

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



Scaled data based on original data using
LM-79-08 Approved Method: Electrical and Photometric Measurements of Solid-
State Lighting Products

Test Report Prepared for
Cooper Lighting Solutions
(formerly Eaton)

Brand: McGRAW-EDISON

Report Number: P438485

Luminaire Tested: **ISW-SA1D-727-U-SL3-HSS**

Issue Date: 12/10/2020

Test Information

Test Method: LM-79-08
Report Number: P438485
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-2011-074-17)
Test Lab: INNOVATION CENTER
Issue Date: 12/10/2020
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: McGRAW-EDISON
Catalog Number: ISW-SA1D-727-U-SL3-HSS
Description: IMPACT ELITE LED WEDGE LUMINAIRE
(1) 70 CRI, 2700K, 800mA LIGHTSQUARE WITH 16 LEDS AND TYPE III SPILL
LIGHT ELIMINATOR OPTICS WITH HOUSE SIDE SHIELD
Light Source: -
Ballast/Driver: ELECTRONIC DRIVER

Summary

Lumens per Lamp: N/A
Luminaire Lumens: 3923 lumens
Efficiency: N/A
Efficacy: 86.8 lumens/watt
Luminous Opening: Rectangular (W 0.5' x L: 0.5' x H: 0')
IES Classification: Type III - Short
BUG Rating: B1 - U0 - G1

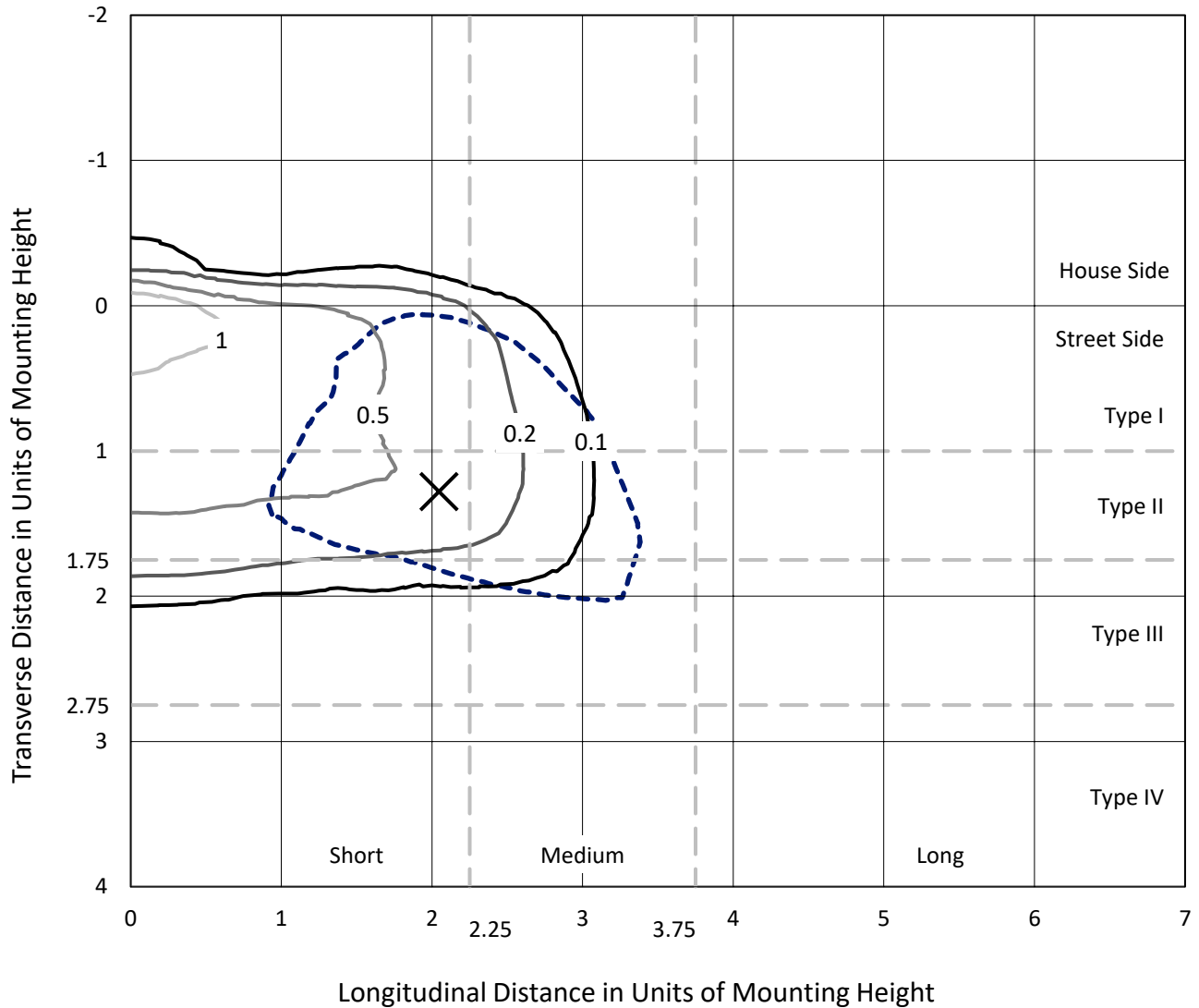
Input Watts (W): 45.2
Input Voltage (V): NR
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 28.75 FT



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Iso-Footcandle Lines of Horizontal Illumination

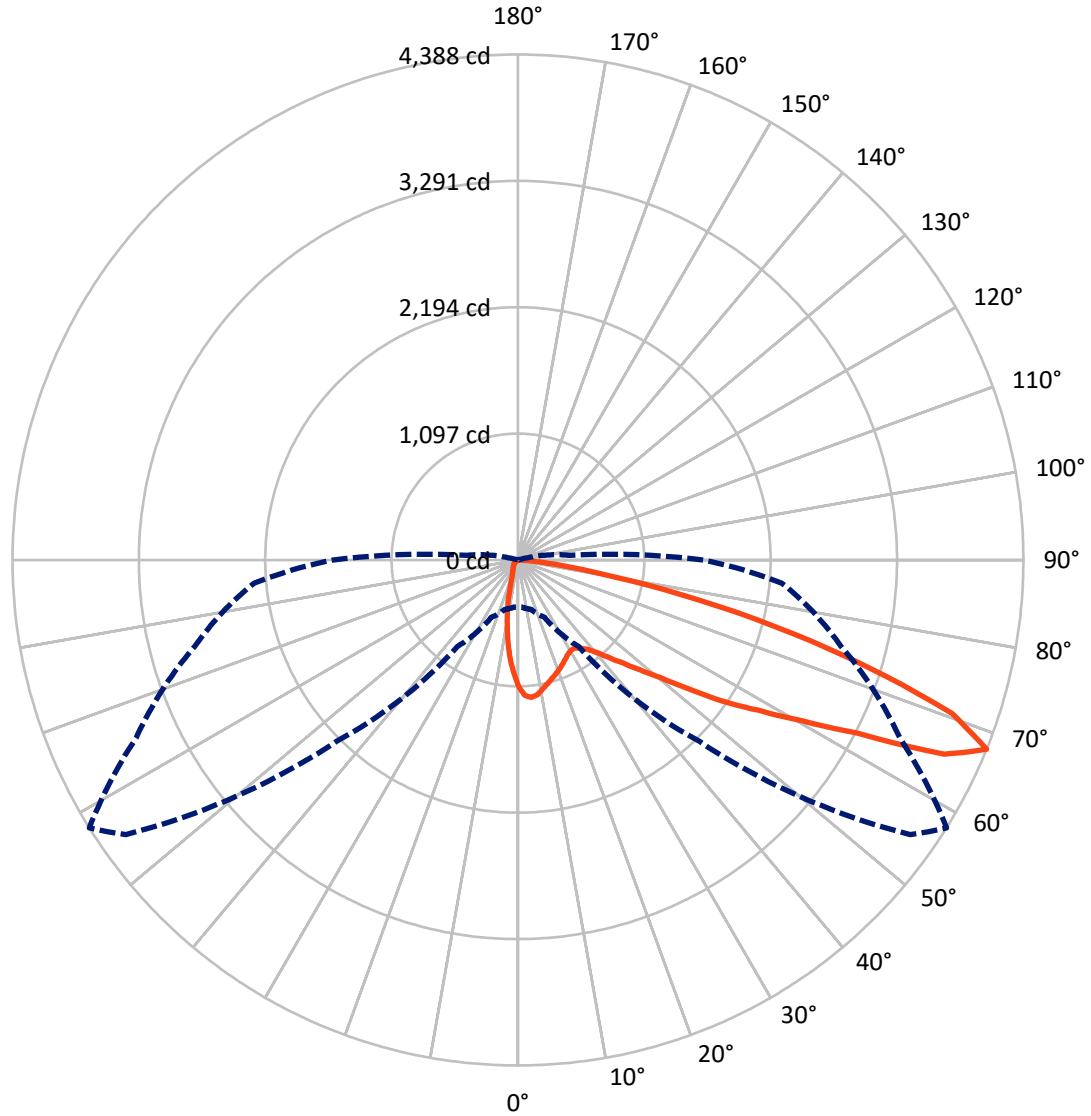
✕ Max cd
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 1.8 fc
 Type III - Short - N/A

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Luminous Intensity Polar Plot



— Vertical Plane Through 58-Deg Lateral - - - Horizontal Cone Through 67.5-Deg Vertical

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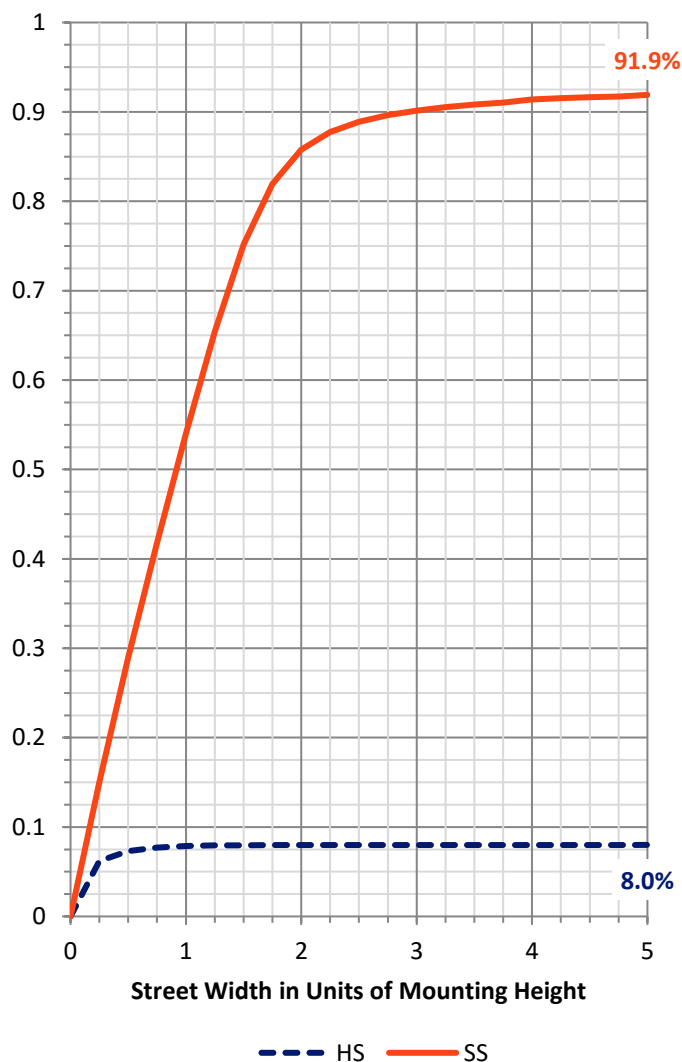
FLUX DISTRIBUTION:

| | | Downward | Upward | Total |
|--------------------|-----------|----------|--------|--------|
| House Side | Lumens | 316.3 | 0.0 | 316.3 |
| | % Fixture | 8.1 | 0.0 | 8.1 |
| Street Side | Lumens | 3606.7 | 0.0 | 3606.7 |
| | % Fixture | 91.9 | 0.0 | 91.9 |
| Total | Lumens | 3923.0 | 0.0 | 3923.0 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10° | 88.4 | 2.3 |
| 10°-20° | 186.4 | 4.8 |
| 20°-30° | 252.2 | 6.4 |
| 30°-40° | 346.8 | 8.8 |
| 40°-50° | 543.0 | 13.8 |
| 50°-60° | 914.7 | 23.3 |
| 60°-70° | 1085.5 | 27.7 |
| 70°-80° | 471.4 | 12.0 |
| 80°-90° | 34.6 | 0.9 |
| 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° | 3923.0 | 100.0 |
| 0°-180° | 3923.0 | 100.0 |

Coefficient of Utilization



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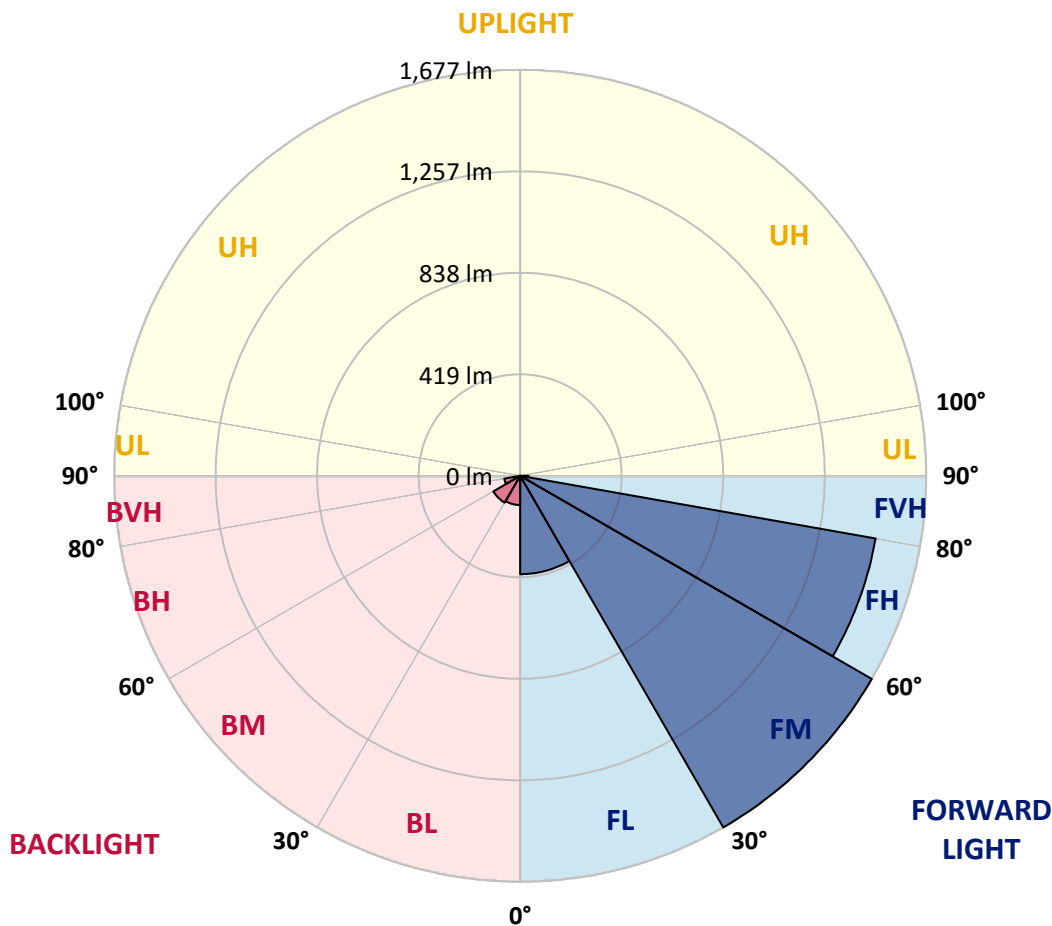
CATALOG NUMBER: ISW-SA1D-727-U-SL3-HSS

LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | Lumens | % Fixture | Zone Rating/Lumen Limit | | |
|----------------|--------|-----------|-------------------------|------|---------|
| | | | B | U | G |
| FL (0°-30°) | 406.2 | 10.4 | | | |
| FM (30°-60°) | 1676.5 | 42.7 | | | |
| FH (60°-80°) | 1490.3 | 38.0 | | | G1/1800 |
| FVH (80°-90°) | 33.6 | 0.9 | | | G1/100 |
| BL (0°-30°) | 120.7 | 3.1 | B1/500 | | |
| BM (30°-60°) | 127.9 | 3.3 | B0/220 | | |
| BH (60°-80°) | 66.6 | 1.7 | B0/110 | | G0/110 |
| 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-G1

Type III Short





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CANDELA DISTRIBUTION (FULL):

| | 0° | 5° | 15° | 25° | 35° | 45° | 55° | 58° | 65° | 75° | 85° |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0° | 1104.5 | 1104.5 | 1104.5 | 1104.5 | 1104.5 | 1104.5 | 1104.5 | 1104.5 | 1104.5 | 1104.5 | 1104.5 |
| 2.5° | 1232.9 | 1226.1 | 1222.7 | 1221.0 | 1209.2 | 1199.1 | 1178.8 | 1177.1 | 1163.6 | 1138.3 | 1113.0 |
| 5° | 1205.8 | 1210.9 | 1212.6 | 1217.7 | 1216.0 | 1216.0 | 1202.5 | 1199.1 | 1180.5 | 1145.1 | 1096.1 |
| 7.5° | 1146.7 | 1145.1 | 1148.4 | 1161.9 | 1168.7 | 1182.2 | 1180.5 | 1183.9 | 1175.4 | 1136.6 | 1067.4 |
| 10° | 1060.6 | 1064.0 | 1074.1 | 1085.9 | 1104.5 | 1128.2 | 1143.4 | 1146.7 | 1153.5 | 1121.4 | 1040.3 |
| 12.5° | 981.2 | 986.3 | 993.1 | 1016.7 | 1037.0 | 1074.1 | 1102.8 | 1109.6 | 1123.1 | 1106.2 | 1016.7 |
| 15° | 915.4 | 917.1 | 922.1 | 944.1 | 977.9 | 1025.1 | 1067.4 | 1077.5 | 1099.5 | 1092.7 | 998.1 |
| 17.5° | 863.0 | 864.7 | 871.5 | 890.0 | 917.1 | 972.8 | 1030.2 | 1047.1 | 1079.2 | 1084.3 | 977.9 |
| 20° | 834.3 | 834.3 | 834.3 | 846.1 | 873.1 | 925.5 | 993.1 | 1016.7 | 1062.3 | 1070.7 | 961.0 |
| 22.5° | 825.9 | 825.9 | 822.5 | 825.9 | 842.7 | 886.7 | 955.9 | 984.6 | 1042.0 | 1065.7 | 940.7 |
| 25° | 837.7 | 832.6 | 832.6 | 824.2 | 825.9 | 854.6 | 922.1 | 954.2 | 1030.2 | 1062.3 | 930.6 |
| 27.5° | 859.6 | 857.9 | 851.2 | 844.4 | 834.3 | 841.1 | 893.4 | 925.5 | 1018.4 | 1067.4 | 922.1 |
| 30° | 885.0 | 885.0 | 881.6 | 878.2 | 861.3 | 847.8 | 879.9 | 908.6 | 1013.3 | 1075.8 | 917.1 |
| 32.5° | 913.7 | 912.0 | 920.4 | 923.8 | 903.5 | 878.2 | 883.3 | 910.3 | 1016.7 | 1101.1 | 920.4 |
| 35° | 947.5 | 947.5 | 962.7 | 982.9 | 966.0 | 927.2 | 915.4 | 939.0 | 1033.6 | 1128.2 | 933.9 |
| 37.5° | 984.6 | 986.3 | 1013.3 | 1042.0 | 1030.2 | 996.4 | 976.2 | 984.6 | 1069.1 | 1178.8 | 964.3 |
| 40° | 1028.5 | 1028.5 | 1069.1 | 1116.3 | 1116.3 | 1077.5 | 1050.5 | 1057.2 | 1119.7 | 1251.4 | 1018.4 |
| 42.5° | 1075.8 | 1080.9 | 1138.3 | 1195.7 | 1212.6 | 1177.1 | 1148.4 | 1156.9 | 1200.8 | 1346.0 | 1097.8 |
| 45° | 1143.4 | 1158.6 | 1232.9 | 1288.6 | 1322.4 | 1305.5 | 1268.3 | 1275.1 | 1307.2 | 1482.8 | 1217.7 |
| 47.5° | 1263.3 | 1276.8 | 1341.0 | 1396.7 | 1438.9 | 1447.4 | 1430.5 | 1427.1 | 1440.6 | 1643.3 | 1369.7 |
| 50° | 1406.8 | 1418.6 | 1462.6 | 1509.8 | 1569.0 | 1619.6 | 1609.5 | 1604.4 | 1609.5 | 1818.9 | 1555.4 |
| 52.5° | 1548.7 | 1543.6 | 1596.0 | 1621.3 | 1704.1 | 1815.5 | 1859.4 | 1859.4 | 1832.4 | 2003.0 | 1737.8 |
| 55° | 1675.4 | 1697.3 | 1753.0 | 1798.6 | 1867.9 | 2001.3 | 2149.9 | 2168.5 | 2075.6 | 2185.4 | 1889.8 |
| 57.5° | 1660.2 | 1682.1 | 1785.1 | 1928.7 | 2133.0 | 2313.7 | 2459.0 | 2462.4 | 2327.3 | 2325.6 | 2077.3 |
| 60° | 1482.8 | 1484.5 | 1623.0 | 1840.9 | 2249.6 | 2764.7 | 2849.1 | 2832.2 | 2546.8 | 2521.5 | 2335.7 |
| 62.5° | 1043.7 | 1037.0 | 1216.0 | 1493.0 | 2075.6 | 3011.2 | 3440.2 | 3311.9 | 2911.6 | 2828.8 | 2577.2 |
| 65° | 608.0 | 604.6 | 673.9 | 891.7 | 1572.3 | 2837.3 | 4044.8 | 4065.1 | 3391.2 | 2985.9 | 2526.5 |
| 67.5° | 408.7 | 412.1 | 444.2 | 550.6 | 917.1 | 2225.9 | 4156.3 | 4387.7 | 3658.1 | 2904.8 | 2298.5 |
| 70° | 300.6 | 300.6 | 326.0 | 405.3 | 543.8 | 1395.0 | 3631.1 | 4000.9 | 3710.4 | 2702.2 | 1923.6 |
| 72.5° | 214.5 | 214.5 | 250.0 | 327.6 | 444.2 | 719.5 | 2698.8 | 3171.7 | 3132.8 | 2242.8 | 1330.8 |
| 75° | 136.8 | 140.2 | 179.0 | 268.5 | 405.3 | 461.1 | 1830.7 | 2298.5 | 2185.4 | 1254.8 | 567.5 |
| 77.5° | 52.4 | 59.1 | 96.3 | 197.6 | 354.7 | 383.4 | 1043.7 | 1449.0 | 1153.5 | 439.1 | 152.0 |
| 80° | 18.6 | 18.6 | 32.1 | 101.3 | 250.0 | 315.8 | 545.5 | 719.5 | 374.9 | 106.4 | 57.4 |
| 82.5° | 3.4 | 3.4 | 11.8 | 42.2 | 123.3 | 219.6 | 317.5 | 354.7 | 146.9 | 35.5 | 33.8 |
| 85° | 0.0 | 0.0 | 1.7 | 8.4 | 28.7 | 22.0 | 126.7 | 119.9 | 45.6 | 15.2 | 22.0 |
| 87.5° | 0.0 | 0.0 | 0.0 | 0.0 | 1.7 | 1.7 | 3.4 | 3.4 | 3.4 | 3.4 | 3.4 |
| 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: P438485
 CATALOG NUMBER: ISW-SA1D-727-U-SL3-HSS

CANDELA DISTRIBUTION (continued):

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0° | 1104.5 | 1104.5 | 1104.5 | 1104.5 | 1104.5 | 1104.5 | 1104.5 | 1104.5 | 1104.5 | 1104.5 | 1104.5 |
| 2.5° | 1092.7 | 1079.2 | 1040.3 | 1013.3 | 976.2 | 939.0 | 915.4 | 896.8 | 888.3 | 876.5 | 881.6 |
| 5° | 1065.7 | 1035.3 | 964.3 | 900.2 | 839.4 | 775.2 | 727.9 | 685.7 | 672.2 | 648.5 | 645.1 |
| 7.5° | 1025.1 | 982.9 | 878.2 | 776.9 | 678.9 | 597.9 | 525.2 | 469.5 | 418.8 | 396.9 | 410.4 |
| 10° | 986.3 | 928.9 | 792.1 | 657.0 | 526.9 | 413.8 | 327.6 | 260.1 | 221.2 | 204.4 | 207.7 |
| 12.5° | 949.1 | 876.5 | 702.6 | 542.1 | 383.4 | 255.0 | 185.8 | 150.3 | 138.5 | 136.8 | 133.4 |
| 15° | 917.1 | 827.5 | 623.2 | 420.5 | 255.0 | 160.4 | 131.7 | 123.3 | 121.6 | 121.6 | 121.6 |
| 17.5° | 881.6 | 776.9 | 537.1 | 309.1 | 167.2 | 125.0 | 116.5 | 114.8 | 113.2 | 113.2 | 113.2 |
| 20° | 854.6 | 733.0 | 457.7 | 216.2 | 128.4 | 111.5 | 108.1 | 108.1 | 106.4 | 106.4 | 106.4 |
| 22.5° | 825.9 | 687.4 | 380.0 | 158.8 | 109.8 | 103.0 | 99.6 | 98.0 | 98.0 | 96.3 | 96.3 |
| 25° | 798.8 | 645.1 | 305.7 | 121.6 | 98.0 | 92.9 | 89.5 | 87.8 | 87.8 | 86.1 | 84.4 |
| 27.5° | 781.9 | 611.4 | 239.8 | 103.0 | 87.8 | 84.4 | 81.1 | 77.7 | 74.3 | 72.6 | 72.6 |
| 30° | 770.1 | 570.8 | 182.4 | 89.5 | 81.1 | 76.0 | 70.9 | 65.9 | 60.8 | 59.1 | 59.1 |
| 32.5° | 753.2 | 538.7 | 140.2 | 81.1 | 72.6 | 67.6 | 60.8 | 55.7 | 50.7 | 47.3 | 47.3 |
| 35° | 753.2 | 511.7 | 108.1 | 72.6 | 65.9 | 59.1 | 54.0 | 45.6 | 40.5 | 38.8 | 37.2 |
| 37.5° | 765.1 | 481.3 | 89.5 | 67.6 | 60.8 | 54.0 | 47.3 | 38.8 | 33.8 | 32.1 | 32.1 |
| 40° | 792.1 | 471.2 | 76.0 | 60.8 | 54.0 | 47.3 | 40.5 | 32.1 | 28.7 | 25.3 | 25.3 |
| 42.5° | 847.8 | 474.6 | 67.6 | 57.4 | 49.0 | 42.2 | 33.8 | 27.0 | 23.6 | 22.0 | 22.0 |
| 45° | 928.9 | 484.7 | 62.5 | 52.4 | 43.9 | 35.5 | 28.7 | 23.6 | 18.6 | 16.9 | 16.9 |
| 47.5° | 1042.0 | 516.8 | 55.7 | 47.3 | 38.8 | 30.4 | 23.6 | 18.6 | 15.2 | 13.5 | 13.5 |
| 50° | 1177.1 | 572.5 | 52.4 | 42.2 | 35.5 | 25.3 | 18.6 | 13.5 | 10.1 | 10.1 | 10.1 |
| 52.5° | 1335.9 | 628.3 | 47.3 | 38.8 | 30.4 | 22.0 | 15.2 | 10.1 | 8.4 | 6.8 | 6.8 |
| 55° | 1469.3 | 677.2 | 42.2 | 35.5 | 25.3 | 16.9 | 11.8 | 8.4 | 6.8 | 5.1 | 5.1 |
| 57.5° | 1643.3 | 748.2 | 35.5 | 30.4 | 20.3 | 13.5 | 8.4 | 6.8 | 3.4 | 3.4 | 3.4 |
| 60° | 1876.3 | 832.6 | 30.4 | 25.3 | 15.2 | 10.1 | 6.8 | 3.4 | 3.4 | 1.7 | 1.7 |
| 62.5° | 1976.0 | 765.1 | 27.0 | 20.3 | 11.8 | 6.8 | 5.1 | 3.4 | 1.7 | 1.7 | 1.7 |
| 65° | 1866.2 | 624.9 | 22.0 | 15.2 | 8.4 | 5.1 | 3.4 | 1.7 | 1.7 | 0.0 | 0.0 |
| 67.5° | 1609.5 | 461.1 | 18.6 | 10.1 | 6.8 | 3.4 | 1.7 | 0.0 | 0.0 | 0.0 | 0.0 |
| 70° | 1312.2 | 341.2 | 13.5 | 6.8 | 3.4 | 3.4 | 1.7 | 0.0 | 0.0 | 0.0 | 0.0 |
| 72.5° | 908.6 | 206.0 | 10.1 | 5.1 | 3.4 | 1.7 | 1.7 | 0.0 | 0.0 | 0.0 | 0.0 |
| 75° | 353.0 | 81.1 | 8.4 | 5.1 | 3.4 | 1.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 77.5° | 99.6 | 28.7 | 6.8 | 3.4 | 3.4 | 1.7 | 1.7 | 1.7 | 0.0 | 0.0 | 0.0 |
| 80° | 40.5 | 15.2 | 5.1 | 3.4 | 3.4 | 3.4 | 1.7 | 1.7 | 0.0 | 0.0 | 0.0 |
| 82.5° | 25.3 | 8.4 | 3.4 | 1.7 | 1.7 | 1.7 | 1.7 | 0.0 | 0.0 | 0.0 | 0.0 |
| 85° | 16.9 | 5.1 | 3.4 | 1.7 | 1.7 | 0.0 | 0.0 | 0.0 | 0.0 | 1.7 | 1.7 |
| 87.5° | 3.4 | 3.4 | 1.7 | 1.7 | 1.7 | 1.7 | 0.0 | 0.0 | 0.0 | 0.0 | 1.7 |
| 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: SP1-1908-441-1-R4

Test Date: 08/20/2019

Luminaire Tested: SA1C-727-U-5WQ

Test Information

Test Method: LM-79-2008
 Report Number: SP1-1908-441-1-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-727-U-5WQ**
 Description: McGRAW EDISON ROADWAY AND AREA LUMINAIRE

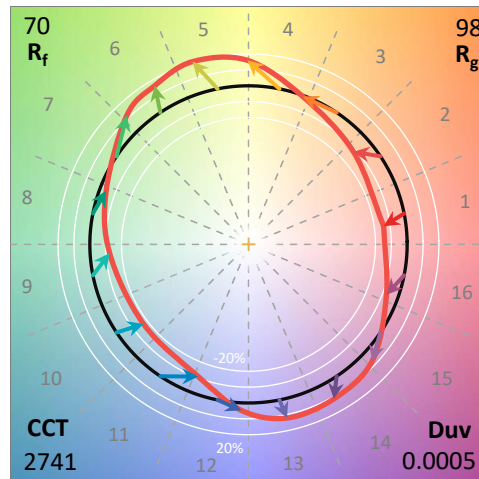
THIS IS A REVISION OF SP1-1908-441-1-R3. TO UPDATE THE CATALOG NUMBER.TESTED IN
 SITU. (1) 70 CRI, 2700K, 1050MA LIGHTSQUARE WITH 16 LEDS AND TYPE V WIDE OPTICS.

Spectral Parameters

CCT (K): 2741
 CIE u': 0.2605
 CIE v': 0.5272
 Duv: 0.0005
 CIE x: 0.4573
 CIE y: 0.4113
 CIE z: 0.1313
 Peak Wavelength (nm): 602
 Dominant Wavelength (nm): 583
 Purity: 61.2

| | | | |
|-----------|------|------|-------|
| CRI (Ra): | 71.5 | | |
| R1: | 69.2 | R9: | -16.1 |
| R2: | 79.4 | R10: | 51.4 |
| R3: | 87.8 | R11: | 63.1 |
| R4: | 69.4 | R12: | 42.0 |
| R5: | 66.4 | R13: | 70.2 |
| R6: | 69.8 | R14: | 92.4 |
| R7: | 79.8 | | |
| R8: | 50.1 | | |

Rf: 69.9
 Rg: 98.3



Test Conditions

Stabilization Time: 56M
 Operation Time: 12H
 Room Temperature (°C) / RH%: 25.3./42%
 Sphere Temperature (°C): 25.7

REPORT NUMBER: SP1-1908-441-1-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 |

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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 2700K 4-step quadrangle

REPORT NUMBER: SP1-1908-441-1-R4

Photopic Flux vs. Wavelength



Photopic Lumens: 6211.7

| λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) | λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) | λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) | λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) | λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) |
|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|
| 360 | 2044 | 0.0 | 490 | 7179 | 1.0 | 620 | 118034 | 30.7 | 750 | 8362 | 0.0 | 880 | 3128 | 0.0 |
| 365 | 2016 | 0.0 | 495 | 10476 | 1.9 | 625 | 111884 | 24.7 | 755 | 7635 | 0.0 | 885 | 3110 | 0.0 |
| 370 | 2020 | 0.0 | 500 | 15549 | 3.4 | 630 | 106119 | 19.2 | 760 | 6582 | 0.0 | 890 | 2632 | 0.0 |
| 375 | 2137 | 0.0 | 505 | 22477 | 6.3 | 635 | 99706 | 15.0 | 765 | 5777 | 0.0 | 895 | 2709 | 0.0 |
| 380 | 2046 | 0.0 | 510 | 30417 | 10.4 | 640 | 92142 | 11.0 | 770 | 5474 | 0.0 | 900 | 2016 | 0.0 |
| 385 | 1925 | 0.0 | 515 | 39274 | 16.3 | 645 | 84987 | 8.2 | 775 | 4977 | 0.0 | 905 | 1748 | 0.0 |
| 390 | 1893 | 0.0 | 520 | 47282 | 22.9 | 650 | 78016 | 5.7 | 780 | 4723 | 0.0 | 910 | 2046 | 0.0 |
| 395 | 1695 | 0.0 | 525 | 55413 | 29.7 | 655 | 71541 | 4.1 | 785 | 4219 | 0.0 | 915 | 1844 | 0.0 |
| 400 | 1633 | 0.0 | 530 | 62377 | 36.7 | 660 | 64863 | 2.7 | 790 | 3969 | 0.0 | 920 | 2734 | 0.0 |
| 405 | 2065 | 0.0 | 535 | 68520 | 42.5 | 665 | 58485 | 1.9 | 795 | 4122 | 0.0 | 925 | 2307 | 0.0 |
| 410 | 3449 | 0.0 | 540 | 73435 | 47.8 | 670 | 51641 | 1.1 | 800 | 2864 | 0.0 | 930 | 2039 | 0.0 |
| 415 | 7117 | 0.0 | 545 | 78677 | 52.4 | 675 | 46030 | 0.8 | 805 | 3151 | 0.0 | 935 | 1784 | 0.0 |
| 420 | 13992 | 0.0 | 550 | 83331 | 56.6 | 680 | 40590 | 0.5 | 810 | 3022 | 0.0 | 940 | 2464 | 0.0 |
| 425 | 25176 | 0.1 | 555 | 89120 | 60.9 | 685 | 35691 | 0.3 | 815 | 3471 | 0.0 | 945 | 2794 | 0.0 |
| 430 | 38151 | 0.3 | 560 | 94613 | 64.3 | 690 | 31631 | 0.2 | 820 | 2749 | 0.0 | 950 | 3090 | 0.0 |
| 435 | 49673 | 0.6 | 565 | 99818 | 66.4 | 695 | 27437 | 0.1 | 825 | 2729 | 0.0 | 955 | 1866 | 0.0 |
| 440 | 57273 | 0.9 | 570 | 106526 | 69.3 | 700 | 24589 | 0.1 | 830 | 2282 | 0.0 | 960 | 3110 | 0.0 |
| 445 | 54802 | 1.1 | 575 | 111610 | 69.4 | 705 | 21832 | 0.0 | 835 | 3140 | 0.0 | 965 | 3880 | 0.0 |
| 450 | 39184 | 1.0 | 580 | 117163 | 69.6 | 710 | 19500 | 0.0 | 840 | 2365 | 0.0 | 970 | 3243 | 0.0 |
| 455 | 22506 | 0.8 | 585 | 122201 | 67.9 | 715 | 17870 | 0.0 | 845 | 3024 | 0.0 | 975 | 2014 | 0.0 |
| 460 | 13692 | 0.6 | 590 | 125662 | 65.0 | 720 | 15924 | 0.0 | 850 | 2510 | 0.0 | 980 | 1688 | 0.0 |
| 465 | 9446 | 0.5 | 595 | 127415 | 60.4 | 725 | 14268 | 0.0 | 855 | 2739 | 0.0 | 985 | 2827 | 0.0 |
| 470 | 6698 | 0.4 | 600 | 129155 | 55.7 | 730 | 12438 | 0.0 | 860 | 3515 | 0.0 | 990 | 4172 | 0.0 |
| 475 | 5328 | 0.4 | 605 | 128057 | 49.6 | 735 | 11255 | 0.0 | 865 | 3600 | 0.0 | 995 | 3177 | 0.0 |
| 480 | 5081 | 0.5 | 610 | 126031 | 43.3 | 740 | 9951 | 0.0 | 870 | 3609 | 0.0 | 1000 | 3241 | 0.0 |
| 485 | 5579 | 0.7 | 615 | 123059 | 37.1 | 745 | 8870 | 0.0 | 875 | 3208 | 0.0 | | | |

REPORT NUMBER: SP1-1908-441-1-R4

Scotopic Flux vs. Wavelength



Scotopic Lumens: 6474.3

S/P: 1.04

| 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 | 2044 | 0.0 | 490 | 7179 | 6.0 | 620 | 118034 | 0.1 | 750 | 8362 | 0.0 | 880 | 3128 | 0.0 |
| 365 | 2016 | 0.0 | 495 | 10476 | 8.6 | 625 | 111884 | 0.1 | 755 | 7635 | 0.0 | 885 | 3110 | 0.0 |
| 370 | 2020 | 0.0 | 500 | 15549 | 12.5 | 630 | 106119 | 0.0 | 760 | 6582 | 0.0 | 890 | 2632 | 0.0 |
| 375 | 2137 | 0.0 | 505 | 22477 | 17.3 | 635 | 99706 | 0.0 | 765 | 5777 | 0.0 | 895 | 2709 | 0.0 |
| 380 | 2046 | 0.0 | 510 | 30417 | 21.8 | 640 | 92142 | 0.0 | 770 | 5474 | 0.0 | 900 | 2016 | 0.0 |
| 385 | 1925 | 0.0 | 515 | 39274 | 25.7 | 645 | 84987 | 0.0 | 775 | 4977 | 0.0 | 905 | 1748 | 0.0 |
| 390 | 1893 | 0.0 | 520 | 47282 | 27.5 | 650 | 78016 | 0.0 | 780 | 4723 | 0.0 | 910 | 2046 | 0.0 |
| 395 | 1695 | 0.0 | 525 | 55413 | 28.1 | 655 | 71541 | 0.0 | 785 | 4219 | 0.0 | 915 | 1844 | 0.0 |
| 400 | 1633 | 0.0 | 530 | 62377 | 27.0 | 660 | 64863 | 0.0 | 790 | 3969 | 0.0 | 920 | 2734 | 0.0 |
| 405 | 2065 | 0.0 | 535 | 68520 | 24.7 | 665 | 58485 | 0.0 | 795 | 4122 | 0.0 | 925 | 2307 | 0.0 |
| 410 | 3449 | 0.1 | 540 | 73435 | 21.5 | 670 | 51641 | 0.0 | 800 | 2864 | 0.0 | 930 | 2039 | 0.0 |
| 415 | 7117 | 0.5 | 545 | 78677 | 18.3 | 675 | 46030 | 0.0 | 805 | 3151 | 0.0 | 935 | 1784 | 0.0 |
| 420 | 13992 | 1.6 | 550 | 83331 | 15.0 | 680 | 40590 | 0.0 | 810 | 3022 | 0.0 | 940 | 2464 | 0.0 |
| 425 | 25176 | 3.9 | 555 | 89120 | 12.0 | 685 | 35691 | 0.0 | 815 | 3471 | 0.0 | 945 | 2794 | 0.0 |
| 430 | 38151 | 8.1 | 560 | 94613 | 9.3 | 690 | 31631 | 0.0 | 820 | 2749 | 0.0 | 950 | 3090 | 0.0 |
| 435 | 49673 | 13.3 | 565 | 99818 | 7.0 | 695 | 27437 | 0.0 | 825 | 2729 | 0.0 | 955 | 1866 | 0.0 |
| 440 | 57273 | 19.1 | 570 | 106526 | 5.2 | 700 | 24589 | 0.0 | 830 | 2282 | 0.0 | 960 | 3110 | 0.0 |
| 445 | 54802 | 21.6 | 575 | 111610 | 3.7 | 705 | 21832 | 0.0 | 835 | 3140 | 0.0 | 965 | 3880 | 0.0 |
| 450 | 39184 | 18.1 | 580 | 117163 | 2.6 | 710 | 19500 | 0.0 | 840 | 2365 | 0.0 | 970 | 3243 | 0.0 |
| 455 | 22506 | 11.8 | 585 | 122201 | 1.8 | 715 | 17870 | 0.0 | 845 | 3024 | 0.0 | 975 | 2014 | 0.0 |
| 460 | 13692 | 8.1 | 590 | 125662 | 1.2 | 720 | 15924 | 0.0 | 850 | 2510 | 0.0 | 980 | 1688 | 0.0 |
| 465 | 9446 | 6.2 | 595 | 127415 | 0.8 | 725 | 14268 | 0.0 | 855 | 2739 | 0.0 | 985 | 2827 | 0.0 |
| 470 | 6698 | 4.8 | 600 | 129155 | 0.5 | 730 | 12438 | 0.0 | 860 | 3515 | 0.0 | 990 | 4172 | 0.0 |
| 475 | 5328 | 4.1 | 605 | 128057 | 0.4 | 735 | 11255 | 0.0 | 865 | 3600 | 0.0 | 995 | 3177 | 0.0 |
| 480 | 5081 | 4.1 | 610 | 126031 | 0.2 | 740 | 9951 | 0.0 | 870 | 3609 | 0.0 | 1000 | 3241 | 0.0 |
| 485 | 5579 | 4.6 | 615 | 123059 | 0.1 | 745 | 8870 | 0.0 | 875 | 3208 | 0.0 | | | |

REPORT NUMBER: SP1-1908-441-1-R4

Melanopic Flux vs. Wavelength



Melanopic Lumens: 2145.7 M/P: 0.35

| λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) | λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) | λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) | λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) | λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) |
|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|
| 360 | 2044 | 0.0 | 490 | 7179 | 11.1 | 620 | 118034 | 1.5 | 750 | 8362 | 0.0 | 880 | 3128 | 0.0 |
| 365 | 2016 | 0.0 | 495 | 10476 | 16.9 | 625 | 111884 | 0.9 | 755 | 7635 | 0.0 | 885 | 3110 | 0.0 |
| 370 | 2020 | 0.0 | 500 | 15549 | 26.0 | 630 | 106119 | 0.6 | 760 | 6582 | 0.0 | 890 | 2632 | 0.0 |
| 375 | 2137 | 0.0 | 505 | 22477 | 38.2 | 635 | 99706 | 0.4 | 765 | 5777 | 0.0 | 895 | 2709 | 0.0 |
| 380 | 2046 | 0.0 | 510 | 30417 | 51.6 | 640 | 92142 | 0.2 | 770 | 5474 | 0.0 | 900 | 2016 | 0.0 |
| 385 | 1925 | 0.0 | 515 | 39274 | 65.1 | 645 | 84987 | 0.1 | 775 | 4977 | 0.0 | 905 | 1748 | 0.0 |
| 390 | 1893 | 0.0 | 520 | 47282 | 75.2 | 650 | 78016 | 0.1 | 780 | 4723 | 0.0 | 910 | 2046 | 0.0 |
| 395 | 1695 | 0.0 | 525 | 55413 | 82.9 | 655 | 71541 | 0.1 | 785 | 4219 | 0.0 | 915 | 1844 | 0.0 |
| 400 | 1633 | 0.0 | 530 | 62377 | 86.0 | 660 | 64863 | 0.0 | 790 | 3969 | 0.0 | 920 | 2734 | 0.0 |
| 405 | 2065 | 0.1 | 535 | 68520 | 85.4 | 665 | 58485 | 0.0 | 795 | 4122 | 0.0 | 925 | 2307 | 0.0 |
| 410 | 3449 | 0.2 | 540 | 73435 | 81.1 | 670 | 51641 | 0.0 | 800 | 2864 | 0.0 | 930 | 2039 | 0.0 |
| 415 | 7117 | 0.7 | 545 | 78677 | 75.4 | 675 | 46030 | 0.0 | 805 | 3151 | 0.0 | 935 | 1784 | 0.0 |
| 420 | 13992 | 2.3 | 550 | 83331 | 68.1 | 680 | 40590 | 0.0 | 810 | 3022 | 0.0 | 940 | 2464 | 0.0 |
| 425 | 25176 | 6.2 | 555 | 89120 | 60.9 | 685 | 35691 | 0.0 | 815 | 3471 | 0.0 | 945 | 2794 | 0.0 |
| 430 | 38151 | 13.0 | 560 | 94613 | 52.9 | 690 | 31631 | 0.0 | 820 | 2749 | 0.0 | 950 | 3090 | 0.0 |
| 435 | 49673 | 22.2 | 565 | 99818 | 44.8 | 695 | 27437 | 0.0 | 825 | 2729 | 0.0 | 955 | 1866 | 0.0 |
| 440 | 57273 | 32.0 | 570 | 106526 | 37.6 | 700 | 24589 | 0.0 | 830 | 2282 | 0.0 | 960 | 3110 | 0.0 |
| 445 | 54802 | 36.7 | 575 | 111610 | 30.4 | 705 | 21832 | 0.0 | 835 | 3140 | 0.0 | 965 | 3880 | 0.0 |
| 450 | 39184 | 30.4 | 580 | 117163 | 24.1 | 710 | 19500 | 0.0 | 840 | 2365 | 0.0 | 970 | 3243 | 0.0 |
| 455 | 22506 | 19.7 | 585 | 122201 | 18.7 | 715 | 17870 | 0.0 | 845 | 3024 | 0.0 | 975 | 2014 | 0.0 |
| 460 | 13692 | 13.2 | 590 | 125662 | 14.0 | 720 | 15924 | 0.0 | 850 | 2510 | 0.0 | 980 | 1688 | 0.0 |
| 465 | 9446 | 10.0 | 595 | 127415 | 10.2 | 725 | 14268 | 0.0 | 855 | 2739 | 0.0 | 985 | 2827 | 0.0 |
| 470 | 6698 | 7.7 | 600 | 129155 | 7.3 | 730 | 12438 | 0.0 | 860 | 3515 | 0.0 | 990 | 4172 | 0.0 |
| 475 | 5328 | 6.7 | 605 | 128057 | 5.0 | 735 | 11255 | 0.0 | 865 | 3600 | 0.0 | 995 | 3177 | 0.0 |
| 480 | 5081 | 6.9 | 610 | 126031 | 3.4 | 740 | 9951 | 0.0 | 870 | 3609 | 0.0 | 1000 | 3241 | 0.0 |
| 485 | 5579 | 8.1 | 615 | 123059 | 2.3 | 745 | 8870 | 0.0 | 875 | 3208 | 0.0 | | | |

REPORT NUMBER: SP1-1908-441-1-R4

TM-30-18

Summary

$R_f = 69.9$
 $R_g = 98.3$
 CIE $R_a = 71.5$
 $R_9 = -16.1$



Color Vector Graphics



REPORT NUMBER: SP1-1908-441-1-R4

TM-30-18

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

| | | | |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 54 | CES51 = 77 | CES76 = 48 |
| CES02 = 63 | CES27 = 74 | CES52 = 80 | CES77 = 75 |
| CES03 = 31 | CES28 = 80 | CES53 = 66 | CES78 = 56 |
| CES04 = 71 | CES29 = 44 | CES54 = 77 | CES79 = 81 |
| CES05 = 50 | CES30 = 46 | CES55 = 74 | CES80 = 80 |
| CES06 = 52 | CES31 = 50 | CES56 = 63 | CES81 = 73 |
| CES07 = 42 | CES32 = 49 | CES57 = 60 | CES82 = 91 |
| CES08 = 41 | CES33 = 53 | CES58 = 63 | CES83 = 84 |
| CES09 = 29 | CES34 = 66 | CES59 = 85 | CES84 = 90 |
| CES10 = 77 | CES35 = 82 | CES60 = 89 | CES85 = 87 |
| CES11 = 60 | CES36 = 78 | CES61 = 85 | CES86 = 65 |
| CES12 = 66 | CES37 = 75 | CES62 = 69 | CES87 = 78 |
| CES13 = 43 | CES38 = 53 | CES63 = 68 | CES88 = 73 |
| CES14 = 74 | CES39 = 91 | CES64 = 68 | CES89 = 68 |
| CES15 = 71 | CES40 = 85 | CES65 = 65 | CES90 = 68 |
| CES16 = 48 | CES41 = 76 | CES66 = 62 | CES91 = 91 |
| CES17 = 50 | CES42 = 76 | CES67 = 60 | CES92 = 71 |
| CES18 = 57 | CES43 = 65 | CES68 = 68 | CES93 = 82 |
| CES19 = 73 | CES44 = 98 | CES69 = 77 | CES94 = 57 |
| CES20 = 67 | CES45 = 75 | CES70 = 60 | CES95 = 78 |
| CES21 = 88 | CES46 = 70 | CES71 = 57 | CES96 = 80 |
| CES22 = 80 | CES47 = 63 | CES72 = 86 | CES97 = 79 |
| CES23 = 92 | CES48 = 51 | CES73 = 52 | CES98 = 71 |
| CES24 = 91 | CES49 = 68 | CES74 = 90 | CES99 = 64 |
| CES25 = 73 | CES50 = 77 | CES75 = 58 | |



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Color Rendition by Hue-Angle Bin



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Measure Comparisons



(END OF REPORT)