

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: P361408

Luminaire Tested: NVN-SA6B-722-U-T3

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-2019  
Report Number: P361408  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-14)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: STREETWORKS  
Catalog Number: NVN-SA6B-722-U-T3  
Description: NAVION ROADWAY AND AREA LUMINAIRE  
(6) 70 CRI, 2200K, 800mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE III OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 25430 lumens  
Efficiency: N/A  
Efficacy: 102.1 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 1.5' x H: 0')  
IES Classification: Type III - Short  
BUG Rating: B3 - U0 - G4

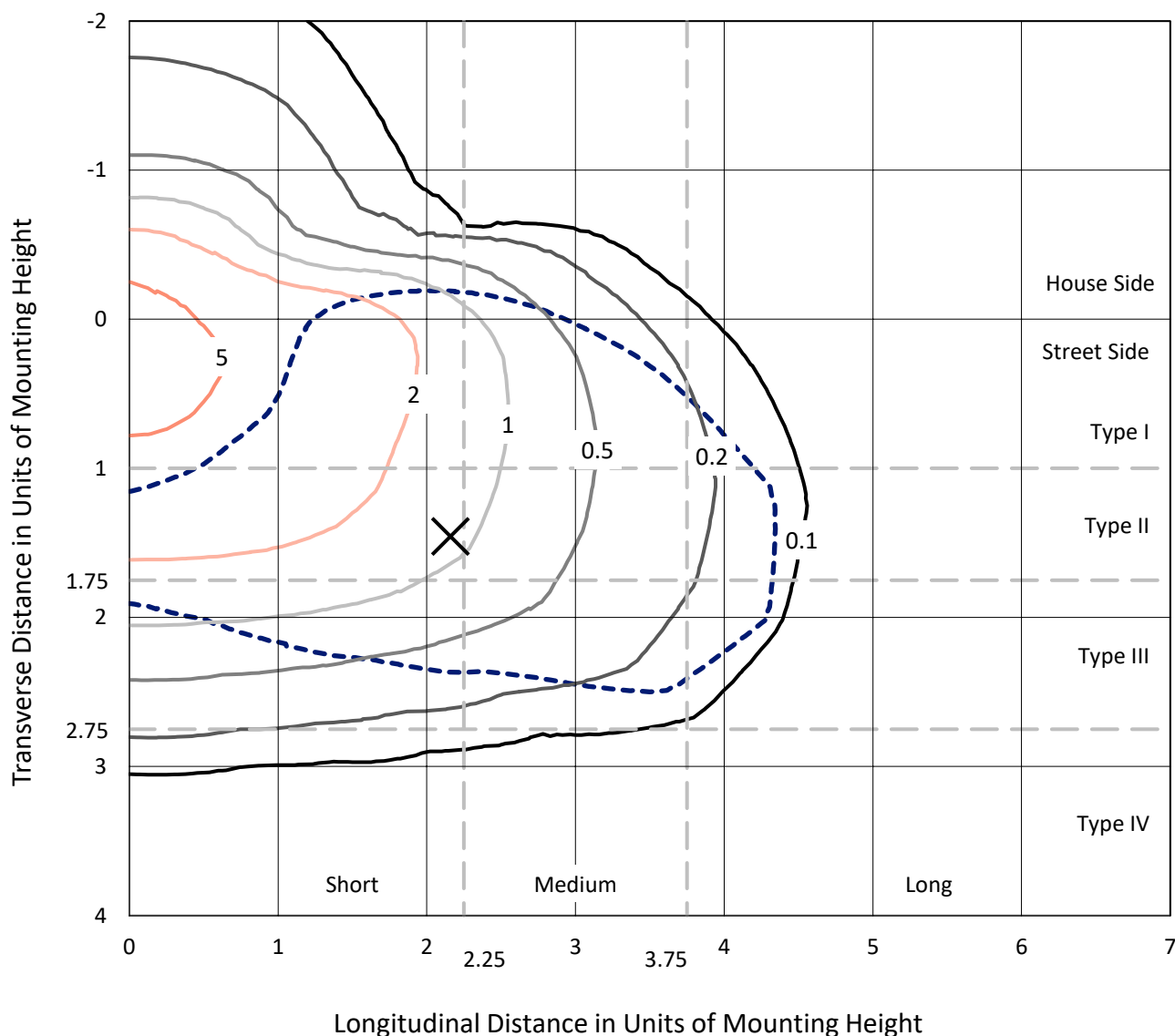
Input Watts (W): 249  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT



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## Iso-Footcandle Lines of Horizontal Illumination

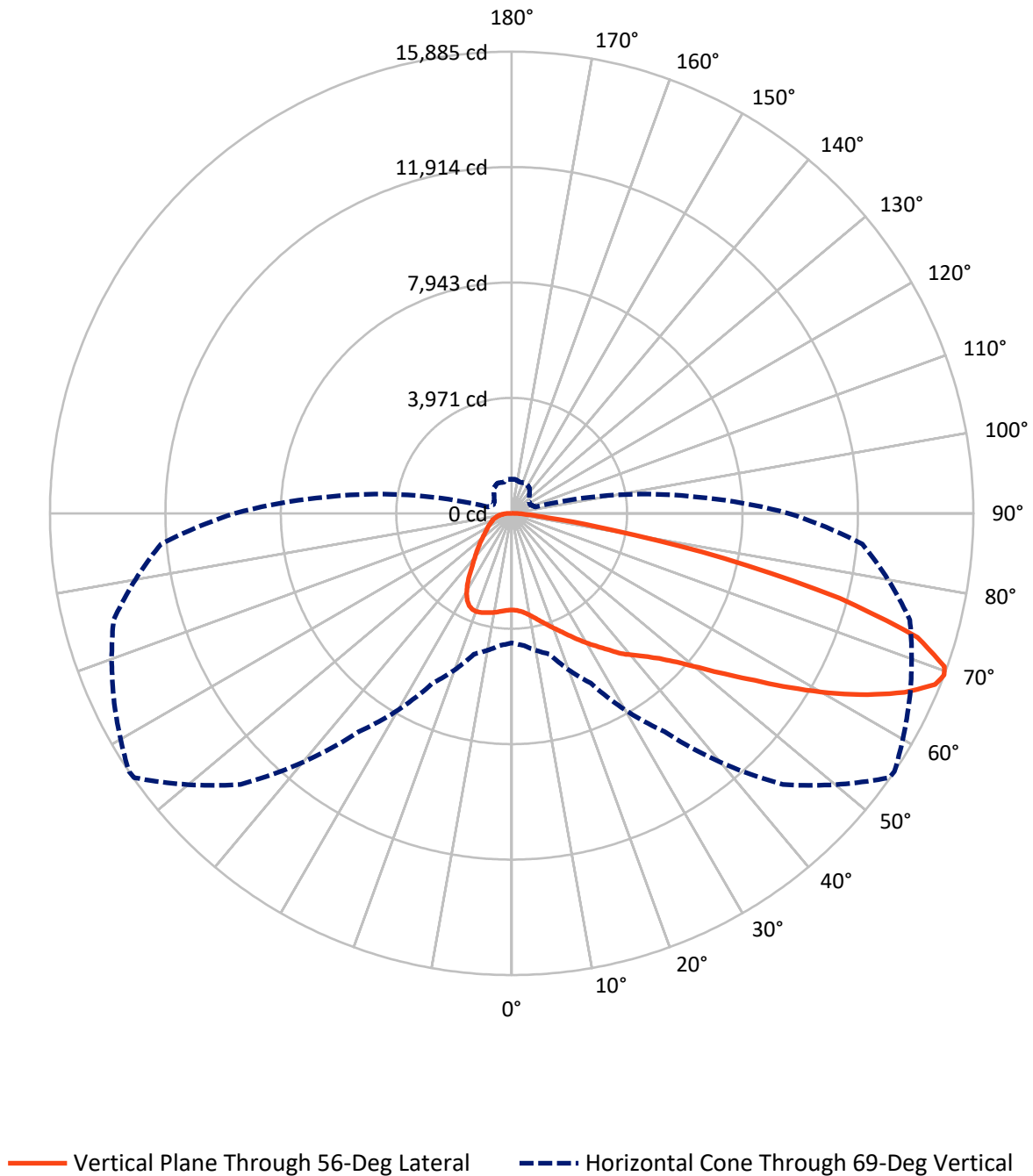
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 5.8 fc  
 Type III - Short - N/A

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## Luminous Intensity Polar Plot



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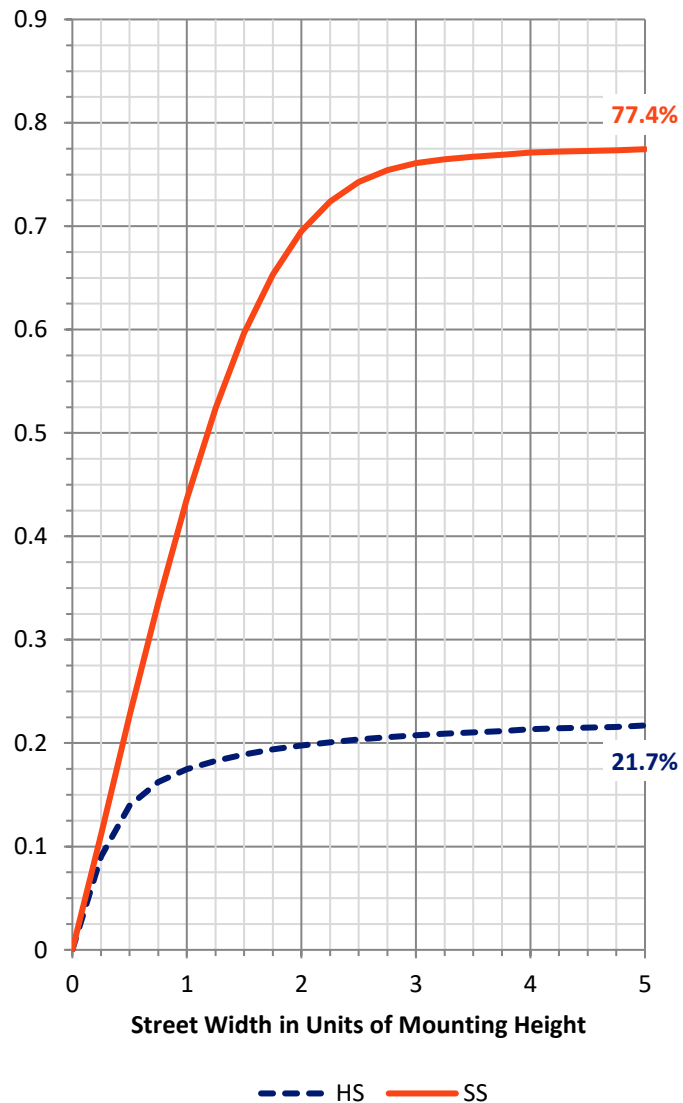
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 5663.2   | 0.0    | 5663.2  |
|                    | % Fixture | 22.3     | 0.0    | 22.3    |
| <b>Street Side</b> | Lumens    | 19766.8  | 0.0    | 19766.8 |
|                    | % Fixture | 77.7     | 0.0    | 77.7    |
| <b>Total</b>       | Lumens    | 25430.0  | 0.0    | 25430.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 326.5   | 1.3       |
| 10°-20°   | 1050.0  | 4.1       |
| 20°-30°   | 1832.9  | 7.2       |
| 30°-40°   | 2632.8  | 10.4      |
| 40°-50°   | 3643.7  | 14.3      |
| 50°-60°   | 5338.6  | 21.0      |
| 60°-70°   | 6508.7  | 25.6      |
| 70°-80°   | 3598.4  | 14.2      |
| 80°-90°   | 498.4   | 2.0       |
| 90°-100°  | 0.0     | 0.0       |
| 100°-110° | 0.0     | 0.0       |
| 110°-120° | 0.0     | 0.0       |
| 120°-130° | 0.0     | 0.0       |
| 130°-140° | 0.0     | 0.0       |
| 140°-150° | 0.0     | 0.0       |
| 150°-160° | 0.0     | 0.0       |
| 160°-170° | 0.0     | 0.0       |
| 170°-180° | 0.0     | 0.0       |
| 0°-90°    | 25430.0 | 100.0     |
| 0°-180°   | 25430.0 | 100.0     |

**Coefficient of Utilization**



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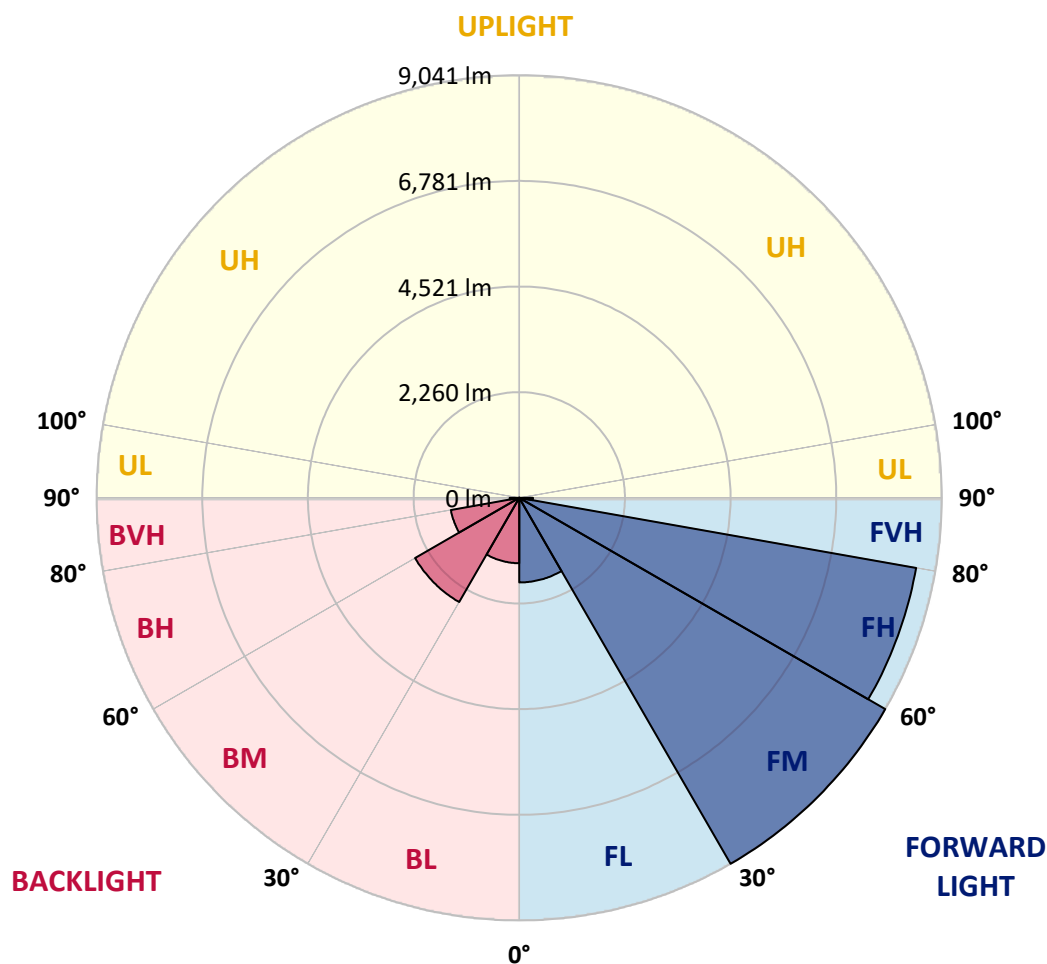
CATALOG NUMBER: NVN-SA6B-722-U-T3

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |          |
|------|-------------|--------|-----------|-------------------------|------|----------|
|      |             |        |           | B                       | U    | G        |
| FL   | (0°-30°)    | 1809.9 | 7.1       |                         |      |          |
| FM   | (30°-60°)   | 9041.3 | 35.6      |                         |      |          |
| FH   | (60°-80°)   | 8622.0 | 33.9      |                         |      | G4/12000 |
| FVH  | (80°-90°)   | 293.6  | 1.2       |                         |      | G3/500   |
| BL   | (0°-30°)    | 1399.5 | 5.5       | B3/2500                 |      |          |
| BM   | (30°-60°)   | 2573.8 | 10.1      | B3/5000                 |      |          |
| BH   | (60°-80°)   | 1485.1 | 5.8       | B3/2500                 |      | G3/2500  |
| BVH  | (80°-90°)   | 204.8  | 0.8       |                         |      | G2/225   |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |          |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |          |

**BUG Rating: B3-U0-G4**

Type III Short



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°     | 35°     | 45°     | 55°     | 56°     | 65°     | 75°     | 85°     |
|-------|--------|--------|--------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 3324.6 | 3324.6 | 3324.6 | 3324.6  | 3324.6  | 3324.6  | 3324.6  | 3324.6  | 3324.6  | 3324.6  | 3324.6  |
| 2.5°  | 3345.6 | 3349.1 | 3346.5 | 3353.5  | 3345.6  | 3350.9  | 3346.5  | 3346.5  | 3343.9  | 3336.0  | 3327.2  |
| 5°    | 3398.2 | 3405.2 | 3400.8 | 3407.8  | 3398.2  | 3399.9  | 3392.0  | 3392.0  | 3384.2  | 3367.5  | 3350.0  |
| 7.5°  | 3480.5 | 3488.4 | 3484.9 | 3491.9  | 3478.8  | 3478.8  | 3468.3  | 3467.4  | 3451.6  | 3424.5  | 3404.3  |
| 10°   | 3578.6 | 3589.2 | 3585.7 | 3596.2  | 3585.7  | 3589.2  | 3578.6  | 3578.6  | 3557.6  | 3519.1  | 3493.7  |
| 12.5° | 3721.4 | 3734.6 | 3724.9 | 3724.1  | 3719.7  | 3726.7  | 3717.9  | 3716.2  | 3696.9  | 3644.3  | 3609.3  |
| 15°   | 3912.4 | 3926.4 | 3906.3 | 3904.5  | 3880.0  | 3877.4  | 3877.4  | 3874.7  | 3862.5  | 3799.4  | 3741.6  |
| 17.5° | 4132.3 | 4136.7 | 4119.2 | 4091.1  | 4059.6  | 4039.4  | 4036.8  | 4043.8  | 4043.8  | 3970.2  | 3878.2  |
| 20°   | 4347.8 | 4355.7 | 4341.7 | 4310.1  | 4269.8  | 4240.1  | 4219.0  | 4233.0  | 4232.2  | 4144.6  | 4014.0  |
| 22.5° | 4582.6 | 4601.0 | 4580.0 | 4539.7  | 4492.4  | 4459.1  | 4422.3  | 4434.5  | 4435.4  | 4327.7  | 4147.2  |
| 25°   | 4886.6 | 4869.9 | 4856.8 | 4799.8  | 4732.4  | 4698.2  | 4664.1  | 4676.3  | 4672.8  | 4524.8  | 4284.7  |
| 27.5° | 5155.5 | 5159.0 | 5141.5 | 5081.1  | 5003.1  | 4927.8  | 4926.0  | 4933.9  | 4920.7  | 4729.8  | 4414.4  |
| 30°   | 5468.3 | 5470.0 | 5445.5 | 5391.2  | 5306.2  | 5209.0  | 5186.2  | 5199.3  | 5171.3  | 4924.2  | 4551.1  |
| 32.5° | 5779.3 | 5788.0 | 5760.9 | 5695.2  | 5626.8  | 5508.6  | 5463.0  | 5471.8  | 5401.7  | 5123.1  | 4692.1  |
| 35°   | 6051.7 | 6064.0 | 6055.2 | 6011.4  | 5937.0  | 5835.3  | 5781.0  | 5775.8  | 5689.0  | 5366.6  | 4878.7  |
| 37.5° | 6329.4 | 6340.8 | 6331.2 | 6294.4  | 6264.6  | 6156.8  | 6127.9  | 6127.9  | 5977.3  | 5615.4  | 5116.1  |
| 40°   | 6615.0 | 6632.5 | 6621.1 | 6570.3  | 6544.9  | 6495.9  | 6426.7  | 6410.0  | 6247.1  | 5914.2  | 5503.3  |
| 42.5° | 6880.5 | 6903.2 | 6948.8 | 6919.0  | 6867.3  | 6874.3  | 6735.0  | 6726.3  | 6607.1  | 6355.7  | 5989.5  |
| 45°   | 7257.2 | 7290.4 | 7367.5 | 7344.8  | 7334.2  | 7295.7  | 7130.1  | 7122.2  | 7076.7  | 6949.7  | 6593.1  |
| 47.5° | 7668.0 | 7713.6 | 7852.9 | 7857.2  | 7970.3  | 7897.5  | 7672.4  | 7645.2  | 7655.8  | 7661.0  | 7329.9  |
| 50°   | 8046.5 | 8096.4 | 8325.1 | 8432.8  | 8699.1  | 8714.9  | 8354.8  | 8330.3  | 8371.5  | 8492.4  | 8188.4  |
| 52.5° | 8348.7 | 8411.8 | 8697.4 | 9030.3  | 9486.7  | 9616.3  | 9195.0  | 9176.6  | 9207.2  | 9415.7  | 9159.0  |
| 55°   | 8570.3 | 8638.7 | 8949.7 | 9555.9  | 10284.8 | 10513.4 | 10162.1 | 10144.6 | 10163.9 | 10429.3 | 10214.7 |
| 57.5° | 8622.0 | 8638.7 | 9089.8 | 9909.8  | 10958.4 | 11507.7 | 11345.7 | 11310.6 | 11216.0 | 11447.3 | 11379.8 |
| 60°   | 8379.4 | 8445.9 | 8974.2 | 10034.2 | 11479.7 | 12488.0 | 12582.6 | 12538.8 | 12273.4 | 12462.6 | 12408.3 |
| 62.5° | 7887.0 | 8006.2 | 8542.3 | 9845.0  | 11683.8 | 13288.7 | 13796.0 | 13743.4 | 13286.1 | 13408.7 | 13147.7 |
| 65°   | 7082.8 | 7133.6 | 7696.9 | 9192.3  | 11424.5 | 13801.2 | 14877.9 | 14851.6 | 14276.0 | 14084.2 | 13284.3 |
| 67.5° | 5644.4 | 5739.8 | 6218.2 | 7828.3  | 10363.6 | 13740.8 | 15714.5 | 15711.9 | 14922.5 | 14334.7 | 12799.9 |
| 69°   | 4459.1 | 4558.1 | 5013.6 | 6448.6  | 9170.4  | 13188.0 | 15854.7 | 15885.3 | 15104.8 | 14182.3 | 12107.8 |
| 70°   | 3555.0 | 3669.8 | 3982.5 | 5431.5  | 8111.3  | 12459.1 | 15738.1 | 15793.3 | 15069.7 | 13930.9 | 11469.2 |
| 72.5° | 1512.9 | 1605.8 | 1828.3 | 2799.8  | 4943.5  | 9303.6  | 14389.9 | 14598.4 | 14257.6 | 12750.0 | 9478.8  |
| 75°   | 660.5  | 689.4  | 790.2  | 1141.5  | 2194.5  | 5063.5  | 11272.9 | 11658.4 | 12191.0 | 10777.1 | 7060.9  |
| 77.5° | 483.6  | 495.8  | 551.0  | 670.2   | 984.7   | 1912.4  | 7249.3  | 7473.5  | 8792.0  | 7842.4  | 4331.2  |
| 80°   | 374.1  | 382.8  | 425.8  | 492.3   | 643.0   | 773.5   | 3306.2  | 3498.9  | 4943.5  | 4028.1  | 1803.8  |
| 82.5° | 297.9  | 304.0  | 333.8  | 362.7   | 444.2   | 468.7   | 1097.7  | 1217.7  | 1824.8  | 1112.6  | 477.4   |
| 85°   | 276.8  | 283.8  | 294.4  | 264.6   | 284.7   | 275.1   | 474.8   | 496.7   | 551.0   | 437.1   | 199.7   |
| 87.5° | 125.3  | 148.1  | 291.7  | 205.9   | 151.6   | 120.9   | 194.5   | 203.2   | 228.6   | 229.5   | 88.5    |
| 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: P361408

CATALOG NUMBER: NVN-SA6B-722-U-T3

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 3324.6  | 3324.6 | 3324.6 | 3324.6 | 3324.6 | 3324.6 | 3324.6 | 3324.6 | 3324.6 | 3324.6 | 3324.6 |
| 2.5°  | 3332.5  | 3329.8 | 3334.2 | 3323.7 | 3336.9 | 3336.0 | 3331.6 | 3333.4 | 3342.1 | 3341.2 | 3342.1 |
| 5°    | 3352.6  | 3350.9 | 3356.1 | 3348.2 | 3364.0 | 3369.3 | 3370.1 | 3378.0 | 3387.7 | 3390.3 | 3390.3 |
| 7.5°  | 3403.4  | 3403.4 | 3406.1 | 3395.5 | 3406.1 | 3405.2 | 3400.8 | 3408.7 | 3418.3 | 3419.2 | 3418.3 |
| 10°   | 3491.0  | 3491.9 | 3487.5 | 3460.4 | 3451.6 | 3428.0 | 3406.1 | 3406.9 | 3419.2 | 3428.8 | 3431.5 |
| 12.5° | 3601.4  | 3597.9 | 3578.6 | 3528.7 | 3491.9 | 3443.7 | 3421.0 | 3420.1 | 3432.3 | 3440.2 | 3442.9 |
| 15°   | 3727.6  | 3717.9 | 3668.0 | 3586.5 | 3521.7 | 3474.4 | 3437.6 | 3428.8 | 3421.8 | 3413.1 | 3413.9 |
| 17.5° | 3846.7  | 3824.8 | 3741.6 | 3628.6 | 3560.2 | 3497.2 | 3426.2 | 3369.3 | 3329.8 | 3307.1 | 3300.1 |
| 20°   | 3967.6  | 3924.7 | 3804.7 | 3668.0 | 3581.3 | 3466.5 | 3329.8 | 3214.2 | 3142.4 | 3109.1 | 3103.0 |
| 22.5° | 4078.0  | 4008.8 | 3863.4 | 3709.2 | 3564.6 | 3363.1 | 3148.5 | 2980.3 | 2880.4 | 2835.8 | 2839.3 |
| 25°   | 4185.7  | 4089.4 | 3924.7 | 3738.1 | 3480.5 | 3180.9 | 2896.2 | 2689.5 | 2573.8 | 2523.9 | 2522.1 |
| 27.5° | 4280.4  | 4170.8 | 3991.3 | 3714.4 | 3323.7 | 2921.6 | 2597.5 | 2396.0 | 2299.6 | 2256.7 | 2249.7 |
| 30°   | 4389.0  | 4273.3 | 4079.7 | 3624.2 | 3094.2 | 2622.0 | 2305.7 | 2163.8 | 2095.5 | 2052.6 | 2044.7 |
| 32.5° | 4521.3  | 4412.6 | 4152.5 | 3460.4 | 2800.7 | 2309.3 | 2078.0 | 1979.0 | 1916.8 | 1868.6 | 1859.8 |
| 35°   | 4714.0  | 4596.6 | 4170.8 | 3225.6 | 2478.3 | 2062.2 | 1910.7 | 1809.0 | 1724.9 | 1662.7 | 1656.6 |
| 37.5° | 4955.8  | 4827.0 | 4128.8 | 2921.6 | 2165.6 | 1901.9 | 1771.4 | 1646.1 | 1536.6 | 1449.0 | 1435.0 |
| 40°   | 5304.5  | 5110.0 | 4012.3 | 2571.2 | 1935.2 | 1778.4 | 1635.6 | 1492.8 | 1357.0 | 1254.5 | 1234.3 |
| 42.5° | 5723.2  | 5442.0 | 3833.6 | 2222.5 | 1766.1 | 1653.1 | 1500.7 | 1323.7 | 1194.0 | 1121.3 | 1110.8 |
| 45°   | 6255.8  | 5787.2 | 3585.7 | 1917.7 | 1599.7 | 1527.8 | 1355.2 | 1192.3 | 1111.7 | 1058.3 | 1049.5 |
| 47.5° | 6863.8  | 6174.4 | 3325.5 | 1669.7 | 1458.6 | 1410.4 | 1238.7 | 1133.6 | 1069.7 | 1027.6 | 1019.7 |
| 50°   | 7611.1  | 6611.5 | 3049.5 | 1466.5 | 1316.7 | 1269.4 | 1183.5 | 1101.2 | 1050.4 | 1018.0 | 1010.1 |
| 52.5° | 8453.8  | 7104.7 | 2850.6 | 1306.2 | 1199.3 | 1165.1 | 1154.6 | 1083.7 | 1042.5 | 1018.0 | 1010.1 |
| 55°   | 9361.4  | 7606.7 | 2636.0 | 1171.3 | 1097.7 | 1107.3 | 1135.4 | 1085.4 | 1057.4 | 1027.6 | 1016.2 |
| 57.5° | 10269.9 | 8125.3 | 2396.9 | 1057.4 | 1017.1 | 1064.4 | 1122.2 | 1088.9 | 1065.3 | 1036.4 | 1025.8 |
| 60°   | 10988.2 | 8453.8 | 2026.3 | 961.9  | 953.1  | 1017.1 | 1090.7 | 1062.6 | 1032.0 | 1032.9 | 1031.1 |
| 62.5° | 11323.8 | 8436.3 | 1617.2 | 876.9  | 889.2  | 953.1  | 1039.9 | 1021.5 | 996.1  | 1030.2 | 1032.9 |
| 65°   | 11135.4 | 8015.8 | 1258.9 | 799.8  | 820.9  | 886.6  | 987.3  | 1001.3 | 1010.1 | 1075.8 | 1084.5 |
| 67.5° | 10345.2 | 7197.6 | 975.0  | 732.4  | 758.7  | 841.0  | 992.6  | 1090.7 | 1102.1 | 1171.3 | 1170.4 |
| 69°   | 9527.9  | 6430.2 | 847.1  | 697.3  | 728.0  | 852.4  | 1060.9 | 1147.6 | 1104.7 | 1178.3 | 1167.8 |
| 70°   | 8842.8  | 5823.1 | 778.8  | 673.7  | 714.0  | 872.5  | 1106.4 | 1146.7 | 1091.6 | 1154.6 | 1137.1 |
| 72.5° | 6810.4  | 4189.2 | 660.5  | 629.9  | 666.7  | 834.9  | 1119.6 | 1121.3 | 1060.9 | 1073.2 | 1043.4 |
| 75°   | 4671.1  | 2647.4 | 576.4  | 570.3  | 594.8  | 752.5  | 1077.5 | 1071.4 | 981.2  | 963.6  | 939.1  |
| 77.5° | 2575.6  | 1344.7 | 489.7  | 513.4  | 530.0  | 666.7  | 979.4  | 970.7  | 896.2  | 859.4  | 850.6  |
| 80°   | 993.4   | 588.7  | 413.5  | 456.4  | 466.9  | 577.3  | 858.5  | 850.6  | 788.4  | 741.1  | 728.0  |
| 82.5° | 374.9   | 308.4  | 341.7  | 395.1  | 391.6  | 476.6  | 727.1  | 722.7  | 662.3  | 593.1  | 572.1  |
| 85°   | 173.5   | 184.8  | 270.7  | 325.9  | 300.5  | 353.0  | 581.7  | 589.6  | 516.0  | 433.6  | 433.6  |
| 87.5° | 73.6    | 103.4  | 191.9  | 246.2  | 202.4  | 238.3  | 426.6  | 407.4  | 374.1  | 259.3  | 243.5  |
| 90°   | 0.0     | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

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

Report Prepared for

Cooper Lighting Solutions

McGRAW-EDISON

Report Number: SP1-1908-441-10-R4

Test Date: 10/25/2019

Luminaire Tested: SA1C-722-U-5WQ

Data in this report applies to families of products SA1C-722-U-5WQ.

### Test Information

Test Method: LM-79-2008 Report  
 Number: SP1-1908-441-10-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-722-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):                  | 2237    | CRI (Ra): | 72.0 |      |       |
| CIE u':                   | 0.2876  | R1:       | 68.9 | R9:  | -17.4 |
| CIE v':                   | 0.5346  | R2:       | 83.0 | R10: | 61.3  |
| Duv:                      | -0.0006 | R3:       | 95.2 | R11: | 59.8  |
| CIE x:                    | 0.5005  | R4:       | 66.2 | R12: | 50.5  |
| CIE y:                    | 0.4134  | R5:       | 65.9 | R13: | 71.1  |
| CIE z:                    | 0.0860  | R6:       | 76.3 | R14: | 96.9  |
| Peak Wavelength (nm):     | 603     | R7:       | 76.7 |      |       |
| Dominant Wavelength (nm): | 587     | R8:       | 43.8 |      |       |
| Purity:                   | 74.5    |           |      |      |       |
| Rf:                       | 69.8    |           |      |      |       |
| Rg:                       | 99.2    |           |      |      |       |



### Test Conditions

Stabilization Time: 71M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.7/41%  
 Sphere Temperature (°C): 25.6

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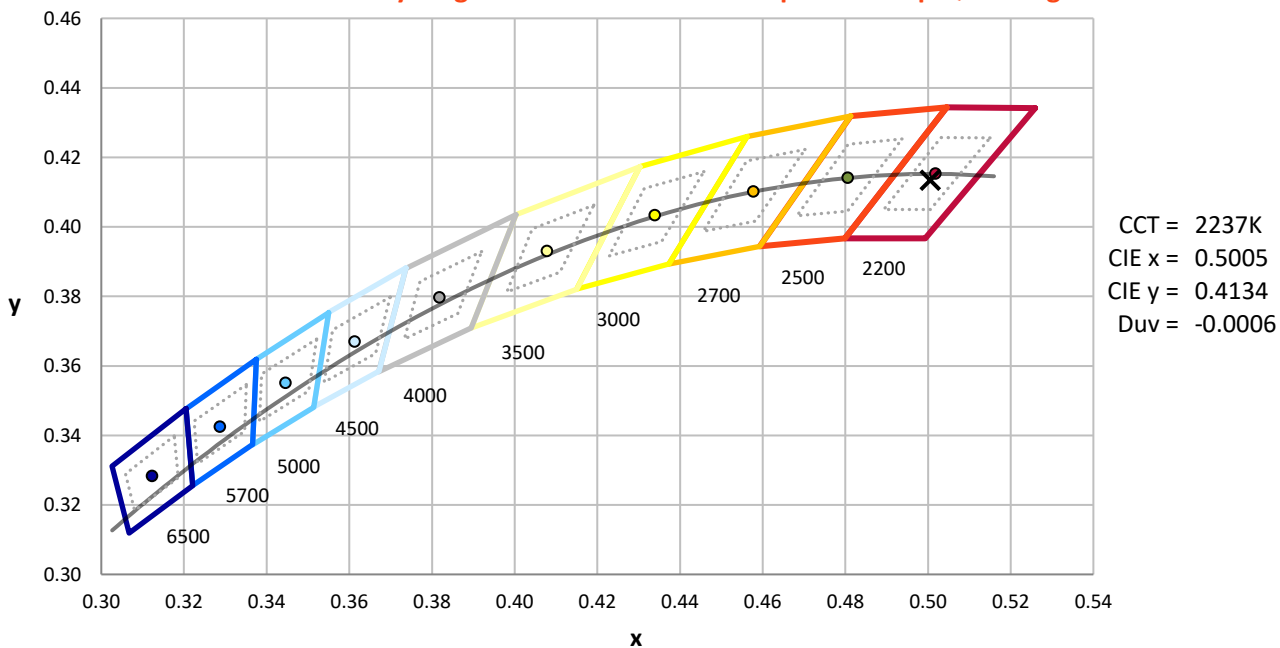
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| 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 2200K 4-step quadrangle

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**Photopic Flux vs. Wavelength**



#####

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 1768             | NR               | 490       | 5206             | NR               | 620       | 130919           | NR               | 750       | 8553             | NR               | 880       | 2713             | NR               |
| 365       | 1569             | NR               | 495       | 7286             | NR               | 625       | 125335           | NR               | 755       | 7696             | NR               | 885       | 2316             | NR               |
| 370       | 1594             | NR               | 500       | 10654            | NR               | 630       | 118388           | NR               | 760       | 6978             | NR               | 890       | 2539             | NR               |
| 375       | 1744             | NR               | 505       | 15189            | NR               | 635       | 111855           | NR               | 765       | 6377             | NR               | 895       | 1933             | NR               |
| 380       | 1659             | NR               | 510       | 20541            | NR               | 640       | 104062           | NR               | 770       | 5600             | NR               | 900       | 2216             | NR               |
| 385       | 1504             | NR               | 515       | 26492            | NR               | 645       | 96365            | NR               | 775       | 5000             | NR               | 905       | 2067             | NR               |
| 390       | 1541             | NR               | 520       | 32294            | NR               | 650       | 88651            | NR               | 780       | 4709             | NR               | 910       | 1959             | NR               |
| 395       | 1355             | NR               | 525       | 38123            | NR               | 655       | 81152            | NR               | 785       | 4305             | NR               | 915       | 1874             | NR               |
| 400       | 1243             | NR               | 530       | 43232            | NR               | 660       | 73523            | NR               | 790       | 4040             | NR               | 920       | 1484             | NR               |
| 405       | 1417             | NR               | 535       | 48012            | NR               | 665       | 66123            | NR               | 795       | 3642             | NR               | 925       | 1914             | NR               |
| 410       | 2147             | NR               | 540       | 52623            | NR               | 670       | 58677            | NR               | 800       | 3594             | NR               | 930       | 1948             | NR               |
| 415       | 3837             | NR               | 545       | 57516            | NR               | 675       | 52349            | NR               | 805       | 3190             | NR               | 935       | 2079             | NR               |
| 420       | 7159             | NR               | 550       | 62613            | NR               | 680       | 46159            | NR               | 810       | 3241             | NR               | 940       | 2263             | NR               |
| 425       | 12599            | NR               | 555       | 68554            | NR               | 685       | 40525            | NR               | 815       | 2732             | NR               | 945       | 1688             | NR               |
| 430       | 19019            | NR               | 560       | 75325            | NR               | 690       | 35615            | NR               | 820       | 2612             | NR               | 950       | 1560             | NR               |
| 435       | 24875            | NR               | 565       | 82533            | NR               | 695       | 31158            | NR               | 825       | 2966             | NR               | 955       | 2826             | NR               |
| 440       | 29103            | NR               | 570       | 90909            | NR               | 700       | 27409            | NR               | 830       | 2574             | NR               | 960       | 1477             | NR               |
| 445       | 29901            | NR               | 575       | 99621            | NR               | 705       | 24204            | NR               | 835       | 2633             | NR               | 965       | 1568             | NR               |
| 450       | 24862            | NR               | 580       | 108484           | NR               | 710       | 21558            | NR               | 840       | 2526             | NR               | 970       | 2030             | NR               |
| 455       | 15942            | NR               | 585       | 116679           | NR               | 715       | 19222            | NR               | 845       | 2631             | NR               | 975       | 1986             | NR               |
| 460       | 9916             | NR               | 590       | 123752           | NR               | 720       | 17310            | NR               | 850       | 2079             | NR               | 980       | 2540             | NR               |
| 465       | 7051             | NR               | 595       | 129324           | NR               | 725       | 15280            | NR               | 855       | 2309             | NR               | 985       | 1139             | NR               |
| 470       | 5227             | NR               | 600       | 134082           | NR               | 730       | 13282            | NR               | 860       | 2528             | NR               | 990       | 2018             | NR               |
| 475       | 4257             | NR               | 605       | 135698           | NR               | 735       | 11753            | NR               | 865       | 2121             | NR               | 995       | 3445             | NR               |
| 480       | 4052             | NR               | 610       | 135144           | NR               | 740       | 10654            | NR               | 870       | 2751             | NR               | 1000      | 3704             | NR               |
| 485       | 4298             | NR               | 615       | 134180           | NR               | 745       | 9451             | NR               | 875       | 2317             | NR               |           |                  |                  |

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**Scotopic Flux vs. Wavelength**



**Scotopic Lumens: 4696.9**

**S/P: 0.85**

| 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       | 1768             | NR               | 490       | 5206             | NR               | 620       | 130919           | NR               | 750       | 8553             | NR               | 880       | 2713             | NR               |
| 365       | 1569             | NR               | 495       | 7286             | NR               | 625       | 125335           | NR               | 755       | 7696             | NR               | 885       | 2316             | NR               |
| 370       | 1594             | NR               | 500       | 10654            | NR               | 630       | 118388           | NR               | 760       | 6978             | NR               | 890       | 2539             | NR               |
| 375       | 1744             | NR               | 505       | 15189            | NR               | 635       | 111855           | NR               | 765       | 6377             | NR               | 895       | 1933             | NR               |
| 380       | 1659             | NR               | 510       | 20541            | NR               | 640       | 104062           | NR               | 770       | 5600             | NR               | 900       | 2216             | NR               |
| 385       | 1504             | NR               | 515       | 26492            | NR               | 645       | 96365            | NR               | 775       | 5000             | NR               | 905       | 2067             | NR               |
| 390       | 1541             | NR               | 520       | 32294            | NR               | 650       | 88651            | NR               | 780       | 4709             | NR               | 910       | 1959             | NR               |
| 395       | 1355             | NR               | 525       | 38123            | NR               | 655       | 81152            | NR               | 785       | 4305             | NR               | 915       | 1874             | NR               |
| 400       | 1243             | NR               | 530       | 43232            | NR               | 660       | 73523            | NR               | 790       | 4040             | NR               | 920       | 1484             | NR               |
| 405       | 1417             | NR               | 535       | 48012            | NR               | 665       | 66123            | NR               | 795       | 3642             | NR               | 925       | 1914             | NR               |
| 410       | 2147             | NR               | 540       | 52623            | NR               | 670       | 58677            | NR               | 800       | 3594             | NR               | 930       | 1948             | NR               |
| 415       | 3837             | NR               | 545       | 57516            | NR               | 675       | 52349            | NR               | 805       | 3190             | NR               | 935       | 2079             | NR               |
| 420       | 7159             | NR               | 550       | 62613            | NR               | 680       | 46159            | NR               | 810       | 3241             | NR               | 940       | 2263             | NR               |
| 425       | 12599            | NR               | 555       | 68554            | NR               | 685       | 40525            | NR               | 815       | 2732             | NR               | 945       | 1688             | NR               |
| 430       | 19019            | NR               | 560       | 75325            | NR               | 690       | 35615            | NR               | 820       | 2612             | NR               | 950       | 1560             | NR               |
| 435       | 24875            | NR               | 565       | 82533            | NR               | 695       | 31158            | NR               | 825       | 2966             | NR               | 955       | 2826             | NR               |
| 440       | 29103            | NR               | 570       | 90909            | NR               | 700       | 27409            | NR               | 830       | 2574             | NR               | 960       | 1477             | NR               |
| 445       | 29901            | NR               | 575       | 99621            | NR               | 705       | 24204            | NR               | 835       | 2633             | NR               | 965       | 1568             | NR               |
| 450       | 24862            | NR               | 580       | 108484           | NR               | 710       | 21558            | NR               | 840       | 2526             | NR               | 970       | 2030             | NR               |
| 455       | 15942            | NR               | 585       | 116679           | NR               | 715       | 19222            | NR               | 845       | 2631             | NR               | 975       | 1986             | NR               |
| 460       | 9916             | NR               | 590       | 123752           | NR               | 720       | 17310            | NR               | 850       | 2079             | NR               | 980       | 2540             | NR               |
| 465       | 7051             | NR               | 595       | 129324           | NR               | 725       | 15280            | NR               | 855       | 2309             | NR               | 985       | 1139             | NR               |
| 470       | 5227             | NR               | 600       | 134082           | NR               | 730       | 13282            | NR               | 860       | 2528             | NR               | 990       | 2018             | NR               |
| 475       | 4257             | NR               | 605       | 135698           | NR               | 735       | 11753            | NR               | 865       | 2121             | NR               | 995       | 3445             | NR               |
| 480       | 4052             | NR               | 610       | 135144           | NR               | 740       | 10654            | NR               | 870       | 2751             | NR               | 1000      | 3704             | NR               |
| 485       | 4298             | NR               | 615       | 134180           | NR               | 745       | 9451             | NR               | 875       | 2317             | NR               |           |                  |                  |

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**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 1470.8 M/P: 0.27**

| 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       | 1768             | NR               | 490       | 5206             | NR               | 620       | 130919           | NR               | 750       | 8553             | NR               | 880       | 2713             | NR               |
| 365       | 1569             | NR               | 495       | 7286             | NR               | 625       | 125335           | NR               | 755       | 7696             | NR               | 885       | 2316             | NR               |
| 370       | 1594             | NR               | 500       | 10654            | NR               | 630       | 118388           | NR               | 760       | 6978             | NR               | 890       | 2539             | NR               |
| 375       | 1744             | NR               | 505       | 15189            | NR               | 635       | 111855           | NR               | 765       | 6377             | NR               | 895       | 1933             | NR               |
| 380       | 1659             | NR               | 510       | 20541            | NR               | 640       | 104062           | NR               | 770       | 5600             | NR               | 900       | 2216             | NR               |
| 385       | 1504             | NR               | 515       | 26492            | NR               | 645       | 96365            | NR               | 775       | 5000             | NR               | 905       | 2067             | NR               |
| 390       | 1541             | NR               | 520       | 32294            | NR               | 650       | 88651            | NR               | 780       | 4709             | NR               | 910       | 1959             | NR               |
| 395       | 1355             | NR               | 525       | 38123            | NR               | 655       | 81152            | NR               | 785       | 4305             | NR               | 915       | 1874             | NR               |
| 400       | 1243             | NR               | 530       | 43232            | NR               | 660       | 73523            | NR               | 790       | 4040             | NR               | 920       | 1484             | NR               |
| 405       | 1417             | NR               | 535       | 48012            | NR               | 665       | 66123            | NR               | 795       | 3642             | NR               | 925       | 1914             | NR               |
| 410       | 2147             | NR               | 540       | 52623            | NR               | 670       | 58677            | NR               | 800       | 3594             | NR               | 930       | 1948             | NR               |
| 415       | 3837             | NR               | 545       | 57516            | NR               | 675       | 52349            | NR               | 805       | 3190             | NR               | 935       | 2079             | NR               |
| 420       | 7159             | NR               | 550       | 62613            | NR               | 680       | 46159            | NR               | 810       | 3241             | NR               | 940       | 2263             | NR               |
| 425       | 12599            | NR               | 555       | 68554            | NR               | 685       | 40525            | NR               | 815       | 2732             | NR               | 945       | 1688             | NR               |
| 430       | 19019            | NR               | 560       | 75325            | NR               | 690       | 35615            | NR               | 820       | 2612             | NR               | 950       | 1560             | NR               |
| 435       | 24875            | NR               | 565       | 82533            | NR               | 695       | 31158            | NR               | 825       | 2966             | NR               | 955       | 2826             | NR               |
| 440       | 29103            | NR               | 570       | 90909            | NR               | 700       | 27409            | NR               | 830       | 2574             | NR               | 960       | 1477             | NR               |
| 445       | 29901            | NR               | 575       | 99621            | NR               | 705       | 24204            | NR               | 835       | 2633             | NR               | 965       | 1568             | NR               |
| 450       | 24862            | NR               | 580       | 108484           | NR               | 710       | 21558            | NR               | 840       | 2526             | NR               | 970       | 2030             | NR               |
| 455       | 15942            | NR               | 585       | 116679           | NR               | 715       | 19222            | NR               | 845       | 2631             | NR               | 975       | 1986             | NR               |
| 460       | 9916             | NR               | 590       | 123752           | NR               | 720       | 17310            | NR               | 850       | 2079             | NR               | 980       | 2540             | NR               |
| 465       | 7051             | NR               | 595       | 129324           | NR               | 725       | 15280            | NR               | 855       | 2309             | NR               | 985       | 1139             | NR               |
| 470       | 5227             | NR               | 600       | 134082           | NR               | 730       | 13282            | NR               | 860       | 2528             | NR               | 990       | 2018             | NR               |
| 475       | 4257             | NR               | 605       | 135698           | NR               | 735       | 11753            | NR               | 865       | 2121             | NR               | 995       | 3445             | NR               |
| 480       | 4052             | NR               | 610       | 135144           | NR               | 740       | 10654            | NR               | 870       | 2751             | NR               | 1000      | 3704             | NR               |
| 485       | 4298             | NR               | 615       | 134180           | NR               | 745       | 9451             | NR               | 875       | 2317             | NR               |           |                  |                  |

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### Summary

$R_f = 69.8$   
 $R_g = 99.2$   
 CIE  $R_a = 72.0$   
 $R_g = -17.4$



### Color Vector Graphics



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 87 | CES26 = 56 | CES51 = 74 | CES76 = 56 |
| CES02 = 65 | CES27 = 76 | CES52 = 76 | CES77 = 81 |
| CES03 = 32 | CES28 = 83 | CES53 = 65 | CES78 = 63 |
| CES04 = 72 | CES29 = 46 | CES54 = 78 | CES79 = 84 |
| CES05 = 52 | CES30 = 48 | CES55 = 75 | CES80 = 84 |
| CES06 = 52 | CES31 = 51 | CES56 = 65 | CES81 = 63 |
| CES07 = 44 | CES32 = 51 | CES57 = 62 | CES82 = 92 |
| CES08 = 42 | CES33 = 53 | CES58 = 66 | CES83 = 83 |
| CES09 = 29 | CES34 = 70 | CES59 = 84 | CES84 = 92 |
| CES10 = 78 | CES35 = 85 | CES60 = 90 | CES85 = 81 |
| CES11 = 61 | CES36 = 78 | CES61 = 84 | CES86 = 56 |
| CES12 = 68 | CES37 = 80 | CES62 = 70 | CES87 = 78 |
| CES13 = 45 | CES38 = 53 | CES63 = 68 | CES88 = 72 |
| CES14 = 75 | CES39 = 90 | CES64 = 69 | CES89 = 62 |
| CES15 = 72 | CES40 = 84 | CES65 = 67 | CES90 = 67 |
| CES16 = 49 | CES41 = 75 | CES66 = 64 | CES91 = 90 |
| CES17 = 51 | CES42 = 79 | CES67 = 63 | CES92 = 67 |
| CES18 = 57 | CES43 = 64 | CES68 = 69 | CES93 = 79 |
| CES19 = 74 | CES44 = 98 | CES69 = 80 | CES94 = 52 |
| CES20 = 68 | CES45 = 73 | CES70 = 63 | CES95 = 76 |
| CES21 = 89 | CES46 = 67 | CES71 = 63 | CES96 = 78 |
| CES22 = 81 | CES47 = 60 | CES72 = 87 | CES97 = 77 |
| CES23 = 92 | CES48 = 48 | CES73 = 56 | CES98 = 71 |
| CES24 = 92 | CES49 = 64 | CES74 = 87 | CES99 = 65 |
| CES25 = 74 | CES50 = 74 | CES75 = 66 |            |



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Color Rendition by Hue-Angle Bin



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**Measure Comparisons**



(END OF REPORT)