

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: P867618

Luminaire Tested: **MEM2-HTN-SA-40-730-U-T3**

Issue Date: 08/21/2024



**Test Information**

Test Method: LM-79-08  
Report Number: P867618  
Test Lab: INNOVATION CENTER(G3)  
Issue Date: 08/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: STREETWORKS  
Catalog Number: MEM2-HTN-SA-40-730-U-T3  
Description: EPIC MODERN TALL HOUSING DISCRETE LED ARRAYS 40W 70CRI 3000K  
FIXTURE w/ TYPE III DISTRIBUTION OPTIC  
Light Source: (10) 3000K CCT, 70 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

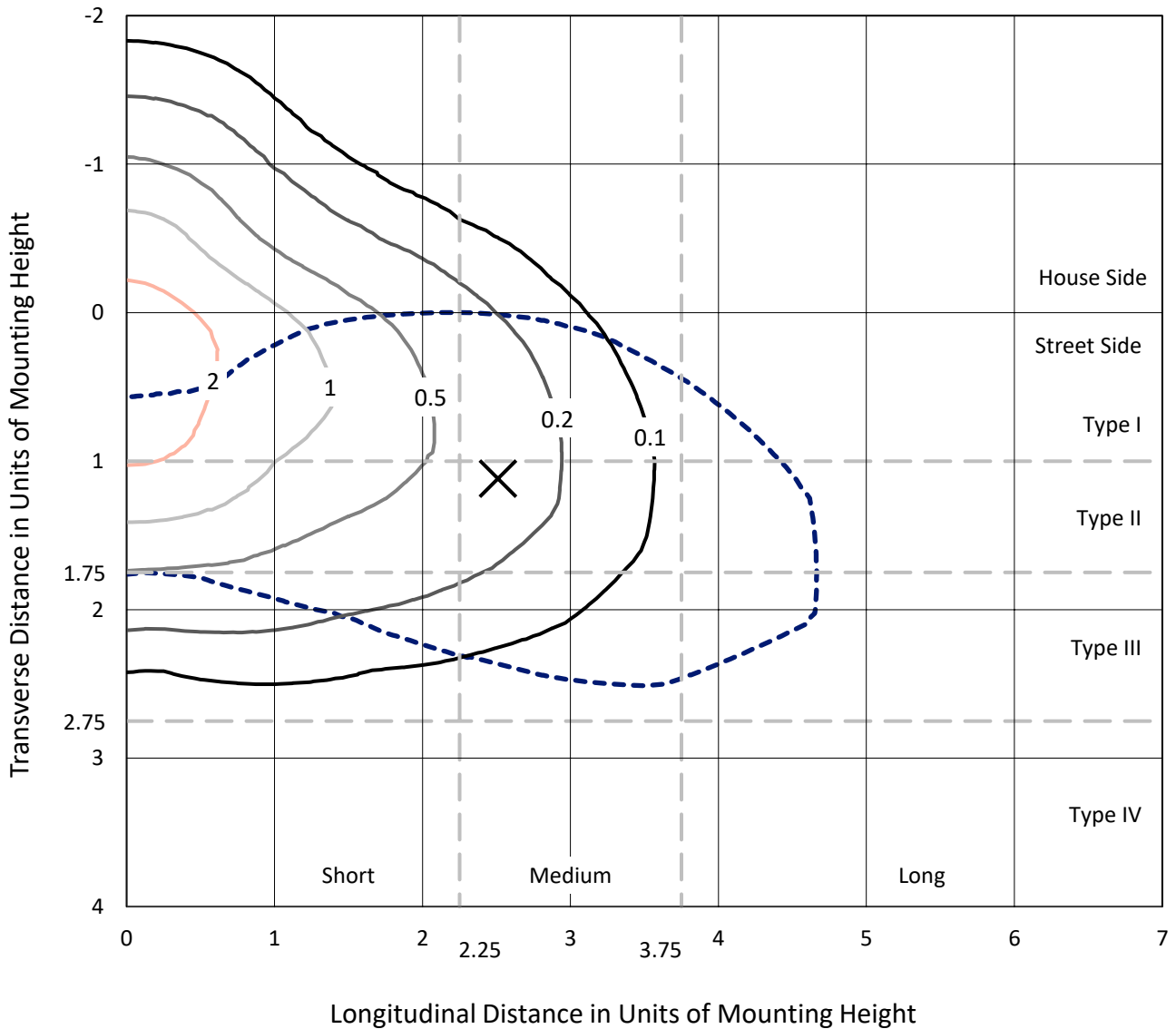
Lumens per Lamp: N/A  
Luminaire Lumens: 5919.4 lumens  
Efficiency: N/A  
Efficacy: 134.5 lumens/watt  
Luminous Opening: Rectangular (W 0.33' x L: 0.33' x H: 0')  
IES Classification: Type III - Medium  
BUG Rating: B1 - U0 - G1

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

REPORT NUMBER: P867618  
 CATALOG NUMBER: MEM2-HTN-SA-40-730-U-T3

### Iso-Footcandle Lines of Horizontal Illumination

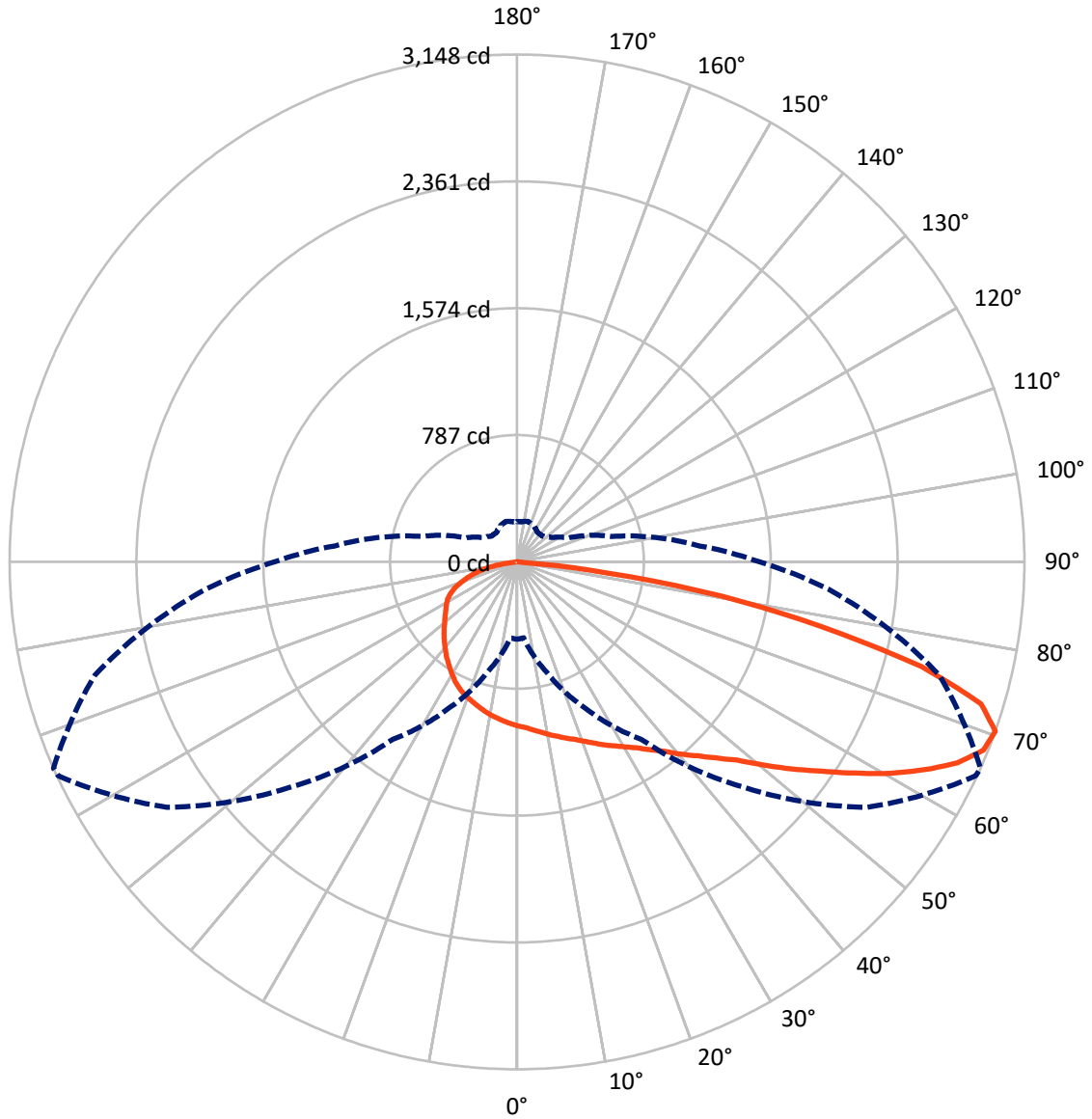
× Max cd  
 - - - 1/2 Max cd



Based on 20 foot mounting height. Maximum calculated value = 2.7 fc  
 Type III - Medium - N/A

REPORT NUMBER: P867618  
CATALOG NUMBER: MEM2-HTN-SA-40-730-U-T3

### Luminous Intensity Polar Plot



— Vertical Plane Through 66-Deg Lateral      - - - Horizontal Cone Through 70-Deg Vertical

REPORT NUMBER: P867618  
 CATALOG NUMBER: MEM2-HTN-SA-40-730-U-T3

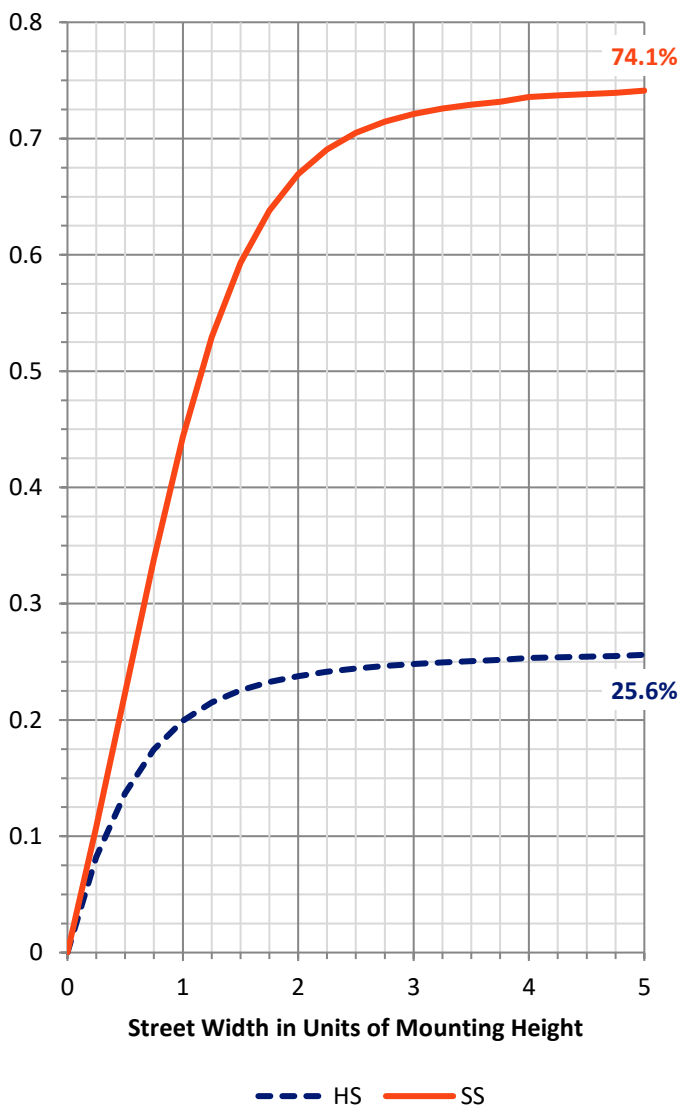
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 1525.5   | 0.0    | 1525.5 |
|                    | % Fixture | 25.8     | 0.0    | 25.8   |
| <b>Street Side</b> | Lumens    | 4393.9   | 0.0    | 4393.9 |
|                    | % Fixture | 74.2     | 0.0    | 74.2   |
| <b>Total</b>       | Lumens    | 5919.4   | 0.0    | 5919.4 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 97.5   | 1.6       |
| 10°-20°   | 290.3  | 4.9       |
| 20°-30°   | 487.6  | 8.2       |
| 30°-40°   | 734.6  | 12.4      |
| 40°-50°   | 997.4  | 16.8      |
| 50°-60°   | 1185.2 | 20.0      |
| 60°-70°   | 1209.6 | 20.4      |
| 70°-80°   | 809.0  | 13.7      |
| 80°-90°   | 108.2  | 1.8       |
| 90°-100°  | 0.0    | 0.0       |
| 100°-110° | 0.0    | 0.0       |
| 110°-120° | 0.0    | 0.0       |
| 120°-130° | 0.0    | 0.0       |
| 130°-140° | 0.0    | 0.0       |
| 140°-150° | 0.0    | 0.0       |
| 150°-160° | 0.0    | 0.0       |
| 160°-170° | 0.0    | 0.0       |
| 170°-180° | 0.0    | 0.0       |
| 0°-90°    | 5919.4 | 100.0     |
| 0°-180°   | 5919.4 | 100.0     |

**Coefficient of Utilization**



REPORT NUMBER: P867618

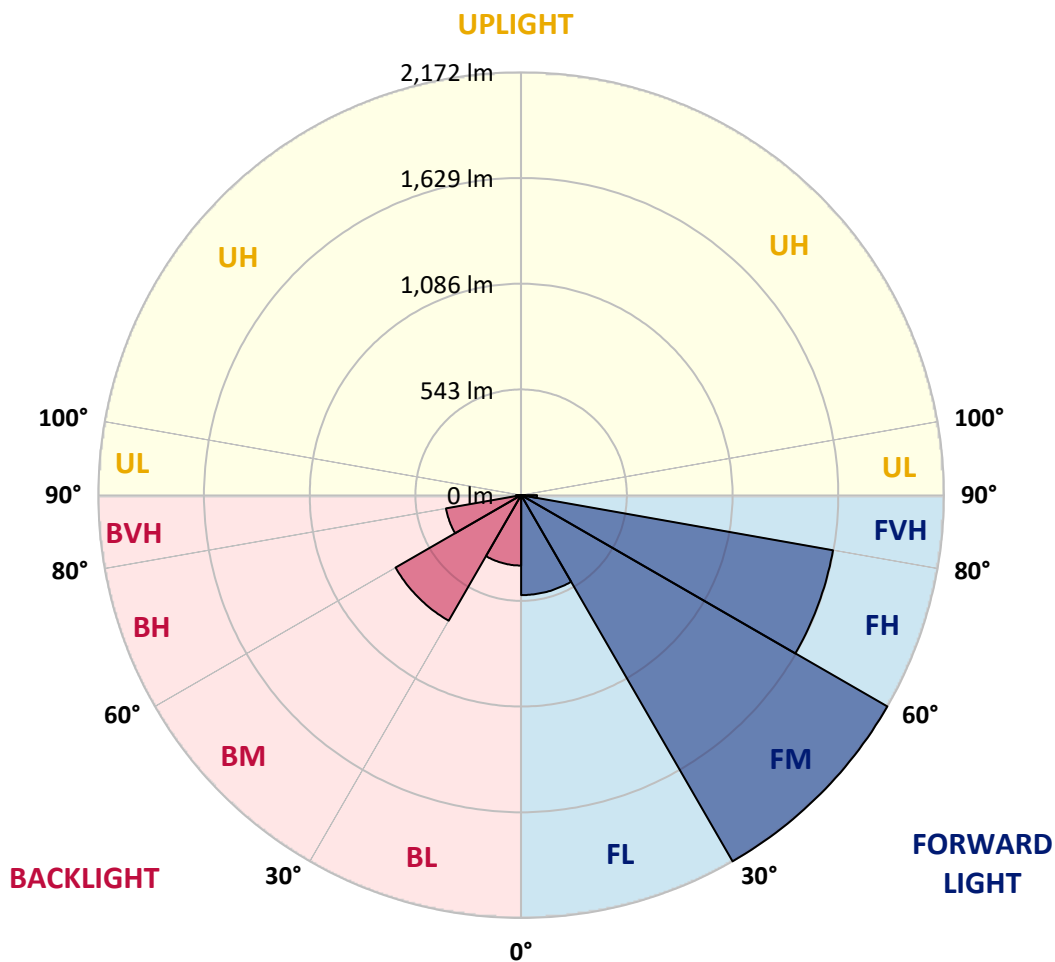
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**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 513.7  | 8.7       |                         |      |         |
| FM   | (30°-60°)   | 2172.3 | 36.7      |                         |      |         |
| FH   | (60°-80°)   | 1626.9 | 27.5      |                         |      | G1/1800 |
| FVH  | (80°-90°)   | 81.1   | 1.4       |                         |      | G1/100  |
| BL   | (0°-30°)    | 361.7  | 6.1       | B1/500                  |      |         |
| BM   | (30°-60°)   | 744.9  | 12.6      | B1/1000                 |      |         |
| BH   | (60°-80°)   | 391.7  | 6.6       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 27.2   | 0.5       |                         |      | 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





REPORT NUMBER: P867618

CATALOG NUMBER: MEM2-HTN-SA-40-730-U-T3

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 66°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1018.5 | 1018.5 | 1018.5 | 1018.5 | 1018.5 | 1018.5 | 1018.5 | 1018.5 | 1018.5 | 1018.5 | 1018.5 |
| 2.5°  | 1054.9 | 1050.2 | 1046.7 | 1049.0 | 1042.0 | 1044.3 | 1036.1 | 1030.2 | 1029.1 | 1026.7 | 1024.3 |
| 5°    | 1087.9 | 1087.9 | 1082.0 | 1082.0 | 1073.7 | 1072.6 | 1060.8 | 1047.9 | 1047.9 | 1039.6 | 1030.2 |
| 7.5°  | 1123.1 | 1120.8 | 1113.7 | 1112.6 | 1103.1 | 1100.8 | 1087.9 | 1067.9 | 1066.7 | 1051.4 | 1037.3 |
| 10°   | 1147.8 | 1149.0 | 1144.3 | 1144.3 | 1137.2 | 1131.4 | 1112.6 | 1091.4 | 1089.0 | 1069.0 | 1046.7 |
| 12.5° | 1166.6 | 1169.0 | 1167.8 | 1167.8 | 1161.9 | 1161.9 | 1140.8 | 1112.6 | 1110.2 | 1084.3 | 1052.6 |
| 15°   | 1186.6 | 1185.5 | 1189.0 | 1190.2 | 1187.8 | 1184.3 | 1169.0 | 1136.1 | 1134.9 | 1100.8 | 1060.8 |
| 17.5° | 1204.3 | 1203.1 | 1204.3 | 1210.2 | 1211.3 | 1211.3 | 1196.1 | 1161.9 | 1157.2 | 1120.8 | 1067.9 |
| 20°   | 1214.9 | 1217.2 | 1221.9 | 1229.0 | 1232.5 | 1241.9 | 1229.0 | 1192.5 | 1187.8 | 1142.0 | 1083.1 |
| 22.5° | 1254.9 | 1247.8 | 1251.3 | 1256.0 | 1260.7 | 1273.7 | 1261.9 | 1224.3 | 1220.7 | 1173.7 | 1100.8 |
| 25°   | 1323.1 | 1323.1 | 1314.8 | 1306.6 | 1300.7 | 1306.6 | 1297.2 | 1260.7 | 1258.4 | 1201.9 | 1120.8 |
| 27.5° | 1441.8 | 1441.8 | 1424.2 | 1393.6 | 1354.8 | 1344.2 | 1337.2 | 1299.5 | 1292.5 | 1232.5 | 1133.7 |
| 30°   | 1592.4 | 1597.1 | 1565.3 | 1513.6 | 1441.8 | 1394.8 | 1377.2 | 1336.0 | 1332.5 | 1263.1 | 1153.7 |
| 32.5° | 1753.5 | 1762.9 | 1739.4 | 1664.1 | 1546.5 | 1454.8 | 1426.6 | 1384.2 | 1376.0 | 1299.5 | 1179.6 |
| 35°   | 1898.2 | 1907.6 | 1875.8 | 1805.2 | 1654.7 | 1541.8 | 1485.4 | 1437.1 | 1432.4 | 1346.6 | 1218.4 |
| 37.5° | 2015.8 | 2018.1 | 1998.1 | 1912.3 | 1745.3 | 1614.7 | 1558.3 | 1500.6 | 1491.2 | 1403.0 | 1259.6 |
| 40°   | 2140.4 | 2149.8 | 2129.8 | 2024.0 | 1827.6 | 1693.5 | 1631.2 | 1577.1 | 1568.9 | 1461.8 | 1298.4 |
| 42.5° | 2271.0 | 2269.8 | 2269.8 | 2120.4 | 1909.9 | 1759.4 | 1710.0 | 1650.0 | 1645.3 | 1521.8 | 1340.7 |
| 45°   | 2350.9 | 2355.6 | 2342.7 | 2178.1 | 2031.1 | 1827.6 | 1786.4 | 1742.9 | 1734.7 | 1605.3 | 1396.0 |
| 47.5° | 2370.9 | 2360.3 | 2301.5 | 2222.7 | 2167.5 | 1898.2 | 1882.9 | 1857.0 | 1838.2 | 1697.1 | 1464.2 |
| 50°   | 2343.9 | 2327.4 | 2293.3 | 2242.7 | 2218.0 | 1982.8 | 1980.5 | 1993.4 | 1980.5 | 1808.8 | 1543.0 |
| 52.5° | 2242.7 | 2240.4 | 2234.5 | 2246.3 | 2206.3 | 2049.9 | 2091.0 | 2135.7 | 2133.4 | 1922.9 | 1625.3 |
| 55°   | 2029.9 | 2045.2 | 2115.7 | 2189.8 | 2161.6 | 2095.7 | 2214.5 | 2300.4 | 2291.0 | 2056.9 | 1710.0 |
| 57.5° | 1812.3 | 1827.6 | 1918.2 | 2094.6 | 2118.1 | 2145.1 | 2353.3 | 2487.4 | 2472.1 | 2202.8 | 1787.6 |
| 60°   | 1623.0 | 1606.5 | 1697.1 | 1951.1 | 2056.9 | 2189.8 | 2490.9 | 2676.7 | 2663.8 | 2348.6 | 1867.6 |
| 62.5° | 1323.1 | 1339.5 | 1484.2 | 1741.7 | 1971.1 | 2218.0 | 2603.8 | 2848.4 | 2840.2 | 2482.7 | 1932.3 |
| 65°   | 1046.7 | 1024.3 | 1241.9 | 1521.8 | 1822.9 | 2208.6 | 2701.4 | 3009.5 | 3003.7 | 2614.4 | 1981.7 |
| 67.5° | 711.5  | 696.2  | 983.2  | 1303.1 | 1621.8 | 2133.4 | 2723.7 | 3117.7 | 3120.1 | 2692.0 | 1994.6 |
| 70°   | 479.8  | 472.8  | 706.8  | 1002.0 | 1343.1 | 1971.1 | 2654.4 | 3140.1 | 3148.3 | 2712.0 | 1937.0 |
| 72.5° | 354.0  | 352.8  | 517.5  | 715.0  | 999.6  | 1664.1 | 2465.0 | 2994.2 | 3009.5 | 2570.9 | 1767.6 |
| 75°   | 278.7  | 282.3  | 369.3  | 508.1  | 666.8  | 1231.3 | 2073.4 | 2567.3 | 2590.9 | 2220.4 | 1467.7 |
| 77.5° | 228.2  | 228.2  | 258.7  | 364.6  | 445.7  | 764.4  | 1491.2 | 1879.3 | 1926.4 | 1713.5 | 1130.2 |
| 80°   | 184.6  | 188.2  | 191.7  | 254.0  | 295.2  | 436.3  | 867.9  | 1253.7 | 1287.8 | 1193.7 | 816.2  |
| 82.5° | 101.1  | 108.2  | 104.7  | 131.7  | 148.2  | 202.3  | 344.6  | 506.9  | 558.6  | 497.5  | 370.5  |
| 85°   | 7.1    | 4.7    | 8.2    | 10.6   | 12.9   | 20.0   | 27.0   | 37.6   | 35.3   | 50.6   | 25.9   |
| 87.5° | 1.2    | 1.2    | 1.2    | 2.4    | 2.4    | 3.5    | 4.7    | 4.7    | 4.7    | 4.7    | 4.7    |
| 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: P867618

CATALOG NUMBER: MEM2-HTN-SA-40-730-U-T3

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1018.5 | 1018.5 | 1018.5 | 1018.5 | 1018.5 | 1018.5 | 1018.5 | 1018.5 | 1018.5 | 1018.5 | 1018.5 |
| 2.5°  | 1023.2 | 1017.3 | 1007.9 | 1005.5 | 1002.0 | 997.3  | 992.6  | 985.5  | 983.2  | 985.5  | 987.9  |
| 5°    | 1024.3 | 1016.1 | 1000.8 | 991.4  | 982.0  | 973.8  | 964.4  | 955.0  | 949.1  | 950.3  | 955.0  |
| 7.5°  | 1027.9 | 1016.1 | 992.6  | 977.3  | 962.0  | 949.1  | 933.8  | 923.2  | 916.1  | 917.3  | 920.9  |
| 10°   | 1032.6 | 1016.1 | 987.9  | 962.0  | 940.8  | 922.0  | 906.7  | 893.8  | 886.7  | 885.6  | 886.7  |
| 12.5° | 1033.8 | 1014.9 | 977.3  | 945.6  | 919.7  | 895.0  | 878.5  | 866.8  | 859.7  | 856.2  | 858.5  |
| 15°   | 1037.3 | 1011.4 | 966.7  | 927.9  | 896.2  | 870.3  | 850.3  | 836.2  | 831.5  | 829.1  | 827.9  |
| 17.5° | 1042.0 | 1010.2 | 957.3  | 910.3  | 872.6  | 843.2  | 825.6  | 811.5  | 805.6  | 803.2  | 805.6  |
| 20°   | 1049.0 | 1011.4 | 946.7  | 892.6  | 851.5  | 822.1  | 802.1  | 788.0  | 783.3  | 782.1  | 780.9  |
| 22.5° | 1058.5 | 1013.8 | 938.5  | 876.2  | 827.9  | 798.5  | 778.6  | 769.1  | 765.6  | 766.8  | 766.8  |
| 25°   | 1067.9 | 1016.1 | 926.7  | 853.8  | 803.2  | 772.7  | 758.6  | 751.5  | 753.9  | 758.6  | 758.6  |
| 27.5° | 1076.1 | 1014.9 | 910.3  | 830.3  | 773.8  | 745.6  | 735.0  | 736.2  | 742.1  | 750.3  | 751.5  |
| 30°   | 1086.7 | 1014.9 | 892.6  | 800.9  | 740.9  | 713.9  | 711.5  | 720.9  | 730.3  | 738.6  | 738.6  |
| 32.5° | 1103.1 | 1022.0 | 878.5  | 771.5  | 706.8  | 685.6  | 696.2  | 709.2  | 719.7  | 728.0  | 730.3  |
| 35°   | 1131.4 | 1037.3 | 869.1  | 742.1  | 673.9  | 658.6  | 678.6  | 699.8  | 706.8  | 712.7  | 713.9  |
| 37.5° | 1158.4 | 1051.4 | 857.3  | 713.9  | 639.8  | 633.9  | 660.9  | 683.3  | 684.5  | 688.0  | 688.0  |
| 40°   | 1184.3 | 1062.0 | 842.1  | 683.3  | 606.8  | 606.8  | 638.6  | 657.4  | 655.1  | 651.5  | 652.7  |
| 42.5° | 1212.5 | 1067.9 | 824.4  | 655.1  | 579.8  | 579.8  | 605.7  | 622.1  | 621.0  | 625.7  | 629.2  |
| 45°   | 1246.6 | 1079.6 | 800.9  | 629.2  | 551.6  | 546.9  | 568.0  | 582.1  | 599.8  | 621.0  | 626.8  |
| 47.5° | 1293.7 | 1096.1 | 782.1  | 601.0  | 528.0  | 511.6  | 519.8  | 549.2  | 569.2  | 586.9  | 589.2  |
| 50°   | 1343.1 | 1119.6 | 765.6  | 571.6  | 499.8  | 470.4  | 477.5  | 510.4  | 522.2  | 529.2  | 532.8  |
| 52.5° | 1396.0 | 1138.4 | 751.5  | 546.9  | 470.4  | 428.1  | 437.5  | 469.2  | 477.5  | 483.4  | 484.5  |
| 55°   | 1441.8 | 1153.7 | 733.9  | 523.3  | 438.7  | 388.1  | 399.9  | 430.4  | 438.7  | 445.7  | 445.7  |
| 57.5° | 1490.1 | 1167.8 | 722.1  | 503.4  | 404.6  | 355.2  | 363.4  | 394.0  | 405.7  | 408.1  | 411.6  |
| 60°   | 1530.1 | 1180.8 | 711.5  | 484.5  | 372.8  | 325.8  | 331.6  | 358.7  | 372.8  | 374.0  | 376.3  |
| 62.5° | 1558.3 | 1189.0 | 705.6  | 461.0  | 341.1  | 296.4  | 301.1  | 328.1  | 344.6  | 348.1  | 349.3  |
| 65°   | 1575.9 | 1193.7 | 695.1  | 430.4  | 314.0  | 271.7  | 271.7  | 298.7  | 315.2  | 323.4  | 325.8  |
| 67.5° | 1567.7 | 1185.5 | 666.8  | 395.2  | 289.3  | 247.0  | 245.8  | 272.8  | 287.0  | 291.7  | 292.8  |
| 70°   | 1504.2 | 1137.2 | 609.2  | 351.6  | 263.4  | 224.6  | 222.3  | 247.0  | 259.9  | 249.3  | 250.5  |
| 72.5° | 1374.8 | 1027.9 | 530.4  | 308.1  | 236.4  | 203.5  | 201.1  | 222.3  | 223.5  | 223.5  | 222.3  |
| 75°   | 1158.4 | 839.7  | 423.4  | 262.3  | 208.2  | 181.1  | 182.3  | 198.8  | 199.9  | 205.8  | 202.3  |
| 77.5° | 887.9  | 622.1  | 330.5  | 209.3  | 176.4  | 161.1  | 167.0  | 172.9  | 181.1  | 189.3  | 181.1  |
| 80°   | 645.7  | 429.3  | 229.3  | 156.4  | 136.4  | 136.4  | 138.8  | 144.7  | 156.4  | 164.6  | 156.4  |
| 82.5° | 276.4  | 189.3  | 105.8  | 77.6   | 67.0   | 65.9   | 67.0   | 67.0   | 82.3   | 84.7   | 74.1   |
| 85°   | 21.2   | 17.6   | 12.9   | 12.9   | 10.6   | 5.9    | 5.9    | 4.7    | 3.5    | 3.5    | 3.5    |
| 87.5° | 4.7    | 3.5    | 3.5    | 3.5    | 2.4    | 2.4    | 2.4    | 2.4    | 2.4    | 2.4    | 2.4    |
| 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-30-730-U-5WQ-2

Data in this report applies to families of products including MEM2-HTN-SA-30-730-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-30-730-U-5WQ-2**  
 Description: Epic Modern Light Square 30W 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



CCT = 3057K  
 CIE x = 0.4326  
 CIE y = 0.4020  
 Duv = -0.0002

Point lies inside the ANSI 3000K 4-step quadrangle

REPORT NUMBER: SP1-2407-157-4

**Photopic Flux vs. Wavelength**



**Photopic Lumens: NR**

| $\lambda$ (nm) | Power W <sup>^</sup> /nm | Lumens ( $\phi$ /nm) | $\lambda$ (nm) | Power W <sup>^</sup> /nm | Lumens ( $\phi$ /nm) | $\lambda$ (nm) | Power W <sup>^</sup> /nm | Lumens ( $\phi$ /nm) | $\lambda$ (nm) | Power W <sup>^</sup> /nm | Lumens ( $\phi$ /nm) | $\lambda$ (nm) | Power W <sup>^</sup> /nm | Lumens ( $\phi$ /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**

| $\lambda$ (nm) | Power W <sup>^</sup> /nm | Lumens ( $\phi$ /nm) | $\lambda$ (nm) | Power W <sup>^</sup> /nm | Lumens ( $\phi$ /nm) | $\lambda$ (nm) | Power W <sup>^</sup> /nm | Lumens ( $\phi$ /nm) | $\lambda$ (nm) | Power W <sup>^</sup> /nm | Lumens ( $\phi$ /nm) | $\lambda$ (nm) | Power W <sup>^</sup> /nm | Lumens ( $\phi$ /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**

| $\lambda$ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | $\lambda$ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | $\lambda$ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | $\lambda$ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | $\lambda$ (nm) | Power W <sup>^</sup> /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)