

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: P800936

Luminaire Tested: **ARCH-M-PA2-100-827-24VDC-T3-HSS**

Issue Date: 5/19/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P800936  
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-PA2-100-827-24VDC-T3-HSS  
Description: ARCHEON-M ROADWAY AND AREA LUMINAIRE  
(2) 80 CRI, 2700K, 660mA 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: 8744 lumens  
Efficiency: N/A  
Efficacy: 89.2 lumens/watt  
Luminous Opening: Rectangular (W 0.75' x L: 1' x H: 0')  
IES Classification: Type IV - Medium  
BUG Rating: B1 - U0 - G2

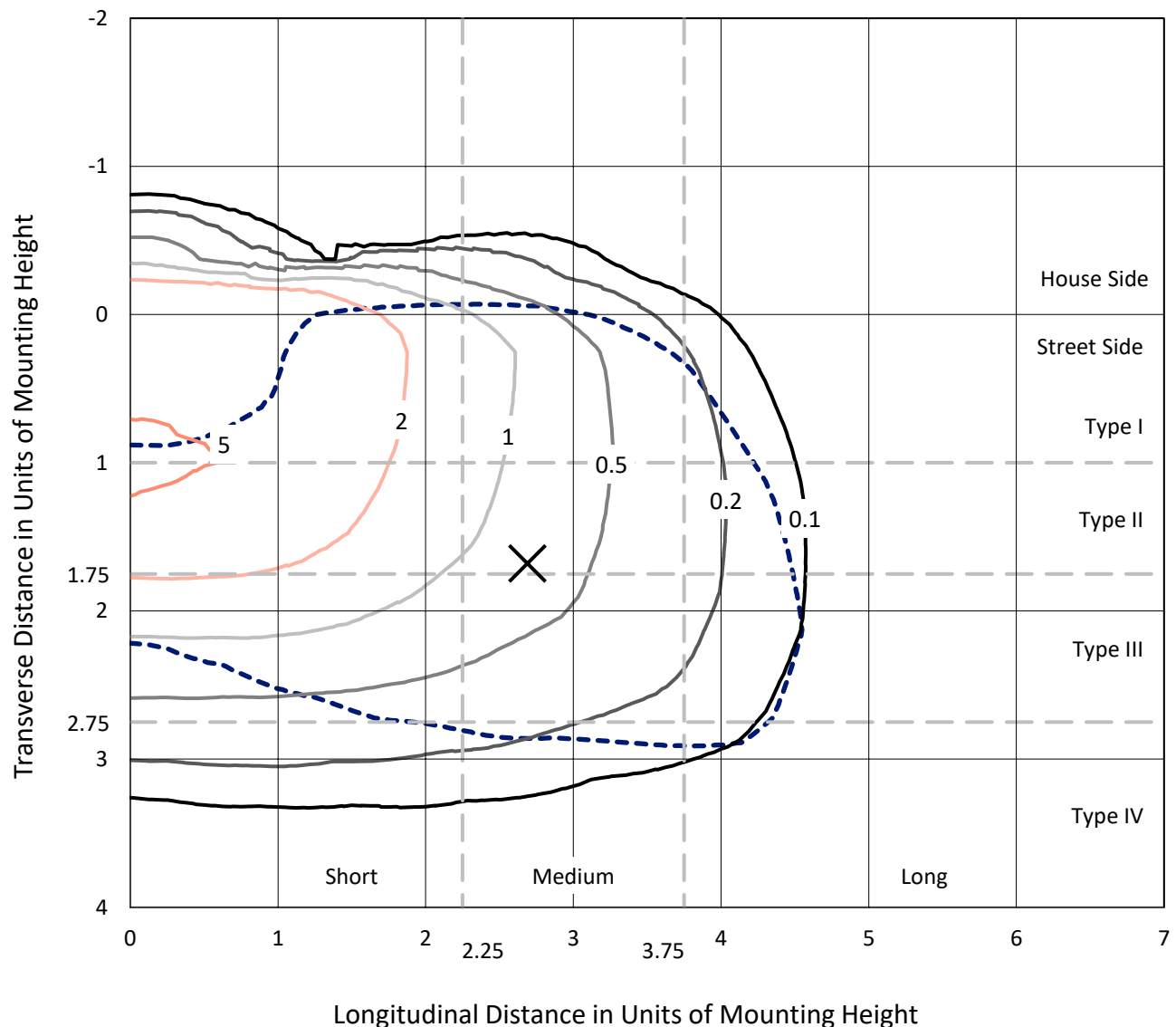
Input Watts (W): 98  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 25 FT

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## Iso-Footcandle Lines of Horizontal Illumination

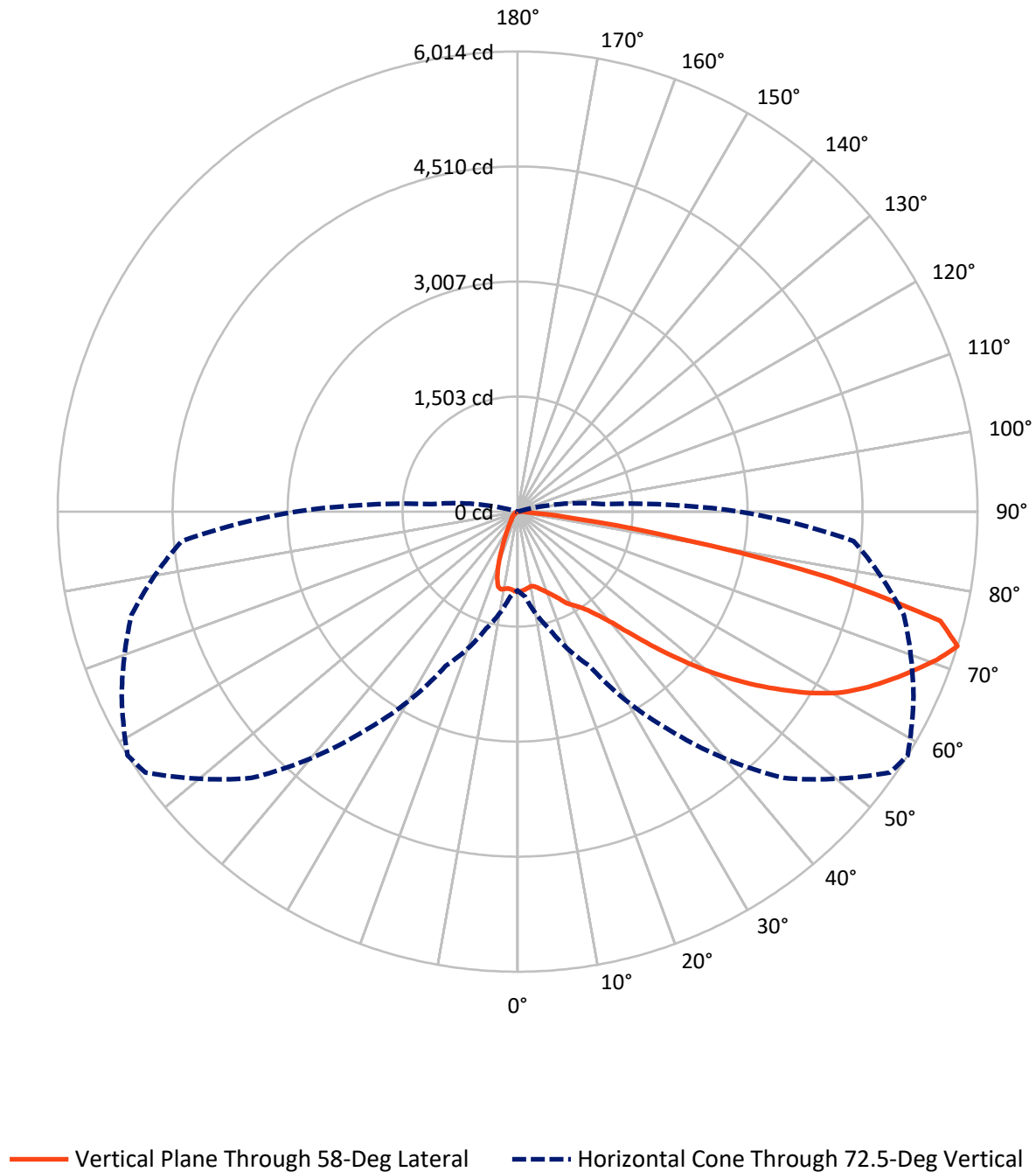
× Max cd  
 - - - 1/2 Max cd



Based on 15 foot mounting height. Maximum calculated value = 5.7 fc  
 Type IV - Medium - N/A

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## Luminous Intensity Polar Plot



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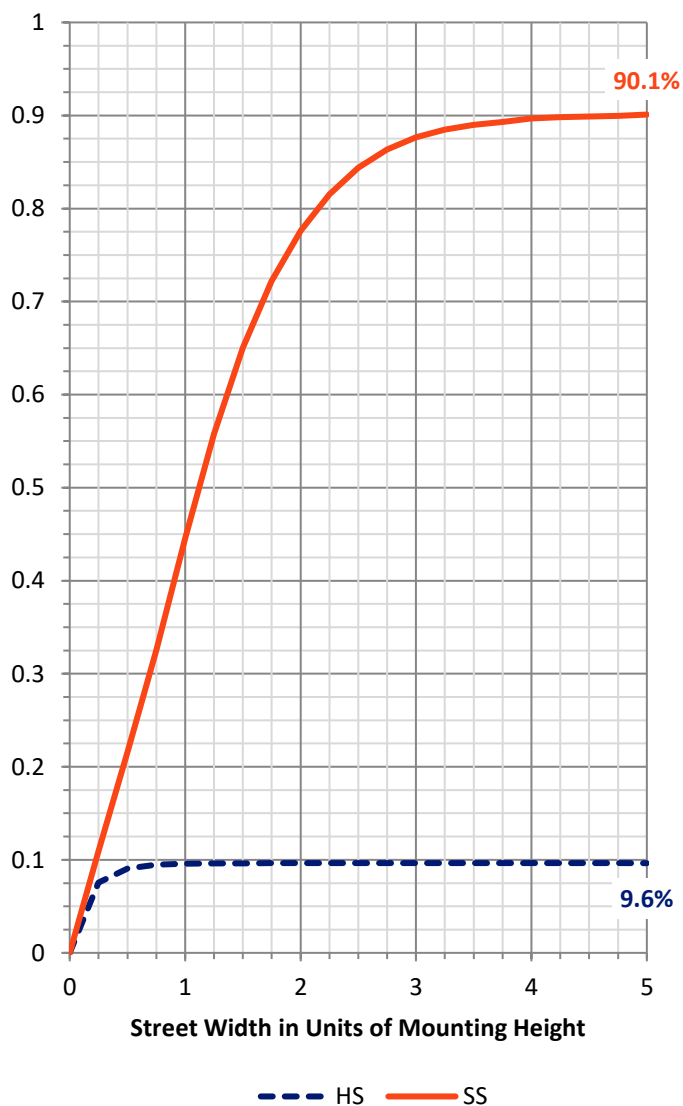
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 850.3    | 0.0    | 850.3  |
|                    | % Fixture | 9.7      | 0.0    | 9.7    |
| <b>Street Side</b> | Lumens    | 7893.7   | 0.0    | 7893.7 |
|                    | % Fixture | 90.3     | 0.0    | 90.3   |
| <b>Total</b>       | Lumens    | 8744.0   | 0.0    | 8744.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 96.3   | 1.1       |
| 10°-20°   | 250.8  | 2.9       |
| 20°-30°   | 394.0  | 4.5       |
| 30°-40°   | 679.5  | 7.8       |
| 40°-50°   | 1292.7 | 14.8      |
| 50°-60°   | 2047.3 | 23.4      |
| 60°-70°   | 2389.0 | 27.3      |
| 70°-80°   | 1496.2 | 17.1      |
| 80°-90°   | 98.2   | 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°    | 8744.0 | 100.0     |
| 0°-180°   | 8744.0 | 100.0     |

**Coefficient of Utilization**



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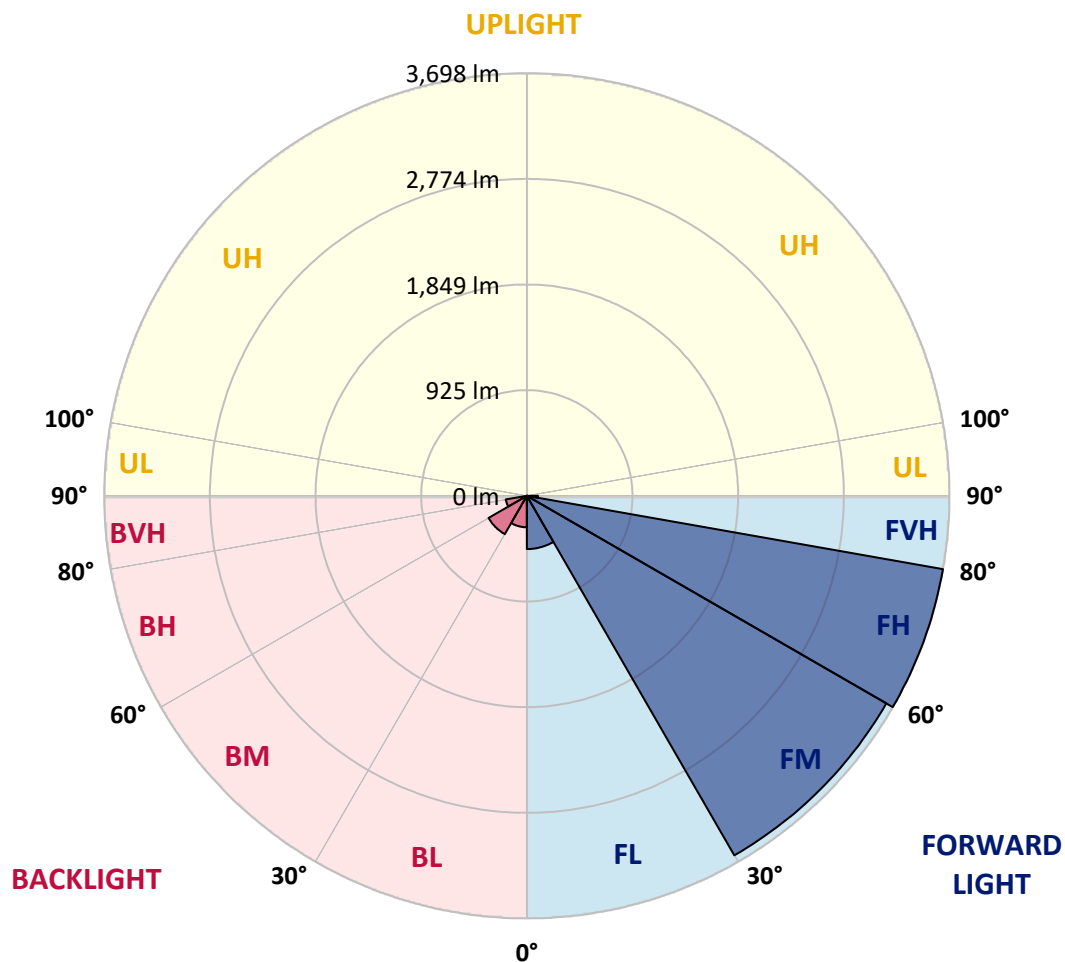
CATALOG NUMBER: ARCH-M-PA2-100-827-24VDC-T3-HSS

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 465.7  | 5.3       |                         |      |         |
| FM   | (30°-60°)   | 3632.6 | 41.5      |                         |      |         |
| FH   | (60°-80°)   | 3698.1 | 42.3      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 97.3   | 1.1       |                         |      | G1/100  |
| BL   | (0°-30°)    | 275.4  | 3.1       | B1/500                  |      |         |
| BM   | (30°-60°)   | 386.9  | 4.4       | B1/1000                 |      |         |
| BH   | (60°-80°)   | 187.1  | 2.1       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 0.9    | 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°    | 1049.2 | 1049.2 | 1049.2 | 1049.2 | 1049.2 | 1049.2 | 1049.2 | 1049.2 | 1049.2 | 1049.2 | 1049.2 |
| 2.5°  | 1044.5 | 1039.8 | 1038.3 | 1036.7 | 1038.3 | 1039.8 | 1035.2 | 1039.8 | 1036.7 | 1038.3 | 1041.4 |
| 5°    | 1007.0 | 1002.3 | 1000.8 | 1002.3 | 1007.0 | 1014.8 | 1018.0 | 1022.6 | 1022.6 | 1027.3 | 1028.9 |
| 7.5°  | 964.8  | 961.7  | 960.1  | 963.2  | 972.6  | 989.8  | 999.2  | 1005.4 | 1011.7 | 1021.1 | 1030.5 |
| 10°   | 941.3  | 939.8  | 938.2  | 942.9  | 952.3  | 967.9  | 980.4  | 989.8  | 1013.3 | 1039.8 | 1057.0 |
| 12.5° | 925.7  | 925.7  | 928.8  | 938.2  | 950.7  | 963.2  | 992.9  | 1005.4 | 1041.4 | 1082.1 | 1105.5 |
| 15°   | 913.2  | 913.2  | 917.9  | 935.1  | 952.3  | 982.0  | 1025.8 | 1039.8 | 1082.1 | 1132.1 | 1163.4 |
| 17.5° | 903.8  | 906.9  | 910.1  | 927.3  | 960.1  | 1010.1 | 1061.7 | 1082.1 | 1133.7 | 1188.4 | 1222.8 |
| 20°   | 905.4  | 908.5  | 910.1  | 927.3  | 974.2  | 1043.0 | 1108.6 | 1132.1 | 1191.5 | 1249.4 | 1283.8 |
| 22.5° | 914.8  | 919.4  | 921.0  | 944.5  | 999.2  | 1077.4 | 1161.8 | 1188.4 | 1252.5 | 1313.5 | 1340.1 |
| 25°   | 953.8  | 957.0  | 947.6  | 967.9  | 1035.2 | 1130.5 | 1230.6 | 1258.8 | 1322.9 | 1379.2 | 1401.1 |
| 27.5° | 1086.8 | 1089.9 | 1038.3 | 1014.8 | 1063.3 | 1174.3 | 1315.1 | 1354.1 | 1433.9 | 1471.4 | 1474.5 |
| 30°   | 1374.5 | 1377.6 | 1276.0 | 1164.9 | 1130.5 | 1211.8 | 1362.0 | 1416.7 | 1519.9 | 1562.1 | 1543.3 |
| 32.5° | 1745.1 | 1741.9 | 1602.8 | 1438.6 | 1290.0 | 1277.5 | 1429.2 | 1487.1 | 1599.6 | 1640.3 | 1626.2 |
| 35°   | 2117.2 | 2121.9 | 2003.1 | 1756.0 | 1543.3 | 1401.1 | 1515.2 | 1582.4 | 1718.5 | 1776.3 | 1751.3 |
| 37.5° | 2372.1 | 2403.4 | 2351.8 | 2084.4 | 1854.5 | 1629.4 | 1654.4 | 1726.3 | 1896.7 | 1974.9 | 1921.8 |
| 40°   | 2731.7 | 2723.9 | 2598.8 | 2401.8 | 2198.5 | 1967.1 | 1879.5 | 1913.9 | 2109.4 | 2214.2 | 2131.3 |
| 42.5° | 3214.9 | 3199.3 | 2986.6 | 2794.3 | 2567.6 | 2378.4 | 2200.1 | 2193.8 | 2353.3 | 2475.3 | 2354.9 |
| 45°   | 3652.7 | 3629.3 | 3483.9 | 3297.8 | 3049.2 | 2831.8 | 2591.0 | 2536.3 | 2647.3 | 2750.5 | 2609.8 |
| 47.5° | 4001.4 | 3962.4 | 3859.2 | 3760.6 | 3699.7 | 3361.9 | 3000.7 | 2917.8 | 2974.1 | 3050.7 | 2852.1 |
| 50°   | 4414.3 | 4306.4 | 4156.3 | 4096.8 | 4223.5 | 3962.4 | 3394.7 | 3315.0 | 3311.9 | 3355.6 | 3102.3 |
| 52.5° | 4601.9 | 4406.4 | 4322.0 | 4372.0 | 4595.6 | 4520.6 | 3820.1 | 3705.9 | 3660.6 | 3665.3 | 3335.3 |
| 55°   | 4375.2 | 4353.3 | 4398.6 | 4555.0 | 4847.4 | 4803.6 | 4228.2 | 4087.4 | 4020.2 | 3935.8 | 3558.9 |
| 57.5° | 4117.2 | 4184.4 | 4364.2 | 4662.9 | 5166.4 | 5099.1 | 4630.0 | 4470.6 | 4347.0 | 4153.1 | 3807.6 |
| 60°   | 3879.5 | 3948.3 | 4245.4 | 4687.9 | 5341.5 | 5383.7 | 4964.7 | 4813.0 | 4630.0 | 4375.2 | 4081.2 |
| 62.5° | 3518.3 | 3571.4 | 3988.9 | 4651.9 | 5264.9 | 5549.5 | 5197.7 | 5083.5 | 4913.1 | 4586.3 | 4395.5 |
| 65°   | 3111.7 | 3146.1 | 3558.9 | 4364.2 | 5114.8 | 5530.7 | 5390.0 | 5325.9 | 5160.1 | 4806.7 | 4706.7 |
| 67.5° | 2666.1 | 2706.7 | 3050.7 | 3846.6 | 4820.8 | 5443.2 | 5571.4 | 5565.1 | 5375.9 | 5050.7 | 4931.8 |
| 70°   | 2153.2 | 2156.3 | 2440.9 | 3189.9 | 4307.9 | 5268.0 | 5796.5 | 5810.6 | 5582.3 | 5233.6 | 4941.2 |
| 72.5° | 1030.5 | 1114.9 | 1582.4 | 2226.7 | 3501.1 | 4924.0 | 5943.5 | 6013.9 | 5712.1 | 5227.4 | 4408.0 |
| 75°   | 236.1  | 243.9  | 461.3  | 1058.6 | 2053.1 | 3779.4 | 5576.1 | 5707.4 | 5396.2 | 4520.6 | 3105.5 |
| 77.5° | 86.0   | 90.7   | 129.8  | 309.6  | 789.7  | 1953.0 | 3990.5 | 4182.8 | 3988.9 | 2922.5 | 1468.3 |
| 80°   | 57.9   | 56.3   | 67.2   | 137.6  | 362.8  | 553.5  | 2040.6 | 2154.7 | 1967.1 | 997.6  | 351.8  |
| 82.5° | 29.7   | 31.3   | 46.9   | 76.6   | 243.9  | 192.3  | 681.8  | 741.2  | 609.8  | 200.2  | 65.7   |
| 85°   | 14.1   | 14.1   | 26.6   | 48.5   | 103.2  | 67.2   | 151.7  | 183.0  | 164.2  | 87.6   | 21.9   |
| 87.5° | 14.1   | 14.1   | 25.0   | 31.3   | 53.2   | 28.1   | 37.5   | 46.9   | 43.8   | 46.9   | 7.8    |
| 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-PA2-100-827-24VDC-T3-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1049.2 | 1049.2 | 1049.2 | 1049.2 | 1049.2 | 1049.2 | 1049.2 | 1049.2 | 1049.2 | 1049.2 | 1049.2 |
| 2.5°  | 1041.4 | 1039.8 | 1038.3 | 1041.4 | 1039.8 | 1043.0 | 1043.0 | 1046.1 | 1046.1 | 1043.0 | 1041.4 |
| 5°    | 1027.3 | 1024.2 | 1021.1 | 1021.1 | 1019.5 | 1022.6 | 1032.0 | 1039.8 | 1041.4 | 1036.7 | 1035.2 |
| 7.5°  | 1028.9 | 1028.9 | 1025.8 | 1019.5 | 1008.6 | 1008.6 | 1008.6 | 1018.0 | 1022.6 | 1019.5 | 1018.0 |
| 10°   | 1057.0 | 1058.6 | 1050.8 | 1036.7 | 1018.0 | 1000.8 | 967.9  | 919.4  | 874.1  | 861.6  | 856.9  |
| 12.5° | 1105.5 | 1107.1 | 1091.4 | 1066.4 | 1027.3 | 925.7  | 800.6  | 684.9  | 595.8  | 570.7  | 566.1  |
| 15°   | 1163.4 | 1164.9 | 1136.8 | 1096.1 | 977.3  | 741.2  | 555.1  | 423.8  | 345.6  | 326.8  | 325.2  |
| 17.5° | 1222.8 | 1219.7 | 1177.4 | 1099.3 | 828.7  | 525.4  | 337.8  | 270.5  | 250.2  | 245.5  | 247.1  |
| 20°   | 1280.7 | 1271.3 | 1213.4 | 1041.4 | 638.0  | 344.0  | 247.1  | 231.4  | 226.7  | 223.6  | 223.6  |
| 22.5° | 1333.8 | 1315.1 | 1243.1 | 927.3  | 447.2  | 247.1  | 220.5  | 217.4  | 211.1  | 206.4  | 204.8  |
| 25°   | 1387.0 | 1360.4 | 1261.9 | 778.7  | 300.2  | 215.8  | 208.0  | 201.7  | 193.9  | 187.6  | 186.1  |
| 27.5° | 1451.1 | 1413.6 | 1252.5 | 591.1  | 225.2  | 200.2  | 193.9  | 184.5  | 173.6  | 164.2  | 161.1  |
| 30°   | 1512.1 | 1469.9 | 1199.3 | 408.1  | 192.3  | 184.5  | 175.1  | 161.1  | 147.0  | 136.0  | 132.9  |
| 32.5° | 1588.7 | 1540.2 | 1104.0 | 267.4  | 167.3  | 161.1  | 151.7  | 134.5  | 115.7  | 103.2  | 100.1  |
| 35°   | 1698.2 | 1643.4 | 982.0  | 187.6  | 147.0  | 136.0  | 123.5  | 104.8  | 84.4   | 75.1   | 73.5   |
| 37.5° | 1851.4 | 1777.9 | 828.7  | 151.7  | 129.8  | 114.1  | 95.4   | 76.6   | 62.5   | 54.7   | 53.2   |
| 40°   | 2039.0 | 1926.4 | 658.3  | 134.5  | 115.7  | 95.4   | 71.9   | 54.7   | 45.3   | 39.1   | 39.1   |
| 42.5° | 2242.3 | 2065.6 | 484.7  | 123.5  | 101.6  | 78.2   | 53.2   | 39.1   | 32.8   | 29.7   | 28.1   |
| 45°   | 2451.8 | 2189.1 | 326.8  | 114.1  | 89.1   | 59.4   | 37.5   | 26.6   | 21.9   | 21.9   | 20.3   |
| 47.5° | 2669.2 | 2272.0 | 211.1  | 103.2  | 75.1   | 43.8   | 25.0   | 18.8   | 15.6   | 15.6   | 15.6   |
| 50°   | 2885.0 | 2315.8 | 150.1  | 93.8   | 61.0   | 29.7   | 18.8   | 14.1   | 12.5   | 12.5   | 12.5   |
| 52.5° | 3041.4 | 2287.7 | 120.4  | 81.3   | 46.9   | 21.9   | 14.1   | 10.9   | 9.4    | 9.4    | 9.4    |
| 55°   | 3177.4 | 2239.2 | 104.8  | 70.4   | 34.4   | 15.6   | 10.9   | 9.4    | 7.8    | 7.8    | 7.8    |
| 57.5° | 3316.6 | 2176.6 | 93.8   | 59.4   | 25.0   | 10.9   | 7.8    | 6.3    | 6.3    | 6.3    | 6.3    |
| 60°   | 3443.2 | 2070.3 | 81.3   | 46.9   | 17.2   | 7.8    | 6.3    | 4.7    | 4.7    | 4.7    | 4.7    |
| 62.5° | 3566.7 | 1979.6 | 70.4   | 36.0   | 12.5   | 6.3    | 3.1    | 3.1    | 1.6    | 1.6    | 1.6    |
| 65°   | 3637.1 | 1857.6 | 56.3   | 23.5   | 7.8    | 4.7    | 1.6    | 1.6    | 0.0    | 0.0    | 0.0    |
| 67.5° | 3615.2 | 1712.2 | 39.1   | 14.1   | 4.7    | 3.1    | 1.6    | 0.0    | 0.0    | 0.0    | 0.0    |
| 70°   | 3463.5 | 1516.8 | 23.5   | 7.8    | 4.7    | 3.1    | 1.6    | 0.0    | 0.0    | 0.0    | 0.0    |
| 72.5° | 2900.6 | 1122.7 | 14.1   | 6.3    | 3.1    | 1.6    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 75°   | 1937.4 | 516.0  | 7.8    | 4.7    | 1.6    | 1.6    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 77.5° | 886.6  | 154.8  | 4.7    | 3.1    | 1.6    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 80°   | 178.3  | 40.7   | 3.1    | 1.6    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 82.5° | 37.5   | 7.8    | 1.6    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 85°   | 7.8    | 3.1    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 87.5° | 3.1    | 1.6    | 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: SP1-2101-121-9

Luminaire Tested: IFLD-S-SA2A-827-U-T2

Test Date: 03/05/2021

### Test Information

Test Method: LM-79-08  
 Report Number: SP1-2101-121-9  
 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-827-U-T2**  
 Description: STREETWORKS INF FLOOD

PROGRAMMED @ 615mA.

### Spectral Parameters

|                           |        |           |      |      |      |
|---------------------------|--------|-----------|------|------|------|
| CCT (K):                  | 2709   | CRI (Ra): | 82.1 |      |      |
| CIE u':                   | 0.2620 | R1:       | 80.4 | R9:  | 4.5  |
| CIE v':                   | 0.5273 | R2:       | 91.2 | R10: | 81.3 |
| Duv:                      | 0.0001 | R3:       | 95.2 | R11: | 81.0 |
| CIE x:                    | 0.4591 | R4:       | 80.5 | R12: | 79.0 |
| CIE y:                    | 0.4107 | R5:       | 81.2 | R13: | 82.9 |
| CIE z:                    | 0.1301 | R6:       | 90.9 | R14: | 97.9 |
| Peak Wavelength (nm):     | 606    | R7:       | 81.1 |      |      |
| Dominant Wavelength (nm): | 584    | R8:       | 56.0 |      |      |
| Purity:                   | 61.2   |           |      |      |      |
| Rf:                       | 85.2   |           |      |      |      |
| Rg:                       | 96.4   |           |      |      |      |



### Test Conditions

Stabilization Time: 60M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.9/31%  
 Sphere Temperature (°C): 24.4

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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 2700K 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       | 2013             | 0.0              | 490       | 33356            | 4.7              | 620       | 150993           | 39.3             | 750       | 7593             | 0.0              | 880       | 2373             | 0.0              |
| 365       | 1908             | 0.0              | 495       | 40031            | 7.3              | 625       | 145077           | 32.0             | 755       | 6765             | 0.0              | 885       | 2481             | 0.0              |
| 370       | 1889             | 0.0              | 500       | 46287            | 10.2             | 630       | 136072           | 24.6             | 760       | 6000             | 0.0              | 890       | 2394             | 0.0              |
| 375       | 2095             | 0.0              | 505       | 51783            | 14.5             | 635       | 126417           | 19.0             | 765       | 5393             | 0.0              | 895       | 2574             | 0.0              |
| 380       | 2228             | 0.0              | 510       | 56588            | 19.4             | 640       | 116412           | 13.9             | 770       | 5030             | 0.0              | 900       | 2048             | 0.0              |
| 385       | 2074             | 0.0              | 515       | 60751            | 25.2             | 645       | 107525           | 10.4             | 775       | 4491             | 0.0              | 905       | 2381             | 0.0              |
| 390       | 1820             | 0.0              | 520       | 63966            | 31.0             | 650       | 97857            | 7.2              | 780       | 3943             | 0.0              | 910       | 2017             | 0.0              |
| 395       | 1728             | 0.0              | 525       | 66683            | 35.8             | 655       | 88582            | 5.1              | 785       | 3682             | 0.0              | 915       | 1904             | 0.0              |
| 400       | 1557             | 0.0              | 530       | 69869            | 41.1             | 660       | 79462            | 3.3              | 790       | 3402             | 0.0              | 920       | 2254             | 0.0              |
| 405       | 1644             | 0.0              | 535       | 72510            | 45.0             | 665       | 70606            | 2.2              | 795       | 3156             | 0.0              | 925       | 1998             | 0.0              |
| 410       | 2044             | 0.0              | 540       | 75299            | 49.1             | 670       | 61774            | 1.4              | 800       | 3062             | 0.0              | 930       | 1776             | 0.0              |
| 415       | 3009             | 0.0              | 545       | 79297            | 52.8             | 675       | 53771            | 0.9              | 805       | 2712             | 0.0              | 935       | 2086             | 0.0              |
| 420       | 4992             | 0.0              | 550       | 84946            | 57.7             | 680       | 46786            | 0.5              | 810       | 2896             | 0.0              | 940       | 1766             | 0.0              |
| 425       | 8631             | 0.0              | 555       | 90790            | 62.0             | 685       | 40747            | 0.4              | 815       | 2605             | 0.0              | 945       | 1738             | 0.0              |
| 430       | 14680            | 0.1              | 560       | 98231            | 66.8             | 690       | 35400            | 0.2              | 820       | 2901             | 0.0              | 950       | 2303             | 0.0              |
| 435       | 23899            | 0.3              | 565       | 105738           | 70.3             | 695       | 30445            | 0.1              | 825       | 2541             | 0.0              | 955       | 2567             | 0.0              |
| 440       | 38159            | 0.6              | 570       | 114034           | 74.1             | 700       | 26278            | 0.1              | 830       | 2014             | 0.0              | 960       | 2492             | 0.0              |
| 445       | 53061            | 1.1              | 575       | 123632           | 76.9             | 705       | 22703            | 0.0              | 835       | 2258             | 0.0              | 965       | 810              | 0.0              |
| 450       | 53893            | 1.4              | 580       | 132443           | 78.7             | 710       | 19853            | 0.0              | 840       | 2203             | 0.0              | 970       | 3201             | 0.0              |
| 455       | 41221            | 1.4              | 585       | 141502           | 78.6             | 715       | 17730            | 0.0              | 845       | 2073             | 0.0              | 975       | 1858             | 0.0              |
| 460       | 32969            | 1.4              | 590       | 148917           | 77.0             | 720       | 15616            | 0.0              | 850       | 2096             | 0.0              | 980       | 1769             | 0.0              |
| 465       | 28048            | 1.4              | 595       | 154326           | 73.2             | 725       | 13986            | 0.0              | 855       | 2751             | 0.0              | 985       | 1043             | 0.0              |
| 470       | 23347            | 1.5              | 600       | 159208           | 68.6             | 730       | 12029            | 0.0              | 860       | 2501             | 0.0              | 990       | 2950             | 0.0              |
| 475       | 22136            | 1.7              | 605       | 161290           | 62.5             | 735       | 10461            | 0.0              | 865       | 2512             | 0.0              | 995       | 1643             | 0.0              |
| 480       | 24192            | 2.3              | 610       | 159549           | 54.8             | 740       | 9230             | 0.0              | 870       | 2913             | 0.0              | 1000      | 292              | 0.0              |
| 485       | 28231            | 3.3              | 615       | 156663           | 47.3             | 745       | 8376             | 0.0              | 875       | 2299             | 0.0              |           |                  |                  |

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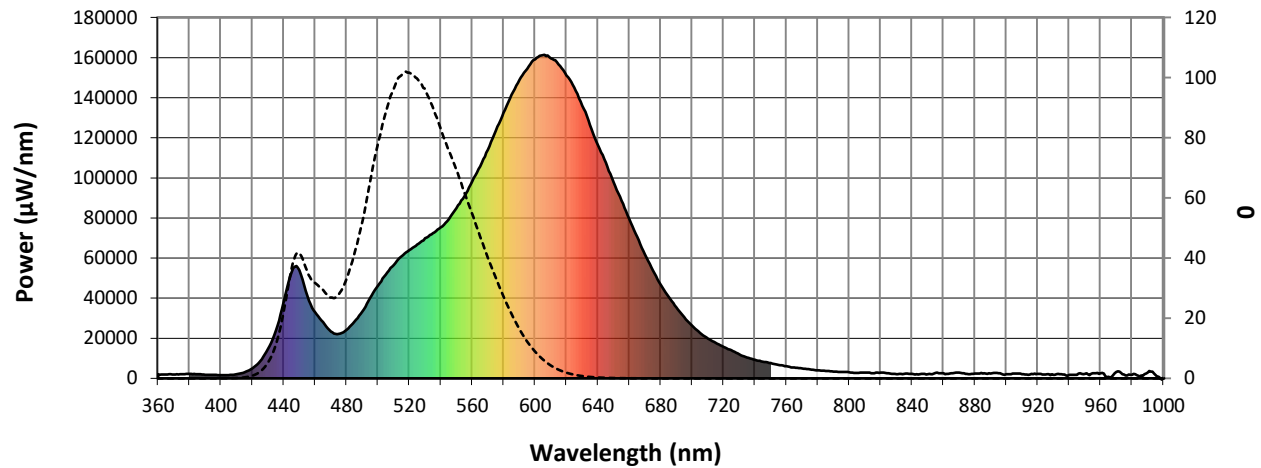
### Scotopic Flux vs. Wavelength


**Scotopic Lumens: 8911.3**
**S/P: 1.22**

| 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       | 2013             | 0.0              | 490       | 33356            | 51.4             | 620       | 150993           | 1.9              | 750       | 7593             | 0.0              | 880       | 2373             | 0.0              |
| 365       | 1908             | 0.0              | 495       | 40031            | 64.7             | 625       | 145077           | 1.2              | 755       | 6765             | 0.0              | 885       | 2481             | 0.0              |
| 370       | 1889             | 0.0              | 500       | 46287            | 77.4             | 630       | 136072           | 0.8              | 760       | 6000             | 0.0              | 890       | 2394             | 0.0              |
| 375       | 2095             | 0.0              | 505       | 51783            | 88.0             | 635       | 126417           | 0.5              | 765       | 5393             | 0.0              | 895       | 2574             | 0.0              |
| 380       | 2228             | 0.0              | 510       | 56588            | 95.9             | 640       | 116412           | 0.3              | 770       | 5030             | 0.0              | 900       | 2048             | 0.0              |
| 385       | 2074             | 0.0              | 515       | 60751            | 100.7            | 645       | 107525           | 0.2              | 775       | 4491             | 0.0              | 905       | 2381             | 0.0              |
| 390       | 1820             | 0.0              | 520       | 63966            | 101.7            | 650       | 97857            | 0.1              | 780       | 3943             | 0.0              | 910       | 2017             | 0.0              |
| 395       | 1728             | 0.0              | 525       | 66683            | 99.8             | 655       | 88582            | 0.1              | 785       | 3682             | 0.0              | 915       | 1904             | 0.0              |
| 400       | 1557             | 0.0              | 530       | 69869            | 96.3             | 660       | 79462            | 0.0              | 790       | 3402             | 0.0              | 920       | 2254             | 0.0              |
| 405       | 1644             | 0.1              | 535       | 72510            | 90.4             | 665       | 70606            | 0.0              | 795       | 3156             | 0.0              | 925       | 1998             | 0.0              |
| 410       | 2044             | 0.1              | 540       | 75299            | 83.2             | 670       | 61774            | 0.0              | 800       | 3062             | 0.0              | 930       | 1776             | 0.0              |
| 415       | 3009             | 0.3              | 545       | 79297            | 76.0             | 675       | 53771            | 0.0              | 805       | 2712             | 0.0              | 935       | 2086             | 0.0              |
| 420       | 4992             | 0.8              | 550       | 84946            | 69.5             | 680       | 46786            | 0.0              | 810       | 2896             | 0.0              | 940       | 1766             | 0.0              |
| 425       | 8631             | 2.1              | 555       | 90790            | 62.0             | 685       | 40747            | 0.0              | 815       | 2605             | 0.0              | 945       | 1738             | 0.0              |
| 430       | 14680            | 5.0              | 560       | 98231            | 54.9             | 690       | 35400            | 0.0              | 820       | 2901             | 0.0              | 950       | 2303             | 0.0              |
| 435       | 23899            | 10.7             | 565       | 105738           | 47.4             | 695       | 30445            | 0.0              | 825       | 2541             | 0.0              | 955       | 2567             | 0.0              |
| 440       | 38159            | 21.3             | 570       | 114034           | 40.2             | 700       | 26278            | 0.0              | 830       | 2014             | 0.0              | 960       | 2492             | 0.0              |
| 445       | 53061            | 35.5             | 575       | 123632           | 33.7             | 705       | 22703            | 0.0              | 835       | 2258             | 0.0              | 965       | 810              | 0.0              |
| 450       | 53893            | 41.8             | 580       | 132443           | 27.3             | 710       | 19853            | 0.0              | 840       | 2203             | 0.0              | 970       | 3201             | 0.0              |
| 455       | 41221            | 36.0             | 585       | 141502           | 21.6             | 715       | 17730            | 0.0              | 845       | 2073             | 0.0              | 975       | 1858             | 0.0              |
| 460       | 32969            | 31.8             | 590       | 148917           | 16.6             | 720       | 15616            | 0.0              | 850       | 2096             | 0.0              | 980       | 1769             | 0.0              |
| 465       | 28048            | 29.6             | 595       | 154326           | 12.3             | 725       | 13986            | 0.0              | 855       | 2751             | 0.0              | 985       | 1043             | 0.0              |
| 470       | 23347            | 26.9             | 600       | 159208           | 9.0              | 730       | 12029            | 0.0              | 860       | 2501             | 0.0              | 990       | 2950             | 0.0              |
| 475       | 22136            | 27.7             | 605       | 161290           | 6.3              | 735       | 10461            | 0.0              | 865       | 2512             | 0.0              | 995       | 1643             | 0.0              |
| 480       | 24192            | 32.7             | 610       | 159549           | 4.3              | 740       | 9230             | 0.0              | 870       | 2913             | 0.0              | 1000      | 292              | 0.0              |
| 485       | 28231            | 40.9             | 615       | 156663           | 2.9              | 745       | 8376             | 0.0              | 875       | 2299             | 0.0              |           |                  |                  |

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### Melanopic Flux vs. Wavelength


**Melanopic Lumens: 3277.6**
**M/P: 0.45**

| 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       | 2013             | 0.0              | 490       | 33356            | 27.8             | 620       | 150993           | 0.1              | 750       | 7593             | 0.0              | 880       | 2373             | 0.0              |
| 365       | 1908             | 0.0              | 495       | 40031            | 33.0             | 625       | 145077           | 0.1              | 755       | 6765             | 0.0              | 885       | 2481             | 0.0              |
| 370       | 1889             | 0.0              | 500       | 46287            | 37.2             | 630       | 136072           | 0.0              | 760       | 6000             | 0.0              | 890       | 2394             | 0.0              |
| 375       | 2095             | 0.0              | 505       | 51783            | 39.7             | 635       | 126417           | 0.0              | 765       | 5393             | 0.0              | 895       | 2574             | 0.0              |
| 380       | 2228             | 0.0              | 510       | 56588            | 40.6             | 640       | 116412           | 0.0              | 770       | 5030             | 0.0              | 900       | 2048             | 0.0              |
| 385       | 2074             | 0.0              | 515       | 60751            | 39.7             | 645       | 107525           | 0.0              | 775       | 4491             | 0.0              | 905       | 2381             | 0.0              |
| 390       | 1820             | 0.0              | 520       | 63966            | 37.2             | 650       | 97857            | 0.0              | 780       | 3943             | 0.0              | 910       | 2017             | 0.0              |
| 395       | 1728             | 0.0              | 525       | 66683            | 33.8             | 655       | 88582            | 0.0              | 785       | 3682             | 0.0              | 915       | 1904             | 0.0              |
| 400       | 1557             | 0.0              | 530       | 69869            | 30.2             | 660       | 79462            | 0.0              | 790       | 3402             | 0.0              | 920       | 2254             | 0.0              |
| 405       | 1644             | 0.0              | 535       | 72510            | 26.1             | 665       | 70606            | 0.0              | 795       | 3156             | 0.0              | 925       | 1998             | 0.0              |
| 410       | 2044             | 0.1              | 540       | 75299            | 22.0             | 670       | 61774            | 0.0              | 800       | 3062             | 0.0              | 930       | 1776             | 0.0              |
| 415       | 3009             | 0.2              | 545       | 79297            | 18.4             | 675       | 53771            | 0.0              | 805       | 2712             | 0.0              | 935       | 2086             | 0.0              |
| 420       | 4992             | 0.6              | 550       | 84946            | 15.2             | 680       | 46786            | 0.0              | 810       | 2896             | 0.0              | 940       | 1766             | 0.0              |
| 425       | 8631             | 1.3              | 555       | 90790            | 12.2             | 685       | 40747            | 0.0              | 815       | 2605             | 0.0              | 945       | 1738             | 0.0              |
| 430       | 14680            | 3.1              | 560       | 98231            | 9.7              | 690       | 35400            | 0.0              | 820       | 2901             | 0.0              | 950       | 2303             | 0.0              |
| 435       | 23899            | 6.4              | 565       | 105738           | 7.4              | 695       | 30445            | 0.0              | 825       | 2541             | 0.0              | 955       | 2567             | 0.0              |
| 440       | 38159            | 12.8             | 570       | 114034           | 5.6              | 700       | 26278            | 0.0              | 830       | 2014             | 0.0              | 960       | 2492             | 0.0              |
| 445       | 53061            | 20.9             | 575       | 123632           | 4.1              | 705       | 22703            | 0.0              | 835       | 2258             | 0.0              | 965       | 810              | 0.0              |
| 450       | 53893            | 24.8             | 580       | 132443           | 3.0              | 710       | 19853            | 0.0              | 840       | 2203             | 0.0              | 970       | 3201             | 0.0              |
| 455       | 41221            | 21.6             | 585       | 141502           | 2.1              | 715       | 17730            | 0.0              | 845       | 2073             | 0.0              | 975       | 1858             | 0.0              |
| 460       | 32969            | 19.4             | 590       | 148917           | 1.5              | 720       | 15616            | 0.0              | 850       | 2096             | 0.0              | 980       | 1769             | 0.0              |
| 465       | 28048            | 18.3             | 595       | 154326           | 1.0              | 725       | 13986            | 0.0              | 855       | 2751             | 0.0              | 985       | 1043             | 0.0              |
| 470       | 23347            | 16.7             | 600       | 159208           | 0.7              | 730       | 12029            | 0.0              | 860       | 2501             | 0.0              | 990       | 2950             | 0.0              |
| 475       | 22136            | 16.9             | 605       | 161290           | 0.4              | 735       | 10461            | 0.0              | 865       | 2512             | 0.0              | 995       | 1643             | 0.0              |
| 480       | 24192            | 19.4             | 610       | 159549           | 0.3              | 740       | 9230             | 0.0              | 870       | 2913             | 0.0              | 1000      | 292              | 0.0              |
| 485       | 28231            | 23.3             | 615       | 156663           | 0.2              | 745       | 8376             | 0.0              | 875       | 2299             | 0.0              |           |                  |                  |

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TM-30-18

### Summary

$R_f = 85.2$   
 $R_g = 96.4$   
 CIE  $R_a = 82.1$   
 $R_9 = 4.5$



### Color Vector Graphics

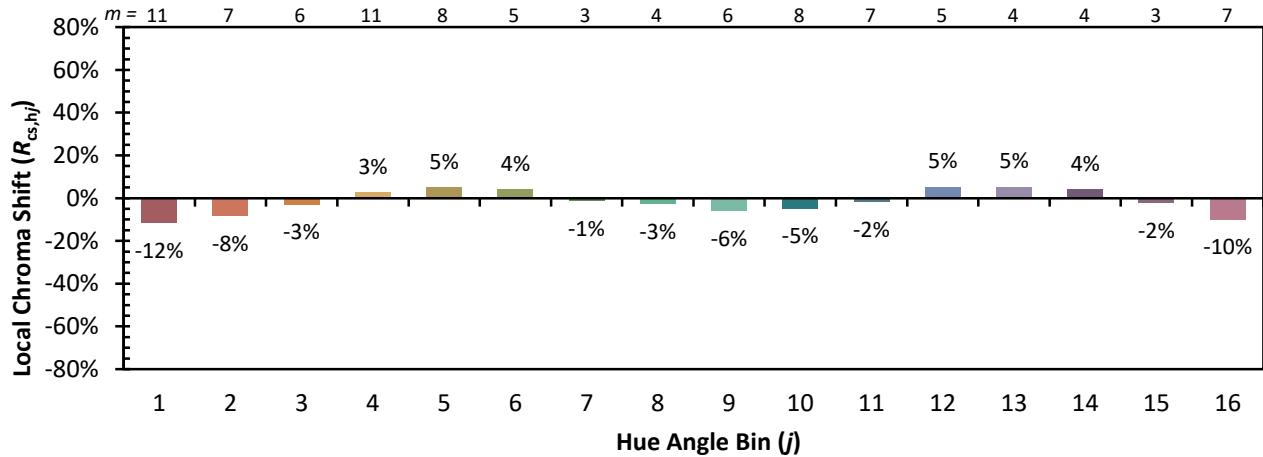


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 83 | CES51 = 95 | CES76 = 83 |
| CES02 = 64 | CES27 = 95 | CES52 = 94 | CES77 = 85 |
| CES03 = 31 | CES28 = 94 | CES53 = 89 | CES78 = 82 |
| CES04 = 71 | CES29 = 82 | CES54 = 92 | CES79 = 89 |
| CES05 = 50 | CES30 = 87 | CES55 = 92 | CES80 = 89 |
| CES06 = 52 | CES31 = 85 | CES56 = 87 | CES81 = 69 |
| CES07 = 43 | CES32 = 80 | CES57 = 87 | CES82 = 96 |
| CES08 = 42 | CES33 = 86 | CES58 = 88 | CES83 = 93 |
| CES09 = 29 | CES34 = 91 | CES59 = 92 | CES84 = 93 |
| CES10 = 77 | CES35 = 96 | CES60 = 96 | CES85 = 78 |
| CES11 = 60 | CES36 = 96 | CES61 = 91 | CES86 = 65 |
| CES12 = 66 | CES37 = 95 | CES62 = 97 | CES87 = 85 |
| CES13 = 44 | CES38 = 93 | CES63 = 87 | CES88 = 86 |
| CES14 = 74 | CES39 = 97 | CES64 = 86 | CES89 = 74 |
| CES15 = 72 | CES40 = 94 | CES65 = 81 | CES90 = 86 |
| CES16 = 48 | CES41 = 93 | CES66 = 85 | CES91 = 87 |
| CES17 = 50 | CES42 = 95 | CES67 = 84 | CES92 = 67 |
| CES18 = 57 | CES43 = 88 | CES68 = 85 | CES93 = 80 |
| CES19 = 73 | CES44 = 99 | CES69 = 91 | CES94 = 61 |
| CES20 = 67 | CES45 = 92 | CES70 = 82 | CES95 = 77 |
| CES21 = 87 | CES46 = 88 | CES71 = 83 | CES96 = 84 |
| CES22 = 79 | CES47 = 88 | CES72 = 93 | CES97 = 88 |
| CES23 = 92 | CES48 = 81 | CES73 = 78 | CES98 = 84 |
| CES24 = 91 | CES49 = 88 | CES74 = 91 | CES99 = 76 |
| CES25 = 72 | CES50 = 94 | CES75 = 85 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)