

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: P868628

Luminaire Tested: **EMM2-HTN-SA1B-727-U-T4W-HSS**

Issue Date: 08/22/2024

Test Information

Test Method: LM-79-08
Report Number: P868628
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-T4W-HSS
Description: EPIC MODERN TALL HOUSING DISCRETE LED ARRAYS 60W 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

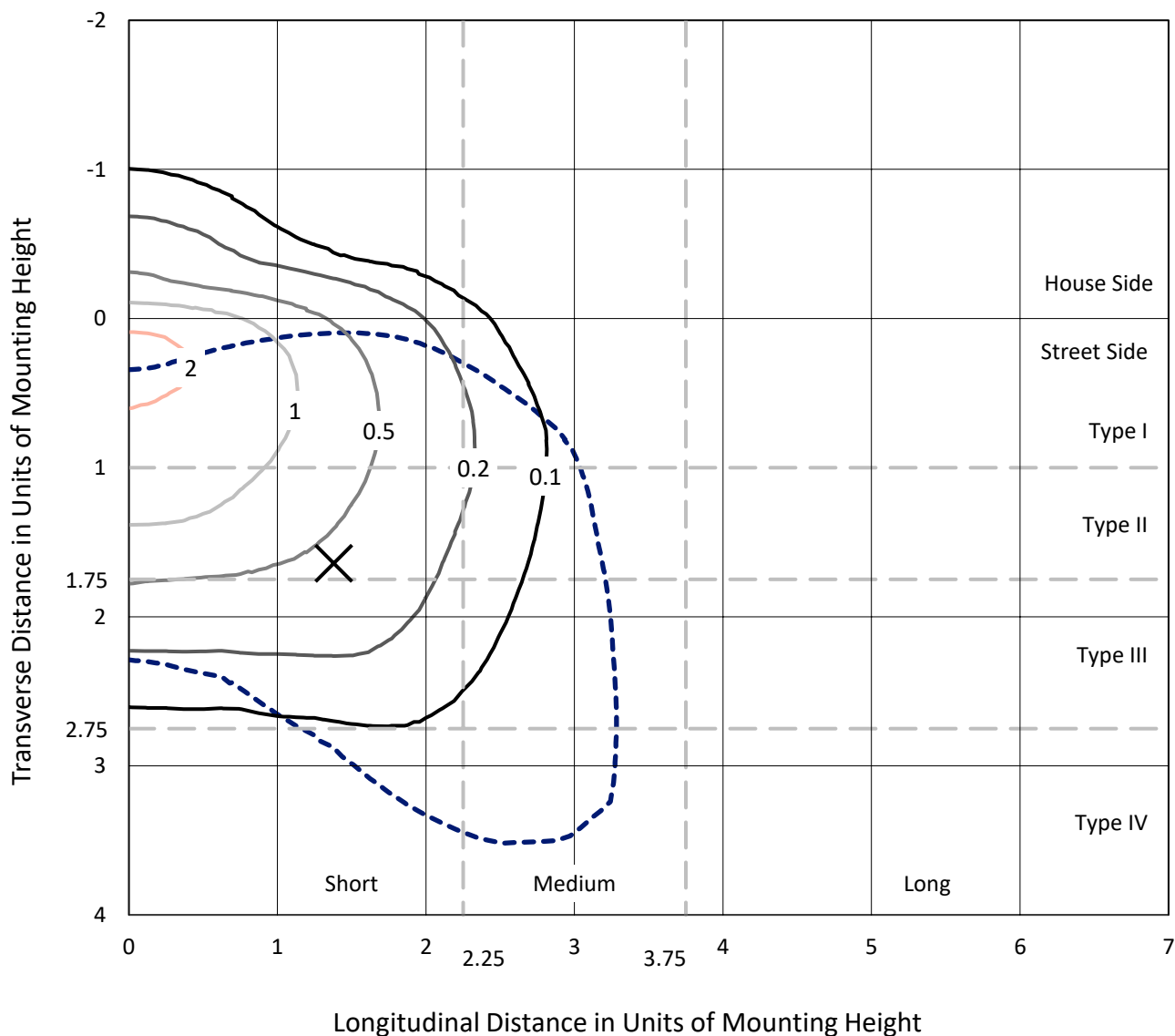
Lumens per Lamp: N/A
Luminaire Lumens: 4084.4 lumens
Efficiency: N/A
Efficacy: 92.8 lumens/watt
Luminous Opening: Rectangular (W 0.33' x L: 0.33' x H: 0')
IES Classification: Type IV - Short
BUG Rating: B1 - U0 - G1

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

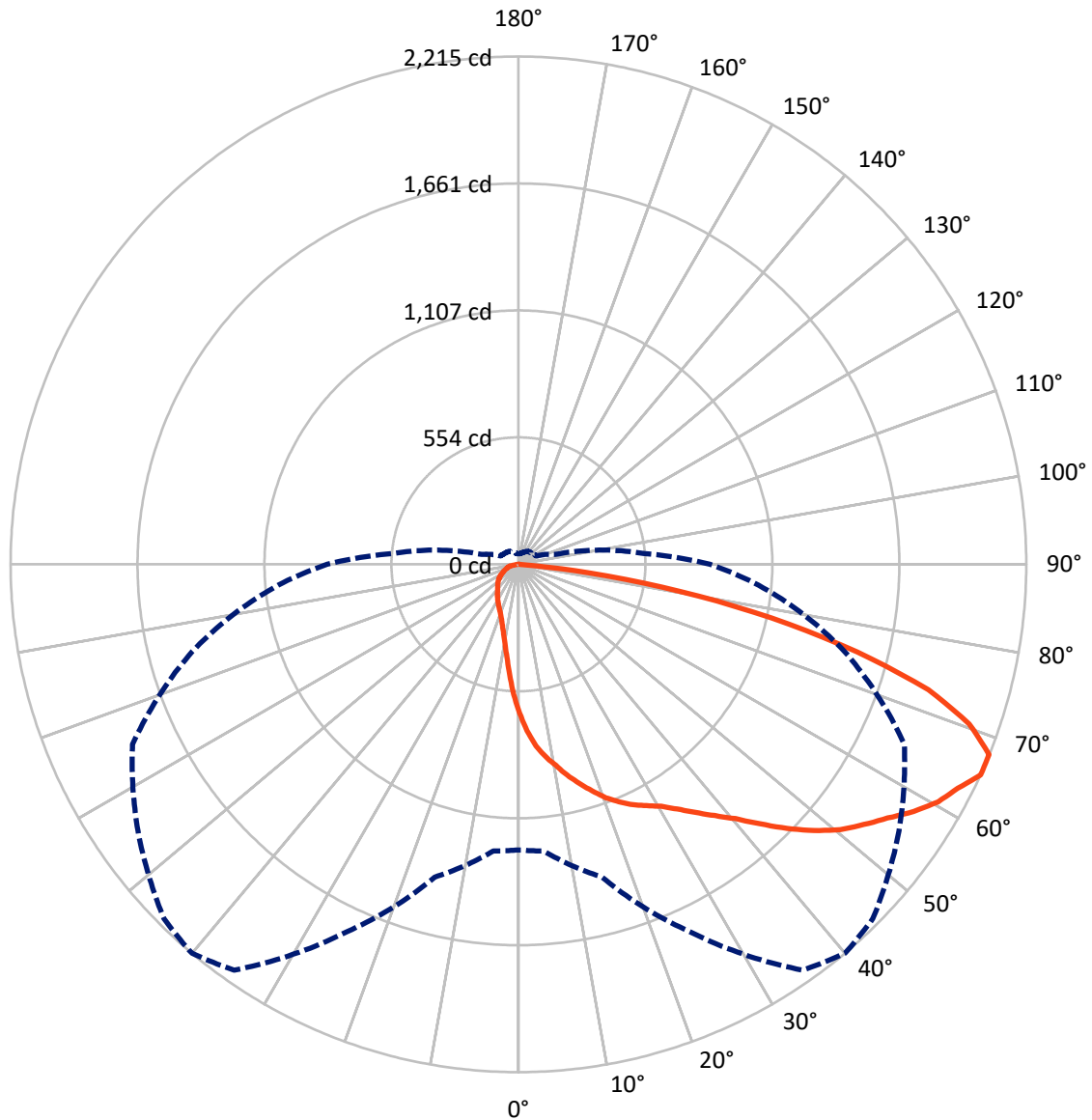
× Max cd
 - - - 1/2 Max cd



Based on 20 foot mounting height. Maximum calculated value = 2.4 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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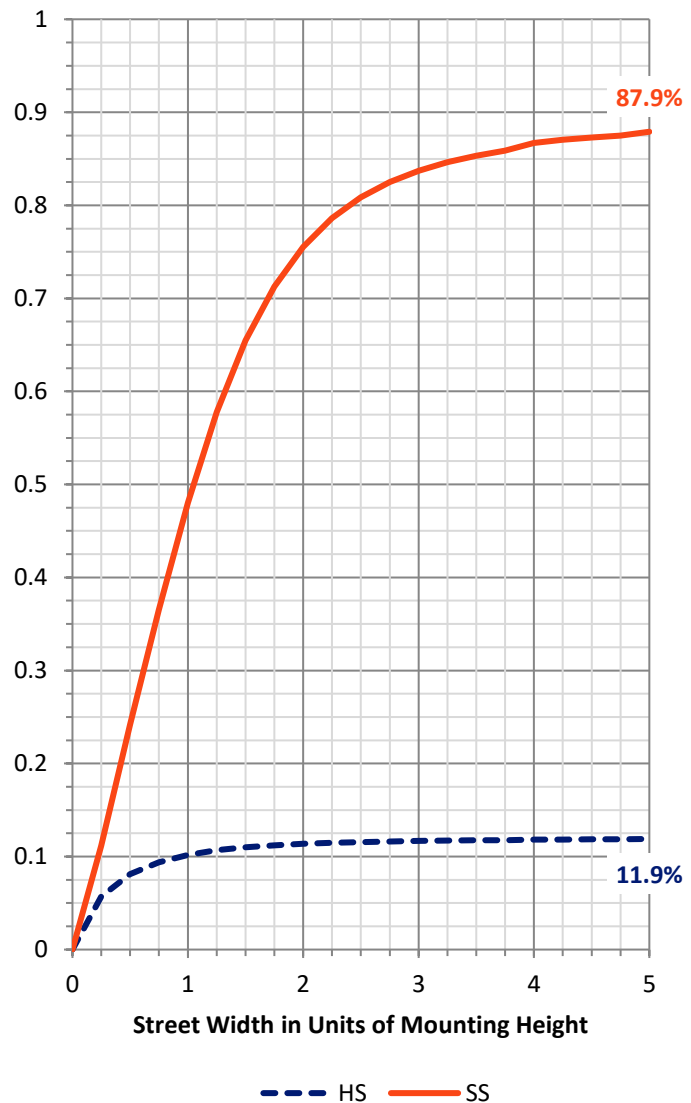
FLUX DISTRIBUTION:

| | | Downward | Upward | Total |
|--------------------|-----------|----------|--------|--------|
| House Side | Lumens | 489.0 | 0.0 | 489.0 |
| | % Fixture | 12.0 | 0.0 | 12.0 |
| Street Side | Lumens | 3595.4 | 0.0 | 3595.4 |
| | % Fixture | 88.0 | 0.0 | 88.0 |
| Total | Lumens | 4084.4 | 0.0 | 4084.4 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

Coefficient of Utilization

ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10° | 60.8 | 1.5 |
| 10°-20° | 182.7 | 4.5 |
| 20°-30° | 314.4 | 7.7 |
| 30°-40° | 475.2 | 11.6 |
| 40°-50° | 694.8 | 17.0 |
| 50°-60° | 887.5 | 21.7 |
| 60°-70° | 885.7 | 21.7 |
| 70°-80° | 519.4 | 12.7 |
| 80°-90° | 64.0 | 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° | 4084.4 | 100.0 |
| 0°-180° | 4084.4 | 100.0 |



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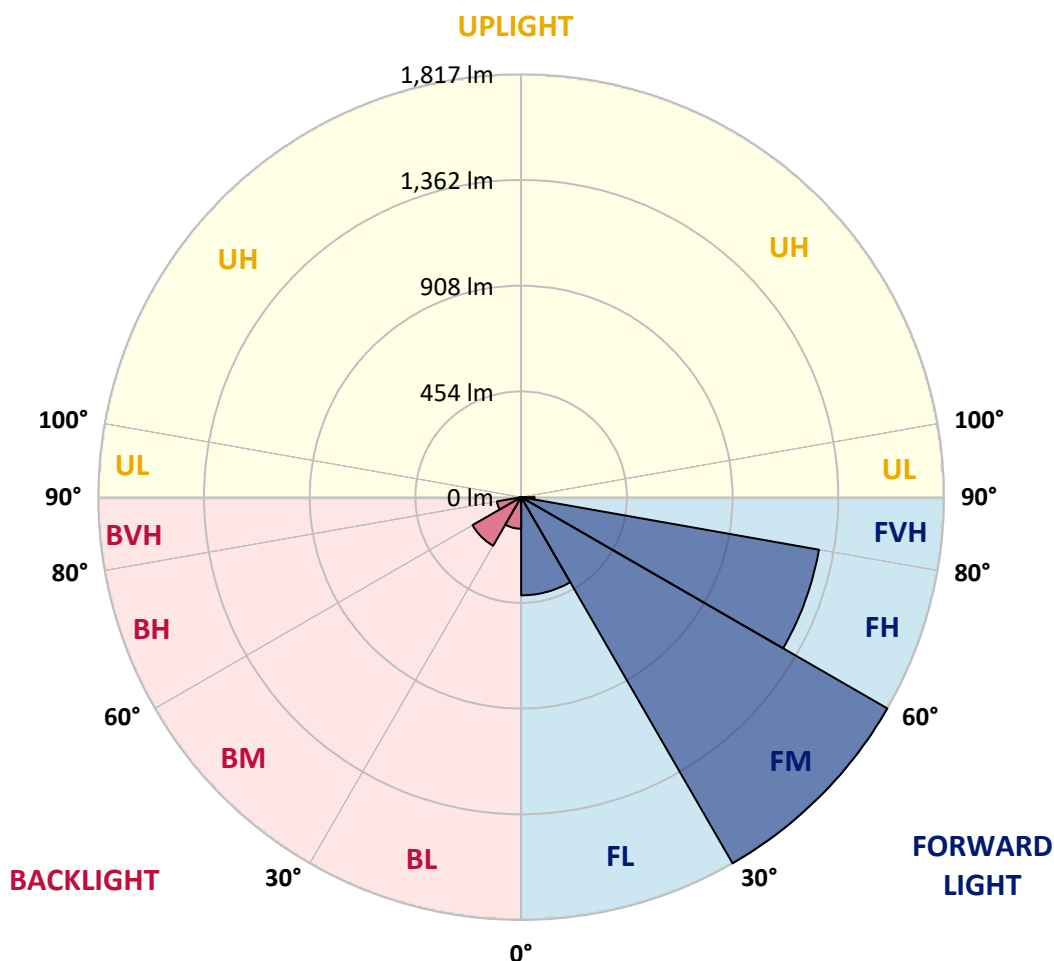
CATALOG NUMBER: EMM2-HTN-SA1B-727-U-T4W-HSS

LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | Lumens | % Fixture | Zone Rating/Lumen Limit | | |
|----------------|--------|-----------|-------------------------|------|---------|
| | | | B | U | G |
| FL (0°-30°) | 421.9 | 10.3 | | | |
| FM (30°-60°) | 1816.5 | 44.5 | | | |
| FH (60°-80°) | 1299.2 | 31.8 | | | G1/1800 |
| FVH (80°-90°) | 57.8 | 1.4 | | | G1/100 |
| BL (0°-30°) | 136.0 | 3.3 | B1/500 | | |
| BM (30°-60°) | 240.9 | 5.9 | B1/1000 | | |
| BH (60°-80°) | 105.9 | 2.6 | B0/110 | | G0/110 |
| BVH (80°-90°) | 6.2 | 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 IV Short





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CANDELA DISTRIBUTION (FULL):

| | 0° | 5° | 15° | 25° | 35° | 40° | 45° | 55° | 65° | 75° | 85° |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0° | 649.2 | 649.2 | 649.2 | 649.2 | 649.2 | 649.2 | 649.2 | 649.2 | 649.2 | 649.2 | 649.2 |
| 2.5° | 757.5 | 754.0 | 747.1 | 741.3 | 733.3 | 726.4 | 719.5 | 706.8 | 690.7 | 676.9 | 659.6 |
| 5° | 832.3 | 826.5 | 821.9 | 815.0 | 801.2 | 795.4 | 790.8 | 764.4 | 736.7 | 708.0 | 670.0 |
| 7.5° | 885.2 | 889.8 | 880.6 | 870.3 | 853.0 | 846.1 | 839.2 | 812.7 | 778.2 | 736.7 | 682.6 |
| 10° | 946.2 | 947.4 | 935.9 | 923.2 | 904.8 | 891.0 | 881.8 | 849.5 | 811.6 | 765.5 | 696.4 |
| 12.5° | 1004.9 | 1004.9 | 998.0 | 979.6 | 955.4 | 942.8 | 926.7 | 889.8 | 843.8 | 789.7 | 712.6 |
| 15° | 1052.1 | 1054.4 | 1048.7 | 1034.9 | 1008.4 | 991.1 | 975.0 | 932.4 | 873.7 | 817.3 | 725.2 |
| 17.5° | 1094.7 | 1093.6 | 1090.1 | 1077.5 | 1052.1 | 1038.3 | 1022.2 | 975.0 | 908.3 | 839.2 | 744.8 |
| 20° | 1123.5 | 1123.5 | 1122.4 | 1115.5 | 1097.0 | 1086.7 | 1067.1 | 1017.6 | 946.2 | 871.4 | 765.5 |
| 22.5° | 1145.4 | 1144.2 | 1144.2 | 1145.4 | 1135.0 | 1124.7 | 1116.6 | 1067.1 | 985.4 | 899.0 | 786.2 |
| 25° | 1163.8 | 1162.7 | 1166.1 | 1168.4 | 1163.8 | 1161.5 | 1152.3 | 1114.3 | 1033.7 | 931.3 | 807.0 |
| 27.5° | 1188.0 | 1191.4 | 1190.3 | 1190.3 | 1189.1 | 1191.4 | 1190.3 | 1158.0 | 1080.9 | 965.8 | 828.8 |
| 30° | 1226.0 | 1231.7 | 1228.3 | 1223.7 | 1223.7 | 1224.8 | 1230.6 | 1209.8 | 1136.2 | 1008.4 | 853.0 |
| 32.5° | 1314.6 | 1308.8 | 1284.7 | 1268.6 | 1270.9 | 1272.0 | 1277.8 | 1266.3 | 1191.4 | 1056.7 | 878.3 |
| 35° | 1415.9 | 1409.0 | 1382.5 | 1345.7 | 1333.0 | 1328.4 | 1327.3 | 1320.4 | 1251.3 | 1108.5 | 908.3 |
| 37.5° | 1547.1 | 1549.4 | 1510.3 | 1457.3 | 1419.4 | 1390.6 | 1384.8 | 1369.9 | 1303.1 | 1155.7 | 939.3 |
| 40° | 1680.7 | 1671.5 | 1638.1 | 1586.3 | 1511.4 | 1458.5 | 1441.2 | 1420.5 | 1361.8 | 1205.2 | 969.3 |
| 42.5° | 1809.6 | 1792.3 | 1748.6 | 1692.2 | 1604.7 | 1547.1 | 1508.0 | 1481.5 | 1415.9 | 1259.3 | 998.0 |
| 45° | 1977.7 | 1928.2 | 1849.9 | 1799.2 | 1689.9 | 1642.7 | 1607.0 | 1548.3 | 1480.4 | 1313.5 | 1032.6 |
| 47.5° | 2110.0 | 2014.5 | 1943.1 | 1921.3 | 1778.5 | 1734.8 | 1702.5 | 1620.8 | 1546.0 | 1374.5 | 1068.3 |
| 50° | 2085.9 | 2027.2 | 2009.9 | 1990.3 | 1845.3 | 1818.8 | 1788.9 | 1703.7 | 1612.7 | 1438.9 | 1102.8 |
| 52.5° | 2023.7 | 2030.6 | 2052.5 | 2019.1 | 1904.0 | 1885.6 | 1866.0 | 1792.3 | 1679.5 | 1491.9 | 1133.9 |
| 55° | 1974.2 | 1988.0 | 2046.7 | 2036.4 | 1974.2 | 1953.5 | 1939.7 | 1879.8 | 1744.0 | 1540.2 | 1160.4 |
| 57.5° | 1884.4 | 1872.9 | 1946.6 | 2066.3 | 2049.0 | 2032.9 | 2019.1 | 1971.9 | 1809.6 | 1574.8 | 1177.6 |
| 60° | 1742.8 | 1700.2 | 1799.2 | 2029.5 | 2100.8 | 2103.1 | 2095.1 | 2041.0 | 1862.5 | 1574.8 | 1168.4 |
| 62.5° | 1543.7 | 1503.4 | 1625.4 | 1906.3 | 2128.5 | 2150.3 | 2145.7 | 2065.1 | 1885.6 | 1540.2 | 1132.7 |
| 65° | 1245.5 | 1254.7 | 1412.5 | 1767.0 | 2160.7 | 2214.8 | 2186.0 | 2026.0 | 1856.8 | 1473.5 | 1052.1 |
| 67.5° | 994.6 | 1022.2 | 1163.8 | 1586.3 | 2145.7 | 2213.6 | 2173.4 | 1915.5 | 1733.6 | 1380.2 | 929.0 |
| 70° | 785.1 | 803.5 | 920.9 | 1342.2 | 2014.5 | 2085.9 | 2035.2 | 1746.3 | 1525.3 | 1236.3 | 772.4 |
| 72.5° | 613.6 | 630.8 | 731.0 | 1074.0 | 1786.6 | 1869.5 | 1806.1 | 1518.4 | 1265.1 | 1048.7 | 613.6 |
| 75° | 466.2 | 478.9 | 553.7 | 827.7 | 1422.8 | 1526.4 | 1480.4 | 1215.6 | 987.7 | 830.0 | 469.7 |
| 77.5° | 300.4 | 317.7 | 401.7 | 580.2 | 1004.9 | 1129.3 | 1135.0 | 908.3 | 710.3 | 599.7 | 345.3 |
| 80° | 199.1 | 206.1 | 257.9 | 377.6 | 618.2 | 714.9 | 748.2 | 613.6 | 453.5 | 382.2 | 248.6 |
| 82.5° | 82.9 | 92.1 | 123.2 | 189.9 | 309.7 | 310.8 | 355.7 | 259.0 | 184.2 | 162.3 | 104.8 |
| 85° | 2.3 | 4.6 | 3.5 | 9.2 | 8.1 | 12.7 | 15.0 | 20.7 | 15.0 | 16.1 | 16.1 |
| 87.5° | 0.0 | 0.0 | 1.2 | 1.2 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 | 3.5 | 2.3 |
| 90° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |



REPORT NUMBER: P868628

CATALOG NUMBER: EMM2-HTN-SA1B-727-U-T4W-HSS

CANDELA DISTRIBUTION (continued):

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0° | 649.2 | 649.2 | 649.2 | 649.2 | 649.2 | 649.2 | 649.2 | 649.2 | 649.2 | 649.2 | 649.2 |
| 2.5° | 651.5 | 641.2 | 620.5 | 604.3 | 587.1 | 574.4 | 562.9 | 550.2 | 542.2 | 543.3 | 535.3 |
| 5° | 651.5 | 632.0 | 590.5 | 553.7 | 520.3 | 496.1 | 469.7 | 448.9 | 434.0 | 431.7 | 438.6 |
| 7.5° | 655.0 | 622.8 | 560.6 | 505.4 | 459.3 | 421.3 | 393.7 | 373.0 | 362.6 | 355.7 | 354.6 |
| 10° | 658.5 | 615.9 | 533.0 | 462.8 | 405.2 | 363.8 | 339.6 | 316.6 | 305.1 | 303.9 | 300.4 |
| 12.5° | 660.8 | 607.8 | 507.7 | 420.2 | 360.3 | 321.2 | 297.0 | 278.6 | 269.4 | 269.4 | 268.2 |
| 15° | 668.8 | 605.5 | 481.2 | 387.9 | 325.8 | 287.8 | 267.1 | 252.1 | 246.3 | 242.9 | 241.7 |
| 17.5° | 675.7 | 600.9 | 458.2 | 355.7 | 294.7 | 261.3 | 241.7 | 231.4 | 225.6 | 223.3 | 222.2 |
| 20° | 686.1 | 598.6 | 436.3 | 329.2 | 271.7 | 239.4 | 224.5 | 215.3 | 211.8 | 209.5 | 209.5 |
| 22.5° | 696.4 | 596.3 | 414.4 | 306.2 | 252.1 | 223.3 | 209.5 | 201.4 | 198.0 | 196.8 | 195.7 |
| 25° | 709.1 | 595.1 | 396.0 | 286.6 | 234.8 | 210.7 | 198.0 | 191.1 | 186.5 | 184.2 | 184.2 |
| 27.5° | 721.8 | 596.3 | 377.6 | 267.1 | 219.9 | 199.1 | 186.5 | 178.4 | 175.0 | 170.4 | 171.5 |
| 30° | 739.0 | 597.4 | 362.6 | 250.9 | 207.2 | 187.6 | 176.1 | 165.8 | 161.2 | 158.9 | 158.9 |
| 32.5° | 756.3 | 602.0 | 347.6 | 236.0 | 194.5 | 178.4 | 164.6 | 155.4 | 149.6 | 148.5 | 147.3 |
| 35° | 774.7 | 605.5 | 333.8 | 223.3 | 184.2 | 168.1 | 154.3 | 145.0 | 140.4 | 139.3 | 139.3 |
| 37.5° | 795.4 | 611.3 | 323.5 | 211.8 | 173.8 | 157.7 | 145.0 | 135.8 | 132.4 | 131.2 | 131.2 |
| 40° | 817.3 | 620.5 | 315.4 | 201.4 | 165.8 | 148.5 | 137.0 | 128.9 | 126.6 | 125.5 | 125.5 |
| 42.5° | 839.2 | 628.5 | 308.5 | 193.4 | 157.7 | 140.4 | 131.2 | 123.2 | 119.7 | 119.7 | 119.7 |
| 45° | 859.9 | 634.3 | 301.6 | 185.3 | 149.6 | 134.7 | 124.3 | 117.4 | 114.0 | 114.0 | 114.0 |
| 47.5° | 878.3 | 640.0 | 291.2 | 177.3 | 141.6 | 126.6 | 118.6 | 111.7 | 108.2 | 108.2 | 108.2 |
| 50° | 897.9 | 643.5 | 279.7 | 166.9 | 133.5 | 120.9 | 112.8 | 104.8 | 102.5 | 101.3 | 101.3 |
| 52.5° | 914.0 | 643.5 | 264.8 | 156.6 | 124.3 | 112.8 | 105.9 | 99.0 | 95.5 | 93.2 | 93.2 |
| 55° | 925.5 | 643.5 | 248.6 | 143.9 | 115.1 | 105.9 | 99.0 | 92.1 | 87.5 | 84.0 | 84.0 |
| 57.5° | 932.4 | 640.0 | 230.2 | 128.9 | 105.9 | 96.7 | 92.1 | 84.0 | 74.8 | 67.9 | 65.6 |
| 60° | 926.7 | 629.7 | 210.7 | 112.8 | 95.5 | 88.6 | 85.2 | 74.8 | 62.2 | 58.7 | 58.7 |
| 62.5° | 902.5 | 605.5 | 191.1 | 99.0 | 87.5 | 80.6 | 77.1 | 65.6 | 56.4 | 53.0 | 53.0 |
| 65° | 834.6 | 546.8 | 166.9 | 86.3 | 78.3 | 73.7 | 69.1 | 58.7 | 50.7 | 46.0 | 46.0 |
| 67.5° | 735.6 | 472.0 | 139.3 | 76.0 | 70.2 | 66.8 | 63.3 | 53.0 | 44.9 | 40.3 | 40.3 |
| 70° | 596.3 | 381.0 | 118.6 | 66.8 | 62.2 | 59.9 | 56.4 | 48.3 | 39.1 | 35.7 | 35.7 |
| 72.5° | 468.5 | 299.3 | 99.0 | 59.9 | 57.6 | 53.0 | 50.7 | 42.6 | 35.7 | 32.2 | 32.2 |
| 75° | 348.8 | 223.3 | 87.5 | 53.0 | 53.0 | 47.2 | 46.0 | 38.0 | 31.1 | 28.8 | 28.8 |
| 77.5° | 256.7 | 165.8 | 76.0 | 46.0 | 46.0 | 41.4 | 39.1 | 33.4 | 28.8 | 26.5 | 26.5 |
| 80° | 173.8 | 112.8 | 56.4 | 34.5 | 34.5 | 33.4 | 31.1 | 28.8 | 24.2 | 21.9 | 20.7 |
| 82.5° | 73.7 | 47.2 | 27.6 | 17.3 | 16.1 | 12.7 | 10.4 | 8.1 | 8.1 | 6.9 | 6.9 |
| 85° | 12.7 | 5.8 | 5.8 | 4.6 | 3.5 | 3.5 | 3.5 | 2.3 | 2.3 | 2.3 | 2.3 |
| 87.5° | 2.3 | 2.3 | 2.3 | 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

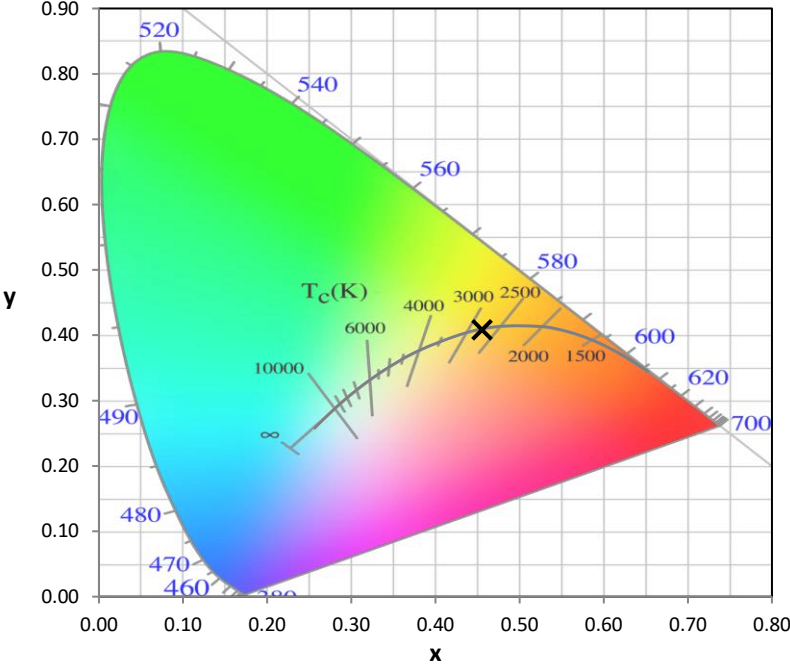
Stabilization Time: 22M
 Operation Time: 1H 22M
 Sphere Temperature (°C): 24.2

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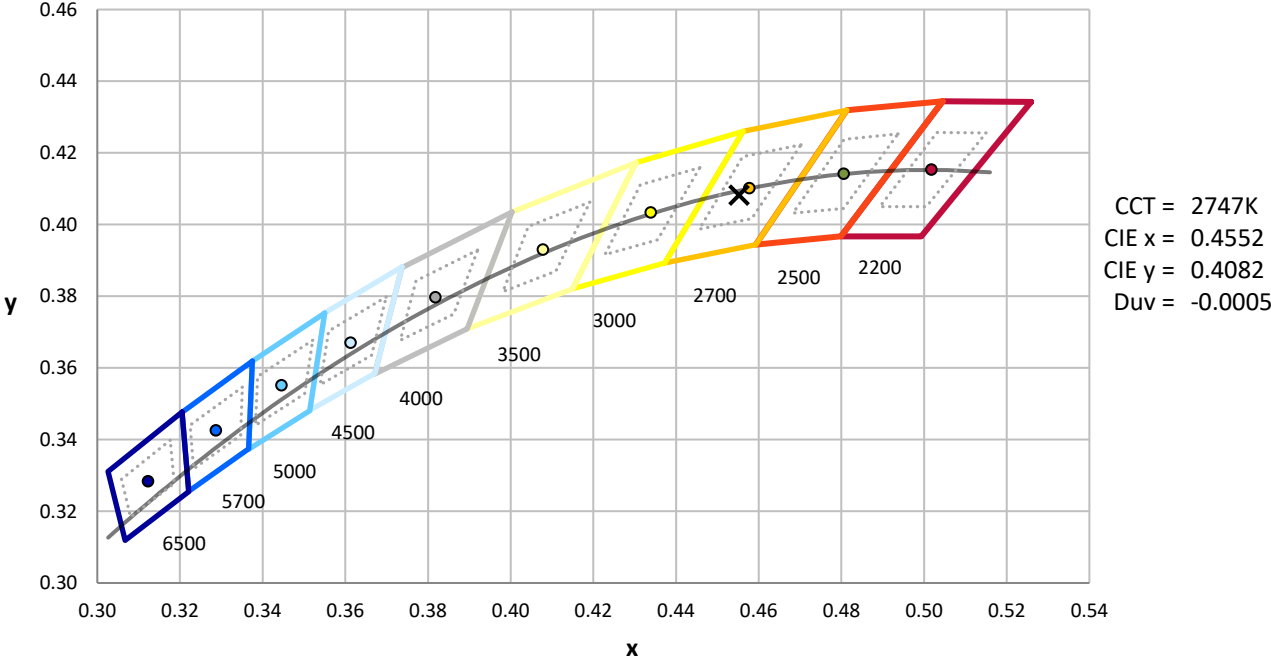
| Measurement and Test Equipment | | | |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | IN0058 | 6/18/2024 | 12/18/2024 |
| Power Meter | INXT2011004 | 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



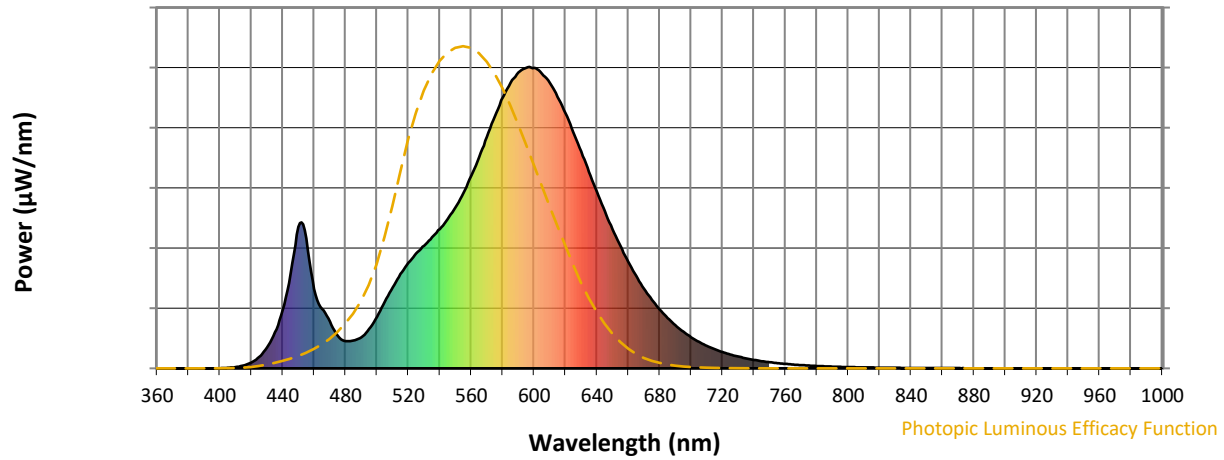
CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies inside the ANSI 2700K 4-step quadrangle

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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



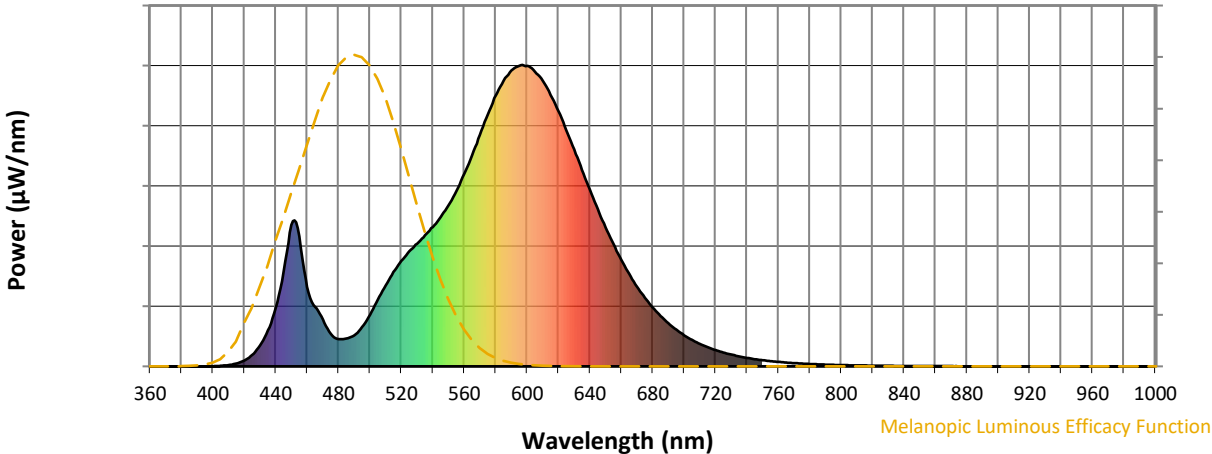
Scotopic Lumens: NR

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

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

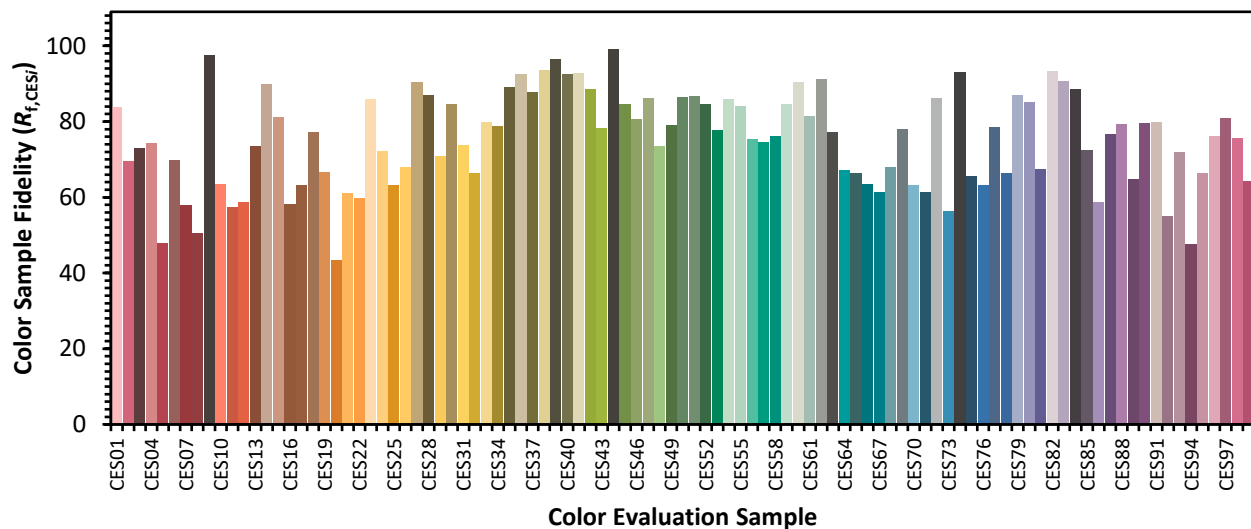


Color Vector Graphics

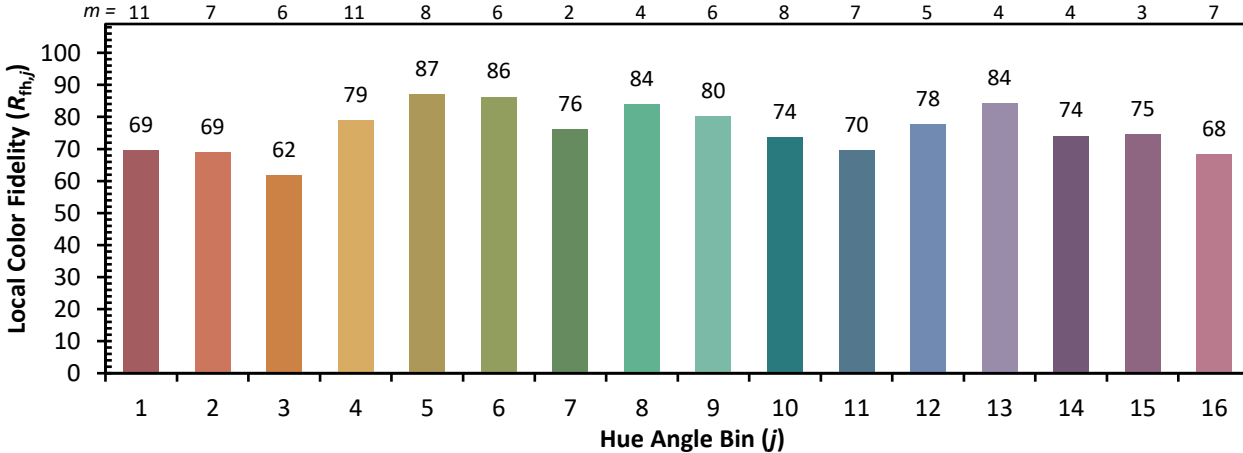


Individual Sample Fidelity Index ($R_{f,i}$)

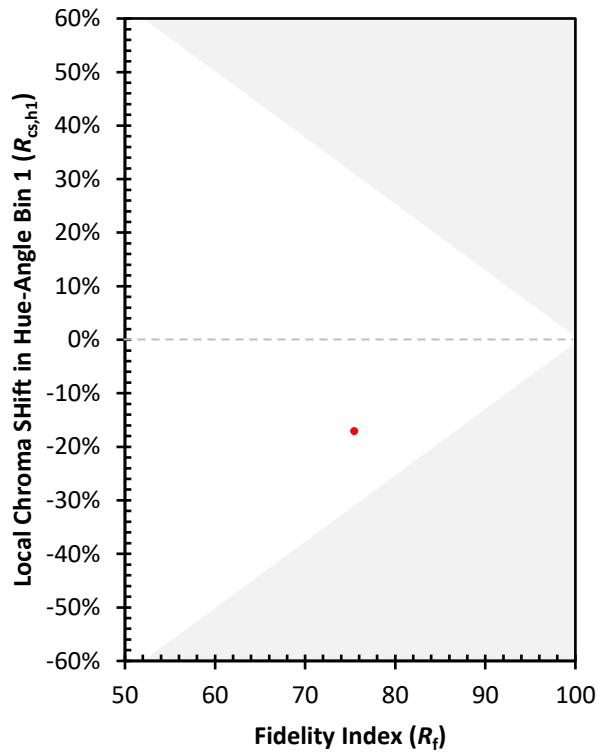
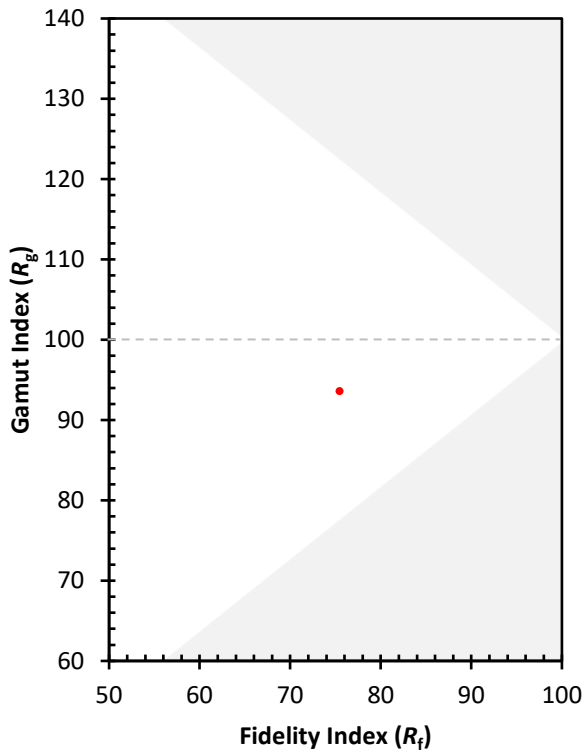
| | | | |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 68 | CES51 = 87 | CES76 = 63 |
| CES02 = 63 | CES27 = 90 | CES52 = 85 | CES77 = 79 |
| CES03 = 31 | CES28 = 87 | CES53 = 78 | CES78 = 66 |
| CES04 = 71 | CES29 = 71 | CES54 = 86 | CES79 = 87 |
| CES05 = 50 | CES30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