

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: P363433

Luminaire Tested: NVN-SA3D-722-U-T4W-HSS

Issue Date: 3/3/2020

Test Information

Test Method: LM-79-2019
Report Number: P363433
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-19)
Test Lab: INNOVATION CENTER
Issue Date: 3/3/2020
Manufacturer: COOPER LIGHTING SOLUTIONS
Product Line: STREETWORKS
Catalog Number: NVN-SA3D-722-U-T4W-HSS
Description: NAVION ROADWAY AND AREA LUMINAIRE
(3) 70 CRI, 2200K, 1200mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE IV WIDE OPTICS WITH HOUSE SIDE SHIELD
Light Source: -
Ballast/Driver: ELECTRONIC DRIVER

Summary

Lumens per Lamp: N/A
Luminaire Lumens: 12519 lumens
Efficiency: N/A
Efficacy: 65.5 lumens/watt
Luminous Opening: Rectangular (W 0.5' x L: 1.5' x H: 0')
IES Classification: Type IV - Short
BUG Rating: B1 - U0 - G3

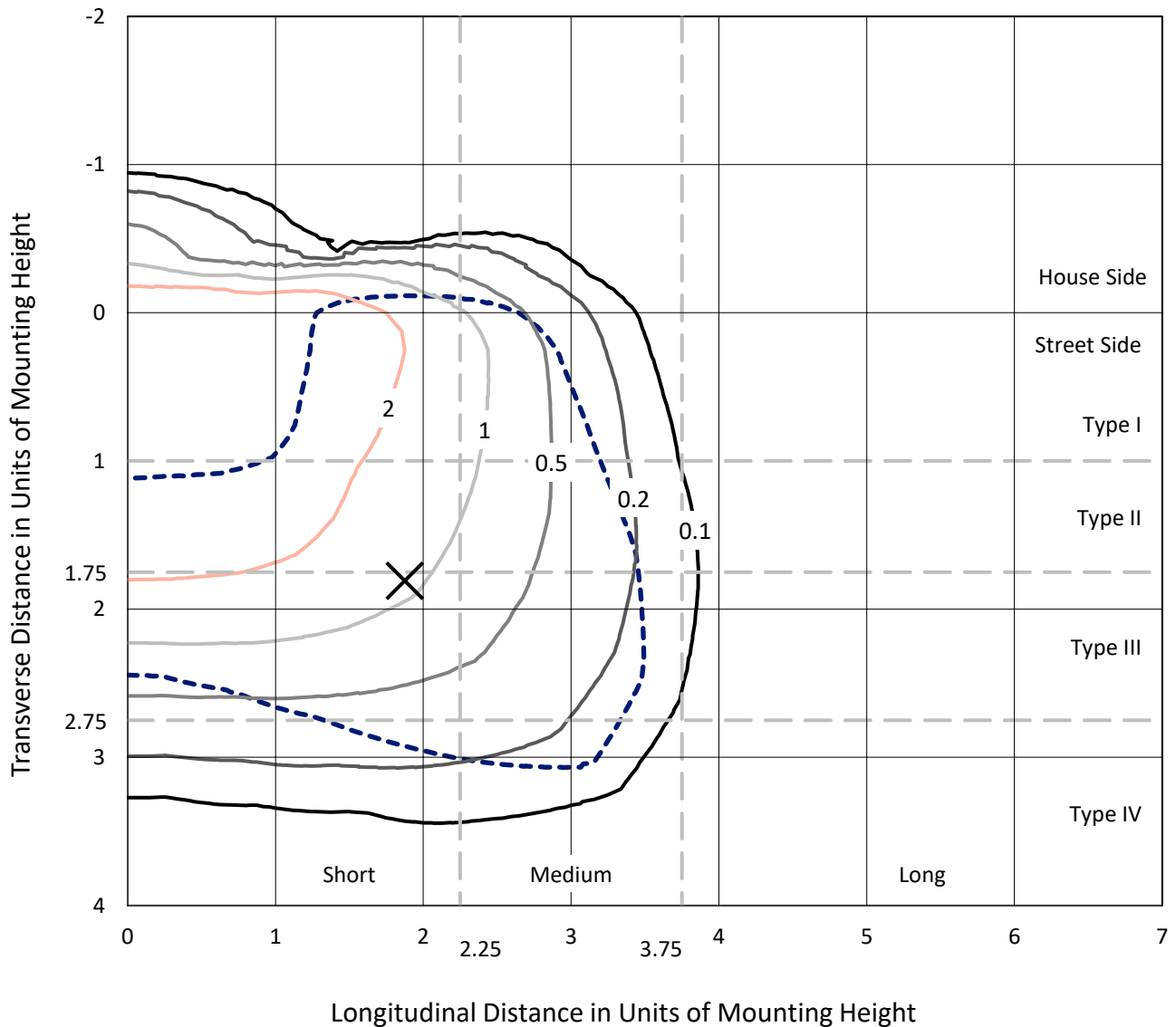
Input Watts (W): 191
Input Voltage (V): NR
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 28.75 FT



REPORT NUMBER: P363433
 CATALOG NUMBER: NVN-SA3D-722-U-T4W-HSS

Iso-Footcandle Lines of Horizontal Illumination

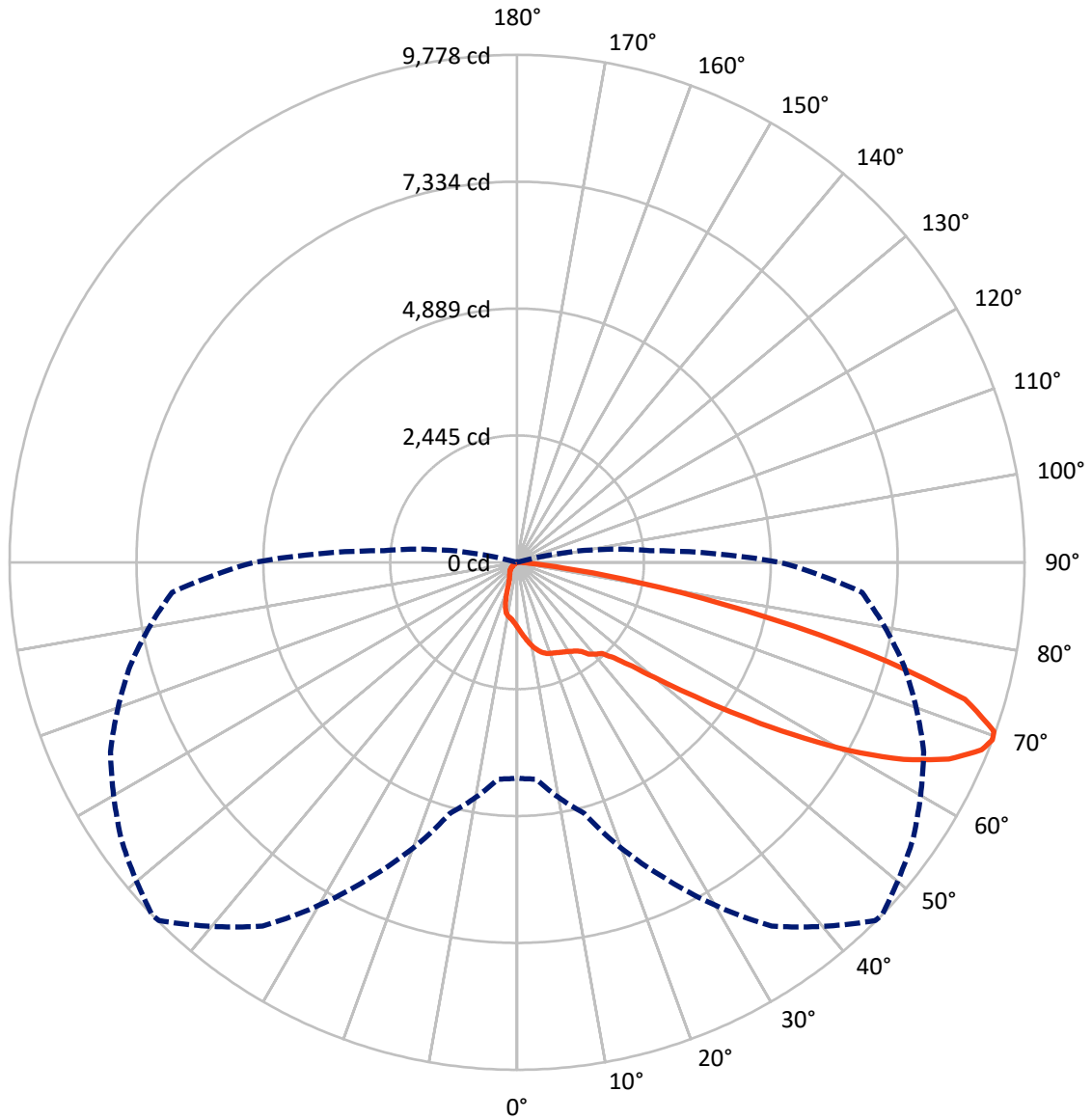
× Max cd
 - - - 1/2 Max cd



Based on 20 foot mounting height. Maximum calculated value = 4.6 fc
 Type IV - Short - N/A

REPORT NUMBER: P363433
CATALOG NUMBER: NVN-SA3D-722-U-T4W-HSS

Luminous Intensity Polar Plot



— Vertical Plane Through 46-Deg Lateral - - - Horizontal Cone Through 69-Deg Vertical

REPORT NUMBER: P363433
 CATALOG NUMBER: NVN-SA3D-722-U-T4W-HSS

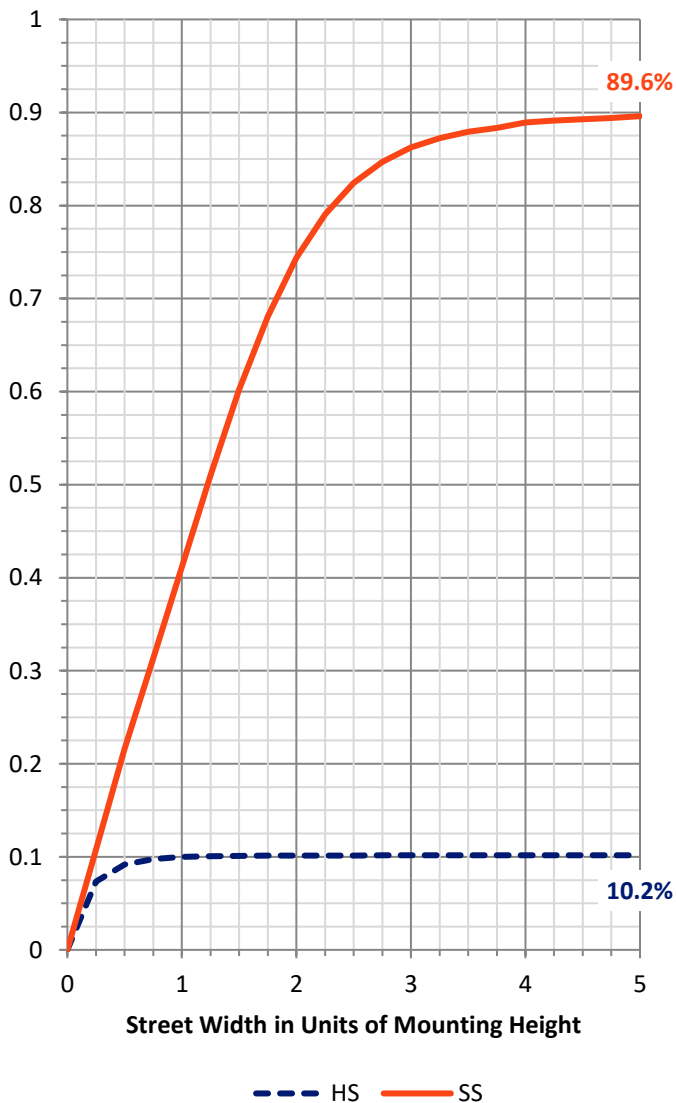
FLUX DISTRIBUTION:

| | | Downward | Upward | Total |
|--------------------|-----------|----------|--------|---------|
| House Side | Lumens | 1284.8 | 0.0 | 1284.8 |
| | % Fixture | 10.3 | 0.0 | 10.3 |
| Street Side | Lumens | 11234.2 | 0.0 | 11234.2 |
| | % Fixture | 89.7 | 0.0 | 89.7 |
| Total | Lumens | 12519.0 | 0.0 | 12519.0 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|---------|-----------|
| 0°-10° | 124.9 | 1.0 |
| 10°-20° | 378.8 | 3.0 |
| 20°-30° | 595.7 | 4.8 |
| 30°-40° | 854.2 | 6.8 |
| 40°-50° | 1476.4 | 11.8 |
| 50°-60° | 2916.7 | 23.3 |
| 60°-70° | 4076.4 | 32.6 |
| 70°-80° | 1969.3 | 15.7 |
| 80°-90° | 126.6 | 1.0 |
| 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° | 12519.0 | 100.0 |
| 0°-180° | 12519.0 | 100.0 |

Coefficient of Utilization



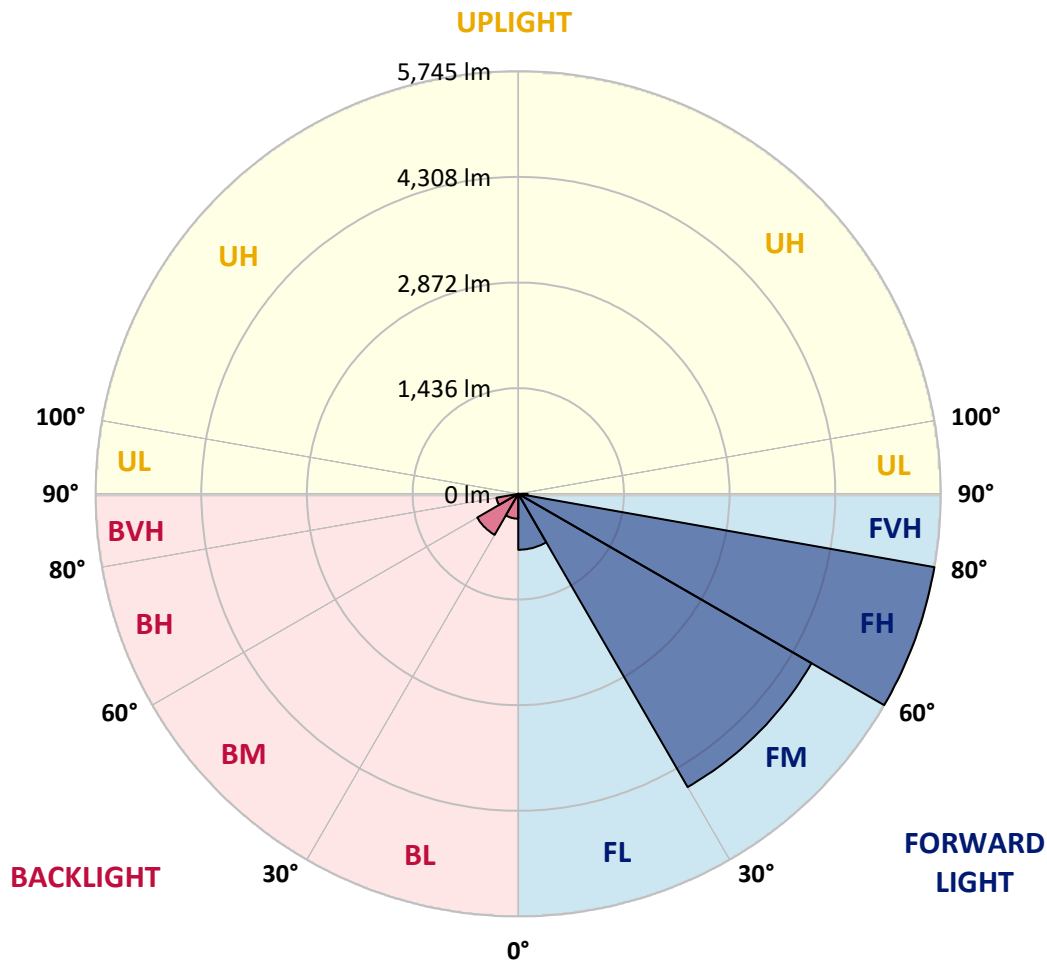
REPORT NUMBER: P363433
 CATALOG NUMBER: NVN-SA3D-722-U-T4W-HSS

LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | Lumens | % Fixture | Zone Rating/Lumen Limit | | |
|----------------|--------|-----------|-------------------------|------|---------|
| | | | B | U | G |
| FL (0°-30°) | 760.7 | 6.1 | | | |
| FM (30°-60°) | 4603.5 | 36.8 | | | |
| FH (60°-80°) | 5744.5 | 45.9 | | | G3/7500 |
| FVH (80°-90°) | 125.5 | 1.0 | | | G2/225 |
| BL (0°-30°) | 338.6 | 2.7 | B1/500 | | |
| BM (30°-60°) | 643.8 | 5.1 | B1/1000 | | |
| BH (60°-80°) | 301.3 | 2.4 | B1/500 | | G1/500 |
| BVH (80°-90°) | 1.1 | 0.0 | | | G0/10 |
| UL (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH (100°-180°) | 0.0 | 0.0 | | U0/0 | |

BUG Rating: B1-U0-G3

Type IV Short





REPORT NUMBER: P363433

CATALOG NUMBER: NVN-SA3D-722-U-T4W-HSS

CANDELA DISTRIBUTION (FULL):

| | 0° | 5° | 15° | 25° | 35° | 45° | 46° | 55° | 65° | 75° | 85° |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0° | 1254.4 | 1254.4 | 1254.4 | 1254.4 | 1254.4 | 1254.4 | 1254.4 | 1254.4 | 1254.4 | 1254.4 | 1254.4 |
| 2.5° | 1393.5 | 1391.7 | 1383.5 | 1380.0 | 1360.0 | 1348.3 | 1343.6 | 1328.9 | 1307.8 | 1286.6 | 1263.2 |
| 5° | 1552.0 | 1551.4 | 1536.1 | 1521.4 | 1483.9 | 1448.6 | 1442.2 | 1408.1 | 1360.6 | 1316.0 | 1271.4 |
| 7.5° | 1714.0 | 1706.3 | 1691.1 | 1662.9 | 1608.3 | 1552.0 | 1546.7 | 1498.5 | 1431.0 | 1366.5 | 1302.5 |
| 10° | 1851.3 | 1846.6 | 1826.7 | 1783.8 | 1719.8 | 1655.8 | 1649.4 | 1590.1 | 1513.8 | 1434.6 | 1353.0 |
| 12.5° | 1958.1 | 1954.6 | 1928.2 | 1874.8 | 1806.7 | 1740.4 | 1731.6 | 1678.7 | 1597.1 | 1508.5 | 1412.3 |
| 15° | 2023.3 | 2021.5 | 1989.2 | 1932.3 | 1865.4 | 1807.9 | 1800.2 | 1753.9 | 1678.2 | 1585.4 | 1476.8 |
| 17.5° | 2038.6 | 2039.1 | 2005.7 | 1948.2 | 1893.0 | 1851.9 | 1846.0 | 1810.8 | 1747.4 | 1655.3 | 1541.4 |
| 20° | 2004.5 | 2011.5 | 1981.6 | 1931.7 | 1897.7 | 1876.0 | 1871.3 | 1850.1 | 1796.7 | 1709.8 | 1593.0 |
| 22.5° | 1956.4 | 1959.9 | 1939.4 | 1905.9 | 1891.8 | 1895.9 | 1893.6 | 1881.8 | 1836.6 | 1756.8 | 1644.1 |
| 25° | 1927.0 | 1927.0 | 1914.7 | 1886.5 | 1895.9 | 1921.2 | 1921.7 | 1919.4 | 1883.6 | 1814.3 | 1706.3 |
| 27.5° | 1925.9 | 1922.3 | 1908.2 | 1887.1 | 1912.9 | 1951.7 | 1954.0 | 1969.9 | 1947.6 | 1884.2 | 1783.8 |
| 30° | 1972.8 | 1968.7 | 1938.8 | 1911.2 | 1944.0 | 1985.7 | 1991.6 | 2026.2 | 2015.1 | 1959.9 | 1870.1 |
| 32.5° | 2082.6 | 2067.9 | 2001.6 | 1956.4 | 1981.0 | 2030.9 | 2038.6 | 2093.7 | 2111.3 | 2053.2 | 1953.4 |
| 35° | 2232.8 | 2186.5 | 2090.8 | 2042.1 | 2044.4 | 2096.7 | 2103.7 | 2184.7 | 2236.9 | 2138.9 | 2018.0 |
| 37.5° | 2440.0 | 2417.1 | 2261.6 | 2131.3 | 2141.9 | 2221.1 | 2241.6 | 2329.7 | 2315.0 | 2185.9 | 2091.4 |
| 40° | 2894.4 | 2858.5 | 2693.0 | 2381.3 | 2235.2 | 2322.1 | 2328.5 | 2375.5 | 2376.6 | 2292.1 | 2244.0 |
| 42.5° | 3513.0 | 3498.3 | 3324.0 | 2835.1 | 2418.9 | 2389.6 | 2401.3 | 2480.5 | 2569.2 | 2516.3 | 2514.0 |
| 45° | 4198.0 | 4190.4 | 4005.5 | 3437.3 | 2790.5 | 2610.8 | 2625.5 | 2731.8 | 2901.4 | 2913.1 | 2987.7 |
| 47.5° | 4749.2 | 4745.7 | 4639.4 | 4109.4 | 3359.2 | 2985.9 | 2990.6 | 3103.3 | 3401.5 | 3548.8 | 3668.0 |
| 50° | 5251.6 | 5268.7 | 5184.7 | 4836.6 | 4134.0 | 3573.5 | 3562.3 | 3637.5 | 4116.4 | 4357.7 | 4505.6 |
| 52.5° | 5950.1 | 5974.2 | 5738.8 | 5515.2 | 4947.0 | 4302.5 | 4293.7 | 4372.3 | 4975.8 | 5156.5 | 5183.0 |
| 55° | 6567.0 | 6525.9 | 6339.9 | 6275.3 | 5938.4 | 5202.9 | 5200.6 | 5269.8 | 5806.9 | 5883.8 | 5932.5 |
| 57.5° | 6839.4 | 6823.5 | 6913.3 | 7061.3 | 6976.7 | 6267.1 | 6261.8 | 6209.0 | 6550.6 | 6558.8 | 6708.5 |
| 60° | 7011.4 | 7030.7 | 7306.0 | 7762.1 | 7972.8 | 7412.3 | 7378.2 | 7056.0 | 7260.8 | 7242.6 | 7402.9 |
| 62.5° | 6882.2 | 6920.4 | 7415.8 | 8175.9 | 8718.3 | 8411.9 | 8363.7 | 7832.0 | 7867.8 | 7805.0 | 7954.0 |
| 65° | 6196.7 | 6255.9 | 7067.7 | 8097.9 | 9088.1 | 9193.1 | 9144.4 | 8516.9 | 8349.7 | 8246.4 | 8163.6 |
| 67.5° | 5031.5 | 5066.7 | 5914.3 | 7418.7 | 8921.4 | 9659.2 | 9649.2 | 9117.4 | 8713.6 | 8171.8 | 7529.7 |
| 69° | 4158.1 | 4192.7 | 5008.6 | 6703.8 | 8554.5 | 9759.0 | 9778.3 | 9309.9 | 8644.3 | 7718.7 | 6671.5 |
| 70° | 3521.8 | 3558.8 | 4318.9 | 6091.0 | 8129.0 | 9712.6 | 9747.2 | 9291.8 | 8445.9 | 7193.9 | 5918.4 |
| 72.5° | 1847.2 | 1878.9 | 2659.0 | 4196.3 | 6626.9 | 8918.4 | 9023.5 | 8506.4 | 7159.3 | 5224.6 | 3499.5 |
| 75° | 580.5 | 598.7 | 1038.4 | 2193.5 | 4537.3 | 6934.5 | 6958.5 | 6672.7 | 5083.8 | 2873.8 | 1457.4 |
| 77.5° | 221.3 | 216.0 | 345.7 | 808.3 | 2293.9 | 4366.5 | 4513.8 | 4169.8 | 2667.8 | 1016.0 | 336.3 |
| 80° | 119.2 | 119.7 | 179.6 | 334.6 | 981.4 | 2244.0 | 2368.4 | 2020.9 | 948.0 | 317.0 | 77.5 |
| 82.5° | 51.7 | 54.0 | 101.0 | 177.3 | 450.8 | 827.6 | 889.8 | 740.8 | 362.2 | 213.1 | 28.8 |
| 85° | 11.2 | 12.3 | 48.7 | 96.3 | 183.7 | 232.4 | 243.6 | 240.1 | 230.7 | 165.5 | 11.2 |
| 87.5° | 0.0 | 0.0 | 21.7 | 34.6 | 46.4 | 52.8 | 46.4 | 60.5 | 127.4 | 111.5 | 5.9 |
| 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: P363433

CATALOG NUMBER: NVN-SA3D-722-U-T4W-HSS

CANDELA DISTRIBUTION (continued):

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0° | 1254.4 | 1254.4 | 1254.4 | 1254.4 | 1254.4 | 1254.4 | 1254.4 | 1254.4 | 1254.4 | 1254.4 | 1254.4 |
| 2.5° | 1255.5 | 1245.0 | 1226.8 | 1206.8 | 1192.7 | 1178.1 | 1166.3 | 1161.0 | 1155.2 | 1151.1 | 1156.3 |
| 5° | 1253.2 | 1232.6 | 1197.4 | 1163.4 | 1138.7 | 1118.8 | 1102.3 | 1095.9 | 1089.4 | 1084.7 | 1084.1 |
| 7.5° | 1273.7 | 1245.0 | 1191.0 | 1141.1 | 1102.9 | 1075.9 | 1053.6 | 1044.2 | 1036.6 | 1033.1 | 1030.1 |
| 10° | 1313.1 | 1276.1 | 1203.9 | 1138.7 | 1089.4 | 1043.6 | 995.5 | 958.5 | 934.5 | 923.3 | 919.2 |
| 12.5° | 1364.1 | 1317.7 | 1228.5 | 1151.1 | 1079.4 | 991.4 | 889.3 | 801.2 | 744.3 | 725.5 | 714.3 |
| 15° | 1424.0 | 1366.5 | 1260.8 | 1166.9 | 1043.0 | 882.2 | 709.1 | 594.0 | 541.2 | 530.6 | 518.9 |
| 17.5° | 1481.5 | 1418.1 | 1299.6 | 1169.8 | 963.2 | 705.0 | 519.5 | 441.4 | 420.9 | 427.9 | 429.7 |
| 20° | 1532.0 | 1469.2 | 1337.7 | 1144.0 | 818.2 | 528.9 | 402.1 | 382.7 | 390.3 | 403.8 | 406.2 |
| 22.5° | 1583.1 | 1518.5 | 1372.9 | 1075.9 | 632.8 | 401.5 | 362.2 | 366.9 | 374.5 | 388.0 | 390.3 |
| 25° | 1645.3 | 1578.4 | 1405.8 | 950.9 | 474.9 | 341.6 | 344.0 | 351.0 | 358.6 | 371.0 | 372.1 |
| 27.5° | 1716.9 | 1654.1 | 1427.5 | 788.3 | 352.2 | 314.0 | 321.7 | 332.2 | 339.9 | 351.6 | 353.9 |
| 30° | 1812.0 | 1753.9 | 1434.6 | 619.8 | 295.2 | 289.4 | 292.9 | 305.8 | 317.0 | 327.5 | 329.3 |
| 32.5° | 1901.2 | 1852.5 | 1411.1 | 467.8 | 273.5 | 266.5 | 266.5 | 274.1 | 287.0 | 297.0 | 299.4 |
| 35° | 1983.4 | 1951.7 | 1335.9 | 342.2 | 257.1 | 245.4 | 239.5 | 239.5 | 247.7 | 255.9 | 258.3 |
| 37.5° | 2092.0 | 2090.8 | 1214.4 | 272.9 | 241.2 | 227.7 | 215.4 | 206.0 | 203.1 | 204.9 | 206.0 |
| 40° | 2278.0 | 2279.8 | 1056.0 | 244.8 | 227.7 | 209.5 | 190.8 | 173.7 | 157.9 | 152.6 | 152.0 |
| 42.5° | 2568.6 | 2542.2 | 889.8 | 231.3 | 216.0 | 190.8 | 162.6 | 139.7 | 115.0 | 107.4 | 106.8 |
| 45° | 3029.9 | 2873.2 | 713.8 | 218.9 | 203.7 | 169.6 | 134.4 | 103.3 | 83.3 | 77.5 | 77.5 |
| 47.5° | 3702.0 | 3308.2 | 552.9 | 205.4 | 187.2 | 145.6 | 101.5 | 74.5 | 61.0 | 58.1 | 58.7 |
| 50° | 4397.0 | 3734.3 | 423.8 | 188.4 | 167.3 | 120.3 | 75.1 | 54.0 | 46.4 | 46.4 | 47.0 |
| 52.5° | 5013.3 | 4046.6 | 330.5 | 170.2 | 142.6 | 94.5 | 56.9 | 42.3 | 38.7 | 38.2 | 38.7 |
| 55° | 5590.3 | 4247.9 | 253.0 | 149.1 | 113.3 | 70.4 | 43.4 | 34.6 | 32.3 | 31.1 | 30.5 |
| 57.5° | 6146.8 | 4347.7 | 189.6 | 120.3 | 82.2 | 51.1 | 34.6 | 29.3 | 27.0 | 25.2 | 24.7 |
| 60° | 6517.1 | 4266.7 | 130.3 | 88.6 | 56.9 | 37.0 | 28.8 | 25.2 | 22.3 | 20.5 | 20.0 |
| 62.5° | 6726.1 | 4045.4 | 83.9 | 64.0 | 40.5 | 27.6 | 22.9 | 21.1 | 17.0 | 15.3 | 15.3 |
| 65° | 6641.6 | 3680.3 | 58.7 | 45.8 | 29.3 | 20.5 | 17.0 | 17.0 | 12.3 | 10.0 | 9.4 |
| 67.5° | 5885.6 | 3109.2 | 44.6 | 34.0 | 21.1 | 15.3 | 12.9 | 14.7 | 7.6 | 4.7 | 4.7 |
| 69° | 5063.8 | 2576.8 | 38.2 | 28.2 | 17.6 | 12.3 | 11.2 | 13.5 | 5.3 | 3.5 | 2.9 |
| 70° | 4401.1 | 2222.9 | 34.6 | 24.7 | 14.7 | 10.6 | 10.0 | 12.9 | 5.3 | 2.9 | 2.3 |
| 72.5° | 2633.2 | 1239.7 | 26.4 | 17.6 | 9.4 | 8.2 | 8.2 | 14.7 | 5.3 | 2.9 | 2.3 |
| 75° | 1064.2 | 436.7 | 19.4 | 12.3 | 7.0 | 7.0 | 10.0 | 18.8 | 4.7 | 2.3 | 1.8 |
| 77.5° | 241.2 | 95.7 | 11.2 | 7.6 | 4.7 | 7.0 | 11.7 | 14.7 | 2.9 | 1.2 | 0.0 |
| 80° | 58.7 | 23.5 | 7.0 | 4.7 | 2.9 | 5.3 | 8.8 | 8.2 | 0.6 | 0.0 | 0.0 |
| 82.5° | 19.4 | 8.2 | 2.9 | 2.3 | 0.6 | 1.8 | 4.1 | 2.3 | 0.0 | 0.0 | 0.0 |
| 85° | 8.2 | 4.7 | 1.2 | 0.6 | 0.0 | 0.0 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 |
| 87.5° | 5.3 | 1.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 90° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

Signify Classified - Internal
Cooper Lighting Solutions Photometric Lab
1121 Highway 74 South
Peachtree City, GA 30269



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

Report Prepared for

Cooper Lighting Solutions

McGRAW-EDISON

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

Test Date: 10/25/2019

Luminaire Tested: SA1C-722-U-5WQ

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

Test Information

Test Method: LM-79-2008 Report
 Number: SP1-1908-441-10-R4
 Test Lab: COOPER LIGHTING SOLUTIONS
 Photometer: SP1 - 76IN SPHERE
 Measurement Geometry: 4π
 Issue Date: 10/28/2024
 Manufacturer: COOPER LIGHTING SOLUTIONS
 Product Line: McGRAW-EDISON
 Catalog Number: **SA1C-722-U-5WQ**
 Description: McGRAW EDISON ROADWAY AND AREA LUMINAIRE

THIS IS A REVISION OF SP1-1908-441-4-R3. TO UPDATE THE CATALOG INFORMATION.TESTED IN SITU. ROADWAY AND AREA LUMINAIRE. (1) 70 CRI, 5000K, 1050MA LIGHTSQUARE WITH 16 LEDS AND TYPE V WIDE OPTICS.

Spectral Parameters

CCT (K): 2237
 CIE u': 0.2876
 CIE v': 0.5346
 Duv: -0.0006
 CIE x: 0.5005
 CIE y: 0.4134
 CIE z: 0.0860
 Peak Wavelength (nm): 603
 Dominant Wavelength (nm): 587
 Purity: 74.5

| | | | |
|-----------|------|------|-------|
| CRI (Ra): | 72.0 | | |
| R1: | 68.9 | R9: | -17.4 |
| R2: | 83.0 | R10: | 61.3 |
| R3: | 95.2 | R11: | 59.8 |
| R4: | 66.2 | R12: | 50.5 |
| R5: | 65.9 | R13: | 71.1 |
| R6: | 76.3 | R14: | 96.9 |
| R7: | 76.7 | | |
| R8: | 43.8 | | |

Rf: 69.8
 Rg: 99.2



Test Conditions

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

REPORT NUMBER: SP1-1908-441-10-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: SP1-1908-441-10-R4

CIE 1931 Chromaticity Diagram



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



Point lies inside the ANSI 2200K 4-step quadrangle

REPORT NUMBER: SP1-1908-441-10-R4

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

REPORT NUMBER: SP1-1908-441-10-R4

Scotopic Flux vs. Wavelength



Scotopic Lumens: 4696.9

S/P: 0.85

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

REPORT NUMBER: SP1-1908-441-10-R4

Melanopic Flux vs. Wavelength



Melanopic Lumens: 1470.8 M/P: 0.27

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

REPORT NUMBER: SP1-1908-441-10-R4

TM-30-18

Summary

$R_f = 69.8$
 $R_g = 99.2$
 $CIE R_a = 72.0$
 $R_9 = -17.4$



Color Vector Graphics



REPORT NUMBER: SP1-1908-441-10-R4

TM-30-18

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

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



REPORT NUMBER: SP1-1908-441-10-R4

TM-30-18

Color Rendition by Hue-Angle Bin



REPORT NUMBER: SP1-1908-441-10-R4

TM-30-18

Measure Comparisons



(END OF REPORT)