

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: P318849

Luminaire Tested: **GLEON-SA5C-827-U-T4FT**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P318849  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-16)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA5C-827-U-T4FT  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(5) 80 CRI, 2700K, 1050mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE IV  
FORWARD THROW OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 26144 lumens  
Efficiency: N/A  
Efficacy: 93.7 lumens/watt  
Luminous Opening: Rectangular (W 1.5' x L: 1' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B3 - U0 - G5

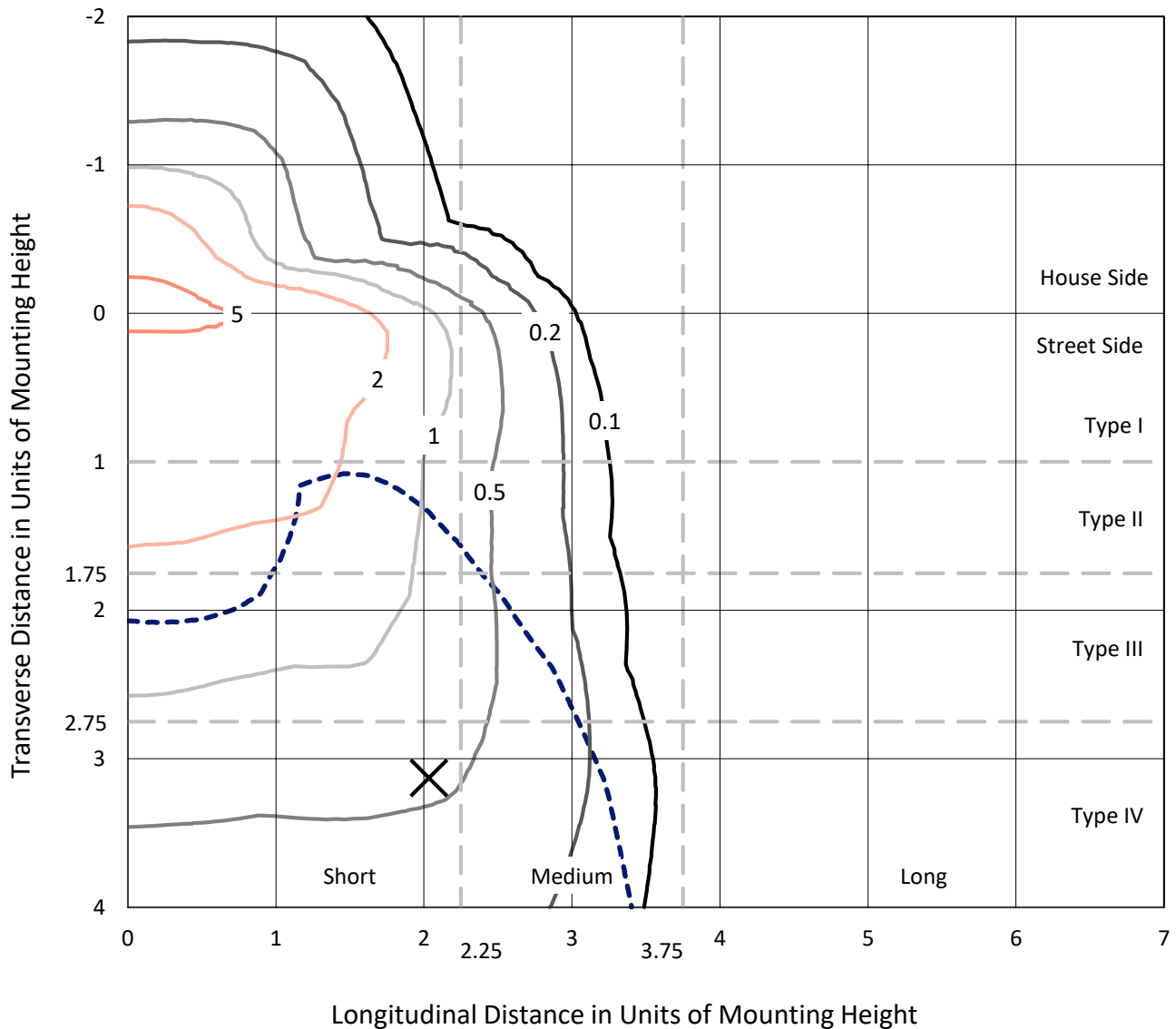
Input Watts (W): 279  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



REPORT NUMBER: P318849  
CATALOG NUMBER: GLEON-SA5C-827-U-T4FT

## Iso-Footcandle Lines of Horizontal Illumination

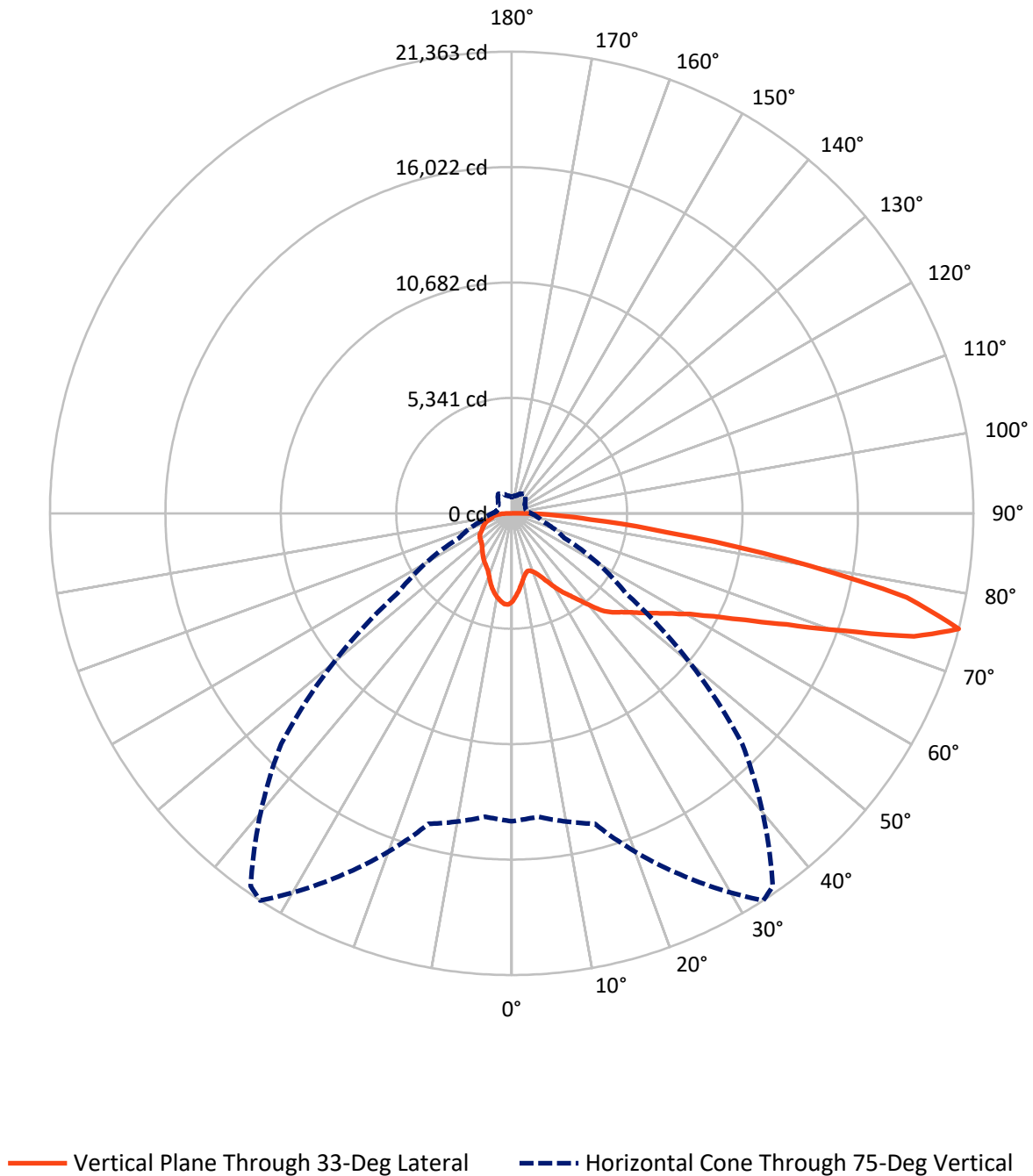
× Max cd  
- - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 6.5 fc  
Type IV - Short - N/A

REPORT NUMBER: P318849  
CATALOG NUMBER: GLEON-SA5C-827-U-T4FT

## Luminous Intensity Polar Plot



REPORT NUMBER: P318849

CATALOG NUMBER: GLEON-SA5C-827-U-T4FT

**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 5613.8   | 0.0    | 5613.8  |
|                    | % Fixture | 21.5     | 0.0    | 21.5    |
| <b>Street Side</b> | Lumens    | 20530.2  | 0.0    | 20530.2 |
|                    | % Fixture | 78.5     | 0.0    | 78.5    |
| <b>Total</b>       | Lumens    | 26144.0  | 0.0    | 26144.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 369.6   | 1.4       |
| 10°-20°   | 1000.9  | 3.8       |
| 20°-30°   | 1634.7  | 6.3       |
| 30°-40°   | 2434.4  | 9.3       |
| 40°-50°   | 3491.6  | 13.4      |
| 50°-60°   | 4793.5  | 18.3      |
| 60°-70°   | 6001.2  | 23.0      |
| 70°-80°   | 5429.0  | 20.8      |
| 80°-90°   | 988.9   | 3.8       |
| 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°    | 26144.0 | 100.0     |
| 0°-180°   | 26144.0 | 100.0     |

**Coefficient of Utilization**



REPORT NUMBER: P318849

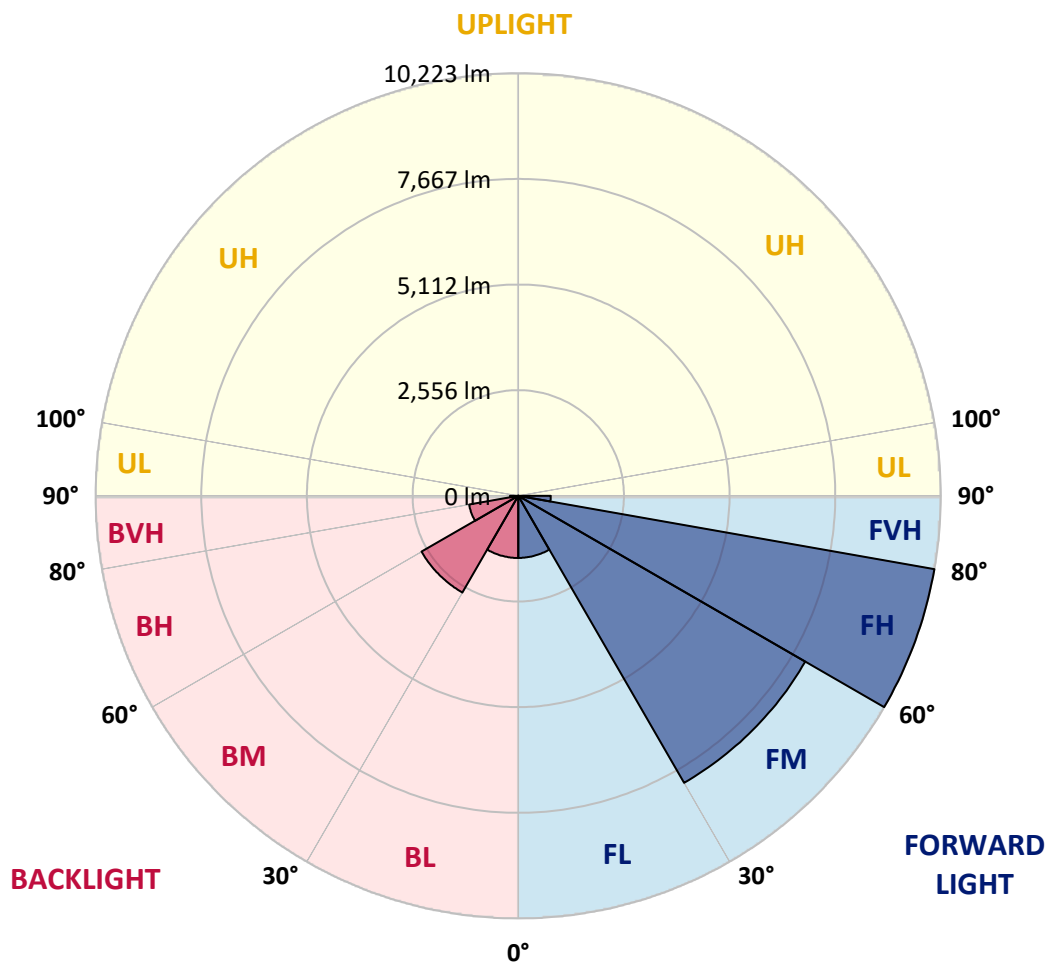
CATALOG NUMBER: GLEON-SA5C-827-U-T4FT

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |          |
|------|-------------|---------|-----------|-------------------------|------|----------|
|      |             |         |           | B                       | U    | G        |
| FL   | (0°-30°)    | 1501.6  | 5.7       |                         |      |          |
| FM   | (30°-60°)   | 8017.8  | 30.7      |                         |      |          |
| FH   | (60°-80°)   | 10223.2 | 39.1      |                         |      | G4/12000 |
| FVH  | (80°-90°)   | 787.6   | 3.0       |                         |      | G5       |
| BL   | (0°-30°)    | 1503.6  | 5.8       | B3/2500                 |      |          |
| BM   | (30°-60°)   | 2701.8  | 10.3      | B3/5000                 |      |          |
| BH   | (60°-80°)   | 1207.1  | 4.6       | B3/2500                 |      | G3/2500  |
| BVH  | (80°-90°)   | 201.3   | 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-G5**

Type IV Short



REPORT NUMBER: P318849

CATALOG NUMBER: GLEON-SA5C-827-U-T4FT

**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 33°     | 35°     | 45°     | 55°     | 65°    | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|--------|---------|---------|
| 0°    | 4086.5  | 4086.5  | 4086.5  | 4086.5  | 4086.5  | 4086.5  | 4086.5  | 4086.5  | 4086.5 | 4086.5  | 4086.5  |
| 2.5°  | 3794.8  | 3780.3  | 3807.4  | 3811.0  | 3834.5  | 3843.5  | 3876.0  | 3926.6  | 3968.1 | 4016.0  | 4059.4  |
| 5°    | 3450.7  | 3440.7  | 3478.7  | 3505.8  | 3557.2  | 3578.9  | 3655.7  | 3763.1  | 3858.9 | 3967.2  | 4065.7  |
| 7.5°  | 3123.8  | 3118.3  | 3160.8  | 3222.2  | 3281.8  | 3311.6  | 3444.4  | 3600.6  | 3760.4 | 3935.6  | 4086.5  |
| 10°   | 2848.3  | 2846.5  | 2887.2  | 2947.7  | 3035.3  | 3068.7  | 3240.3  | 3446.2  | 3670.1 | 3911.3  | 4121.7  |
| 12.5° | 2693.9  | 2700.2  | 2719.2  | 2769.8  | 2851.0  | 2884.4  | 3075.0  | 3317.0  | 3594.3 | 3903.1  | 4173.1  |
| 15°   | 2731.8  | 2741.8  | 2709.3  | 2707.4  | 2765.2  | 2791.4  | 2970.2  | 3224.9  | 3540.1 | 3916.7  | 4248.1  |
| 17.5° | 2893.5  | 2895.3  | 2809.5  | 2755.3  | 2790.5  | 2804.1  | 2937.7  | 3172.5  | 3508.5 | 3947.4  | 4342.0  |
| 20°   | 3121.1  | 3116.5  | 2964.8  | 2874.5  | 2893.5  | 2897.1  | 2983.8  | 3173.4  | 3505.8 | 4000.7  | 4463.9  |
| 22.5° | 3422.7  | 3389.3  | 3185.2  | 3062.4  | 3057.8  | 3052.4  | 3102.1  | 3240.3  | 3545.5 | 4087.4  | 4609.3  |
| 25°   | 3816.4  | 3784.8  | 3504.0  | 3336.0  | 3299.9  | 3286.3  | 3293.5  | 3383.0  | 3624.1 | 4180.4  | 4771.9  |
| 27.5° | 4254.4  | 4199.3  | 3928.4  | 3690.9  | 3615.9  | 3597.0  | 3553.6  | 3584.3  | 3709.9 | 4269.8  | 4965.2  |
| 30°   | 4621.1  | 4591.3  | 4354.7  | 4072.9  | 3984.4  | 3957.3  | 3843.5  | 3810.1  | 3833.6 | 4391.7  | 5209.0  |
| 32.5° | 4826.1  | 4806.2  | 4662.6  | 4435.0  | 4352.9  | 4314.9  | 4154.2  | 4087.4  | 4032.3 | 4584.1  | 5539.5  |
| 35°   | 5074.4  | 5061.8  | 4975.1  | 4809.8  | 4687.9  | 4648.2  | 4523.5  | 4454.0  | 4312.2 | 4848.7  | 5966.7  |
| 37.5° | 5390.5  | 5377.0  | 5378.8  | 5245.1  | 5099.7  | 5062.7  | 4980.5  | 4907.4  | 4675.3 | 5196.3  | 6430.9  |
| 40°   | 5748.1  | 5721.9  | 5712.0  | 5705.7  | 5613.6  | 5592.8  | 5549.4  | 5450.1  | 5130.4 | 5611.8  | 6888.7  |
| 42.5° | 6286.4  | 6193.3  | 5994.7  | 6069.6  | 6160.8  | 6150.0  | 6185.2  | 6042.5  | 5636.1 | 6103.0  | 7335.7  |
| 45°   | 6805.6  | 6653.0  | 6309.8  | 6326.1  | 6525.7  | 6586.2  | 6849.9  | 6748.7  | 6184.3 | 6641.3  | 7798.1  |
| 47.5° | 7042.2  | 6926.7  | 6635.0  | 6635.9  | 6833.6  | 6959.2  | 7537.1  | 7464.9  | 6760.5 | 7252.7  | 8362.6  |
| 50°   | 7306.9  | 7191.3  | 6929.4  | 7027.8  | 7200.3  | 7333.9  | 8200.9  | 8163.9  | 7308.7 | 7921.9  | 9039.0  |
| 52.5° | 7595.8  | 7399.9  | 7233.7  | 7409.8  | 7651.8  | 7807.2  | 8865.6  | 8764.4  | 7811.7 | 8595.6  | 9816.5  |
| 55°   | 7599.4  | 7546.2  | 7672.6  | 7801.7  | 8163.9  | 8354.4  | 9561.9  | 9294.5  | 8221.7 | 9257.5  | 10449.6 |
| 57.5° | 8032.0  | 7945.3  | 8213.5  | 8273.1  | 8746.4  | 8961.3  | 10254.5 | 9756.0  | 8638.9 | 9765.0  | 10790.9 |
| 60°   | 8604.6  | 8530.5  | 8750.0  | 8907.1  | 9467.0  | 9754.2  | 10994.1 | 10230.1 | 8966.7 | 10148.0 | 10774.7 |
| 62.5° | 9593.5  | 9509.5  | 9506.8  | 9727.1  | 10481.2 | 10815.3 | 11824.1 | 10695.2 | 9096.8 | 10223.8 | 10315.0 |
| 65°   | 11041.1 | 10907.4 | 10655.5 | 10760.2 | 11881.9 | 12215.1 | 12751.5 | 11032.1 | 8925.2 | 9817.4  | 9131.1  |
| 67.5° | 12449.9 | 12445.4 | 12135.6 | 12350.6 | 13731.4 | 13998.7 | 13808.1 | 11065.5 | 8389.6 | 8402.3  | 7030.5  |
| 70°   | 13854.2 | 13872.3 | 13819.9 | 14567.6 | 16230.2 | 16508.4 | 14933.4 | 10616.7 | 7185.8 | 6067.8  | 4212.0  |
| 72.5° | 14966.8 | 14962.3 | 15226.0 | 17154.1 | 19473.2 | 19410.9 | 15881.6 | 9256.6  | 5159.3 | 3275.5  | 2013.0  |
| 75°   | 14246.1 | 14089.0 | 14874.7 | 18434.6 | 21363.3 | 21059.0 | 15075.2 | 6457.0  | 2677.6 | 1491.0  | 1083.7  |
| 77.5° | 9291.8  | 9440.8  | 10594.1 | 15228.7 | 18686.6 | 18316.3 | 11060.1 | 3012.7  | 1261.6 | 978.0   | 785.7   |
| 80°   | 3364.9  | 3522.0  | 4960.6  | 8626.3  | 12874.4 | 12813.9 | 5446.5  | 1238.1  | 853.4  | 738.7   | 572.6   |
| 82.5° | 1157.8  | 1215.6  | 1957.0  | 3830.9  | 7268.9  | 7539.8  | 2049.1  | 703.5   | 620.4  | 523.8   | 391.9   |
| 85°   | 454.3   | 520.2   | 895.0   | 1843.2  | 3666.5  | 3693.6  | 829.9   | 420.8   | 431.7  | 343.2   | 214.9   |
| 87.5° | 172.5   | 209.5   | 428.1   | 856.1   | 1674.3  | 1538.0  | 297.1   | 200.5   | 245.6  | 204.1   | 102.0   |
| 90°   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0    | 0.0     | 0.0     |



REPORT NUMBER: P318849

CATALOG NUMBER: GLEON-SA5C-827-U-T4FT

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 4086.5 | 4086.5 | 4086.5 | 4086.5 | 4086.5 | 4086.5 | 4086.5 | 4086.5 | 4086.5 | 4086.5 | 4086.5 |
| 2.5°  | 4092.8 | 4111.7 | 4151.5 | 4178.6 | 4207.5 | 4215.6 | 4219.2 | 4226.4 | 4233.7 | 4230.9 | 4231.9 |
| 5°    | 4118.1 | 4155.1 | 4219.2 | 4246.3 | 4258.9 | 4244.5 | 4216.5 | 4193.9 | 4177.7 | 4168.6 | 4165.9 |
| 7.5°  | 4159.6 | 4212.0 | 4280.6 | 4276.1 | 4247.2 | 4183.1 | 4110.8 | 4056.7 | 4011.5 | 3995.2 | 3986.2 |
| 10°   | 4214.7 | 4276.1 | 4324.0 | 4272.5 | 4188.5 | 4077.4 | 3969.1 | 3885.1 | 3817.3 | 3791.1 | 3786.6 |
| 12.5° | 4285.1 | 4347.4 | 4356.5 | 4247.2 | 4108.1 | 3956.4 | 3809.2 | 3698.1 | 3597.0 | 3564.5 | 3557.2 |
| 15°   | 4376.3 | 4435.0 | 4379.1 | 4203.0 | 4008.8 | 3804.7 | 3614.1 | 3463.3 | 3356.8 | 3317.0 | 3302.6 |
| 17.5° | 4472.1 | 4528.1 | 4383.6 | 4129.8 | 3878.7 | 3625.0 | 3385.7 | 3231.2 | 3109.3 | 3063.3 | 3057.8 |
| 20°   | 4586.8 | 4612.0 | 4364.6 | 4025.0 | 3699.9 | 3392.0 | 3140.0 | 2994.6 | 2929.6 | 2897.1 | 2893.5 |
| 22.5° | 4728.5 | 4701.5 | 4321.3 | 3883.3 | 3473.3 | 3122.9 | 2917.9 | 2850.1 | 2833.9 | 2826.7 | 2829.4 |
| 25°   | 4878.5 | 4795.4 | 4257.1 | 3698.1 | 3187.0 | 2853.7 | 2755.3 | 2774.3 | 2795.9 | 2793.2 | 2793.2 |
| 27.5° | 5043.7 | 4891.1 | 4158.7 | 3452.5 | 2870.0 | 2633.4 | 2645.1 | 2714.7 | 2747.2 | 2746.3 | 2745.4 |
| 30°   | 5255.9 | 4999.5 | 4033.2 | 3157.2 | 2573.8 | 2478.1 | 2549.4 | 2634.3 | 2678.5 | 2676.7 | 2677.6 |
| 32.5° | 5516.9 | 5118.7 | 3862.5 | 2827.6 | 2359.8 | 2363.4 | 2445.6 | 2529.5 | 2581.0 | 2576.5 | 2577.4 |
| 35°   | 5822.2 | 5252.3 | 3631.3 | 2502.4 | 2218.0 | 2272.2 | 2337.2 | 2395.9 | 2444.6 | 2438.3 | 2432.0 |
| 37.5° | 6154.5 | 5383.3 | 3324.3 | 2211.7 | 2102.4 | 2187.3 | 2241.5 | 2251.4 | 2274.0 | 2257.7 | 2246.0 |
| 40°   | 6470.6 | 5483.5 | 2928.7 | 1973.2 | 1985.9 | 2115.0 | 2150.2 | 2110.5 | 2069.9 | 2064.4 | 2048.2 |
| 42.5° | 6746.0 | 5516.9 | 2528.6 | 1782.7 | 1863.1 | 2039.2 | 2060.8 | 1977.8 | 1904.6 | 1870.3 | 1855.8 |
| 45°   | 7036.8 | 5528.7 | 2155.7 | 1622.8 | 1744.8 | 1971.4 | 1994.9 | 1883.8 | 1780.9 | 1706.8 | 1682.4 |
| 47.5° | 7417.0 | 5613.6 | 1865.8 | 1504.5 | 1654.4 | 1926.3 | 1959.7 | 1808.9 | 1675.2 | 1569.6 | 1547.0 |
| 50°   | 7914.6 | 5781.5 | 1630.1 | 1414.2 | 1595.7 | 1896.5 | 1934.4 | 1735.7 | 1588.5 | 1461.2 | 1438.6 |
| 52.5° | 8467.3 | 5936.0 | 1439.5 | 1341.1 | 1538.9 | 1844.1 | 1901.9 | 1683.3 | 1507.2 | 1360.9 | 1336.6 |
| 55°   | 8853.8 | 5817.7 | 1286.0 | 1265.2 | 1464.8 | 1769.1 | 1856.7 | 1639.1 | 1390.7 | 1263.4 | 1241.7 |
| 57.5° | 8927.9 | 5413.1 | 1169.5 | 1186.7 | 1375.4 | 1675.2 | 1787.2 | 1540.7 | 1327.5 | 1221.0 | 1198.4 |
| 60°   | 8725.6 | 4849.6 | 1082.8 | 1114.4 | 1279.7 | 1556.9 | 1657.2 | 1471.1 | 1267.0 | 1175.8 | 1156.9 |
| 62.5° | 8217.2 | 4272.5 | 1018.7 | 1049.4 | 1190.3 | 1436.8 | 1575.9 | 1398.0 | 1205.6 | 1124.3 | 1105.4 |
| 65°   | 7190.4 | 3587.0 | 957.3  | 991.6  | 1107.2 | 1333.0 | 1502.7 | 1330.2 | 1145.1 | 1082.8 | 1064.7 |
| 67.5° | 5427.5 | 2686.7 | 899.5  | 930.2  | 1033.1 | 1242.6 | 1423.3 | 1263.4 | 1086.4 | 1046.7 | 1025.0 |
| 70°   | 3196.0 | 1682.4 | 833.5  | 866.1  | 955.5  | 1148.7 | 1338.4 | 1190.3 | 1013.3 | 995.2  | 967.2  |
| 72.5° | 1487.4 | 1012.4 | 758.6  | 790.2  | 857.9  | 1023.2 | 1229.1 | 1094.5 | 926.6  | 886.8  | 848.9  |
| 75°   | 887.7  | 740.5  | 670.1  | 698.1  | 745.9  | 889.5  | 1091.8 | 997.0  | 844.4  | 792.0  | 752.3  |
| 77.5° | 663.8  | 566.2  | 572.6  | 602.4  | 641.2  | 778.5  | 967.2  | 920.2  | 781.2  | 740.5  | 713.4  |
| 80°   | 477.7  | 429.9  | 466.9  | 499.4  | 540.0  | 708.0  | 926.6  | 850.7  | 706.2  | 652.0  | 626.7  |
| 82.5° | 318.8  | 308.9  | 351.3  | 384.7  | 424.4  | 619.5  | 870.6  | 745.0  | 603.3  | 534.6  | 478.6  |
| 85°   | 176.1  | 186.0  | 236.6  | 251.1  | 285.4  | 436.2  | 713.4  | 598.7  | 454.3  | 365.7  | 349.5  |
| 87.5° | 73.1   | 85.8   | 127.3  | 122.8  | 151.7  | 260.1  | 469.6  | 361.2  | 289.0  | 215.8  | 168.0  |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

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:  $4\pi$   
 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  
 R<sub>f</sub>: 84.7  
 R<sub>g</sub>: 94.6

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



### 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**

| 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    | 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

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/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**

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/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              |           |                  |                  |

REPORT NUMBER: SP1-2407-157-9

TM-30-18

### Summary

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



### 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)