571.8 | 1452.7 | 1154.4 | 883.0  | 689.9  | 557.9  | 472.1  | 431.3  | 415.2  | 409.8  | 404.5  |
| 52.5° | 1666.2 | 1528.8 | 1180.2 | 872.2  | 652.3  | 505.3  | 421.6  | 375.5  | 357.3  | 346.5  | 347.6  |
| 55°   | 1765.9 | 1598.6 | 1203.8 | 859.4  | 609.4  | 456.0  | 371.2  | 332.6  | 314.4  | 311.1  | 311.1  |
| 57.5° | 1858.2 | 1670.5 | 1220.9 | 836.8  | 566.5  | 407.7  | 329.4  | 296.1  | 287.5  | 291.8  | 291.8  |
| 60°   | 1952.6 | 1728.4 | 1229.5 | 812.2  | 522.5  | 366.9  | 300.4  | 273.6  | 269.3  | 277.9  | 278.9  |
| 62.5° | 2028.8 | 1774.5 | 1227.4 | 777.8  | 474.2  | 331.5  | 272.5  | 251.1  | 253.2  | 268.2  | 271.4  |
| 65°   | 2083.5 | 1797.1 | 1200.5 | 726.3  | 428.1  | 300.4  | 247.8  | 227.4  | 227.4  | 238.2  | 241.4  |
| 67.5° | 2079.2 | 1768.1 | 1146.9 | 654.5  | 378.7  | 269.3  | 225.3  | 209.2  | 209.2  | 216.7  | 215.6  |
| 70°   | 1991.3 | 1668.3 | 1045.0 | 567.5  | 330.4  | 242.5  | 206.0  | 194.2  | 193.1  | 196.3  | 195.3  |
| 72.5° | 1779.9 | 1465.5 | 886.2  | 468.8  | 285.4  | 215.6  | 186.7  | 176.0  | 173.8  | 169.5  | 166.3  |
| 75°   | 1468.8 | 1203.8 | 692.0  | 373.4  | 241.4  | 189.9  | 168.4  | 158.8  | 150.2  | 155.6  | 152.3  |
| 77.5° | 1139.4 | 923.7  | 515.0  | 289.7  | 196.3  | 165.2  | 150.2  | 139.5  | 137.3  | 156.6  | 150.2  |
| 80°   | 831.5  | 638.4  | 363.7  | 207.1  | 152.3  | 134.1  | 125.5  | 116.9  | 148.1  | 198.5  | 197.4  |
| 82.5° | 369.1  | 307.9  | 166.3  | 98.7   | 70.8   | 59.0   | 49.4   | 55.8   | 93.3   | 91.2   | 94.4   |
| 85°   | 33.3   | 34.3   | 18.2   | 11.8   | 7.5    | 6.4    | 4.3    | 4.3    | 3.2    | 3.2    | 3.2    |
| 87.5° | 4.3    | 4.3    | 3.2    | 3.2    | 2.1    | 2.1    | 2.1    | 2.1    | 1.1    | 1.1    | 1.1    |
| 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: SP1-2407-157-2

Test Date: 08/07/2024

Luminaire Tested: MEM2-HTN-SA-40-722-U-5WQ-2

Data in this report applies to families of products including MEM2-HTN-SA-40-722-U-5WQ-2

**Test Information**

Test Method: LM-79-2019  
 Report Number: SP1-2407-157-2  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry:  $4\pi$   
 Issue Date: 08/20/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: Streetworks  
 Catalog Number: **MEM2-HTN-SA-40-722-U-5WQ-2**  
 Description: Epic Modern Light Square 40W 5WQ Optic and Flare Trim

**Spectral Parameters**

CCT (K): 2253  
 CIE u': 0.2868  
 CIE v': 0.5332  
 Duv: -0.0014  
 CIE x: 0.4974  
 CIE y: 0.4110  
 CIE z: 0.0915  
 Peak Wavelength (nm): 603  
 Dominant Wavelength (nm): 587  
 Purity: 72.69432  
 Rf: 76.9  
 Rg: 92.7

|           |      |      |       |
|-----------|------|------|-------|
| CRI (Ra): | 70.6 |      |       |
| R1:       | 68.4 | R9:  | -36.0 |
| R2:       | 88.7 | R10: | 78.2  |
| R3:       | 85.4 | R11: | 61.0  |
| R4:       | 63.5 | R12: | 74.2  |
| R5:       | 69.0 | R13: | 72.8  |
| R6:       | 88.9 | R14: | 92.2  |
| R7:       | 68.5 | R15: | 58.0  |
| R8:       | 32.0 |      |       |



**Test Conditions**

Stabilization Time: 29M  
 Operation Time: 1H 29M  
 Sphere Temperature (°C): 24.1

REPORT NUMBER: SP1-2407-157-2

| 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 2200K 4-step quadrangle

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**Photopic Flux vs. Wavelength**



**Photopic Lumens: NR**

| $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) | $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) | $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) | $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) | $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) |
|-------------------|-----------------------------|-------------------------|-------------------|-----------------------------|-------------------------|-------------------|-----------------------------|-------------------------|-------------------|-----------------------------|-------------------------|-------------------|-----------------------------|-------------------------|
| 360               | 0                           | NR                      | 490               | 117                         | NR                      | 620               | 896                         | NR                      | 750               | 20                          | NR                      | 880               | 0                           | NR                      |
| 365               | 0                           | NR                      | 495               | 137                         | NR                      | 625               | 838                         | NR                      | 755               | 17                          | NR                      | 885               | 0                           | NR                      |
| 370               | 0                           | NR                      | 500               | 160                         | NR                      | 630               | 774                         | NR                      | 760               | 14                          | NR                      | 890               | 0                           | NR                      |
| 375               | 0                           | NR                      | 505               | 183                         | NR                      | 635               | 704                         | NR                      | 765               | 12                          | NR                      | 895               | 0                           | NR                      |
| 380               | 0                           | NR                      | 510               | 202                         | NR                      | 640               | 635                         | NR                      | 770               | 10                          | NR                      | 900               | 0                           | NR                      |
| 385               | 0                           | NR                      | 515               | 219                         | NR                      | 645               | 565                         | NR                      | 775               | 9                           | NR                      | 905               | 0                           | NR                      |
| 390               | 0                           | NR                      | 520               | 235                         | NR                      | 650               | 501                         | NR                      | 780               | 7                           | NR                      | 910               | 0                           | NR                      |
| 395               | 0                           | NR                      | 525               | 249                         | NR                      | 655               | 440                         | NR                      | 785               | 6                           | NR                      | 915               | 0                           | NR                      |
| 400               | 0                           | NR                      | 530               | 263                         | NR                      | 660               | 383                         | NR                      | 790               | 5                           | NR                      | 920               | 0                           | NR                      |
| 405               | 0                           | NR                      | 535               | 281                         | NR                      | 665               | 332                         | NR                      | 795               | 5                           | NR                      | 925               | 0                           | NR                      |
| 410               | 1                           | NR                      | 540               | 302                         | NR                      | 670               | 286                         | NR                      | 800               | 4                           | NR                      | 930               | 0                           | NR                      |
| 415               | 3                           | NR                      | 545               | 331                         | NR                      | 675               | 245                         | NR                      | 805               | 3                           | NR                      | 935               | 0                           | NR                      |
| 420               | 6                           | NR                      | 550               | 366                         | NR                      | 680               | 210                         | NR                      | 810               | 3                           | NR                      | 940               | 0                           | NR                      |
| 425               | 12                          | NR                      | 555               | 411                         | NR                      | 685               | 178                         | NR                      | 815               | 3                           | NR                      | 945               | 0                           | NR                      |
| 430               | 21                          | NR                      | 560               | 469                         | NR                      | 690               | 152                         | NR                      | 820               | 2                           | NR                      | 950               | 0                           | NR                      |
| 435               | 38                          | NR                      | 565               | 536                         | NR                      | 695               | 129                         | NR                      | 825               | 2                           | NR                      | 955               | 0                           | NR                      |
| 440               | 66                          | NR                      | 570               | 614                         | NR                      | 700               | 109                         | NR                      | 830               | 2                           | NR                      | 960               | 0                           | NR                      |
| 445               | 122                         | NR                      | 575               | 701                         | NR                      | 705               | 92                          | NR                      | 835               | 1                           | NR                      | 965               | 0                           | NR                      |
| 450               | 215                         | NR                      | 580               | 785                         | NR                      | 710               | 77                          | NR                      | 840               | 1                           | NR                      | 970               | 0                           | NR                      |
| 455               | 236                         | NR                      | 585               | 863                         | NR                      | 715               | 66                          | NR                      | 845               | 1                           | NR                      | 975               | 0                           | NR                      |
| 460               | 170                         | NR                      | 590               | 928                         | NR                      | 720               | 55                          | NR                      | 850               | 1                           | NR                      | 980               | 0                           | NR                      |
| 465               | 148                         | NR                      | 595               | 971                         | NR                      | 725               | 47                          | NR                      | 855               | 1                           | NR                      | 985               | 0                           | NR                      |
| 470               | 132                         | NR                      | 600               | 994                         | NR                      | 730               | 40                          | NR                      | 860               | 1                           | NR                      | 990               | 0                           | NR                      |
| 475               | 104                         | NR                      | 605               | 996                         | NR                      | 735               | 33                          | NR                      | 865               | 1                           | NR                      | 995               | 0                           | NR                      |
| 480               | 97                          | NR                      | 610               | 979                         | NR                      | 740               | 28                          | NR                      | 870               | 1                           | NR                      | 1000              | 0                           | NR                      |
| 485               | 105                         | NR                      | 615               | 943                         | NR                      | 745               | 24                          | NR                      | 875               | 0                           | NR                      |                   |                             |                         |

REPORT NUMBER: SP1-2407-157-2

**Scotopic Flux vs. Wavelength**



**Scotopic Lumens: NR**

**S/P: 0.96**

| λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) |
|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|
| 360    | 0                        | NR            | 490    | 117                      | NR            | 620    | 896                      | NR            | 750    | 20                       | NR            | 880    | 0                        | NR            |
| 365    | 0                        | NR            | 495    | 137                      | NR            | 625    | 838                      | NR            | 755    | 17                       | NR            | 885    | 0                        | NR            |
| 370    | 0                        | NR            | 500    | 160                      | NR            | 630    | 774                      | NR            | 760    | 14                       | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 183                      | NR            | 635    | 704                      | NR            | 765    | 12                       | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 202                      | NR            | 640    | 635                      | NR            | 770    | 10                       | NR            | 900    | 0                        | NR            |
| 385    | 0                        | NR            | 515    | 219                      | NR            | 645    | 565                      | NR            | 775    | 9                        | NR            | 905    | 0                        | NR            |
| 390    | 0                        | NR            | 520    | 235                      | NR            | 650    | 501                      | NR            | 780    | 7                        | NR            | 910    | 0                        | NR            |
| 395    | 0                        | NR            | 525    | 249                      | NR            | 655    | 440                      | NR            | 785    | 6                        | NR            | 915    | 0                        | NR            |
| 400    | 0                        | NR            | 530    | 263                      | NR            | 660    | 383                      | NR            | 790    | 5                        | NR            | 920    | 0                        | NR            |
| 405    | 0                        | NR            | 535    | 281                      | NR            | 665    | 332                      | NR            | 795    | 5                        | NR            | 925    | 0                        | NR            |
| 410    | 1                        | NR            | 540    | 302                      | NR            | 670    | 286                      | NR            | 800    | 4                        | NR            | 930    | 0                        | NR            |
| 415    | 3                        | NR            | 545    | 331                      | NR            | 675    | 245                      | NR            | 805    | 3                        | NR            | 935    | 0                        | NR            |
| 420    | 6                        | NR            | 550    | 366                      | NR            | 680    | 210                      | NR            | 810    | 3                        | NR            | 940    | 0                        | NR            |
| 425    | 12                       | NR            | 555    | 411                      | NR            | 685    | 178                      | NR            | 815    | 3                        | NR            | 945    | 0                        | NR            |
| 430    | 21                       | NR            | 560    | 469                      | NR            | 690    | 152                      | NR            | 820    | 2                        | NR            | 950    | 0                        | NR            |
| 435    | 38                       | NR            | 565    | 536                      | NR            | 695    | 129                      | NR            | 825    | 2                        | NR            | 955    | 0                        | NR            |
| 440    | 66                       | NR            | 570    | 614                      | NR            | 700    | 109                      | NR            | 830    | 2                        | NR            | 960    | 0                        | NR            |
| 445    | 122                      | NR            | 575    | 701                      | NR            | 705    | 92                       | NR            | 835    | 1                        | NR            | 965    | 0                        | NR            |
| 450    | 215                      | NR            | 580    | 785                      | NR            | 710    | 77                       | NR            | 840    | 1                        | NR            | 970    | 0                        | NR            |
| 455    | 236                      | NR            | 585    | 863                      | NR            | 715    | 66                       | NR            | 845    | 1                        | NR            | 975    | 0                        | NR            |
| 460    | 170                      | NR            | 590    | 928                      | NR            | 720    | 55                       | NR            | 850    | 1                        | NR            | 980    | 0                        | NR            |
| 465    | 148                      | NR            | 595    | 971                      | NR            | 725    | 47                       | NR            | 855    | 1                        | NR            | 985    | 0                        | NR            |
| 470    | 132                      | NR            | 600    | 994                      | NR            | 730    | 40                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 104                      | NR            | 605    | 996                      | NR            | 735    | 33                       | NR            | 865    | 1                        | NR            | 995    | 0                        | NR            |
| 480    | 97                       | NR            | 610    | 979                      | NR            | 740    | 28                       | NR            | 870    | 1                        | NR            | 1000   | 0                        | NR            |
| 485    | 105                      | NR            | 615    | 943                      | NR            | 745    | 24                       | NR            | 875    | 0                        | NR            |        |                          |               |

REPORT NUMBER: SP1-2407-157-2

Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 1.71

| λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) |
|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|
| 360    | 0                        | NR            | 490    | 117                      | NR            | 620    | 896                      | NR            | 750    | 20                       | NR            | 880    | 0                        | NR            |
| 365    | 0                        | NR            | 495    | 137                      | NR            | 625    | 838                      | NR            | 755    | 17                       | NR            | 885    | 0                        | NR            |
| 370    | 0                        | NR            | 500    | 160                      | NR            | 630    | 774                      | NR            | 760    | 14                       | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 183                      | NR            | 635    | 704                      | NR            | 765    | 12                       | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 202                      | NR            | 640    | 635                      | NR            | 770    | 10                       | NR            | 900    | 0                        | NR            |
| 385    | 0                        | NR            | 515    | 219                      | NR            | 645    | 565                      | NR            | 775    | 9                        | NR            | 905    | 0                        | NR            |
| 390    | 0                        | NR            | 520    | 235                      | NR            | 650    | 501                      | NR            | 780    | 7                        | NR            | 910    | 0                        | NR            |
| 395    | 0                        | NR            | 525    | 249                      | NR            | 655    | 440                      | NR            | 785    | 6                        | NR            | 915    | 0                        | NR            |
| 400    | 0                        | NR            | 530    | 263                      | NR            | 660    | 383                      | NR            | 790    | 5                        | NR            | 920    | 0                        | NR            |
| 405    | 0                        | NR            | 535    | 281                      | NR            | 665    | 332                      | NR            | 795    | 5                        | NR            | 925    | 0                        | NR            |
| 410    | 1                        | NR            | 540    | 302                      | NR            | 670    | 286                      | NR            | 800    | 4                        | NR            | 930    | 0                        | NR            |
| 415    | 3                        | NR            | 545    | 331                      | NR            | 675    | 245                      | NR            | 805    | 3                        | NR            | 935    | 0                        | NR            |
| 420    | 6                        | NR            | 550    | 366                      | NR            | 680    | 210                      | NR            | 810    | 3                        | NR            | 940    | 0                        | NR            |
| 425    | 12                       | NR            | 555    | 411                      | NR            | 685    | 178                      | NR            | 815    | 3                        | NR            | 945    | 0                        | NR            |
| 430    | 21                       | NR            | 560    | 469                      | NR            | 690    | 152                      | NR            | 820    | 2                        | NR            | 950    | 0                        | NR            |
| 435    | 38                       | NR            | 565    | 536                      | NR            | 695    | 129                      | NR            | 825    | 2                        | NR            | 955    | 0                        | NR            |
| 440    | 66                       | NR            | 570    | 614                      | NR            | 700    | 109                      | NR            | 830    | 2                        | NR            | 960    | 0                        | NR            |
| 445    | 122                      | NR            | 575    | 701                      | NR            | 705    | 92                       | NR            | 835    | 1                        | NR            | 965    | 0                        | NR            |
| 450    | 215                      | NR            | 580    | 785                      | NR            | 710    | 77                       | NR            | 840    | 1                        | NR            | 970    | 0                        | NR            |
| 455    | 236                      | NR            | 585    | 863                      | NR            | 715    | 66                       | NR            | 845    | 1                        | NR            | 975    | 0                        | NR            |
| 460    | 170                      | NR            | 590    | 928                      | NR            | 720    | 55                       | NR            | 850    | 1                        | NR            | 980    | 0                        | NR            |
| 465    | 148                      | NR            | 595    | 971                      | NR            | 725    | 47                       | NR            | 855    | 1                        | NR            | 985    | 0                        | NR            |
| 470    | 132                      | NR            | 600    | 994                      | NR            | 730    | 40                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 104                      | NR            | 605    | 996                      | NR            | 735    | 33                       | NR            | 865    | 1                        | NR            | 995    | 0                        | NR            |
| 480    | 97                       | NR            | 610    | 979                      | NR            | 740    | 28                       | NR            | 870    | 1                        | NR            | 1000   | 0                        | NR            |
| 485    | 105                      | NR            | 615    | 943                      | NR            | 745    | 24                       | NR            | 875    | 0                        | NR            |        |                          |               |

**Summary**

$R_f = 76.9$   
 $R_g = 92.7$   
 CIE  $R_a = 70.6$   
 $R_9 = -36.0$



**Color Vector Graphics**





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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 87 | CES26 = 76 | CES51 = 88 | CES76 = 78 |
| CES02 = 65 | CES27 = 94 | CES52 = 85 | CES77 = 75 |
| CES03 = 32 | CES28 = 93 | CES53 = 80 | CES78 = 79 |
| CES04 = 72 | CES29 = 81 | CES54 = 86 | CES79 = 82 |
| CES05 = 51 | CES30 = 91 | CES55 = 83 | CES80 = 81 |
| CES06 = 52 | CES31 = 83 | CES56 = 77 | CES81 = 51 |
| CES07 = 44 | CES32 = 75 | CES57 = 75 | CES82 = 92 |
| CES08 = 42 | CES33 = 88 | CES58 = 76 | CES83 = 88 |
| CES09 = 29 | CES34 = 88 | CES59 = 84 | CES84 = 90 |
| CES10 = 79 | CES35 = 94 | CES60 = 91 | CES85 = 65 |
| CES11 = 62 | CES36 = 90 | CES61 = 82 | CES86 = 48 |
| CES12 = 68 | CES37 = 97 | CES62 = 91 | CES87 = 76 |
| CES13 = 45 | CES38 = 98 | CES63 = 86 | CES88 = 78 |
| CES14 = 75 | CES39 = 97 | CES64 = 70 | CES89 = 61 |
| CES15 = 72 | CES40 = 94 | CES65 = 71 | CES90 = 80 |
| CES16 = 48 | CES41 = 95 | CES66 = 71 | CES91 = 80 |
| CES17 = 51 | CES42 = 89 | CES67 = 70 | CES92 = 51 |
| CES18 = 57 | CES43 = 80 | CES68 = 74 | CES93 = 68 |
| CES19 = 74 | CES44 = 99 | CES69 = 84 | CES94 = 44 |
| CES20 = 68 | CES45 = 83 | CES70 = 72 | CES95 = 66 |
| CES21 = 88 | CES46 = 81 | CES71 = 75 | CES96 = 75 |
| CES22 = 81 | CES47 = 88 | CES72 = 89 | CES97 = 76 |
| CES23 = 92 | CES48 = 73 | CES73 = 68 | CES98 = 72 |
| CES24 = 92 | CES49 = 82 | CES74 = 85 | CES99 = 63 |
| CES25 = 73 | CES50 = 87 | CES75 = 80 |            |



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)