

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: P822456

Luminaire Tested: **PMM-SA2B-735-U-RW**

Issue Date: 04/10/2024



**Test Information**

Test Method: LM-79-08  
Report Number: P822456  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1910-543-7)  
Test Lab: INNOVATION CENTER  
Issue Date: 04/10/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: STREETWORKS  
Catalog Number: PMM-SA2B-735-U-RW  
Description: MESA POST TOP DECORATIVE LUMINAIRE. (2) LIGHTSQUARES WITH 16 LEDS EACH AND RECTANGULAR WIDE OPTICS.  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 9529.3 lumens  
Efficiency: N/A  
Efficacy: 112.1 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 1' x H: 0')  
IES Classification: Type III - Short  
BUG Rating: B3 - U0 - G3

Input Watts (W): 85  
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

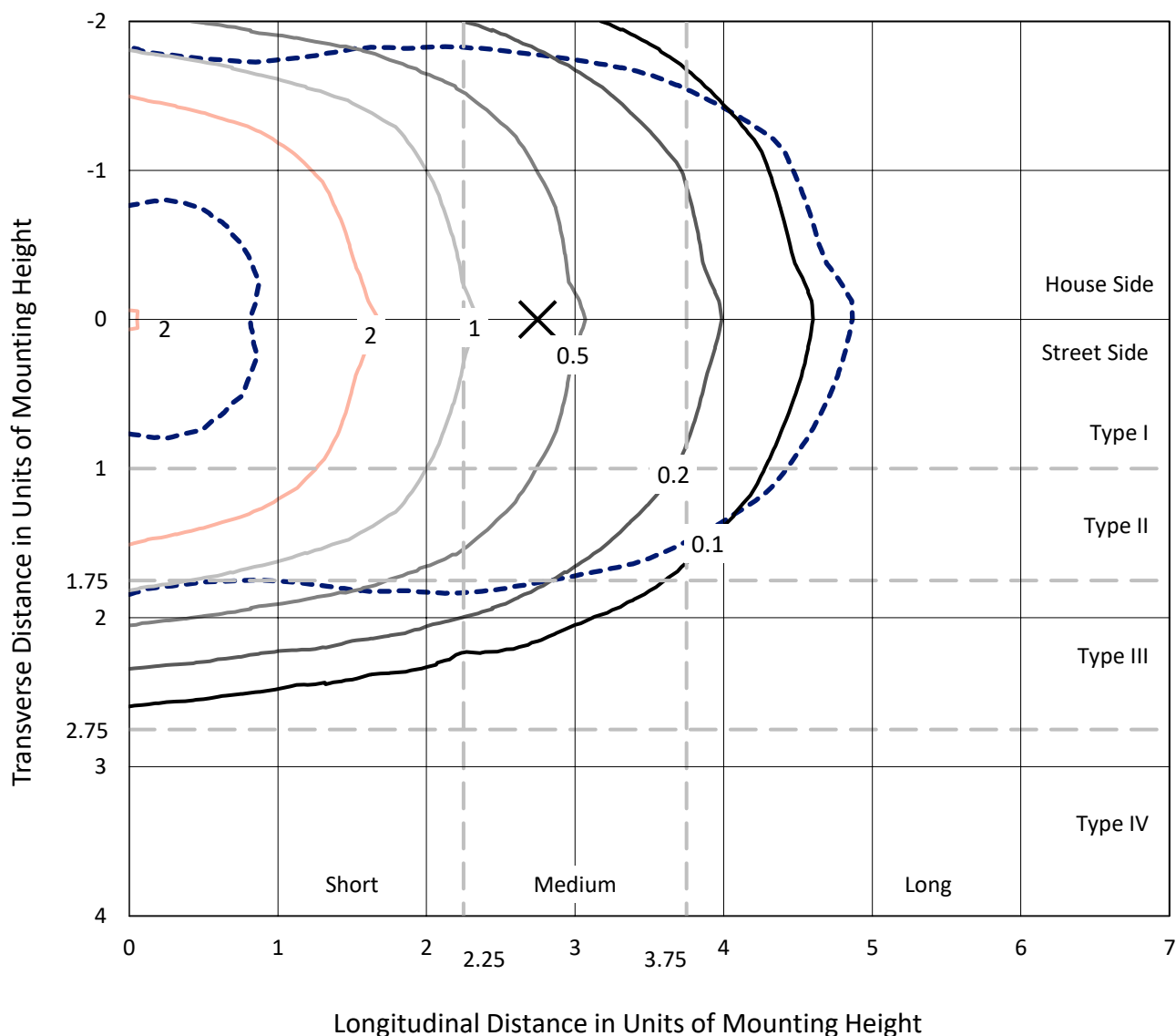
REPORT NUMBER: P822456

CATALOG NUMBER: PMM-SA2B-735-U-RW

## Iso-Footcandle Lines of Horizontal Illumination

× Max cd

--- 1/2 Max cd

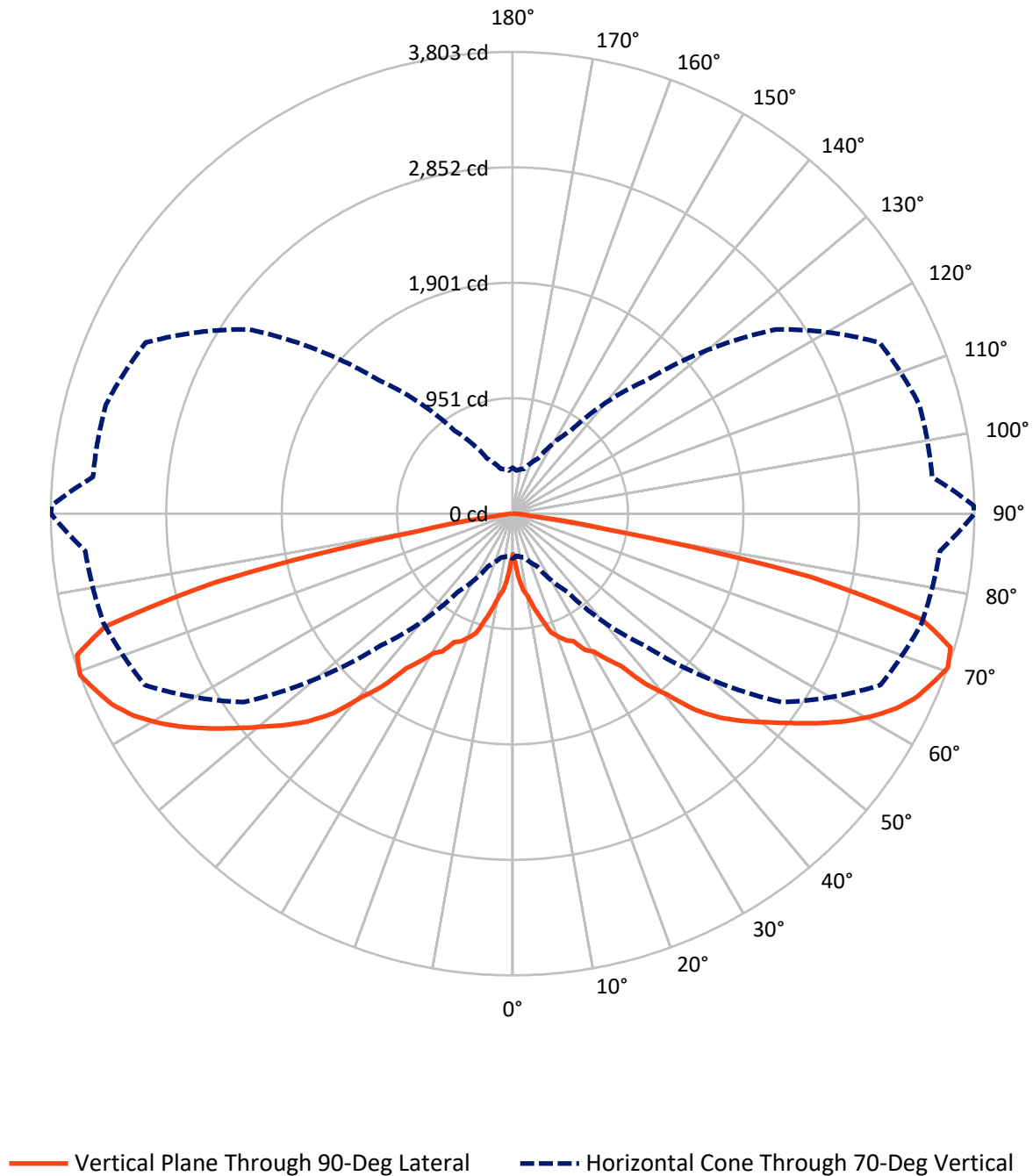


Based on 15 foot mounting height. Maximum calculated value = 4.3 fc

Type III - Short - N/A

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CATALOG NUMBER: PMM-SA2B-735-U-RW

## Luminous Intensity Polar Plot



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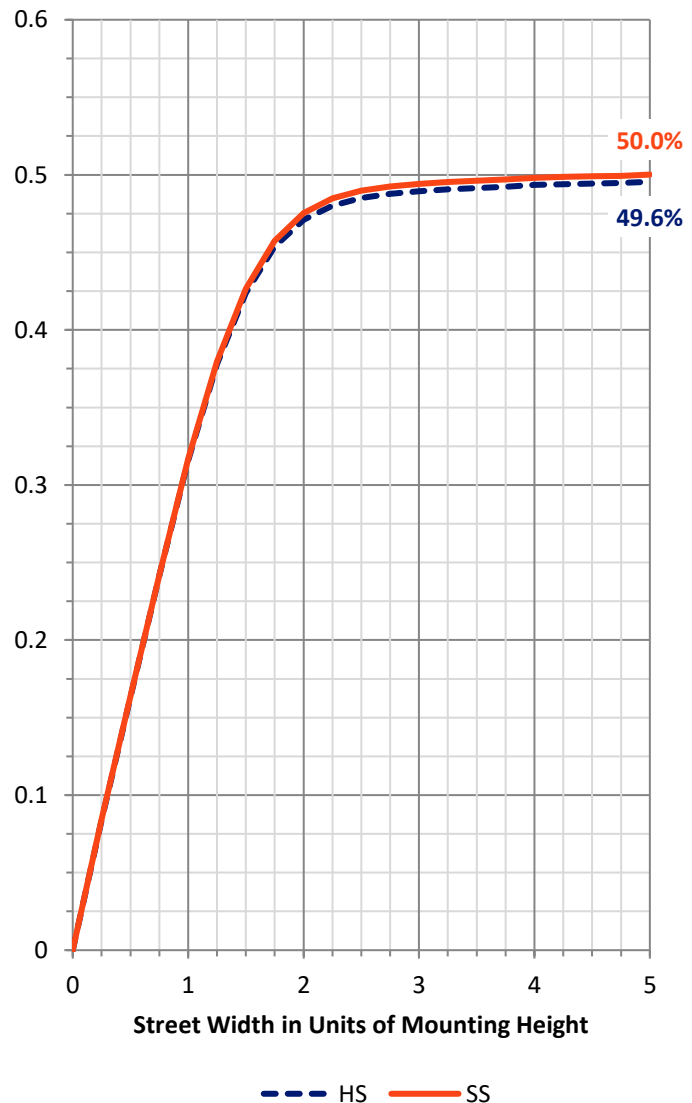
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 4747.0   | 0.0    | 4747.0 |
|                    | % Fixture | 49.8     | 0.0    | 49.8   |
| <b>Street Side</b> | Lumens    | 4782.3   | 0.0    | 4782.3 |
|                    | % Fixture | 50.2     | 0.0    | 50.2   |
| <b>Total</b>       | Lumens    | 9529.3   | 0.0    | 9529.3 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 50.4   | 0.5       |
| 10°-20°   | 231.2  | 2.4       |
| 20°-30°   | 500.0  | 5.2       |
| 30°-40°   | 953.9  | 10.0      |
| 40°-50°   | 1732.9 | 18.2      |
| 50°-60°   | 2434.3 | 25.5      |
| 60°-70°   | 2324.3 | 24.4      |
| 70°-80°   | 1192.8 | 12.5      |
| 80°-90°   | 109.4  | 1.1       |
| 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°    | 9529.3 | 100.0     |
| 0°-180°   | 9529.3 | 100.0     |



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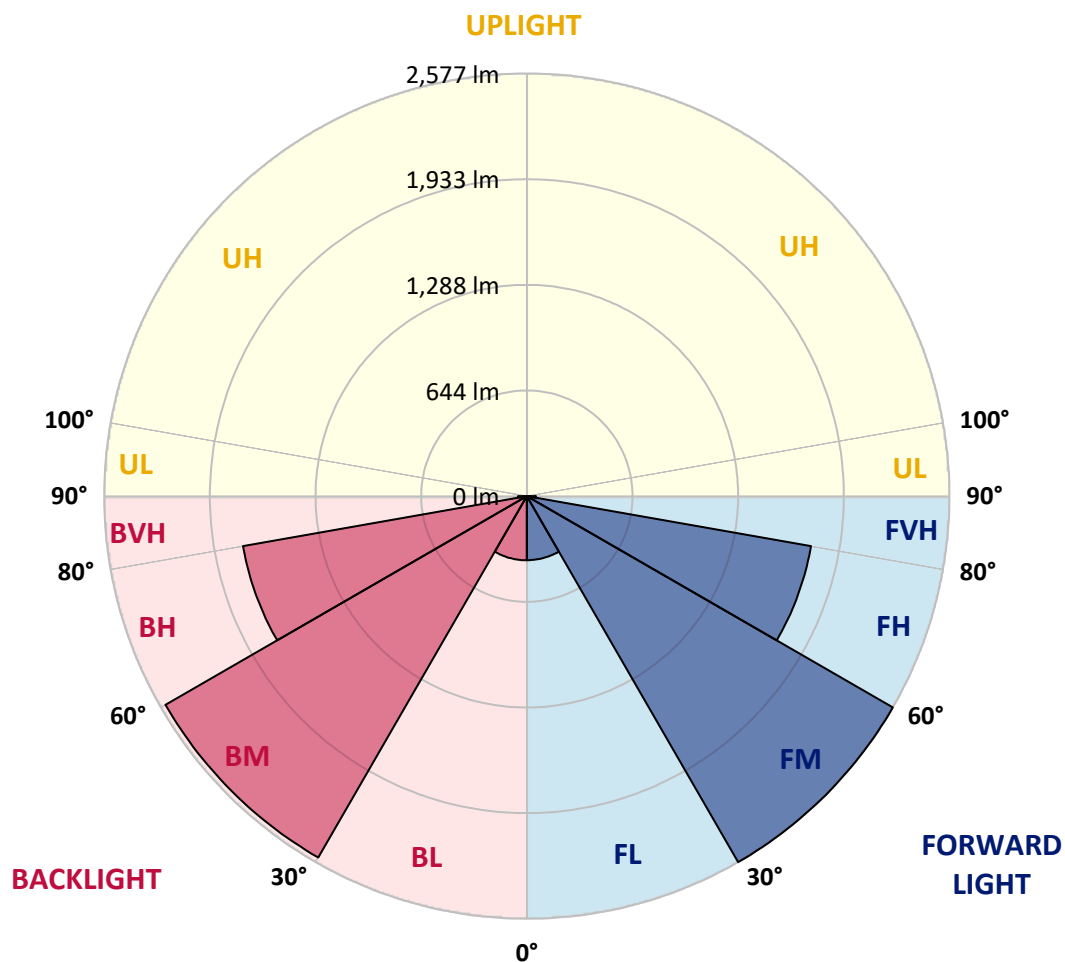
CATALOG NUMBER: PMM-SA2B-735-U-RW

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 390.4  | 4.1       |                         |      |         |
| FM   | (30°-60°)   | 2576.8 | 27.0      |                         |      |         |
| FH   | (60°-80°)   | 1759.5 | 18.5      |                         |      | G1/1800 |
| FVH  | (80°-90°)   | 55.5   | 0.6       |                         |      | G1/100  |
| BL   | (0°-30°)    | 391.2  | 4.1       | B1/500                  |      |         |
| BM   | (30°-60°)   | 2544.3 | 26.7      | B3/5000                 |      |         |
| BH   | (60°-80°)   | 1757.6 | 18.4      | B3/2500                 |      | G3/2500 |
| BVH  | (80°-90°)   | 53.9   | 0.6       |                         |      | G1/100  |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B3-U0-G3**

Type III Short



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 75°    | 85°    | 90°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 334.4  | 334.4  | 334.4  | 334.4  | 334.4  | 334.4  | 334.4  | 334.4  | 334.4  | 334.4  | 334.4  |
| 2.5°  | 405.2  | 390.1  | 371.1  | 382.3  | 387.0  | 395.1  | 394.0  | 390.1  | 373.5  | 401.2  | 404.4  |
| 5°    | 507.1  | 483.1  | 474.3  | 472.7  | 475.0  | 467.3  | 492.4  | 485.1  | 498.6  | 523.7  | 529.5  |
| 7.5°  | 577.4  | 559.6  | 540.7  | 546.5  | 522.5  | 519.1  | 551.5  | 580.5  | 587.8  | 633.8  | 636.8  |
| 10°   | 610.6  | 593.2  | 598.3  | 594.7  | 592.0  | 614.5  | 629.5  | 650.7  | 681.3  | 685.6  | 692.1  |
| 12.5° | 638.8  | 645.8  | 667.8  | 667.0  | 703.3  | 743.0  | 737.3  | 759.3  | 764.3  | 817.6  | 801.4  |
| 15°   | 710.3  | 724.5  | 723.0  | 736.5  | 752.4  | 817.6  | 818.0  | 855.5  | 889.9  | 910.6  | 905.2  |
| 17.5° | 814.9  | 819.9  | 799.0  | 799.9  | 845.8  | 872.4  | 902.2  | 895.6  | 985.3  | 1026.2 | 1028.9 |
| 20°   | 877.5  | 890.2  | 866.3  | 834.6  | 916.1  | 952.7  | 969.4  | 931.1  | 1026.9 | 1082.1 | 1082.1 |
| 22.5° | 986.8  | 954.0  | 917.6  | 896.4  | 968.2  | 1007.2 | 1005.3 | 994.5  | 1045.4 | 1143.2 | 1133.9 |
| 25°   | 1047.0 | 1028.5 | 1010.3 | 1015.7 | 1052.1 | 1072.1 | 1098.7 | 1073.7 | 1121.6 | 1194.1 | 1163.7 |
| 27.5° | 1161.3 | 1127.0 | 1037.7 | 1108.8 | 1108.8 | 1093.8 | 1150.2 | 1162.1 | 1130.9 | 1249.0 | 1271.8 |
| 30°   | 1290.7 | 1278.7 | 1152.5 | 1227.8 | 1204.6 | 1162.1 | 1270.2 | 1262.5 | 1210.0 | 1330.5 | 1320.1 |
| 32.5° | 1413.1 | 1452.6 | 1332.8 | 1291.5 | 1326.2 | 1342.4 | 1285.7 | 1308.9 | 1318.9 | 1435.1 | 1430.1 |
| 35°   | 1600.9 | 1634.0 | 1475.3 | 1464.9 | 1407.0 | 1391.9 | 1435.1 | 1442.9 | 1443.7 | 1566.1 | 1543.7 |
| 37.5° | 1925.6 | 1877.7 | 1720.9 | 1647.2 | 1653.8 | 1635.6 | 1644.1 | 1583.1 | 1591.5 | 1769.2 | 1780.5 |
| 40°   | 2163.2 | 2109.0 | 1934.6 | 1881.6 | 1751.9 | 1829.5 | 1760.7 | 1754.6 | 1737.5 | 1967.7 | 1961.6 |
| 42.5° | 2425.4 | 2351.3 | 2158.1 | 2087.4 | 1949.6 | 1917.9 | 1886.2 | 1957.7 | 1953.1 | 2166.2 | 2213.4 |
| 45°   | 2623.6 | 2473.7 | 2372.9 | 2328.8 | 2246.2 | 2168.6 | 2138.5 | 2170.5 | 2155.8 | 2314.2 | 2396.4 |
| 47.5° | 2748.7 | 2618.5 | 2502.7 | 2410.0 | 2330.8 | 2521.2 | 2368.6 | 2325.7 | 2296.0 | 2473.3 | 2552.5 |
| 50°   | 2848.3 | 2698.1 | 2561.3 | 2530.4 | 2593.0 | 2761.4 | 2520.8 | 2426.2 | 2462.5 | 2593.0 | 2700.8 |
| 52.5° | 2875.3 | 2716.2 | 2593.4 | 2573.7 | 2742.9 | 2773.4 | 2734.3 | 2575.2 | 2565.6 | 2736.7 | 2866.8 |
| 55°   | 2792.7 | 2640.2 | 2581.8 | 2689.5 | 2876.5 | 2851.0 | 2910.5 | 2808.9 | 2740.6 | 2883.5 | 3047.2 |
| 57.5° | 2579.9 | 2428.5 | 2414.6 | 2569.8 | 2805.4 | 3022.5 | 3051.8 | 2971.5 | 2881.9 | 3033.3 | 3226.4 |
| 60°   | 2230.3 | 2092.1 | 2127.2 | 2298.7 | 2654.0 | 2963.0 | 3119.0 | 3045.7 | 3017.8 | 3168.5 | 3392.5 |
| 62.5° | 1686.2 | 1578.4 | 1672.3 | 1911.4 | 2377.5 | 2886.2 | 3211.7 | 3200.1 | 3160.0 | 3312.1 | 3539.2 |
| 65°   | 1075.3 | 1018.4 | 1114.2 | 1357.2 | 1948.4 | 2746.4 | 3256.1 | 3271.6 | 3308.7 | 3423.0 | 3652.8 |
| 67.5° | 624.9  | 594.7  | 653.1  | 851.9  | 1387.6 | 2255.1 | 3173.5 | 3395.2 | 3414.5 | 3480.2 | 3727.3 |
| 70°   | 369.6  | 349.9  | 373.9  | 478.5  | 785.5  | 1536.3 | 2707.0 | 3341.1 | 3487.1 | 3532.6 | 3802.6 |
| 72.5° | 281.9  | 263.4  | 252.9  | 283.1  | 410.2  | 793.6  | 1830.2 | 2832.1 | 3428.8 | 3497.9 | 3770.9 |
| 75°   | 243.7  | 225.9  | 213.6  | 216.3  | 244.1  | 376.9  | 992.2  | 2025.7 | 2921.7 | 3185.0 | 3483.3 |
| 77.5° | 209.3  | 193.5  | 184.6  | 183.8  | 187.3  | 207.0  | 414.7  | 1098.4 | 1829.8 | 2289.5 | 2511.1 |
| 80°   | 167.6  | 155.3  | 153.3  | 153.3  | 148.3  | 146.7  | 206.3  | 417.9  | 696.4  | 825.7  | 791.8  |
| 82.5° | 122.4  | 110.1  | 122.4  | 120.9  | 113.2  | 106.9  | 131.4  | 180.7  | 214.7  | 169.6  | 134.1  |
| 85°   | 82.6   | 71.5   | 80.7   | 82.3   | 74.9   | 55.6   | 78.8   | 90.4   | 92.7   | 57.9   | 47.9   |
| 87.5° | 29.0   | 28.2   | 45.6   | 39.8   | 32.4   | 18.9   | 29.0   | 31.3   | 32.8   | 20.5   | 13.9   |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |



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CATALOG NUMBER: PMM-SA2B-735-U-RW

**CANDELA DISTRIBUTION (continued):**

|       | 91°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 334.4  | 334.4  | 334.4  | 334.4  | 334.4  | 334.4  | 334.4  | 334.4  | 334.4  | 334.4  | 334.4  |
| 2.5°  | 405.5  | 400.9  | 377.7  | 381.2  | 390.1  | 394.3  | 398.5  | 381.2  | 372.7  | 399.7  | 397.0  |
| 5°    | 531.0  | 514.1  | 495.1  | 492.4  | 493.6  | 477.0  | 486.7  | 482.4  | 484.3  | 501.7  | 505.2  |
| 7.5°  | 636.1  | 615.6  | 590.5  | 570.8  | 536.8  | 509.8  | 532.6  | 544.1  | 547.7  | 578.5  | 590.2  |
| 10°   | 692.8  | 675.5  | 668.1  | 631.1  | 619.9  | 616.3  | 610.9  | 592.4  | 612.9  | 605.5  | 611.4  |
| 12.5° | 804.1  | 800.6  | 762.4  | 738.0  | 740.3  | 747.0  | 713.0  | 694.4  | 667.8  | 709.5  | 694.4  |
| 15°   | 898.7  | 913.8  | 875.5  | 831.1  | 809.1  | 820.3  | 794.5  | 767.4  | 743.4  | 756.2  | 740.0  |
| 17.5° | 1019.6 | 1019.2 | 944.6  | 897.1  | 895.3  | 894.4  | 856.2  | 796.8  | 825.3  | 816.5  | 817.2  |
| 20°   | 1083.7 | 1073.3 | 980.6  | 925.7  | 972.5  | 955.9  | 921.5  | 845.1  | 878.2  | 889.0  | 896.0  |
| 22.5° | 1137.4 | 1131.6 | 1019.2 | 979.0  | 1009.2 | 1009.6 | 975.2  | 935.0  | 930.8  | 964.4  | 946.2  |
| 25°   | 1174.8 | 1198.0 | 1092.2 | 1082.5 | 1095.7 | 1082.5 | 1049.0 | 1022.7 | 1005.7 | 1055.9 | 1005.7 |
| 27.5° | 1263.7 | 1230.8 | 1103.4 | 1158.3 | 1166.4 | 1100.3 | 1142.4 | 1111.5 | 1064.4 | 1126.6 | 1147.1 |
| 30°   | 1327.1 | 1346.3 | 1182.2 | 1264.8 | 1255.1 | 1194.1 | 1211.5 | 1210.4 | 1154.0 | 1275.3 | 1261.0 |
| 32.5° | 1436.0 | 1412.8 | 1310.8 | 1304.2 | 1327.4 | 1324.7 | 1295.4 | 1309.6 | 1323.5 | 1411.6 | 1432.8 |
| 35°   | 1547.6 | 1572.3 | 1393.0 | 1437.5 | 1430.9 | 1389.2 | 1466.1 | 1457.2 | 1498.5 | 1679.2 | 1619.4 |
| 37.5° | 1799.4 | 1681.5 | 1577.7 | 1571.9 | 1615.9 | 1622.5 | 1597.8 | 1636.7 | 1726.0 | 1865.0 | 1929.2 |
| 40°   | 1964.3 | 1910.6 | 1734.1 | 1741.1 | 1680.0 | 1785.0 | 1715.5 | 1841.0 | 1909.0 | 2143.4 | 2120.7 |
| 42.5° | 2213.8 | 2082.9 | 1913.3 | 1936.4 | 1924.1 | 1873.5 | 1965.0 | 2029.5 | 2126.8 | 2305.7 | 2421.1 |
| 45°   | 2399.5 | 2219.9 | 2139.6 | 2125.4 | 2123.8 | 2211.8 | 2200.3 | 2303.4 | 2338.1 | 2472.6 | 2568.3 |
| 47.5° | 2540.5 | 2388.0 | 2269.0 | 2285.2 | 2238.1 | 2489.5 | 2355.5 | 2387.6 | 2457.8 | 2584.5 | 2696.1 |
| 50°   | 2707.7 | 2537.8 | 2402.6 | 2442.7 | 2557.5 | 2654.0 | 2532.7 | 2478.0 | 2512.3 | 2661.8 | 2786.1 |
| 52.5° | 2862.6 | 2683.8 | 2535.1 | 2568.7 | 2756.0 | 2712.0 | 2698.8 | 2560.2 | 2555.9 | 2676.0 | 2817.4 |
| 55°   | 3043.7 | 2842.1 | 2710.8 | 2817.4 | 2883.9 | 2829.4 | 2808.5 | 2639.8 | 2535.4 | 2602.3 | 2735.6 |
| 57.5° | 3221.4 | 2998.9 | 2868.4 | 2890.4 | 2974.6 | 2920.6 | 2764.2 | 2504.2 | 2374.0 | 2387.1 | 2521.9 |
| 60°   | 3387.9 | 3142.9 | 3035.2 | 3014.0 | 3081.2 | 2869.1 | 2595.3 | 2255.9 | 2083.2 | 2051.6 | 2168.2 |
| 62.5° | 3530.4 | 3263.5 | 3161.5 | 3103.6 | 3167.7 | 2871.1 | 2332.4 | 1857.3 | 1667.7 | 1560.2 | 1651.1 |
| 65°   | 3643.5 | 3363.5 | 3290.9 | 3260.8 | 3284.0 | 2696.5 | 1922.5 | 1363.7 | 1131.2 | 1012.3 | 1065.2 |
| 67.5° | 3718.9 | 3419.5 | 3386.3 | 3425.7 | 3116.8 | 2245.8 | 1424.3 | 872.8  | 657.7  | 592.9  | 626.0  |
| 70°   | 3796.8 | 3468.9 | 3467.8 | 3333.7 | 2642.9 | 1548.3 | 831.9  | 503.3  | 382.7  | 357.6  | 378.5  |
| 72.5° | 3770.6 | 3410.2 | 3427.6 | 2915.5 | 1831.4 | 827.6  | 439.2  | 284.6  | 259.2  | 268.0  | 286.6  |
| 75°   | 3491.7 | 3100.5 | 3016.7 | 2096.0 | 1038.9 | 384.7  | 252.9  | 215.5  | 214.0  | 227.5  | 245.7  |
| 77.5° | 2532.7 | 2159.3 | 1937.6 | 1188.0 | 445.3  | 208.2  | 186.1  | 180.0  | 180.0  | 190.8  | 207.0  |
| 80°   | 835.0  | 722.6  | 753.1  | 459.6  | 210.4  | 143.7  | 145.2  | 147.9  | 147.1  | 149.9  | 163.4  |
| 82.5° | 137.1  | 142.2  | 219.8  | 187.7  | 127.1  | 98.1   | 109.6  | 115.1  | 116.6  | 104.2  | 118.6  |
| 85°   | 48.6   | 54.9   | 93.4   | 86.9   | 73.4   | 49.5   | 72.2   | 80.7   | 79.6   | 69.5   | 76.9   |
| 87.5° | 15.1   | 19.3   | 34.0   | 26.3   | 22.0   | 13.5   | 27.0   | 31.7   | 39.8   | 16.2   | 14.7   |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

STREETWORKS

Report Number: SP1-2101-121-7

Luminaire Tested: IFLD-S-SA2A-735-U-T2

Test Date: 03/04/2021

### Test Information

Test Method: LM-79-08  
 Report Number: SP1-2101-121-7  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1  
 Measurement Geometry:  $4\pi$   
 Issue Date: 03/04/2021  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: STREETWORKS  
 Catalog Number: **IFLD-S-SA2A-735-U-T2**  
 Description: STREETWORKS INF FLOOD

PROGRAMMED @ 615mA.

### Spectral Parameters

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 3388   | CRI (Ra): | 73.1 |      |       |
| CIE u':                   | 0.2371 | R1:       | 68.9 | R9:  | -34.6 |
| CIE v':                   | 0.5177 | R2:       | 81.1 | R10: | 57.8  |
| Duv:                      | 0.0032 | R3:       | 93.1 | R11: | 68.6  |
| CIE x:                    | 0.4153 | R4:       | 71.6 | R12: | 53.9  |
| CIE y:                    | 0.4030 | R5:       | 69.4 | R13: | 70.9  |
| CIE z:                    | 0.1817 | R6:       | 75.0 | R14: | 96.2  |
| Peak Wavelength (nm):     | 590    | R7:       | 79.5 |      |       |
| Dominant Wavelength (nm): | 580    | R8:       | 46.4 |      |       |
| Purity:                   | 45.7   |           |      |      |       |
| Rf:                       | 76.9   |           |      |      |       |
| Rg:                       | 94.4   |           |      |      |       |



### Test Conditions

Stabilization Time: 81M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.0/30%  
 Sphere Temperature (°C): 24.1

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| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 1/31/2021        | 7/31/2021            |
| Power Meter                    | IN0071                | 12/1/2020        | 12/1/2021            |
| AC Power Source                | IN0063                | 12/1/2020        | 12/1/2021            |
| DC Power Source                | IN0208                | 12/1/2020        | 12/1/2021            |
| Sphere Thermometer             | IN0085                | 12/1/2020        | 12/1/2021            |
| Room Thermometer               | IN0046                | 12/1/2020        | 12/1/2021            |

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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 3500K 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       | 2672             | 0.0              | 490       | 34553            | 4.9              | 620       | 136720           | 35.6             | 750       | 5870             | 0.0              | 880       | 4216             | 0.0              |
| 365       | 2252             | 0.0              | 495       | 44336            | 8.0              | 625       | 126308           | 27.9             | 755       | 5421             | 0.0              | 885       | 4132             | 0.0              |
| 370       | 2217             | 0.0              | 500       | 54643            | 12.1             | 630       | 114625           | 20.7             | 760       | 5097             | 0.0              | 890       | 3992             | 0.0              |
| 375       | 2697             | 0.0              | 505       | 64676            | 18.1             | 635       | 103216           | 15.5             | 765       | 4626             | 0.0              | 895       | 3214             | 0.0              |
| 380       | 3039             | 0.0              | 510       | 73825            | 25.4             | 640       | 92605            | 11.1             | 770       | 3782             | 0.0              | 900       | 2580             | 0.0              |
| 385       | 2655             | 0.0              | 515       | 81872            | 33.9             | 645       | 83234            | 8.0              | 775       | 3506             | 0.0              | 905       | 1776             | 0.0              |
| 390       | 2357             | 0.0              | 520       | 88574            | 43.0             | 650       | 73263            | 5.4              | 780       | 3507             | 0.0              | 910       | 3995             | 0.0              |
| 395       | 2186             | 0.0              | 525       | 93289            | 50.1             | 655       | 64627            | 3.7              | 785       | 3267             | 0.0              | 915       | 4288             | 0.0              |
| 400       | 2015             | 0.0              | 530       | 98393            | 57.9             | 660       | 56614            | 2.4              | 790       | 2849             | 0.0              | 920       | 2446             | 0.0              |
| 405       | 2234             | 0.0              | 535       | 103269           | 64.0             | 665       | 49537            | 1.6              | 795       | 3037             | 0.0              | 925       | 3009             | 0.0              |
| 410       | 3412             | 0.0              | 540       | 107316           | 69.9             | 670       | 42866            | 0.9              | 800       | 2716             | 0.0              | 930       | 3026             | 0.0              |
| 415       | 6135             | 0.0              | 545       | 113101           | 75.3             | 675       | 36708            | 0.6              | 805       | 2648             | 0.0              | 935       | 4734             | 0.0              |
| 420       | 12146            | 0.0              | 550       | 120690           | 82.0             | 680       | 31814            | 0.4              | 810       | 3187             | 0.0              | 940       | 3719             | 0.0              |
| 425       | 23983            | 0.1              | 555       | 128583           | 87.8             | 685       | 27485            | 0.2              | 815       | 2931             | 0.0              | 945       | 1480             | 0.0              |
| 430       | 42142            | 0.3              | 560       | 137796           | 93.6             | 690       | 23698            | 0.1              | 820       | 2717             | 0.0              | 950       | 3450             | 0.0              |
| 435       | 68228            | 0.8              | 565       | 146577           | 97.5             | 695       | 20309            | 0.1              | 825       | 2236             | 0.0              | 955       | 5051             | 0.0              |
| 440       | 99323            | 1.6              | 570       | 154581           | 100.5            | 700       | 17890            | 0.1              | 830       | 2628             | 0.0              | 960       | 3176             | 0.0              |
| 445       | 115584           | 2.4              | 575       | 162633           | 101.2            | 705       | 15500            | 0.0              | 835       | 3140             | 0.0              | 965       | 5178             | 0.0              |
| 450       | 94997            | 2.5              | 580       | 168101           | 99.9             | 710       | 13699            | 0.0              | 840       | 3675             | 0.0              | 970       | 6385             | 0.0              |
| 455       | 61433            | 2.1              | 585       | 173145           | 96.2             | 715       | 12398            | 0.0              | 845       | 3283             | 0.0              | 975       | 3810             | 0.0              |
| 460       | 43373            | 1.8              | 590       | 174675           | 90.3             | 720       | 11147            | 0.0              | 850       | 3055             | 0.0              | 980       | 4322             | 0.0              |
| 465       | 32472            | 1.7              | 595       | 173724           | 82.3             | 725       | 9761             | 0.0              | 855       | 2932             | 0.0              | 985       | 4200             | 0.0              |
| 470       | 24257            | 1.5              | 600       | 171241           | 73.8             | 730       | 8651             | 0.0              | 860       | 3382             | 0.0              | 990       | 4661             | 0.0              |
| 475       | 21690            | 1.7              | 605       | 165134           | 64.0             | 735       | 7730             | 0.0              | 865       | 2605             | 0.0              | 995       | 6746             | 0.0              |
| 480       | 23173            | 2.2              | 610       | 156652           | 53.8             | 740       | 6847             | 0.0              | 870       | 3325             | 0.0              | 1000      | 4150             | 0.0              |
| 485       | 27564            | 3.3              | 615       | 147879           | 44.6             | 745       | 6124             | 0.0              | 875       | 3325             | 0.0              |           |                  |                  |

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### Scotopic Flux vs. Wavelength


**Scotopic Lumens: 12126**
**S/P: 1.36**

| 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       | 2672             | 0.0              | 490       | 34553            | 53.2             | 620       | 136720           | 1.7              | 750       | 5870             | 0.0              | 880       | 4216             | 0.0              |
| 365       | 2252             | 0.0              | 495       | 44336            | 71.7             | 625       | 126308           | 1.1              | 755       | 5421             | 0.0              | 885       | 4132             | 0.0              |
| 370       | 2217             | 0.0              | 500       | 54643            | 91.4             | 630       | 114625           | 0.6              | 760       | 5097             | 0.0              | 890       | 3992             | 0.0              |
| 375       | 2697             | 0.0              | 505       | 64676            | 110.0            | 635       | 103216           | 0.4              | 765       | 4626             | 0.0              | 895       | 3214             | 0.0              |
| 380       | 3039             | 0.0              | 510       | 73825            | 125.1            | 640       | 92605            | 0.2              | 770       | 3782             | 0.0              | 900       | 2580             | 0.0              |
| 385       | 2655             | 0.0              | 515       | 81872            | 135.7            | 645       | 83234            | 0.1              | 775       | 3506             | 0.0              | 905       | 1776             | 0.0              |
| 390       | 2357             | 0.0              | 520       | 88574            | 140.8            | 650       | 73263            | 0.1              | 780       | 3507             | 0.0              | 910       | 3995             | 0.0              |
| 395       | 2186             | 0.0              | 525       | 93289            | 139.6            | 655       | 64627            | 0.1              | 785       | 3267             | 0.0              | 915       | 4288             | 0.0              |
| 400       | 2015             | 0.0              | 530       | 98393            | 135.7            | 660       | 56614            | 0.0              | 790       | 2849             | 0.0              | 920       | 2446             | 0.0              |
| 405       | 2234             | 0.1              | 535       | 103269           | 128.7            | 665       | 49537            | 0.0              | 795       | 3037             | 0.0              | 925       | 3009             | 0.0              |
| 410       | 3412             | 0.2              | 540       | 107316           | 118.6            | 670       | 42866            | 0.0              | 800       | 2716             | 0.0              | 930       | 3026             | 0.0              |
| 415       | 6135             | 0.6              | 545       | 113101           | 108.4            | 675       | 36708            | 0.0              | 805       | 2648             | 0.0              | 935       | 4734             | 0.0              |
| 420       | 12146            | 2.0              | 550       | 120690           | 98.7             | 680       | 31814            | 0.0              | 810       | 3187             | 0.0              | 940       | 3719             | 0.0              |
| 425       | 23983            | 5.9              | 555       | 128583           | 87.9             | 685       | 27485            | 0.0              | 815       | 2931             | 0.0              | 945       | 1480             | 0.0              |
| 430       | 42142            | 14.3             | 560       | 137796           | 77.0             | 690       | 23698            | 0.0              | 820       | 2717             | 0.0              | 950       | 3450             | 0.0              |
| 435       | 68228            | 30.5             | 565       | 146577           | 65.8             | 695       | 20309            | 0.0              | 825       | 2236             | 0.0              | 955       | 5051             | 0.0              |
| 440       | 99323            | 55.5             | 570       | 154581           | 54.6             | 700       | 17890            | 0.0              | 830       | 2628             | 0.0              | 960       | 3176             | 0.0              |
| 445       | 115584           | 77.4             | 575       | 162633           | 44.3             | 705       | 15500            | 0.0              | 835       | 3140             | 0.0              | 965       | 5178             | 0.0              |
| 450       | 94997            | 73.6             | 580       | 168101           | 34.6             | 710       | 13699            | 0.0              | 840       | 3675             | 0.0              | 970       | 6385             | 0.0              |
| 455       | 61433            | 53.7             | 585       | 173145           | 26.5             | 715       | 12398            | 0.0              | 845       | 3283             | 0.0              | 975       | 3810             | 0.0              |
| 460       | 43373            | 41.9             | 590       | 174675           | 19.5             | 720       | 11147            | 0.0              | 850       | 3055             | 0.0              | 980       | 4322             | 0.0              |
| 465       | 32472            | 34.3             | 595       | 173724           | 13.9             | 725       | 9761             | 0.0              | 855       | 2932             | 0.0              | 985       | 4200             | 0.0              |
| 470       | 24257            | 27.9             | 600       | 171241           | 9.7              | 730       | 8651             | 0.0              | 860       | 3382             | 0.0              | 990       | 4661             | 0.0              |
| 475       | 21690            | 27.1             | 605       | 165134           | 6.5              | 735       | 7730             | 0.0              | 865       | 2605             | 0.0              | 995       | 6746             | 0.0              |
| 480       | 23173            | 31.3             | 610       | 156652           | 4.2              | 740       | 6847             | 0.0              | 870       | 3325             | 0.0              | 1000      | 4150             | 0.0              |
| 485       | 27564            | 40.0             | 615       | 147879           | 2.7              | 745       | 6124             | 0.0              | 875       | 3325             | 0.0              |           |                  |                  |

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### Melanopic Flux vs. Wavelength



Melanopic Lumens: 4490.7

M/P: 0.5

| 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       | 2672             | 0.0              | 490       | 34553            | 28.8             | 620       | 136720           | 0.1              | 750       | 5870             | 0.0              | 880       | 4216             | 0.0              |
| 365       | 2252             | 0.0              | 495       | 44336            | 36.6             | 625       | 126308           | 0.1              | 755       | 5421             | 0.0              | 885       | 4132             | 0.0              |
| 370       | 2217             | 0.0              | 500       | 54643            | 43.9             | 630       | 114625           | 0.0              | 760       | 5097             | 0.0              | 890       | 3992             | 0.0              |
| 375       | 2697             | 0.0              | 505       | 64676            | 49.6             | 635       | 103216           | 0.0              | 765       | 4626             | 0.0              | 895       | 3214             | 0.0              |
| 380       | 3039             | 0.0              | 510       | 73825            | 53.0             | 640       | 92605            | 0.0              | 770       | 3782             | 0.0              | 900       | 2580             | 0.0              |
| 385       | 2655             | 0.0              | 515       | 81872            | 53.5             | 645       | 83234            | 0.0              | 775       | 3506             | 0.0              | 905       | 1776             | 0.0              |
| 390       | 2357             | 0.0              | 520       | 88574            | 51.6             | 650       | 73263            | 0.0              | 780       | 3507             | 0.0              | 910       | 3995             | 0.0              |
| 395       | 2186             | 0.0              | 525       | 93289            | 47.3             | 655       | 64627            | 0.0              | 785       | 3267             | 0.0              | 915       | 4288             | 0.0              |
| 400       | 2015             | 0.0              | 530       | 98393            | 42.5             | 660       | 56614            | 0.0              | 790       | 2849             | 0.0              | 920       | 2446             | 0.0              |
| 405       | 2234             | 0.0              | 535       | 103269           | 37.2             | 665       | 49537            | 0.0              | 795       | 3037             | 0.0              | 925       | 3009             | 0.0              |
| 410       | 3412             | 0.1              | 540       | 107316           | 31.4             | 670       | 42866            | 0.0              | 800       | 2716             | 0.0              | 930       | 3026             | 0.0              |
| 415       | 6135             | 0.4              | 545       | 113101           | 26.3             | 675       | 36708            | 0.0              | 805       | 2648             | 0.0              | 935       | 4734             | 0.0              |
| 420       | 12146            | 1.4              | 550       | 120690           | 21.7             | 680       | 31814            | 0.0              | 810       | 3187             | 0.0              | 940       | 3719             | 0.0              |
| 425       | 23983            | 3.7              | 555       | 128583           | 17.3             | 685       | 27485            | 0.0              | 815       | 2931             | 0.0              | 945       | 1480             | 0.0              |
| 430       | 42142            | 8.9              | 560       | 137796           | 13.6             | 690       | 23698            | 0.0              | 820       | 2717             | 0.0              | 950       | 3450             | 0.0              |
| 435       | 68228            | 18.2             | 565       | 146577           | 10.3             | 695       | 20309            | 0.0              | 825       | 2236             | 0.0              | 955       | 5051             | 0.0              |
| 440       | 99323            | 33.2             | 570       | 154581           | 7.6              | 700       | 17890            | 0.0              | 830       | 2628             | 0.0              | 960       | 3176             | 0.0              |
| 445       | 115584           | 45.6             | 575       | 162633           | 5.4              | 705       | 15500            | 0.0              | 835       | 3140             | 0.0              | 965       | 5178             | 0.0              |
| 450       | 94997            | 43.8             | 580       | 168101           | 3.8              | 710       | 13699            | 0.0              | 840       | 3675             | 0.0              | 970       | 6385             | 0.0              |
| 455       | 61433            | 32.2             | 585       | 173145           | 2.6              | 715       | 12398            | 0.0              | 845       | 3283             | 0.0              | 975       | 3810             | 0.0              |
| 460       | 43373            | 25.6             | 590       | 174675           | 1.7              | 720       | 11147            | 0.0              | 850       | 3055             | 0.0              | 980       | 4322             | 0.0              |
| 465       | 32472            | 21.2             | 595       | 173724           | 1.1              | 725       | 9761             | 0.0              | 855       | 2932             | 0.0              | 985       | 4200             | 0.0              |
| 470       | 24257            | 17.4             | 600       | 171241           | 0.7              | 730       | 8651             | 0.0              | 860       | 3382             | 0.0              | 990       | 4661             | 0.0              |
| 475       | 21690            | 16.6             | 605       | 165134           | 0.5              | 735       | 7730             | 0.0              | 865       | 2605             | 0.0              | 995       | 6746             | 0.0              |
| 480       | 23173            | 18.6             | 610       | 156652           | 0.3              | 740       | 6847             | 0.0              | 870       | 3325             | 0.0              | 1000      | 4150             | 0.0              |
| 485       | 27564            | 22.7             | 615       | 147879           | 0.2              | 745       | 6124             | 0.0              | 875       | 3325             | 0.0              |           |                  |                  |

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TM-30-18

### Summary

$R_f = 76.9$   
 $R_g = 94.4$   
 CIE  $R_a = 73.1$   
 $R_g = -34.6$

### Spectral Power Distribution Comparison



### Color Vector Graphics



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 68 | CES51 = 90 | CES76 = 63 |
| CES02 = 62 | CES27 = 88 | CES52 = 89 | CES77 = 80 |
| CES03 = 31 | CES28 = 87 | CES53 = 80 | CES78 = 65 |
| CES04 = 70 | CES29 = 67 | CES54 = 84 | CES79 = 87 |
| CES05 = 48 | CES30 = 74 | CES55 = 84 | CES80 = 86 |
| CES06 = 51 | CES31 = 71 | CES56 = 75 | CES81 = 75 |
| CES07 = 40 | CES32 = 67 | CES57 = 74 | CES82 = 94 |
| CES08 = 39 | CES33 = 74 | CES58 = 76 | CES83 = 91 |
| CES09 = 29 | CES34 = 78 | CES59 = 87 | CES84 = 89 |
| CES10 = 75 | CES35 = 89 | CES60 = 93 | CES85 = 80 |
| CES11 = 58 | CES36 = 98 | CES61 = 86 | CES86 = 66 |
| CES12 = 64 | CES37 = 86 | CES62 = 89 | CES87 = 79 |
| CES13 = 43 | CES38 = 82 | CES63 = 77 | CES88 = 79 |
| CES14 = 74 | CES39 = 95 | CES64 = 74 | CES89 = 70 |
| CES15 = 71 | CES40 = 91 | CES65 = 68 | CES90 = 77 |
| CES16 = 47 | CES41 = 89 | CES66 = 71 | CES91 = 88 |
| CES17 = 50 | CES42 = 88 | CES67 = 69 | CES92 = 60 |
| CES18 = 56 | CES43 = 82 | CES68 = 74 | CES93 = 77 |
| CES19 = 72 | CES44 = 99 | CES69 = 82 | CES94 = 52 |
| CES20 = 65 | CES45 = 87 | CES70 = 67 | CES95 = 69 |
| CES21 = 86 | CES46 = 82 | CES71 = 66 | CES96 = 78 |
| CES22 = 79 | CES47 = 82 | CES72 = 88 | CES97 = 85 |
| CES23 = 92 | CES48 = 72 | CES73 = 59 | CES98 = 76 |
| CES24 = 91 | CES49 = 82 | CES74 = 97 | CES99 = 63 |
| CES25 = 72 | CES50 = 88 | CES75 = 66 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)