

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: P319611

Luminaire Tested: **GLEON-SA7C-727-U-SL3**

Issue Date: 3/3/2020

Test Information

Test Method: LM-79-08
Report Number: P319611
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-22)
Test Lab: INNOVATION CENTER
Issue Date: 3/3/2020
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: McGRAW-EDISON
Catalog Number: GLEON-SA7C-727-U-SL3
Description: GALLEON AREA AND ROADWAY LUMINAIRE
(7) 70 CRI, 2700K, 1050mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE III
SPILL LIGHT ELIMINATOR OPTICS
Light Source: -
Ballast/Driver: ELECTRONIC DRIVER

Summary

Lumens per Lamp: N/A
Luminaire Lumens: 41842 lumens
Efficiency: N/A
Efficacy: 107.0 lumens/watt
Luminous Opening: Rectangular (W 2' x L: 1' x H: 0')
IES Classification: Type III - Medium
BUG Rating: B3 - U0 - G5

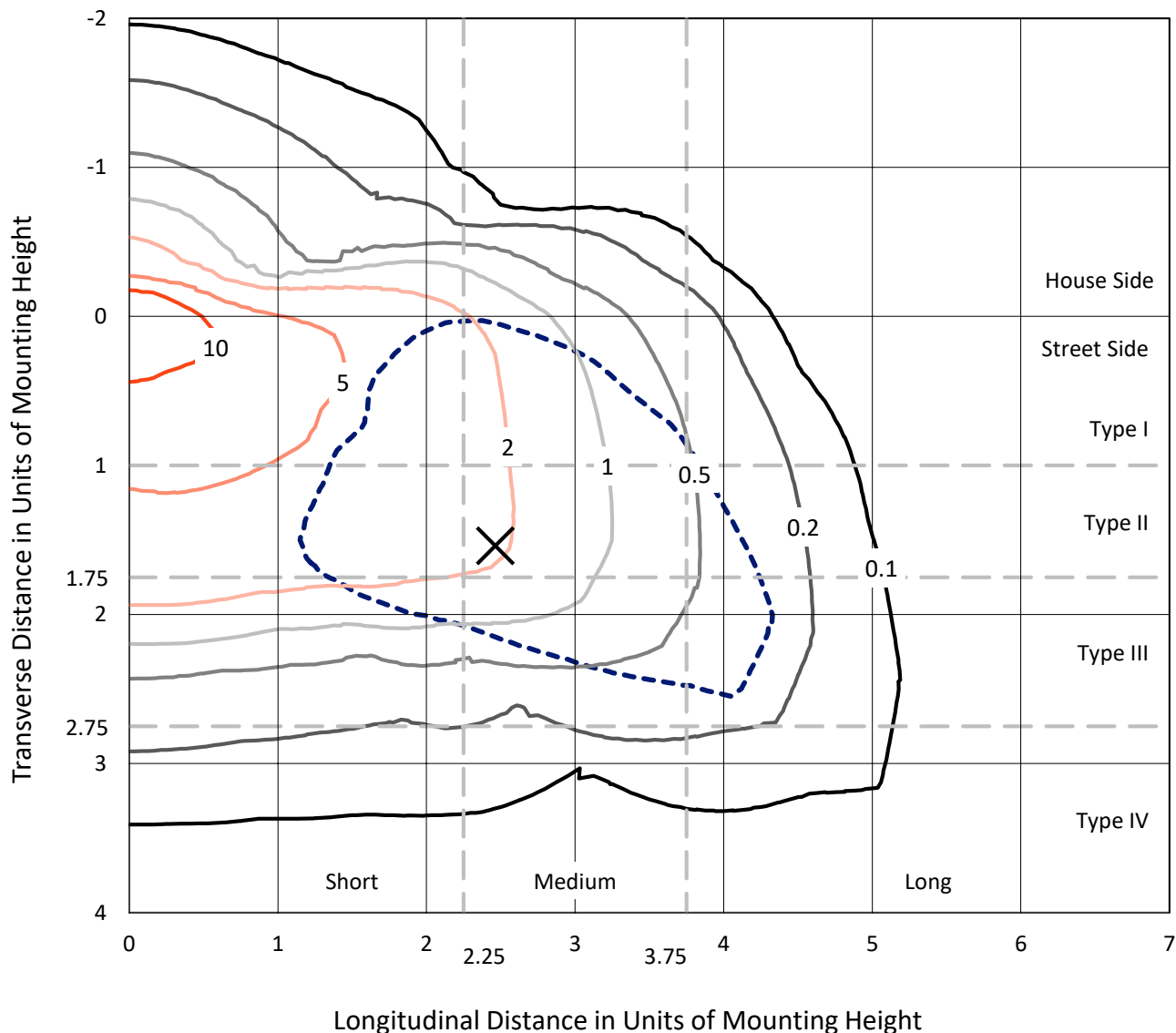
Input Watts (W): 391
Input Voltage (V): NR
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 24 FT



REPORT NUMBER: P319611
 CATALOG NUMBER: GLEON-SA7C-727-U-SL3

Iso-Footcandle Lines of Horizontal Illumination

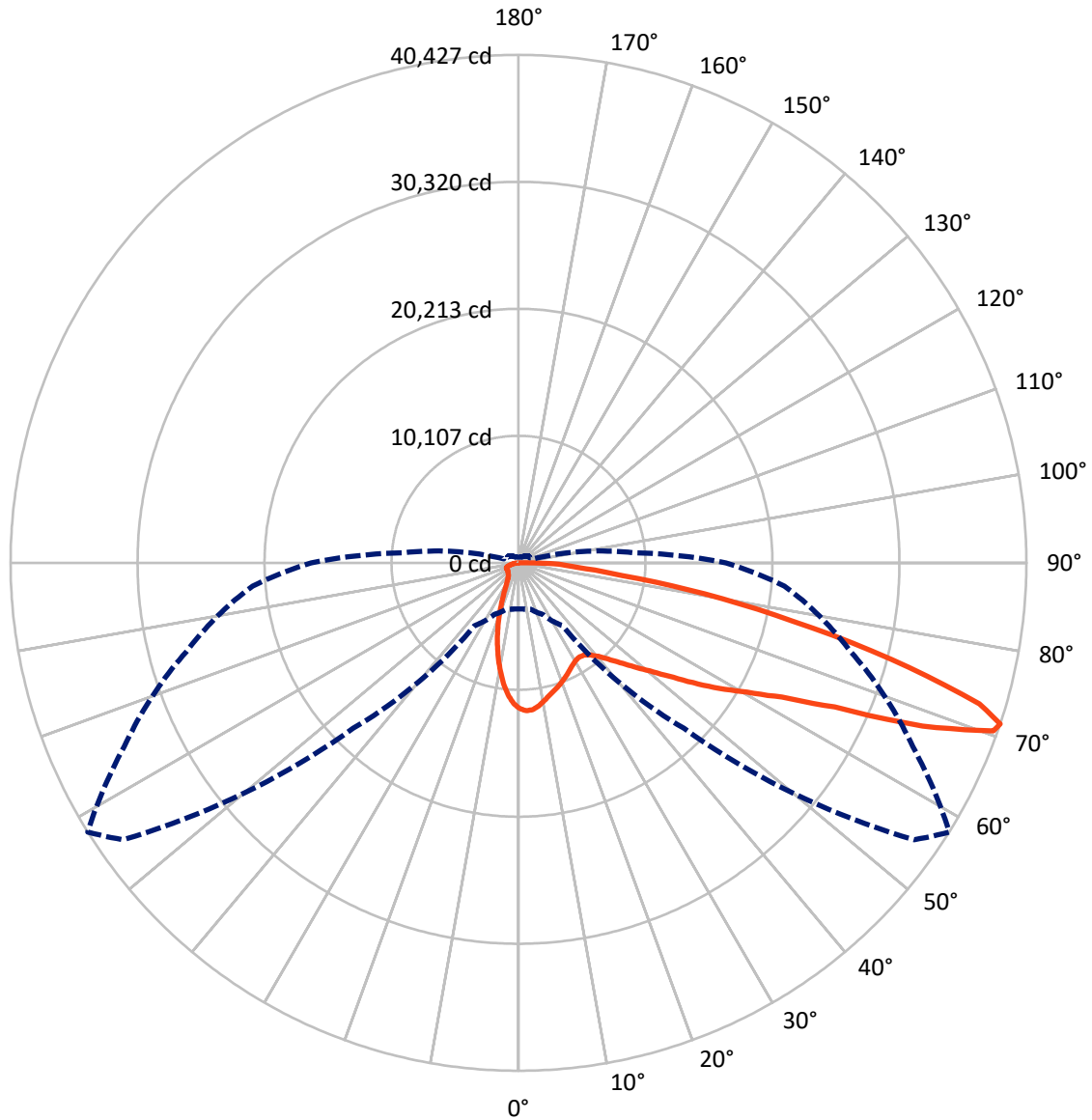
✕ Max cd
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 18.5 fc
 Type III - Medium - N/A

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Luminous Intensity Polar Plot



— Vertical Plane Through 58-Deg Lateral - - - Horizontal Cone Through 71-Deg Vertical



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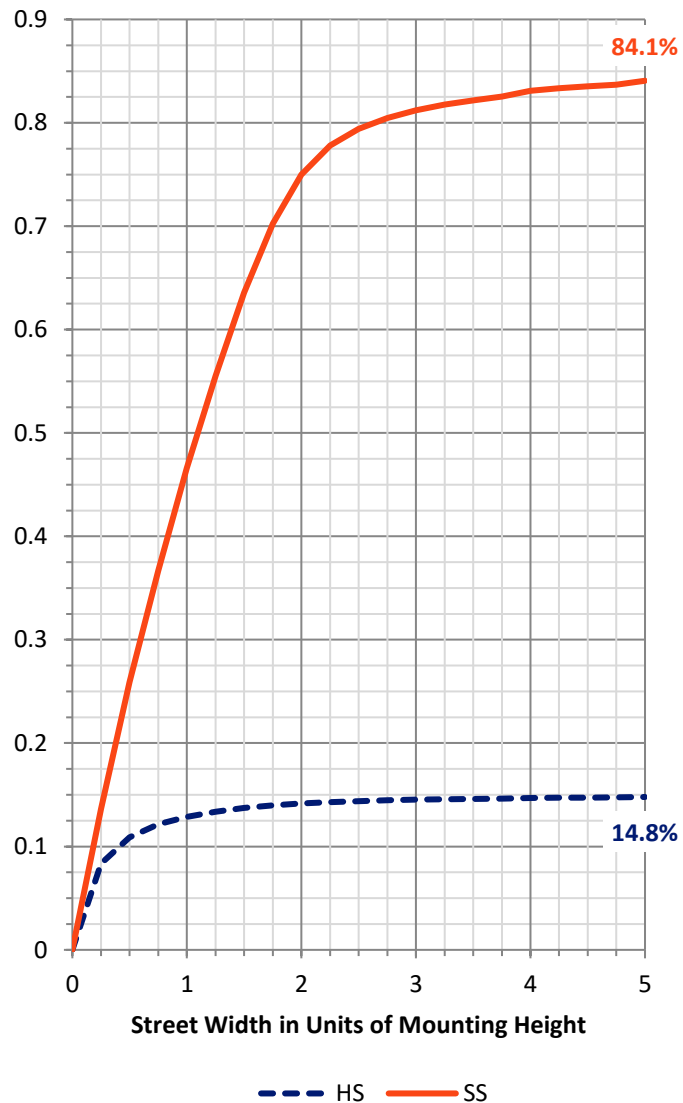
FLUX DISTRIBUTION:

| | | Downward | Upward | Total |
|--------------------|-----------|----------|--------|---------|
| House Side | Lumens | 6255.7 | 0.0 | 6255.7 |
| | % Fixture | 15.0 | 0.0 | 15.0 |
| Street Side | Lumens | 35586.3 | 0.0 | 35586.3 |
| | % Fixture | 85.0 | 0.0 | 85.0 |
| Total | Lumens | 41842.0 | 0.0 | 41842.0 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|---------|-----------|
| 0°-10° | 1000.1 | 2.4 |
| 10°-20° | 2223.9 | 5.3 |
| 20°-30° | 2826.4 | 6.8 |
| 30°-40° | 3600.2 | 8.6 |
| 40°-50° | 5105.3 | 12.2 |
| 50°-60° | 7900.6 | 18.9 |
| 60°-70° | 10755.7 | 25.7 |
| 70°-80° | 7175.3 | 17.1 |
| 80°-90° | 1254.5 | 3.0 |
| 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° | 41842.0 | 100.0 |
| 0°-180° | 41842.0 | 100.0 |

Coefficient of Utilization

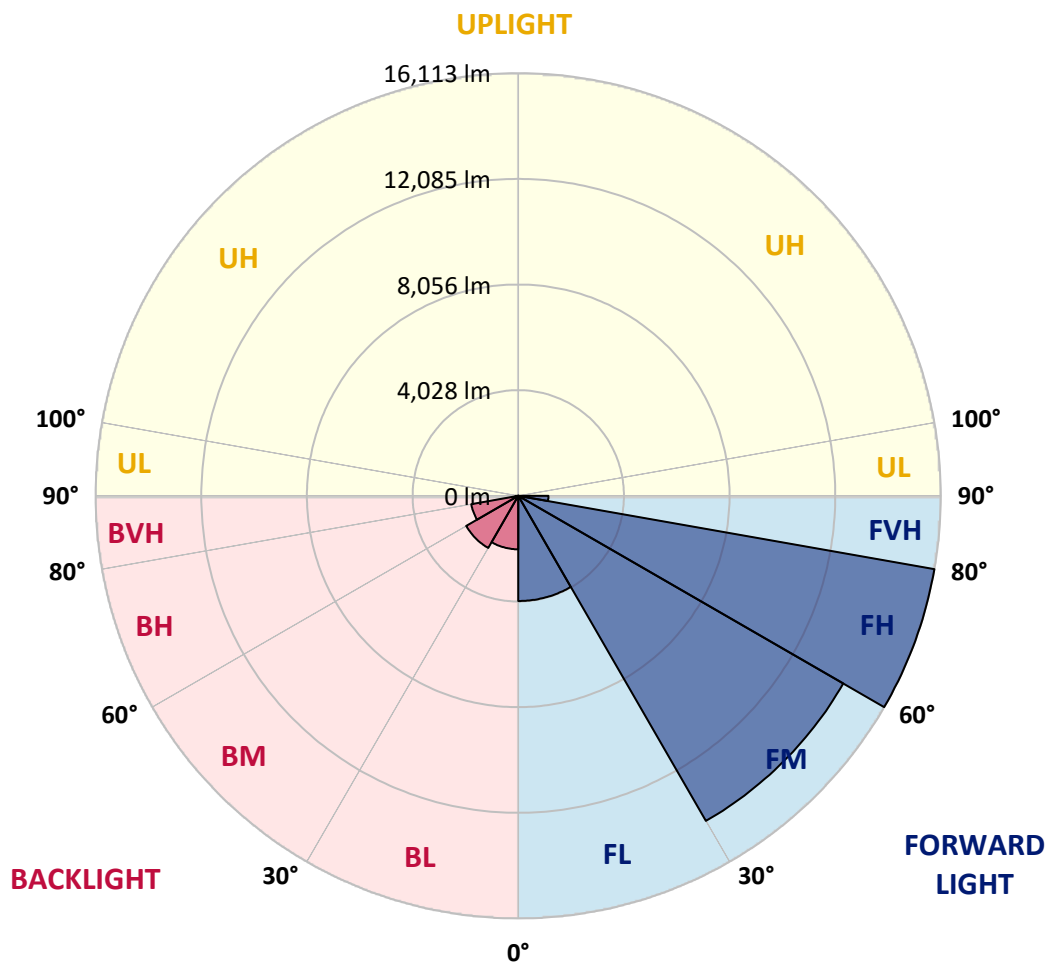


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 CATALOG NUMBER: GLEON-SA7C-727-U-SL3

LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | Lumens | % Fixture | Zone Rating/Lumen Limit | | |
|----------------|---------|-----------|-------------------------|------|---------|
| | | | B | U | G |
| FL (0°-30°) | 4011.2 | 9.6 | | | |
| FM (30°-60°) | 14312.0 | 34.2 | | | |
| FH (60°-80°) | 16112.8 | 38.5 | | | G5 |
| FVH (80°-90°) | 1150.3 | 2.7 | | | G5 |
| BL (0°-30°) | 2039.2 | 4.9 | B3/2500 | | |
| BM (30°-60°) | 2294.1 | 5.5 | B2/2500 | | |
| BH (60°-80°) | 1818.1 | 4.3 | B3/2500 | | G3/2500 |
| BVH (80°-90°) | 104.2 | 0.2 | | | G2/225 |
| UL (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH (100°-180°) | 0.0 | 0.0 | | U0/0 | |

BUG Rating: B3-U0-G5
 Type III Medium





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CANDELA DISTRIBUTION (FULL):

| | 0° | 5° | 15° | 25° | 35° | 45° | 55° | 58° | 65° | 75° | 85° |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0° | 11593.0 | 11593.0 | 11593.0 | 11593.0 | 11593.0 | 11593.0 | 11593.0 | 11593.0 | 11593.0 | 11593.0 | 11593.0 |
| 2.5° | 11900.6 | 11884.5 | 11890.4 | 11878.7 | 11851.0 | 11823.3 | 11782.5 | 11789.8 | 11733.0 | 11648.4 | 11543.5 |
| 5° | 11676.1 | 11670.3 | 11714.0 | 11738.8 | 11759.2 | 11743.2 | 11731.5 | 11746.1 | 11663.0 | 11546.4 | 11364.2 |
| 7.5° | 11205.3 | 11141.2 | 11196.6 | 11279.7 | 11358.4 | 11418.1 | 11496.8 | 11507.0 | 11454.6 | 11332.1 | 11093.1 |
| 10° | 10536.3 | 10475.1 | 10556.7 | 10686.5 | 10843.9 | 10986.7 | 11145.6 | 11174.7 | 11184.9 | 11074.2 | 10784.1 |
| 12.5° | 9842.6 | 9795.9 | 9877.5 | 10059.7 | 10320.6 | 10540.7 | 10794.3 | 10838.0 | 10928.4 | 10854.1 | 10498.4 |
| 15° | 9221.7 | 9204.2 | 9303.3 | 9482.6 | 9782.8 | 10119.5 | 10485.3 | 10565.5 | 10718.5 | 10693.7 | 10275.4 |
| 17.5° | 8685.3 | 8680.9 | 8756.7 | 8944.7 | 9277.0 | 9702.6 | 10177.8 | 10313.3 | 10540.7 | 10569.9 | 10091.8 |
| 20° | 8285.9 | 8277.2 | 8329.7 | 8468.1 | 8810.6 | 9293.1 | 9845.5 | 10032.0 | 10360.0 | 10462.0 | 9902.3 |
| 22.5° | 8071.7 | 8070.2 | 8071.7 | 8137.3 | 8417.1 | 8866.0 | 9521.9 | 9749.3 | 10183.6 | 10376.0 | 9692.4 |
| 25° | 8035.3 | 8030.9 | 7998.8 | 7991.5 | 8150.4 | 8508.9 | 9201.3 | 9451.9 | 10016.0 | 10316.3 | 9492.8 |
| 27.5° | 8130.0 | 8135.8 | 8093.6 | 8025.0 | 8057.1 | 8274.3 | 8922.9 | 9191.1 | 9881.9 | 10304.6 | 9354.3 |
| 30° | 8326.8 | 8323.8 | 8287.4 | 8216.0 | 8153.3 | 8186.8 | 8724.7 | 8992.8 | 9791.5 | 10355.6 | 9259.6 |
| 32.5° | 8543.9 | 8560.0 | 8552.7 | 8513.3 | 8420.0 | 8285.9 | 8664.9 | 8927.2 | 9765.3 | 10478.0 | 9218.7 |
| 35° | 8804.8 | 8822.3 | 8874.8 | 8905.4 | 8796.1 | 8580.4 | 8793.2 | 9020.5 | 9841.1 | 10708.3 | 9284.3 |
| 37.5° | 9052.6 | 9097.8 | 9245.0 | 9374.7 | 9281.4 | 9040.9 | 9134.2 | 9296.0 | 10075.8 | 11071.2 | 9460.7 |
| 40° | 9338.3 | 9377.6 | 9618.1 | 9893.6 | 9879.0 | 9629.8 | 9683.7 | 9791.5 | 10489.7 | 11591.6 | 9779.9 |
| 42.5° | 9619.6 | 9698.3 | 10046.6 | 10437.2 | 10549.5 | 10329.4 | 10415.4 | 10472.2 | 11072.7 | 12281.0 | 10336.7 |
| 45° | 9994.1 | 10078.7 | 10562.6 | 11033.3 | 11295.7 | 11171.8 | 11308.8 | 11330.7 | 11805.8 | 13219.6 | 11145.6 |
| 47.5° | 10561.1 | 10657.3 | 11221.4 | 11715.5 | 12116.3 | 12129.4 | 12355.3 | 12346.6 | 12721.1 | 14293.8 | 12164.4 |
| 50° | 11444.4 | 11582.8 | 12044.9 | 12506.9 | 12993.7 | 13264.8 | 13566.5 | 13524.2 | 13818.6 | 15437.9 | 13337.7 |
| 52.5° | 12601.6 | 12665.8 | 13008.3 | 13349.3 | 13954.2 | 14562.0 | 14994.9 | 14957.0 | 15063.4 | 16614.2 | 14669.8 |
| 55° | 13801.2 | 13849.3 | 13990.6 | 14177.2 | 14990.5 | 15981.6 | 16896.9 | 16837.2 | 16567.5 | 17835.5 | 15986.0 |
| 57.5° | 14879.7 | 14977.4 | 15075.0 | 15152.3 | 16034.1 | 17465.3 | 18842.7 | 18847.1 | 18199.9 | 19153.1 | 17345.8 |
| 60° | 15047.3 | 15133.3 | 15779.0 | 16388.2 | 17819.5 | 19444.6 | 20925.5 | 20881.7 | 19889.2 | 20583.0 | 18861.6 |
| 62.5° | 13301.2 | 13495.1 | 14573.6 | 16194.4 | 19539.4 | 23065.1 | 23582.5 | 23528.6 | 21909.3 | 22345.1 | 20626.7 |
| 65° | 9532.1 | 9752.2 | 11053.8 | 13489.3 | 18705.7 | 27054.3 | 28377.7 | 27651.9 | 24664.0 | 24512.4 | 22693.4 |
| 67.5° | 5499.2 | 5551.7 | 6115.7 | 8071.7 | 14242.8 | 27262.7 | 35693.0 | 34677.1 | 28941.8 | 26971.2 | 23704.9 |
| 70° | 4066.5 | 4065.0 | 4199.1 | 4967.2 | 7707.3 | 22250.3 | 39172.0 | 40083.0 | 33445.5 | 27780.1 | 22275.1 |
| 71° | 3677.3 | 3681.7 | 3831.8 | 4521.2 | 6104.1 | 18624.1 | 38433.1 | 40426.9 | 34631.9 | 27380.8 | 21240.3 |
| 72.5° | 3145.3 | 3159.9 | 3368.3 | 4054.8 | 5134.8 | 12843.6 | 35249.9 | 38363.1 | 35194.5 | 26395.5 | 19621.0 |
| 75° | 2385.9 | 2419.5 | 2708.1 | 3417.9 | 4693.2 | 6513.6 | 25870.8 | 30633.9 | 31265.0 | 23291.0 | 14579.5 |
| 77.5° | 1702.4 | 1740.3 | 2066.7 | 2874.2 | 4461.4 | 4908.9 | 17325.4 | 22345.1 | 23008.2 | 14926.4 | 6576.3 |
| 80° | 1075.6 | 1120.8 | 1367.1 | 2286.8 | 4191.8 | 4661.1 | 10887.6 | 15019.6 | 12546.2 | 4776.3 | 1673.2 |
| 82.5° | 631.1 | 666.1 | 848.3 | 1493.9 | 3423.7 | 4489.1 | 6405.8 | 8325.3 | 4882.7 | 1442.9 | 760.8 |
| 85° | 365.8 | 381.9 | 529.1 | 951.8 | 2486.5 | 4237.0 | 4706.3 | 4653.8 | 2119.2 | 705.4 | 360.0 |
| 87.5° | 170.5 | 189.5 | 313.4 | 497.0 | 1380.3 | 3071.0 | 3719.6 | 3213.8 | 1317.6 | 330.9 | 169.1 |
| 90° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |



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 CATALOG NUMBER: GLEON-SA7C-727-U-SL3

CANDELA DISTRIBUTION (continued):

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0° | 11593.0 | 11593.0 | 11593.0 | 11593.0 | 11593.0 | 11593.0 | 11593.0 | 11593.0 | 11593.0 | 11593.0 | 11593.0 |
| 2.5° | 11492.5 | 11467.7 | 11364.2 | 11272.4 | 11176.2 | 11050.8 | 10912.4 | 10894.9 | 10810.3 | 10826.4 | 10797.2 |
| 5° | 11265.1 | 11202.4 | 10953.2 | 10727.3 | 10460.5 | 10221.5 | 9962.1 | 9842.6 | 9670.6 | 9658.9 | 9615.2 |
| 7.5° | 10940.1 | 10823.5 | 10437.2 | 10008.7 | 9580.2 | 9172.1 | 8768.4 | 8503.1 | 8232.0 | 8116.9 | 8106.7 |
| 10° | 10574.2 | 10376.0 | 9807.6 | 9173.6 | 8555.6 | 7959.5 | 7382.3 | 6955.2 | 6570.5 | 6388.3 | 6381.0 |
| 12.5° | 10227.3 | 9934.4 | 9154.6 | 8291.8 | 7446.4 | 6673.9 | 5882.5 | 5321.4 | 4838.9 | 4677.1 | 4608.6 |
| 15° | 9932.9 | 9520.5 | 8519.1 | 7415.8 | 6389.7 | 5317.0 | 4416.3 | 3826.0 | 3380.0 | 3225.5 | 3196.3 |
| 17.5° | 9647.3 | 9116.7 | 7867.6 | 6531.1 | 5290.8 | 4111.6 | 3209.4 | 2770.7 | 2533.2 | 2470.5 | 2469.0 |
| 20° | 9363.0 | 8701.3 | 7187.0 | 5626.0 | 4228.2 | 3075.3 | 2467.6 | 2270.8 | 2190.6 | 2183.3 | 2171.7 |
| 22.5° | 9040.9 | 8261.2 | 6471.3 | 4718.0 | 3299.8 | 2418.0 | 2097.4 | 2018.7 | 2008.4 | 2034.7 | 2034.7 |
| 25° | 8739.2 | 7823.9 | 5745.5 | 3828.9 | 2566.7 | 2017.2 | 1872.9 | 1856.9 | 1884.6 | 1931.2 | 1935.6 |
| 27.5° | 8457.9 | 7402.7 | 5037.2 | 3038.9 | 2056.5 | 1776.7 | 1716.9 | 1735.9 | 1785.4 | 1839.4 | 1840.8 |
| 30° | 8226.2 | 7004.8 | 4349.2 | 2394.7 | 1737.4 | 1597.4 | 1587.2 | 1625.1 | 1679.1 | 1721.3 | 1731.5 |
| 32.5° | 8046.9 | 6665.2 | 3684.6 | 1925.4 | 1528.9 | 1463.3 | 1472.1 | 1504.1 | 1537.7 | 1561.0 | 1577.0 |
| 35° | 7963.8 | 6373.7 | 3071.0 | 1623.7 | 1396.3 | 1359.9 | 1371.5 | 1389.0 | 1403.6 | 1421.1 | 1434.2 |
| 37.5° | 7978.4 | 6147.8 | 2522.9 | 1435.6 | 1307.4 | 1288.4 | 1288.4 | 1288.4 | 1288.4 | 1297.2 | 1298.6 |
| 40° | 8114.0 | 6018.1 | 2077.0 | 1316.1 | 1247.6 | 1227.2 | 1211.2 | 1196.6 | 1185.0 | 1190.8 | 1187.9 |
| 42.5° | 8460.8 | 6006.4 | 1750.5 | 1240.3 | 1199.5 | 1166.0 | 1133.9 | 1113.5 | 1099.0 | 1104.8 | 1107.7 |
| 45° | 9049.7 | 6152.1 | 1530.4 | 1186.4 | 1154.3 | 1103.3 | 1062.5 | 1040.7 | 1030.5 | 1049.4 | 1052.3 |
| 47.5° | 9812.0 | 6469.9 | 1396.3 | 1147.1 | 1112.1 | 1045.0 | 1001.3 | 980.9 | 983.8 | 1011.5 | 1018.8 |
| 50° | 10794.3 | 6985.8 | 1332.2 | 1122.3 | 1082.9 | 995.5 | 950.3 | 932.8 | 941.6 | 980.9 | 989.6 |
| 52.5° | 11872.9 | 7729.2 | 1339.5 | 1115.0 | 1064.0 | 959.0 | 910.9 | 890.5 | 905.1 | 941.6 | 948.8 |
| 55° | 13117.6 | 8622.6 | 1460.4 | 1125.2 | 1036.3 | 935.7 | 878.9 | 843.9 | 855.6 | 889.1 | 894.9 |
| 57.5° | 14500.8 | 9645.8 | 1703.8 | 1122.3 | 1001.3 | 913.9 | 845.4 | 792.9 | 801.6 | 822.0 | 827.9 |
| 60° | 15940.8 | 10881.8 | 2081.3 | 1131.0 | 985.3 | 887.6 | 800.2 | 734.6 | 731.7 | 749.2 | 752.1 |
| 62.5° | 17669.4 | 12311.6 | 2512.7 | 1136.9 | 995.5 | 854.1 | 740.4 | 676.3 | 667.5 | 671.9 | 674.8 |
| 65° | 19450.5 | 13346.4 | 2351.0 | 1113.5 | 1027.5 | 826.4 | 687.9 | 619.4 | 603.4 | 600.5 | 602.0 |
| 67.5° | 19505.9 | 12237.3 | 1648.4 | 1066.9 | 1040.7 | 811.8 | 648.6 | 571.3 | 545.1 | 534.9 | 533.4 |
| 70° | 17493.0 | 9941.7 | 1284.1 | 1017.3 | 988.2 | 788.5 | 612.2 | 532.0 | 492.6 | 476.6 | 475.1 |
| 71° | 16510.7 | 9151.7 | 1217.0 | 992.6 | 948.8 | 765.2 | 596.1 | 514.5 | 473.7 | 456.2 | 453.3 |
| 72.5° | 14970.1 | 8204.3 | 1135.4 | 953.2 | 873.0 | 705.4 | 565.5 | 489.7 | 447.5 | 427.1 | 422.7 |
| 75° | 10743.3 | 5365.1 | 975.1 | 849.7 | 722.9 | 562.6 | 495.6 | 440.2 | 403.7 | 379.0 | 376.0 |
| 77.5° | 4139.3 | 2135.3 | 737.5 | 706.9 | 553.9 | 440.2 | 408.1 | 380.4 | 354.2 | 329.4 | 327.9 |
| 80° | 1279.7 | 954.7 | 537.8 | 532.0 | 400.8 | 327.9 | 317.7 | 310.4 | 300.2 | 274.0 | 268.2 |
| 82.5° | 683.6 | 548.0 | 370.2 | 344.0 | 262.4 | 218.6 | 230.3 | 233.2 | 234.7 | 207.0 | 204.1 |
| 85° | 326.5 | 290.0 | 208.4 | 195.3 | 153.0 | 122.4 | 141.4 | 153.0 | 154.5 | 126.8 | 118.1 |
| 87.5° | 156.0 | 151.6 | 97.7 | 74.3 | 56.8 | 40.8 | 49.6 | 61.2 | 67.0 | 48.1 | 42.3 |
| 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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TM-30-18

Color Rendition by Hue-Angle Bin



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

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Measure Comparisons



(END OF REPORT)