

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: P359404

Luminaire Tested: NVN-SA6D-740-U-T4W

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-2019  
Report Number: P359404  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-18)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: STREETWORKS  
Catalog Number: NVN-SA6D-740-U-T4W  
Description: NAVION ROADWAY AND AREA LUMINAIRE  
(6) 70 CRI, 4000K, 1200mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE IV WIDE OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 46400 lumens  
Efficiency: N/A  
Efficacy: 121.5 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 1.5' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B4 - U0 - G5

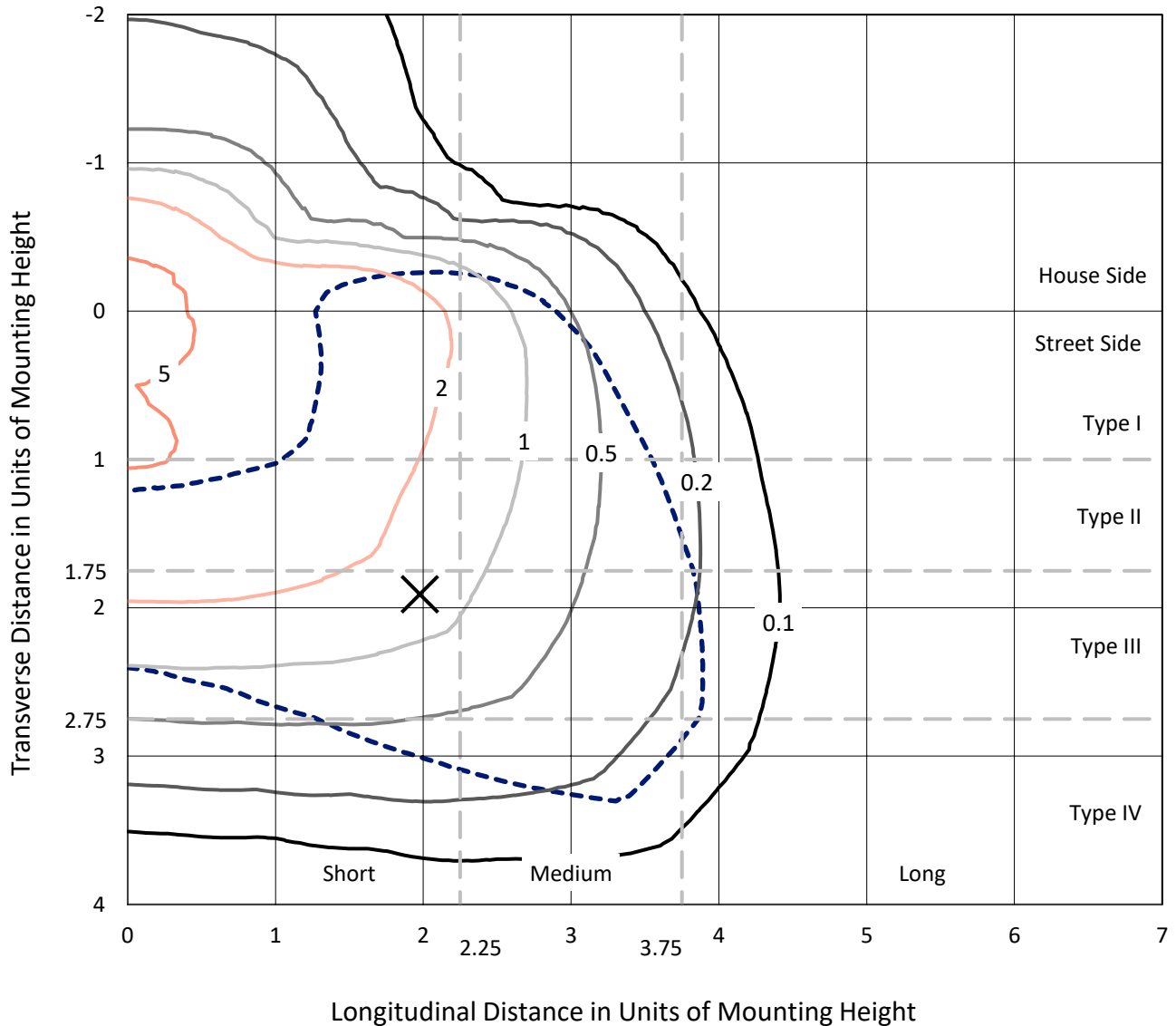
Input Watts (W): 382  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT



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### Iso-Footcandle Lines of Horizontal Illumination

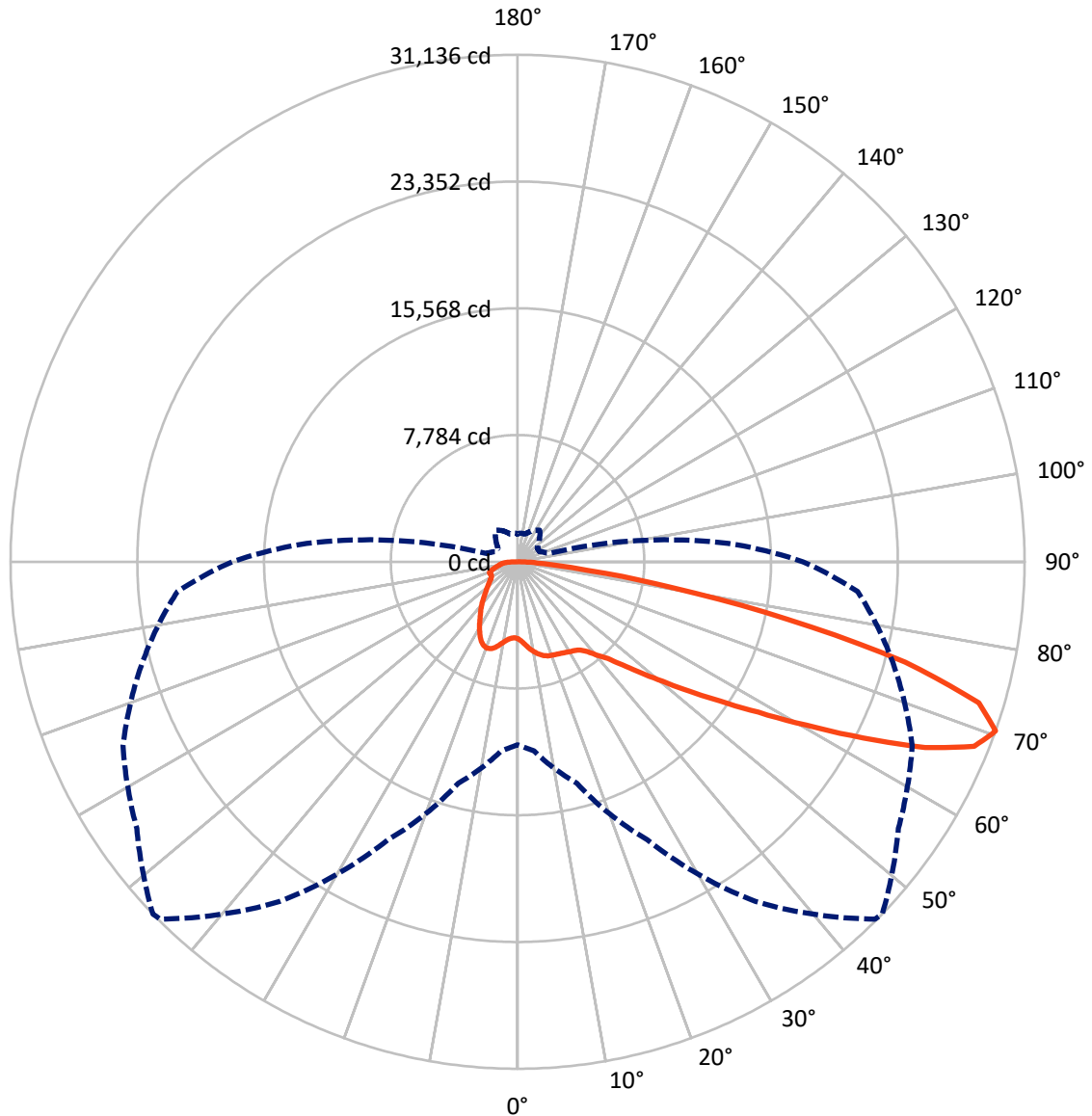
× Max cd  
 - - - 1/2 Max cd



Based on 30 foot mounting height. Maximum calculated value = 6.6 fc  
 Type IV - Short - N/A

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### Luminous Intensity Polar Plot



— Vertical Plane Through 46-Deg Lateral      - - - Horizontal Cone Through 70-Deg Vertical

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**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 10634.7  | 0.0    | 10634.7 |
|                    | % Fixture | 22.9     | 0.0    | 22.9    |
| <b>Street Side</b> | Lumens    | 35765.3  | 0.0    | 35765.3 |
|                    | % Fixture | 77.1     | 0.0    | 77.1    |
| <b>Total</b>       | Lumens    | 46400.0  | 0.0    | 46400.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 481.9   | 1.0       |
| 10°-20°   | 1605.6  | 3.5       |
| 20°-30°   | 2677.1  | 5.8       |
| 30°-40°   | 3799.0  | 8.2       |
| 40°-50°   | 5588.1  | 12.0      |
| 50°-60°   | 9463.4  | 20.4      |
| 60°-70°   | 13433.2 | 29.0      |
| 70°-80°   | 8160.8  | 17.6      |
| 80°-90°   | 1191.0  | 2.6       |
| 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°    | 46400.0 | 100.0     |
| 0°-180°   | 46400.0 | 100.0     |

**Coefficient of Utilization**

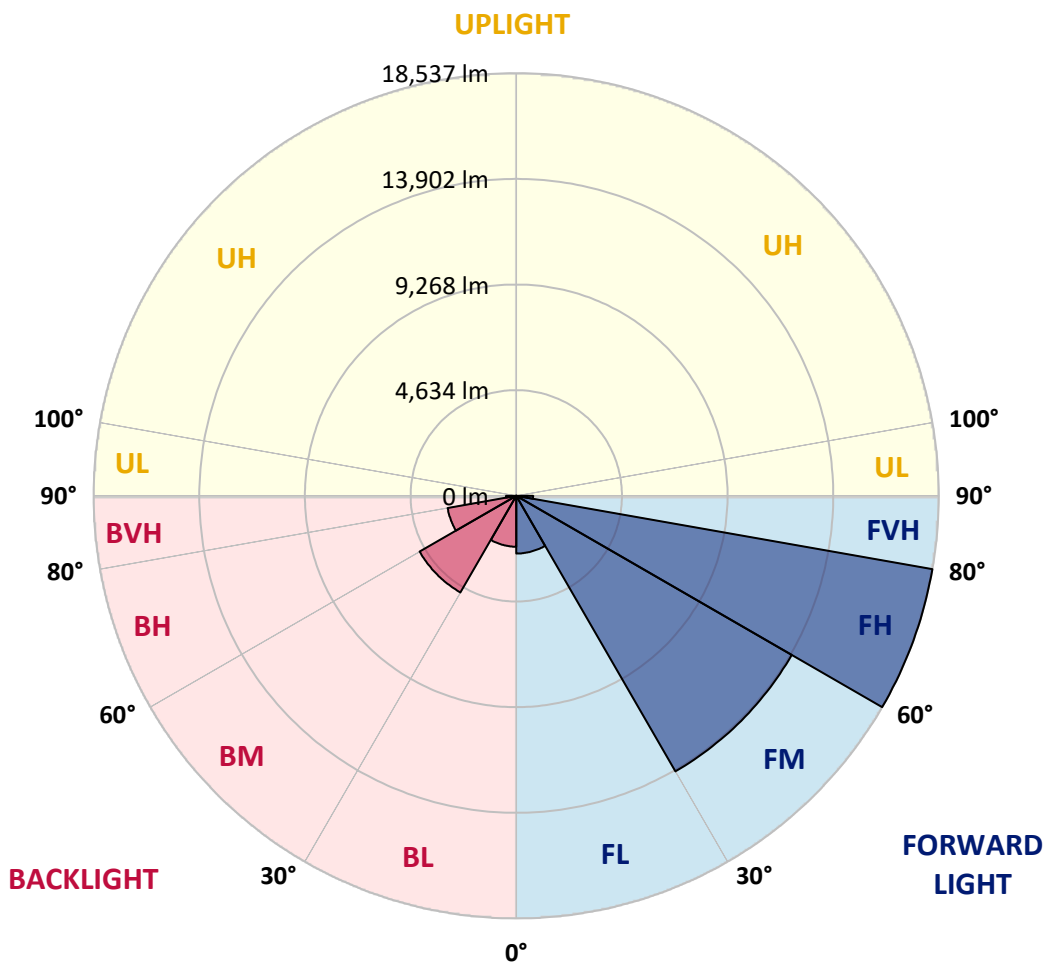


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**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone           | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |         |
|----------------|---------|-----------|-------------------------|------|---------|
|                |         |           | B                       | U    | G       |
| FL (0°-30°)    | 2531.8  | 5.5       |                         |      |         |
| FM (30°-60°)   | 13955.1 | 30.1      |                         |      |         |
| FH (60°-80°)   | 18536.5 | 39.9      |                         |      | G5      |
| FVH (80°-90°)  | 741.9   | 1.6       |                         |      | G4/750  |
| BL (0°-30°)    | 2232.8  | 4.8       | B3/2500                 |      |         |
| BM (30°-60°)   | 4895.5  | 10.6      | B3/5000                 |      |         |
| BH (60°-80°)   | 3057.4  | 6.6       | B4/5000                 |      | G4/5000 |
| BVH (80°-90°)  | 449.1   | 1.0       |                         |      | G3/500  |
| UL (90°-100°)  | 0.0     | 0.0       |                         | U0/0 |         |
| UH (100°-180°) | 0.0     | 0.0       |                         | U0/0 |         |

**BUG Rating: B4-U0-G5**  
 Type IV Short





REPORT NUMBER: P359404

CATALOG NUMBER: NVN-SA6D-740-U-T4W

**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 46°     | 55°     | 65°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 4727.3  | 4727.3  | 4727.3  | 4727.3  | 4727.3  | 4727.3  | 4727.3  | 4727.3  | 4727.3  | 4727.3  | 4727.3  |
| 2.5°  | 4963.9  | 4967.0  | 4973.4  | 4957.5  | 4913.0  | 4900.3  | 4895.6  | 4849.5  | 4819.4  | 4774.9  | 4736.8  |
| 5°    | 5360.8  | 5364.0  | 5354.5  | 5310.0  | 5211.6  | 5138.5  | 5132.2  | 5027.4  | 4932.1  | 4830.5  | 4754.2  |
| 7.5°  | 5775.3  | 5780.0  | 5749.9  | 5665.7  | 5527.6  | 5400.5  | 5392.6  | 5249.7  | 5105.2  | 4951.1  | 4836.8  |
| 10°   | 6142.1  | 6123.0  | 6073.8  | 5956.3  | 5792.7  | 5637.1  | 5630.8  | 5481.5  | 5314.8  | 5129.0  | 4976.6  |
| 12.5° | 6386.6  | 6370.8  | 6307.2  | 6164.3  | 5984.9  | 5842.0  | 5829.3  | 5691.1  | 5529.2  | 5325.9  | 5143.3  |
| 15°   | 6521.6  | 6532.7  | 6447.0  | 6285.0  | 6110.3  | 5989.7  | 5978.5  | 5880.1  | 5735.6  | 5530.7  | 5321.1  |
| 17.5° | 6539.1  | 6548.6  | 6466.0  | 6305.6  | 6162.7  | 6080.2  | 6075.4  | 6010.3  | 5905.5  | 5708.6  | 5489.5  |
| 20°   | 6437.4  | 6443.8  | 6375.5  | 6243.7  | 6150.0  | 6124.6  | 6123.0  | 6094.5  | 6016.6  | 5842.0  | 5629.2  |
| 22.5° | 6289.8  | 6294.5  | 6245.3  | 6150.0  | 6118.3  | 6158.0  | 6169.1  | 6158.0  | 6102.4  | 5938.8  | 5738.8  |
| 25°   | 6253.2  | 6250.1  | 6199.3  | 6102.4  | 6129.4  | 6213.5  | 6227.8  | 6232.6  | 6194.5  | 6051.6  | 5878.5  |
| 27.5° | 6429.5  | 6418.4  | 6321.5  | 6165.9  | 6183.4  | 6285.0  | 6304.1  | 6350.1  | 6326.3  | 6200.8  | 6037.3  |
| 30°   | 6939.2  | 6920.2  | 6721.7  | 6407.3  | 6321.5  | 6373.9  | 6397.7  | 6470.8  | 6475.6  | 6370.8  | 6248.5  |
| 32.5° | 7799.9  | 7776.1  | 7420.4  | 6858.2  | 6555.0  | 6464.4  | 6486.7  | 6596.2  | 6655.0  | 6574.0  | 6442.2  |
| 35°   | 8887.6  | 8860.6  | 8393.8  | 7625.2  | 6945.6  | 6637.5  | 6653.4  | 6740.7  | 6858.2  | 6743.9  | 6569.2  |
| 37.5° | 10021.4 | 9956.3  | 9506.9  | 8527.2  | 7566.5  | 7007.5  | 7007.5  | 7018.6  | 7074.2  | 6836.0  | 6718.5  |
| 40°   | 11148.8 | 11083.7 | 10677.2 | 9587.9  | 8370.0  | 7590.3  | 7553.8  | 7307.6  | 7263.2  | 7058.3  | 7018.6  |
| 42.5° | 12196.8 | 12177.8 | 11938.0 | 10786.8 | 9313.2  | 8163.5  | 8112.7  | 7695.1  | 7704.6  | 7577.6  | 7579.2  |
| 45°   | 13311.6 | 13311.6 | 13116.3 | 11996.8 | 10412.0 | 9084.5  | 9033.7  | 8419.2  | 8514.5  | 8455.7  | 8597.0  |
| 47.5° | 14221.5 | 14250.0 | 14223.0 | 13257.6 | 11690.3 | 10254.8 | 10162.7 | 9422.7  | 9689.5  | 9891.2  | 10302.5 |
| 50°   | 15150.4 | 15194.9 | 15199.6 | 14640.7 | 13235.4 | 11645.8 | 11541.0 | 10755.0 | 11350.5 | 11928.5 | 12736.7 |
| 52.5° | 16498.5 | 16598.6 | 16200.0 | 16020.6 | 15128.2 | 13297.3 | 13194.1 | 12468.4 | 13462.4 | 14273.9 | 15666.5 |
| 55°   | 17748.2 | 17660.9 | 17376.7 | 17487.8 | 17154.4 | 15177.4 | 15099.6 | 14462.8 | 15815.7 | 16870.1 | 18678.8 |
| 57.5° | 18424.7 | 18418.3 | 18704.2 | 19180.5 | 19339.3 | 17495.8 | 17430.6 | 16811.4 | 18469.2 | 19261.5 | 21506.9 |
| 60°   | 19218.7 | 19229.8 | 19938.0 | 21019.4 | 21673.6 | 20382.6 | 20354.0 | 19884.0 | 21046.4 | 21494.1 | 23725.2 |
| 62.5° | 19329.8 | 19529.9 | 20749.4 | 22610.5 | 23858.6 | 23755.4 | 23818.9 | 22651.7 | 23352.0 | 23275.8 | 25381.4 |
| 65°   | 18051.5 | 18315.1 | 20522.3 | 23091.6 | 26030.8 | 27444.1 | 27502.9 | 25435.4 | 25170.2 | 24798.6 | 25973.7 |
| 67.5° | 15431.5 | 15822.1 | 18219.8 | 22045.2 | 26747.0 | 30170.6 | 30253.1 | 27593.4 | 26678.7 | 25314.7 | 24547.7 |
| 70°   | 11229.8 | 11663.3 | 14077.0 | 18828.0 | 25470.3 | 31042.3 | 31136.0 | 28547.7 | 26735.9 | 23845.9 | 20955.8 |
| 72.5° | 6783.6  | 7123.4  | 9113.1  | 13861.0 | 21497.3 | 29454.4 | 29621.1 | 27337.7 | 24409.6 | 20198.4 | 15474.3 |
| 75°   | 2978.9  | 3201.3  | 4406.5  | 7987.3  | 15390.2 | 24369.9 | 24577.9 | 23399.7 | 19833.2 | 14678.8 | 9146.4  |
| 77.5° | 1268.8  | 1332.3  | 1807.1  | 3469.6  | 8700.2  | 16652.6 | 16938.4 | 17097.2 | 13456.1 | 7987.3  | 3865.0  |
| 80°   | 790.8   | 816.2   | 1022.6  | 1570.5  | 4071.4  | 9352.9  | 9660.9  | 10059.5 | 6682.0  | 2936.1  | 1349.7  |
| 82.5° | 481.1   | 509.7   | 679.6   | 949.6   | 2119.9  | 4239.8  | 4387.4  | 4668.5  | 2593.1  | 1268.8  | 698.7   |
| 85°   | 289.0   | 309.6   | 416.0   | 600.2   | 1206.8  | 1667.3  | 1665.7  | 1842.0  | 1221.1  | 816.2   | 368.4   |
| 87.5° | 138.1   | 154.0   | 222.3   | 311.2   | 608.2   | 625.6   | 585.9   | 663.8   | 741.6   | 535.1   | 185.8   |
| 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: P359404  
 CATALOG NUMBER: NVN-SA6D-740-U-T4W

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°     | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|---------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 4727.3  | 4727.3  | 4727.3 | 4727.3 | 4727.3 | 4727.3 | 4727.3 | 4727.3 | 4727.3 | 4727.3 | 4727.3 |
| 2.5°  | 4724.1  | 4717.7  | 4697.1 | 4681.2 | 4678.0 | 4668.5 | 4660.6 | 4665.3 | 4671.7 | 4673.3 | 4673.3 |
| 5°    | 4722.5  | 4705.0  | 4678.0 | 4666.9 | 4681.2 | 4700.3 | 4724.1 | 4755.8 | 4774.9 | 4789.2 | 4798.7 |
| 7.5°  | 4798.7  | 4765.4  | 4735.2 | 4728.8 | 4757.4 | 4808.2 | 4862.2 | 4928.9 | 4975.0 | 5006.7 | 5013.1 |
| 10°   | 4925.7  | 4884.5  | 4854.3 | 4860.6 | 4911.5 | 4984.5 | 5060.7 | 5146.5 | 5216.3 | 5259.2 | 5262.4 |
| 12.5° | 5071.8  | 5032.1  | 5003.6 | 5030.5 | 5114.7 | 5203.6 | 5283.0 | 5357.7 | 5421.2 | 5464.0 | 5464.0 |
| 15°   | 5240.2  | 5211.6  | 5178.2 | 5240.2 | 5354.5 | 5433.9 | 5467.2 | 5503.7 | 5538.7 | 5570.4 | 5564.1 |
| 17.5° | 5402.1  | 5375.1  | 5357.7 | 5430.7 | 5549.8 | 5586.3 | 5564.1 | 5537.1 | 5537.1 | 5554.6 | 5557.7 |
| 20°   | 5541.9  | 5518.0  | 5529.2 | 5600.6 | 5662.5 | 5624.4 | 5541.9 | 5456.1 | 5421.2 | 5430.7 | 5440.2 |
| 22.5° | 5664.1  | 5653.0  | 5686.4 | 5719.7 | 5675.2 | 5541.9 | 5389.4 | 5273.5 | 5230.6 | 5227.4 | 5230.6 |
| 25°   | 5807.0  | 5805.5  | 5846.7 | 5786.4 | 5589.5 | 5343.4 | 5138.5 | 5025.8 | 5002.0 | 5021.0 | 5052.8 |
| 27.5° | 5984.9  | 6002.4  | 6023.0 | 5802.3 | 5414.8 | 5043.2 | 4835.2 | 4757.4 | 4781.2 | 4827.3 | 4857.5 |
| 30°   | 6212.0  | 6259.6  | 6215.1 | 5762.6 | 5163.9 | 4700.3 | 4501.8 | 4479.5 | 4544.6 | 4609.7 | 4641.5 |
| 32.5° | 6432.7  | 6507.3  | 6399.3 | 5659.4 | 4840.0 | 4336.6 | 4182.6 | 4176.2 | 4255.6 | 4319.2 | 4363.6 |
| 35°   | 6610.5  | 6758.2  | 6537.5 | 5454.5 | 4465.2 | 4001.6 | 3888.8 | 3846.0 | 3874.5 | 3949.2 | 4000.0 |
| 37.5° | 6842.4  | 7088.5  | 6632.8 | 5141.7 | 4058.7 | 3725.3 | 3593.5 | 3495.0 | 3469.6 | 3499.8 | 3525.2 |
| 40°   | 7266.3  | 7591.9  | 6677.2 | 4705.0 | 3661.8 | 3449.0 | 3315.6 | 3171.1 | 3071.0 | 2998.0 | 2999.6 |
| 42.5° | 7958.7  | 8247.7  | 6648.6 | 4174.7 | 3294.9 | 3179.0 | 3028.2 | 2861.4 | 2699.5 | 2534.3 | 2521.6 |
| 45°   | 9082.9  | 9222.7  | 6562.9 | 3612.5 | 2972.6 | 2896.4 | 2755.0 | 2588.3 | 2372.4 | 2185.0 | 2167.5 |
| 47.5° | 10882.0 | 10572.4 | 6429.5 | 3121.9 | 2688.4 | 2656.6 | 2526.4 | 2334.2 | 2105.6 | 1954.7 | 1942.0 |
| 50°   | 13335.4 | 12520.8 | 6364.4 | 2731.2 | 2437.5 | 2447.0 | 2340.6 | 2137.3 | 1921.4 | 1810.2 | 1797.5 |
| 52.5° | 16269.9 | 14789.9 | 6489.8 | 2429.5 | 2235.8 | 2269.1 | 2189.7 | 1999.2 | 1818.2 | 1730.8 | 1718.1 |
| 55°   | 19313.9 | 17140.1 | 6624.8 | 2210.4 | 2045.2 | 2110.4 | 2083.4 | 1926.2 | 1762.6 | 1681.6 | 1670.5 |
| 57.5° | 21919.7 | 18894.7 | 6354.9 | 2032.5 | 1875.3 | 1977.0 | 2000.8 | 1880.1 | 1734.0 | 1661.0 | 1648.3 |
| 60°   | 23560.0 | 19601.3 | 5646.7 | 1865.8 | 1740.4 | 1870.6 | 1953.1 | 1867.4 | 1745.1 | 1738.8 | 1729.2 |
| 62.5° | 24338.1 | 19539.4 | 4584.3 | 1734.0 | 1656.2 | 1824.5 | 1988.1 | 1938.9 | 1872.2 | 1929.3 | 1934.1 |
| 65°   | 23988.8 | 18605.7 | 3414.0 | 1646.7 | 1595.9 | 1842.0 | 2092.9 | 2073.8 | 1908.7 | 1965.9 | 1973.8 |
| 67.5° | 21689.5 | 16377.9 | 2528.0 | 1570.5 | 1529.2 | 1891.2 | 2283.4 | 2118.3 | 1837.2 | 1878.5 | 1853.1 |
| 70°   | 17530.7 | 12984.5 | 1950.0 | 1484.7 | 1460.9 | 1884.9 | 2369.2 | 2091.3 | 1759.4 | 1768.9 | 1700.7 |
| 72.5° | 12088.9 | 8854.3  | 1586.3 | 1405.3 | 1362.4 | 1718.1 | 2308.8 | 2024.6 | 1694.3 | 1621.3 | 1530.8 |
| 75°   | 6574.0  | 4752.7  | 1348.1 | 1322.7 | 1189.4 | 1508.5 | 2197.7 | 1977.0 | 1635.6 | 1538.7 | 1487.9 |
| 77.5° | 2586.7  | 1972.2  | 1170.3 | 1210.0 | 1040.1 | 1332.3 | 2073.8 | 1886.5 | 1554.6 | 1427.5 | 1402.1 |
| 80°   | 1056.0  | 1006.7  | 970.2  | 1046.4 | 894.0  | 1165.5 | 1924.6 | 1780.1 | 1457.7 | 1324.3 | 1273.5 |
| 82.5° | 598.6   | 625.6   | 754.3  | 825.7  | 725.7  | 1073.4 | 1853.1 | 1694.3 | 1341.8 | 1186.2 | 1125.8 |
| 85°   | 306.5   | 366.8   | 525.6  | 592.3  | 533.5  | 913.1  | 1707.0 | 1483.1 | 1076.6 | 908.3  | 913.1  |
| 87.5° | 147.7   | 204.8   | 331.9  | 371.6  | 346.2  | 660.6  | 1275.1 | 1075.0 | 838.4  | 663.8  | 643.1  |
| 90°   | 0.0     | 0.0     | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |



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

Report Prepared for

Cooper Lighting Solutions

MCGRAW, INVUE, LUMARK AND STREETWORKS

DATA VALID FOR LUMINAIRES UTILIZING SA LIGHT ENGINES

Report Number: SP1-2101-121-2

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

Test Date: 03/05/2021

**Test Information**

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

SHIELD, DRIVER PROGRAMMED @ 615mA.

**Spectral Parameters**

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



**Test Conditions**

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

REPORT NUMBER: SP1-2101-121-2

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

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CIE 1931 Chromaticity Diagram



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



Point lies inside the ANSI 4000K 4-step quadrangle

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**Photopic Flux vs. Wavelength**



#####

| λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) |
|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|
| 360    | 2304          | 0.0           | 490    | 19043         | 2.7           | 620    | 97577         | 25.4          | 750    | 4830          | 0.0           | 880    | 3505          | 0.0           |
| 365    | 2150          | 0.0           | 495    | 26606         | 4.8           | 625    | 90158         | 19.9          | 755    | 4664          | 0.0           | 885    | 2991          | 0.0           |
| 370    | 2146          | 0.0           | 500    | 36376         | 8.0           | 630    | 82240         | 14.9          | 760    | 4006          | 0.0           | 890    | 2327          | 0.0           |
| 375    | 2332          | 0.0           | 505    | 47714         | 13.3          | 635    | 74361         | 11.2          | 765    | 3715          | 0.0           | 895    | 2775          | 0.0           |
| 380    | 2527          | 0.0           | 510    | 58741         | 20.2          | 640    | 66994         | 8.0           | 770    | 3696          | 0.0           | 900    | 2141          | 0.0           |
| 385    | 2304          | 0.0           | 515    | 68716         | 28.5          | 645    | 60405         | 5.8           | 775    | 3117          | 0.0           | 905    | 2421          | 0.0           |
| 390    | 2064          | 0.0           | 520    | 77136         | 37.4          | 650    | 53806         | 3.9           | 780    | 3062          | 0.0           | 910    | 2200          | 0.0           |
| 395    | 1856          | 0.0           | 525    | 83567         | 44.9          | 655    | 47610         | 2.7           | 785    | 2907          | 0.0           | 915    | 2716          | 0.0           |
| 400    | 1856          | 0.0           | 530    | 89283         | 52.6          | 660    | 42018         | 1.8           | 790    | 2655          | 0.0           | 920    | 2656          | 0.0           |
| 405    | 2374          | 0.0           | 535    | 94097         | 58.4          | 665    | 36742         | 1.2           | 795    | 2467          | 0.0           | 925    | 2671          | 0.0           |
| 410    | 4084          | 0.0           | 540    | 96845         | 63.1          | 670    | 32105         | 0.7           | 800    | 2609          | 0.0           | 930    | 3292          | 0.0           |
| 415    | 8543          | 0.0           | 545    | 100829        | 67.1          | 675    | 27946         | 0.5           | 805    | 2293          | 0.0           | 935    | 3188          | 0.0           |
| 420    | 18394         | 0.1           | 550    | 105648        | 71.8          | 680    | 24146         | 0.3           | 810    | 2188          | 0.0           | 940    | 1997          | 0.0           |
| 425    | 37987         | 0.2           | 555    | 110017        | 75.1          | 685    | 21191         | 0.2           | 815    | 2386          | 0.0           | 945    | 2623          | 0.0           |
| 430    | 67605         | 0.5           | 560    | 114586        | 77.9          | 690    | 18544         | 0.1           | 820    | 2712          | 0.0           | 950    | 2969          | 0.0           |
| 435    | 102160        | 1.2           | 565    | 118987        | 79.1          | 695    | 16058         | 0.1           | 825    | 2473          | 0.0           | 955    | 2277          | 0.0           |
| 440    | 135103        | 2.1           | 570    | 122326        | 79.5          | 700    | 14133         | 0.0           | 830    | 1969          | 0.0           | 960    | 4267          | 0.0           |
| 445    | 140126        | 2.9           | 575    | 125968        | 78.4          | 705    | 12309         | 0.0           | 835    | 1917          | 0.0           | 965    | 2034          | 0.0           |
| 450    | 102339        | 2.7           | 580    | 127613        | 75.8          | 710    | 11142         | 0.0           | 840    | 2248          | 0.0           | 970    | 3586          | 0.0           |
| 455    | 58751         | 2.0           | 585    | 129466        | 71.9          | 715    | 10143         | 0.0           | 845    | 2266          | 0.0           | 975    | 2505          | 0.0           |
| 460    | 36892         | 1.5           | 590    | 128813        | 66.6          | 720    | 9072          | 0.0           | 850    | 2558          | 0.0           | 980    | 2666          | 0.0           |
| 465    | 24637         | 1.3           | 595    | 126387        | 59.9          | 725    | 8130          | 0.0           | 855    | 2767          | 0.0           | 985    | 2934          | 0.0           |
| 470    | 16738         | 1.0           | 600    | 123477        | 53.2          | 730    | 7149          | 0.0           | 860    | 2826          | 0.0           | 990    | 4120          | 0.0           |
| 475    | 13456         | 1.1           | 605    | 118718        | 46.0          | 735    | 6311          | 0.0           | 865    | 2385          | 0.0           | 995    | 3858          | 0.0           |
| 480    | 13081         | 1.2           | 610    | 112091        | 38.5          | 740    | 5711          | 0.0           | 870    | 3194          | 0.0           | 1000   | 3405          | 0.0           |
| 485    | 14734         | 1.7           | 615    | 105039        | 31.7          | 745    | 5111          | 0.0           | 875    | 3189          | 0.0           |        |               |               |

REPORT NUMBER: SP1-2101-121-2

Scotopic Flux vs. Wavelength



Scotopic Lumens: 10425.8 S/P: 1.47

| λ (nm) | Power (µW/nm) | Lumens (Φ/nm) | λ (nm) | Power (µW/nm) | Lumens (Φ/nm) | λ (nm) | Power (µW/nm) | Lumens (Φ/nm) | λ (nm) | Power (µW/nm) | Lumens (Φ/nm) | λ (nm) | Power (µW/nm) | Lumens (Φ/nm) |
|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|
| 360    | 2304          | 0.0           | 490    | 19043         | 29.3          | 620    | 97577         | 1.2           | 750    | 4830          | 0.0           | 880    | 3505          | 0.0           |
| 365    | 2150          | 0.0           | 495    | 26606         | 43.0          | 625    | 90158         | 0.8           | 755    | 4664          | 0.0           | 885    | 2991          | 0.0           |
| 370    | 2146          | 0.0           | 500    | 36376         | 60.8          | 630    | 82240         | 0.5           | 760    | 4006          | 0.0           | 890    | 2327          | 0.0           |
| 375    | 2332          | 0.0           | 505    | 47714         | 81.1          | 635    | 74361         | 0.3           | 765    | 3715          | 0.0           | 895    | 2775          | 0.0           |
| 380    | 2527          | 0.0           | 510    | 58741         | 99.6          | 640    | 66994         | 0.2           | 770    | 3696          | 0.0           | 900    | 2141          | 0.0           |
| 385    | 2304          | 0.0           | 515    | 68716         | 113.9         | 645    | 60405         | 0.1           | 775    | 3117          | 0.0           | 905    | 2421          | 0.0           |
| 390    | 2064          | 0.0           | 520    | 77136         | 122.6         | 650    | 53806         | 0.1           | 780    | 3062          | 0.0           | 910    | 2200          | 0.0           |
| 395    | 1856          | 0.0           | 525    | 83567         | 125.0         | 655    | 47610         | 0.0           | 785    | 2907          | 0.0           | 915    | 2716          | 0.0           |
| 400    | 1856          | 0.0           | 530    | 89283         | 123.1         | 660    | 42018         | 0.0           | 790    | 2655          | 0.0           | 920    | 2656          | 0.0           |
| 405    | 2374          | 0.1           | 535    | 94097         | 117.3         | 665    | 36742         | 0.0           | 795    | 2467          | 0.0           | 925    | 2671          | 0.0           |
| 410    | 4084          | 0.2           | 540    | 96845         | 107.0         | 670    | 32105         | 0.0           | 800    | 2609          | 0.0           | 930    | 3292          | 0.0           |
| 415    | 8543          | 0.9           | 545    | 100829        | 96.7          | 675    | 27946         | 0.0           | 805    | 2293          | 0.0           | 935    | 3188          | 0.0           |
| 420    | 18394         | 3.0           | 550    | 105648        | 86.4          | 680    | 24146         | 0.0           | 810    | 2188          | 0.0           | 940    | 1997          | 0.0           |
| 425    | 37987         | 9.3           | 555    | 110017        | 75.2          | 685    | 21191         | 0.0           | 815    | 2386          | 0.0           | 945    | 2623          | 0.0           |
| 430    | 67605         | 23.0          | 560    | 114586        | 64.0          | 690    | 18544         | 0.0           | 820    | 2712          | 0.0           | 950    | 2969          | 0.0           |
| 435    | 102160        | 45.7          | 565    | 118987        | 53.4          | 695    | 16058         | 0.0           | 825    | 2473          | 0.0           | 955    | 2277          | 0.0           |
| 440    | 135103        | 75.5          | 570    | 122326        | 43.2          | 700    | 14133         | 0.0           | 830    | 1969          | 0.0           | 960    | 4267          | 0.0           |
| 445    | 140126        | 93.8          | 575    | 125968        | 34.3          | 705    | 12309         | 0.0           | 835    | 1917          | 0.0           | 965    | 2034          | 0.0           |
| 450    | 102339        | 79.3          | 580    | 127613        | 26.3          | 710    | 11142         | 0.0           | 840    | 2248          | 0.0           | 970    | 3586          | 0.0           |
| 455    | 58751         | 51.3          | 585    | 129466        | 19.8          | 715    | 10143         | 0.0           | 845    | 2266          | 0.0           | 975    | 2505          | 0.0           |
| 460    | 36892         | 35.6          | 590    | 128813        | 14.3          | 720    | 9072          | 0.0           | 850    | 2558          | 0.0           | 980    | 2666          | 0.0           |
| 465    | 24637         | 26.0          | 595    | 126387        | 10.1          | 725    | 8130          | 0.0           | 855    | 2767          | 0.0           | 985    | 2934          | 0.0           |
| 470    | 16738         | 19.3          | 600    | 123477        | 7.0           | 730    | 7149          | 0.0           | 860    | 2826          | 0.0           | 990    | 4120          | 0.0           |
| 475    | 13456         | 16.8          | 605    | 118718        | 4.7           | 735    | 6311          | 0.0           | 865    | 2385          | 0.0           | 995    | 3858          | 0.0           |
| 480    | 13081         | 17.7          | 610    | 112091        | 3.0           | 740    | 5711          | 0.0           | 870    | 3194          | 0.0           | 1000   | 3405          | 0.0           |
| 485    | 14734         | 21.4          | 615    | 105039        | 1.9           | 745    | 5111          | 0.0           | 875    | 3189          | 0.0           |        |               |               |

REPORT NUMBER: SP1-2101-121-2

**Melanopic Flux vs. Wavelength**



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

| λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) |
|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|
| 360    | 2304          | 0.0           | 490    | 19043         | 15.8          | 620    | 97577         | 0.1           | 750    | 4830          | 0.0           | 880    | 3505          | 0.0           |
| 365    | 2150          | 0.0           | 495    | 26606         | 22.0          | 625    | 90158         | 0.0           | 755    | 4664          | 0.0           | 885    | 2991          | 0.0           |
| 370    | 2146          | 0.0           | 500    | 36376         | 29.2          | 630    | 82240         | 0.0           | 760    | 4006          | 0.0           | 890    | 2327          | 0.0           |
| 375    | 2332          | 0.0           | 505    | 47714         | 36.6          | 635    | 74361         | 0.0           | 765    | 3715          | 0.0           | 895    | 2775          | 0.0           |
| 380    | 2527          | 0.0           | 510    | 58741         | 42.2          | 640    | 66994         | 0.0           | 770    | 3696          | 0.0           | 900    | 2141          | 0.0           |
| 385    | 2304          | 0.0           | 515    | 68716         | 44.9          | 645    | 60405         | 0.0           | 775    | 3117          | 0.0           | 905    | 2421          | 0.0           |
| 390    | 2064          | 0.0           | 520    | 77136         | 44.9          | 650    | 53806         | 0.0           | 780    | 3062          | 0.0           | 910    | 2200          | 0.0           |
| 395    | 1856          | 0.0           | 525    | 83567         | 42.4          | 655    | 47610         | 0.0           | 785    | 2907          | 0.0           | 915    | 2716          | 0.0           |
| 400    | 1856          | 0.0           | 530    | 89283         | 38.6          | 660    | 42018         | 0.0           | 790    | 2655          | 0.0           | 920    | 2656          | 0.0           |
| 405    | 2374          | 0.0           | 535    | 94097         | 33.9          | 665    | 36742         | 0.0           | 795    | 2467          | 0.0           | 925    | 2671          | 0.0           |
| 410    | 4084          | 0.2           | 540    | 96845         | 28.3          | 670    | 32105         | 0.0           | 800    | 2609          | 0.0           | 930    | 3292          | 0.0           |
| 415    | 8543          | 0.6           | 545    | 100829        | 23.4          | 675    | 27946         | 0.0           | 805    | 2293          | 0.0           | 935    | 3188          | 0.0           |
| 420    | 18394         | 2.1           | 550    | 105648        | 19.0          | 680    | 24146         | 0.0           | 810    | 2188          | 0.0           | 940    | 1997          | 0.0           |
| 425    | 37987         | 5.9           | 555    | 110017        | 14.8          | 685    | 21191         | 0.0           | 815    | 2386          | 0.0           | 945    | 2623          | 0.0           |
| 430    | 67605         | 14.3          | 560    | 114586        | 11.3          | 690    | 18544         | 0.0           | 820    | 2712          | 0.0           | 950    | 2969          | 0.0           |
| 435    | 102160        | 27.3          | 565    | 118987        | 8.4           | 695    | 16058         | 0.0           | 825    | 2473          | 0.0           | 955    | 2277          | 0.0           |
| 440    | 135103        | 45.1          | 570    | 122326        | 6.0           | 700    | 14133         | 0.0           | 830    | 1969          | 0.0           | 960    | 4267          | 0.0           |
| 445    | 140126        | 55.3          | 575    | 125968        | 4.2           | 705    | 12309         | 0.0           | 835    | 1917          | 0.0           | 965    | 2034          | 0.0           |
| 450    | 102339        | 47.2          | 580    | 127613        | 2.9           | 710    | 11142         | 0.0           | 840    | 2248          | 0.0           | 970    | 3586          | 0.0           |
| 455    | 58751         | 30.8          | 585    | 129466        | 1.9           | 715    | 10143         | 0.0           | 845    | 2266          | 0.0           | 975    | 2505          | 0.0           |
| 460    | 36892         | 21.7          | 590    | 128813        | 1.3           | 720    | 9072          | 0.0           | 850    | 2558          | 0.0           | 980    | 2666          | 0.0           |
| 465    | 24637         | 16.1          | 595    | 126387        | 0.8           | 725    | 8130          | 0.0           | 855    | 2767          | 0.0           | 985    | 2934          | 0.0           |
| 470    | 16738         | 12.0          | 600    | 123477        | 0.5           | 730    | 7149          | 0.0           | 860    | 2826          | 0.0           | 990    | 4120          | 0.0           |
| 475    | 13456         | 10.3          | 605    | 118718        | 0.3           | 735    | 6311          | 0.0           | 865    | 2385          | 0.0           | 995    | 3858          | 0.0           |
| 480    | 13081         | 10.5          | 610    | 112091        | 0.2           | 740    | 5711          | 0.0           | 870    | 3194          | 0.0           | 1000   | 3405          | 0.0           |
| 485    | 14734         | 12.1          | 615    | 105039        | 0.1           | 745    | 5111          | 0.0           | 875    | 3189          | 0.0           |        |               |               |

**Summary**

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



**Color Vector Graphics**





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

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



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)