

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: P868627

Luminaire Tested: **EMM2-HTN-SA1A-727-U-T4W-HSS**

Issue Date: 08/22/2024



Test Information

Test Method: LM-79-08
Report Number: P868627
Test Lab: INNOVATION CENTER(G3)
Issue Date: 08/22/2024
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: INVUE
Catalog Number: EMM2-HTN-SA1A-727-U-T4W-HSS
Description: EPIC MODERN TALL HOUSING DISCRETE LED ARRAYS 40W 70CRI 2700K
FIXTURE w/ TYPE IV WIDE DISTRIBUTION OPTIC AND HOUSE SIDE SHIELD
Light Source: (10) 2700K CCT, 70 CRI LEDS
Ballast/Driver: ELECTRONIC DRIVER

Summary

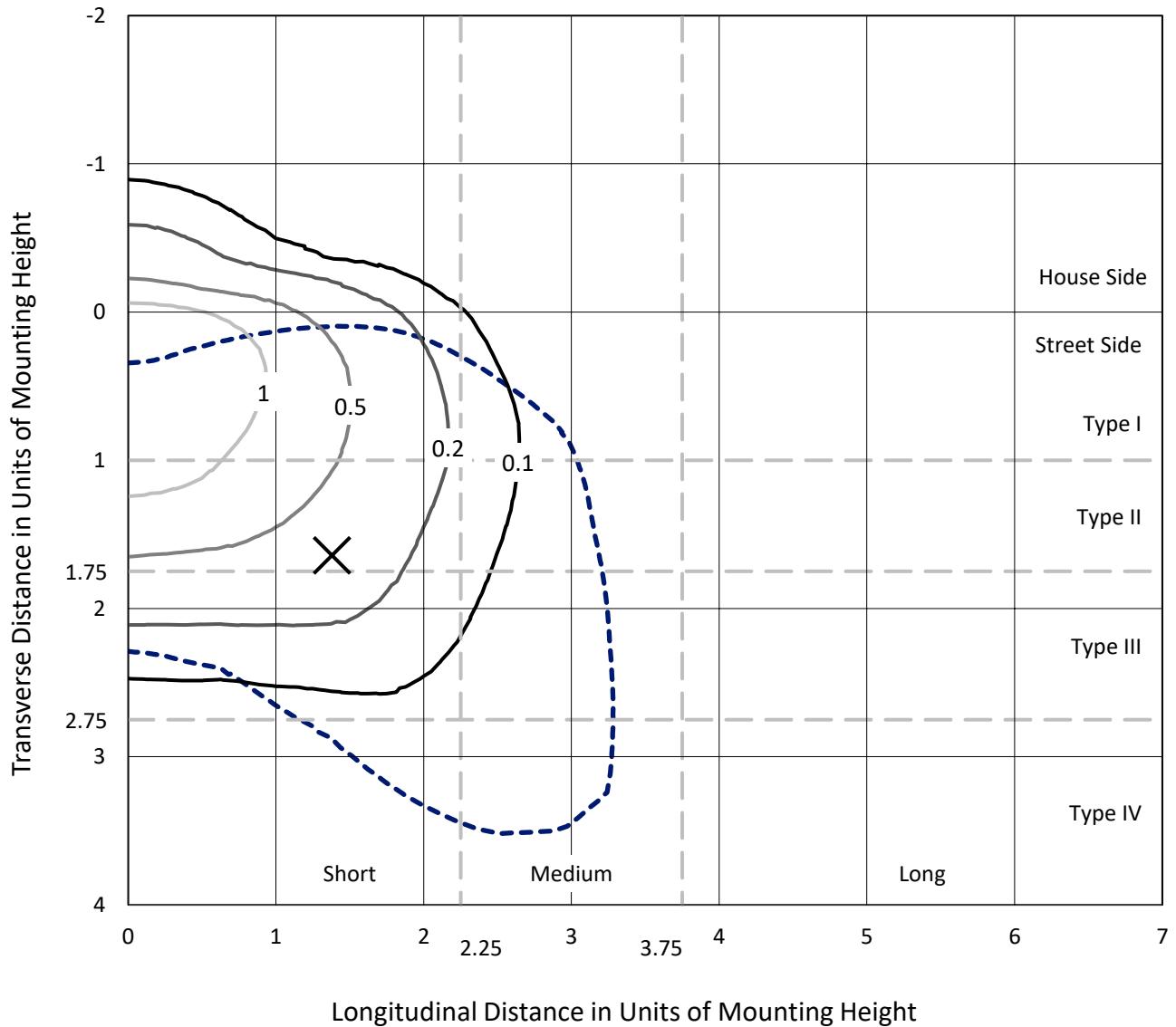
Lumens per Lamp: N/A
Luminaire Lumens: 3236 lumens
Efficiency: N/A
Efficacy: 98.7 lumens/watt
Luminous Opening: Rectangular (W 0.33' x L: 0.33' x H: 0')
IES Classification: Type IV - Short
BUG Rating: B0 - U0 - G1

Input Watts (W): 32.8
Input Voltage (V): 120
Input Current (A_{in}): NR
Voltage Rise (V): NR
Power Factor: 0.99
Total Harmonic Distortion (THDi): 9.76%
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

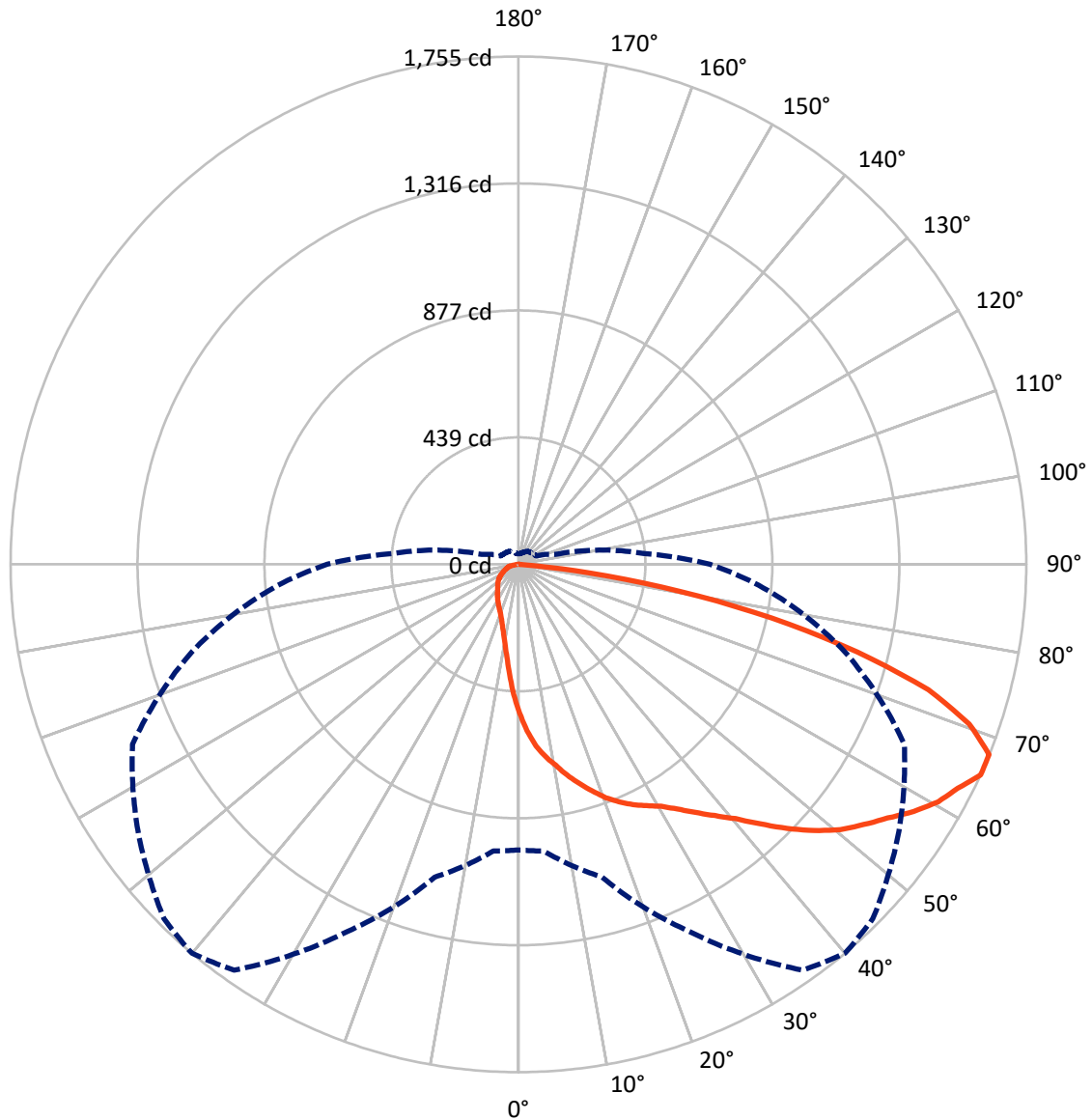
× Max cd
 - - - 1/2 Max cd



Based on 20 foot mounting height. Maximum calculated value = 1.9 fc
 Type IV - Short - N/A

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Luminous Intensity Polar Plot



— Vertical Plane Through 40-Deg Lateral - - - Horizontal Cone Through 65-Deg Vertical

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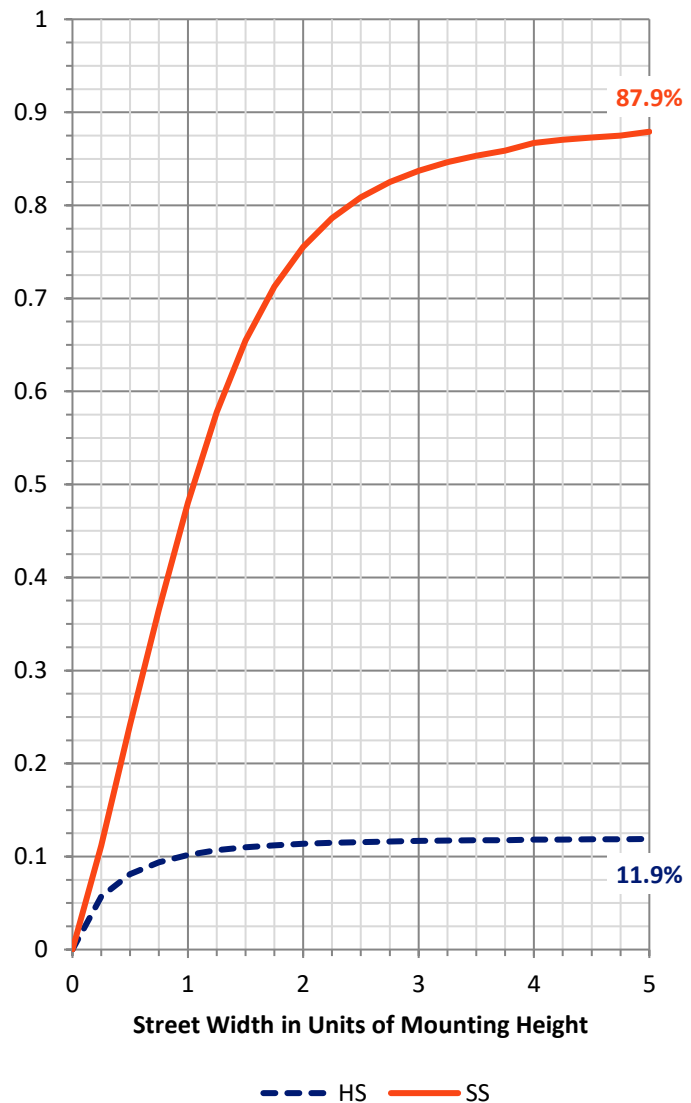
FLUX DISTRIBUTION:

| | | Downward | Upward | Total |
|--------------------|-----------|----------|--------|--------|
| House Side | Lumens | 387.4 | 0.0 | 387.4 |
| | % Fixture | 12.0 | 0.0 | 12.0 |
| Street Side | Lumens | 2848.6 | 0.0 | 2848.6 |
| | % Fixture | 88.0 | 0.0 | 88.0 |
| Total | Lumens | 3236.0 | 0.0 | 3236.0 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

Coefficient of Utilization

ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10° | 48.1 | 1.5 |
| 10°-20° | 144.8 | 4.5 |
| 20°-30° | 249.1 | 7.7 |
| 30°-40° | 376.5 | 11.6 |
| 40°-50° | 550.5 | 17.0 |
| 50°-60° | 703.1 | 21.7 |
| 60°-70° | 701.7 | 21.7 |
| 70°-80° | 411.5 | 12.7 |
| 80°-90° | 50.7 | 1.6 |
| 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° | 3236.0 | 100.0 |
| 0°-180° | 3236.0 | 100.0 |



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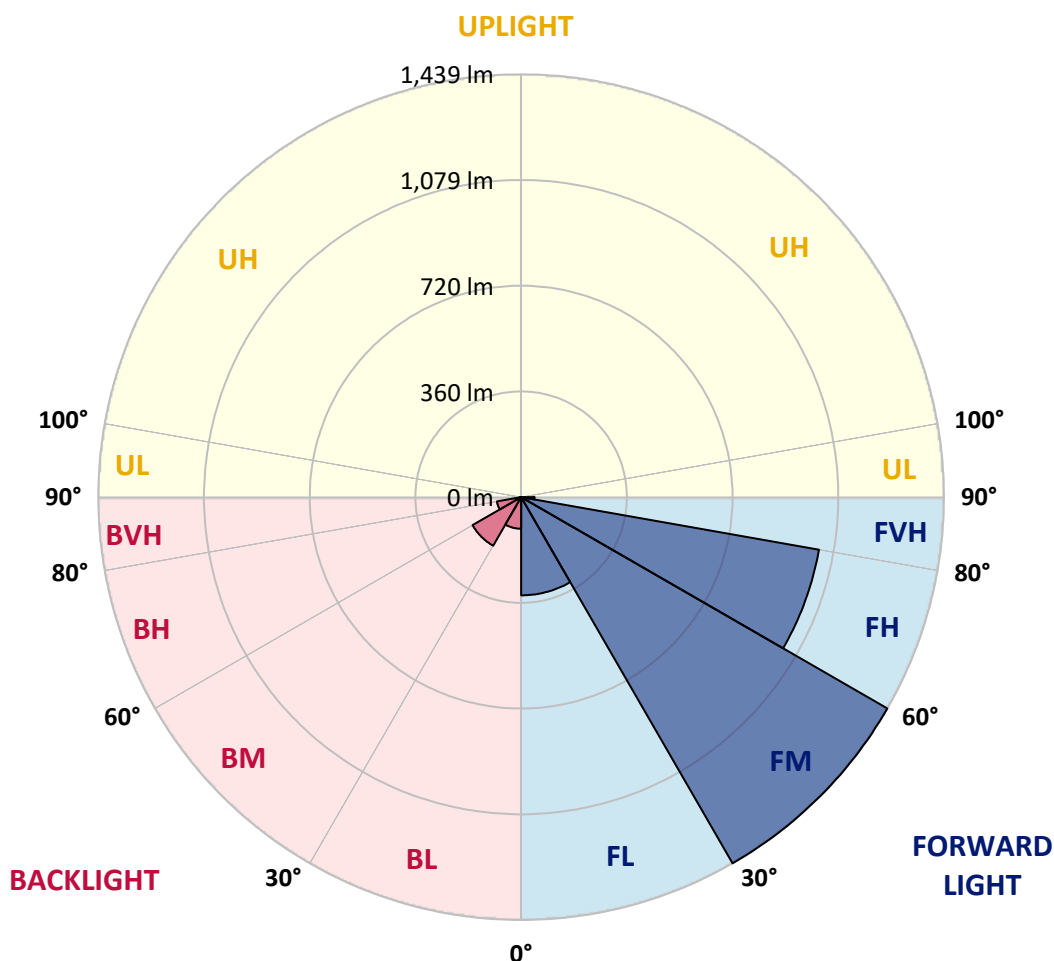
CATALOG NUMBER: EMM2-HTN-SA1A-727-U-T4W-HSS

LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit | | |
|------|-------------|--------|-----------|-------------------------|------|---------|
| | | | | B | U | G |
| FL | (0°-30°) | 334.2 | 10.3 | | | |
| FM | (30°-60°) | 1439.2 | 44.5 | | | |
| FH | (60°-80°) | 1029.3 | 31.8 | | | G1/1800 |
| FVH | (80°-90°) | 45.8 | 1.4 | | | G1/100 |
| BL | (0°-30°) | 107.8 | 3.3 | B0/110 | | |
| BM | (30°-60°) | 190.9 | 5.9 | B0/220 | | |
| BH | (60°-80°) | 83.9 | 2.6 | B0/110 | | G0/110 |
| BVH | (80°-90°) | 4.9 | 0.2 | | | G0/10 |
| UL | (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH | (100°-180°) | 0.0 | 0.0 | | U0/0 | |

BUG Rating: B0-U0-G1

Type IV Short





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CANDELA DISTRIBUTION (FULL):

| | 0° | 5° | 15° | 25° | 35° | 40° | 45° | 55° | 65° | 75° | 85° |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|
| 0° | 514.4 | 514.4 | 514.4 | 514.4 | 514.4 | 514.4 | 514.4 | 514.4 | 514.4 | 514.4 | 514.4 |
| 2.5° | 600.1 | 597.4 | 591.9 | 587.4 | 581.0 | 575.5 | 570.0 | 560.0 | 547.2 | 536.3 | 522.6 |
| 5° | 659.4 | 654.8 | 651.2 | 645.7 | 634.8 | 630.2 | 626.6 | 605.6 | 583.7 | 560.9 | 530.8 |
| 7.5° | 701.4 | 705.0 | 697.7 | 689.5 | 675.8 | 670.3 | 664.9 | 643.9 | 616.5 | 583.7 | 540.8 |
| 10° | 749.7 | 750.6 | 741.5 | 731.5 | 716.9 | 705.9 | 698.6 | 673.1 | 643.0 | 606.5 | 551.8 |
| 12.5° | 796.2 | 796.2 | 790.7 | 776.1 | 757.0 | 747.0 | 734.2 | 705.0 | 668.5 | 625.7 | 564.6 |
| 15° | 833.6 | 835.4 | 830.9 | 819.9 | 798.9 | 785.3 | 772.5 | 738.8 | 692.2 | 647.5 | 574.6 |
| 17.5° | 867.4 | 866.4 | 863.7 | 853.7 | 833.6 | 822.7 | 809.9 | 772.5 | 719.6 | 664.9 | 590.1 |
| 20° | 890.2 | 890.2 | 889.2 | 883.8 | 869.2 | 861.0 | 845.5 | 806.2 | 749.7 | 690.4 | 606.5 |
| 22.5° | 907.5 | 906.6 | 906.6 | 907.5 | 899.3 | 891.1 | 884.7 | 845.5 | 780.7 | 712.3 | 622.9 |
| 25° | 922.1 | 921.2 | 923.9 | 925.7 | 922.1 | 920.2 | 913.0 | 882.9 | 819.0 | 737.8 | 639.3 |
| 27.5° | 941.2 | 944.0 | 943.0 | 943.0 | 942.1 | 944.0 | 943.0 | 917.5 | 856.4 | 765.2 | 656.7 |
| 30° | 971.3 | 975.9 | 973.1 | 969.5 | 969.5 | 970.4 | 975.0 | 958.6 | 900.2 | 798.9 | 675.8 |
| 32.5° | 1041.6 | 1037.0 | 1017.8 | 1005.1 | 1006.9 | 1007.8 | 1012.4 | 1003.2 | 944.0 | 837.3 | 695.9 |
| 35° | 1121.8 | 1116.3 | 1095.4 | 1066.2 | 1056.1 | 1052.5 | 1051.6 | 1046.1 | 991.4 | 878.3 | 719.6 |
| 37.5° | 1225.8 | 1227.6 | 1196.6 | 1154.6 | 1124.5 | 1101.7 | 1097.2 | 1085.3 | 1032.4 | 915.7 | 744.2 |
| 40° | 1331.6 | 1324.3 | 1297.8 | 1256.8 | 1197.5 | 1155.6 | 1141.9 | 1125.5 | 1078.9 | 954.9 | 767.9 |
| 42.5° | 1433.7 | 1420.0 | 1385.4 | 1340.7 | 1271.4 | 1225.8 | 1194.8 | 1173.8 | 1121.8 | 997.8 | 790.7 |
| 45° | 1566.9 | 1527.7 | 1465.6 | 1425.5 | 1338.9 | 1301.5 | 1273.2 | 1226.7 | 1172.9 | 1040.6 | 818.1 |
| 47.5° | 1671.8 | 1596.1 | 1539.5 | 1522.2 | 1409.1 | 1374.4 | 1348.9 | 1284.2 | 1224.9 | 1089.0 | 846.4 |
| 50° | 1652.6 | 1606.1 | 1592.4 | 1576.9 | 1462.0 | 1441.0 | 1417.3 | 1349.8 | 1277.8 | 1140.1 | 873.7 |
| 52.5° | 1603.4 | 1608.8 | 1626.2 | 1599.7 | 1508.5 | 1493.9 | 1478.4 | 1420.0 | 1330.7 | 1182.0 | 898.4 |
| 55° | 1564.1 | 1575.1 | 1621.6 | 1613.4 | 1564.1 | 1547.7 | 1536.8 | 1489.4 | 1381.7 | 1220.3 | 919.3 |
| 57.5° | 1493.0 | 1483.9 | 1542.3 | 1637.1 | 1623.4 | 1610.7 | 1599.7 | 1562.3 | 1433.7 | 1247.7 | 933.0 |
| 60° | 1380.8 | 1347.1 | 1425.5 | 1607.9 | 1664.5 | 1666.3 | 1659.9 | 1617.0 | 1475.7 | 1247.7 | 925.7 |
| 62.5° | 1223.0 | 1191.1 | 1287.8 | 1510.3 | 1686.4 | 1703.7 | 1700.0 | 1636.2 | 1493.9 | 1220.3 | 897.4 |
| 65° | 986.8 | 994.1 | 1119.1 | 1400.0 | 1711.9 | 1754.8 | 1732.0 | 1605.2 | 1471.1 | 1167.4 | 833.6 |
| 67.5° | 788.0 | 809.9 | 922.1 | 1256.8 | 1700.0 | 1753.9 | 1721.9 | 1517.6 | 1373.5 | 1093.5 | 736.0 |
| 70° | 622.0 | 636.6 | 729.6 | 1063.4 | 1596.1 | 1652.6 | 1612.5 | 1383.6 | 1208.5 | 979.5 | 612.0 |
| 72.5° | 486.1 | 499.8 | 579.1 | 850.9 | 1415.5 | 1481.2 | 1431.0 | 1203.0 | 1002.3 | 830.9 | 486.1 |
| 75° | 369.4 | 379.4 | 438.7 | 655.8 | 1127.3 | 1209.4 | 1172.9 | 963.1 | 782.5 | 657.6 | 372.1 |
| 77.5° | 238.0 | 251.7 | 318.3 | 459.7 | 796.2 | 894.7 | 899.3 | 719.6 | 562.7 | 475.2 | 273.6 |
| 80° | 157.8 | 163.3 | 204.3 | 299.1 | 489.8 | 566.4 | 592.8 | 486.1 | 359.3 | 302.8 | 197.0 |
| 82.5° | 65.7 | 73.0 | 97.6 | 150.5 | 245.3 | 246.3 | 281.8 | 205.2 | 145.9 | 128.6 | 83.0 |
| 85° | 1.8 | 3.6 | 2.7 | 7.3 | 6.4 | 10.0 | 11.9 | 16.4 | 11.9 | 12.8 | 12.8 |
| 87.5° | 0.0 | 0.0 | 0.9 | 0.9 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 2.7 | 1.8 |
| 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: EMM2-HTN-SA1A-727-U-T4W-HSS

CANDELA DISTRIBUTION (continued):

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0° | 514.4 | 514.4 | 514.4 | 514.4 | 514.4 | 514.4 | 514.4 | 514.4 | 514.4 | 514.4 | 514.4 |
| 2.5° | 516.2 | 508.0 | 491.6 | 478.8 | 465.1 | 455.1 | 446.0 | 436.0 | 429.6 | 430.5 | 424.1 |
| 5° | 516.2 | 500.7 | 467.9 | 438.7 | 412.2 | 393.1 | 372.1 | 355.7 | 343.8 | 342.0 | 347.5 |
| 7.5° | 519.0 | 493.4 | 444.2 | 400.4 | 363.9 | 333.8 | 311.9 | 295.5 | 287.3 | 281.8 | 280.9 |
| 10° | 521.7 | 487.9 | 422.3 | 366.6 | 321.0 | 288.2 | 269.1 | 250.8 | 241.7 | 240.8 | 238.0 |
| 12.5° | 523.5 | 481.6 | 402.2 | 332.9 | 285.5 | 254.5 | 235.3 | 220.7 | 213.4 | 213.4 | 212.5 |
| 15° | 529.9 | 479.7 | 381.2 | 307.4 | 258.1 | 228.0 | 211.6 | 199.7 | 195.2 | 192.4 | 191.5 |
| 17.5° | 535.4 | 476.1 | 363.0 | 281.8 | 233.5 | 207.0 | 191.5 | 183.3 | 178.8 | 176.9 | 176.0 |
| 20° | 543.6 | 474.3 | 345.7 | 260.8 | 215.2 | 189.7 | 177.8 | 170.6 | 167.8 | 166.0 | 166.0 |
| 22.5° | 551.8 | 472.4 | 328.3 | 242.6 | 199.7 | 176.9 | 166.0 | 159.6 | 156.9 | 156.0 | 155.0 |
| 25° | 561.8 | 471.5 | 313.7 | 227.1 | 186.1 | 166.9 | 156.9 | 151.4 | 147.8 | 145.9 | 145.9 |
| 27.5° | 571.8 | 472.4 | 299.1 | 211.6 | 174.2 | 157.8 | 147.8 | 141.4 | 138.6 | 135.0 | 135.9 |
| 30° | 585.5 | 473.3 | 287.3 | 198.8 | 164.2 | 148.7 | 139.5 | 131.3 | 127.7 | 125.9 | 125.9 |
| 32.5° | 599.2 | 477.0 | 275.4 | 187.0 | 154.1 | 141.4 | 130.4 | 123.1 | 118.6 | 117.7 | 116.7 |
| 35° | 613.8 | 479.7 | 264.5 | 176.9 | 145.9 | 133.2 | 122.2 | 114.9 | 111.3 | 110.4 | 110.4 |
| 37.5° | 630.2 | 484.3 | 256.3 | 167.8 | 137.7 | 124.9 | 114.9 | 107.6 | 104.9 | 104.0 | 104.0 |
| 40° | 647.5 | 491.6 | 249.9 | 159.6 | 131.3 | 117.7 | 108.5 | 102.1 | 100.3 | 99.4 | 99.4 |
| 42.5° | 664.9 | 498.0 | 244.4 | 153.2 | 124.9 | 111.3 | 104.0 | 97.6 | 94.9 | 94.9 | 94.9 |
| 45° | 681.3 | 502.5 | 239.0 | 146.8 | 118.6 | 106.7 | 98.5 | 93.0 | 90.3 | 90.3 | 90.3 |
| 47.5° | 695.9 | 507.1 | 230.7 | 140.5 | 112.2 | 100.3 | 93.9 | 88.5 | 85.7 | 85.7 | 85.7 |
| 50° | 711.4 | 509.8 | 221.6 | 132.2 | 105.8 | 95.8 | 89.4 | 83.0 | 81.2 | 80.3 | 80.3 |
| 52.5° | 724.2 | 509.8 | 209.8 | 124.0 | 98.5 | 89.4 | 83.9 | 78.4 | 75.7 | 73.9 | 73.9 |
| 55° | 733.3 | 509.8 | 197.0 | 114.0 | 91.2 | 83.9 | 78.4 | 73.0 | 69.3 | 66.6 | 66.6 |
| 57.5° | 738.8 | 507.1 | 182.4 | 102.1 | 83.9 | 76.6 | 73.0 | 66.6 | 59.3 | 53.8 | 52.0 |
| 60° | 734.2 | 498.9 | 166.9 | 89.4 | 75.7 | 70.2 | 67.5 | 59.3 | 49.3 | 46.5 | 46.5 |
| 62.5° | 715.0 | 479.7 | 151.4 | 78.4 | 69.3 | 63.8 | 61.1 | 52.0 | 44.7 | 42.0 | 42.0 |
| 65° | 661.2 | 433.2 | 132.2 | 68.4 | 62.0 | 58.4 | 54.7 | 46.5 | 40.1 | 36.5 | 36.5 |
| 67.5° | 582.8 | 373.9 | 110.4 | 60.2 | 55.6 | 52.9 | 50.2 | 42.0 | 35.6 | 31.9 | 31.9 |
| 70° | 472.4 | 301.9 | 93.9 | 52.9 | 49.3 | 47.4 | 44.7 | 38.3 | 31.0 | 28.3 | 28.3 |
| 72.5° | 371.2 | 237.1 | 78.4 | 47.4 | 45.6 | 42.0 | 40.1 | 33.7 | 28.3 | 25.5 | 25.5 |
| 75° | 276.3 | 176.9 | 69.3 | 42.0 | 42.0 | 37.4 | 36.5 | 30.1 | 24.6 | 22.8 | 22.8 |
| 77.5° | 203.4 | 131.3 | 60.2 | 36.5 | 36.5 | 32.8 | 31.0 | 26.4 | 22.8 | 21.0 | 21.0 |
| 80° | 137.7 | 89.4 | 44.7 | 27.4 | 27.4 | 26.4 | 24.6 | 22.8 | 19.2 | 17.3 | 16.4 |
| 82.5° | 58.4 | 37.4 | 21.9 | 13.7 | 12.8 | 10.0 | 8.2 | 6.4 | 6.4 | 5.5 | 5.5 |
| 85° | 10.0 | 4.6 | 4.6 | 3.6 | 2.7 | 2.7 | 2.7 | 1.8 | 1.8 | 1.8 | 1.8 |
| 87.5° | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 |
| 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
 Rf: 75.5
 Rg: 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 |

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CIE 1931 Chromaticity Diagram



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



Point lies inside the ANSI 2700K 4-step quadrangle

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



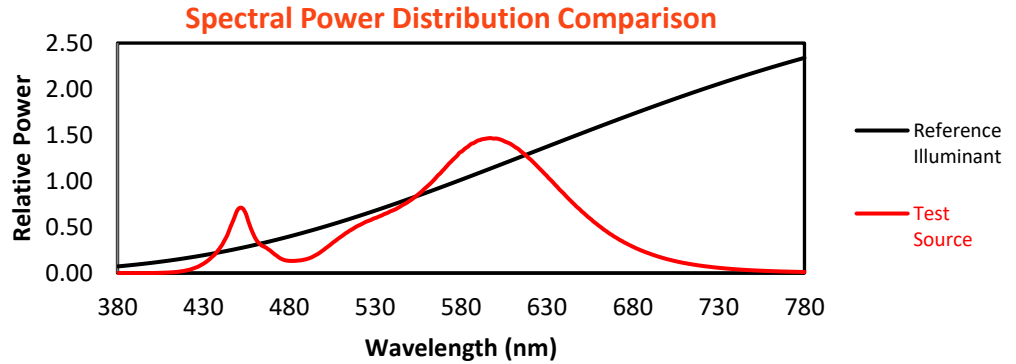
Melanopic Lumens: NR

M/P: 2.04

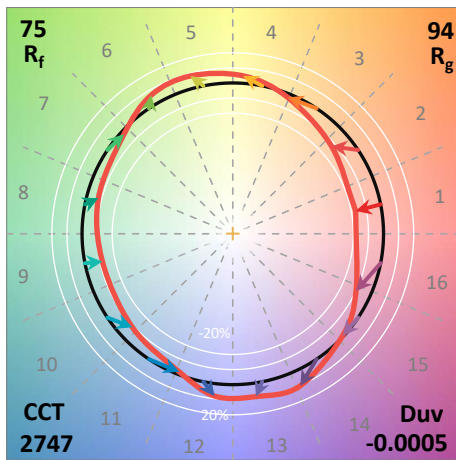
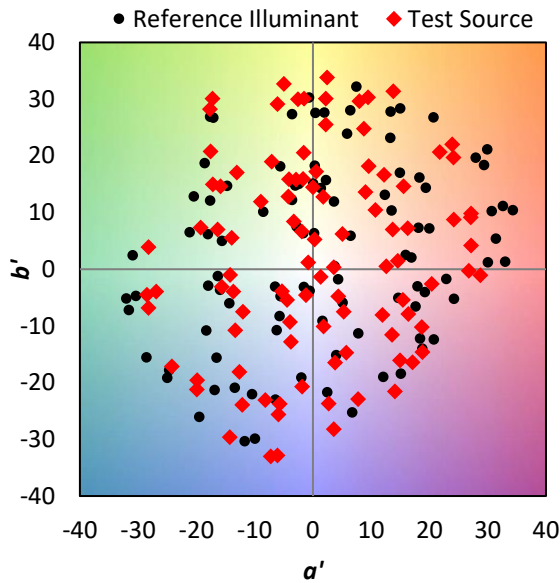
| λ (nm) | Power W [^] /nm | Lumens (φ/nm) | λ (nm) | Power W [^] /nm | Lumens (φ/nm) | λ (nm) | Power W [^] /nm | Lumens (φ/nm) | λ (nm) | Power W [^] /nm | Lumens (φ/nm) | λ (nm) | Power W [^] /nm | Lumens (φ/nm) |
|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|
| 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

$R_f = 75.5$
 $R_g = 93.6$
 $CIE R_a = 71.7$
 $R_9 = -35.3$



Color Vector Graphics

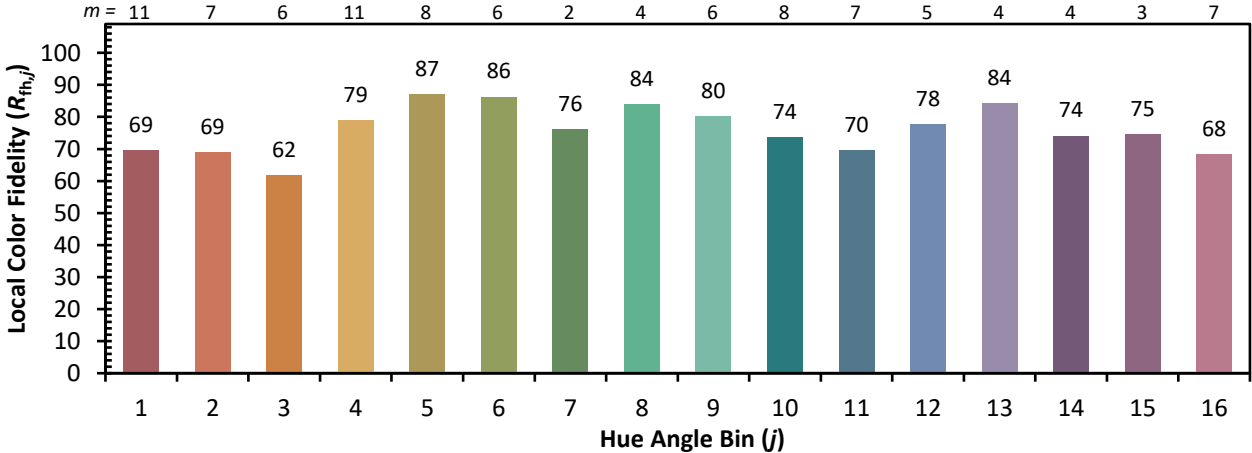


Individual Sample Fidelity Index ($R_{f,i}$)

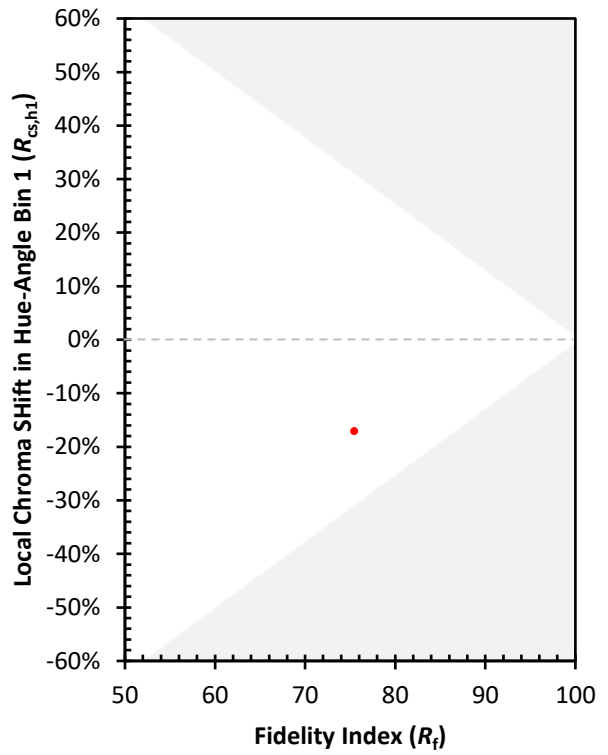
| | | | |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 68 | CES51 = 87 | CES76 = 63 |
| CES02 = 63 | CES27 = 90 | CES52 = 85 | CES77 = 79 |
| CES03 = 31 | CES28 = 87 | CES53 = 78 | CES78 = 66 |
| CES04 = 71 | CES29 = 71 | CES54 = 86 | CES79 = 87 |
| CES05 = 50 | CES30 = 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)