

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: P800837

Luminaire Tested: **ARCH-M-PA2-60-740-24VDC-T3-HSS**

Issue Date: 5/19/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P800837  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1910-568-14)  
Test Lab: INNOVATION CENTER  
Issue Date: 5/19/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: STREETWORKS  
Catalog Number: ARCH-M-PA2-60-740-24VDC-T3-HSS  
Description: ARCHEON-M ROADWAY AND AREA LUMINAIRE  
(2) 70 CRI, 4000K, 405mA LIGHT ENGINES WITH 16 LEDS AND TYPE III OPTICS  
WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 7793 lumens  
Efficiency: N/A  
Efficacy: 127.8 lumens/watt  
Luminous Opening: Rectangular (W 0.75' x L: 1' x H: 0')  
IES Classification: Type IV - Medium  
BUG Rating: B1 - U0 - G2

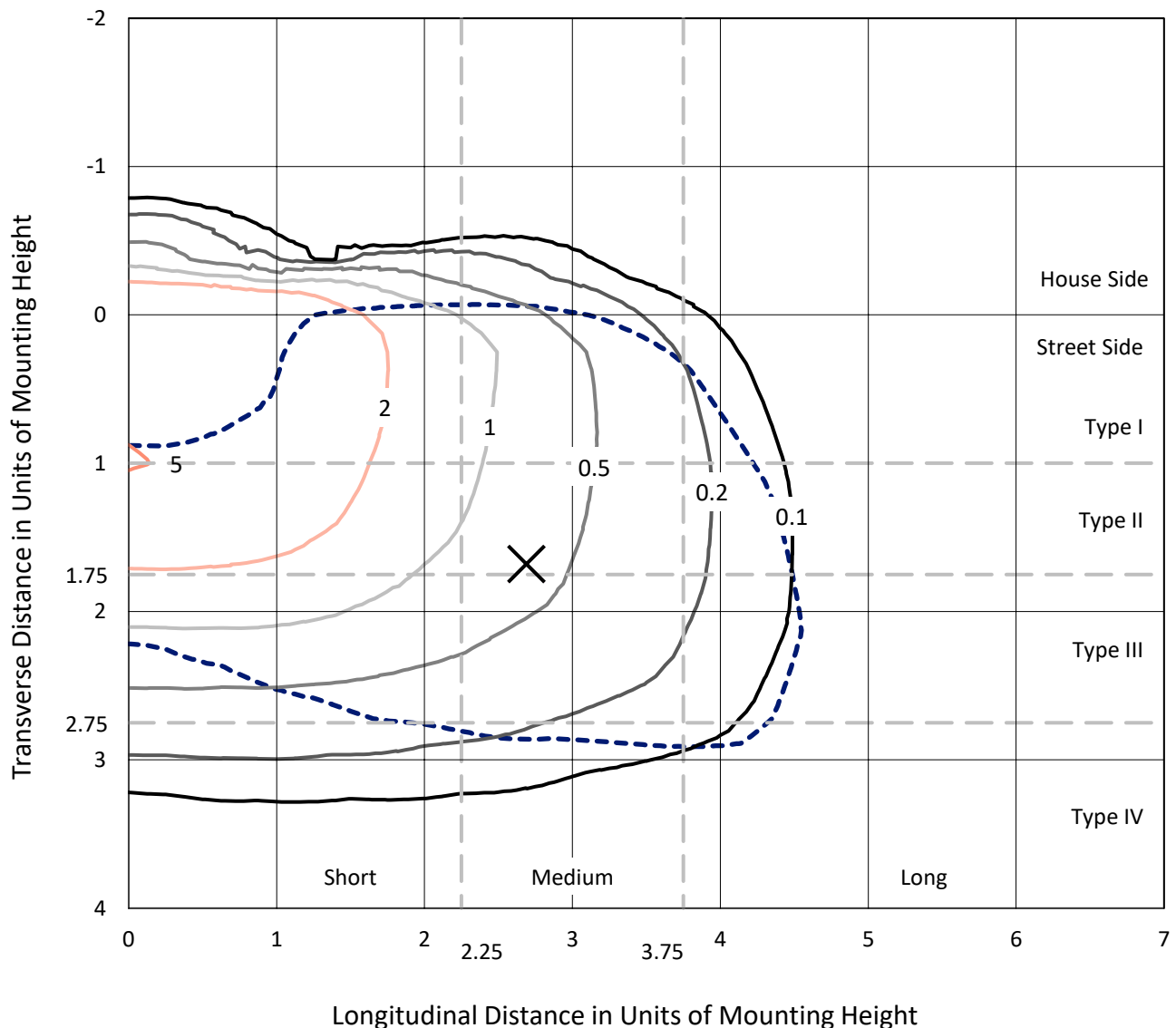
Input Watts (W): 61  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 25 FT

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## Iso-Footcandle Lines of Horizontal Illumination

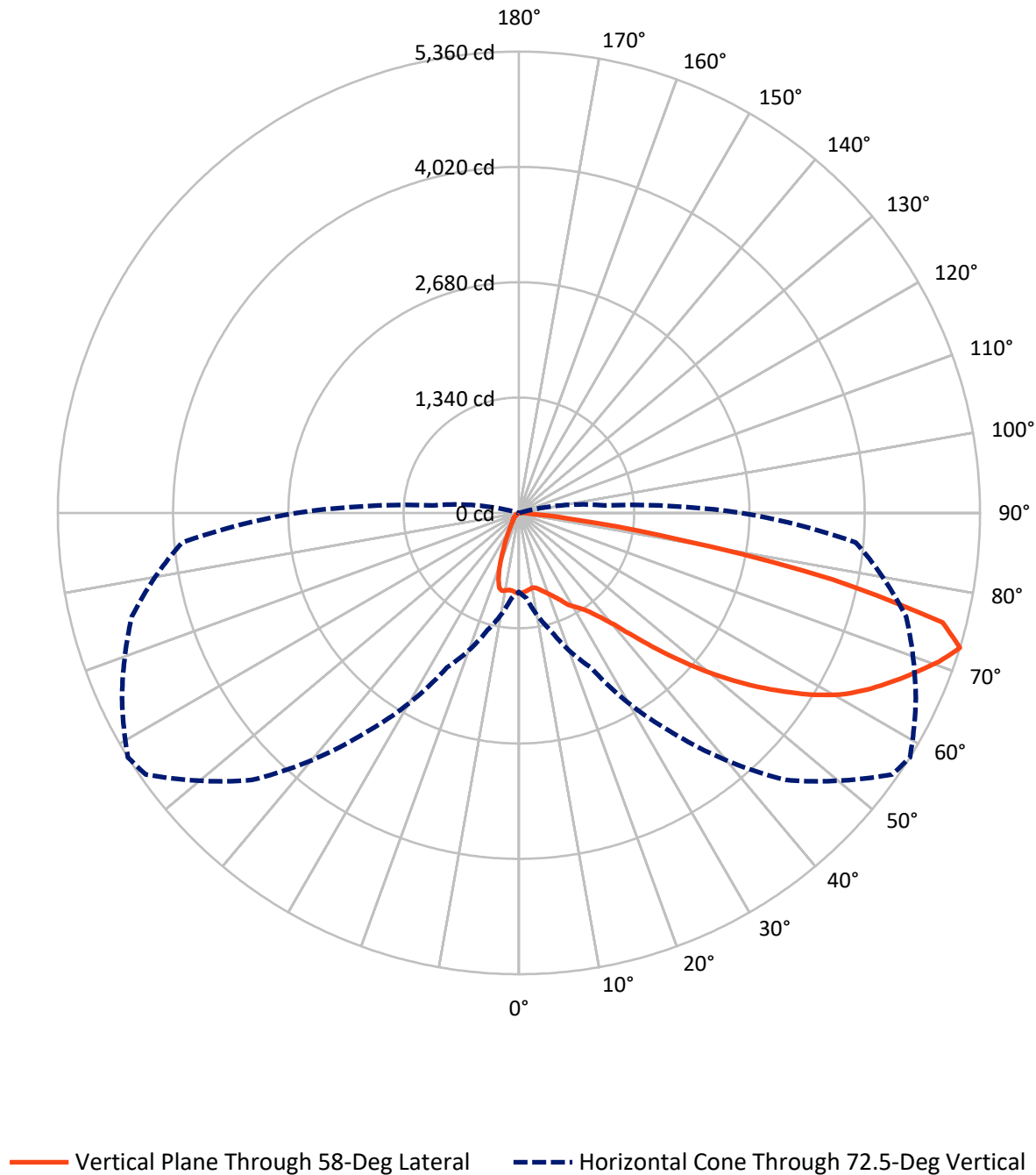
× Max cd  
 - - - 1/2 Max cd



Based on 15 foot mounting height. Maximum calculated value = 5.1 fc  
 Type IV - Medium - N/A

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## Luminous Intensity Polar Plot



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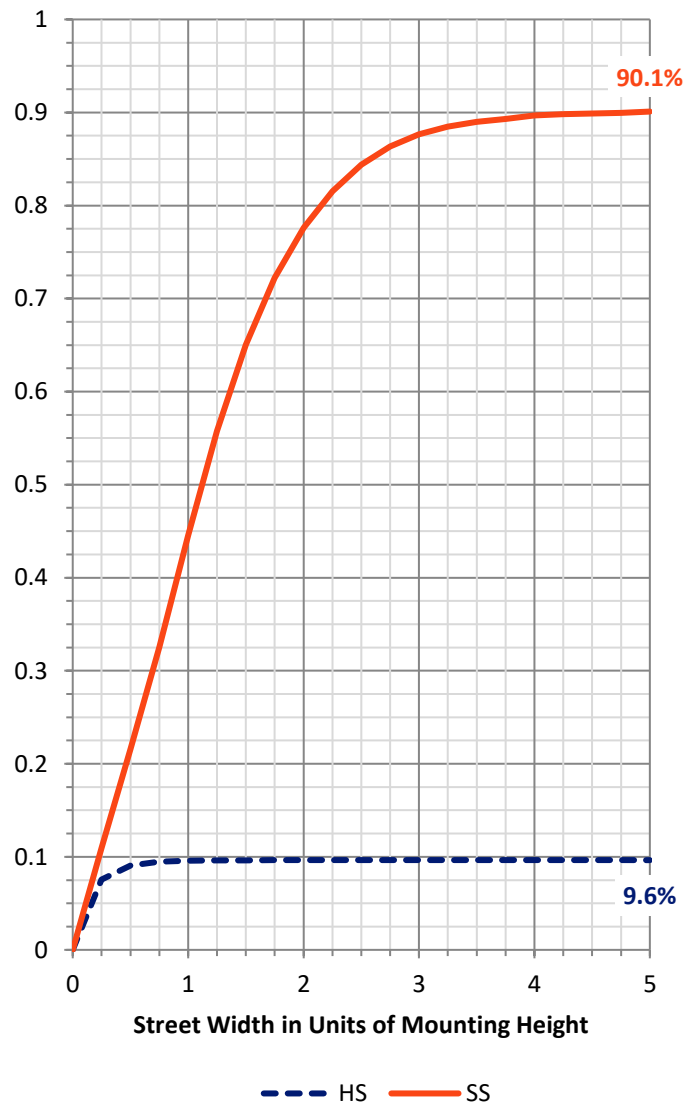
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 757.8    | 0.0    | 757.8  |
|                    | % Fixture | 9.7      | 0.0    | 9.7    |
| <b>Street Side</b> | Lumens    | 7035.2   | 0.0    | 7035.2 |
|                    | % Fixture | 90.3     | 0.0    | 90.3   |
| <b>Total</b>       | Lumens    | 7793.0   | 0.0    | 7793.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 85.8   | 1.1       |
| 10°-20°   | 223.5  | 2.9       |
| 20°-30°   | 351.1  | 4.5       |
| 30°-40°   | 605.6  | 7.8       |
| 40°-50°   | 1152.1 | 14.8      |
| 50°-60°   | 1824.6 | 23.4      |
| 60°-70°   | 2129.1 | 27.3      |
| 70°-80°   | 1333.5 | 17.1      |
| 80°-90°   | 87.5   | 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°    | 7793.0 | 100.0     |
| 0°-180°   | 7793.0 | 100.0     |

**Coefficient of Utilization**



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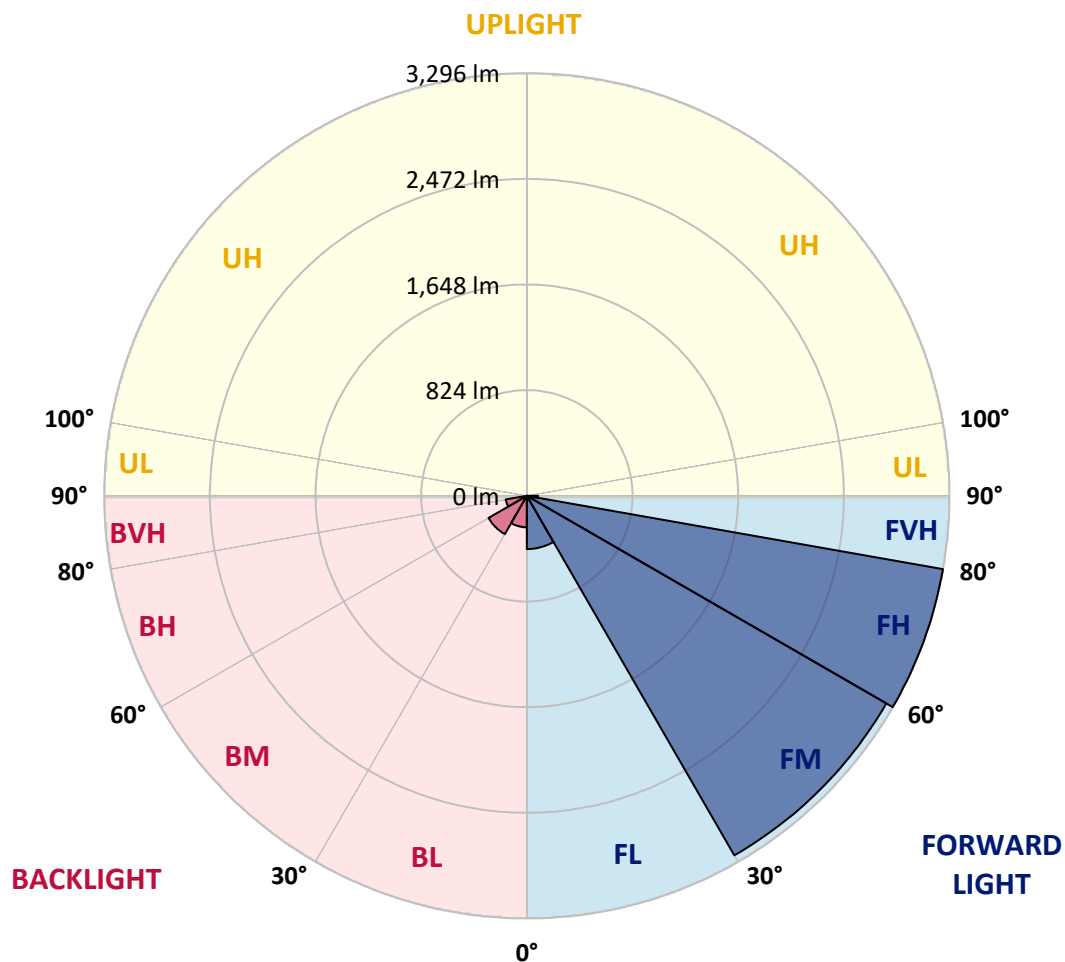
CATALOG NUMBER: ARCH-M-PA2-60-740-24VDC-T3-HSS

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 415.1  | 5.3       |                         |      |         |
| FM   | (30°-60°)   | 3237.5 | 41.5      |                         |      |         |
| FH   | (60°-80°)   | 3295.9 | 42.3      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 86.7   | 1.1       |                         |      | G1/100  |
| BL   | (0°-30°)    | 245.4  | 3.1       | B1/500                  |      |         |
| BM   | (30°-60°)   | 344.8  | 4.4       | B1/1000                 |      |         |
| BH   | (60°-80°)   | 166.8  | 2.1       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 0.8    | 0.0       |                         |      | 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 IV Medium



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 58°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 935.1  | 935.1  | 935.1  | 935.1  | 935.1  | 935.1  | 935.1  | 935.1  | 935.1  | 935.1  | 935.1  |
| 2.5°  | 930.9  | 926.8  | 925.4  | 924.0  | 925.4  | 926.8  | 922.6  | 926.8  | 924.0  | 925.4  | 928.1  |
| 5°    | 897.5  | 893.3  | 891.9  | 893.3  | 897.5  | 904.5  | 907.2  | 911.4  | 911.4  | 915.6  | 917.0  |
| 7.5°  | 859.9  | 857.1  | 855.7  | 858.5  | 866.8  | 882.2  | 890.5  | 896.1  | 901.7  | 910.0  | 918.4  |
| 10°   | 839.0  | 837.6  | 836.2  | 840.3  | 848.7  | 862.6  | 873.8  | 882.2  | 903.1  | 926.8  | 942.1  |
| 12.5° | 825.0  | 825.0  | 827.8  | 836.2  | 847.3  | 858.5  | 884.9  | 896.1  | 928.1  | 964.4  | 985.3  |
| 15°   | 813.9  | 813.9  | 818.0  | 833.4  | 848.7  | 875.2  | 914.2  | 926.8  | 964.4  | 1009.0 | 1036.8 |
| 17.5° | 805.5  | 808.3  | 811.1  | 826.4  | 855.7  | 900.3  | 946.3  | 964.4  | 1010.4 | 1059.1 | 1089.8 |
| 20°   | 806.9  | 809.7  | 811.1  | 826.4  | 868.2  | 929.5  | 988.1  | 1009.0 | 1061.9 | 1113.5 | 1144.2 |
| 22.5° | 815.3  | 819.4  | 820.8  | 841.7  | 890.5  | 960.2  | 1035.5 | 1059.1 | 1116.3 | 1170.6 | 1194.3 |
| 25°   | 850.1  | 852.9  | 844.5  | 862.6  | 922.6  | 1007.6 | 1096.8 | 1121.9 | 1179.0 | 1229.2 | 1248.7 |
| 27.5° | 968.6  | 971.3  | 925.4  | 904.5  | 947.7  | 1046.6 | 1172.0 | 1206.9 | 1277.9 | 1311.4 | 1314.2 |
| 30°   | 1225.0 | 1227.8 | 1137.2 | 1038.2 | 1007.6 | 1080.0 | 1213.8 | 1262.6 | 1354.6 | 1392.2 | 1375.5 |
| 32.5° | 1555.3 | 1552.5 | 1428.5 | 1282.1 | 1149.7 | 1138.6 | 1273.8 | 1325.3 | 1425.7 | 1461.9 | 1449.4 |
| 35°   | 1886.9 | 1891.1 | 1785.2 | 1565.0 | 1375.5 | 1248.7 | 1350.4 | 1410.3 | 1531.6 | 1583.1 | 1560.8 |
| 37.5° | 2114.1 | 2142.0 | 2096.0 | 1857.7 | 1652.8 | 1452.1 | 1474.4 | 1538.5 | 1690.4 | 1760.1 | 1712.7 |
| 40°   | 2434.6 | 2427.7 | 2316.2 | 2140.6 | 1959.4 | 1753.2 | 1675.1 | 1705.8 | 1880.0 | 1973.4 | 1899.5 |
| 42.5° | 2865.3 | 2851.3 | 2661.8 | 2490.4 | 2288.3 | 2119.7 | 1960.8 | 1955.2 | 2097.4 | 2206.1 | 2098.8 |
| 45°   | 3255.5 | 3234.6 | 3105.0 | 2939.1 | 2717.5 | 2523.8 | 2309.2 | 2260.4 | 2359.4 | 2451.4 | 2325.9 |
| 47.5° | 3566.2 | 3531.4 | 3439.4 | 3351.6 | 3297.3 | 2996.3 | 2674.3 | 2600.5 | 2650.6 | 2718.9 | 2541.9 |
| 50°   | 3934.2 | 3838.0 | 3704.2 | 3651.3 | 3764.1 | 3531.4 | 3025.5 | 2954.5 | 2951.7 | 2990.7 | 2764.9 |
| 52.5° | 4101.4 | 3927.2 | 3851.9 | 3896.5 | 4095.8 | 4028.9 | 3404.6 | 3302.9 | 3262.4 | 3266.6 | 2972.6 |
| 55°   | 3899.3 | 3879.8 | 3920.2 | 4059.6 | 4320.2 | 4281.2 | 3768.3 | 3642.9 | 3583.0 | 3507.7 | 3171.9 |
| 57.5° | 3669.4 | 3729.3 | 3889.6 | 4155.7 | 4604.5 | 4544.6 | 4126.5 | 3984.3 | 3874.2 | 3701.4 | 3393.4 |
| 60°   | 3457.5 | 3518.9 | 3783.7 | 4178.0 | 4760.6 | 4798.2 | 4424.7 | 4289.5 | 4126.5 | 3899.3 | 3637.3 |
| 62.5° | 3135.6 | 3183.0 | 3555.1 | 4146.0 | 4692.3 | 4945.9 | 4632.4 | 4530.6 | 4378.7 | 4087.5 | 3917.4 |
| 65°   | 2773.3 | 2803.9 | 3171.9 | 3889.6 | 4558.5 | 4929.2 | 4803.8 | 4746.6 | 4598.9 | 4284.0 | 4194.8 |
| 67.5° | 2376.1 | 2412.3 | 2718.9 | 3428.3 | 4296.5 | 4851.2 | 4965.4 | 4959.9 | 4791.2 | 4501.4 | 4395.4 |
| 70°   | 1919.0 | 1921.8 | 2175.4 | 2843.0 | 3839.4 | 4695.1 | 5166.1 | 5178.7 | 4975.2 | 4664.4 | 4403.8 |
| 72.5° | 918.4  | 993.6  | 1410.3 | 1984.5 | 3120.3 | 4388.5 | 5297.1 | 5359.8 | 5090.9 | 4658.8 | 3928.6 |
| 75°   | 210.4  | 217.4  | 411.1  | 943.5  | 1829.8 | 3368.4 | 4969.6 | 5086.7 | 4809.3 | 4028.9 | 2767.7 |
| 77.5° | 76.6   | 80.8   | 115.7  | 275.9  | 703.8  | 1740.6 | 3556.5 | 3727.9 | 3555.1 | 2604.7 | 1308.6 |
| 80°   | 51.6   | 50.2   | 59.9   | 122.6  | 323.3  | 493.3  | 1818.7 | 1920.4 | 1753.2 | 889.1  | 313.6  |
| 82.5° | 26.5   | 27.9   | 41.8   | 68.3   | 217.4  | 171.4  | 607.6  | 660.6  | 543.5  | 178.4  | 58.5   |
| 85°   | 12.5   | 12.5   | 23.7   | 43.2   | 92.0   | 59.9   | 135.2  | 163.1  | 146.3  | 78.0   | 19.5   |
| 87.5° | 12.5   | 12.5   | 22.3   | 27.9   | 47.4   | 25.1   | 33.4   | 41.8   | 39.0   | 41.8   | 7.0    |
| 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: ARCH-M-PA2-60-740-24VDC-T3-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 935.1  | 935.1  | 935.1  | 935.1 | 935.1 | 935.1 | 935.1 | 935.1 | 935.1 | 935.1 | 935.1 |
| 2.5°  | 928.1  | 926.8  | 925.4  | 928.1 | 926.8 | 929.5 | 929.5 | 932.3 | 932.3 | 929.5 | 928.1 |
| 5°    | 915.6  | 912.8  | 910.0  | 910.0 | 908.6 | 911.4 | 919.8 | 926.8 | 928.1 | 924.0 | 922.6 |
| 7.5°  | 917.0  | 917.0  | 914.2  | 908.6 | 898.9 | 898.9 | 898.9 | 907.2 | 911.4 | 908.6 | 907.2 |
| 10°   | 942.1  | 943.5  | 936.5  | 924.0 | 907.2 | 891.9 | 862.6 | 819.4 | 779.0 | 767.9 | 763.7 |
| 12.5° | 985.3  | 986.7  | 972.7  | 950.4 | 915.6 | 825.0 | 713.5 | 610.4 | 531.0 | 508.7 | 504.5 |
| 15°   | 1036.8 | 1038.2 | 1013.2 | 976.9 | 871.0 | 660.6 | 494.7 | 377.7 | 308.0 | 291.3 | 289.9 |
| 17.5° | 1089.8 | 1087.0 | 1049.4 | 979.7 | 738.6 | 468.3 | 301.0 | 241.1 | 223.0 | 218.8 | 220.2 |
| 20°   | 1141.4 | 1133.0 | 1081.4 | 928.1 | 568.6 | 306.6 | 220.2 | 206.3 | 202.1 | 199.3 | 199.3 |
| 22.5° | 1188.7 | 1172.0 | 1107.9 | 826.4 | 398.6 | 220.2 | 196.5 | 193.7 | 188.1 | 184.0 | 182.6 |
| 25°   | 1236.1 | 1212.4 | 1124.6 | 694.0 | 267.6 | 192.3 | 185.4 | 179.8 | 172.8 | 167.2 | 165.8 |
| 27.5° | 1293.3 | 1259.8 | 1116.3 | 526.8 | 200.7 | 178.4 | 172.8 | 164.4 | 154.7 | 146.3 | 143.5 |
| 30°   | 1347.6 | 1310.0 | 1068.9 | 363.7 | 171.4 | 164.4 | 156.1 | 143.5 | 131.0 | 121.2 | 118.5 |
| 32.5° | 1415.9 | 1372.7 | 983.9  | 238.3 | 149.1 | 143.5 | 135.2 | 119.9 | 103.1 | 92.0  | 89.2  |
| 35°   | 1513.5 | 1464.7 | 875.2  | 167.2 | 131.0 | 121.2 | 110.1 | 93.4  | 75.3  | 66.9  | 65.5  |
| 37.5° | 1650.0 | 1584.5 | 738.6  | 135.2 | 115.7 | 101.7 | 85.0  | 68.3  | 55.7  | 48.8  | 47.4  |
| 40°   | 1817.3 | 1716.9 | 586.7  | 119.9 | 103.1 | 85.0  | 64.1  | 48.8  | 40.4  | 34.8  | 34.8  |
| 42.5° | 1998.4 | 1841.0 | 432.0  | 110.1 | 90.6  | 69.7  | 47.4  | 34.8  | 29.3  | 26.5  | 25.1  |
| 45°   | 2185.2 | 1951.1 | 291.3  | 101.7 | 79.4  | 53.0  | 33.4  | 23.7  | 19.5  | 19.5  | 18.1  |
| 47.5° | 2378.9 | 2024.9 | 188.1  | 92.0  | 66.9  | 39.0  | 22.3  | 16.7  | 13.9  | 13.9  | 13.9  |
| 50°   | 2571.2 | 2063.9 | 133.8  | 83.6  | 54.4  | 26.5  | 16.7  | 12.5  | 11.1  | 11.1  | 11.1  |
| 52.5° | 2710.6 | 2038.9 | 107.3  | 72.5  | 41.8  | 19.5  | 12.5  | 9.8   | 8.4   | 8.4   | 8.4   |
| 55°   | 2831.8 | 1995.6 | 93.4   | 62.7  | 30.7  | 13.9  | 9.8   | 8.4   | 7.0   | 7.0   | 7.0   |
| 57.5° | 2955.8 | 1939.9 | 83.6   | 53.0  | 22.3  | 9.8   | 7.0   | 5.6   | 5.6   | 5.6   | 5.6   |
| 60°   | 3068.7 | 1845.1 | 72.5   | 41.8  | 15.3  | 7.0   | 5.6   | 4.2   | 4.2   | 4.2   | 4.2   |
| 62.5° | 3178.8 | 1764.3 | 62.7   | 32.1  | 11.1  | 5.6   | 2.8   | 2.8   | 1.4   | 1.4   | 1.4   |
| 65°   | 3241.5 | 1655.6 | 50.2   | 20.9  | 7.0   | 4.2   | 1.4   | 1.4   | 0.0   | 0.0   | 0.0   |
| 67.5° | 3222.0 | 1526.0 | 34.8   | 12.5  | 4.2   | 2.8   | 1.4   | 0.0   | 0.0   | 0.0   | 0.0   |
| 70°   | 3086.8 | 1351.8 | 20.9   | 7.0   | 4.2   | 2.8   | 1.4   | 0.0   | 0.0   | 0.0   | 0.0   |
| 72.5° | 2585.1 | 1000.6 | 12.5   | 5.6   | 2.8   | 1.4   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 75°   | 1726.7 | 459.9  | 7.0    | 4.2   | 1.4   | 1.4   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 77.5° | 790.2  | 138.0  | 4.2    | 2.8   | 1.4   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 80°   | 158.9  | 36.2   | 2.8    | 1.4   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 82.5° | 33.4   | 7.0    | 1.4    | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 85°   | 7.0    | 2.8    | 0.0    | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 87.5° | 2.8    | 1.4    | 0.0    | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |

Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

STREETWORKS

Report Number: SP1-2101-121-2

Luminaire Tested: IFLD-S-SA2A-740-U-T3R-HSS

Test Date: 03/05/2021

### Test Information

Test Method: LM-79-08  
 Report Number: SP1-2101-121-2  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1  
 Measurement Geometry:  $4\pi$   
 Issue Date: 03/05/2021  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: STREETWORKS  
 Catalog Number: **IFLD-S-SA2A-740-U-T3R-HSS**  
 Description: STREETWORKS INF FLOOD

SHIELD, DRIVER PROGRAMMED @ 615mA.

### Spectral Parameters

|                           |         |           |      |      |       |
|---------------------------|---------|-----------|------|------|-------|
| CCT (K):                  | 3905    | CRI (Ra): | 71.2 |      |       |
| CIE u':                   | 0.2273  | R1:       | 68.9 | R9:  | -29.7 |
| CIE v':                   | 0.5024  | R2:       | 77.0 | R10: | 46.2  |
| Duv:                      | -0.0008 | R3:       | 84.0 | R11: | 68.8  |
| CIE x:                    | 0.3841  | R4:       | 71.6 | R12: | 45.6  |
| CIE y:                    | 0.3774  | R5:       | 68.9 | R13: | 69.5  |
| CIE z:                    | 0.2385  | R6:       | 68.3 | R14: | 90.7  |
| Peak Wavelength (nm):     | 443     | R7:       | 78.7 |      |       |
| Dominant Wavelength (nm): | 579     | R8:       | 52.2 |      |       |
| Purity:                   | 28.7    |           |      |      |       |
| Rf:                       | 71.7    |           |      |      |       |
| Rg:                       | 96.9    |           |      |      |       |



### Test Conditions

Stabilization Time: 211M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.8/312%  
 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 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       | 2304             | 0.0              | 490       | 19043            | 2.7              | 620       | 97577            | 25.4             | 750       | 4830             | 0.0              | 880       | 3505             | 0.0              |
| 365       | 2150             | 0.0              | 495       | 26606            | 4.8              | 625       | 90158            | 19.9             | 755       | 4664             | 0.0              | 885       | 2991             | 0.0              |
| 370       | 2146             | 0.0              | 500       | 36376            | 8.0              | 630       | 82240            | 14.9             | 760       | 4006             | 0.0              | 890       | 2327             | 0.0              |
| 375       | 2332             | 0.0              | 505       | 47714            | 13.3             | 635       | 74361            | 11.2             | 765       | 3715             | 0.0              | 895       | 2775             | 0.0              |
| 380       | 2527             | 0.0              | 510       | 58741            | 20.2             | 640       | 66994            | 8.0              | 770       | 3696             | 0.0              | 900       | 2141             | 0.0              |
| 385       | 2304             | 0.0              | 515       | 68716            | 28.5             | 645       | 60405            | 5.8              | 775       | 3117             | 0.0              | 905       | 2421             | 0.0              |
| 390       | 2064             | 0.0              | 520       | 77136            | 37.4             | 650       | 53806            | 3.9              | 780       | 3062             | 0.0              | 910       | 2200             | 0.0              |
| 395       | 1856             | 0.0              | 525       | 83567            | 44.9             | 655       | 47610            | 2.7              | 785       | 2907             | 0.0              | 915       | 2716             | 0.0              |
| 400       | 1856             | 0.0              | 530       | 89283            | 52.6             | 660       | 42018            | 1.8              | 790       | 2655             | 0.0              | 920       | 2656             | 0.0              |
| 405       | 2374             | 0.0              | 535       | 94097            | 58.4             | 665       | 36742            | 1.2              | 795       | 2467             | 0.0              | 925       | 2671             | 0.0              |
| 410       | 4084             | 0.0              | 540       | 96845            | 63.1             | 670       | 32105            | 0.7              | 800       | 2609             | 0.0              | 930       | 3292             | 0.0              |
| 415       | 8543             | 0.0              | 545       | 100829           | 67.1             | 675       | 27946            | 0.5              | 805       | 2293             | 0.0              | 935       | 3188             | 0.0              |
| 420       | 18394            | 0.1              | 550       | 105648           | 71.8             | 680       | 24146            | 0.3              | 810       | 2188             | 0.0              | 940       | 1997             | 0.0              |
| 425       | 37987            | 0.2              | 555       | 110017           | 75.1             | 685       | 21191            | 0.2              | 815       | 2386             | 0.0              | 945       | 2623             | 0.0              |
| 430       | 67605            | 0.5              | 560       | 114586           | 77.9             | 690       | 18544            | 0.1              | 820       | 2712             | 0.0              | 950       | 2969             | 0.0              |
| 435       | 102160           | 1.2              | 565       | 118987           | 79.1             | 695       | 16058            | 0.1              | 825       | 2473             | 0.0              | 955       | 2277             | 0.0              |
| 440       | 135103           | 2.1              | 570       | 122326           | 79.5             | 700       | 14133            | 0.0              | 830       | 1969             | 0.0              | 960       | 4267             | 0.0              |
| 445       | 140126           | 2.9              | 575       | 125968           | 78.4             | 705       | 12309            | 0.0              | 835       | 1917             | 0.0              | 965       | 2034             | 0.0              |
| 450       | 102339           | 2.7              | 580       | 127613           | 75.8             | 710       | 11142            | 0.0              | 840       | 2248             | 0.0              | 970       | 3586             | 0.0              |
| 455       | 58751            | 2.0              | 585       | 129466           | 71.9             | 715       | 10143            | 0.0              | 845       | 2266             | 0.0              | 975       | 2505             | 0.0              |
| 460       | 36892            | 1.5              | 590       | 128813           | 66.6             | 720       | 9072             | 0.0              | 850       | 2558             | 0.0              | 980       | 2666             | 0.0              |
| 465       | 24637            | 1.3              | 595       | 126387           | 59.9             | 725       | 8130             | 0.0              | 855       | 2767             | 0.0              | 985       | 2934             | 0.0              |
| 470       | 16738            | 1.0              | 600       | 123477           | 53.2             | 730       | 7149             | 0.0              | 860       | 2826             | 0.0              | 990       | 4120             | 0.0              |
| 475       | 13456            | 1.1              | 605       | 118718           | 46.0             | 735       | 6311             | 0.0              | 865       | 2385             | 0.0              | 995       | 3858             | 0.0              |
| 480       | 13081            | 1.2              | 610       | 112091           | 38.5             | 740       | 5711             | 0.0              | 870       | 3194             | 0.0              | 1000      | 3405             | 0.0              |
| 485       | 14734            | 1.7              | 615       | 105039           | 31.7             | 745       | 5111             | 0.0              | 875       | 3189             | 0.0              |           |                  |                  |

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### Scotopic Flux vs. Wavelength



Scotopic Lumens: 10425.8

S/P: 1.47

| 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       | 2304             | 0.0              | 490       | 19043            | 29.3             | 620       | 97577            | 1.2              | 750       | 4830             | 0.0              | 880       | 3505             | 0.0              |
| 365       | 2150             | 0.0              | 495       | 26606            | 43.0             | 625       | 90158            | 0.8              | 755       | 4664             | 0.0              | 885       | 2991             | 0.0              |
| 370       | 2146             | 0.0              | 500       | 36376            | 60.8             | 630       | 82240            | 0.5              | 760       | 4006             | 0.0              | 890       | 2327             | 0.0              |
| 375       | 2332             | 0.0              | 505       | 47714            | 81.1             | 635       | 74361            | 0.3              | 765       | 3715             | 0.0              | 895       | 2775             | 0.0              |
| 380       | 2527             | 0.0              | 510       | 58741            | 99.6             | 640       | 66994            | 0.2              | 770       | 3696             | 0.0              | 900       | 2141             | 0.0              |
| 385       | 2304             | 0.0              | 515       | 68716            | 113.9            | 645       | 60405            | 0.1              | 775       | 3117             | 0.0              | 905       | 2421             | 0.0              |
| 390       | 2064             | 0.0              | 520       | 77136            | 122.6            | 650       | 53806            | 0.1              | 780       | 3062             | 0.0              | 910       | 2200             | 0.0              |
| 395       | 1856             | 0.0              | 525       | 83567            | 125.0            | 655       | 47610            | 0.0              | 785       | 2907             | 0.0              | 915       | 2716             | 0.0              |
| 400       | 1856             | 0.0              | 530       | 89283            | 123.1            | 660       | 42018            | 0.0              | 790       | 2655             | 0.0              | 920       | 2656             | 0.0              |
| 405       | 2374             | 0.1              | 535       | 94097            | 117.3            | 665       | 36742            | 0.0              | 795       | 2467             | 0.0              | 925       | 2671             | 0.0              |
| 410       | 4084             | 0.2              | 540       | 96845            | 107.0            | 670       | 32105            | 0.0              | 800       | 2609             | 0.0              | 930       | 3292             | 0.0              |
| 415       | 8543             | 0.9              | 545       | 100829           | 96.7             | 675       | 27946            | 0.0              | 805       | 2293             | 0.0              | 935       | 3188             | 0.0              |
| 420       | 18394            | 3.0              | 550       | 105648           | 86.4             | 680       | 24146            | 0.0              | 810       | 2188             | 0.0              | 940       | 1997             | 0.0              |
| 425       | 37987            | 9.3              | 555       | 110017           | 75.2             | 685       | 21191            | 0.0              | 815       | 2386             | 0.0              | 945       | 2623             | 0.0              |
| 430       | 67605            | 23.0             | 560       | 114586           | 64.0             | 690       | 18544            | 0.0              | 820       | 2712             | 0.0              | 950       | 2969             | 0.0              |
| 435       | 102160           | 45.7             | 565       | 118987           | 53.4             | 695       | 16058            | 0.0              | 825       | 2473             | 0.0              | 955       | 2277             | 0.0              |
| 440       | 135103           | 75.5             | 570       | 122326           | 43.2             | 700       | 14133            | 0.0              | 830       | 1969             | 0.0              | 960       | 4267             | 0.0              |
| 445       | 140126           | 93.8             | 575       | 125968           | 34.3             | 705       | 12309            | 0.0              | 835       | 1917             | 0.0              | 965       | 2034             | 0.0              |
| 450       | 102339           | 79.3             | 580       | 127613           | 26.3             | 710       | 11142            | 0.0              | 840       | 2248             | 0.0              | 970       | 3586             | 0.0              |
| 455       | 58751            | 51.3             | 585       | 129466           | 19.8             | 715       | 10143            | 0.0              | 845       | 2266             | 0.0              | 975       | 2505             | 0.0              |
| 460       | 36892            | 35.6             | 590       | 128813           | 14.3             | 720       | 9072             | 0.0              | 850       | 2558             | 0.0              | 980       | 2666             | 0.0              |
| 465       | 24637            | 26.0             | 595       | 126387           | 10.1             | 725       | 8130             | 0.0              | 855       | 2767             | 0.0              | 985       | 2934             | 0.0              |
| 470       | 16738            | 19.3             | 600       | 123477           | 7.0              | 730       | 7149             | 0.0              | 860       | 2826             | 0.0              | 990       | 4120             | 0.0              |
| 475       | 13456            | 16.8             | 605       | 118718           | 4.7              | 735       | 6311             | 0.0              | 865       | 2385             | 0.0              | 995       | 3858             | 0.0              |
| 480       | 13081            | 17.7             | 610       | 112091           | 3.0              | 740       | 5711             | 0.0              | 870       | 3194             | 0.0              | 1000      | 3405             | 0.0              |
| 485       | 14734            | 21.4             | 615       | 105039           | 1.9              | 745       | 5111             | 0.0              | 875       | 3189             | 0.0              |           |                  |                  |

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### Melanopic Flux vs. Wavelength



Melanopic Lumens: 3927.2 M/P: 0.55

| 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       | 2304             | 0.0              | 490       | 19043            | 15.8             | 620       | 97577            | 0.1              | 750       | 4830             | 0.0              | 880       | 3505             | 0.0              |
| 365       | 2150             | 0.0              | 495       | 26606            | 22.0             | 625       | 90158            | 0.0              | 755       | 4664             | 0.0              | 885       | 2991             | 0.0              |
| 370       | 2146             | 0.0              | 500       | 36376            | 29.2             | 630       | 82240            | 0.0              | 760       | 4006             | 0.0              | 890       | 2327             | 0.0              |
| 375       | 2332             | 0.0              | 505       | 47714            | 36.6             | 635       | 74361            | 0.0              | 765       | 3715             | 0.0              | 895       | 2775             | 0.0              |
| 380       | 2527             | 0.0              | 510       | 58741            | 42.2             | 640       | 66994            | 0.0              | 770       | 3696             | 0.0              | 900       | 2141             | 0.0              |
| 385       | 2304             | 0.0              | 515       | 68716            | 44.9             | 645       | 60405            | 0.0              | 775       | 3117             | 0.0              | 905       | 2421             | 0.0              |
| 390       | 2064             | 0.0              | 520       | 77136            | 44.9             | 650       | 53806            | 0.0              | 780       | 3062             | 0.0              | 910       | 2200             | 0.0              |
| 395       | 1856             | 0.0              | 525       | 83567            | 42.4             | 655       | 47610            | 0.0              | 785       | 2907             | 0.0              | 915       | 2716             | 0.0              |
| 400       | 1856             | 0.0              | 530       | 89283            | 38.6             | 660       | 42018            | 0.0              | 790       | 2655             | 0.0              | 920       | 2656             | 0.0              |
| 405       | 2374             | 0.0              | 535       | 94097            | 33.9             | 665       | 36742            | 0.0              | 795       | 2467             | 0.0              | 925       | 2671             | 0.0              |
| 410       | 4084             | 0.2              | 540       | 96845            | 28.3             | 670       | 32105            | 0.0              | 800       | 2609             | 0.0              | 930       | 3292             | 0.0              |
| 415       | 8543             | 0.6              | 545       | 100829           | 23.4             | 675       | 27946            | 0.0              | 805       | 2293             | 0.0              | 935       | 3188             | 0.0              |
| 420       | 18394            | 2.1              | 550       | 105648           | 19.0             | 680       | 24146            | 0.0              | 810       | 2188             | 0.0              | 940       | 1997             | 0.0              |
| 425       | 37987            | 5.9              | 555       | 110017           | 14.8             | 685       | 21191            | 0.0              | 815       | 2386             | 0.0              | 945       | 2623             | 0.0              |
| 430       | 67605            | 14.3             | 560       | 114586           | 11.3             | 690       | 18544            | 0.0              | 820       | 2712             | 0.0              | 950       | 2969             | 0.0              |
| 435       | 102160           | 27.3             | 565       | 118987           | 8.4              | 695       | 16058            | 0.0              | 825       | 2473             | 0.0              | 955       | 2277             | 0.0              |
| 440       | 135103           | 45.1             | 570       | 122326           | 6.0              | 700       | 14133            | 0.0              | 830       | 1969             | 0.0              | 960       | 4267             | 0.0              |
| 445       | 140126           | 55.3             | 575       | 125968           | 4.2              | 705       | 12309            | 0.0              | 835       | 1917             | 0.0              | 965       | 2034             | 0.0              |
| 450       | 102339           | 47.2             | 580       | 127613           | 2.9              | 710       | 11142            | 0.0              | 840       | 2248             | 0.0              | 970       | 3586             | 0.0              |
| 455       | 58751            | 30.8             | 585       | 129466           | 1.9              | 715       | 10143            | 0.0              | 845       | 2266             | 0.0              | 975       | 2505             | 0.0              |
| 460       | 36892            | 21.7             | 590       | 128813           | 1.3              | 720       | 9072             | 0.0              | 850       | 2558             | 0.0              | 980       | 2666             | 0.0              |
| 465       | 24637            | 16.1             | 595       | 126387           | 0.8              | 725       | 8130             | 0.0              | 855       | 2767             | 0.0              | 985       | 2934             | 0.0              |
| 470       | 16738            | 12.0             | 600       | 123477           | 0.5              | 730       | 7149             | 0.0              | 860       | 2826             | 0.0              | 990       | 4120             | 0.0              |
| 475       | 13456            | 10.3             | 605       | 118718           | 0.3              | 735       | 6311             | 0.0              | 865       | 2385             | 0.0              | 995       | 3858             | 0.0              |
| 480       | 13081            | 10.5             | 610       | 112091           | 0.2              | 740       | 5711             | 0.0              | 870       | 3194             | 0.0              | 1000      | 3405             | 0.0              |
| 485       | 14734            | 12.1             | 615       | 105039           | 0.1              | 745       | 5111             | 0.0              | 875       | 3189             | 0.0              |           |                  |                  |

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TM-30-18

### Summary

$R_f = 71.7$   
 $R_g = 96.9$   
 CIE  $R_a = 71.2$   
 $R_g = -29.7$



### Color Vector Graphics



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 55 | CES51 = 86 | CES76 = 45 |
| CES02 = 61 | CES27 = 80 | CES52 = 87 | CES77 = 68 |
| CES03 = 30 | CES28 = 79 | CES53 = 74 | CES78 = 49 |
| CES04 = 70 | CES29 = 51 | CES54 = 81 | CES79 = 77 |
| CES05 = 47 | CES30 = 60 | CES55 = 80 | CES80 = 75 |
| CES06 = 50 | CES31 = 56 | CES56 = 69 | CES81 = 75 |
| CES07 = 40 | CES32 = 52 | CES57 = 67 | CES82 = 90 |
| CES08 = 39 | CES33 = 62 | CES58 = 69 | CES83 = 85 |
| CES09 = 29 | CES34 = 65 | CES59 = 86 | CES84 = 87 |
| CES10 = 74 | CES35 = 81 | CES60 = 91 | CES85 = 83 |
| CES11 = 57 | CES36 = 92 | CES61 = 85 | CES86 = 72 |
| CES12 = 63 | CES37 = 74 | CES62 = 81 | CES87 = 77 |
| CES13 = 42 | CES38 = 69 | CES63 = 72 | CES88 = 77 |
| CES14 = 74 | CES39 = 92 | CES64 = 69 | CES89 = 72 |
| CES15 = 71 | CES40 = 86 | CES65 = 64 | CES90 = 75 |
| CES16 = 46 | CES41 = 84 | CES66 = 63 | CES91 = 91 |
| CES17 = 49 | CES42 = 75 | CES67 = 60 | CES92 = 66 |
| CES18 = 56 | CES43 = 70 | CES68 = 67 | CES93 = 80 |
| CES19 = 72 | CES44 = 98 | CES69 = 77 | CES94 = 56 |
| CES20 = 65 | CES45 = 80 | CES70 = 57 | CES95 = 72 |
| CES21 = 86 | CES46 = 77 | CES71 = 53 | CES96 = 78 |
| CES22 = 78 | CES47 = 74 | CES72 = 84 | CES97 = 83 |
| CES23 = 92 | CES48 = 66 | CES73 = 47 | CES98 = 73 |
| CES24 = 91 | CES49 = 76 | CES74 = 96 | CES99 = 63 |
| CES25 = 72 | CES50 = 85 | CES75 = 52 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**


(END OF REPORT)