

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: P800498

Luminaire Tested: **ARCH-S-PA2-50-735-24VDC-T4W**

Issue Date: 10/13/2021

**Test Information**

Test Method: LM-79-08  
Report Number: P800498  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-2108-332-19)  
Test Lab: INNOVATION CENTER  
Issue Date: 10/13/2021  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: STREETWORKS  
Catalog Number: ARCH-S-PA2-50-735-24VDC-T4W  
Description: ARCHEON ROADWAY AND AREA LUMINAIRE  
(2) 70 CRI, 3500K, 520mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE IV WIDE OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 7440 lumens  
Efficiency: N/A  
Efficacy: 151.8 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 1' x H: 0')  
IES Classification: Type III - Short  
BUG Rating: B1 - U0 - G2

Input Watts (W): 49  
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

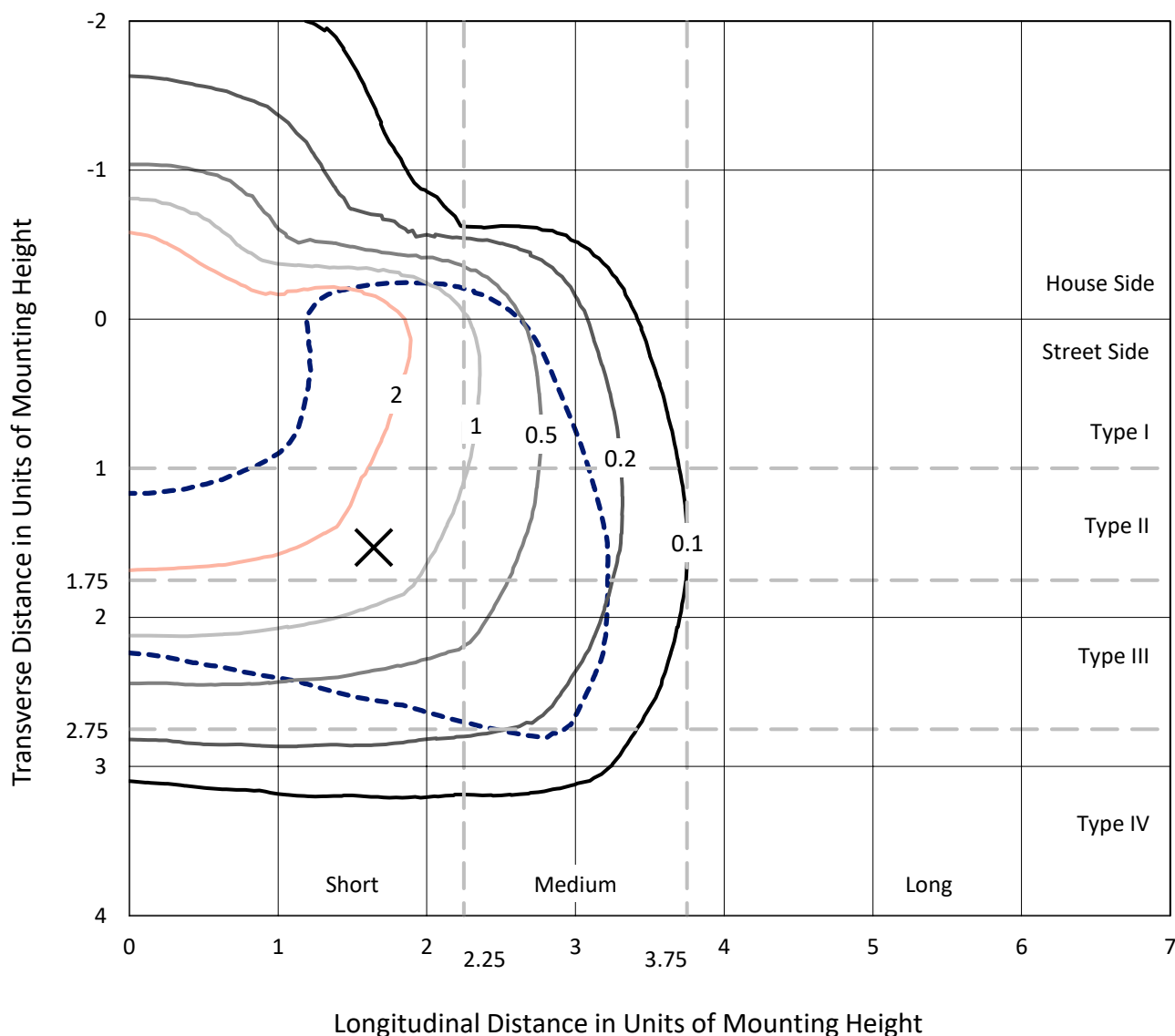
REPORT NUMBER: P800498

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## Iso-Footcandle Lines of Horizontal Illumination

× Max cd

--- 1/2 Max cd

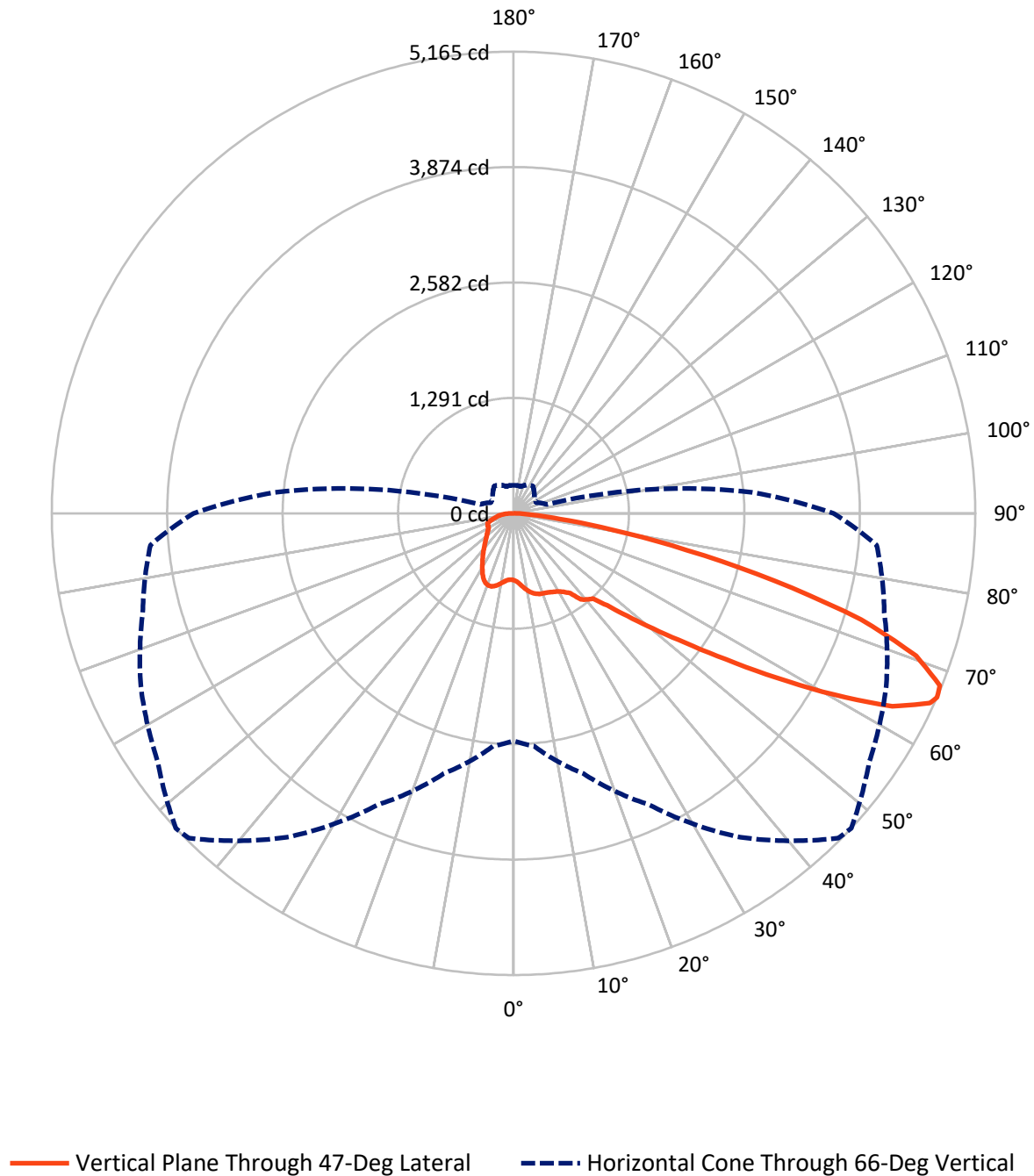


Based on 15 foot mounting height. Maximum calculated value = 4.1 fc

Type III - Short - N/A

REPORT NUMBER: P800498  
CATALOG NUMBER: ARCH-S-PA2-50-735-24VDC-T4W

## Luminous Intensity Polar Plot



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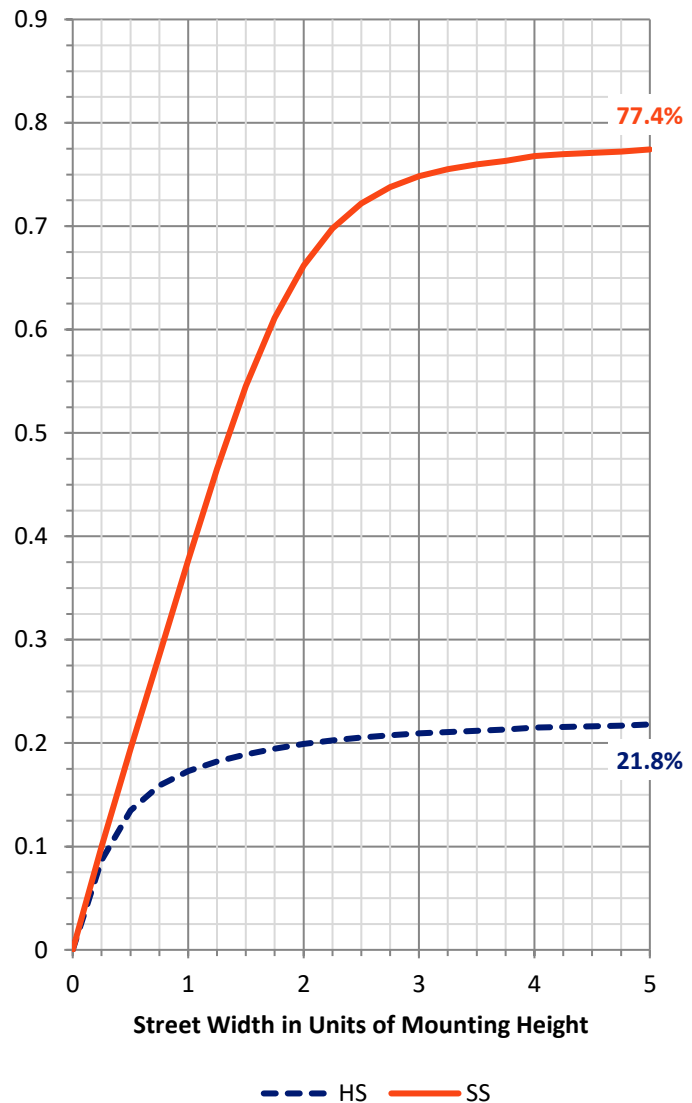
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 1654.1   | 0.0    | 1654.1 |
|                    | % Fixture | 22.2     | 0.0    | 22.2   |
| <b>Street Side</b> | Lumens    | 5785.9   | 0.0    | 5785.9 |
|                    | % Fixture | 77.8     | 0.0    | 77.8   |
| <b>Total</b>       | Lumens    | 7440.0   | 0.0    | 7440.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 76.1   | 1.0       |
| 10°-20°   | 249.7  | 3.4       |
| 20°-30°   | 416.5  | 5.6       |
| 30°-40°   | 604.8  | 8.1       |
| 40°-50°   | 925.0  | 12.4      |
| 50°-60°   | 1748.4 | 23.5      |
| 60°-70°   | 2259.2 | 30.4      |
| 70°-80°   | 1015.5 | 13.6      |
| 80°-90°   | 144.8  | 1.9       |
| 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°    | 7440.0 | 100.0     |
| 0°-180°   | 7440.0 | 100.0     |

**Coefficient of Utilization**



REPORT NUMBER: P800498

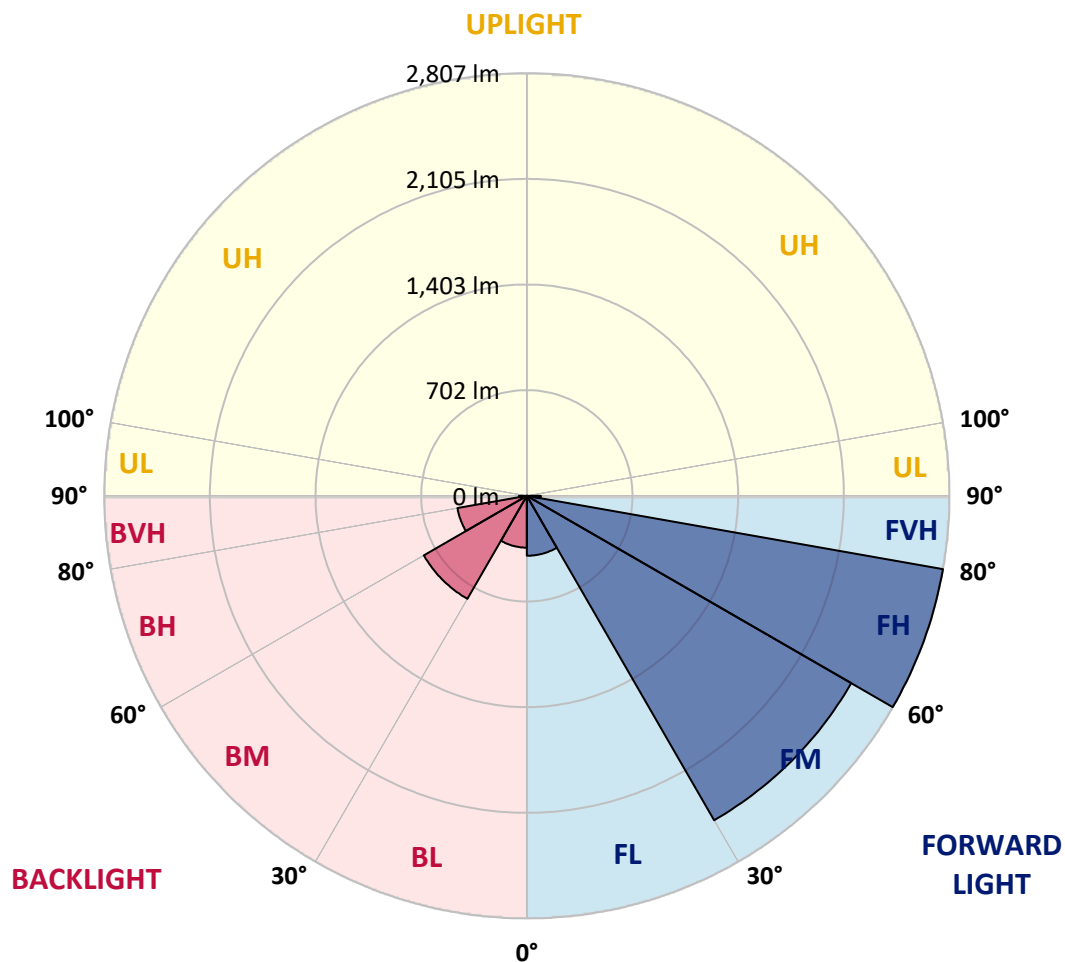
CATALOG NUMBER: ARCH-S-PA2-50-735-24VDC-T4W

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 398.1  | 5.4       |                         |      |         |
| FM   | (30°-60°)   | 2488.1 | 33.4      |                         |      |         |
| FH   | (60°-80°)   | 2806.6 | 37.7      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 93.1   | 1.3       |                         |      | G1/100  |
| BL   | (0°-30°)    | 344.2  | 4.6       | B1/500                  |      |         |
| BM   | (30°-60°)   | 790.1  | 10.6      | B1/1000                 |      |         |
| BH   | (60°-80°)   | 468.0  | 6.3       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 51.8   | 0.7       |                         |      | G1/100  |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

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

Type III Short





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CATALOG NUMBER: ARCH-S-PA2-50-735-24VDC-T4W

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 47°    | 55°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 747.9  | 747.9  | 747.9  | 747.9  | 747.9  | 747.9  | 747.9  | 747.9  | 747.9  | 747.9  | 747.9  |
| 2.5°  | 790.4  | 784.3  | 780.3  | 778.3  | 774.2  | 766.1  | 766.1  | 764.1  | 756.0  | 752.0  | 750.0  |
| 5°    | 853.1  | 849.0  | 838.9  | 830.8  | 818.7  | 802.5  | 800.5  | 788.4  | 772.2  | 760.1  | 752.0  |
| 7.5°  | 913.7  | 909.7  | 899.6  | 887.4  | 867.2  | 847.0  | 840.9  | 824.8  | 798.5  | 780.3  | 766.1  |
| 10°   | 966.3  | 960.2  | 948.1  | 931.9  | 909.7  | 887.4  | 881.4  | 863.2  | 836.9  | 810.6  | 786.4  |
| 12.5° | 1000.6 | 996.6  | 982.4  | 962.2  | 938.0  | 915.7  | 911.7  | 895.5  | 869.2  | 840.9  | 810.6  |
| 15°   | 1016.8 | 1014.8 | 998.6  | 978.4  | 954.1  | 935.9  | 933.9  | 919.8  | 897.5  | 869.2  | 834.9  |
| 17.5° | 1012.8 | 1010.7 | 996.6  | 976.4  | 958.2  | 948.1  | 948.1  | 938.0  | 919.8  | 895.5  | 859.1  |
| 20°   | 992.5  | 992.5  | 980.4  | 966.3  | 956.2  | 954.1  | 954.1  | 952.1  | 940.0  | 919.8  | 883.4  |
| 22.5° | 972.3  | 972.3  | 964.2  | 954.1  | 952.1  | 960.2  | 962.2  | 966.3  | 962.2  | 946.1  | 913.7  |
| 25°   | 976.4  | 974.4  | 964.2  | 952.1  | 954.1  | 972.3  | 976.4  | 986.5  | 984.5  | 972.3  | 944.0  |
| 27.5° | 1020.8 | 1018.8 | 992.5  | 968.3  | 966.3  | 988.5  | 992.5  | 1006.7 | 1006.7 | 996.6  | 978.4  |
| 30°   | 1132.0 | 1136.1 | 1087.6 | 1026.9 | 996.6  | 1010.7 | 1014.8 | 1031.0 | 1039.0 | 1043.1 | 1028.9 |
| 32.5° | 1301.8 | 1295.8 | 1223.0 | 1123.9 | 1057.2 | 1043.1 | 1049.1 | 1063.3 | 1091.6 | 1099.7 | 1065.3 |
| 35°   | 1473.7 | 1477.7 | 1406.9 | 1281.6 | 1154.3 | 1101.7 | 1097.7 | 1117.9 | 1160.3 | 1123.9 | 1063.3 |
| 37.5° | 1633.4 | 1627.3 | 1544.4 | 1409.0 | 1281.6 | 1221.0 | 1223.0 | 1214.9 | 1178.5 | 1105.7 | 1077.4 |
| 40°   | 1807.2 | 1791.0 | 1722.3 | 1548.5 | 1386.7 | 1285.7 | 1267.5 | 1198.7 | 1168.4 | 1138.1 | 1134.0 |
| 42.5° | 1979.0 | 1981.0 | 1924.4 | 1752.6 | 1512.1 | 1332.2 | 1303.9 | 1233.1 | 1253.3 | 1247.3 | 1243.2 |
| 45°   | 2195.3 | 2195.3 | 2138.7 | 1979.0 | 1710.2 | 1506.0 | 1467.6 | 1382.7 | 1415.0 | 1439.3 | 1487.8 |
| 47.5° | 2393.4 | 2381.3 | 2365.1 | 2229.7 | 1968.9 | 1732.4 | 1716.2 | 1619.2 | 1704.1 | 1778.9 | 1878.0 |
| 50°   | 2603.7 | 2587.5 | 2577.4 | 2494.5 | 2308.5 | 2076.1 | 2027.5 | 1926.5 | 2112.4 | 2251.9 | 2435.9 |
| 52.5° | 2931.1 | 2902.8 | 2850.3 | 2803.8 | 2731.0 | 2462.2 | 2401.5 | 2326.7 | 2567.3 | 2743.1 | 3119.1 |
| 55°   | 3226.3 | 3202.0 | 3151.5 | 3185.8 | 3175.7 | 2931.1 | 2878.6 | 2807.8 | 3068.6 | 3282.9 | 3713.5 |
| 57.5° | 3335.4 | 3337.5 | 3406.2 | 3590.1 | 3687.2 | 3545.7 | 3470.9 | 3400.1 | 3620.5 | 3719.5 | 4107.6 |
| 60°   | 3386.0 | 3379.9 | 3557.8 | 3857.0 | 4172.3 | 4214.8 | 4119.8 | 3974.2 | 4057.1 | 4063.2 | 4441.2 |
| 62.5° | 3276.8 | 3293.0 | 3537.6 | 3968.2 | 4463.4 | 4768.7 | 4754.5 | 4499.8 | 4423.0 | 4338.1 | 4530.1 |
| 65°   | 2862.4 | 2884.6 | 3244.5 | 3770.1 | 4509.9 | 5104.2 | 5118.4 | 4821.2 | 4606.9 | 4370.4 | 4277.4 |
| 66°   | 2547.1 | 2613.8 | 3014.0 | 3598.2 | 4425.0 | 5138.6 | 5164.9 | 4855.6 | 4598.9 | 4293.6 | 4077.3 |
| 67.5° | 2136.7 | 2132.7 | 2579.4 | 3220.2 | 4188.5 | 5108.3 | 5142.6 | 4807.1 | 4489.7 | 4067.2 | 3677.1 |
| 70°   | 1307.9 | 1348.3 | 1732.4 | 2403.5 | 3466.8 | 4730.3 | 4776.7 | 4465.4 | 4018.7 | 3444.6 | 2718.9 |
| 72.5° | 671.1  | 737.8  | 990.5  | 1562.6 | 2516.7 | 3909.5 | 4067.2 | 3749.8 | 3284.9 | 2492.5 | 1659.6 |
| 75°   | 355.8  | 351.7  | 467.0  | 847.0  | 1607.1 | 2933.2 | 3016.0 | 2811.9 | 2270.1 | 1485.8 | 845.0  |
| 77.5° | 190.0  | 200.1  | 244.6  | 434.6  | 883.4  | 1873.9 | 1979.0 | 1813.3 | 1293.7 | 760.1  | 404.3  |
| 80°   | 129.4  | 135.4  | 165.8  | 244.6  | 479.1  | 1016.8 | 1113.8 | 966.3  | 677.2  | 359.8  | 190.0  |
| 82.5° | 82.9   | 86.9   | 113.2  | 151.6  | 287.0  | 493.2  | 519.5  | 495.3  | 331.5  | 204.2  | 115.2  |
| 85°   | 50.5   | 52.6   | 68.7   | 97.0   | 179.9  | 200.1  | 208.2  | 210.2  | 186.0  | 133.4  | 62.7   |
| 87.5° | 24.3   | 26.3   | 38.4   | 48.5   | 84.9   | 72.8   | 66.7   | 68.7   | 103.1  | 78.8   | 28.3   |
| 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-S-PA2-50-735-24VDC-T4W

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 747.9  | 747.9  | 747.9 | 747.9 | 747.9 | 747.9 | 747.9 | 747.9 | 747.9 | 747.9 | 747.9 |
| 2.5°  | 747.9  | 745.9  | 741.9 | 739.9 | 741.9 | 741.9 | 741.9 | 743.9 | 747.9 | 747.9 | 750.0 |
| 5°    | 747.9  | 743.9  | 739.9 | 739.9 | 743.9 | 747.9 | 752.0 | 760.1 | 764.1 | 766.1 | 766.1 |
| 7.5°  | 758.1  | 754.0  | 750.0 | 750.0 | 756.0 | 764.1 | 772.2 | 782.3 | 792.4 | 800.5 | 800.5 |
| 10°   | 778.3  | 772.2  | 768.2 | 770.2 | 780.3 | 790.4 | 800.5 | 812.6 | 822.7 | 832.8 | 832.8 |
| 12.5° | 800.5  | 794.4  | 788.4 | 792.4 | 806.6 | 818.7 | 828.8 | 834.9 | 845.0 | 853.1 | 853.1 |
| 15°   | 822.7  | 812.6  | 810.6 | 818.7 | 832.8 | 840.9 | 845.0 | 845.0 | 849.0 | 857.1 | 857.1 |
| 17.5° | 847.0  | 836.9  | 834.9 | 843.0 | 855.1 | 855.1 | 847.0 | 840.9 | 838.9 | 845.0 | 847.0 |
| 20°   | 871.3  | 861.1  | 861.1 | 867.2 | 865.2 | 851.0 | 836.9 | 826.8 | 818.7 | 824.8 | 826.8 |
| 22.5° | 901.6  | 891.5  | 887.4 | 879.3 | 861.1 | 832.8 | 810.6 | 798.5 | 792.4 | 796.5 | 800.5 |
| 25°   | 931.9  | 923.8  | 913.7 | 885.4 | 843.0 | 798.5 | 770.2 | 760.1 | 762.1 | 770.2 | 774.2 |
| 27.5° | 970.3  | 966.3  | 942.0 | 881.4 | 810.6 | 750.0 | 721.7 | 719.6 | 727.7 | 739.9 | 745.9 |
| 30°   | 1016.8 | 1010.7 | 968.3 | 869.2 | 766.1 | 693.4 | 673.2 | 677.2 | 689.3 | 699.4 | 705.5 |
| 32.5° | 1049.1 | 1045.1 | 980.4 | 840.9 | 711.6 | 642.8 | 626.7 | 626.7 | 632.7 | 646.9 | 652.9 |
| 35°   | 1059.3 | 1075.4 | 988.5 | 798.5 | 646.9 | 598.4 | 582.2 | 572.1 | 572.1 | 584.2 | 588.2 |
| 37.5° | 1093.6 | 1130.0 | 992.5 | 741.9 | 594.3 | 557.9 | 537.7 | 519.5 | 513.5 | 511.4 | 511.4 |
| 40°   | 1172.5 | 1214.9 | 990.5 | 669.1 | 543.8 | 517.5 | 493.2 | 473.0 | 456.9 | 434.6 | 436.6 |
| 42.5° | 1309.9 | 1342.3 | 984.5 | 592.3 | 499.3 | 481.1 | 456.9 | 432.6 | 406.3 | 382.1 | 380.0 |
| 45°   | 1574.7 | 1526.2 | 968.3 | 525.6 | 458.9 | 448.8 | 426.5 | 398.2 | 365.9 | 343.7 | 343.7 |
| 47.5° | 1993.2 | 1859.8 | 958.2 | 462.9 | 422.5 | 420.5 | 400.3 | 369.9 | 337.6 | 321.4 | 319.4 |
| 50°   | 2567.3 | 2320.7 | 974.4 | 418.4 | 390.1 | 396.2 | 380.0 | 351.7 | 325.5 | 311.3 | 309.3 |
| 52.5° | 3226.3 | 2815.9 | 992.5 | 390.1 | 365.9 | 378.0 | 369.9 | 343.7 | 317.4 | 305.2 | 303.2 |
| 55°   | 3735.7 | 3218.2 | 966.3 | 363.9 | 341.6 | 359.8 | 359.8 | 335.6 | 313.3 | 301.2 | 301.2 |
| 57.5° | 4093.5 | 3379.9 | 875.3 | 339.6 | 321.4 | 343.7 | 349.7 | 331.5 | 311.3 | 307.3 | 307.3 |
| 60°   | 4247.1 | 3371.8 | 715.6 | 317.4 | 307.3 | 327.5 | 343.7 | 327.5 | 315.4 | 325.5 | 327.5 |
| 62.5° | 4164.2 | 3196.0 | 555.9 | 301.2 | 297.2 | 323.4 | 349.7 | 343.7 | 329.5 | 337.6 | 341.6 |
| 65°   | 3790.3 | 2886.7 | 418.4 | 287.0 | 285.0 | 325.5 | 365.9 | 353.8 | 319.4 | 321.4 | 323.4 |
| 66°   | 3580.0 | 2678.5 | 384.1 | 283.0 | 281.0 | 327.5 | 374.0 | 349.7 | 311.3 | 315.4 | 313.3 |
| 67.5° | 3131.3 | 2351.0 | 337.6 | 274.9 | 272.9 | 327.5 | 384.1 | 341.6 | 301.2 | 307.3 | 301.2 |
| 70°   | 2296.4 | 1663.7 | 289.1 | 264.8 | 260.8 | 321.4 | 382.1 | 325.5 | 279.0 | 274.9 | 264.8 |
| 72.5° | 1332.2 | 1006.7 | 256.7 | 252.7 | 242.6 | 283.0 | 357.8 | 299.2 | 254.7 | 242.6 | 232.5 |
| 75°   | 655.0  | 511.4  | 228.4 | 238.5 | 212.3 | 248.6 | 323.4 | 276.9 | 234.5 | 218.3 | 212.3 |
| 77.5° | 301.2  | 258.7  | 206.2 | 218.3 | 188.0 | 214.3 | 295.1 | 252.7 | 208.2 | 184.0 | 177.9 |
| 80°   | 163.7  | 161.7  | 173.8 | 181.9 | 157.7 | 188.0 | 260.8 | 220.3 | 175.9 | 149.6 | 141.5 |
| 82.5° | 101.1  | 103.1  | 127.4 | 139.5 | 123.3 | 163.7 | 230.4 | 184.0 | 133.4 | 105.1 | 107.1 |
| 85°   | 52.6   | 58.6   | 84.9  | 93.0  | 80.9  | 121.3 | 173.8 | 123.3 | 74.8  | 54.6  | 54.6  |
| 87.5° | 18.2   | 24.3   | 42.5  | 50.5  | 44.5  | 72.8  | 109.2 | 58.6  | 16.2  | 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: SP1-2101-121-7

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)