

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: P871115

Luminaire Tested: **EMM2-HSN-SA2C-840-U-T2U**

Issue Date: 09/05/2024



Test Information

Test Method: LM-79-08
Report Number: P871115
Test Lab: INNOVATION CENTER(G3)
Issue Date: 09/05/2024
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: INVUE
Catalog Number: EMM2-HSN-SA2C-840-U-T2U
Description: EPIC MODERN SHORT HOUSING DISCRETE LED ARRAYS 120W 80CRI 4000K
FIXTURE w/ TYPE II URBAN DISTRIBUTION OPTIC
Light Source: (20) 4000K CCT, 80 CRI LEDS
Ballast/Driver: ELECTRONIC DRIVER

Summary

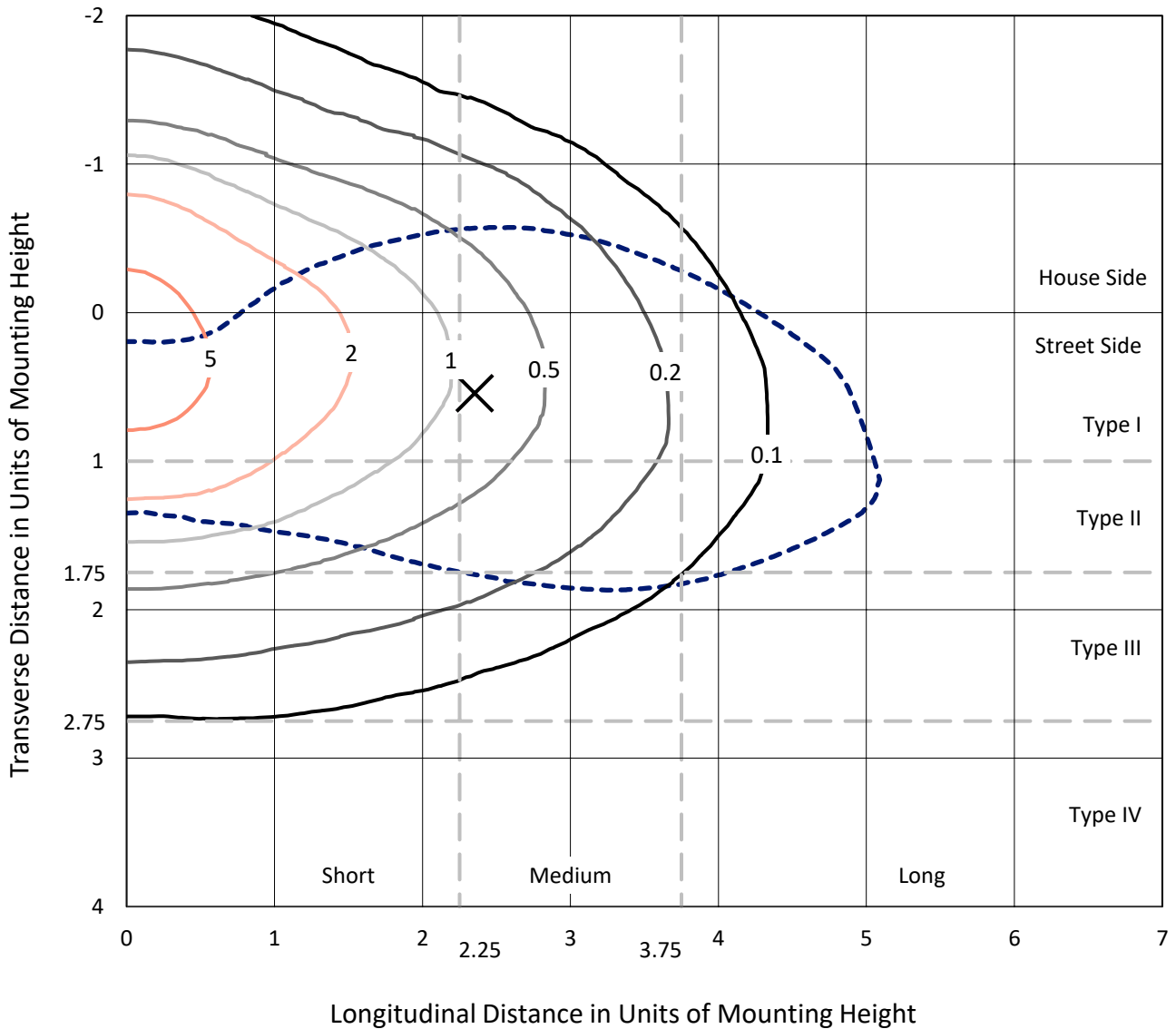
Lumens per Lamp: N/A
Luminaire Lumens: 13163.1 lumens
Efficiency: N/A
Efficacy: 130.3 lumens/watt
Luminous Opening: Rectangular (W 0.67' x L: 0.33' x H: 0')
IES Classification: Type III - Medium
BUG Rating: B3 - U0 - G3

Input Watts (W): 101
Input Voltage (V): 120
Input Current (A_{in}): NR
Voltage Rise (V): NR
Power Factor: 0.99
Total Harmonic Distortion (THDi): 9.45%
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 24 FT

REPORT NUMBER: P871115
 CATALOG NUMBER: EMM2-HSN-SA2C-840-U-T2U

Iso-Footcandle Lines of Horizontal Illumination

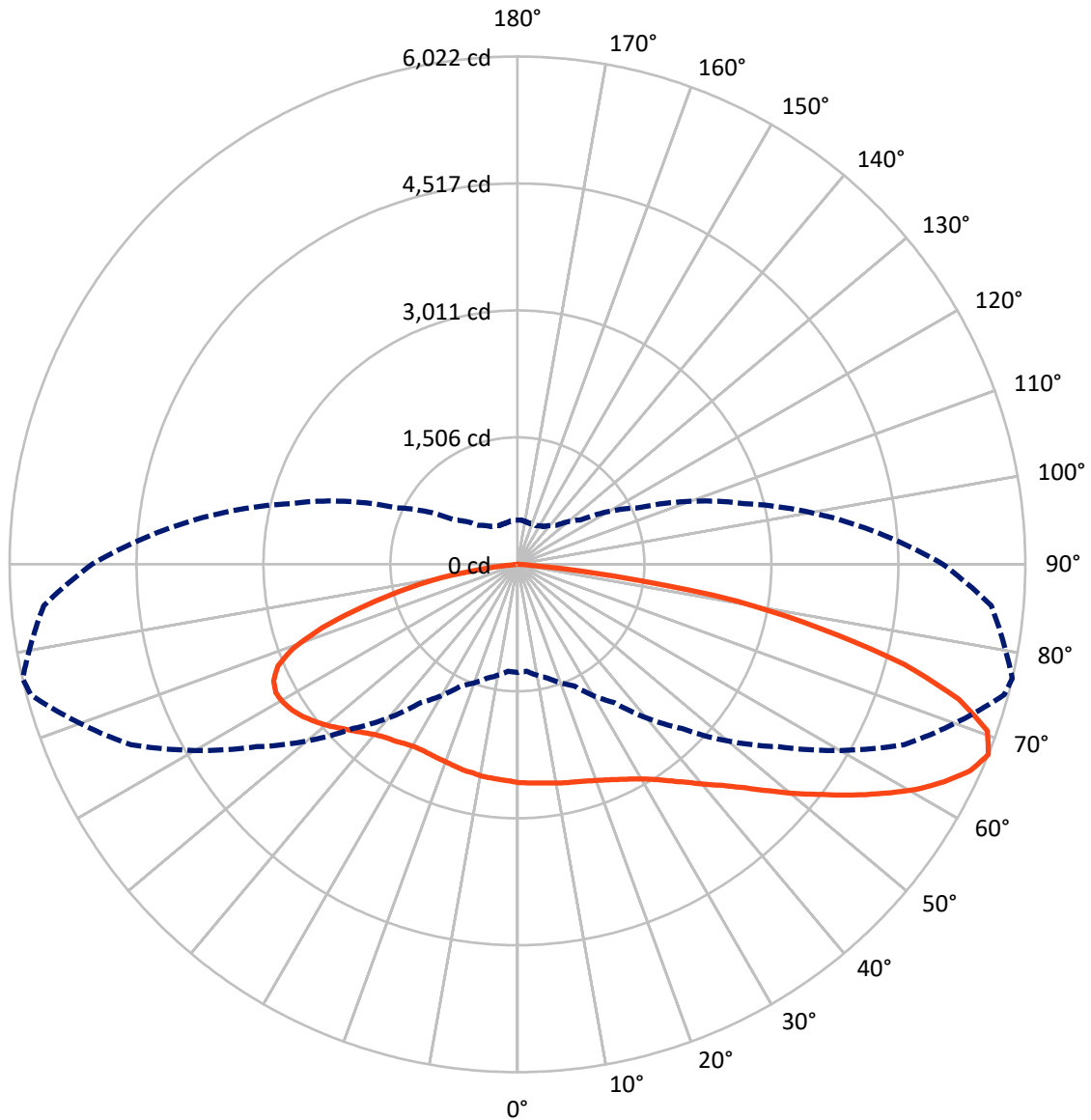
✕ Max cd
 - - - 1/2 Max cd



Based on 20 foot mounting height. Maximum calculated value = 7.1 fc
 Type III - Medium - N/A

REPORT NUMBER: P871115
CATALOG NUMBER: EMM2-HSN-SA2C-840-U-T2U

Luminous Intensity Polar Plot



— Vertical Plane Through 77-Deg Lateral - - - Horizontal Cone Through 67.5-Deg Vertical

REPORT NUMBER: P871115
 CATALOG NUMBER: EMM2-HSN-SA2C-840-U-T2U

FLUX DISTRIBUTION:

| | | Downward | Upward | Total |
|--------------------|-----------|----------|--------|---------|
| House Side | Lumens | 4377.2 | 0.0 | 4377.2 |
| | % Fixture | 33.3 | 0.0 | 33.3 |
| Street Side | Lumens | 8785.9 | 0.0 | 8785.9 |
| | % Fixture | 66.7 | 0.0 | 66.7 |
| Total | Lumens | 13163.1 | 0.0 | 13163.1 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|---------|-----------|
| 0°-10° | 248.7 | 1.9 |
| 10°-20° | 754.4 | 5.7 |
| 20°-30° | 1271.8 | 9.7 |
| 30°-40° | 1804.8 | 13.7 |
| 40°-50° | 2283.5 | 17.3 |
| 50°-60° | 2501.4 | 19.0 |
| 60°-70° | 2418.0 | 18.4 |
| 70°-80° | 1626.3 | 12.4 |
| 80°-90° | 254.1 | 1.9 |
| 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° | 13163.1 | 100.0 |
| 0°-180° | 13163.1 | 100.0 |

Coefficient of Utilization

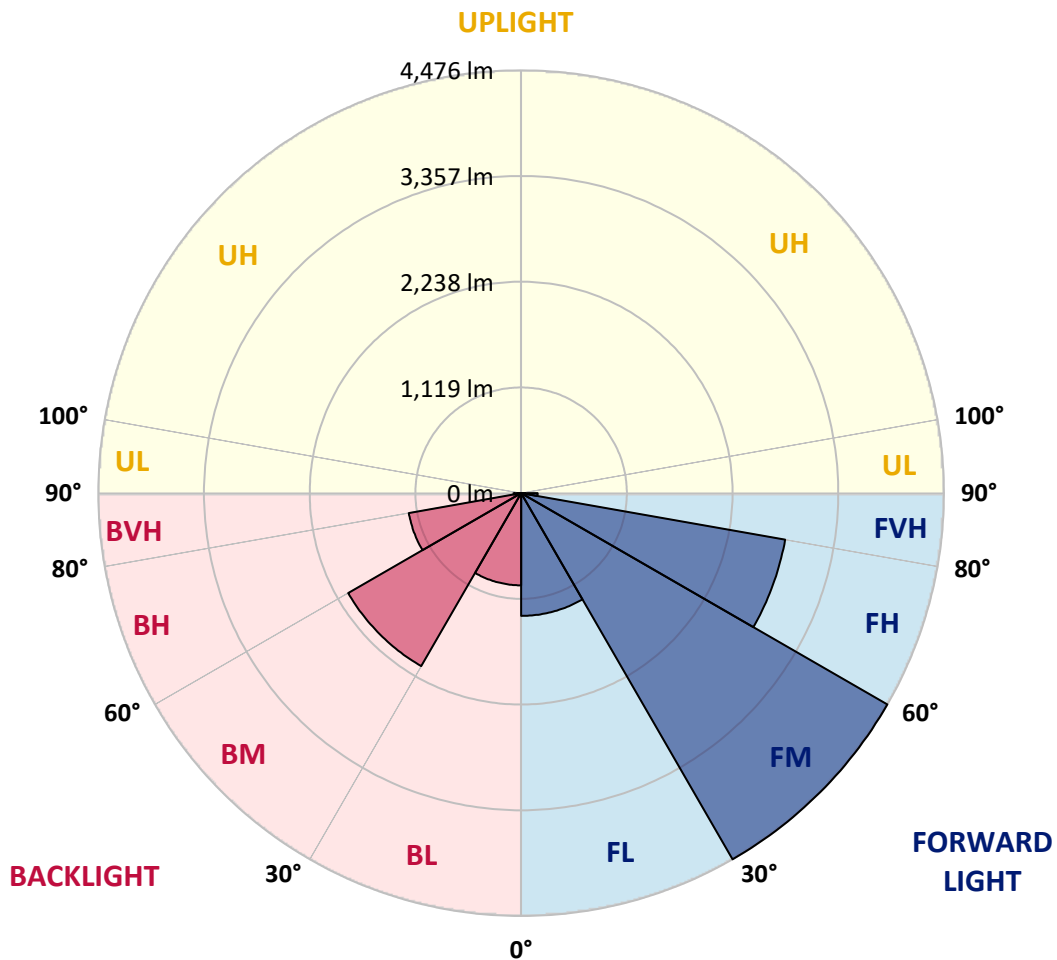


REPORT NUMBER: P871115
 CATALOG NUMBER: EMM2-HSN-SA2C-840-U-T2U

LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | Lumens | % Fixture | Zone Rating/Lumen Limit | | |
|----------------|--------|-----------|-------------------------|------|---------|
| | | | B | U | G |
| FL (0°-30°) | 1299.2 | 9.9 | | | |
| FM (30°-60°) | 4475.6 | 34.0 | | | |
| FH (60°-80°) | 2837.1 | 21.6 | | | G2/5000 |
| FVH (80°-90°) | 174.0 | 1.3 | | | G2/225 |
| BL (0°-30°) | 975.8 | 7.4 | B2/1000 | | |
| BM (30°-60°) | 2114.1 | 16.1 | B2/2500 | | |
| BH (60°-80°) | 1207.2 | 9.2 | B3/2500 | | G3/2500 |
| BVH (80°-90°) | 80.1 | 0.6 | | | G1/100 |
| UL (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH (100°-180°) | 0.0 | 0.0 | | U0/0 | |

BUG Rating: B3-U0-G3
 Type III Medium





REPORT NUMBER: P871115

CATALOG NUMBER: EMM2-HSN-SA2C-840-U-T2U

CANDELA DISTRIBUTION (FULL):

| | 0° | 5° | 15° | 25° | 35° | 45° | 55° | 65° | 75° | 77° | 85° |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0° | 2588.0 | 2588.0 | 2588.0 | 2588.0 | 2588.0 | 2588.0 | 2588.0 | 2588.0 | 2588.0 | 2588.0 | 2588.0 |
| 2.5° | 2645.3 | 2642.7 | 2629.7 | 2634.9 | 2619.3 | 2629.7 | 2614.1 | 2601.0 | 2598.4 | 2595.8 | 2598.4 |
| 5° | 2728.6 | 2715.6 | 2702.6 | 2694.8 | 2681.7 | 2676.5 | 2650.5 | 2624.5 | 2608.8 | 2606.2 | 2601.0 |
| 7.5° | 2824.9 | 2819.7 | 2801.5 | 2791.1 | 2754.6 | 2736.4 | 2700.0 | 2653.1 | 2629.7 | 2619.3 | 2606.2 |
| 10° | 2923.9 | 2936.9 | 2913.5 | 2892.6 | 2851.0 | 2811.9 | 2749.4 | 2689.6 | 2642.7 | 2637.5 | 2608.8 |
| 12.5° | 3046.3 | 3043.7 | 3028.0 | 2991.6 | 2942.1 | 2887.4 | 2811.9 | 2728.6 | 2666.1 | 2655.7 | 2614.1 |
| 15° | 3155.6 | 3153.0 | 3132.2 | 3098.3 | 3033.2 | 2965.5 | 2864.0 | 2767.7 | 2689.6 | 2673.9 | 2624.5 |
| 17.5° | 3257.1 | 3251.9 | 3238.9 | 3202.5 | 3121.8 | 3038.4 | 2939.5 | 2811.9 | 2718.2 | 2700.0 | 2632.3 |
| 20° | 3345.7 | 3350.9 | 3335.3 | 3298.8 | 3223.3 | 3134.8 | 3009.8 | 2869.2 | 2754.6 | 2733.8 | 2655.7 |
| 22.5° | 3442.0 | 3444.6 | 3436.8 | 3423.8 | 3327.4 | 3233.7 | 3098.3 | 2934.3 | 2796.3 | 2775.5 | 2681.7 |
| 25° | 3543.5 | 3546.2 | 3551.4 | 3543.5 | 3434.2 | 3332.7 | 3189.5 | 3015.0 | 2853.6 | 2824.9 | 2718.2 |
| 27.5° | 3660.7 | 3663.3 | 3673.7 | 3658.1 | 3540.9 | 3434.2 | 3291.0 | 3100.9 | 2913.5 | 2882.2 | 2749.4 |
| 30° | 3793.5 | 3803.9 | 3796.1 | 3790.9 | 3655.5 | 3551.4 | 3392.5 | 3189.5 | 2991.6 | 2952.5 | 2804.1 |
| 32.5° | 3952.3 | 3949.7 | 3934.1 | 3918.5 | 3780.5 | 3671.1 | 3507.1 | 3304.0 | 3087.9 | 3043.7 | 2892.6 |
| 35° | 4066.9 | 4066.9 | 4043.4 | 4035.6 | 3908.1 | 3793.5 | 3632.1 | 3431.6 | 3197.3 | 3155.6 | 2986.4 |
| 37.5° | 4137.2 | 4147.6 | 4129.4 | 4134.6 | 4012.2 | 3905.5 | 3757.0 | 3561.8 | 3317.0 | 3280.6 | 3100.9 |
| 40° | 4163.2 | 4189.3 | 4204.9 | 4225.7 | 4103.3 | 4012.2 | 3889.8 | 3702.4 | 3470.6 | 3429.0 | 3238.9 |
| 42.5° | 4168.4 | 4207.5 | 4262.2 | 4306.4 | 4168.4 | 4092.9 | 4017.4 | 3845.6 | 3621.7 | 3585.2 | 3389.9 |
| 45° | 4142.4 | 4124.2 | 4256.9 | 4262.2 | 4204.9 | 4158.0 | 4129.4 | 4017.4 | 3840.4 | 3780.5 | 3577.4 |
| 47.5° | 3944.5 | 3923.7 | 3960.1 | 4126.8 | 4160.6 | 4186.6 | 4243.9 | 4217.9 | 4059.1 | 4012.2 | 3793.5 |
| 50° | 3624.3 | 3613.8 | 3759.7 | 3939.3 | 4051.3 | 4184.0 | 4337.7 | 4410.6 | 4301.2 | 4272.6 | 4066.9 |
| 52.5° | 3095.7 | 3067.1 | 3363.9 | 3712.8 | 3908.1 | 4158.0 | 4402.8 | 4608.4 | 4574.6 | 4532.9 | 4301.2 |
| 55° | 2759.9 | 2759.9 | 2960.3 | 3395.1 | 3725.8 | 4064.3 | 4444.4 | 4816.7 | 4876.6 | 4829.7 | 4569.4 |
| 57.5° | 2400.6 | 2429.2 | 2637.5 | 2936.9 | 3462.8 | 3892.4 | 4439.2 | 4991.2 | 5168.2 | 5124.0 | 4853.2 |
| 60° | 2093.3 | 2116.8 | 2236.5 | 2538.5 | 3153.0 | 3665.9 | 4381.9 | 5134.4 | 5439.0 | 5423.4 | 5103.1 |
| 62.5° | 1780.9 | 1809.5 | 1905.9 | 2189.7 | 2744.2 | 3405.6 | 4262.2 | 5212.5 | 5694.2 | 5678.5 | 5355.7 |
| 65° | 1530.9 | 1533.5 | 1629.9 | 1866.8 | 2335.5 | 3090.5 | 4051.3 | 5196.9 | 5892.0 | 5902.4 | 5569.2 |
| 67.5° | 1281.0 | 1273.2 | 1398.2 | 1590.8 | 2002.2 | 2752.0 | 3770.1 | 5058.9 | 5975.3 | 6022.2 | 5639.5 |
| 70° | 942.5 | 952.9 | 1127.4 | 1340.9 | 1692.4 | 2361.5 | 3376.9 | 4790.7 | 5840.0 | 5912.9 | 5478.1 |
| 72.5° | 708.2 | 729.0 | 898.3 | 1119.6 | 1413.8 | 1971.0 | 2947.3 | 4324.6 | 5462.4 | 5472.8 | 4986.0 |
| 75° | 575.4 | 580.6 | 731.6 | 929.5 | 1158.6 | 1580.4 | 2366.7 | 3611.2 | 4618.9 | 4738.6 | 4236.1 |
| 77.5° | 489.5 | 484.3 | 557.2 | 749.8 | 934.7 | 1262.8 | 1783.5 | 2746.8 | 3626.9 | 3681.5 | 3317.0 |
| 80° | 416.6 | 414.0 | 440.0 | 606.6 | 731.6 | 900.9 | 1221.1 | 1913.7 | 2588.0 | 2647.9 | 2356.3 |
| 82.5° | 218.7 | 234.3 | 229.1 | 374.9 | 414.0 | 473.9 | 585.8 | 869.6 | 1130.0 | 1145.6 | 1083.1 |
| 85° | 10.4 | 10.4 | 10.4 | 15.6 | 26.0 | 41.7 | 80.7 | 80.7 | 88.5 | 169.2 | 192.7 |
| 87.5° | 2.6 | 2.6 | 5.2 | 5.2 | 5.2 | 7.8 | 7.8 | 10.4 | 10.4 | 10.4 | 10.4 |
| 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: P871115
 CATALOG NUMBER: EMM2-HSN-SA2C-840-U-T2U

CANDELA DISTRIBUTION (continued):

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0° | 2588.0 | 2588.0 | 2588.0 | 2588.0 | 2588.0 | 2588.0 | 2588.0 | 2588.0 | 2588.0 | 2588.0 | 2588.0 |
| 2.5° | 2593.2 | 2582.8 | 2567.2 | 2569.8 | 2567.2 | 2567.2 | 2554.2 | 2543.8 | 2541.1 | 2546.4 | 2556.8 |
| 5° | 2595.8 | 2580.2 | 2556.8 | 2549.0 | 2541.1 | 2535.9 | 2515.1 | 2499.5 | 2491.7 | 2496.9 | 2499.5 |
| 7.5° | 2595.8 | 2572.4 | 2546.4 | 2530.7 | 2509.9 | 2494.3 | 2470.9 | 2450.0 | 2439.6 | 2442.2 | 2447.4 |
| 10° | 2590.6 | 2564.6 | 2543.8 | 2512.5 | 2478.7 | 2460.4 | 2424.0 | 2397.9 | 2384.9 | 2387.5 | 2374.5 |
| 12.5° | 2590.6 | 2562.0 | 2520.3 | 2491.7 | 2444.8 | 2405.8 | 2377.1 | 2348.5 | 2338.1 | 2327.7 | 2322.4 |
| 15° | 2593.2 | 2556.8 | 2515.1 | 2455.2 | 2400.6 | 2358.9 | 2322.4 | 2304.2 | 2288.6 | 2283.4 | 2286.0 |
| 17.5° | 2593.2 | 2556.8 | 2494.3 | 2424.0 | 2361.5 | 2309.4 | 2278.2 | 2257.4 | 2252.1 | 2246.9 | 2246.9 |
| 20° | 2606.2 | 2559.4 | 2476.1 | 2392.7 | 2314.6 | 2260.0 | 2231.3 | 2218.3 | 2218.3 | 2210.5 | 2210.5 |
| 22.5° | 2627.1 | 2564.6 | 2465.6 | 2366.7 | 2275.6 | 2215.7 | 2184.5 | 2168.8 | 2176.6 | 2171.4 | 2168.8 |
| 25° | 2650.5 | 2582.8 | 2452.6 | 2330.3 | 2223.5 | 2161.0 | 2129.8 | 2119.4 | 2116.8 | 2103.7 | 2122.0 |
| 27.5° | 2668.7 | 2595.8 | 2444.8 | 2293.8 | 2176.6 | 2103.7 | 2064.7 | 2046.5 | 2033.4 | 2038.6 | 2033.4 |
| 30° | 2718.2 | 2632.3 | 2447.4 | 2262.6 | 2124.6 | 2036.0 | 1989.2 | 1968.3 | 1963.1 | 1963.1 | 1963.1 |
| 32.5° | 2785.9 | 2679.1 | 2465.6 | 2249.5 | 2075.1 | 1971.0 | 1913.7 | 1892.8 | 1887.6 | 1877.2 | 1882.4 |
| 35° | 2871.8 | 2749.4 | 2494.3 | 2228.7 | 2036.0 | 1895.4 | 1833.0 | 1804.3 | 1796.5 | 1786.1 | 1786.1 |
| 37.5° | 2968.1 | 2819.7 | 2515.1 | 2218.3 | 1984.0 | 1817.3 | 1747.0 | 1710.6 | 1705.4 | 1695.0 | 1700.2 |
| 40° | 3090.5 | 2916.1 | 2549.0 | 2197.5 | 1924.1 | 1747.0 | 1653.3 | 1593.4 | 1606.4 | 1611.7 | 1622.1 |
| 42.5° | 3228.5 | 3038.4 | 2601.0 | 2176.6 | 1877.2 | 1674.1 | 1536.1 | 1476.3 | 1491.9 | 1486.7 | 1497.1 |
| 45° | 3416.0 | 3181.6 | 2666.1 | 2168.8 | 1819.9 | 1585.6 | 1416.4 | 1348.7 | 1343.5 | 1335.7 | 1340.9 |
| 47.5° | 3611.2 | 3353.5 | 2728.6 | 2153.2 | 1757.5 | 1476.3 | 1281.0 | 1195.1 | 1174.2 | 1163.8 | 1153.4 |
| 50° | 3814.3 | 3525.3 | 2801.5 | 2142.8 | 1674.1 | 1353.9 | 1145.6 | 1046.7 | 1007.6 | 994.6 | 981.6 |
| 52.5° | 4043.4 | 3710.2 | 2864.0 | 2116.8 | 1583.0 | 1226.3 | 1023.2 | 911.3 | 867.0 | 841.0 | 843.6 |
| 55° | 4285.6 | 3879.4 | 2921.3 | 2085.5 | 1478.9 | 1106.5 | 900.9 | 807.1 | 762.9 | 755.1 | 755.1 |
| 57.5° | 4509.5 | 4053.9 | 2962.9 | 2030.8 | 1374.7 | 989.4 | 799.3 | 718.6 | 697.8 | 708.2 | 708.2 |
| 60° | 4738.6 | 4194.5 | 2983.8 | 1971.0 | 1268.0 | 890.4 | 729.0 | 663.9 | 653.5 | 674.3 | 676.9 |
| 62.5° | 4923.5 | 4306.4 | 2978.6 | 1887.6 | 1150.8 | 804.5 | 661.3 | 609.3 | 614.5 | 650.9 | 658.7 |
| 65° | 5056.3 | 4361.1 | 2913.5 | 1762.7 | 1038.9 | 729.0 | 601.4 | 552.0 | 552.0 | 578.0 | 585.8 |
| 67.5° | 5045.8 | 4290.8 | 2783.3 | 1588.2 | 919.1 | 653.5 | 546.8 | 507.7 | 507.7 | 525.9 | 523.3 |
| 70° | 4832.4 | 4048.7 | 2535.9 | 1377.3 | 801.9 | 588.4 | 499.9 | 471.3 | 468.7 | 476.5 | 473.9 |
| 72.5° | 4319.4 | 3556.6 | 2150.6 | 1137.8 | 692.6 | 523.3 | 453.0 | 427.0 | 421.8 | 411.4 | 403.6 |
| 75° | 3564.4 | 2921.3 | 1679.3 | 906.1 | 585.8 | 460.8 | 408.8 | 385.3 | 364.5 | 377.5 | 369.7 |
| 77.5° | 2765.1 | 2241.7 | 1249.7 | 703.0 | 476.5 | 401.0 | 364.5 | 338.5 | 333.3 | 380.1 | 364.5 |
| 80° | 2017.8 | 1549.2 | 882.6 | 502.5 | 369.7 | 325.5 | 304.6 | 283.8 | 359.3 | 481.7 | 479.1 |
| 82.5° | 895.7 | 747.2 | 403.6 | 239.5 | 171.8 | 143.2 | 119.8 | 135.4 | 226.5 | 221.3 | 229.1 |
| 85° | 80.7 | 83.3 | 44.3 | 28.6 | 18.2 | 15.6 | 10.4 | 10.4 | 7.8 | 7.8 | 7.8 |
| 87.5° | 10.4 | 10.4 | 7.8 | 7.8 | 5.2 | 5.2 | 5.2 | 5.2 | 2.6 | 2.6 | 2.6 |
| 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: SP1-2407-157-8

Test Date: 09/05/2024

Luminaire Tested: MEM2-HTN-SA-40-840-U-5WQ

Data in this report applies to families of products including MEM2-HTN-SA-40-840-U-5WQ

Test Information

Test Method: LM-79-2019
 Report Number: SP1-2407-157-8
 Test Lab: COOPER LIGHTING SOLUTIONS
 Photometer: SP1 - 76IN SPHERE
 Measurement Geometry: 4π
 Issue Date: 09/05/2024
 Manufacturer: COOPER LIGHTING SOLUTIONS
 Product Line: Streetworks
 Catalog Number: **MEM2-HTN-SA-40-840-U-5WQ**
 Description: Epic Modern Light Square 40W 5WQ Optic

Spectral Parameters

CCT (K): 3996
 CIE u': 0.2245
 CIE v': 0.5031
 Duv: 0.0012
 CIE x: 0.3815
 CIE y: 0.3799
 CIE z: 0.2386
 Peak Wavelength (nm): 449
 Dominant Wavelength (nm): 578
 Purity: 28.49233
 Rf: 82.6
 Rg: 95.1

| | | | |
|-----------|------|------|------|
| CRI (Ra): | 80.6 | | |
| R1: | 78.1 | R9: | -5.8 |
| R2: | 87.1 | R10: | 70.3 |
| R3: | 94.5 | R11: | 78.7 |
| R4: | 79.7 | R12: | 60.5 |
| R5: | 78.7 | R13: | 80.2 |
| R6: | 82.7 | R14: | 97.2 |
| R7: | 84.3 | R15: | 70.6 |
| R8: | 59.5 | | |



Test Conditions

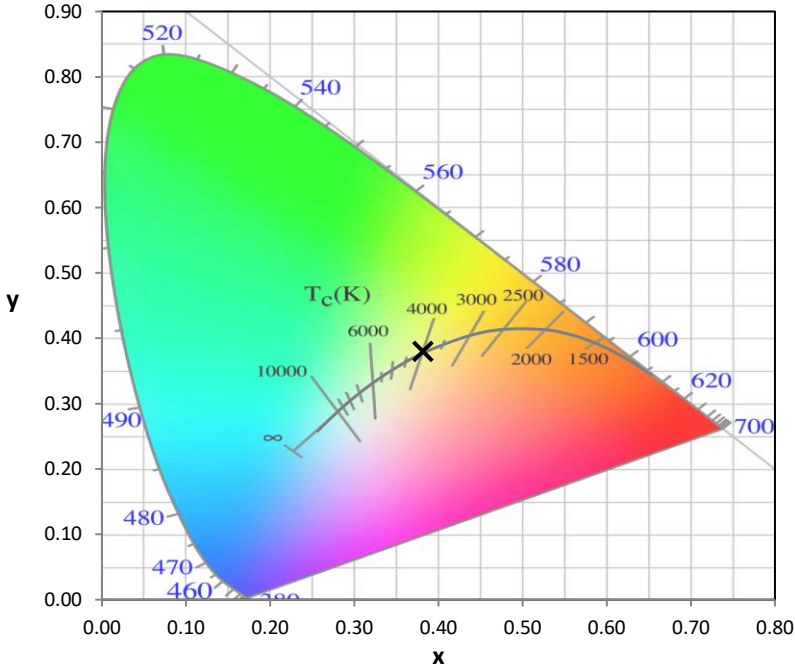
Stabilization Time: 29M
 Operation Time: 1H 29M
 Sphere Temperature (°C): 24.3

REPORT NUMBER: SP1-2407-157-8

| 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: SP1-2407-157-8

CIE 1931 Chromaticity Diagram



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



Point lies inside the ANSI 4000K 4-step quadrangle

REPORT NUMBER: SP1-2407-157-8

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 | 289 | NR | 620 | 725 | NR | 750 | 17 | NR | 880 | 0 | NR |
| 365 | 0 | NR | 495 | 351 | NR | 625 | 673 | NR | 755 | 15 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 414 | NR | 630 | 619 | NR | 760 | 13 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 470 | NR | 635 | 562 | NR | 765 | 11 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 513 | NR | 640 | 506 | NR | 770 | 9 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 546 | NR | 645 | 452 | NR | 775 | 8 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 571 | NR | 650 | 400 | NR | 780 | 7 | NR | 910 | 0 | NR |
| 395 | 1 | NR | 525 | 592 | NR | 655 | 352 | NR | 785 | 6 | NR | 915 | 0 | NR |
| 400 | 3 | NR | 530 | 606 | NR | 660 | 307 | NR | 790 | 5 | NR | 920 | 0 | NR |
| 405 | 6 | NR | 535 | 624 | NR | 665 | 267 | NR | 795 | 4 | NR | 925 | 0 | NR |
| 410 | 12 | NR | 540 | 642 | NR | 670 | 231 | NR | 800 | 4 | NR | 930 | 0 | NR |
| 415 | 22 | NR | 545 | 663 | NR | 675 | 199 | NR | 805 | 3 | NR | 935 | 0 | NR |
| 420 | 44 | NR | 550 | 686 | NR | 680 | 171 | NR | 810 | 3 | NR | 940 | 0 | NR |
| 425 | 83 | NR | 555 | 713 | NR | 685 | 146 | NR | 815 | 2 | NR | 945 | 0 | NR |
| 430 | 150 | NR | 560 | 745 | NR | 690 | 125 | NR | 820 | 2 | NR | 950 | 0 | NR |
| 435 | 267 | NR | 565 | 774 | NR | 695 | 106 | NR | 825 | 2 | NR | 955 | 0 | NR |
| 440 | 466 | NR | 570 | 806 | NR | 700 | 90 | NR | 830 | 1 | NR | 960 | 0 | NR |
| 445 | 804 | NR | 575 | 835 | NR | 705 | 76 | NR | 835 | 1 | NR | 965 | 0 | NR |
| 450 | 1000 | NR | 580 | 858 | NR | 710 | 65 | NR | 840 | 1 | NR | 970 | 0 | NR |
| 455 | 715 | NR | 585 | 875 | NR | 715 | 55 | NR | 845 | 1 | NR | 975 | 0 | NR |
| 460 | 492 | NR | 590 | 884 | NR | 720 | 47 | NR | 850 | 1 | NR | 980 | 0 | NR |
| 465 | 402 | NR | 595 | 880 | NR | 725 | 40 | NR | 855 | 1 | NR | 985 | 0 | NR |
| 470 | 288 | NR | 600 | 868 | NR | 730 | 34 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 226 | NR | 605 | 844 | NR | 735 | 28 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 227 | NR | 610 | 814 | NR | 740 | 24 | NR | 870 | 0 | NR | 1000 | 0 | NR |
| 485 | 248 | NR | 615 | 771 | NR | 745 | 20 | NR | 875 | 0 | NR | | | |

REPORT NUMBER: SP1-2407-157-8

Scotopic Flux vs. Wavelength



Scotopic Lumens: NR

S/P: 1.66

| 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 | 289 | NR | 620 | 725 | NR | 750 | 17 | NR | 880 | 0 | NR |
| 365 | 0 | NR | 495 | 351 | NR | 625 | 673 | NR | 755 | 15 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 414 | NR | 630 | 619 | NR | 760 | 13 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 470 | NR | 635 | 562 | NR | 765 | 11 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 513 | NR | 640 | 506 | NR | 770 | 9 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 546 | NR | 645 | 452 | NR | 775 | 8 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 571 | NR | 650 | 400 | NR | 780 | 7 | NR | 910 | 0 | NR |
| 395 | 1 | NR | 525 | 592 | NR | 655 | 352 | NR | 785 | 6 | NR | 915 | 0 | NR |
| 400 | 3 | NR | 530 | 606 | NR | 660 | 307 | NR | 790 | 5 | NR | 920 | 0 | NR |
| 405 | 6 | NR | 535 | 624 | NR | 665 | 267 | NR | 795 | 4 | NR | 925 | 0 | NR |
| 410 | 12 | NR | 540 | 642 | NR | 670 | 231 | NR | 800 | 4 | NR | 930 | 0 | NR |
| 415 | 22 | NR | 545 | 663 | NR | 675 | 199 | NR | 805 | 3 | NR | 935 | 0 | NR |
| 420 | 44 | NR | 550 | 686 | NR | 680 | 171 | NR | 810 | 3 | NR | 940 | 0 | NR |
| 425 | 83 | NR | 555 | 713 | NR | 685 | 146 | NR | 815 | 2 | NR | 945 | 0 | NR |
| 430 | 150 | NR | 560 | 745 | NR | 690 | 125 | NR | 820 | 2 | NR | 950 | 0 | NR |
| 435 | 267 | NR | 565 | 774 | NR | 695 | 106 | NR | 825 | 2 | NR | 955 | 0 | NR |
| 440 | 466 | NR | 570 | 806 | NR | 700 | 90 | NR | 830 | 1 | NR | 960 | 0 | NR |
| 445 | 804 | NR | 575 | 835 | NR | 705 | 76 | NR | 835 | 1 | NR | 965 | 0 | NR |
| 450 | 1000 | NR | 580 | 858 | NR | 710 | 65 | NR | 840 | 1 | NR | 970 | 0 | NR |
| 455 | 715 | NR | 585 | 875 | NR | 715 | 55 | NR | 845 | 1 | NR | 975 | 0 | NR |
| 460 | 492 | NR | 590 | 884 | NR | 720 | 47 | NR | 850 | 1 | NR | 980 | 0 | NR |
| 465 | 402 | NR | 595 | 880 | NR | 725 | 40 | NR | 855 | 1 | NR | 985 | 0 | NR |
| 470 | 288 | NR | 600 | 868 | NR | 730 | 34 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 226 | NR | 605 | 844 | NR | 735 | 28 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 227 | NR | 610 | 814 | NR | 740 | 24 | NR | 870 | 0 | NR | 1000 | 0 | NR |
| 485 | 248 | NR | 615 | 771 | NR | 745 | 20 | NR | 875 | 0 | NR | | | |

REPORT NUMBER: SP1-2407-157-8

Melanopic Flux vs. Wavelength



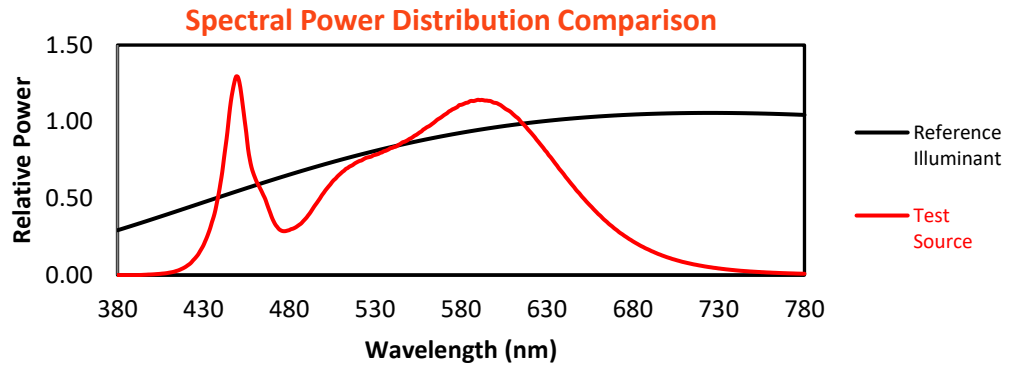
Melanopic Lumens: NR

M/P: 3.37

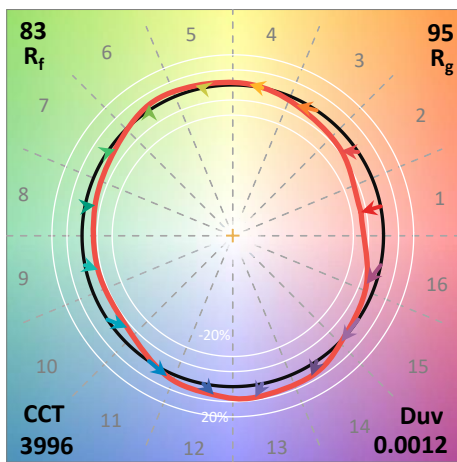
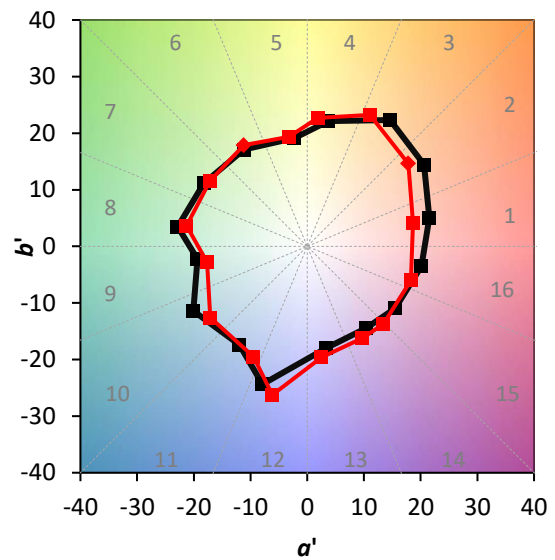
| λ (nm) | Power W [^] /nm | Lumens (φ/nm) | λ (nm) | Power W [^] /nm | Lumens (φ/nm) | λ (nm) | Power W [^] /nm | Lumens (φ/nm) | λ (nm) | Power W [^] /nm | Lumens (φ/nm) | λ (nm) | Power W [^] /nm | Lumens (φ/nm) |
|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|
| 360 | 0 | NR | 490 | 289 | NR | 620 | 725 | NR | 750 | 17 | NR | 880 | 0 | NR |
| 365 | 0 | NR | 495 | 351 | NR | 625 | 673 | NR | 755 | 15 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 414 | NR | 630 | 619 | NR | 760 | 13 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 470 | NR | 635 | 562 | NR | 765 | 11 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 513 | NR | 640 | 506 | NR | 770 | 9 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 546 | NR | 645 | 452 | NR | 775 | 8 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 571 | NR | 650 | 400 | NR | 780 | 7 | NR | 910 | 0 | NR |
| 395 | 1 | NR | 525 | 592 | NR | 655 | 352 | NR | 785 | 6 | NR | 915 | 0 | NR |
| 400 | 3 | NR | 530 | 606 | NR | 660 | 307 | NR | 790 | 5 | NR | 920 | 0 | NR |
| 405 | 6 | NR | 535 | 624 | NR | 665 | 267 | NR | 795 | 4 | NR | 925 | 0 | NR |
| 410 | 12 | NR | 540 | 642 | NR | 670 | 231 | NR | 800 | 4 | NR | 930 | 0 | NR |
| 415 | 22 | NR | 545 | 663 | NR | 675 | 199 | NR | 805 | 3 | NR | 935 | 0 | NR |
| 420 | 44 | NR | 550 | 686 | NR | 680 | 171 | NR | 810 | 3 | NR | 940 | 0 | NR |
| 425 | 83 | NR | 555 | 713 | NR | 685 | 146 | NR | 815 | 2 | NR | 945 | 0 | NR |
| 430 | 150 | NR | 560 | 745 | NR | 690 | 125 | NR | 820 | 2 | NR | 950 | 0 | NR |
| 435 | 267 | NR | 565 | 774 | NR | 695 | 106 | NR | 825 | 2 | NR | 955 | 0 | NR |
| 440 | 466 | NR | 570 | 806 | NR | 700 | 90 | NR | 830 | 1 | NR | 960 | 0 | NR |
| 445 | 804 | NR | 575 | 835 | NR | 705 | 76 | NR | 835 | 1 | NR | 965 | 0 | NR |
| 450 | 1000 | NR | 580 | 858 | NR | 710 | 65 | NR | 840 | 1 | NR | 970 | 0 | NR |
| 455 | 715 | NR | 585 | 875 | NR | 715 | 55 | NR | 845 | 1 | NR | 975 | 0 | NR |
| 460 | 492 | NR | 590 | 884 | NR | 720 | 47 | NR | 850 | 1 | NR | 980 | 0 | NR |
| 465 | 402 | NR | 595 | 880 | NR | 725 | 40 | NR | 855 | 1 | NR | 985 | 0 | NR |
| 470 | 288 | NR | 600 | 868 | NR | 730 | 34 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 226 | NR | 605 | 844 | NR | 735 | 28 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 227 | NR | 610 | 814 | NR | 740 | 24 | NR | 870 | 0 | NR | 1000 | 0 | NR |
| 485 | 248 | NR | 615 | 771 | NR | 745 | 20 | NR | 875 | 0 | NR | | | |

Summary

$R_f = 82.6$
 $R_g = 95.1$
 CIE $R_a = 80.6$
 $R_9 = -5.8$



Color Vector Graphics

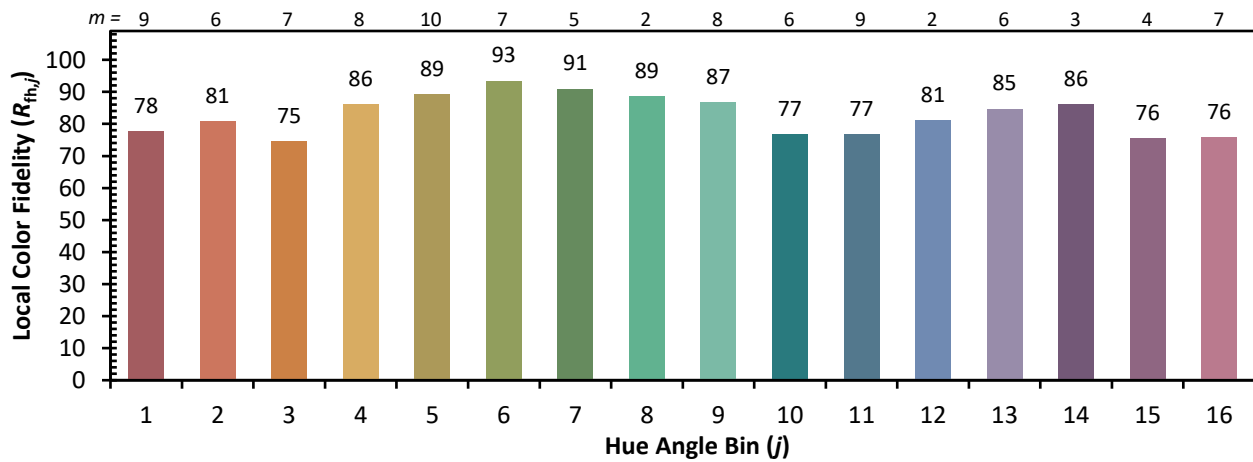


Individual Sample Fidelity Index ($R_{f,i}$)

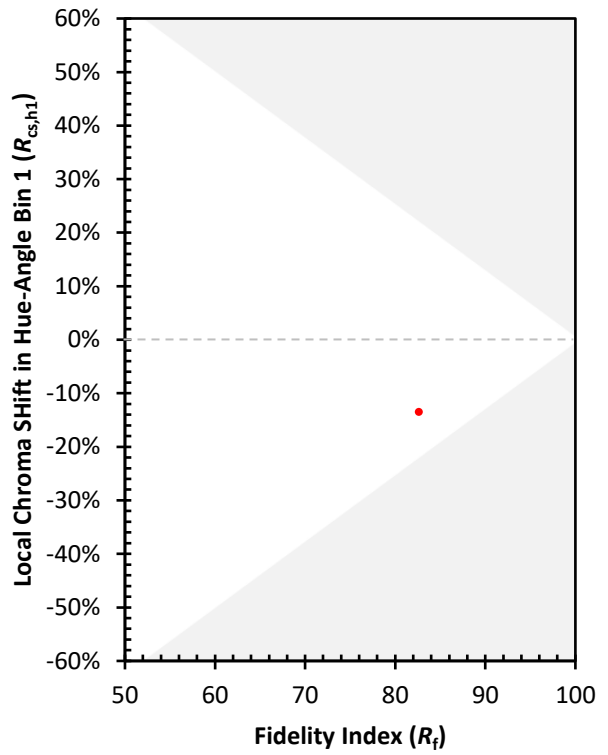
| | | | |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 79 | CES51 = 94 | CES76 = 72 |
| CES02 = 61 | CES27 = 93 | CES52 = 94 | CES77 = 82 |
| CES03 = 31 | CES28 = 90 | CES53 = 88 | CES78 = 71 |
| CES04 = 69 | CES29 = 83 | CES54 = 89 | CES79 = 91 |
| CES05 = 48 | CES30 = 95 | CES55 = 88 | CES80 = 88 |
| CES06 = 50 | CES31 = 86 | CES56 = 84 | CES81 = 80 |
| CES07 = 40 | CES32 = 78 | CES57 = 84 | CES82 = 95 |
| CES08 = 39 | CES33 = 90 | CES58 = 84 | CES83 = 95 |
| CES09 = 29 | CES34 = 85 | CES59 = 90 | CES84 = 90 |
| CES10 = 74 | CES35 = 92 | CES60 = 91 | CES85 = 78 |
| CES11 = 57 | CES36 = 85 | CES61 = 87 | CES86 = 73 |
| CES12 = 63 | CES37 = 91 | CES62 = 87 | CES87 = 83 |
| CES13 = 42 | CES38 = 95 | CES63 = 84 | CES88 = 86 |
| CES14 = 74 | CES39 = 98 | CES64 = 78 | CES89 = 76 |
| CES15 = 71 | CES40 = 94 | CES65 = 75 | CES90 = 87 |
| CES16 = 46 | CES41 = 98 | CES66 = 75 | CES91 = 72 |
| CES17 = 49 | CES42 = 92 | CES67 = 73 | CES92 = 62 |
| CES18 = 56 | CES43 = 88 | CES68 = 77 | CES93 = 78 |
| CES19 = 71 | CES44 = 99 | CES69 = 82 | CES94 = 60 |
| CES20 = 65 | CES45 = 93 | CES70 = 72 | CES95 = 70 |
| CES21 = 86 | CES46 = 90 | CES71 = 67 | CES96 = 82 |
| CES22 = 78 | CES47 = 95 | CES72 = 89 | CES97 = 90 |
| CES23 = 91 | CES48 = 84 | CES73 = 65 | CES98 = 84 |
| CES24 = 90 | CES49 = 89 | CES74 = 93 | CES99 = 73 |
| CES25 = 71 | CES50 = 94 | CES75 = 69 | |



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)