

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: P318520

Luminaire Tested: **GLEON-SA6B-827-U-T3**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P318520  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-14)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA6B-827-U-T3  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(6) 80 CRI, 2700K, 800mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE III OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 25131 lumens  
Efficiency: N/A  
Efficacy: 100.9 lumens/watt  
Luminous Opening: Rectangular (W 1.5' x L: 1' x H: 0')  
IES Classification: Type III - Short  
BUG Rating: B3 - U0 - G4

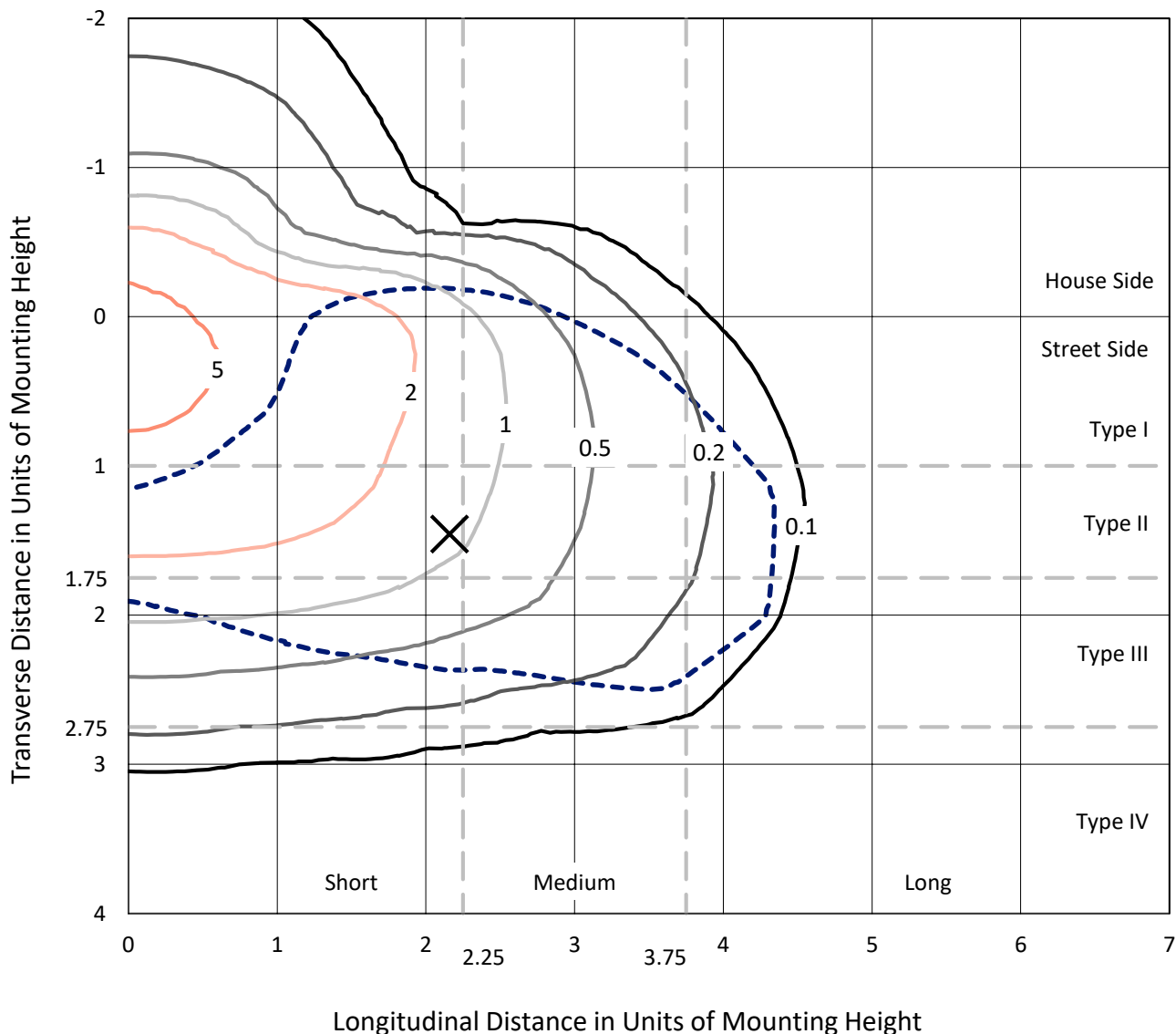
Input Watts (W): 249  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



REPORT NUMBER: P318520  
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### Iso-Footcandle Lines of Horizontal Illumination

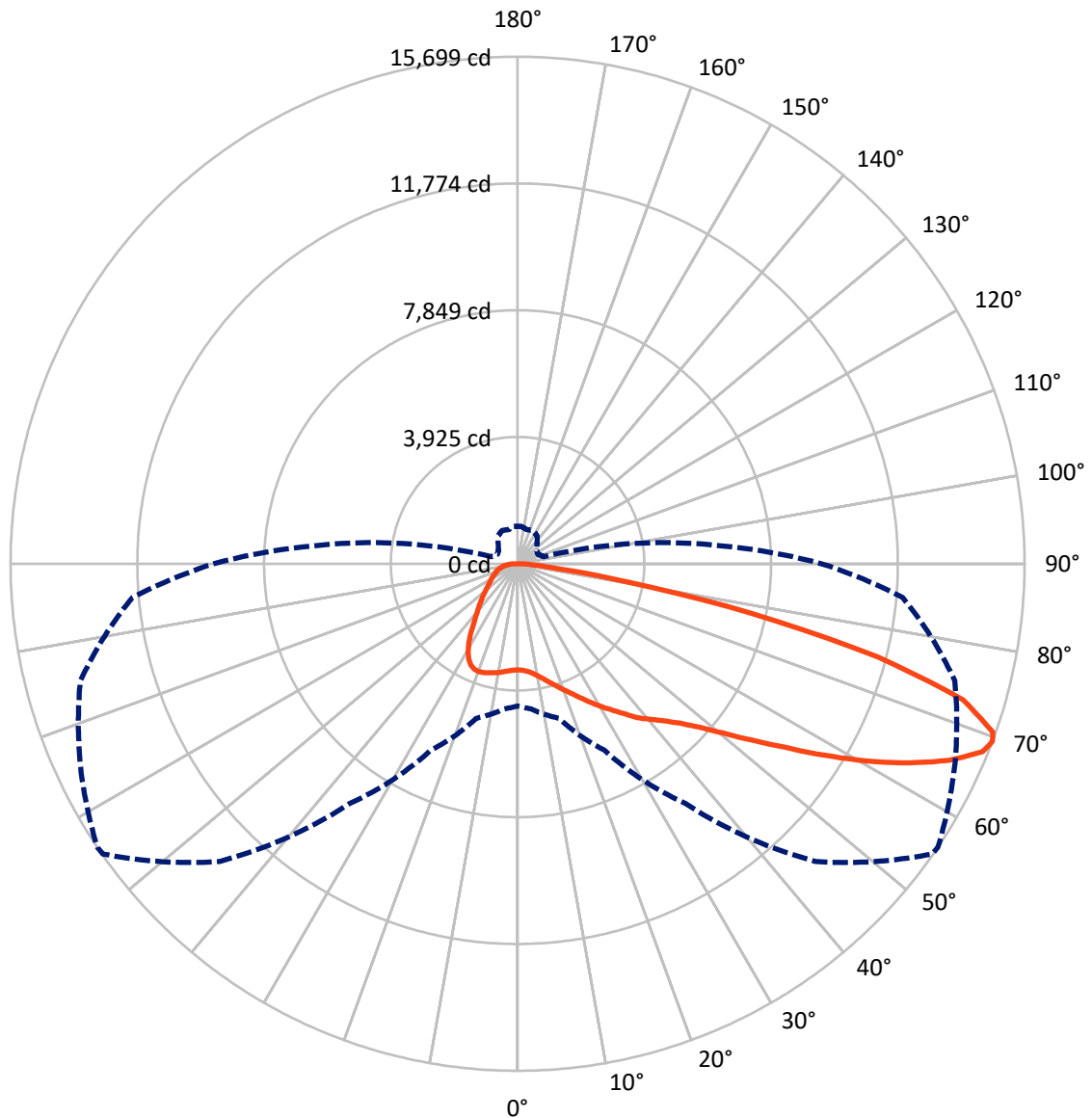
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 5.7 fc  
 Type III - Short - N/A

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### Luminous Intensity Polar Plot



— Vertical Plane Through 56-Deg Lateral      - - - Horizontal Cone Through 69-Deg Vertical

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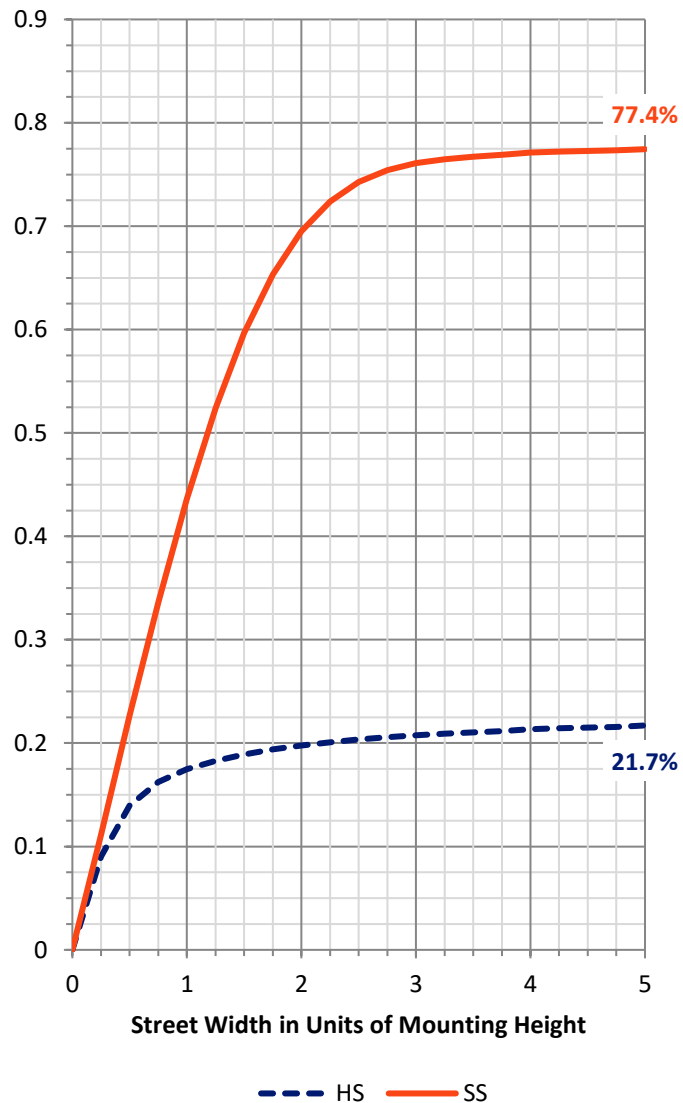
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 5596.6   | 0.0    | 5596.6  |
|                    | % Fixture | 22.3     | 0.0    | 22.3    |
| <b>Street Side</b> | Lumens    | 19534.4  | 0.0    | 19534.4 |
|                    | % Fixture | 77.7     | 0.0    | 77.7    |
| <b>Total</b>       | Lumens    | 25131.0  | 0.0    | 25131.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 322.7   | 1.3       |
| 10°-20°   | 1037.6  | 4.1       |
| 20°-30°   | 1811.3  | 7.2       |
| 30°-40°   | 2601.9  | 10.4      |
| 40°-50°   | 3600.9  | 14.3      |
| 50°-60°   | 5275.8  | 21.0      |
| 60°-70°   | 6432.2  | 25.6      |
| 70°-80°   | 3556.1  | 14.2      |
| 80°-90°   | 492.5   | 2.0       |
| 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°    | 25131.0 | 100.0     |
| 0°-180°   | 25131.0 | 100.0     |

**Coefficient of Utilization**



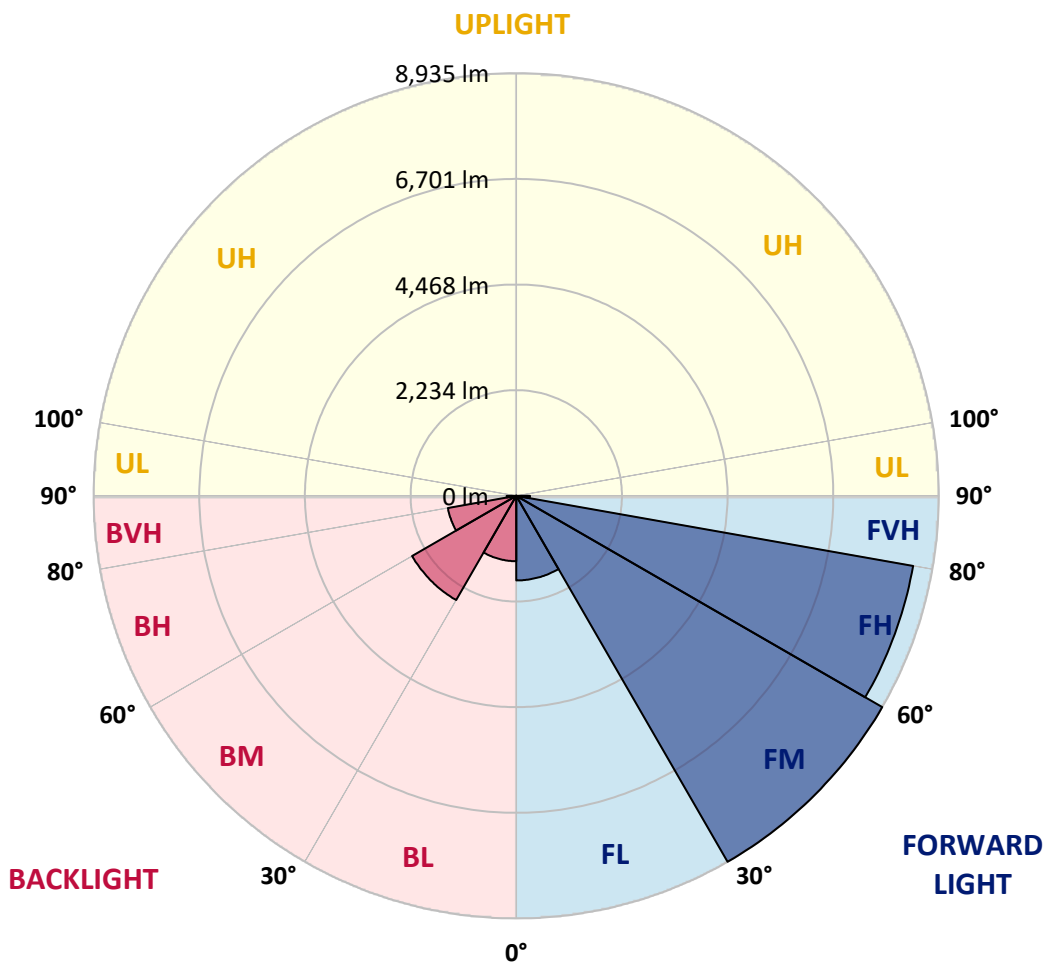
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**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone           | Lumens | % Fixture | Zone Rating/Lumen Limit |      |          |
|----------------|--------|-----------|-------------------------|------|----------|
|                |        |           | B                       | U    | G        |
| FL (0°-30°)    | 1788.6 | 7.1       |                         |      |          |
| FM (30°-60°)   | 8935.0 | 35.6      |                         |      |          |
| FH (60°-80°)   | 8520.7 | 33.9      |                         |      | G4/12000 |
| FVH (80°-90°)  | 290.1  | 1.2       |                         |      | G3/500   |
| BL (0°-30°)    | 1383.1 | 5.5       | B3/2500                 |      |          |
| BM (30°-60°)   | 2543.5 | 10.1      | B3/5000                 |      |          |
| BH (60°-80°)   | 1467.6 | 5.8       | B3/2500                 |      | G3/2500  |
| BVH (80°-90°)  | 202.4  | 0.8       |                         |      | G2/225   |
| 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 Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°     | 45°     | 55°     | 56°     | 65°     | 75°     | 85°     |
|-------|--------|--------|--------|--------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 3285.5 | 3285.5 | 3285.5 | 3285.5 | 3285.5  | 3285.5  | 3285.5  | 3285.5  | 3285.5  | 3285.5  | 3285.5  |
| 2.5°  | 3306.3 | 3309.7 | 3307.1 | 3314.1 | 3306.3  | 3311.5  | 3307.1  | 3307.1  | 3304.5  | 3296.8  | 3288.1  |
| 5°    | 3358.2 | 3365.1 | 3360.8 | 3367.7 | 3358.2  | 3360.0  | 3352.2  | 3352.2  | 3344.4  | 3327.9  | 3310.6  |
| 7.5°  | 3439.6 | 3447.4 | 3443.9 | 3450.9 | 3437.9  | 3437.9  | 3427.5  | 3426.6  | 3411.0  | 3384.2  | 3364.3  |
| 10°   | 3536.6 | 3547.0 | 3543.5 | 3553.9 | 3543.5  | 3547.0  | 3536.6  | 3536.6  | 3515.8  | 3477.7  | 3452.6  |
| 12.5° | 3677.7 | 3690.7 | 3681.1 | 3680.3 | 3676.0  | 3682.9  | 3674.2  | 3672.5  | 3653.4  | 3601.5  | 3566.9  |
| 15°   | 3866.4 | 3880.3 | 3860.4 | 3858.6 | 3834.4  | 3831.8  | 3831.8  | 3829.2  | 3817.1  | 3754.7  | 3697.6  |
| 17.5° | 4083.7 | 4088.0 | 4070.7 | 4043.0 | 4011.9  | 3991.9  | 3989.4  | 3996.3  | 3996.3  | 3923.6  | 3832.7  |
| 20°   | 4296.7 | 4304.5 | 4290.6 | 4259.5 | 4219.6  | 4190.2  | 4169.4  | 4183.3  | 4182.4  | 4095.8  | 3966.8  |
| 22.5° | 4528.7 | 4546.9 | 4526.1 | 4486.3 | 4439.5  | 4406.6  | 4370.3  | 4382.4  | 4383.3  | 4276.8  | 4098.4  |
| 25°   | 4829.1 | 4812.7 | 4799.7 | 4743.4 | 4676.8  | 4643.0  | 4609.2  | 4621.3  | 4617.9  | 4471.6  | 4234.4  |
| 27.5° | 5094.9 | 5098.4 | 5081.1 | 5021.3 | 4944.3  | 4869.8  | 4868.1  | 4875.9  | 4862.9  | 4674.2  | 4362.5  |
| 30°   | 5404.0 | 5405.7 | 5381.5 | 5327.8 | 5243.8  | 5147.7  | 5125.2  | 5138.2  | 5110.5  | 4866.3  | 4497.5  |
| 32.5° | 5711.3 | 5720.0 | 5693.1 | 5628.2 | 5560.7  | 5443.8  | 5398.8  | 5407.4  | 5338.2  | 5062.9  | 4636.9  |
| 35°   | 5980.6 | 5992.7 | 5984.0 | 5940.7 | 5867.1  | 5766.7  | 5713.0  | 5707.9  | 5622.1  | 5303.6  | 4821.3  |
| 37.5° | 6255.0 | 6266.3 | 6256.7 | 6220.4 | 6190.9  | 6084.5  | 6055.9  | 6055.9  | 5907.0  | 5549.4  | 5055.9  |
| 40°   | 6537.2 | 6554.6 | 6543.3 | 6493.1 | 6468.0  | 6419.5  | 6351.1  | 6334.7  | 6173.6  | 5844.6  | 5438.6  |
| 42.5° | 6799.6 | 6822.1 | 6867.1 | 6837.6 | 6786.6  | 6793.5  | 6655.8  | 6647.2  | 6529.4  | 6281.0  | 5919.1  |
| 45°   | 7171.8 | 7204.7 | 7280.9 | 7258.4 | 7248.0  | 7209.9  | 7046.3  | 7038.5  | 6993.5  | 6868.0  | 6515.6  |
| 47.5° | 7577.9 | 7622.9 | 7760.5 | 7764.9 | 7876.5  | 7804.7  | 7582.2  | 7555.4  | 7565.7  | 7570.9  | 7243.7  |
| 50°   | 7951.9 | 8001.2 | 8227.2 | 8333.7 | 8596.8  | 8612.4  | 8256.6  | 8232.4  | 8273.1  | 8392.5  | 8092.1  |
| 52.5° | 8250.5 | 8312.9 | 8595.1 | 8924.1 | 9375.1  | 9503.3  | 9086.9  | 9068.7  | 9099.0  | 9305.0  | 9051.4  |
| 55°   | 8469.6 | 8537.1 | 8844.4 | 9443.5 | 10163.8 | 10389.8 | 10042.6 | 10025.3 | 10044.4 | 10306.7 | 10094.6 |
| 57.5° | 8520.7 | 8537.1 | 8983.0 | 9793.3 | 10829.6 | 11372.4 | 11212.3 | 11177.6 | 11084.1 | 11312.7 | 11246.0 |
| 60°   | 8280.8 | 8346.6 | 8868.7 | 9916.2 | 11344.7 | 12341.2 | 12434.7 | 12391.4 | 12129.1 | 12316.1 | 12262.4 |
| 62.5° | 7794.3 | 7912.0 | 8441.9 | 9729.2 | 11546.4 | 13132.5 | 13633.7 | 13581.8 | 13129.9 | 13251.1 | 12993.1 |
| 65°   | 6999.5 | 7049.8 | 7606.4 | 9084.3 | 11290.2 | 13638.9 | 14702.9 | 14677.0 | 14108.2 | 13918.6 | 13128.1 |
| 67.5° | 5578.0 | 5672.4 | 6145.1 | 7736.3 | 10241.8 | 13579.2 | 15529.7 | 15527.1 | 14747.1 | 14166.2 | 12649.4 |
| 69°   | 4406.6 | 4504.5 | 4954.7 | 6372.7 | 9062.6  | 13032.9 | 15668.2 | 15698.5 | 14927.2 | 14015.5 | 11965.5 |
| 70°   | 3513.2 | 3626.6 | 3935.7 | 5367.6 | 8015.9  | 12312.6 | 15553.1 | 15607.6 | 14892.5 | 13767.1 | 11334.3 |
| 72.5° | 1495.1 | 1586.9 | 1806.8 | 2766.9 | 4885.4  | 9194.2  | 14220.7 | 14426.8 | 14090.0 | 12600.0 | 9367.4  |
| 75°   | 652.8  | 681.3  | 780.9  | 1128.1 | 2168.7  | 5004.0  | 11140.4 | 11521.3 | 12047.7 | 10650.4 | 6977.9  |
| 77.5° | 477.9  | 490.0  | 544.6  | 662.3  | 973.1   | 1889.9  | 7164.0  | 7385.7  | 8688.6  | 7750.1  | 4280.2  |
| 80°   | 369.7  | 378.3  | 420.8  | 486.5  | 635.5   | 764.5   | 3267.3  | 3457.8  | 4885.4  | 3980.7  | 1782.6  |
| 82.5° | 294.4  | 300.4  | 329.8  | 358.4  | 438.9   | 463.2   | 1084.8  | 1203.4  | 1803.3  | 1099.5  | 471.8   |
| 85°   | 273.6  | 280.5  | 290.9  | 261.5  | 281.4   | 271.8   | 469.2   | 490.9   | 544.6   | 432.0   | 197.4   |
| 87.5° | 123.8  | 146.3  | 288.3  | 203.4  | 149.8   | 119.5   | 192.2   | 200.9   | 226.0   | 226.8   | 87.4    |
| 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-SA6B-827-U-T3

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 3285.5  | 3285.5 | 3285.5 | 3285.5 | 3285.5 | 3285.5 | 3285.5 | 3285.5 | 3285.5 | 3285.5 | 3285.5 |
| 2.5°  | 3293.3  | 3290.7 | 3295.0 | 3284.6 | 3297.6 | 3296.8 | 3292.4 | 3294.2 | 3302.8 | 3301.9 | 3302.8 |
| 5°    | 3313.2  | 3311.5 | 3316.7 | 3308.9 | 3324.5 | 3329.7 | 3330.5 | 3338.3 | 3347.8 | 3350.4 | 3350.4 |
| 7.5°  | 3363.4  | 3363.4 | 3366.0 | 3355.6 | 3366.0 | 3365.1 | 3360.8 | 3368.6 | 3378.1 | 3379.0 | 3378.1 |
| 10°   | 3450.0  | 3450.9 | 3446.5 | 3419.7 | 3411.0 | 3387.7 | 3366.0 | 3366.9 | 3379.0 | 3388.5 | 3391.1 |
| 12.5° | 3559.1  | 3555.6 | 3536.6 | 3487.2 | 3450.9 | 3403.2 | 3380.7 | 3379.9 | 3392.0 | 3399.8 | 3402.4 |
| 15°   | 3683.7  | 3674.2 | 3624.9 | 3544.4 | 3480.3 | 3433.5 | 3397.2 | 3388.5 | 3381.6 | 3372.9 | 3373.8 |
| 17.5° | 3801.5  | 3779.8 | 3697.6 | 3585.9 | 3518.4 | 3456.1 | 3385.9 | 3329.7 | 3290.7 | 3268.2 | 3261.3 |
| 20°   | 3921.0  | 3878.5 | 3759.9 | 3624.9 | 3539.2 | 3425.8 | 3290.7 | 3176.4 | 3105.4 | 3072.5 | 3066.5 |
| 22.5° | 4030.0  | 3961.6 | 3817.9 | 3665.6 | 3522.7 | 3323.6 | 3111.5 | 2945.3 | 2846.6 | 2802.4 | 2805.9 |
| 25°   | 4136.5  | 4041.3 | 3878.5 | 3694.1 | 3439.6 | 3143.5 | 2862.2 | 2657.8 | 2543.6 | 2494.2 | 2492.5 |
| 27.5° | 4230.0  | 4121.8 | 3944.3 | 3670.8 | 3284.6 | 2887.3 | 2566.9 | 2367.8 | 2272.6 | 2230.2 | 2223.2 |
| 30°   | 4337.4  | 4223.1 | 4031.8 | 3581.6 | 3057.8 | 2591.2 | 2278.6 | 2138.4 | 2070.9 | 2028.4 | 2020.6 |
| 32.5° | 4468.1  | 4360.8 | 4103.6 | 3419.7 | 2767.8 | 2282.1 | 2053.5 | 1955.7 | 1894.2 | 1846.6 | 1838.0 |
| 35°   | 4658.6  | 4542.6 | 4121.8 | 3187.7 | 2449.2 | 2038.0 | 1888.2 | 1787.8 | 1704.7 | 1643.2 | 1637.1 |
| 37.5° | 4897.5  | 4770.3 | 4080.3 | 2887.3 | 2140.1 | 1879.5 | 1750.5 | 1626.7 | 1518.5 | 1431.9 | 1418.1 |
| 40°   | 5242.1  | 5049.9 | 3965.1 | 2541.0 | 1912.4 | 1757.5 | 1616.3 | 1475.2 | 1341.0 | 1239.7 | 1219.8 |
| 42.5° | 5655.9  | 5378.0 | 3788.5 | 2196.4 | 1745.3 | 1633.7 | 1483.0 | 1308.1 | 1180.0 | 1108.2 | 1097.8 |
| 45°   | 6182.3  | 5719.1 | 3543.5 | 1895.1 | 1580.8 | 1509.9 | 1339.3 | 1178.3 | 1098.6 | 1045.8 | 1037.2 |
| 47.5° | 6783.1  | 6101.8 | 3286.4 | 1650.1 | 1441.5 | 1393.8 | 1224.2 | 1120.3 | 1057.1 | 1015.5 | 1007.7 |
| 50°   | 7521.6  | 6533.8 | 3013.7 | 1449.3 | 1301.2 | 1254.5 | 1169.6 | 1088.2 | 1038.0 | 1006.0 | 998.2  |
| 52.5° | 8354.4  | 7021.2 | 2817.1 | 1290.8 | 1185.2 | 1151.4 | 1141.1 | 1070.9 | 1030.2 | 1006.0 | 998.2  |
| 55°   | 9251.3  | 7517.3 | 2605.0 | 1157.5 | 1084.8 | 1094.3 | 1122.0 | 1072.7 | 1045.0 | 1015.5 | 1004.3 |
| 57.5° | 10149.1 | 8029.8 | 2368.7 | 1045.0 | 1005.1 | 1051.9 | 1109.0 | 1076.1 | 1052.7 | 1024.2 | 1013.8 |
| 60°   | 10859.0 | 8354.4 | 2002.5 | 950.6  | 941.9  | 1005.1 | 1077.9 | 1050.1 | 1019.8 | 1020.7 | 1019.0 |
| 62.5° | 11190.6 | 8337.1 | 1598.2 | 866.6  | 878.7  | 941.9  | 1027.6 | 1009.5 | 984.4  | 1018.1 | 1020.7 |
| 65°   | 11004.5 | 7921.6 | 1244.1 | 790.4  | 811.2  | 876.1  | 975.7  | 989.5  | 998.2  | 1063.1 | 1071.8 |
| 67.5° | 10223.6 | 7113.0 | 963.6  | 723.8  | 749.7  | 831.1  | 980.9  | 1077.9 | 1089.1 | 1157.5 | 1156.6 |
| 69°   | 9415.8  | 6354.6 | 837.2  | 689.1  | 719.4  | 842.4  | 1048.4 | 1134.1 | 1091.7 | 1164.4 | 1154.0 |
| 70°   | 8738.8  | 5754.6 | 769.6  | 665.8  | 705.6  | 862.3  | 1093.4 | 1133.3 | 1078.7 | 1141.1 | 1123.7 |
| 72.5° | 6730.3  | 4140.0 | 652.8  | 622.5  | 658.8  | 825.1  | 1106.4 | 1108.2 | 1048.4 | 1060.5 | 1031.1 |
| 75°   | 4616.1  | 2616.3 | 569.7  | 563.6  | 587.8  | 743.7  | 1064.9 | 1058.8 | 969.6  | 952.3  | 928.1  |
| 77.5° | 2545.3  | 1328.9 | 484.0  | 507.3  | 523.8  | 658.8  | 967.9  | 959.2  | 885.7  | 849.3  | 840.6  |
| 80°   | 981.8   | 581.8  | 408.6  | 451.1  | 461.4  | 570.5  | 848.4  | 840.6  | 779.2  | 732.4  | 719.4  |
| 82.5° | 370.5   | 304.7  | 337.6  | 390.5  | 387.0  | 471.0  | 718.6  | 714.2  | 654.5  | 586.1  | 565.3  |
| 85°   | 171.4   | 182.7  | 267.5  | 322.1  | 297.0  | 348.9  | 574.9  | 582.6  | 509.9  | 428.5  | 428.5  |
| 87.5° | 72.7    | 102.2  | 189.6  | 243.3  | 200.0  | 235.5  | 421.6  | 402.6  | 369.7  | 256.3  | 240.7  |
| 90°   | 0.0     | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |



Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269



LM-79-2019: Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Report Prepared for

Cooper Lighting Solutions

Invue

Report Number: SP1-2407-157-9

Test Date: 10/03/2024

Luminaire Tested: EMM2-HTN-SA1A-827-U-5WQ

Data applicable to all product families utilizing light square engine

**Test Information**

Test Method: LM-79-2019  
 Report Number: SP1-2407-157-9  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry: 4π  
 Issue Date: 10/03/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: Invue  
 Catalog Number: **EMM2-HTN-SA1A-827-U-5WQ**  
 Description: Epic Modern Light Square 40W 5WQ Optic

**Spectral Parameters**

CCT (K): 2764  
 CIE u': 0.2591  
 CIE v': 0.5290  
 Duv: 0.0020  
 CIE x: 0.4581  
 CIE y: 0.4156  
 CIE z: 0.1263  
 Peak Wavelength (nm): 603  
 Dominant Wavelength (nm): 583  
 Purity: 62.2537  
 Rf: 84.7  
 Rg: 94.6

|           |      |      |      |
|-----------|------|------|------|
| CRI (Ra): | 80.9 |      |      |
| R1:       | 78.8 | R9:  | -1.5 |
| R2:       | 89.9 | R10: | 77.9 |
| R3:       | 96.2 | R11: | 78.9 |
| R4:       | 79.1 | R12: | 71.6 |
| R5:       | 79.1 | R13: | 81.2 |
| R6:       | 88.8 | R14: | 98.5 |
| R7:       | 81.3 | R15: | 69.9 |
| R8:       | 54.3 |      |      |



**Test Conditions**

Stabilization Time: 81M  
 Operation Time: 2H 21M  
 Sphere Temperature (°C): 25.2

REPORT NUMBER: SP1-2407-157-9

| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 6/18/2024        | 12/18/2024           |
| Power Meter                    | INXT2011004           | 2/8/2024         | 2/8/2025             |
| AC Power Source                | IN0063                | 10/24/2023       | 10/24/2024           |
| DC Power Source                | IN0208                | 10/24/2023       | 10/24/2024           |
| Sphere Thermometer             | IN0085                | 10/24/2023       | 10/24/2024           |
| Room Thermometer               | IN0046                | 10/24/2023       | 10/24/2024           |

REPORT NUMBER: SP1-2407-157-9

**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: SP1-2407-157-9

**Photopic Flux vs. Wavelength**



**Photopic Lumens: 4337.9**

| $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) |
|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|
| 360               | 0                                    | 0.0                            | 490               | 18018                                | 2.6                            | 620               | 87426                                | 22.8                           | 750               | 2680                                 | 0.0                            | 880               | 58                                   | 0.0                            |
| 365               | 0                                    | 0.0                            | 495               | 22295                                | 3.9                            | 625               | 83013                                | 18.2                           | 755               | 2287                                 | 0.0                            | 885               | 46                                   | 0.0                            |
| 370               | 0                                    | 0.0                            | 500               | 26478                                | 5.8                            | 630               | 78077                                | 14.1                           | 760               | 1944                                 | 0.0                            | 890               | 45                                   | 0.0                            |
| 375               | 0                                    | 0.0                            | 505               | 30524                                | 8.5                            | 635               | 72080                                | 10.7                           | 765               | 1653                                 | 0.0                            | 895               | 41                                   | 0.0                            |
| 380               | 0                                    | 0.0                            | 510               | 33611                                | 11.5                           | 640               | 66249                                | 7.9                            | 770               | 1413                                 | 0.0                            | 900               | 38                                   | 0.0                            |
| 385               | 0                                    | 0.0                            | 515               | 36490                                | 15.2                           | 645               | 59973                                | 5.7                            | 775               | 1198                                 | 0.0                            | 905               | 33                                   | 0.0                            |
| 390               | 0                                    | 0.0                            | 520               | 38610                                | 18.7                           | 650               | 53972                                | 3.9                            | 780               | 1025                                 | 0.0                            | 910               | 30                                   | 0.0                            |
| 395               | 0                                    | 0.0                            | 525               | 40511                                | 21.9                           | 655               | 48369                                | 2.7                            | 785               | 874                                  | 0.0                            | 915               | 23                                   | 0.0                            |
| 400               | 48                                   | 0.0                            | 530               | 42223                                | 24.9                           | 660               | 42641                                | 1.8                            | 790               | 747                                  | 0.0                            | 920               | 24                                   | 0.0                            |
| 405               | 201                                  | 0.0                            | 535               | 44137                                | 27.6                           | 665               | 37602                                | 1.1                            | 795               | 639                                  | 0.0                            | 925               | 22                                   | 0.0                            |
| 410               | 457                                  | 0.0                            | 540               | 46032                                | 30.0                           | 670               | 32798                                | 0.7                            | 800               | 547                                  | 0.0                            | 930               | 22                                   | 0.0                            |
| 415               | 925                                  | 0.0                            | 545               | 48553                                | 32.5                           | 675               | 28558                                | 0.5                            | 805               | 473                                  | 0.0                            | 935               | 17                                   | 0.0                            |
| 420               | 1816                                 | 0.0                            | 550               | 51408                                | 34.9                           | 680               | 24782                                | 0.3                            | 810               | 401                                  | 0.0                            | 940               | 13                                   | 0.0                            |
| 425               | 3217                                 | 0.0                            | 555               | 54711                                | 37.4                           | 685               | 21386                                | 0.2                            | 815               | 351                                  | 0.0                            | 945               | 6                                    | 0.0                            |
| 430               | 5520                                 | 0.0                            | 560               | 58847                                | 40.0                           | 690               | 18413                                | 0.1                            | 820               | 307                                  | 0.0                            | 950               | 10                                   | 0.0                            |
| 435               | 9225                                 | 0.1                            | 565               | 63386                                | 42.4                           | 695               | 15721                                | 0.1                            | 825               | 261                                  | 0.0                            | 955               | 11                                   | 0.0                            |
| 440               | 15522                                | 0.2                            | 570               | 68196                                | 44.3                           | 700               | 13432                                | 0.0                            | 830               | 228                                  | 0.0                            | 960               | 8                                    | 0.0                            |
| 445               | 27642                                | 0.6                            | 575               | 73613                                | 46.0                           | 705               | 11513                                | 0.0                            | 835               | 193                                  | 0.0                            | 965               | 12                                   | 0.0                            |
| 450               | 36602                                | 0.9                            | 580               | 79207                                | 47.1                           | 710               | 9780                                 | 0.0                            | 840               | 174                                  | 0.0                            | 970               | 3                                    | 0.0                            |
| 455               | 28292                                | 0.9                            | 585               | 84248                                | 47.0                           | 715               | 8356                                 | 0.0                            | 845               | 151                                  | 0.0                            | 975               | 8                                    | 0.0                            |
| 460               | 21166                                | 0.9                            | 590               | 88397                                | 45.7                           | 720               | 7161                                 | 0.0                            | 850               | 123                                  | 0.0                            | 980               | 2                                    | 0.0                            |
| 465               | 19092                                | 1.0                            | 595               | 91428                                | 43.4                           | 725               | 6067                                 | 0.0                            | 855               | 106                                  | 0.0                            | 985               | 13                                   | 0.0                            |
| 470               | 14951                                | 0.9                            | 600               | 93452                                | 40.3                           | 730               | 5164                                 | 0.0                            | 860               | 95                                   | 0.0                            | 990               | 16                                   | 0.0                            |
| 475               | 12606                                | 1.0                            | 605               | 93959                                | 36.4                           | 735               | 4393                                 | 0.0                            | 865               | 82                                   | 0.0                            | 995               | 20                                   | 0.0                            |
| 480               | 13323                                | 1.3                            | 610               | 93079                                | 32.0                           | 740               | 3694                                 | 0.0                            | 870               | 77                                   | 0.0                            | 1000              | 0                                    | 0.0                            |
| 485               | 15164                                | 1.8                            | 615               | 90707                                | 27.3                           | 745               | 3157                                 | 0.0                            | 875               | 65                                   | 0.0                            |                   |                                      |                                |

REPORT NUMBER: SP1-2407-157-9

**Scotopic Flux vs. Wavelength**



**Scotopic Lumens: 5286.7**

**S/P: 1.22**

| $\lambda$ (nm) | Power ( $\mu\text{W}/\text{nm}$ ) | Lumens ( $\phi/\text{nm}$ ) | $\lambda$ (nm) | Power ( $\mu\text{W}/\text{nm}$ ) | Lumens ( $\phi/\text{nm}$ ) | $\lambda$ (nm) | Power ( $\mu\text{W}/\text{nm}$ ) | Lumens ( $\phi/\text{nm}$ ) | $\lambda$ (nm) | Power ( $\mu\text{W}/\text{nm}$ ) | Lumens ( $\phi/\text{nm}$ ) | $\lambda$ (nm) | Power ( $\mu\text{W}/\text{nm}$ ) | Lumens ( $\phi/\text{nm}$ ) |
|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|
| 360            | 0                                 | 0.0                         | 490            | 18018                             | 75.9                        | 620            | 87426                             | 0.4                         | 750            | 2680                              | 0.0                         | 880            | 58                                | 0.0                         |
| 365            | 0                                 | 0.0                         | 495            | 22295                             | 93.2                        | 625            | 83013                             | 0.2                         | 755            | 2287                              | 0.0                         | 885            | 46                                | 0.0                         |
| 370            | 0                                 | 0.0                         | 500            | 26478                             | 107.8                       | 630            | 78077                             | 0.1                         | 760            | 1944                              | 0.0                         | 890            | 45                                | 0.0                         |
| 375            | 0                                 | 0.0                         | 505            | 30524                             | 118.7                       | 635            | 72080                             | 0.1                         | 765            | 1653                              | 0.0                         | 895            | 41                                | 0.0                         |
| 380            | 0                                 | 0.0                         | 510            | 33611                             | 122.2                       | 640            | 66249                             | 0.1                         | 770            | 1413                              | 0.0                         | 900            | 38                                | 0.0                         |
| 385            | 0                                 | 0.0                         | 515            | 36490                             | 120.8                       | 645            | 59973                             | 0.0                         | 775            | 1198                              | 0.0                         | 905            | 33                                | 0.0                         |
| 390            | 0                                 | 0.0                         | 520            | 38610                             | 113.9                       | 650            | 53972                             | 0.0                         | 780            | 1025                              | 0.0                         | 910            | 30                                | 0.0                         |
| 395            | 0                                 | 0.0                         | 525            | 40511                             | 104.1                       | 655            | 48369                             | 0.0                         | 785            | 874                               | 0.0                         | 915            | 23                                | 0.0                         |
| 400            | 48                                | 0.0                         | 530            | 42223                             | 92.4                        | 660            | 42641                             | 0.0                         | 790            | 747                               | 0.0                         | 920            | 24                                | 0.0                         |
| 405            | 201                               | 0.0                         | 535            | 44137                             | 80.5                        | 665            | 37602                             | 0.0                         | 795            | 639                               | 0.0                         | 925            | 22                                | 0.0                         |
| 410            | 457                               | 0.1                         | 540            | 46032                             | 68.2                        | 670            | 32798                             | 0.0                         | 800            | 547                               | 0.0                         | 930            | 22                                | 0.0                         |
| 415            | 925                               | 0.3                         | 545            | 48553                             | 57.1                        | 675            | 28558                             | 0.0                         | 805            | 473                               | 0.0                         | 935            | 17                                | 0.0                         |
| 420            | 1816                              | 1.1                         | 550            | 51408                             | 46.7                        | 680            | 24782                             | 0.0                         | 810            | 401                               | 0.0                         | 940            | 13                                | 0.0                         |
| 425            | 3217                              | 2.5                         | 555            | 54711                             | 37.4                        | 685            | 21386                             | 0.0                         | 815            | 351                               | 0.0                         | 945            | 6                                 | 0.0                         |
| 430            | 5520                              | 5.9                         | 560            | 58847                             | 29.4                        | 690            | 18413                             | 0.0                         | 820            | 307                               | 0.0                         | 950            | 10                                | 0.0                         |
| 435            | 9225                              | 12.5                        | 565            | 63386                             | 22.5                        | 695            | 15721                             | 0.0                         | 825            | 261                               | 0.0                         | 955            | 11                                | 0.0                         |
| 440            | 15522                             | 26.3                        | 570            | 68196                             | 16.9                        | 700            | 13432                             | 0.0                         | 830            | 228                               | 0.0                         | 960            | 8                                 | 0.0                         |
| 445            | 27642                             | 55.2                        | 575            | 73613                             | 12.4                        | 705            | 11513                             | 0.0                         | 835            | 193                               | 0.0                         | 965            | 12                                | 0.0                         |
| 450            | 36602                             | 85.4                        | 580            | 79207                             | 9.0                         | 710            | 9780                              | 0.0                         | 840            | 174                               | 0.0                         | 970            | 3                                 | 0.0                         |
| 455            | 28292                             | 75.1                        | 585            | 84248                             | 6.3                         | 715            | 8356                              | 0.0                         | 845            | 151                               | 0.0                         | 975            | 8                                 | 0.0                         |
| 460            | 21166                             | 63.2                        | 590            | 88397                             | 4.4                         | 720            | 7161                              | 0.0                         | 850            | 123                               | 0.0                         | 980            | 2                                 | 0.0                         |
| 465            | 19092                             | 63.2                        | 595            | 91428                             | 3.0                         | 725            | 6067                              | 0.0                         | 855            | 106                               | 0.0                         | 985            | 13                                | 0.0                         |
| 470            | 14951                             | 54.2                        | 600            | 93452                             | 2.0                         | 730            | 5164                              | 0.0                         | 860            | 95                                | 0.0                         | 990            | 16                                | 0.0                         |
| 475            | 12606                             | 48.8                        | 605            | 93959                             | 1.3                         | 735            | 4393                              | 0.0                         | 865            | 82                                | 0.0                         | 995            | 20                                | 0.0                         |
| 480            | 13323                             | 54.2                        | 610            | 93079                             | 0.9                         | 740            | 3694                              | 0.0                         | 870            | 77                                | 0.0                         | 1000           | 0                                 | 0.0                         |
| 485            | 15164                             | 63.3                        | 615            | 90707                             | 0.5                         | 745            | 3157                              | 0.0                         | 875            | 65                                | 0.0                         |                |                                   |                             |

REPORT NUMBER: SP1-2407-157-9

**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 9797**

**M/P: 2.26**

| $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) |
|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|
| 360               | 0                                    | 0.0                            | 490               | 18018                                | 27.7                           | 620               | 87426                                | 1.1                            | 750               | 2680                                 | 0.0                            | 880               | 58                                   | 0.0                            |
| 365               | 0                                    | 0.0                            | 495               | 22295                                | 36.0                           | 625               | 83013                                | 0.7                            | 755               | 2287                                 | 0.0                            | 885               | 46                                   | 0.0                            |
| 370               | 0                                    | 0.0                            | 500               | 26478                                | 44.2                           | 630               | 78077                                | 0.4                            | 760               | 1944                                 | 0.0                            | 890               | 45                                   | 0.0                            |
| 375               | 0                                    | 0.0                            | 505               | 30524                                | 51.8                           | 635               | 72080                                | 0.3                            | 765               | 1653                                 | 0.0                            | 895               | 41                                   | 0.0                            |
| 380               | 0                                    | 0.0                            | 510               | 33611                                | 57.0                           | 640               | 66249                                | 0.2                            | 770               | 1413                                 | 0.0                            | 900               | 38                                   | 0.0                            |
| 385               | 0                                    | 0.0                            | 515               | 36490                                | 60.5                           | 645               | 59973                                | 0.1                            | 775               | 1198                                 | 0.0                            | 905               | 33                                   | 0.0                            |
| 390               | 0                                    | 0.0                            | 520               | 38610                                | 61.4                           | 650               | 53972                                | 0.1                            | 780               | 1025                                 | 0.0                            | 910               | 30                                   | 0.0                            |
| 395               | 0                                    | 0.0                            | 525               | 40511                                | 60.6                           | 655               | 48369                                | 0.0                            | 785               | 874                                  | 0.0                            | 915               | 23                                   | 0.0                            |
| 400               | 48                                   | 0.0                            | 530               | 42223                                | 58.2                           | 660               | 42641                                | 0.0                            | 790               | 747                                  | 0.0                            | 920               | 24                                   | 0.0                            |
| 405               | 201                                  | 0.0                            | 535               | 44137                                | 55.0                           | 665               | 37602                                | 0.0                            | 795               | 639                                  | 0.0                            | 925               | 22                                   | 0.0                            |
| 410               | 457                                  | 0.0                            | 540               | 46032                                | 50.9                           | 670               | 32798                                | 0.0                            | 800               | 547                                  | 0.0                            | 930               | 22                                   | 0.0                            |
| 415               | 925                                  | 0.1                            | 545               | 48553                                | 46.6                           | 675               | 28558                                | 0.0                            | 805               | 473                                  | 0.0                            | 935               | 17                                   | 0.0                            |
| 420               | 1816                                 | 0.3                            | 550               | 51408                                | 42.0                           | 680               | 24782                                | 0.0                            | 810               | 401                                  | 0.0                            | 940               | 13                                   | 0.0                            |
| 425               | 3217                                 | 0.8                            | 555               | 54711                                | 37.4                           | 685               | 21386                                | 0.0                            | 815               | 351                                  | 0.0                            | 945               | 6                                    | 0.0                            |
| 430               | 5520                                 | 1.9                            | 560               | 58847                                | 32.9                           | 690               | 18413                                | 0.0                            | 820               | 307                                  | 0.0                            | 950               | 10                                   | 0.0                            |
| 435               | 9225                                 | 4.1                            | 565               | 63386                                | 28.4                           | 695               | 15721                                | 0.0                            | 825               | 261                                  | 0.0                            | 955               | 11                                   | 0.0                            |
| 440               | 15522                                | 8.7                            | 570               | 68196                                | 24.1                           | 700               | 13432                                | 0.0                            | 830               | 228                                  | 0.0                            | 960               | 8                                    | 0.0                            |
| 445               | 27642                                | 18.5                           | 575               | 73613                                | 20.0                           | 705               | 11513                                | 0.0                            | 835               | 193                                  | 0.0                            | 965               | 12                                   | 0.0                            |
| 450               | 36602                                | 28.3                           | 580               | 79207                                | 16.3                           | 710               | 9780                                 | 0.0                            | 840               | 174                                  | 0.0                            | 970               | 3                                    | 0.0                            |
| 455               | 28292                                | 24.7                           | 585               | 84248                                | 12.9                           | 715               | 8356                                 | 0.0                            | 845               | 151                                  | 0.0                            | 975               | 8                                    | 0.0                            |
| 460               | 21166                                | 20.4                           | 590               | 88397                                | 9.8                            | 720               | 7161                                 | 0.0                            | 850               | 123                                  | 0.0                            | 980               | 2                                    | 0.0                            |
| 465               | 19092                                | 20.1                           | 595               | 91428                                | 7.3                            | 725               | 6067                                 | 0.0                            | 855               | 106                                  | 0.0                            | 985               | 13                                   | 0.0                            |
| 470               | 14951                                | 17.2                           | 600               | 93452                                | 5.3                            | 730               | 5164                                 | 0.0                            | 860               | 95                                   | 0.0                            | 990               | 16                                   | 0.0                            |
| 475               | 12606                                | 15.7                           | 605               | 93959                                | 3.7                            | 735               | 4393                                 | 0.0                            | 865               | 82                                   | 0.0                            | 995               | 20                                   | 0.0                            |
| 480               | 13323                                | 18.0                           | 610               | 93079                                | 2.5                            | 740               | 3694                                 | 0.0                            | 870               | 77                                   | 0.0                            | 1000              | 0                                    | 0.0                            |
| 485               | 15164                                | 21.9                           | 615               | 90707                                | 1.7                            | 745               | 3157                                 | 0.0                            | 875               | 65                                   | 0.0                            |                   |                                      |                                |

**Summary**

$R_f = 84.7$   
 $R_g = 94.6$   
 CIE  $R_a = 80.9$   
 $R_9 = -1.5$



**Color Vector Graphics**



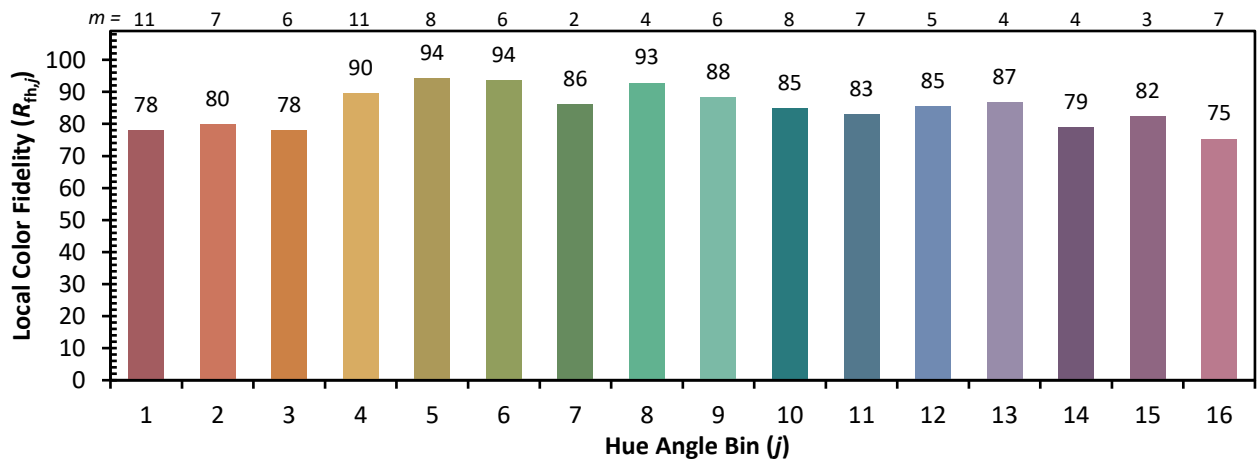


Individual Sample Fidelity Index ( $R_{f,i}$ )

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 84 | CES51 = 95 | CES76 = 81 |
| CES02 = 63 | CES27 = 95 | CES52 = 94 | CES77 = 84 |
| CES03 = 31 | CES28 = 94 | CES53 = 89 | CES78 = 81 |
| CES04 = 71 | CES29 = 87 | CES54 = 91 | CES79 = 89 |
| CES05 = 50 | CES30 = 94 | CES55 = 90 | CES80 = 89 |
| CES06 = 52 | CES31 = 89 | CES56 = 86 | CES81 = 69 |
| CES07 = 43 | CES32 = 82 | CES57 = 85 | CES82 = 96 |
| CES08 = 41 | CES33 = 91 | CES58 = 86 | CES83 = 93 |
| CES09 = 29 | CES34 = 92 | CES59 = 91 | CES84 = 92 |
| CES10 = 77 | CES35 = 96 | CES60 = 94 | CES85 = 76 |
| CES11 = 60 | CES36 = 90 | CES61 = 89 | CES86 = 65 |
| CES12 = 66 | CES37 = 96 | CES62 = 94 | CES87 = 84 |
| CES13 = 44 | CES38 = 98 | CES63 = 87 | CES88 = 86 |
| CES14 = 74 | CES39 = 98 | CES64 = 82 | CES89 = 73 |
| CES15 = 72 | CES40 = 95 | CES65 = 78 | CES90 = 88 |
| CES16 = 48 | CES41 = 96 | CES66 = 81 | CES91 = 82 |
| CES17 = 50 | CES42 = 97 | CES67 = 80 | CES92 = 64 |
| CES18 = 57 | CES43 = 91 | CES68 = 83 | CES93 = 78 |
| CES19 = 73 | CES44 = 99 | CES69 = 88 | CES94 = 59 |
| CES20 = 67 | CES45 = 93 | CES70 = 80 | CES95 = 74 |
| CES21 = 87 | CES46 = 89 | CES71 = 79 | CES96 = 83 |
| CES22 = 79 | CES47 = 92 | CES72 = 92 | CES97 = 88 |
| CES23 = 92 | CES48 = 83 | CES73 = 75 | CES98 = 83 |
| CES24 = 91 | CES49 = 90 | CES74 = 91 | CES99 = 74 |
| CES25 = 72 | CES50 = 94 | CES75 = 81 |            |



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)