

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: P385431

Luminaire Tested: **GPC-SA1A-727-U-RW**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P385431  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-7)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GPC-SA1A-727-U-RW  
Description: GALLEON PEDESTRIAN LUMINAIRE  
(1) 70 CRI, 2700K, 615mA LIGHTSQUARE WITH 16 LEDS AND RECTANGULAR WIDE OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 4255 lumens  
Efficiency: N/A  
Efficacy: 125.1 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 0.5' x H: 0')  
IES Classification: Type III - Short  
BUG Rating: B2 - U0 - G2

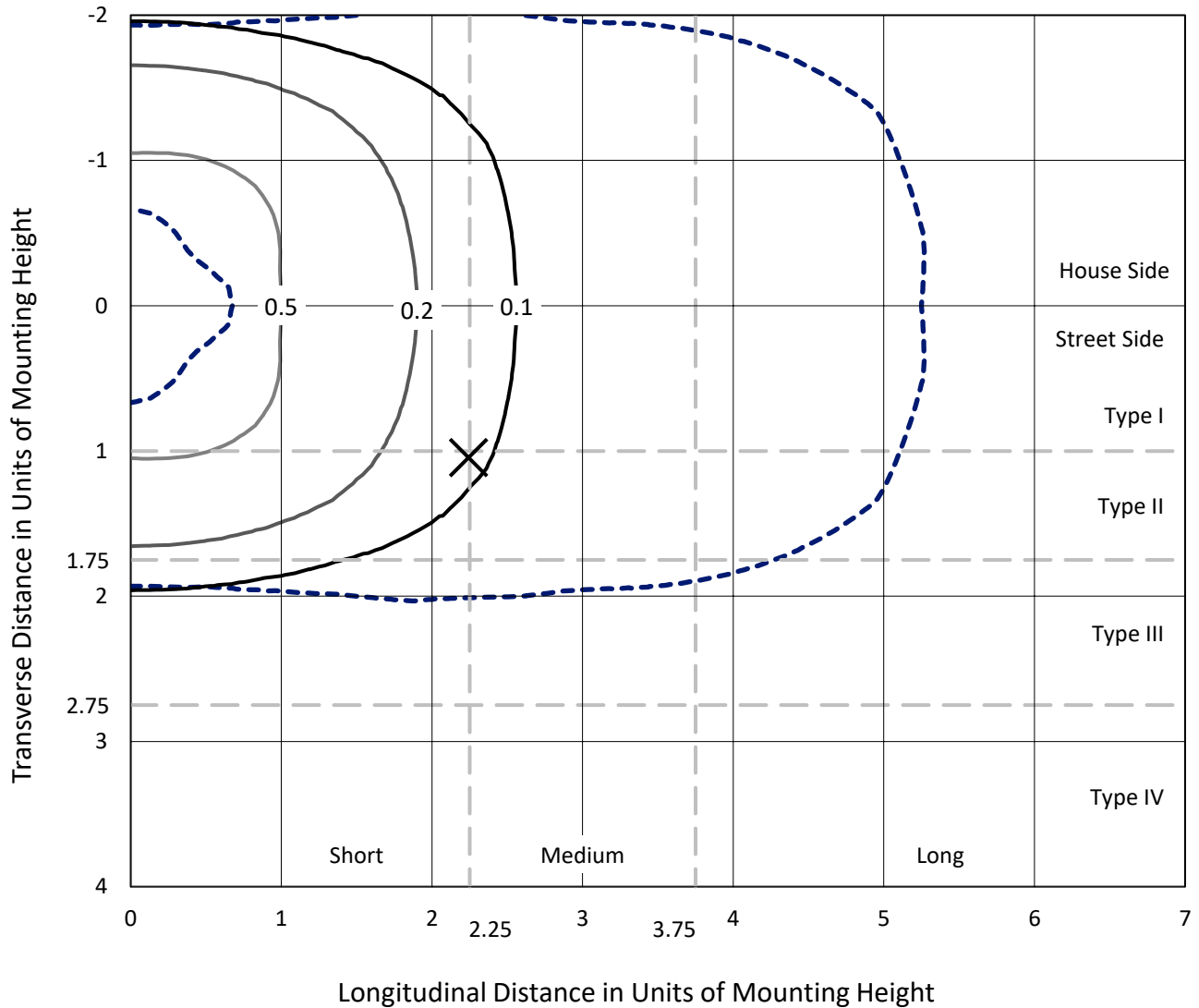
Input Watts (W): 34  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT



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 CATALOG NUMBER: GPC-SA1A-727-U-RW

### Iso-Footcandle Lines of Horizontal Illumination

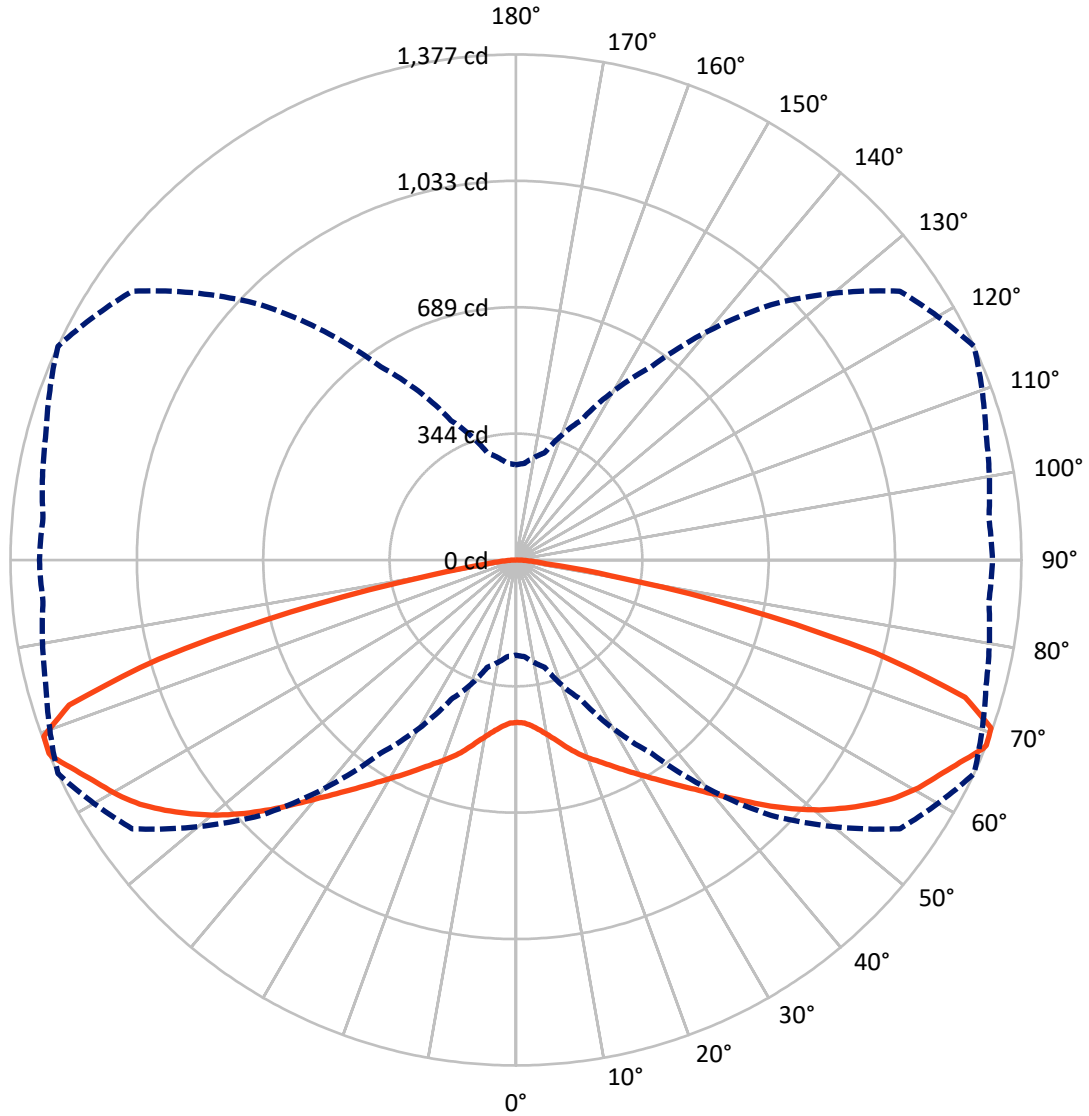
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 0.8 fc  
 Type III - Short - N/A

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### Luminous Intensity Polar Plot



— Vertical Plane Through 65-Deg Lateral    - - - Horizontal Cone Through 68-Deg Vertical

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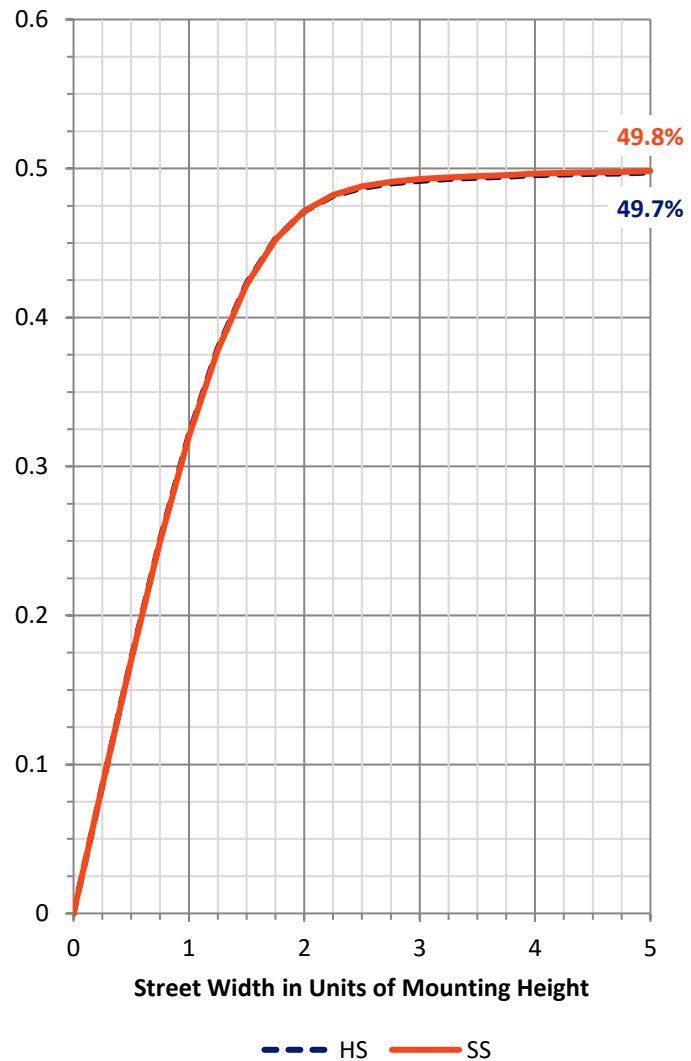
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 2127.5   | 0.0    | 2127.5 |
|                    | % Fixture | 50.0     | 0.0    | 50.0   |
| <b>Street Side</b> | Lumens    | 2127.5   | 0.0    | 2127.5 |
|                    | % Fixture | 50.0     | 0.0    | 50.0   |
| <b>Total</b>       | Lumens    | 4255.0   | 0.0    | 4255.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 43.3   | 1.0       |
| 10°-20°   | 145.0  | 3.4       |
| 20°-30°   | 282.8  | 6.6       |
| 30°-40°   | 475.1  | 11.2      |
| 40°-50°   | 748.5  | 17.6      |
| 50°-60°   | 1001.0 | 23.5      |
| 60°-70°   | 973.1  | 22.9      |
| 70°-80°   | 532.0  | 12.5      |
| 80°-90°   | 54.1   | 1.3       |
| 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°    | 4255.0 | 100.0     |
| 0°-180°   | 4255.0 | 100.0     |

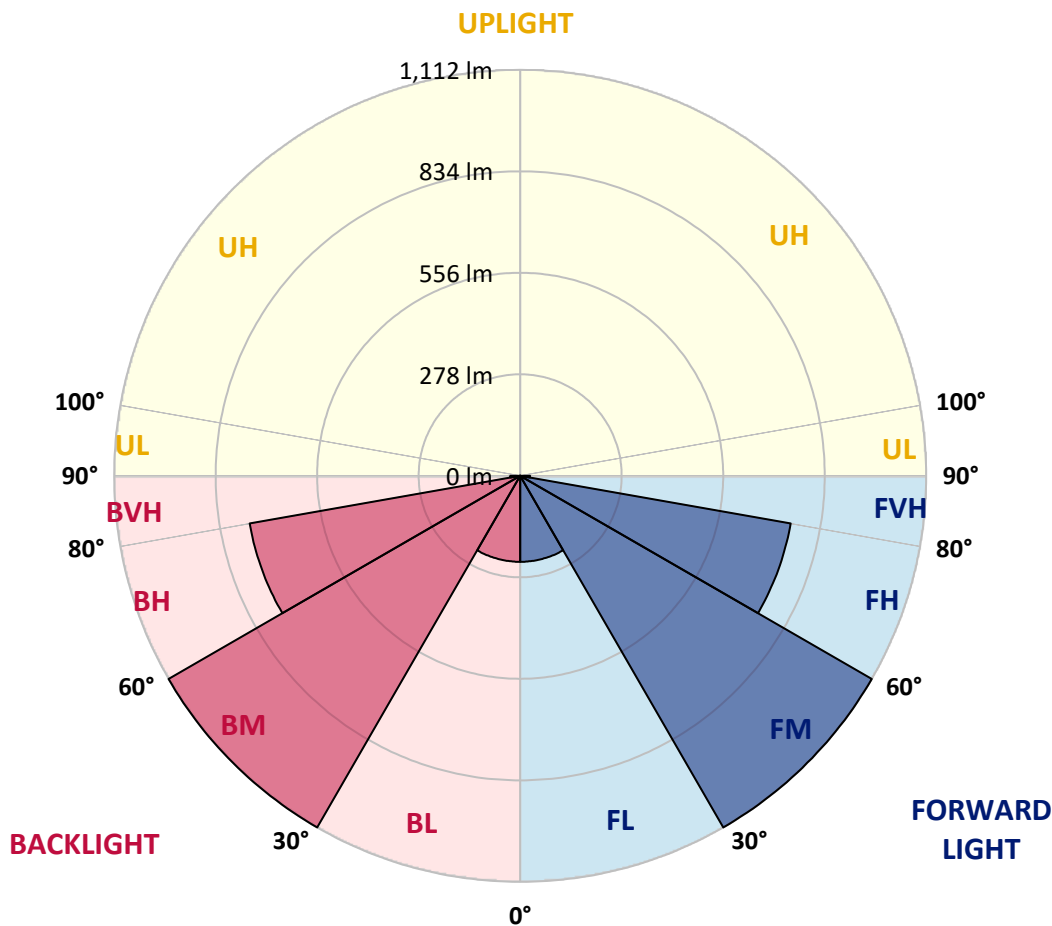


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 CATALOG NUMBER: GPC-SA1A-727-U-RW

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

| Zone           | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|----------------|--------|-----------|-------------------------|------|---------|
|                |        |           | B                       | U    | G       |
| FL (0°-30°)    | 235.6  | 5.5       |                         |      |         |
| FM (30°-60°)   | 1112.3 | 26.1      |                         |      |         |
| FH (60°-80°)   | 752.6  | 17.7      |                         |      | G1/1800 |
| FVH (80°-90°)  | 27.1   | 0.6       |                         |      | G1/100  |
| BL (0°-30°)    | 235.6  | 5.5       | B1/500                  |      |         |
| BM (30°-60°)   | 1112.3 | 26.1      | B2/2500                 |      |         |
| BH (60°-80°)   | 752.6  | 17.7      | B2/1000                 |      | G2/1000 |
| BVH (80°-90°)  | 27.1   | 0.6       |                         |      | G1/100  |
| UL (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B2-U0-G2**  
 Type III Short





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CATALOG NUMBER: GPC-SA1A-727-U-RW

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 75°    | 85°    | 90°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 442.4  | 442.4  | 442.4  | 442.4  | 442.4  | 442.4  | 442.4  | 442.4  | 442.4  | 442.4  | 442.4  |
| 2.5°  | 439.3  | 439.4  | 440.1  | 441.0  | 441.7  | 443.6  | 444.0  | 444.7  | 445.0  | 445.7  | 445.7  |
| 5°    | 435.4  | 435.7  | 437.4  | 439.7  | 442.3  | 446.8  | 450.1  | 453.8  | 455.7  | 457.7  | 457.5  |
| 7.5°  | 435.0  | 435.7  | 438.1  | 441.8  | 446.1  | 453.7  | 460.5  | 468.0  | 473.0  | 477.5  | 477.2  |
| 10°   | 439.4  | 440.6  | 444.0  | 449.6  | 456.0  | 465.4  | 475.5  | 485.5  | 494.2  | 501.2  | 501.5  |
| 12.5° | 446.1  | 447.6  | 453.0  | 461.4  | 471.1  | 483.2  | 495.2  | 506.5  | 518.5  | 528.9  | 529.7  |
| 15°   | 455.0  | 456.8  | 465.0  | 477.5  | 492.4  | 506.8  | 519.6  | 531.2  | 545.0  | 559.4  | 560.8  |
| 17.5° | 468.1  | 470.7  | 481.4  | 498.3  | 517.9  | 533.7  | 547.1  | 555.8  | 567.4  | 582.2  | 584.9  |
| 20°   | 488.1  | 491.4  | 504.9  | 525.2  | 549.0  | 565.5  | 575.8  | 577.7  | 583.4  | 596.6  | 599.8  |
| 22.5° | 514.0  | 516.9  | 532.0  | 556.1  | 582.8  | 600.8  | 606.2  | 598.8  | 598.2  | 608.9  | 611.9  |
| 25°   | 543.0  | 545.6  | 563.1  | 590.2  | 618.9  | 638.7  | 638.6  | 624.2  | 614.2  | 622.5  | 625.6  |
| 27.5° | 575.5  | 579.5  | 596.4  | 624.9  | 655.6  | 675.1  | 674.0  | 651.7  | 632.7  | 634.9  | 637.6  |
| 30°   | 612.9  | 617.3  | 633.7  | 662.7  | 693.4  | 712.5  | 711.1  | 681.7  | 653.1  | 647.4  | 649.4  |
| 32.5° | 659.3  | 664.6  | 680.1  | 708.6  | 735.7  | 753.0  | 748.9  | 714.2  | 677.7  | 665.3  | 667.1  |
| 35°   | 715.1  | 718.2  | 734.6  | 762.7  | 784.7  | 796.5  | 787.8  | 751.9  | 708.8  | 693.8  | 693.8  |
| 37.5° | 771.6  | 774.0  | 792.4  | 819.6  | 840.9  | 847.2  | 830.2  | 793.1  | 749.4  | 728.2  | 728.6  |
| 40°   | 825.8  | 832.3  | 853.0  | 881.0  | 902.0  | 903.7  | 881.1  | 840.2  | 794.7  | 772.7  | 775.3  |
| 42.5° | 882.4  | 888.8  | 913.5  | 945.2  | 963.7  | 966.6  | 940.2  | 893.0  | 845.7  | 827.9  | 830.8  |
| 45°   | 932.9  | 938.1  | 966.6  | 1003.4 | 1026.5 | 1033.9 | 1002.7 | 953.5  | 901.0  | 883.6  | 884.3  |
| 47.5° | 968.2  | 974.9  | 1006.3 | 1049.6 | 1083.3 | 1094.7 | 1064.0 | 1012.4 | 955.3  | 934.2  | 936.1  |
| 50°   | 1000.1 | 1003.7 | 1035.5 | 1082.9 | 1125.7 | 1149.2 | 1123.0 | 1070.6 | 1010.2 | 987.8  | 989.8  |
| 52.5° | 1018.0 | 1022.5 | 1053.3 | 1102.7 | 1153.3 | 1191.3 | 1175.3 | 1123.0 | 1063.3 | 1041.5 | 1043.9 |
| 55°   | 1005.5 | 1009.0 | 1045.9 | 1107.1 | 1170.5 | 1217.3 | 1219.7 | 1174.2 | 1115.4 | 1096.3 | 1103.1 |
| 57.5° | 949.0  | 953.3  | 998.4  | 1078.6 | 1172.6 | 1234.8 | 1253.1 | 1221.7 | 1164.0 | 1148.5 | 1152.5 |
| 60°   | 860.7  | 863.4  | 911.5  | 1001.7 | 1130.9 | 1242.1 | 1274.3 | 1260.5 | 1211.7 | 1196.1 | 1201.6 |
| 62.5° | 703.4  | 707.4  | 764.9  | 885.7  | 1042.9 | 1220.5 | 1294.9 | 1292.6 | 1256.1 | 1241.8 | 1246.7 |
| 65°   | 480.8  | 487.8  | 551.4  | 704.2  | 907.2  | 1154.6 | 1313.6 | 1330.0 | 1295.3 | 1277.3 | 1283.7 |
| 67.5° | 290.3  | 295.5  | 341.6  | 465.0  | 694.2  | 1021.7 | 1294.3 | 1372.5 | 1323.0 | 1294.0 | 1299.3 |
| 68°   | 259.5  | 264.2  | 302.7  | 419.6  | 642.2  | 984.1  | 1276.8 | 1377.3 | 1326.0 | 1293.7 | 1298.4 |
| 70°   | 156.8  | 159.9  | 185.8  | 259.4  | 428.2  | 780.7  | 1157.1 | 1373.3 | 1345.1 | 1297.7 | 1300.4 |
| 72.5° | 102.2  | 103.2  | 107.4  | 133.1  | 218.7  | 436.6  | 868.4  | 1279.8 | 1373.8 | 1321.0 | 1320.6 |
| 75°   | 84.9   | 84.3   | 84.7   | 87.7   | 107.9  | 191.5  | 507.5  | 1011.0 | 1309.6 | 1284.3 | 1275.3 |
| 77.5° | 71.8   | 71.3   | 71.2   | 71.3   | 72.2   | 92.5   | 220.3  | 629.7  | 1002.1 | 1136.1 | 1144.1 |
| 80°   | 58.1   | 57.5   | 59.4   | 58.5   | 55.9   | 57.5   | 92.3   | 261.9  | 472.4  | 508.2  | 476.2  |
| 82.5° | 42.2   | 40.1   | 48.1   | 45.8   | 43.7   | 40.5   | 50.9   | 84.6   | 112.7  | 77.3   | 54.4   |
| 85°   | 32.5   | 30.2   | 36.5   | 35.1   | 30.0   | 20.7   | 30.2   | 41.4   | 45.7   | 26.1   | 20.5   |
| 87.5° | 13.3   | 14.0   | 26.4   | 20.8   | 17.5   | 10.0   | 12.4   | 16.5   | 22.3   | 11.1   | 8.6    |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

LM-79-2008: Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Report Prepared for

Cooper Lighting Solutions

McGRAW-EDISON

Report Number: SP1-1908-441-1-R4

Test Date: 08/20/2019

Luminaire Tested: SA1C-727-U-5WQ

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**Test Information**

Test Method: LM-79-2008  
 Report Number: SP1-1908-441-1-R4  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry: 4π  
 Issue Date: 10/28/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: McGRAW-EDISON  
 Catalog Number: **SA1C-727-U-5WQ**  
 Description: McGRAW EDISON ROADWAY AND AREA LUMINAIRE

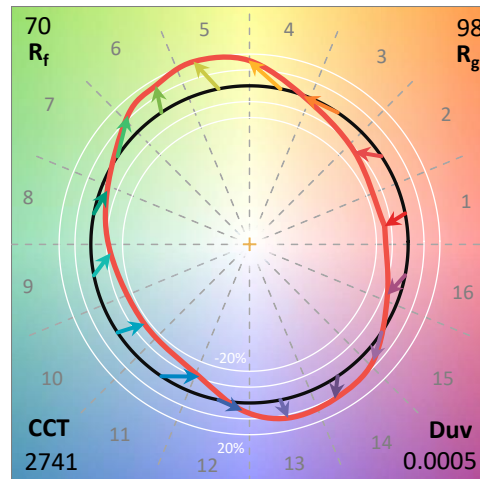
\*\*\*THIS IS A REVISION OF SP1-1908-441-1-R3. TO UPDATE THE CATALOG NUMBER.\*\*\*TESTED IN  
 SITU. (1) 70 CRI, 2700K, 1050MA LIGHTSQUARE WITH 16 LEDS AND TYPE V WIDE OPTICS.

**Spectral Parameters**

CCT (K): 2741  
 CIE u': 0.2605  
 CIE v': 0.5272  
 Duv: 0.0005  
 CIE x: 0.4573  
 CIE y: 0.4113  
 CIE z: 0.1313  
 Peak Wavelength (nm): 602  
 Dominant Wavelength (nm): 583  
 Purity: 61.2

|           |      |      |       |
|-----------|------|------|-------|
| CRI (Ra): | 71.5 |      |       |
| R1:       | 69.2 | R9:  | -16.1 |
| R2:       | 79.4 | R10: | 51.4  |
| R3:       | 87.8 | R11: | 63.1  |
| R4:       | 69.4 | R12: | 42.0  |
| R5:       | 66.4 | R13: | 70.2  |
| R6:       | 69.8 | R14: | 92.4  |
| R7:       | 79.8 |      |       |
| R8:       | 50.1 |      |       |

Rf: 69.9  
 Rg: 98.3



**Test Conditions**

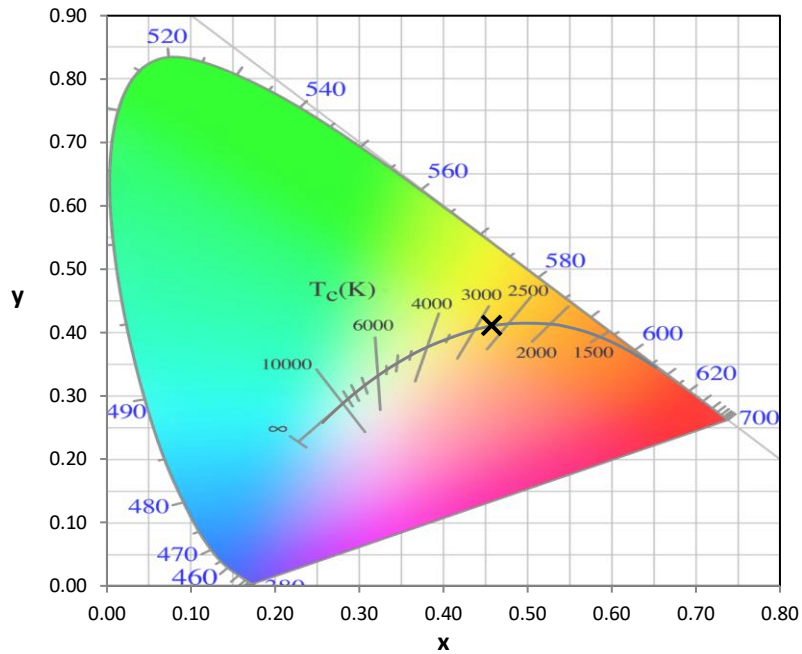
Stabilization Time: 56M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.3./42%  
 Sphere Temperature (°C): 25.7

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

| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 6/28/2019        | 12/28/2019           |
| Power Meter                    | IN0071                | 12/5/2018        | 12/5/2019            |
| AC Power Source                | IN0063                | 12/5/2018        | 12/5/2019            |
| DC Power Source                | IN0208                | 12/5/2018        | 12/5/2019            |
| Sphere Thermometer             | IN0085                | 12/5/2018        | 12/5/2019            |
| Room Thermometer               | IN0046                | 12/5/2018        | 12/5/2019            |

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

CIE 1931 Chromaticity Diagram



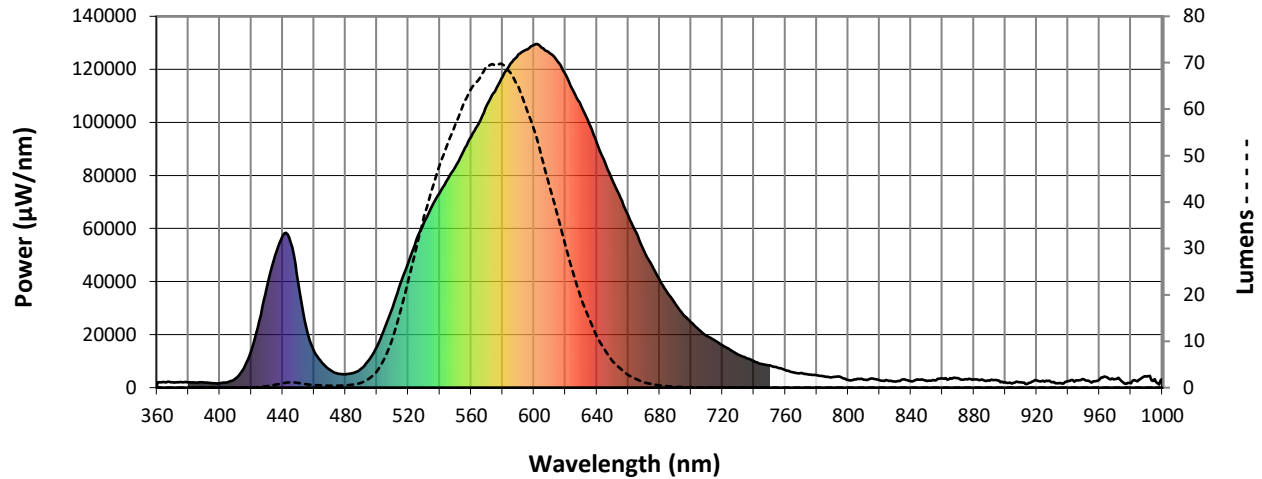
CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies inside the ANSI 2700K 4-step quadrangle

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**Photopic Flux vs. Wavelength**

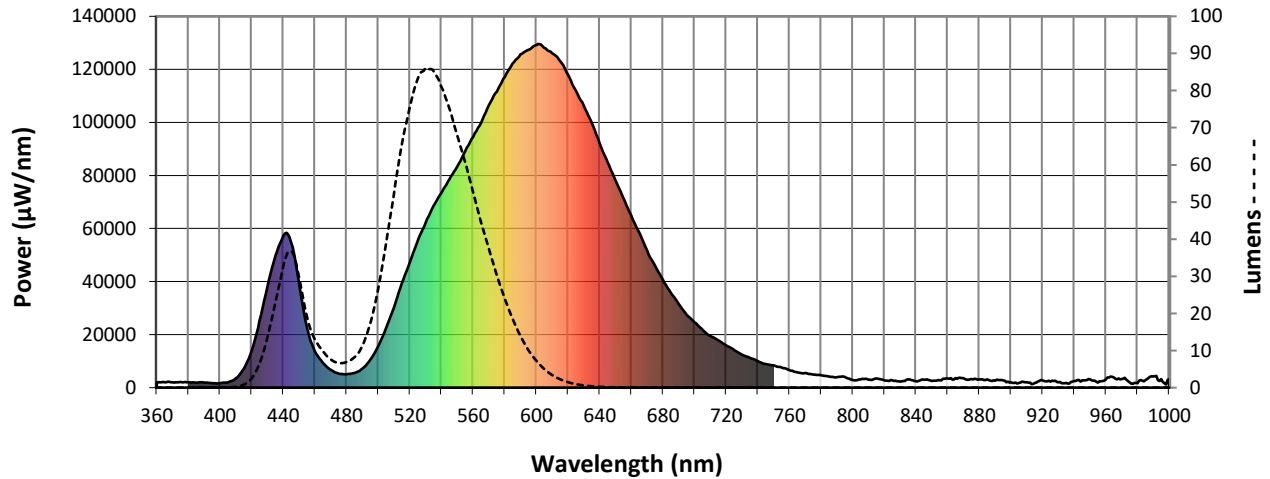


**Photopic Lumens: 6211.7**

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

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Scotopic Flux vs. Wavelength



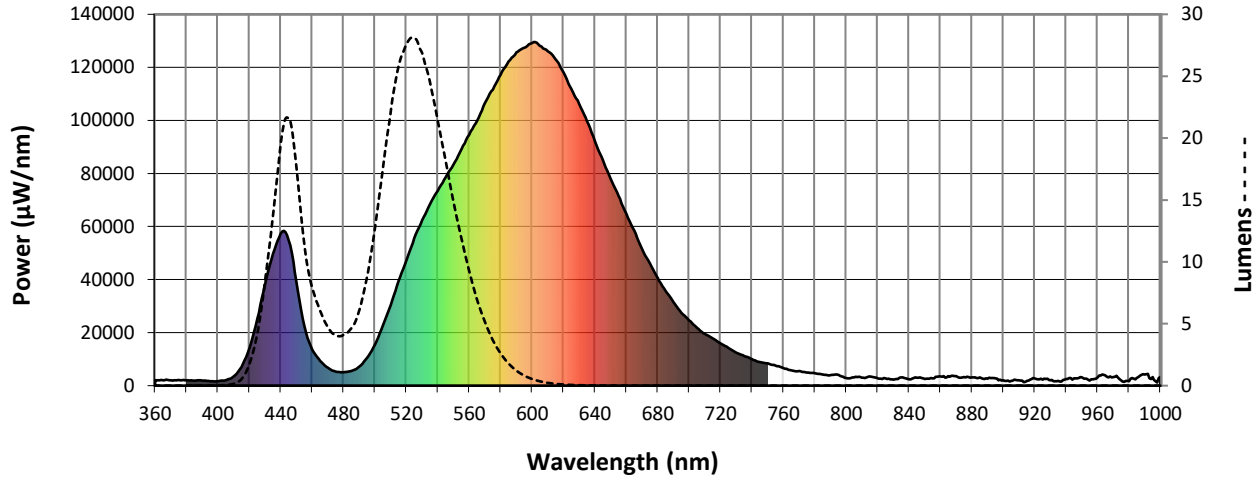
Scotopic Lumens: 6474.3

S/P: 1.04

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

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**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 2145.7 M/P: 0.35**

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

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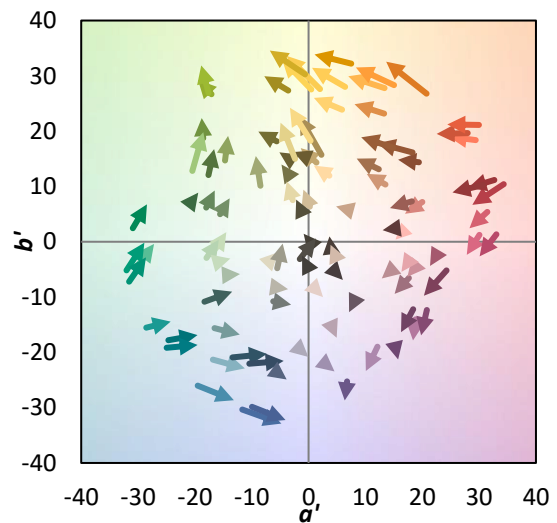
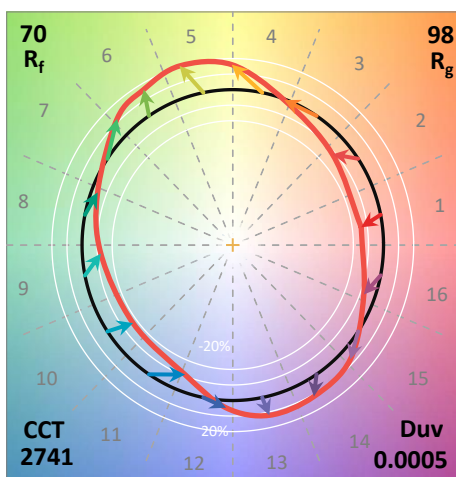
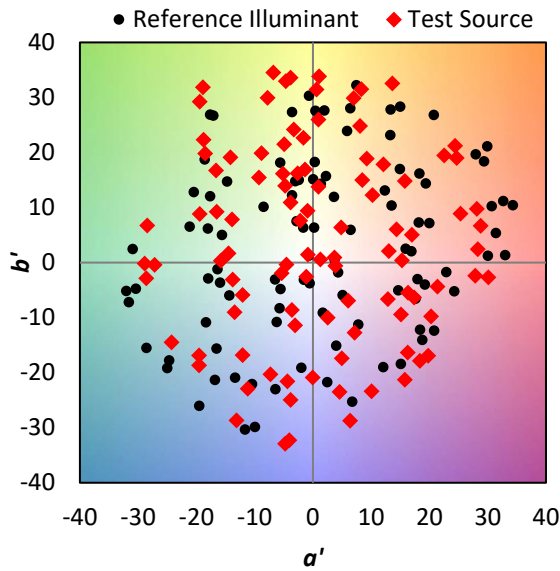
TM-30-18

**Summary**

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



**Color Vector Graphics**

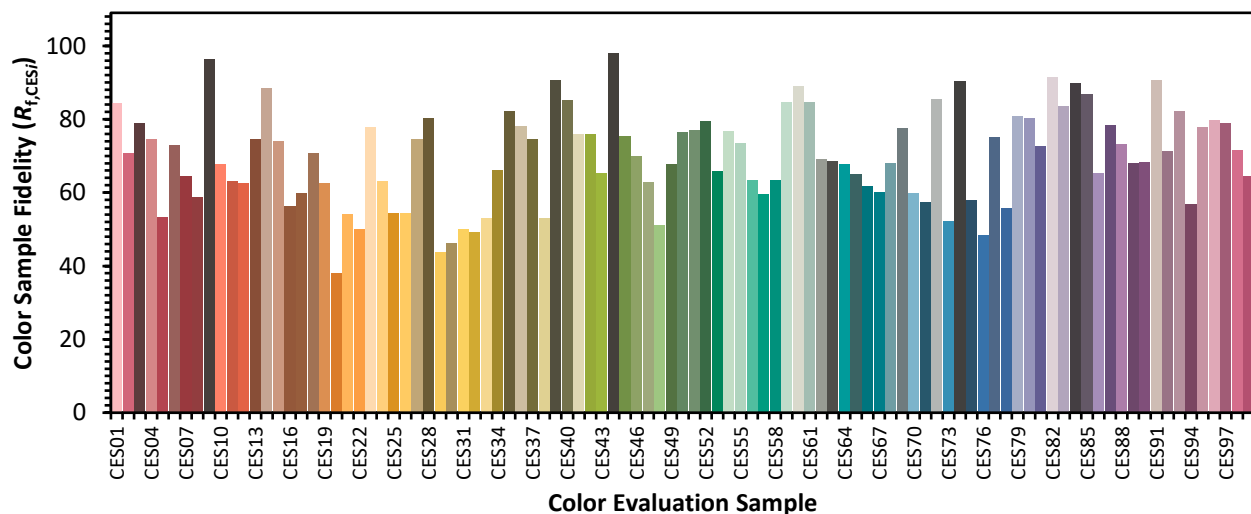


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**Individual Sample Fidelity Index ( $R_{f,i}$ )**

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

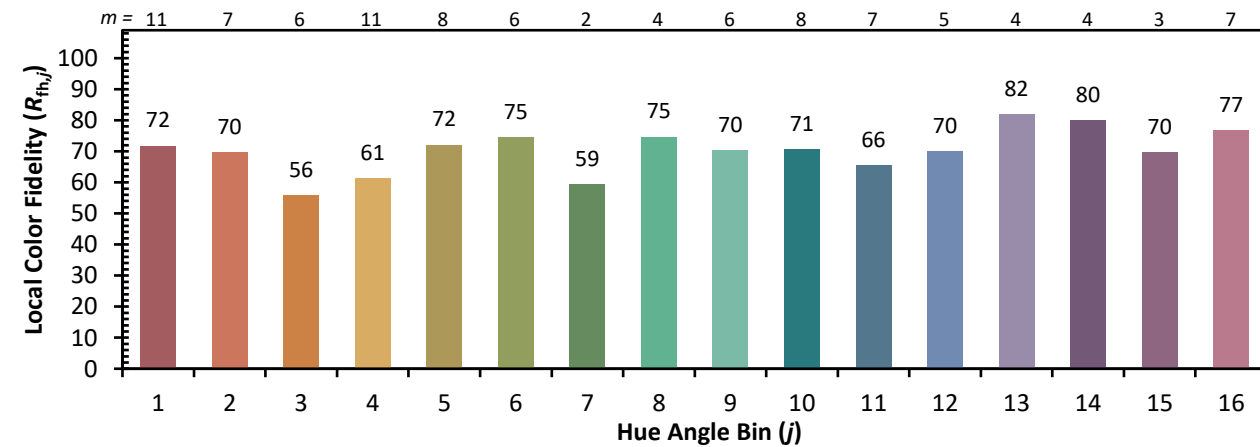
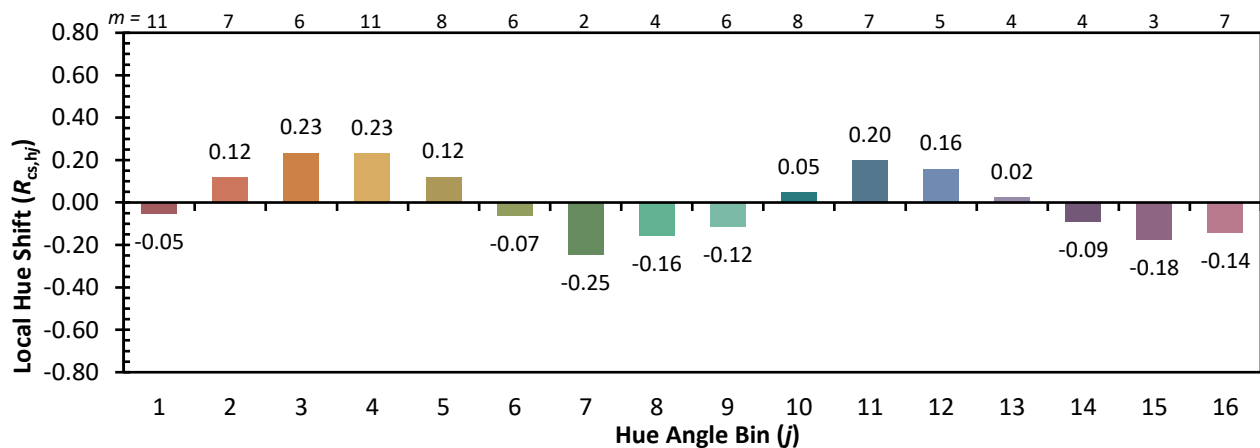
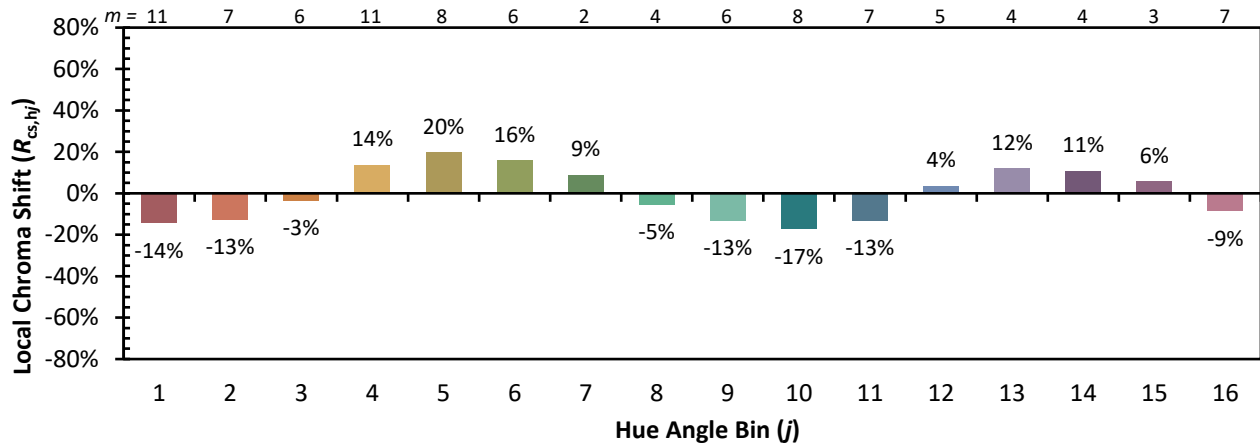




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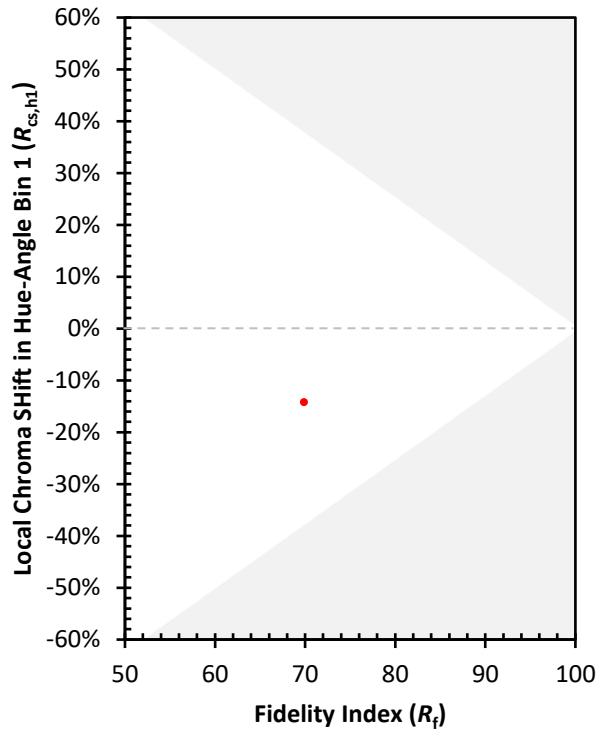
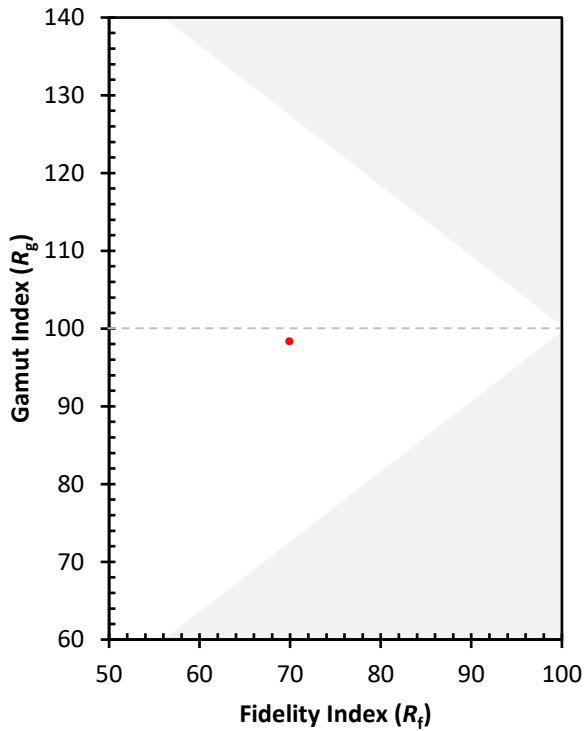
Color Rendition by Hue-Angle Bin



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Measure Comparisons



(END OF REPORT)