

Signify Classified - Internal  
Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269



Scaled data based on original data using  
LM-79-2019 Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Test Report Prepared for  
Cooper Lighting Solutions

Brand: STREETWORKS

Report Number: P360403

Luminaire Tested: NVN-SA3C-722-U-5WQ

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-2019  
Report Number: P360403  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-2)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: STREETWORKS  
Catalog Number: NVN-SA3C-722-U-5WQ  
Description: NAVION ROADWAY AND AREA LUMINAIRE  
(3) 70 CRI, 2200K, 1050mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE V WIDE OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 16462 lumens  
Efficiency: N/A  
Efficacy: 99.2 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 1.5' x H: 0')  
IES Classification: Type V - Short  
BUG Rating: B4 - U0 - G2

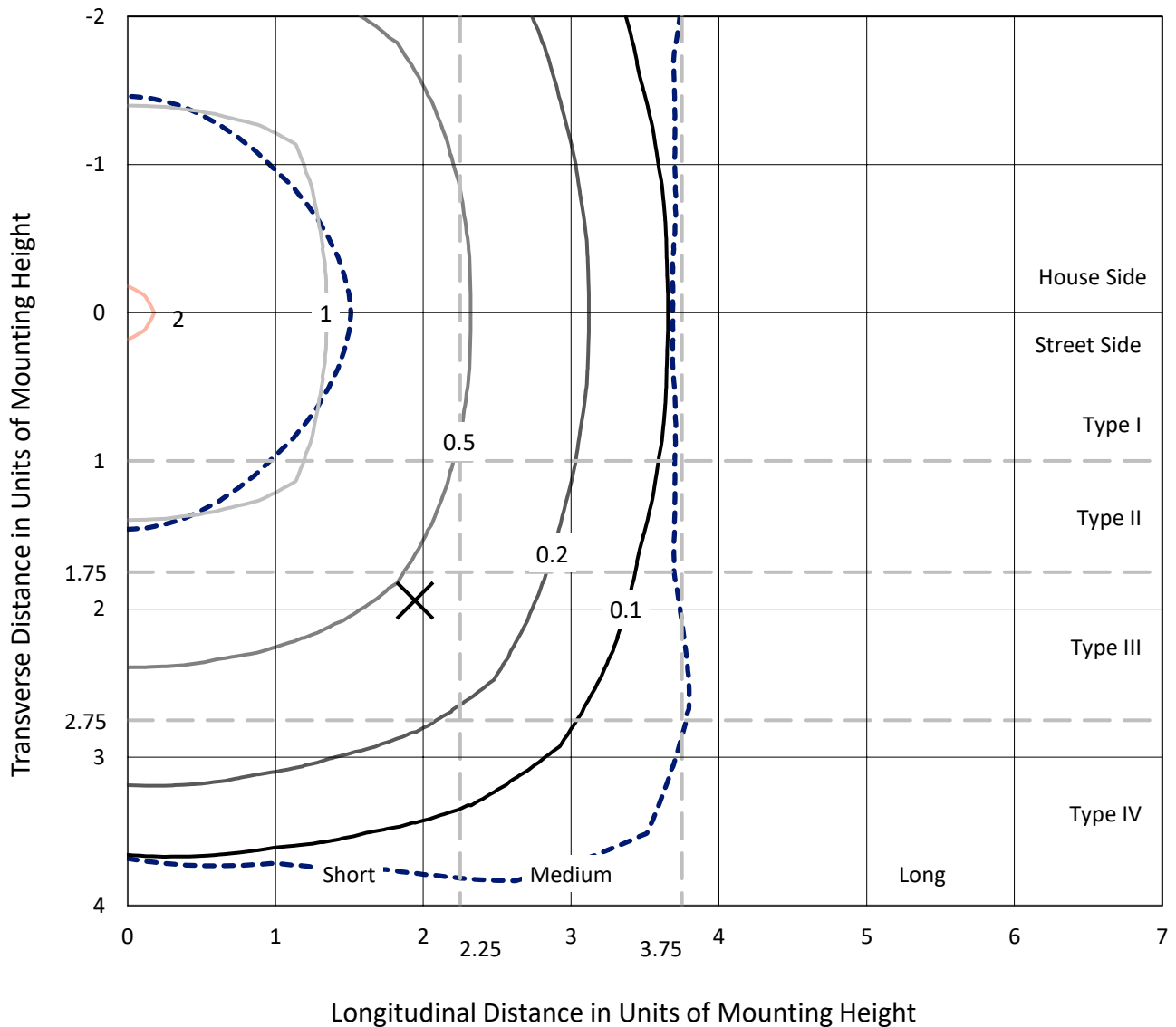
Input Watts (W): 166  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT



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### Iso-Footcandle Lines of Horizontal Illumination

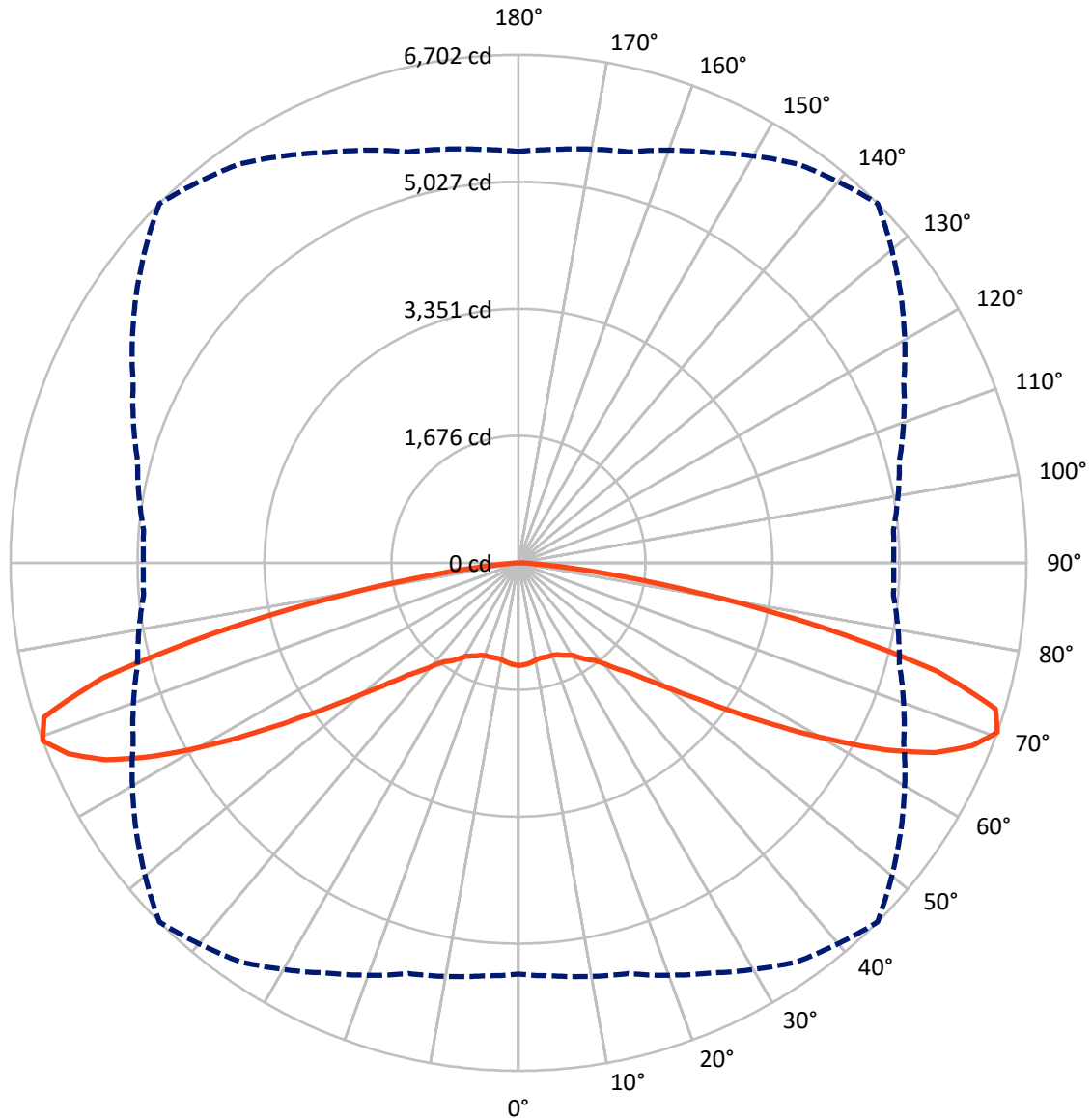
× Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 2.2 fc  
 Type V - Short - N/A

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### Luminous Intensity Polar Plot



— Vertical Plane Through 45-Deg Lateral      - - - Horizontal Cone Through 70-Deg Vertical

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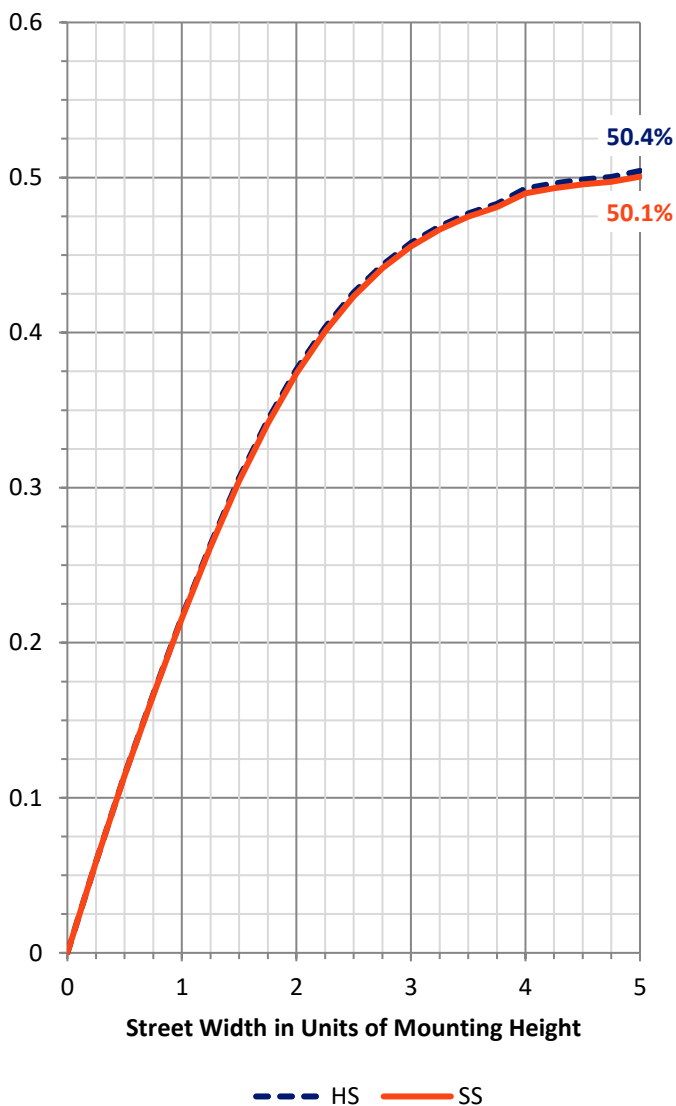
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 8231.0   | 0.0    | 8231.0  |
|                    | % Fixture | 50.0     | 0.0    | 50.0    |
| <b>Street Side</b> | Lumens    | 8231.0   | 0.0    | 8231.0  |
|                    | % Fixture | 50.0     | 0.0    | 50.0    |
| <b>Total</b>       | Lumens    | 16462.0  | 0.0    | 16462.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 126.5   | 0.8       |
| 10°-20°   | 369.4   | 2.2       |
| 20°-30°   | 629.8   | 3.8       |
| 30°-40°   | 984.0   | 6.0       |
| 40°-50°   | 1667.7  | 10.1      |
| 50°-60°   | 3041.1  | 18.5      |
| 60°-70°   | 5235.5  | 31.8      |
| 70°-80°   | 4103.8  | 24.9      |
| 80°-90°   | 304.3   | 1.8       |
| 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°    | 16462.0 | 100.0     |
| 0°-180°   | 16462.0 | 100.0     |

**Coefficient of Utilization**

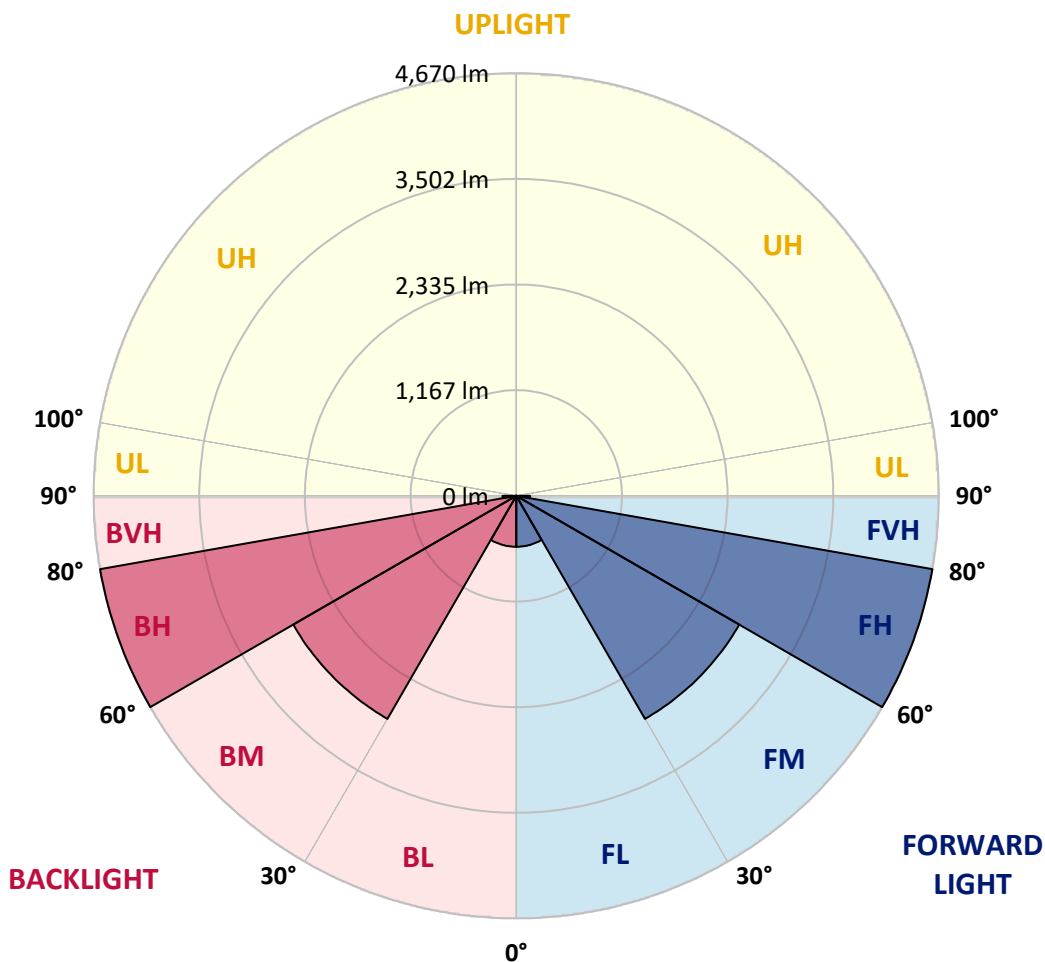


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**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone           | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|----------------|--------|-----------|-------------------------|------|---------|
|                |        |           | B                       | U    | G       |
| FL (0°-30°)    | 562.8  | 3.4       |                         |      |         |
| FM (30°-60°)   | 2846.4 | 17.3      |                         |      |         |
| FH (60°-80°)   | 4669.7 | 28.4      |                         |      | G2/5000 |
| FVH (80°-90°)  | 152.1  | 0.9       |                         |      | G2/225  |
| BL (0°-30°)    | 562.8  | 3.4       | B2/1000                 |      |         |
| BM (30°-60°)   | 2846.4 | 17.3      | B3/5000                 |      |         |
| BH (60°-80°)   | 4669.7 | 28.4      | B4/5000                 |      | G2/5000 |
| BVH (80°-90°)  | 152.1  | 0.9       |                         |      | G2/225  |
| UL (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B4-U0-G2**  
 Type V Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 75°    | 85°    | 90°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1354.8 | 1354.8 | 1354.8 | 1354.8 | 1354.8 | 1354.8 | 1354.8 | 1354.8 | 1354.8 | 1354.8 | 1354.8 |
| 2.5°  | 1348.8 | 1350.5 | 1348.8 | 1349.9 | 1347.2 | 1348.3 | 1348.3 | 1348.3 | 1347.7 | 1348.3 | 1347.2 |
| 5°    | 1336.9 | 1337.9 | 1335.8 | 1336.9 | 1335.2 | 1336.9 | 1337.4 | 1336.9 | 1335.8 | 1336.3 | 1334.1 |
| 7.5°  | 1318.9 | 1320.0 | 1318.3 | 1320.0 | 1317.8 | 1320.5 | 1320.0 | 1318.3 | 1316.7 | 1316.7 | 1314.5 |
| 10°   | 1309.1 | 1309.6 | 1305.3 | 1303.6 | 1298.7 | 1299.8 | 1301.5 | 1303.1 | 1304.7 | 1308.0 | 1307.4 |
| 12.5° | 1309.6 | 1309.6 | 1303.1 | 1296.0 | 1288.9 | 1290.6 | 1293.3 | 1299.3 | 1305.8 | 1311.8 | 1312.4 |
| 15°   | 1315.1 | 1314.5 | 1304.7 | 1293.3 | 1288.4 | 1293.3 | 1294.9 | 1298.7 | 1309.1 | 1319.4 | 1320.0 |
| 17.5° | 1318.9 | 1318.9 | 1303.6 | 1290.6 | 1290.0 | 1297.6 | 1297.1 | 1298.7 | 1310.2 | 1325.4 | 1326.0 |
| 20°   | 1326.0 | 1326.0 | 1306.4 | 1292.2 | 1292.2 | 1300.4 | 1300.9 | 1303.6 | 1315.1 | 1332.0 | 1334.7 |
| 22.5° | 1341.8 | 1342.3 | 1321.6 | 1310.2 | 1311.3 | 1316.2 | 1317.8 | 1322.2 | 1332.5 | 1351.0 | 1354.3 |
| 25°   | 1364.1 | 1365.2 | 1343.9 | 1337.4 | 1341.2 | 1350.5 | 1349.4 | 1352.6 | 1364.1 | 1382.1 | 1385.3 |
| 27.5° | 1395.1 | 1392.4 | 1372.8 | 1370.1 | 1373.9 | 1380.4 | 1379.9 | 1380.4 | 1389.7 | 1406.0 | 1409.8 |
| 30°   | 1435.4 | 1434.3 | 1420.2 | 1421.8 | 1420.2 | 1418.0 | 1418.5 | 1422.9 | 1427.8 | 1440.9 | 1444.7 |
| 32.5° | 1474.6 | 1475.7 | 1467.0 | 1475.2 | 1487.1 | 1495.3 | 1482.8 | 1470.8 | 1465.4 | 1472.4 | 1475.7 |
| 35°   | 1545.4 | 1548.1 | 1534.5 | 1529.1 | 1545.4 | 1569.4 | 1534.0 | 1514.4 | 1525.3 | 1534.5 | 1537.2 |
| 37.5° | 1665.8 | 1667.4 | 1644.5 | 1622.7 | 1610.8 | 1633.6 | 1598.2 | 1599.9 | 1638.0 | 1655.4 | 1654.9 |
| 40°   | 1803.0 | 1803.5 | 1788.3 | 1769.2 | 1748.5 | 1754.0 | 1739.8 | 1744.2 | 1769.2 | 1785.0 | 1789.4 |
| 42.5° | 1966.3 | 1964.7 | 1940.8 | 1913.5 | 1907.5 | 1913.0 | 1889.0 | 1885.8 | 1914.6 | 1942.9 | 1943.5 |
| 45°   | 2178.2 | 2174.4 | 2143.3 | 2113.4 | 2084.5 | 2072.5 | 2066.5 | 2082.3 | 2122.1 | 2148.2 | 2148.8 |
| 47.5° | 2406.3 | 2396.0 | 2379.7 | 2355.7 | 2330.6 | 2318.7 | 2308.9 | 2316.5 | 2345.3 | 2355.7 | 2356.8 |
| 50°   | 2641.0 | 2643.2 | 2646.5 | 2637.2 | 2628.0 | 2624.2 | 2598.6 | 2583.9 | 2592.6 | 2573.5 | 2570.8 |
| 52.5° | 2919.3 | 2923.7 | 2955.2 | 2981.9 | 2997.7 | 3005.9 | 2957.4 | 2906.8 | 2878.5 | 2841.4 | 2830.5 |
| 55°   | 3247.7 | 3254.7 | 3301.0 | 3375.1 | 3451.3 | 3491.6 | 3403.9 | 3309.2 | 3221.5 | 3152.4 | 3130.0 |
| 57.5° | 3613.6 | 3626.1 | 3689.8 | 3832.0 | 3988.2 | 4083.5 | 3935.4 | 3763.3 | 3594.0 | 3494.3 | 3476.9 |
| 60°   | 4042.7 | 4054.7 | 4142.9 | 4346.5 | 4599.8 | 4743.0 | 4518.6 | 4237.1 | 4026.4 | 3931.1 | 3898.9 |
| 62.5° | 4553.5 | 4554.6 | 4662.9 | 4900.9 | 5235.2 | 5434.5 | 5130.7 | 4754.4 | 4537.1 | 4422.2 | 4391.2 |
| 65°   | 5102.9 | 5105.6 | 5217.8 | 5474.8 | 5820.6 | 6037.4 | 5694.3 | 5302.2 | 5036.5 | 4867.1 | 4843.2 |
| 67.5° | 5491.2 | 5502.6 | 5620.8 | 5930.1 | 6253.5 | 6449.0 | 6094.0 | 5650.7 | 5343.6 | 5141.6 | 5121.4 |
| 70°   | 5429.1 | 5473.8 | 5612.6 | 5973.6 | 6423.4 | 6702.2 | 6158.8 | 5609.3 | 5204.2 | 4965.7 | 4948.8 |
| 72.5° | 4734.8 | 4820.3 | 5005.4 | 5479.2 | 6198.5 | 6582.4 | 5805.4 | 5024.0 | 4565.5 | 4362.3 | 4331.8 |
| 75°   | 3224.2 | 3363.1 | 3642.5 | 4325.9 | 5295.7 | 5699.2 | 4887.3 | 4005.7 | 3574.4 | 3293.4 | 3272.7 |
| 77.5° | 1437.6 | 1469.2 | 1823.1 | 2610.0 | 3654.4 | 4092.8 | 3551.0 | 2620.3 | 1966.9 | 1568.8 | 1485.0 |
| 80°   | 400.8  | 405.7  | 541.3  | 972.0  | 1829.1 | 2404.7 | 1963.6 | 1021.0 | 573.9  | 404.6  | 381.2  |
| 82.5° | 127.4  | 138.3  | 168.8  | 252.1  | 614.8  | 1097.3 | 631.1  | 272.3  | 193.9  | 154.7  | 139.4  |
| 85°   | 62.1   | 61.5   | 85.5   | 102.4  | 156.8  | 242.9  | 167.2  | 126.3  | 110.5  | 73.5   | 66.4   |
| 87.5° | 26.1   | 26.7   | 39.8   | 35.9   | 45.7   | 39.2   | 53.9   | 56.6   | 59.4   | 32.7   | 28.3   |
| 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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1121 Highway 74 South  
Peachtree City, GA 30269



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

Report Prepared for

Cooper Lighting Solutions

McGRAW-EDISON

Report Number: SP1-1908-441-10-R4

Test Date: 10/25/2019

Luminaire Tested: SA1C-722-U-5WQ

Data in this report applies to families of products SA1C-722-U-5WQ.



**Test Information**

Test Method: LM-79-2008 Report  
 Number: SP1-1908-441-10-R4  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry: 4π  
 Issue Date: 10/28/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: McGRAW-EDISON  
 Catalog Number: **SA1C-722-U-5WQ**  
 Description: McGRAW EDISON ROADWAY AND AREA LUMINAIRE

\*\*\*THIS IS A REVISION OF SP1-1908-441-4-R3. TO UPDATE THE CATALOG INFORMATION.\*\*\*TESTED IN SITU. ROADWAY AND AREA LUMINAIRE. (1) 70 CRI, 5000K, 1050MA LIGHTSQUARE WITH 16 LEDS AND TYPE V WIDE OPTICS.

**Spectral Parameters**

CCT (K): 2237  
 CIE u': 0.2876  
 CIE v': 0.5346  
 Duv: -0.0006  
 CIE x: 0.5005  
 CIE y: 0.4134  
 CIE z: 0.0860  
 Peak Wavelength (nm): 603  
 Dominant Wavelength (nm): 587  
 Purity: 74.5  
 Rf: 69.8  
 Rg: 99.2

|           |      |      |       |
|-----------|------|------|-------|
| CRI (Ra): | 72.0 |      |       |
| R1:       | 68.9 | R9:  | -17.4 |
| R2:       | 83.0 | R10: | 61.3  |
| R3:       | 95.2 | R11: | 59.8  |
| R4:       | 66.2 | R12: | 50.5  |
| R5:       | 65.9 | R13: | 71.1  |
| R6:       | 76.3 | R14: | 96.9  |
| R7:       | 76.7 |      |       |
| R8:       | 43.8 |      |       |



**Test Conditions**

Stabilization Time: 71M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.7/41%  
 Sphere Temperature (°C): 25.6

REPORT NUMBER: SP1-1908-441-10-R4

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

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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 2200K 4-step quadrangle

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**Photopic Flux vs. Wavelength**



#####

| $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) |
|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|
| 360               | 1768                                 | NR                             | 490               | 5206                                 | NR                             | 620               | 130919                               | NR                             | 750               | 8553                                 | NR                             | 880               | 2713                                 | NR                             |
| 365               | 1569                                 | NR                             | 495               | 7286                                 | NR                             | 625               | 125335                               | NR                             | 755               | 7696                                 | NR                             | 885               | 2316                                 | NR                             |
| 370               | 1594                                 | NR                             | 500               | 10654                                | NR                             | 630               | 118388                               | NR                             | 760               | 6978                                 | NR                             | 890               | 2539                                 | NR                             |
| 375               | 1744                                 | NR                             | 505               | 15189                                | NR                             | 635               | 111855                               | NR                             | 765               | 6377                                 | NR                             | 895               | 1933                                 | NR                             |
| 380               | 1659                                 | NR                             | 510               | 20541                                | NR                             | 640               | 104062                               | NR                             | 770               | 5600                                 | NR                             | 900               | 2216                                 | NR                             |
| 385               | 1504                                 | NR                             | 515               | 26492                                | NR                             | 645               | 96365                                | NR                             | 775               | 5000                                 | NR                             | 905               | 2067                                 | NR                             |
| 390               | 1541                                 | NR                             | 520               | 32294                                | NR                             | 650               | 88651                                | NR                             | 780               | 4709                                 | NR                             | 910               | 1959                                 | NR                             |
| 395               | 1355                                 | NR                             | 525               | 38123                                | NR                             | 655               | 81152                                | NR                             | 785               | 4305                                 | NR                             | 915               | 1874                                 | NR                             |
| 400               | 1243                                 | NR                             | 530               | 43232                                | NR                             | 660               | 73523                                | NR                             | 790               | 4040                                 | NR                             | 920               | 1484                                 | NR                             |
| 405               | 1417                                 | NR                             | 535               | 48012                                | NR                             | 665               | 66123                                | NR                             | 795               | 3642                                 | NR                             | 925               | 1914                                 | NR                             |
| 410               | 2147                                 | NR                             | 540               | 52623                                | NR                             | 670               | 58677                                | NR                             | 800               | 3594                                 | NR                             | 930               | 1948                                 | NR                             |
| 415               | 3837                                 | NR                             | 545               | 57516                                | NR                             | 675               | 52349                                | NR                             | 805               | 3190                                 | NR                             | 935               | 2079                                 | NR                             |
| 420               | 7159                                 | NR                             | 550               | 62613                                | NR                             | 680               | 46159                                | NR                             | 810               | 3241                                 | NR                             | 940               | 2263                                 | NR                             |
| 425               | 12599                                | NR                             | 555               | 68554                                | NR                             | 685               | 40525                                | NR                             | 815               | 2732                                 | NR                             | 945               | 1688                                 | NR                             |
| 430               | 19019                                | NR                             | 560               | 75325                                | NR                             | 690               | 35615                                | NR                             | 820               | 2612                                 | NR                             | 950               | 1560                                 | NR                             |
| 435               | 24875                                | NR                             | 565               | 82533                                | NR                             | 695               | 31158                                | NR                             | 825               | 2966                                 | NR                             | 955               | 2826                                 | NR                             |
| 440               | 29103                                | NR                             | 570               | 90909                                | NR                             | 700               | 27409                                | NR                             | 830               | 2574                                 | NR                             | 960               | 1477                                 | NR                             |
| 445               | 29901                                | NR                             | 575               | 99621                                | NR                             | 705               | 24204                                | NR                             | 835               | 2633                                 | NR                             | 965               | 1568                                 | NR                             |
| 450               | 24862                                | NR                             | 580               | 108484                               | NR                             | 710               | 21558                                | NR                             | 840               | 2526                                 | NR                             | 970               | 2030                                 | NR                             |
| 455               | 15942                                | NR                             | 585               | 116679                               | NR                             | 715               | 19222                                | NR                             | 845               | 2631                                 | NR                             | 975               | 1986                                 | NR                             |
| 460               | 9916                                 | NR                             | 590               | 123752                               | NR                             | 720               | 17310                                | NR                             | 850               | 2079                                 | NR                             | 980               | 2540                                 | NR                             |
| 465               | 7051                                 | NR                             | 595               | 129324                               | NR                             | 725               | 15280                                | NR                             | 855               | 2309                                 | NR                             | 985               | 1139                                 | NR                             |
| 470               | 5227                                 | NR                             | 600               | 134082                               | NR                             | 730               | 13282                                | NR                             | 860               | 2528                                 | NR                             | 990               | 2018                                 | NR                             |
| 475               | 4257                                 | NR                             | 605               | 135698                               | NR                             | 735               | 11753                                | NR                             | 865               | 2121                                 | NR                             | 995               | 3445                                 | NR                             |
| 480               | 4052                                 | NR                             | 610               | 135144                               | NR                             | 740               | 10654                                | NR                             | 870               | 2751                                 | NR                             | 1000              | 3704                                 | NR                             |
| 485               | 4298                                 | NR                             | 615               | 134180                               | NR                             | 745               | 9451                                 | NR                             | 875               | 2317                                 | NR                             |                   |                                      |                                |

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Scotopic Flux vs. Wavelength



Scotopic Lumens: 4696.9

S/P: 0.85

| $\lambda$ (nm) | Power ( $\mu\text{W}/\text{nm}$ ) | Lumens ( $\phi/\text{nm}$ ) | $\lambda$ (nm) | Power ( $\mu\text{W}/\text{nm}$ ) | Lumens ( $\phi/\text{nm}$ ) | $\lambda$ (nm) | Power ( $\mu\text{W}/\text{nm}$ ) | Lumens ( $\phi/\text{nm}$ ) | $\lambda$ (nm) | Power ( $\mu\text{W}/\text{nm}$ ) | Lumens ( $\phi/\text{nm}$ ) | $\lambda$ (nm) | Power ( $\mu\text{W}/\text{nm}$ ) | Lumens ( $\phi/\text{nm}$ ) |
|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|
| 360            | 1768                              | NR                          | 490            | 5206                              | NR                          | 620            | 130919                            | NR                          | 750            | 8553                              | NR                          | 880            | 2713                              | NR                          |
| 365            | 1569                              | NR                          | 495            | 7286                              | NR                          | 625            | 125335                            | NR                          | 755            | 7696                              | NR                          | 885            | 2316                              | NR                          |
| 370            | 1594                              | NR                          | 500            | 10654                             | NR                          | 630            | 118388                            | NR                          | 760            | 6978                              | NR                          | 890            | 2539                              | NR                          |
| 375            | 1744                              | NR                          | 505            | 15189                             | NR                          | 635            | 111855                            | NR                          | 765            | 6377                              | NR                          | 895            | 1933                              | NR                          |
| 380            | 1659                              | NR                          | 510            | 20541                             | NR                          | 640            | 104062                            | NR                          | 770            | 5600                              | NR                          | 900            | 2216                              | NR                          |
| 385            | 1504                              | NR                          | 515            | 26492                             | NR                          | 645            | 96365                             | NR                          | 775            | 5000                              | NR                          | 905            | 2067                              | NR                          |
| 390            | 1541                              | NR                          | 520            | 32294                             | NR                          | 650            | 88651                             | NR                          | 780            | 4709                              | NR                          | 910            | 1959                              | NR                          |
| 395            | 1355                              | NR                          | 525            | 38123                             | NR                          | 655            | 81152                             | NR                          | 785            | 4305                              | NR                          | 915            | 1874                              | NR                          |
| 400            | 1243                              | NR                          | 530            | 43232                             | NR                          | 660            | 73523                             | NR                          | 790            | 4040                              | NR                          | 920            | 1484                              | NR                          |
| 405            | 1417                              | NR                          | 535            | 48012                             | NR                          | 665            | 66123                             | NR                          | 795            | 3642                              | NR                          | 925            | 1914                              | NR                          |
| 410            | 2147                              | NR                          | 540            | 52623                             | NR                          | 670            | 58677                             | NR                          | 800            | 3594                              | NR                          | 930            | 1948                              | NR                          |
| 415            | 3837                              | NR                          | 545            | 57516                             | NR                          | 675            | 52349                             | NR                          | 805            | 3190                              | NR                          | 935            | 2079                              | NR                          |
| 420            | 7159                              | NR                          | 550            | 62613                             | NR                          | 680            | 46159                             | NR                          | 810            | 3241                              | NR                          | 940            | 2263                              | NR                          |
| 425            | 12599                             | NR                          | 555            | 68554                             | NR                          | 685            | 40525                             | NR                          | 815            | 2732                              | NR                          | 945            | 1688                              | NR                          |
| 430            | 19019                             | NR                          | 560            | 75325                             | NR                          | 690            | 35615                             | NR                          | 820            | 2612                              | NR                          | 950            | 1560                              | NR                          |
| 435            | 24875                             | NR                          | 565            | 82533                             | NR                          | 695            | 31158                             | NR                          | 825            | 2966                              | NR                          | 955            | 2826                              | NR                          |
| 440            | 29103                             | NR                          | 570            | 90909                             | NR                          | 700            | 27409                             | NR                          | 830            | 2574                              | NR                          | 960            | 1477                              | NR                          |
| 445            | 29901                             | NR                          | 575            | 99621                             | NR                          | 705            | 24204                             | NR                          | 835            | 2633                              | NR                          | 965            | 1568                              | NR                          |
| 450            | 24862                             | NR                          | 580            | 108484                            | NR                          | 710            | 21558                             | NR                          | 840            | 2526                              | NR                          | 970            | 2030                              | NR                          |
| 455            | 15942                             | NR                          | 585            | 116679                            | NR                          | 715            | 19222                             | NR                          | 845            | 2631                              | NR                          | 975            | 1986                              | NR                          |
| 460            | 9916                              | NR                          | 590            | 123752                            | NR                          | 720            | 17310                             | NR                          | 850            | 2079                              | NR                          | 980            | 2540                              | NR                          |
| 465            | 7051                              | NR                          | 595            | 129324                            | NR                          | 725            | 15280                             | NR                          | 855            | 2309                              | NR                          | 985            | 1139                              | NR                          |
| 470            | 5227                              | NR                          | 600            | 134082                            | NR                          | 730            | 13282                             | NR                          | 860            | 2528                              | NR                          | 990            | 2018                              | NR                          |
| 475            | 4257                              | NR                          | 605            | 135698                            | NR                          | 735            | 11753                             | NR                          | 865            | 2121                              | NR                          | 995            | 3445                              | NR                          |
| 480            | 4052                              | NR                          | 610            | 135144                            | NR                          | 740            | 10654                             | NR                          | 870            | 2751                              | NR                          | 1000           | 3704                              | NR                          |
| 485            | 4298                              | NR                          | 615            | 134180                            | NR                          | 745            | 9451                              | NR                          | 875            | 2317                              | NR                          |                |                                   |                             |

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**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 1470.8 M/P: 0.27**

| λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) |
|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|
| 360    | 1768          | NR            | 490    | 5206          | NR            | 620    | 130919        | NR            | 750    | 8553          | NR            | 880    | 2713          | NR            |
| 365    | 1569          | NR            | 495    | 7286          | NR            | 625    | 125335        | NR            | 755    | 7696          | NR            | 885    | 2316          | NR            |
| 370    | 1594          | NR            | 500    | 10654         | NR            | 630    | 118388        | NR            | 760    | 6978          | NR            | 890    | 2539          | NR            |
| 375    | 1744          | NR            | 505    | 15189         | NR            | 635    | 111855        | NR            | 765    | 6377          | NR            | 895    | 1933          | NR            |
| 380    | 1659          | NR            | 510    | 20541         | NR            | 640    | 104062        | NR            | 770    | 5600          | NR            | 900    | 2216          | NR            |
| 385    | 1504          | NR            | 515    | 26492         | NR            | 645    | 96365         | NR            | 775    | 5000          | NR            | 905    | 2067          | NR            |
| 390    | 1541          | NR            | 520    | 32294         | NR            | 650    | 88651         | NR            | 780    | 4709          | NR            | 910    | 1959          | NR            |
| 395    | 1355          | NR            | 525    | 38123         | NR            | 655    | 81152         | NR            | 785    | 4305          | NR            | 915    | 1874          | NR            |
| 400    | 1243          | NR            | 530    | 43232         | NR            | 660    | 73523         | NR            | 790    | 4040          | NR            | 920    | 1484          | NR            |
| 405    | 1417          | NR            | 535    | 48012         | NR            | 665    | 66123         | NR            | 795    | 3642          | NR            | 925    | 1914          | NR            |
| 410    | 2147          | NR            | 540    | 52623         | NR            | 670    | 58677         | NR            | 800    | 3594          | NR            | 930    | 1948          | NR            |
| 415    | 3837          | NR            | 545    | 57516         | NR            | 675    | 52349         | NR            | 805    | 3190          | NR            | 935    | 2079          | NR            |
| 420    | 7159          | NR            | 550    | 62613         | NR            | 680    | 46159         | NR            | 810    | 3241          | NR            | 940    | 2263          | NR            |
| 425    | 12599         | NR            | 555    | 68554         | NR            | 685    | 40525         | NR            | 815    | 2732          | NR            | 945    | 1688          | NR            |
| 430    | 19019         | NR            | 560    | 75325         | NR            | 690    | 35615         | NR            | 820    | 2612          | NR            | 950    | 1560          | NR            |
| 435    | 24875         | NR            | 565    | 82533         | NR            | 695    | 31158         | NR            | 825    | 2966          | NR            | 955    | 2826          | NR            |
| 440    | 29103         | NR            | 570    | 90909         | NR            | 700    | 27409         | NR            | 830    | 2574          | NR            | 960    | 1477          | NR            |
| 445    | 29901         | NR            | 575    | 99621         | NR            | 705    | 24204         | NR            | 835    | 2633          | NR            | 965    | 1568          | NR            |
| 450    | 24862         | NR            | 580    | 108484        | NR            | 710    | 21558         | NR            | 840    | 2526          | NR            | 970    | 2030          | NR            |
| 455    | 15942         | NR            | 585    | 116679        | NR            | 715    | 19222         | NR            | 845    | 2631          | NR            | 975    | 1986          | NR            |
| 460    | 9916          | NR            | 590    | 123752        | NR            | 720    | 17310         | NR            | 850    | 2079          | NR            | 980    | 2540          | NR            |
| 465    | 7051          | NR            | 595    | 129324        | NR            | 725    | 15280         | NR            | 855    | 2309          | NR            | 985    | 1139          | NR            |
| 470    | 5227          | NR            | 600    | 134082        | NR            | 730    | 13282         | NR            | 860    | 2528          | NR            | 990    | 2018          | NR            |
| 475    | 4257          | NR            | 605    | 135698        | NR            | 735    | 11753         | NR            | 865    | 2121          | NR            | 995    | 3445          | NR            |
| 480    | 4052          | NR            | 610    | 135144        | NR            | 740    | 10654         | NR            | 870    | 2751          | NR            | 1000   | 3704          | NR            |
| 485    | 4298          | NR            | 615    | 134180        | NR            | 745    | 9451          | NR            | 875    | 2317          | NR            |        |               |               |

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**Summary**

$R_f = 69.8$   
 $R_g = 99.2$   
 CIE  $R_a = 72.0$   
 $R_9 = -17.4$



**Color Vector Graphics**



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 87 | CES26 = 56 | CES51 = 74 | CES76 = 56 |
| CES02 = 65 | CES27 = 76 | CES52 = 76 | CES77 = 81 |
| CES03 = 32 | CES28 = 83 | CES53 = 65 | CES78 = 63 |
| CES04 = 72 | CES29 = 46 | CES54 = 78 | CES79 = 84 |
| CES05 = 52 | CES30 = 48 | CES55 = 75 | CES80 = 84 |
| CES06 = 52 | CES31 = 51 | CES56 = 65 | CES81 = 63 |
| CES07 = 44 | CES32 = 51 | CES57 = 62 | CES82 = 92 |
| CES08 = 42 | CES33 = 53 | CES58 = 66 | CES83 = 83 |
| CES09 = 29 | CES34 = 70 | CES59 = 84 | CES84 = 92 |
| CES10 = 78 | CES35 = 85 | CES60 = 90 | CES85 = 81 |
| CES11 = 61 | CES36 = 78 | CES61 = 84 | CES86 = 56 |
| CES12 = 68 | CES37 = 80 | CES62 = 70 | CES87 = 78 |
| CES13 = 45 | CES38 = 53 | CES63 = 68 | CES88 = 72 |
| CES14 = 75 | CES39 = 90 | CES64 = 69 | CES89 = 62 |
| CES15 = 72 | CES40 = 84 | CES65 = 67 | CES90 = 67 |
| CES16 = 49 | CES41 = 75 | CES66 = 64 | CES91 = 90 |
| CES17 = 51 | CES42 = 79 | CES67 = 63 | CES92 = 67 |
| CES18 = 57 | CES43 = 64 | CES68 = 69 | CES93 = 79 |
| CES19 = 74 | CES44 = 98 | CES69 = 80 | CES94 = 52 |
| CES20 = 68 | CES45 = 73 | CES70 = 63 | CES95 = 76 |
| CES21 = 89 | CES46 = 67 | CES71 = 63 | CES96 = 78 |
| CES22 = 81 | CES47 = 60 | CES72 = 87 | CES97 = 77 |
| CES23 = 92 | CES48 = 48 | CES73 = 56 | CES98 = 71 |
| CES24 = 92 | CES49 = 64 | CES74 = 87 | CES99 = 65 |
| CES25 = 74 | CES50 = 74 | CES75 = 66 |            |





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Color Rendition by Hue-Angle Bin



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Measure Comparisons



(END OF REPORT)