

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: P362637

Luminaire Tested: NVN-SA5C-760-U-T2R-HSS

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-2019  
Report Number: P362637  
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-SA5C-760-U-T2R-HSS  
Description: NAVION ROADWAY AND AREA LUMINAIRE  
(5) 70 CRI, 5700K, 1050mA 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: 29009 lumens  
Efficiency: N/A  
Efficacy: 104.0 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 1.5' x H: 0')  
IES Classification: Type II - Medium  
BUG Rating: B1 - U0 - G3

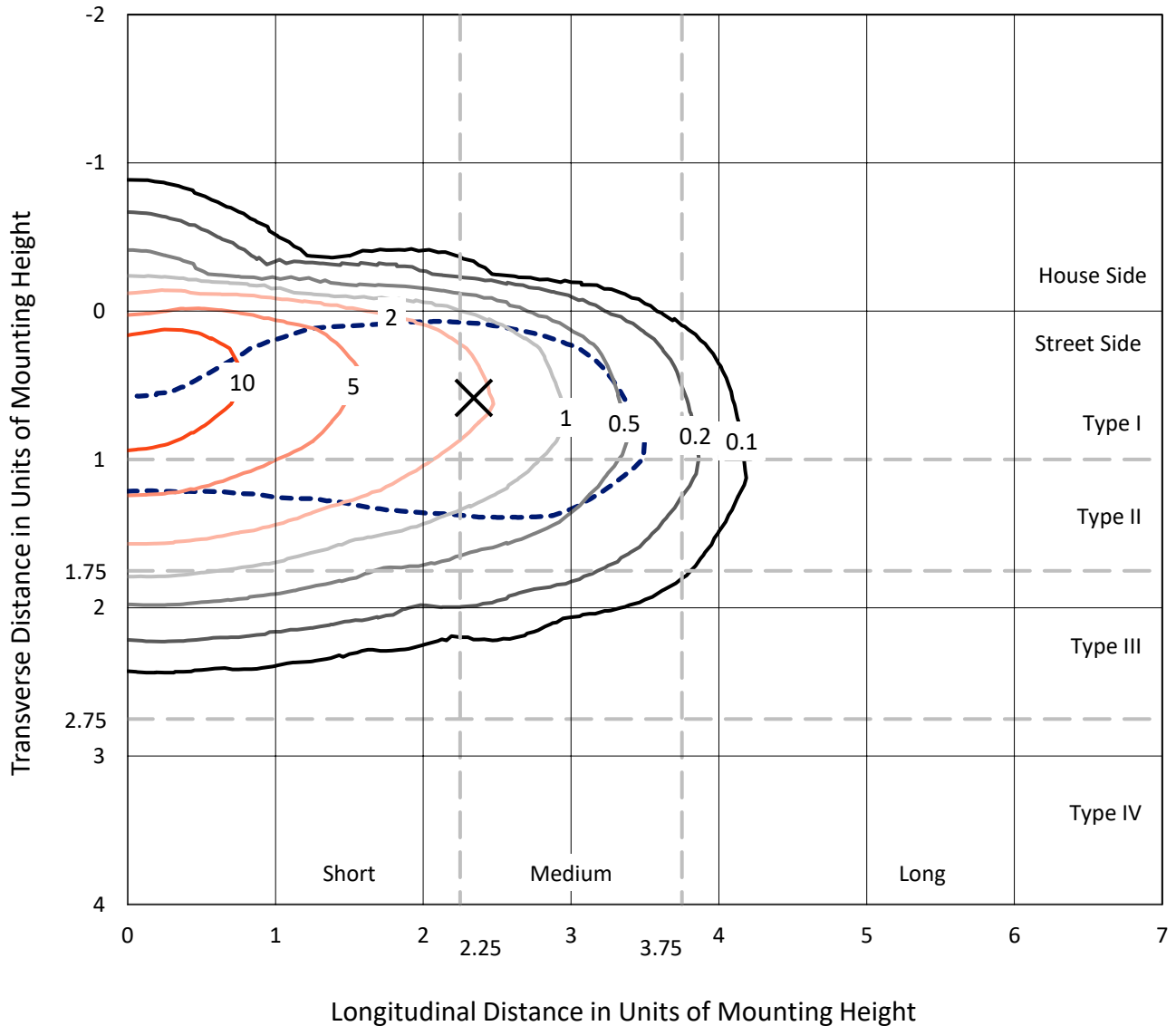
Input Watts (W): 279  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT



REPORT NUMBER: P362637  
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### Iso-Footcandle Lines of Horizontal Illumination

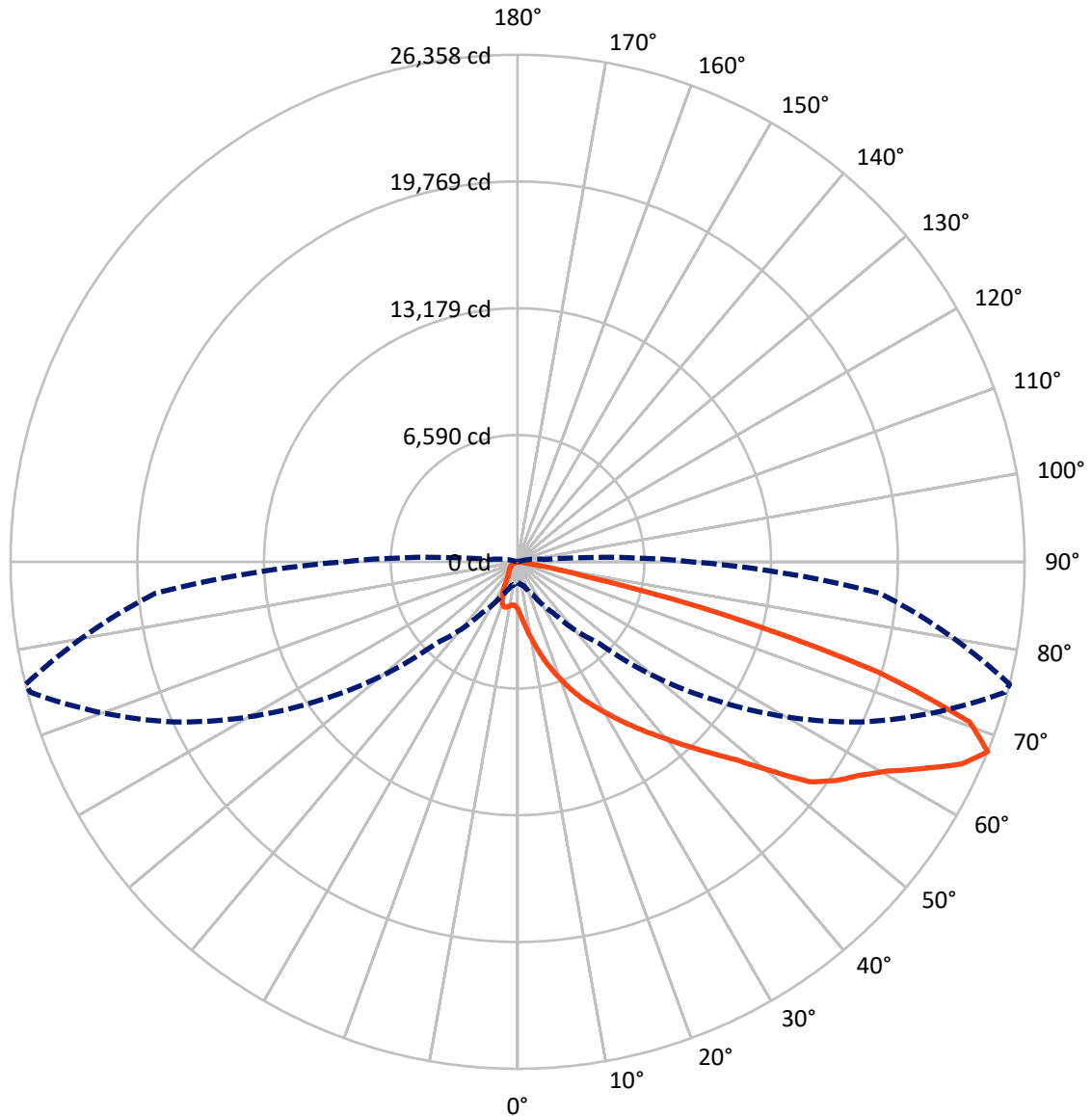
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 13.9 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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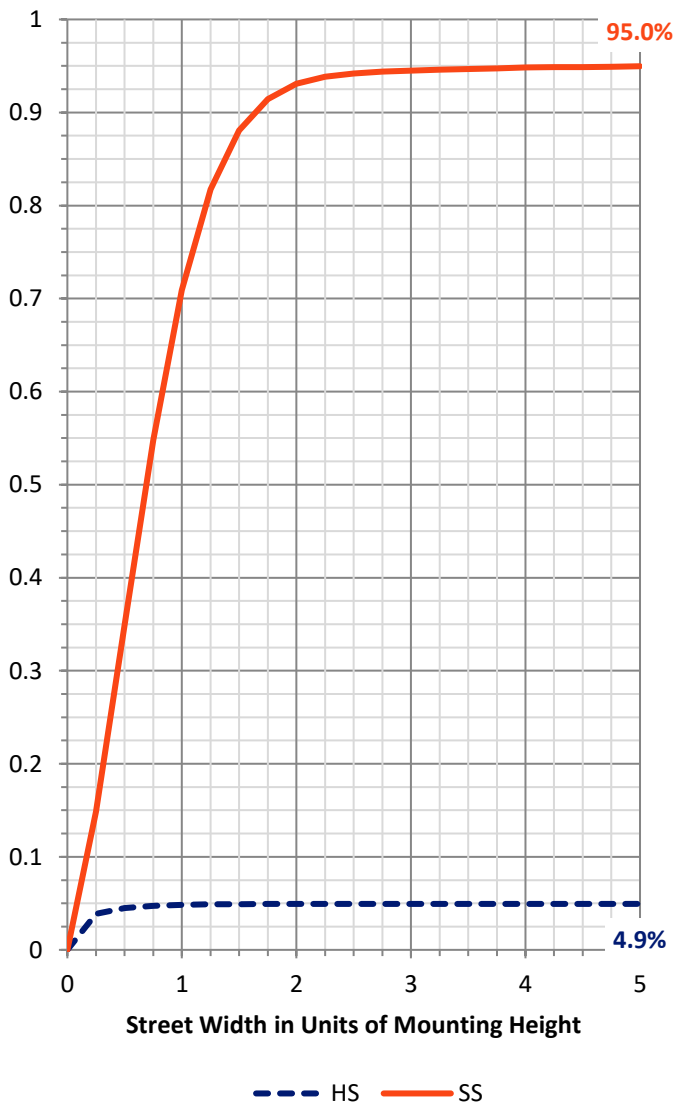
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 1440.5   | 0.0    | 1440.5  |
|                    | % Fixture | 5.0      | 0.0    | 5.0     |
| <b>Street Side</b> | Lumens    | 27568.5  | 0.0    | 27568.5 |
|                    | % Fixture | 95.0     | 0.0    | 95.0    |
| <b>Total</b>       | Lumens    | 29009.0  | 0.0    | 29009.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 306.0   | 1.1       |
| 10°-20°   | 1213.0  | 4.2       |
| 20°-30°   | 2468.1  | 8.5       |
| 30°-40°   | 4283.8  | 14.8      |
| 40°-50°   | 6052.5  | 20.9      |
| 50°-60°   | 6863.8  | 23.7      |
| 60°-70°   | 5692.9  | 19.6      |
| 70°-80°   | 2062.1  | 7.1       |
| 80°-90°   | 66.9    | 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°    | 29009.0 | 100.0     |
| 0°-180°   | 29009.0 | 100.0     |

**Coefficient of Utilization**

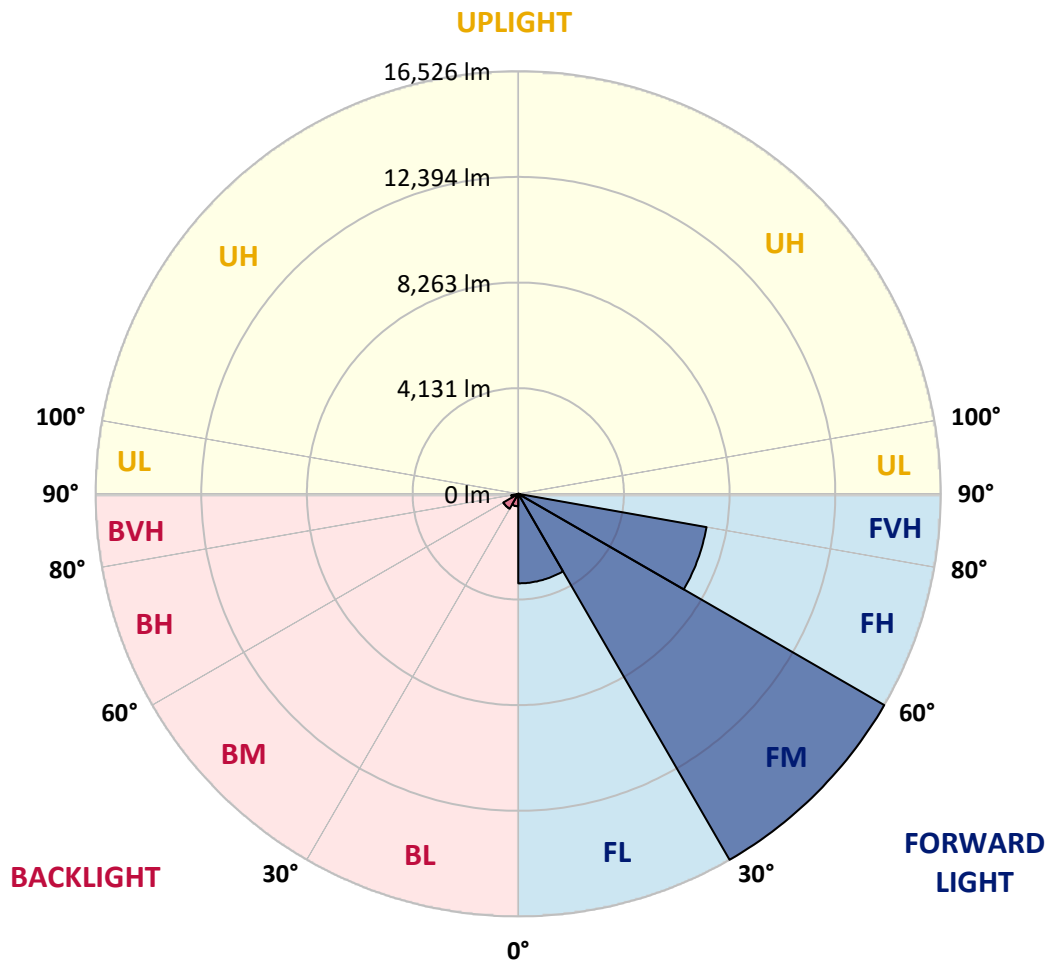


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**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone           | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |         |
|----------------|---------|-----------|-------------------------|------|---------|
|                |         |           | B                       | U    | G       |
| FL (0°-30°)    | 3501.3  | 12.1      |                         |      |         |
| FM (30°-60°)   | 16525.8 | 57.0      |                         |      |         |
| FH (60°-80°)   | 7476.6  | 25.8      |                         |      | G3/7500 |
| FVH (80°-90°)  | 64.8    | 0.2       |                         |      | G1/100  |
| BL (0°-30°)    | 485.8   | 1.7       | B1/500                  |      |         |
| BM (30°-60°)   | 674.2   | 2.3       | B1/1000                 |      |         |
| BH (60°-80°)   | 278.4   | 1.0       | B1/500                  |      | G1/500  |
| BVH (80°-90°)  | 2.1     | 0.0       |                         |      | G0/10   |
| UL (90°-100°)  | 0.0     | 0.0       |                         | U0/0 |         |
| UH (100°-180°) | 0.0     | 0.0       |                         | U0/0 |         |

**BUG Rating: B1-U0-G3**  
 Type II Medium





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 55°     | 65°     | 75°     | 76°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 2460.8  | 2460.8  | 2460.8  | 2460.8  | 2460.8  | 2460.8  | 2460.8  | 2460.8  | 2460.8  | 2460.8  | 2460.8  |
| 2.5°  | 3673.4  | 3590.8  | 3609.9  | 3556.5  | 3459.9  | 3261.6  | 3092.5  | 2932.4  | 2745.5  | 2739.2  | 2585.4  |
| 5°    | 4953.4  | 4883.5  | 4874.6  | 4766.5  | 4591.1  | 4254.3  | 3926.4  | 3552.7  | 3135.7  | 3105.2  | 2778.6  |
| 7.5°  | 6115.1  | 6059.2  | 6038.9  | 5910.5  | 5583.8  | 5255.9  | 4828.8  | 4279.7  | 3627.7  | 3571.7  | 3039.1  |
| 10°   | 7007.4  | 6980.8  | 6985.8  | 6894.3  | 6614.7  | 6309.6  | 5749.1  | 5048.7  | 4185.7  | 4099.2  | 3351.8  |
| 12.5° | 7683.7  | 7690.0  | 7735.8  | 7679.8  | 7523.5  | 7297.2  | 6698.6  | 5868.6  | 4803.4  | 4685.2  | 3709.0  |
| 15°   | 8180.6  | 8212.4  | 8296.3  | 8366.2  | 8354.8  | 8159.0  | 7609.9  | 6701.1  | 5459.3  | 5328.4  | 4106.8  |
| 17.5° | 8502.2  | 8537.8  | 8659.8  | 8814.9  | 8957.3  | 8911.5  | 8489.5  | 7504.4  | 6122.8  | 5971.5  | 4532.7  |
| 20°   | 8784.4  | 8826.4  | 8957.3  | 9161.9  | 9427.6  | 9484.8  | 9207.7  | 8283.6  | 6785.0  | 6600.7  | 4972.4  |
| 22.5° | 9395.8  | 9394.5  | 9474.6  | 9594.1  | 9847.0  | 9994.5  | 9819.1  | 9006.8  | 7439.6  | 7247.7  | 5421.1  |
| 25°   | 10501.6 | 10459.7 | 10431.7 | 10337.7 | 10393.6 | 10485.1 | 10387.2 | 9683.1  | 8098.0  | 7903.6  | 5876.2  |
| 27.5° | 11815.9 | 11841.3 | 11615.1 | 11362.1 | 11166.4 | 11072.3 | 10912.2 | 10309.7 | 8731.0  | 8517.5  | 6321.1  |
| 30°   | 13202.7 | 13210.3 | 12943.4 | 12620.5 | 12189.6 | 11832.4 | 11555.4 | 10908.4 | 9381.8  | 9149.2  | 6753.2  |
| 32.5° | 14453.4 | 14403.8 | 14139.5 | 13699.7 | 13155.6 | 12754.0 | 12178.2 | 11577.0 | 10070.7 | 9845.8  | 7233.7  |
| 35°   | 15444.8 | 15386.4 | 15064.8 | 14664.4 | 14100.0 | 13695.8 | 13003.1 | 12244.3 | 10795.2 | 10575.4 | 7715.4  |
| 37.5° | 16169.4 | 16100.7 | 15770.2 | 15358.4 | 14871.6 | 14636.4 | 13960.2 | 12970.1 | 11585.9 | 11349.4 | 8222.6  |
| 40°   | 16421.0 | 16361.3 | 16154.1 | 15852.9 | 15461.4 | 15408.0 | 14975.8 | 13805.2 | 12446.4 | 12194.7 | 8797.1  |
| 42.5° | 16271.0 | 16212.6 | 16138.9 | 16037.2 | 15874.5 | 15925.3 | 15934.2 | 14757.2 | 13402.2 | 13154.4 | 9431.4  |
| 45°   | 15676.2 | 15624.1 | 15700.3 | 15849.0 | 16051.1 | 16302.8 | 16808.7 | 15780.4 | 14469.9 | 14205.5 | 10164.8 |
| 47.5° | 14800.4 | 14762.3 | 14973.3 | 15344.4 | 15935.5 | 16629.5 | 17608.2 | 16855.7 | 15668.6 | 15423.2 | 11080.0 |
| 50°   | 13554.8 | 13548.4 | 13970.4 | 14647.9 | 15556.7 | 16787.1 | 18434.4 | 18078.5 | 17333.7 | 17075.6 | 12352.3 |
| 52.5° | 11615.1 | 11627.8 | 12457.8 | 13542.0 | 14891.9 | 16680.3 | 18965.7 | 19649.6 | 19270.8 | 19002.6 | 13454.3 |
| 55°   | 9768.2  | 9844.5  | 10433.0 | 11996.4 | 13872.5 | 16283.8 | 19148.8 | 20383.0 | 20339.8 | 20085.5 | 14067.0 |
| 57.5° | 7959.5  | 8098.0  | 8664.9  | 10125.4 | 12384.1 | 15369.9 | 19048.3 | 20700.7 | 21135.5 | 20941.0 | 14875.4 |
| 60°   | 5999.5  | 6063.0  | 6716.4  | 8081.5  | 10473.7 | 13702.2 | 18320.0 | 20873.6 | 22223.5 | 22088.8 | 16048.6 |
| 62.5° | 3817.0  | 3975.9  | 4555.5  | 5872.4  | 8155.2  | 11386.3 | 17092.2 | 20871.1 | 23584.8 | 23658.5 | 17562.5 |
| 65°   | 2010.8  | 2196.4  | 2504.0  | 3639.1  | 5604.2  | 8799.7  | 15245.3 | 20675.3 | 25255.0 | 25358.0 | 18745.8 |
| 67.5° | 1084.2  | 1137.6  | 1300.3  | 1888.8  | 3250.1  | 5961.3  | 12531.5 | 19709.3 | 26222.3 | 26358.3 | 18911.1 |
| 70°   | 793.2   | 822.4   | 883.4   | 1044.8  | 1635.9  | 3462.4  | 9144.1  | 17519.2 | 24975.4 | 24924.5 | 16802.4 |
| 72.5° | 608.8   | 654.6   | 700.4   | 765.2   | 940.6   | 1848.1  | 5693.1  | 13718.7 | 19927.9 | 19592.4 | 12559.5 |
| 75°   | 480.5   | 488.1   | 552.9   | 611.4   | 705.4   | 1052.5  | 2528.2  | 7990.0  | 12162.9 | 11368.5 | 6513.0  |
| 77.5° | 383.9   | 388.9   | 427.1   | 477.9   | 566.9   | 691.5   | 783.0   | 3143.4  | 3883.1  | 3465.0  | 1413.4  |
| 80°   | 227.5   | 240.2   | 317.8   | 368.6   | 470.3   | 436.0   | 286.0   | 682.6   | 606.3   | 549.1   | 237.7   |
| 82.5° | 127.1   | 137.3   | 179.2   | 291.1   | 327.9   | 208.5   | 142.4   | 184.3   | 142.4   | 138.5   | 67.4    |
| 85°   | 0.0     | 6.4     | 115.7   | 180.5   | 133.5   | 45.8    | 59.7    | 61.0    | 41.9    | 39.4    | 26.7    |
| 87.5° | 0.0     | 0.0     | 35.6    | 34.3    | 5.1     | 7.6     | 14.0    | 20.3    | 16.5    | 16.5    | 14.0    |
| 90°   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |



REPORT NUMBER: P362637

CATALOG NUMBER: NVN-SA5C-760-U-T2R-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 2460.8 | 2460.8 | 2460.8 | 2460.8 | 2460.8 | 2460.8 | 2460.8 | 2460.8 | 2460.8 | 2460.8 | 2460.8 |
| 2.5°  | 2509.1 | 2440.5 | 2310.8 | 2183.7 | 2076.9 | 1989.2 | 1910.4 | 1878.7 | 1853.2 | 1849.4 | 1829.1 |
| 5°    | 2621.0 | 2482.4 | 2234.6 | 2031.2 | 1895.2 | 1798.6 | 1716.0 | 1665.1 | 1625.7 | 1610.5 | 1596.5 |
| 7.5°  | 2790.0 | 2580.3 | 2224.4 | 1990.5 | 1827.8 | 1665.1 | 1512.6 | 1347.3 | 1244.4 | 1205.0 | 1182.1 |
| 10°   | 2995.9 | 2709.9 | 2262.5 | 1979.1 | 1694.3 | 1351.2 | 1098.2 | 888.5  | 803.3  | 775.4  | 767.7  |
| 12.5° | 3236.2 | 2871.4 | 2328.6 | 1907.9 | 1409.6 | 959.7  | 757.6  | 686.4  | 667.3  | 658.4  | 658.4  |
| 15°   | 3512.0 | 3048.0 | 2375.6 | 1702.0 | 1042.3 | 725.8  | 655.9  | 622.8  | 602.5  | 591.1  | 592.3  |
| 17.5° | 3794.2 | 3220.9 | 2352.8 | 1403.3 | 769.0  | 645.7  | 593.6  | 558.0  | 530.0  | 518.6  | 516.1  |
| 20°   | 4078.9 | 3381.1 | 2225.7 | 1044.8 | 650.8  | 586.0  | 527.5  | 488.1  | 460.1  | 448.7  | 446.1  |
| 22.5° | 4373.8 | 3517.1 | 2001.9 | 766.5  | 584.7  | 519.9  | 462.7  | 423.3  | 396.6  | 386.4  | 381.3  |
| 25°   | 4661.0 | 3627.7 | 1689.3 | 620.3  | 522.4  | 457.6  | 402.9  | 366.1  | 341.9  | 331.8  | 330.5  |
| 27.5° | 4929.2 | 3697.6 | 1327.0 | 547.8  | 467.8  | 401.7  | 352.1  | 319.0  | 298.7  | 291.1  | 289.8  |
| 30°   | 5170.7 | 3703.9 | 981.3  | 494.4  | 419.5  | 353.4  | 307.6  | 278.4  | 260.6  | 252.9  | 250.4  |
| 32.5° | 5414.8 | 3650.5 | 714.3  | 446.1  | 375.0  | 311.4  | 266.9  | 244.0  | 231.3  | 225.0  | 225.0  |
| 35°   | 5644.8 | 3527.2 | 556.7  | 404.2  | 331.8  | 270.7  | 235.1  | 218.6  | 211.0  | 204.6  | 204.6  |
| 37.5° | 5869.8 | 3350.6 | 472.8  | 367.3  | 291.1  | 236.4  | 207.2  | 197.0  | 190.7  | 184.3  | 184.3  |
| 40°   | 6098.6 | 3128.1 | 429.6  | 333.0  | 258.0  | 209.7  | 184.3  | 175.4  | 169.1  | 164.0  | 162.7  |
| 42.5° | 6379.5 | 2871.4 | 401.7  | 301.2  | 228.8  | 185.6  | 162.7  | 152.5  | 147.4  | 142.4  | 139.8  |
| 45°   | 6704.9 | 2650.2 | 378.8  | 269.5  | 204.6  | 165.2  | 141.1  | 130.9  | 123.3  | 116.9  | 115.7  |
| 47.5° | 7174.0 | 2490.0 | 348.3  | 235.1  | 181.8  | 143.6  | 122.0  | 110.6  | 99.1   | 92.8   | 91.5   |
| 50°   | 7772.6 | 2357.8 | 308.9  | 204.6  | 158.9  | 122.0  | 101.7  | 87.7   | 77.5   | 71.2   | 71.2   |
| 52.5° | 8070.1 | 2185.0 | 273.3  | 178.0  | 133.5  | 103.0  | 82.6   | 66.1   | 61.0   | 54.7   | 54.7   |
| 55°   | 8189.5 | 2052.8 | 237.7  | 151.3  | 110.6  | 85.2   | 64.8   | 50.8   | 47.0   | 43.2   | 41.9   |
| 57.5° | 8525.1 | 2014.7 | 207.2  | 128.4  | 91.5   | 67.4   | 49.6   | 38.1   | 35.6   | 30.5   | 30.5   |
| 60°   | 9065.3 | 2033.7 | 179.2  | 109.3  | 73.7   | 52.1   | 36.9   | 29.2   | 26.7   | 21.6   | 21.6   |
| 62.5° | 9648.7 | 2009.6 | 151.3  | 94.1   | 57.2   | 38.1   | 25.4   | 21.6   | 21.6   | 12.7   | 11.4   |
| 65°   | 9760.6 | 1789.7 | 129.6  | 77.5   | 44.5   | 28.0   | 16.5   | 14.0   | 19.1   | 2.5    | 0.0    |
| 67.5° | 9059.0 | 1388.0 | 111.9  | 59.7   | 33.0   | 21.6   | 12.7   | 6.4    | 16.5   | 0.0    | 0.0    |
| 70°   | 7243.9 | 882.1  | 90.2   | 43.2   | 25.4   | 17.8   | 10.2   | 2.5    | 12.7   | 0.0    | 0.0    |
| 72.5° | 5122.4 | 512.2  | 71.2   | 30.5   | 21.6   | 14.0   | 7.6    | 0.0    | 7.6    | 0.0    | 0.0    |
| 75°   | 2590.5 | 273.3  | 44.5   | 22.9   | 16.5   | 10.2   | 5.1    | 0.0    | 1.3    | 0.0    | 0.0    |
| 77.5° | 560.5  | 127.1  | 28.0   | 16.5   | 11.4   | 6.4    | 2.5    | 0.0    | 0.0    | 0.0    | 0.0    |
| 80°   | 122.0  | 55.9   | 17.8   | 10.2   | 6.4    | 3.8    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 82.5° | 44.5   | 29.2   | 8.9    | 5.1    | 2.5    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 85°   | 24.2   | 15.3   | 5.1    | 2.5    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 87.5° | 12.7   | 5.1    | 1.3    | 1.3    | 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    |



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

Report Prepared for

Cooper Lighting Solutions

McGRAW-EDISON

Report Number: SP1-1908-441-9-R4

Test Date: 10/23/2019

Luminaire Tested: SA1C-760-U-5WQ

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

**Test Information**

Test Method: LM-79-2008  
 Report Number: SP1-1908-441-9-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-760-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):                  | 5474   | CRI (Ra): | 71.7 | R9:  | -27.1 |
| CIE u':                   | 0.2052 | R1:       | 70.6 | R10: | 40.8  |
| CIE v':                   | 0.4804 | R2:       | 74.6 | R11: | 74.6  |
| Duv:                      | 0.0025 | R3:       | 78.3 | R12: | 50.4  |
| CIE x:                    | 0.3330 | R4:       | 73.8 | R13: | 70.0  |
| CIE y:                    | 0.3466 | R5:       | 72.4 | R14: | 87.8  |
| CIE z:                    | 0.3204 | R6:       | 67.5 |      |       |
| Peak Wavelength (nm):     | 442    | R7:       | 77.5 |      |       |
| Dominant Wavelength (nm): | 554    | R8:       | 58.9 |      |       |
| Purity:                   | 4.1    |           |      |      |       |
| Rf:                       | 72.1   |           |      |      |       |
| Rg:                       | 97.2   |           |      |      |       |



**Test Conditions**

Stabilization Time: 240M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.6/31%  
 Sphere Temperature (°C): 25.9

REPORT NUMBER: SP1-1908-441-9-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 5700K 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    | 3540          | NR            | 490    | 33363         | NR            | 620    | 80193         | NR            | 750    | 4663          | NR            | 880    | 4678          | NR            |
| 365    | 2862          | NR            | 495    | 44177         | NR            | 625    | 73091         | NR            | 755    | 4147          | NR            | 885    | 4128          | NR            |
| 370    | 2865          | NR            | 500    | 57019         | NR            | 630    | 66269         | NR            | 760    | 4040          | NR            | 890    | 4504          | NR            |
| 375    | 3254          | NR            | 505    | 70030         | NR            | 635    | 60012         | NR            | 765    | 3474          | NR            | 895    | 4371          | NR            |
| 380    | 3076          | NR            | 510    | 81972         | NR            | 640    | 53914         | NR            | 770    | 3469          | NR            | 900    | 4082          | NR            |
| 385    | 2904          | NR            | 515    | 92590         | NR            | 645    | 48385         | NR            | 775    | 3181          | NR            | 905    | 2982          | NR            |
| 390    | 2689          | NR            | 520    | 100305        | NR            | 650    | 43219         | NR            | 780    | 2969          | NR            | 910    | 4351          | NR            |
| 395    | 2619          | NR            | 525    | 107452        | NR            | 655    | 38562         | NR            | 785    | 3132          | NR            | 915    | 3365          | NR            |
| 400    | 2679          | NR            | 530    | 111373        | NR            | 660    | 34110         | NR            | 790    | 2507          | NR            | 920    | 3430          | NR            |
| 405    | 3515          | NR            | 535    | 114505        | NR            | 665    | 30085         | NR            | 795    | 2968          | NR            | 925    | 4264          | NR            |
| 410    | 6934          | NR            | 540    | 116408        | NR            | 670    | 26205         | NR            | 800    | 2758          | NR            | 930    | 4095          | NR            |
| 415    | 14943         | NR            | 545    | 118700        | NR            | 675    | 22906         | NR            | 805    | 2872          | NR            | 935    | 5048          | NR            |
| 420    | 31939         | NR            | 550    | 119209        | NR            | 680    | 20058         | NR            | 810    | 3094          | NR            | 940    | 4074          | NR            |
| 425    | 64701         | NR            | 555    | 120742        | NR            | 685    | 17413         | NR            | 815    | 3222          | NR            | 945    | 4949          | NR            |
| 430    | 110939        | NR            | 560    | 121594        | NR            | 690    | 15447         | NR            | 820    | 3238          | NR            | 950    | 4387          | NR            |
| 435    | 164597        | NR            | 565    | 121913        | NR            | 695    | 13398         | NR            | 825    | 3524          | NR            | 955    | 4978          | NR            |
| 440    | 207696        | NR            | 570    | 122147        | NR            | 700    | 11777         | NR            | 830    | 2921          | NR            | 960    | 4706          | NR            |
| 445    | 201830        | NR            | 575    | 121605        | NR            | 705    | 10412         | NR            | 835    | 3595          | NR            | 965    | 5083          | NR            |
| 450    | 145410        | NR            | 580    | 120248        | NR            | 710    | 9544          | NR            | 840    | 3016          | NR            | 970    | 4522          | NR            |
| 455    | 89594         | NR            | 585    | 117717        | NR            | 715    | 8940          | NR            | 845    | 4032          | NR            | 975    | 4740          | NR            |
| 460    | 58321         | NR            | 590    | 114359        | NR            | 720    | 7897          | NR            | 850    | 3579          | NR            | 980    | 6122          | NR            |
| 465    | 39318         | NR            | 595    | 109974        | NR            | 725    | 7045          | NR            | 855    | 4571          | NR            | 985    | 6450          | NR            |
| 470    | 27693         | NR            | 600    | 105269        | NR            | 730    | 6483          | NR            | 860    | 4485          | NR            | 990    | 4875          | NR            |
| 475    | 23081         | NR            | 605    | 99453         | NR            | 735    | 5838          | NR            | 865    | 3978          | NR            | 995    | 4764          | NR            |
| 480    | 23002         | NR            | 610    | 92921         | NR            | 740    | 5261          | NR            | 870    | 4298          | NR            | 1000   | 3640          | NR            |
| 485    | 26201         | NR            | 615    | 86989         | NR            | 745    | 4760          | NR            | 875    | 4356          | NR            |        |               |               |

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Scotopic Flux vs. Wavelength



Scotopic Lumens: 13759.3 S/P: 1.85

| 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    | 3540          | NR            | 490    | 33363         | NR            | 620    | 80193         | NR            | 750    | 4663          | NR            | 880    | 4678          | NR            |
| 365    | 2862          | NR            | 495    | 44177         | NR            | 625    | 73091         | NR            | 755    | 4147          | NR            | 885    | 4128          | NR            |
| 370    | 2865          | NR            | 500    | 57019         | NR            | 630    | 66269         | NR            | 760    | 4040          | NR            | 890    | 4504          | NR            |
| 375    | 3254          | NR            | 505    | 70030         | NR            | 635    | 60012         | NR            | 765    | 3474          | NR            | 895    | 4371          | NR            |
| 380    | 3076          | NR            | 510    | 81972         | NR            | 640    | 53914         | NR            | 770    | 3469          | NR            | 900    | 4082          | NR            |
| 385    | 2904          | NR            | 515    | 92590         | NR            | 645    | 48385         | NR            | 775    | 3181          | NR            | 905    | 2982          | NR            |
| 390    | 2689          | NR            | 520    | 100305        | NR            | 650    | 43219         | NR            | 780    | 2969          | NR            | 910    | 4351          | NR            |
| 395    | 2619          | NR            | 525    | 107452        | NR            | 655    | 38562         | NR            | 785    | 3132          | NR            | 915    | 3365          | NR            |
| 400    | 2679          | NR            | 530    | 111373        | NR            | 660    | 34110         | NR            | 790    | 2507          | NR            | 920    | 3430          | NR            |
| 405    | 3515          | NR            | 535    | 114505        | NR            | 665    | 30085         | NR            | 795    | 2968          | NR            | 925    | 4264          | NR            |
| 410    | 6934          | NR            | 540    | 116408        | NR            | 670    | 26205         | NR            | 800    | 2758          | NR            | 930    | 4095          | NR            |
| 415    | 14943         | NR            | 545    | 118700        | NR            | 675    | 22906         | NR            | 805    | 2872          | NR            | 935    | 5048          | NR            |
| 420    | 31939         | NR            | 550    | 119209        | NR            | 680    | 20058         | NR            | 810    | 3094          | NR            | 940    | 4074          | NR            |
| 425    | 64701         | NR            | 555    | 120742        | NR            | 685    | 17413         | NR            | 815    | 3222          | NR            | 945    | 4949          | NR            |
| 430    | 110939        | NR            | 560    | 121594        | NR            | 690    | 15447         | NR            | 820    | 3238          | NR            | 950    | 4387          | NR            |
| 435    | 164597        | NR            | 565    | 121913        | NR            | 695    | 13398         | NR            | 825    | 3524          | NR            | 955    | 4978          | NR            |
| 440    | 207696        | NR            | 570    | 122147        | NR            | 700    | 11777         | NR            | 830    | 2921          | NR            | 960    | 4706          | NR            |
| 445    | 201830        | NR            | 575    | 121605        | NR            | 705    | 10412         | NR            | 835    | 3595          | NR            | 965    | 5083          | NR            |
| 450    | 145410        | NR            | 580    | 120248        | NR            | 710    | 9544          | NR            | 840    | 3016          | NR            | 970    | 4522          | NR            |
| 455    | 89594         | NR            | 585    | 117717        | NR            | 715    | 8940          | NR            | 845    | 4032          | NR            | 975    | 4740          | NR            |
| 460    | 58321         | NR            | 590    | 114359        | NR            | 720    | 7897          | NR            | 850    | 3579          | NR            | 980    | 6122          | NR            |
| 465    | 39318         | NR            | 595    | 109974        | NR            | 725    | 7045          | NR            | 855    | 4571          | NR            | 985    | 6450          | NR            |
| 470    | 27693         | NR            | 600    | 105269        | NR            | 730    | 6483          | NR            | 860    | 4485          | NR            | 990    | 4875          | NR            |
| 475    | 23081         | NR            | 605    | 99453         | NR            | 735    | 5838          | NR            | 865    | 3978          | NR            | 995    | 4764          | NR            |
| 480    | 23002         | NR            | 610    | 92921         | NR            | 740    | 5261          | NR            | 870    | 4298          | NR            | 1000   | 3640          | NR            |
| 485    | 26201         | NR            | 615    | 86989         | NR            | 745    | 4760          | NR            | 875    | 4356          | NR            |        |               |               |

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**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 5527.6 M/P: 0.74**

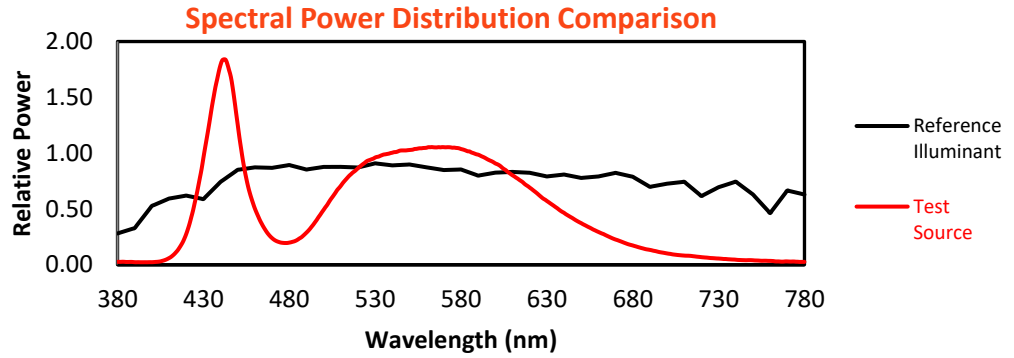
| λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) |
|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|
| 360    | 3540          | NR            | 490    | 33363         | NR            | 620    | 80193         | NR            | 750    | 4663          | NR            | 880    | 4678          | NR            |
| 365    | 2862          | NR            | 495    | 44177         | NR            | 625    | 73091         | NR            | 755    | 4147          | NR            | 885    | 4128          | NR            |
| 370    | 2865          | NR            | 500    | 57019         | NR            | 630    | 66269         | NR            | 760    | 4040          | NR            | 890    | 4504          | NR            |
| 375    | 3254          | NR            | 505    | 70030         | NR            | 635    | 60012         | NR            | 765    | 3474          | NR            | 895    | 4371          | NR            |
| 380    | 3076          | NR            | 510    | 81972         | NR            | 640    | 53914         | NR            | 770    | 3469          | NR            | 900    | 4082          | NR            |
| 385    | 2904          | NR            | 515    | 92590         | NR            | 645    | 48385         | NR            | 775    | 3181          | NR            | 905    | 2982          | NR            |
| 390    | 2689          | NR            | 520    | 100305        | NR            | 650    | 43219         | NR            | 780    | 2969          | NR            | 910    | 4351          | NR            |
| 395    | 2619          | NR            | 525    | 107452        | NR            | 655    | 38562         | NR            | 785    | 3132          | NR            | 915    | 3365          | NR            |
| 400    | 2679          | NR            | 530    | 111373        | NR            | 660    | 34110         | NR            | 790    | 2507          | NR            | 920    | 3430          | NR            |
| 405    | 3515          | NR            | 535    | 114505        | NR            | 665    | 30085         | NR            | 795    | 2968          | NR            | 925    | 4264          | NR            |
| 410    | 6934          | NR            | 540    | 116408        | NR            | 670    | 26205         | NR            | 800    | 2758          | NR            | 930    | 4095          | NR            |
| 415    | 14943         | NR            | 545    | 118700        | NR            | 675    | 22906         | NR            | 805    | 2872          | NR            | 935    | 5048          | NR            |
| 420    | 31939         | NR            | 550    | 119209        | NR            | 680    | 20058         | NR            | 810    | 3094          | NR            | 940    | 4074          | NR            |
| 425    | 64701         | NR            | 555    | 120742        | NR            | 685    | 17413         | NR            | 815    | 3222          | NR            | 945    | 4949          | NR            |
| 430    | 110939        | NR            | 560    | 121594        | NR            | 690    | 15447         | NR            | 820    | 3238          | NR            | 950    | 4387          | NR            |
| 435    | 164597        | NR            | 565    | 121913        | NR            | 695    | 13398         | NR            | 825    | 3524          | NR            | 955    | 4978          | NR            |
| 440    | 207696        | NR            | 570    | 122147        | NR            | 700    | 11777         | NR            | 830    | 2921          | NR            | 960    | 4706          | NR            |
| 445    | 201830        | NR            | 575    | 121605        | NR            | 705    | 10412         | NR            | 835    | 3595          | NR            | 965    | 5083          | NR            |
| 450    | 145410        | NR            | 580    | 120248        | NR            | 710    | 9544          | NR            | 840    | 3016          | NR            | 970    | 4522          | NR            |
| 455    | 89594         | NR            | 585    | 117717        | NR            | 715    | 8940          | NR            | 845    | 4032          | NR            | 975    | 4740          | NR            |
| 460    | 58321         | NR            | 590    | 114359        | NR            | 720    | 7897          | NR            | 850    | 3579          | NR            | 980    | 6122          | NR            |
| 465    | 39318         | NR            | 595    | 109974        | NR            | 725    | 7045          | NR            | 855    | 4571          | NR            | 985    | 6450          | NR            |
| 470    | 27693         | NR            | 600    | 105269        | NR            | 730    | 6483          | NR            | 860    | 4485          | NR            | 990    | 4875          | NR            |
| 475    | 23081         | NR            | 605    | 99453         | NR            | 735    | 5838          | NR            | 865    | 3978          | NR            | 995    | 4764          | NR            |
| 480    | 23002         | NR            | 610    | 92921         | NR            | 740    | 5261          | NR            | 870    | 4298          | NR            | 1000   | 3640          | NR            |
| 485    | 26201         | NR            | 615    | 86989         | NR            | 745    | 4760          | NR            | 875    | 4356          | NR            |        |               |               |

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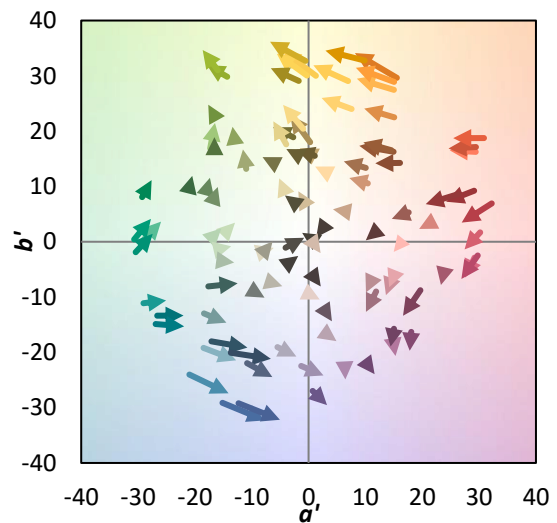
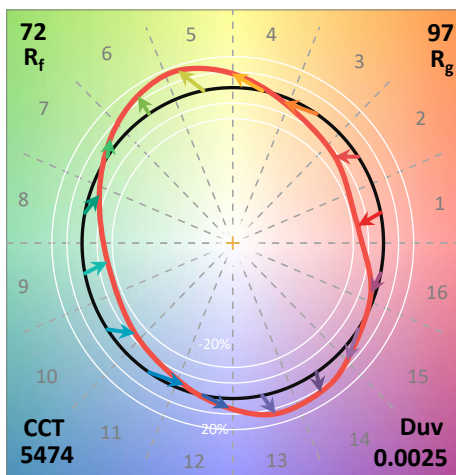
TM-30-18

**Summary**

$R_f = 72.1$   
 $R_g = 97.2$   
 CIE  $R_a = 71.7$   
 $R_9 = -27.1$



**Color Vector Graphics**





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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 54 | CES51 = 88 | CES76 = 43 |
| CES02 = 59 | CES27 = 79 | CES52 = 90 | CES77 = 64 |
| CES03 = 30 | CES28 = 77 | CES53 = 77 | CES78 = 46 |
| CES04 = 69 | CES29 = 50 | CES54 = 81 | CES79 = 74 |
| CES05 = 46 | CES30 = 59 | CES55 = 80 | CES80 = 70 |
| CES06 = 50 | CES31 = 55 | CES56 = 70 | CES81 = 71 |
| CES07 = 38 | CES32 = 52 | CES57 = 68 | CES82 = 88 |
| CES08 = 38 | CES33 = 63 | CES58 = 70 | CES83 = 82 |
| CES09 = 29 | CES34 = 63 | CES59 = 88 | CES84 = 87 |
| CES10 = 72 | CES35 = 79 | CES60 = 92 | CES85 = 84 |
| CES11 = 55 | CES36 = 90 | CES61 = 88 | CES86 = 76 |
| CES12 = 61 | CES37 = 72 | CES62 = 81 | CES87 = 75 |
| CES13 = 41 | CES38 = 68 | CES63 = 75 | CES88 = 77 |
| CES14 = 74 | CES39 = 91 | CES64 = 72 | CES89 = 76 |
| CES15 = 70 | CES40 = 83 | CES65 = 65 | CES90 = 76 |
| CES16 = 46 | CES41 = 84 | CES66 = 66 | CES91 = 92 |
| CES17 = 48 | CES42 = 70 | CES67 = 64 | CES92 = 70 |
| CES18 = 55 | CES43 = 69 | CES68 = 71 | CES93 = 83 |
| CES19 = 70 | CES44 = 98 | CES69 = 80 | CES94 = 60 |
| CES20 = 64 | CES45 = 79 | CES70 = 58 | CES95 = 73 |
| CES21 = 85 | CES46 = 78 | CES71 = 55 | CES96 = 79 |
| CES22 = 77 | CES47 = 76 | CES72 = 84 | CES97 = 84 |
| CES23 = 91 | CES48 = 68 | CES73 = 47 | CES98 = 73 |
| CES24 = 90 | CES49 = 78 | CES74 = 94 | CES99 = 62 |
| CES25 = 71 | CES50 = 87 | CES75 = 51 |            |



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Color Rendition by Hue-Angle Bin



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Measure Comparisons



(END OF REPORT)