

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: P318980

Luminaire Tested: **GLEON-SA6D-727-U-T4W**

Issue Date: 3/3/2020

Test Information

Test Method: LM-79-08
Report Number: P318980
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-18)
Test Lab: INNOVATION CENTER
Issue Date: 3/3/2020
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: McGRAW-EDISON
Catalog Number: GLEON-SA6D-727-U-T4W
Description: GALLEON AREA AND ROADWAY LUMINAIRE
(6) 70 CRI, 2700K, 1200mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE IV WIDE OPTICS
Light Source: -
Ballast/Driver: ELECTRONIC DRIVER

Summary

Lumens per Lamp: N/A
Luminaire Lumens: 38539 lumens
Efficiency: N/A
Efficacy: 100.9 lumens/watt
Luminous Opening: Rectangular (W 1.5' x L: 1' x H: 0')
IES Classification: Type IV - Short
BUG Rating: B4 - U0 - G5

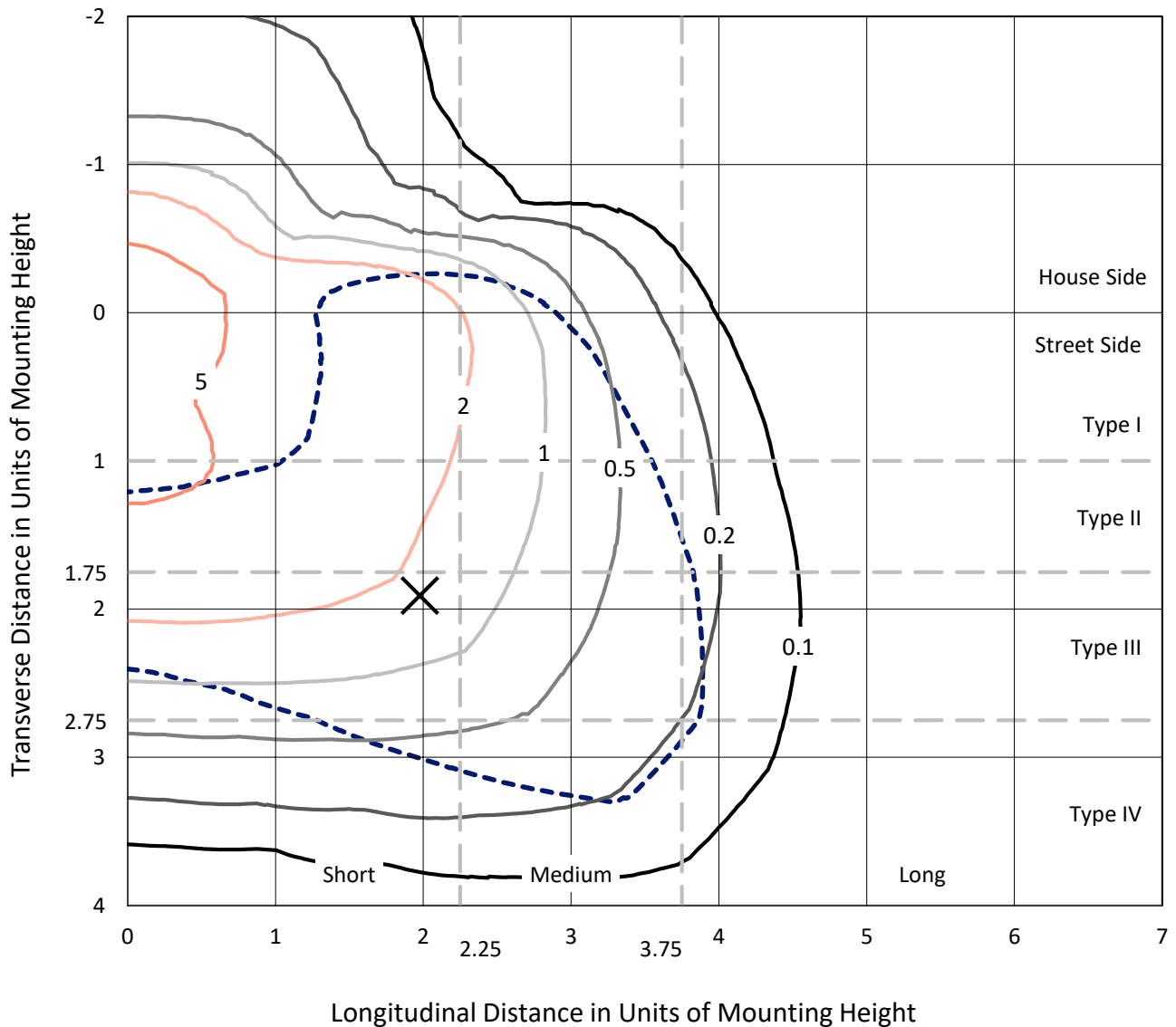
Input Watts (W): 382
Input Voltage (V): NR
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 24 FT



REPORT NUMBER: P318980
 CATALOG NUMBER: GLEON-SA6D-727-U-T4W

Iso-Footcandle Lines of Horizontal Illumination

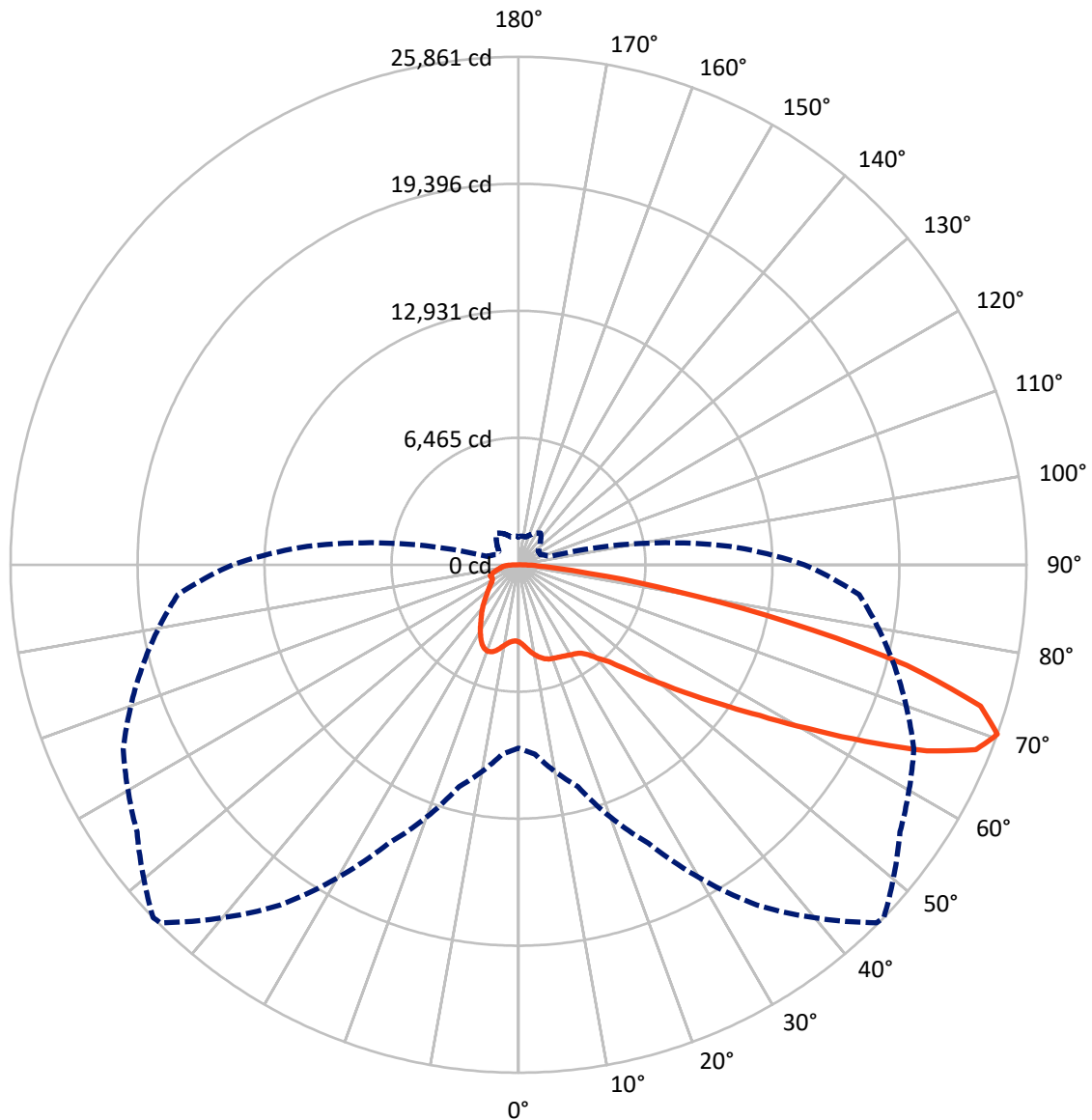
✕ Max cd
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 7.9 fc
 Type IV - Short - N/A

REPORT NUMBER: P318980
CATALOG NUMBER: GLEON-SA6D-727-U-T4W

Luminous Intensity Polar Plot



— Vertical Plane Through 46-Deg Lateral - - - Horizontal Cone Through 70-Deg Vertical

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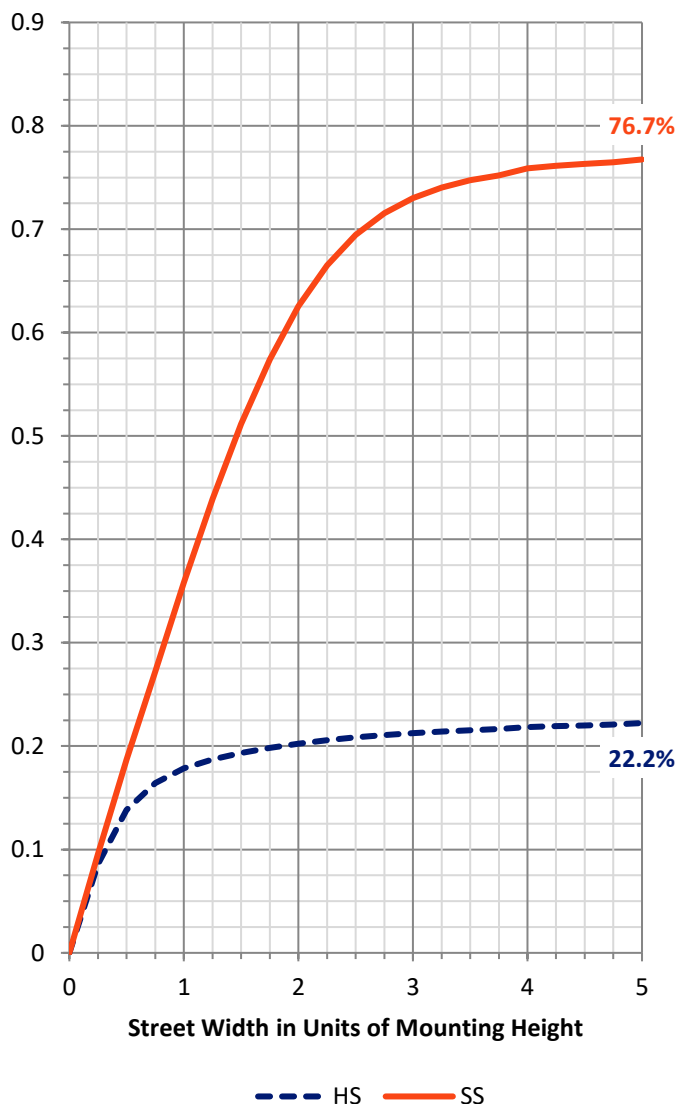
FLUX DISTRIBUTION:

| | | Downward | Upward | Total |
|--------------------|-----------|----------|--------|---------|
| House Side | Lumens | 8833.0 | 0.0 | 8833.0 |
| | % Fixture | 22.9 | 0.0 | 22.9 |
| Street Side | Lumens | 29706.0 | 0.0 | 29706.0 |
| | % Fixture | 77.1 | 0.0 | 77.1 |
| Total | Lumens | 38539.0 | 0.0 | 38539.0 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|---------|-----------|
| 0°-10° | 400.3 | 1.0 |
| 10°-20° | 1333.6 | 3.5 |
| 20°-30° | 2223.6 | 5.8 |
| 30°-40° | 3155.4 | 8.2 |
| 40°-50° | 4641.4 | 12.0 |
| 50°-60° | 7860.1 | 20.4 |
| 60°-70° | 11157.4 | 29.0 |
| 70°-80° | 6778.2 | 17.6 |
| 80°-90° | 989.2 | 2.6 |
| 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° | 38539.0 | 100.0 |
| 0°-180° | 38539.0 | 100.0 |

Coefficient of Utilization

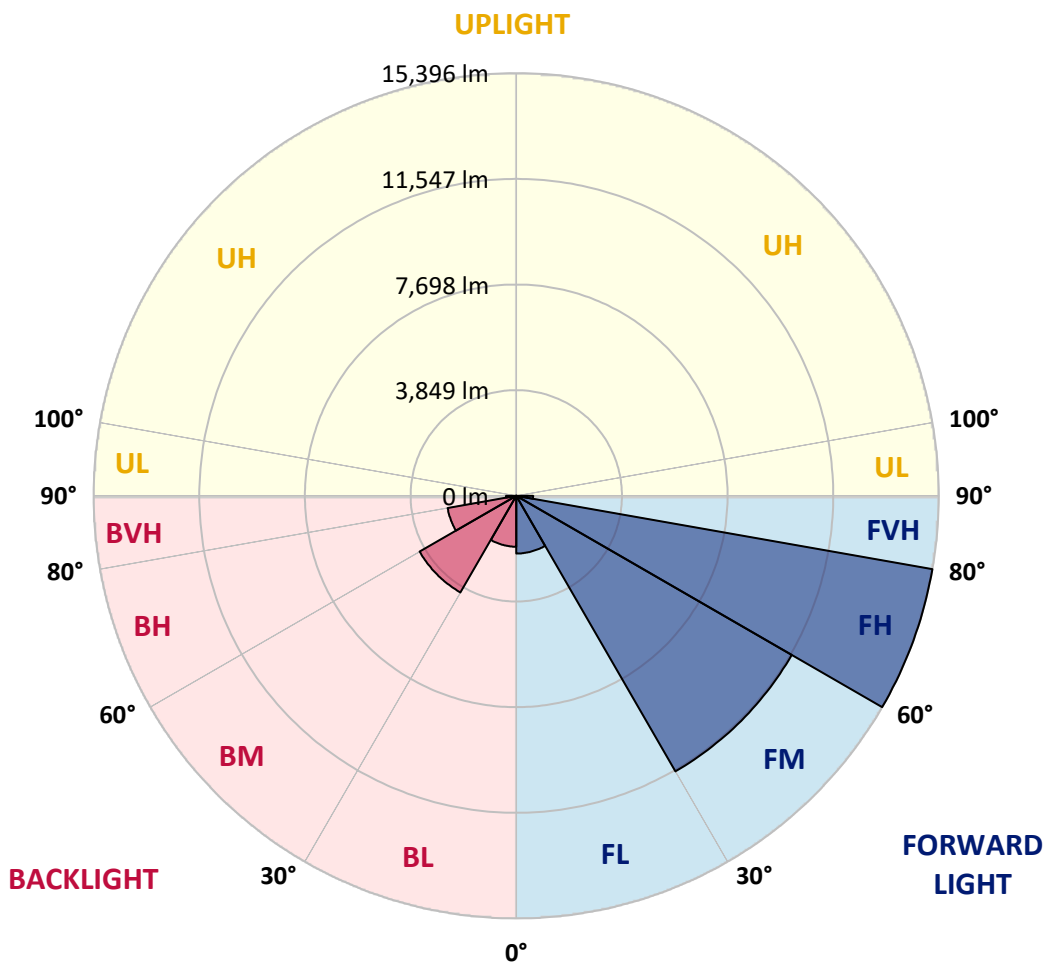


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LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | Lumens | % Fixture | Zone Rating/Lumen Limit | | |
|----------------|---------|-----------|-------------------------|------|---------|
| | | | B | U | G |
| FL (0°-30°) | 2102.9 | 5.5 | | | |
| FM (30°-60°) | 11590.8 | 30.1 | | | |
| FH (60°-80°) | 15396.1 | 39.9 | | | G5 |
| FVH (80°-90°) | 616.2 | 1.6 | | | G4/750 |
| BL (0°-30°) | 1854.5 | 4.8 | B3/2500 | | |
| BM (30°-60°) | 4066.1 | 10.6 | B3/5000 | | |
| BH (60°-80°) | 2539.4 | 6.6 | B4/5000 | | G4/5000 |
| BVH (80°-90°) | 373.0 | 1.0 | | | G3/500 |
| UL (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH (100°-180°) | 0.0 | 0.0 | | U0/0 | |

BUG Rating: B4-U0-G5
 Type IV Short





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CANDELA DISTRIBUTION (FULL):

| | 0° | 5° | 15° | 25° | 35° | 45° | 46° | 55° | 65° | 75° | 85° |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0° | 3926.4 | 3926.4 | 3926.4 | 3926.4 | 3926.4 | 3926.4 | 3926.4 | 3926.4 | 3926.4 | 3926.4 | 3926.4 |
| 2.5° | 4122.9 | 4125.5 | 4130.8 | 4117.6 | 4080.7 | 4070.1 | 4066.2 | 4027.9 | 4002.9 | 3965.9 | 3934.3 |
| 5° | 4452.6 | 4455.2 | 4447.3 | 4410.4 | 4328.6 | 4268.0 | 4262.7 | 4175.6 | 4096.5 | 4012.1 | 3948.8 |
| 7.5° | 4796.8 | 4800.8 | 4775.7 | 4705.8 | 4591.1 | 4485.6 | 4479.0 | 4360.3 | 4240.3 | 4112.3 | 4017.4 |
| 10° | 5101.5 | 5085.7 | 5044.8 | 4947.2 | 4811.4 | 4682.1 | 4676.8 | 4552.8 | 4414.4 | 4260.1 | 4133.4 |
| 12.5° | 5304.6 | 5291.4 | 5238.7 | 5120.0 | 4970.9 | 4852.2 | 4841.7 | 4726.9 | 4592.4 | 4423.6 | 4271.9 |
| 15° | 5416.7 | 5426.0 | 5354.7 | 5220.2 | 5075.1 | 4974.9 | 4965.7 | 4883.9 | 4763.9 | 4593.7 | 4419.6 |
| 17.5° | 5431.2 | 5439.1 | 5370.6 | 5237.4 | 5118.7 | 5050.1 | 5046.1 | 4992.0 | 4905.0 | 4741.5 | 4559.4 |
| 20° | 5346.8 | 5352.1 | 5295.4 | 5185.9 | 5108.1 | 5087.0 | 5085.7 | 5061.9 | 4997.3 | 4852.2 | 4675.5 |
| 22.5° | 5224.2 | 5228.1 | 5187.2 | 5108.1 | 5081.7 | 5114.7 | 5123.9 | 5114.7 | 5068.5 | 4932.7 | 4766.5 |
| 25° | 5193.8 | 5191.2 | 5149.0 | 5068.5 | 5091.0 | 5160.9 | 5172.7 | 5176.7 | 5145.0 | 5026.3 | 4882.6 |
| 27.5° | 5340.2 | 5331.0 | 5250.5 | 5121.3 | 5135.8 | 5220.2 | 5236.0 | 5274.3 | 5254.5 | 5150.3 | 5014.5 |
| 30° | 5763.6 | 5747.8 | 5582.9 | 5321.8 | 5250.5 | 5294.1 | 5313.9 | 5374.5 | 5378.5 | 5291.4 | 5189.9 |
| 32.5° | 6478.4 | 6458.7 | 6163.2 | 5696.3 | 5444.4 | 5369.2 | 5387.7 | 5478.7 | 5527.5 | 5460.3 | 5350.8 |
| 35° | 7381.9 | 7359.5 | 6971.7 | 6333.4 | 5768.9 | 5513.0 | 5526.2 | 5598.7 | 5696.3 | 5601.4 | 5456.3 |
| 37.5° | 8323.6 | 8269.5 | 7896.3 | 7082.5 | 6284.6 | 5820.3 | 5820.3 | 5829.5 | 5875.7 | 5677.9 | 5580.3 |
| 40° | 9260.0 | 9205.9 | 8868.3 | 7963.5 | 6951.9 | 6304.3 | 6274.0 | 6069.6 | 6032.7 | 5862.5 | 5829.5 |
| 42.5° | 10130.5 | 10114.7 | 9915.5 | 8959.3 | 7735.4 | 6780.5 | 6738.3 | 6391.4 | 6399.3 | 6293.8 | 6295.1 |
| 45° | 11056.4 | 11056.4 | 10894.1 | 9964.3 | 8648.0 | 7545.4 | 7503.2 | 6992.8 | 7071.9 | 7023.2 | 7140.5 |
| 47.5° | 11812.1 | 11835.8 | 11813.4 | 11011.5 | 9709.8 | 8517.5 | 8441.0 | 7826.4 | 8047.9 | 8215.4 | 8557.0 |
| 50° | 12583.6 | 12620.6 | 12624.5 | 12160.3 | 10993.0 | 9672.8 | 9585.8 | 8932.9 | 9427.5 | 9907.6 | 10578.9 |
| 52.5° | 13703.4 | 13786.5 | 13455.4 | 13306.4 | 12565.2 | 11044.5 | 10958.8 | 10356.0 | 11181.6 | 11855.6 | 13012.3 |
| 55° | 14741.4 | 14668.8 | 14432.7 | 14525.1 | 14248.1 | 12606.1 | 12541.4 | 12012.6 | 13136.3 | 14012.0 | 15514.2 |
| 57.5° | 15303.2 | 15297.9 | 15535.3 | 15931.0 | 16062.9 | 14531.7 | 14477.6 | 13963.2 | 15340.1 | 15998.3 | 17863.2 |
| 60° | 15962.7 | 15971.9 | 16560.1 | 17458.3 | 18001.7 | 16929.4 | 16905.7 | 16515.3 | 17480.7 | 17852.7 | 19705.7 |
| 62.5° | 16055.0 | 16221.2 | 17234.1 | 18779.8 | 19816.5 | 19730.8 | 19783.5 | 18814.1 | 19395.8 | 19332.5 | 21081.3 |
| 65° | 14993.3 | 15212.2 | 17045.5 | 19179.5 | 21620.8 | 22794.6 | 22843.4 | 21126.2 | 20905.9 | 20597.3 | 21573.3 |
| 67.5° | 12817.1 | 13141.5 | 15133.1 | 18310.3 | 22215.6 | 25059.1 | 25127.7 | 22918.6 | 22158.9 | 21025.9 | 20388.9 |
| 70° | 9327.3 | 9687.3 | 11692.1 | 15638.2 | 21155.2 | 25783.2 | 25861.0 | 23711.2 | 22206.3 | 19805.9 | 17405.5 |
| 72.5° | 5634.3 | 5916.6 | 7569.2 | 11512.7 | 17855.3 | 24464.3 | 24602.8 | 22706.2 | 20274.2 | 16776.4 | 12852.7 |
| 75° | 2474.3 | 2658.9 | 3660.0 | 6634.1 | 12782.8 | 20241.2 | 20414.0 | 19435.3 | 16473.1 | 12191.9 | 7596.9 |
| 77.5° | 1053.8 | 1106.6 | 1500.9 | 2881.8 | 7226.3 | 13831.3 | 14068.7 | 14200.6 | 11176.4 | 6634.1 | 3210.2 |
| 80° | 656.8 | 677.9 | 849.4 | 1304.4 | 3381.7 | 7768.3 | 8024.2 | 8355.2 | 5549.9 | 2438.6 | 1121.1 |
| 82.5° | 399.6 | 423.4 | 564.5 | 788.7 | 1760.7 | 3521.5 | 3644.1 | 3877.6 | 2153.8 | 1053.8 | 580.3 |
| 85° | 240.0 | 257.2 | 345.6 | 498.5 | 1002.4 | 1384.8 | 1383.5 | 1529.9 | 1014.2 | 677.9 | 306.0 |
| 87.5° | 114.7 | 127.9 | 184.6 | 258.5 | 505.1 | 519.6 | 486.7 | 551.3 | 615.9 | 444.5 | 154.3 |
| 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-SA6D-727-U-T4W

CANDELA DISTRIBUTION (continued):

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|-------|---------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0° | 3926.4 | 3926.4 | 3926.4 | 3926.4 | 3926.4 | 3926.4 | 3926.4 | 3926.4 | 3926.4 | 3926.4 | 3926.4 |
| 2.5° | 3923.7 | 3918.5 | 3901.3 | 3888.1 | 3885.5 | 3877.6 | 3871.0 | 3874.9 | 3880.2 | 3881.5 | 3881.5 |
| 5° | 3922.4 | 3907.9 | 3885.5 | 3876.3 | 3888.1 | 3903.9 | 3923.7 | 3950.1 | 3965.9 | 3977.8 | 3985.7 |
| 7.5° | 3985.7 | 3958.0 | 3933.0 | 3927.7 | 3951.4 | 3993.6 | 4038.5 | 4093.9 | 4132.1 | 4158.5 | 4163.8 |
| 10° | 4091.2 | 4056.9 | 4031.9 | 4037.2 | 4079.4 | 4140.0 | 4203.3 | 4274.6 | 4332.6 | 4368.2 | 4370.8 |
| 12.5° | 4212.6 | 4179.6 | 4155.9 | 4178.3 | 4248.2 | 4322.0 | 4388.0 | 4450.0 | 4502.7 | 4538.3 | 4538.3 |
| 15° | 4352.4 | 4328.6 | 4300.9 | 4352.4 | 4447.3 | 4513.3 | 4541.0 | 4571.3 | 4600.3 | 4626.7 | 4621.4 |
| 17.5° | 4486.9 | 4464.5 | 4450.0 | 4510.6 | 4609.6 | 4639.9 | 4621.4 | 4599.0 | 4599.0 | 4613.5 | 4616.2 |
| 20° | 4603.0 | 4583.2 | 4592.4 | 4651.8 | 4703.2 | 4671.5 | 4603.0 | 4531.7 | 4502.7 | 4510.6 | 4518.6 |
| 22.5° | 4704.5 | 4695.3 | 4723.0 | 4750.7 | 4713.8 | 4603.0 | 4476.4 | 4380.1 | 4344.5 | 4341.8 | 4344.5 |
| 25° | 4823.2 | 4821.9 | 4856.2 | 4806.1 | 4642.5 | 4438.1 | 4268.0 | 4174.3 | 4154.5 | 4170.4 | 4196.7 |
| 27.5° | 4970.9 | 4985.4 | 5002.6 | 4819.3 | 4497.5 | 4188.8 | 4016.1 | 3951.4 | 3971.2 | 4009.5 | 4034.5 |
| 30° | 5159.5 | 5199.1 | 5162.2 | 4786.3 | 4289.1 | 3903.9 | 3739.1 | 3720.6 | 3774.7 | 3828.8 | 3855.1 |
| 32.5° | 5342.9 | 5404.9 | 5315.2 | 4700.6 | 4020.0 | 3601.9 | 3474.0 | 3468.7 | 3534.7 | 3587.4 | 3624.3 |
| 35° | 5490.6 | 5613.2 | 5429.9 | 4530.4 | 3708.8 | 3323.6 | 3230.0 | 3194.4 | 3218.1 | 3280.1 | 3322.3 |
| 37.5° | 5683.1 | 5887.6 | 5509.1 | 4270.6 | 3371.1 | 3094.1 | 2984.7 | 2902.9 | 2881.8 | 2906.9 | 2928.0 |
| 40° | 6035.3 | 6305.7 | 5546.0 | 3907.9 | 3041.4 | 2864.7 | 2753.9 | 2633.8 | 2550.8 | 2490.1 | 2491.4 |
| 42.5° | 6610.3 | 6850.4 | 5522.2 | 3467.4 | 2736.7 | 2640.4 | 2515.1 | 2376.7 | 2242.1 | 2105.0 | 2094.4 |
| 45° | 7544.1 | 7660.2 | 5451.0 | 3000.5 | 2469.0 | 2405.7 | 2288.3 | 2149.8 | 1970.4 | 1814.8 | 1800.3 |
| 47.5° | 9038.4 | 8781.2 | 5340.2 | 2593.0 | 2232.9 | 2206.5 | 2098.4 | 1938.8 | 1748.9 | 1623.6 | 1613.0 |
| 50° | 11076.1 | 10399.5 | 5286.2 | 2268.5 | 2024.5 | 2032.4 | 1944.1 | 1775.2 | 1595.9 | 1503.5 | 1493.0 |
| 52.5° | 13513.5 | 12284.2 | 5390.4 | 2017.9 | 1857.0 | 1884.7 | 1818.8 | 1660.5 | 1510.1 | 1437.6 | 1427.1 |
| 55° | 16041.8 | 14236.2 | 5502.5 | 1835.9 | 1698.7 | 1752.8 | 1730.4 | 1599.8 | 1464.0 | 1396.7 | 1387.5 |
| 57.5° | 18206.1 | 15693.6 | 5278.2 | 1688.2 | 1557.6 | 1642.0 | 1661.8 | 1561.6 | 1440.2 | 1379.6 | 1369.0 |
| 60° | 19568.5 | 16280.5 | 4690.0 | 1549.7 | 1445.5 | 1553.7 | 1622.2 | 1551.0 | 1449.5 | 1444.2 | 1436.3 |
| 62.5° | 20214.8 | 16229.1 | 3807.7 | 1440.2 | 1375.6 | 1515.4 | 1651.3 | 1610.4 | 1555.0 | 1602.5 | 1606.4 |
| 65° | 19924.6 | 15453.6 | 2835.6 | 1367.7 | 1325.5 | 1529.9 | 1738.3 | 1722.5 | 1585.3 | 1632.8 | 1639.4 |
| 67.5° | 18014.9 | 13603.2 | 2099.7 | 1304.4 | 1270.1 | 1570.8 | 1896.6 | 1759.4 | 1526.0 | 1560.3 | 1539.2 |
| 70° | 14560.7 | 10784.7 | 1619.6 | 1233.2 | 1213.4 | 1565.5 | 1967.8 | 1737.0 | 1461.3 | 1469.3 | 1412.5 |
| 72.5° | 10040.8 | 7354.2 | 1317.6 | 1167.2 | 1131.6 | 1427.1 | 1917.7 | 1681.6 | 1407.3 | 1346.6 | 1271.4 |
| 75° | 5460.3 | 3947.5 | 1119.7 | 1098.6 | 987.9 | 1253.0 | 1825.4 | 1642.0 | 1358.5 | 1278.0 | 1235.8 |
| 77.5° | 2148.5 | 1638.1 | 972.0 | 1005.0 | 863.9 | 1106.6 | 1722.5 | 1566.9 | 1291.2 | 1185.7 | 1164.6 |
| 80° | 877.1 | 836.2 | 805.8 | 869.2 | 742.5 | 968.1 | 1598.5 | 1478.5 | 1210.8 | 1100.0 | 1057.8 |
| 82.5° | 497.2 | 519.6 | 626.5 | 685.8 | 602.7 | 891.6 | 1539.2 | 1407.3 | 1114.5 | 985.2 | 935.1 |
| 85° | 254.5 | 304.7 | 436.6 | 492.0 | 443.2 | 758.4 | 1417.8 | 1231.9 | 894.2 | 754.4 | 758.4 |
| 87.5° | 122.7 | 170.1 | 275.7 | 308.6 | 287.5 | 548.7 | 1059.1 | 892.9 | 696.4 | 551.3 | 534.2 |
| 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 ($\mu\text{W}/\text{nm}$) | 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)