

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: P672725

Luminaire Tested: **CCP-SA-2A-827-U-5NQ**

Issue Date: 04/16/2023

**Test Information**

Test Method: LM-79-08  
Report Number: P672725  
Test Lab: INNOVATION CENTER(G2)  
Issue Date: 04/16/2023  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: INVUE  
Catalog Number: CCP-SA-2A-827-U-5NQ  
Description: INVUE CLEAR CURVE POLE MOUNT LIGHT SQUARE LUMINAIRE @350mA w/ 5NQ  
distribution lens  
Light Source: (32) 2700K CCT, 80 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 4185.6 lumens  
Efficiency: N/A  
Efficacy: 115.6 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 1' x H: 0')  
IES Classification: Type V - Short  
BUG Rating: B2 - U0 - G0

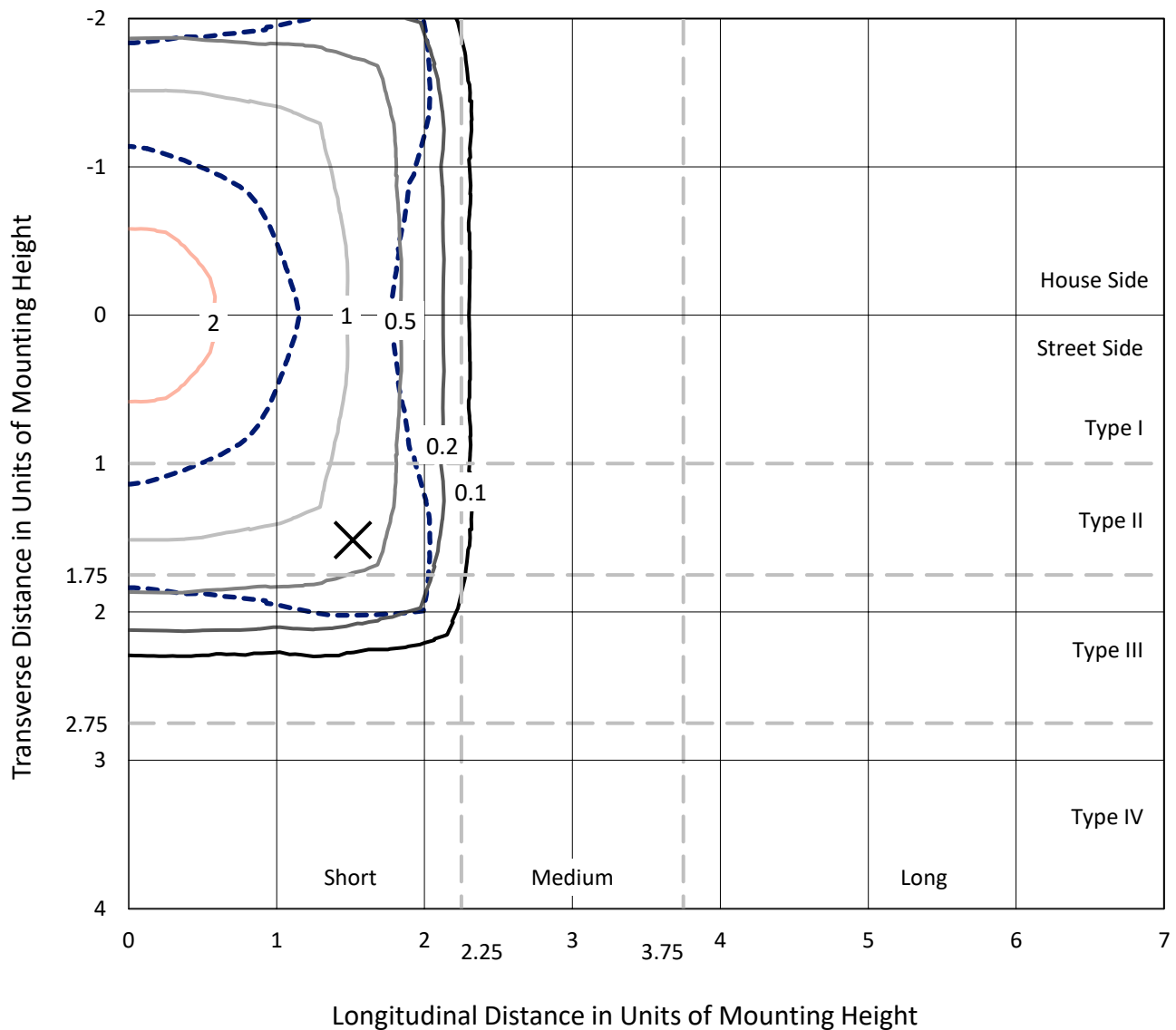
Input Watts (W): 36.2  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 25 FT

REPORT NUMBER: P672725

CATALOG NUMBER: CCP-SA-2A-827-U-5NQ

## Iso-Footcandle Lines of Horizontal Illumination

× Max cd  
 - - - 1/2 Max cd

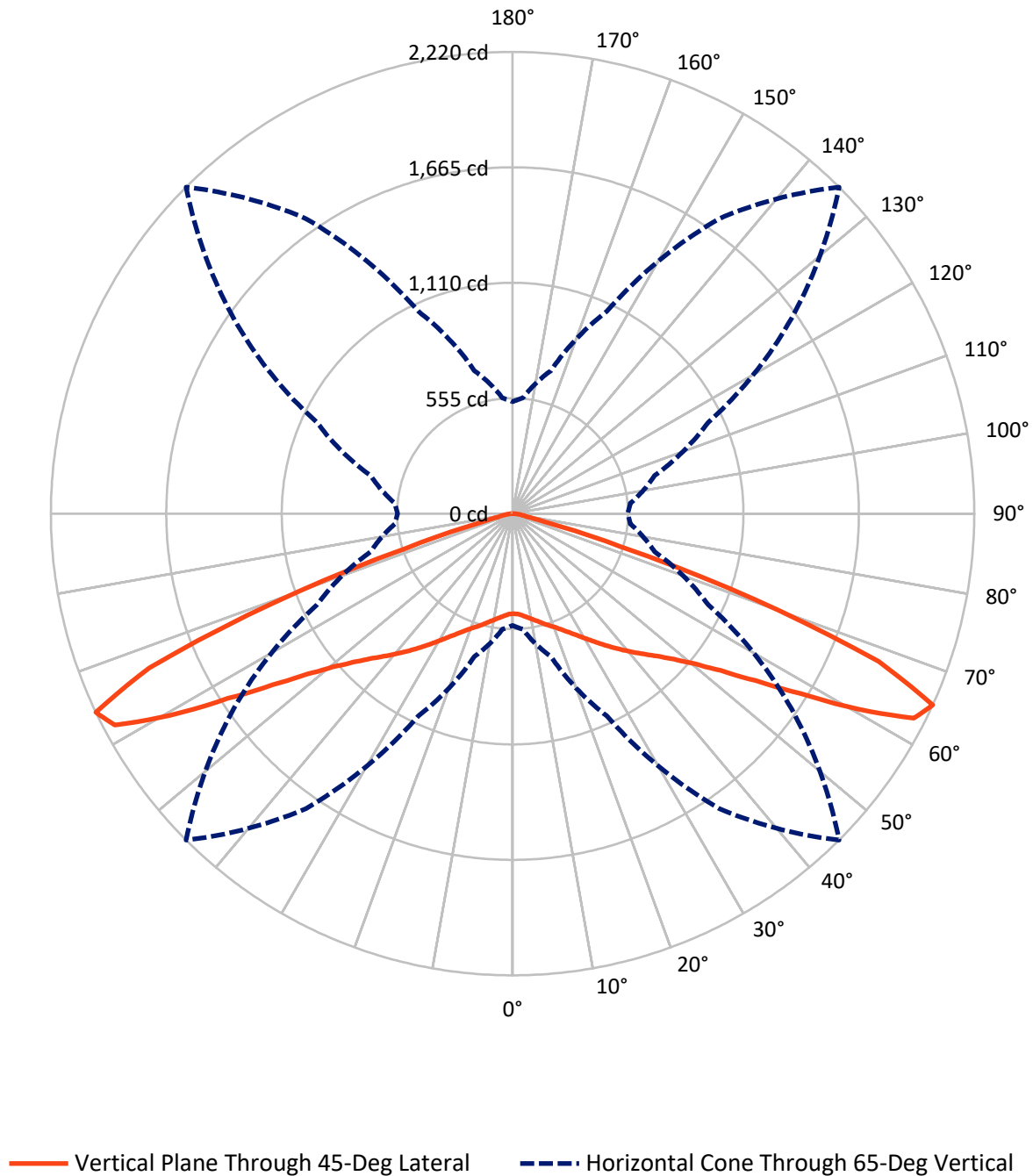


Based on 15 foot mounting height. Maximum calculated value = 2.2 fc  
 Type V - Short - N/A

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## Luminous Intensity Polar Plot



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CATALOG NUMBER: CCP-SA-2A-827-U-5NQ

**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 2092.8   | 0.0    | 2092.8 |
|                    | % Fixture | 50.0     | 0.0    | 50.0   |
| <b>Street Side</b> | Lumens    | 2092.8   | 0.0    | 2092.8 |
|                    | % Fixture | 50.0     | 0.0    | 50.0   |
| <b>Total</b>       | Lumens    | 4185.6   | 0.0    | 4185.6 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 47.7   | 1.1       |
| 10°-20°   | 155.6  | 3.7       |
| 20°-30°   | 295.1  | 7.1       |
| 30°-40°   | 494.9  | 11.8      |
| 40°-50°   | 783.2  | 18.7      |
| 50°-60°   | 1230.4 | 29.4      |
| 60°-70°   | 1039.6 | 24.8      |
| 70°-80°   | 121.0  | 2.9       |
| 80°-90°   | 18.0   | 0.4       |
| 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°    | 4185.6 | 100.0     |
| 0°-180°   | 4185.6 | 100.0     |



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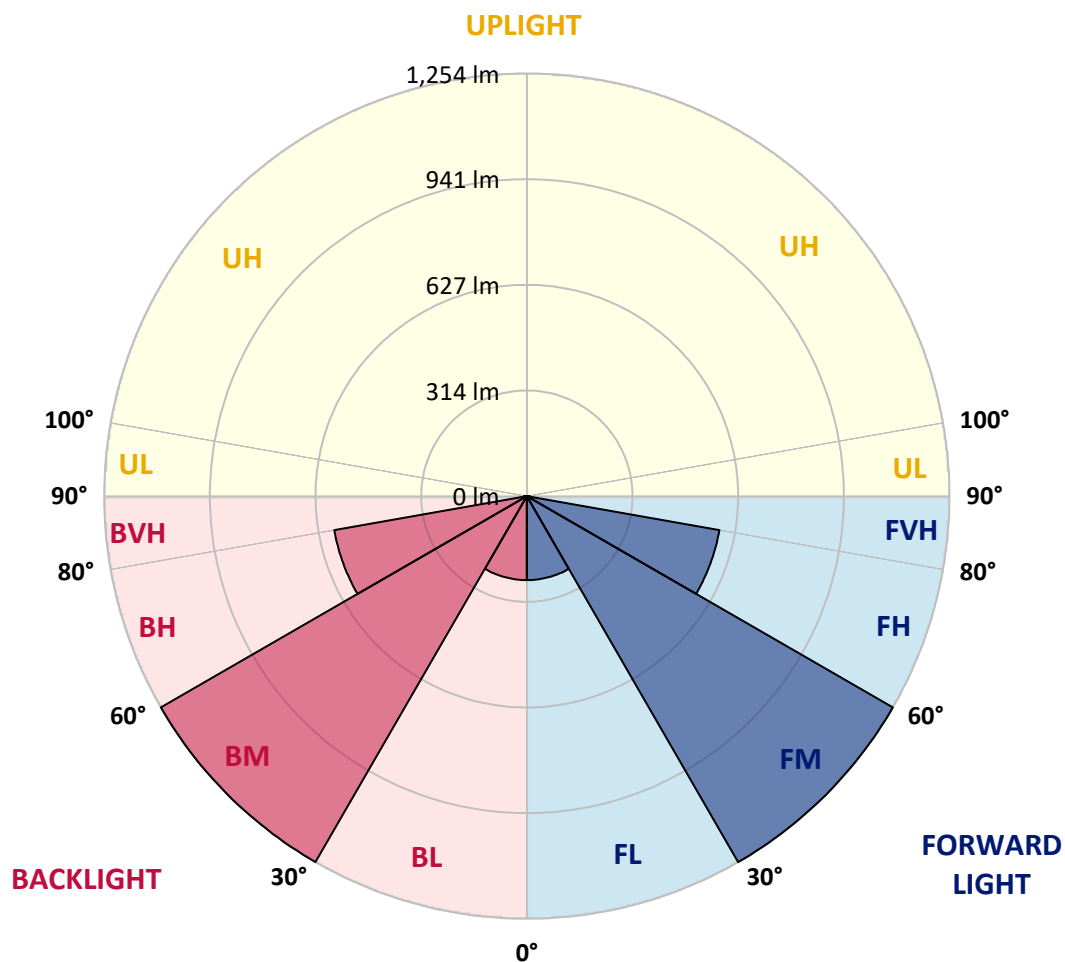
CATALOG NUMBER: CCP-SA-2A-827-U-5NQ

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |        |
|------|-------------|--------|-----------|-------------------------|------|--------|
|      |             |        |           | B                       | U    | G      |
| FL   | (0°-30°)    | 249.2  | 6.0       |                         |      |        |
| FM   | (30°-60°)   | 1254.3 | 30.0      |                         |      |        |
| FH   | (60°-80°)   | 580.3  | 13.9      |                         |      | G0/660 |
| FVH  | (80°-90°)   | 9.0    | 0.2       |                         |      | G0/10  |
| BL   | (0°-30°)    | 249.2  | 6.0       | B1/500                  |      |        |
| BM   | (30°-60°)   | 1254.3 | 30.0      | B2/2500                 |      |        |
| BH   | (60°-80°)   | 580.3  | 13.9      | B2/1000                 |      | G0/660 |
| BVH  | (80°-90°)   | 9.0    | 0.2       |                         |      | G0/10  |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |        |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |        |

**BUG Rating: B2-U0-G0**

Type V Short



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 75°    | 85°    | 90°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 481.3  | 481.3  | 481.3  | 481.3  | 481.3  | 481.3  | 481.3  | 481.3  | 481.3  | 481.3  | 481.3  |
| 2.5°  | 483.9  | 482.4  | 483.9  | 483.9  | 483.0  | 483.3  | 482.2  | 481.9  | 483.3  | 482.2  | 481.9  |
| 5°    | 493.9  | 492.7  | 493.9  | 493.0  | 491.6  | 491.9  | 490.1  | 489.5  | 491.3  | 489.5  | 489.8  |
| 7.5°  | 505.4  | 503.3  | 503.9  | 504.8  | 503.3  | 503.3  | 501.9  | 501.0  | 501.9  | 500.1  | 501.3  |
| 10°   | 515.1  | 513.3  | 514.2  | 515.4  | 515.1  | 516.0  | 514.5  | 513.9  | 513.0  | 511.0  | 512.7  |
| 12.5° | 527.7  | 527.2  | 528.3  | 529.8  | 529.2  | 530.4  | 527.2  | 526.3  | 526.0  | 523.6  | 525.7  |
| 15°   | 544.2  | 542.8  | 544.8  | 546.6  | 545.7  | 547.8  | 545.1  | 543.9  | 542.5  | 539.5  | 541.3  |
| 17.5° | 560.7  | 559.5  | 562.5  | 563.3  | 563.6  | 565.4  | 563.3  | 561.6  | 561.0  | 558.9  | 557.8  |
| 20°   | 580.4  | 578.9  | 581.3  | 583.1  | 581.6  | 583.6  | 582.8  | 581.6  | 581.0  | 577.8  | 577.5  |
| 22.5° | 602.5  | 600.4  | 603.9  | 606.0  | 603.9  | 606.0  | 604.2  | 603.9  | 604.2  | 599.5  | 600.1  |
| 25°   | 627.2  | 627.5  | 631.0  | 632.5  | 631.3  | 632.5  | 629.8  | 631.6  | 630.7  | 625.7  | 623.9  |
| 27.5° | 658.9  | 657.8  | 661.6  | 666.0  | 663.1  | 663.1  | 661.9  | 663.7  | 663.4  | 658.7  | 657.5  |
| 30°   | 696.0  | 695.7  | 701.3  | 704.0  | 699.8  | 698.1  | 697.8  | 702.2  | 702.5  | 697.5  | 695.4  |
| 32.5° | 734.8  | 734.8  | 741.6  | 744.8  | 739.0  | 737.8  | 736.6  | 742.5  | 741.6  | 734.8  | 730.4  |
| 35°   | 777.5  | 775.7  | 784.9  | 789.6  | 783.7  | 780.1  | 779.6  | 784.9  | 783.7  | 774.3  | 769.0  |
| 37.5° | 819.6  | 820.7  | 831.3  | 836.6  | 829.6  | 825.2  | 826.6  | 830.2  | 830.5  | 820.2  | 814.6  |
| 40°   | 871.0  | 871.3  | 884.6  | 888.7  | 879.6  | 872.8  | 874.9  | 882.8  | 882.2  | 869.6  | 862.5  |
| 42.5° | 928.7  | 927.5  | 944.0  | 947.5  | 935.2  | 922.2  | 928.4  | 940.8  | 943.7  | 929.6  | 922.2  |
| 45°   | 990.5  | 992.2  | 1009.3 | 1013.1 | 993.7  | 977.2  | 990.5  | 1009.0 | 1012.8 | 997.5  | 988.4  |
| 47.5° | 1065.5 | 1067.6 | 1088.1 | 1089.6 | 1067.6 | 1046.1 | 1063.7 | 1087.9 | 1089.3 | 1068.1 | 1057.6 |
| 50°   | 1151.1 | 1158.2 | 1181.1 | 1184.0 | 1162.3 | 1134.6 | 1159.9 | 1181.4 | 1175.8 | 1147.6 | 1137.9 |
| 52.5° | 1248.2 | 1253.8 | 1289.7 | 1302.0 | 1282.9 | 1253.2 | 1273.5 | 1286.7 | 1268.8 | 1231.7 | 1216.7 |
| 55°   | 1330.8 | 1340.3 | 1387.9 | 1425.6 | 1440.0 | 1417.6 | 1415.3 | 1395.9 | 1345.8 | 1289.4 | 1273.8 |
| 57.5° | 1354.1 | 1363.2 | 1437.0 | 1534.1 | 1619.7 | 1630.9 | 1579.1 | 1481.8 | 1374.1 | 1287.0 | 1271.1 |
| 60°   | 1259.7 | 1272.0 | 1380.0 | 1563.8 | 1809.5 | 1910.7 | 1723.6 | 1489.1 | 1300.8 | 1184.0 | 1164.0 |
| 62.5° | 989.3  | 1012.3 | 1151.7 | 1440.0 | 1885.9 | 2165.4 | 1783.0 | 1362.3 | 1079.9 | 941.9  | 915.5  |
| 65°   | 538.0  | 557.8  | 711.6  | 1073.1 | 1730.9 | 2219.8 | 1637.4 | 1037.3 | 706.3  | 567.8  | 553.3  |
| 67.5° | 201.8  | 216.2  | 286.8  | 530.4  | 1223.8 | 1897.7 | 1242.9 | 593.9  | 320.6  | 230.0  | 209.7  |
| 70°   | 85.9   | 87.7   | 103.8  | 184.7  | 556.3  | 1234.6 | 636.3  | 201.8  | 107.1  | 86.5   | 84.1   |
| 72.5° | 61.8   | 62.1   | 66.5   | 81.8   | 169.4  | 541.6  | 192.4  | 84.7   | 65.3   | 58.8   | 58.8   |
| 75°   | 49.4   | 49.7   | 52.4   | 59.1   | 80.0   | 159.4  | 83.0   | 59.4   | 50.6   | 46.2   | 45.6   |
| 77.5° | 38.8   | 39.4   | 42.1   | 46.2   | 53.5   | 73.0   | 56.2   | 46.8   | 40.6   | 36.5   | 35.9   |
| 80°   | 28.8   | 29.7   | 33.2   | 35.3   | 37.7   | 48.5   | 40.9   | 36.5   | 32.4   | 27.9   | 27.1   |
| 82.5° | 19.1   | 20.0   | 24.7   | 26.2   | 25.9   | 30.6   | 28.2   | 27.9   | 24.7   | 18.5   | 17.7   |
| 85°   | 11.5   | 12.1   | 15.9   | 17.1   | 15.9   | 15.0   | 17.9   | 19.4   | 17.4   | 12.1   | 11.2   |
| 87.5° | 5.0    | 5.0    | 7.1    | 7.4    | 7.1    | 5.6    | 8.5    | 10.0   | 10.3   | 6.2    | 5.6    |
| 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: SP1-2104-224-5

Luminaire Tested: CCW-SA-2A-827-U-SL4

Test Date: 04/27/2021

### Test Information

Test Method: LM-79-08  
 Report Number: SP1-2104-224-5  
 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-827-U-SL4**  
 Description: INVUE WALL PACK ClearCurve Light Square

### Spectral Parameters

|                           |        |           |      |      |      |
|---------------------------|--------|-----------|------|------|------|
| CCT (K):                  | 2661   | CRI (Ra): | 82.2 |      |      |
| CIE u':                   | 0.2642 | R1:       | 80.7 | R9:  | 5.2  |
| CIE v':                   | 0.5282 | R2:       | 91.5 | R10: | 82.2 |
| Duv:                      | 0.0001 | R3:       | 94.9 | R11: | 81.4 |
| CIE x:                    | 0.4631 | R4:       | 80.7 | R12: | 80.4 |
| CIE y:                    | 0.4115 | R5:       | 81.5 | R13: | 83.2 |
| CIE z:                    | 0.1254 | R6:       | 91.6 | R14: | 97.8 |
| Peak Wavelength (nm):     | 606    | R7:       | 81.0 |      |      |
| Dominant Wavelength (nm): | 584    | R8:       | 56.0 |      |      |
| Purity:                   | 62.8   |           |      |      |      |
| Rf:                       | 85.3   |           |      |      |      |
| Rg:                       | 96.5   |           |      |      |      |



### Test Conditions

Stabilization Time: 163M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.0/47%  
 Sphere Temperature (°C): 24.1

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| 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**



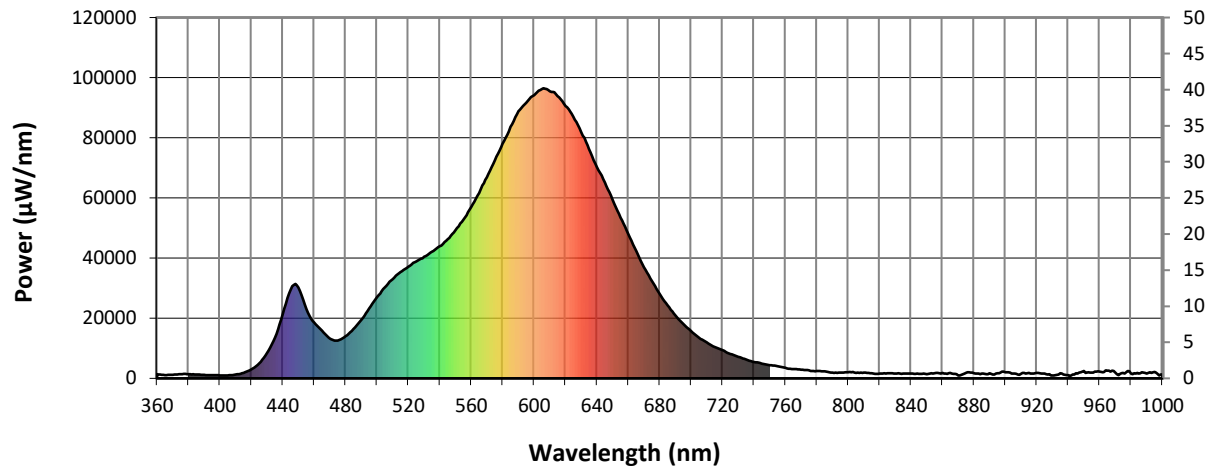
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 2700K 4-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       | 1379             | 0.0              | 490       | 19477            | 2.8              | 620       | 90616            | 23.6             | 750       | 4384             | 0.0              | 880       | 1655             | 0.0              |
| 365       | 1114             | 0.0              | 495       | 23200            | 4.2              | 625       | 87050            | 19.2             | 755       | 4013             | 0.0              | 885       | 1597             | 0.0              |
| 370       | 1169             | 0.0              | 500       | 26999            | 6.0              | 630       | 81805            | 14.8             | 760       | 3486             | 0.0              | 890       | 1696             | 0.0              |
| 375       | 1418             | 0.0              | 505       | 30185            | 8.4              | 635       | 76273            | 11.5             | 765       | 3111             | 0.0              | 895       | 1694             | 0.0              |
| 380       | 1358             | 0.0              | 510       | 33025            | 11.3             | 640       | 70276            | 8.4              | 770       | 2922             | 0.0              | 900       | 2016             | 0.0              |
| 385       | 1234             | 0.0              | 515       | 35307            | 14.6             | 645       | 65174            | 6.3              | 775       | 2649             | 0.0              | 905       | 1631             | 0.0              |
| 390       | 1133             | 0.0              | 520       | 37140            | 18.0             | 650       | 59417            | 4.3              | 780       | 2399             | 0.0              | 910       | 1506             | 0.0              |
| 395       | 1066             | 0.0              | 525       | 38834            | 20.8             | 655       | 53417            | 3.1              | 785       | 2386             | 0.0              | 915       | 1763             | 0.0              |
| 400       | 982              | 0.0              | 530       | 40401            | 23.8             | 660       | 48038            | 2.0              | 790       | 1912             | 0.0              | 920       | 1860             | 0.0              |
| 405       | 996              | 0.0              | 535       | 42121            | 26.1             | 665       | 42350            | 1.3              | 795       | 1902             | 0.0              | 925       | 1612             | 0.0              |
| 410       | 1276             | 0.0              | 540       | 43918            | 28.6             | 670       | 36925            | 0.8              | 800       | 2023             | 0.0              | 930       | 976              | 0.0              |
| 415       | 1798             | 0.0              | 545       | 46244            | 30.8             | 675       | 32385            | 0.5              | 805       | 1813             | 0.0              | 935       | 1702             | 0.0              |
| 420       | 2943             | 0.0              | 550       | 49225            | 33.5             | 680       | 28089            | 0.3              | 810       | 1888             | 0.0              | 940       | 1083             | 0.0              |
| 425       | 4989             | 0.0              | 555       | 52758            | 36.0             | 685       | 24306            | 0.2              | 815       | 1669             | 0.0              | 945       | 1672             | 0.0              |
| 430       | 8360             | 0.1              | 560       | 56904            | 38.7             | 690       | 20941            | 0.1              | 820       | 1558             | 0.0              | 950       | 2462             | 0.0              |
| 435       | 13537            | 0.2              | 565       | 61643            | 41.0             | 695       | 18065            | 0.1              | 825       | 1689             | 0.0              | 955       | 1958             | 0.0              |
| 440       | 21265            | 0.3              | 570       | 66872            | 43.5             | 700       | 15715            | 0.0              | 830       | 1632             | 0.0              | 960       | 2236             | 0.0              |
| 445       | 29496            | 0.6              | 575       | 72519            | 45.1             | 705       | 13502            | 0.0              | 835       | 1615             | 0.0              | 965       | 2541             | 0.0              |
| 450       | 30225            | 0.8              | 580       | 78030            | 46.4             | 710       | 11899            | 0.0              | 840       | 1583             | 0.0              | 970       | 1960             | 0.0              |
| 455       | 23120            | 0.8              | 585       | 83595            | 46.4             | 715       | 10427            | 0.0              | 845       | 1541             | 0.0              | 975       | 1763             | 0.0              |
| 460       | 18596            | 0.8              | 590       | 88814            | 45.9             | 720       | 9351             | 0.0              | 850       | 1350             | 0.0              | 980       | 1627             | 0.0              |
| 465       | 15865            | 0.8              | 595       | 91588            | 43.4             | 725       | 8139             | 0.0              | 855       | 1689             | 0.0              | 985       | 1556             | 0.0              |
| 470       | 13251            | 0.8              | 600       | 94210            | 40.6             | 730       | 7143             | 0.0              | 860       | 1763             | 0.0              | 990       | 1638             | 0.0              |
| 475       | 12609            | 1.0              | 605       | 96240            | 37.3             | 735       | 6273             | 0.0              | 865       | 1765             | 0.0              | 995       | 2124             | 0.0              |
| 480       | 14016            | 1.3              | 610       | 95474            | 32.8             | 740       | 5462             | 0.0              | 870       | 942              | 0.0              | 1000      | 1228             | 0.0              |
| 485       | 16368            | 1.9              | 615       | 93812            | 28.3             | 745       | 4946             | 0.0              | 875       | 1844             | 0.0              |           |                  |                  |

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### Scotopic Flux vs. Wavelength



Scotopic Lumens: 5165.4

S/P: 1.2

| 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       | 1379             | 0.0              | 490       | 19477            | 30.0             | 620       | 90616            | 1.1              | 750       | 4384             | 0.0              | 880       | 1655             | 0.0              |
| 365       | 1114             | 0.0              | 495       | 23200            | 37.5             | 625       | 87050            | 0.7              | 755       | 4013             | 0.0              | 885       | 1597             | 0.0              |
| 370       | 1169             | 0.0              | 500       | 26999            | 45.2             | 630       | 81805            | 0.5              | 760       | 3486             | 0.0              | 890       | 1696             | 0.0              |
| 375       | 1418             | 0.0              | 505       | 30185            | 51.3             | 635       | 76273            | 0.3              | 765       | 3111             | 0.0              | 895       | 1694             | 0.0              |
| 380       | 1358             | 0.0              | 510       | 33025            | 56.0             | 640       | 70276            | 0.2              | 770       | 2922             | 0.0              | 900       | 2016             | 0.0              |
| 385       | 1234             | 0.0              | 515       | 35307            | 58.5             | 645       | 65174            | 0.1              | 775       | 2649             | 0.0              | 905       | 1631             | 0.0              |
| 390       | 1133             | 0.0              | 520       | 37140            | 59.0             | 650       | 59417            | 0.1              | 780       | 2399             | 0.0              | 910       | 1506             | 0.0              |
| 395       | 1066             | 0.0              | 525       | 38834            | 58.1             | 655       | 53417            | 0.0              | 785       | 2386             | 0.0              | 915       | 1763             | 0.0              |
| 400       | 982              | 0.0              | 530       | 40401            | 55.7             | 660       | 48038            | 0.0              | 790       | 1912             | 0.0              | 920       | 1860             | 0.0              |
| 405       | 996              | 0.0              | 535       | 42121            | 52.5             | 665       | 42350            | 0.0              | 795       | 1902             | 0.0              | 925       | 1612             | 0.0              |
| 410       | 1276             | 0.1              | 540       | 43918            | 48.5             | 670       | 36925            | 0.0              | 800       | 2023             | 0.0              | 930       | 976              | 0.0              |
| 415       | 1798             | 0.2              | 545       | 46244            | 44.3             | 675       | 32385            | 0.0              | 805       | 1813             | 0.0              | 935       | 1702             | 0.0              |
| 420       | 2943             | 0.5              | 550       | 49225            | 40.3             | 680       | 28089            | 0.0              | 810       | 1888             | 0.0              | 940       | 1083             | 0.0              |
| 425       | 4989             | 1.2              | 555       | 52758            | 36.1             | 685       | 24306            | 0.0              | 815       | 1669             | 0.0              | 945       | 1672             | 0.0              |
| 430       | 8360             | 2.8              | 560       | 56904            | 31.8             | 690       | 20941            | 0.0              | 820       | 1558             | 0.0              | 950       | 2462             | 0.0              |
| 435       | 13537            | 6.1              | 565       | 61643            | 27.7             | 695       | 18065            | 0.0              | 825       | 1689             | 0.0              | 955       | 1958             | 0.0              |
| 440       | 21265            | 11.9             | 570       | 66872            | 23.6             | 700       | 15715            | 0.0              | 830       | 1632             | 0.0              | 960       | 2236             | 0.0              |
| 445       | 29496            | 19.8             | 575       | 72519            | 19.7             | 705       | 13502            | 0.0              | 835       | 1615             | 0.0              | 965       | 2541             | 0.0              |
| 450       | 30225            | 23.4             | 580       | 78030            | 16.1             | 710       | 11899            | 0.0              | 840       | 1583             | 0.0              | 970       | 1960             | 0.0              |
| 455       | 23120            | 20.2             | 585       | 83595            | 12.8             | 715       | 10427            | 0.0              | 845       | 1541             | 0.0              | 975       | 1763             | 0.0              |
| 460       | 18596            | 18.0             | 590       | 88814            | 9.9              | 720       | 9351             | 0.0              | 850       | 1350             | 0.0              | 980       | 1627             | 0.0              |
| 465       | 15865            | 16.8             | 595       | 91588            | 7.3              | 725       | 8139             | 0.0              | 855       | 1689             | 0.0              | 985       | 1556             | 0.0              |
| 470       | 13251            | 15.3             | 600       | 94210            | 5.3              | 730       | 7143             | 0.0              | 860       | 1763             | 0.0              | 990       | 1638             | 0.0              |
| 475       | 12609            | 15.8             | 605       | 96240            | 3.8              | 735       | 6273             | 0.0              | 865       | 1765             | 0.0              | 995       | 2124             | 0.0              |
| 480       | 14016            | 18.9             | 610       | 95474            | 2.6              | 740       | 5462             | 0.0              | 870       | 942              | 0.0              | 1000      | 1228             | 0.0              |
| 485       | 16368            | 23.7             | 615       | 93812            | 1.7              | 745       | 4946             | 0.0              | 875       | 1844             | 0.0              |           |                  |                  |

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### Melanopic Flux vs. Wavelength


**Melanopic Lumens: 1892.1      M/P: 0.44**

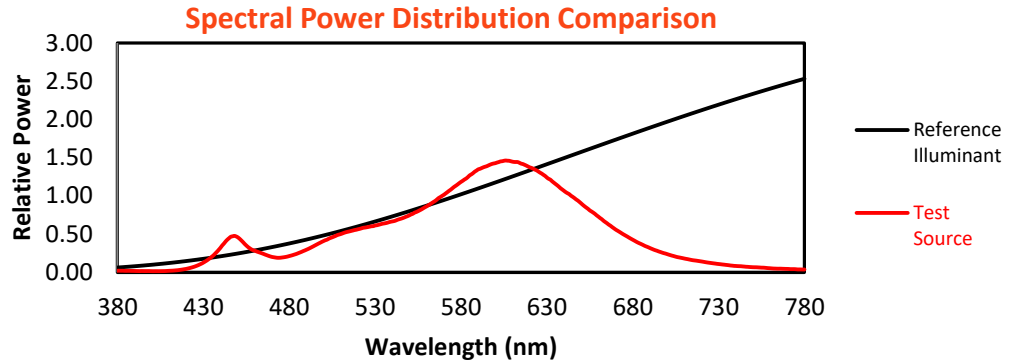
| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 1379             | 0.0              | 490       | 19477            | 16.2             | 620       | 90616            | 0.1              | 750       | 4384             | 0.0              | 880       | 1655             | 0.0              |
| 365       | 1114             | 0.0              | 495       | 23200            | 19.2             | 625       | 87050            | 0.0              | 755       | 4013             | 0.0              | 885       | 1597             | 0.0              |
| 370       | 1169             | 0.0              | 500       | 26999            | 21.7             | 630       | 81805            | 0.0              | 760       | 3486             | 0.0              | 890       | 1696             | 0.0              |
| 375       | 1418             | 0.0              | 505       | 30185            | 23.2             | 635       | 76273            | 0.0              | 765       | 3111             | 0.0              | 895       | 1694             | 0.0              |
| 380       | 1358             | 0.0              | 510       | 33025            | 23.7             | 640       | 70276            | 0.0              | 770       | 2922             | 0.0              | 900       | 2016             | 0.0              |
| 385       | 1234             | 0.0              | 515       | 35307            | 23.1             | 645       | 65174            | 0.0              | 775       | 2649             | 0.0              | 905       | 1631             | 0.0              |
| 390       | 1133             | 0.0              | 520       | 37140            | 21.6             | 650       | 59417            | 0.0              | 780       | 2399             | 0.0              | 910       | 1506             | 0.0              |
| 395       | 1066             | 0.0              | 525       | 38834            | 19.7             | 655       | 53417            | 0.0              | 785       | 2386             | 0.0              | 915       | 1763             | 0.0              |
| 400       | 982              | 0.0              | 530       | 40401            | 17.5             | 660       | 48038            | 0.0              | 790       | 1912             | 0.0              | 920       | 1860             | 0.0              |
| 405       | 996              | 0.0              | 535       | 42121            | 15.2             | 665       | 42350            | 0.0              | 795       | 1902             | 0.0              | 925       | 1612             | 0.0              |
| 410       | 1276             | 0.0              | 540       | 43918            | 12.9             | 670       | 36925            | 0.0              | 800       | 2023             | 0.0              | 930       | 976              | 0.0              |
| 415       | 1798             | 0.1              | 545       | 46244            | 10.7             | 675       | 32385            | 0.0              | 805       | 1813             | 0.0              | 935       | 1702             | 0.0              |
| 420       | 2943             | 0.3              | 550       | 49225            | 8.8              | 680       | 28089            | 0.0              | 810       | 1888             | 0.0              | 940       | 1083             | 0.0              |
| 425       | 4989             | 0.8              | 555       | 52758            | 7.1              | 685       | 24306            | 0.0              | 815       | 1669             | 0.0              | 945       | 1672             | 0.0              |
| 430       | 8360             | 1.8              | 560       | 56904            | 5.6              | 690       | 20941            | 0.0              | 820       | 1558             | 0.0              | 950       | 2462             | 0.0              |
| 435       | 13537            | 3.6              | 565       | 61643            | 4.3              | 695       | 18065            | 0.0              | 825       | 1689             | 0.0              | 955       | 1958             | 0.0              |
| 440       | 21265            | 7.1              | 570       | 66872            | 3.3              | 700       | 15715            | 0.0              | 830       | 1632             | 0.0              | 960       | 2236             | 0.0              |
| 445       | 29496            | 11.6             | 575       | 72519            | 2.4              | 705       | 13502            | 0.0              | 835       | 1615             | 0.0              | 965       | 2541             | 0.0              |
| 450       | 30225            | 13.9             | 580       | 78030            | 1.7              | 710       | 11899            | 0.0              | 840       | 1583             | 0.0              | 970       | 1960             | 0.0              |
| 455       | 23120            | 12.1             | 585       | 83595            | 1.2              | 715       | 10427            | 0.0              | 845       | 1541             | 0.0              | 975       | 1763             | 0.0              |
| 460       | 18596            | 11.0             | 590       | 88814            | 0.9              | 720       | 9351             | 0.0              | 850       | 1350             | 0.0              | 980       | 1627             | 0.0              |
| 465       | 15865            | 10.4             | 595       | 91588            | 0.6              | 725       | 8139             | 0.0              | 855       | 1689             | 0.0              | 985       | 1556             | 0.0              |
| 470       | 13251            | 9.5              | 600       | 94210            | 0.4              | 730       | 7143             | 0.0              | 860       | 1763             | 0.0              | 990       | 1638             | 0.0              |
| 475       | 12609            | 9.6              | 605       | 96240            | 0.3              | 735       | 6273             | 0.0              | 865       | 1765             | 0.0              | 995       | 2124             | 0.0              |
| 480       | 14016            | 11.3             | 610       | 95474            | 0.2              | 740       | 5462             | 0.0              | 870       | 942              | 0.0              | 1000      | 1228             | 0.0              |
| 485       | 16368            | 13.5             | 615       | 93812            | 0.1              | 745       | 4946             | 0.0              | 875       | 1844             | 0.0              |           |                  |                  |

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TM-30-18

### Summary

$R_f = 85.3$   
 $R_g = 96.5$   
 CIE  $R_a = 82.2$   
 $R_g = 5.2$



### Color Vector Graphics



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 87 | CES26 = 83 | CES51 = 95 | CES76 = 83 |
| CES02 = 64 | CES27 = 95 | CES52 = 94 | CES77 = 85 |
| CES03 = 32 | CES28 = 95 | CES53 = 89 | CES78 = 83 |
| CES04 = 71 | CES29 = 83 | CES54 = 92 | CES79 = 89 |
| CES05 = 51 | CES30 = 87 | CES55 = 92 | CES80 = 89 |
| CES06 = 52 | CES31 = 85 | CES56 = 87 | CES81 = 69 |
| CES07 = 43 | CES32 = 81 | CES57 = 87 | CES82 = 95 |
| CES08 = 42 | CES33 = 86 | CES58 = 88 | CES83 = 92 |
| CES09 = 29 | CES34 = 91 | CES59 = 92 | CES84 = 93 |
| CES10 = 77 | CES35 = 96 | CES60 = 96 | CES85 = 77 |
| CES11 = 60 | CES36 = 97 | CES61 = 91 | CES86 = 65 |
| CES12 = 66 | CES37 = 96 | CES62 = 97 | CES87 = 85 |
| CES13 = 44 | CES38 = 93 | CES63 = 87 | CES88 = 85 |
| CES14 = 74 | CES39 = 97 | CES64 = 86 | CES89 = 74 |
| CES15 = 72 | CES40 = 94 | CES65 = 81 | CES90 = 86 |
| CES16 = 48 | CES41 = 93 | CES66 = 86 | CES91 = 88 |
| CES17 = 50 | CES42 = 95 | CES67 = 85 | CES92 = 67 |
| CES18 = 57 | CES43 = 88 | CES68 = 86 | CES93 = 80 |
| CES19 = 73 | CES44 = 99 | CES69 = 91 | CES94 = 61 |
| CES20 = 67 | CES45 = 92 | CES70 = 83 | CES95 = 77 |
| CES21 = 87 | CES46 = 88 | CES71 = 85 | CES96 = 84 |
| CES22 = 80 | CES47 = 87 | CES72 = 94 | CES97 = 88 |
| CES23 = 92 | CES48 = 81 | CES73 = 79 | CES98 = 84 |
| CES24 = 91 | CES49 = 88 | CES74 = 90 | CES99 = 76 |
| CES25 = 72 | CES50 = 94 | CES75 = 86 |            |



**Color Rendition by Hue-Angle Bin**


**Measure Comparisons**



(END OF REPORT)