

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: P319269

Luminaire Tested: **GLEON-SA5A-727-U-SL2**

Issue Date: 3/3/2020

Test Information

Test Method: LM-79-08
Report Number: P319269
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-20)
Test Lab: INNOVATION CENTER
Issue Date: 3/3/2020
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: McGRAW-EDISON
Catalog Number: GLEON-SA5A-727-U-SL2
Description: GALLEON AREA AND ROADWAY LUMINAIRE
(5) 70 CRI, 2700K, 615mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE II SPILL
LIGHT ELIMINATOR OPTICS
Light Source: -
Ballast/Driver: ELECTRONIC DRIVER

Summary

Lumens per Lamp: N/A
Luminaire Lumens: 19082 lumens
Efficiency: N/A
Efficacy: 117.8 lumens/watt
Luminous Opening: Rectangular (W 1.5' x L: 1' x H: 0')
IES Classification: Type III - Medium
BUG Rating: B3 - U0 - G4

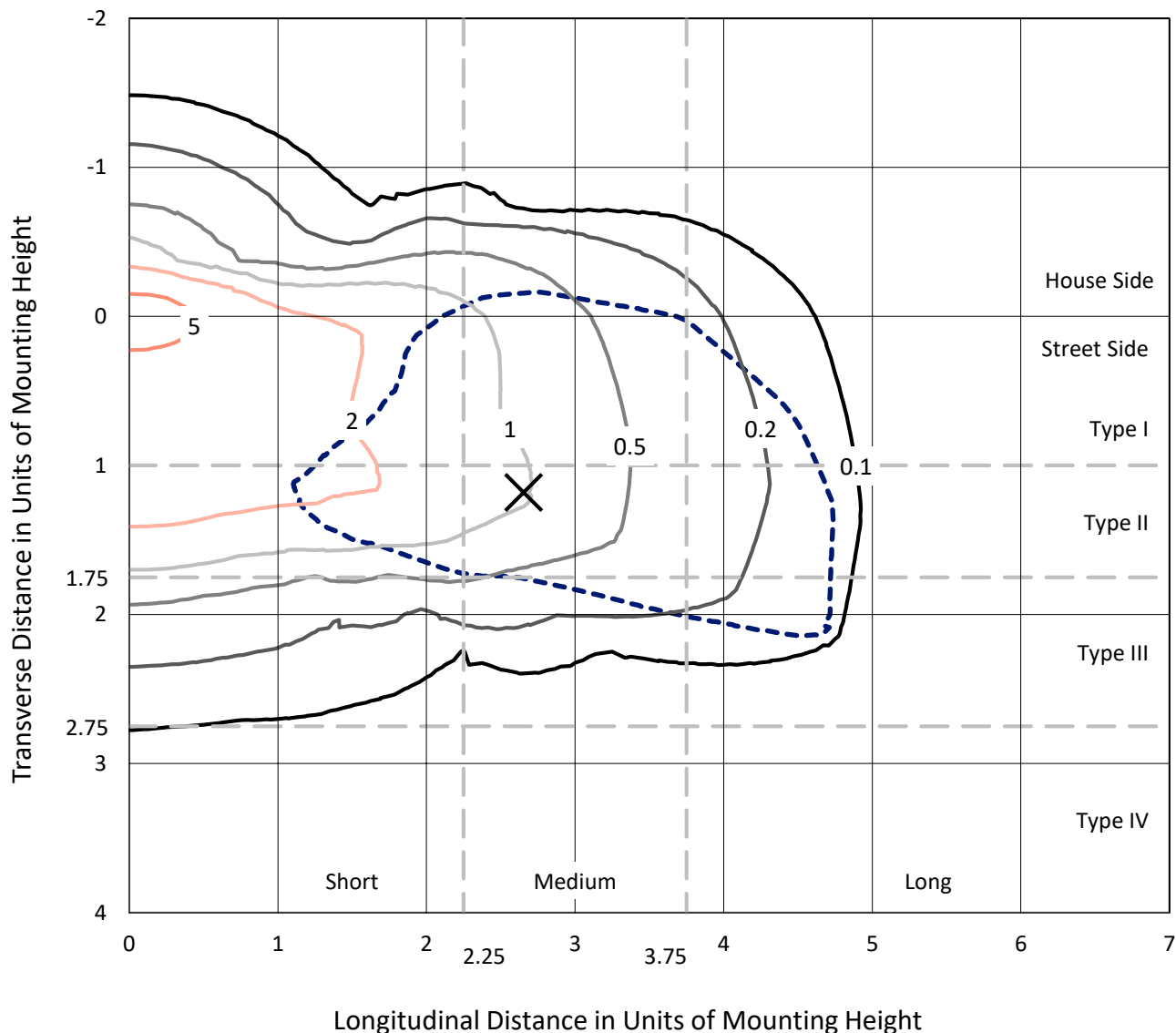
Input Watts (W): 162
Input Voltage (V): NR
Input Current (A_{in}): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 24 FT



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Iso-Footcandle Lines of Horizontal Illumination

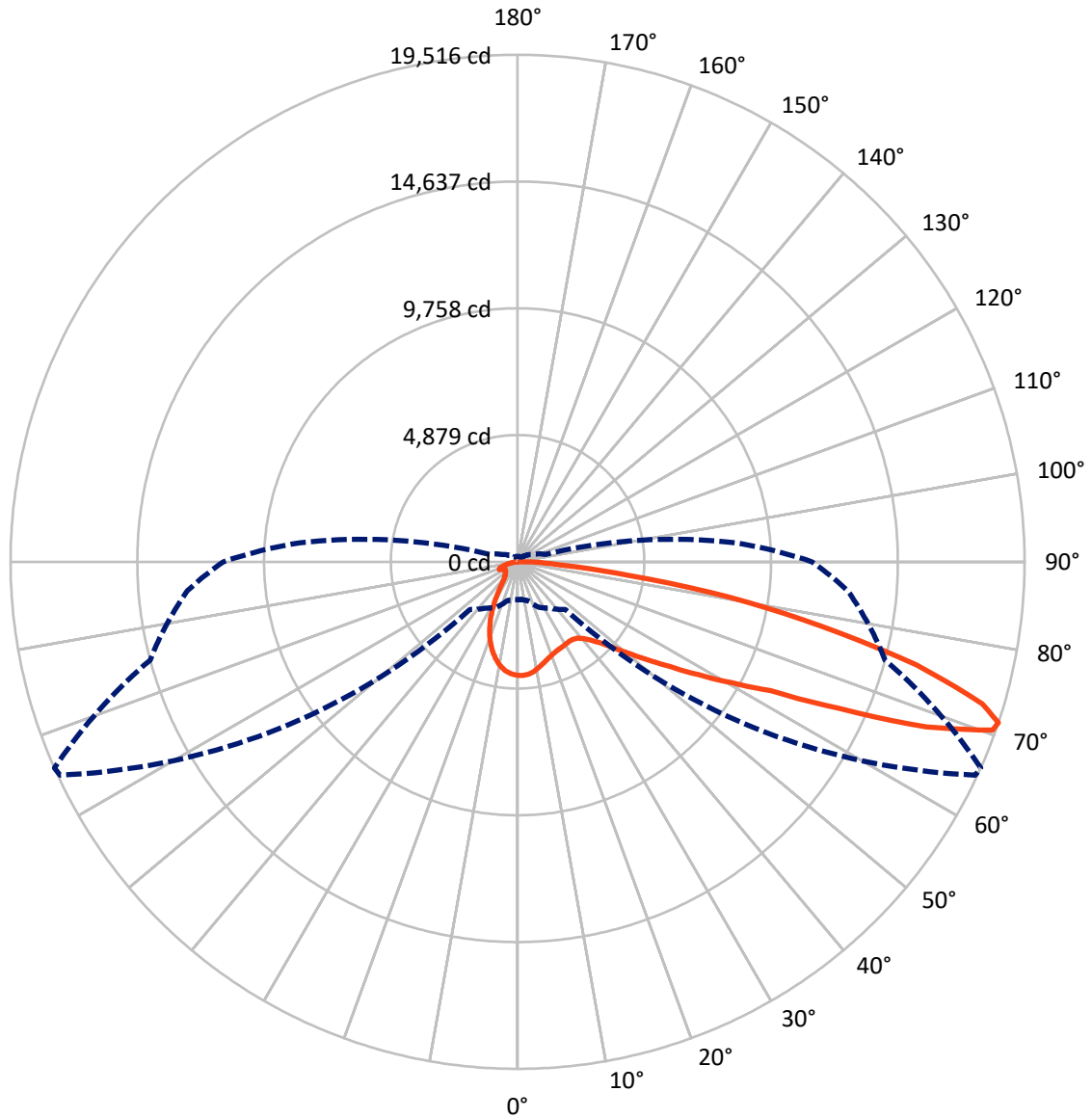
✕ Max cd
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 7 fc
 Type III - Medium - N/A

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Luminous Intensity Polar Plot



— Vertical Plane Through 66-Deg Lateral - - - Horizontal Cone Through 71-Deg Vertical

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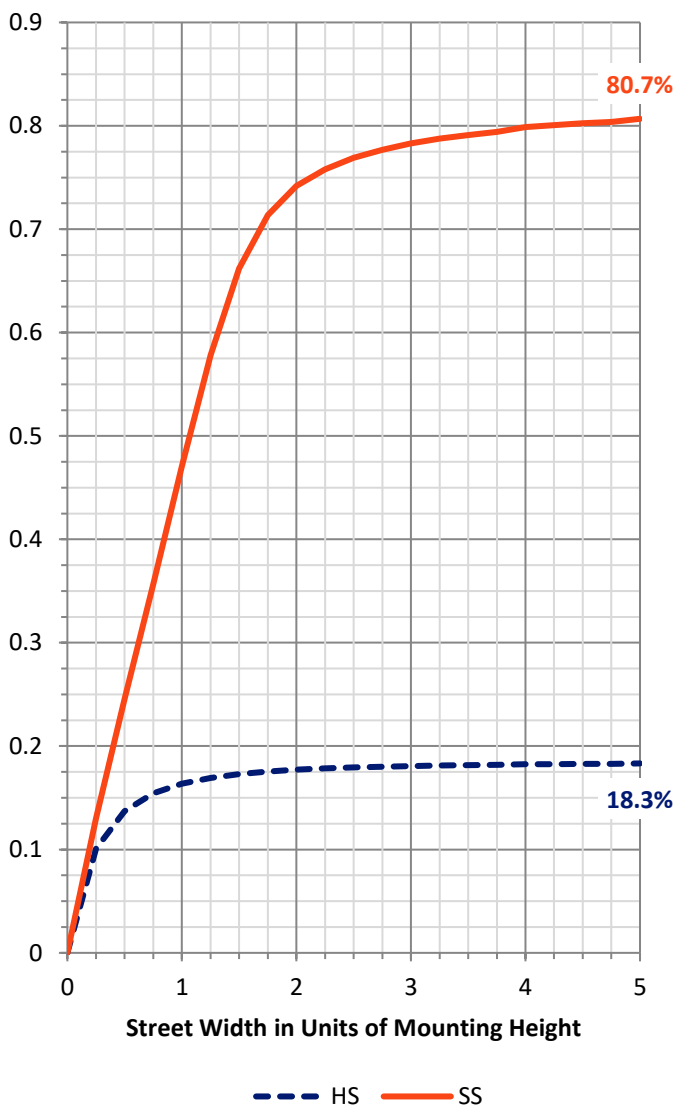
FLUX DISTRIBUTION:

| | | Downward | Upward | Total |
|--------------------|-----------|----------|--------|---------|
| House Side | Lumens | 3536.4 | 0.0 | 3536.4 |
| | % Fixture | 18.5 | 0.0 | 18.5 |
| Street Side | Lumens | 15545.6 | 0.0 | 15545.6 |
| | % Fixture | 81.5 | 0.0 | 81.5 |
| Total | Lumens | 19082.0 | 0.0 | 19082.0 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|---------|-----------|
| 0°-10° | 384.8 | 2.0 |
| 10°-20° | 922.9 | 4.8 |
| 20°-30° | 1239.6 | 6.5 |
| 30°-40° | 1630.7 | 8.5 |
| 40°-50° | 2372.3 | 12.4 |
| 50°-60° | 3705.8 | 19.4 |
| 60°-70° | 4642.1 | 24.3 |
| 70°-80° | 3540.9 | 18.6 |
| 80°-90° | 643.0 | 3.4 |
| 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° | 19082.0 | 100.0 |
| 0°-180° | 19082.0 | 100.0 |

Coefficient of Utilization

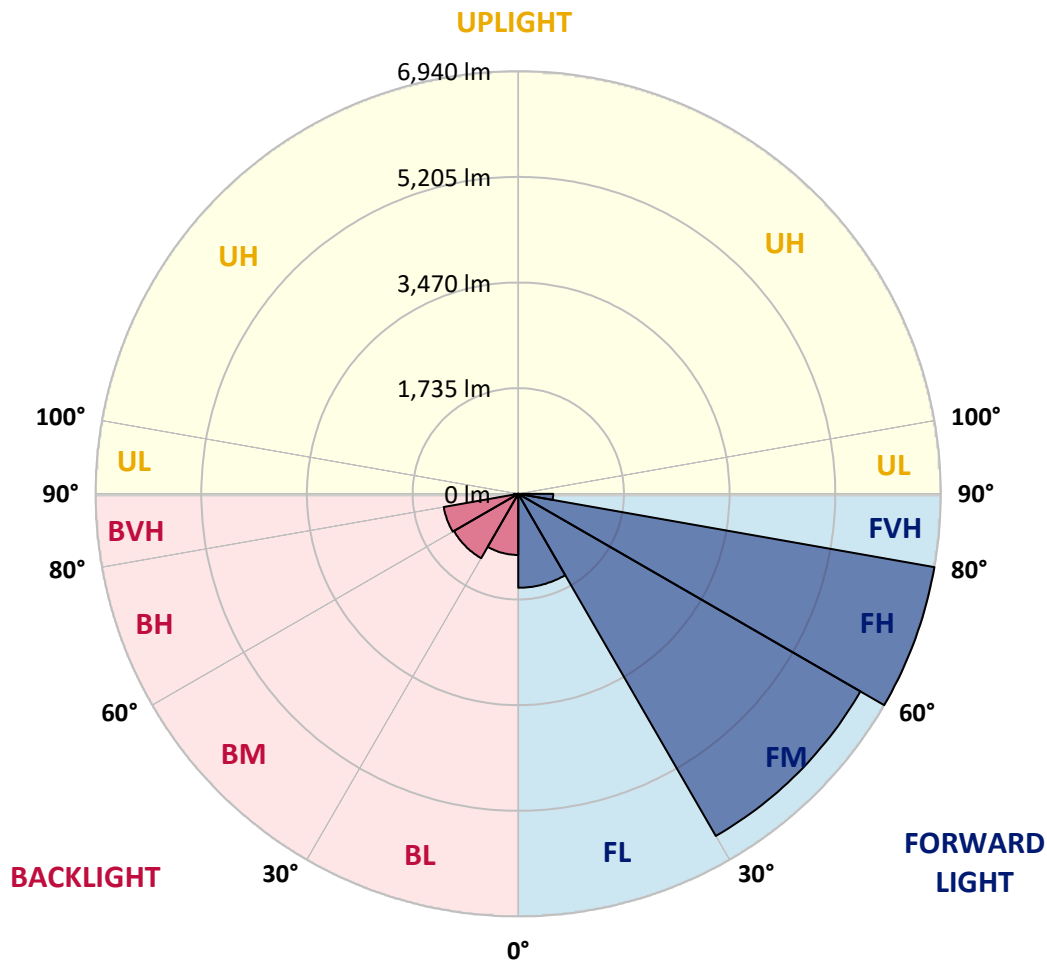


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LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | Lumens | % Fixture | Zone Rating/Lumen Limit | | |
|----------------|--------|-----------|-------------------------|------|---------|
| | | | B | U | G |
| FL (0°-30°) | 1543.0 | 8.1 | | | |
| FM (30°-60°) | 6488.8 | 34.0 | | | |
| FH (60°-80°) | 6940.3 | 36.4 | | | G3/7500 |
| FVH (80°-90°) | 573.4 | 3.0 | | | G4/750 |
| BL (0°-30°) | 1004.2 | 5.3 | B3/2500 | | |
| BM (30°-60°) | 1220.0 | 6.4 | B2/2500 | | |
| BH (60°-80°) | 1242.6 | 6.5 | B3/2500 | | G3/2500 |
| BVH (80°-90°) | 69.6 | 0.4 | | | G1/100 |
| UL (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH (100°-180°) | 0.0 | 0.0 | | U0/0 | |

BUG Rating: B3-U0-G4
 Type III Medium





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CANDELA DISTRIBUTION (FULL):

| | 0° | 5° | 15° | 25° | 35° | 45° | 55° | 65° | 66° | 75° | 85° |
|-------|--------|--------|--------|--------|--------|---------|---------|---------|---------|---------|---------|
| 0° | 4371.3 | 4371.3 | 4371.3 | 4371.3 | 4371.3 | 4371.3 | 4371.3 | 4371.3 | 4371.3 | 4371.3 | 4371.3 |
| 2.5° | 4290.3 | 4283.7 | 4303.5 | 4323.9 | 4331.8 | 4345.0 | 4364.7 | 4375.9 | 4375.3 | 4377.2 | 4370.7 |
| 5° | 4005.7 | 3997.1 | 4036.6 | 4068.9 | 4130.8 | 4200.7 | 4285.7 | 4346.3 | 4347.6 | 4381.9 | 4391.1 |
| 7.5° | 3736.2 | 3730.3 | 3775.7 | 3827.8 | 3899.6 | 4006.3 | 4144.0 | 4274.5 | 4282.4 | 4375.3 | 4407.6 |
| 10° | 3520.1 | 3518.8 | 3562.9 | 3619.6 | 3703.3 | 3822.5 | 3980.6 | 4171.7 | 4183.6 | 4343.6 | 4410.2 |
| 12.5° | 3351.5 | 3354.1 | 3392.3 | 3456.9 | 3545.1 | 3669.7 | 3841.0 | 4056.4 | 4075.5 | 4293.6 | 4395.0 |
| 15° | 3226.9 | 3237.5 | 3268.4 | 3333.7 | 3420.6 | 3547.1 | 3723.0 | 3949.7 | 3978.7 | 4237.6 | 4386.5 |
| 17.5° | 3155.8 | 3167.6 | 3189.4 | 3243.4 | 3325.1 | 3447.0 | 3613.7 | 3862.0 | 3888.4 | 4194.8 | 4387.1 |
| 20° | 3134.7 | 3144.6 | 3157.1 | 3190.0 | 3259.2 | 3369.9 | 3527.4 | 3783.0 | 3811.3 | 4160.5 | 4393.7 |
| 22.5° | 3176.2 | 3183.5 | 3184.8 | 3182.1 | 3224.3 | 3314.6 | 3464.8 | 3725.0 | 3755.3 | 4138.1 | 4398.3 |
| 25° | 3265.1 | 3275.0 | 3267.8 | 3243.4 | 3229.6 | 3284.9 | 3432.5 | 3686.8 | 3717.1 | 4121.6 | 4389.1 |
| 27.5° | 3398.9 | 3400.2 | 3394.3 | 3362.7 | 3297.4 | 3288.2 | 3422.6 | 3664.4 | 3693.4 | 4102.5 | 4370.0 |
| 30° | 3580.7 | 3589.3 | 3578.7 | 3535.9 | 3429.2 | 3340.9 | 3434.5 | 3642.7 | 3669.0 | 4078.1 | 4339.0 |
| 32.5° | 3793.5 | 3814.6 | 3813.9 | 3769.1 | 3616.3 | 3458.8 | 3483.2 | 3629.5 | 3649.9 | 4052.4 | 4301.5 |
| 35° | 4014.2 | 4043.2 | 4097.2 | 4078.1 | 3889.1 | 3645.3 | 3576.8 | 3650.6 | 3664.4 | 4049.2 | 4275.1 |
| 37.5° | 4243.5 | 4272.5 | 4383.8 | 4435.2 | 4213.9 | 3912.1 | 3724.3 | 3725.0 | 3731.6 | 4089.3 | 4273.2 |
| 40° | 4483.3 | 4514.3 | 4681.6 | 4815.4 | 4634.8 | 4250.1 | 3962.2 | 3880.5 | 3873.2 | 4188.2 | 4312.0 |
| 42.5° | 4819.3 | 4847.0 | 5047.9 | 5218.6 | 5102.0 | 4682.9 | 4290.9 | 4120.3 | 4105.2 | 4381.9 | 4436.5 |
| 45° | 5244.3 | 5268.0 | 5481.4 | 5663.9 | 5604.0 | 5177.1 | 4704.0 | 4450.4 | 4447.7 | 4704.7 | 4688.9 |
| 47.5° | 5749.6 | 5768.0 | 5959.7 | 6136.3 | 6158.1 | 5745.6 | 5223.2 | 4959.6 | 4916.8 | 5147.4 | 5079.6 |
| 50° | 6276.0 | 6296.4 | 6426.9 | 6616.6 | 6778.0 | 6506.6 | 5891.2 | 5583.6 | 5526.2 | 5731.8 | 5633.0 |
| 52.5° | 6624.5 | 6651.5 | 6764.8 | 7005.3 | 7475.1 | 7340.6 | 6681.2 | 6339.9 | 6252.9 | 6440.0 | 6364.3 |
| 55° | 6469.0 | 6529.6 | 6702.9 | 7088.3 | 8032.4 | 8614.8 | 7655.6 | 7222.1 | 7123.9 | 7279.4 | 7234.6 |
| 57.5° | 5762.1 | 5845.1 | 6081.6 | 6676.6 | 8110.8 | 9737.5 | 9128.7 | 8261.0 | 8191.9 | 8147.1 | 8167.5 |
| 60° | 4470.1 | 4549.9 | 4843.0 | 5618.5 | 7564.7 | 10557.0 | 11345.7 | 9541.8 | 9441.6 | 9018.0 | 9036.5 |
| 62.5° | 3163.7 | 3123.5 | 3324.4 | 3891.7 | 6146.9 | 10653.2 | 13868.3 | 11254.7 | 10925.3 | 9937.7 | 9856.7 |
| 65° | 2412.6 | 2403.4 | 2493.7 | 2674.2 | 3723.0 | 9502.3 | 15371.1 | 14133.8 | 13619.3 | 11019.5 | 10828.5 |
| 67.5° | 1982.4 | 1965.9 | 2054.9 | 2317.8 | 2397.5 | 6130.4 | 15404.0 | 17474.1 | 16968.7 | 12366.2 | 11952.4 |
| 70° | 1629.9 | 1611.5 | 1694.5 | 2033.8 | 2215.6 | 3109.0 | 12964.4 | 19430.1 | 19403.1 | 14071.2 | 12801.0 |
| 71° | 1461.3 | 1448.1 | 1547.6 | 1924.4 | 2176.8 | 2591.2 | 11193.5 | 19435.4 | 19516.4 | 14648.4 | 12750.9 |
| 72.5° | 1189.8 | 1194.5 | 1299.9 | 1713.0 | 2147.8 | 2288.1 | 8226.8 | 18529.5 | 18700.8 | 15198.5 | 12295.7 |
| 75° | 790.6 | 794.5 | 932.9 | 1317.7 | 2082.6 | 2238.7 | 4521.5 | 15548.3 | 15863.2 | 14869.1 | 11219.8 |
| 77.5° | 531.0 | 529.7 | 623.9 | 903.9 | 1814.4 | 2238.7 | 2651.1 | 11629.0 | 11974.8 | 11831.2 | 8649.7 |
| 80° | 365.6 | 363.0 | 429.6 | 623.9 | 1373.7 | 2265.7 | 2049.6 | 8149.7 | 8254.4 | 6389.3 | 3515.5 |
| 82.5° | 224.0 | 226.0 | 280.7 | 440.8 | 934.9 | 2039.1 | 1935.0 | 4443.8 | 4329.8 | 1792.0 | 878.2 |
| 85° | 128.5 | 127.8 | 179.2 | 298.4 | 600.2 | 1720.9 | 1886.9 | 1912.6 | 1754.5 | 539.6 | 317.6 |
| 87.5° | 46.1 | 49.4 | 96.2 | 165.4 | 343.9 | 1198.4 | 1600.9 | 994.8 | 896.7 | 243.8 | 143.6 |
| 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-SA5A-727-U-SL2

CANDELA DISTRIBUTION (continued):

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|-------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0° | 4371.3 | 4371.3 | 4371.3 | 4371.3 | 4371.3 | 4371.3 | 4371.3 | 4371.3 | 4371.3 | 4371.3 | 4371.3 |
| 2.5° | 4366.0 | 4370.0 | 4365.4 | 4339.0 | 4316.6 | 4280.4 | 4260.0 | 4231.6 | 4223.1 | 4219.1 | 4229.7 |
| 5° | 4382.5 | 4383.8 | 4345.0 | 4275.8 | 4198.0 | 4106.5 | 4040.6 | 3959.5 | 3921.3 | 3904.9 | 3915.4 |
| 7.5° | 4397.7 | 4391.7 | 4306.8 | 4174.3 | 4030.7 | 3871.3 | 3729.6 | 3599.8 | 3524.1 | 3493.1 | 3495.7 |
| 10° | 4399.6 | 4374.6 | 4238.2 | 4033.3 | 3810.7 | 3576.8 | 3359.4 | 3159.1 | 3032.6 | 2950.2 | 2975.3 |
| 12.5° | 4379.2 | 4337.1 | 4137.4 | 3850.8 | 3541.9 | 3223.0 | 2929.1 | 2628.7 | 2448.2 | 2364.5 | 2367.2 |
| 15° | 4363.4 | 4287.0 | 4013.6 | 3636.1 | 3221.0 | 2798.7 | 2397.5 | 2044.3 | 1852.0 | 1766.3 | 1726.1 |
| 17.5° | 4350.2 | 4233.0 | 3869.9 | 3394.3 | 2842.2 | 2306.6 | 1824.3 | 1509.4 | 1404.0 | 1378.9 | 1368.4 |
| 20° | 4331.8 | 4175.6 | 3709.9 | 3114.3 | 2410.6 | 1755.8 | 1332.1 | 1176.7 | 1177.3 | 1206.3 | 1210.3 |
| 22.5° | 4306.1 | 4110.4 | 3539.2 | 2800.0 | 1947.5 | 1278.8 | 1044.2 | 999.4 | 1044.9 | 1100.2 | 1110.1 |
| 25° | 4267.9 | 4033.3 | 3349.5 | 2452.8 | 1485.0 | 983.0 | 892.1 | 890.1 | 945.4 | 1003.4 | 1012.0 |
| 27.5° | 4213.9 | 3932.5 | 3138.7 | 2079.9 | 1094.3 | 835.4 | 799.2 | 813.0 | 853.8 | 896.0 | 899.3 |
| 30° | 4141.4 | 3815.3 | 2906.1 | 1686.6 | 857.8 | 743.8 | 739.9 | 752.4 | 777.4 | 807.1 | 809.7 |
| 32.5° | 4061.7 | 3696.0 | 2657.7 | 1305.8 | 734.6 | 694.4 | 698.4 | 704.3 | 716.1 | 728.0 | 730.6 |
| 35° | 3989.2 | 3574.1 | 2403.4 | 992.2 | 676.0 | 662.1 | 659.5 | 658.2 | 659.5 | 655.5 | 656.2 |
| 37.5° | 3942.4 | 3473.3 | 2138.6 | 789.9 | 642.4 | 633.8 | 625.9 | 616.0 | 604.8 | 598.2 | 599.5 |
| 40° | 3925.3 | 3398.2 | 1870.4 | 682.5 | 614.7 | 608.8 | 593.6 | 572.5 | 559.3 | 555.4 | 555.4 |
| 42.5° | 3971.4 | 3359.4 | 1611.5 | 628.5 | 591.6 | 581.7 | 556.7 | 532.3 | 522.4 | 521.8 | 521.1 |
| 45° | 4112.4 | 3375.2 | 1365.1 | 598.9 | 570.5 | 551.4 | 518.5 | 498.1 | 491.5 | 492.8 | 492.1 |
| 47.5° | 4365.4 | 3474.7 | 1154.3 | 579.1 | 549.5 | 524.4 | 487.5 | 471.1 | 463.2 | 463.2 | 463.8 |
| 50° | 4795.6 | 3707.2 | 986.3 | 562.6 | 531.7 | 499.4 | 465.1 | 444.7 | 434.2 | 433.5 | 433.5 |
| 52.5° | 5422.1 | 4123.6 | 881.5 | 548.8 | 511.9 | 477.0 | 442.7 | 417.0 | 404.5 | 401.9 | 400.6 |
| 55° | 6207.5 | 4720.5 | 852.5 | 539.6 | 485.6 | 452.6 | 415.7 | 390.0 | 376.2 | 370.3 | 369.6 |
| 57.5° | 7085.7 | 5446.5 | 909.8 | 528.4 | 458.5 | 423.6 | 386.1 | 361.7 | 347.2 | 340.0 | 339.3 |
| 60° | 7974.4 | 6239.1 | 1143.7 | 512.6 | 436.1 | 392.0 | 355.8 | 333.4 | 318.9 | 311.0 | 309.6 |
| 62.5° | 8864.5 | 7074.5 | 1621.4 | 511.2 | 420.3 | 361.7 | 324.8 | 305.7 | 291.9 | 283.3 | 281.3 |
| 65° | 9868.6 | 7988.9 | 2164.2 | 546.2 | 415.1 | 334.0 | 293.2 | 278.0 | 266.2 | 258.3 | 257.6 |
| 67.5° | 11021.5 | 9021.3 | 2112.2 | 618.0 | 432.8 | 309.0 | 263.5 | 251.7 | 243.1 | 236.5 | 235.9 |
| 70° | 11562.4 | 8859.9 | 1313.0 | 668.7 | 457.9 | 284.6 | 235.2 | 226.6 | 220.0 | 215.4 | 213.5 |
| 71° | 11335.8 | 8412.6 | 1100.9 | 662.8 | 455.2 | 274.1 | 224.0 | 217.4 | 210.8 | 206.9 | 204.9 |
| 72.5° | 10717.8 | 7672.0 | 918.4 | 616.7 | 425.6 | 255.0 | 209.5 | 202.9 | 197.0 | 192.4 | 191.1 |
| 75° | 9617.6 | 6851.8 | 735.3 | 492.8 | 339.3 | 215.4 | 183.8 | 176.6 | 172.0 | 169.3 | 166.7 |
| 77.5° | 7069.9 | 4889.8 | 568.6 | 389.4 | 249.7 | 175.9 | 156.8 | 151.5 | 146.9 | 143.0 | 141.0 |
| 80° | 2708.4 | 1894.1 | 382.8 | 290.5 | 183.2 | 139.0 | 126.5 | 123.9 | 119.2 | 116.6 | 116.6 |
| 82.5° | 729.3 | 565.9 | 204.2 | 175.9 | 122.5 | 101.5 | 96.8 | 95.5 | 91.6 | 86.3 | 87.0 |
| 85° | 295.2 | 249.7 | 114.6 | 96.8 | 75.1 | 60.0 | 65.2 | 65.9 | 61.3 | 54.7 | 55.3 |
| 87.5° | 129.8 | 106.1 | 63.9 | 42.8 | 32.9 | 23.1 | 29.6 | 29.6 | 27.0 | 22.4 | 20.4 |
| 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

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| 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

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Photopic Flux vs. Wavelength



Photopic Lumens: 6211.7

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

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

Scotopic Flux vs. Wavelength



Scotopic Lumens: 6474.3

S/P: 1.04

| λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) |
|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|
| 360 | 2044 | 0.0 | 490 | 7179 | 6.0 | 620 | 118034 | 0.1 | 750 | 8362 | 0.0 | 880 | 3128 | 0.0 |
| 365 | 2016 | 0.0 | 495 | 10476 | 8.6 | 625 | 111884 | 0.1 | 755 | 7635 | 0.0 | 885 | 3110 | 0.0 |
| 370 | 2020 | 0.0 | 500 | 15549 | 12.5 | 630 | 106119 | 0.0 | 760 | 6582 | 0.0 | 890 | 2632 | 0.0 |
| 375 | 2137 | 0.0 | 505 | 22477 | 17.3 | 635 | 99706 | 0.0 | 765 | 5777 | 0.0 | 895 | 2709 | 0.0 |
| 380 | 2046 | 0.0 | 510 | 30417 | 21.8 | 640 | 92142 | 0.0 | 770 | 5474 | 0.0 | 900 | 2016 | 0.0 |
| 385 | 1925 | 0.0 | 515 | 39274 | 25.7 | 645 | 84987 | 0.0 | 775 | 4977 | 0.0 | 905 | 1748 | 0.0 |
| 390 | 1893 | 0.0 | 520 | 47282 | 27.5 | 650 | 78016 | 0.0 | 780 | 4723 | 0.0 | 910 | 2046 | 0.0 |
| 395 | 1695 | 0.0 | 525 | 55413 | 28.1 | 655 | 71541 | 0.0 | 785 | 4219 | 0.0 | 915 | 1844 | 0.0 |
| 400 | 1633 | 0.0 | 530 | 62377 | 27.0 | 660 | 64863 | 0.0 | 790 | 3969 | 0.0 | 920 | 2734 | 0.0 |
| 405 | 2065 | 0.0 | 535 | 68520 | 24.7 | 665 | 58485 | 0.0 | 795 | 4122 | 0.0 | 925 | 2307 | 0.0 |
| 410 | 3449 | 0.1 | 540 | 73435 | 21.5 | 670 | 51641 | 0.0 | 800 | 2864 | 0.0 | 930 | 2039 | 0.0 |
| 415 | 7117 | 0.5 | 545 | 78677 | 18.3 | 675 | 46030 | 0.0 | 805 | 3151 | 0.0 | 935 | 1784 | 0.0 |
| 420 | 13992 | 1.6 | 550 | 83331 | 15.0 | 680 | 40590 | 0.0 | 810 | 3022 | 0.0 | 940 | 2464 | 0.0 |
| 425 | 25176 | 3.9 | 555 | 89120 | 12.0 | 685 | 35691 | 0.0 | 815 | 3471 | 0.0 | 945 | 2794 | 0.0 |
| 430 | 38151 | 8.1 | 560 | 94613 | 9.3 | 690 | 31631 | 0.0 | 820 | 2749 | 0.0 | 950 | 3090 | 0.0 |
| 435 | 49673 | 13.3 | 565 | 99818 | 7.0 | 695 | 27437 | 0.0 | 825 | 2729 | 0.0 | 955 | 1866 | 0.0 |
| 440 | 57273 | 19.1 | 570 | 106526 | 5.2 | 700 | 24589 | 0.0 | 830 | 2282 | 0.0 | 960 | 3110 | 0.0 |
| 445 | 54802 | 21.6 | 575 | 111610 | 3.7 | 705 | 21832 | 0.0 | 835 | 3140 | 0.0 | 965 | 3880 | 0.0 |
| 450 | 39184 | 18.1 | 580 | 117163 | 2.6 | 710 | 19500 | 0.0 | 840 | 2365 | 0.0 | 970 | 3243 | 0.0 |
| 455 | 22506 | 11.8 | 585 | 122201 | 1.8 | 715 | 17870 | 0.0 | 845 | 3024 | 0.0 | 975 | 2014 | 0.0 |
| 460 | 13692 | 8.1 | 590 | 125662 | 1.2 | 720 | 15924 | 0.0 | 850 | 2510 | 0.0 | 980 | 1688 | 0.0 |
| 465 | 9446 | 6.2 | 595 | 127415 | 0.8 | 725 | 14268 | 0.0 | 855 | 2739 | 0.0 | 985 | 2827 | 0.0 |
| 470 | 6698 | 4.8 | 600 | 129155 | 0.5 | 730 | 12438 | 0.0 | 860 | 3515 | 0.0 | 990 | 4172 | 0.0 |
| 475 | 5328 | 4.1 | 605 | 128057 | 0.4 | 735 | 11255 | 0.0 | 865 | 3600 | 0.0 | 995 | 3177 | 0.0 |
| 480 | 5081 | 4.1 | 610 | 126031 | 0.2 | 740 | 9951 | 0.0 | 870 | 3609 | 0.0 | 1000 | 3241 | 0.0 |
| 485 | 5579 | 4.6 | 615 | 123059 | 0.1 | 745 | 8870 | 0.0 | 875 | 3208 | 0.0 | | | |

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

Melanopic Flux vs. Wavelength



Melanopic Lumens: 2145.7 M/P: 0.35

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

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

TM-30-18

Summary

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



Color Vector Graphics



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

TM-30-18

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

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



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Color Rendition by Hue-Angle Bin



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Measure Comparisons



(END OF REPORT)