

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: INVUE

Report Number: P672610

Luminaire Tested: **CCP-SA-1C-840-U-5MQ**

Issue Date: 04/16/2023



**Test Information**

Test Method: LM-79-08  
Report Number: P672610  
Test Lab: INNOVATION CENTER(G2)  
Issue Date: 04/16/2023  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: INVUE  
Catalog Number: CCP-SA-1C-840-U-5MQ  
Description: INVUE CLEAR CURVE POLE MOUNT LIGHT SQUARE LUMINAIRE @615mA w/ 5MQ  
distribution lens  
Light Source: (16) 4000K CCT, 80 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 3979.1 lumens  
Efficiency: N/A  
Efficacy: 124.3 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 0.5' x H: 0')  
IES Classification: Type V - Short  
BUG Rating: B2 - U0 - G1

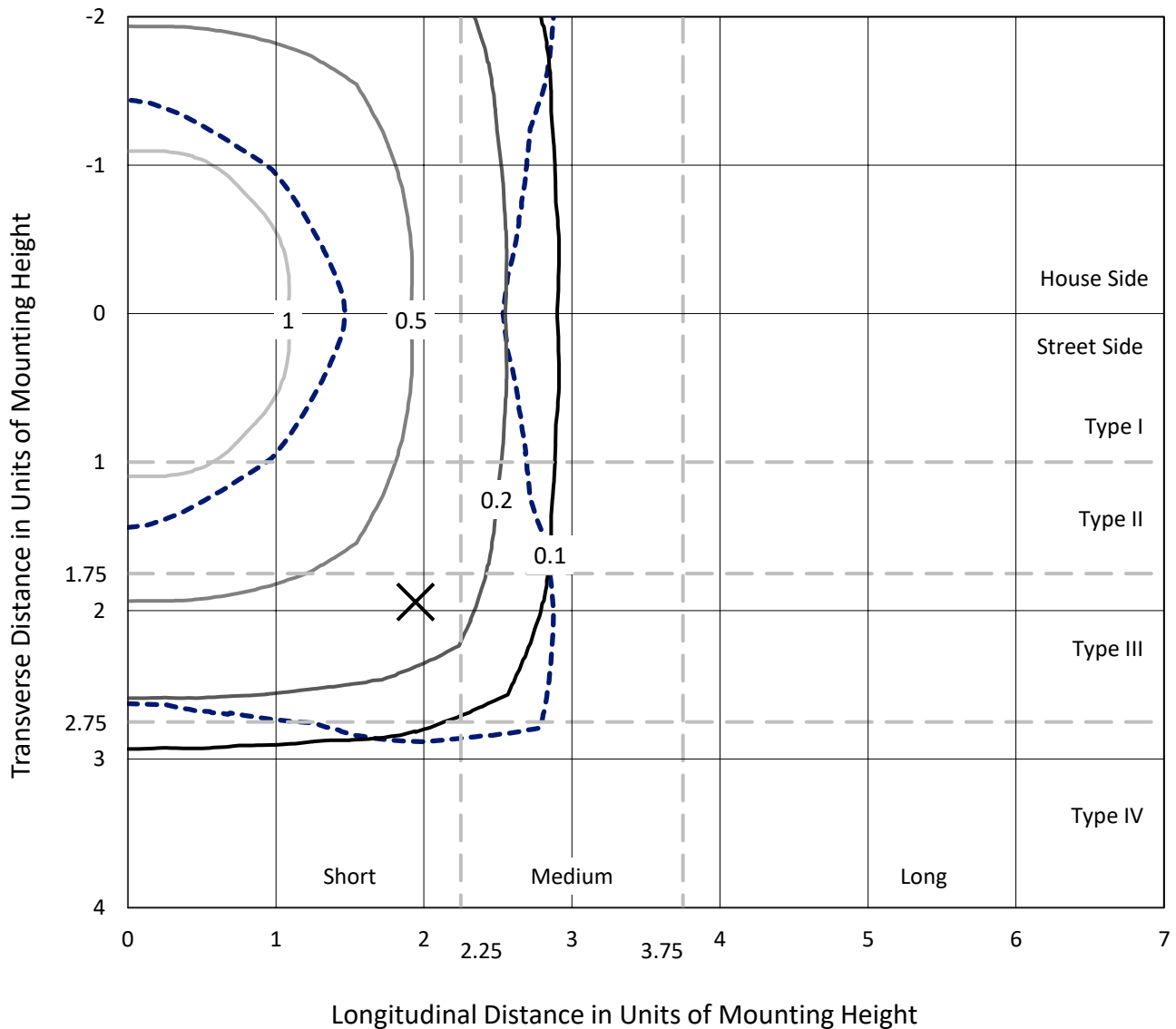
Input Watts (W): 32  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 25 FT

REPORT NUMBER: P672610

CATALOG NUMBER: CCP-SA-1C-840-U-5MQ

## Iso-Footcandle Lines of Horizontal Illumination

× Max cd  
 - - - 1/2 Max cd

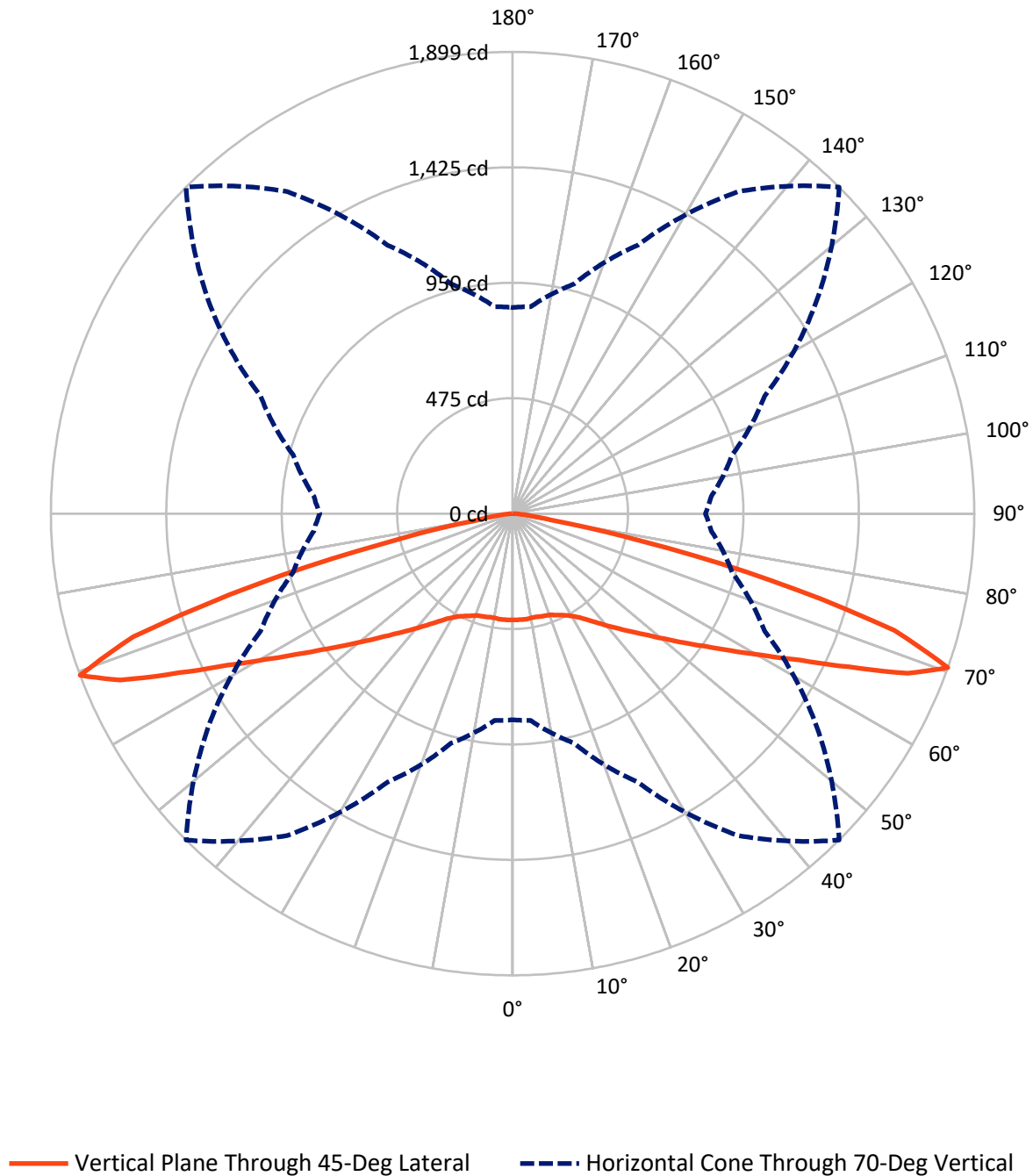


Based on 15 foot mounting height. Maximum calculated value = 1.9 fc  
 Type V - Short - N/A

REPORT NUMBER: P672610

CATALOG NUMBER: CCP-SA-1C-840-U-5MQ

## Luminous Intensity Polar Plot



REPORT NUMBER: P672610

CATALOG NUMBER: CCP-SA-1C-840-U-5MQ

**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 1989.5   | 0.0    | 1989.5 |
|                    | % Fixture | 50.0     | 0.0    | 50.0   |
| <b>Street Side</b> | Lumens    | 1989.5   | 0.0    | 1989.5 |
|                    | % Fixture | 50.0     | 0.0    | 50.0   |
| <b>Total</b>       | Lumens    | 3979.1   | 0.0    | 3979.1 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 41.6   | 1.0       |
| 10°-20°   | 123.2  | 3.1       |
| 20°-30°   | 210.4  | 5.3       |
| 30°-40°   | 335.7  | 8.4       |
| 40°-50°   | 541.7  | 13.6      |
| 50°-60°   | 867.5  | 21.8      |
| 60°-70°   | 1269.9 | 31.9      |
| 70°-80°   | 558.5  | 14.0      |
| 80°-90°   | 30.6   | 0.8       |
| 90°-100°  | 0.0    | 0.0       |
| 100°-110° | 0.0    | 0.0       |
| 110°-120° | 0.0    | 0.0       |
| 120°-130° | 0.0    | 0.0       |
| 130°-140° | 0.0    | 0.0       |
| 140°-150° | 0.0    | 0.0       |
| 150°-160° | 0.0    | 0.0       |
| 160°-170° | 0.0    | 0.0       |
| 170°-180° | 0.0    | 0.0       |
| 0°-90°    | 3979.1 | 100.0     |
| 0°-180°   | 3979.1 | 100.0     |



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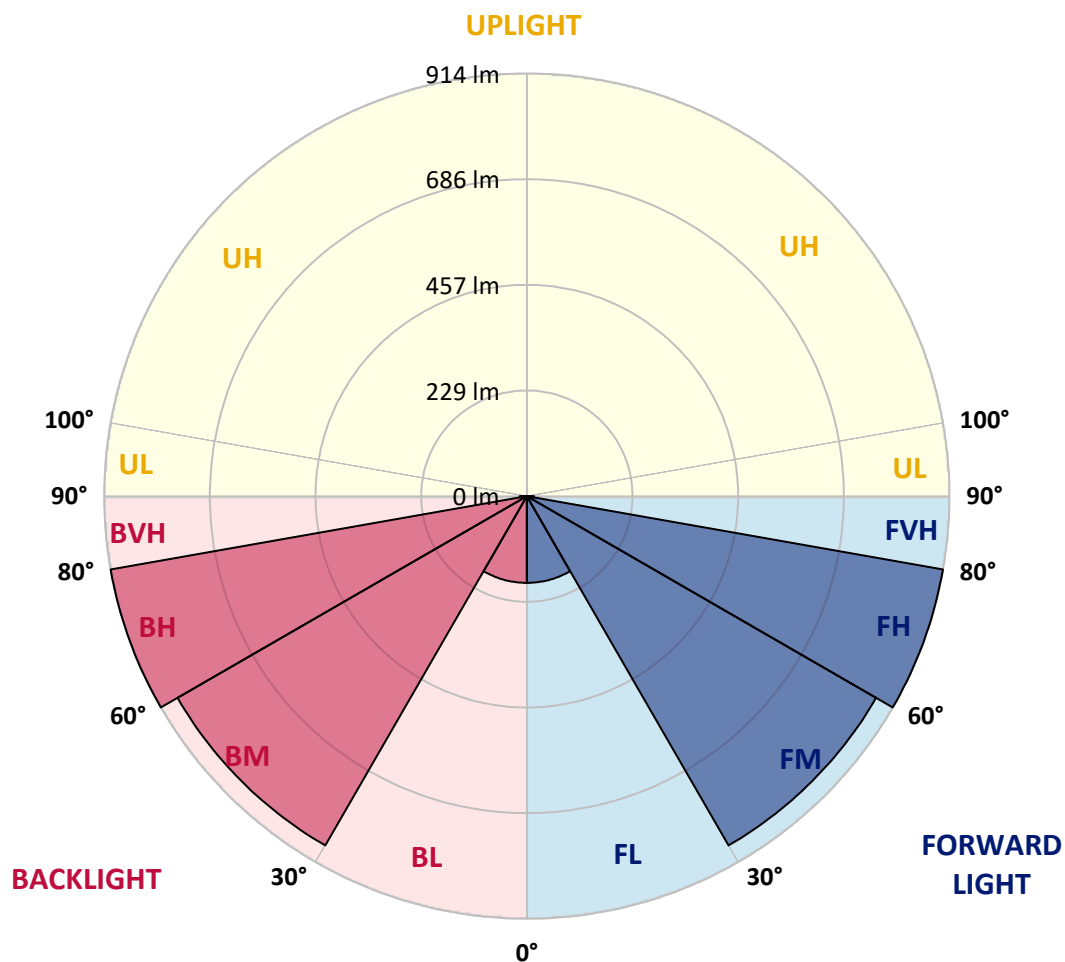
CATALOG NUMBER: CCP-SA-1C-840-U-5MQ

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 187.6  | 4.7       |                         |      |         |
| FM   | (30°-60°)   | 872.4  | 21.9      |                         |      |         |
| FH   | (60°-80°)   | 914.2  | 23.0      |                         |      | G1/1800 |
| FVH  | (80°-90°)   | 15.3   | 0.4       |                         |      | G1/100  |
| BL   | (0°-30°)    | 187.6  | 4.7       | B1/500                  |      |         |
| BM   | (30°-60°)   | 872.4  | 21.9      | B1/1000                 |      |         |
| BH   | (60°-80°)   | 914.2  | 23.0      | B2/1000                 |      | G1/1800 |
| BVH  | (80°-90°)   | 15.3   | 0.4       |                         |      | G1/100  |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B2-U0-G1**

Type V Short



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CATALOG NUMBER: CCP-SA-1C-840-U-5MQ

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 75°    | 85°    | 90°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 437.6  | 437.6  | 437.6  | 437.6  | 437.6  | 437.6  | 437.6  | 437.6  | 437.6  | 437.6  | 437.6  |
| 2.5°  | 437.0  | 436.7  | 437.3  | 437.6  | 437.0  | 437.3  | 435.6  | 435.6  | 436.4  | 435.6  | 436.7  |
| 5°    | 439.0  | 438.4  | 439.0  | 439.0  | 437.6  | 437.6  | 435.6  | 435.0  | 435.6  | 434.2  | 435.3  |
| 7.5°  | 439.3  | 438.1  | 439.0  | 438.7  | 437.6  | 437.6  | 434.8  | 433.6  | 433.9  | 432.5  | 433.3  |
| 10°   | 436.4  | 435.9  | 437.0  | 436.4  | 435.6  | 435.6  | 433.3  | 431.7  | 431.7  | 430.2  | 431.1  |
| 12.5° | 434.8  | 434.2  | 435.6  | 435.9  | 435.3  | 435.6  | 432.8  | 430.5  | 429.7  | 428.0  | 428.6  |
| 15°   | 434.8  | 433.6  | 435.9  | 436.4  | 437.0  | 439.0  | 434.8  | 430.8  | 429.1  | 426.9  | 427.4  |
| 17.5° | 434.5  | 433.9  | 436.4  | 438.4  | 439.0  | 441.2  | 436.4  | 432.2  | 430.2  | 426.9  | 427.4  |
| 20°   | 434.5  | 434.2  | 437.3  | 441.0  | 442.6  | 444.6  | 439.5  | 435.6  | 432.2  | 428.6  | 428.6  |
| 22.5° | 435.9  | 435.6  | 439.8  | 445.2  | 450.0  | 453.4  | 447.4  | 441.0  | 436.4  | 431.7  | 431.1  |
| 25°   | 441.8  | 441.2  | 446.3  | 452.8  | 459.3  | 462.7  | 456.7  | 450.3  | 443.8  | 438.4  | 437.9  |
| 27.5° | 453.9  | 453.6  | 458.7  | 466.6  | 471.1  | 473.7  | 468.6  | 462.9  | 456.5  | 450.3  | 450.0  |
| 30°   | 470.3  | 470.3  | 476.8  | 484.9  | 487.5  | 489.5  | 484.4  | 480.4  | 473.7  | 466.9  | 466.3  |
| 32.5° | 490.0  | 491.1  | 498.8  | 507.8  | 509.5  | 510.6  | 505.2  | 502.7  | 495.4  | 488.0  | 486.9  |
| 35°   | 516.0  | 516.2  | 525.5  | 534.6  | 536.8  | 537.9  | 531.7  | 529.5  | 522.7  | 514.8  | 513.1  |
| 37.5° | 548.9  | 548.1  | 556.8  | 567.0  | 569.2  | 570.6  | 565.6  | 563.9  | 555.4  | 547.5  | 545.0  |
| 40°   | 585.9  | 586.4  | 596.3  | 605.9  | 607.3  | 607.9  | 605.3  | 602.8  | 594.9  | 585.9  | 582.8  |
| 42.5° | 628.7  | 628.7  | 640.3  | 651.6  | 651.6  | 648.7  | 647.6  | 647.1  | 639.4  | 629.3  | 625.9  |
| 45°   | 677.8  | 678.4  | 692.7  | 701.2  | 701.8  | 694.1  | 695.3  | 698.7  | 691.3  | 678.4  | 673.8  |
| 47.5° | 731.6  | 732.5  | 749.4  | 758.7  | 757.0  | 747.1  | 753.3  | 755.0  | 746.6  | 729.9  | 724.0  |
| 50°   | 788.3  | 790.8  | 809.7  | 826.1  | 823.8  | 809.5  | 817.6  | 818.2  | 804.4  | 785.2  | 777.0  |
| 52.5° | 849.5  | 855.4  | 880.5  | 898.0  | 900.2  | 882.2  | 889.2  | 888.7  | 870.9  | 844.7  | 839.3  |
| 55°   | 925.3  | 928.7  | 953.5  | 978.3  | 986.8  | 964.5  | 972.4  | 968.5  | 944.5  | 914.6  | 905.6  |
| 57.5° | 1001.2 | 1006.2 | 1038.1 | 1066.0 | 1082.9 | 1064.0 | 1065.7 | 1055.6 | 1025.4 | 989.3  | 984.8  |
| 60°   | 1091.1 | 1093.4 | 1128.6 | 1165.0 | 1194.3 | 1183.0 | 1175.1 | 1154.0 | 1118.5 | 1082.4 | 1075.9 |
| 62.5° | 1164.7 | 1169.2 | 1221.7 | 1275.2 | 1324.8 | 1326.8 | 1302.9 | 1271.3 | 1214.6 | 1154.3 | 1141.3 |
| 65°   | 1185.0 | 1192.3 | 1265.9 | 1371.6 | 1474.8 | 1520.8 | 1455.1 | 1358.7 | 1232.1 | 1141.0 | 1121.6 |
| 67.5° | 1090.5 | 1104.6 | 1209.8 | 1385.5 | 1614.4 | 1752.3 | 1576.3 | 1317.2 | 1140.5 | 1034.2 | 1015.6 |
| 70°   | 848.1  | 854.3  | 977.8  | 1218.8 | 1616.7 | 1899.4 | 1527.6 | 1143.8 | 934.9  | 820.7  | 793.4  |
| 72.5° | 450.5  | 453.6  | 565.0  | 820.7  | 1315.5 | 1640.9 | 1262.3 | 800.4  | 550.3  | 446.6  | 415.3  |
| 75°   | 145.5  | 149.4  | 194.5  | 336.1  | 725.7  | 1102.7 | 744.3  | 333.0  | 189.7  | 153.1  | 144.9  |
| 77.5° | 74.2   | 73.9   | 82.0   | 108.3  | 244.2  | 540.5  | 258.3  | 116.7  | 82.0   | 73.6   | 71.3   |
| 80°   | 46.2   | 45.4   | 51.6   | 59.2   | 85.4   | 157.9  | 92.8   | 65.4   | 51.9   | 44.5   | 44.3   |
| 82.5° | 26.2   | 26.2   | 34.7   | 38.1   | 48.2   | 65.1   | 54.1   | 44.8   | 35.5   | 26.5   | 25.7   |
| 85°   | 14.7   | 13.0   | 21.7   | 24.0   | 27.6   | 32.1   | 33.0   | 29.0   | 24.0   | 14.7   | 15.2   |
| 87.5° | 5.4    | 5.9    | 10.1   | 9.6    | 11.0   | 7.6    | 13.5   | 15.2   | 13.5   | 7.0    | 5.9    |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

INVUE

Report Number: SP1-2104-224-8

Luminaire Tested: CCW-SA-2A-840-U-SL4

Test Date: 04/27/2021

### Test Information

Test Method: LM-79-08  
 Report Number: SP1-2104-224-8  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1  
 Measurement Geometry:  $4\pi$   
 Issue Date: 04/27/2021  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: INVUE  
 Catalog Number: **CCW-SA-2A-840-U-SL4**  
 Description: INVUE WALL PACK ClearCurve Light Square

### Spectral Parameters

|                           |        |           |      |      |      |
|---------------------------|--------|-----------|------|------|------|
| CCT (K):                  | 3932   | CRI (Ra): | 81.8 |      |      |
| CIE u':                   | 0.2235 | R1:       | 78.9 | R9:  | 0.1  |
| CIE v':                   | 0.5092 | R2:       | 86.4 | R10: | 69.8 |
| Duv:                      | 0.0051 | R3:       | 94.7 | R11: | 82.4 |
| CIE x:                    | 0.3873 | R4:       | 82.5 | R12: | 67.7 |
| CIE y:                    | 0.3923 | R5:       | 79.9 | R13: | 80.2 |
| CIE z:                    | 0.2205 | R6:       | 83.2 | R14: | 97.1 |
| Peak Wavelength (nm):     | 590    | R7:       | 86.3 |      |      |
| Dominant Wavelength (nm): | 576    | R8:       | 62.5 |      |      |
| Purity:                   | 34     |           |      |      |      |
|                           |        |           |      |      |      |
| Rf:                       | 85.2   |           |      |      |      |
| Rg:                       | 96.1   |           |      |      |      |



### Test Conditions

Stabilization Time: 123M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.9/41%  
 Sphere Temperature (°C): 24.2

REPORT NUMBER: SP1-2104-224-8

| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 1/31/2021        | 7/31/2021            |
| Power Meter                    | IN0071                | 12/1/2020        | 12/1/2021            |
| AC Power Source                | IN0063                | 12/1/2020        | 12/1/2021            |
| DC Power Source                | IN0208                | 12/1/2020        | 12/1/2021            |
| Sphere Thermometer             | IN0085                | 12/1/2020        | 12/1/2021            |
| Room Thermometer               | IN0046                | 12/1/2020        | 12/1/2021            |

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**CIE 1931 Chromaticity Diagram**



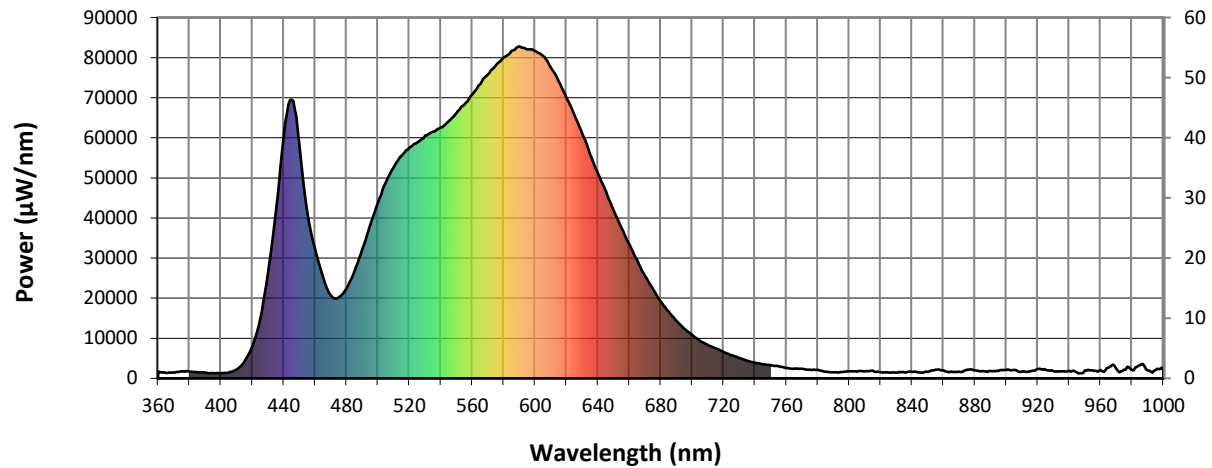
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 4000K 7-step quadrangle

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### Photopic Flux vs. Wavelength

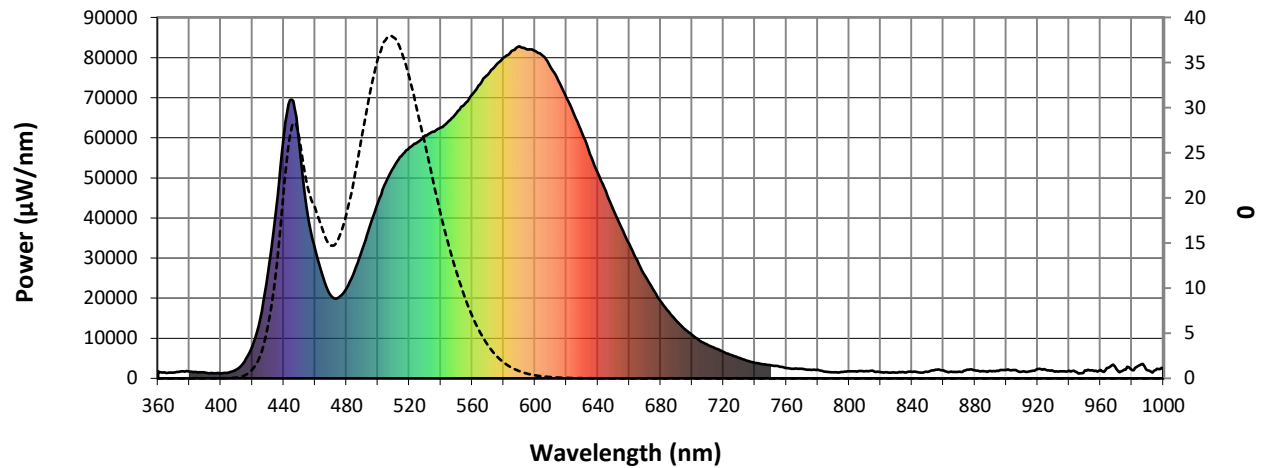


#####

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 1725             | 0.0              | 490       | 32247            | 4.6              | 620       | 69956            | 18.2             | 750       | 3261             | 0.0              | 880       | 1960             | 0.0              |
| 365       | 1400             | 0.0              | 495       | 38143            | 6.9              | 625       | 65781            | 14.5             | 755       | 3018             | 0.0              | 885       | 1828             | 0.0              |
| 370       | 1447             | 0.0              | 500       | 43918            | 9.7              | 630       | 61092            | 11.1             | 760       | 2521             | 0.0              | 890       | 1806             | 0.0              |
| 375       | 1728             | 0.0              | 505       | 48833            | 13.7             | 635       | 55954            | 8.4              | 765       | 2437             | 0.0              | 895       | 1814             | 0.0              |
| 380       | 1669             | 0.0              | 510       | 52659            | 18.1             | 640       | 51151            | 6.1              | 770       | 2407             | 0.0              | 900       | 2078             | 0.0              |
| 385       | 1495             | 0.0              | 515       | 55510            | 23.0             | 645       | 46656            | 4.5              | 775       | 2143             | 0.0              | 905       | 2072             | 0.0              |
| 390       | 1437             | 0.0              | 520       | 57534            | 27.9             | 650       | 41933            | 3.1              | 780       | 2156             | 0.0              | 910       | 1650             | 0.0              |
| 395       | 1307             | 0.0              | 525       | 58806            | 31.6             | 655       | 37478            | 2.2              | 785       | 1708             | 0.0              | 915       | 1725             | 0.0              |
| 400       | 1277             | 0.0              | 530       | 60565            | 35.7             | 660       | 33501            | 1.4              | 790       | 1555             | 0.0              | 920       | 2324             | 0.0              |
| 405       | 1471             | 0.0              | 535       | 61554            | 38.2             | 665       | 29439            | 0.9              | 795       | 1560             | 0.0              | 925       | 2173             | 0.0              |
| 410       | 2252             | 0.0              | 540       | 62542            | 40.8             | 670       | 25594            | 0.6              | 800       | 1752             | 0.0              | 930       | 1833             | 0.0              |
| 415       | 4196             | 0.0              | 545       | 64150            | 42.7             | 675       | 22306            | 0.4              | 805       | 1696             | 0.0              | 935       | 1740             | 0.0              |
| 420       | 7969             | 0.0              | 550       | 66171            | 45.0             | 680       | 19204            | 0.2              | 810       | 1762             | 0.0              | 940       | 1956             | 0.0              |
| 425       | 14965            | 0.1              | 555       | 68352            | 46.7             | 685       | 16645            | 0.1              | 815       | 1884             | 0.0              | 945       | 1549             | 0.0              |
| 430       | 26348            | 0.2              | 560       | 70775            | 48.1             | 690       | 14365            | 0.1              | 820       | 1502             | 0.0              | 950       | 2026             | 0.0              |
| 435       | 41840            | 0.5              | 565       | 73374            | 48.8             | 695       | 12367            | 0.1              | 825       | 1454             | 0.0              | 955       | 1971             | 0.0              |
| 440       | 60229            | 0.9              | 570       | 75776            | 49.3             | 700       | 10847            | 0.0              | 830       | 1466             | 0.0              | 960       | 2048             | 0.0              |
| 445       | 69537            | 1.4              | 575       | 78035            | 48.6             | 705       | 9369             | 0.0              | 835       | 1541             | 0.0              | 965       | 2608             | 0.0              |
| 450       | 58253            | 1.5              | 580       | 79996            | 47.5             | 710       | 8303             | 0.0              | 840       | 1616             | 0.0              | 970       | 2403             | 0.0              |
| 455       | 41363            | 1.4              | 585       | 81672            | 45.4             | 715       | 7458             | 0.0              | 845       | 1445             | 0.0              | 975       | 2154             | 0.0              |
| 460       | 32336            | 1.3              | 590       | 82819            | 42.8             | 720       | 6565             | 0.0              | 850       | 1636             | 0.0              | 980       | 2109             | 0.0              |
| 465       | 25279            | 1.3              | 595       | 82030            | 38.9             | 725       | 5799             | 0.0              | 855       | 2149             | 0.0              | 985       | 3271             | 0.0              |
| 470       | 20560            | 1.3              | 600       | 81639            | 35.2             | 730       | 5071             | 0.0              | 860       | 2002             | 0.0              | 990       | 1987             | 0.0              |
| 475       | 20192            | 1.6              | 605       | 80430            | 31.1             | 735       | 4394             | 0.0              | 865       | 1653             | 0.0              | 995       | 2115             | 0.0              |
| 480       | 22473            | 2.1              | 610       | 77509            | 26.6             | 740       | 3856             | 0.0              | 870       | 1669             | 0.0              | 1000      | 2424             | 0.0              |
| 485       | 26686            | 3.2              | 615       | 74116            | 22.4             | 745       | 3544             | 0.0              | 875       | 2164             | 0.0              |           |                  |                  |

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### Scotopic Flux vs. Wavelength



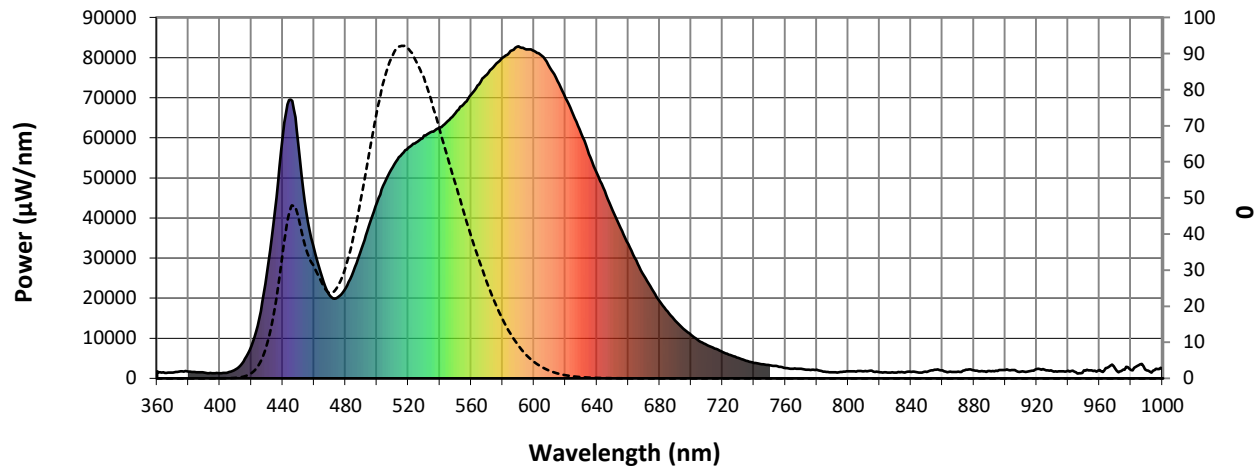
Scotopic Lumens: 7846

S/P: 1.64

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 1725             | 0.0              | 490       | 32247            | 49.7             | 620       | 69956            | 0.9              | 750       | 3261             | 0.0              | 880       | 1960             | 0.0              |
| 365       | 1400             | 0.0              | 495       | 38143            | 61.7             | 625       | 65781            | 0.6              | 755       | 3018             | 0.0              | 885       | 1828             | 0.0              |
| 370       | 1447             | 0.0              | 500       | 43918            | 73.5             | 630       | 61092            | 0.3              | 760       | 2521             | 0.0              | 890       | 1806             | 0.0              |
| 375       | 1728             | 0.0              | 505       | 48833            | 83.0             | 635       | 55954            | 0.2              | 765       | 2437             | 0.0              | 895       | 1814             | 0.0              |
| 380       | 1669             | 0.0              | 510       | 52659            | 89.3             | 640       | 51151            | 0.1              | 770       | 2407             | 0.0              | 900       | 2078             | 0.0              |
| 385       | 1495             | 0.0              | 515       | 55510            | 92.0             | 645       | 46656            | 0.1              | 775       | 2143             | 0.0              | 905       | 2072             | 0.0              |
| 390       | 1437             | 0.0              | 520       | 57534            | 91.5             | 650       | 41933            | 0.0              | 780       | 2156             | 0.0              | 910       | 1650             | 0.0              |
| 395       | 1307             | 0.0              | 525       | 58806            | 88.0             | 655       | 37478            | 0.0              | 785       | 1708             | 0.0              | 915       | 1725             | 0.0              |
| 400       | 1277             | 0.0              | 530       | 60565            | 83.5             | 660       | 33501            | 0.0              | 790       | 1555             | 0.0              | 920       | 2324             | 0.0              |
| 405       | 1471             | 0.0              | 535       | 61554            | 76.7             | 665       | 29439            | 0.0              | 795       | 1560             | 0.0              | 925       | 2173             | 0.0              |
| 410       | 2252             | 0.1              | 540       | 62542            | 69.1             | 670       | 25594            | 0.0              | 800       | 1752             | 0.0              | 930       | 1833             | 0.0              |
| 415       | 4196             | 0.4              | 545       | 64150            | 61.5             | 675       | 22306            | 0.0              | 805       | 1696             | 0.0              | 935       | 1740             | 0.0              |
| 420       | 7969             | 1.3              | 550       | 66171            | 54.1             | 680       | 19204            | 0.0              | 810       | 1762             | 0.0              | 940       | 1956             | 0.0              |
| 425       | 14965            | 3.7              | 555       | 68352            | 46.7             | 685       | 16645            | 0.0              | 815       | 1884             | 0.0              | 945       | 1549             | 0.0              |
| 430       | 26348            | 9.0              | 560       | 70775            | 39.6             | 690       | 14365            | 0.0              | 820       | 1502             | 0.0              | 950       | 2026             | 0.0              |
| 435       | 41840            | 18.7             | 565       | 73374            | 32.9             | 695       | 12367            | 0.0              | 825       | 1454             | 0.0              | 955       | 1971             | 0.0              |
| 440       | 60229            | 33.7             | 570       | 75776            | 26.7             | 700       | 10847            | 0.0              | 830       | 1466             | 0.0              | 960       | 2048             | 0.0              |
| 445       | 69537            | 46.6             | 575       | 78035            | 21.3             | 705       | 9369             | 0.0              | 835       | 1541             | 0.0              | 965       | 2608             | 0.0              |
| 450       | 58253            | 45.1             | 580       | 79996            | 16.5             | 710       | 8303             | 0.0              | 840       | 1616             | 0.0              | 970       | 2403             | 0.0              |
| 455       | 41363            | 36.1             | 585       | 81672            | 12.5             | 715       | 7458             | 0.0              | 845       | 1445             | 0.0              | 975       | 2154             | 0.0              |
| 460       | 32336            | 31.2             | 590       | 82819            | 9.2              | 720       | 6565             | 0.0              | 850       | 1636             | 0.0              | 980       | 2109             | 0.0              |
| 465       | 25279            | 26.7             | 595       | 82030            | 6.5              | 725       | 5799             | 0.0              | 855       | 2149             | 0.0              | 985       | 3271             | 0.0              |
| 470       | 20560            | 23.7             | 600       | 81639            | 4.6              | 730       | 5071             | 0.0              | 860       | 2002             | 0.0              | 990       | 1987             | 0.0              |
| 475       | 20192            | 25.2             | 605       | 80430            | 3.2              | 735       | 4394             | 0.0              | 865       | 1653             | 0.0              | 995       | 2115             | 0.0              |
| 480       | 22473            | 30.4             | 610       | 77509            | 2.1              | 740       | 3856             | 0.0              | 870       | 1669             | 0.0              | 1000      | 2424             | 0.0              |
| 485       | 26686            | 38.7             | 615       | 74116            | 1.4              | 745       | 3544             | 0.0              | 875       | 2164             | 0.0              |           |                  |                  |

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### Melanopic Flux vs. Wavelength



**Melanopic Lumens: 3084.4**

**M/P: 0.64**

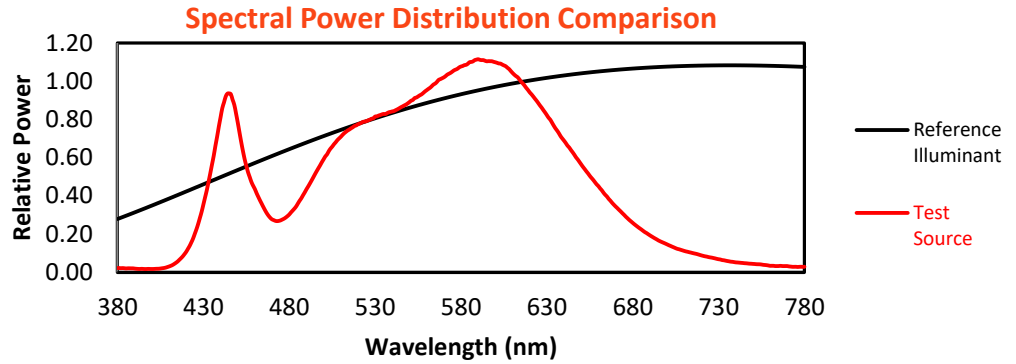
| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 1725             | 0.0              | 490       | 32247            | 26.8             | 620       | 69956            | 0.1              | 750       | 3261             | 0.0              | 880       | 1960             | 0.0              |
| 365       | 1400             | 0.0              | 495       | 38143            | 31.5             | 625       | 65781            | 0.0              | 755       | 3018             | 0.0              | 885       | 1828             | 0.0              |
| 370       | 1447             | 0.0              | 500       | 43918            | 35.3             | 630       | 61092            | 0.0              | 760       | 2521             | 0.0              | 890       | 1806             | 0.0              |
| 375       | 1728             | 0.0              | 505       | 48833            | 37.5             | 635       | 55954            | 0.0              | 765       | 2437             | 0.0              | 895       | 1814             | 0.0              |
| 380       | 1669             | 0.0              | 510       | 52659            | 37.8             | 640       | 51151            | 0.0              | 770       | 2407             | 0.0              | 900       | 2078             | 0.0              |
| 385       | 1495             | 0.0              | 515       | 55510            | 36.3             | 645       | 46656            | 0.0              | 775       | 2143             | 0.0              | 905       | 2072             | 0.0              |
| 390       | 1437             | 0.0              | 520       | 57534            | 33.5             | 650       | 41933            | 0.0              | 780       | 2156             | 0.0              | 910       | 1650             | 0.0              |
| 395       | 1307             | 0.0              | 525       | 58806            | 29.8             | 655       | 37478            | 0.0              | 785       | 1708             | 0.0              | 915       | 1725             | 0.0              |
| 400       | 1277             | 0.0              | 530       | 60565            | 26.2             | 660       | 33501            | 0.0              | 790       | 1555             | 0.0              | 920       | 2324             | 0.0              |
| 405       | 1471             | 0.0              | 535       | 61554            | 22.2             | 665       | 29439            | 0.0              | 795       | 1560             | 0.0              | 925       | 2173             | 0.0              |
| 410       | 2252             | 0.1              | 540       | 62542            | 18.3             | 670       | 25594            | 0.0              | 800       | 1752             | 0.0              | 930       | 1833             | 0.0              |
| 415       | 4196             | 0.3              | 545       | 64150            | 14.9             | 675       | 22306            | 0.0              | 805       | 1696             | 0.0              | 935       | 1740             | 0.0              |
| 420       | 7969             | 0.9              | 550       | 66171            | 11.9             | 680       | 19204            | 0.0              | 810       | 1762             | 0.0              | 940       | 1956             | 0.0              |
| 425       | 14965            | 2.3              | 555       | 68352            | 9.2              | 685       | 16645            | 0.0              | 815       | 1884             | 0.0              | 945       | 1549             | 0.0              |
| 430       | 26348            | 5.6              | 560       | 70775            | 7.0              | 690       | 14365            | 0.0              | 820       | 1502             | 0.0              | 950       | 2026             | 0.0              |
| 435       | 41840            | 11.2             | 565       | 73374            | 5.1              | 695       | 12367            | 0.0              | 825       | 1454             | 0.0              | 955       | 1971             | 0.0              |
| 440       | 60229            | 20.1             | 570       | 75776            | 3.7              | 700       | 10847            | 0.0              | 830       | 1466             | 0.0              | 960       | 2048             | 0.0              |
| 445       | 69537            | 27.4             | 575       | 78035            | 2.6              | 705       | 9369             | 0.0              | 835       | 1541             | 0.0              | 965       | 2608             | 0.0              |
| 450       | 58253            | 26.8             | 580       | 79996            | 1.8              | 710       | 8303             | 0.0              | 840       | 1616             | 0.0              | 970       | 2403             | 0.0              |
| 455       | 41363            | 21.7             | 585       | 81672            | 1.2              | 715       | 7458             | 0.0              | 845       | 1445             | 0.0              | 975       | 2154             | 0.0              |
| 460       | 32336            | 19.1             | 590       | 82819            | 0.8              | 720       | 6565             | 0.0              | 850       | 1636             | 0.0              | 980       | 2109             | 0.0              |
| 465       | 25279            | 16.5             | 595       | 82030            | 0.5              | 725       | 5799             | 0.0              | 855       | 2149             | 0.0              | 985       | 3271             | 0.0              |
| 470       | 20560            | 14.7             | 600       | 81639            | 0.3              | 730       | 5071             | 0.0              | 860       | 2002             | 0.0              | 990       | 1987             | 0.0              |
| 475       | 20192            | 15.4             | 605       | 80430            | 0.2              | 735       | 4394             | 0.0              | 865       | 1653             | 0.0              | 995       | 2115             | 0.0              |
| 480       | 22473            | 18.1             | 610       | 77509            | 0.1              | 740       | 3856             | 0.0              | 870       | 1669             | 0.0              | 1000      | 2424             | 0.0              |
| 485       | 26686            | 22.0             | 615       | 74116            | 0.1              | 745       | 3544             | 0.0              | 875       | 2164             | 0.0              |           |                  |                  |

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TM-30-18

### Summary

$R_f = 85.2$   
 $R_g = 96.1$   
 CIE  $R_a = 81.8$   
 $R_9 = 0.1$

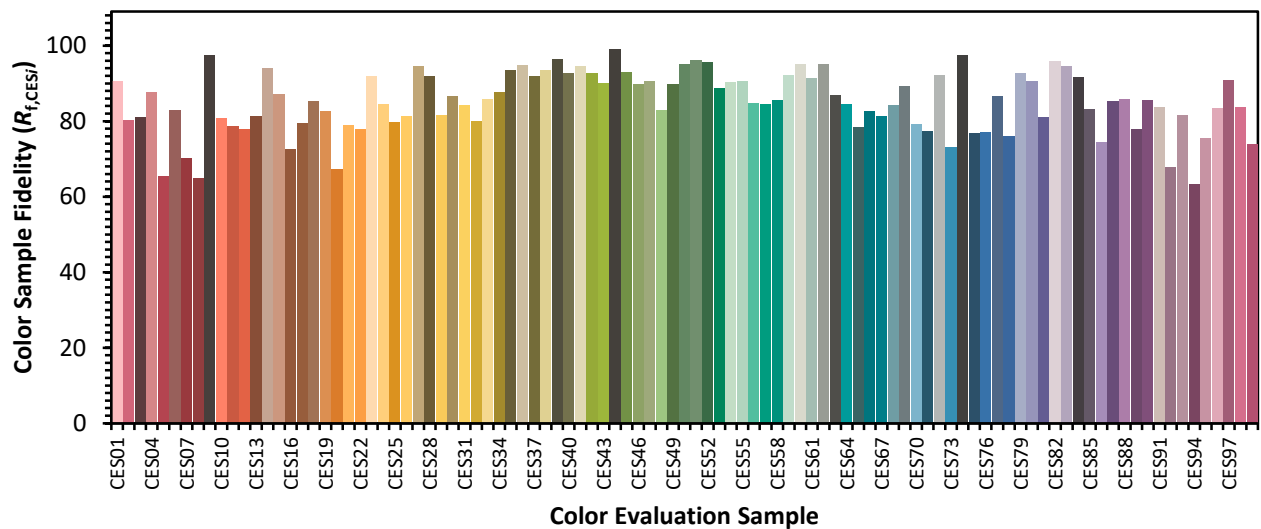


### Color Vector Graphics



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 81 | CES51 = 96 | CES76 = 77 |
| CES02 = 61 | CES27 = 95 | CES52 = 96 | CES77 = 87 |
| CES03 = 31 | CES28 = 92 | CES53 = 89 | CES78 = 76 |
| CES04 = 69 | CES29 = 82 | CES54 = 90 | CES79 = 93 |
| CES05 = 48 | CES30 = 87 | CES55 = 91 | CES80 = 91 |
| CES06 = 50 | CES31 = 84 | CES56 = 85 | CES81 = 81 |
| CES07 = 40 | CES32 = 80 | CES57 = 84 | CES82 = 96 |
| CES08 = 39 | CES33 = 86 | CES58 = 85 | CES83 = 95 |
| CES09 = 29 | CES34 = 88 | CES59 = 92 | CES84 = 92 |
| CES10 = 74 | CES35 = 93 | CES60 = 95 | CES85 = 83 |
| CES11 = 57 | CES36 = 95 | CES61 = 91 | CES86 = 74 |
| CES12 = 63 | CES37 = 92 | CES62 = 95 | CES87 = 85 |
| CES13 = 42 | CES38 = 93 | CES63 = 87 | CES88 = 86 |
| CES14 = 74 | CES39 = 96 | CES64 = 84 | CES89 = 78 |
| CES15 = 71 | CES40 = 93 | CES65 = 78 | CES90 = 85 |
| CES16 = 47 | CES41 = 95 | CES66 = 83 | CES91 = 84 |
| CES17 = 49 | CES42 = 93 | CES67 = 81 | CES92 = 68 |
| CES18 = 56 | CES43 = 90 | CES68 = 84 | CES93 = 82 |
| CES19 = 71 | CES44 = 99 | CES69 = 89 | CES94 = 63 |
| CES20 = 65 | CES45 = 93 | CES70 = 79 | CES95 = 75 |
| CES21 = 86 | CES46 = 90 | CES71 = 77 | CES96 = 83 |
| CES22 = 78 | CES47 = 91 | CES72 = 92 | CES97 = 91 |
| CES23 = 91 | CES48 = 83 | CES73 = 73 | CES98 = 84 |
| CES24 = 90 | CES49 = 90 | CES74 = 98 | CES99 = 74 |
| CES25 = 71 | CES50 = 95 | CES75 = 77 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)