

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: P868418

Luminaire Tested: **EMM2-HTN-SA1B-727-U-T2R-HSS**

Issue Date: 08/22/2024



Test Information

Test Method: LM-79-08
Report Number: P868418
Test Lab: INNOVATION CENTER(G3)
Issue Date: 08/22/2024
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: INVUE
Catalog Number: EMM2-HTN-SA1B-727-U-T2R-HSS
Description: EPIC MODERN TALL HOUSING DISCRETE LED ARRAYS 60W 70CRI 2700K
FIXTURE w/ TYPE II ROADWAY DISTRIBUTION OPTIC AND HOUSE SIDE SHIELD
Light Source: (10) 2700K CCT, 70 CRI LEDs
Ballast/Driver: ELECTRONIC DRIVER

Summary

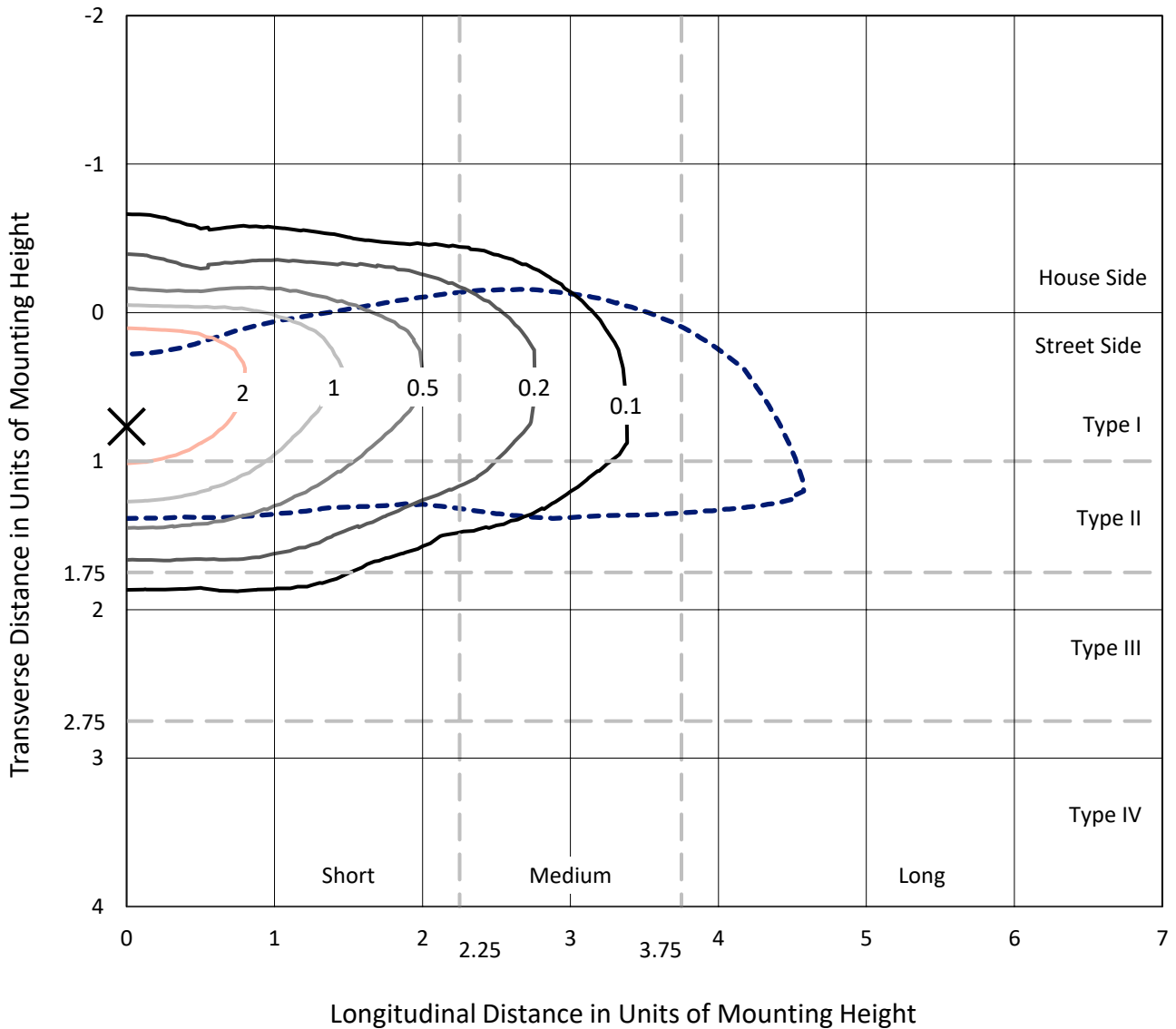
Lumens per Lamp: N/A
Luminaire Lumens: 4125 lumens
Efficiency: N/A
Efficacy: 93.7 lumens/watt
Luminous Opening: Rectangular (W 0.33' x L: 0.33' x H: 0')
IES Classification: Type II - Short
BUG Rating: B1 - U0 - G1

Input Watts (W): 44
Input Voltage (V): 120
Input Current (A_{in}): NR
Voltage Rise (V): NR
Power Factor: 0.99
Total Harmonic Distortion (THDi): 6.91%
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 24 FT

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Iso-Footcandle Lines of Horizontal Illumination

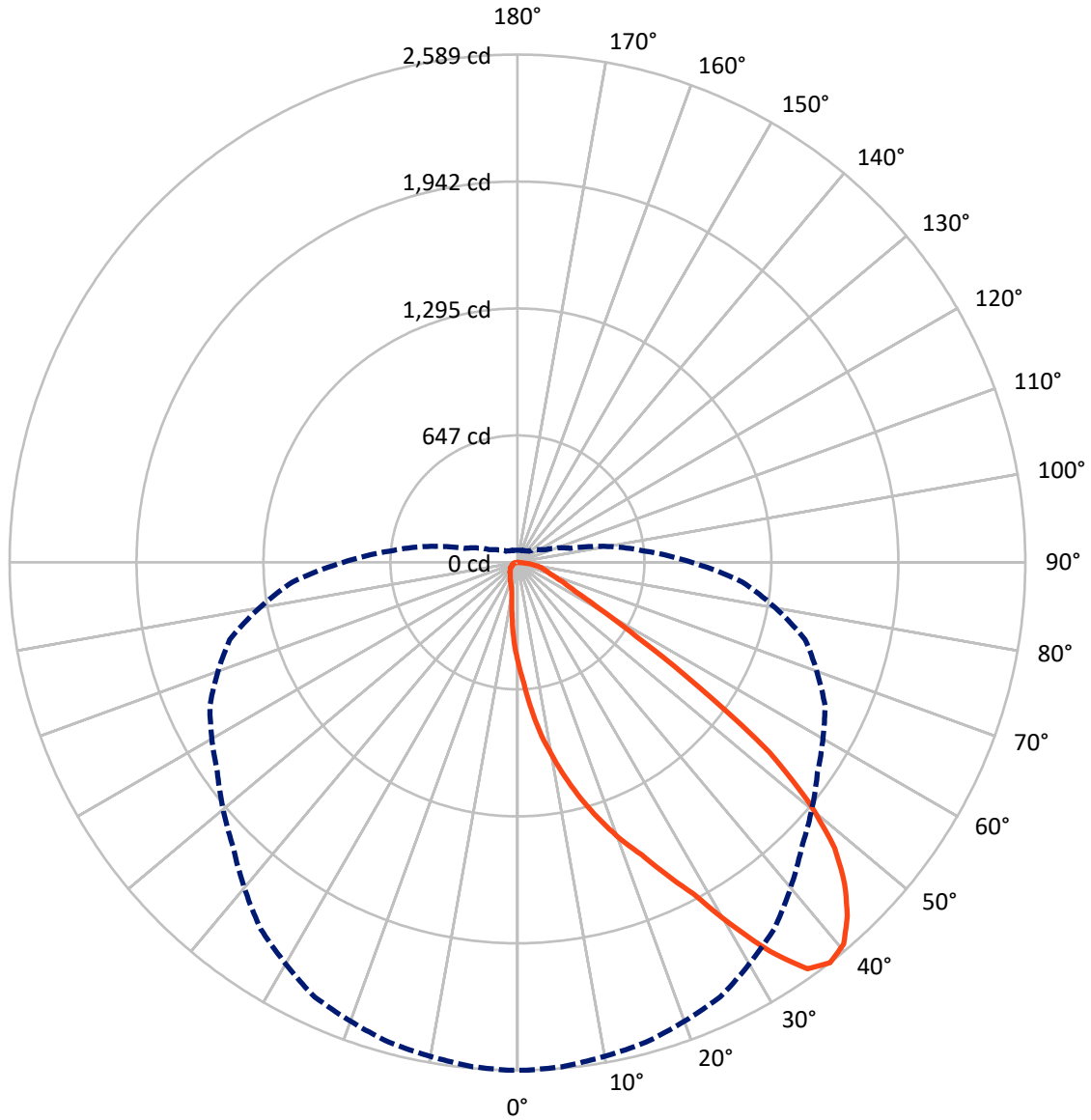
× Max cd
 - - - 1/2 Max cd



Based on 20 foot mounting height. Maximum calculated value = 3.5 fc
 Type II - Short - N/A

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Luminous Intensity Polar Plot



— Vertical Plane Through 0-Deg Lateral - - - Horizontal Cone Through 37.5-Deg Vertical

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FLUX DISTRIBUTION:

| | | Downward | Upward | Total |
|--------------------|-----------|----------|--------|--------|
| House Side | Lumens | 492.0 | 0.0 | 492.0 |
| | % Fixture | 11.9 | 0.0 | 11.9 |
| Street Side | Lumens | 3633.0 | 0.0 | 3633.0 |
| | % Fixture | 88.1 | 0.0 | 88.1 |
| Total | Lumens | 4125.0 | 0.0 | 4125.0 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10° | 51.3 | 1.2 |
| 10°-20° | 179.3 | 4.3 |
| 20°-30° | 369.8 | 9.0 |
| 30°-40° | 650.7 | 15.8 |
| 40°-50° | 883.6 | 21.4 |
| 50°-60° | 875.4 | 21.2 |
| 60°-70° | 673.9 | 16.3 |
| 70°-80° | 391.1 | 9.5 |
| 80°-90° | 49.8 | 1.2 |
| 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° | 4125.0 | 100.0 |
| 0°-180° | 4125.0 | 100.0 |

Coefficient of Utilization



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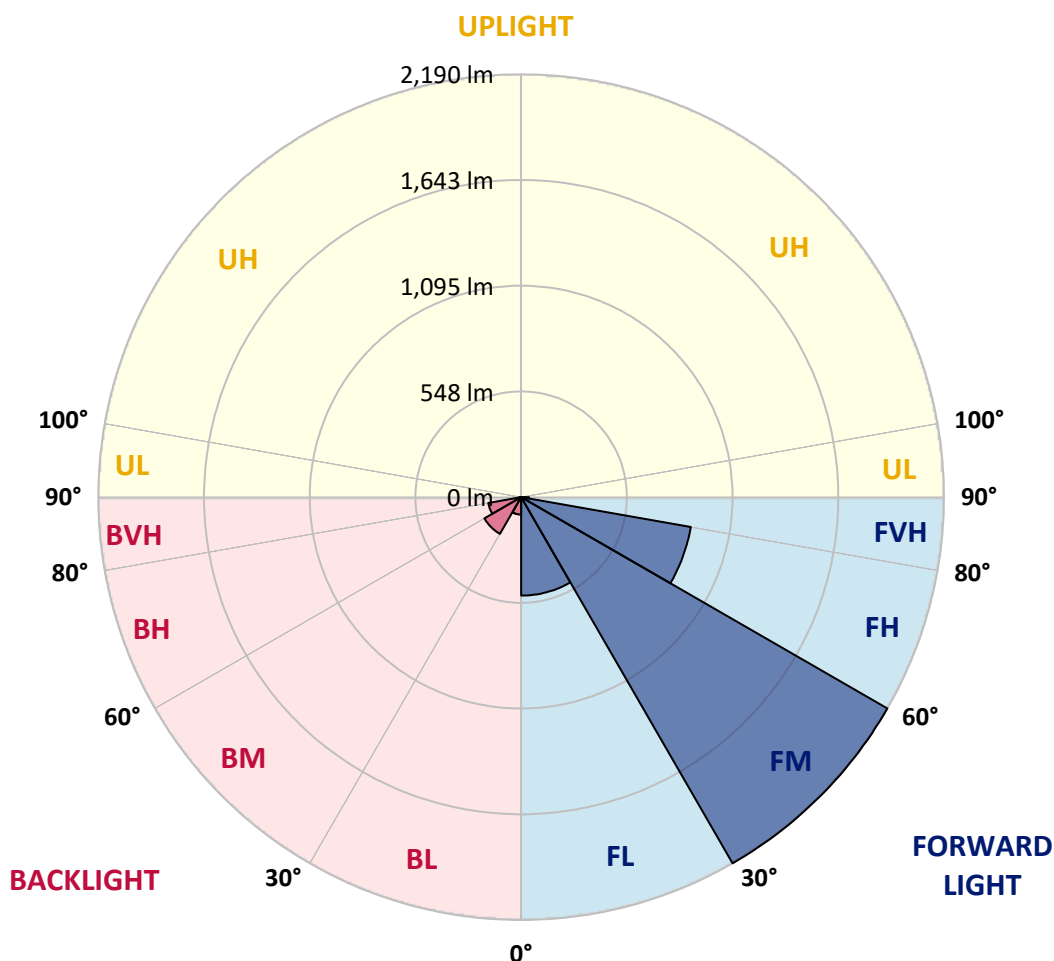
CATALOG NUMBER: EMM2-HTN-SA1B-727-U-T2R-HSS

LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | Lumens | % Fixture | Zone Rating/Lumen Limit | | |
|----------------|--------|-----------|-------------------------|------|---------|
| | | | B | U | G |
| FL (0°-30°) | 509.9 | 12.4 | | | |
| FM (30°-60°) | 2190.0 | 53.1 | | | |
| FH (60°-80°) | 892.5 | 21.6 | | | G1/1800 |
| FVH (80°-90°) | 40.6 | 1.0 | | | G1/100 |
| BL (0°-30°) | 90.5 | 2.2 | B0/110 | | |
| BM (30°-60°) | 219.7 | 5.3 | B0/220 | | |
| BH (60°-80°) | 172.6 | 4.2 | B1/500 | | G1/500 |
| BVH (80°-90°) | 9.2 | 0.2 | | | G0/10 |
| UL (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH (100°-180°) | 0.0 | 0.0 | | U0/0 | |

BUG Rating: B1-U0-G1

Type II Short





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CANDELA DISTRIBUTION (FULL):

| | 0° | 1° | 5° | 15° | 25° | 35° | 45° | 55° | 65° | 75° | 85° |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0° | 511.1 | 511.1 | 511.1 | 511.1 | 511.1 | 511.1 | 511.1 | 511.1 | 511.1 | 511.1 | 511.1 |
| 2.5° | 615.9 | 625.1 | 618.2 | 612.4 | 604.4 | 596.3 | 584.8 | 572.2 | 556.0 | 536.5 | 519.2 |
| 5° | 755.2 | 759.8 | 757.5 | 754.0 | 728.7 | 704.5 | 680.4 | 650.4 | 609.0 | 572.2 | 533.0 |
| 7.5° | 894.5 | 892.2 | 886.4 | 876.1 | 853.1 | 825.4 | 781.7 | 732.2 | 673.5 | 609.0 | 548.0 |
| 10° | 1016.5 | 1020.0 | 1015.4 | 999.3 | 970.5 | 932.5 | 879.5 | 823.1 | 743.7 | 653.9 | 568.7 |
| 12.5° | 1144.3 | 1146.6 | 1146.6 | 1112.1 | 1092.5 | 1033.8 | 977.4 | 901.4 | 812.8 | 709.1 | 592.9 |
| 15° | 1269.8 | 1265.2 | 1265.2 | 1242.2 | 1207.6 | 1142.0 | 1078.7 | 986.6 | 886.4 | 761.0 | 620.5 |
| 17.5° | 1389.5 | 1391.8 | 1381.5 | 1356.1 | 1322.7 | 1259.4 | 1181.1 | 1079.8 | 959.0 | 823.1 | 649.3 |
| 20° | 1508.1 | 1501.2 | 1496.6 | 1471.3 | 1435.6 | 1360.7 | 1285.9 | 1170.8 | 1044.2 | 893.3 | 689.6 |
| 22.5° | 1618.6 | 1622.1 | 1610.6 | 1570.3 | 1536.9 | 1469.0 | 1383.8 | 1277.8 | 1133.9 | 963.6 | 733.3 |
| 25° | 1761.4 | 1749.8 | 1760.2 | 1711.9 | 1660.1 | 1579.5 | 1482.8 | 1378.0 | 1231.8 | 1049.9 | 787.4 |
| 27.5° | 1913.3 | 1920.2 | 1914.5 | 1861.5 | 1791.3 | 1683.1 | 1581.8 | 1470.1 | 1330.8 | 1131.6 | 848.4 |
| 30° | 2140.1 | 2136.7 | 2137.8 | 2058.4 | 1942.1 | 1813.2 | 1688.8 | 1566.8 | 1429.8 | 1231.8 | 919.8 |
| 32.5° | 2364.6 | 2377.3 | 2346.2 | 2276.0 | 2142.4 | 1947.9 | 1795.9 | 1660.1 | 1525.4 | 1318.1 | 992.3 |
| 35° | 2545.3 | 2541.9 | 2529.2 | 2450.9 | 2318.5 | 2129.7 | 1917.9 | 1763.7 | 1626.7 | 1424.1 | 1072.9 |
| 37.5° | 2589.1 | 2589.1 | 2581.0 | 2532.7 | 2445.2 | 2281.7 | 2050.3 | 1867.3 | 1730.3 | 1518.5 | 1151.2 |
| 40° | 2560.3 | 2554.5 | 2549.9 | 2517.7 | 2470.5 | 2373.8 | 2189.6 | 1974.3 | 1840.8 | 1640.5 | 1237.6 |
| 42.5° | 2465.9 | 2467.1 | 2461.3 | 2442.9 | 2417.6 | 2380.7 | 2276.0 | 2088.3 | 1949.0 | 1755.6 | 1322.7 |
| 45° | 2339.3 | 2341.6 | 2334.7 | 2332.4 | 2319.7 | 2319.7 | 2295.5 | 2178.1 | 2051.5 | 1873.0 | 1416.0 |
| 47.5° | 2176.9 | 2175.8 | 2172.3 | 2166.6 | 2191.9 | 2219.5 | 2241.4 | 2228.8 | 2142.4 | 1999.7 | 1500.0 |
| 50° | 1929.4 | 1927.1 | 1937.5 | 1966.3 | 2028.4 | 2089.5 | 2153.9 | 2213.8 | 2208.0 | 2117.1 | 1601.3 |
| 52.5° | 1608.2 | 1593.3 | 1604.8 | 1693.4 | 1821.2 | 1957.1 | 2048.0 | 2142.4 | 2241.4 | 2241.4 | 1701.5 |
| 55° | 1124.7 | 1137.4 | 1144.3 | 1274.4 | 1526.5 | 1760.2 | 1920.2 | 2042.3 | 2228.8 | 2340.4 | 1812.0 |
| 57.5° | 716.1 | 720.7 | 741.4 | 881.8 | 1177.7 | 1470.1 | 1753.3 | 1953.6 | 2181.6 | 2423.3 | 1922.5 |
| 60° | 482.4 | 466.2 | 482.4 | 562.9 | 847.3 | 1153.5 | 1508.1 | 1841.9 | 2113.6 | 2483.2 | 2044.6 |
| 62.5° | 340.8 | 339.6 | 344.2 | 391.4 | 604.4 | 866.9 | 1200.7 | 1691.1 | 2059.5 | 2486.6 | 2135.5 |
| 65° | 275.1 | 267.1 | 270.5 | 297.0 | 405.2 | 635.5 | 880.7 | 1418.3 | 2011.2 | 2425.6 | 2180.4 |
| 67.5° | 221.0 | 217.6 | 219.9 | 237.2 | 303.9 | 477.8 | 620.5 | 1078.7 | 1908.7 | 2322.0 | 2155.1 |
| 70° | 180.7 | 181.9 | 183.0 | 200.3 | 241.8 | 361.5 | 443.2 | 740.2 | 1690.0 | 2204.6 | 2041.1 |
| 72.5° | 156.6 | 156.6 | 157.7 | 169.2 | 202.6 | 286.7 | 335.0 | 481.2 | 1367.6 | 2077.9 | 1831.6 |
| 75° | 138.1 | 138.1 | 138.1 | 148.5 | 172.7 | 230.2 | 260.2 | 329.2 | 982.0 | 1843.1 | 1515.0 |
| 77.5° | 119.7 | 120.9 | 120.9 | 130.1 | 148.5 | 179.6 | 200.3 | 227.9 | 626.3 | 1424.1 | 1146.6 |
| 80° | 92.1 | 92.1 | 93.2 | 103.6 | 126.6 | 140.4 | 147.4 | 161.2 | 329.2 | 894.5 | 727.6 |
| 82.5° | 64.5 | 65.6 | 65.6 | 66.8 | 85.2 | 86.3 | 79.4 | 80.6 | 119.7 | 297.0 | 276.3 |
| 85° | 6.9 | 8.1 | 9.2 | 9.2 | 15.0 | 18.4 | 19.6 | 18.4 | 19.6 | 34.5 | 34.5 |
| 87.5° | 0.0 | 0.0 | 0.0 | 0.0 | 1.2 | 2.3 | 2.3 | 3.5 | 3.5 | 3.5 | 3.5 |
| 90° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |



REPORT NUMBER: P868418

CATALOG NUMBER: EMM2-HTN-SA1B-727-U-T2R-HSS

CANDELA DISTRIBUTION (continued):

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|-------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0° | 511.1 | 511.1 | 511.1 | 511.1 | 511.1 | 511.1 | 511.1 | 511.1 | 511.1 | 511.1 | 511.1 |
| 2.5° | 510.0 | 501.9 | 484.7 | 469.7 | 455.9 | 444.4 | 436.3 | 425.9 | 417.9 | 417.9 | 422.5 |
| 5° | 513.4 | 495.0 | 459.3 | 425.9 | 399.5 | 374.1 | 351.1 | 336.2 | 324.6 | 317.7 | 317.7 |
| 7.5° | 518.0 | 490.4 | 436.3 | 385.7 | 344.2 | 303.9 | 268.2 | 251.0 | 233.7 | 227.9 | 229.1 |
| 10° | 527.3 | 488.1 | 415.6 | 350.0 | 287.8 | 237.2 | 202.6 | 184.2 | 175.0 | 170.4 | 170.4 |
| 12.5° | 537.6 | 488.1 | 393.7 | 309.7 | 237.2 | 185.3 | 164.6 | 150.8 | 146.2 | 143.9 | 141.6 |
| 15° | 551.4 | 490.4 | 375.3 | 267.1 | 193.4 | 156.6 | 141.6 | 133.5 | 128.9 | 126.6 | 126.6 |
| 17.5° | 567.5 | 492.7 | 355.7 | 232.5 | 164.6 | 138.1 | 126.6 | 120.9 | 116.3 | 114.0 | 114.0 |
| 20° | 588.3 | 498.5 | 336.2 | 201.5 | 143.9 | 126.6 | 116.3 | 110.5 | 105.9 | 104.8 | 103.6 |
| 22.5° | 613.6 | 507.7 | 316.6 | 176.1 | 130.1 | 115.1 | 105.9 | 101.3 | 97.9 | 95.6 | 95.6 |
| 25° | 643.5 | 519.2 | 301.6 | 157.7 | 119.7 | 107.1 | 99.0 | 93.2 | 89.8 | 88.6 | 88.6 |
| 27.5° | 685.0 | 538.8 | 286.7 | 143.9 | 111.7 | 99.0 | 90.9 | 86.3 | 82.9 | 81.7 | 80.6 |
| 30° | 724.1 | 562.9 | 279.7 | 140.4 | 105.9 | 92.1 | 86.3 | 80.6 | 77.1 | 76.0 | 74.8 |
| 32.5° | 774.8 | 590.6 | 275.1 | 140.4 | 103.6 | 87.5 | 80.6 | 76.0 | 72.5 | 71.4 | 70.2 |
| 35° | 828.9 | 622.8 | 275.1 | 145.1 | 104.8 | 84.0 | 76.0 | 71.4 | 67.9 | 65.6 | 65.6 |
| 37.5° | 887.6 | 655.0 | 277.4 | 152.0 | 108.2 | 81.7 | 71.4 | 66.8 | 63.3 | 62.2 | 62.2 |
| 40° | 949.8 | 698.8 | 282.0 | 157.7 | 111.7 | 80.6 | 66.8 | 63.3 | 59.9 | 57.6 | 57.6 |
| 42.5° | 1007.3 | 733.3 | 290.1 | 164.6 | 114.0 | 79.4 | 63.3 | 59.9 | 56.4 | 55.3 | 55.3 |
| 45° | 1074.1 | 771.3 | 297.0 | 169.2 | 114.0 | 76.0 | 59.9 | 56.4 | 54.1 | 53.0 | 51.8 |
| 47.5° | 1127.0 | 802.4 | 300.5 | 171.5 | 111.7 | 72.5 | 56.4 | 54.1 | 51.8 | 49.5 | 50.7 |
| 50° | 1191.5 | 835.8 | 306.2 | 172.7 | 107.1 | 67.9 | 54.1 | 50.7 | 48.4 | 47.2 | 47.2 |
| 52.5° | 1253.7 | 869.2 | 310.8 | 170.4 | 101.3 | 62.2 | 50.7 | 48.4 | 46.0 | 43.7 | 43.7 |
| 55° | 1327.4 | 906.0 | 317.7 | 166.9 | 92.1 | 56.4 | 47.2 | 44.9 | 41.4 | 40.3 | 39.1 |
| 57.5° | 1411.4 | 954.4 | 323.5 | 160.0 | 80.6 | 50.7 | 44.9 | 41.4 | 36.8 | 34.5 | 34.5 |
| 60° | 1488.5 | 1009.6 | 328.1 | 142.8 | 70.2 | 47.2 | 41.4 | 38.0 | 33.4 | 32.2 | 32.2 |
| 62.5° | 1571.4 | 1067.2 | 328.1 | 112.8 | 59.9 | 42.6 | 39.1 | 35.7 | 31.1 | 29.9 | 29.9 |
| 65° | 1629.0 | 1119.0 | 317.7 | 84.0 | 50.7 | 40.3 | 38.0 | 33.4 | 28.8 | 27.6 | 27.6 |
| 67.5° | 1645.1 | 1151.2 | 289.0 | 59.9 | 43.7 | 38.0 | 35.7 | 31.1 | 27.6 | 25.3 | 25.3 |
| 70° | 1593.3 | 1125.9 | 236.0 | 46.0 | 38.0 | 34.5 | 32.2 | 28.8 | 25.3 | 24.2 | 24.2 |
| 72.5° | 1444.8 | 1029.2 | 176.1 | 39.1 | 33.4 | 32.2 | 29.9 | 26.5 | 24.2 | 23.0 | 23.0 |
| 75° | 1209.9 | 855.4 | 124.3 | 34.5 | 31.1 | 28.8 | 26.5 | 24.2 | 21.9 | 21.9 | 21.9 |
| 77.5° | 916.4 | 618.2 | 77.1 | 31.1 | 26.5 | 26.5 | 24.2 | 21.9 | 20.7 | 19.6 | 19.6 |
| 80° | 591.7 | 390.3 | 43.7 | 21.9 | 18.4 | 19.6 | 17.3 | 15.0 | 15.0 | 13.8 | 13.8 |
| 82.5° | 251.0 | 154.3 | 23.0 | 12.7 | 9.2 | 8.1 | 5.8 | 5.8 | 4.6 | 4.6 | 4.6 |
| 85° | 25.3 | 9.2 | 4.6 | 3.5 | 3.5 | 2.3 | 2.3 | 2.3 | 2.3 | 1.2 | 1.2 |
| 87.5° | 3.5 | 3.5 | 3.5 | 2.3 | 2.3 | 2.3 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 |
| 90° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

LM-79-2019: Approved Method: Electrical and Photometric Measurements of Solid-
State Lighting Products

Report Prepared for

Cooper Lighting Solutions

Streetworks

Report Number: SP1-2407-157-3

Test Date: 08/07/2024

Luminaire Tested: MEM2-HTN-SA-40-727-U-5WQ-2

Data in this report applies to families of products including MEM2-HTN-SA-40-727-U-5WQ-2

Test Information

Test Method: LM-79-2019
 Report Number: SP1-2407-157-3
 Test Lab: COOPER LIGHTING SOLUTIONS
 Photometer: SP1 - 76IN SPHERE
 Measurement Geometry: 4π
 Issue Date: 08/20/2024
 Manufacturer: COOPER LIGHTING SOLUTIONS
 Product Line: Streetworks
 Catalog Number: **MEM2-HTN-SA-40-727-U-5WQ-2**
 Description: Epic Modern Light Square 40W 5WQ Optic and Flare Trim

Spectral Parameters

CCT (K): 2747
 CIE u': 0.2606
 CIE v': 0.5257
 Duv: -0.0005
 CIE x: 0.4552
 CIE y: 0.4082
 CIE z: 0.1366
 Peak Wavelength (nm): 597
 Dominant Wavelength (nm): 584
 Purity: 59.16856
 R_f: 75.5
 R_g: 93.6

| | | | |
|-----------|------|------|-------|
| CRI (Ra): | 71.7 | | |
| R1: | 68.1 | R9: | -35.3 |
| R2: | 83.9 | R10: | 64.2 |
| R3: | 94.7 | R11: | 61.7 |
| R4: | 66.3 | R12: | 53.9 |
| R5: | 67.4 | R13: | 71.2 |
| R6: | 78.7 | R14: | 97.6 |
| R7: | 75.0 | R15: | 59.3 |
| R8: | 39.4 | | |



Test Conditions

Stabilization Time: 22M
 Operation Time: 1H 22M
 Sphere Temperature (°C): 24.2

REPORT NUMBER: SP1-2407-157-3

| Measurement and Test Equipment | | | |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | IN0058 | 6/18/2024 | 12/18/2024 |
| Power Meter | INXT2011004 | 2/8/2024 | 2/8/2025 |
| AC Power Source | IN0063 | 10/24/2023 | 10/24/2024 |
| DC Power Source | IN0208 | 10/24/2023 | 10/24/2024 |
| Sphere Thermometer | IN0085 | 10/24/2023 | 10/24/2024 |
| Room Thermometer | IN0046 | 10/24/2023 | 10/24/2024 |

REPORT NUMBER: SP1-2407-157-3

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

REPORT NUMBER: SP1-2407-157-3

Photopic Flux vs. Wavelength



Photopic Lumens: NR

| λ (nm) | Power W [^] /nm | Lumens (ϕ /nm) | λ (nm) | Power W [^] /nm | Lumens (ϕ /nm) | λ (nm) | Power W [^] /nm | Lumens (ϕ /nm) | λ (nm) | Power W [^] /nm | Lumens (ϕ /nm) | λ (nm) | Power W [^] /nm | Lumens (ϕ /nm) |
|-------------------|-----------------------------|-------------------------|-------------------|-----------------------------|-------------------------|-------------------|-----------------------------|-------------------------|-------------------|-----------------------------|-------------------------|-------------------|-----------------------------|-------------------------|
| 360 | 0 | NR | 490 | 103 | NR | 620 | 846 | NR | 750 | 20 | NR | 880 | 0 | NR |
| 365 | 0 | NR | 495 | 130 | NR | 625 | 784 | NR | 755 | 17 | NR | 885 | 1 | NR |
| 370 | 0 | NR | 500 | 171 | NR | 630 | 720 | NR | 760 | 15 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 221 | NR | 635 | 652 | NR | 765 | 13 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 268 | NR | 640 | 587 | NR | 770 | 11 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 313 | NR | 645 | 521 | NR | 775 | 9 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 350 | NR | 650 | 461 | NR | 780 | 8 | NR | 910 | 0 | NR |
| 395 | 0 | NR | 525 | 381 | NR | 655 | 406 | NR | 785 | 7 | NR | 915 | 0 | NR |
| 400 | 0 | NR | 530 | 407 | NR | 660 | 353 | NR | 790 | 6 | NR | 920 | 0 | NR |
| 405 | 2 | NR | 535 | 435 | NR | 665 | 307 | NR | 795 | 5 | NR | 925 | 0 | NR |
| 410 | 4 | NR | 540 | 462 | NR | 670 | 264 | NR | 800 | 4 | NR | 930 | 0 | NR |
| 415 | 9 | NR | 545 | 496 | NR | 675 | 227 | NR | 805 | 4 | NR | 935 | 0 | NR |
| 420 | 20 | NR | 550 | 534 | NR | 680 | 196 | NR | 810 | 3 | NR | 940 | 0 | NR |
| 425 | 38 | NR | 555 | 582 | NR | 685 | 167 | NR | 815 | 3 | NR | 945 | 0 | NR |
| 430 | 69 | NR | 560 | 638 | NR | 690 | 144 | NR | 820 | 2 | NR | 950 | 0 | NR |
| 435 | 120 | NR | 565 | 700 | NR | 695 | 122 | NR | 825 | 2 | NR | 955 | 0 | NR |
| 440 | 193 | NR | 570 | 767 | NR | 700 | 103 | NR | 830 | 2 | NR | 960 | 0 | NR |
| 445 | 316 | NR | 575 | 836 | NR | 705 | 88 | NR | 835 | 2 | NR | 965 | 0 | NR |
| 450 | 469 | NR | 580 | 898 | NR | 710 | 74 | NR | 840 | 1 | NR | 970 | 0 | NR |
| 455 | 431 | NR | 585 | 947 | NR | 715 | 63 | NR | 845 | 1 | NR | 975 | 0 | NR |
| 460 | 264 | NR | 590 | 982 | NR | 720 | 54 | NR | 850 | 1 | NR | 980 | 0 | NR |
| 465 | 197 | NR | 595 | 997 | NR | 725 | 46 | NR | 855 | 1 | NR | 985 | 0 | NR |
| 470 | 155 | NR | 600 | 997 | NR | 730 | 39 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 108 | NR | 605 | 978 | NR | 735 | 33 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 90 | NR | 610 | 947 | NR | 740 | 28 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 92 | NR | 615 | 900 | NR | 745 | 24 | NR | 875 | 1 | NR | | | |

REPORT NUMBER: SP1-2407-157-3

Scotopic Flux vs. Wavelength



Scotopic Lumens: NR

S/P: 1.13

| λ (nm) | Power W [^] /nm | Lumens (φ/nm) | λ (nm) | Power W [^] /nm | Lumens (φ/nm) | λ (nm) | Power W [^] /nm | Lumens (φ/nm) | λ (nm) | Power W [^] /nm | Lumens (φ/nm) | λ (nm) | Power W [^] /nm | Lumens (φ/nm) |
|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|
| 360 | 0 | NR | 490 | 103 | NR | 620 | 846 | NR | 750 | 20 | NR | 880 | 0 | NR |
| 365 | 0 | NR | 495 | 130 | NR | 625 | 784 | NR | 755 | 17 | NR | 885 | 1 | NR |
| 370 | 0 | NR | 500 | 171 | NR | 630 | 720 | NR | 760 | 15 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 221 | NR | 635 | 652 | NR | 765 | 13 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 268 | NR | 640 | 587 | NR | 770 | 11 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 313 | NR | 645 | 521 | NR | 775 | 9 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 350 | NR | 650 | 461 | NR | 780 | 8 | NR | 910 | 0 | NR |
| 395 | 0 | NR | 525 | 381 | NR | 655 | 406 | NR | 785 | 7 | NR | 915 | 0 | NR |
| 400 | 0 | NR | 530 | 407 | NR | 660 | 353 | NR | 790 | 6 | NR | 920 | 0 | NR |
| 405 | 2 | NR | 535 | 435 | NR | 665 | 307 | NR | 795 | 5 | NR | 925 | 0 | NR |
| 410 | 4 | NR | 540 | 462 | NR | 670 | 264 | NR | 800 | 4 | NR | 930 | 0 | NR |
| 415 | 9 | NR | 545 | 496 | NR | 675 | 227 | NR | 805 | 4 | NR | 935 | 0 | NR |
| 420 | 20 | NR | 550 | 534 | NR | 680 | 196 | NR | 810 | 3 | NR | 940 | 0 | NR |
| 425 | 38 | NR | 555 | 582 | NR | 685 | 167 | NR | 815 | 3 | NR | 945 | 0 | NR |
| 430 | 69 | NR | 560 | 638 | NR | 690 | 144 | NR | 820 | 2 | NR | 950 | 0 | NR |
| 435 | 120 | NR | 565 | 700 | NR | 695 | 122 | NR | 825 | 2 | NR | 955 | 0 | NR |
| 440 | 193 | NR | 570 | 767 | NR | 700 | 103 | NR | 830 | 2 | NR | 960 | 0 | NR |
| 445 | 316 | NR | 575 | 836 | NR | 705 | 88 | NR | 835 | 2 | NR | 965 | 0 | NR |
| 450 | 469 | NR | 580 | 898 | NR | 710 | 74 | NR | 840 | 1 | NR | 970 | 0 | NR |
| 455 | 431 | NR | 585 | 947 | NR | 715 | 63 | NR | 845 | 1 | NR | 975 | 0 | NR |
| 460 | 264 | NR | 590 | 982 | NR | 720 | 54 | NR | 850 | 1 | NR | 980 | 0 | NR |
| 465 | 197 | NR | 595 | 997 | NR | 725 | 46 | NR | 855 | 1 | NR | 985 | 0 | NR |
| 470 | 155 | NR | 600 | 997 | NR | 730 | 39 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 108 | NR | 605 | 978 | NR | 735 | 33 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 90 | NR | 610 | 947 | NR | 740 | 28 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 92 | NR | 615 | 900 | NR | 745 | 24 | NR | 875 | 1 | NR | | | |

REPORT NUMBER: SP1-2407-157-3

Melanopic Flux vs. Wavelength



Melanopic Lumens: NR M/P: 2.04

| λ (nm) | Power W [^] /nm | Lumens (φ/nm) | λ (nm) | Power W [^] /nm | Lumens (φ/nm) | λ (nm) | Power W [^] /nm | Lumens (φ/nm) | λ (nm) | Power W [^] /nm | Lumens (φ/nm) | λ (nm) | Power W [^] /nm | Lumens (φ/nm) |
|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|
| 360 | 0 | NR | 490 | 103 | NR | 620 | 846 | NR | 750 | 20 | NR | 880 | 0 | NR |
| 365 | 0 | NR | 495 | 130 | NR | 625 | 784 | NR | 755 | 17 | NR | 885 | 1 | NR |
| 370 | 0 | NR | 500 | 171 | NR | 630 | 720 | NR | 760 | 15 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 221 | NR | 635 | 652 | NR | 765 | 13 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 268 | NR | 640 | 587 | NR | 770 | 11 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 313 | NR | 645 | 521 | NR | 775 | 9 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 350 | NR | 650 | 461 | NR | 780 | 8 | NR | 910 | 0 | NR |
| 395 | 0 | NR | 525 | 381 | NR | 655 | 406 | NR | 785 | 7 | NR | 915 | 0 | NR |
| 400 | 0 | NR | 530 | 407 | NR | 660 | 353 | NR | 790 | 6 | NR | 920 | 0 | NR |
| 405 | 2 | NR | 535 | 435 | NR | 665 | 307 | NR | 795 | 5 | NR | 925 | 0 | NR |
| 410 | 4 | NR | 540 | 462 | NR | 670 | 264 | NR | 800 | 4 | NR | 930 | 0 | NR |
| 415 | 9 | NR | 545 | 496 | NR | 675 | 227 | NR | 805 | 4 | NR | 935 | 0 | NR |
| 420 | 20 | NR | 550 | 534 | NR | 680 | 196 | NR | 810 | 3 | NR | 940 | 0 | NR |
| 425 | 38 | NR | 555 | 582 | NR | 685 | 167 | NR | 815 | 3 | NR | 945 | 0 | NR |
| 430 | 69 | NR | 560 | 638 | NR | 690 | 144 | NR | 820 | 2 | NR | 950 | 0 | NR |
| 435 | 120 | NR | 565 | 700 | NR | 695 | 122 | NR | 825 | 2 | NR | 955 | 0 | NR |
| 440 | 193 | NR | 570 | 767 | NR | 700 | 103 | NR | 830 | 2 | NR | 960 | 0 | NR |
| 445 | 316 | NR | 575 | 836 | NR | 705 | 88 | NR | 835 | 2 | NR | 965 | 0 | NR |
| 450 | 469 | NR | 580 | 898 | NR | 710 | 74 | NR | 840 | 1 | NR | 970 | 0 | NR |
| 455 | 431 | NR | 585 | 947 | NR | 715 | 63 | NR | 845 | 1 | NR | 975 | 0 | NR |
| 460 | 264 | NR | 590 | 982 | NR | 720 | 54 | NR | 850 | 1 | NR | 980 | 0 | NR |
| 465 | 197 | NR | 595 | 997 | NR | 725 | 46 | NR | 855 | 1 | NR | 985 | 0 | NR |
| 470 | 155 | NR | 600 | 997 | NR | 730 | 39 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 108 | NR | 605 | 978 | NR | 735 | 33 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 90 | NR | 610 | 947 | NR | 740 | 28 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 92 | NR | 615 | 900 | NR | 745 | 24 | NR | 875 | 1 | NR | | | |

Summary

$R_f = 75.5$
 $R_g = 93.6$
 $CIE R_a = 71.7$
 $R_g = -35.3$



Color Vector Graphics



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

| | | | |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 68 | CES51 = 87 | CES76 = 63 |
| CES02 = 63 | CES27 = 90 | CES52 = 85 | CES77 = 79 |
| CES03 = 31 | CES28 = 87 | CES53 = 78 | CES78 = 66 |
| CES04 = 71 | CES29 = 71 | CES54 = 86 | CES79 = 87 |
| CES05 = 50 | CES30 = 85 | CES55 = 84 | CES80 = 85 |
| CES06 = 52 | CES31 = 74 | CES56 = 75 | CES81 = 67 |
| CES07 = 42 | CES32 = 66 | CES57 = 75 | CES82 = 93 |
| CES08 = 41 | CES33 = 80 | CES58 = 76 | CES83 = 91 |
| CES09 = 29 | CES34 = 79 | CES59 = 85 | CES84 = 89 |
| CES10 = 77 | CES35 = 89 | CES60 = 90 | CES85 = 72 |
| CES11 = 60 | CES36 = 93 | CES61 = 81 | CES86 = 59 |
| CES12 = 66 | CES37 = 88 | CES62 = 91 | CES87 = 77 |
| CES13 = 43 | CES38 = 93 | CES63 = 77 | CES88 = 79 |
| CES14 = 74 | CES39 = 97 | CES64 = 67 | CES89 = 65 |
| CES15 = 72 | CES40 = 93 | CES65 = 66 | CES90 = 80 |
| CES16 = 48 | CES41 = 93 | CES66 = 63 | CES91 = 80 |
| CES17 = 51 | CES42 = 89 | CES67 = 61 | CES92 = 55 |
| CES18 = 57 | CES43 = 78 | CES68 = 68 | CES93 = 72 |
| CES19 = 73 | CES44 = 99 | CES69 = 78 | CES94 = 48 |
| CES20 = 67 | CES45 = 85 | CES70 = 63 | CES95 = 66 |
| CES21 = 88 | CES46 = 81 | CES71 = 61 | CES96 = 76 |
| CES22 = 80 | CES47 = 86 | CES72 = 86 | CES97 = 81 |
| CES23 = 92 | CES48 = 74 | CES73 = 56 | CES98 = 76 |
| CES24 = 91 | CES49 = 79 | CES74 = 93 | CES99 = 64 |
| CES25 = 73 | CES50 = 86 | CES75 = 66 | |



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)