

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: P324912

Luminaire Tested: **GLEON-SA8A-827-U-AFL-HSS**

Issue Date: 3/3/2020

### Test Information

Test Method: LM-79-08  
Report Number: P324912  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-30)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA8A-827-U-AFL-HSS  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(8) 80 CRI, 2700K, 615mA LIGHTSQUARES WITH 16 LEDS EACH AND AUTOMOTIVE  
FRONTLINE OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

### Summary

Lumens per Lamp: N/A  
Luminaire Lumens: 22476 lumens  
Efficiency: N/A  
Efficacy: 87.5 lumens/watt  
Luminous Opening: Rectangular (W 2' x L: 1' x H: 0')  
IES Classification: Type II - Short  
BUG Rating: B2 - U0 - G2

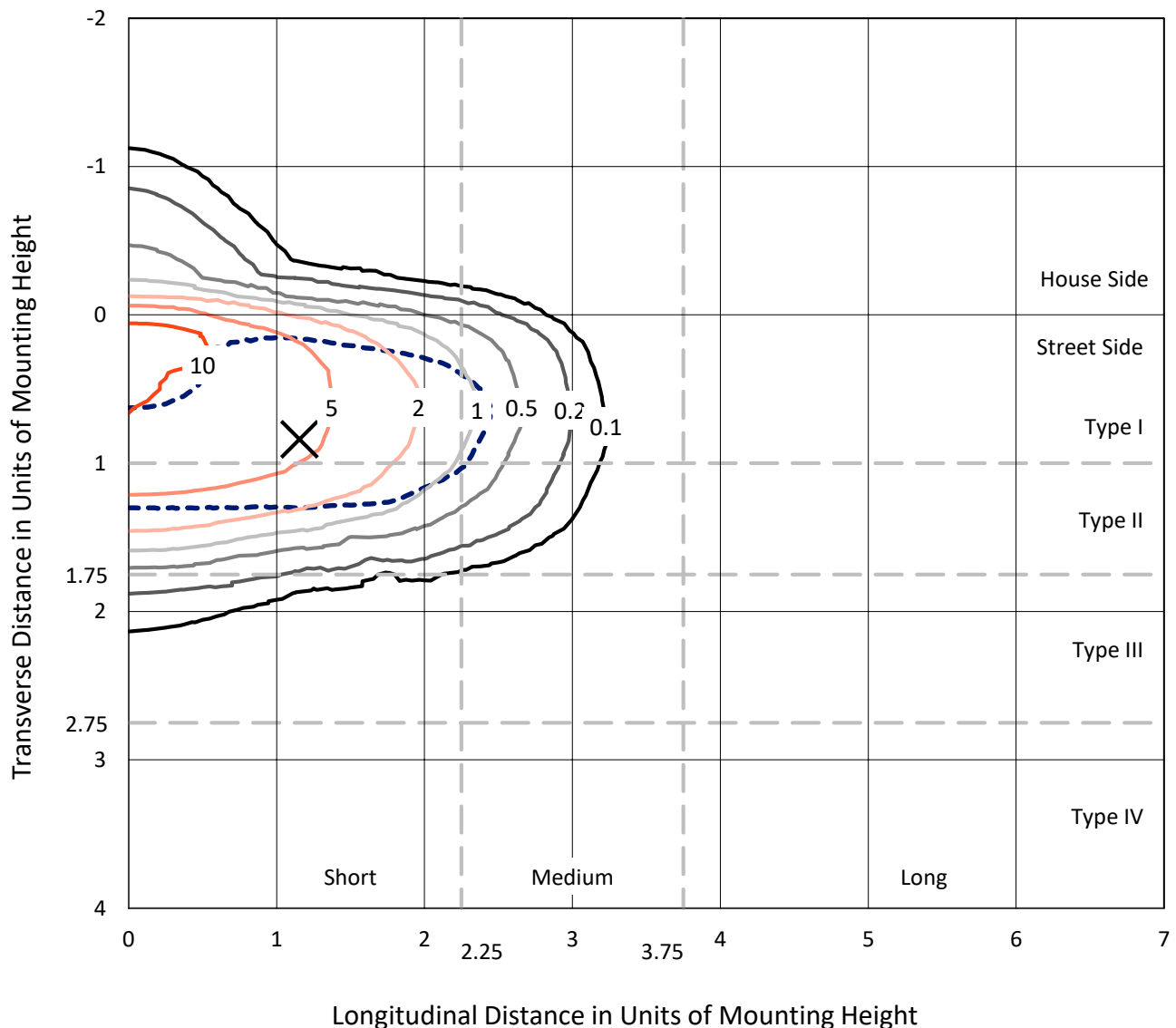
Input Watts (W): 257  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



REPORT NUMBER: P324912  
 CATALOG NUMBER: GLEON-SA8A-827-U-AFL-HSS

## Iso-Footcandle Lines of Horizontal Illumination

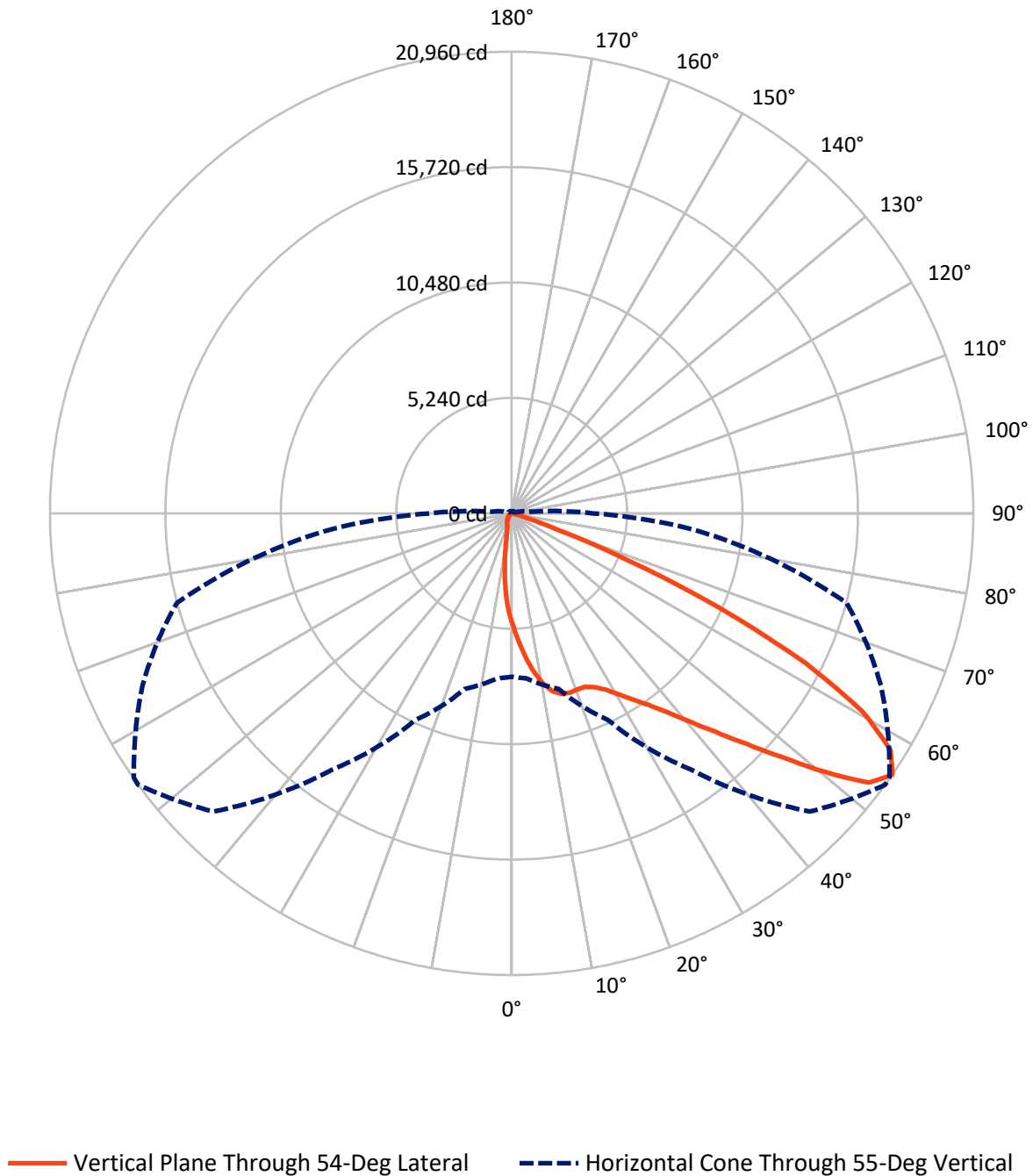
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 12.4 fc  
 Type II - Short - N/A

REPORT NUMBER: P324912  
CATALOG NUMBER: GLEON-SA8A-827-U-AFL-HSS

## Luminous Intensity Polar Plot



REPORT NUMBER: P324912  
 CATALOG NUMBER: GLEON-SA8A-827-U-AFL-HSS

**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 1121.4   | 0.0    | 1121.4  |
|                    | % Fixture | 5.0      | 0.0    | 5.0     |
| <b>Street Side</b> | Lumens    | 21354.6  | 0.0    | 21354.6 |
|                    | % Fixture | 95.0     | 0.0    | 95.0    |
| <b>Total</b>       | Lumens    | 22476.0  | 0.0    | 22476.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 463.5   | 2.1       |
| 10°-20°   | 1271.3  | 5.7       |
| 20°-30°   | 2170.5  | 9.7       |
| 30°-40°   | 3483.3  | 15.5      |
| 40°-50°   | 5566.4  | 24.8      |
| 50°-60°   | 5964.5  | 26.5      |
| 60°-70°   | 3062.4  | 13.6      |
| 70°-80°   | 463.9   | 2.1       |
| 80°-90°   | 30.2    | 0.1       |
| 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°    | 22476.0 | 100.0     |
| 0°-180°   | 22476.0 | 100.0     |

**Coefficient of Utilization**



REPORT NUMBER: P324912

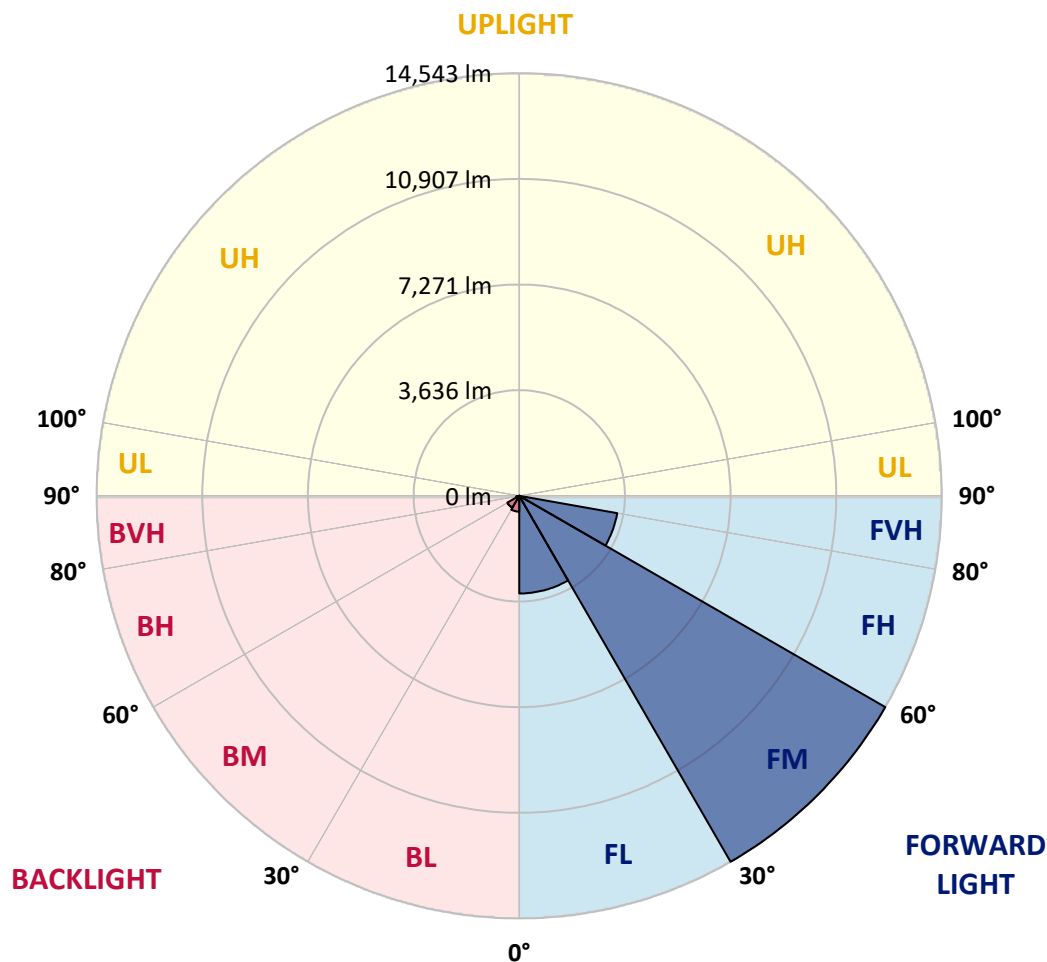
CATALOG NUMBER: GLEON-SA8A-827-U-AFL-HSS

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|---------|-----------|-------------------------|------|---------|
|      |             |         |           | B                       | U    | G       |
| FL   | (0°-30°)    | 3359.8  | 14.9      |                         |      |         |
| FM   | (30°-60°)   | 14543.0 | 64.7      |                         |      |         |
| FH   | (60°-80°)   | 3422.9  | 15.2      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 29.0    | 0.1       |                         |      | G1/100  |
| BL   | (0°-30°)    | 545.6   | 2.4       | B2/1000                 |      |         |
| BM   | (30°-60°)   | 471.2   | 2.1       | B1/1000                 |      |         |
| BH   | (60°-80°)   | 103.3   | 0.5       | B0/110                  |      | G0/110  |
| BVH  | (80°-90°)   | 1.2     | 0.0       |                         |      | G0/10   |
| UL   | (90°-100°)  | 0.0     | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0     | 0.0       |                         | U0/0 |         |

**BUG Rating: B2-U0-G2**

Type II Short





REPORT NUMBER: P324912

CATALOG NUMBER: GLEON-SA8A-827-U-AFL-HSS

**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 54°     | 55°     | 65°     | 75°     | 85°    |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--------|
| 0°    | 5033.7  | 5033.7  | 5033.7  | 5033.7  | 5033.7  | 5033.7  | 5033.7  | 5033.7  | 5033.7  | 5033.7  | 5033.7 |
| 2.5°  | 6316.9  | 6222.8  | 6225.7  | 6183.0  | 6026.7  | 5904.4  | 5777.2  | 5747.1  | 5549.1  | 5341.4  | 5141.5 |
| 5°    | 7408.9  | 7340.0  | 7323.5  | 7240.9  | 7023.5  | 6793.5  | 6546.9  | 6489.7  | 6102.4  | 5677.3  | 5258.9 |
| 7.5°  | 7969.9  | 7970.9  | 7957.3  | 7927.2  | 7791.3  | 7568.1  | 7267.2  | 7207.0  | 6679.9  | 6042.2  | 5381.2 |
| 10°   | 7806.8  | 7843.7  | 7919.4  | 8019.4  | 8123.3  | 8095.1  | 7869.0  | 7814.6  | 7241.9  | 6428.5  | 5517.1 |
| 12.5° | 7426.3  | 7431.2  | 7515.6  | 7679.7  | 7978.6  | 8285.4  | 8289.2  | 8270.8  | 7778.7  | 6832.3  | 5666.6 |
| 15°   | 7237.1  | 7255.5  | 7286.6  | 7392.4  | 7675.8  | 8166.9  | 8518.3  | 8544.5  | 8270.8  | 7261.3  | 5825.8 |
| 17.5° | 7361.3  | 7387.5  | 7361.3  | 7373.9  | 7538.0  | 7979.6  | 8558.1  | 8625.1  | 8700.8  | 7685.5  | 5976.2 |
| 20°   | 7698.1  | 7722.4  | 7675.8  | 7624.4  | 7656.4  | 7925.2  | 8530.0  | 8620.2  | 9037.6  | 8062.1  | 6102.4 |
| 22.5° | 8152.4  | 8162.1  | 8091.2  | 8006.8  | 7983.5  | 8109.7  | 8553.3  | 8646.4  | 9307.4  | 8402.8  | 6182.0 |
| 25°   | 8652.3  | 8661.0  | 8572.7  | 8475.6  | 8420.3  | 8471.7  | 8744.5  | 8814.4  | 9545.2  | 8728.0  | 6227.6 |
| 27.5° | 9196.8  | 9204.5  | 9093.9  | 8974.5  | 8910.4  | 8912.4  | 9059.9  | 9134.7  | 9798.6  | 9098.7  | 6264.5 |
| 30°   | 9772.4  | 9768.5  | 9666.6  | 9500.6  | 9419.1  | 9417.1  | 9514.2  | 9589.9  | 10165.5 | 9574.4  | 6315.0 |
| 32.5° | 10418.8 | 10411.0 | 10266.4 | 10060.6 | 9968.4  | 9982.0  | 10068.4 | 10112.1 | 10620.7 | 10081.0 | 6405.2 |
| 35°   | 11270.1 | 11247.7 | 11029.3 | 10774.1 | 10604.2 | 10599.4 | 10672.2 | 10707.1 | 11201.1 | 10694.5 | 6555.7 |
| 37.5° | 12374.6 | 12354.3 | 12058.2 | 11687.4 | 11448.7 | 11359.4 | 11445.7 | 11490.4 | 12029.1 | 11481.7 | 6797.4 |
| 40°   | 13463.7 | 13443.3 | 13267.6 | 12927.9 | 12560.0 | 12345.5 | 12413.5 | 12461.0 | 13062.8 | 12436.8 | 7102.1 |
| 42.5° | 14215.0 | 14232.4 | 14293.6 | 14321.7 | 13977.2 | 13526.8 | 13557.9 | 13607.4 | 14149.0 | 13457.9 | 7450.6 |
| 45°   | 14413.0 | 14450.8 | 14796.4 | 15474.9 | 15604.0 | 15252.6 | 14927.4 | 14954.6 | 15252.6 | 14479.0 | 7799.1 |
| 47.5° | 13818.0 | 13887.9 | 14554.7 | 15816.5 | 16909.5 | 17157.9 | 16542.6 | 16506.6 | 16311.5 | 15305.0 | 8046.6 |
| 50°   | 12465.9 | 12529.9 | 13393.8 | 15260.4 | 17305.5 | 18976.9 | 18478.0 | 18372.2 | 17240.4 | 15799.1 | 8133.9 |
| 52.5° | 10509.1 | 10586.7 | 11288.5 | 13509.3 | 16559.1 | 19788.4 | 20310.6 | 20222.2 | 17921.8 | 15837.9 | 8148.5 |
| 55°   | 7421.5  | 7515.6  | 8258.2  | 10353.8 | 14193.6 | 19142.9 | 20959.9 | 20933.7 | 18487.7 | 15735.0 | 8179.6 |
| 57.5° | 4170.8  | 4238.8  | 5039.5  | 6637.2  | 10395.5 | 16673.6 | 20281.5 | 20455.2 | 18829.4 | 15556.4 | 8226.1 |
| 60°   | 1852.0  | 1870.4  | 2284.9  | 3304.0  | 6085.9  | 12742.5 | 18339.2 | 18632.3 | 18536.2 | 15317.6 | 8304.8 |
| 62.5° | 1026.9  | 1011.4  | 1011.4  | 1373.5  | 2645.0  | 7888.4  | 14954.6 | 15438.9 | 17285.1 | 15035.2 | 8308.7 |
| 65°   | 804.7   | 790.1   | 748.4   | 754.2   | 1007.5  | 3501.1  | 10355.7 | 11216.7 | 14909.0 | 14207.2 | 8029.1 |
| 67.5° | 682.4   | 669.7   | 628.0   | 611.5   | 626.1   | 1155.1  | 5689.9  | 6583.8  | 11312.8 | 12055.3 | 6954.6 |
| 70°   | 576.6   | 567.8   | 546.5   | 526.1   | 489.2   | 570.7   | 2177.1  | 2784.8  | 6971.1  | 8019.4  | 4747.4 |
| 72.5° | 464.0   | 460.1   | 467.8   | 450.4   | 405.7   | 380.5   | 744.5   | 901.7   | 3131.3  | 3578.7  | 1955.8 |
| 75°   | 399.9   | 398.0   | 401.8   | 384.4   | 333.9   | 265.0   | 378.5   | 413.5   | 883.3   | 875.5   | 396.0  |
| 77.5° | 260.1   | 263.0   | 332.9   | 325.2   | 287.3   | 176.7   | 196.1   | 211.6   | 267.9   | 200.9   | 120.4  |
| 80°   | 166.0   | 164.0   | 168.9   | 269.8   | 258.2   | 134.9   | 98.0    | 102.9   | 129.1   | 99.0    | 58.2   |
| 82.5° | 100.9   | 99.0    | 110.7   | 126.2   | 130.1   | 94.2    | 60.2    | 61.2    | 80.6    | 64.1    | 31.1   |
| 85°   | 8.7     | 11.6    | 67.0    | 62.1    | 44.6    | 29.1    | 29.1    | 31.1    | 42.7    | 37.9    | 17.5   |
| 87.5° | 0.0     | 0.0     | 11.6    | 17.5    | 9.7     | 10.7    | 10.7    | 11.6    | 16.5    | 16.5    | 8.7    |
| 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: P324912

CATALOG NUMBER: GLEON-SA8A-827-U-AFL-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 5033.7 | 5033.7 | 5033.7 | 5033.7 | 5033.7 | 5033.7 | 5033.7 | 5033.7 | 5033.7 | 5033.7 | 5033.7 |
| 2.5°  | 5037.6 | 4936.7 | 4732.8 | 4536.8 | 4370.8 | 4210.6 | 4028.1 | 3847.6 | 3763.2 | 3729.2 | 3694.2 |
| 5°    | 5046.3 | 4838.6 | 4418.3 | 3995.1 | 3556.4 | 3161.4 | 2824.6 | 2479.0 | 2306.2 | 2230.5 | 2195.6 |
| 7.5°  | 5058.0 | 4741.6 | 4062.1 | 3351.6 | 2645.0 | 2109.2 | 1641.3 | 1340.4 | 1210.4 | 1190.0 | 1139.5 |
| 10°   | 5059.9 | 4624.1 | 3648.6 | 2641.1 | 1773.4 | 1271.5 | 978.4  | 823.1  | 765.8  | 756.1  | 739.6  |
| 12.5° | 5063.8 | 4485.3 | 3189.5 | 1955.8 | 1182.2 | 850.3  | 707.6  | 656.2  | 640.6  | 639.6  | 639.6  |
| 15°   | 5075.5 | 4339.7 | 2712.9 | 1409.4 | 849.3  | 673.6  | 621.2  | 600.8  | 595.0  | 597.9  | 596.9  |
| 17.5° | 5075.5 | 4167.9 | 2245.1 | 1050.2 | 686.2  | 605.7  | 576.6  | 563.0  | 561.0  | 563.9  | 564.9  |
| 20°   | 5038.6 | 3959.2 | 1816.1 | 817.3  | 608.6  | 562.0  | 535.8  | 523.2  | 518.3  | 520.3  | 521.2  |
| 22.5° | 4950.2 | 3703.0 | 1466.6 | 676.5  | 557.1  | 522.2  | 494.1  | 474.6  | 466.9  | 467.8  | 467.8  |
| 25°   | 4812.4 | 3399.2 | 1147.3 | 585.3  | 515.4  | 479.5  | 446.5  | 424.2  | 419.3  | 418.3  | 420.3  |
| 27.5° | 4635.8 | 3063.3 | 913.4  | 515.4  | 465.9  | 431.9  | 398.9  | 380.5  | 376.6  | 377.6  | 378.5  |
| 30°   | 4462.0 | 2714.9 | 720.2  | 456.2  | 410.6  | 378.5  | 353.3  | 344.6  | 344.6  | 347.5  | 348.5  |
| 32.5° | 4302.8 | 2380.0 | 569.8  | 404.8  | 361.1  | 332.0  | 317.4  | 316.4  | 321.3  | 323.2  | 324.2  |
| 35°   | 4166.0 | 2070.4 | 471.7  | 365.0  | 322.3  | 297.0  | 292.2  | 296.0  | 301.9  | 305.8  | 306.7  |
| 37.5° | 4068.9 | 1793.7 | 412.5  | 332.0  | 292.2  | 271.8  | 270.8  | 278.6  | 286.3  | 295.1  | 297.0  |
| 40°   | 4028.1 | 1559.8 | 371.8  | 302.8  | 267.9  | 252.4  | 249.5  | 260.1  | 274.7  | 287.3  | 289.2  |
| 42.5° | 3994.2 | 1368.6 | 336.8  | 274.7  | 248.5  | 226.2  | 225.2  | 238.8  | 256.2  | 268.9  | 271.8  |
| 45°   | 3965.1 | 1215.2 | 304.8  | 244.6  | 223.2  | 194.1  | 197.0  | 214.5  | 228.1  | 241.7  | 244.6  |
| 47.5° | 3904.9 | 1089.1 | 269.8  | 212.6  | 184.4  | 166.0  | 171.8  | 187.3  | 198.0  | 218.4  | 221.3  |
| 50°   | 3797.1 | 986.2  | 233.9  | 173.7  | 150.4  | 143.7  | 152.4  | 163.1  | 176.7  | 194.1  | 196.1  |
| 52.5° | 3724.3 | 908.5  | 202.9  | 145.6  | 124.2  | 126.2  | 134.9  | 138.8  | 146.6  | 153.4  | 151.4  |
| 55°   | 3682.6 | 865.8  | 177.6  | 126.2  | 105.8  | 111.6  | 113.6  | 108.7  | 104.8  | 98.0   | 95.1   |
| 57.5° | 3677.7 | 827.0  | 158.2  | 109.7  | 93.2   | 96.1   | 89.3   | 72.8   | 59.2   | 51.4   | 49.5   |
| 60°   | 3670.0 | 779.4  | 142.7  | 92.2   | 82.5   | 78.6   | 64.1   | 39.8   | 28.1   | 26.2   | 26.2   |
| 62.5° | 3585.5 | 705.7  | 131.0  | 77.7   | 69.9   | 59.2   | 36.9   | 18.4   | 15.5   | 16.5   | 16.5   |
| 65°   | 3316.7 | 602.8  | 119.4  | 63.1   | 55.3   | 42.7   | 18.4   | 10.7   | 5.8    | 6.8    | 6.8    |
| 67.5° | 2819.7 | 480.5  | 106.8  | 48.5   | 41.7   | 27.2   | 10.7   | 4.9    | 0.0    | 0.0    | 0.0    |
| 70°   | 1887.9 | 298.0  | 90.3   | 34.0   | 27.2   | 16.5   | 7.8    | 1.0    | 0.0    | 0.0    | 0.0    |
| 72.5° | 724.1  | 161.1  | 72.8   | 20.4   | 17.5   | 11.6   | 4.9    | 0.0    | 0.0    | 0.0    | 0.0    |
| 75°   | 163.1  | 105.8  | 50.5   | 14.6   | 12.6   | 7.8    | 1.9    | 0.0    | 0.0    | 0.0    | 0.0    |
| 77.5° | 62.1   | 76.7   | 29.1   | 9.7    | 8.7    | 4.9    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 80°   | 30.1   | 45.6   | 13.6   | 5.8    | 4.9    | 1.9    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 82.5° | 15.5   | 17.5   | 5.8    | 2.9    | 1.9    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 85°   | 8.7    | 8.7    | 2.9    | 1.9    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 87.5° | 4.9    | 2.9    | 1.0    | 1.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 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**



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)