

Signify Classified - Internal
Cooper Lighting Solutions Photometric Lab
1121 Highway 74 South
Peachtree City, GA 30269



Scaled data based on original data using
LM-79-2019 Approved Method: Electrical and Photometric Measurements of Solid-
State Lighting Products

Test Report Prepared for
Cooper Lighting Solutions

Brand: STREETWORKS

Report Number: P361282

Luminaire Tested: NVN-SA6A-727-U-T3

Issue Date: 3/3/2020

Test Information

Test Method: LM-79-2019
Report Number: P361282
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-14)
Test Lab: INNOVATION CENTER
Issue Date: 3/3/2020
Manufacturer: COOPER LIGHTING SOLUTIONS
Product Line: STREETWORKS
Catalog Number: NVN-SA6A-727-U-T3
Description: NAVION ROADWAY AND AREA LUMINAIRE
(6) 70 CRI, 2700K, 615mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE III OPTICS
Light Source: -
Ballast/Driver: ELECTRONIC DRIVER

Summary

Lumens per Lamp: N/A
Luminaire Lumens: 23592 lumens
Efficiency: N/A
Efficacy: 122.2 lumens/watt
Luminous Opening: Rectangular (W 1' x L: 1.5' x H: 0')
IES Classification: Type III - Short
BUG Rating: B3 - U0 - G4

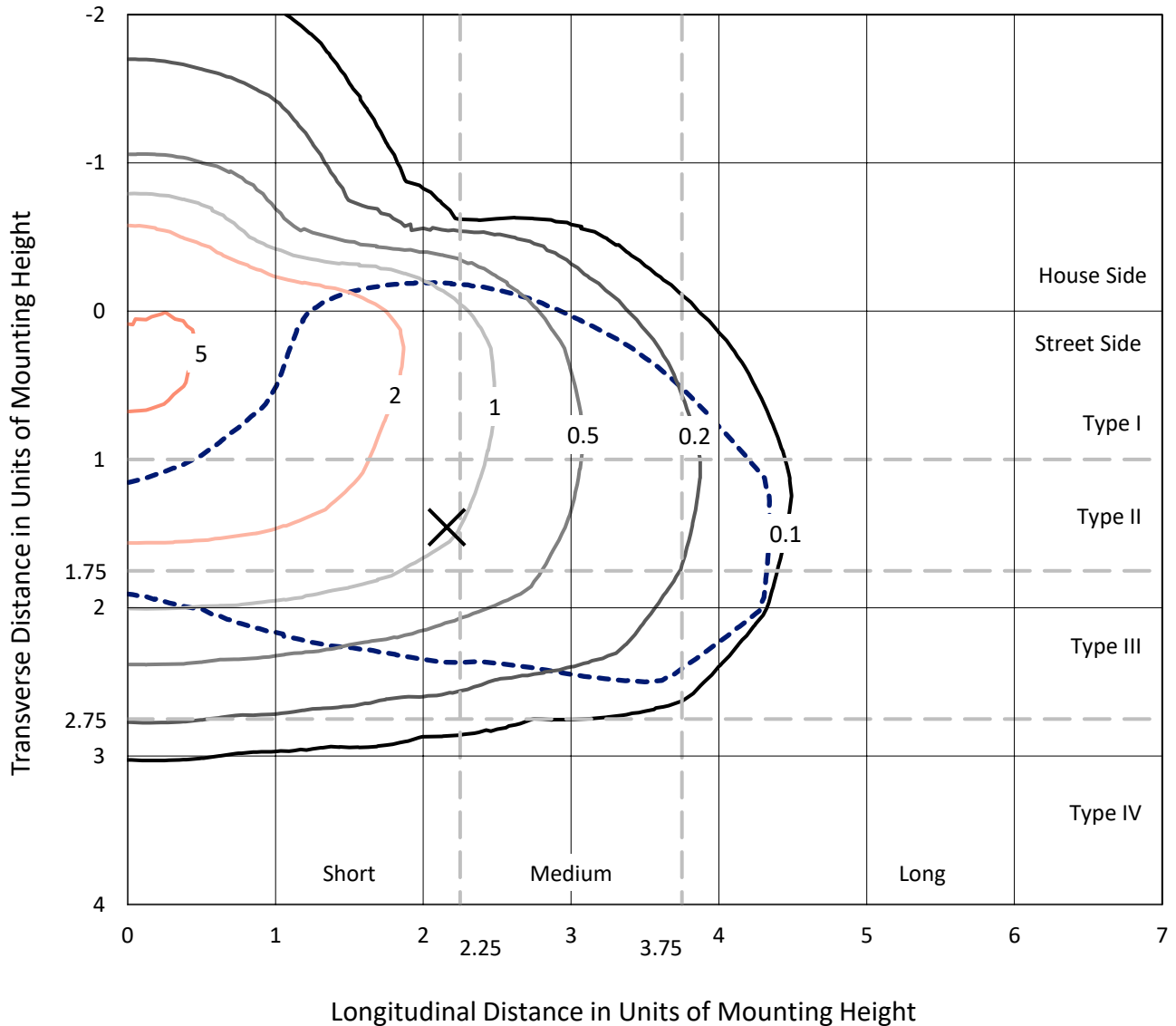
Input Watts (W): 193
Input Voltage (V): NR
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 28.75 FT



REPORT NUMBER: P361282
 CATALOG NUMBER: NVN-SA6A-727-U-T3

Iso-Footcandle Lines of Horizontal Illumination

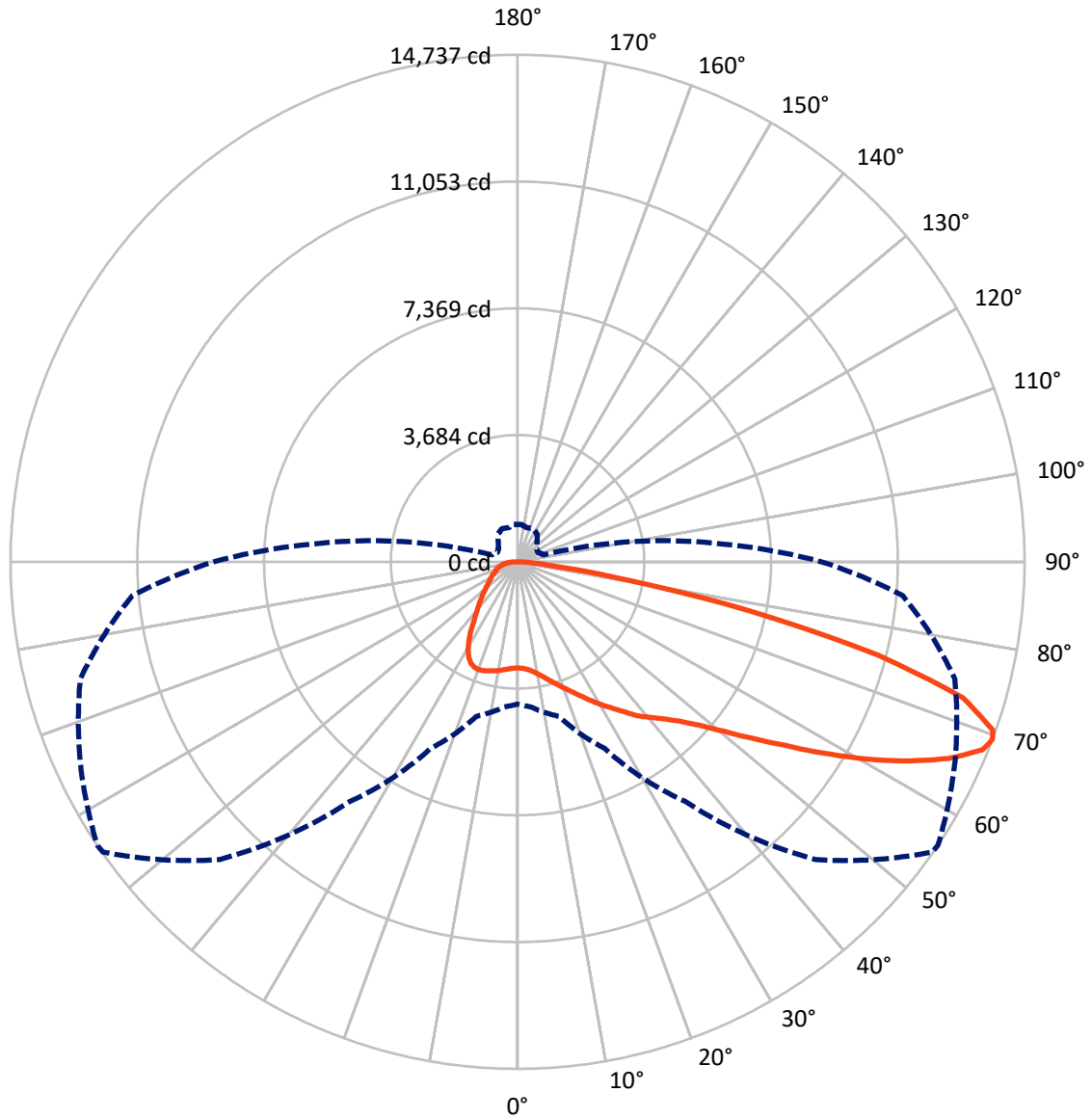
✕ Max cd
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 5.4 fc
 Type III - Short - N/A

REPORT NUMBER: P361282
CATALOG NUMBER: NVN-SA6A-727-U-T3

Luminous Intensity Polar Plot



— Vertical Plane Through 56-Deg Lateral - - - Horizontal Cone Through 69-Deg Vertical

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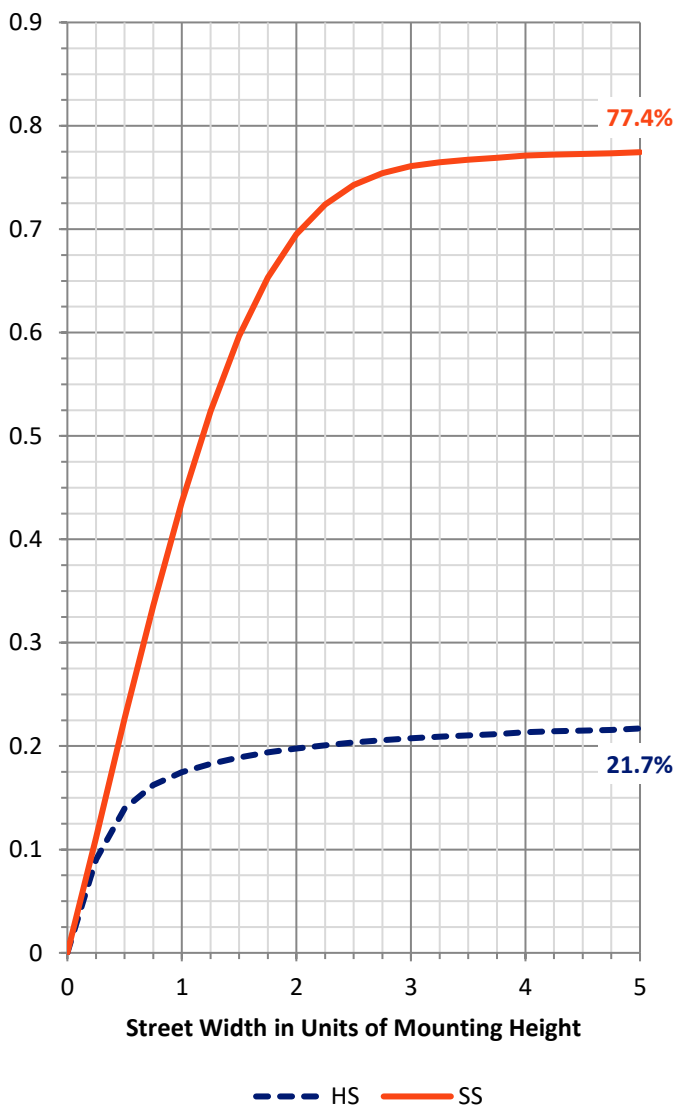
FLUX DISTRIBUTION:

| | | Downward | Upward | Total |
|--------------------|-----------|----------|--------|---------|
| House Side | Lumens | 5253.9 | 0.0 | 5253.9 |
| | % Fixture | 22.3 | 0.0 | 22.3 |
| Street Side | Lumens | 18338.1 | 0.0 | 18338.1 |
| | % Fixture | 77.7 | 0.0 | 77.7 |
| Total | Lumens | 23592.0 | 0.0 | 23592.0 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|---------|-----------|
| 0°-10° | 302.9 | 1.3 |
| 10°-20° | 974.1 | 4.1 |
| 20°-30° | 1700.4 | 7.2 |
| 30°-40° | 2442.6 | 10.4 |
| 40°-50° | 3380.4 | 14.3 |
| 50°-60° | 4952.7 | 21.0 |
| 60°-70° | 6038.3 | 25.6 |
| 70°-80° | 3338.4 | 14.2 |
| 80°-90° | 462.4 | 2.0 |
| 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° | 23592.0 | 100.0 |
| 0°-180° | 23592.0 | 100.0 |

Coefficient of Utilization

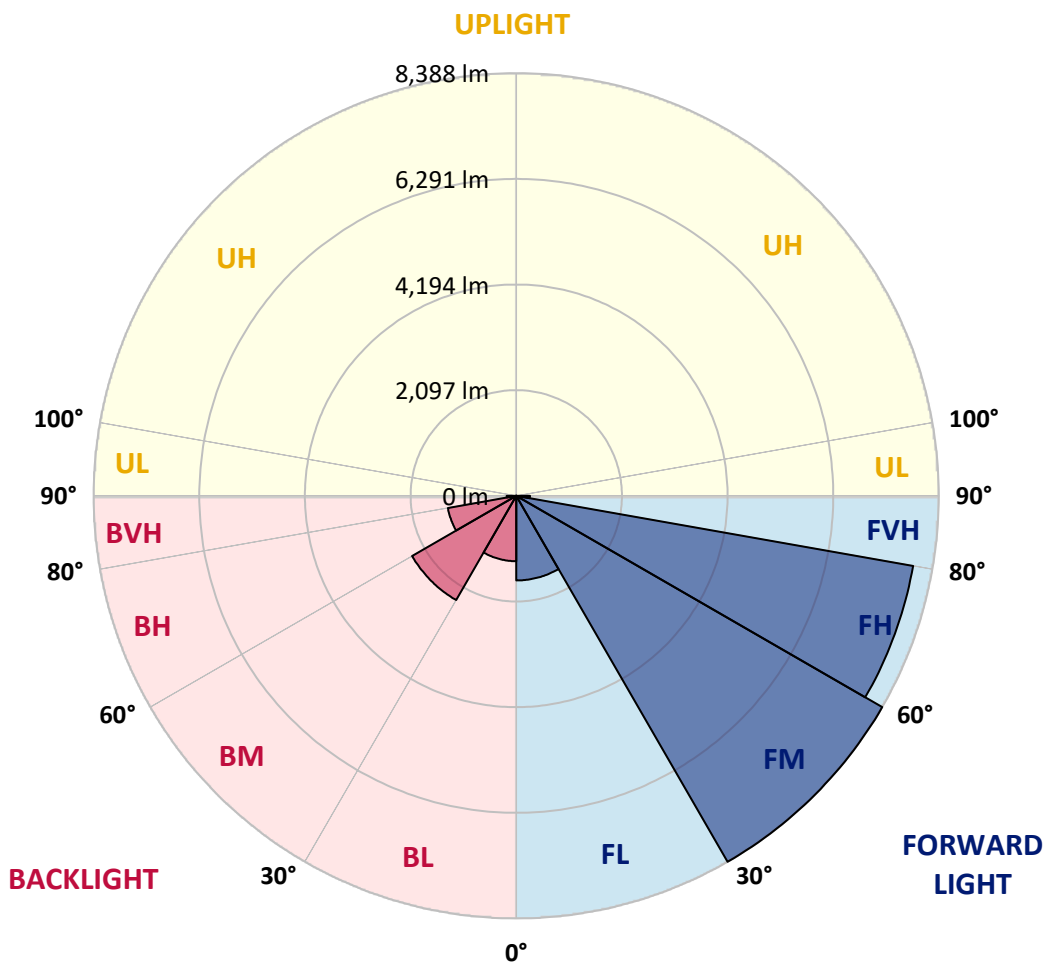


REPORT NUMBER: P361282
 CATALOG NUMBER: NVN-SA6A-727-U-T3

LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | Lumens | % Fixture | Zone Rating/Lumen Limit | | |
|----------------|--------|-----------|-------------------------|------|----------|
| | | | B | U | G |
| FL (0°-30°) | 1679.0 | 7.1 | | | |
| FM (30°-60°) | 8387.8 | 35.6 | | | |
| FH (60°-80°) | 7998.9 | 33.9 | | | G4/12000 |
| FVH (80°-90°) | 272.3 | 1.2 | | | G3/500 |
| BL (0°-30°) | 1298.4 | 5.5 | B3/2500 | | |
| BM (30°-60°) | 2387.8 | 10.1 | B2/2500 | | |
| BH (60°-80°) | 1377.7 | 5.8 | B3/2500 | | G3/2500 |
| BVH (80°-90°) | 190.0 | 0.8 | | | G2/225 |
| UL (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH (100°-180°) | 0.0 | 0.0 | | U0/0 | |

BUG Rating: B3-U0-G4
 Type III Short





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CANDELA DISTRIBUTION (FULL):

| | 0° | 5° | 15° | 25° | 35° | 45° | 55° | 56° | 65° | 75° | 85° |
|-------|--------|--------|--------|--------|---------|---------|---------|---------|---------|---------|---------|
| 0° | 3084.3 | 3084.3 | 3084.3 | 3084.3 | 3084.3 | 3084.3 | 3084.3 | 3084.3 | 3084.3 | 3084.3 | 3084.3 |
| 2.5° | 3103.8 | 3107.1 | 3104.6 | 3111.1 | 3103.8 | 3108.7 | 3104.6 | 3104.6 | 3102.2 | 3094.9 | 3086.7 |
| 5° | 3152.6 | 3159.1 | 3155.0 | 3161.5 | 3152.6 | 3154.2 | 3146.9 | 3146.9 | 3139.6 | 3124.1 | 3107.9 |
| 7.5° | 3229.0 | 3236.3 | 3233.0 | 3239.5 | 3227.3 | 3227.3 | 3217.6 | 3216.8 | 3202.1 | 3176.9 | 3158.3 |
| 10° | 3320.0 | 3329.7 | 3326.5 | 3336.2 | 3326.5 | 3329.7 | 3320.0 | 3320.0 | 3300.5 | 3264.7 | 3241.2 |
| 12.5° | 3452.5 | 3464.7 | 3455.7 | 3454.9 | 3450.8 | 3457.3 | 3449.2 | 3447.6 | 3429.7 | 3380.9 | 3348.4 |
| 15° | 3629.6 | 3642.6 | 3623.9 | 3622.3 | 3599.6 | 3597.1 | 3597.1 | 3594.7 | 3583.3 | 3524.8 | 3471.2 |
| 17.5° | 3833.6 | 3837.7 | 3821.4 | 3795.4 | 3766.2 | 3747.5 | 3745.0 | 3751.5 | 3751.5 | 3683.3 | 3597.9 |
| 20° | 4033.6 | 4040.9 | 4027.9 | 3998.6 | 3961.2 | 3933.6 | 3914.1 | 3927.1 | 3926.3 | 3845.0 | 3723.9 |
| 22.5° | 4251.4 | 4268.4 | 4248.9 | 4211.6 | 4167.7 | 4136.8 | 4102.6 | 4114.0 | 4114.8 | 4014.9 | 3847.4 |
| 25° | 4533.4 | 4517.9 | 4505.8 | 4452.9 | 4390.4 | 4358.7 | 4327.0 | 4338.3 | 4335.1 | 4197.7 | 3975.0 |
| 27.5° | 4782.9 | 4786.1 | 4769.9 | 4713.8 | 4641.5 | 4571.6 | 4570.0 | 4577.3 | 4565.1 | 4387.9 | 4095.3 |
| 30° | 5073.0 | 5074.7 | 5051.9 | 5001.5 | 4922.7 | 4832.5 | 4811.3 | 4823.5 | 4797.5 | 4568.3 | 4222.1 |
| 32.5° | 5361.6 | 5369.7 | 5344.5 | 5283.5 | 5220.1 | 5110.4 | 5068.2 | 5076.3 | 5011.3 | 4752.8 | 4353.0 |
| 35° | 5614.3 | 5625.7 | 5617.6 | 5576.9 | 5507.9 | 5413.6 | 5363.2 | 5358.3 | 5277.8 | 4978.8 | 4526.1 |
| 37.5° | 5872.0 | 5882.5 | 5873.6 | 5839.4 | 5811.8 | 5711.8 | 5685.0 | 5685.0 | 5545.2 | 5209.6 | 4746.3 |
| 40° | 6136.9 | 6153.2 | 6142.6 | 6095.5 | 6071.9 | 6026.4 | 5962.2 | 5946.7 | 5795.6 | 5486.7 | 5105.6 |
| 42.5° | 6383.2 | 6404.3 | 6446.6 | 6418.9 | 6371.0 | 6377.5 | 6248.2 | 6240.1 | 6129.6 | 5896.3 | 5556.6 |
| 45° | 6732.6 | 6763.5 | 6835.0 | 6813.9 | 6804.2 | 6768.4 | 6614.8 | 6607.5 | 6565.2 | 6447.4 | 6116.6 |
| 47.5° | 7113.8 | 7156.1 | 7285.3 | 7289.3 | 7394.2 | 7326.7 | 7117.9 | 7092.7 | 7102.4 | 7107.3 | 6800.1 |
| 50° | 7464.9 | 7511.2 | 7723.3 | 7823.3 | 8070.4 | 8085.0 | 7751.0 | 7728.2 | 7766.4 | 7878.6 | 7596.6 |
| 52.5° | 7745.3 | 7803.8 | 8068.8 | 8377.6 | 8801.0 | 8921.3 | 8530.4 | 8513.3 | 8541.8 | 8735.2 | 8497.1 |
| 55° | 7950.9 | 8014.3 | 8302.8 | 8865.2 | 9541.4 | 9753.5 | 9427.6 | 9411.4 | 9429.3 | 9675.5 | 9476.4 |
| 57.5° | 7998.9 | 8014.3 | 8432.9 | 9193.6 | 10166.4 | 10676.0 | 10525.6 | 10493.1 | 10405.3 | 10619.9 | 10557.3 |
| 60° | 7773.7 | 7835.5 | 8325.6 | 9309.0 | 10650.0 | 11585.4 | 11673.2 | 11632.6 | 11386.3 | 11561.9 | 11511.5 |
| 62.5° | 7317.0 | 7427.5 | 7924.9 | 9133.4 | 10839.3 | 12328.3 | 12798.8 | 12750.1 | 12325.8 | 12439.6 | 12197.4 |
| 65° | 6570.9 | 6618.0 | 7140.6 | 8527.9 | 10598.8 | 12803.7 | 13802.5 | 13778.2 | 13244.2 | 13066.2 | 12324.2 |
| 67.5° | 5236.4 | 5325.0 | 5768.7 | 7262.5 | 9614.6 | 12747.6 | 14578.7 | 14576.3 | 13844.0 | 13298.7 | 11874.8 |
| 69° | 4136.8 | 4228.6 | 4651.2 | 5982.5 | 8507.6 | 12234.8 | 14708.7 | 14737.2 | 14013.0 | 13157.2 | 11232.7 |
| 70° | 3298.0 | 3404.5 | 3694.7 | 5038.9 | 7525.0 | 11558.6 | 14600.6 | 14651.8 | 13980.5 | 12924.0 | 10640.2 |
| 72.5° | 1403.6 | 1489.7 | 1696.2 | 2597.5 | 4586.2 | 8631.2 | 13349.9 | 13543.3 | 13227.1 | 11828.4 | 8793.7 |
| 75° | 612.8 | 639.6 | 733.1 | 1059.0 | 2035.9 | 4697.6 | 10458.2 | 10815.8 | 11309.9 | 9998.2 | 6550.6 |
| 77.5° | 448.6 | 460.0 | 511.2 | 621.7 | 913.5 | 1774.2 | 6725.3 | 6933.4 | 8156.5 | 7275.5 | 4018.1 |
| 80° | 347.0 | 355.2 | 395.0 | 456.8 | 596.5 | 717.6 | 3067.2 | 3246.0 | 4586.2 | 3736.9 | 1673.4 |
| 82.5° | 276.3 | 282.0 | 309.6 | 336.5 | 412.1 | 434.8 | 1018.3 | 1129.7 | 1692.9 | 1032.2 | 442.9 |
| 85° | 256.8 | 263.3 | 273.1 | 245.4 | 264.1 | 255.2 | 440.5 | 460.8 | 511.2 | 405.6 | 185.3 |
| 87.5° | 116.2 | 137.4 | 270.6 | 191.0 | 140.6 | 112.2 | 180.4 | 188.6 | 212.1 | 212.9 | 82.1 |
| 90° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |



REPORT NUMBER: P361282
 CATALOG NUMBER: NVN-SA6A-727-U-T3

CANDELA DISTRIBUTION (continued):

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|-------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0° | 3084.3 | 3084.3 | 3084.3 | 3084.3 | 3084.3 | 3084.3 | 3084.3 | 3084.3 | 3084.3 | 3084.3 | 3084.3 |
| 2.5° | 3091.6 | 3089.2 | 3093.2 | 3083.5 | 3095.7 | 3094.9 | 3090.8 | 3092.4 | 3100.6 | 3099.7 | 3100.6 |
| 5° | 3110.3 | 3108.7 | 3113.6 | 3106.2 | 3120.9 | 3125.7 | 3126.6 | 3133.9 | 3142.8 | 3145.3 | 3145.3 |
| 7.5° | 3157.4 | 3157.4 | 3159.9 | 3150.1 | 3159.9 | 3159.1 | 3155.0 | 3162.3 | 3171.3 | 3172.1 | 3171.3 |
| 10° | 3238.7 | 3239.5 | 3235.5 | 3210.3 | 3202.1 | 3180.2 | 3159.9 | 3160.7 | 3172.1 | 3181.0 | 3183.5 |
| 12.5° | 3341.1 | 3337.9 | 3320.0 | 3273.7 | 3239.5 | 3194.8 | 3173.7 | 3172.9 | 3184.3 | 3191.6 | 3194.0 |
| 15° | 3458.2 | 3449.2 | 3402.9 | 3327.3 | 3267.2 | 3223.3 | 3189.1 | 3181.0 | 3174.5 | 3166.4 | 3167.2 |
| 17.5° | 3568.7 | 3548.4 | 3471.2 | 3366.3 | 3302.9 | 3244.4 | 3178.6 | 3125.7 | 3089.2 | 3068.0 | 3061.5 |
| 20° | 3680.8 | 3641.0 | 3529.7 | 3402.9 | 3322.4 | 3216.0 | 3089.2 | 2981.9 | 2915.3 | 2884.4 | 2878.7 |
| 22.5° | 3783.2 | 3719.0 | 3584.1 | 3441.1 | 3307.0 | 3120.1 | 2920.9 | 2764.9 | 2672.2 | 2630.8 | 2634.0 |
| 25° | 3883.2 | 3793.8 | 3641.0 | 3467.9 | 3229.0 | 2951.0 | 2686.9 | 2495.1 | 2387.8 | 2341.5 | 2339.8 |
| 27.5° | 3971.0 | 3869.4 | 3702.8 | 3446.0 | 3083.5 | 2710.4 | 2409.7 | 2222.8 | 2133.4 | 2093.6 | 2087.1 |
| 30° | 4071.8 | 3964.5 | 3784.9 | 3362.3 | 2870.6 | 2432.5 | 2139.1 | 2007.4 | 1944.0 | 1904.2 | 1896.9 |
| 32.5° | 4194.5 | 4093.7 | 3852.3 | 3210.3 | 2598.3 | 2142.3 | 1927.8 | 1836.0 | 1778.2 | 1733.5 | 1725.4 |
| 35° | 4373.3 | 4264.4 | 3869.4 | 2992.5 | 2299.2 | 1913.2 | 1772.6 | 1678.3 | 1600.3 | 1542.6 | 1536.9 |
| 37.5° | 4597.6 | 4478.1 | 3830.4 | 2710.4 | 2009.1 | 1764.4 | 1643.3 | 1527.1 | 1425.5 | 1344.3 | 1331.2 |
| 40° | 4921.1 | 4740.6 | 3722.3 | 2385.4 | 1795.3 | 1649.8 | 1517.4 | 1384.9 | 1258.9 | 1163.8 | 1145.1 |
| 42.5° | 5309.5 | 5048.7 | 3556.5 | 2061.9 | 1638.5 | 1533.6 | 1392.2 | 1228.0 | 1107.7 | 1040.3 | 1030.5 |
| 45° | 5803.7 | 5368.9 | 3326.5 | 1779.1 | 1484.0 | 1417.4 | 1257.3 | 1106.1 | 1031.4 | 981.8 | 973.6 |
| 47.5° | 6367.7 | 5728.1 | 3085.1 | 1549.1 | 1353.2 | 1308.5 | 1149.2 | 1051.7 | 992.3 | 953.3 | 946.0 |
| 50° | 7061.0 | 6133.7 | 2829.1 | 1360.5 | 1221.5 | 1177.6 | 1098.0 | 1021.6 | 974.5 | 944.4 | 937.1 |
| 52.5° | 7842.8 | 6591.2 | 2644.6 | 1211.8 | 1112.6 | 1080.9 | 1071.2 | 1005.3 | 967.1 | 944.4 | 937.1 |
| 55° | 8684.8 | 7056.9 | 2445.5 | 1086.6 | 1018.3 | 1027.3 | 1053.3 | 1007.0 | 981.0 | 953.3 | 942.8 |
| 57.5° | 9527.6 | 7538.0 | 2223.6 | 981.0 | 943.6 | 987.5 | 1041.1 | 1010.2 | 988.3 | 961.5 | 951.7 |
| 60° | 10194.0 | 7842.8 | 1879.8 | 892.4 | 884.2 | 943.6 | 1011.8 | 985.8 | 957.4 | 958.2 | 956.6 |
| 62.5° | 10505.3 | 7826.6 | 1500.3 | 813.5 | 824.9 | 884.2 | 964.7 | 947.6 | 924.1 | 955.8 | 958.2 |
| 65° | 10330.6 | 7436.5 | 1167.9 | 742.0 | 761.5 | 822.5 | 915.9 | 928.9 | 937.1 | 998.0 | 1006.2 |
| 67.5° | 9597.5 | 6677.4 | 904.6 | 679.4 | 703.8 | 780.2 | 920.8 | 1011.8 | 1022.4 | 1086.6 | 1085.8 |
| 69° | 8839.2 | 5965.4 | 785.9 | 646.9 | 675.4 | 790.8 | 984.2 | 1064.7 | 1024.8 | 1093.1 | 1083.4 |
| 70° | 8203.7 | 5402.2 | 722.5 | 625.0 | 662.4 | 809.5 | 1026.5 | 1063.9 | 1012.7 | 1071.2 | 1054.9 |
| 72.5° | 6318.1 | 3886.5 | 612.8 | 584.4 | 618.5 | 774.5 | 1038.7 | 1040.3 | 984.2 | 995.6 | 968.0 |
| 75° | 4333.5 | 2456.1 | 534.8 | 529.1 | 551.8 | 698.1 | 999.7 | 994.0 | 910.3 | 894.0 | 871.2 |
| 77.5° | 2389.4 | 1247.5 | 454.3 | 476.3 | 491.7 | 618.5 | 908.6 | 900.5 | 831.4 | 797.3 | 789.2 |
| 80° | 921.6 | 546.2 | 383.6 | 423.4 | 433.2 | 535.6 | 796.5 | 789.2 | 731.5 | 687.6 | 675.4 |
| 82.5° | 347.8 | 286.1 | 317.0 | 366.5 | 363.3 | 442.1 | 674.6 | 670.5 | 614.4 | 550.2 | 530.7 |
| 85° | 160.9 | 171.5 | 251.1 | 302.3 | 278.8 | 327.5 | 539.7 | 547.0 | 478.7 | 402.3 | 402.3 |
| 87.5° | 68.3 | 95.9 | 178.0 | 228.4 | 187.7 | 221.1 | 395.8 | 377.9 | 347.0 | 240.6 | 225.9 |
| 90° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

Signify Classified - Internal
Cooper Lighting Solutions Photometric Lab
1121 Highway 74 South
Peachtree City, GA 30269



LM-79-2008: Approved Method: Electrical and Photometric Measurements of Solid-
State Lighting Products

Report Prepared for

Cooper Lighting Solutions

McGRAW-EDISON

Report Number: SP1-1908-441-1-R4

Test Date: 08/20/2019

Luminaire Tested: SA1C-727-U-5WQ

Test Information

Test Method: LM-79-2008
 Report Number: SP1-1908-441-1-R4
 Test Lab: COOPER LIGHTING SOLUTIONS
 Photometer: SP1 - 76IN SPHERE
 Measurement Geometry: 4π
 Issue Date: 10/28/2024
 Manufacturer: COOPER LIGHTING SOLUTIONS
 Product Line: McGRAW-EDISON
 Catalog Number: **SA1C-727-U-5WQ**
 Description: McGRAW EDISON ROADWAY AND AREA LUMINAIRE

THIS IS A REVISION OF SP1-1908-441-1-R3. TO UPDATE THE CATALOG NUMBER.TESTED IN
 SITU. (1) 70 CRI, 2700K, 1050MA LIGHTSQUARE WITH 16 LEDS AND TYPE V WIDE OPTICS.

Spectral Parameters

CCT (K): 2741
 CIE u': 0.2605
 CIE v': 0.5272
 Duv: 0.0005
 CIE x: 0.4573
 CIE y: 0.4113
 CIE z: 0.1313
 Peak Wavelength (nm): 602
 Dominant Wavelength (nm): 583
 Purity: 61.2
 Rf: 69.9
 Rg: 98.3

| | | | |
|-----------|------|------|-------|
| CRI (Ra): | 71.5 | | |
| R1: | 69.2 | R9: | -16.1 |
| R2: | 79.4 | R10: | 51.4 |
| R3: | 87.8 | R11: | 63.1 |
| R4: | 69.4 | R12: | 42.0 |
| R5: | 66.4 | R13: | 70.2 |
| R6: | 69.8 | R14: | 92.4 |
| R7: | 79.8 | | |
| R8: | 50.1 | | |



Test Conditions

Stabilization Time: 56M
 Operation Time: 12H
 Room Temperature (°C) / RH%: 25.3./42%
 Sphere Temperature (°C): 25.7

REPORT NUMBER: SP1-1908-441-1-R4

| Measurement and Test Equipment | | | |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | IN0058 | 6/28/2019 | 12/28/2019 |
| Power Meter | IN0071 | 12/5/2018 | 12/5/2019 |
| AC Power Source | IN0063 | 12/5/2018 | 12/5/2019 |
| DC Power Source | IN0208 | 12/5/2018 | 12/5/2019 |
| Sphere Thermometer | IN0085 | 12/5/2018 | 12/5/2019 |
| Room Thermometer | IN0046 | 12/5/2018 | 12/5/2019 |

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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



Photopic Lumens: 6211.7

| λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) | λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) | λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) | λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) | λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) |
|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|
| 360 | 2044 | 0.0 | 490 | 7179 | 1.0 | 620 | 118034 | 30.7 | 750 | 8362 | 0.0 | 880 | 3128 | 0.0 |
| 365 | 2016 | 0.0 | 495 | 10476 | 1.9 | 625 | 111884 | 24.7 | 755 | 7635 | 0.0 | 885 | 3110 | 0.0 |
| 370 | 2020 | 0.0 | 500 | 15549 | 3.4 | 630 | 106119 | 19.2 | 760 | 6582 | 0.0 | 890 | 2632 | 0.0 |
| 375 | 2137 | 0.0 | 505 | 22477 | 6.3 | 635 | 99706 | 15.0 | 765 | 5777 | 0.0 | 895 | 2709 | 0.0 |
| 380 | 2046 | 0.0 | 510 | 30417 | 10.4 | 640 | 92142 | 11.0 | 770 | 5474 | 0.0 | 900 | 2016 | 0.0 |
| 385 | 1925 | 0.0 | 515 | 39274 | 16.3 | 645 | 84987 | 8.2 | 775 | 4977 | 0.0 | 905 | 1748 | 0.0 |
| 390 | 1893 | 0.0 | 520 | 47282 | 22.9 | 650 | 78016 | 5.7 | 780 | 4723 | 0.0 | 910 | 2046 | 0.0 |
| 395 | 1695 | 0.0 | 525 | 55413 | 29.7 | 655 | 71541 | 4.1 | 785 | 4219 | 0.0 | 915 | 1844 | 0.0 |
| 400 | 1633 | 0.0 | 530 | 62377 | 36.7 | 660 | 64863 | 2.7 | 790 | 3969 | 0.0 | 920 | 2734 | 0.0 |
| 405 | 2065 | 0.0 | 535 | 68520 | 42.5 | 665 | 58485 | 1.9 | 795 | 4122 | 0.0 | 925 | 2307 | 0.0 |
| 410 | 3449 | 0.0 | 540 | 73435 | 47.8 | 670 | 51641 | 1.1 | 800 | 2864 | 0.0 | 930 | 2039 | 0.0 |
| 415 | 7117 | 0.0 | 545 | 78677 | 52.4 | 675 | 46030 | 0.8 | 805 | 3151 | 0.0 | 935 | 1784 | 0.0 |
| 420 | 13992 | 0.0 | 550 | 83331 | 56.6 | 680 | 40590 | 0.5 | 810 | 3022 | 0.0 | 940 | 2464 | 0.0 |
| 425 | 25176 | 0.1 | 555 | 89120 | 60.9 | 685 | 35691 | 0.3 | 815 | 3471 | 0.0 | 945 | 2794 | 0.0 |
| 430 | 38151 | 0.3 | 560 | 94613 | 64.3 | 690 | 31631 | 0.2 | 820 | 2749 | 0.0 | 950 | 3090 | 0.0 |
| 435 | 49673 | 0.6 | 565 | 99818 | 66.4 | 695 | 27437 | 0.1 | 825 | 2729 | 0.0 | 955 | 1866 | 0.0 |
| 440 | 57273 | 0.9 | 570 | 106526 | 69.3 | 700 | 24589 | 0.1 | 830 | 2282 | 0.0 | 960 | 3110 | 0.0 |
| 445 | 54802 | 1.1 | 575 | 111610 | 69.4 | 705 | 21832 | 0.0 | 835 | 3140 | 0.0 | 965 | 3880 | 0.0 |
| 450 | 39184 | 1.0 | 580 | 117163 | 69.6 | 710 | 19500 | 0.0 | 840 | 2365 | 0.0 | 970 | 3243 | 0.0 |
| 455 | 22506 | 0.8 | 585 | 122201 | 67.9 | 715 | 17870 | 0.0 | 845 | 3024 | 0.0 | 975 | 2014 | 0.0 |
| 460 | 13692 | 0.6 | 590 | 125662 | 65.0 | 720 | 15924 | 0.0 | 850 | 2510 | 0.0 | 980 | 1688 | 0.0 |
| 465 | 9446 | 0.5 | 595 | 127415 | 60.4 | 725 | 14268 | 0.0 | 855 | 2739 | 0.0 | 985 | 2827 | 0.0 |
| 470 | 6698 | 0.4 | 600 | 129155 | 55.7 | 730 | 12438 | 0.0 | 860 | 3515 | 0.0 | 990 | 4172 | 0.0 |
| 475 | 5328 | 0.4 | 605 | 128057 | 49.6 | 735 | 11255 | 0.0 | 865 | 3600 | 0.0 | 995 | 3177 | 0.0 |
| 480 | 5081 | 0.5 | 610 | 126031 | 43.3 | 740 | 9951 | 0.0 | 870 | 3609 | 0.0 | 1000 | 3241 | 0.0 |
| 485 | 5579 | 0.7 | 615 | 123059 | 37.1 | 745 | 8870 | 0.0 | 875 | 3208 | 0.0 | | | |

REPORT NUMBER: SP1-1908-441-1-R4

Scotopic Flux vs. Wavelength



Scotopic Lumens: 6474.3 S/P: 1.04

| λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) |
|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|
| 360 | 2044 | 0.0 | 490 | 7179 | 6.0 | 620 | 118034 | 0.1 | 750 | 8362 | 0.0 | 880 | 3128 | 0.0 |
| 365 | 2016 | 0.0 | 495 | 10476 | 8.6 | 625 | 111884 | 0.1 | 755 | 7635 | 0.0 | 885 | 3110 | 0.0 |
| 370 | 2020 | 0.0 | 500 | 15549 | 12.5 | 630 | 106119 | 0.0 | 760 | 6582 | 0.0 | 890 | 2632 | 0.0 |
| 375 | 2137 | 0.0 | 505 | 22477 | 17.3 | 635 | 99706 | 0.0 | 765 | 5777 | 0.0 | 895 | 2709 | 0.0 |
| 380 | 2046 | 0.0 | 510 | 30417 | 21.8 | 640 | 92142 | 0.0 | 770 | 5474 | 0.0 | 900 | 2016 | 0.0 |
| 385 | 1925 | 0.0 | 515 | 39274 | 25.7 | 645 | 84987 | 0.0 | 775 | 4977 | 0.0 | 905 | 1748 | 0.0 |
| 390 | 1893 | 0.0 | 520 | 47282 | 27.5 | 650 | 78016 | 0.0 | 780 | 4723 | 0.0 | 910 | 2046 | 0.0 |
| 395 | 1695 | 0.0 | 525 | 55413 | 28.1 | 655 | 71541 | 0.0 | 785 | 4219 | 0.0 | 915 | 1844 | 0.0 |
| 400 | 1633 | 0.0 | 530 | 62377 | 27.0 | 660 | 64863 | 0.0 | 790 | 3969 | 0.0 | 920 | 2734 | 0.0 |
| 405 | 2065 | 0.0 | 535 | 68520 | 24.7 | 665 | 58485 | 0.0 | 795 | 4122 | 0.0 | 925 | 2307 | 0.0 |
| 410 | 3449 | 0.1 | 540 | 73435 | 21.5 | 670 | 51641 | 0.0 | 800 | 2864 | 0.0 | 930 | 2039 | 0.0 |
| 415 | 7117 | 0.5 | 545 | 78677 | 18.3 | 675 | 46030 | 0.0 | 805 | 3151 | 0.0 | 935 | 1784 | 0.0 |
| 420 | 13992 | 1.6 | 550 | 83331 | 15.0 | 680 | 40590 | 0.0 | 810 | 3022 | 0.0 | 940 | 2464 | 0.0 |
| 425 | 25176 | 3.9 | 555 | 89120 | 12.0 | 685 | 35691 | 0.0 | 815 | 3471 | 0.0 | 945 | 2794 | 0.0 |
| 430 | 38151 | 8.1 | 560 | 94613 | 9.3 | 690 | 31631 | 0.0 | 820 | 2749 | 0.0 | 950 | 3090 | 0.0 |
| 435 | 49673 | 13.3 | 565 | 99818 | 7.0 | 695 | 27437 | 0.0 | 825 | 2729 | 0.0 | 955 | 1866 | 0.0 |
| 440 | 57273 | 19.1 | 570 | 106526 | 5.2 | 700 | 24589 | 0.0 | 830 | 2282 | 0.0 | 960 | 3110 | 0.0 |
| 445 | 54802 | 21.6 | 575 | 111610 | 3.7 | 705 | 21832 | 0.0 | 835 | 3140 | 0.0 | 965 | 3880 | 0.0 |
| 450 | 39184 | 18.1 | 580 | 117163 | 2.6 | 710 | 19500 | 0.0 | 840 | 2365 | 0.0 | 970 | 3243 | 0.0 |
| 455 | 22506 | 11.8 | 585 | 122201 | 1.8 | 715 | 17870 | 0.0 | 845 | 3024 | 0.0 | 975 | 2014 | 0.0 |
| 460 | 13692 | 8.1 | 590 | 125662 | 1.2 | 720 | 15924 | 0.0 | 850 | 2510 | 0.0 | 980 | 1688 | 0.0 |
| 465 | 9446 | 6.2 | 595 | 127415 | 0.8 | 725 | 14268 | 0.0 | 855 | 2739 | 0.0 | 985 | 2827 | 0.0 |
| 470 | 6698 | 4.8 | 600 | 129155 | 0.5 | 730 | 12438 | 0.0 | 860 | 3515 | 0.0 | 990 | 4172 | 0.0 |
| 475 | 5328 | 4.1 | 605 | 128057 | 0.4 | 735 | 11255 | 0.0 | 865 | 3600 | 0.0 | 995 | 3177 | 0.0 |
| 480 | 5081 | 4.1 | 610 | 126031 | 0.2 | 740 | 9951 | 0.0 | 870 | 3609 | 0.0 | 1000 | 3241 | 0.0 |
| 485 | 5579 | 4.6 | 615 | 123059 | 0.1 | 745 | 8870 | 0.0 | 875 | 3208 | 0.0 | | | |

REPORT NUMBER: SP1-1908-441-1-R4

Melanopic Flux vs. Wavelength



Melanopic Lumens: 2145.7 M/P: 0.35

| λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) | λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) | λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) | λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) | λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) |
|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|
| 360 | 2044 | 0.0 | 490 | 7179 | 11.1 | 620 | 118034 | 1.5 | 750 | 8362 | 0.0 | 880 | 3128 | 0.0 |
| 365 | 2016 | 0.0 | 495 | 10476 | 16.9 | 625 | 111884 | 0.9 | 755 | 7635 | 0.0 | 885 | 3110 | 0.0 |
| 370 | 2020 | 0.0 | 500 | 15549 | 26.0 | 630 | 106119 | 0.6 | 760 | 6582 | 0.0 | 890 | 2632 | 0.0 |
| 375 | 2137 | 0.0 | 505 | 22477 | 38.2 | 635 | 99706 | 0.4 | 765 | 5777 | 0.0 | 895 | 2709 | 0.0 |
| 380 | 2046 | 0.0 | 510 | 30417 | 51.6 | 640 | 92142 | 0.2 | 770 | 5474 | 0.0 | 900 | 2016 | 0.0 |
| 385 | 1925 | 0.0 | 515 | 39274 | 65.1 | 645 | 84987 | 0.1 | 775 | 4977 | 0.0 | 905 | 1748 | 0.0 |
| 390 | 1893 | 0.0 | 520 | 47282 | 75.2 | 650 | 78016 | 0.1 | 780 | 4723 | 0.0 | 910 | 2046 | 0.0 |
| 395 | 1695 | 0.0 | 525 | 55413 | 82.9 | 655 | 71541 | 0.1 | 785 | 4219 | 0.0 | 915 | 1844 | 0.0 |
| 400 | 1633 | 0.0 | 530 | 62377 | 86.0 | 660 | 64863 | 0.0 | 790 | 3969 | 0.0 | 920 | 2734 | 0.0 |
| 405 | 2065 | 0.1 | 535 | 68520 | 85.4 | 665 | 58485 | 0.0 | 795 | 4122 | 0.0 | 925 | 2307 | 0.0 |
| 410 | 3449 | 0.2 | 540 | 73435 | 81.1 | 670 | 51641 | 0.0 | 800 | 2864 | 0.0 | 930 | 2039 | 0.0 |
| 415 | 7117 | 0.7 | 545 | 78677 | 75.4 | 675 | 46030 | 0.0 | 805 | 3151 | 0.0 | 935 | 1784 | 0.0 |
| 420 | 13992 | 2.3 | 550 | 83331 | 68.1 | 680 | 40590 | 0.0 | 810 | 3022 | 0.0 | 940 | 2464 | 0.0 |
| 425 | 25176 | 6.2 | 555 | 89120 | 60.9 | 685 | 35691 | 0.0 | 815 | 3471 | 0.0 | 945 | 2794 | 0.0 |
| 430 | 38151 | 13.0 | 560 | 94613 | 52.9 | 690 | 31631 | 0.0 | 820 | 2749 | 0.0 | 950 | 3090 | 0.0 |
| 435 | 49673 | 22.2 | 565 | 99818 | 44.8 | 695 | 27437 | 0.0 | 825 | 2729 | 0.0 | 955 | 1866 | 0.0 |
| 440 | 57273 | 32.0 | 570 | 106526 | 37.6 | 700 | 24589 | 0.0 | 830 | 2282 | 0.0 | 960 | 3110 | 0.0 |
| 445 | 54802 | 36.7 | 575 | 111610 | 30.4 | 705 | 21832 | 0.0 | 835 | 3140 | 0.0 | 965 | 3880 | 0.0 |
| 450 | 39184 | 30.4 | 580 | 117163 | 24.1 | 710 | 19500 | 0.0 | 840 | 2365 | 0.0 | 970 | 3243 | 0.0 |
| 455 | 22506 | 19.7 | 585 | 122201 | 18.7 | 715 | 17870 | 0.0 | 845 | 3024 | 0.0 | 975 | 2014 | 0.0 |
| 460 | 13692 | 13.2 | 590 | 125662 | 14.0 | 720 | 15924 | 0.0 | 850 | 2510 | 0.0 | 980 | 1688 | 0.0 |
| 465 | 9446 | 10.0 | 595 | 127415 | 10.2 | 725 | 14268 | 0.0 | 855 | 2739 | 0.0 | 985 | 2827 | 0.0 |
| 470 | 6698 | 7.7 | 600 | 129155 | 7.3 | 730 | 12438 | 0.0 | 860 | 3515 | 0.0 | 990 | 4172 | 0.0 |
| 475 | 5328 | 6.7 | 605 | 128057 | 5.0 | 735 | 11255 | 0.0 | 865 | 3600 | 0.0 | 995 | 3177 | 0.0 |
| 480 | 5081 | 6.9 | 610 | 126031 | 3.4 | 740 | 9951 | 0.0 | 870 | 3609 | 0.0 | 1000 | 3241 | 0.0 |
| 485 | 5579 | 8.1 | 615 | 123059 | 2.3 | 745 | 8870 | 0.0 | 875 | 3208 | 0.0 | | | |

REPORT NUMBER: SP1-1908-441-1-R4

TM-30-18

Summary

$R_f = 69.9$
 $R_g = 98.3$
 CIE $R_a = 71.5$
 $R_9 = -16.1$



Color Vector Graphics



REPORT NUMBER: SP1-1908-441-1-R4

TM-30-18

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

| | | | |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 54 | CES51 = 77 | CES76 = 48 |
| CES02 = 63 | CES27 = 74 | CES52 = 80 | CES77 = 75 |
| CES03 = 31 | CES28 = 80 | CES53 = 66 | CES78 = 56 |
| CES04 = 71 | CES29 = 44 | CES54 = 77 | CES79 = 81 |
| CES05 = 50 | CES30 = 46 | CES55 = 74 | CES80 = 80 |
| CES06 = 52 | CES31 = 50 | CES56 = 63 | CES81 = 73 |
| CES07 = 42 | CES32 = 49 | CES57 = 60 | CES82 = 91 |
| CES08 = 41 | CES33 = 53 | CES58 = 63 | CES83 = 84 |
| CES09 = 29 | CES34 = 66 | CES59 = 85 | CES84 = 90 |
| CES10 = 77 | CES35 = 82 | CES60 = 89 | CES85 = 87 |
| CES11 = 60 | CES36 = 78 | CES61 = 85 | CES86 = 65 |
| CES12 = 66 | CES37 = 75 | CES62 = 69 | CES87 = 78 |
| CES13 = 43 | CES38 = 53 | CES63 = 68 | CES88 = 73 |
| CES14 = 74 | CES39 = 91 | CES64 = 68 | CES89 = 68 |
| CES15 = 71 | CES40 = 85 | CES65 = 65 | CES90 = 68 |
| CES16 = 48 | CES41 = 76 | CES66 = 62 | CES91 = 91 |
| CES17 = 50 | CES42 = 76 | CES67 = 60 | CES92 = 71 |
| CES18 = 57 | CES43 = 65 | CES68 = 68 | CES93 = 82 |
| CES19 = 73 | CES44 = 98 | CES69 = 77 | CES94 = 57 |
| CES20 = 67 | CES45 = 75 | CES70 = 60 | CES95 = 78 |
| CES21 = 88 | CES46 = 70 | CES71 = 57 | CES96 = 80 |
| CES22 = 80 | CES47 = 63 | CES72 = 86 | CES97 = 79 |
| CES23 = 92 | CES48 = 51 | CES73 = 52 | CES98 = 71 |
| CES24 = 91 | CES49 = 68 | CES74 = 90 | CES99 = 64 |
| CES25 = 73 | CES50 = 77 | CES75 = 58 | |



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Color Rendition by Hue-Angle Bin



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Measure Comparisons



(END OF REPORT)