

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: P437063

Luminaire Tested: **ISC-SA1A-827-U-SL4**

Issue Date: 12/9/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P437063  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-2011-074-18)  
Test Lab: INNOVATION CENTER  
Issue Date: 12/9/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: MCGRAW-EDISON  
Catalog Number: ISC-SA1A-827-U-SL4  
Description: IMPACT ELITE LED CYLINDER LUMINAIRE  
(1) 80 CRI, 2700K, 350mA LIGHTSQUARE WITH 16 LEDS AND TYPE IV SPILL LIGHT  
ELIMINATOR OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 1970 lumens  
Efficiency: N/A  
Efficacy: 98.0 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 0.5' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B0 - U0 - G1

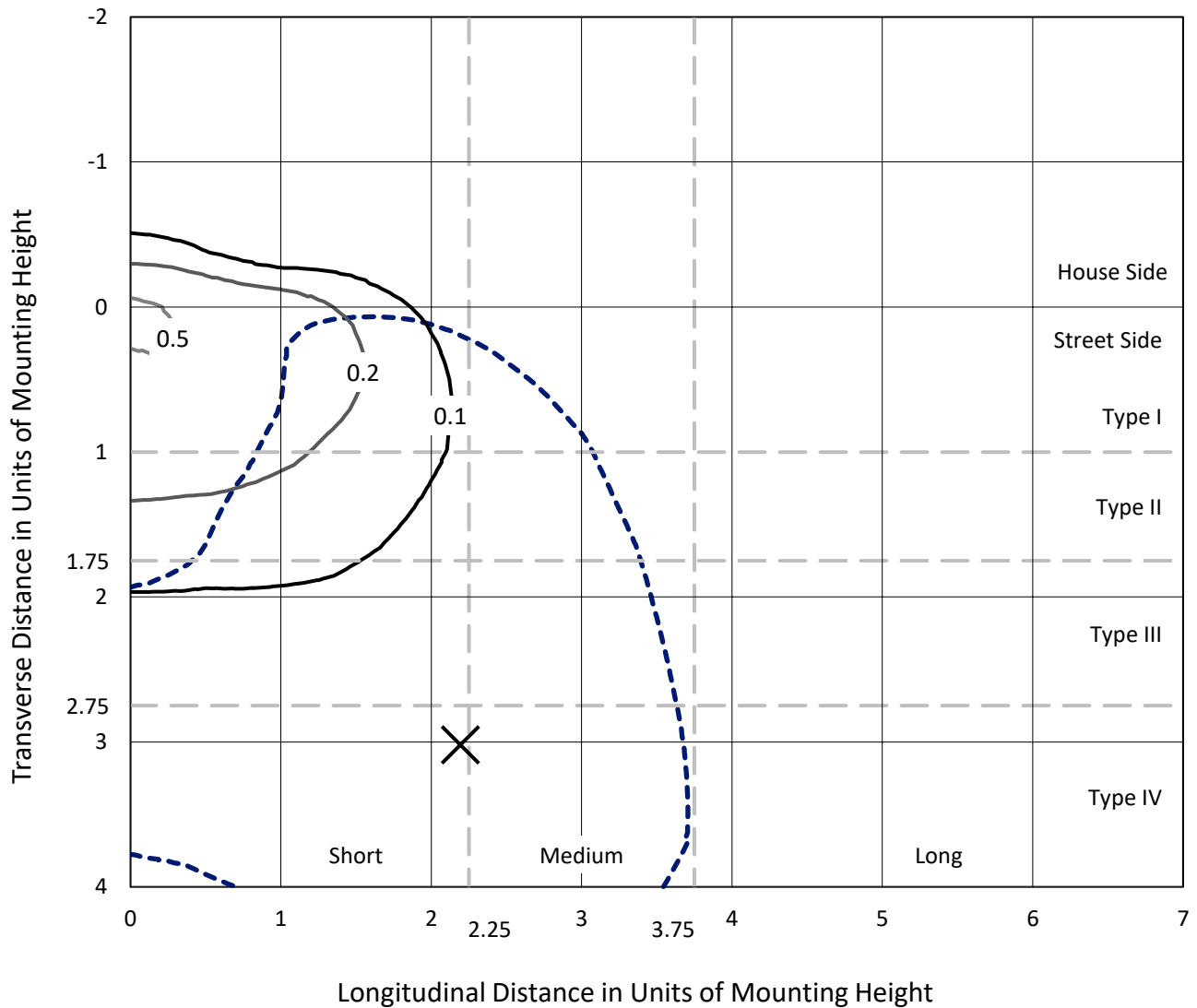
Input Watts (W): 20.1  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT



REPORT NUMBER: P437063  
 CATALOG NUMBER: ISC-SA1A-827-U-SL4

### Iso-Footcandle Lines of Horizontal Illumination

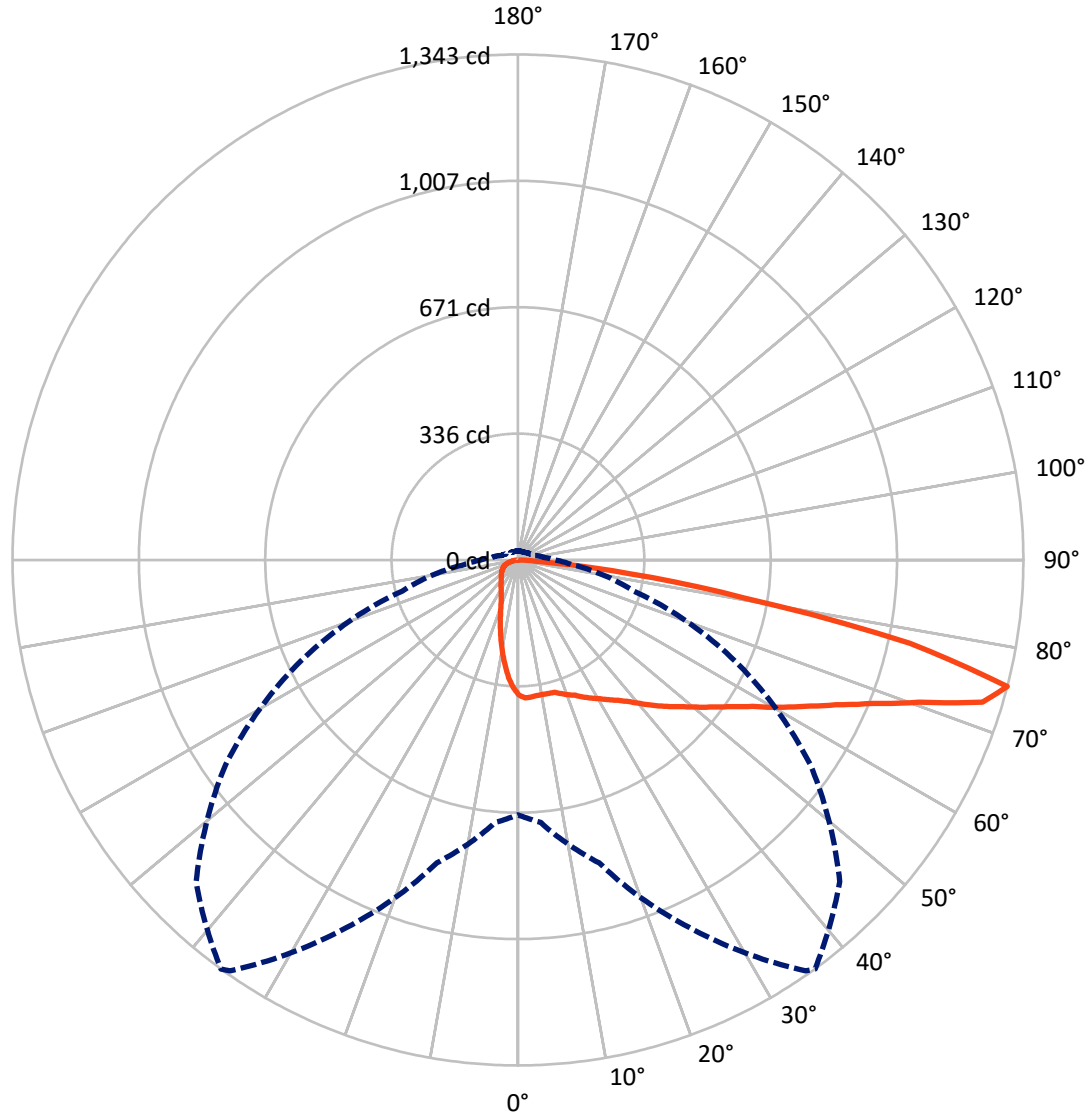
× Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 0.6 fc  
 Type IV - Short - N/A

REPORT NUMBER: P437063  
CATALOG NUMBER: ISC-SA1A-827-U-SL4

### Luminous Intensity Polar Plot



— Vertical Plane Through 36-Deg Lateral    - - - Horizontal Cone Through 75-Deg Vertical

REPORT NUMBER: P437063  
 CATALOG NUMBER: ISC-SA1A-827-U-SL4

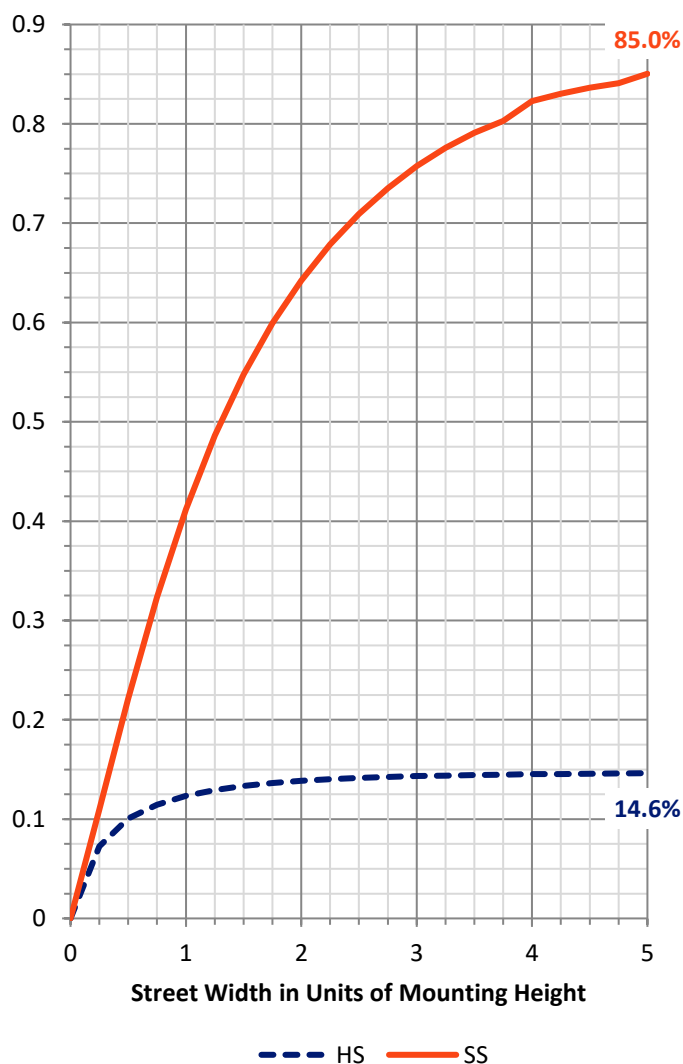
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 290.7    | 0.0    | 290.7  |
|                    | % Fixture | 14.8     | 0.0    | 14.8   |
| <b>Street Side</b> | Lumens    | 1679.3   | 0.0    | 1679.3 |
|                    | % Fixture | 85.2     | 0.0    | 85.2   |
| <b>Total</b>       | Lumens    | 1970.0   | 0.0    | 1970.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 31.7   | 1.6       |
| 10°-20°   | 82.0   | 4.2       |
| 20°-30°   | 126.8  | 6.4       |
| 30°-40°   | 183.6  | 9.3       |
| 40°-50°   | 265.5  | 13.5      |
| 50°-60°   | 368.3  | 18.7      |
| 60°-70°   | 465.1  | 23.6      |
| 70°-80°   | 399.5  | 20.3      |
| 80°-90°   | 47.6   | 2.4       |
| 90°-100°  | 0.0    | 0.0       |
| 100°-110° | 0.0    | 0.0       |
| 110°-120° | 0.0    | 0.0       |
| 120°-130° | 0.0    | 0.0       |
| 130°-140° | 0.0    | 0.0       |
| 140°-150° | 0.0    | 0.0       |
| 150°-160° | 0.0    | 0.0       |
| 160°-170° | 0.0    | 0.0       |
| 170°-180° | 0.0    | 0.0       |
| 0°-90°    | 1970.0 | 100.0     |
| 0°-180°   | 1970.0 | 100.0     |

**Coefficient of Utilization**

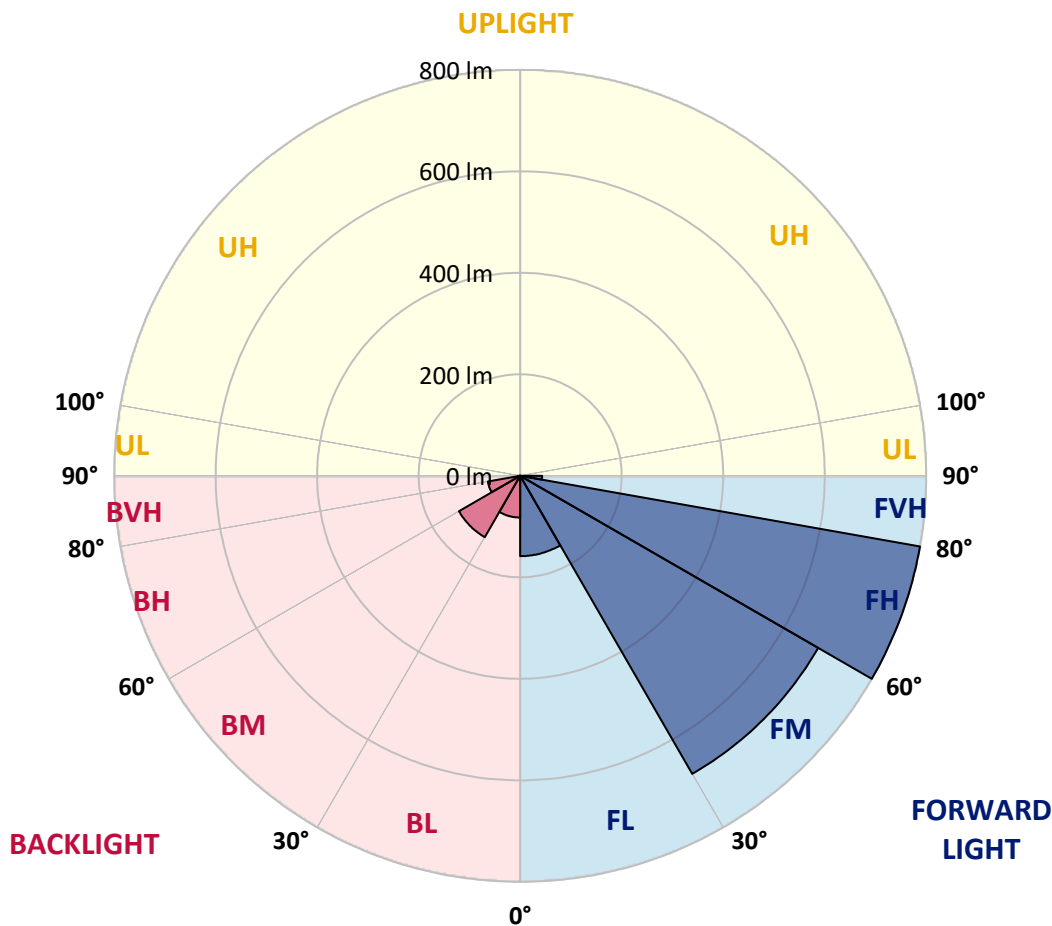


REPORT NUMBER: P437063  
 CATALOG NUMBER: ISC-SA1A-827-U-SL4

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

| Zone           | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|----------------|--------|-----------|-------------------------|------|---------|
|                |        |           | B                       | U    | G       |
| FL (0°-30°)    | 158.2  | 8.0       |                         |      |         |
| FM (30°-60°)   | 678.1  | 34.4      |                         |      |         |
| FH (60°-80°)   | 799.8  | 40.6      |                         |      | G1/1800 |
| FVH (80°-90°)  | 43.2   | 2.2       |                         |      | G1/100  |
| BL (0°-30°)    | 82.2   | 4.2       | B0/110                  |      |         |
| BM (30°-60°)   | 139.4  | 7.1       | B0/220                  |      |         |
| BH (60°-80°)   | 64.7   | 3.3       | B0/110                  |      | G0/110  |
| BVH (80°-90°)  | 4.4    | 0.2       |                         |      | G0/10   |
| UL (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B0-U0-G1**  
 Type IV Short





REPORT NUMBER: P437063  
 CATALOG NUMBER: ISC-SA1A-827-U-SL4

**CANDELA DISTRIBUTION (FULL):**

|       | 0°    | 5°    | 15°   | 25°    | 35°    | 36°    | 45°    | 55°    | 65°    | 75°   | 85°   |
|-------|-------|-------|-------|--------|--------|--------|--------|--------|--------|-------|-------|
| 0°    | 359.4 | 359.4 | 359.4 | 359.4  | 359.4  | 359.4  | 359.4  | 359.4  | 359.4  | 359.4 | 359.4 |
| 2.5°  | 369.7 | 369.7 | 369.7 | 369.0  | 367.5  | 366.8  | 365.3  | 363.8  | 363.1  | 360.2 | 359.4 |
| 5°    | 369.7 | 370.4 | 369.7 | 369.0  | 367.5  | 366.0  | 364.6  | 361.6  | 359.4  | 355.7 | 352.1 |
| 7.5°  | 366.0 | 366.8 | 366.8 | 366.0  | 364.6  | 363.8  | 362.4  | 358.7  | 355.7  | 350.6 | 344.7 |
| 10°   | 360.2 | 361.6 | 361.6 | 362.4  | 363.1  | 363.1  | 361.6  | 358.7  | 354.3  | 348.4 | 338.8 |
| 12.5° | 352.8 | 356.5 | 358.7 | 360.9  | 363.8  | 363.8  | 364.6  | 360.2  | 356.5  | 348.4 | 338.8 |
| 15°   | 350.6 | 352.8 | 357.2 | 363.8  | 366.8  | 364.6  | 367.5  | 365.3  | 360.9  | 352.8 | 341.0 |
| 17.5° | 349.9 | 352.1 | 359.4 | 367.5  | 371.9  | 373.4  | 373.4  | 370.4  | 365.3  | 357.2 | 342.5 |
| 20°   | 352.8 | 355.7 | 365.3 | 375.6  | 382.2  | 382.2  | 381.5  | 377.8  | 371.2  | 361.6 | 345.5 |
| 22.5° | 362.4 | 363.1 | 374.1 | 386.6  | 391.8  | 390.3  | 391.8  | 385.1  | 377.8  | 368.2 | 349.1 |
| 25°   | 374.9 | 376.3 | 385.1 | 399.8  | 402.8  | 403.5  | 401.3  | 394.0  | 385.9  | 376.3 | 353.5 |
| 27.5° | 391.8 | 394.0 | 400.6 | 414.5  | 416.7  | 415.3  | 412.3  | 403.5  | 395.4  | 386.6 | 362.4 |
| 30°   | 411.6 | 413.1 | 421.2 | 427.0  | 429.2  | 427.8  | 425.6  | 416.0  | 409.4  | 401.3 | 375.6 |
| 32.5° | 430.7 | 431.4 | 440.3 | 446.1  | 442.5  | 442.5  | 439.5  | 430.0  | 424.8  | 423.4 | 392.5 |
| 35°   | 450.6 | 452.0 | 460.1 | 463.1  | 457.2  | 457.9  | 457.2  | 449.1  | 450.6  | 453.5 | 418.2 |
| 37.5° | 468.9 | 471.1 | 480.7 | 481.4  | 479.2  | 477.0  | 479.2  | 474.8  | 477.8  | 489.5 | 448.4 |
| 40°   | 485.1 | 488.0 | 499.8 | 502.0  | 501.3  | 501.3  | 502.7  | 502.0  | 513.0  | 532.1 | 485.1 |
| 42.5° | 498.3 | 502.0 | 516.0 | 521.9  | 526.3  | 528.5  | 533.6  | 535.1  | 551.3  | 582.1 | 527.7 |
| 45°   | 511.6 | 515.2 | 534.3 | 543.9  | 554.2  | 554.9  | 565.2  | 570.4  | 600.5  | 628.4 | 574.0 |
| 47.5° | 527.0 | 531.4 | 549.0 | 568.2  | 579.9  | 582.1  | 601.2  | 611.5  | 648.3  | 684.3 | 617.4 |
| 50°   | 548.3 | 549.8 | 563.7 | 596.1  | 610.8  | 614.5  | 635.8  | 657.1  | 697.5  | 733.5 | 655.6 |
| 52.5° | 574.8 | 573.3 | 579.9 | 621.1  | 643.9  | 649.0  | 683.6  | 704.9  | 753.4  | 786.5 | 685.8 |
| 55°   | 596.8 | 595.4 | 604.9 | 649.7  | 685.8  | 687.2  | 728.4  | 749.0  | 804.8  | 825.4 | 711.5 |
| 57.5° | 622.5 | 619.6 | 629.2 | 684.3  | 733.5  | 734.3  | 782.0  | 805.6  | 851.1  | 860.0 | 728.4 |
| 60°   | 643.9 | 643.9 | 656.4 | 718.1  | 786.5  | 794.5  | 837.9  | 856.3  | 896.0  | 884.9 | 736.5 |
| 62.5° | 663.7 | 667.4 | 685.0 | 762.9  | 848.9  | 855.5  | 899.6  | 907.0  | 942.3  | 904.1 | 727.7 |
| 65°   | 687.2 | 693.1 | 726.9 | 816.6  | 923.2  | 927.6  | 964.3  | 974.6  | 988.6  | 903.3 | 689.4 |
| 67.5° | 712.2 | 721.8 | 766.6 | 876.9  | 1004.7 | 1016.5 | 1056.2 | 1045.9 | 1019.4 | 874.7 | 609.3 |
| 70°   | 746.0 | 757.8 | 821.7 | 957.0  | 1116.5 | 1131.2 | 1183.4 | 1120.1 | 1003.3 | 772.5 | 493.9 |
| 72.5° | 771.8 | 787.2 | 874.7 | 1060.6 | 1267.9 | 1290.7 | 1278.2 | 1121.6 | 899.6  | 615.9 | 330.8 |
| 75°   | 676.9 | 700.5 | 832.8 | 1077.5 | 1332.6 | 1342.9 | 1209.1 | 948.2  | 637.2  | 318.3 | 142.6 |
| 77.5° | 494.7 | 493.2 | 608.6 | 837.2  | 1092.2 | 1065.0 | 917.3  | 616.7  | 302.8  | 115.4 | 72.0  |
| 80°   | 248.4 | 238.9 | 329.3 | 446.1  | 589.5  | 607.8  | 542.4  | 320.5  | 119.8  | 61.7  | 43.4  |
| 82.5° | 91.9  | 94.1  | 120.5 | 182.3  | 296.2  | 300.6  | 219.0  | 136.0  | 65.4   | 32.3  | 22.8  |
| 85°   | 35.3  | 36.8  | 39.7  | 39.7   | 55.1   | 61.0   | 56.6   | 54.4   | 22.1   | 11.0  | 12.5  |
| 87.5° | 0.0   | 0.0   | 0.0   | 0.0    | 0.7    | 0.7    | 0.7    | 0.7    | 0.7    | 0.7   | 0.7   |
| 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: P437063  
 CATALOG NUMBER: ISC-SA1A-827-U-SL4

**CANDELA DISTRIBUTION (continued):**

|       | 90°   | 95°   | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 359.4 | 359.4 | 359.4 | 359.4 | 359.4 | 359.4 | 359.4 | 359.4 | 359.4 | 359.4 | 359.4 |
| 2.5°  | 357.2 | 355.7 | 352.8 | 347.7 | 344.7 | 342.5 | 339.6 | 336.6 | 335.9 | 335.2 | 338.8 |
| 5°    | 348.4 | 346.2 | 338.8 | 332.2 | 324.9 | 319.0 | 313.1 | 308.0 | 305.0 | 304.3 | 305.8 |
| 7.5°  | 339.6 | 336.6 | 325.6 | 312.4 | 299.9 | 289.6 | 279.3 | 274.2 | 266.1 | 266.1 | 266.8 |
| 10°   | 334.4 | 329.3 | 313.8 | 294.0 | 277.8 | 259.5 | 247.0 | 234.5 | 229.3 | 225.6 | 224.2 |
| 12.5° | 331.5 | 323.4 | 302.8 | 280.8 | 255.8 | 231.5 | 214.6 | 199.2 | 191.1 | 185.2 | 185.2 |
| 15°   | 332.2 | 323.4 | 295.5 | 266.8 | 234.5 | 205.1 | 183.8 | 166.8 | 156.6 | 150.7 | 149.2 |
| 17.5° | 331.5 | 320.5 | 286.7 | 249.2 | 213.2 | 182.3 | 156.6 | 138.9 | 128.6 | 125.0 | 124.2 |
| 20°   | 333.0 | 318.3 | 276.4 | 233.0 | 192.6 | 159.5 | 133.0 | 116.9 | 111.0 | 108.0 | 107.3 |
| 22.5° | 333.7 | 313.8 | 266.1 | 215.4 | 170.5 | 138.2 | 116.1 | 105.1 | 100.7 | 98.5  | 97.8  |
| 25°   | 335.2 | 313.1 | 254.3 | 199.2 | 152.1 | 122.0 | 105.1 | 95.6  | 93.3  | 91.9  | 91.9  |
| 27.5° | 341.0 | 313.1 | 244.0 | 178.6 | 133.0 | 108.8 | 95.6  | 89.7  | 88.2  | 87.5  | 87.5  |
| 30°   | 348.4 | 314.6 | 234.5 | 161.7 | 118.3 | 98.5  | 88.9  | 84.5  | 83.8  | 83.1  | 83.1  |
| 32.5° | 360.9 | 319.7 | 223.4 | 145.5 | 105.8 | 91.1  | 83.8  | 80.1  | 78.6  | 78.6  | 78.6  |
| 35°   | 377.8 | 328.5 | 212.4 | 130.8 | 95.6  | 83.8  | 78.6  | 75.0  | 74.2  | 75.0  | 75.0  |
| 37.5° | 402.0 | 338.8 | 202.9 | 117.6 | 87.5  | 77.9  | 73.5  | 71.3  | 70.6  | 70.6  | 71.3  |
| 40°   | 432.2 | 357.2 | 193.3 | 107.3 | 81.6  | 72.8  | 69.8  | 67.6  | 66.9  | 67.6  | 67.6  |
| 42.5° | 465.3 | 377.1 | 185.2 | 97.0  | 75.7  | 69.1  | 65.4  | 63.9  | 63.2  | 63.9  | 64.7  |
| 45°   | 502.0 | 397.6 | 178.6 | 89.7  | 71.3  | 65.4  | 62.5  | 61.7  | 61.0  | 61.0  | 61.7  |
| 47.5° | 532.9 | 419.7 | 173.5 | 84.5  | 67.6  | 62.5  | 60.3  | 58.8  | 58.1  | 57.3  | 58.1  |
| 50°   | 561.5 | 436.6 | 172.0 | 81.6  | 65.4  | 59.5  | 57.3  | 55.9  | 55.1  | 54.4  | 55.1  |
| 52.5° | 582.9 | 445.4 | 172.0 | 79.4  | 63.2  | 57.3  | 55.1  | 53.7  | 52.9  | 51.5  | 52.2  |
| 55°   | 597.6 | 449.8 | 169.8 | 77.9  | 61.0  | 55.1  | 52.2  | 51.5  | 50.7  | 49.2  | 49.2  |
| 57.5° | 606.4 | 449.1 | 161.7 | 77.2  | 60.3  | 52.2  | 50.0  | 49.2  | 48.5  | 47.0  | 47.0  |
| 60°   | 604.9 | 435.1 | 147.0 | 74.2  | 58.8  | 50.0  | 47.0  | 47.0  | 47.0  | 45.6  | 45.6  |
| 62.5° | 583.6 | 396.2 | 122.7 | 69.8  | 57.3  | 47.8  | 44.1  | 45.6  | 46.3  | 44.8  | 44.8  |
| 65°   | 526.3 | 336.6 | 101.4 | 63.9  | 53.7  | 45.6  | 41.9  | 44.1  | 45.6  | 44.8  | 44.1  |
| 67.5° | 443.2 | 266.8 | 83.8  | 58.1  | 50.0  | 42.6  | 39.0  | 41.9  | 42.6  | 42.6  | 42.6  |
| 70°   | 342.5 | 191.8 | 69.1  | 50.7  | 44.8  | 38.2  | 35.3  | 36.8  | 37.5  | 37.5  | 38.2  |
| 72.5° | 202.9 | 114.7 | 56.6  | 43.4  | 38.2  | 33.1  | 30.9  | 31.6  | 30.9  | 30.9  | 30.9  |
| 75°   | 100.0 | 71.3  | 45.6  | 36.8  | 32.3  | 27.9  | 25.7  | 24.3  | 24.3  | 24.3  | 23.5  |
| 77.5° | 61.0  | 52.9  | 37.5  | 29.4  | 25.7  | 21.3  | 19.8  | 18.4  | 18.4  | 18.4  | 18.4  |
| 80°   | 43.4  | 41.2  | 28.7  | 22.1  | 17.6  | 15.4  | 14.7  | 14.0  | 14.0  | 13.2  | 13.2  |
| 82.5° | 27.2  | 30.9  | 21.3  | 14.7  | 11.8  | 11.0  | 10.3  | 9.6   | 8.8   | 8.1   | 8.1   |
| 85°   | 15.4  | 19.8  | 12.5  | 8.1   | 6.6   | 5.1   | 4.4   | 4.4   | 3.7   | 3.7   | 2.9   |
| 87.5° | 0.7   | 1.5   | 1.5   | 1.5   | 1.5   | 0.7   | 0.7   | 0.7   | 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   |



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



**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**



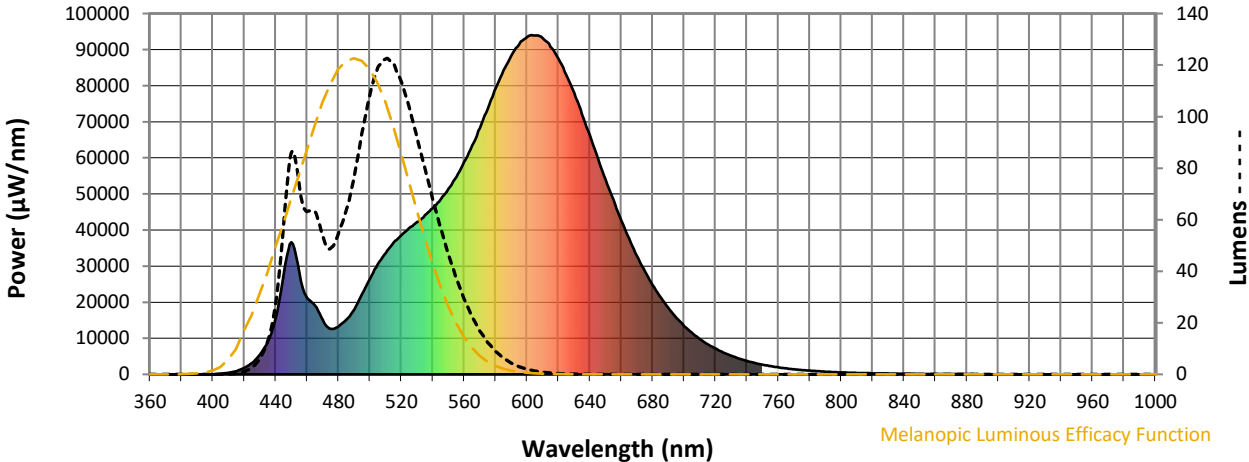
**Scotopic Lumens: 5286.7**

**S/P: 1.22**

| $\lambda$<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                                | 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 (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         | 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  $R_a = 80.9$   
 $R_g = -1.5$



**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)