

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: P322796

Luminaire Tested: **GLEON-SA2B-727-U-T4W-HSS**

Issue Date: 3/3/2020

Test Information

Test Method: LM-79-08
Report Number: P322796
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 (FORMERLY EATON)
Product Line: McGRAW-EDISON
Catalog Number: GLEON-SA2B-727-U-T4W-HSS
Description: GALLEON AREA AND ROADWAY LUMINAIRE
(2) 70 CRI, 2700K, 800mA 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: 7088 lumens
Efficiency: N/A
Efficacy: 83.4 lumens/watt
Luminous Opening: Rectangular (W 0.5' x L: 1' x H: 0')
IES Classification: Type IV - Short
BUG Rating: B1 - U0 - G2

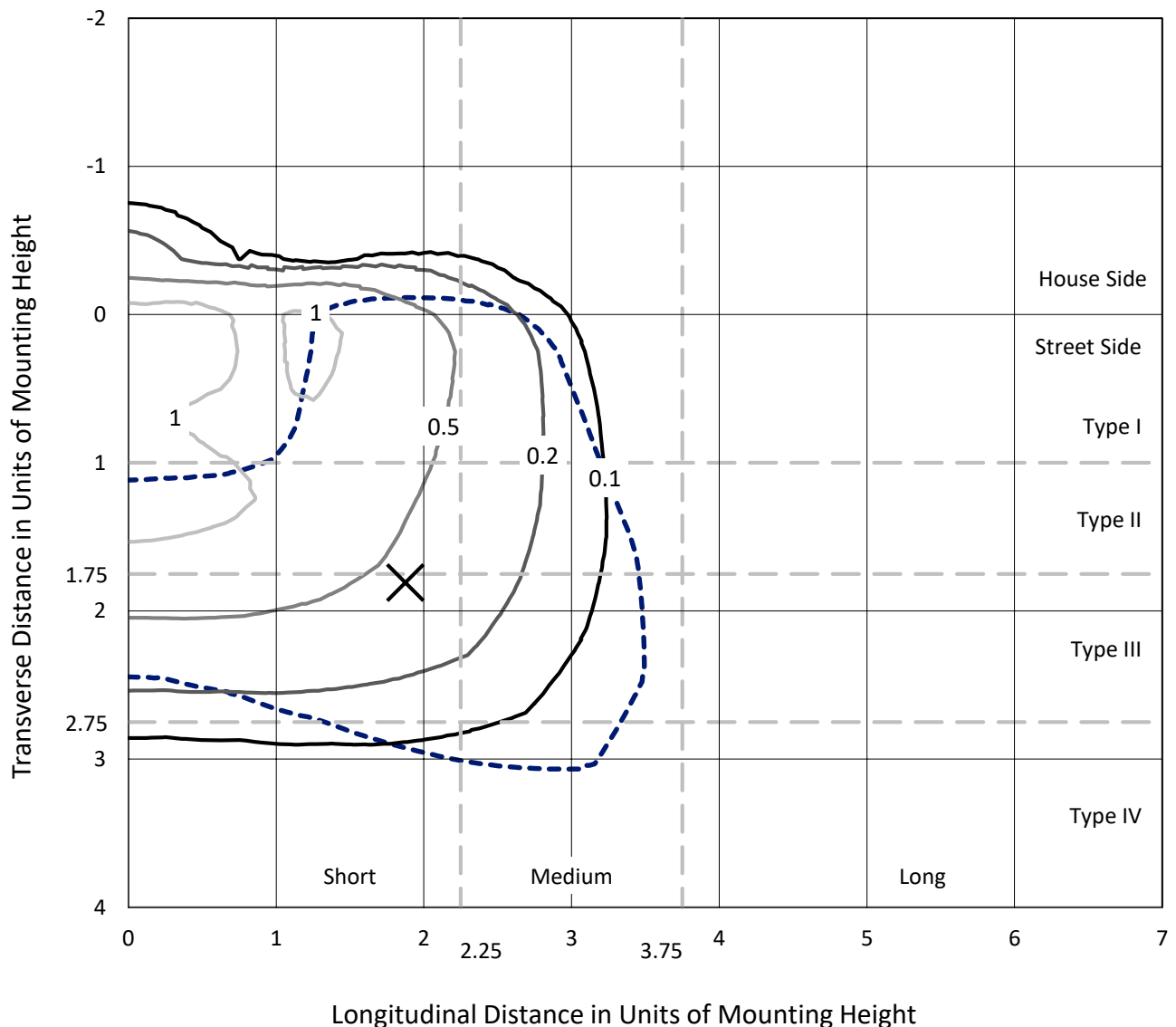
Input Watts (W): 85
Input Voltage (V): NR
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 24 FT



REPORT NUMBER: P322796
 CATALOG NUMBER: GLEON-SA2B-727-U-T4W-HSS

Iso-Footcandle Lines of Horizontal Illumination

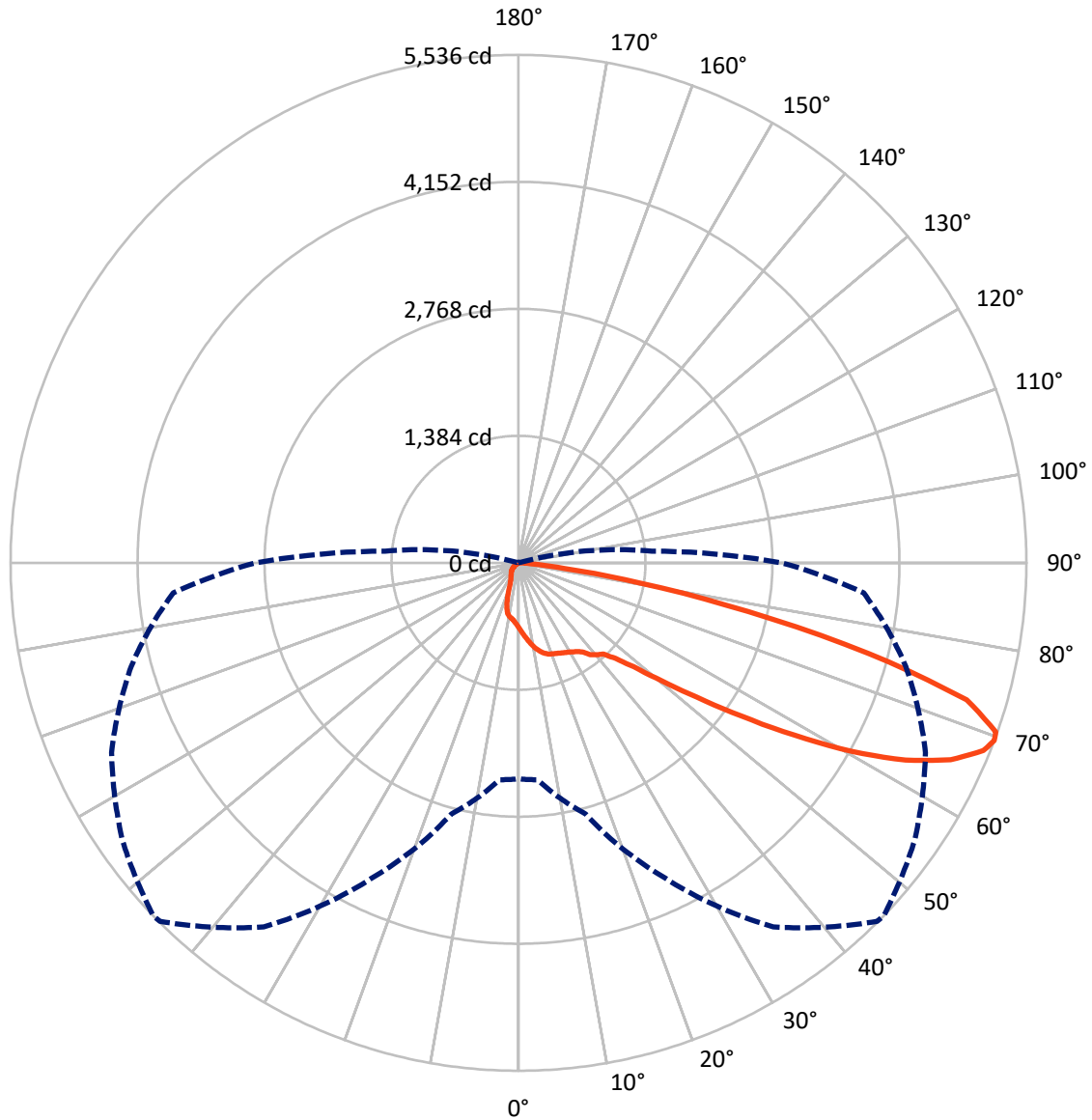
✕ Max cd
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 1.7 fc
 Type IV - Short - N/A

REPORT NUMBER: P322796
CATALOG NUMBER: GLEON-SA2B-727-U-T4W-HSS

Luminous Intensity Polar Plot



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

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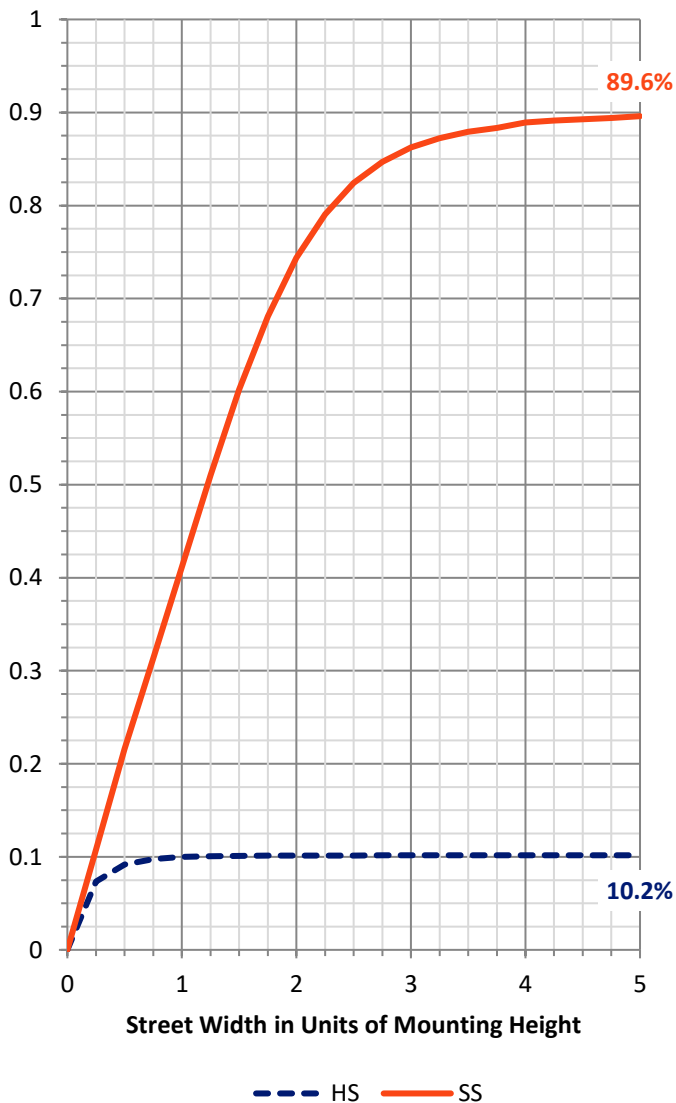
FLUX DISTRIBUTION:

| | | Downward | Upward | Total |
|--------------------|-----------|----------|--------|--------|
| House Side | Lumens | 727.4 | 0.0 | 727.4 |
| | % Fixture | 10.3 | 0.0 | 10.3 |
| Street Side | Lumens | 6360.6 | 0.0 | 6360.6 |
| | % Fixture | 89.7 | 0.0 | 89.7 |
| Total | Lumens | 7088.0 | 0.0 | 7088.0 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10° | 70.7 | 1.0 |
| 10°-20° | 214.5 | 3.0 |
| 20°-30° | 337.3 | 4.8 |
| 30°-40° | 483.6 | 6.8 |
| 40°-50° | 835.9 | 11.8 |
| 50°-60° | 1651.4 | 23.3 |
| 60°-70° | 2308.0 | 32.6 |
| 70°-80° | 1115.0 | 15.7 |
| 80°-90° | 71.7 | 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° | 7088.0 | 100.0 |
| 0°-180° | 7088.0 | 100.0 |

Coefficient of Utilization

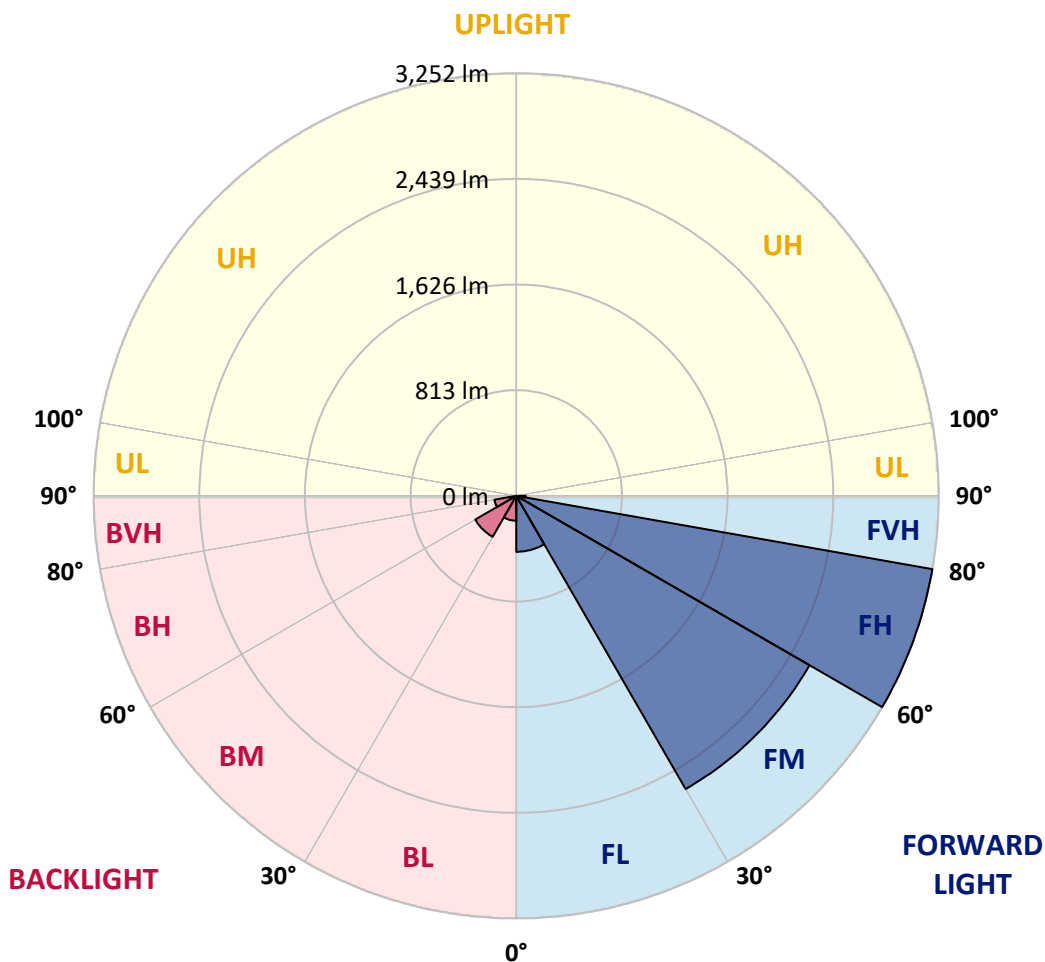


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LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | Lumens | % Fixture | Zone Rating/Lumen Limit | | |
|----------------|--------|-----------|-------------------------|------|---------|
| | | | B | U | G |
| FL (0°-30°) | 430.7 | 6.1 | | | |
| FM (30°-60°) | 2606.4 | 36.8 | | | |
| FH (60°-80°) | 3252.4 | 45.9 | | | G2/5000 |
| FVH (80°-90°) | 71.1 | 1.0 | | | G1/100 |
| BL (0°-30°) | 191.7 | 2.7 | B1/500 | | |
| BM (30°-60°) | 364.5 | 5.1 | B1/1000 | | |
| BH (60°-80°) | 170.6 | 2.4 | B1/500 | | G1/500 |
| BVH (80°-90°) | 0.6 | 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-G2
 Type IV Short





REPORT NUMBER: P322796

CATALOG NUMBER: GLEON-SA2B-727-U-T4W-HSS

CANDELA DISTRIBUTION (FULL):

| | 0° | 5° | 15° | 25° | 35° | 45° | 46° | 55° | 65° | 75° | 85° |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0° | 710.2 | 710.2 | 710.2 | 710.2 | 710.2 | 710.2 | 710.2 | 710.2 | 710.2 | 710.2 | 710.2 |
| 2.5° | 789.0 | 788.0 | 783.3 | 781.3 | 770.0 | 763.4 | 760.7 | 752.4 | 740.4 | 728.5 | 715.2 |
| 5° | 878.7 | 878.4 | 869.7 | 861.4 | 840.1 | 820.2 | 816.5 | 797.3 | 770.3 | 745.1 | 719.8 |
| 7.5° | 970.4 | 966.1 | 957.4 | 941.5 | 910.6 | 878.7 | 875.7 | 848.4 | 810.2 | 773.7 | 737.4 |
| 10° | 1048.2 | 1045.5 | 1034.2 | 1010.0 | 973.7 | 937.5 | 933.8 | 900.3 | 857.1 | 812.2 | 766.0 |
| 12.5° | 1108.7 | 1106.7 | 1091.7 | 1061.5 | 1022.9 | 985.4 | 980.4 | 950.5 | 904.3 | 854.1 | 799.6 |
| 15° | 1145.5 | 1144.5 | 1126.3 | 1094.0 | 1056.1 | 1023.6 | 1019.3 | 993.0 | 950.1 | 897.6 | 836.1 |
| 17.5° | 1154.2 | 1154.5 | 1135.6 | 1103.0 | 1071.8 | 1048.5 | 1045.2 | 1025.2 | 989.3 | 937.2 | 872.7 |
| 20° | 1134.9 | 1138.9 | 1121.9 | 1093.7 | 1074.4 | 1062.1 | 1059.5 | 1047.5 | 1017.3 | 968.1 | 901.9 |
| 22.5° | 1107.7 | 1109.7 | 1098.0 | 1079.1 | 1071.1 | 1073.4 | 1072.1 | 1065.5 | 1039.9 | 994.7 | 930.9 |
| 25° | 1091.0 | 1091.0 | 1084.1 | 1068.1 | 1073.4 | 1087.7 | 1088.1 | 1086.7 | 1066.4 | 1027.2 | 966.1 |
| 27.5° | 1090.4 | 1088.4 | 1080.4 | 1068.4 | 1083.1 | 1105.0 | 1106.3 | 1115.3 | 1102.7 | 1066.8 | 1010.0 |
| 30° | 1117.0 | 1114.6 | 1097.7 | 1082.1 | 1100.7 | 1124.3 | 1127.6 | 1147.2 | 1140.9 | 1109.7 | 1058.8 |
| 32.5° | 1179.1 | 1170.8 | 1133.2 | 1107.7 | 1121.6 | 1149.9 | 1154.2 | 1185.4 | 1195.4 | 1162.5 | 1106.0 |
| 35° | 1264.2 | 1237.9 | 1183.8 | 1156.2 | 1157.5 | 1187.1 | 1191.1 | 1236.9 | 1266.5 | 1211.0 | 1142.6 |
| 37.5° | 1381.5 | 1368.5 | 1280.5 | 1206.7 | 1212.7 | 1257.5 | 1269.2 | 1319.0 | 1310.7 | 1237.6 | 1184.1 |
| 40° | 1638.7 | 1618.5 | 1524.7 | 1348.3 | 1265.5 | 1314.7 | 1318.4 | 1344.9 | 1345.6 | 1297.8 | 1270.5 |
| 42.5° | 1989.0 | 1980.7 | 1882.0 | 1605.2 | 1369.5 | 1352.9 | 1359.6 | 1404.4 | 1454.6 | 1424.7 | 1423.4 |
| 45° | 2376.8 | 2372.5 | 2267.8 | 1946.1 | 1579.9 | 1478.2 | 1486.5 | 1546.7 | 1642.7 | 1649.4 | 1691.6 |
| 47.5° | 2688.9 | 2686.9 | 2626.7 | 2326.6 | 1901.9 | 1690.6 | 1693.2 | 1757.0 | 1925.9 | 2009.3 | 2076.7 |
| 50° | 2973.4 | 2983.0 | 2935.5 | 2738.4 | 2340.6 | 2023.2 | 2016.9 | 2059.5 | 2330.6 | 2467.2 | 2551.0 |
| 52.5° | 3368.8 | 3382.5 | 3249.2 | 3122.6 | 2800.9 | 2436.0 | 2431.0 | 2475.5 | 2817.2 | 2919.5 | 2934.5 |
| 55° | 3718.1 | 3694.9 | 3589.5 | 3552.9 | 3362.2 | 2945.8 | 2944.5 | 2983.7 | 3287.7 | 3331.3 | 3358.9 |
| 57.5° | 3872.3 | 3863.3 | 3914.2 | 3997.9 | 3950.1 | 3548.3 | 3545.3 | 3515.4 | 3708.8 | 3713.5 | 3798.2 |
| 60° | 3969.7 | 3980.7 | 4136.5 | 4394.7 | 4514.1 | 4196.7 | 4177.4 | 3994.9 | 4110.9 | 4100.6 | 4191.4 |
| 62.5° | 3896.6 | 3918.2 | 4198.7 | 4629.0 | 4936.1 | 4762.6 | 4735.4 | 4434.3 | 4454.6 | 4419.0 | 4503.4 |
| 65° | 3508.4 | 3542.0 | 4001.6 | 4584.8 | 5145.5 | 5205.0 | 5177.4 | 4822.1 | 4727.4 | 4668.9 | 4622.1 |
| 67.5° | 2848.7 | 2868.7 | 3348.6 | 4200.3 | 5051.1 | 5468.8 | 5463.2 | 5162.1 | 4933.5 | 4626.7 | 4263.1 |
| 69° | 2354.2 | 2373.8 | 2835.8 | 3795.6 | 4843.4 | 5525.3 | 5536.3 | 5271.1 | 4894.2 | 4370.2 | 3777.3 |
| 70° | 1994.0 | 2014.9 | 2445.3 | 3448.6 | 4602.5 | 5499.1 | 5518.7 | 5260.8 | 4781.9 | 4073.0 | 3350.9 |
| 72.5° | 1045.8 | 1063.8 | 1505.5 | 2375.8 | 3752.0 | 5049.4 | 5108.9 | 4816.1 | 4053.4 | 2958.1 | 1981.4 |
| 75° | 328.7 | 339.0 | 587.9 | 1241.9 | 2568.9 | 3926.2 | 3939.8 | 3777.9 | 2878.3 | 1627.1 | 825.2 |
| 77.5° | 125.3 | 122.3 | 195.7 | 457.6 | 1298.7 | 2472.2 | 2555.6 | 2360.9 | 1510.4 | 575.3 | 190.4 |
| 80° | 67.5 | 67.8 | 101.7 | 189.4 | 555.7 | 1270.5 | 1341.0 | 1144.2 | 536.7 | 179.5 | 43.9 |
| 82.5° | 29.2 | 30.6 | 57.2 | 100.4 | 255.2 | 468.6 | 503.8 | 419.4 | 205.0 | 120.6 | 16.3 |
| 85° | 6.3 | 7.0 | 27.6 | 54.5 | 104.0 | 131.6 | 137.9 | 135.9 | 130.6 | 93.7 | 6.3 |
| 87.5° | 0.0 | 0.0 | 12.3 | 19.6 | 26.3 | 29.9 | 26.3 | 34.2 | 72.1 | 63.1 | 3.3 |
| 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: P322796

CATALOG NUMBER: GLEON-SA2B-727-U-T4W-HSS

CANDELA DISTRIBUTION (continued):

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|-------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0° | 710.2 | 710.2 | 710.2 | 710.2 | 710.2 | 710.2 | 710.2 | 710.2 | 710.2 | 710.2 | 710.2 |
| 2.5° | 710.9 | 704.9 | 694.6 | 683.3 | 675.3 | 667.0 | 660.3 | 657.4 | 654.0 | 651.7 | 654.7 |
| 5° | 709.5 | 697.9 | 678.0 | 658.7 | 644.7 | 633.4 | 624.1 | 620.5 | 616.8 | 614.1 | 613.8 |
| 7.5° | 721.2 | 704.9 | 674.3 | 646.1 | 624.4 | 609.2 | 596.5 | 591.2 | 586.9 | 584.9 | 583.2 |
| 10° | 743.4 | 722.5 | 681.6 | 644.7 | 616.8 | 590.9 | 563.6 | 542.7 | 529.1 | 522.8 | 520.4 |
| 12.5° | 772.3 | 746.1 | 695.6 | 651.7 | 611.2 | 561.3 | 503.5 | 453.6 | 421.4 | 410.8 | 404.4 |
| 15° | 806.2 | 773.7 | 713.8 | 660.7 | 590.6 | 499.5 | 401.5 | 336.3 | 306.4 | 300.4 | 293.8 |
| 17.5° | 838.8 | 802.9 | 735.8 | 662.3 | 545.4 | 399.1 | 294.1 | 249.9 | 238.3 | 242.3 | 243.3 |
| 20° | 867.4 | 831.8 | 757.4 | 647.7 | 463.3 | 299.4 | 227.6 | 216.7 | 221.0 | 228.6 | 230.0 |
| 22.5° | 896.3 | 859.7 | 777.3 | 609.2 | 358.3 | 227.3 | 205.0 | 207.7 | 212.0 | 219.7 | 221.0 |
| 25° | 931.5 | 893.6 | 795.9 | 538.4 | 268.9 | 193.4 | 194.7 | 198.7 | 203.1 | 210.0 | 210.7 |
| 27.5° | 972.1 | 936.5 | 808.2 | 446.3 | 199.4 | 177.8 | 182.1 | 188.1 | 192.4 | 199.1 | 200.4 |
| 30° | 1025.9 | 993.0 | 812.2 | 350.9 | 167.2 | 163.8 | 165.8 | 173.1 | 179.5 | 185.4 | 186.4 |
| 32.5° | 1076.4 | 1048.8 | 798.9 | 264.9 | 154.9 | 150.9 | 150.9 | 155.2 | 162.5 | 168.2 | 169.5 |
| 35° | 1122.9 | 1105.0 | 756.4 | 193.7 | 145.6 | 138.9 | 135.6 | 135.6 | 140.2 | 144.9 | 146.2 |
| 37.5° | 1184.4 | 1183.8 | 687.6 | 154.5 | 136.6 | 128.9 | 122.0 | 116.6 | 115.0 | 116.0 | 116.6 |
| 40° | 1289.8 | 1290.8 | 597.9 | 138.6 | 128.9 | 118.6 | 108.0 | 98.4 | 89.4 | 86.4 | 86.1 |
| 42.5° | 1454.3 | 1439.3 | 503.8 | 130.9 | 122.3 | 108.0 | 92.1 | 79.1 | 65.1 | 60.8 | 60.5 |
| 45° | 1715.5 | 1626.8 | 404.1 | 124.0 | 115.3 | 96.0 | 76.1 | 58.5 | 47.2 | 43.9 | 43.9 |
| 47.5° | 2096.0 | 1873.0 | 313.1 | 116.3 | 106.0 | 82.4 | 57.5 | 42.2 | 34.6 | 32.9 | 33.2 |
| 50° | 2489.5 | 2114.3 | 239.9 | 106.7 | 94.7 | 68.1 | 42.5 | 30.6 | 26.3 | 26.3 | 26.6 |
| 52.5° | 2838.4 | 2291.1 | 187.1 | 96.4 | 80.8 | 53.5 | 32.2 | 23.9 | 21.9 | 21.6 | 21.9 |
| 55° | 3165.1 | 2405.1 | 143.2 | 84.4 | 64.1 | 39.9 | 24.6 | 19.6 | 18.3 | 17.6 | 17.3 |
| 57.5° | 3480.2 | 2461.6 | 107.3 | 68.1 | 46.5 | 28.9 | 19.6 | 16.6 | 15.3 | 14.3 | 14.0 |
| 60° | 3689.9 | 2415.7 | 73.8 | 50.2 | 32.2 | 20.9 | 16.3 | 14.3 | 12.6 | 11.6 | 11.3 |
| 62.5° | 3808.2 | 2290.4 | 47.5 | 36.2 | 22.9 | 15.6 | 13.0 | 12.0 | 9.6 | 8.6 | 8.6 |
| 65° | 3760.3 | 2083.7 | 33.2 | 25.9 | 16.6 | 11.6 | 9.6 | 9.6 | 7.0 | 5.6 | 5.3 |
| 67.5° | 3332.3 | 1760.4 | 25.3 | 19.3 | 12.0 | 8.6 | 7.3 | 8.3 | 4.3 | 2.7 | 2.7 |
| 69° | 2867.0 | 1458.9 | 21.6 | 16.0 | 10.0 | 7.0 | 6.3 | 7.6 | 3.0 | 2.0 | 1.7 |
| 70° | 2491.8 | 1258.5 | 19.6 | 14.0 | 8.3 | 6.0 | 5.6 | 7.3 | 3.0 | 1.7 | 1.3 |
| 72.5° | 1490.8 | 701.9 | 15.0 | 10.0 | 5.3 | 4.7 | 4.7 | 8.3 | 3.0 | 1.7 | 1.3 |
| 75° | 602.5 | 247.3 | 11.0 | 7.0 | 4.0 | 4.0 | 5.6 | 10.6 | 2.7 | 1.3 | 1.0 |
| 77.5° | 136.6 | 54.2 | 6.3 | 4.3 | 2.7 | 4.0 | 6.6 | 8.3 | 1.7 | 0.7 | 0.0 |
| 80° | 33.2 | 13.3 | 4.0 | 2.7 | 1.7 | 3.0 | 5.0 | 4.7 | 0.3 | 0.0 | 0.0 |
| 82.5° | 11.0 | 4.7 | 1.7 | 1.3 | 0.3 | 1.0 | 2.3 | 1.3 | 0.0 | 0.0 | 0.0 |
| 85° | 4.7 | 2.7 | 0.7 | 0.3 | 0.0 | 0.0 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 |
| 87.5° | 3.0 | 1.0 | 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: SP1-1908-441-1-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 |

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

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

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

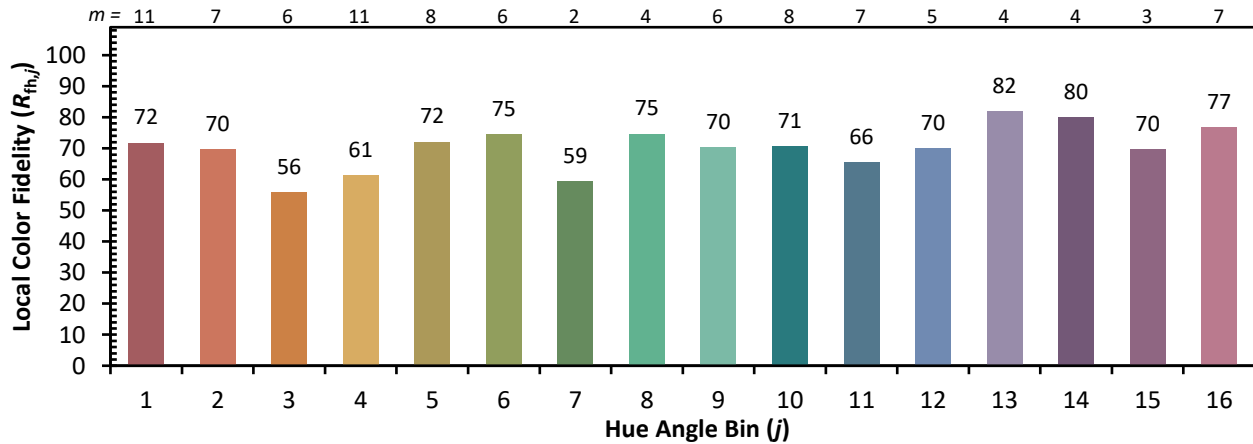
| | | | |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 54 | CES51 = 77 | CES76 = 48 |
| CES02 = 63 | CES27 = 74 | CES52 = 80 | CES77 = 75 |
| CES03 = 31 | CES28 = 80 | CES53 = 66 | CES78 = 56 |
| CES04 = 71 | CES29 = 44 | CES54 = 77 | CES79 = 81 |
| CES05 = 50 | CES30 = 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)