

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: P317375

Luminaire Tested: **GLEON-SA1D-727-U-T2R**

Issue Date: 3/3/2020

Test Information

Test Method: LM-79-08
Report Number: P317375
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-8)
Test Lab: INNOVATION CENTER
Issue Date: 3/3/2020
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: McGRAW-EDISON
Catalog Number: GLEON-SA1D-727-U-T2R
Description: GALLEON AREA AND ROADWAY LUMINAIRE
(1) 70 CRI, 2700K, 1200mA LIGHTSQUARE WITH 16 LEDS AND TYPE II ROADWAY OPTICS
Light Source: -
Ballast/Driver: ELECTRONIC DRIVER

Summary

Lumens per Lamp: N/A
Luminaire Lumens: 7078 lumens
Efficiency: N/A
Efficacy: 105.6 lumens/watt
Luminous Opening: Rectangular (W 0.5' x L: 0.5' x H: 0')
IES Classification: Type II - Short
BUG Rating: B1 - U0 - G1

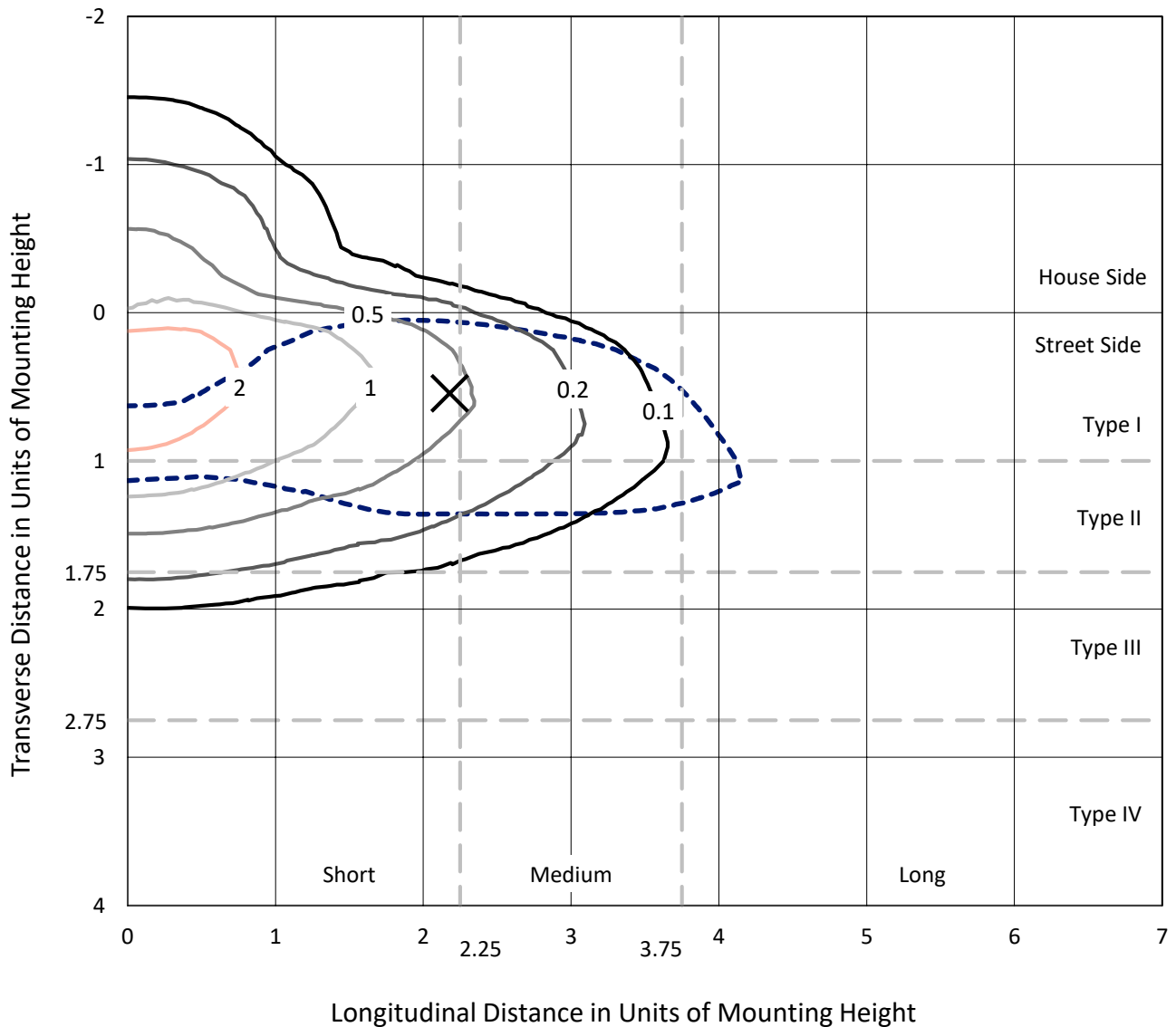
Input Watts (W): 67
Input Voltage (V): NR
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 24 FT



REPORT NUMBER: P317375
 CATALOG NUMBER: GLEON-SA1D-727-U-T2R

Iso-Footcandle Lines of Horizontal Illumination

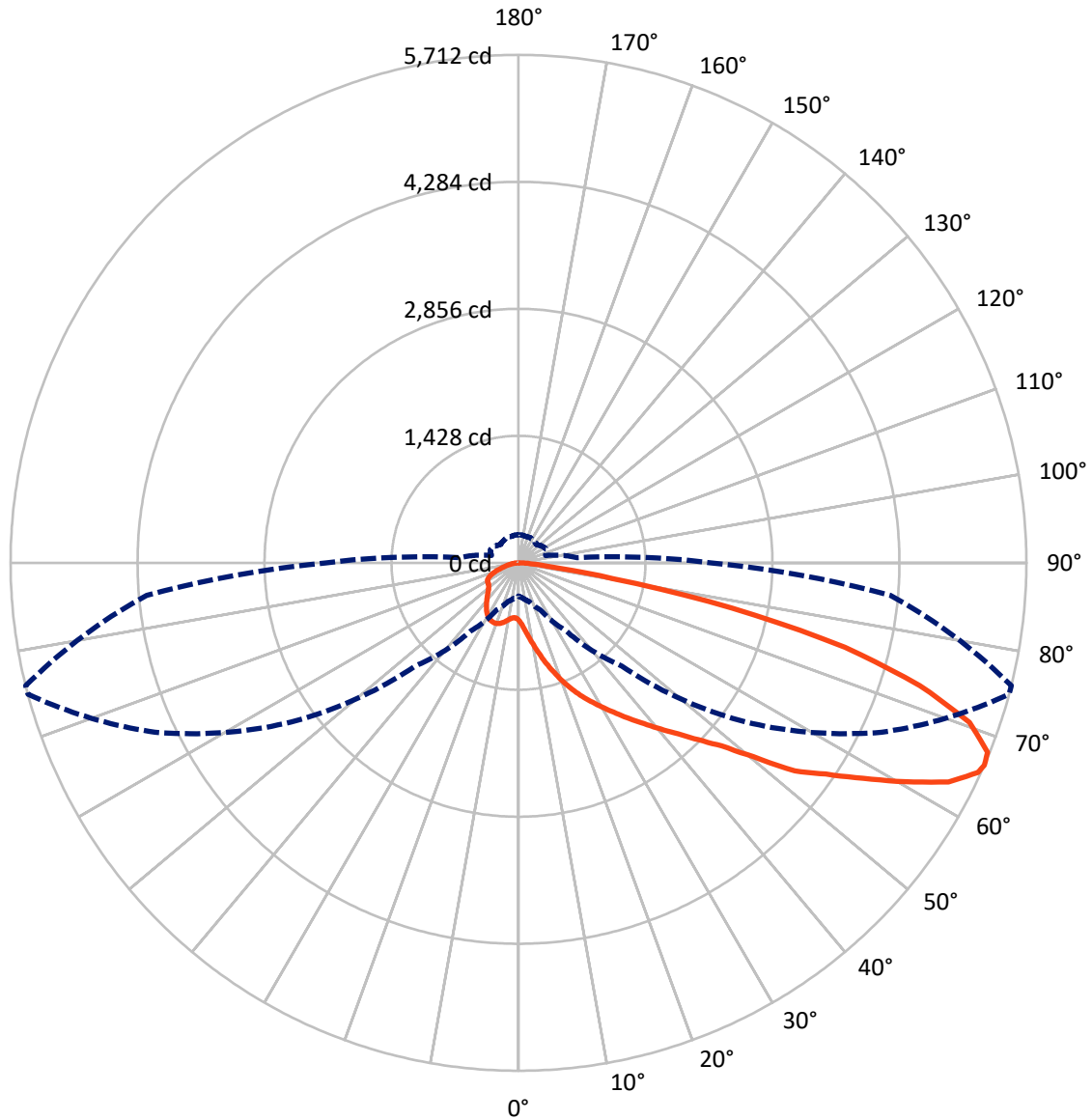
✕ Max cd
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 2.7 fc
 Type II - Short - N/A

REPORT NUMBER: P317375
CATALOG NUMBER: GLEON-SA1D-727-U-T2R

Luminous Intensity Polar Plot



— Vertical Plane Through 76-Deg Lateral - - - Horizontal Cone Through 66-Deg Vertical



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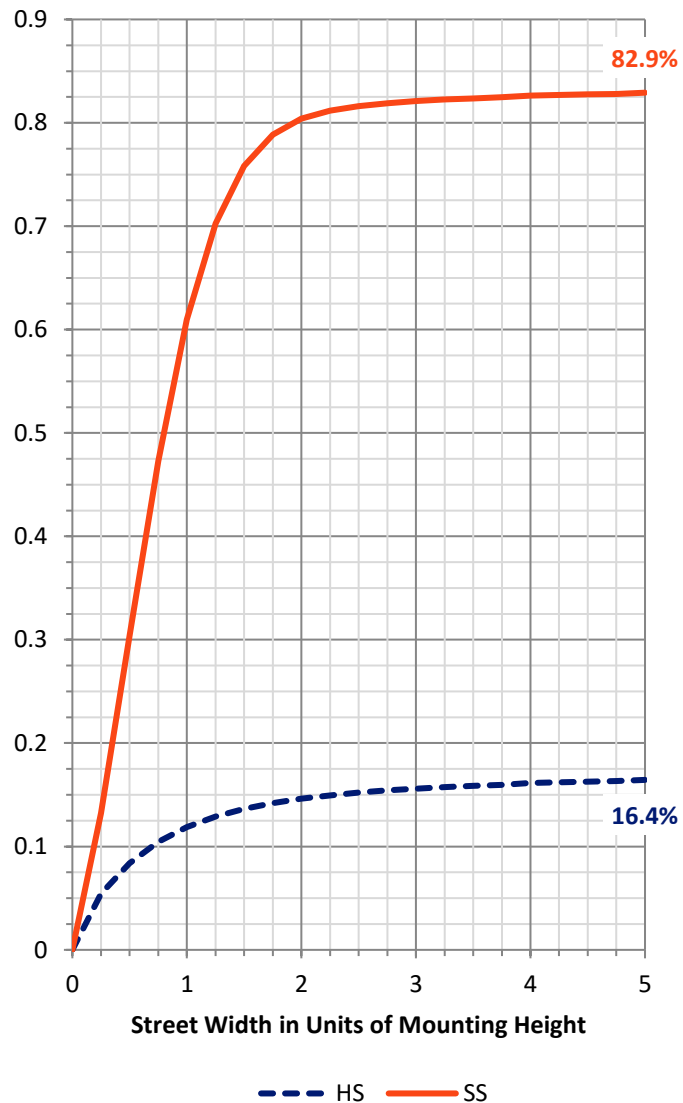
FLUX DISTRIBUTION:

| | | Downward | Upward | Total |
|--------------------|-----------|----------|--------|--------|
| House Side | Lumens | 1191.0 | 0.0 | 1191.0 |
| | % Fixture | 16.8 | 0.0 | 16.8 |
| Street Side | Lumens | 5887.0 | 0.0 | 5887.0 |
| | % Fixture | 83.2 | 0.0 | 83.2 |
| Total | Lumens | 7078.0 | 0.0 | 7078.0 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10° | 78.2 | 1.1 |
| 10°-20° | 308.7 | 4.4 |
| 20°-30° | 599.8 | 8.5 |
| 30°-40° | 979.0 | 13.8 |
| 40°-50° | 1337.6 | 18.9 |
| 50°-60° | 1558.0 | 22.0 |
| 60°-70° | 1396.8 | 19.7 |
| 70°-80° | 705.9 | 10.0 |
| 80°-90° | 114.0 | 1.6 |
| 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° | 7078.0 | 100.0 |
| 0°-180° | 7078.0 | 100.0 |

Coefficient of Utilization

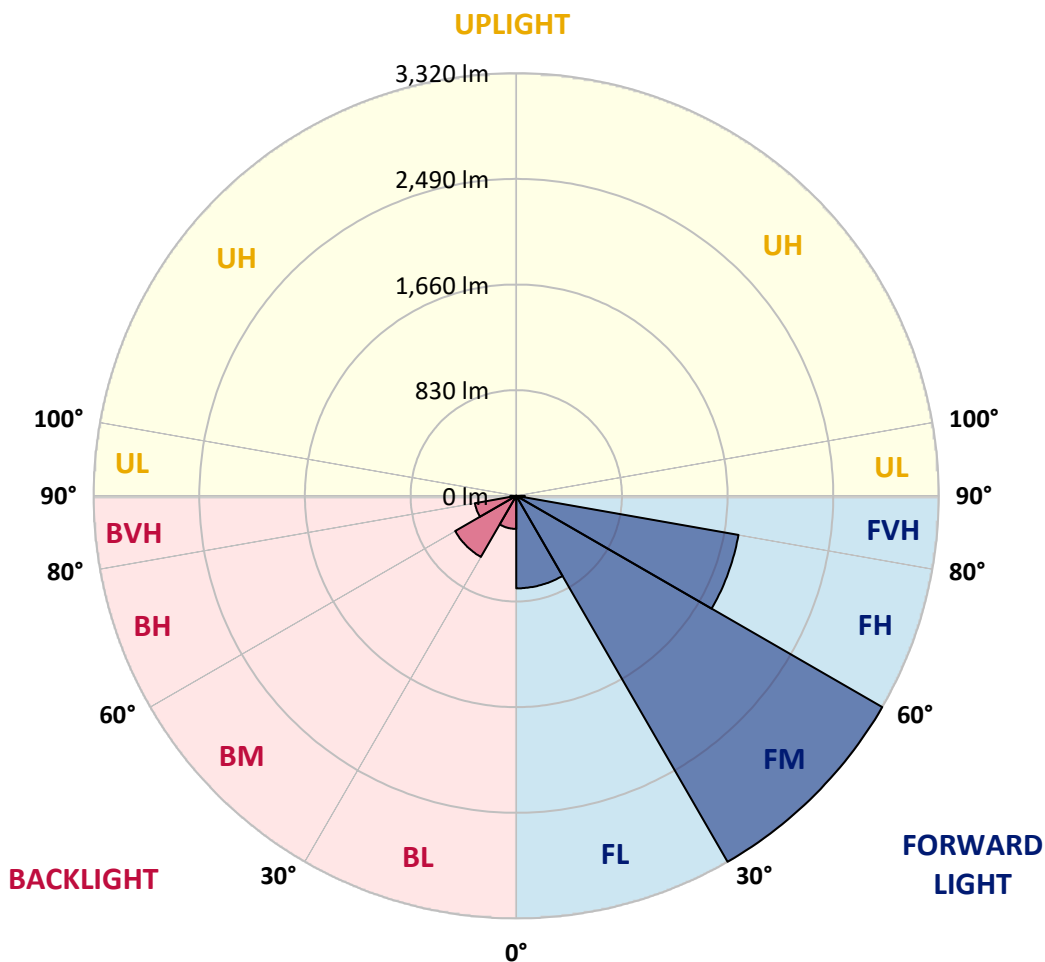


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LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | Lumens | % Fixture | Zone Rating/Lumen Limit | | |
|----------------|--------|-----------|-------------------------|------|---------|
| | | | B | U | G |
| FL (0°-30°) | 726.9 | 10.3 | | | |
| FM (30°-60°) | 3320.1 | 46.9 | | | |
| FH (60°-80°) | 1772.7 | 25.0 | | | G1/1800 |
| FVH (80°-90°) | 67.3 | 1.0 | | | G1/100 |
| BL (0°-30°) | 259.8 | 3.7 | B1/500 | | |
| BM (30°-60°) | 554.6 | 7.8 | B1/1000 | | |
| BH (60°-80°) | 330.0 | 4.7 | B1/500 | | G1/500 |
| BVH (80°-90°) | 46.7 | 0.7 | | | G1/100 |
| UL (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH (100°-180°) | 0.0 | 0.0 | | U0/0 | |

BUG Rating: B1-U0-G1
 Type II Short





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CANDELA DISTRIBUTION (FULL):

| | 0° | 5° | 15° | 25° | 35° | 45° | 55° | 65° | 75° | 76° | 85° |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0° | 646.4 | 646.4 | 646.4 | 646.4 | 646.4 | 646.4 | 646.4 | 646.4 | 646.4 | 646.4 | 646.4 |
| 2.5° | 858.1 | 845.1 | 843.9 | 824.9 | 820.6 | 784.3 | 757.6 | 729.8 | 698.0 | 691.8 | 666.8 |
| 5° | 1102.2 | 1101.0 | 1084.4 | 1053.4 | 1029.2 | 967.2 | 905.9 | 841.0 | 769.9 | 758.4 | 702.1 |
| 7.5° | 1321.8 | 1319.9 | 1307.2 | 1273.8 | 1238.7 | 1162.5 | 1075.1 | 975.6 | 860.2 | 843.2 | 749.9 |
| 10° | 1488.6 | 1487.9 | 1483.6 | 1459.0 | 1429.2 | 1356.2 | 1259.6 | 1123.8 | 965.2 | 941.9 | 809.8 |
| 12.5° | 1617.4 | 1618.8 | 1621.7 | 1613.1 | 1598.9 | 1536.7 | 1437.7 | 1281.0 | 1077.2 | 1054.2 | 876.3 |
| 15° | 1704.6 | 1708.9 | 1723.8 | 1736.1 | 1743.5 | 1705.3 | 1609.5 | 1441.7 | 1202.7 | 1175.0 | 950.1 |
| 17.5° | 1748.6 | 1753.4 | 1779.1 | 1816.1 | 1850.2 | 1846.4 | 1770.2 | 1595.0 | 1323.0 | 1296.4 | 1029.4 |
| 20° | 1786.6 | 1790.2 | 1819.0 | 1863.5 | 1923.8 | 1950.4 | 1907.7 | 1742.6 | 1455.0 | 1423.2 | 1113.5 |
| 22.5° | 1896.6 | 1901.2 | 1909.8 | 1935.1 | 1988.4 | 2037.4 | 2016.8 | 1882.2 | 1575.8 | 1546.3 | 1193.3 |
| 25° | 2109.0 | 2114.6 | 2095.8 | 2074.4 | 2084.5 | 2118.6 | 2122.5 | 2009.5 | 1698.4 | 1665.0 | 1279.1 |
| 27.5° | 2364.9 | 2372.9 | 2340.9 | 2285.9 | 2237.8 | 2224.6 | 2220.0 | 2113.8 | 1815.4 | 1776.7 | 1363.9 |
| 30° | 2615.6 | 2629.3 | 2587.7 | 2516.3 | 2428.1 | 2366.1 | 2320.2 | 2216.0 | 1930.7 | 1893.7 | 1443.9 |
| 32.5° | 2860.4 | 2854.9 | 2794.6 | 2724.9 | 2621.6 | 2544.0 | 2432.9 | 2325.5 | 2060.5 | 2018.0 | 1523.4 |
| 35° | 3028.1 | 3030.1 | 2974.1 | 2891.4 | 2792.9 | 2733.3 | 2583.8 | 2443.8 | 2192.9 | 2153.7 | 1613.8 |
| 37.5° | 3170.9 | 3162.0 | 3098.5 | 3021.4 | 2936.6 | 2911.1 | 2760.5 | 2574.0 | 2336.3 | 2293.6 | 1709.9 |
| 40° | 3218.4 | 3208.1 | 3166.5 | 3111.0 | 3043.0 | 3040.9 | 2955.3 | 2721.5 | 2498.5 | 2456.2 | 1818.3 |
| 42.5° | 3189.6 | 3176.4 | 3159.3 | 3144.2 | 3123.3 | 3132.9 | 3138.4 | 2894.5 | 2676.8 | 2629.5 | 1943.7 |
| 45° | 3083.2 | 3063.2 | 3075.2 | 3108.2 | 3153.6 | 3207.9 | 3303.8 | 3086.0 | 2876.5 | 2836.9 | 2091.0 |
| 47.5° | 2919.5 | 2901.5 | 2939.0 | 3009.4 | 3132.9 | 3270.4 | 3460.2 | 3297.5 | 3114.9 | 3075.5 | 2300.8 |
| 50° | 2689.3 | 2694.6 | 2748.2 | 2876.3 | 3063.0 | 3299.2 | 3652.9 | 3577.4 | 3461.4 | 3424.6 | 2587.0 |
| 52.5° | 2311.6 | 2312.6 | 2463.5 | 2673.7 | 2939.0 | 3284.3 | 3759.8 | 3935.2 | 3934.5 | 3890.1 | 2859.5 |
| 55° | 1960.8 | 1982.2 | 2101.6 | 2381.0 | 2738.1 | 3224.7 | 3834.6 | 4109.2 | 4245.2 | 4193.1 | 3113.4 |
| 57.5° | 1618.1 | 1630.6 | 1743.8 | 2024.4 | 2451.4 | 3065.9 | 3911.2 | 4318.0 | 4603.2 | 4570.3 | 3429.2 |
| 60° | 1228.4 | 1247.6 | 1364.6 | 1623.9 | 2084.8 | 2784.0 | 3918.4 | 4536.0 | 5031.2 | 4998.0 | 3781.7 |
| 62.5° | 797.3 | 830.4 | 940.0 | 1182.9 | 1641.2 | 2378.6 | 3751.2 | 4678.5 | 5436.8 | 5425.0 | 4094.5 |
| 65° | 458.2 | 483.2 | 559.4 | 746.8 | 1132.2 | 1869.7 | 3353.5 | 4623.7 | 5686.5 | 5679.7 | 4211.6 |
| 66° | 374.4 | 390.0 | 448.4 | 583.7 | 934.2 | 1641.9 | 3122.3 | 4508.1 | 5711.2 | 5711.5 | 4198.1 |
| 67.5° | 299.4 | 306.4 | 332.6 | 417.9 | 689.4 | 1301.4 | 2709.3 | 4253.1 | 5680.5 | 5688.9 | 4111.4 |
| 70° | 247.7 | 251.3 | 259.5 | 280.2 | 376.3 | 784.8 | 1923.0 | 3590.7 | 5371.7 | 5378.2 | 3772.8 |
| 72.5° | 222.3 | 224.4 | 227.6 | 230.4 | 265.5 | 438.5 | 1174.5 | 2872.4 | 4709.7 | 4718.1 | 3256.9 |
| 75° | 201.4 | 202.6 | 202.1 | 202.3 | 222.7 | 279.5 | 607.0 | 2144.6 | 3808.1 | 3791.3 | 2494.9 |
| 77.5° | 176.9 | 178.1 | 175.7 | 176.1 | 197.0 | 214.8 | 302.0 | 1501.3 | 2569.9 | 2451.2 | 1405.7 |
| 80° | 149.5 | 150.4 | 149.5 | 151.1 | 171.6 | 162.2 | 175.7 | 844.6 | 1136.3 | 1074.8 | 499.8 |
| 82.5° | 112.9 | 117.0 | 119.9 | 126.6 | 141.3 | 115.3 | 117.5 | 329.0 | 346.0 | 329.4 | 153.3 |
| 85° | 49.5 | 60.3 | 90.3 | 96.8 | 106.2 | 69.2 | 77.1 | 134.1 | 140.8 | 136.5 | 55.7 |
| 87.5° | 13.0 | 14.2 | 44.7 | 56.2 | 58.9 | 31.2 | 40.1 | 61.0 | 64.4 | 61.0 | 18.5 |
| 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: P317375
 CATALOG NUMBER: GLEON-SA1D-727-U-T2R

CANDELA DISTRIBUTION (continued):

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0° | 646.4 | 646.4 | 646.4 | 646.4 | 646.4 | 646.4 | 646.4 | 646.4 | 646.4 | 646.4 | 646.4 |
| 2.5° | 653.6 | 641.8 | 620.7 | 601.9 | 587.8 | 578.1 | 568.5 | 563.7 | 560.8 | 558.0 | 558.4 |
| 5° | 674.5 | 650.7 | 614.4 | 588.7 | 574.3 | 565.2 | 560.4 | 558.4 | 557.2 | 554.3 | 554.3 |
| 7.5° | 706.0 | 672.3 | 622.4 | 595.9 | 584.6 | 577.7 | 574.8 | 573.8 | 572.4 | 569.0 | 569.5 |
| 10° | 745.6 | 698.5 | 638.9 | 613.2 | 602.9 | 595.2 | 591.1 | 589.7 | 587.0 | 583.2 | 583.7 |
| 12.5° | 792.2 | 731.0 | 660.8 | 633.9 | 621.4 | 611.1 | 604.3 | 600.2 | 595.7 | 590.6 | 590.9 |
| 15° | 843.2 | 766.3 | 684.3 | 652.4 | 635.3 | 620.9 | 610.1 | 603.1 | 595.9 | 589.7 | 589.4 |
| 17.5° | 894.8 | 800.4 | 702.4 | 662.5 | 639.4 | 620.4 | 605.8 | 595.0 | 586.1 | 578.4 | 577.7 |
| 20° | 950.6 | 831.2 | 712.5 | 661.5 | 631.7 | 609.1 | 589.7 | 576.2 | 566.4 | 558.7 | 557.5 |
| 22.5° | 1007.3 | 860.0 | 714.1 | 651.7 | 614.7 | 587.0 | 566.6 | 551.7 | 541.6 | 533.7 | 530.8 |
| 25° | 1059.2 | 882.3 | 707.2 | 632.7 | 590.9 | 561.1 | 541.1 | 526.0 | 517.8 | 508.5 | 505.6 |
| 27.5° | 1106.5 | 898.0 | 693.2 | 608.4 | 564.2 | 534.9 | 516.1 | 503.2 | 494.3 | 487.1 | 484.7 |
| 30° | 1149.1 | 906.4 | 670.4 | 579.6 | 536.8 | 510.1 | 494.3 | 485.4 | 477.7 | 468.6 | 466.9 |
| 32.5° | 1189.4 | 906.4 | 641.1 | 548.1 | 509.7 | 488.3 | 478.9 | 473.4 | 464.7 | 455.8 | 453.4 |
| 35° | 1229.8 | 900.8 | 606.5 | 515.2 | 484.7 | 472.7 | 472.2 | 465.7 | 452.5 | 440.5 | 437.3 |
| 37.5° | 1272.3 | 889.6 | 567.6 | 484.4 | 464.2 | 465.7 | 469.8 | 455.4 | 436.6 | 419.5 | 415.0 |
| 40° | 1320.4 | 873.9 | 527.2 | 457.8 | 447.2 | 462.6 | 463.3 | 440.5 | 403.9 | 388.3 | 384.2 |
| 42.5° | 1376.9 | 858.3 | 489.7 | 434.2 | 433.7 | 453.2 | 451.0 | 408.3 | 386.4 | 378.5 | 376.3 |
| 45° | 1451.1 | 849.4 | 454.1 | 411.9 | 423.2 | 438.0 | 430.1 | 390.5 | 381.3 | 376.8 | 374.9 |
| 47.5° | 1568.1 | 854.0 | 421.5 | 394.1 | 412.6 | 422.9 | 391.2 | 383.3 | 376.8 | 371.2 | 369.3 |
| 50° | 1714.7 | 851.3 | 395.0 | 381.8 | 400.6 | 407.1 | 373.7 | 373.9 | 370.5 | 364.3 | 361.4 |
| 52.5° | 1825.0 | 830.7 | 378.0 | 374.9 | 390.0 | 378.9 | 362.6 | 364.8 | 363.1 | 353.9 | 350.8 |
| 55° | 1931.5 | 812.9 | 369.3 | 372.2 | 382.3 | 343.9 | 349.6 | 354.9 | 353.2 | 344.3 | 342.9 |
| 57.5° | 2063.9 | 809.5 | 364.0 | 372.9 | 375.8 | 326.3 | 337.1 | 344.1 | 342.9 | 339.0 | 338.3 |
| 60° | 2226.0 | 810.5 | 359.2 | 374.1 | 368.6 | 313.3 | 325.4 | 334.2 | 335.0 | 334.2 | 333.8 |
| 62.5° | 2315.2 | 784.3 | 347.2 | 370.8 | 355.9 | 302.0 | 313.1 | 326.1 | 326.3 | 327.8 | 327.5 |
| 65° | 2239.5 | 706.0 | 324.9 | 359.0 | 334.5 | 292.7 | 302.5 | 316.7 | 313.1 | 319.6 | 319.6 |
| 66° | 2166.0 | 660.8 | 313.8 | 351.3 | 325.4 | 289.1 | 299.2 | 311.9 | 307.3 | 316.2 | 316.2 |
| 67.5° | 2015.8 | 584.6 | 293.9 | 335.0 | 312.4 | 284.0 | 295.3 | 304.0 | 297.7 | 310.9 | 310.0 |
| 70° | 1741.4 | 452.2 | 253.7 | 298.0 | 291.0 | 276.6 | 290.0 | 288.1 | 279.0 | 299.2 | 295.3 |
| 72.5° | 1468.2 | 343.6 | 203.8 | 249.4 | 258.6 | 267.2 | 282.6 | 267.9 | 256.4 | 270.6 | 262.2 |
| 75° | 1139.2 | 258.3 | 161.0 | 193.9 | 218.4 | 252.5 | 273.7 | 244.6 | 228.0 | 226.6 | 222.0 |
| 77.5° | 615.9 | 177.3 | 127.6 | 148.0 | 173.5 | 234.3 | 267.7 | 219.6 | 194.6 | 188.9 | 185.3 |
| 80° | 243.9 | 115.3 | 92.8 | 112.2 | 121.3 | 207.9 | 253.3 | 190.6 | 160.5 | 154.7 | 149.2 |
| 82.5° | 100.7 | 68.2 | 59.8 | 75.2 | 79.1 | 177.8 | 227.3 | 156.2 | 124.0 | 171.6 | 182.1 |
| 85° | 43.3 | 37.5 | 35.6 | 38.9 | 44.7 | 124.7 | 180.9 | 119.2 | 133.8 | 119.4 | 94.9 |
| 87.5° | 13.0 | 15.9 | 15.1 | 14.9 | 16.3 | 29.8 | 96.4 | 66.3 | 98.3 | 37.2 | 27.9 |
| 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 |

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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 (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 | 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 ($R_{f,i}$)

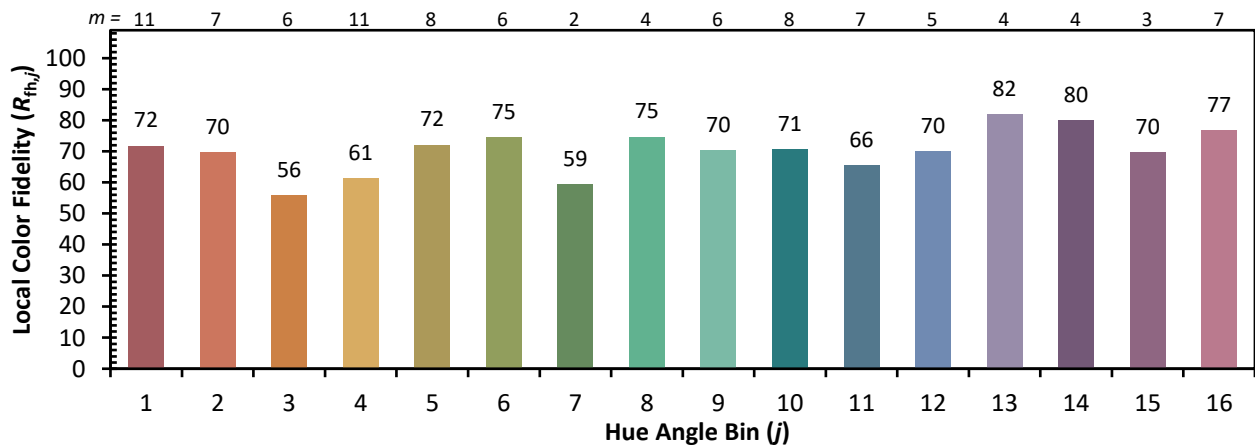
| | | | |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 54 | CES51 = 77 | CES76 = 48 |
| CES02 = 63 | CES27 = 74 | CES52 = 80 | CES77 = 75 |
| CES03 = 31 | CES28 = 80 | CES53 = 66 | CES78 = 56 |
| CES04 = 71 | CES29 = 44 | CES54 = 77 | CES79 = 81 |
| CES05 = 50 | CES30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