

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: P822664

Luminaire Tested: **PMM-SA2C-840-U-SL2-HSS**

Issue Date: 04/10/2024

**Test Information**

Test Method: LM-79-08  
Report Number: P822664  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1910-543-17)  
Test Lab: INNOVATION CENTER  
Issue Date: 04/10/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: STREETWORKS  
Catalog Number: PMM-SA2C-840-U-SL2-HSS  
Description: MESA POST TOP DECORATIVE LUMINAIRE. (2) LIGHTSQUARES WITH 16 LEDS  
EACH AND TYPE II SPILL LIGHT ELIMINATOR OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 8502.3 lumens  
Efficiency: N/A  
Efficacy: 75.2 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 1' x H: 0')  
IES Classification: Type II - Short  
BUG Rating: B1 - U0 - G2

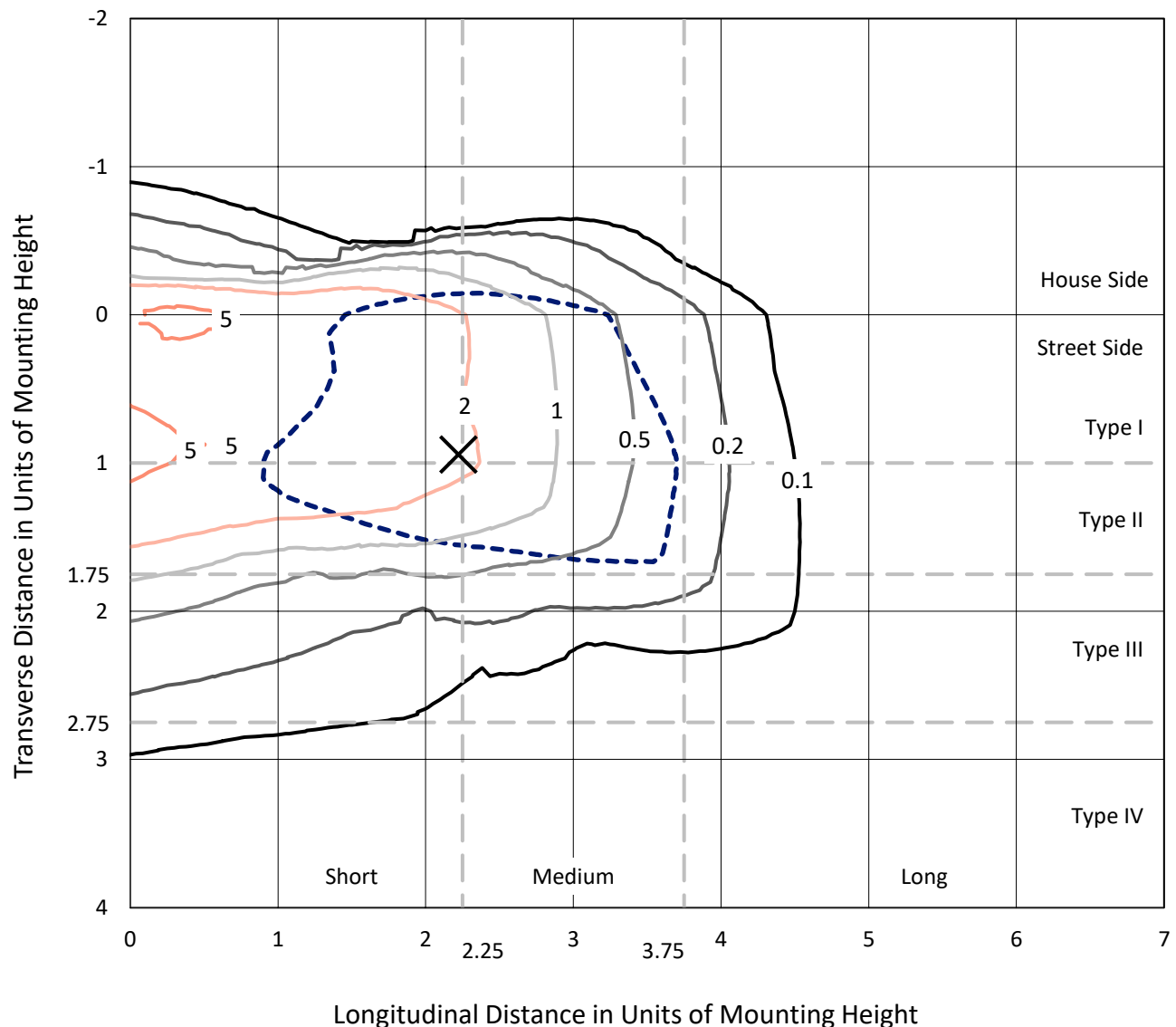
Input Watts (W): 113  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 25 FT

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## Iso-Footcandle Lines of Horizontal Illumination

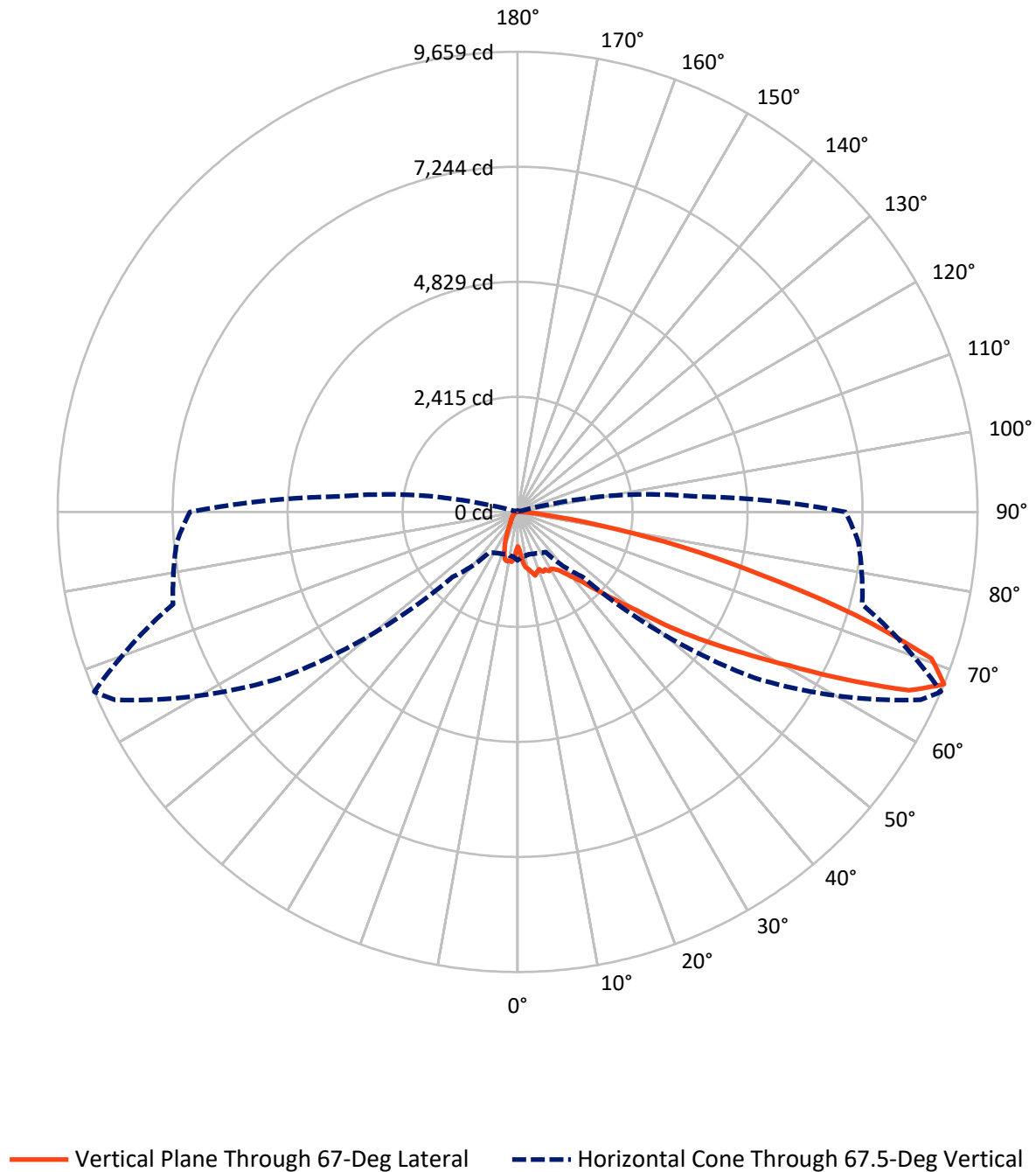
× Max cd  
 - - - 1/2 Max cd



Based on 15 foot mounting height. Maximum calculated value = 6.2 fc  
 Type II - Short - N/A

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## Luminous Intensity Polar Plot



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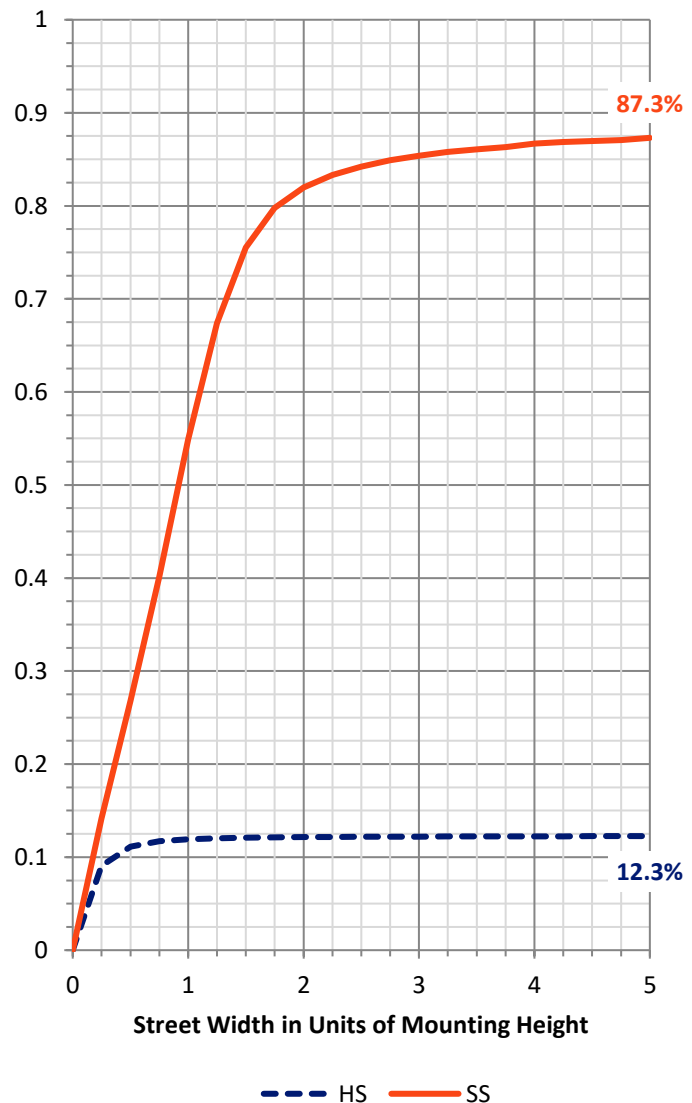
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 1051.5   | 0.0    | 1051.5 |
|                    | % Fixture | 12.4     | 0.0    | 12.4   |
| <b>Street Side</b> | Lumens    | 7450.8   | 0.0    | 7450.8 |
|                    | % Fixture | 87.6     | 0.0    | 87.6   |
| <b>Total</b>       | Lumens    | 8502.3   | 0.0    | 8502.3 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 90.9   | 1.1       |
| 10°-20°   | 269.0  | 3.2       |
| 20°-30°   | 421.5  | 5.0       |
| 30°-40°   | 679.6  | 8.0       |
| 40°-50°   | 1248.9 | 14.7      |
| 50°-60°   | 2109.2 | 24.8      |
| 60°-70°   | 2331.8 | 27.4      |
| 70°-80°   | 1220.4 | 14.4      |
| 80°-90°   | 131.1  | 1.5       |
| 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°    | 8502.3 | 100.0     |
| 0°-180°   | 8502.3 | 100.0     |

**Coefficient of Utilization**



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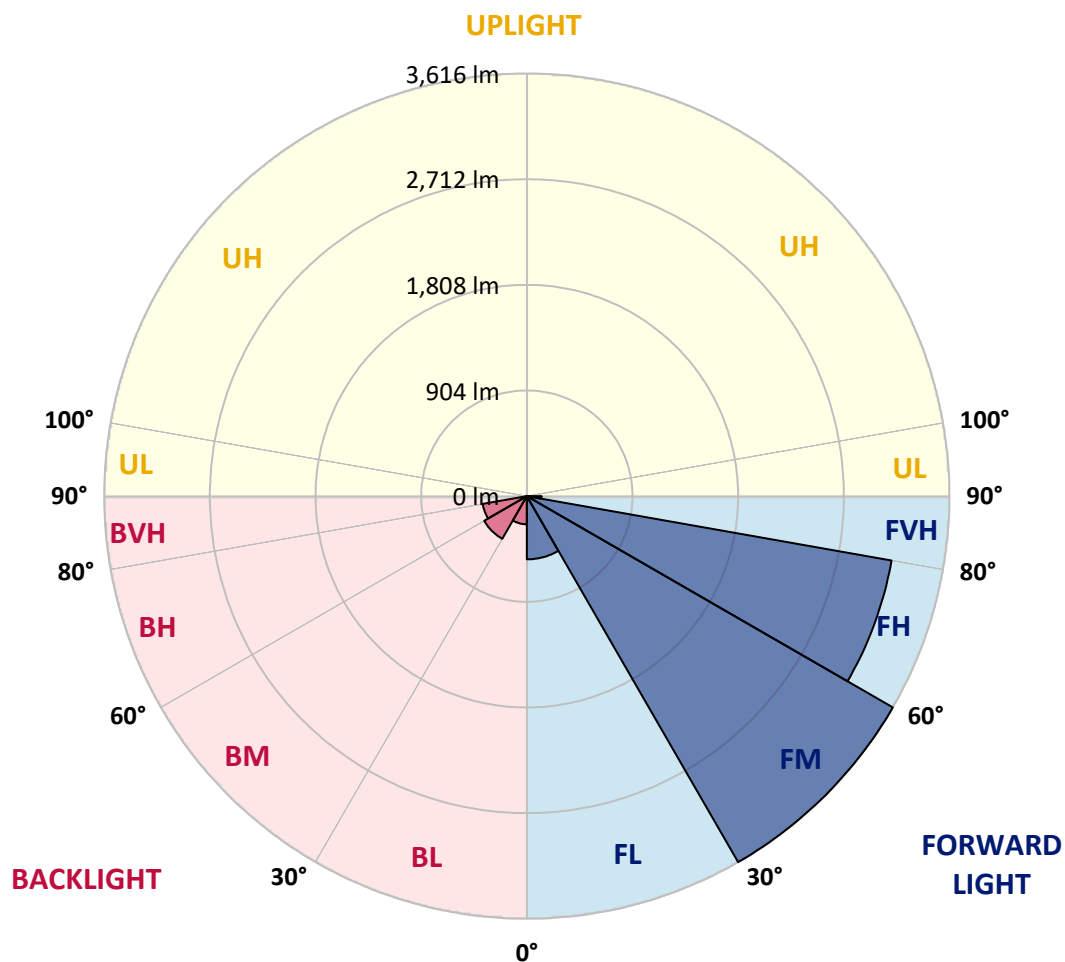
CATALOG NUMBER: PMM-SA2C-840-U-SL2-HSS

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 540.6  | 6.4       |                         |      |         |
| FM   | (30°-60°)   | 3616.1 | 42.5      |                         |      |         |
| FH   | (60°-80°)   | 3168.7 | 37.3      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 125.5  | 1.5       |                         |      | G2/225  |
| BL   | (0°-30°)    | 240.8  | 2.8       | B1/500                  |      |         |
| BM   | (30°-60°)   | 421.6  | 5.0       | B1/1000                 |      |         |
| BH   | (60°-80°)   | 383.5  | 4.5       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 5.6    | 0.1       |                         |      | G0/10   |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B1-U0-G2**

Type II Short



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 67°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 724.2  | 724.2  | 724.2  | 724.2  | 724.2  | 724.2  | 724.2  | 724.2  | 724.2  | 724.2  | 724.2  |
| 2.5°  | 854.9  | 825.9  | 776.7  | 791.0  | 819.5  | 843.2  | 832.0  | 810.0  | 810.5  | 788.0  | 868.6  |
| 5°    | 994.6  | 955.8  | 927.3  | 937.3  | 935.9  | 935.1  | 988.1  | 1008.4 | 1017.0 | 1054.1 | 1108.9 |
| 7.5°  | 1034.7 | 1020.9 | 991.2  | 1000.2 | 970.4  | 972.6  | 1065.8 | 1153.7 | 1167.5 | 1190.4 | 1287.8 |
| 10°   | 1019.2 | 992.4  | 1003.2 | 1003.2 | 1003.6 | 1052.0 | 1114.5 | 1198.6 | 1215.4 | 1303.4 | 1313.7 |
| 12.5° | 1002.4 | 1003.6 | 1046.3 | 1038.6 | 1097.2 | 1183.9 | 1205.1 | 1299.5 | 1291.3 | 1367.6 | 1481.1 |
| 15°   | 1064.9 | 1097.7 | 1070.0 | 1080.8 | 1086.4 | 1188.3 | 1222.3 | 1347.8 | 1384.0 | 1480.7 | 1554.4 |
| 17.5° | 1172.3 | 1176.6 | 1119.2 | 1103.7 | 1144.2 | 1173.1 | 1241.8 | 1302.1 | 1326.3 | 1579.9 | 1684.2 |
| 20°   | 1191.7 | 1219.3 | 1161.0 | 1071.4 | 1157.2 | 1196.9 | 1244.8 | 1273.6 | 1284.0 | 1610.5 | 1757.6 |
| 22.5° | 1308.6 | 1277.9 | 1184.8 | 1116.6 | 1141.3 | 1184.3 | 1214.1 | 1301.2 | 1363.4 | 1552.7 | 1827.9 |
| 25°   | 1368.6 | 1360.3 | 1271.5 | 1213.3 | 1188.3 | 1184.8 | 1252.9 | 1319.0 | 1338.8 | 1612.7 | 1845.1 |
| 27.5° | 1512.2 | 1493.6 | 1321.6 | 1314.2 | 1231.8 | 1159.3 | 1254.2 | 1372.9 | 1409.9 | 1556.2 | 1909.9 |
| 30°   | 1707.5 | 1700.6 | 1471.6 | 1466.9 | 1335.8 | 1205.5 | 1324.1 | 1406.1 | 1383.6 | 1585.0 | 1953.0 |
| 32.5° | 1904.2 | 1960.3 | 1726.1 | 1592.4 | 1494.0 | 1375.0 | 1304.2 | 1395.7 | 1435.8 | 1655.3 | 2032.3 |
| 35°   | 2141.9 | 2182.4 | 1943.9 | 1846.9 | 1628.2 | 1454.3 | 1435.8 | 1494.4 | 1511.7 | 1739.0 | 2122.4 |
| 37.5° | 2557.6 | 2496.4 | 2293.2 | 2128.1 | 2013.4 | 1737.7 | 1646.3 | 1599.7 | 1639.8 | 1852.4 | 2306.6 |
| 40°   | 2864.7 | 2825.9 | 2575.8 | 2477.0 | 2213.0 | 2051.7 | 1812.8 | 1769.3 | 1814.1 | 1968.9 | 2434.7 |
| 42.5° | 3235.2 | 3154.6 | 2919.1 | 2852.2 | 2580.5 | 2269.5 | 2027.2 | 2042.2 | 2014.2 | 2198.8 | 2659.4 |
| 45°   | 3570.4 | 3388.3 | 3257.2 | 3272.3 | 3127.4 | 2707.3 | 2384.7 | 2377.4 | 2354.1 | 2531.8 | 2895.8 |
| 47.5° | 3795.9 | 3636.7 | 3509.1 | 3467.3 | 3450.0 | 3477.2 | 2901.4 | 2771.1 | 2753.9 | 2881.5 | 3268.0 |
| 50°   | 3917.1 | 3742.8 | 3585.0 | 3593.7 | 3943.8 | 4207.4 | 3434.5 | 3249.5 | 3255.9 | 3389.2 | 3776.9 |
| 52.5° | 3835.6 | 3638.5 | 3472.0 | 3633.8 | 4326.9 | 4694.3 | 4316.9 | 3874.4 | 4024.5 | 3990.4 | 4459.7 |
| 55°   | 3459.0 | 3287.8 | 3169.7 | 3459.0 | 4368.7 | 5218.4 | 5403.4 | 4815.1 | 4781.4 | 4703.8 | 5155.8 |
| 57.5° | 2825.5 | 2677.9 | 2605.1 | 2910.4 | 3911.1 | 5640.6 | 6494.6 | 5878.2 | 5591.4 | 5266.2 | 5733.8 |
| 60°   | 2105.2 | 1996.5 | 1920.6 | 2081.9 | 3081.6 | 5230.4 | 7209.3 | 6880.2 | 6548.1 | 5808.3 | 6253.0 |
| 62.5° | 1559.2 | 1470.7 | 1390.1 | 1404.7 | 2122.0 | 4498.5 | 7483.6 | 7941.6 | 7751.0 | 6380.7 | 6743.0 |
| 65°   | 1244.3 | 1163.6 | 1107.1 | 1074.8 | 1314.2 | 3384.5 | 7101.9 | 8811.5 | 9031.5 | 6919.9 | 7096.7 |
| 67.5° | 1016.1 | 948.0  | 919.9  | 957.0  | 1030.9 | 1929.2 | 6082.2 | 9339.5 | 9658.7 | 7491.7 | 7183.8 |
| 70°   | 826.8  | 770.8  | 767.7  | 867.8  | 949.3  | 1176.2 | 4473.9 | 8975.0 | 9215.3 | 7589.2 | 6661.5 |
| 72.5° | 576.2  | 551.6  | 590.9  | 732.8  | 940.7  | 979.5  | 2569.3 | 7427.1 | 7435.7 | 6702.9 | 5479.3 |
| 75°   | 326.1  | 322.1  | 384.3  | 584.4  | 916.1  | 969.6  | 1432.4 | 5248.6 | 5252.4 | 5069.5 | 3795.9 |
| 77.5° | 179.4  | 167.8  | 223.8  | 395.1  | 786.7  | 947.1  | 923.9  | 3583.7 | 3491.8 | 2821.1 | 1733.9 |
| 80°   | 82.8   | 78.0   | 121.2  | 253.2  | 575.3  | 895.8  | 740.6  | 1969.8 | 1776.1 | 919.1  | 423.1  |
| 82.5° | 34.1   | 32.4   | 55.7   | 162.6  | 363.6  | 721.6  | 624.1  | 873.9  | 701.3  | 174.7  | 130.7  |
| 85°   | 6.1    | 6.5    | 22.9   | 98.3   | 203.6  | 332.6  | 505.9  | 414.9  | 304.9  | 48.3   | 71.6   |
| 87.5° | 0.0    | 0.0    | 4.7    | 23.7   | 49.2   | 91.0   | 205.3  | 116.0  | 79.8   | 14.2   | 21.1   |
| 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: P822664

CATALOG NUMBER: PMM-SA2C-840-U-SL2-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|--------|--------|--------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 724.2  | 724.2  | 724.2  | 724.2  | 724.2 | 724.2 | 724.2 | 724.2 | 724.2 | 724.2 | 724.2 |
| 2.5°  | 884.6  | 877.3  | 803.1  | 806.5  | 811.7 | 807.0 | 806.1 | 785.4 | 766.4 | 829.0 | 828.1 |
| 5°    | 1118.8 | 1066.6 | 1015.3 | 995.5  | 952.7 | 896.7 | 897.1 | 879.4 | 861.3 | 886.7 | 886.7 |
| 7.5°  | 1285.7 | 1213.7 | 1148.6 | 1032.5 | 919.5 | 817.4 | 808.3 | 784.1 | 756.5 | 789.7 | 796.2 |
| 10°   | 1324.5 | 1262.0 | 1177.9 | 1007.6 | 900.6 | 801.0 | 691.4 | 601.2 | 559.4 | 540.0 | 536.6 |
| 12.5° | 1444.0 | 1397.4 | 1209.4 | 1020.9 | 866.9 | 698.3 | 518.8 | 411.9 | 339.0 | 333.4 | 325.6 |
| 15°   | 1523.8 | 1491.0 | 1240.4 | 987.7  | 724.6 | 502.0 | 326.1 | 250.2 | 220.8 | 218.2 | 214.3 |
| 17.5° | 1647.6 | 1590.6 | 1210.6 | 882.0  | 566.8 | 331.2 | 219.1 | 197.5 | 201.0 | 208.7 | 202.7 |
| 20°   | 1698.0 | 1586.8 | 1146.0 | 728.9  | 398.1 | 222.1 | 190.2 | 178.5 | 187.6 | 194.9 | 191.5 |
| 22.5° | 1749.8 | 1598.0 | 1088.6 | 600.8  | 260.1 | 183.7 | 169.5 | 163.5 | 164.3 | 171.6 | 172.1 |
| 25°   | 1749.4 | 1629.1 | 1022.2 | 468.0  | 193.7 | 163.5 | 153.1 | 145.4 | 142.4 | 147.5 | 146.2 |
| 27.5° | 1834.3 | 1593.3 | 901.0  | 347.2  | 170.4 | 146.2 | 136.3 | 126.8 | 116.0 | 121.2 | 121.2 |
| 30°   | 1834.8 | 1651.4 | 816.4  | 249.3  | 156.2 | 130.3 | 121.6 | 107.0 | 94.4  | 98.8  | 99.2  |
| 32.5° | 1883.5 | 1601.0 | 738.4  | 190.6  | 144.9 | 120.8 | 101.7 | 88.4  | 81.1  | 83.7  | 83.7  |
| 35°   | 1939.1 | 1644.1 | 618.5  | 168.2  | 133.7 | 107.4 | 87.1  | 76.4  | 70.7  | 72.9  | 72.9  |
| 37.5° | 2122.9 | 1635.0 | 535.2  | 156.6  | 126.4 | 97.0  | 79.4  | 67.3  | 64.7  | 66.0  | 67.7  |
| 40°   | 2189.3 | 1699.4 | 422.2  | 149.7  | 114.3 | 87.5  | 69.9  | 60.8  | 57.3  | 58.2  | 58.7  |
| 42.5° | 2358.4 | 1713.6 | 337.3  | 144.0  | 103.5 | 75.9  | 62.1  | 55.7  | 51.3  | 51.3  | 52.6  |
| 45°   | 2545.2 | 1749.4 | 268.2  | 139.3  | 94.4  | 68.1  | 56.1  | 50.9  | 44.4  | 43.6  | 45.3  |
| 47.5° | 2815.6 | 1886.6 | 218.6  | 129.8  | 83.7  | 63.4  | 51.7  | 44.0  | 38.8  | 37.1  | 38.8  |
| 50°   | 3268.0 | 2119.4 | 193.2  | 118.1  | 75.9  | 59.5  | 45.7  | 37.5  | 33.6  | 31.4  | 32.8  |
| 52.5° | 3906.3 | 2521.9 | 179.9  | 107.4  | 69.0  | 53.5  | 41.0  | 32.8  | 28.9  | 27.2  | 28.0  |
| 55°   | 4615.4 | 2983.3 | 173.4  | 96.6   | 63.0  | 47.0  | 35.8  | 28.9  | 25.5  | 23.3  | 23.7  |
| 57.5° | 5271.0 | 3417.2 | 166.9  | 86.3   | 56.9  | 41.9  | 31.4  | 25.5  | 22.0  | 19.8  | 20.3  |
| 60°   | 5917.1 | 3763.5 | 151.4  | 74.2   | 51.3  | 37.5  | 27.6  | 22.0  | 19.8  | 17.2  | 17.2  |
| 62.5° | 6488.6 | 3970.6 | 129.0  | 64.2   | 46.2  | 33.2  | 24.6  | 19.8  | 18.1  | 15.6  | 15.6  |
| 65°   | 6877.6 | 3980.1 | 103.9  | 55.2   | 40.5  | 28.5  | 21.5  | 18.6  | 16.8  | 13.8  | 13.4  |
| 67.5° | 6883.2 | 3721.3 | 83.2   | 49.2   | 35.8  | 25.0  | 19.4  | 17.7  | 15.6  | 12.9  | 12.1  |
| 70°   | 6160.8 | 3074.3 | 69.5   | 43.1   | 31.0  | 22.0  | 16.8  | 16.8  | 15.1  | 12.5  | 11.2  |
| 72.5° | 4928.1 | 2349.3 | 58.2   | 37.5   | 27.6  | 19.0  | 15.6  | 16.0  | 14.6  | 12.5  | 11.2  |
| 75°   | 3312.4 | 1347.4 | 48.3   | 32.0   | 24.1  | 16.0  | 15.1  | 15.6  | 15.1  | 12.5  | 10.8  |
| 77.5° | 1525.6 | 429.1  | 37.5   | 26.3   | 20.7  | 13.4  | 14.6  | 14.6  | 13.8  | 11.2  | 9.5   |
| 80°   | 343.8  | 105.7  | 27.2   | 19.4   | 16.8  | 9.9   | 13.4  | 12.1  | 10.8  | 7.7   | 5.6   |
| 82.5° | 125.0  | 32.4   | 16.4   | 12.1   | 10.3  | 3.9   | 8.7   | 8.7   | 7.7   | 5.6   | 3.4   |
| 85°   | 71.6   | 16.8   | 9.1    | 7.7    | 5.6   | 1.8   | 4.7   | 5.2   | 4.3   | 3.9   | 1.8   |
| 87.5° | 23.3   | 3.9    | 4.3    | 4.7    | 4.3   | 0.8   | 1.8   | 1.8   | 1.3   | 0.8   | 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

McGRAW-EDISON

Report Number: SP1-2309-178-2

Test Date: 09/22/2023

Luminaire Tested: GALN-SA2A-840-U-T4W

Data in this report applies to families of products including GALN-SA2A-840-U-T4W.

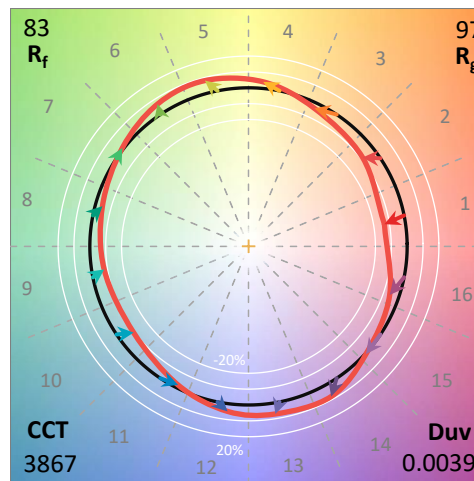
### Test Information

Test Method: LM-79-2019  
 Report Number: SP1-2309-178-2  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry: 4π  
 Issue Date: 09/22/2023  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: MCGRAW-EDISON  
 Catalog Number: **GALN-SA2A-840-U-T4W**  
 Description: GALLEON 2 AREA AND ROADWAY LUMINAIRE. (2) 80 CRI, 4000K, 615MA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE IV WIDE OPTICS

LIGHTSQUARES WITH 16 LEDS EACH AND TYPE IV WIDE OPTICS

### Spectral Parameters

|                           |        |           |      |      |      |
|---------------------------|--------|-----------|------|------|------|
| CCT (K):                  | 3867   | CRI (Ra): | 79.8 |      |      |
| CIE u':                   | 0.2254 | R1:       | 76.6 | R9:  | -8.6 |
| CIE v':                   | 0.5090 | R2:       | 84.7 | R10: | 66.3 |
| Duv:                      | 0.0039 | R3:       | 93.7 | R11: | 80.5 |
| CIE x:                    | 0.3895 | R4:       | 80.6 | R12: | 67.3 |
| CIE y:                    | 0.3908 | R5:       | 77.9 | R13: | 77.9 |
| CIE z:                    | 0.2197 | R6:       | 81.2 | R14: | 96.6 |
| Peak Wavelength (nm):     | 593    | R7:       | 84.2 |      |      |
| Dominant Wavelength (nm): | 577    | R8:       | 59.0 |      |      |
| Purity:                   | 34.3   |           |      |      |      |
| Rf:                       | 82.7   |           |      |      |      |
| Rg:                       | 96.5   |           |      |      |      |



### Test Conditions

Stabilization Time: 25M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.8/46%  
 Sphere Temperature (°C): 24.7

REPORT NUMBER: SP1-2309-178-2

| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | 76INCH SPHERE IN0058  | 8/9/2023         | 2/9/2024             |
| Power Meter                    | XITRON 2801 IN0071    | 11/29/2022       | 11/29/2023           |
| AC Power Source                | CHROMA 61603 IN0063   | 11/28/2022       | 11/28/2023           |
| DC Power Source                | AGILENT E3634A IN0208 | 11/28/2022       | 11/28/2023           |
| Sphere Thermometer             | ONSET IN0085          | 11/28/2022       | 11/28/2023           |
| Room Thermometer               | ONSET IN0046          | 11/28/2022       | 11/28/2023           |

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CIE 1931 Chromaticity Diagram



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



Point lies inside the ANSI 4000K 4-step quadrangle

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**Photopic Flux vs. Wavelength**



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| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 3123             | NR               | 490       | 57459            | NR               | 620       | 129941           | NR               | 750       | 5858             | NR               | 880       | 4622             | NR               |
| 365       | 3041             | NR               | 495       | 69038            | NR               | 625       | 121678           | NR               | 755       | 5395             | NR               | 885       | 3949             | NR               |
| 370       | 2965             | NR               | 500       | 79493            | NR               | 630       | 112252           | NR               | 760       | 5011             | NR               | 890       | 4035             | NR               |
| 375       | 3195             | NR               | 505       | 87950            | NR               | 635       | 102369           | NR               | 765       | 4514             | NR               | 895       | 3391             | NR               |
| 380       | 3028             | NR               | 510       | 94704            | NR               | 640       | 93616            | NR               | 770       | 4375             | NR               | 900       | 3268             | NR               |
| 385       | 2738             | NR               | 515       | 100214           | NR               | 645       | 84211            | NR               | 775       | 3450             | NR               | 905       | 2767             | NR               |
| 390       | 2690             | NR               | 520       | 103961           | NR               | 650       | 75380            | NR               | 780       | 3547             | NR               | 910       | 3391             | NR               |
| 395       | 2604             | NR               | 525       | 106854           | NR               | 655       | 66946            | NR               | 785       | 3648             | NR               | 915       | 3784             | NR               |
| 400       | 2384             | NR               | 530       | 109533           | NR               | 660       | 59483            | NR               | 790       | 3081             | NR               | 920       | 3790             | NR               |
| 405       | 3031             | NR               | 535       | 112417           | NR               | 665       | 51858            | NR               | 795       | 3104             | NR               | 925       | 3175             | NR               |
| 410       | 5239             | NR               | 540       | 115725           | NR               | 670       | 44882            | NR               | 800       | 3444             | NR               | 930       | 3642             | NR               |
| 415       | 10499            | NR               | 545       | 119091           | NR               | 675       | 38742            | NR               | 805       | 3315             | NR               | 935       | 3040             | NR               |
| 420       | 20790            | NR               | 550       | 122884           | NR               | 680       | 33597            | NR               | 810       | 3022             | NR               | 940       | 4039             | NR               |
| 425       | 39276            | NR               | 555       | 128300           | NR               | 685       | 29101            | NR               | 815       | 2832             | NR               | 945       | 4797             | NR               |
| 430       | 66418            | NR               | 560       | 133274           | NR               | 690       | 24855            | NR               | 820       | 3142             | NR               | 950       | 4945             | NR               |
| 435       | 101961           | NR               | 565       | 139112           | NR               | 695       | 21367            | NR               | 825       | 3115             | NR               | 955       | 3757             | NR               |
| 440       | 134023           | NR               | 570       | 144467           | NR               | 700       | 18479            | NR               | 830       | 2520             | NR               | 960       | 4539             | NR               |
| 445       | 129385           | NR               | 575       | 149331           | NR               | 705       | 16131            | NR               | 835       | 2783             | NR               | 965       | 4857             | NR               |
| 450       | 90434            | NR               | 580       | 154784           | NR               | 710       | 14388            | NR               | 840       | 3364             | NR               | 970       | 4463             | NR               |
| 455       | 63521            | NR               | 585       | 156899           | NR               | 715       | 12865            | NR               | 845       | 3807             | NR               | 975       | 3718             | NR               |
| 460       | 48429            | NR               | 590       | 157796           | NR               | 720       | 11277            | NR               | 850       | 2907             | NR               | 980       | 3955             | NR               |
| 465       | 36445            | NR               | 595       | 157849           | NR               | 725       | 10063            | NR               | 855       | 3470             | NR               | 985       | 4314             | NR               |
| 470       | 31953            | NR               | 600       | 155418           | NR               | 730       | 8942             | NR               | 860       | 3820             | NR               | 990       | 4478             | NR               |
| 475       | 32768            | NR               | 605       | 151601           | NR               | 735       | 7722             | NR               | 865       | 3922             | NR               | 995       | 2959             | NR               |
| 480       | 37631            | NR               | 610       | 146416           | NR               | 740       | 6964             | NR               | 870       | 4061             | NR               | 1000      | 4570             | NR               |
| 485       | 46354            | NR               | 615       | 139241           | NR               | 745       | 6117             | NR               | 875       | 3975             | NR               |           |                  |                  |

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Scotopic Flux vs. Wavelength



Scotopic Lumens: 14236

S/P: 1.59

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 3123             | NR               | 490       | 57459            | NR               | 620       | 129941           | NR               | 750       | 5858             | NR               | 880       | 4622             | NR               |
| 365       | 3041             | NR               | 495       | 69038            | NR               | 625       | 121678           | NR               | 755       | 5395             | NR               | 885       | 3949             | NR               |
| 370       | 2965             | NR               | 500       | 79493            | NR               | 630       | 112252           | NR               | 760       | 5011             | NR               | 890       | 4035             | NR               |
| 375       | 3195             | NR               | 505       | 87950            | NR               | 635       | 102369           | NR               | 765       | 4514             | NR               | 895       | 3391             | NR               |
| 380       | 3028             | NR               | 510       | 94704            | NR               | 640       | 93616            | NR               | 770       | 4375             | NR               | 900       | 3268             | NR               |
| 385       | 2738             | NR               | 515       | 100214           | NR               | 645       | 84211            | NR               | 775       | 3450             | NR               | 905       | 2767             | NR               |
| 390       | 2690             | NR               | 520       | 103961           | NR               | 650       | 75380            | NR               | 780       | 3547             | NR               | 910       | 3391             | NR               |
| 395       | 2604             | NR               | 525       | 106854           | NR               | 655       | 66946            | NR               | 785       | 3648             | NR               | 915       | 3784             | NR               |
| 400       | 2384             | NR               | 530       | 109533           | NR               | 660       | 59483            | NR               | 790       | 3081             | NR               | 920       | 3790             | NR               |
| 405       | 3031             | NR               | 535       | 112417           | NR               | 665       | 51858            | NR               | 795       | 3104             | NR               | 925       | 3175             | NR               |
| 410       | 5239             | NR               | 540       | 115725           | NR               | 670       | 44882            | NR               | 800       | 3444             | NR               | 930       | 3642             | NR               |
| 415       | 10499            | NR               | 545       | 119091           | NR               | 675       | 38742            | NR               | 805       | 3315             | NR               | 935       | 3040             | NR               |
| 420       | 20790            | NR               | 550       | 122884           | NR               | 680       | 33597            | NR               | 810       | 3022             | NR               | 940       | 4039             | NR               |
| 425       | 39276            | NR               | 555       | 128300           | NR               | 685       | 29101            | NR               | 815       | 2832             | NR               | 945       | 4797             | NR               |
| 430       | 66418            | NR               | 560       | 133274           | NR               | 690       | 24855            | NR               | 820       | 3142             | NR               | 950       | 4945             | NR               |
| 435       | 101961           | NR               | 565       | 139112           | NR               | 695       | 21367            | NR               | 825       | 3115             | NR               | 955       | 3757             | NR               |
| 440       | 134023           | NR               | 570       | 144467           | NR               | 700       | 18479            | NR               | 830       | 2520             | NR               | 960       | 4539             | NR               |
| 445       | 129385           | NR               | 575       | 149331           | NR               | 705       | 16131            | NR               | 835       | 2783             | NR               | 965       | 4857             | NR               |
| 450       | 90434            | NR               | 580       | 154784           | NR               | 710       | 14388            | NR               | 840       | 3364             | NR               | 970       | 4463             | NR               |
| 455       | 63521            | NR               | 585       | 156899           | NR               | 715       | 12865            | NR               | 845       | 3807             | NR               | 975       | 3718             | NR               |
| 460       | 48429            | NR               | 590       | 157796           | NR               | 720       | 11277            | NR               | 850       | 2907             | NR               | 980       | 3955             | NR               |
| 465       | 36445            | NR               | 595       | 157849           | NR               | 725       | 10063            | NR               | 855       | 3470             | NR               | 985       | 4314             | NR               |
| 470       | 31953            | NR               | 600       | 155418           | NR               | 730       | 8942             | NR               | 860       | 3820             | NR               | 990       | 4478             | NR               |
| 475       | 32768            | NR               | 605       | 151601           | NR               | 735       | 7722             | NR               | 865       | 3922             | NR               | 995       | 2959             | NR               |
| 480       | 37631            | NR               | 610       | 146416           | NR               | 740       | 6964             | NR               | 870       | 4061             | NR               | 1000      | 4570             | NR               |
| 485       | 46354            | NR               | 615       | 139241           | NR               | 745       | 6117             | NR               | 875       | 3975             | NR               |           |                  |                  |

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**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 5542.6**

**M/P: 0.62**

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 3123             | NR               | 490       | 57459            | NR               | 620       | 129941           | NR               | 750       | 5858             | NR               | 880       | 4622             | NR               |
| 365       | 3041             | NR               | 495       | 69038            | NR               | 625       | 121678           | NR               | 755       | 5395             | NR               | 885       | 3949             | NR               |
| 370       | 2965             | NR               | 500       | 79493            | NR               | 630       | 112252           | NR               | 760       | 5011             | NR               | 890       | 4035             | NR               |
| 375       | 3195             | NR               | 505       | 87950            | NR               | 635       | 102369           | NR               | 765       | 4514             | NR               | 895       | 3391             | NR               |
| 380       | 3028             | NR               | 510       | 94704            | NR               | 640       | 93616            | NR               | 770       | 4375             | NR               | 900       | 3268             | NR               |
| 385       | 2738             | NR               | 515       | 100214           | NR               | 645       | 84211            | NR               | 775       | 3450             | NR               | 905       | 2767             | NR               |
| 390       | 2690             | NR               | 520       | 103961           | NR               | 650       | 75380            | NR               | 780       | 3547             | NR               | 910       | 3391             | NR               |
| 395       | 2604             | NR               | 525       | 106854           | NR               | 655       | 66946            | NR               | 785       | 3648             | NR               | 915       | 3784             | NR               |
| 400       | 2384             | NR               | 530       | 109533           | NR               | 660       | 59483            | NR               | 790       | 3081             | NR               | 920       | 3790             | NR               |
| 405       | 3031             | NR               | 535       | 112417           | NR               | 665       | 51858            | NR               | 795       | 3104             | NR               | 925       | 3175             | NR               |
| 410       | 5239             | NR               | 540       | 115725           | NR               | 670       | 44882            | NR               | 800       | 3444             | NR               | 930       | 3642             | NR               |
| 415       | 10499            | NR               | 545       | 119091           | NR               | 675       | 38742            | NR               | 805       | 3315             | NR               | 935       | 3040             | NR               |
| 420       | 20790            | NR               | 550       | 122884           | NR               | 680       | 33597            | NR               | 810       | 3022             | NR               | 940       | 4039             | NR               |
| 425       | 39276            | NR               | 555       | 128300           | NR               | 685       | 29101            | NR               | 815       | 2832             | NR               | 945       | 4797             | NR               |
| 430       | 66418            | NR               | 560       | 133274           | NR               | 690       | 24855            | NR               | 820       | 3142             | NR               | 950       | 4945             | NR               |
| 435       | 101961           | NR               | 565       | 139112           | NR               | 695       | 21367            | NR               | 825       | 3115             | NR               | 955       | 3757             | NR               |
| 440       | 134023           | NR               | 570       | 144467           | NR               | 700       | 18479            | NR               | 830       | 2520             | NR               | 960       | 4539             | NR               |
| 445       | 129385           | NR               | 575       | 149331           | NR               | 705       | 16131            | NR               | 835       | 2783             | NR               | 965       | 4857             | NR               |
| 450       | 90434            | NR               | 580       | 154784           | NR               | 710       | 14388            | NR               | 840       | 3364             | NR               | 970       | 4463             | NR               |
| 455       | 63521            | NR               | 585       | 156899           | NR               | 715       | 12865            | NR               | 845       | 3807             | NR               | 975       | 3718             | NR               |
| 460       | 48429            | NR               | 590       | 157796           | NR               | 720       | 11277            | NR               | 850       | 2907             | NR               | 980       | 3955             | NR               |
| 465       | 36445            | NR               | 595       | 157849           | NR               | 725       | 10063            | NR               | 855       | 3470             | NR               | 985       | 4314             | NR               |
| 470       | 31953            | NR               | 600       | 155418           | NR               | 730       | 8942             | NR               | 860       | 3820             | NR               | 990       | 4478             | NR               |
| 475       | 32768            | NR               | 605       | 151601           | NR               | 735       | 7722             | NR               | 865       | 3922             | NR               | 995       | 2959             | NR               |
| 480       | 37631            | NR               | 610       | 146416           | NR               | 740       | 6964             | NR               | 870       | 4061             | NR               | 1000      | 4570             | NR               |
| 485       | 46354            | NR               | 615       | 139241           | NR               | 745       | 6117             | NR               | 875       | 3975             | NR               |           |                  |                  |

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**Summary**

$R_f = 82.7$   
 $R_g = 96.5$   
 $CIE R_a = 79.8$   
 $R_g = -8.6$



**Color Vector Graphics**



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 76 | CES51 = 94 | CES76 = 73 |
| CES02 = 61 | CES27 = 91 | CES52 = 94 | CES77 = 85 |
| CES03 = 31 | CES28 = 90 | CES53 = 86 | CES78 = 73 |
| CES04 = 69 | CES29 = 73 | CES54 = 88 | CES79 = 91 |
| CES05 = 48 | CES30 = 76 | CES55 = 88 | CES80 = 89 |
| CES06 = 50 | CES31 = 77 | CES56 = 81 | CES81 = 80 |
| CES07 = 40 | CES32 = 74 | CES57 = 80 | CES82 = 95 |
| CES08 = 39 | CES33 = 78 | CES58 = 82 | CES83 = 92 |
| CES09 = 29 | CES34 = 84 | CES59 = 91 | CES84 = 92 |
| CES10 = 74 | CES35 = 92 | CES60 = 96 | CES85 = 85 |
| CES11 = 57 | CES36 = 97 | CES61 = 92 | CES86 = 73 |
| CES12 = 63 | CES37 = 89 | CES62 = 90 | CES87 = 85 |
| CES13 = 42 | CES38 = 83 | CES63 = 83 | CES88 = 83 |
| CES14 = 74 | CES39 = 95 | CES64 = 83 | CES89 = 77 |
| CES15 = 71 | CES40 = 91 | CES65 = 77 | CES90 = 82 |
| CES16 = 47 | CES41 = 90 | CES66 = 82 | CES91 = 91 |
| CES17 = 49 | CES42 = 90 | CES67 = 80 | CES92 = 68 |
| CES18 = 56 | CES43 = 86 | CES68 = 83 | CES93 = 82 |
| CES19 = 71 | CES44 = 99 | CES69 = 90 | CES94 = 61 |
| CES20 = 65 | CES45 = 91 | CES70 = 77 | CES95 = 76 |
| CES21 = 86 | CES46 = 87 | CES71 = 77 | CES96 = 82 |
| CES22 = 78 | CES47 = 85 | CES72 = 92 | CES97 = 89 |
| CES23 = 91 | CES48 = 77 | CES73 = 71 | CES98 = 81 |
| CES24 = 90 | CES49 = 87 | CES74 = 97 | CES99 = 70 |
| CES25 = 71 | CES50 = 93 | CES75 = 76 |            |



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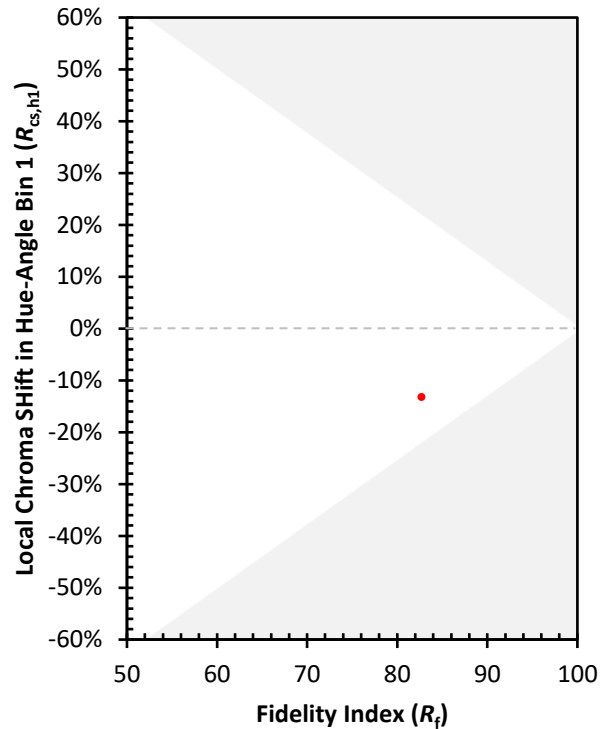
Color Rendition by Hue-Angle Bin



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**Measure Comparisons**



(END OF REPORT)