

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: P359476

Luminaire Tested: NVN-SA6D-730-U-SL3

Issue Date: 3/3/2020

### Test Information

Test Method: LM-79-2019  
Report Number: P359476  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-22)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: STREETWORKS  
Catalog Number: NVN-SA6D-730-U-SL3  
Description: NAVION ROADWAY AND AREA LUMINAIRE  
(6) 70 CRI, 3000K, 1200mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE III  
SPILL LIGHT ELIMINATOR OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

### Summary

Lumens per Lamp: N/A  
Luminaire Lumens: 42707 lumens  
Efficiency: N/A  
Efficacy: 111.8 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 1.5' x H: 0')  
IES Classification: Type III - Medium  
BUG Rating: B3 - U0 - G5

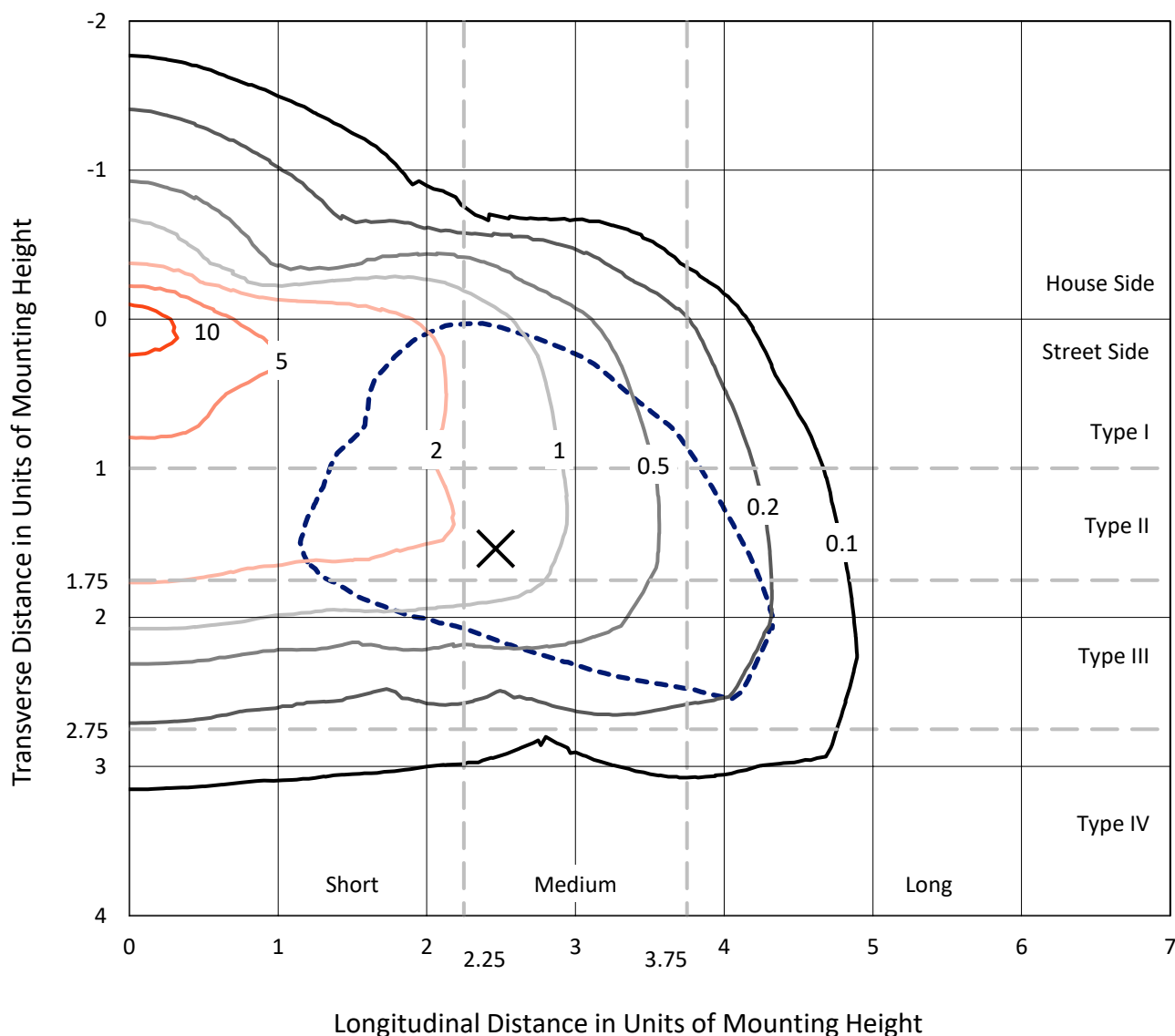
Input Watts (W): 382  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT



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## Iso-Footcandle Lines of Horizontal Illumination

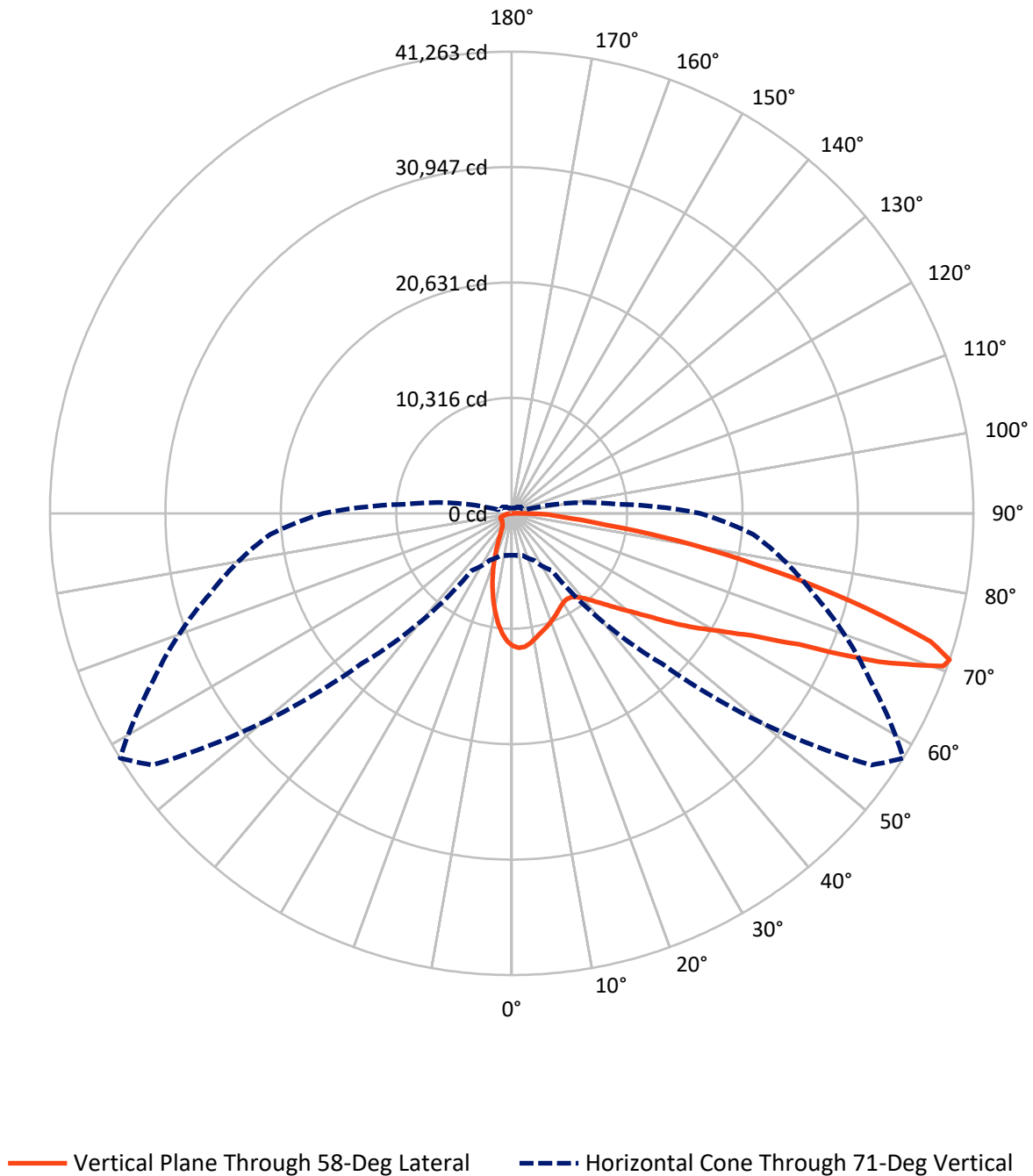
✕ Max cd  
 - - - 1/2 Max cd



Based on 30 foot mounting height. Maximum calculated value = 13.1 fc  
 Type III - Medium - N/A

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## Luminous Intensity Polar Plot



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**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 6385.0   | 0.0    | 6385.0  |
|                    | % Fixture | 15.0     | 0.0    | 15.0    |
| <b>Street Side</b> | Lumens    | 36322.0  | 0.0    | 36322.0 |
|                    | % Fixture | 85.0     | 0.0    | 85.0    |
| <b>Total</b>       | Lumens    | 42707.0  | 0.0    | 42707.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 1020.8  | 2.4       |
| 10°-20°   | 2269.9  | 5.3       |
| 20°-30°   | 2884.8  | 6.8       |
| 30°-40°   | 3674.6  | 8.6       |
| 40°-50°   | 5210.8  | 12.2      |
| 50°-60°   | 8063.9  | 18.9      |
| 60°-70°   | 10978.1 | 25.7      |
| 70°-80°   | 7323.6  | 17.1      |
| 80°-90°   | 1280.4  | 3.0       |
| 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°    | 42707.0 | 100.0     |
| 0°-180°   | 42707.0 | 100.0     |

**Coefficient of Utilization**



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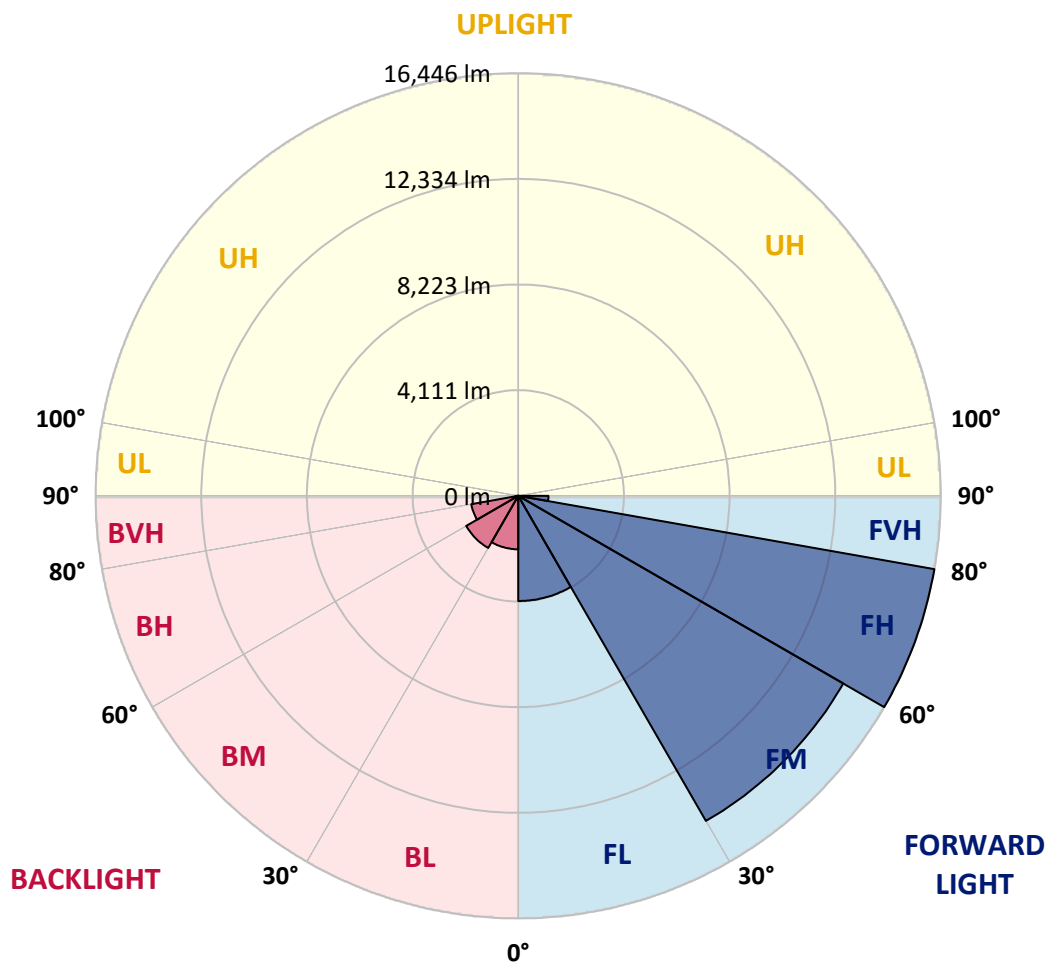
CATALOG NUMBER: NVN-SA6D-730-U-SL3

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|---------|-----------|-------------------------|------|---------|
|      |             |         |           | B                       | U    | G       |
| FL   | (0°-30°)    | 4094.2  | 9.6       |                         |      |         |
| FM   | (30°-60°)   | 14607.9 | 34.2      |                         |      |         |
| FH   | (60°-80°)   | 16445.9 | 38.5      |                         |      | G5      |
| FVH  | (80°-90°)   | 1174.0  | 2.7       |                         |      | G5      |
| BL   | (0°-30°)    | 2081.3  | 4.9       | B3/2500                 |      |         |
| BM   | (30°-60°)   | 2341.6  | 5.5       | B2/2500                 |      |         |
| BH   | (60°-80°)   | 1855.7  | 4.3       | B3/2500                 |      | G3/2500 |
| BVH  | (80°-90°)   | 106.4   | 0.2       |                         |      | G2/225  |
| UL   | (90°-100°)  | 0.0     | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0     | 0.0       |                         | U0/0 |         |

**BUG Rating: B3-U0-G5**

Type III Medium





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 55°     | 58°     | 65°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 11832.7 | 11832.7 | 11832.7 | 11832.7 | 11832.7 | 11832.7 | 11832.7 | 11832.7 | 11832.7 | 11832.7 | 11832.7 |
| 2.5°  | 12146.6 | 12130.2 | 12136.2 | 12124.3 | 12096.0 | 12067.7 | 12026.1 | 12033.5 | 11975.5 | 11889.2 | 11782.1 |
| 5°    | 11917.5 | 11911.5 | 11956.2 | 11981.5 | 12002.3 | 11985.9 | 11974.0 | 11988.9 | 11904.1 | 11785.1 | 11599.1 |
| 7.5°  | 11437.0 | 11371.5 | 11428.1 | 11512.9 | 11593.2 | 11654.2 | 11734.5 | 11744.9 | 11691.4 | 11566.4 | 11322.4 |
| 10°   | 10754.2 | 10691.7 | 10775.0 | 10907.4 | 11068.0 | 11213.8 | 11376.0 | 11405.7 | 11416.2 | 11303.1 | 11007.1 |
| 12.5° | 10046.0 | 9998.4  | 10081.7 | 10267.7 | 10534.0 | 10758.6 | 11017.5 | 11062.1 | 11154.3 | 11078.5 | 10715.5 |
| 15°   | 9412.3  | 9394.5  | 9495.6  | 9678.6  | 9985.0  | 10328.7 | 10702.1 | 10783.9 | 10940.1 | 10914.8 | 10487.9 |
| 17.5° | 8864.9  | 8860.4  | 8937.7  | 9129.7  | 9468.8  | 9903.2  | 10388.2 | 10526.5 | 10758.6 | 10788.4 | 10300.4 |
| 20°   | 8457.2  | 8448.3  | 8501.9  | 8643.2  | 8992.8  | 9485.2  | 10049.0 | 10239.4 | 10574.1 | 10678.3 | 10107.0 |
| 22.5° | 8238.6  | 8237.1  | 8238.6  | 8305.5  | 8591.1  | 9049.3  | 9718.8  | 9950.8  | 10394.1 | 10590.5 | 9892.8  |
| 25°   | 8201.4  | 8196.9  | 8164.2  | 8156.7  | 8318.9  | 8684.8  | 9391.5  | 9647.3  | 10223.1 | 10529.5 | 9689.0  |
| 27.5° | 8298.1  | 8304.0  | 8260.9  | 8190.9  | 8223.7  | 8445.3  | 9107.3  | 9381.1  | 10086.2 | 10517.6 | 9547.7  |
| 30°   | 8498.9  | 8495.9  | 8458.7  | 8385.8  | 8321.9  | 8356.1  | 8905.0  | 9178.7  | 9994.0  | 10569.7 | 9451.0  |
| 32.5° | 8720.5  | 8736.9  | 8729.5  | 8689.3  | 8594.1  | 8457.2  | 8844.0  | 9111.8  | 9967.2  | 10694.6 | 9409.3  |
| 35°   | 8986.8  | 9004.7  | 9058.2  | 9089.5  | 8977.9  | 8757.7  | 8974.9  | 9207.0  | 10044.5 | 10929.7 | 9476.3  |
| 37.5° | 9239.7  | 9285.9  | 9436.1  | 9568.5  | 9473.3  | 9227.8  | 9323.0  | 9488.2  | 10284.1 | 11300.1 | 9656.3  |
| 40°   | 9531.3  | 9571.5  | 9816.9  | 10098.1 | 10083.2 | 9828.8  | 9883.9  | 9994.0  | 10706.5 | 11831.2 | 9982.1  |
| 42.5° | 9818.4  | 9898.8  | 10254.3 | 10653.0 | 10767.5 | 10542.9 | 10630.7 | 10688.7 | 11301.6 | 12534.9 | 10550.3 |
| 45°   | 10200.8 | 10287.0 | 10780.9 | 11261.4 | 11529.2 | 11402.8 | 11542.6 | 11564.9 | 12049.9 | 13492.9 | 11376.0 |
| 47.5° | 10779.4 | 10877.6 | 11453.3 | 11957.7 | 12366.8 | 12380.1 | 12610.7 | 12601.8 | 12984.1 | 14589.3 | 12415.8 |
| 50°   | 11681.0 | 11822.3 | 12293.9 | 12765.4 | 13262.3 | 13539.0 | 13847.0 | 13803.8 | 14104.3 | 15757.1 | 13613.4 |
| 52.5° | 12862.1 | 12927.6 | 13277.2 | 13625.3 | 14242.7 | 14863.0 | 15304.8 | 15266.2 | 15374.8 | 16957.6 | 14973.1 |
| 55°   | 14086.5 | 14135.6 | 14279.9 | 14470.3 | 15300.4 | 16312.0 | 17246.2 | 17185.2 | 16910.0 | 18204.3 | 16316.4 |
| 57.5° | 15187.3 | 15287.0 | 15386.7 | 15465.5 | 16365.5 | 17826.4 | 19232.2 | 19236.7 | 18576.2 | 19549.1 | 17704.4 |
| 60°   | 15358.4 | 15446.2 | 16105.2 | 16727.0 | 18187.9 | 19846.6 | 21358.1 | 21313.4 | 20300.3 | 21008.5 | 19251.6 |
| 62.5° | 13576.2 | 13774.1 | 14874.9 | 16529.2 | 19943.3 | 23541.9 | 24070.0 | 24015.0 | 22362.2 | 22807.0 | 21053.1 |
| 65°   | 9729.2  | 9953.8  | 11282.3 | 13768.1 | 19092.4 | 27613.6 | 28964.4 | 28223.5 | 25173.9 | 25019.1 | 23162.6 |
| 67.5° | 5612.9  | 5666.4  | 6242.1  | 8238.6  | 14537.2 | 27826.3 | 36430.8 | 35393.9 | 29540.1 | 27528.8 | 24195.0 |
| 70°   | 4150.5  | 4149.0  | 4285.9  | 5069.9  | 7866.6  | 22710.3 | 39981.8 | 40911.6 | 34136.9 | 28354.4 | 22735.6 |
| 71°   | 3753.3  | 3757.8  | 3911.0  | 4614.7  | 6230.2  | 19009.1 | 39227.6 | 41262.7 | 35347.8 | 27946.8 | 21679.4 |
| 72.5° | 3210.3  | 3225.2  | 3437.9  | 4138.6  | 5241.0  | 13109.1 | 35978.6 | 39156.2 | 35922.1 | 26941.2 | 20026.6 |
| 75°   | 2435.3  | 2469.5  | 2764.0  | 3488.5  | 4790.2  | 6648.3  | 26405.6 | 31267.2 | 31911.4 | 23772.5 | 14880.9 |
| 77.5° | 1737.6  | 1776.2  | 2109.5  | 2933.6  | 4553.7  | 5010.4  | 17683.6 | 22807.0 | 23483.9 | 15234.9 | 6712.2  |
| 80°   | 1097.9  | 1144.0  | 1395.4  | 2334.1  | 4278.5  | 4757.5  | 11112.7 | 15330.1 | 12805.6 | 4875.0  | 1707.8  |
| 82.5° | 644.1   | 679.9   | 865.8   | 1524.8  | 3494.5  | 4581.9  | 6538.2  | 8497.4  | 4983.6  | 1472.8  | 776.5   |
| 85°   | 373.4   | 389.8   | 540.0   | 971.4   | 2537.9  | 4324.6  | 4803.6  | 4750.0  | 2163.0  | 720.0   | 367.4   |
| 87.5° | 174.1   | 193.4   | 319.8   | 507.3   | 1408.8  | 3134.5  | 3796.5  | 3280.2  | 1344.8  | 337.7   | 172.6   |
| 90°   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |

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CATALOG NUMBER: NVN-SA6D-730-U-SL3

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°     | 105°    | 115°    | 125°    | 135°    | 145°    | 155°    | 165°    | 175°    | 180°    |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 11832.7 | 11832.7 | 11832.7 | 11832.7 | 11832.7 | 11832.7 | 11832.7 | 11832.7 | 11832.7 | 11832.7 | 11832.7 |
| 2.5°  | 11730.0 | 11704.8 | 11599.1 | 11505.4 | 11407.2 | 11279.3 | 11138.0 | 11120.1 | 11033.8 | 11050.2 | 11020.4 |
| 5°    | 11498.0 | 11434.0 | 11179.6 | 10949.0 | 10676.8 | 10432.8 | 10168.0 | 10046.0 | 9870.5  | 9858.6  | 9814.0  |
| 7.5°  | 11166.2 | 11047.2 | 10653.0 | 10215.6 | 9778.3  | 9361.7  | 8949.6  | 8678.9  | 8402.2  | 8284.7  | 8274.3  |
| 10°   | 10792.8 | 10590.5 | 10010.3 | 9363.2  | 8732.5  | 8124.0  | 7534.9  | 7099.0  | 6706.3  | 6520.3  | 6512.9  |
| 12.5° | 10438.8 | 10139.8 | 9343.9  | 8463.2  | 7600.4  | 6811.9  | 6004.1  | 5431.4  | 4939.0  | 4773.8  | 4703.9  |
| 15°   | 10138.3 | 9717.3  | 8695.3  | 7569.1  | 6521.8  | 5426.9  | 4507.6  | 3905.1  | 3449.8  | 3292.1  | 3262.4  |
| 17.5° | 9846.7  | 9305.2  | 8030.3  | 6666.1  | 5400.1  | 4196.6  | 3275.8  | 2828.0  | 2585.5  | 2521.6  | 2520.1  |
| 20°   | 9556.6  | 8881.2  | 7335.6  | 5742.3  | 4315.6  | 3138.9  | 2518.6  | 2317.7  | 2235.9  | 2228.5  | 2216.6  |
| 22.5° | 9227.8  | 8431.9  | 6605.1  | 4815.5  | 3368.0  | 2468.0  | 2140.7  | 2060.4  | 2050.0  | 2076.7  | 2076.7  |
| 25°   | 8919.9  | 7985.7  | 5864.3  | 3908.0  | 2619.7  | 2058.9  | 1911.6  | 1895.3  | 1923.5  | 1971.1  | 1975.6  |
| 27.5° | 8632.8  | 7555.7  | 5141.3  | 3101.7  | 2099.1  | 1813.4  | 1752.4  | 1771.8  | 1822.4  | 1877.4  | 1878.9  |
| 30°   | 8396.2  | 7149.6  | 4439.1  | 2444.2  | 1773.3  | 1630.5  | 1620.0  | 1658.7  | 1713.8  | 1756.9  | 1767.3  |
| 32.5° | 8213.3  | 6803.0  | 3760.8  | 1965.2  | 1560.5  | 1493.6  | 1502.5  | 1535.2  | 1569.5  | 1593.3  | 1609.6  |
| 35°   | 8128.5  | 6505.5  | 3134.5  | 1657.2  | 1425.2  | 1388.0  | 1399.9  | 1417.7  | 1432.6  | 1450.4  | 1463.8  |
| 37.5° | 8143.3  | 6274.9  | 2575.1  | 1465.3  | 1334.4  | 1315.1  | 1315.1  | 1315.1  | 1315.1  | 1324.0  | 1325.5  |
| 40°   | 8281.7  | 6142.5  | 2119.9  | 1343.3  | 1273.4  | 1252.6  | 1236.2  | 1221.4  | 1209.5  | 1215.4  | 1212.4  |
| 42.5° | 8635.8  | 6130.6  | 1786.7  | 1266.0  | 1224.3  | 1190.1  | 1157.4  | 1136.6  | 1121.7  | 1127.6  | 1130.6  |
| 45°   | 9236.8  | 6279.3  | 1562.0  | 1210.9  | 1178.2  | 1126.1  | 1084.5  | 1062.2  | 1051.8  | 1071.1  | 1074.1  |
| 47.5° | 10014.8 | 6603.6  | 1425.2  | 1170.8  | 1135.1  | 1066.6  | 1022.0  | 1001.2  | 1004.2  | 1032.4  | 1039.9  |
| 50°   | 11017.5 | 7130.3  | 1359.7  | 1145.5  | 1105.3  | 1016.1  | 969.9   | 952.1   | 961.0   | 1001.2  | 1010.1  |
| 52.5° | 12118.3 | 7889.0  | 1367.1  | 1138.0  | 1086.0  | 978.9   | 929.8   | 908.9   | 923.8   | 961.0   | 968.5   |
| 55°   | 13388.8 | 8800.9  | 1490.6  | 1148.5  | 1057.7  | 955.1   | 897.0   | 861.3   | 873.2   | 907.5   | 913.4   |
| 57.5° | 14800.5 | 9845.2  | 1739.1  | 1145.5  | 1022.0  | 932.8   | 862.8   | 809.3   | 818.2   | 839.0   | 845.0   |
| 60°   | 16270.3 | 11106.7 | 2124.4  | 1154.4  | 1005.6  | 906.0   | 816.7   | 749.8   | 746.8   | 764.6   | 767.6   |
| 62.5° | 18034.7 | 12566.1 | 2564.7  | 1160.4  | 1016.1  | 871.8   | 755.7   | 690.3   | 681.3   | 685.8   | 688.8   |
| 65°   | 19852.6 | 13622.3 | 2399.6  | 1136.6  | 1048.8  | 843.5   | 702.2   | 632.2   | 615.9   | 612.9   | 614.4   |
| 67.5° | 19909.1 | 12490.2 | 1682.5  | 1089.0  | 1062.2  | 828.6   | 662.0   | 583.2   | 556.4   | 546.0   | 544.5   |
| 70°   | 17854.7 | 10147.2 | 1310.6  | 1038.4  | 1008.6  | 804.8   | 624.8   | 543.0   | 502.8   | 486.5   | 485.0   |
| 71°   | 16852.0 | 9340.9  | 1242.2  | 1013.1  | 968.5   | 781.0   | 608.4   | 525.1   | 483.5   | 465.6   | 462.7   |
| 72.5° | 15279.6 | 8373.9  | 1158.9  | 972.9   | 891.1   | 720.0   | 577.2   | 499.8   | 456.7   | 435.9   | 431.4   |
| 75°   | 10965.4 | 5476.0  | 995.2   | 867.3   | 737.9   | 574.2   | 505.8   | 449.3   | 412.1   | 386.8   | 383.8   |
| 77.5° | 4224.9  | 2179.4  | 752.7   | 721.5   | 565.3   | 449.3   | 416.5   | 388.3   | 361.5   | 336.2   | 334.7   |
| 80°   | 1306.1  | 974.4   | 548.9   | 543.0   | 409.1   | 334.7   | 324.3   | 316.9   | 306.5   | 279.7   | 273.7   |
| 82.5° | 697.7   | 559.4   | 377.9   | 351.1   | 267.8   | 223.1   | 235.0   | 238.0   | 239.5   | 211.2   | 208.3   |
| 85°   | 333.2   | 296.0   | 212.7   | 199.3   | 156.2   | 125.0   | 144.3   | 156.2   | 157.7   | 129.4   | 120.5   |
| 87.5° | 159.2   | 154.7   | 99.7    | 75.9    | 58.0    | 41.7    | 50.6    | 62.5    | 68.4    | 49.1    | 43.1    |
| 90°   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |

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

Report Prepared for

Cooper Lighting Solutions

McGRAW-EDISON

Report Number: SP1-1908-441-2-R4

Test Date: 10/03/2019

Luminaire Tested: SA1C-730-U-5WQ

Data in this report applies to families of products SA1C-730-U-5WQ .

### Test Information

Test Method: LM-79-2008  
 Report Number: SP1-1908-441-2-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-730-U-5WQ**  
 Description: MCGRAW EDISON ROADWAY AND AREA LUMINAIRE

\*\*\*THIS IS A REVISION OF SP1-1908-441-2-R3. TO UPDATE THE CATALOG INFORMATION.\*\*\*TESTED IN SITU. (1) 70 CRI, 3000K, 1050MA LIGHTSQUARE WITH 16 LEDS AND TYPE V WIDE OPTICS.

### Spectral Parameters

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 2993   | CRI (Ra): | 71.8 |      |       |
| CIE u':                   | 0.2508 | R1:       | 67.5 | R9:  | -38.3 |
| CIE v':                   | 0.5215 | R2:       | 82.9 | R10: | 62.5  |
| Duv:                      | 0.0000 | R3:       | 94.7 | R11: | 63.7  |
| CIE x:                    | 0.4374 | R4:       | 67.7 | R12: | 57.8  |
| CIE y:                    | 0.4043 | R5:       | 67.9 | R13: | 70.4  |
| CIE z:                    | 0.1583 | R6:       | 77.6 | R14: | 97.3  |
| Peak Wavelength (nm):     | 593    | R7:       | 76.0 |      |       |
| Dominant Wavelength (nm): | 582    | R8:       | 40.5 |      |       |
| Purity:                   | 53     |           |      |      |       |
| Rf:                       | 75.7   |           |      |      |       |
| Rg:                       | 93.9   |           |      |      |       |



### Test Conditions

Stabilization Time: 53M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.0./44%  
 Sphere Temperature (°C): 25.7

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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 3000K 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       | 2397             | NR               | 490       | 24908            | NR               | 620       | 118784           | NR               | 750       | 5037             | NR               | 880       | 2677             | NR               |
| 365       | 2084             | NR               | 495       | 30998            | NR               | 625       | 108951           | NR               | 755       | 4413             | NR               | 885       | 2940             | NR               |
| 370       | 2143             | NR               | 500       | 37103            | NR               | 630       | 99573            | NR               | 760       | 4189             | NR               | 890       | 3116             | NR               |
| 375       | 2413             | NR               | 505       | 42987            | NR               | 635       | 90444            | NR               | 765       | 3677             | NR               | 895       | 3345             | NR               |
| 380       | 2172             | NR               | 510       | 48702            | NR               | 640       | 80749            | NR               | 770       | 3366             | NR               | 900       | 2312             | NR               |
| 385       | 1997             | NR               | 515       | 53741            | NR               | 645       | 71664            | NR               | 775       | 3211             | NR               | 905       | 2829             | NR               |
| 390       | 1830             | NR               | 520       | 57283            | NR               | 650       | 63936            | NR               | 780       | 2682             | NR               | 910       | 2783             | NR               |
| 395       | 1861             | NR               | 525       | 61876            | NR               | 655       | 56611            | NR               | 785       | 2804             | NR               | 915       | 2662             | NR               |
| 400       | 1717             | NR               | 530       | 65398            | NR               | 660       | 49763            | NR               | 790       | 2581             | NR               | 920       | 3047             | NR               |
| 405       | 1761             | NR               | 535       | 69597            | NR               | 665       | 42891            | NR               | 795       | 2711             | NR               | 925       | 2256             | NR               |
| 410       | 2680             | NR               | 540       | 74214            | NR               | 670       | 36939            | NR               | 800       | 2609             | NR               | 930       | 2976             | NR               |
| 415       | 4374             | NR               | 545       | 79911            | NR               | 675       | 31946            | NR               | 805       | 2581             | NR               | 935       | 3503             | NR               |
| 420       | 8071             | NR               | 550       | 86153            | NR               | 680       | 27385            | NR               | 810       | 2404             | NR               | 940       | 4226             | NR               |
| 425       | 15169            | NR               | 555       | 93952            | NR               | 685       | 23504            | NR               | 815       | 2556             | NR               | 945       | 2930             | NR               |
| 430       | 26038            | NR               | 560       | 102904           | NR               | 690       | 20210            | NR               | 820       | 2742             | NR               | 950       | 2115             | NR               |
| 435       | 41316            | NR               | 565       | 112009           | NR               | 695       | 17459            | NR               | 825       | 2014             | NR               | 955       | 2634             | NR               |
| 440       | 59674            | NR               | 570       | 121662           | NR               | 700       | 15207            | NR               | 830       | 2488             | NR               | 960       | 4200             | NR               |
| 445       | 72751            | NR               | 575       | 130476           | NR               | 705       | 13322            | NR               | 835       | 2625             | NR               | 965       | 1982             | NR               |
| 450       | 65091            | NR               | 580       | 137926           | NR               | 710       | 11676            | NR               | 840       | 2754             | NR               | 970       | 3613             | NR               |
| 455       | 44894            | NR               | 585       | 143406           | NR               | 715       | 10626            | NR               | 845       | 2708             | NR               | 975       | 4034             | NR               |
| 460       | 32712            | NR               | 590       | 147039           | NR               | 720       | 9416             | NR               | 850       | 2608             | NR               | 980       | 3922             | NR               |
| 465       | 25296            | NR               | 595       | 147365           | NR               | 725       | 8333             | NR               | 855       | 2605             | NR               | 985       | 1909             | NR               |
| 470       | 19318            | NR               | 600       | 145800           | NR               | 730       | 7134             | NR               | 860       | 1765             | NR               | 990       | 3617             | NR               |
| 475       | 17265            | NR               | 605       | 141363           | NR               | 735       | 6437             | NR               | 865       | 2581             | NR               | 995       | 4767             | NR               |
| 480       | 18260            | NR               | 610       | 134199           | NR               | 740       | 5834             | NR               | 870       | 3016             | NR               | 1000      | 2528             | NR               |
| 485       | 20845            | NR               | 615       | 127683           | NR               | 745       | 5500             | NR               | 875       | 3952             | NR               |           |                  |                  |

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**Scotopic Flux vs. Wavelength**



**Scotopic Lumens: 8494.8**

**S/P: 1.23**

| 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       | 2397             | NR               | 490       | 24908            | NR               | 620       | 118784           | NR               | 750       | 5037             | NR               | 880       | 2677             | NR               |
| 365       | 2084             | NR               | 495       | 30998            | NR               | 625       | 108951           | NR               | 755       | 4413             | NR               | 885       | 2940             | NR               |
| 370       | 2143             | NR               | 500       | 37103            | NR               | 630       | 99573            | NR               | 760       | 4189             | NR               | 890       | 3116             | NR               |
| 375       | 2413             | NR               | 505       | 42987            | NR               | 635       | 90444            | NR               | 765       | 3677             | NR               | 895       | 3345             | NR               |
| 380       | 2172             | NR               | 510       | 48702            | NR               | 640       | 80749            | NR               | 770       | 3366             | NR               | 900       | 2312             | NR               |
| 385       | 1997             | NR               | 515       | 53741            | NR               | 645       | 71664            | NR               | 775       | 3211             | NR               | 905       | 2829             | NR               |
| 390       | 1830             | NR               | 520       | 57283            | NR               | 650       | 63936            | NR               | 780       | 2682             | NR               | 910       | 2783             | NR               |
| 395       | 1861             | NR               | 525       | 61876            | NR               | 655       | 56611            | NR               | 785       | 2804             | NR               | 915       | 2662             | NR               |
| 400       | 1717             | NR               | 530       | 65398            | NR               | 660       | 49763            | NR               | 790       | 2581             | NR               | 920       | 3047             | NR               |
| 405       | 1761             | NR               | 535       | 69597            | NR               | 665       | 42891            | NR               | 795       | 2711             | NR               | 925       | 2256             | NR               |
| 410       | 2680             | NR               | 540       | 74214            | NR               | 670       | 36939            | NR               | 800       | 2609             | NR               | 930       | 2976             | NR               |
| 415       | 4374             | NR               | 545       | 79911            | NR               | 675       | 31946            | NR               | 805       | 2581             | NR               | 935       | 3503             | NR               |
| 420       | 8071             | NR               | 550       | 86153            | NR               | 680       | 27385            | NR               | 810       | 2404             | NR               | 940       | 4226             | NR               |
| 425       | 15169            | NR               | 555       | 93952            | NR               | 685       | 23504            | NR               | 815       | 2556             | NR               | 945       | 2930             | NR               |
| 430       | 26038            | NR               | 560       | 102904           | NR               | 690       | 20210            | NR               | 820       | 2742             | NR               | 950       | 2115             | NR               |
| 435       | 41316            | NR               | 565       | 112009           | NR               | 695       | 17459            | NR               | 825       | 2014             | NR               | 955       | 2634             | NR               |
| 440       | 59674            | NR               | 570       | 121662           | NR               | 700       | 15207            | NR               | 830       | 2488             | NR               | 960       | 4200             | NR               |
| 445       | 72751            | NR               | 575       | 130476           | NR               | 705       | 13322            | NR               | 835       | 2625             | NR               | 965       | 1982             | NR               |
| 450       | 65091            | NR               | 580       | 137926           | NR               | 710       | 11676            | NR               | 840       | 2754             | NR               | 970       | 3613             | NR               |
| 455       | 44894            | NR               | 585       | 143406           | NR               | 715       | 10626            | NR               | 845       | 2708             | NR               | 975       | 4034             | NR               |
| 460       | 32712            | NR               | 590       | 147039           | NR               | 720       | 9416             | NR               | 850       | 2608             | NR               | 980       | 3922             | NR               |
| 465       | 25296            | NR               | 595       | 147365           | NR               | 725       | 8333             | NR               | 855       | 2605             | NR               | 985       | 1909             | NR               |
| 470       | 19318            | NR               | 600       | 145800           | NR               | 730       | 7134             | NR               | 860       | 1765             | NR               | 990       | 3617             | NR               |
| 475       | 17265            | NR               | 605       | 141363           | NR               | 735       | 6437             | NR               | 865       | 2581             | NR               | 995       | 4767             | NR               |
| 480       | 18260            | NR               | 610       | 134199           | NR               | 740       | 5834             | NR               | 870       | 3016             | NR               | 1000      | 2528             | NR               |
| 485       | 20845            | NR               | 615       | 127683           | NR               | 745       | 5500             | NR               | 875       | 3952             | NR               |           |                  |                  |

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**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 3101.5 M/P: 0.45**

| 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       | 2397             | NR               | 490       | 24908            | NR               | 620       | 118784           | NR               | 750       | 5037             | NR               | 880       | 2677             | NR               |
| 365       | 2084             | NR               | 495       | 30998            | NR               | 625       | 108951           | NR               | 755       | 4413             | NR               | 885       | 2940             | NR               |
| 370       | 2143             | NR               | 500       | 37103            | NR               | 630       | 99573            | NR               | 760       | 4189             | NR               | 890       | 3116             | NR               |
| 375       | 2413             | NR               | 505       | 42987            | NR               | 635       | 90444            | NR               | 765       | 3677             | NR               | 895       | 3345             | NR               |
| 380       | 2172             | NR               | 510       | 48702            | NR               | 640       | 80749            | NR               | 770       | 3366             | NR               | 900       | 2312             | NR               |
| 385       | 1997             | NR               | 515       | 53741            | NR               | 645       | 71664            | NR               | 775       | 3211             | NR               | 905       | 2829             | NR               |
| 390       | 1830             | NR               | 520       | 57283            | NR               | 650       | 63936            | NR               | 780       | 2682             | NR               | 910       | 2783             | NR               |
| 395       | 1861             | NR               | 525       | 61876            | NR               | 655       | 56611            | NR               | 785       | 2804             | NR               | 915       | 2662             | NR               |
| 400       | 1717             | NR               | 530       | 65398            | NR               | 660       | 49763            | NR               | 790       | 2581             | NR               | 920       | 3047             | NR               |
| 405       | 1761             | NR               | 535       | 69597            | NR               | 665       | 42891            | NR               | 795       | 2711             | NR               | 925       | 2256             | NR               |
| 410       | 2680             | NR               | 540       | 74214            | NR               | 670       | 36939            | NR               | 800       | 2609             | NR               | 930       | 2976             | NR               |
| 415       | 4374             | NR               | 545       | 79911            | NR               | 675       | 31946            | NR               | 805       | 2581             | NR               | 935       | 3503             | NR               |
| 420       | 8071             | NR               | 550       | 86153            | NR               | 680       | 27385            | NR               | 810       | 2404             | NR               | 940       | 4226             | NR               |
| 425       | 15169            | NR               | 555       | 93952            | NR               | 685       | 23504            | NR               | 815       | 2556             | NR               | 945       | 2930             | NR               |
| 430       | 26038            | NR               | 560       | 102904           | NR               | 690       | 20210            | NR               | 820       | 2742             | NR               | 950       | 2115             | NR               |
| 435       | 41316            | NR               | 565       | 112009           | NR               | 695       | 17459            | NR               | 825       | 2014             | NR               | 955       | 2634             | NR               |
| 440       | 59674            | NR               | 570       | 121662           | NR               | 700       | 15207            | NR               | 830       | 2488             | NR               | 960       | 4200             | NR               |
| 445       | 72751            | NR               | 575       | 130476           | NR               | 705       | 13322            | NR               | 835       | 2625             | NR               | 965       | 1982             | NR               |
| 450       | 65091            | NR               | 580       | 137926           | NR               | 710       | 11676            | NR               | 840       | 2754             | NR               | 970       | 3613             | NR               |
| 455       | 44894            | NR               | 585       | 143406           | NR               | 715       | 10626            | NR               | 845       | 2708             | NR               | 975       | 4034             | NR               |
| 460       | 32712            | NR               | 590       | 147039           | NR               | 720       | 9416             | NR               | 850       | 2608             | NR               | 980       | 3922             | NR               |
| 465       | 25296            | NR               | 595       | 147365           | NR               | 725       | 8333             | NR               | 855       | 2605             | NR               | 985       | 1909             | NR               |
| 470       | 19318            | NR               | 600       | 145800           | NR               | 730       | 7134             | NR               | 860       | 1765             | NR               | 990       | 3617             | NR               |
| 475       | 17265            | NR               | 605       | 141363           | NR               | 735       | 6437             | NR               | 865       | 2581             | NR               | 995       | 4767             | NR               |
| 480       | 18260            | NR               | 610       | 134199           | NR               | 740       | 5834             | NR               | 870       | 3016             | NR               | 1000      | 2528             | NR               |
| 485       | 20845            | NR               | 615       | 127683           | NR               | 745       | 5500             | NR               | 875       | 3952             | NR               |           |                  |                  |

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**Summary**

$R_f = 75.7$   
 $R_g = 93.9$   
 CIE  $R_a = 71.8$   
 $R_g = -38.3$



**Color Vector Graphics**



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 67 | CES51 = 87 | CES76 = 63 |
| CES02 = 63 | CES27 = 88 | CES52 = 86 | CES77 = 80 |
| CES03 = 31 | CES28 = 87 | CES53 = 78 | CES78 = 67 |
| CES04 = 71 | CES29 = 66 | CES54 = 84 | CES79 = 87 |
| CES05 = 49 | CES30 = 73 | CES55 = 84 | CES80 = 86 |
| CES06 = 51 | CES31 = 70 | CES56 = 75 | CES81 = 71 |
| CES07 = 41 | CES32 = 65 | CES57 = 74 | CES82 = 94 |
| CES08 = 40 | CES33 = 73 | CES58 = 76 | CES83 = 90 |
| CES09 = 29 | CES34 = 79 | CES59 = 85 | CES84 = 89 |
| CES10 = 76 | CES35 = 89 | CES60 = 93 | CES85 = 77 |
| CES11 = 59 | CES36 = 97 | CES61 = 84 | CES86 = 61 |
| CES12 = 65 | CES37 = 87 | CES62 = 91 | CES87 = 78 |
| CES13 = 43 | CES38 = 81 | CES63 = 77 | CES88 = 77 |
| CES14 = 74 | CES39 = 95 | CES64 = 72 | CES89 = 67 |
| CES15 = 71 | CES40 = 92 | CES65 = 68 | CES90 = 76 |
| CES16 = 47 | CES41 = 88 | CES66 = 69 | CES91 = 89 |
| CES17 = 50 | CES42 = 89 | CES67 = 67 | CES92 = 58 |
| CES18 = 56 | CES43 = 79 | CES68 = 72 | CES93 = 74 |
| CES19 = 73 | CES44 = 99 | CES69 = 81 | CES94 = 49 |
| CES20 = 66 | CES45 = 85 | CES70 = 66 | CES95 = 68 |
| CES21 = 87 | CES46 = 80 | CES71 = 67 | CES96 = 76 |
| CES22 = 79 | CES47 = 82 | CES72 = 88 | CES97 = 82 |
| CES23 = 92 | CES48 = 69 | CES73 = 59 | CES98 = 75 |
| CES24 = 91 | CES49 = 80 | CES74 = 95 | CES99 = 62 |
| CES25 = 73 | CES50 = 87 | CES75 = 69 |            |



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**Color Rendition by Hue-Angle Bin**



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**Measure Comparisons**



(END OF REPORT)