

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: P364168

Luminaire Tested: NVN-SA6B-727-U-AFL-HSS

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-2019  
Report Number: P364168  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-30)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: STREETWORKS  
Catalog Number: NVN-SA6B-727-U-AFL-HSS  
Description: NAVION ROADWAY AND AREA LUMINAIRE  
(6) 70 CRI, 2700K, 800mA LIGHTSQUARES WITH 16 LEDS EACH AND AUTOMOTIVE  
FRONTLINE OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 24275 lumens  
Efficiency: N/A  
Efficacy: 97.5 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 1.5' x H: 0')  
IES Classification: Type II - Short  
BUG Rating: B2 - U0 - G2

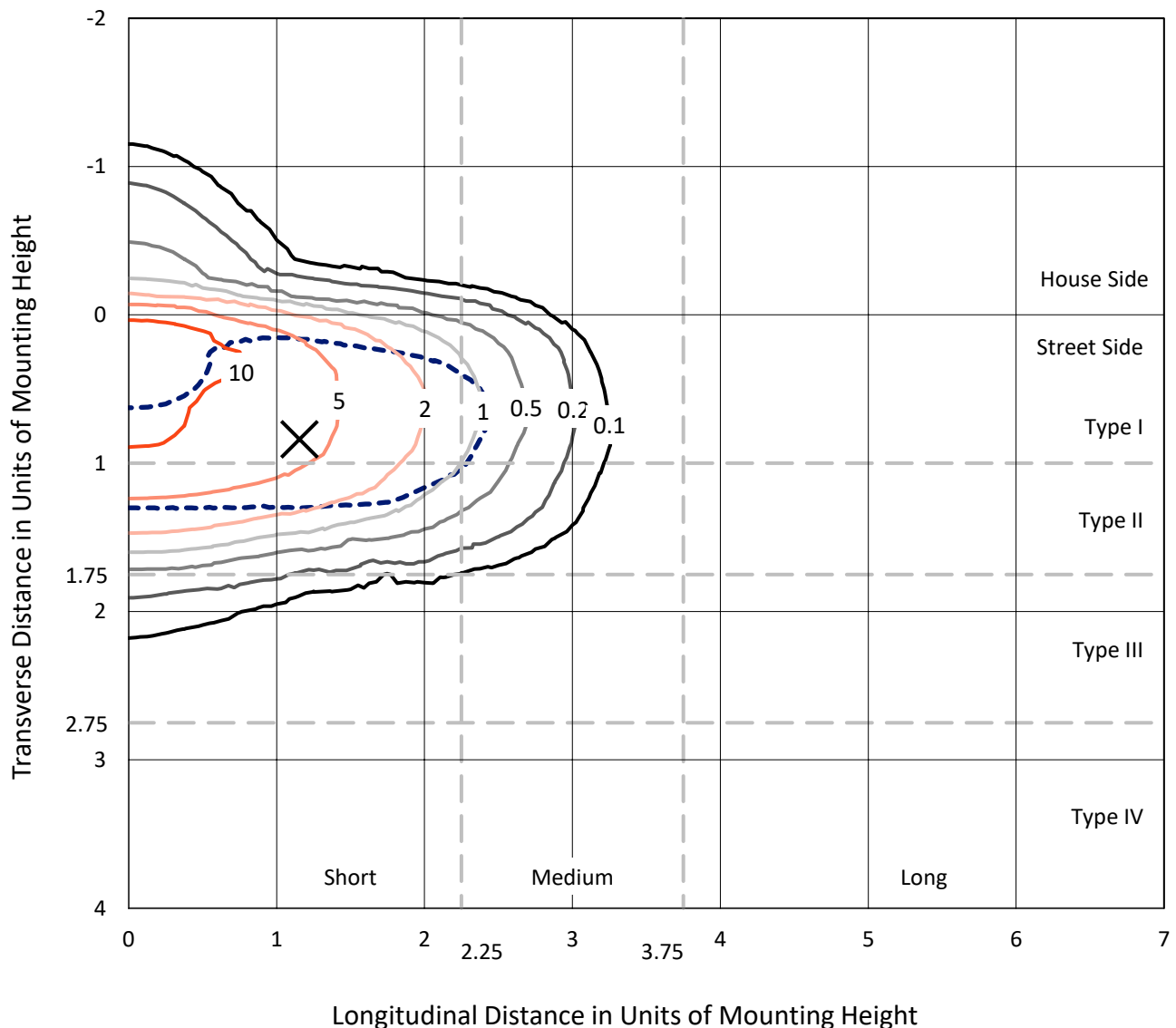
Input Watts (W): 249  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT



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## Iso-Footcandle Lines of Horizontal Illumination

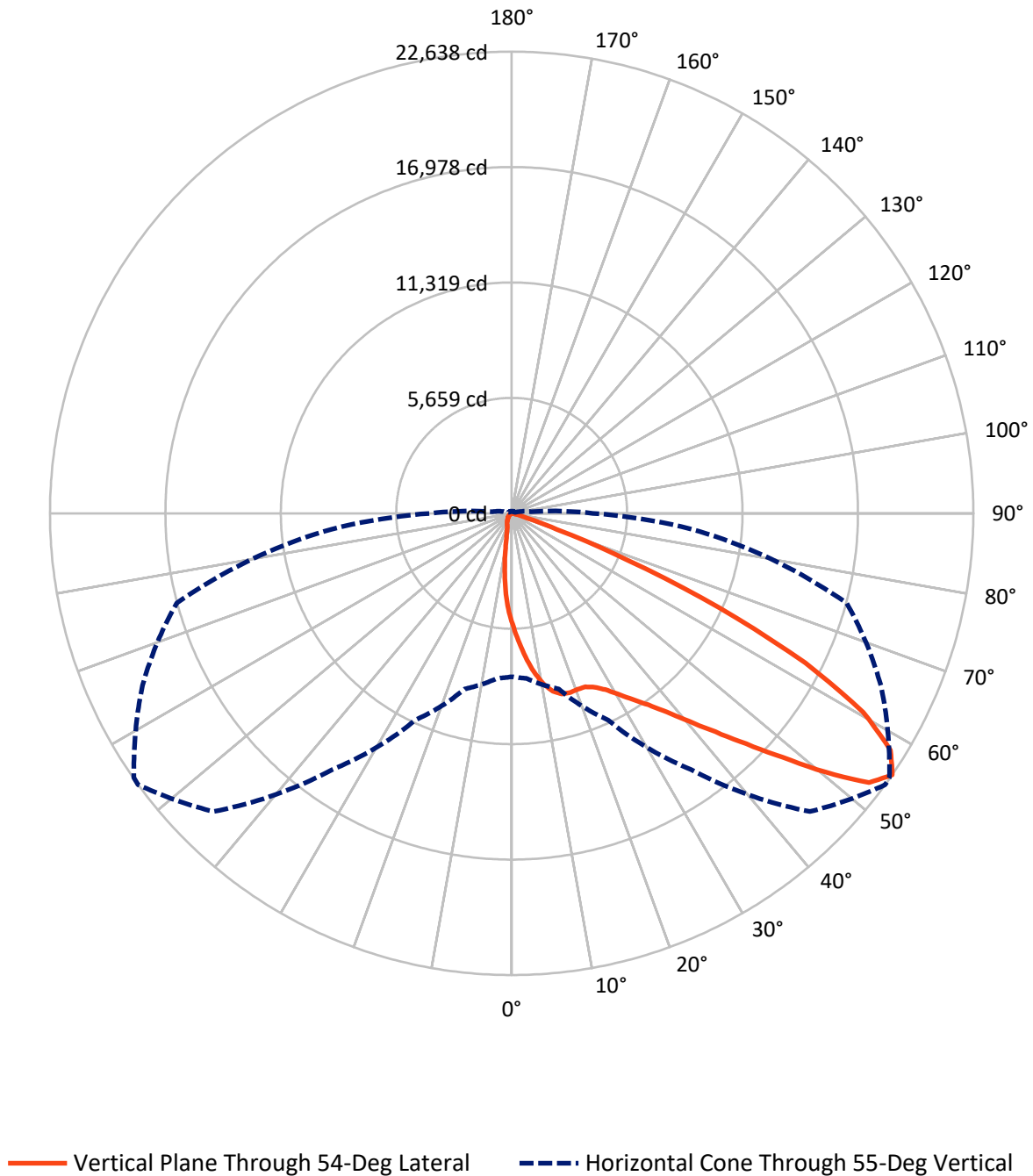
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 13.4 fc  
 Type II - Short - N/A

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## Luminous Intensity Polar Plot



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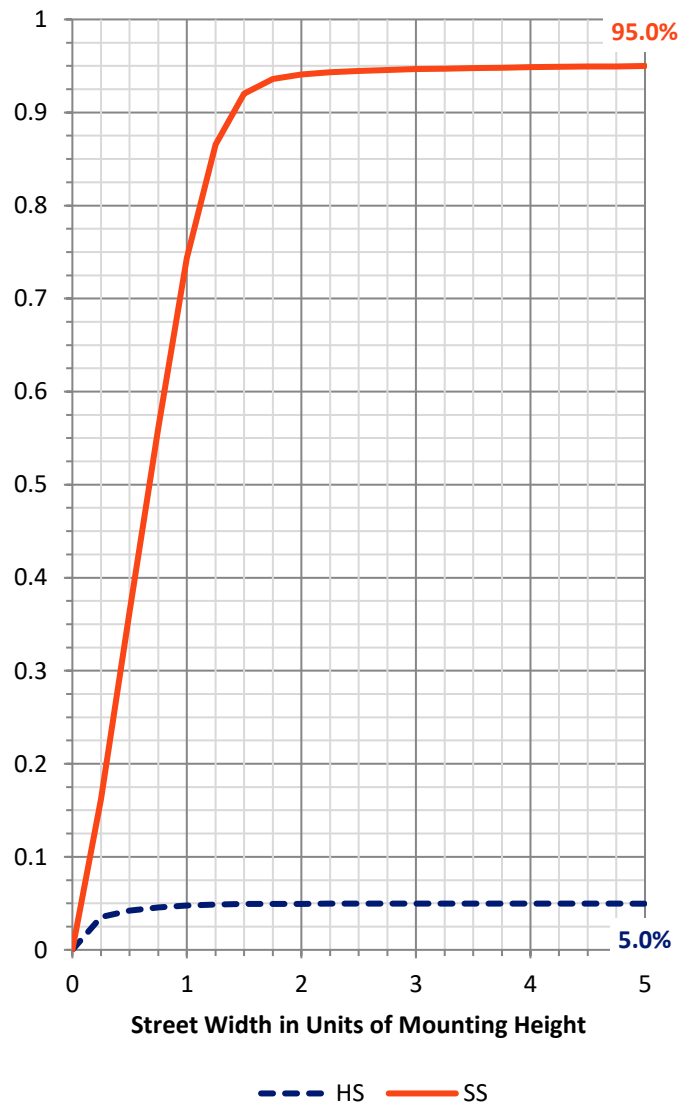
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 1211.1   | 0.0    | 1211.1  |
|                    | % Fixture | 5.0      | 0.0    | 5.0     |
| <b>Street Side</b> | Lumens    | 23063.9  | 0.0    | 23063.9 |
|                    | % Fixture | 95.0     | 0.0    | 95.0    |
| <b>Total</b>       | Lumens    | 24275.0  | 0.0    | 24275.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 500.6   | 2.1       |
| 10°-20°   | 1373.1  | 5.7       |
| 20°-30°   | 2344.3  | 9.7       |
| 30°-40°   | 3762.1  | 15.5      |
| 40°-50°   | 6011.9  | 24.8      |
| 50°-60°   | 6441.9  | 26.5      |
| 60°-70°   | 3307.5  | 13.6      |
| 70°-80°   | 501.0   | 2.1       |
| 80°-90°   | 32.6    | 0.1       |
| 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°    | 24275.0 | 100.0     |
| 0°-180°   | 24275.0 | 100.0     |

**Coefficient of Utilization**



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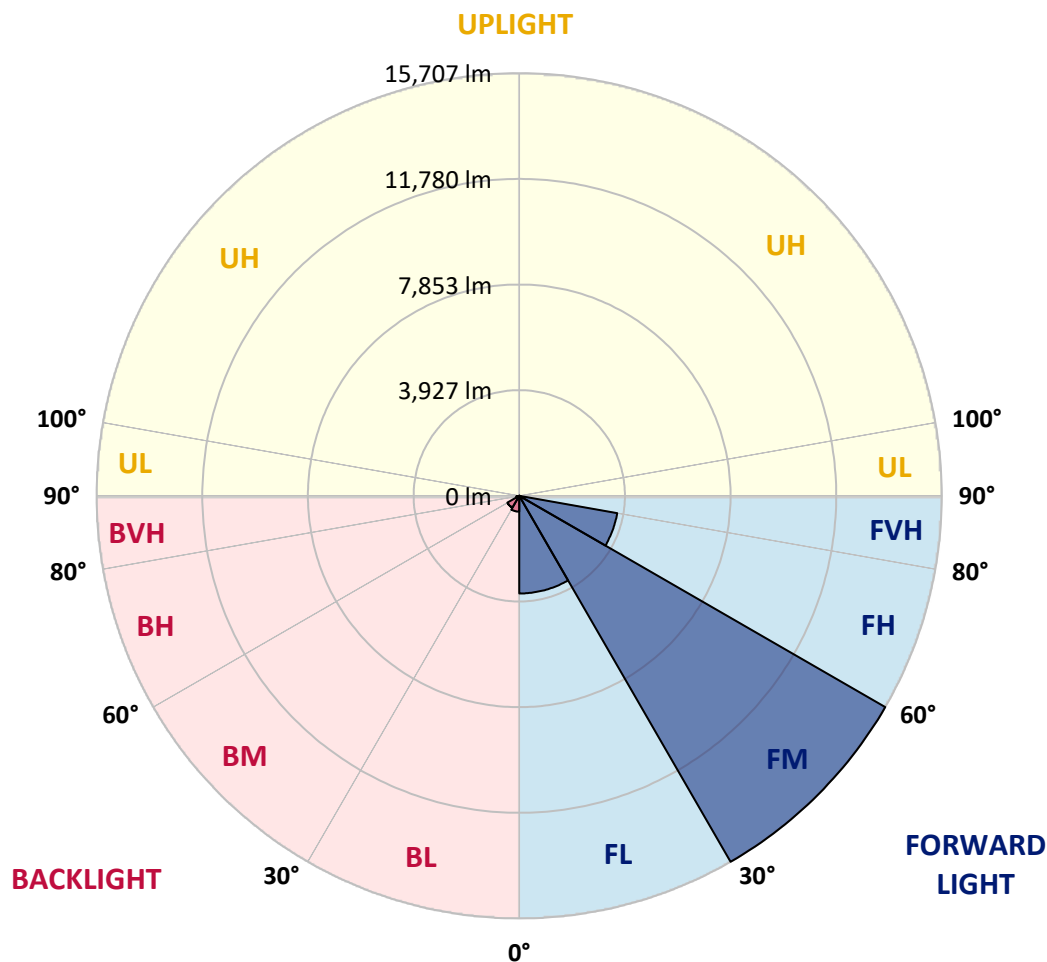
CATALOG NUMBER: NVN-SA6B-727-U-AFL-HSS

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|---------|-----------|-------------------------|------|---------|
|      |             |         |           | B                       | U    | G       |
| FL   | (0°-30°)    | 3628.7  | 14.9      |                         |      |         |
| FM   | (30°-60°)   | 15707.0 | 64.7      |                         |      |         |
| FH   | (60°-80°)   | 3696.9  | 15.2      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 31.3    | 0.1       |                         |      | G1/100  |
| BL   | (0°-30°)    | 589.3   | 2.4       | B2/1000                 |      |         |
| BM   | (30°-60°)   | 509.0   | 2.1       | B1/1000                 |      |         |
| BH   | (60°-80°)   | 111.6   | 0.5       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 1.3     | 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-G2**

Type II Short



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 54°     | 55°     | 65°     | 75°     | 85°    |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--------|
| 0°    | 5436.6  | 5436.6  | 5436.6  | 5436.6  | 5436.6  | 5436.6  | 5436.6  | 5436.6  | 5436.6  | 5436.6  | 5436.6 |
| 2.5°  | 6822.5  | 6720.8  | 6724.0  | 6677.8  | 6509.1  | 6377.0  | 6239.6  | 6207.1  | 5993.3  | 5768.9  | 5553.0 |
| 5°    | 8001.9  | 7927.5  | 7909.6  | 7820.5  | 7585.7  | 7337.2  | 7071.0  | 7009.1  | 6590.8  | 6131.7  | 5679.8 |
| 7.5°  | 8607.8  | 8608.9  | 8594.2  | 8561.7  | 8414.9  | 8173.8  | 7848.8  | 7783.8  | 7214.6  | 6525.8  | 5811.9 |
| 10°   | 8431.7  | 8471.5  | 8553.3  | 8661.3  | 8773.5  | 8743.1  | 8498.8  | 8440.1  | 7821.6  | 6943.1  | 5958.7 |
| 12.5° | 8020.8  | 8026.0  | 8117.2  | 8294.4  | 8617.3  | 8948.5  | 8952.7  | 8932.8  | 8401.3  | 7379.2  | 6120.1 |
| 15°   | 7816.3  | 7836.2  | 7869.8  | 7984.1  | 8290.2  | 8820.6  | 9200.1  | 9228.4  | 8932.8  | 7842.5  | 6292.1 |
| 17.5° | 7950.5  | 7978.8  | 7950.5  | 7964.1  | 8141.3  | 8618.3  | 9243.1  | 9315.4  | 9397.2  | 8300.7  | 6454.6 |
| 20°   | 8314.3  | 8340.5  | 8290.2  | 8234.6  | 8269.2  | 8559.6  | 9212.7  | 9310.2  | 9761.0  | 8707.4  | 6590.8 |
| 22.5° | 8804.9  | 8815.4  | 8738.9  | 8647.7  | 8622.5  | 8758.8  | 9237.9  | 9338.5  | 10052.4 | 9075.4  | 6676.8 |
| 25°   | 9344.8  | 9354.2  | 9258.8  | 9154.0  | 9094.2  | 9149.8  | 9444.4  | 9519.9  | 10309.3 | 9426.6  | 6726.1 |
| 27.5° | 9932.9  | 9941.3  | 9821.8  | 9692.8  | 9623.6  | 9625.7  | 9785.1  | 9865.8  | 10582.9 | 9827.0  | 6765.9 |
| 30°   | 10554.6 | 10550.4 | 10440.3 | 10261.0 | 10173.0 | 10170.9 | 10275.7 | 10357.5 | 10979.1 | 10340.7 | 6820.4 |
| 32.5° | 11252.7 | 11244.4 | 11088.2 | 10865.9 | 10766.3 | 10781.0 | 10874.3 | 10921.5 | 11470.8 | 10887.9 | 6917.9 |
| 35°   | 12172.1 | 12148.0 | 11912.1 | 11636.4 | 11453.0 | 11447.7 | 11526.4 | 11564.1 | 12097.7 | 11550.5 | 7080.4 |
| 37.5° | 13365.1 | 13343.1 | 13023.4 | 12622.9 | 12365.0 | 12268.6 | 12361.9 | 12410.1 | 12991.9 | 12400.7 | 7341.4 |
| 40°   | 14541.3 | 14519.3 | 14329.6 | 13962.7 | 13565.4 | 13333.7 | 13407.1 | 13458.4 | 14108.4 | 13432.2 | 7670.6 |
| 42.5° | 15352.8 | 15371.6 | 15437.7 | 15468.1 | 15095.9 | 14609.5 | 14643.0 | 14696.5 | 15281.5 | 14535.1 | 8047.0 |
| 45°   | 15566.6 | 15607.5 | 15980.7 | 16713.5 | 16852.9 | 16473.4 | 16122.2 | 16151.6 | 16473.4 | 15637.9 | 8423.3 |
| 47.5° | 14924.0 | 14999.5 | 15719.7 | 17082.5 | 18262.9 | 18531.3 | 17866.6 | 17827.9 | 17617.1 | 16530.0 | 8690.6 |
| 50°   | 13463.7 | 13532.9 | 14465.9 | 16481.8 | 18690.6 | 20495.8 | 19957.0 | 19842.7 | 18620.4 | 17063.6 | 8785.0 |
| 52.5° | 11350.2 | 11434.1 | 12192.0 | 14590.6 | 17884.5 | 21372.3 | 21936.3 | 21840.9 | 19356.3 | 17105.6 | 8800.7 |
| 55°   | 8015.5  | 8117.2  | 8919.2  | 11182.5 | 15329.7 | 20675.1 | 22637.6 | 22609.3 | 19967.5 | 16994.4 | 8834.3 |
| 57.5° | 4504.7  | 4578.0  | 5442.9  | 7168.5  | 11227.6 | 18008.2 | 21904.8 | 22092.5 | 20336.5 | 16801.5 | 8884.6 |
| 60°   | 2000.2  | 2020.1  | 2467.8  | 3568.5  | 6573.0  | 13762.4 | 19807.1 | 20123.7 | 20019.9 | 16543.7 | 8969.5 |
| 62.5° | 1109.1  | 1092.4  | 1092.4  | 1483.4  | 2856.7  | 8519.8  | 16151.6 | 16674.7 | 18668.6 | 16238.6 | 8973.7 |
| 65°   | 869.1   | 853.3   | 808.3   | 814.6   | 1088.2  | 3781.3  | 11184.6 | 12114.5 | 16102.3 | 15344.4 | 8671.8 |
| 67.5° | 737.0   | 723.3   | 678.3   | 660.4   | 676.2   | 1247.5  | 6145.3  | 7110.8  | 12218.3 | 13020.2 | 7511.3 |
| 70°   | 622.7   | 613.3   | 590.2   | 568.2   | 528.4   | 616.4   | 2351.4  | 3007.7  | 7529.1  | 8661.3  | 5127.4 |
| 72.5° | 501.1   | 496.9   | 505.3   | 486.4   | 438.2   | 410.9   | 804.1   | 973.9   | 3381.9  | 3865.2  | 2112.4 |
| 75°   | 431.9   | 429.8   | 434.0   | 415.1   | 360.6   | 286.2   | 408.8   | 446.6   | 954.0   | 945.6   | 427.7  |
| 77.5° | 281.0   | 284.1   | 359.6   | 351.2   | 310.3   | 190.8   | 211.8   | 228.5   | 289.3   | 217.0   | 130.0  |
| 80°   | 179.3   | 177.2   | 182.4   | 291.4   | 278.9   | 145.7   | 105.9   | 111.1   | 139.4   | 106.9   | 62.9   |
| 82.5° | 109.0   | 106.9   | 119.5   | 136.3   | 140.5   | 101.7   | 65.0    | 66.0    | 87.0    | 69.2    | 33.5   |
| 85°   | 9.4     | 12.6    | 72.3    | 67.1    | 48.2    | 31.4    | 31.4    | 33.5    | 46.1    | 40.9    | 18.9   |
| 87.5° | 0.0     | 0.0     | 12.6    | 18.9    | 10.5    | 11.5    | 11.5    | 12.6    | 17.8    | 17.8    | 9.4    |
| 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: P364168

CATALOG NUMBER: NVN-SA6B-727-U-AFL-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 5436.6 | 5436.6 | 5436.6 | 5436.6 | 5436.6 | 5436.6 | 5436.6 | 5436.6 | 5436.6 | 5436.6 | 5436.6 |
| 2.5°  | 5440.8 | 5331.8 | 5111.6 | 4899.9 | 4720.6 | 4547.6 | 4350.6 | 4155.6 | 4064.4 | 4027.7 | 3989.9 |
| 5°    | 5450.3 | 5225.9 | 4772.0 | 4314.9 | 3841.1 | 3414.4 | 3050.6 | 2677.4 | 2490.8 | 2409.1 | 2371.3 |
| 7.5°  | 5462.8 | 5121.1 | 4387.3 | 3619.9 | 2856.7 | 2278.0 | 1772.7 | 1447.7 | 1307.3 | 1285.2 | 1230.7 |
| 10°   | 5464.9 | 4994.2 | 3940.7 | 2852.5 | 1915.3 | 1373.3 | 1056.7 | 889.0  | 827.1  | 816.6  | 798.8  |
| 12.5° | 5469.1 | 4844.3 | 3444.8 | 2112.4 | 1276.9 | 918.3  | 764.2  | 708.7  | 691.9  | 690.8  | 690.8  |
| 15°   | 5481.7 | 4687.1 | 2930.1 | 1522.2 | 917.3  | 727.5  | 670.9  | 648.9  | 642.6  | 645.8  | 644.7  |
| 17.5° | 5481.7 | 4501.5 | 2424.8 | 1134.3 | 741.2  | 654.2  | 622.7  | 608.0  | 605.9  | 609.1  | 610.1  |
| 20°   | 5441.9 | 4276.1 | 1961.4 | 882.7  | 657.3  | 607.0  | 578.7  | 565.0  | 559.8  | 561.9  | 563.0  |
| 22.5° | 5346.5 | 3999.4 | 1584.0 | 730.7  | 601.7  | 564.0  | 533.6  | 512.6  | 504.2  | 505.3  | 505.3  |
| 25°   | 5197.6 | 3671.2 | 1239.1 | 632.1  | 556.7  | 517.9  | 482.2  | 458.1  | 452.9  | 451.8  | 453.9  |
| 27.5° | 5006.8 | 3308.5 | 986.5  | 556.7  | 503.2  | 466.5  | 430.9  | 410.9  | 406.8  | 407.8  | 408.8  |
| 30°   | 4819.2 | 2932.2 | 777.9  | 492.7  | 443.4  | 408.8  | 381.6  | 372.2  | 372.2  | 375.3  | 376.3  |
| 32.5° | 4647.2 | 2570.5 | 615.4  | 437.2  | 390.0  | 358.5  | 342.8  | 341.8  | 347.0  | 349.1  | 350.1  |
| 35°   | 4499.4 | 2236.1 | 509.5  | 394.2  | 348.0  | 320.8  | 315.5  | 319.7  | 326.0  | 330.2  | 331.3  |
| 37.5° | 4394.6 | 1937.3 | 445.5  | 358.5  | 315.5  | 293.5  | 292.5  | 300.9  | 309.3  | 318.7  | 320.8  |
| 40°   | 4350.6 | 1684.7 | 401.5  | 327.1  | 289.3  | 272.6  | 269.4  | 281.0  | 296.7  | 310.3  | 312.4  |
| 42.5° | 4313.9 | 1478.1 | 363.8  | 296.7  | 268.4  | 244.3  | 243.2  | 257.9  | 276.8  | 290.4  | 293.5  |
| 45°   | 4282.4 | 1312.5 | 329.2  | 264.2  | 241.1  | 209.7  | 212.8  | 231.7  | 246.4  | 261.0  | 264.2  |
| 47.5° | 4217.4 | 1176.2 | 291.4  | 229.6  | 199.2  | 179.3  | 185.6  | 202.3  | 213.9  | 235.9  | 239.0  |
| 50°   | 4101.1 | 1065.1 | 252.6  | 187.7  | 162.5  | 155.2  | 164.6  | 176.1  | 190.8  | 209.7  | 211.8  |
| 52.5° | 4022.4 | 981.2  | 219.1  | 157.2  | 134.2  | 136.3  | 145.7  | 149.9  | 158.3  | 165.6  | 163.5  |
| 55°   | 3977.4 | 935.1  | 191.8  | 136.3  | 114.3  | 120.6  | 122.7  | 117.4  | 113.2  | 105.9  | 102.7  |
| 57.5° | 3972.1 | 893.2  | 170.9  | 118.5  | 100.6  | 103.8  | 96.4   | 78.6   | 63.9   | 55.6   | 53.5   |
| 60°   | 3963.7 | 841.8  | 154.1  | 99.6   | 89.1   | 84.9   | 69.2   | 43.0   | 30.4   | 28.3   | 28.3   |
| 62.5° | 3872.5 | 762.1  | 141.5  | 83.9   | 75.5   | 63.9   | 39.8   | 19.9   | 16.8   | 17.8   | 17.8   |
| 65°   | 3582.1 | 651.0  | 128.9  | 68.1   | 59.8   | 46.1   | 19.9   | 11.5   | 6.3    | 7.3    | 7.3    |
| 67.5° | 3045.4 | 518.9  | 115.3  | 52.4   | 45.1   | 29.4   | 11.5   | 5.2    | 0.0    | 0.0    | 0.0    |
| 70°   | 2039.0 | 321.8  | 97.5   | 36.7   | 29.4   | 17.8   | 8.4    | 1.0    | 0.0    | 0.0    | 0.0    |
| 72.5° | 782.1  | 174.0  | 78.6   | 22.0   | 18.9   | 12.6   | 5.2    | 0.0    | 0.0    | 0.0    | 0.0    |
| 75°   | 176.1  | 114.3  | 54.5   | 15.7   | 13.6   | 8.4    | 2.1    | 0.0    | 0.0    | 0.0    | 0.0    |
| 77.5° | 67.1   | 82.8   | 31.4   | 10.5   | 9.4    | 5.2    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 80°   | 32.5   | 49.3   | 14.7   | 6.3    | 5.2    | 2.1    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 82.5° | 16.8   | 18.9   | 6.3    | 3.1    | 2.1    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 85°   | 9.4    | 9.4    | 3.1    | 2.1    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 87.5° | 5.2    | 3.1    | 1.0    | 1.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

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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: SP1-1908-441-1-R4

Test Date: 08/20/2019

Luminaire Tested: SA1C-727-U-5WQ

### Test Information

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

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

### Spectral Parameters

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 2741   | CRI (Ra): | 71.5 |      |       |
| CIE u':                   | 0.2605 | R1:       | 69.2 | R9:  | -16.1 |
| CIE v':                   | 0.5272 | R2:       | 79.4 | R10: | 51.4  |
| Duv:                      | 0.0005 | R3:       | 87.8 | R11: | 63.1  |
| CIE x:                    | 0.4573 | R4:       | 69.4 | R12: | 42.0  |
| CIE y:                    | 0.4113 | R5:       | 66.4 | R13: | 70.2  |
| CIE z:                    | 0.1313 | R6:       | 69.8 | R14: | 92.4  |
| Peak Wavelength (nm):     | 602    | R7:       | 79.8 |      |       |
| Dominant Wavelength (nm): | 583    | R8:       | 50.1 |      |       |
| Purity:                   | 61.2   |           |      |      |       |
| Rf:                       | 69.9   |           |      |      |       |
| Rg:                       | 98.3   |           |      |      |       |



### Test Conditions

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

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

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

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CIE 1931 Chromaticity Diagram



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



Point lies inside the ANSI 2700K 4-step quadrangle

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**Photopic Flux vs. Wavelength**



**Photopic Lumens: 6211.7**

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

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Scotopic Flux vs. Wavelength



Scotopic Lumens: 6474.3

S/P: 1.04

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

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**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 2145.7 M/P: 0.35**

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

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**TM-30-18**

**Summary**

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



**Color Vector Graphics**



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**TM-30-18**

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

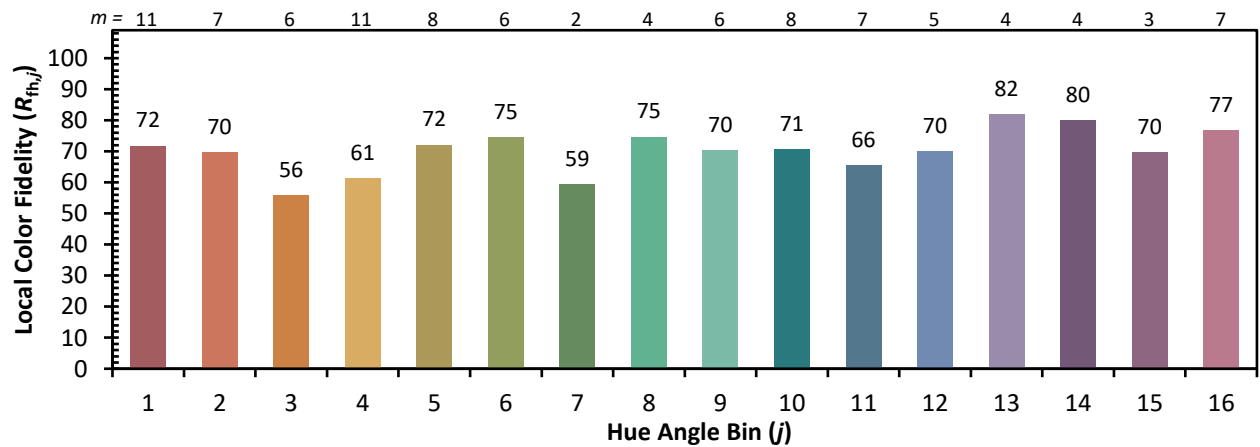
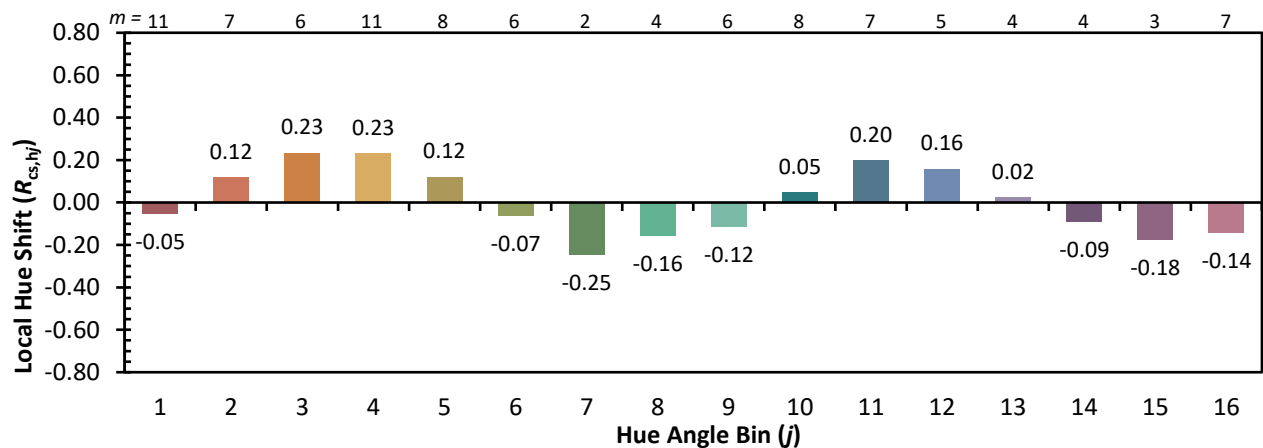
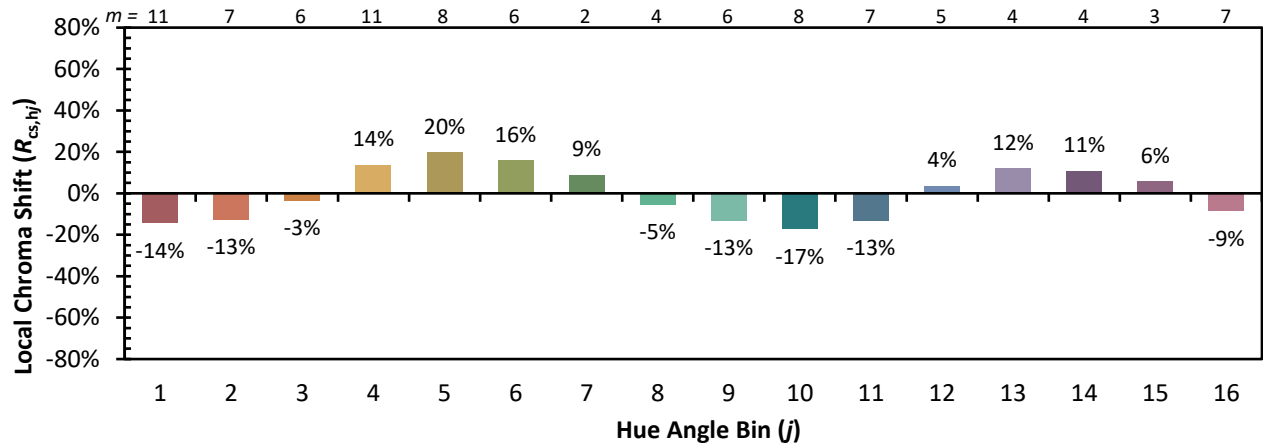
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 54 | CES51 = 77 | CES76 = 48 |
| CES02 = 63 | CES27 = 74 | CES52 = 80 | CES77 = 75 |
| CES03 = 31 | CES28 = 80 | CES53 = 66 | CES78 = 56 |
| CES04 = 71 | CES29 = 44 | CES54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



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**TM-30-18**

Color Rendition by Hue-Angle Bin



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**TM-30-18**

**Measure Comparisons**



(END OF REPORT)