

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: P359740

Luminaire Tested: NVN-SA6D-740-U-T2R-HSS

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-2019  
Report Number: P359740  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-9)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: STREETWORKS  
Catalog Number: NVN-SA6D-740-U-T2R-HSS  
Description: NAVION ROADWAY AND AREA LUMINAIRE  
(6) 70 CRI, 4000K, 1200mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE II  
ROADWAY OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 38124 lumens  
Efficiency: N/A  
Efficacy: 99.8 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 1.5' x H: 0')  
IES Classification: Type II - Medium  
BUG Rating: B2 - U0 - G4

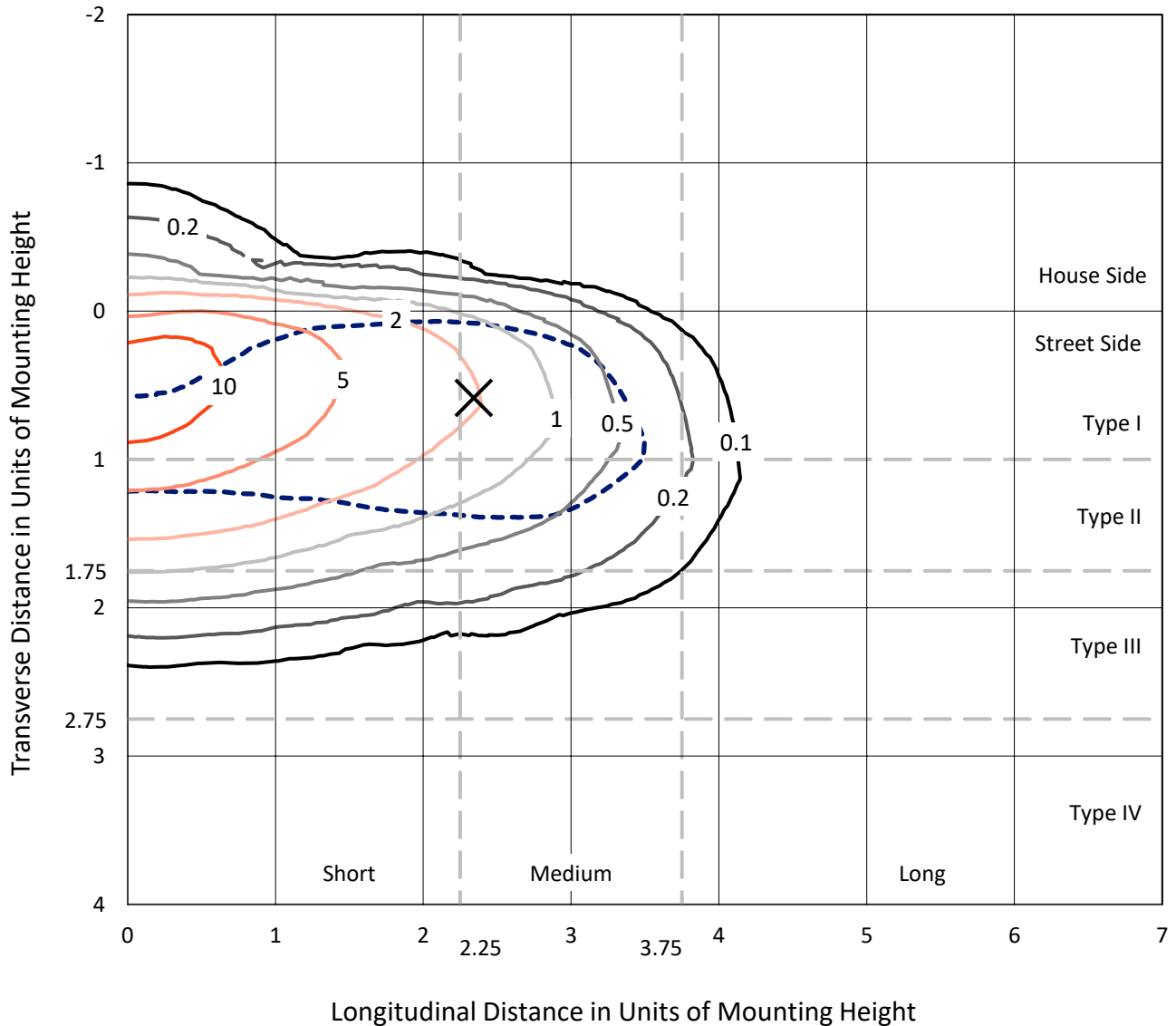
Input Watts (W): 382  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT



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### Iso-Footcandle Lines of Horizontal Illumination

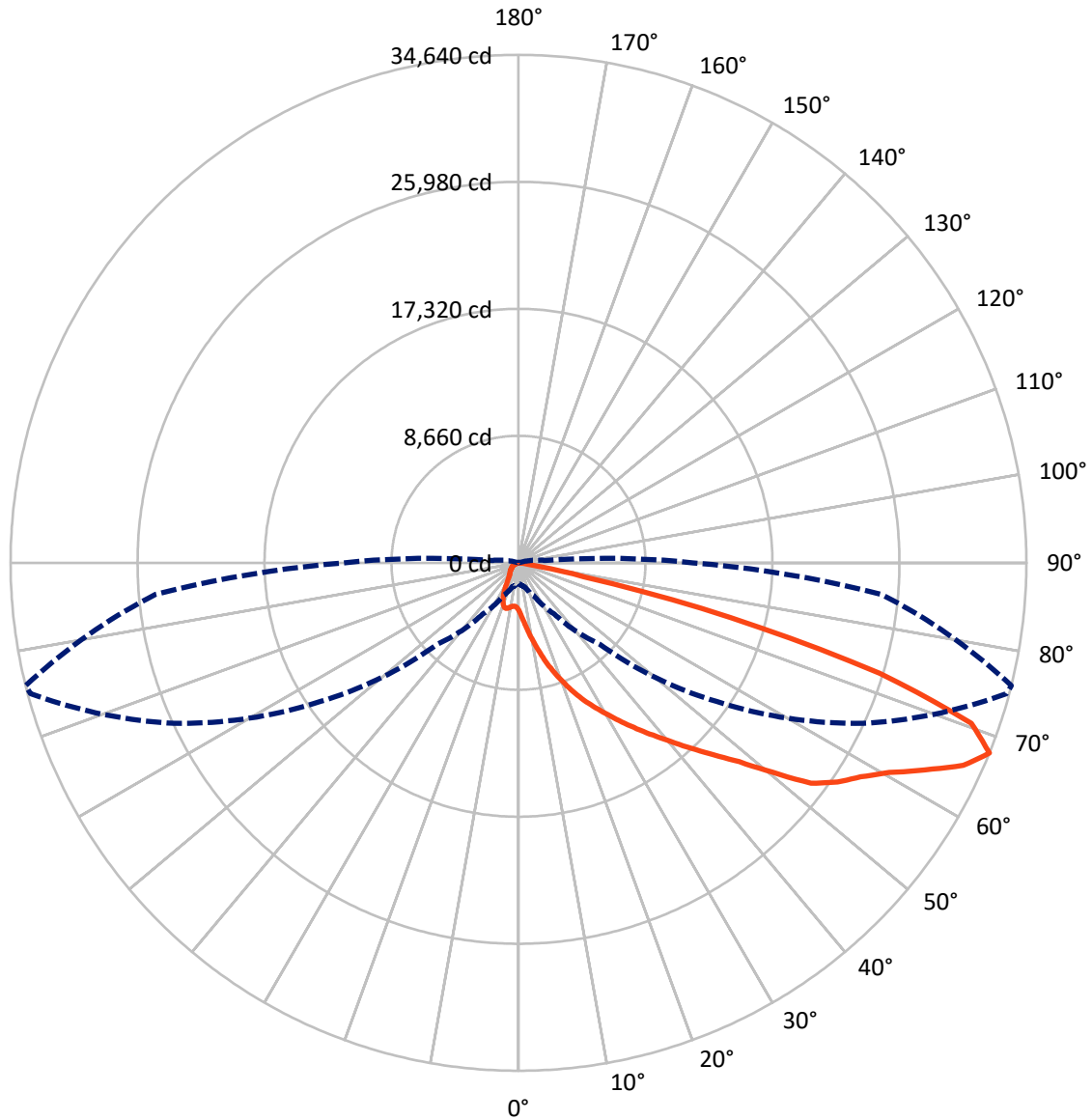
✕ Max cd  
 - - - 1/2 Max cd



Based on 30 foot mounting height. Maximum calculated value = 12.6 fc  
 Type II - Medium - N/A

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### Luminous Intensity Polar Plot



— Vertical Plane Through 76-Deg Lateral      - - - Horizontal Cone Through 67.5-Deg Vertical

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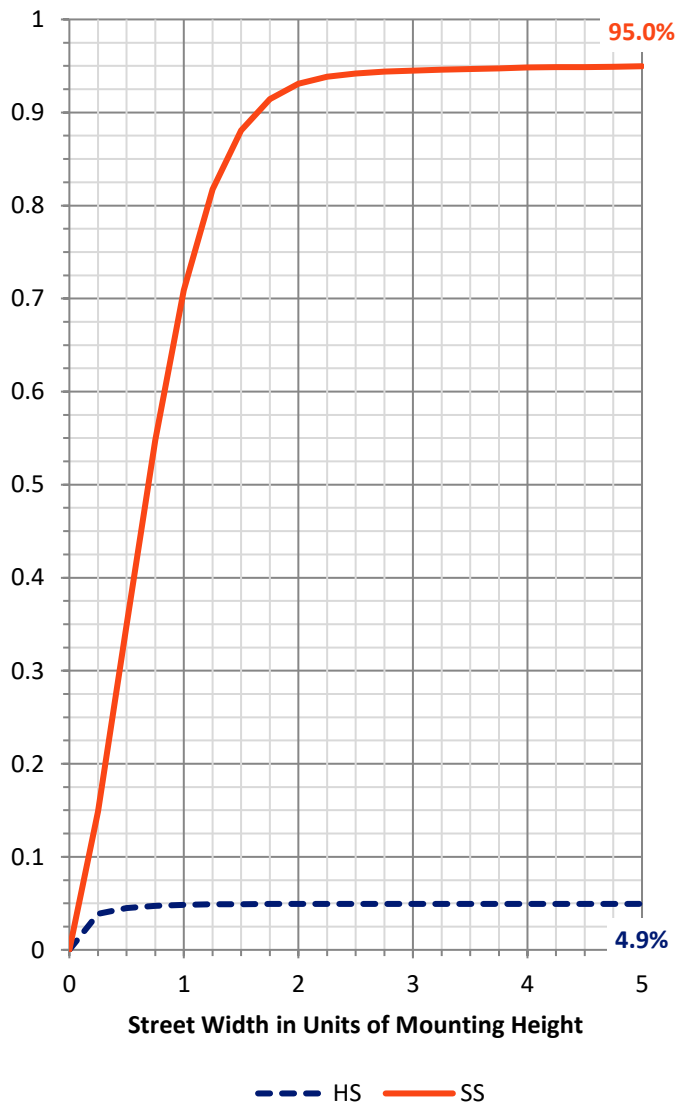
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 1893.1   | 0.0    | 1893.1  |
|                    | % Fixture | 5.0      | 0.0    | 5.0     |
| <b>Street Side</b> | Lumens    | 36230.9  | 0.0    | 36230.9 |
|                    | % Fixture | 95.0     | 0.0    | 95.0    |
| <b>Total</b>       | Lumens    | 38124.0  | 0.0    | 38124.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 402.1   | 1.1       |
| 10°-20°   | 1594.2  | 4.2       |
| 20°-30°   | 3243.6  | 8.5       |
| 30°-40°   | 5629.8  | 14.8      |
| 40°-50°   | 7954.2  | 20.9      |
| 50°-60°   | 9020.5  | 23.7      |
| 60°-70°   | 7481.6  | 19.6      |
| 70°-80°   | 2710.1  | 7.1       |
| 80°-90°   | 87.9    | 0.2       |
| 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°    | 38124.0 | 100.0     |
| 0°-180°   | 38124.0 | 100.0     |

**Coefficient of Utilization**

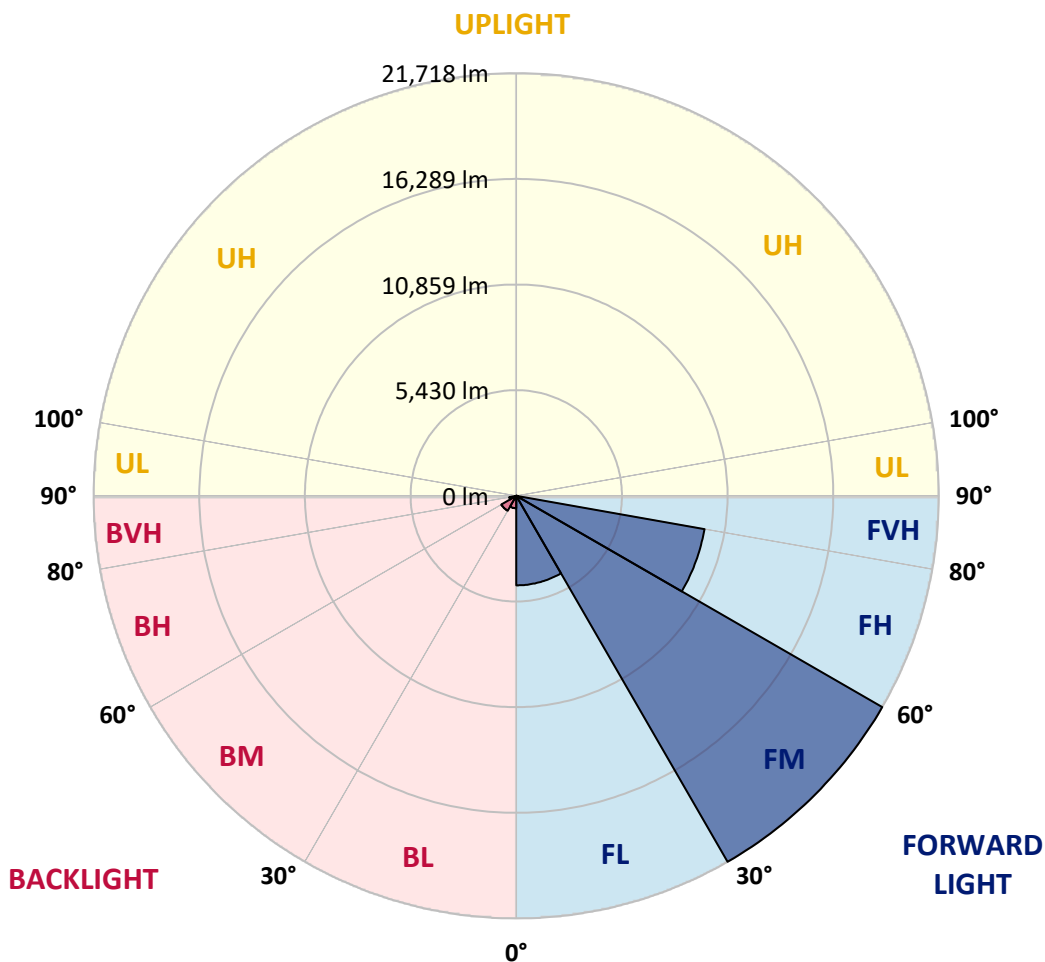


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**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone           | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |          |
|----------------|---------|-----------|-------------------------|------|----------|
|                |         |           | B                       | U    | G        |
| FL (0°-30°)    | 4601.4  | 12.1      |                         |      |          |
| FM (30°-60°)   | 21718.5 | 57.0      |                         |      |          |
| FH (60°-80°)   | 9825.8  | 25.8      |                         |      | G4/12000 |
| FVH (80°-90°)  | 85.1    | 0.2       |                         |      | G1/100   |
| BL (0°-30°)    | 638.5   | 1.7       | B2/1000                 |      |          |
| BM (30°-60°)   | 886.0   | 2.3       | B1/1000                 |      |          |
| BH (60°-80°)   | 365.9   | 1.0       | B1/500                  |      | G1/500   |
| BVH (80°-90°)  | 2.8     | 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 II Medium





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 55°     | 65°     | 75°     | 76°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 3234.0  | 3234.0  | 3234.0  | 3234.0  | 3234.0  | 3234.0  | 3234.0  | 3234.0  | 3234.0  | 3234.0  | 3234.0  |
| 2.5°  | 4827.6  | 4719.1  | 4744.1  | 4674.0  | 4547.0  | 4286.4  | 4064.2  | 3853.8  | 3608.2  | 3599.9  | 3397.7  |
| 5°    | 6509.8  | 6417.9  | 6406.2  | 6264.2  | 6033.7  | 5591.0  | 5160.1  | 4668.9  | 4121.0  | 4080.9  | 3651.6  |
| 7.5°  | 8036.6  | 7963.1  | 7936.4  | 7767.7  | 7338.4  | 6907.4  | 6346.1  | 5624.5  | 4767.5  | 4694.0  | 3994.1  |
| 10°   | 9209.3  | 9174.2  | 9180.9  | 9060.6  | 8693.1  | 8292.2  | 7555.5  | 6635.1  | 5500.8  | 5387.2  | 4405.0  |
| 12.5° | 10098.0 | 10106.3 | 10166.4 | 10092.9 | 9887.5  | 9590.1  | 8803.3  | 7712.5  | 6312.7  | 6157.3  | 4874.4  |
| 15°   | 10751.1 | 10792.9 | 10903.1 | 10995.0 | 10980.0 | 10722.7 | 10001.1 | 8806.7  | 7174.6  | 7002.6  | 5397.3  |
| 17.5° | 11173.7 | 11220.5 | 11380.9 | 11584.7 | 11771.8 | 11711.6 | 11157.0 | 9862.4  | 8046.6  | 7847.8  | 5956.9  |
| 20°   | 11544.6 | 11599.7 | 11771.8 | 12040.7 | 12389.8 | 12465.0 | 12100.8 | 10886.4 | 8916.9  | 8674.7  | 6534.9  |
| 22.5° | 12348.1 | 12346.4 | 12451.6 | 12608.7 | 12941.1 | 13134.9 | 12904.3 | 11836.9 | 9777.2  | 9525.0  | 7124.5  |
| 25°   | 13801.4 | 13746.3 | 13709.5 | 13585.9 | 13659.4 | 13779.7 | 13651.0 | 12725.6 | 10642.5 | 10386.9 | 7722.6  |
| 27.5° | 15528.6 | 15562.0 | 15264.7 | 14932.3 | 14675.0 | 14551.4 | 14340.9 | 13549.1 | 11474.4 | 11193.8 | 8307.2  |
| 30°   | 17351.1 | 17361.1 | 17010.3 | 16586.0 | 16019.8 | 15550.4 | 15186.2 | 14335.9 | 12329.7 | 12024.0 | 8875.2  |
| 32.5° | 18994.9 | 18929.7 | 18582.2 | 18004.3 | 17289.3 | 16761.4 | 16004.7 | 15214.6 | 13235.1 | 12939.4 | 9506.6  |
| 35°   | 20297.8 | 20221.0 | 19798.3 | 19272.1 | 18530.5 | 17999.3 | 17088.9 | 16091.6 | 14187.3 | 13898.3 | 10139.7 |
| 37.5° | 21250.0 | 21159.8 | 20725.5 | 20184.2 | 19544.4 | 19235.4 | 18346.7 | 17045.4 | 15226.3 | 14915.6 | 10806.2 |
| 40°   | 21580.7 | 21502.2 | 21229.9 | 20834.0 | 20319.5 | 20249.4 | 19681.4 | 18142.9 | 16357.2 | 16026.4 | 11561.3 |
| 42.5° | 21383.6 | 21306.8 | 21209.9 | 21076.3 | 20862.4 | 20929.3 | 20940.9 | 19394.1 | 17613.4 | 17287.6 | 12394.8 |
| 45°   | 20601.8 | 20533.4 | 20633.6 | 20829.0 | 21094.6 | 21425.4 | 22090.2 | 20738.8 | 19016.6 | 18669.1 | 13358.7 |
| 47.5° | 19450.9 | 19400.8 | 19678.1 | 20165.8 | 20942.6 | 21854.7 | 23140.9 | 22152.0 | 20591.8 | 20269.4 | 14561.4 |
| 50°   | 17813.8 | 17805.5 | 18360.1 | 19250.4 | 20444.8 | 22061.8 | 24226.7 | 23759.0 | 22780.1 | 22441.0 | 16233.6 |
| 52.5° | 15264.7 | 15281.4 | 16372.2 | 17797.1 | 19571.2 | 21921.5 | 24925.0 | 25823.7 | 25325.9 | 24973.4 | 17681.9 |
| 55°   | 12837.5 | 12937.7 | 13711.2 | 15765.8 | 18231.5 | 21400.3 | 25165.5 | 26787.6 | 26730.8 | 26396.7 | 18487.0 |
| 57.5° | 10460.4 | 10642.5 | 11387.6 | 13306.9 | 16275.3 | 20199.3 | 25033.6 | 27205.2 | 27776.5 | 27520.9 | 19549.4 |
| 60°   | 7884.6  | 7968.1  | 8826.7  | 10620.8 | 13764.6 | 18007.6 | 24076.4 | 27432.4 | 29206.4 | 29029.3 | 21091.3 |
| 62.5° | 5016.4  | 5225.2  | 5986.9  | 7717.5  | 10717.7 | 14964.0 | 22462.7 | 27429.0 | 30995.5 | 31092.4 | 23080.8 |
| 65°   | 2642.7  | 2886.6  | 3290.8  | 4782.5  | 7365.1  | 11564.6 | 20035.6 | 27171.8 | 33190.5 | 33325.8 | 24636.0 |
| 67.5° | 1424.9  | 1495.1  | 1708.9  | 2482.3  | 4271.4  | 7834.5  | 16469.1 | 25902.2 | 34461.7 | 34640.4 | 24853.2 |
| 70°   | 1042.4  | 1080.8  | 1161.0  | 1373.1  | 2149.9  | 4550.3  | 12017.3 | 23024.0 | 32823.0 | 32756.1 | 22081.9 |
| 72.5° | 800.2   | 860.3   | 920.4   | 1005.6  | 1236.1  | 2428.9  | 7482.0  | 18029.3 | 26189.5 | 25748.5 | 16505.9 |
| 75°   | 631.4   | 641.5   | 726.7   | 803.5   | 927.1   | 1383.1  | 3322.6  | 10500.5 | 15984.7 | 14940.6 | 8559.5  |
| 77.5° | 504.5   | 511.2   | 561.3   | 628.1   | 745.0   | 908.7   | 1029.0  | 4131.1  | 5103.3  | 4553.7  | 1857.6  |
| 80°   | 299.0   | 315.7   | 417.6   | 484.4   | 618.1   | 573.0   | 375.9   | 897.0   | 796.8   | 721.6   | 312.4   |
| 82.5° | 167.0   | 180.4   | 235.5   | 382.5   | 431.0   | 274.0   | 187.1   | 242.2   | 187.1   | 182.1   | 88.5    |
| 85°   | 0.0     | 8.4     | 152.0   | 237.2   | 175.4   | 60.1    | 78.5    | 80.2    | 55.1    | 51.8    | 35.1    |
| 87.5° | 0.0     | 0.0     | 46.8    | 45.1    | 6.7     | 10.0    | 18.4    | 26.7    | 21.7    | 21.7    | 18.4    |
| 90°   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |



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 CATALOG NUMBER: NVN-SA6D-740-U-T2R-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 3234.0  | 3234.0 | 3234.0 | 3234.0 | 3234.0 | 3234.0 | 3234.0 | 3234.0 | 3234.0 | 3234.0 | 3234.0 |
| 2.5°  | 3297.5  | 3207.3 | 3036.9 | 2869.9 | 2729.5 | 2614.3 | 2510.7 | 2468.9 | 2435.5 | 2430.5 | 2403.8 |
| 5°    | 3444.5  | 3262.4 | 2936.7 | 2669.4 | 2490.7 | 2363.7 | 2255.1 | 2188.3 | 2136.5 | 2116.5 | 2098.1 |
| 7.5°  | 3666.7  | 3391.0 | 2923.3 | 2615.9 | 2402.1 | 2188.3 | 1987.9 | 1770.7 | 1635.4 | 1583.6 | 1553.5 |
| 10°   | 3937.3  | 3561.4 | 2973.4 | 2600.9 | 2226.7 | 1775.7 | 1443.3 | 1167.7 | 1055.7 | 1019.0 | 1009.0 |
| 12.5° | 4253.0  | 3773.6 | 3060.3 | 2507.4 | 1852.5 | 1261.2 | 995.6  | 902.1  | 877.0  | 865.3  | 865.3  |
| 15°   | 4615.5  | 4005.8 | 3122.1 | 2236.8 | 1369.8 | 953.8  | 862.0  | 818.5  | 791.8  | 776.8  | 778.4  |
| 17.5° | 4986.3  | 4233.0 | 3092.0 | 1844.2 | 1010.6 | 848.6  | 780.1  | 733.3  | 696.6  | 681.5  | 678.2  |
| 20°   | 5360.5  | 4443.4 | 2925.0 | 1373.1 | 855.3  | 770.1  | 693.2  | 641.5  | 604.7  | 589.7  | 586.3  |
| 22.5° | 5748.1  | 4622.2 | 2631.0 | 1007.3 | 768.4  | 683.2  | 608.0  | 556.3  | 521.2  | 507.8  | 501.1  |
| 25°   | 6125.6  | 4767.5 | 2220.0 | 815.2  | 686.6  | 601.4  | 529.5  | 481.1  | 449.4  | 436.0  | 434.3  |
| 27.5° | 6478.1  | 4859.4 | 1744.0 | 720.0  | 614.7  | 527.9  | 462.7  | 419.3  | 392.6  | 382.5  | 380.9  |
| 30°   | 6795.4  | 4867.7 | 1289.6 | 649.8  | 551.3  | 464.4  | 404.3  | 365.8  | 342.4  | 332.4  | 329.1  |
| 32.5° | 7116.2  | 4797.6 | 938.8  | 586.3  | 492.8  | 409.3  | 350.8  | 320.7  | 304.0  | 295.7  | 295.7  |
| 35°   | 7418.5  | 4635.5 | 731.7  | 531.2  | 436.0  | 355.8  | 309.0  | 287.3  | 277.3  | 268.9  | 268.9  |
| 37.5° | 7714.2  | 4403.3 | 621.4  | 482.8  | 382.5  | 310.7  | 272.3  | 258.9  | 250.6  | 242.2  | 242.2  |
| 40°   | 8014.9  | 4111.0 | 564.6  | 437.7  | 339.1  | 275.6  | 242.2  | 230.5  | 222.2  | 215.5  | 213.8  |
| 42.5° | 8384.1  | 3773.6 | 527.9  | 395.9  | 300.7  | 243.9  | 213.8  | 200.5  | 193.8  | 187.1  | 183.8  |
| 45°   | 8811.7  | 3482.9 | 497.8  | 354.1  | 268.9  | 217.2  | 185.4  | 172.1  | 162.0  | 153.7  | 152.0  |
| 47.5° | 9428.1  | 3272.4 | 457.7  | 309.0  | 238.9  | 188.8  | 160.4  | 145.3  | 130.3  | 121.9  | 120.3  |
| 50°   | 10214.9 | 3098.7 | 405.9  | 268.9  | 208.8  | 160.4  | 133.6  | 115.3  | 101.9  | 93.5   | 93.5   |
| 52.5° | 10605.8 | 2871.5 | 359.1  | 233.9  | 175.4  | 135.3  | 108.6  | 86.9   | 80.2   | 71.8   | 71.8   |
| 55°   | 10762.8 | 2697.8 | 312.4  | 198.8  | 145.3  | 111.9  | 85.2   | 66.8   | 61.8   | 56.8   | 55.1   |
| 57.5° | 11203.8 | 2647.7 | 272.3  | 168.7  | 120.3  | 88.5   | 65.1   | 50.1   | 46.8   | 40.1   | 40.1   |
| 60°   | 11913.8 | 2672.7 | 235.5  | 143.7  | 96.9   | 68.5   | 48.4   | 38.4   | 35.1   | 28.4   | 28.4   |
| 62.5° | 12680.5 | 2641.0 | 198.8  | 123.6  | 75.2   | 50.1   | 33.4   | 28.4   | 28.4   | 16.7   | 15.0   |
| 65°   | 12827.5 | 2352.0 | 170.4  | 101.9  | 58.5   | 36.8   | 21.7   | 18.4   | 25.1   | 3.3    | 0.0    |
| 67.5° | 11905.4 | 1824.1 | 147.0  | 78.5   | 43.4   | 28.4   | 16.7   | 8.4    | 21.7   | 0.0    | 0.0    |
| 70°   | 9520.0  | 1159.3 | 118.6  | 56.8   | 33.4   | 23.4   | 13.4   | 3.3    | 16.7   | 0.0    | 0.0    |
| 72.5° | 6732.0  | 673.2  | 93.5   | 40.1   | 28.4   | 18.4   | 10.0   | 0.0    | 10.0   | 0.0    | 0.0    |
| 75°   | 3404.4  | 359.1  | 58.5   | 30.1   | 21.7   | 13.4   | 6.7    | 0.0    | 1.7    | 0.0    | 0.0    |
| 77.5° | 736.7   | 167.0  | 36.8   | 21.7   | 15.0   | 8.4    | 3.3    | 0.0    | 0.0    | 0.0    | 0.0    |
| 80°   | 160.4   | 73.5   | 23.4   | 13.4   | 8.4    | 5.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 82.5° | 58.5    | 38.4   | 11.7   | 6.7    | 3.3    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 85°   | 31.7    | 20.0   | 6.7    | 3.3    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 87.5° | 16.7    | 6.7    | 1.7    | 1.7    | 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    |



LM-79-08: Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Report Prepared for

Cooper Lighting Solutions

MCGRAW, INVUE, LUMARK AND STREETWORKS

DATA VALID FOR LUMINAIRES UTILIZING SA LIGHT ENGINES

Report Number: SP1-2101-121-2

Luminaire Tested: IFLD-S-SA2A-740-U-T3R-HSS

Test Date: 03/05/2021

**Test Information**

Test Method: LM-79-08  
 Report Number: SP1-2101-121-2  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1  
 Measurement Geometry: 4π  
 Issue Date: 03/05/2021  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: STREETWORKS  
 Catalog Number: **IFLD-S-SA2A-740-U-T3R-HSS**  
 Description: STREETWORKS INF FLOOD

SHIELD, DRIVER PROGRAMMED @ 615mA.

**Spectral Parameters**

|                           |         |           |      |      |       |
|---------------------------|---------|-----------|------|------|-------|
| CCT (K):                  | 3905    | CRI (Ra): | 71.2 | R9:  | -29.7 |
| CIE u':                   | 0.2273  | R1:       | 68.9 | R10: | 46.2  |
| CIE v':                   | 0.5024  | R2:       | 77.0 | R11: | 68.8  |
| Duv:                      | -0.0008 | R3:       | 84.0 | R12: | 45.6  |
| CIE x:                    | 0.3841  | R4:       | 71.6 | R13: | 69.5  |
| CIE y:                    | 0.3774  | R5:       | 68.9 | R14: | 90.7  |
| CIE z:                    | 0.2385  | R6:       | 68.3 |      |       |
| Peak Wavelength (nm):     | 443     | R7:       | 78.7 |      |       |
| Dominant Wavelength (nm): | 579     | R8:       | 52.2 |      |       |
| Purity:                   | 28.7    |           |      |      |       |
| Rf:                       | 71.7    |           |      |      |       |
| Rg:                       | 96.9    |           |      |      |       |



**Test Conditions**

Stabilization Time: 211M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.8/312%  
 Sphere Temperature (°C): 24.1

REPORT NUMBER: SP1-2101-121-2

| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 1/31/2021        | 7/31/2021            |
| Power Meter                    | IN0071                | 12/1/2020        | 12/1/2021            |
| AC Power Source                | IN0063                | 12/1/2020        | 12/1/2021            |
| DC Power Source                | IN0208                | 12/1/2020        | 12/1/2021            |
| Sphere Thermometer             | IN0085                | 12/1/2020        | 12/1/2021            |
| Room Thermometer               | IN0046                | 12/1/2020        | 12/1/2021            |

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CIE 1931 Chromaticity Diagram



CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies inside the ANSI 4000K 4-step quadrangle

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**Photopic Flux vs. Wavelength**



#####

| 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    | 2304          | 0.0           | 490    | 19043         | 2.7           | 620    | 97577         | 25.4          | 750    | 4830          | 0.0           | 880    | 3505          | 0.0           |
| 365    | 2150          | 0.0           | 495    | 26606         | 4.8           | 625    | 90158         | 19.9          | 755    | 4664          | 0.0           | 885    | 2991          | 0.0           |
| 370    | 2146          | 0.0           | 500    | 36376         | 8.0           | 630    | 82240         | 14.9          | 760    | 4006          | 0.0           | 890    | 2327          | 0.0           |
| 375    | 2332          | 0.0           | 505    | 47714         | 13.3          | 635    | 74361         | 11.2          | 765    | 3715          | 0.0           | 895    | 2775          | 0.0           |
| 380    | 2527          | 0.0           | 510    | 58741         | 20.2          | 640    | 66994         | 8.0           | 770    | 3696          | 0.0           | 900    | 2141          | 0.0           |
| 385    | 2304          | 0.0           | 515    | 68716         | 28.5          | 645    | 60405         | 5.8           | 775    | 3117          | 0.0           | 905    | 2421          | 0.0           |
| 390    | 2064          | 0.0           | 520    | 77136         | 37.4          | 650    | 53806         | 3.9           | 780    | 3062          | 0.0           | 910    | 2200          | 0.0           |
| 395    | 1856          | 0.0           | 525    | 83567         | 44.9          | 655    | 47610         | 2.7           | 785    | 2907          | 0.0           | 915    | 2716          | 0.0           |
| 400    | 1856          | 0.0           | 530    | 89283         | 52.6          | 660    | 42018         | 1.8           | 790    | 2655          | 0.0           | 920    | 2656          | 0.0           |
| 405    | 2374          | 0.0           | 535    | 94097         | 58.4          | 665    | 36742         | 1.2           | 795    | 2467          | 0.0           | 925    | 2671          | 0.0           |
| 410    | 4084          | 0.0           | 540    | 96845         | 63.1          | 670    | 32105         | 0.7           | 800    | 2609          | 0.0           | 930    | 3292          | 0.0           |
| 415    | 8543          | 0.0           | 545    | 100829        | 67.1          | 675    | 27946         | 0.5           | 805    | 2293          | 0.0           | 935    | 3188          | 0.0           |
| 420    | 18394         | 0.1           | 550    | 105648        | 71.8          | 680    | 24146         | 0.3           | 810    | 2188          | 0.0           | 940    | 1997          | 0.0           |
| 425    | 37987         | 0.2           | 555    | 110017        | 75.1          | 685    | 21191         | 0.2           | 815    | 2386          | 0.0           | 945    | 2623          | 0.0           |
| 430    | 67605         | 0.5           | 560    | 114586        | 77.9          | 690    | 18544         | 0.1           | 820    | 2712          | 0.0           | 950    | 2969          | 0.0           |
| 435    | 102160        | 1.2           | 565    | 118987        | 79.1          | 695    | 16058         | 0.1           | 825    | 2473          | 0.0           | 955    | 2277          | 0.0           |
| 440    | 135103        | 2.1           | 570    | 122326        | 79.5          | 700    | 14133         | 0.0           | 830    | 1969          | 0.0           | 960    | 4267          | 0.0           |
| 445    | 140126        | 2.9           | 575    | 125968        | 78.4          | 705    | 12309         | 0.0           | 835    | 1917          | 0.0           | 965    | 2034          | 0.0           |
| 450    | 102339        | 2.7           | 580    | 127613        | 75.8          | 710    | 11142         | 0.0           | 840    | 2248          | 0.0           | 970    | 3586          | 0.0           |
| 455    | 58751         | 2.0           | 585    | 129466        | 71.9          | 715    | 10143         | 0.0           | 845    | 2266          | 0.0           | 975    | 2505          | 0.0           |
| 460    | 36892         | 1.5           | 590    | 128813        | 66.6          | 720    | 9072          | 0.0           | 850    | 2558          | 0.0           | 980    | 2666          | 0.0           |
| 465    | 24637         | 1.3           | 595    | 126387        | 59.9          | 725    | 8130          | 0.0           | 855    | 2767          | 0.0           | 985    | 2934          | 0.0           |
| 470    | 16738         | 1.0           | 600    | 123477        | 53.2          | 730    | 7149          | 0.0           | 860    | 2826          | 0.0           | 990    | 4120          | 0.0           |
| 475    | 13456         | 1.1           | 605    | 118718        | 46.0          | 735    | 6311          | 0.0           | 865    | 2385          | 0.0           | 995    | 3858          | 0.0           |
| 480    | 13081         | 1.2           | 610    | 112091        | 38.5          | 740    | 5711          | 0.0           | 870    | 3194          | 0.0           | 1000   | 3405          | 0.0           |
| 485    | 14734         | 1.7           | 615    | 105039        | 31.7          | 745    | 5111          | 0.0           | 875    | 3189          | 0.0           |        |               |               |

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**Scotopic Flux vs. Wavelength**



**Scotopic Lumens: 10425.8 S/P: 1.47**

| 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    | 2304          | 0.0           | 490    | 19043         | 29.3          | 620    | 97577         | 1.2           | 750    | 4830          | 0.0           | 880    | 3505          | 0.0           |
| 365    | 2150          | 0.0           | 495    | 26606         | 43.0          | 625    | 90158         | 0.8           | 755    | 4664          | 0.0           | 885    | 2991          | 0.0           |
| 370    | 2146          | 0.0           | 500    | 36376         | 60.8          | 630    | 82240         | 0.5           | 760    | 4006          | 0.0           | 890    | 2327          | 0.0           |
| 375    | 2332          | 0.0           | 505    | 47714         | 81.1          | 635    | 74361         | 0.3           | 765    | 3715          | 0.0           | 895    | 2775          | 0.0           |
| 380    | 2527          | 0.0           | 510    | 58741         | 99.6          | 640    | 66994         | 0.2           | 770    | 3696          | 0.0           | 900    | 2141          | 0.0           |
| 385    | 2304          | 0.0           | 515    | 68716         | 113.9         | 645    | 60405         | 0.1           | 775    | 3117          | 0.0           | 905    | 2421          | 0.0           |
| 390    | 2064          | 0.0           | 520    | 77136         | 122.6         | 650    | 53806         | 0.1           | 780    | 3062          | 0.0           | 910    | 2200          | 0.0           |
| 395    | 1856          | 0.0           | 525    | 83567         | 125.0         | 655    | 47610         | 0.0           | 785    | 2907          | 0.0           | 915    | 2716          | 0.0           |
| 400    | 1856          | 0.0           | 530    | 89283         | 123.1         | 660    | 42018         | 0.0           | 790    | 2655          | 0.0           | 920    | 2656          | 0.0           |
| 405    | 2374          | 0.1           | 535    | 94097         | 117.3         | 665    | 36742         | 0.0           | 795    | 2467          | 0.0           | 925    | 2671          | 0.0           |
| 410    | 4084          | 0.2           | 540    | 96845         | 107.0         | 670    | 32105         | 0.0           | 800    | 2609          | 0.0           | 930    | 3292          | 0.0           |
| 415    | 8543          | 0.9           | 545    | 100829        | 96.7          | 675    | 27946         | 0.0           | 805    | 2293          | 0.0           | 935    | 3188          | 0.0           |
| 420    | 18394         | 3.0           | 550    | 105648        | 86.4          | 680    | 24146         | 0.0           | 810    | 2188          | 0.0           | 940    | 1997          | 0.0           |
| 425    | 37987         | 9.3           | 555    | 110017        | 75.2          | 685    | 21191         | 0.0           | 815    | 2386          | 0.0           | 945    | 2623          | 0.0           |
| 430    | 67605         | 23.0          | 560    | 114586        | 64.0          | 690    | 18544         | 0.0           | 820    | 2712          | 0.0           | 950    | 2969          | 0.0           |
| 435    | 102160        | 45.7          | 565    | 118987        | 53.4          | 695    | 16058         | 0.0           | 825    | 2473          | 0.0           | 955    | 2277          | 0.0           |
| 440    | 135103        | 75.5          | 570    | 122326        | 43.2          | 700    | 14133         | 0.0           | 830    | 1969          | 0.0           | 960    | 4267          | 0.0           |
| 445    | 140126        | 93.8          | 575    | 125968        | 34.3          | 705    | 12309         | 0.0           | 835    | 1917          | 0.0           | 965    | 2034          | 0.0           |
| 450    | 102339        | 79.3          | 580    | 127613        | 26.3          | 710    | 11142         | 0.0           | 840    | 2248          | 0.0           | 970    | 3586          | 0.0           |
| 455    | 58751         | 51.3          | 585    | 129466        | 19.8          | 715    | 10143         | 0.0           | 845    | 2266          | 0.0           | 975    | 2505          | 0.0           |
| 460    | 36892         | 35.6          | 590    | 128813        | 14.3          | 720    | 9072          | 0.0           | 850    | 2558          | 0.0           | 980    | 2666          | 0.0           |
| 465    | 24637         | 26.0          | 595    | 126387        | 10.1          | 725    | 8130          | 0.0           | 855    | 2767          | 0.0           | 985    | 2934          | 0.0           |
| 470    | 16738         | 19.3          | 600    | 123477        | 7.0           | 730    | 7149          | 0.0           | 860    | 2826          | 0.0           | 990    | 4120          | 0.0           |
| 475    | 13456         | 16.8          | 605    | 118718        | 4.7           | 735    | 6311          | 0.0           | 865    | 2385          | 0.0           | 995    | 3858          | 0.0           |
| 480    | 13081         | 17.7          | 610    | 112091        | 3.0           | 740    | 5711          | 0.0           | 870    | 3194          | 0.0           | 1000   | 3405          | 0.0           |
| 485    | 14734         | 21.4          | 615    | 105039        | 1.9           | 745    | 5111          | 0.0           | 875    | 3189          | 0.0           |        |               |               |

REPORT NUMBER: SP1-2101-121-2

**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 3927.2 M/P: 0.55**

| 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    | 2304          | 0.0           | 490    | 19043         | 15.8          | 620    | 97577         | 0.1           | 750    | 4830          | 0.0           | 880    | 3505          | 0.0           |
| 365    | 2150          | 0.0           | 495    | 26606         | 22.0          | 625    | 90158         | 0.0           | 755    | 4664          | 0.0           | 885    | 2991          | 0.0           |
| 370    | 2146          | 0.0           | 500    | 36376         | 29.2          | 630    | 82240         | 0.0           | 760    | 4006          | 0.0           | 890    | 2327          | 0.0           |
| 375    | 2332          | 0.0           | 505    | 47714         | 36.6          | 635    | 74361         | 0.0           | 765    | 3715          | 0.0           | 895    | 2775          | 0.0           |
| 380    | 2527          | 0.0           | 510    | 58741         | 42.2          | 640    | 66994         | 0.0           | 770    | 3696          | 0.0           | 900    | 2141          | 0.0           |
| 385    | 2304          | 0.0           | 515    | 68716         | 44.9          | 645    | 60405         | 0.0           | 775    | 3117          | 0.0           | 905    | 2421          | 0.0           |
| 390    | 2064          | 0.0           | 520    | 77136         | 44.9          | 650    | 53806         | 0.0           | 780    | 3062          | 0.0           | 910    | 2200          | 0.0           |
| 395    | 1856          | 0.0           | 525    | 83567         | 42.4          | 655    | 47610         | 0.0           | 785    | 2907          | 0.0           | 915    | 2716          | 0.0           |
| 400    | 1856          | 0.0           | 530    | 89283         | 38.6          | 660    | 42018         | 0.0           | 790    | 2655          | 0.0           | 920    | 2656          | 0.0           |
| 405    | 2374          | 0.0           | 535    | 94097         | 33.9          | 665    | 36742         | 0.0           | 795    | 2467          | 0.0           | 925    | 2671          | 0.0           |
| 410    | 4084          | 0.2           | 540    | 96845         | 28.3          | 670    | 32105         | 0.0           | 800    | 2609          | 0.0           | 930    | 3292          | 0.0           |
| 415    | 8543          | 0.6           | 545    | 100829        | 23.4          | 675    | 27946         | 0.0           | 805    | 2293          | 0.0           | 935    | 3188          | 0.0           |
| 420    | 18394         | 2.1           | 550    | 105648        | 19.0          | 680    | 24146         | 0.0           | 810    | 2188          | 0.0           | 940    | 1997          | 0.0           |
| 425    | 37987         | 5.9           | 555    | 110017        | 14.8          | 685    | 21191         | 0.0           | 815    | 2386          | 0.0           | 945    | 2623          | 0.0           |
| 430    | 67605         | 14.3          | 560    | 114586        | 11.3          | 690    | 18544         | 0.0           | 820    | 2712          | 0.0           | 950    | 2969          | 0.0           |
| 435    | 102160        | 27.3          | 565    | 118987        | 8.4           | 695    | 16058         | 0.0           | 825    | 2473          | 0.0           | 955    | 2277          | 0.0           |
| 440    | 135103        | 45.1          | 570    | 122326        | 6.0           | 700    | 14133         | 0.0           | 830    | 1969          | 0.0           | 960    | 4267          | 0.0           |
| 445    | 140126        | 55.3          | 575    | 125968        | 4.2           | 705    | 12309         | 0.0           | 835    | 1917          | 0.0           | 965    | 2034          | 0.0           |
| 450    | 102339        | 47.2          | 580    | 127613        | 2.9           | 710    | 11142         | 0.0           | 840    | 2248          | 0.0           | 970    | 3586          | 0.0           |
| 455    | 58751         | 30.8          | 585    | 129466        | 1.9           | 715    | 10143         | 0.0           | 845    | 2266          | 0.0           | 975    | 2505          | 0.0           |
| 460    | 36892         | 21.7          | 590    | 128813        | 1.3           | 720    | 9072          | 0.0           | 850    | 2558          | 0.0           | 980    | 2666          | 0.0           |
| 465    | 24637         | 16.1          | 595    | 126387        | 0.8           | 725    | 8130          | 0.0           | 855    | 2767          | 0.0           | 985    | 2934          | 0.0           |
| 470    | 16738         | 12.0          | 600    | 123477        | 0.5           | 730    | 7149          | 0.0           | 860    | 2826          | 0.0           | 990    | 4120          | 0.0           |
| 475    | 13456         | 10.3          | 605    | 118718        | 0.3           | 735    | 6311          | 0.0           | 865    | 2385          | 0.0           | 995    | 3858          | 0.0           |
| 480    | 13081         | 10.5          | 610    | 112091        | 0.2           | 740    | 5711          | 0.0           | 870    | 3194          | 0.0           | 1000   | 3405          | 0.0           |
| 485    | 14734         | 12.1          | 615    | 105039        | 0.1           | 745    | 5111          | 0.0           | 875    | 3189          | 0.0           |        |               |               |

**Summary**

$R_f = 71.7$   
 $R_g = 96.9$   
 CIE  $R_a = 71.2$   
 $R_g = -29.7$



**Color Vector Graphics**





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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 55 | CES51 = 86 | CES76 = 45 |
| CES02 = 61 | CES27 = 80 | CES52 = 87 | CES77 = 68 |
| CES03 = 30 | CES28 = 79 | CES53 = 74 | CES78 = 49 |
| CES04 = 70 | CES29 = 51 | CES54 = 81 | CES79 = 77 |
| CES05 = 47 | CES30 = 60 | CES55 = 80 | CES80 = 75 |
| CES06 = 50 | CES31 = 56 | CES56 = 69 | CES81 = 75 |
| CES07 = 40 | CES32 = 52 | CES57 = 67 | CES82 = 90 |
| CES08 = 39 | CES33 = 62 | CES58 = 69 | CES83 = 85 |
| CES09 = 29 | CES34 = 65 | CES59 = 86 | CES84 = 87 |
| CES10 = 74 | CES35 = 81 | CES60 = 91 | CES85 = 83 |
| CES11 = 57 | CES36 = 92 | CES61 = 85 | CES86 = 72 |
| CES12 = 63 | CES37 = 74 | CES62 = 81 | CES87 = 77 |
| CES13 = 42 | CES38 = 69 | CES63 = 72 | CES88 = 77 |
| CES14 = 74 | CES39 = 92 | CES64 = 69 | CES89 = 72 |
| CES15 = 71 | CES40 = 86 | CES65 = 64 | CES90 = 75 |
| CES16 = 46 | CES41 = 84 | CES66 = 63 | CES91 = 91 |
| CES17 = 49 | CES42 = 75 | CES67 = 60 | CES92 = 66 |
| CES18 = 56 | CES43 = 70 | CES68 = 67 | CES93 = 80 |
| CES19 = 72 | CES44 = 98 | CES69 = 77 | CES94 = 56 |
| CES20 = 65 | CES45 = 80 | CES70 = 57 | CES95 = 72 |
| CES21 = 86 | CES46 = 77 | CES71 = 53 | CES96 = 78 |
| CES22 = 78 | CES47 = 74 | CES72 = 84 | CES97 = 83 |
| CES23 = 92 | CES48 = 66 | CES73 = 47 | CES98 = 73 |
| CES24 = 91 | CES49 = 76 | CES74 = 96 | CES99 = 63 |
| CES25 = 72 | CES50 = 85 | CES75 = 52 |            |



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)