

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: P363310

Luminaire Tested: NVN-SA6C-727-U-T4W-HSS

Issue Date: 3/3/2020

Test Information

Test Method: LM-79-2019
Report Number: P363310
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-19)
Test Lab: INNOVATION CENTER
Issue Date: 3/3/2020
Manufacturer: COOPER LIGHTING SOLUTIONS
Product Line: STREETWORKS
Catalog Number: NVN-SA6C-727-U-T4W-HSS
Description: NAVION ROADWAY AND AREA LUMINAIRE
(6) 70 CRI, 2700K, 1050mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE IV WIDE OPTICS WITH HOUSE SIDE SHIELD
Light Source: -
Ballast/Driver: ELECTRONIC DRIVER

Summary

Lumens per Lamp: N/A
Luminaire Lumens: 25820 lumens
Efficiency: N/A
Efficacy: 77.5 lumens/watt
Luminous Opening: Rectangular (W 1' x L: 1.5' x H: 0')
IES Classification: Type IV - Short
BUG Rating: B2 - U0 - G4

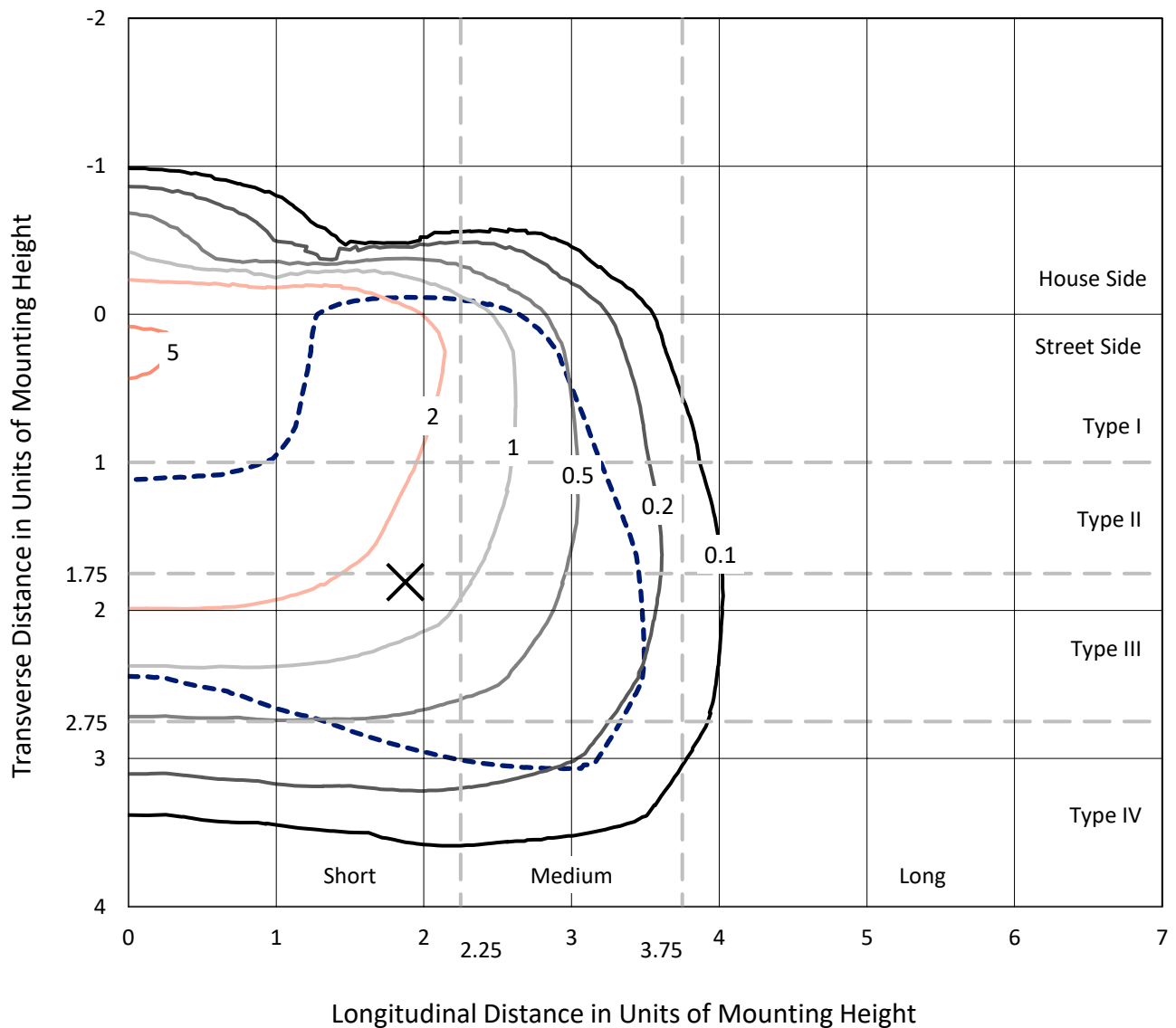
Input Watts (W): 333
Input Voltage (V): NR
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 28.75 FT



REPORT NUMBER: P363310
 CATALOG NUMBER: NVN-SA6C-727-U-T4W-HSS

Iso-Footcandle Lines of Horizontal Illumination

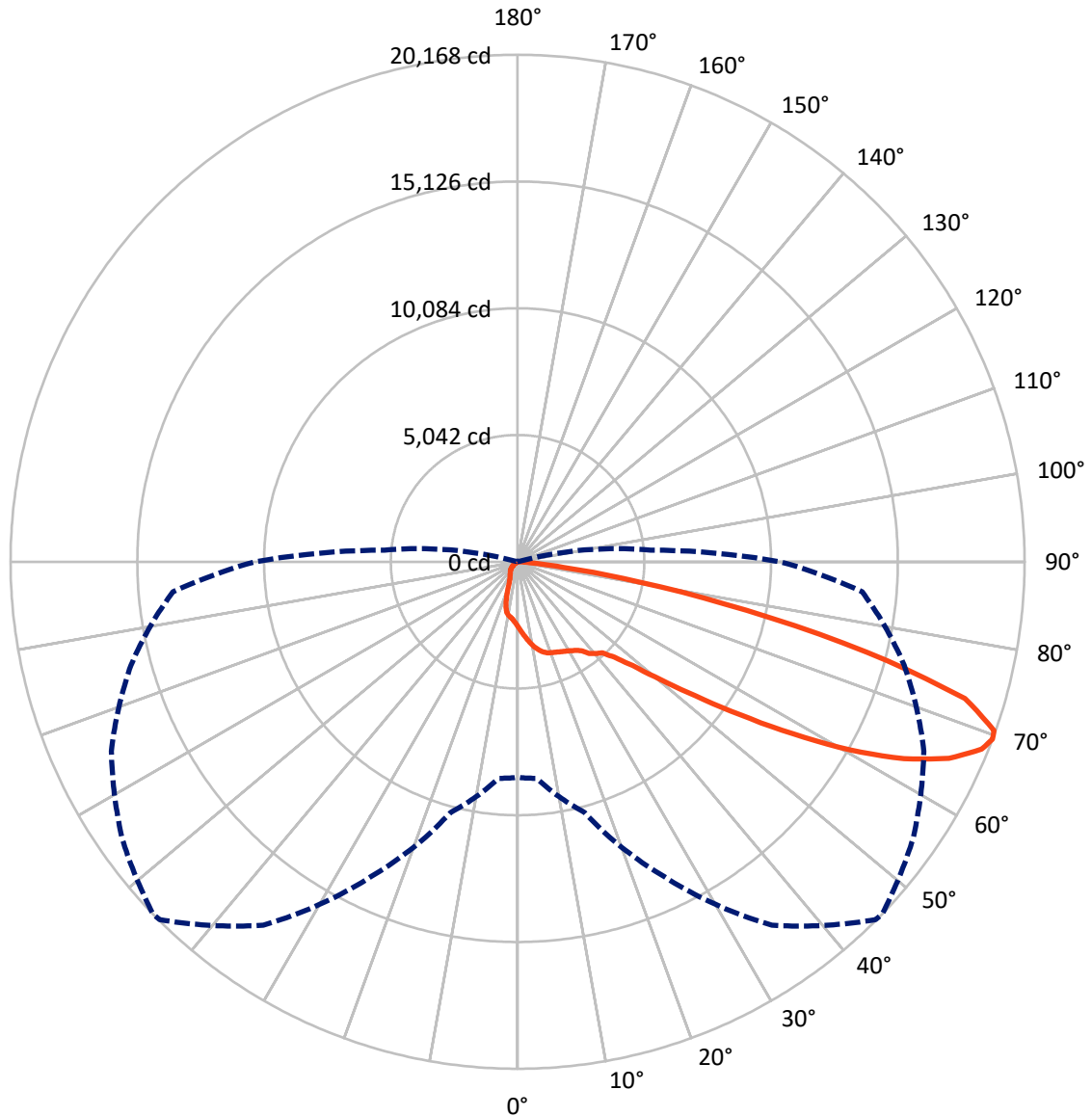
✕ Max cd
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 6 fc
 Type IV - Short - N/A

REPORT NUMBER: P363310
CATALOG NUMBER: NVN-SA6C-727-U-T4W-HSS

Luminous Intensity Polar Plot



— Vertical Plane Through 46-Deg Lateral - - - Horizontal Cone Through 69-Deg Vertical

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 CATALOG NUMBER: NVN-SA6C-727-U-T4W-HSS

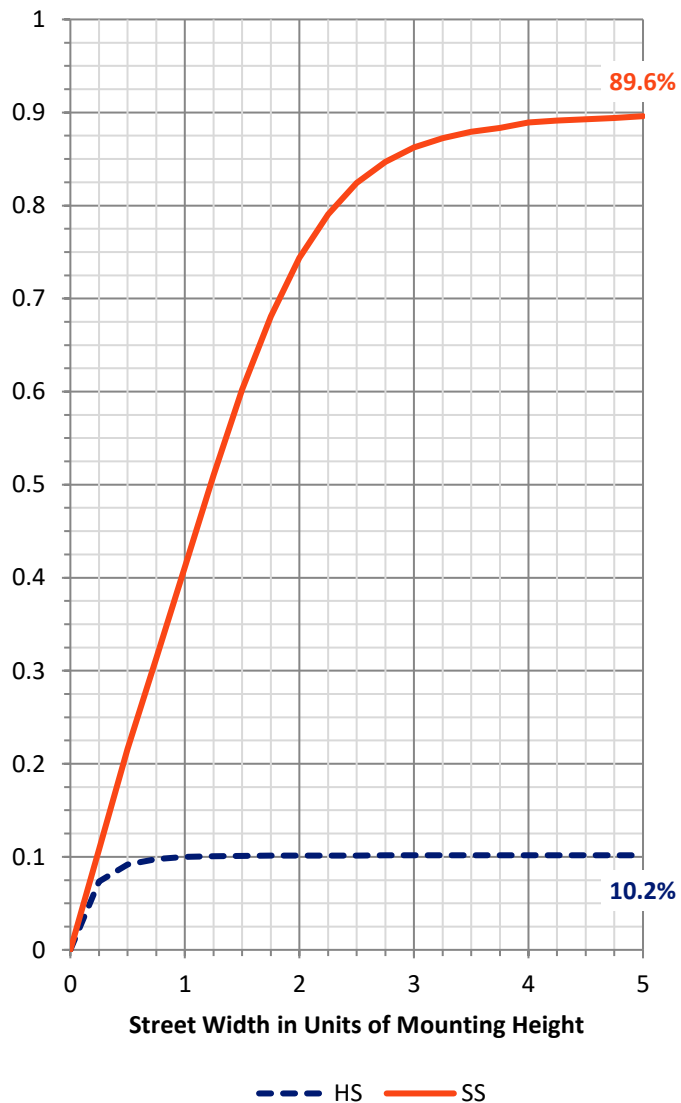
FLUX DISTRIBUTION:

| | | Downward | Upward | Total |
|--------------------|-----------|----------|--------|---------|
| House Side | Lumens | 2649.8 | 0.0 | 2649.8 |
| | % Fixture | 10.3 | 0.0 | 10.3 |
| Street Side | Lumens | 23170.2 | 0.0 | 23170.2 |
| | % Fixture | 89.7 | 0.0 | 89.7 |
| Total | Lumens | 25820.0 | 0.0 | 25820.0 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|---------|-----------|
| 0°-10° | 257.5 | 1.0 |
| 10°-20° | 781.2 | 3.0 |
| 20°-30° | 1228.6 | 4.8 |
| 30°-40° | 1761.8 | 6.8 |
| 40°-50° | 3045.0 | 11.8 |
| 50°-60° | 6015.7 | 23.3 |
| 60°-70° | 8407.5 | 32.6 |
| 70°-80° | 4061.7 | 15.7 |
| 80°-90° | 261.1 | 1.0 |
| 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° | 25820.0 | 100.0 |
| 0°-180° | 25820.0 | 100.0 |

Coefficient of Utilization

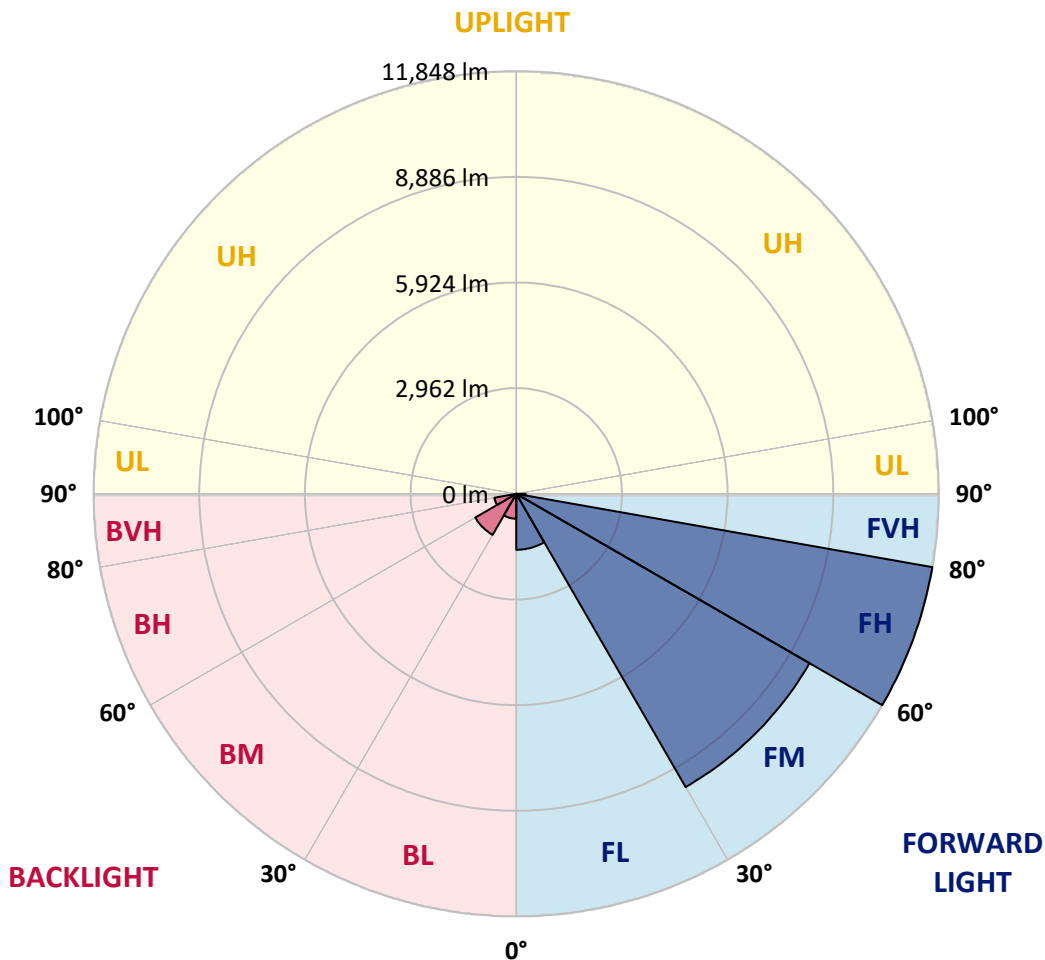


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LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | Lumens | % Fixture | Zone Rating/Lumen Limit | | |
|----------------|---------|-----------|-------------------------|------|----------|
| | | | B | U | G |
| FL (0°-30°) | 1568.9 | 6.1 | | | |
| FM (30°-60°) | 9494.6 | 36.8 | | | |
| FH (60°-80°) | 11847.8 | 45.9 | | | G4/12000 |
| FVH (80°-90°) | 258.9 | 1.0 | | | G3/500 |
| BL (0°-30°) | 698.4 | 2.7 | B2/1000 | | |
| BM (30°-60°) | 1327.9 | 5.1 | B2/2500 | | |
| BH (60°-80°) | 621.3 | 2.4 | B2/1000 | | G2/1000 |
| BVH (80°-90°) | 2.2 | 0.0 | | | G0/10 |
| UL (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH (100°-180°) | 0.0 | 0.0 | | U0/0 | |

BUG Rating: B2-U0-G4
 Type IV Short





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CANDELA DISTRIBUTION (FULL):

| | 0° | 5° | 15° | 25° | 35° | 45° | 46° | 55° | 65° | 75° | 85° |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0° | 2587.1 | 2587.1 | 2587.1 | 2587.1 | 2587.1 | 2587.1 | 2587.1 | 2587.1 | 2587.1 | 2587.1 | 2587.1 |
| 2.5° | 2874.0 | 2870.3 | 2853.4 | 2846.1 | 2805.0 | 2780.8 | 2771.1 | 2740.8 | 2697.2 | 2653.7 | 2605.2 |
| 5° | 3200.8 | 3199.6 | 3168.2 | 3137.9 | 3060.4 | 2987.8 | 2974.5 | 2904.2 | 2806.2 | 2714.2 | 2622.2 |
| 7.5° | 3535.0 | 3519.2 | 3487.8 | 3429.7 | 3317.1 | 3200.8 | 3189.9 | 3090.7 | 2951.5 | 2818.3 | 2686.3 |
| 10° | 3818.3 | 3808.6 | 3767.4 | 3679.0 | 3547.1 | 3415.1 | 3401.8 | 3279.5 | 3122.2 | 2958.7 | 2790.4 |
| 12.5° | 4038.6 | 4031.3 | 3976.8 | 3866.7 | 3726.2 | 3589.5 | 3571.3 | 3462.3 | 3294.1 | 3111.3 | 2912.7 |
| 15° | 4173.0 | 4169.3 | 4102.7 | 3985.3 | 3847.3 | 3728.7 | 3712.9 | 3617.3 | 3461.1 | 3269.8 | 3045.9 |
| 17.5° | 4204.4 | 4205.6 | 4136.6 | 4018.0 | 3904.2 | 3819.5 | 3807.4 | 3734.7 | 3604.0 | 3413.9 | 3179.1 |
| 20° | 4134.2 | 4148.8 | 4087.0 | 3984.1 | 3913.9 | 3869.1 | 3859.4 | 3815.8 | 3705.7 | 3526.5 | 3285.6 |
| 22.5° | 4035.0 | 4042.2 | 3999.8 | 3930.8 | 3901.8 | 3910.3 | 3905.4 | 3881.2 | 3788.0 | 3623.3 | 3390.9 |
| 25° | 3974.4 | 3974.4 | 3949.0 | 3890.9 | 3910.3 | 3962.3 | 3963.5 | 3958.7 | 3884.8 | 3742.0 | 3519.2 |
| 27.5° | 3972.0 | 3964.7 | 3935.7 | 3892.1 | 3945.4 | 4025.3 | 4030.1 | 4062.8 | 4016.8 | 3886.0 | 3679.0 |
| 30° | 4068.9 | 4060.4 | 3998.6 | 3941.7 | 4009.5 | 4095.5 | 4107.6 | 4179.0 | 4156.0 | 4042.2 | 3857.0 |
| 32.5° | 4295.2 | 4265.0 | 4128.2 | 4035.0 | 4085.8 | 4188.7 | 4204.4 | 4318.2 | 4354.6 | 4234.7 | 4028.9 |
| 35° | 4605.1 | 4509.5 | 4312.2 | 4211.7 | 4216.5 | 4324.3 | 4338.8 | 4505.9 | 4613.6 | 4411.5 | 4162.1 |
| 37.5° | 5032.5 | 4985.3 | 4664.5 | 4395.7 | 4417.5 | 4580.9 | 4623.3 | 4804.9 | 4774.6 | 4508.3 | 4313.4 |
| 40° | 5969.5 | 5895.7 | 5554.3 | 4911.4 | 4610.0 | 4789.2 | 4802.5 | 4899.3 | 4901.7 | 4727.4 | 4628.2 |
| 42.5° | 7245.5 | 7215.2 | 6855.7 | 5847.2 | 4988.9 | 4928.4 | 4952.6 | 5116.0 | 5298.8 | 5189.9 | 5185.0 |
| 45° | 8658.3 | 8642.5 | 8261.2 | 7089.3 | 5755.2 | 5384.8 | 5415.0 | 5634.2 | 5984.0 | 6008.2 | 6162.0 |
| 47.5° | 9795.0 | 9787.8 | 9568.6 | 8475.5 | 6928.3 | 6158.4 | 6168.0 | 6400.5 | 7015.5 | 7319.3 | 7565.1 |
| 50° | 10831.3 | 10866.4 | 10693.3 | 9975.4 | 8526.3 | 7370.2 | 7347.2 | 7502.1 | 8490.0 | 8987.5 | 9292.6 |
| 52.5° | 12271.9 | 12321.6 | 11836.1 | 11374.9 | 10203.0 | 8873.8 | 8855.6 | 9017.8 | 10262.3 | 10635.2 | 10689.7 |
| 55° | 13544.3 | 13459.5 | 13075.8 | 12942.6 | 12247.7 | 10730.8 | 10726.0 | 10868.8 | 11976.5 | 12135.1 | 12235.6 |
| 57.5° | 14106.0 | 14073.3 | 14258.5 | 14563.6 | 14389.3 | 12925.7 | 12914.8 | 12805.8 | 13510.4 | 13527.3 | 13836.0 |
| 60° | 14460.7 | 14500.7 | 15068.4 | 16009.1 | 16443.7 | 15287.5 | 15217.3 | 14552.7 | 14975.2 | 14937.7 | 15268.2 |
| 62.5° | 14194.4 | 14273.1 | 15294.8 | 16862.5 | 17981.1 | 17349.2 | 17249.9 | 16153.1 | 16227.0 | 16097.4 | 16404.9 |
| 65° | 12780.4 | 12902.7 | 14576.9 | 16701.5 | 18743.8 | 18960.5 | 18860.0 | 17565.9 | 17220.9 | 17007.8 | 16837.1 |
| 67.5° | 10377.3 | 10450.0 | 12198.1 | 15300.9 | 18400.0 | 19921.8 | 19901.2 | 18804.4 | 17971.5 | 16854.1 | 15529.7 |
| 69° | 8575.9 | 8647.4 | 10330.1 | 13826.3 | 17643.4 | 20127.6 | 20167.5 | 19201.4 | 17828.6 | 15919.5 | 13759.8 |
| 70° | 7263.6 | 7339.9 | 8907.6 | 12562.5 | 16765.7 | 20031.9 | 20103.3 | 19163.9 | 17419.4 | 14837.2 | 12206.6 |
| 72.5° | 3809.8 | 3875.2 | 5484.1 | 8654.6 | 13667.8 | 18394.0 | 18610.7 | 17544.1 | 14765.8 | 10775.6 | 7217.6 |
| 75° | 1197.3 | 1234.8 | 2141.6 | 4524.0 | 9358.0 | 14302.1 | 14351.7 | 13762.2 | 10485.1 | 5927.1 | 3005.9 |
| 77.5° | 456.4 | 445.5 | 713.0 | 1667.0 | 4731.1 | 9005.7 | 9309.6 | 8600.2 | 5502.2 | 2095.6 | 693.7 |
| 80° | 245.8 | 247.0 | 370.4 | 690.0 | 2024.1 | 4628.2 | 4884.8 | 4168.1 | 1955.1 | 653.7 | 159.8 |
| 82.5° | 106.5 | 111.4 | 208.2 | 365.6 | 929.7 | 1707.0 | 1835.3 | 1527.8 | 746.9 | 439.5 | 59.3 |
| 85° | 23.0 | 25.4 | 100.5 | 198.5 | 378.9 | 479.4 | 502.4 | 495.1 | 475.8 | 341.4 | 23.0 |
| 87.5° | 0.0 | 0.0 | 44.8 | 71.4 | 95.6 | 109.0 | 95.6 | 124.7 | 262.7 | 230.0 | 12.1 |
| 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: P363310

CATALOG NUMBER: NVN-SA6C-727-U-T4W-HSS

CANDELA DISTRIBUTION (continued):

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|-------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0° | 2587.1 | 2587.1 | 2587.1 | 2587.1 | 2587.1 | 2587.1 | 2587.1 | 2587.1 | 2587.1 | 2587.1 | 2587.1 |
| 2.5° | 2589.5 | 2567.7 | 2530.2 | 2489.0 | 2460.0 | 2429.7 | 2405.5 | 2394.6 | 2382.5 | 2374.0 | 2384.9 |
| 5° | 2584.6 | 2542.3 | 2469.6 | 2399.4 | 2348.6 | 2307.4 | 2273.5 | 2260.2 | 2246.9 | 2237.2 | 2236.0 |
| 7.5° | 2627.0 | 2567.7 | 2456.3 | 2353.4 | 2274.7 | 2219.0 | 2173.0 | 2153.7 | 2137.9 | 2130.7 | 2124.6 |
| 10° | 2708.1 | 2631.9 | 2483.0 | 2348.6 | 2246.9 | 2152.5 | 2053.2 | 1976.9 | 1927.3 | 1904.3 | 1895.8 |
| 12.5° | 2813.5 | 2717.8 | 2533.8 | 2374.0 | 2226.3 | 2044.7 | 1834.1 | 1652.5 | 1535.0 | 1496.3 | 1473.3 |
| 15° | 2936.9 | 2818.3 | 2600.4 | 2406.7 | 2151.2 | 1819.5 | 1462.4 | 1225.1 | 1116.2 | 1094.4 | 1070.2 |
| 17.5° | 3055.6 | 2924.8 | 2680.3 | 2412.7 | 1986.6 | 1453.9 | 1071.4 | 910.4 | 868.0 | 882.5 | 886.2 |
| 20° | 3159.7 | 3030.1 | 2759.0 | 2359.5 | 1687.6 | 1090.8 | 829.3 | 789.3 | 805.1 | 832.9 | 837.7 |
| 22.5° | 3265.0 | 3131.8 | 2831.6 | 2219.0 | 1305.0 | 828.1 | 746.9 | 756.6 | 772.4 | 800.2 | 805.1 |
| 25° | 3393.3 | 3255.3 | 2899.4 | 1961.2 | 979.4 | 704.6 | 709.4 | 723.9 | 739.7 | 765.1 | 767.5 |
| 27.5° | 3541.0 | 3411.5 | 2944.2 | 1625.8 | 726.4 | 647.7 | 663.4 | 685.2 | 700.9 | 725.2 | 730.0 |
| 30° | 3737.1 | 3617.3 | 2958.7 | 1278.4 | 608.9 | 596.8 | 604.1 | 630.7 | 653.7 | 675.5 | 679.2 |
| 32.5° | 3921.2 | 3820.7 | 2910.3 | 964.9 | 564.1 | 549.6 | 549.6 | 565.4 | 592.0 | 612.6 | 617.4 |
| 35° | 4090.6 | 4025.3 | 2755.3 | 705.8 | 530.2 | 506.0 | 493.9 | 493.9 | 510.9 | 527.8 | 532.7 |
| 37.5° | 4314.6 | 4312.2 | 2504.7 | 562.9 | 497.6 | 469.7 | 444.3 | 424.9 | 418.9 | 422.5 | 424.9 |
| 40° | 4698.4 | 4702.0 | 2177.9 | 504.8 | 469.7 | 432.2 | 393.4 | 358.3 | 325.7 | 314.8 | 313.5 |
| 42.5° | 5297.6 | 5243.1 | 1835.3 | 477.0 | 445.5 | 393.4 | 335.3 | 288.1 | 237.3 | 221.5 | 220.3 |
| 45° | 6249.2 | 5925.9 | 1472.1 | 451.6 | 420.1 | 349.9 | 277.2 | 213.1 | 171.9 | 159.8 | 159.8 |
| 47.5° | 7635.3 | 6823.0 | 1140.4 | 423.7 | 386.2 | 300.2 | 209.4 | 153.7 | 125.9 | 119.9 | 121.1 |
| 50° | 9068.7 | 7701.9 | 874.1 | 388.6 | 345.0 | 248.2 | 155.0 | 111.4 | 95.6 | 95.6 | 96.8 |
| 52.5° | 10339.8 | 8345.9 | 681.6 | 351.1 | 294.2 | 194.9 | 117.4 | 87.2 | 79.9 | 78.7 | 79.9 |
| 55° | 11529.8 | 8761.2 | 521.8 | 307.5 | 233.6 | 145.3 | 89.6 | 71.4 | 66.6 | 64.2 | 63.0 |
| 57.5° | 12677.5 | 8967.0 | 391.0 | 248.2 | 169.5 | 105.3 | 71.4 | 60.5 | 55.7 | 52.1 | 50.8 |
| 60° | 13441.4 | 8799.9 | 268.8 | 182.8 | 117.4 | 76.3 | 59.3 | 52.1 | 46.0 | 42.4 | 41.2 |
| 62.5° | 13872.3 | 8343.5 | 173.1 | 132.0 | 83.5 | 56.9 | 47.2 | 43.6 | 35.1 | 31.5 | 31.5 |
| 65° | 13698.0 | 7590.5 | 121.1 | 94.4 | 60.5 | 42.4 | 35.1 | 35.1 | 25.4 | 20.6 | 19.4 |
| 67.5° | 12138.8 | 6412.6 | 92.0 | 70.2 | 43.6 | 31.5 | 26.6 | 30.3 | 15.7 | 9.7 | 9.7 |
| 69° | 10443.9 | 5314.6 | 78.7 | 58.1 | 36.3 | 25.4 | 23.0 | 27.8 | 10.9 | 7.3 | 6.1 |
| 70° | 9077.1 | 4584.6 | 71.4 | 50.8 | 30.3 | 21.8 | 20.6 | 26.6 | 10.9 | 6.1 | 4.8 |
| 72.5° | 5430.8 | 2556.8 | 54.5 | 36.3 | 19.4 | 16.9 | 16.9 | 30.3 | 10.9 | 6.1 | 4.8 |
| 75° | 2194.8 | 900.7 | 40.0 | 25.4 | 14.5 | 14.5 | 20.6 | 38.7 | 9.7 | 4.8 | 3.6 |
| 77.5° | 497.6 | 197.3 | 23.0 | 15.7 | 9.7 | 14.5 | 24.2 | 30.3 | 6.1 | 2.4 | 0.0 |
| 80° | 121.1 | 48.4 | 14.5 | 9.7 | 6.1 | 10.9 | 18.2 | 16.9 | 1.2 | 0.0 | 0.0 |
| 82.5° | 40.0 | 16.9 | 6.1 | 4.8 | 1.2 | 3.6 | 8.5 | 4.8 | 0.0 | 0.0 | 0.0 |
| 85° | 16.9 | 9.7 | 2.4 | 1.2 | 0.0 | 0.0 | 1.2 | 0.0 | 0.0 | 0.0 | 0.0 |
| 87.5° | 10.9 | 3.6 | 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 |

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

| | | | |
|-----------|------|------|-------|
| 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 | | |

Rf: 69.9
 Rg: 98.3



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 |

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

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

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

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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TM-30-18

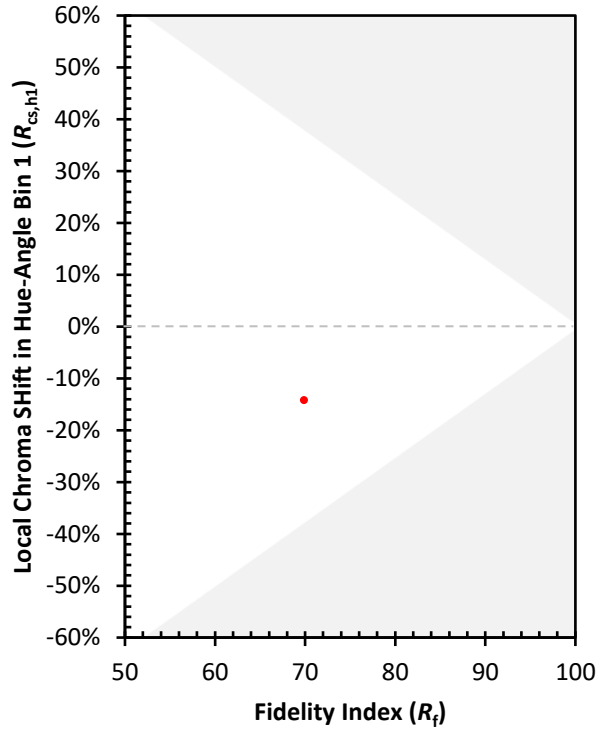
Color Rendition by Hue-Angle Bin



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Measure Comparisons



(END OF REPORT)