

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: P359220

Luminaire Tested: NVN-SA2B-730-U-T2

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-2019  
Report Number: P359220  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-12)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: STREETWORKS  
Catalog Number: NVN-SA2B-730-U-T2  
Description: NAVION ROADWAY AND AREA LUMINAIRE  
(2) 70 CRI, 3000K, 800mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE II OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 10425 lumens  
Efficiency: N/A  
Efficacy: 122.6 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 1' x H: 0')  
IES Classification: Type III - Medium  
BUG Rating: B2 - U0 - G2

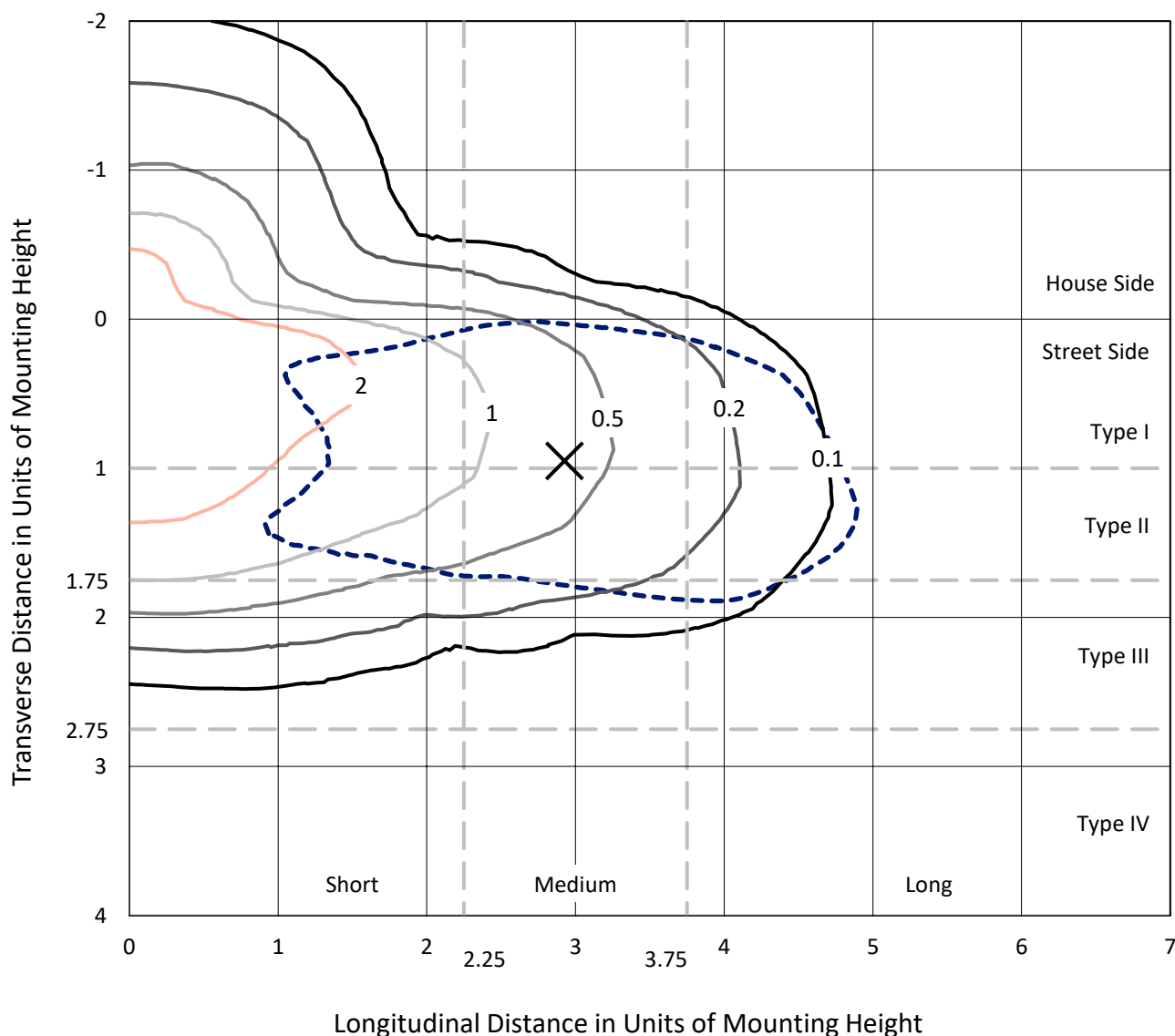
Input Watts (W): 85  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT



REPORT NUMBER: P359220  
 CATALOG NUMBER: NVN-SA2B-730-U-T2

## Iso-Footcandle Lines of Horizontal Illumination

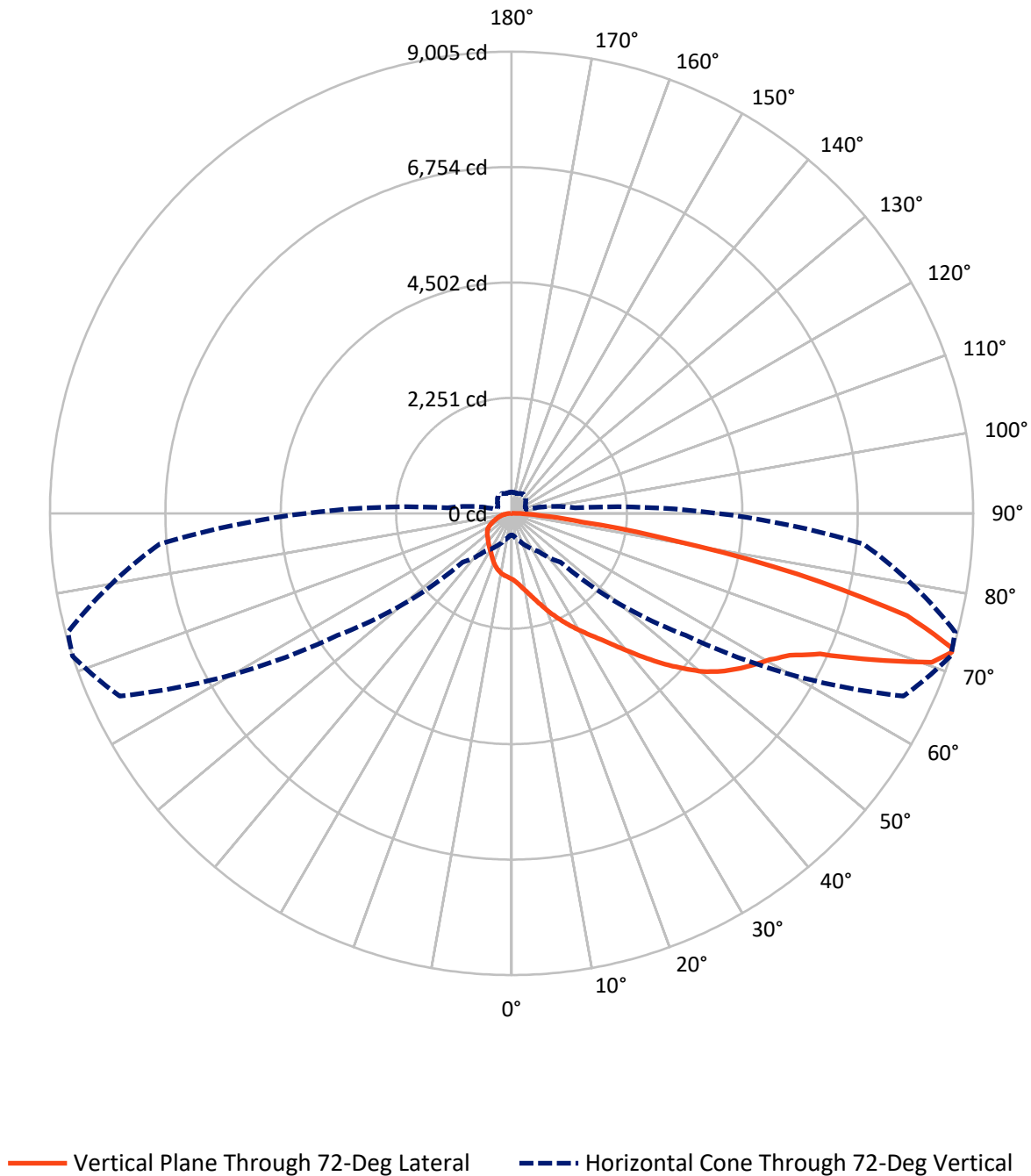
✕ Max cd  
 - - - 1/2 Max cd



Based on 20 foot mounting height. Maximum calculated value = 4.4 fc  
 Type III - Medium - N/A

REPORT NUMBER: P359220  
CATALOG NUMBER: NVN-SA2B-730-U-T2

## Luminous Intensity Polar Plot



REPORT NUMBER: P359220

CATALOG NUMBER: NVN-SA2B-730-U-T2

**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 1933.9   | 0.0    | 1933.9  |
|                    | % Fixture | 18.6     | 0.0    | 18.6    |
| <b>Street Side</b> | Lumens    | 8491.1   | 0.0    | 8491.1  |
|                    | % Fixture | 81.4     | 0.0    | 81.4    |
| <b>Total</b>       | Lumens    | 10425.0  | 0.0    | 10425.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 128.5   | 1.2       |
| 10°-20°   | 415.3   | 4.0       |
| 20°-30°   | 727.7   | 7.0       |
| 30°-40°   | 1079.0  | 10.4      |
| 40°-50°   | 1578.1  | 15.1      |
| 50°-60°   | 2171.5  | 20.8      |
| 60°-70°   | 2417.5  | 23.2      |
| 70°-80°   | 1638.1  | 15.7      |
| 80°-90°   | 269.2   | 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°    | 10425.0 | 100.0     |
| 0°-180°   | 10425.0 | 100.0     |

**Coefficient of Utilization**



REPORT NUMBER: P359220

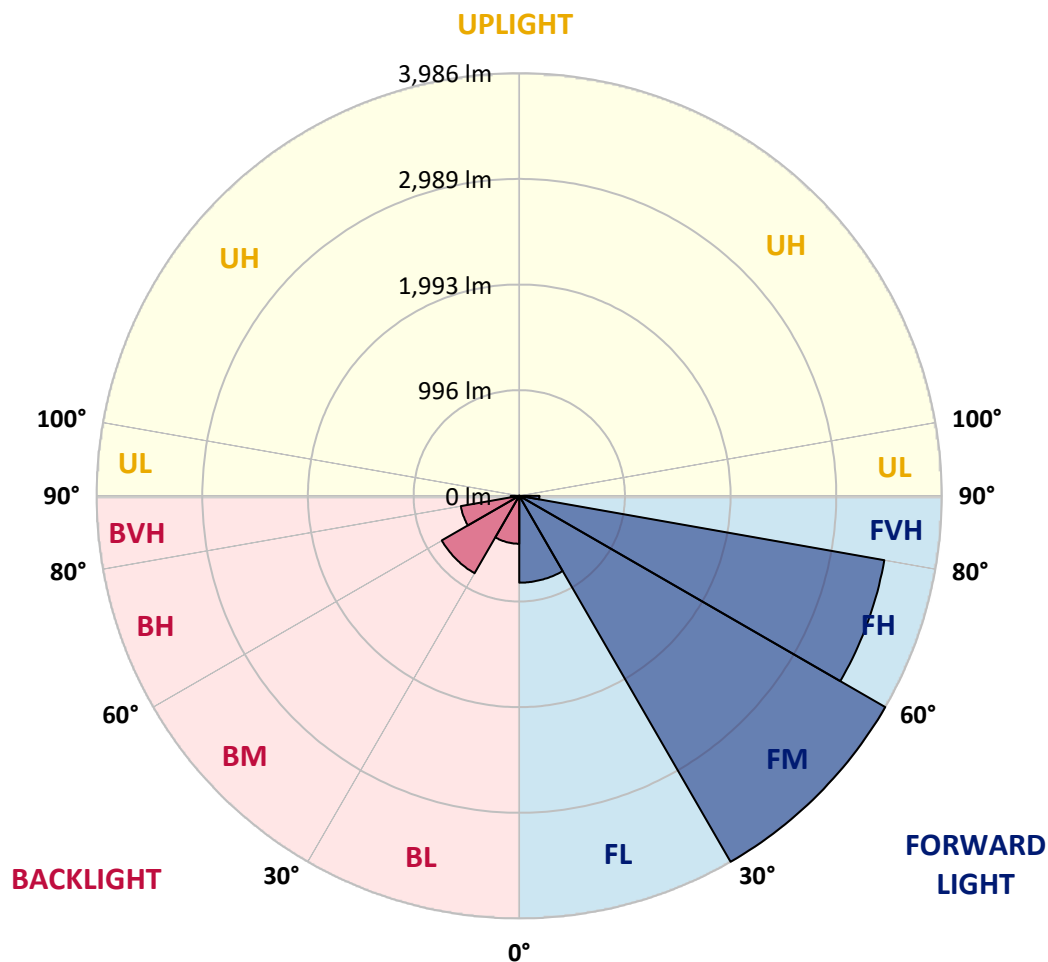
CATALOG NUMBER: NVN-SA2B-730-U-T2

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 819.5  | 7.9       |                         |      |         |
| FM   | (30°-60°)   | 3985.6 | 38.2      |                         |      |         |
| FH   | (60°-80°)   | 3496.1 | 33.5      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 189.9  | 1.8       |                         |      | G2/225  |
| BL   | (0°-30°)    | 452.1  | 4.3       | B1/500                  |      |         |
| BM   | (30°-60°)   | 843.0  | 8.1       | B1/1000                 |      |         |
| BH   | (60°-80°)   | 559.5  | 5.4       | B2/1000                 |      | G2/1000 |
| BVH  | (80°-90°)   | 79.3   | 0.8       |                         |      | G1/100  |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B2-U0-G2**

Type III Medium





REPORT NUMBER: P359220

CATALOG NUMBER: NVN-SA2B-730-U-T2

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 72°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1282.5 | 1282.5 | 1282.5 | 1282.5 | 1282.5 | 1282.5 | 1282.5 | 1282.5 | 1282.5 | 1282.5 | 1282.5 |
| 2.5°  | 1416.8 | 1414.6 | 1407.1 | 1407.1 | 1392.7 | 1380.5 | 1357.6 | 1342.1 | 1323.8 | 1317.4 | 1295.8 |
| 5°    | 1553.9 | 1554.6 | 1545.3 | 1538.8 | 1517.7 | 1491.8 | 1452.7 | 1417.2 | 1381.6 | 1367.3 | 1323.1 |
| 7.5°  | 1669.1 | 1667.7 | 1665.2 | 1659.8 | 1640.1 | 1613.5 | 1560.7 | 1508.0 | 1455.6 | 1434.0 | 1357.9 |
| 10°   | 1743.1 | 1746.3 | 1748.5 | 1751.0 | 1742.7 | 1723.7 | 1673.8 | 1609.6 | 1541.0 | 1511.6 | 1399.6 |
| 12.5° | 1780.4 | 1786.2 | 1796.2 | 1813.4 | 1827.1 | 1824.9 | 1788.7 | 1720.5 | 1639.0 | 1602.0 | 1451.6 |
| 15°   | 1802.3 | 1809.9 | 1825.6 | 1856.5 | 1894.9 | 1916.8 | 1907.1 | 1845.4 | 1754.6 | 1709.0 | 1515.1 |
| 17.5° | 1816.0 | 1822.1 | 1846.5 | 1887.7 | 1944.8 | 2003.0 | 2028.5 | 1976.8 | 1885.2 | 1833.2 | 1588.0 |
| 20°   | 1825.3 | 1830.0 | 1860.5 | 1908.9 | 1982.9 | 2075.5 | 2146.6 | 2133.6 | 2029.2 | 1961.7 | 1664.1 |
| 22.5° | 1846.1 | 1850.1 | 1879.1 | 1927.9 | 2009.8 | 2129.3 | 2260.3 | 2279.7 | 2181.0 | 2104.6 | 1745.6 |
| 25°   | 1904.3 | 1904.3 | 1928.7 | 1962.8 | 2039.6 | 2176.0 | 2356.5 | 2442.3 | 2336.1 | 2247.1 | 1821.0 |
| 27.5° | 2015.2 | 2014.1 | 2023.1 | 2034.9 | 2093.1 | 2223.4 | 2442.3 | 2585.9 | 2496.9 | 2399.6 | 1894.2 |
| 30°   | 2146.6 | 2153.7 | 2154.8 | 2149.1 | 2176.3 | 2282.6 | 2521.7 | 2737.4 | 2658.8 | 2554.0 | 1969.2 |
| 32.5° | 2315.6 | 2320.3 | 2314.9 | 2295.9 | 2291.9 | 2366.6 | 2599.6 | 2896.1 | 2834.0 | 2715.1 | 2037.8 |
| 35°   | 2530.3 | 2521.3 | 2504.4 | 2465.7 | 2428.7 | 2478.9 | 2688.6 | 3054.7 | 3030.7 | 2910.0 | 2132.2 |
| 37.5° | 2760.4 | 2760.7 | 2739.9 | 2652.0 | 2601.0 | 2622.5 | 2811.3 | 3234.5 | 3268.6 | 3141.9 | 2253.2 |
| 40°   | 2944.9 | 2954.6 | 2967.5 | 2851.9 | 2785.9 | 2815.6 | 2967.5 | 3443.1 | 3550.1 | 3416.9 | 2410.7 |
| 42.5° | 3073.7 | 3084.9 | 3121.5 | 3049.0 | 2980.4 | 3035.7 | 3151.3 | 3665.7 | 3865.9 | 3734.2 | 2595.2 |
| 45°   | 3210.1 | 3216.2 | 3242.1 | 3210.9 | 3167.1 | 3291.6 | 3358.4 | 3896.1 | 4200.1 | 4072.3 | 2801.6 |
| 47.5° | 3353.7 | 3360.2 | 3386.7 | 3365.9 | 3342.9 | 3530.7 | 3574.5 | 4113.3 | 4520.3 | 4443.9 | 3022.0 |
| 50°   | 3531.0 | 3535.3 | 3560.5 | 3522.8 | 3530.0 | 3710.9 | 3767.6 | 4312.5 | 4855.9 | 4777.7 | 3243.2 |
| 52.5° | 3773.0 | 3774.1 | 3808.9 | 3774.8 | 3741.0 | 3843.0 | 3933.8 | 4500.2 | 5119.1 | 5082.1 | 3464.3 |
| 55°   | 3962.5 | 3974.0 | 4088.1 | 4081.0 | 4061.6 | 3962.9 | 4072.7 | 4679.0 | 5353.8 | 5371.4 | 3699.0 |
| 57.5° | 3841.5 | 3886.4 | 4117.6 | 4280.5 | 4439.2 | 4261.2 | 4260.4 | 4880.4 | 5572.1 | 5655.3 | 3957.1 |
| 60°   | 3364.5 | 3425.5 | 3766.2 | 4127.6 | 4624.1 | 4780.2 | 4650.3 | 5126.2 | 5792.5 | 5936.8 | 4280.5 |
| 62.5° | 2402.8 | 2503.4 | 2965.0 | 3542.2 | 4370.6 | 5124.1 | 5443.6 | 5516.4 | 6092.2 | 6262.7 | 4700.9 |
| 65°   | 1214.7 | 1290.8 | 1677.8 | 2373.1 | 3491.9 | 4899.4 | 6305.8 | 6370.7 | 6613.0 | 6764.5 | 5348.1 |
| 67.5° | 738.0  | 766.7  | 955.5  | 1319.9 | 2140.8 | 3816.4 | 6587.2 | 7794.7 | 7621.0 | 7701.4 | 6270.9 |
| 70°   | 543.8  | 565.0  | 682.7  | 876.6  | 1231.2 | 2239.5 | 5723.5 | 8810.9 | 8696.8 | 8687.8 | 6953.0 |
| 72°   | 423.6  | 439.0  | 543.1  | 708.2  | 900.3  | 1343.6 | 4148.4 | 8435.8 | 9004.8 | 8959.5 | 6890.5 |
| 72.5° | 401.7  | 415.3  | 510.1  | 666.6  | 850.7  | 1217.9 | 3729.9 | 8182.7 | 8982.5 | 8962.0 | 6809.7 |
| 75°   | 316.2  | 325.9  | 377.6  | 515.5  | 665.9  | 691.0  | 2043.9 | 6341.3 | 7968.4 | 8299.8 | 6124.9 |
| 77.5° | 261.7  | 263.1  | 290.4  | 375.1  | 519.0  | 488.5  | 1004.0 | 4399.7 | 5706.0 | 6070.3 | 4338.7 |
| 80°   | 213.2  | 215.0  | 227.9  | 263.1  | 392.7  | 361.5  | 476.7  | 2529.9 | 3194.7 | 3198.6 | 2063.3 |
| 82.5° | 169.8  | 170.1  | 184.5  | 192.4  | 282.1  | 258.4  | 273.2  | 1187.8 | 1396.0 | 1342.9 | 741.6  |
| 85°   | 119.5  | 117.0  | 180.2  | 157.9  | 184.5  | 165.8  | 150.8  | 470.2  | 577.2  | 552.1  | 232.2  |
| 87.5° | 39.8   | 41.3   | 80.0   | 102.3  | 107.7  | 94.0   | 67.1   | 180.2  | 217.9  | 216.1  | 73.6   |
| 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: P359220

CATALOG NUMBER: NVN-SA2B-730-U-T2

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1282.5 | 1282.5 | 1282.5 | 1282.5 | 1282.5 | 1282.5 | 1282.5 | 1282.5 | 1282.5 | 1282.5 | 1282.5 |
| 2.5°  | 1289.0 | 1277.5 | 1260.7 | 1242.0 | 1227.3 | 1212.2 | 1201.1 | 1195.3 | 1188.9 | 1183.5 | 1189.9 |
| 5°    | 1302.6 | 1281.1 | 1245.2 | 1210.0 | 1184.2 | 1161.2 | 1144.7 | 1136.1 | 1128.2 | 1122.8 | 1123.5 |
| 7.5°  | 1324.9 | 1290.1 | 1229.8 | 1178.4 | 1142.6 | 1117.8 | 1100.9 | 1095.2 | 1090.1 | 1088.7 | 1090.5 |
| 10°   | 1348.6 | 1297.3 | 1209.3 | 1141.1 | 1100.2 | 1079.7 | 1072.2 | 1076.1 | 1079.7 | 1083.0 | 1086.6 |
| 12.5° | 1375.5 | 1303.7 | 1179.5 | 1097.3 | 1062.5 | 1054.6 | 1062.1 | 1079.4 | 1091.9 | 1099.5 | 1104.1 |
| 15°   | 1410.7 | 1309.5 | 1145.1 | 1053.5 | 1030.2 | 1039.2 | 1064.7 | 1094.5 | 1116.4 | 1130.3 | 1132.5 |
| 17.5° | 1443.0 | 1309.1 | 1100.9 | 1009.4 | 1004.0 | 1030.2 | 1068.6 | 1110.6 | 1140.0 | 1159.8 | 1163.7 |
| 20°   | 1476.4 | 1299.4 | 1049.6 | 966.3  | 977.4  | 1020.5 | 1070.4 | 1121.0 | 1156.6 | 1179.5 | 1184.9 |
| 22.5° | 1507.6 | 1282.5 | 993.2  | 927.2  | 955.2  | 1007.6 | 1063.6 | 1114.9 | 1150.5 | 1169.1 | 1174.9 |
| 25°   | 1528.8 | 1253.1 | 936.2  | 894.2  | 935.4  | 991.8  | 1041.3 | 1082.6 | 1109.2 | 1118.5 | 1119.9 |
| 27.5° | 1539.6 | 1214.7 | 882.3  | 865.4  | 915.0  | 965.9  | 1000.0 | 1020.5 | 1028.0 | 1027.3 | 1025.9 |
| 30°   | 1541.0 | 1164.1 | 836.0  | 842.1  | 891.3  | 927.9  | 944.1  | 940.1  | 930.4  | 913.9  | 915.3  |
| 32.5° | 1536.3 | 1107.0 | 797.2  | 819.9  | 861.1  | 881.6  | 882.3  | 863.3  | 837.4  | 811.2  | 804.1  |
| 35°   | 1537.8 | 1051.0 | 763.1  | 794.7  | 824.5  | 833.5  | 825.2  | 797.2  | 762.1  | 728.3  | 721.1  |
| 37.5° | 1553.6 | 1002.2 | 733.7  | 765.7  | 784.0  | 786.1  | 774.3  | 744.8  | 719.0  | 686.0  | 683.1  |
| 40°   | 1591.2 | 967.4  | 705.7  | 733.0  | 743.4  | 744.5  | 727.6  | 706.8  | 708.9  | 691.3  | 691.0  |
| 42.5° | 1659.1 | 952.3  | 680.9  | 698.9  | 705.3  | 707.5  | 694.6  | 681.3  | 700.0  | 688.5  | 684.5  |
| 45°   | 1746.7 | 955.9  | 660.1  | 665.5  | 677.3  | 687.4  | 679.5  | 663.3  | 670.5  | 620.6  | 604.1  |
| 47.5° | 1847.9 | 978.9  | 643.6  | 636.8  | 657.2  | 676.3  | 664.1  | 639.7  | 614.2  | 564.6  | 555.3  |
| 50°   | 1966.4 | 1014.4 | 628.5  | 608.4  | 635.4  | 661.2  | 649.0  | 614.2  | 575.8  | 551.7  | 548.5  |
| 52.5° | 2089.8 | 1057.8 | 613.5  | 577.2  | 607.7  | 649.7  | 643.6  | 608.4  | 561.0  | 537.4  | 533.0  |
| 55°   | 2229.8 | 1101.6 | 594.4  | 540.9  | 577.9  | 644.3  | 641.1  | 587.6  | 549.9  | 536.6  | 533.4  |
| 57.5° | 2403.9 | 1151.5 | 569.3  | 503.3  | 549.9  | 624.9  | 614.9  | 575.0  | 538.4  | 528.4  | 527.3  |
| 60°   | 2630.8 | 1225.1 | 533.0  | 463.1  | 515.8  | 595.1  | 593.0  | 556.7  | 520.1  | 512.9  | 511.5  |
| 62.5° | 2971.1 | 1346.8 | 483.2  | 422.8  | 477.8  | 544.5  | 564.3  | 532.0  | 500.7  | 500.4  | 501.1  |
| 65°   | 3498.7 | 1529.9 | 429.0  | 387.7  | 439.4  | 501.8  | 530.9  | 506.5  | 481.0  | 488.2  | 489.3  |
| 67.5° | 4110.4 | 1681.7 | 375.8  | 353.2  | 400.2  | 461.3  | 500.7  | 481.0  | 454.8  | 473.5  | 473.8  |
| 70°   | 4313.9 | 1546.0 | 329.2  | 319.1  | 359.7  | 422.1  | 468.1  | 453.0  | 426.4  | 445.1  | 443.3  |
| 72°   | 4014.6 | 1248.1 | 299.0  | 293.3  | 329.2  | 389.8  | 439.0  | 426.8  | 400.6  | 413.2  | 408.5  |
| 72.5° | 3920.1 | 1189.9 | 291.5  | 286.8  | 320.9  | 381.6  | 431.5  | 420.3  | 394.1  | 404.9  | 400.6  |
| 75°   | 3496.9 | 1033.4 | 250.6  | 251.6  | 280.0  | 341.4  | 389.1  | 385.5  | 358.6  | 359.7  | 358.2  |
| 77.5° | 2536.4 | 757.8  | 211.1  | 218.2  | 238.3  | 300.1  | 346.4  | 344.2  | 314.8  | 309.4  | 308.3  |
| 80°   | 1177.0 | 386.6  | 171.9  | 175.2  | 196.0  | 250.9  | 295.4  | 292.5  | 268.9  | 262.0  | 258.1  |
| 82.5° | 403.1  | 183.8  | 129.2  | 131.4  | 151.8  | 202.1  | 256.3  | 254.5  | 234.8  | 221.5  | 213.2  |
| 85°   | 143.9  | 91.5   | 90.5   | 88.3   | 108.4  | 159.0  | 223.3  | 213.6  | 184.5  | 157.2  | 156.5  |
| 87.5° | 46.7   | 39.1   | 46.7   | 46.3   | 63.2   | 107.7  | 162.2  | 138.2  | 133.9  | 111.3  | 109.1  |
| 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

REPORT NUMBER: SP1-1908-441-2-R4

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

REPORT NUMBER: SP1-1908-441-2-R4

**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

REPORT NUMBER: SP1-1908-441-2-R4

**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               |           |                  |                  |

REPORT NUMBER: SP1-1908-441-2-R4

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               |           |                  |                  |

REPORT NUMBER: SP1-1908-441-2-R4

**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               |           |                  |                  |

REPORT NUMBER: SP1-1908-441-2-R4

**TM-30-18**

### Summary

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



### Color Vector Graphics



REPORT NUMBER: SP1-1908-441-2-R4

**TM-30-18**

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

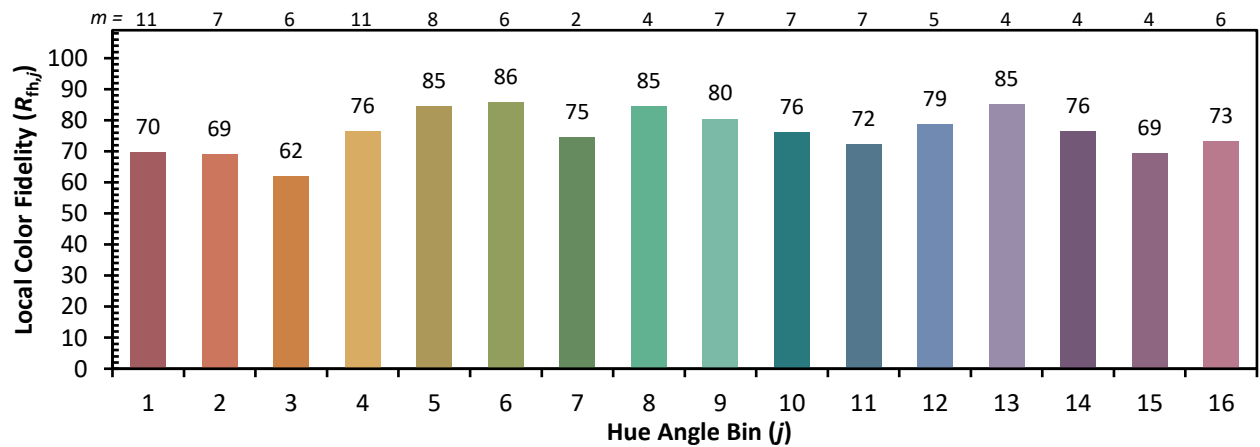
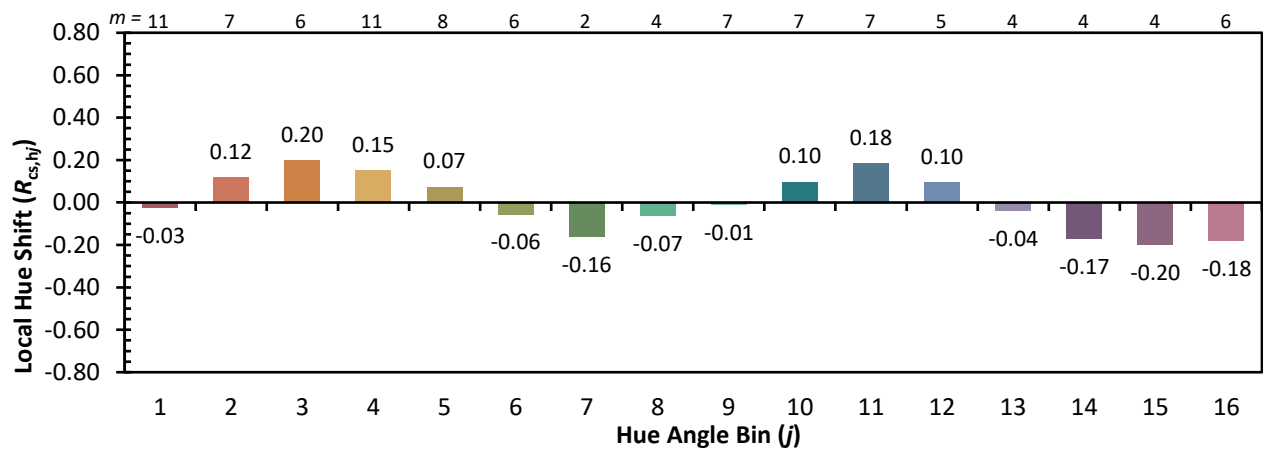
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 67 | CES51 = 87 | CES76 = 63 |
| CES02 = 63 | CES27 = 88 | CES52 = 86 | CES77 = 80 |
| CES03 = 31 | CES28 = 87 | CES53 = 78 | CES78 = 67 |
| CES04 = 71 | CES29 = 66 | CES54 = 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 |            |



REPORT NUMBER: SP1-1908-441-2-R4

**TM-30-18**

**Color Rendition by Hue-Angle Bin**



REPORT NUMBER: SP1-1908-441-2-R4

**TM-30-18**

**Measure Comparisons**



(END OF REPORT)