

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: P363760

Luminaire Tested: NVN-SA6B-750-U-SL4-HSS

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-2019  
Report Number: P363760  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-25)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: STREETWORKS  
Catalog Number: NVN-SA6B-750-U-SL4-HSS  
Description: NAVION ROADWAY AND AREA LUMINAIRE  
(6) 70 CRI, 5000K, 800mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE IV SPILL  
LIGHT ELIMINATOR OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 28172 lumens  
Efficiency: N/A  
Efficacy: 113.1 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 1.5' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B2 - U0 - G4

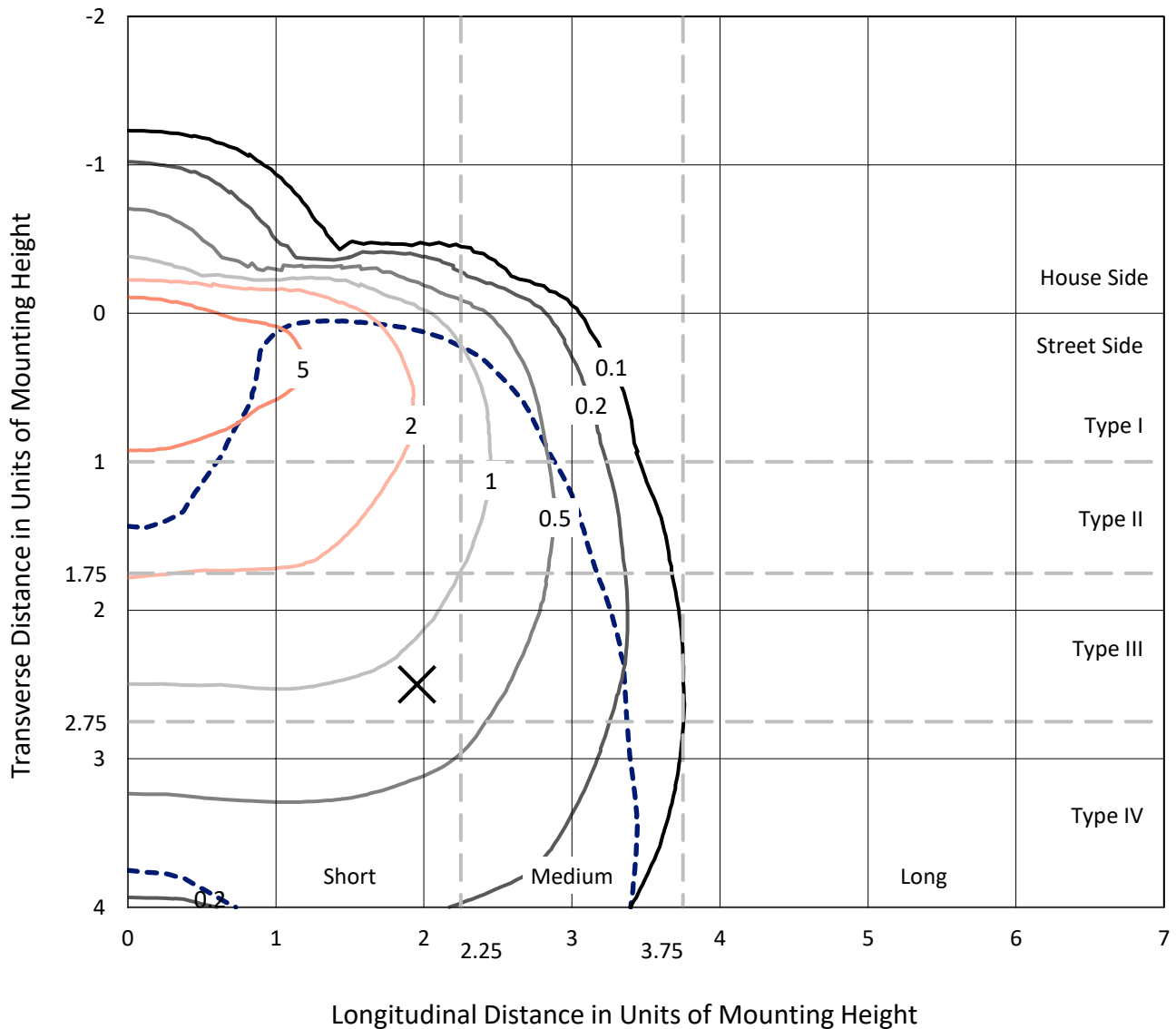
Input Watts (W): 249  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT



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## Iso-Footcandle Lines of Horizontal Illumination

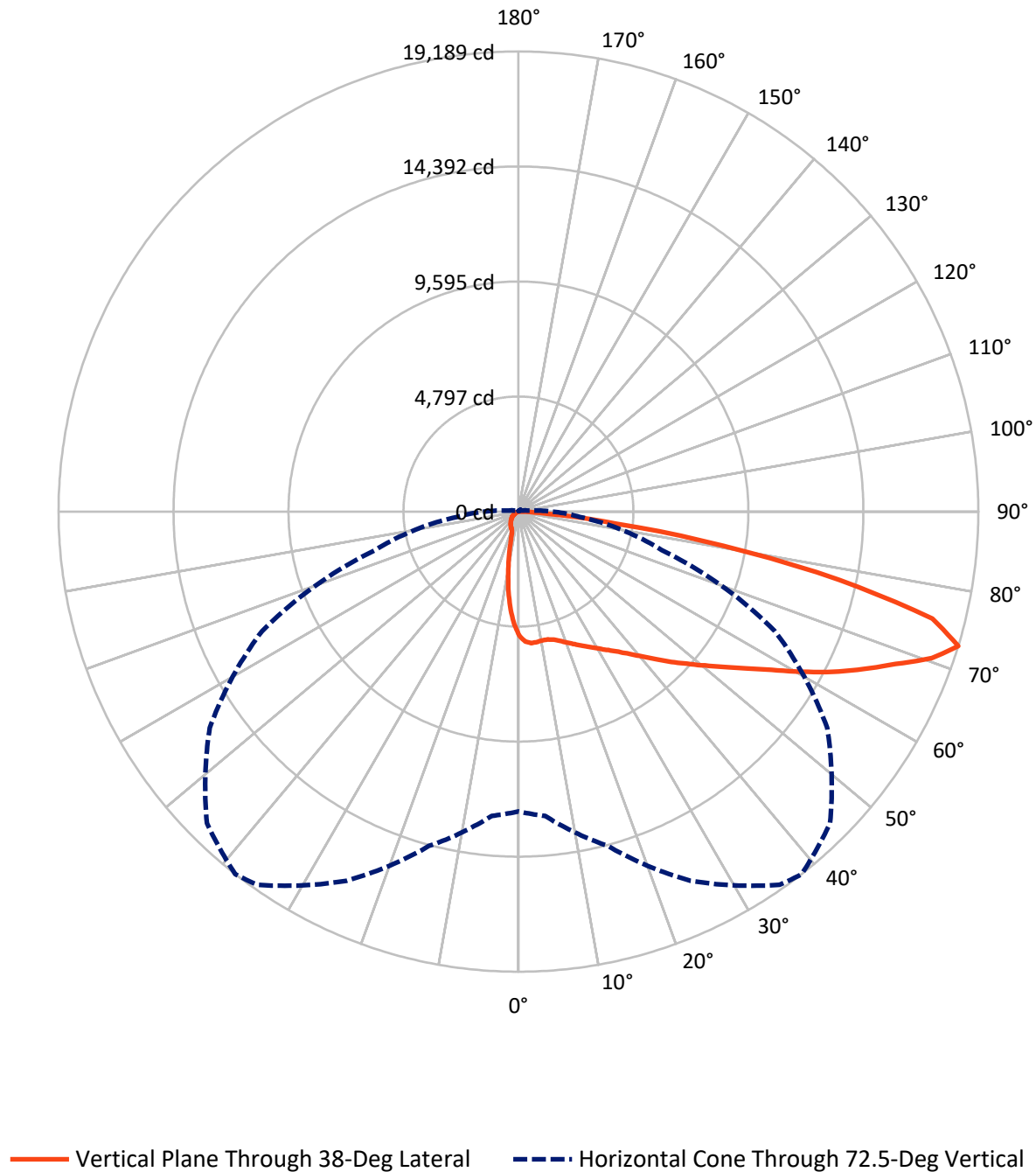
× Max cd  
 --- 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 8.8 fc  
 Type IV - Short - N/A

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## Luminous Intensity Polar Plot



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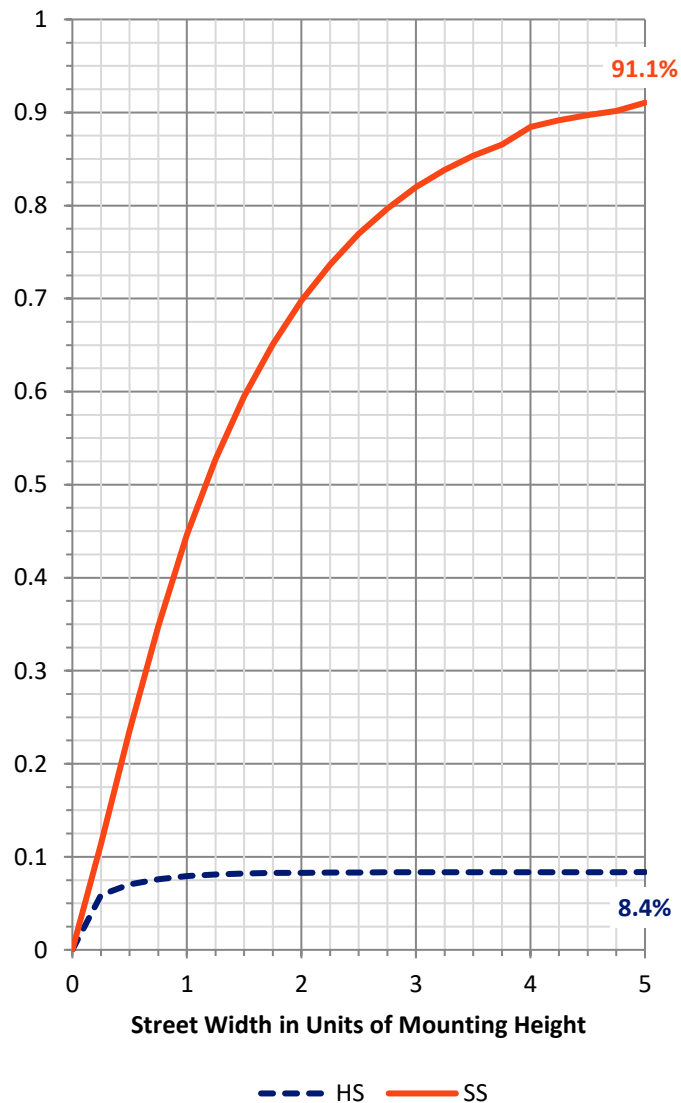
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 2370.8   | 0.0    | 2370.8  |
|                    | % Fixture | 8.4      | 0.0    | 8.4     |
| <b>Street Side</b> | Lumens    | 25801.2  | 0.0    | 25801.2 |
|                    | % Fixture | 91.6     | 0.0    | 91.6    |
| <b>Total</b>       | Lumens    | 28172.0  | 0.0    | 28172.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 441.5   | 1.6       |
| 10°-20°   | 1079.6  | 3.8       |
| 20°-30°   | 1717.0  | 6.1       |
| 30°-40°   | 2581.4  | 9.2       |
| 40°-50°   | 3938.0  | 14.0      |
| 50°-60°   | 5565.8  | 19.8      |
| 60°-70°   | 6981.4  | 24.8      |
| 70°-80°   | 5220.1  | 18.5      |
| 80°-90°   | 647.3   | 2.3       |
| 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°    | 28172.0 | 100.0     |
| 0°-180°   | 28172.0 | 100.0     |

**Coefficient of Utilization**



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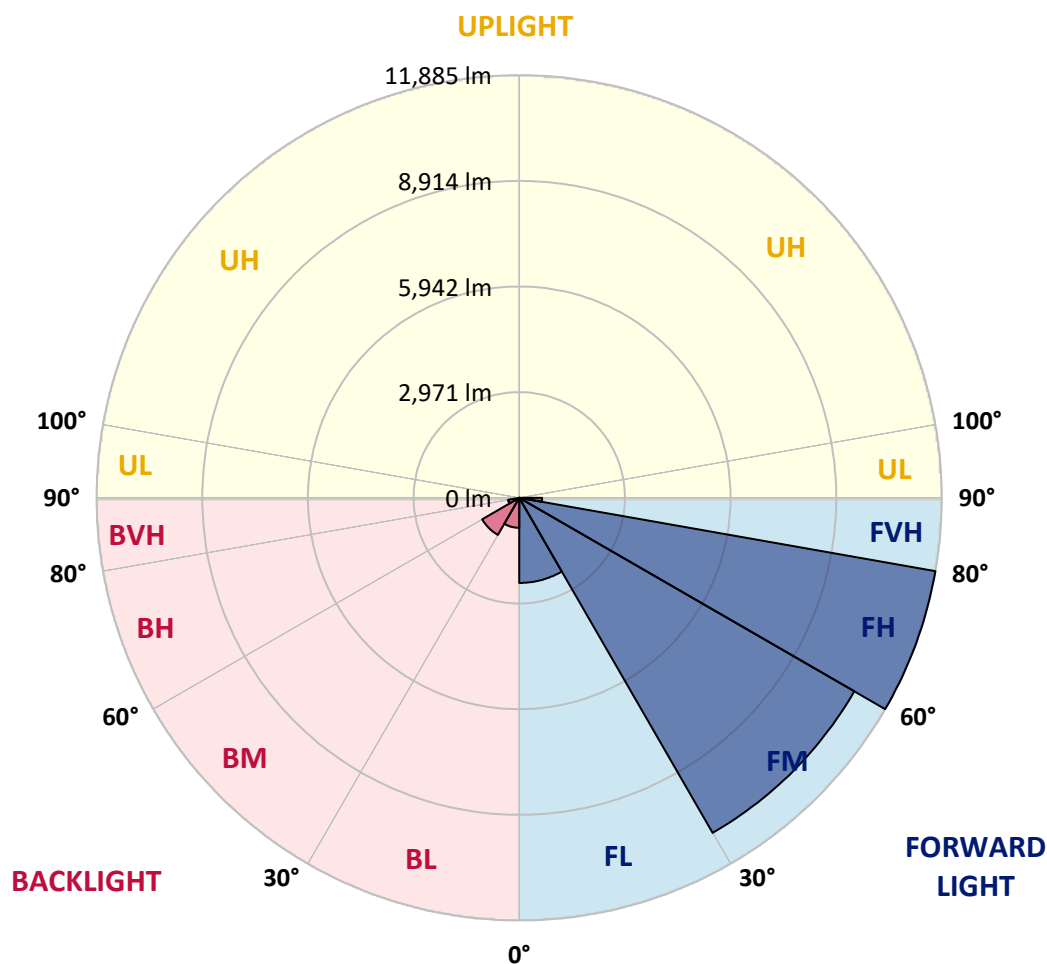
CATALOG NUMBER: NVN-SA6B-750-U-SL4-HSS

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |          |
|------|-------------|---------|-----------|-------------------------|------|----------|
|      |             |         |           | B                       | U    | G        |
| FL   | (0°-30°)    | 2393.9  | 8.5       |                         |      |          |
| FM   | (30°-60°)   | 10881.3 | 38.6      |                         |      |          |
| FH   | (60°-80°)   | 11884.8 | 42.2      |                         |      | G4/12000 |
| FVH  | (80°-90°)   | 641.2   | 2.3       |                         |      | G4/750   |
| BL   | (0°-30°)    | 844.1   | 3.0       | B2/1000                 |      |          |
| BM   | (30°-60°)   | 1203.9  | 4.3       | B2/2500                 |      |          |
| BH   | (60°-80°)   | 316.7   | 1.1       | B1/500                  |      | G1/500   |
| BVH  | (80°-90°)   | 6.0     | 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°     | 38°     | 45°     | 55°     | 65°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 5180.7  | 5180.7  | 5180.7  | 5180.7  | 5180.7  | 5180.7  | 5180.7  | 5180.7  | 5180.7  | 5180.7  | 5180.7  |
| 2.5°  | 5499.0  | 5500.1  | 5487.3  | 5466.2  | 5439.3  | 5425.3  | 5401.9  | 5364.4  | 5324.6  | 5253.3  | 5176.1  |
| 5°    | 5611.3  | 5611.3  | 5594.9  | 5566.8  | 5523.5  | 5510.7  | 5466.2  | 5406.5  | 5324.6  | 5208.8  | 5078.9  |
| 7.5°  | 5599.6  | 5601.9  | 5579.7  | 5550.5  | 5507.2  | 5495.5  | 5441.6  | 5375.0  | 5273.2  | 5132.8  | 4966.6  |
| 10°   | 5538.8  | 5544.6  | 5527.1  | 5513.0  | 5473.2  | 5460.4  | 5410.1  | 5343.4  | 5241.6  | 5091.8  | 4901.1  |
| 12.5° | 5476.7  | 5482.6  | 5488.4  | 5501.3  | 5476.7  | 5472.1  | 5432.3  | 5376.1  | 5279.0  | 5123.4  | 4908.1  |
| 15°   | 5437.0  | 5448.7  | 5490.8  | 5541.1  | 5546.9  | 5542.3  | 5516.5  | 5463.9  | 5365.6  | 5204.1  | 4958.4  |
| 17.5° | 5437.0  | 5455.7  | 5543.4  | 5639.4  | 5673.3  | 5676.8  | 5654.6  | 5580.9  | 5463.9  | 5290.7  | 5005.2  |
| 20°   | 5482.6  | 5508.3  | 5645.2  | 5780.9  | 5837.1  | 5837.1  | 5793.8  | 5690.9  | 5554.0  | 5369.1  | 5036.8  |
| 22.5° | 5599.6  | 5633.5  | 5805.5  | 5962.3  | 6022.0  | 6009.1  | 5950.6  | 5800.8  | 5647.6  | 5458.0  | 5076.6  |
| 25°   | 5830.1  | 5855.8  | 6034.8  | 6192.8  | 6229.1  | 6199.8  | 6126.1  | 5934.2  | 5766.9  | 5578.5  | 5149.1  |
| 27.5° | 6127.3  | 6130.8  | 6315.6  | 6449.0  | 6426.8  | 6406.9  | 6314.5  | 6101.5  | 5938.9  | 5750.5  | 5274.3  |
| 30°   | 6453.7  | 6453.7  | 6616.3  | 6718.1  | 6650.3  | 6633.9  | 6541.4  | 6303.9  | 6158.9  | 5984.5  | 5452.2  |
| 32.5° | 6769.6  | 6783.6  | 6915.8  | 6980.2  | 6904.1  | 6887.8  | 6797.7  | 6560.2  | 6451.4  | 6341.4  | 5729.5  |
| 35°   | 7075.0  | 7085.5  | 7210.7  | 7245.8  | 7173.2  | 7177.9  | 7113.6  | 6912.3  | 6871.4  | 6857.3  | 6147.2  |
| 37.5° | 7371.0  | 7373.3  | 7500.8  | 7523.1  | 7486.8  | 7526.6  | 7532.4  | 7354.6  | 7430.6  | 7544.1  | 6735.7  |
| 40°   | 7641.2  | 7643.6  | 7769.9  | 7827.3  | 7889.3  | 7940.8  | 7986.4  | 7891.6  | 8143.2  | 8406.4  | 7436.5  |
| 42.5° | 7857.7  | 7882.3  | 8042.5  | 8151.4  | 8315.2  | 8413.4  | 8537.5  | 8532.8  | 8991.4  | 9386.9  | 8283.6  |
| 45°   | 8048.4  | 8090.5  | 8314.0  | 8504.7  | 8785.5  | 8942.3  | 9136.5  | 9288.6  | 9946.1  | 10478.5 | 9141.2  |
| 47.5° | 8299.9  | 8339.7  | 8594.8  | 8907.2  | 9281.6  | 9487.5  | 9809.2  | 10138.0 | 10995.6 | 11550.2 | 9978.9  |
| 50°   | 8654.5  | 8636.9  | 8888.5  | 9336.6  | 9817.4  | 10087.7 | 10546.3 | 11038.9 | 12036.9 | 12483.8 | 10471.5 |
| 52.5° | 9032.4  | 9025.3  | 9211.4  | 9803.4  | 10449.2 | 10765.1 | 11371.2 | 11970.2 | 13032.6 | 13127.3 | 10697.3 |
| 55°   | 9500.4  | 9450.0  | 9606.8  | 10335.7 | 11199.2 | 11538.5 | 12252.2 | 12892.2 | 13825.8 | 13490.0 | 10810.8 |
| 57.5° | 9990.6  | 9907.5  | 10057.3 | 10928.9 | 12045.1 | 12446.4 | 13228.0 | 13790.7 | 14353.5 | 13738.1 | 10809.6 |
| 60°   | 10497.2 | 10398.9 | 10576.8 | 11670.7 | 13095.8 | 13560.2 | 14285.6 | 14398.0 | 14846.1 | 13863.3 | 10730.0 |
| 62.5° | 10920.7 | 10862.2 | 11126.7 | 12464.0 | 14269.3 | 14725.6 | 15084.7 | 14950.2 | 15261.4 | 13960.4 | 10544.0 |
| 65°   | 11368.8 | 11372.4 | 11799.4 | 13389.4 | 15516.5 | 15824.2 | 15854.6 | 15666.2 | 15608.9 | 13940.5 | 9914.5  |
| 67.5° | 11974.9 | 12031.1 | 12743.6 | 14646.0 | 16729.8 | 16967.3 | 16964.9 | 16441.9 | 15862.8 | 13149.6 | 8518.7  |
| 70°   | 12616.1 | 12748.3 | 13831.7 | 16083.9 | 18054.2 | 18295.2 | 18171.2 | 16935.7 | 14936.2 | 10632.9 | 6029.0  |
| 72.5° | 12508.4 | 12737.7 | 14436.6 | 16990.7 | 19005.4 | 19189.1 | 18383.0 | 15722.4 | 11805.2 | 6179.9  | 2567.0  |
| 75°   | 9650.1  | 9915.7  | 13237.3 | 16092.1 | 18007.4 | 17842.4 | 15794.9 | 12234.6 | 6451.4  | 1724.6  | 578.0   |
| 77.5° | 5097.7  | 5239.2  | 8744.5  | 12259.2 | 14041.1 | 13696.0 | 11126.7 | 6787.1  | 1966.8  | 427.0   | 259.7   |
| 80°   | 2669.9  | 2702.7  | 3810.7  | 6955.6  | 8666.2  | 8668.5  | 6594.1  | 2981.1  | 810.8   | 218.8   | 174.3   |
| 82.5° | 1429.7  | 1457.8  | 2013.6  | 3214.0  | 4540.8  | 4116.0  | 2524.8  | 1640.3  | 471.5   | 124.0   | 167.3   |
| 85°   | 344.0   | 349.8   | 1141.9  | 1468.3  | 1785.4  | 1275.3  | 750.0   | 1377.1  | 127.5   | 72.5    | 135.7   |
| 87.5° | 132.2   | 134.5   | 423.5   | 635.3   | 455.1   | 294.8   | 351.0   | 513.6   | 16.4    | 28.1    | 21.1    |
| 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: P363760

CATALOG NUMBER: NVN-SA6B-750-U-SL4-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 5180.7 | 5180.7 | 5180.7 | 5180.7 | 5180.7 | 5180.7 | 5180.7 | 5180.7 | 5180.7 | 5180.7 | 5180.7 |
| 2.5°  | 5129.3 | 5098.8 | 5024.0 | 4929.2 | 4844.9 | 4784.1 | 4692.9 | 4633.2 | 4593.4 | 4592.2 | 4577.0 |
| 5°    | 4999.4 | 4937.4 | 4775.9 | 4584.0 | 4409.7 | 4252.9 | 4068.1 | 3921.8 | 3813.0 | 3795.5 | 3758.0 |
| 7.5°  | 4860.2 | 4758.4 | 4510.3 | 4210.8 | 3918.3 | 3621.1 | 3276.0 | 3061.9 | 2878.2 | 2790.4 | 2781.1 |
| 10°   | 4774.7 | 4632.0 | 4279.8 | 3846.9 | 3388.3 | 2905.1 | 2453.5 | 2141.1 | 1915.3 | 1850.9 | 1803.0 |
| 12.5° | 4757.2 | 4568.8 | 4102.0 | 3505.3 | 2850.1 | 2211.3 | 1711.7 | 1379.4 | 1199.2 | 1141.9 | 1126.7 |
| 15°   | 4774.7 | 4539.6 | 3952.2 | 3167.2 | 2304.9 | 1569.0 | 1148.9 | 955.9  | 888.0  | 871.6  | 870.5  |
| 17.5° | 4785.3 | 4504.5 | 3782.6 | 2791.6 | 1776.1 | 1120.9 | 879.8  | 823.7  | 813.1  | 812.0  | 814.3  |
| 20°   | 4784.1 | 4450.7 | 3580.2 | 2372.7 | 1320.9 | 881.0  | 795.6  | 783.9  | 781.6  | 782.7  | 781.6  |
| 22.5° | 4775.9 | 4387.5 | 3357.9 | 1941.0 | 998.0  | 787.4  | 759.3  | 752.3  | 751.1  | 751.1  | 751.1  |
| 25°   | 4791.1 | 4337.2 | 3113.4 | 1528.0 | 822.5  | 744.1  | 726.6  | 720.7  | 719.5  | 719.5  | 717.2  |
| 27.5° | 4846.1 | 4309.1 | 2845.4 | 1175.8 | 742.9  | 705.5  | 691.5  | 690.3  | 686.8  | 685.6  | 688.0  |
| 30°   | 4935.0 | 4309.1 | 2551.8 | 914.9  | 695.0  | 665.7  | 655.2  | 652.9  | 651.7  | 650.5  | 651.7  |
| 32.5° | 5091.8 | 4341.9 | 2231.2 | 760.5  | 649.3  | 621.3  | 614.2  | 617.8  | 614.2  | 614.2  | 614.2  |
| 35°   | 5375.0 | 4440.1 | 1895.4 | 663.4  | 601.4  | 578.0  | 571.0  | 575.6  | 573.3  | 573.3  | 572.1  |
| 37.5° | 5788.0 | 4622.7 | 1557.3 | 604.9  | 559.3  | 534.7  | 525.3  | 532.3  | 530.0  | 530.0  | 528.8  |
| 40°   | 6291.1 | 4888.2 | 1235.5 | 560.4  | 518.3  | 492.6  | 484.4  | 487.9  | 482.0  | 482.0  | 484.4  |
| 42.5° | 6912.3 | 5225.2 | 954.7  | 517.1  | 477.4  | 452.8  | 448.1  | 444.6  | 434.1  | 428.2  | 429.4  |
| 45°   | 7602.6 | 5576.2 | 744.1  | 475.0  | 438.7  | 418.9  | 411.8  | 402.5  | 384.9  | 373.2  | 374.4  |
| 47.5° | 8219.2 | 5846.5 | 604.9  | 434.1  | 403.6  | 388.4  | 377.9  | 360.4  | 334.6  | 320.6  | 321.7  |
| 50°   | 8543.3 | 5887.4 | 514.8  | 393.1  | 370.9  | 355.7  | 340.5  | 313.6  | 283.1  | 267.9  | 266.8  |
| 52.5° | 8626.4 | 5695.5 | 448.1  | 355.7  | 338.1  | 320.6  | 300.7  | 264.4  | 230.5  | 214.1  | 211.8  |
| 55°   | 8656.8 | 5403.0 | 388.4  | 320.6  | 303.0  | 283.1  | 257.4  | 216.4  | 184.9  | 168.5  | 167.3  |
| 57.5° | 8556.2 | 4966.6 | 341.6  | 289.0  | 267.9  | 243.4  | 211.8  | 173.2  | 142.7  | 129.9  | 129.9  |
| 60°   | 8332.7 | 4375.8 | 305.4  | 255.1  | 231.7  | 203.6  | 170.8  | 134.5  | 106.5  | 95.9   | 95.9   |
| 62.5° | 7886.9 | 3610.6 | 271.4  | 220.0  | 197.7  | 168.5  | 138.1  | 101.8  | 74.9   | 69.0   | 70.2   |
| 65°   | 7045.7 | 2739.0 | 237.5  | 188.4  | 168.5  | 139.2  | 107.6  | 72.5   | 50.3   | 50.3   | 52.6   |
| 67.5° | 5745.8 | 1902.4 | 202.4  | 160.3  | 145.1  | 113.5  | 81.9   | 50.3   | 35.1   | 39.8   | 44.5   |
| 70°   | 3803.7 | 1067.0 | 173.2  | 132.2  | 124.0  | 90.1   | 60.8   | 33.9   | 28.1   | 37.4   | 45.6   |
| 72.5° | 1435.6 | 415.3  | 145.1  | 106.5  | 107.6  | 69.0   | 43.3   | 25.7   | 25.7   | 40.9   | 53.8   |
| 75°   | 400.1  | 203.6  | 104.1  | 78.4   | 84.2   | 50.3   | 31.6   | 22.2   | 24.6   | 46.8   | 63.2   |
| 77.5° | 235.2  | 149.8  | 67.9   | 45.6   | 57.3   | 35.1   | 21.1   | 17.5   | 21.1   | 39.8   | 60.8   |
| 80°   | 189.5  | 79.6   | 39.8   | 23.4   | 31.6   | 19.9   | 14.0   | 10.5   | 5.8    | 15.2   | 31.6   |
| 82.5° | 189.5  | 48.0   | 18.7   | 16.4   | 16.4   | 10.5   | 7.0    | 4.7    | 1.2    | 0.0    | 8.2    |
| 85°   | 127.5  | 19.9   | 11.7   | 10.5   | 8.2    | 3.5    | 2.3    | 1.2    | 0.0    | 0.0    | 0.0    |
| 87.5° | 21.1   | 8.2    | 4.7    | 2.3    | 1.2    | 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    |

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

Report Prepared for

Cooper Lighting Solutions

McGRAW-EDISON

Report Number: SP1-1908-441-4-R4

Test Date: 10/02/2019

Luminaire Tested: SA1C-750-U-5WQ

Data in this report applies to families of products SA1C-760-U-5WQ .

### Test Information

Test Method: LM-79-2008  
 Report Number: SP1-1908-441-4-R4  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry:  $4\pi$   
 Issue Date: 10/28/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: MCGRAW-EDISON  
 Catalog Number: **SA1C-750-U-5WQ**  
 Description: MCGRAW EDISON ROADWAY AND AREA LUMINAIRE

\*\*\*THIS IS A REVISION OF SP1-1908-441-4-R3. TO UPDATE THE CATALOG INFORMATION.\*\*\*TESTED IN SITU. ROADWAY AND AREA LUMINAIRE. (1) 70 CRI, 5000K, 1050MA LIGHTSQUARE WITH 16 LEDS AND TYPE V WIDE OPTICS.

### Spectral Parameters

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 4884   | CRI (Ra): | 73.5 |      |       |
| CIE u':                   | 0.2101 | R1:       | 70.5 | R9:  | -28.4 |
| CIE v':                   | 0.4904 | R2:       | 77.7 | R10: | 48.6  |
| Duv:                      | 0.0037 | R3:       | 84.6 | R11: | 73.2  |
| CIE x:                    | 0.3493 | R4:       | 74.7 | R12: | 50.7  |
| CIE y:                    | 0.3624 | R5:       | 71.9 | R13: | 71.2  |
| CIE z:                    | 0.2884 | R6:       | 70.7 | R14: | 91.4  |
| Peak Wavelength (nm):     | 444    | R7:       | 81.2 |      |       |
| Dominant Wavelength (nm): | 571    | R8:       | 56.9 |      |       |
| Purity:                   | 13.7   |           |      |      |       |
| Rf:                       | 74.9   |           |      |      |       |
| Rg:                       | 96.3   |           |      |      |       |



REPORT NUMBER: SP1-1908-441-4-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 5000K 4-step quadrangle

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**Photopic Flux vs. Wavelength**



#####

| 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       | 2945             | NR               | 490       | 37941            | NR               | 620       | 88803            | NR               | 750       | 3908             | NR               | 880       | 2997             | NR               |
| 365       | 2596             | NR               | 495       | 48525            | NR               | 625       | 80578            | NR               | 755       | 3988             | NR               | 885       | 2927             | NR               |
| 370       | 2732             | NR               | 500       | 60609            | NR               | 630       | 73127            | NR               | 760       | 3335             | NR               | 890       | 2649             | NR               |
| 375       | 2894             | NR               | 505       | 72036            | NR               | 635       | 66244            | NR               | 765       | 3438             | NR               | 895       | 2828             | NR               |
| 380       | 2822             | NR               | 510       | 82168            | NR               | 640       | 59440            | NR               | 770       | 3427             | NR               | 900       | 1407             | NR               |
| 385       | 2394             | NR               | 515       | 90898            | NR               | 645       | 52864            | NR               | 775       | 2759             | NR               | 905       | 2224             | NR               |
| 390       | 2370             | NR               | 520       | 97142            | NR               | 650       | 47085            | NR               | 780       | 2340             | NR               | 910       | 2905             | NR               |
| 395       | 2267             | NR               | 525       | 103255           | NR               | 655       | 41789            | NR               | 785       | 2412             | NR               | 915       | 3350             | NR               |
| 400       | 2262             | NR               | 530       | 106697           | NR               | 660       | 37064            | NR               | 790       | 1999             | NR               | 920       | 3114             | NR               |
| 405       | 3000             | NR               | 535       | 110081           | NR               | 665       | 32299            | NR               | 795       | 2054             | NR               | 925       | 2834             | NR               |
| 410       | 5324             | NR               | 540       | 112494           | NR               | 670       | 28142            | NR               | 800       | 2331             | NR               | 930       | 2271             | NR               |
| 415       | 10725            | NR               | 545       | 115513           | NR               | 675       | 24505            | NR               | 805       | 2648             | NR               | 935       | 2228             | NR               |
| 420       | 22128            | NR               | 550       | 117203           | NR               | 680       | 21162            | NR               | 810       | 2485             | NR               | 940       | 2833             | NR               |
| 425       | 44095            | NR               | 555       | 119753           | NR               | 685       | 18400            | NR               | 815       | 2409             | NR               | 945       | 2941             | NR               |
| 430       | 77002            | NR               | 560       | 122602           | NR               | 690       | 16065            | NR               | 820       | 2221             | NR               | 950       | 2323             | NR               |
| 435       | 119881           | NR               | 565       | 124314           | NR               | 695       | 13860            | NR               | 825       | 1562             | NR               | 955       | 1667             | NR               |
| 440       | 164454           | NR               | 570       | 126775           | NR               | 700       | 12177            | NR               | 830       | 2249             | NR               | 960       | 749              | NR               |
| 445       | 179997           | NR               | 575       | 127511           | NR               | 705       | 10757            | NR               | 835       | 2573             | NR               | 965       | 2669             | NR               |
| 450       | 142822           | NR               | 580       | 127577           | NR               | 710       | 9601             | NR               | 840       | 2764             | NR               | 970       | 3968             | NR               |
| 455       | 90008            | NR               | 585       | 126153           | NR               | 715       | 8944             | NR               | 845       | 3109             | NR               | 975       | 3886             | NR               |
| 460       | 60557            | NR               | 590       | 123678           | NR               | 720       | 7947             | NR               | 850       | 2963             | NR               | 980       | 2788             | NR               |
| 465       | 43305            | NR               | 595       | 119774           | NR               | 725       | 7062             | NR               | 855       | 2336             | NR               | 985       | 3496             | NR               |
| 470       | 31089            | NR               | 600       | 115733           | NR               | 730       | 6004             | NR               | 860       | 2118             | NR               | 990       | 2913             | NR               |
| 475       | 26278            | NR               | 605       | 109231           | NR               | 735       | 5594             | NR               | 865       | 3144             | NR               | 995       | 4659             | NR               |
| 480       | 27060            | NR               | 610       | 102408           | NR               | 740       | 5165             | NR               | 870       | 3069             | NR               | 1000      | 1308             | NR               |
| 485       | 30698            | NR               | 615       | 96015            | NR               | 745       | 4687             | NR               | 875       | 3311             | NR               |           |                  |                  |

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Scotopic Flux vs. Wavelength



Scotopic Lumens: 13493.5

S/P: 1.77

| 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       | 2945             | NR               | 490       | 37941            | NR               | 620       | 88803            | NR               | 750       | 3908             | NR               | 880       | 2997             | NR               |
| 365       | 2596             | NR               | 495       | 48525            | NR               | 625       | 80578            | NR               | 755       | 3988             | NR               | 885       | 2927             | NR               |
| 370       | 2732             | NR               | 500       | 60609            | NR               | 630       | 73127            | NR               | 760       | 3335             | NR               | 890       | 2649             | NR               |
| 375       | 2894             | NR               | 505       | 72036            | NR               | 635       | 66244            | NR               | 765       | 3438             | NR               | 895       | 2828             | NR               |
| 380       | 2822             | NR               | 510       | 82168            | NR               | 640       | 59440            | NR               | 770       | 3427             | NR               | 900       | 1407             | NR               |
| 385       | 2394             | NR               | 515       | 90898            | NR               | 645       | 52864            | NR               | 775       | 2759             | NR               | 905       | 2224             | NR               |
| 390       | 2370             | NR               | 520       | 97142            | NR               | 650       | 47085            | NR               | 780       | 2340             | NR               | 910       | 2905             | NR               |
| 395       | 2267             | NR               | 525       | 103255           | NR               | 655       | 41789            | NR               | 785       | 2412             | NR               | 915       | 3350             | NR               |
| 400       | 2262             | NR               | 530       | 106697           | NR               | 660       | 37064            | NR               | 790       | 1999             | NR               | 920       | 3114             | NR               |
| 405       | 3000             | NR               | 535       | 110081           | NR               | 665       | 32299            | NR               | 795       | 2054             | NR               | 925       | 2834             | NR               |
| 410       | 5324             | NR               | 540       | 112494           | NR               | 670       | 28142            | NR               | 800       | 2331             | NR               | 930       | 2271             | NR               |
| 415       | 10725            | NR               | 545       | 115513           | NR               | 675       | 24505            | NR               | 805       | 2648             | NR               | 935       | 2228             | NR               |
| 420       | 22128            | NR               | 550       | 117203           | NR               | 680       | 21162            | NR               | 810       | 2485             | NR               | 940       | 2833             | NR               |
| 425       | 44095            | NR               | 555       | 119753           | NR               | 685       | 18400            | NR               | 815       | 2409             | NR               | 945       | 2941             | NR               |
| 430       | 77002            | NR               | 560       | 122602           | NR               | 690       | 16065            | NR               | 820       | 2221             | NR               | 950       | 2323             | NR               |
| 435       | 119881           | NR               | 565       | 124314           | NR               | 695       | 13860            | NR               | 825       | 1562             | NR               | 955       | 1667             | NR               |
| 440       | 164454           | NR               | 570       | 126775           | NR               | 700       | 12177            | NR               | 830       | 2249             | NR               | 960       | 749              | NR               |
| 445       | 179997           | NR               | 575       | 127511           | NR               | 705       | 10757            | NR               | 835       | 2573             | NR               | 965       | 2669             | NR               |
| 450       | 142822           | NR               | 580       | 127577           | NR               | 710       | 9601             | NR               | 840       | 2764             | NR               | 970       | 3968             | NR               |
| 455       | 90008            | NR               | 585       | 126153           | NR               | 715       | 8944             | NR               | 845       | 3109             | NR               | 975       | 3886             | NR               |
| 460       | 60557            | NR               | 590       | 123678           | NR               | 720       | 7947             | NR               | 850       | 2963             | NR               | 980       | 2788             | NR               |
| 465       | 43305            | NR               | 595       | 119774           | NR               | 725       | 7062             | NR               | 855       | 2336             | NR               | 985       | 3496             | NR               |
| 470       | 31089            | NR               | 600       | 115733           | NR               | 730       | 6004             | NR               | 860       | 2118             | NR               | 990       | 2913             | NR               |
| 475       | 26278            | NR               | 605       | 109231           | NR               | 735       | 5594             | NR               | 865       | 3144             | NR               | 995       | 4659             | NR               |
| 480       | 27060            | NR               | 610       | 102408           | NR               | 740       | 5165             | NR               | 870       | 3069             | NR               | 1000      | 1308             | NR               |
| 485       | 30698            | NR               | 615       | 96015            | NR               | 745       | 4687             | NR               | 875       | 3311             | NR               |           |                  |                  |

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**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 5378.9 M/P: 0.71**

| 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       | 2945             | NR               | 490       | 37941            | NR               | 620       | 88803            | NR               | 750       | 3908             | NR               | 880       | 2997             | NR               |
| 365       | 2596             | NR               | 495       | 48525            | NR               | 625       | 80578            | NR               | 755       | 3988             | NR               | 885       | 2927             | NR               |
| 370       | 2732             | NR               | 500       | 60609            | NR               | 630       | 73127            | NR               | 760       | 3335             | NR               | 890       | 2649             | NR               |
| 375       | 2894             | NR               | 505       | 72036            | NR               | 635       | 66244            | NR               | 765       | 3438             | NR               | 895       | 2828             | NR               |
| 380       | 2822             | NR               | 510       | 82168            | NR               | 640       | 59440            | NR               | 770       | 3427             | NR               | 900       | 1407             | NR               |
| 385       | 2394             | NR               | 515       | 90898            | NR               | 645       | 52864            | NR               | 775       | 2759             | NR               | 905       | 2224             | NR               |
| 390       | 2370             | NR               | 520       | 97142            | NR               | 650       | 47085            | NR               | 780       | 2340             | NR               | 910       | 2905             | NR               |
| 395       | 2267             | NR               | 525       | 103255           | NR               | 655       | 41789            | NR               | 785       | 2412             | NR               | 915       | 3350             | NR               |
| 400       | 2262             | NR               | 530       | 106697           | NR               | 660       | 37064            | NR               | 790       | 1999             | NR               | 920       | 3114             | NR               |
| 405       | 3000             | NR               | 535       | 110081           | NR               | 665       | 32299            | NR               | 795       | 2054             | NR               | 925       | 2834             | NR               |
| 410       | 5324             | NR               | 540       | 112494           | NR               | 670       | 28142            | NR               | 800       | 2331             | NR               | 930       | 2271             | NR               |
| 415       | 10725            | NR               | 545       | 115513           | NR               | 675       | 24505            | NR               | 805       | 2648             | NR               | 935       | 2228             | NR               |
| 420       | 22128            | NR               | 550       | 117203           | NR               | 680       | 21162            | NR               | 810       | 2485             | NR               | 940       | 2833             | NR               |
| 425       | 44095            | NR               | 555       | 119753           | NR               | 685       | 18400            | NR               | 815       | 2409             | NR               | 945       | 2941             | NR               |
| 430       | 77002            | NR               | 560       | 122602           | NR               | 690       | 16065            | NR               | 820       | 2221             | NR               | 950       | 2323             | NR               |
| 435       | 119881           | NR               | 565       | 124314           | NR               | 695       | 13860            | NR               | 825       | 1562             | NR               | 955       | 1667             | NR               |
| 440       | 164454           | NR               | 570       | 126775           | NR               | 700       | 12177            | NR               | 830       | 2249             | NR               | 960       | 749              | NR               |
| 445       | 179997           | NR               | 575       | 127511           | NR               | 705       | 10757            | NR               | 835       | 2573             | NR               | 965       | 2669             | NR               |
| 450       | 142822           | NR               | 580       | 127577           | NR               | 710       | 9601             | NR               | 840       | 2764             | NR               | 970       | 3968             | NR               |
| 455       | 90008            | NR               | 585       | 126153           | NR               | 715       | 8944             | NR               | 845       | 3109             | NR               | 975       | 3886             | NR               |
| 460       | 60557            | NR               | 590       | 123678           | NR               | 720       | 7947             | NR               | 850       | 2963             | NR               | 980       | 2788             | NR               |
| 465       | 43305            | NR               | 595       | 119774           | NR               | 725       | 7062             | NR               | 855       | 2336             | NR               | 985       | 3496             | NR               |
| 470       | 31089            | NR               | 600       | 115733           | NR               | 730       | 6004             | NR               | 860       | 2118             | NR               | 990       | 2913             | NR               |
| 475       | 26278            | NR               | 605       | 109231           | NR               | 735       | 5594             | NR               | 865       | 3144             | NR               | 995       | 4659             | NR               |
| 480       | 27060            | NR               | 610       | 102408           | NR               | 740       | 5165             | NR               | 870       | 3069             | NR               | 1000      | 1308             | NR               |
| 485       | 30698            | NR               | 615       | 96015            | NR               | 745       | 4687             | NR               | 875       | 3311             | NR               |           |                  |                  |

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### Summary

$R_f = 74.9$   
 $R_g = 96.3$   
 CIE  $R_a = 73.5$   
 $R_g = -28.4$

### Spectral Power Distribution Comparison



### Color Vector Graphics



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 61 | CES51 = 90 | CES76 = 52 |
| CES02 = 60 | CES27 = 84 | CES52 = 91 | CES77 = 71 |
| CES03 = 30 | CES28 = 81 | CES53 = 79 | CES78 = 54 |
| CES04 = 69 | CES29 = 58 | CES54 = 83 | CES79 = 80 |
| CES05 = 46 | CES30 = 67 | CES55 = 83 | CES80 = 77 |
| CES06 = 50 | CES31 = 63 | CES56 = 73 | CES81 = 77 |
| CES07 = 39 | CES32 = 59 | CES57 = 72 | CES82 = 90 |
| CES08 = 38 | CES33 = 69 | CES58 = 73 | CES83 = 86 |
| CES09 = 29 | CES34 = 69 | CES59 = 88 | CES84 = 88 |
| CES10 = 73 | CES35 = 83 | CES60 = 93 | CES85 = 84 |
| CES11 = 56 | CES36 = 95 | CES61 = 88 | CES86 = 75 |
| CES12 = 61 | CES37 = 78 | CES62 = 85 | CES87 = 78 |
| CES13 = 41 | CES38 = 76 | CES63 = 77 | CES88 = 79 |
| CES14 = 74 | CES39 = 93 | CES64 = 74 | CES89 = 75 |
| CES15 = 70 | CES40 = 86 | CES65 = 67 | CES90 = 77 |
| CES16 = 46 | CES41 = 87 | CES66 = 69 | CES91 = 89 |
| CES17 = 49 | CES42 = 78 | CES67 = 67 | CES92 = 66 |
| CES18 = 55 | CES43 = 75 | CES68 = 73 | CES93 = 80 |
| CES19 = 71 | CES44 = 99 | CES69 = 81 | CES94 = 57 |
| CES20 = 64 | CES45 = 83 | CES70 = 63 | CES95 = 71 |
| CES21 = 85 | CES46 = 81 | CES71 = 60 | CES96 = 78 |
| CES22 = 77 | CES47 = 80 | CES72 = 86 | CES97 = 85 |
| CES23 = 91 | CES48 = 72 | CES73 = 53 | CES98 = 75 |
| CES24 = 90 | CES49 = 81 | CES74 = 96 | CES99 = 62 |
| CES25 = 71 | CES50 = 89 | CES75 = 58 |            |



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**Color Rendition by Hue-Angle Bin**



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**Measure Comparisons**



(END OF REPORT)