

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: STREETWORKS

Report Number: P348654

Luminaire Tested: **ARCH-N-PA1-20-740-24VDC-T4W**

Issue Date: 3/3/2020



**Test Information**

Test Method: LM-79-08  
Report Number: P348654  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-18)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: STREETWORKS  
Catalog Number: ARCH-N-PA1-20-740-24VDC-T4W  
Description: ARCHEON ROADWAY AND AREA LUMINAIRE  
(1) 70 CRI, 4000K, 420mA LIGHT ENGINE WITH 16 LEDS AND  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 3411 lumens  
Efficiency: N/A  
Efficacy: 155.0 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 0.75' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B1 - U0 - G1

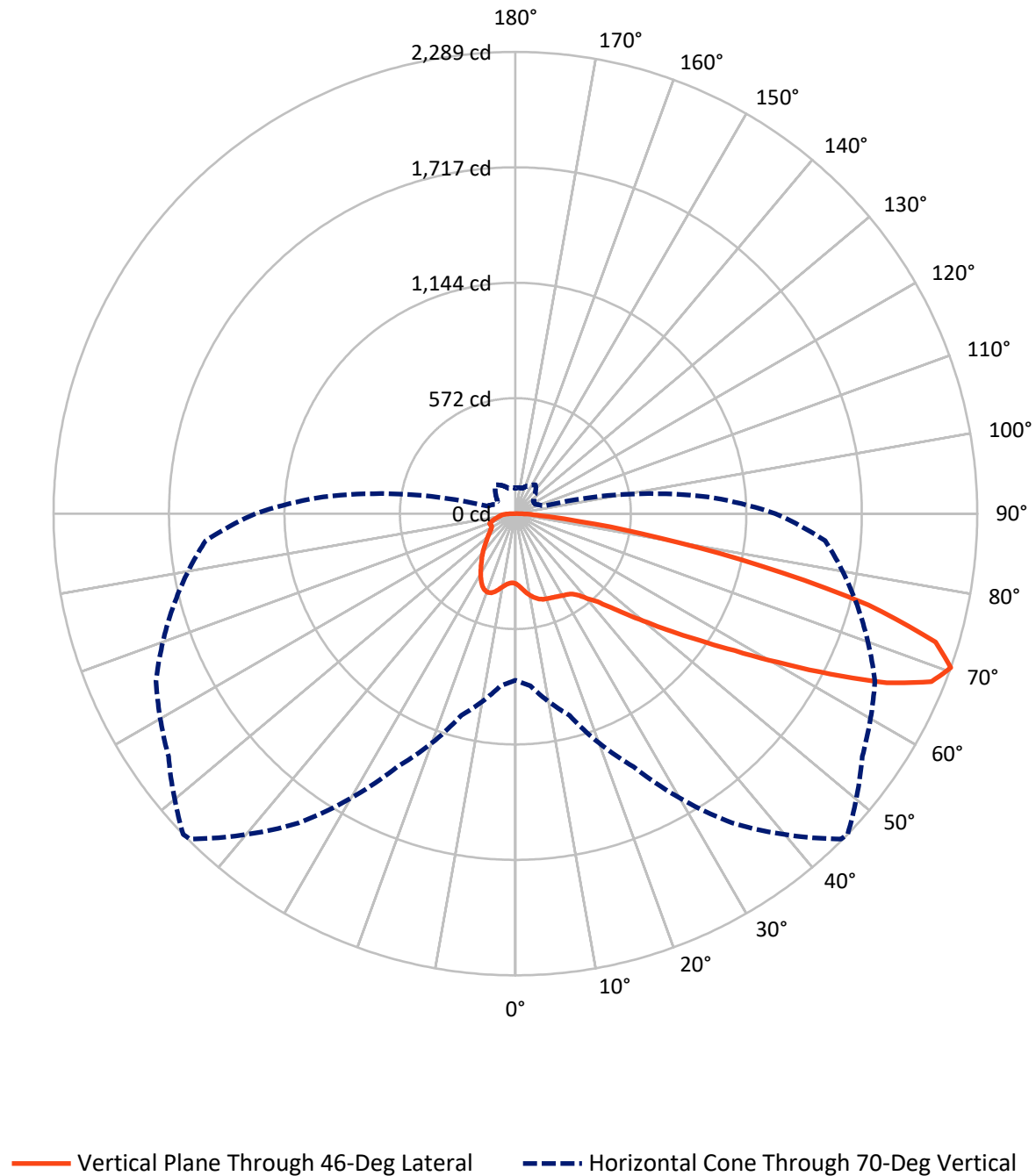
Input Watts (W): 22  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 25 FT



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CATALOG NUMBER: ARCH-N-PA1-20-740-24VDC-T4W

## Luminous Intensity Polar Plot



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CATALOG NUMBER: ARCH-N-PA1-20-740-24VDC-T4W

**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 781.8    | 0.0    | 781.8  |
|                    | % Fixture | 22.9     | 0.0    | 22.9   |
| <b>Street Side</b> | Lumens    | 2629.2   | 0.0    | 2629.2 |
|                    | % Fixture | 77.1     | 0.0    | 77.1   |
| <b>Total</b>       | Lumens    | 3411.0   | 0.0    | 3411.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 35.4   | 1.0       |
| 10°-20°   | 118.0  | 3.5       |
| 20°-30°   | 196.8  | 5.8       |
| 30°-40°   | 279.3  | 8.2       |
| 40°-50°   | 410.8  | 12.0      |
| 50°-60°   | 695.7  | 20.4      |
| 60°-70°   | 987.5  | 29.0      |
| 70°-80°   | 599.9  | 17.6      |
| 80°-90°   | 87.5   | 2.6       |
| 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°    | 3411.0 | 100.0     |
| 0°-180°   | 3411.0 | 100.0     |

**Coefficient of Utilization**



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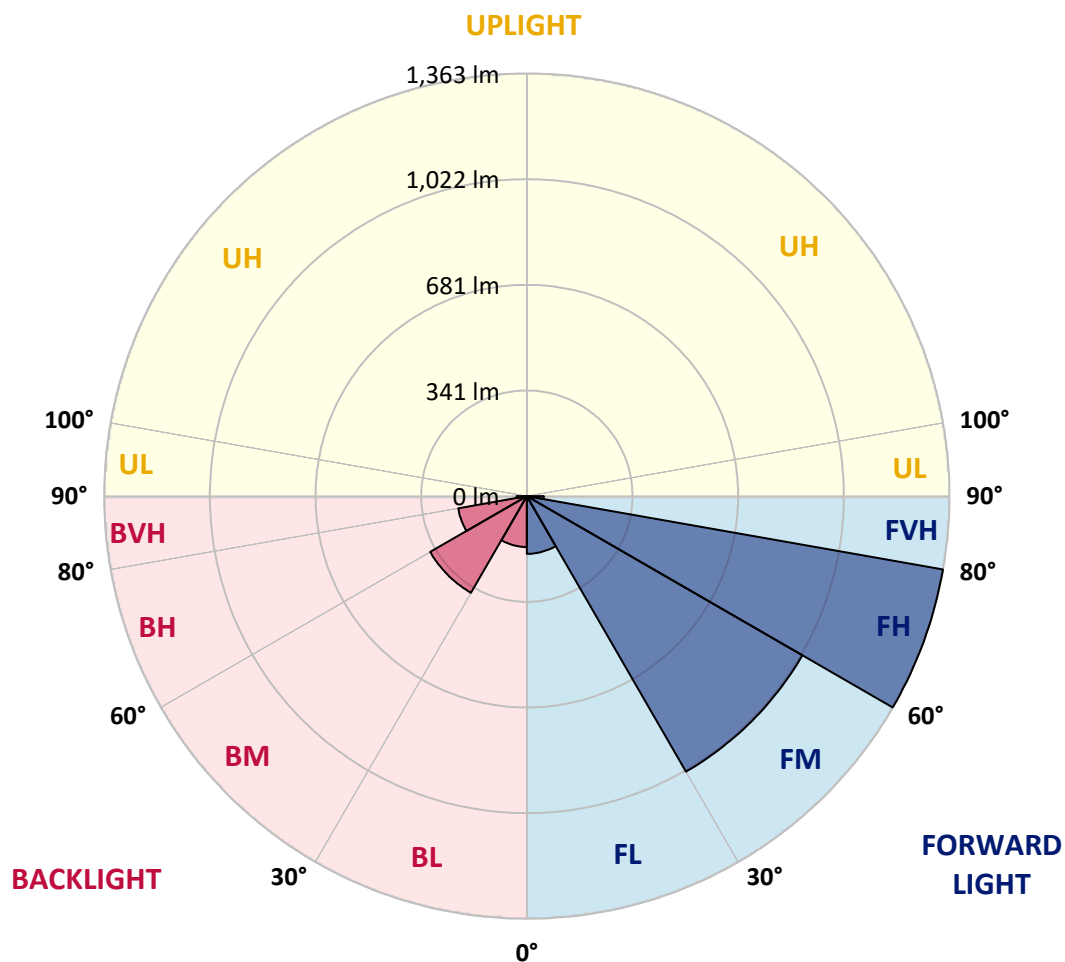
CATALOG NUMBER: ARCH-N-PA1-20-740-24VDC-T4W

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 186.1  | 5.5       |                         |      |         |
| FM   | (30°-60°)   | 1025.9 | 30.1      |                         |      |         |
| FH   | (60°-80°)   | 1362.7 | 39.9      |                         |      | G1/1800 |
| FVH  | (80°-90°)   | 54.5   | 1.6       |                         |      | G1/100  |
| BL   | (0°-30°)    | 164.1  | 4.8       | B1/500                  |      |         |
| BM   | (30°-60°)   | 359.9  | 10.6      | B1/1000                 |      |         |
| BH   | (60°-80°)   | 224.8  | 6.6       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 33.0   | 1.0       |                         |      | G1/100  |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B1-U0-G1**

Type IV Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 46°    | 55°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 347.5  | 347.5  | 347.5  | 347.5  | 347.5  | 347.5  | 347.5  | 347.5  | 347.5  | 347.5  | 347.5  |
| 2.5°  | 364.9  | 365.1  | 365.6  | 364.4  | 361.2  | 360.2  | 359.9  | 356.5  | 354.3  | 351.0  | 348.2  |
| 5°    | 394.1  | 394.3  | 393.6  | 390.4  | 383.1  | 377.7  | 377.3  | 369.6  | 362.6  | 355.1  | 349.5  |
| 7.5°  | 424.6  | 424.9  | 422.7  | 416.5  | 406.3  | 397.0  | 396.4  | 385.9  | 375.3  | 364.0  | 355.6  |
| 10°   | 451.5  | 450.1  | 446.5  | 437.9  | 425.8  | 414.4  | 413.9  | 403.0  | 390.7  | 377.0  | 365.8  |
| 12.5° | 469.5  | 468.3  | 463.7  | 453.2  | 440.0  | 429.5  | 428.5  | 418.4  | 406.5  | 391.5  | 378.1  |
| 15°   | 479.4  | 480.2  | 473.9  | 462.0  | 449.2  | 440.3  | 439.5  | 432.3  | 421.6  | 406.6  | 391.2  |
| 17.5° | 480.7  | 481.4  | 475.3  | 463.5  | 453.0  | 447.0  | 446.6  | 441.8  | 434.1  | 419.7  | 403.5  |
| 20°   | 473.2  | 473.7  | 468.7  | 459.0  | 452.1  | 450.2  | 450.1  | 448.0  | 442.3  | 429.5  | 413.8  |
| 22.5° | 462.4  | 462.7  | 459.1  | 452.1  | 449.8  | 452.7  | 453.5  | 452.7  | 448.6  | 436.6  | 421.9  |
| 25°   | 459.7  | 459.5  | 455.7  | 448.6  | 450.6  | 456.8  | 457.8  | 458.2  | 455.4  | 444.9  | 432.1  |
| 27.5° | 472.7  | 471.8  | 464.7  | 453.3  | 454.6  | 462.0  | 463.4  | 466.8  | 465.1  | 455.8  | 443.8  |
| 30°   | 510.1  | 508.7  | 494.1  | 471.0  | 464.7  | 468.6  | 470.3  | 475.7  | 476.0  | 468.3  | 459.3  |
| 32.5° | 573.4  | 571.6  | 545.5  | 504.2  | 481.9  | 475.2  | 476.9  | 484.9  | 489.2  | 483.3  | 473.6  |
| 35°   | 653.4  | 651.4  | 617.1  | 560.6  | 510.6  | 487.9  | 489.1  | 495.5  | 504.2  | 495.8  | 482.9  |
| 37.5° | 736.7  | 731.9  | 698.9  | 626.9  | 556.2  | 515.1  | 515.1  | 516.0  | 520.0  | 502.5  | 493.9  |
| 40°   | 819.6  | 814.8  | 784.9  | 704.8  | 615.3  | 558.0  | 555.3  | 537.2  | 533.9  | 518.9  | 516.0  |
| 42.5° | 896.6  | 895.2  | 877.6  | 793.0  | 684.6  | 600.1  | 596.4  | 565.7  | 566.4  | 557.0  | 557.2  |
| 45°   | 978.6  | 978.6  | 964.2  | 881.9  | 765.4  | 667.8  | 664.1  | 618.9  | 625.9  | 621.6  | 632.0  |
| 47.5° | 1045.5 | 1047.6 | 1045.6 | 974.6  | 859.4  | 753.9  | 747.1  | 692.7  | 712.3  | 727.1  | 757.4  |
| 50°   | 1113.7 | 1117.0 | 1117.4 | 1076.3 | 973.0  | 856.1  | 848.4  | 790.6  | 834.4  | 876.9  | 936.3  |
| 52.5° | 1212.9 | 1220.2 | 1190.9 | 1177.7 | 1112.1 | 977.5  | 969.9  | 916.6  | 989.7  | 1049.3 | 1151.7 |
| 55°   | 1304.7 | 1298.3 | 1277.4 | 1285.6 | 1261.1 | 1115.7 | 1110.0 | 1063.2 | 1162.7 | 1240.2 | 1373.1 |
| 57.5° | 1354.5 | 1354.0 | 1375.0 | 1410.0 | 1421.7 | 1286.2 | 1281.4 | 1235.9 | 1357.7 | 1416.0 | 1581.0 |
| 60°   | 1412.8 | 1413.6 | 1465.7 | 1545.2 | 1593.3 | 1498.4 | 1496.3 | 1461.7 | 1547.2 | 1580.1 | 1744.1 |
| 62.5° | 1421.0 | 1435.7 | 1525.4 | 1662.2 | 1753.9 | 1746.3 | 1751.0 | 1665.2 | 1716.7 | 1711.1 | 1865.9 |
| 65°   | 1327.0 | 1346.4 | 1508.7 | 1697.5 | 1913.6 | 2017.5 | 2021.8 | 1869.8 | 1850.3 | 1823.0 | 1909.4 |
| 67.5° | 1134.4 | 1163.1 | 1339.4 | 1620.6 | 1966.3 | 2217.9 | 2224.0 | 2028.5 | 1961.2 | 1861.0 | 1804.6 |
| 70°   | 825.5  | 857.4  | 1034.8 | 1384.1 | 1872.4 | 2282.0 | 2288.9 | 2098.6 | 1965.4 | 1753.0 | 1540.5 |
| 72.5° | 498.7  | 523.7  | 669.9  | 1019.0 | 1580.3 | 2165.3 | 2177.5 | 2009.7 | 1794.4 | 1484.8 | 1137.6 |
| 75°   | 219.0  | 235.3  | 323.9  | 587.2  | 1131.4 | 1791.5 | 1806.8 | 1720.2 | 1458.0 | 1079.1 | 672.4  |
| 77.5° | 93.3   | 97.9   | 132.8  | 255.1  | 639.6  | 1224.2 | 1245.2 | 1256.9 | 989.2  | 587.2  | 284.1  |
| 80°   | 58.1   | 60.0   | 75.2   | 115.4  | 299.3  | 687.6  | 710.2  | 739.5  | 491.2  | 215.8  | 99.2   |
| 82.5° | 35.4   | 37.5   | 50.0   | 69.8   | 155.8  | 311.7  | 322.5  | 343.2  | 190.6  | 93.3   | 51.4   |
| 85°   | 21.2   | 22.8   | 30.6   | 44.1   | 88.7   | 122.6  | 122.5  | 135.4  | 89.8   | 60.0   | 27.1   |
| 87.5° | 10.2   | 11.3   | 16.3   | 22.9   | 44.7   | 46.0   | 43.1   | 48.8   | 54.5   | 39.3   | 13.7   |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

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CATALOG NUMBER: ARCH-N-PA1-20-740-24VDC-T4W

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 347.5  | 347.5  | 347.5 | 347.5 | 347.5 | 347.5 | 347.5 | 347.5 | 347.5 | 347.5 | 347.5 |
| 2.5°  | 347.3  | 346.8  | 345.3 | 344.1 | 343.9 | 343.2 | 342.6 | 343.0 | 343.4 | 343.5 | 343.5 |
| 5°    | 347.2  | 345.9  | 343.9 | 343.1 | 344.1 | 345.5 | 347.3 | 349.6 | 351.0 | 352.1 | 352.8 |
| 7.5°  | 352.8  | 350.3  | 348.1 | 347.6 | 349.7 | 353.5 | 357.4 | 362.3 | 365.7 | 368.1 | 368.5 |
| 10°   | 362.1  | 359.1  | 356.9 | 357.3 | 361.1 | 366.4 | 372.0 | 378.3 | 383.5 | 386.6 | 386.9 |
| 12.5° | 372.8  | 369.9  | 367.8 | 369.8 | 376.0 | 382.5 | 388.4 | 393.9 | 398.5 | 401.7 | 401.7 |
| 15°   | 385.2  | 383.1  | 380.7 | 385.2 | 393.6 | 399.5 | 401.9 | 404.6 | 407.2 | 409.5 | 409.0 |
| 17.5° | 397.1  | 395.1  | 393.9 | 399.2 | 408.0 | 410.7 | 409.0 | 407.0 | 407.0 | 408.3 | 408.6 |
| 20°   | 407.4  | 405.6  | 406.5 | 411.7 | 416.3 | 413.5 | 407.4 | 401.1 | 398.5 | 399.2 | 399.9 |
| 22.5° | 416.4  | 415.6  | 418.0 | 420.5 | 417.2 | 407.4 | 396.2 | 387.7 | 384.5 | 384.3 | 384.5 |
| 25°   | 426.9  | 426.8  | 429.8 | 425.4 | 410.9 | 392.8 | 377.7 | 369.5 | 367.7 | 369.1 | 371.4 |
| 27.5° | 440.0  | 441.3  | 442.8 | 426.5 | 398.1 | 370.7 | 355.5 | 349.7 | 351.5 | 354.9 | 357.1 |
| 30°   | 456.7  | 460.2  | 456.9 | 423.6 | 379.6 | 345.5 | 330.9 | 329.3 | 334.1 | 338.9 | 341.2 |
| 32.5° | 472.9  | 478.4  | 470.4 | 416.0 | 355.8 | 318.8 | 307.5 | 307.0 | 312.8 | 317.5 | 320.8 |
| 35°   | 486.0  | 496.8  | 480.6 | 401.0 | 328.3 | 294.2 | 285.9 | 282.7 | 284.8 | 290.3 | 294.1 |
| 37.5° | 503.0  | 521.1  | 487.6 | 378.0 | 298.4 | 273.9 | 264.2 | 256.9 | 255.1 | 257.3 | 259.1 |
| 40°   | 534.2  | 558.1  | 490.9 | 345.9 | 269.2 | 253.5 | 243.7 | 233.1 | 225.8 | 220.4 | 220.5 |
| 42.5° | 585.1  | 606.3  | 488.8 | 306.9 | 242.2 | 233.7 | 222.6 | 210.4 | 198.4 | 186.3 | 185.4 |
| 45°   | 667.7  | 678.0  | 482.5 | 265.6 | 218.5 | 212.9 | 202.5 | 190.3 | 174.4 | 160.6 | 159.3 |
| 47.5° | 800.0  | 777.2  | 472.7 | 229.5 | 197.6 | 195.3 | 185.7 | 171.6 | 154.8 | 143.7 | 142.8 |
| 50°   | 980.3  | 920.4  | 467.9 | 200.8 | 179.2 | 179.9 | 172.1 | 157.1 | 141.2 | 133.1 | 132.1 |
| 52.5° | 1196.0 | 1087.3 | 477.1 | 178.6 | 164.4 | 166.8 | 161.0 | 147.0 | 133.7 | 127.2 | 126.3 |
| 55°   | 1419.8 | 1260.0 | 487.0 | 162.5 | 150.4 | 155.1 | 153.2 | 141.6 | 129.6 | 123.6 | 122.8 |
| 57.5° | 1611.4 | 1389.0 | 467.2 | 149.4 | 137.9 | 145.3 | 147.1 | 138.2 | 127.5 | 122.1 | 121.2 |
| 60°   | 1732.0 | 1441.0 | 415.1 | 137.2 | 127.9 | 137.5 | 143.6 | 137.3 | 128.3 | 127.8 | 127.1 |
| 62.5° | 1789.2 | 1436.4 | 337.0 | 127.5 | 121.8 | 134.1 | 146.1 | 142.5 | 137.6 | 141.8 | 142.2 |
| 65°   | 1763.5 | 1367.8 | 251.0 | 121.1 | 117.3 | 135.4 | 153.9 | 152.5 | 140.3 | 144.5 | 145.1 |
| 67.5° | 1594.5 | 1204.0 | 185.8 | 115.4 | 112.4 | 139.0 | 167.9 | 155.7 | 135.1 | 138.1 | 136.2 |
| 70°   | 1288.7 | 954.5  | 143.3 | 109.1 | 107.4 | 138.6 | 174.2 | 153.7 | 129.3 | 130.0 | 125.0 |
| 72.5° | 888.7  | 650.9  | 116.6 | 103.3 | 100.2 | 126.3 | 169.7 | 148.8 | 124.6 | 119.2 | 112.5 |
| 75°   | 483.3  | 349.4  | 99.1  | 97.2  | 87.4  | 110.9 | 161.6 | 145.3 | 120.2 | 113.1 | 109.4 |
| 77.5° | 190.2  | 145.0  | 86.0  | 89.0  | 76.5  | 97.9  | 152.5 | 138.7 | 114.3 | 104.9 | 103.1 |
| 80°   | 77.6   | 74.0   | 71.3  | 76.9  | 65.7  | 85.7  | 141.5 | 130.9 | 107.2 | 97.4  | 93.6  |
| 82.5° | 44.0   | 46.0   | 55.4  | 60.7  | 53.3  | 78.9  | 136.2 | 124.6 | 98.6  | 87.2  | 82.8  |
| 85°   | 22.5   | 27.0   | 38.6  | 43.5  | 39.2  | 67.1  | 125.5 | 109.0 | 79.1  | 66.8  | 67.1  |
| 87.5° | 10.9   | 15.1   | 24.4  | 27.3  | 25.4  | 48.6  | 93.7  | 79.0  | 61.6  | 48.8  | 47.3  |
| 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)

STREETWORKS

Report Number: SP1-2101-121-2

Luminaire Tested: IFLD-S-SA2A-740-U-T3R-HSS

Test Date: 03/05/2021

### Test Information

Test Method: LM-79-08  
 Report Number: SP1-2101-121-2  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1  
 Measurement Geometry:  $4\pi$   
 Issue Date: 03/05/2021  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: STREETWORKS  
 Catalog Number: **IFLD-S-SA2A-740-U-T3R-HSS**  
 Description: STREETWORKS INF FLOOD

SHIELD, DRIVER PROGRAMMED @ 615mA.

### Spectral Parameters

|                           |         |           |      |      |       |
|---------------------------|---------|-----------|------|------|-------|
| CCT (K):                  | 3905    | CRI (Ra): | 71.2 |      |       |
| CIE u':                   | 0.2273  | R1:       | 68.9 | R9:  | -29.7 |
| CIE v':                   | 0.5024  | R2:       | 77.0 | R10: | 46.2  |
| Duv:                      | -0.0008 | R3:       | 84.0 | R11: | 68.8  |
| CIE x:                    | 0.3841  | R4:       | 71.6 | R12: | 45.6  |
| CIE y:                    | 0.3774  | R5:       | 68.9 | R13: | 69.5  |
| CIE z:                    | 0.2385  | R6:       | 68.3 | R14: | 90.7  |
| Peak Wavelength (nm):     | 443     | R7:       | 78.7 |      |       |
| Dominant Wavelength (nm): | 579     | R8:       | 52.2 |      |       |
| Purity:                   | 28.7    |           |      |      |       |
| Rf:                       | 71.7    |           |      |      |       |
| Rg:                       | 96.9    |           |      |      |       |



### Test Conditions

Stabilization Time: 211M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.8/312%  
 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 4000K 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       | 2304             | 0.0              | 490       | 19043            | 2.7              | 620       | 97577            | 25.4             | 750       | 4830             | 0.0              | 880       | 3505             | 0.0              |
| 365       | 2150             | 0.0              | 495       | 26606            | 4.8              | 625       | 90158            | 19.9             | 755       | 4664             | 0.0              | 885       | 2991             | 0.0              |
| 370       | 2146             | 0.0              | 500       | 36376            | 8.0              | 630       | 82240            | 14.9             | 760       | 4006             | 0.0              | 890       | 2327             | 0.0              |
| 375       | 2332             | 0.0              | 505       | 47714            | 13.3             | 635       | 74361            | 11.2             | 765       | 3715             | 0.0              | 895       | 2775             | 0.0              |
| 380       | 2527             | 0.0              | 510       | 58741            | 20.2             | 640       | 66994            | 8.0              | 770       | 3696             | 0.0              | 900       | 2141             | 0.0              |
| 385       | 2304             | 0.0              | 515       | 68716            | 28.5             | 645       | 60405            | 5.8              | 775       | 3117             | 0.0              | 905       | 2421             | 0.0              |
| 390       | 2064             | 0.0              | 520       | 77136            | 37.4             | 650       | 53806            | 3.9              | 780       | 3062             | 0.0              | 910       | 2200             | 0.0              |
| 395       | 1856             | 0.0              | 525       | 83567            | 44.9             | 655       | 47610            | 2.7              | 785       | 2907             | 0.0              | 915       | 2716             | 0.0              |
| 400       | 1856             | 0.0              | 530       | 89283            | 52.6             | 660       | 42018            | 1.8              | 790       | 2655             | 0.0              | 920       | 2656             | 0.0              |
| 405       | 2374             | 0.0              | 535       | 94097            | 58.4             | 665       | 36742            | 1.2              | 795       | 2467             | 0.0              | 925       | 2671             | 0.0              |
| 410       | 4084             | 0.0              | 540       | 96845            | 63.1             | 670       | 32105            | 0.7              | 800       | 2609             | 0.0              | 930       | 3292             | 0.0              |
| 415       | 8543             | 0.0              | 545       | 100829           | 67.1             | 675       | 27946            | 0.5              | 805       | 2293             | 0.0              | 935       | 3188             | 0.0              |
| 420       | 18394            | 0.1              | 550       | 105648           | 71.8             | 680       | 24146            | 0.3              | 810       | 2188             | 0.0              | 940       | 1997             | 0.0              |
| 425       | 37987            | 0.2              | 555       | 110017           | 75.1             | 685       | 21191            | 0.2              | 815       | 2386             | 0.0              | 945       | 2623             | 0.0              |
| 430       | 67605            | 0.5              | 560       | 114586           | 77.9             | 690       | 18544            | 0.1              | 820       | 2712             | 0.0              | 950       | 2969             | 0.0              |
| 435       | 102160           | 1.2              | 565       | 118987           | 79.1             | 695       | 16058            | 0.1              | 825       | 2473             | 0.0              | 955       | 2277             | 0.0              |
| 440       | 135103           | 2.1              | 570       | 122326           | 79.5             | 700       | 14133            | 0.0              | 830       | 1969             | 0.0              | 960       | 4267             | 0.0              |
| 445       | 140126           | 2.9              | 575       | 125968           | 78.4             | 705       | 12309            | 0.0              | 835       | 1917             | 0.0              | 965       | 2034             | 0.0              |
| 450       | 102339           | 2.7              | 580       | 127613           | 75.8             | 710       | 11142            | 0.0              | 840       | 2248             | 0.0              | 970       | 3586             | 0.0              |
| 455       | 58751            | 2.0              | 585       | 129466           | 71.9             | 715       | 10143            | 0.0              | 845       | 2266             | 0.0              | 975       | 2505             | 0.0              |
| 460       | 36892            | 1.5              | 590       | 128813           | 66.6             | 720       | 9072             | 0.0              | 850       | 2558             | 0.0              | 980       | 2666             | 0.0              |
| 465       | 24637            | 1.3              | 595       | 126387           | 59.9             | 725       | 8130             | 0.0              | 855       | 2767             | 0.0              | 985       | 2934             | 0.0              |
| 470       | 16738            | 1.0              | 600       | 123477           | 53.2             | 730       | 7149             | 0.0              | 860       | 2826             | 0.0              | 990       | 4120             | 0.0              |
| 475       | 13456            | 1.1              | 605       | 118718           | 46.0             | 735       | 6311             | 0.0              | 865       | 2385             | 0.0              | 995       | 3858             | 0.0              |
| 480       | 13081            | 1.2              | 610       | 112091           | 38.5             | 740       | 5711             | 0.0              | 870       | 3194             | 0.0              | 1000      | 3405             | 0.0              |
| 485       | 14734            | 1.7              | 615       | 105039           | 31.7             | 745       | 5111             | 0.0              | 875       | 3189             | 0.0              |           |                  |                  |

REPORT NUMBER: SP1-2101-121-2

### Scotopic Flux vs. Wavelength



Scotopic Lumens: 10425.8

S/P: 1.47

| $\lambda$<br>(nm) | Power<br>( $\mu\text{W/nm}$ ) | Lumens<br>( $\Phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W/nm}$ ) | Lumens<br>( $\Phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W/nm}$ ) | Lumens<br>( $\Phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W/nm}$ ) | Lumens<br>( $\Phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W/nm}$ ) | Lumens<br>( $\Phi/\text{nm}$ ) |
|-------------------|-------------------------------|--------------------------------|-------------------|-------------------------------|--------------------------------|-------------------|-------------------------------|--------------------------------|-------------------|-------------------------------|--------------------------------|-------------------|-------------------------------|--------------------------------|
| 360               | 2304                          | 0.0                            | 490               | 19043                         | 29.3                           | 620               | 97577                         | 1.2                            | 750               | 4830                          | 0.0                            | 880               | 3505                          | 0.0                            |
| 365               | 2150                          | 0.0                            | 495               | 26606                         | 43.0                           | 625               | 90158                         | 0.8                            | 755               | 4664                          | 0.0                            | 885               | 2991                          | 0.0                            |
| 370               | 2146                          | 0.0                            | 500               | 36376                         | 60.8                           | 630               | 82240                         | 0.5                            | 760               | 4006                          | 0.0                            | 890               | 2327                          | 0.0                            |
| 375               | 2332                          | 0.0                            | 505               | 47714                         | 81.1                           | 635               | 74361                         | 0.3                            | 765               | 3715                          | 0.0                            | 895               | 2775                          | 0.0                            |
| 380               | 2527                          | 0.0                            | 510               | 58741                         | 99.6                           | 640               | 66994                         | 0.2                            | 770               | 3696                          | 0.0                            | 900               | 2141                          | 0.0                            |
| 385               | 2304                          | 0.0                            | 515               | 68716                         | 113.9                          | 645               | 60405                         | 0.1                            | 775               | 3117                          | 0.0                            | 905               | 2421                          | 0.0                            |
| 390               | 2064                          | 0.0                            | 520               | 77136                         | 122.6                          | 650               | 53806                         | 0.1                            | 780               | 3062                          | 0.0                            | 910               | 2200                          | 0.0                            |
| 395               | 1856                          | 0.0                            | 525               | 83567                         | 125.0                          | 655               | 47610                         | 0.0                            | 785               | 2907                          | 0.0                            | 915               | 2716                          | 0.0                            |
| 400               | 1856                          | 0.0                            | 530               | 89283                         | 123.1                          | 660               | 42018                         | 0.0                            | 790               | 2655                          | 0.0                            | 920               | 2656                          | 0.0                            |
| 405               | 2374                          | 0.1                            | 535               | 94097                         | 117.3                          | 665               | 36742                         | 0.0                            | 795               | 2467                          | 0.0                            | 925               | 2671                          | 0.0                            |
| 410               | 4084                          | 0.2                            | 540               | 96845                         | 107.0                          | 670               | 32105                         | 0.0                            | 800               | 2609                          | 0.0                            | 930               | 3292                          | 0.0                            |
| 415               | 8543                          | 0.9                            | 545               | 100829                        | 96.7                           | 675               | 27946                         | 0.0                            | 805               | 2293                          | 0.0                            | 935               | 3188                          | 0.0                            |
| 420               | 18394                         | 3.0                            | 550               | 105648                        | 86.4                           | 680               | 24146                         | 0.0                            | 810               | 2188                          | 0.0                            | 940               | 1997                          | 0.0                            |
| 425               | 37987                         | 9.3                            | 555               | 110017                        | 75.2                           | 685               | 21191                         | 0.0                            | 815               | 2386                          | 0.0                            | 945               | 2623                          | 0.0                            |
| 430               | 67605                         | 23.0                           | 560               | 114586                        | 64.0                           | 690               | 18544                         | 0.0                            | 820               | 2712                          | 0.0                            | 950               | 2969                          | 0.0                            |
| 435               | 102160                        | 45.7                           | 565               | 118987                        | 53.4                           | 695               | 16058                         | 0.0                            | 825               | 2473                          | 0.0                            | 955               | 2277                          | 0.0                            |
| 440               | 135103                        | 75.5                           | 570               | 122326                        | 43.2                           | 700               | 14133                         | 0.0                            | 830               | 1969                          | 0.0                            | 960               | 4267                          | 0.0                            |
| 445               | 140126                        | 93.8                           | 575               | 125968                        | 34.3                           | 705               | 12309                         | 0.0                            | 835               | 1917                          | 0.0                            | 965               | 2034                          | 0.0                            |
| 450               | 102339                        | 79.3                           | 580               | 127613                        | 26.3                           | 710               | 11142                         | 0.0                            | 840               | 2248                          | 0.0                            | 970               | 3586                          | 0.0                            |
| 455               | 58751                         | 51.3                           | 585               | 129466                        | 19.8                           | 715               | 10143                         | 0.0                            | 845               | 2266                          | 0.0                            | 975               | 2505                          | 0.0                            |
| 460               | 36892                         | 35.6                           | 590               | 128813                        | 14.3                           | 720               | 9072                          | 0.0                            | 850               | 2558                          | 0.0                            | 980               | 2666                          | 0.0                            |
| 465               | 24637                         | 26.0                           | 595               | 126387                        | 10.1                           | 725               | 8130                          | 0.0                            | 855               | 2767                          | 0.0                            | 985               | 2934                          | 0.0                            |
| 470               | 16738                         | 19.3                           | 600               | 123477                        | 7.0                            | 730               | 7149                          | 0.0                            | 860               | 2826                          | 0.0                            | 990               | 4120                          | 0.0                            |
| 475               | 13456                         | 16.8                           | 605               | 118718                        | 4.7                            | 735               | 6311                          | 0.0                            | 865               | 2385                          | 0.0                            | 995               | 3858                          | 0.0                            |
| 480               | 13081                         | 17.7                           | 610               | 112091                        | 3.0                            | 740               | 5711                          | 0.0                            | 870               | 3194                          | 0.0                            | 1000              | 3405                          | 0.0                            |
| 485               | 14734                         | 21.4                           | 615               | 105039                        | 1.9                            | 745               | 5111                          | 0.0                            | 875               | 3189                          | 0.0                            |                   |                               |                                |

REPORT NUMBER: SP1-2101-121-2

### Melanopic Flux vs. Wavelength



**Melanopic Lumens: 3927.2**

**M/P: 0.55**

| 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       | 2304             | 0.0              | 490       | 19043            | 15.8             | 620       | 97577            | 0.1              | 750       | 4830             | 0.0              | 880       | 3505             | 0.0              |
| 365       | 2150             | 0.0              | 495       | 26606            | 22.0             | 625       | 90158            | 0.0              | 755       | 4664             | 0.0              | 885       | 2991             | 0.0              |
| 370       | 2146             | 0.0              | 500       | 36376            | 29.2             | 630       | 82240            | 0.0              | 760       | 4006             | 0.0              | 890       | 2327             | 0.0              |
| 375       | 2332             | 0.0              | 505       | 47714            | 36.6             | 635       | 74361            | 0.0              | 765       | 3715             | 0.0              | 895       | 2775             | 0.0              |
| 380       | 2527             | 0.0              | 510       | 58741            | 42.2             | 640       | 66994            | 0.0              | 770       | 3696             | 0.0              | 900       | 2141             | 0.0              |
| 385       | 2304             | 0.0              | 515       | 68716            | 44.9             | 645       | 60405            | 0.0              | 775       | 3117             | 0.0              | 905       | 2421             | 0.0              |
| 390       | 2064             | 0.0              | 520       | 77136            | 44.9             | 650       | 53806            | 0.0              | 780       | 3062             | 0.0              | 910       | 2200             | 0.0              |
| 395       | 1856             | 0.0              | 525       | 83567            | 42.4             | 655       | 47610            | 0.0              | 785       | 2907             | 0.0              | 915       | 2716             | 0.0              |
| 400       | 1856             | 0.0              | 530       | 89283            | 38.6             | 660       | 42018            | 0.0              | 790       | 2655             | 0.0              | 920       | 2656             | 0.0              |
| 405       | 2374             | 0.0              | 535       | 94097            | 33.9             | 665       | 36742            | 0.0              | 795       | 2467             | 0.0              | 925       | 2671             | 0.0              |
| 410       | 4084             | 0.2              | 540       | 96845            | 28.3             | 670       | 32105            | 0.0              | 800       | 2609             | 0.0              | 930       | 3292             | 0.0              |
| 415       | 8543             | 0.6              | 545       | 100829           | 23.4             | 675       | 27946            | 0.0              | 805       | 2293             | 0.0              | 935       | 3188             | 0.0              |
| 420       | 18394            | 2.1              | 550       | 105648           | 19.0             | 680       | 24146            | 0.0              | 810       | 2188             | 0.0              | 940       | 1997             | 0.0              |
| 425       | 37987            | 5.9              | 555       | 110017           | 14.8             | 685       | 21191            | 0.0              | 815       | 2386             | 0.0              | 945       | 2623             | 0.0              |
| 430       | 67605            | 14.3             | 560       | 114586           | 11.3             | 690       | 18544            | 0.0              | 820       | 2712             | 0.0              | 950       | 2969             | 0.0              |
| 435       | 102160           | 27.3             | 565       | 118987           | 8.4              | 695       | 16058            | 0.0              | 825       | 2473             | 0.0              | 955       | 2277             | 0.0              |
| 440       | 135103           | 45.1             | 570       | 122326           | 6.0              | 700       | 14133            | 0.0              | 830       | 1969             | 0.0              | 960       | 4267             | 0.0              |
| 445       | 140126           | 55.3             | 575       | 125968           | 4.2              | 705       | 12309            | 0.0              | 835       | 1917             | 0.0              | 965       | 2034             | 0.0              |
| 450       | 102339           | 47.2             | 580       | 127613           | 2.9              | 710       | 11142            | 0.0              | 840       | 2248             | 0.0              | 970       | 3586             | 0.0              |
| 455       | 58751            | 30.8             | 585       | 129466           | 1.9              | 715       | 10143            | 0.0              | 845       | 2266             | 0.0              | 975       | 2505             | 0.0              |
| 460       | 36892            | 21.7             | 590       | 128813           | 1.3              | 720       | 9072             | 0.0              | 850       | 2558             | 0.0              | 980       | 2666             | 0.0              |
| 465       | 24637            | 16.1             | 595       | 126387           | 0.8              | 725       | 8130             | 0.0              | 855       | 2767             | 0.0              | 985       | 2934             | 0.0              |
| 470       | 16738            | 12.0             | 600       | 123477           | 0.5              | 730       | 7149             | 0.0              | 860       | 2826             | 0.0              | 990       | 4120             | 0.0              |
| 475       | 13456            | 10.3             | 605       | 118718           | 0.3              | 735       | 6311             | 0.0              | 865       | 2385             | 0.0              | 995       | 3858             | 0.0              |
| 480       | 13081            | 10.5             | 610       | 112091           | 0.2              | 740       | 5711             | 0.0              | 870       | 3194             | 0.0              | 1000      | 3405             | 0.0              |
| 485       | 14734            | 12.1             | 615       | 105039           | 0.1              | 745       | 5111             | 0.0              | 875       | 3189             | 0.0              |           |                  |                  |

### Summary

$R_f = 71.7$   
 $R_g = 96.9$   
 CIE  $R_a = 71.2$   
 $R_g = -29.7$



### Color Vector Graphics



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 55 | CES51 = 86 | CES76 = 45 |
| CES02 = 61 | CES27 = 80 | CES52 = 87 | CES77 = 68 |
| CES03 = 30 | CES28 = 79 | CES53 = 74 | CES78 = 49 |
| CES04 = 70 | CES29 = 51 | CES54 = 81 | CES79 = 77 |
| CES05 = 47 | CES30 = 60 | CES55 = 80 | CES80 = 75 |
| CES06 = 50 | CES31 = 56 | CES56 = 69 | CES81 = 75 |
| CES07 = 40 | CES32 = 52 | CES57 = 67 | CES82 = 90 |
| CES08 = 39 | CES33 = 62 | CES58 = 69 | CES83 = 85 |
| CES09 = 29 | CES34 = 65 | CES59 = 86 | CES84 = 87 |
| CES10 = 74 | CES35 = 81 | CES60 = 91 | CES85 = 83 |
| CES11 = 57 | CES36 = 92 | CES61 = 85 | CES86 = 72 |
| CES12 = 63 | CES37 = 74 | CES62 = 81 | CES87 = 77 |
| CES13 = 42 | CES38 = 69 | CES63 = 72 | CES88 = 77 |
| CES14 = 74 | CES39 = 92 | CES64 = 69 | CES89 = 72 |
| CES15 = 71 | CES40 = 86 | CES65 = 64 | CES90 = 75 |
| CES16 = 46 | CES41 = 84 | CES66 = 63 | CES91 = 91 |
| CES17 = 49 | CES42 = 75 | CES67 = 60 | CES92 = 66 |
| CES18 = 56 | CES43 = 70 | CES68 = 67 | CES93 = 80 |
| CES19 = 72 | CES44 = 98 | CES69 = 77 | CES94 = 56 |
| CES20 = 65 | CES45 = 80 | CES70 = 57 | CES95 = 72 |
| CES21 = 86 | CES46 = 77 | CES71 = 53 | CES96 = 78 |
| CES22 = 78 | CES47 = 74 | CES72 = 84 | CES97 = 83 |
| CES23 = 92 | CES48 = 66 | CES73 = 47 | CES98 = 73 |
| CES24 = 91 | CES49 = 76 | CES74 = 96 | CES99 = 63 |
| CES25 = 72 | CES50 = 85 | CES75 = 52 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**


(END OF REPORT)