

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: STREETWORKS

Report Number: P870280

Luminaire Tested: **MEM2-HSN-SA-70-840-U-T2R-HSS**

Issue Date: 09/05/2024



Test Information

Test Method: LM-79-08
Report Number: P870280
Test Lab: INNOVATION CENTER(G3)
Issue Date: 09/05/2024
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: STREETWORKS
Catalog Number: MEM2-HSN-SA-70-840-U-T2R-HSS
Description: EPIC MODERN SHORT HOUSING DISCRETE LED ARRAYS 70W 80CRI 4000K
FITXURE w/ TYPE II ROADWAY DISTRIBUTION OPTIC AND HOUSE SIDE SHIELD
Light Source: (20) 4000K CCT, 80 CRI LEDS
Ballast/Driver: ELECTRONIC DRIVER

Summary

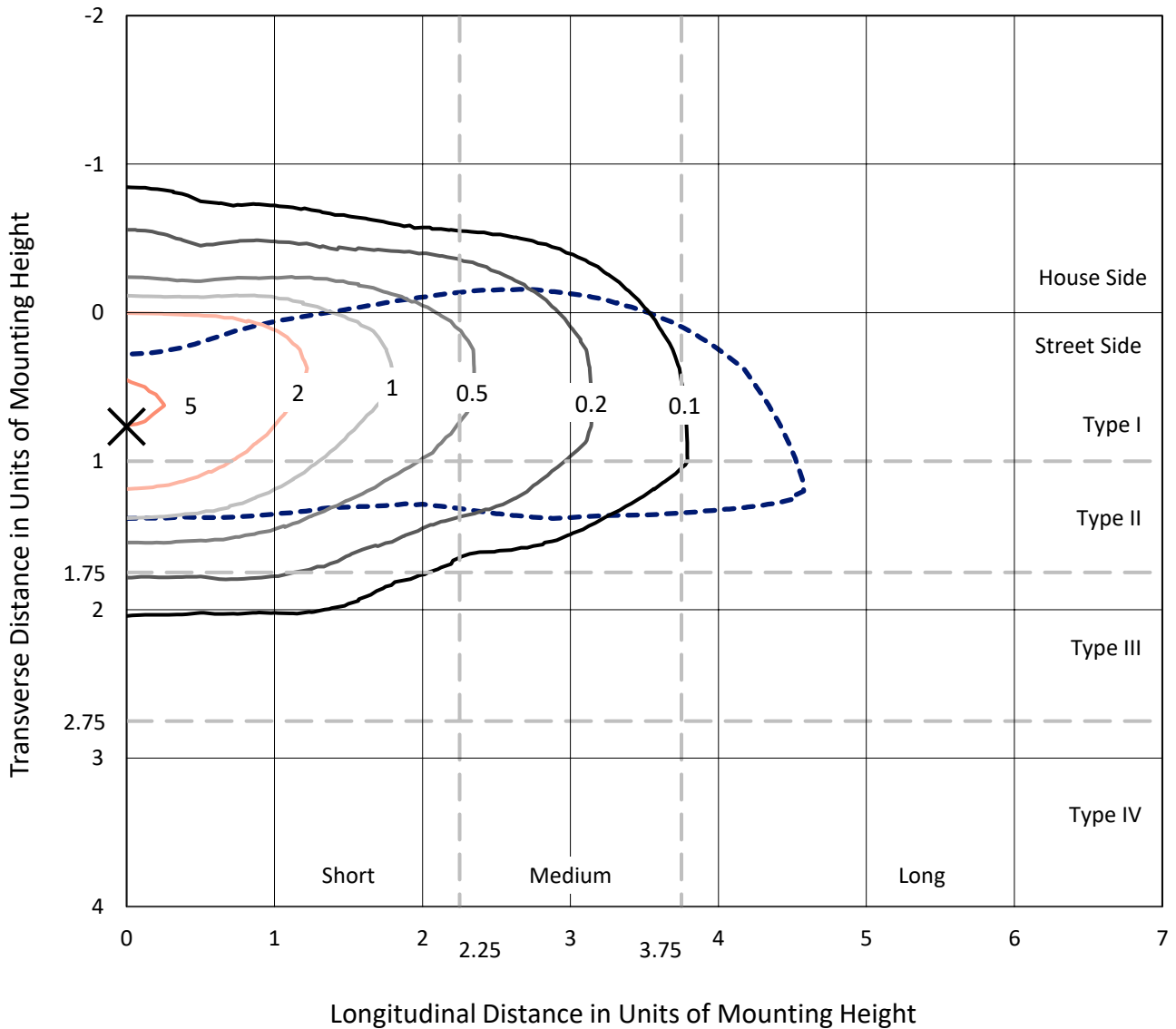
Lumens per Lamp: N/A
Luminaire Lumens: 6335.8 lumens
Efficiency: N/A
Efficacy: 103.9 lumens/watt
Luminous Opening: Rectangular (W 0.67' x L: 0.33' x H: 0')
IES Classification: Type II - Short
BUG Rating: B1 - U0 - G1

Input Watts (W): 61
Input Voltage (V): 120
Input Current (A_{in}): NR
Voltage Rise (V): NR
Power Factor: 0.99
Total Harmonic Distortion (THDi): 9.89%
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 24 FT

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 CATALOG NUMBER: MEM2-HSN-SA-70-840-U-T2R-HSS

Iso-Footcandle Lines of Horizontal Illumination

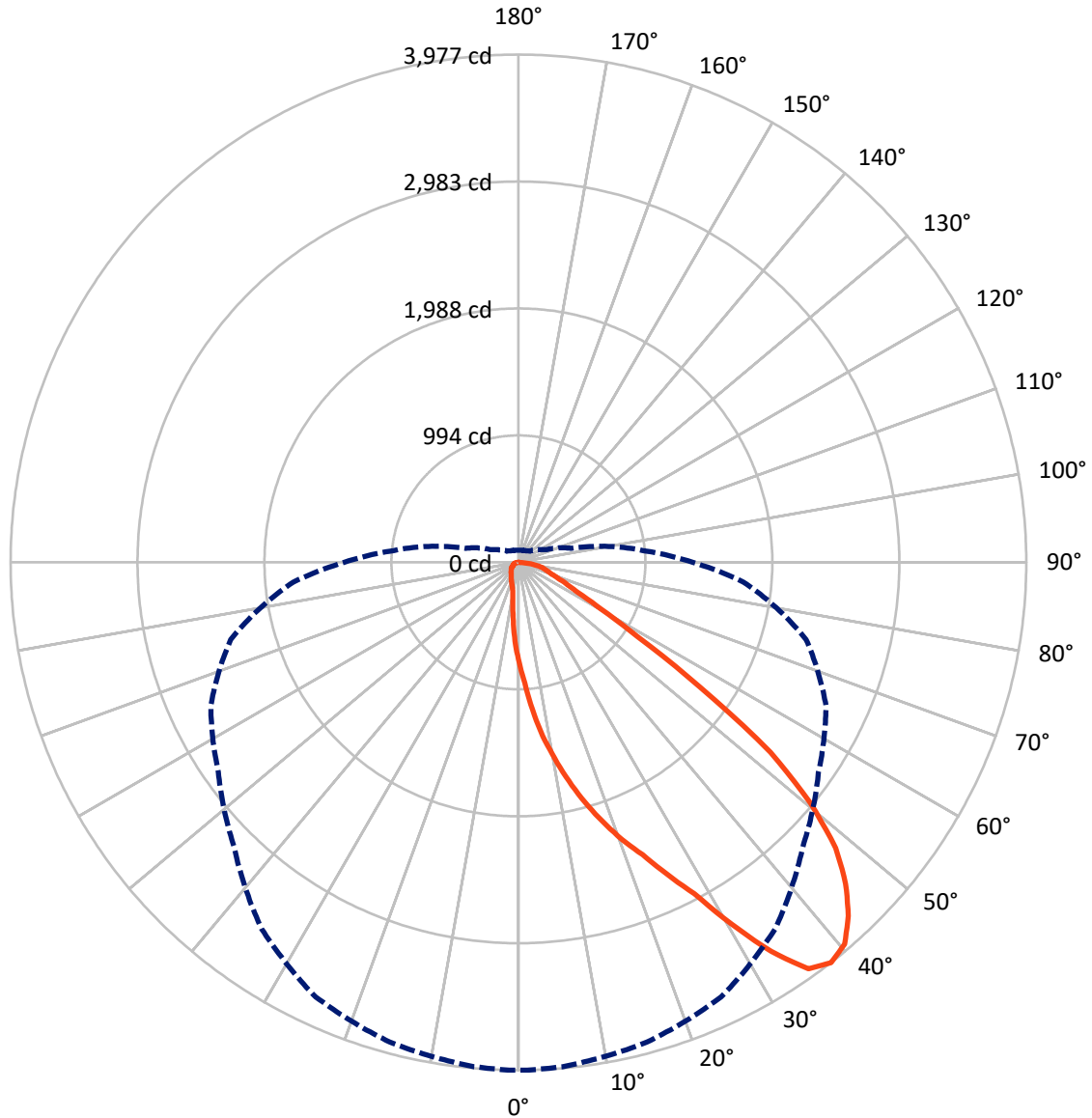
✕ Max cd
 - - - 1/2 Max cd



Based on 20 foot mounting height. Maximum calculated value = 5.4 fc
 Type II - Short - N/A

REPORT NUMBER: P870280
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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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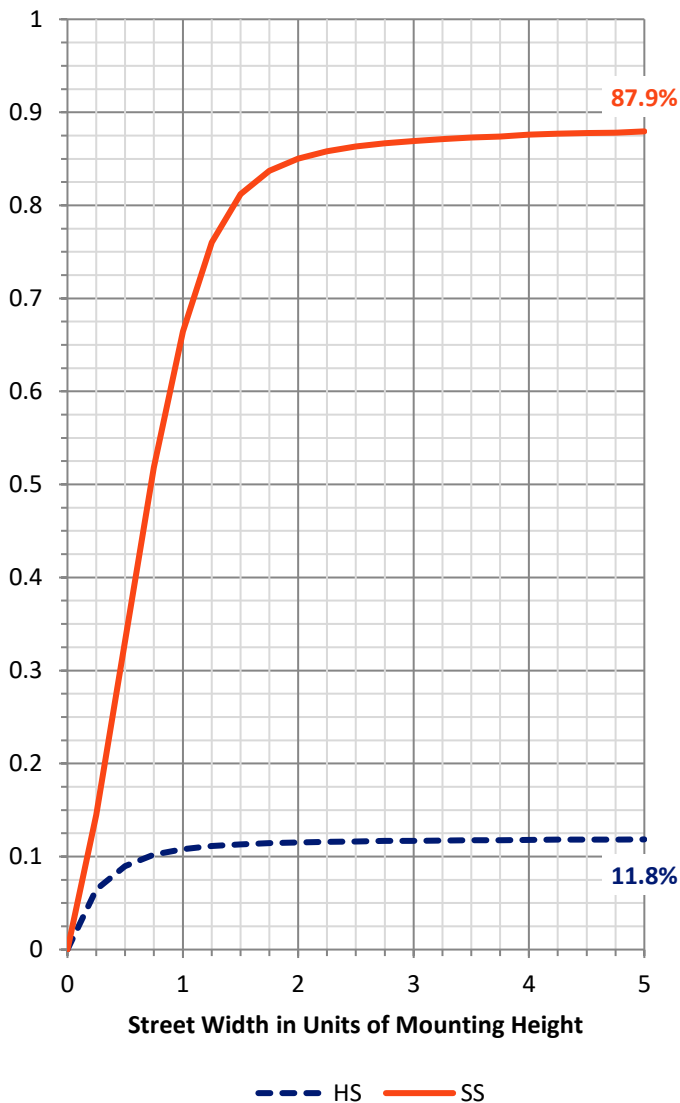
FLUX DISTRIBUTION:

| | | Downward | Upward | Total |
|--------------------|-----------|----------|--------|--------|
| House Side | Lumens | 755.7 | 0.0 | 755.7 |
| | % Fixture | 11.9 | 0.0 | 11.9 |
| Street Side | Lumens | 5580.1 | 0.0 | 5580.1 |
| | % Fixture | 88.1 | 0.0 | 88.1 |
| Total | Lumens | 6335.8 | 0.0 | 6335.8 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10° | 78.8 | 1.2 |
| 10°-20° | 275.3 | 4.3 |
| 20°-30° | 568.1 | 9.0 |
| 30°-40° | 999.5 | 15.8 |
| 40°-50° | 1357.1 | 21.4 |
| 50°-60° | 1344.6 | 21.2 |
| 60°-70° | 1035.2 | 16.3 |
| 70°-80° | 600.8 | 9.5 |
| 80°-90° | 76.4 | 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° | 6335.8 | 100.0 |
| 0°-180° | 6335.8 | 100.0 |

Coefficient of Utilization



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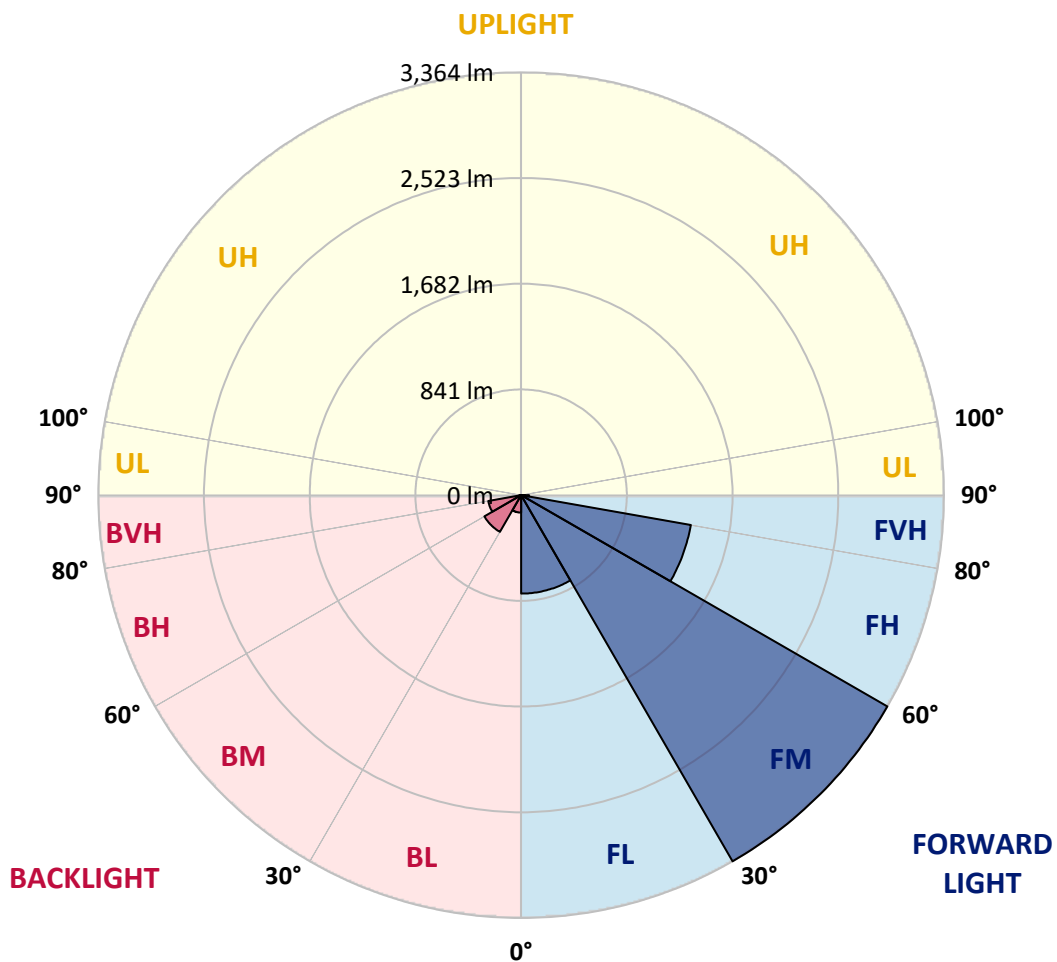
CATALOG NUMBER: MEM2-HSN-SA-70-840-U-T2R-HSS

LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | Lumens | % Fixture | Zone Rating/Lumen Limit | | |
|----------------|--------|-----------|-------------------------|------|---------|
| | | | B | U | G |
| FL (0°-30°) | 783.2 | 12.4 | | | |
| FM (30°-60°) | 3363.8 | 53.1 | | | |
| FH (60°-80°) | 1370.8 | 21.6 | | | G1/1800 |
| FVH (80°-90°) | 62.3 | 1.0 | | | G1/100 |
| BL (0°-30°) | 138.9 | 2.2 | B1/500 | | |
| BM (30°-60°) | 337.5 | 5.3 | B1/1000 | | |
| BH (60°-80°) | 265.1 | 4.2 | B1/500 | | G1/500 |
| BVH (80°-90°) | 14.1 | 0.2 | | | G1/100 |
| 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





REPORT NUMBER: P870280

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CANDELA DISTRIBUTION (FULL):

| | 0° | 1° | 5° | 15° | 25° | 35° | 45° | 55° | 65° | 75° | 85° |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0° | 785.1 | 785.1 | 785.1 | 785.1 | 785.1 | 785.1 | 785.1 | 785.1 | 785.1 | 785.1 | 785.1 |
| 2.5° | 946.0 | 960.2 | 949.5 | 940.7 | 928.3 | 915.9 | 898.3 | 878.8 | 854.1 | 824.0 | 797.5 |
| 5° | 1160.0 | 1167.0 | 1163.5 | 1158.2 | 1119.3 | 1082.2 | 1045.0 | 999.1 | 935.4 | 878.8 | 818.7 |
| 7.5° | 1373.9 | 1370.4 | 1361.5 | 1345.6 | 1310.3 | 1267.8 | 1200.6 | 1124.6 | 1034.4 | 935.4 | 841.7 |
| 10° | 1561.4 | 1566.7 | 1559.6 | 1534.8 | 1490.6 | 1432.3 | 1350.9 | 1264.3 | 1142.3 | 1004.4 | 873.5 |
| 12.5° | 1757.6 | 1761.2 | 1761.2 | 1708.1 | 1678.1 | 1587.9 | 1501.2 | 1384.5 | 1248.4 | 1089.2 | 910.6 |
| 15° | 1950.4 | 1943.3 | 1943.3 | 1907.9 | 1854.9 | 1754.1 | 1656.8 | 1515.4 | 1361.5 | 1168.8 | 953.1 |
| 17.5° | 2134.3 | 2137.8 | 2121.9 | 2083.0 | 2031.7 | 1934.4 | 1814.2 | 1658.6 | 1472.9 | 1264.3 | 997.3 |
| 20° | 2316.4 | 2305.8 | 2298.7 | 2259.8 | 2205.0 | 2090.1 | 1975.1 | 1798.3 | 1603.8 | 1372.1 | 1059.2 |
| 22.5° | 2486.1 | 2491.4 | 2473.8 | 2411.9 | 2360.6 | 2256.3 | 2125.4 | 1962.7 | 1741.7 | 1480.0 | 1126.4 |
| 25° | 2705.4 | 2687.7 | 2703.6 | 2629.4 | 2549.8 | 2426.0 | 2277.5 | 2116.6 | 1892.0 | 1612.6 | 1209.5 |
| 27.5° | 2938.8 | 2949.4 | 2940.6 | 2859.2 | 2751.4 | 2585.2 | 2429.6 | 2258.0 | 2044.1 | 1738.2 | 1303.2 |
| 30° | 3287.1 | 3281.8 | 3283.6 | 3161.6 | 2983.0 | 2785.0 | 2594.0 | 2406.6 | 2196.1 | 1892.0 | 1412.8 |
| 32.5° | 3632.0 | 3651.4 | 3603.7 | 3495.8 | 3290.7 | 2991.9 | 2758.4 | 2549.8 | 2342.9 | 2024.6 | 1524.2 |
| 35° | 3909.6 | 3904.3 | 3884.8 | 3764.6 | 3561.2 | 3271.2 | 2945.9 | 2708.9 | 2498.5 | 2187.3 | 1648.0 |
| 37.5° | 3976.8 | 3976.8 | 3964.4 | 3890.1 | 3755.7 | 3504.6 | 3149.2 | 2868.1 | 2657.7 | 2332.3 | 1768.2 |
| 40° | 3932.6 | 3923.7 | 3916.6 | 3867.1 | 3794.6 | 3646.1 | 3363.2 | 3032.5 | 2827.4 | 2519.7 | 1900.9 |
| 42.5° | 3787.6 | 3789.3 | 3780.5 | 3752.2 | 3713.3 | 3656.7 | 3495.8 | 3207.6 | 2993.6 | 2696.6 | 2031.7 |
| 45° | 3593.1 | 3596.6 | 3586.0 | 3582.4 | 3563.0 | 3563.0 | 3525.9 | 3345.5 | 3151.0 | 2876.9 | 2174.9 |
| 47.5° | 3343.7 | 3342.0 | 3336.7 | 3327.8 | 3366.7 | 3409.2 | 3442.8 | 3423.3 | 3290.7 | 3071.4 | 2304.0 |
| 50° | 2963.6 | 2960.0 | 2975.9 | 3020.1 | 3115.6 | 3209.3 | 3308.4 | 3400.3 | 3391.5 | 3251.8 | 2459.6 |
| 52.5° | 2470.2 | 2447.2 | 2464.9 | 2601.1 | 2797.3 | 3006.0 | 3145.7 | 3290.7 | 3442.8 | 3442.8 | 2613.4 |
| 55° | 1727.6 | 1747.0 | 1757.6 | 1957.4 | 2344.7 | 2703.6 | 2949.4 | 3136.8 | 3423.3 | 3594.8 | 2783.2 |
| 57.5° | 1099.8 | 1106.9 | 1138.7 | 1354.5 | 1808.9 | 2258.0 | 2693.0 | 3000.7 | 3350.8 | 3722.1 | 2953.0 |
| 60° | 740.9 | 716.1 | 740.9 | 864.7 | 1301.4 | 1771.8 | 2316.4 | 2829.2 | 3246.5 | 3814.1 | 3140.4 |
| 62.5° | 523.4 | 521.6 | 528.7 | 601.2 | 928.3 | 1331.5 | 1844.3 | 2597.5 | 3163.4 | 3819.4 | 3280.1 |
| 65° | 422.6 | 410.2 | 415.5 | 456.2 | 622.4 | 976.1 | 1352.7 | 2178.5 | 3089.1 | 3725.7 | 3349.0 |
| 67.5° | 339.5 | 334.2 | 337.7 | 364.3 | 466.8 | 733.8 | 953.1 | 1656.8 | 2931.7 | 3566.5 | 3310.1 |
| 70° | 277.6 | 279.4 | 281.1 | 307.7 | 371.3 | 555.2 | 680.8 | 1137.0 | 2595.8 | 3386.2 | 3135.1 |
| 72.5° | 240.5 | 240.5 | 242.2 | 259.9 | 311.2 | 440.3 | 514.6 | 739.1 | 2100.7 | 3191.7 | 2813.3 |
| 75° | 212.2 | 212.2 | 212.2 | 228.1 | 265.2 | 353.6 | 399.6 | 505.7 | 1508.3 | 2830.9 | 2327.0 |
| 77.5° | 183.9 | 185.7 | 185.7 | 199.8 | 228.1 | 275.8 | 307.7 | 350.1 | 961.9 | 2187.3 | 1761.2 |
| 80° | 141.5 | 141.5 | 143.2 | 159.1 | 194.5 | 215.7 | 226.3 | 247.6 | 505.7 | 1373.9 | 1117.5 |
| 82.5° | 99.0 | 100.8 | 100.8 | 102.6 | 130.8 | 132.6 | 122.0 | 123.8 | 183.9 | 456.2 | 424.4 |
| 85° | 10.6 | 12.4 | 14.1 | 14.1 | 23.0 | 28.3 | 30.1 | 28.3 | 30.1 | 53.0 | 53.0 |
| 87.5° | 0.0 | 0.0 | 0.0 | 0.0 | 1.8 | 3.5 | 3.5 | 5.3 | 5.3 | 5.3 | 5.3 |
| 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: P870280

CATALOG NUMBER: MEM2-HSN-SA-70-840-U-T2R-HSS

CANDELA DISTRIBUTION (continued):

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|-------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0° | 785.1 | 785.1 | 785.1 | 785.1 | 785.1 | 785.1 | 785.1 | 785.1 | 785.1 | 785.1 | 785.1 |
| 2.5° | 783.3 | 770.9 | 744.4 | 721.4 | 700.2 | 682.5 | 670.2 | 654.2 | 641.9 | 641.9 | 648.9 |
| 5° | 788.6 | 760.3 | 705.5 | 654.2 | 613.6 | 574.7 | 539.3 | 516.3 | 498.6 | 488.0 | 488.0 |
| 7.5° | 795.7 | 753.3 | 670.2 | 592.4 | 528.7 | 466.8 | 412.0 | 385.5 | 359.0 | 350.1 | 351.9 |
| 10° | 809.9 | 749.7 | 638.3 | 537.5 | 442.1 | 364.3 | 311.2 | 282.9 | 268.8 | 261.7 | 261.7 |
| 12.5° | 825.8 | 749.7 | 604.7 | 475.7 | 364.3 | 284.7 | 252.9 | 231.6 | 224.6 | 221.0 | 217.5 |
| 15° | 847.0 | 753.3 | 576.4 | 410.2 | 297.1 | 240.5 | 217.5 | 205.1 | 198.0 | 194.5 | 194.5 |
| 17.5° | 871.7 | 756.8 | 546.4 | 357.2 | 252.9 | 212.2 | 194.5 | 185.7 | 178.6 | 175.1 | 175.1 |
| 20° | 903.6 | 765.6 | 516.3 | 309.4 | 221.0 | 194.5 | 178.6 | 169.8 | 162.7 | 160.9 | 159.1 |
| 22.5° | 942.5 | 779.8 | 486.3 | 270.5 | 199.8 | 176.8 | 162.7 | 155.6 | 150.3 | 146.8 | 146.8 |
| 25° | 988.4 | 797.5 | 463.3 | 242.2 | 183.9 | 164.4 | 152.1 | 143.2 | 137.9 | 136.2 | 136.2 |
| 27.5° | 1052.1 | 827.5 | 440.3 | 221.0 | 171.5 | 152.1 | 139.7 | 132.6 | 127.3 | 125.5 | 123.8 |
| 30° | 1112.2 | 864.7 | 429.7 | 215.7 | 162.7 | 141.5 | 132.6 | 123.8 | 118.5 | 116.7 | 114.9 |
| 32.5° | 1190.0 | 907.1 | 422.6 | 215.7 | 159.1 | 134.4 | 123.8 | 116.7 | 111.4 | 109.6 | 107.9 |
| 35° | 1273.1 | 956.6 | 422.6 | 222.8 | 160.9 | 129.1 | 116.7 | 109.6 | 104.3 | 100.8 | 100.8 |
| 37.5° | 1363.3 | 1006.1 | 426.1 | 233.4 | 166.2 | 125.5 | 109.6 | 102.6 | 97.3 | 95.5 | 95.5 |
| 40° | 1458.8 | 1073.3 | 433.2 | 242.2 | 171.5 | 123.8 | 102.6 | 97.3 | 91.9 | 88.4 | 88.4 |
| 42.5° | 1547.2 | 1126.4 | 445.6 | 252.9 | 175.1 | 122.0 | 97.3 | 91.9 | 86.6 | 84.9 | 84.9 |
| 45° | 1649.8 | 1184.7 | 456.2 | 259.9 | 175.1 | 116.7 | 91.9 | 86.6 | 83.1 | 81.3 | 79.6 |
| 47.5° | 1731.1 | 1232.5 | 461.5 | 263.5 | 171.5 | 111.4 | 86.6 | 83.1 | 79.6 | 76.0 | 77.8 |
| 50° | 1830.1 | 1283.7 | 470.4 | 265.2 | 164.4 | 104.3 | 83.1 | 77.8 | 74.3 | 72.5 | 72.5 |
| 52.5° | 1925.6 | 1335.0 | 477.4 | 261.7 | 155.6 | 95.5 | 77.8 | 74.3 | 70.7 | 67.2 | 67.2 |
| 55° | 2038.8 | 1391.6 | 488.0 | 256.4 | 141.5 | 86.6 | 72.5 | 69.0 | 63.7 | 61.9 | 60.1 |
| 57.5° | 2167.9 | 1465.9 | 496.9 | 245.8 | 123.8 | 77.8 | 69.0 | 63.7 | 56.6 | 53.0 | 53.0 |
| 60° | 2286.3 | 1550.7 | 503.9 | 219.3 | 107.9 | 72.5 | 63.7 | 58.4 | 51.3 | 49.5 | 49.5 |
| 62.5° | 2413.6 | 1639.2 | 503.9 | 173.3 | 91.9 | 65.4 | 60.1 | 54.8 | 47.7 | 46.0 | 46.0 |
| 65° | 2502.1 | 1718.7 | 488.0 | 129.1 | 77.8 | 61.9 | 58.4 | 51.3 | 44.2 | 42.4 | 42.4 |
| 67.5° | 2526.8 | 1768.2 | 443.8 | 91.9 | 67.2 | 58.4 | 54.8 | 47.7 | 42.4 | 38.9 | 38.9 |
| 70° | 2447.2 | 1729.3 | 362.5 | 70.7 | 58.4 | 53.0 | 49.5 | 44.2 | 38.9 | 37.1 | 37.1 |
| 72.5° | 2219.1 | 1580.8 | 270.5 | 60.1 | 51.3 | 49.5 | 46.0 | 40.7 | 37.1 | 35.4 | 35.4 |
| 75° | 1858.4 | 1313.8 | 191.0 | 53.0 | 47.7 | 44.2 | 40.7 | 37.1 | 33.6 | 33.6 | 33.6 |
| 77.5° | 1407.5 | 949.5 | 118.5 | 47.7 | 40.7 | 40.7 | 37.1 | 33.6 | 31.8 | 30.1 | 30.1 |
| 80° | 908.9 | 599.4 | 67.2 | 33.6 | 28.3 | 30.1 | 26.5 | 23.0 | 23.0 | 21.2 | 21.2 |
| 82.5° | 385.5 | 236.9 | 35.4 | 19.5 | 14.1 | 12.4 | 8.8 | 8.8 | 7.1 | 7.1 | 7.1 |
| 85° | 38.9 | 14.1 | 7.1 | 5.3 | 5.3 | 3.5 | 3.5 | 3.5 | 3.5 | 1.8 | 1.8 |
| 87.5° | 5.3 | 5.3 | 5.3 | 3.5 | 3.5 | 3.5 | 1.8 | 1.8 | 1.8 | 1.8 | 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 |

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

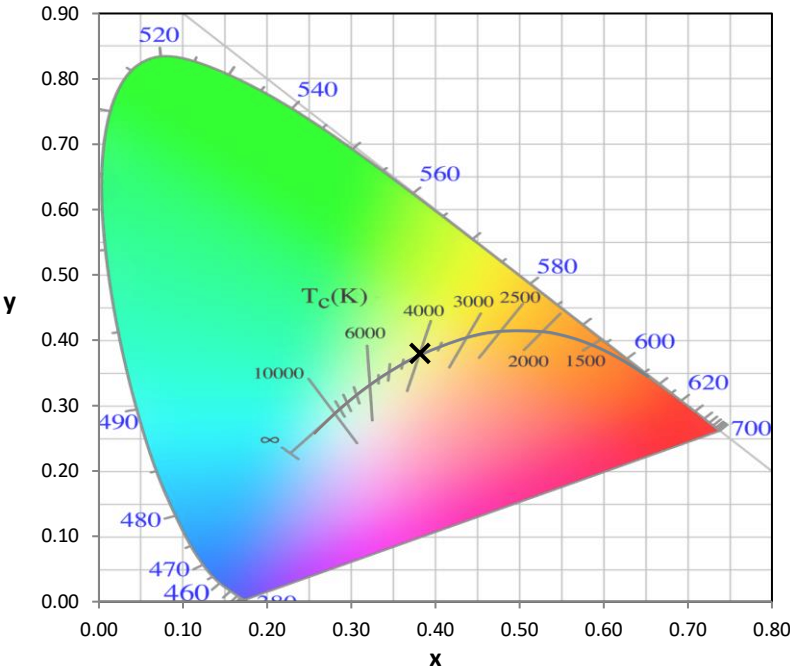
Stabilization Time: 29M
 Operation Time: 1H 29M
 Sphere Temperature (°C): 24.3

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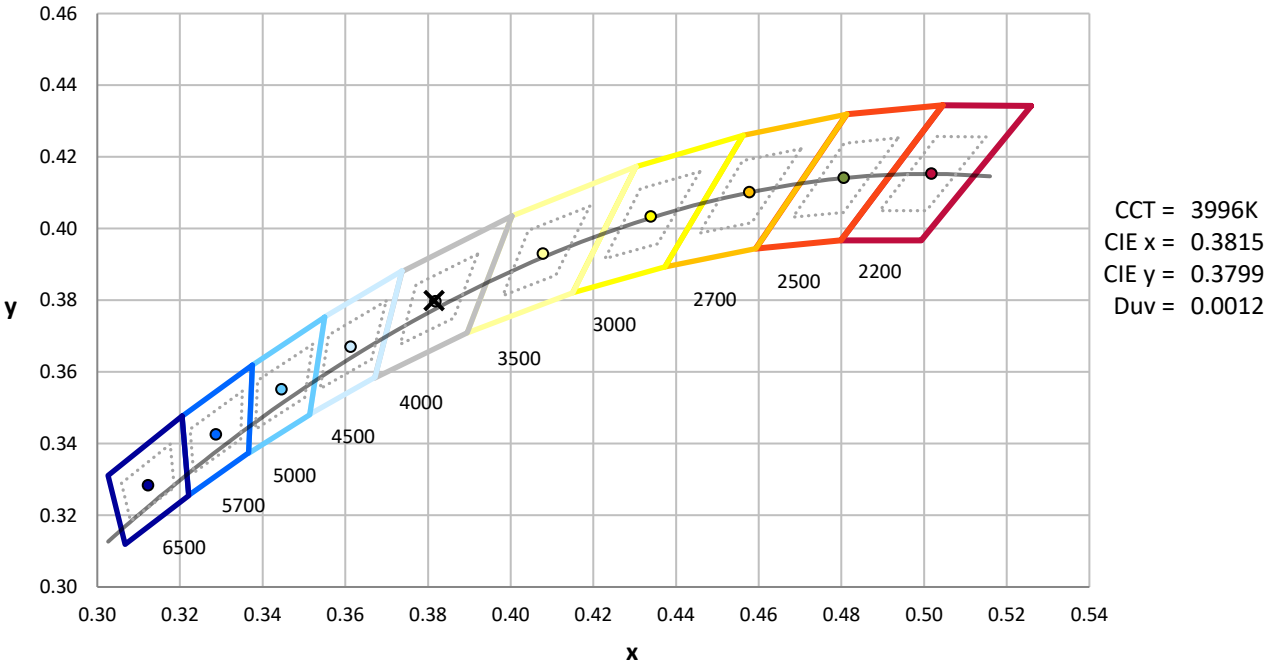
| Measurement and Test Equipment | | | |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | IN0058 | 6/18/2024 | 12/18/2024 |
| Power Meter | INXT2011004 |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



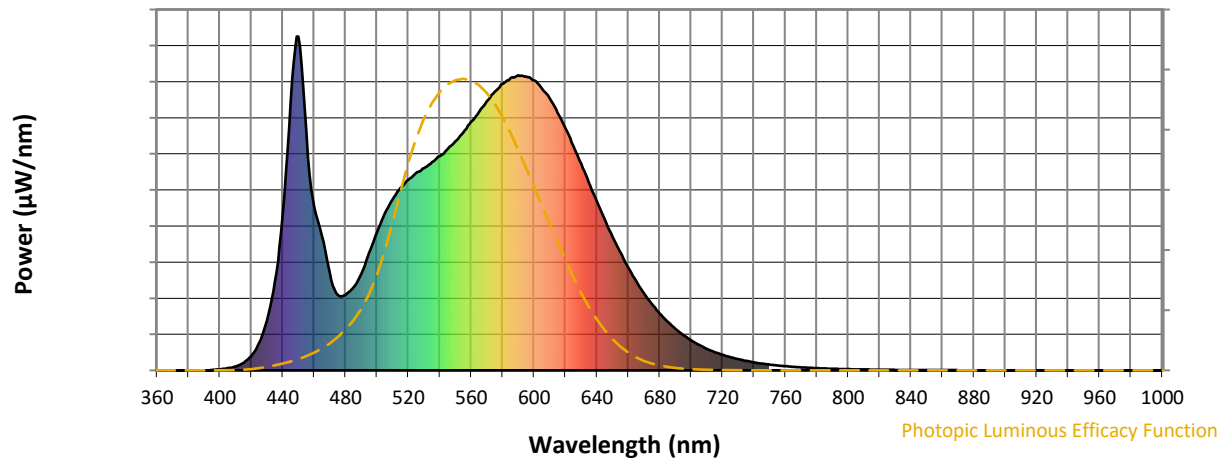
CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies inside the ANSI 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 $R_a = 80.6$
 $R_9 = -5.8$

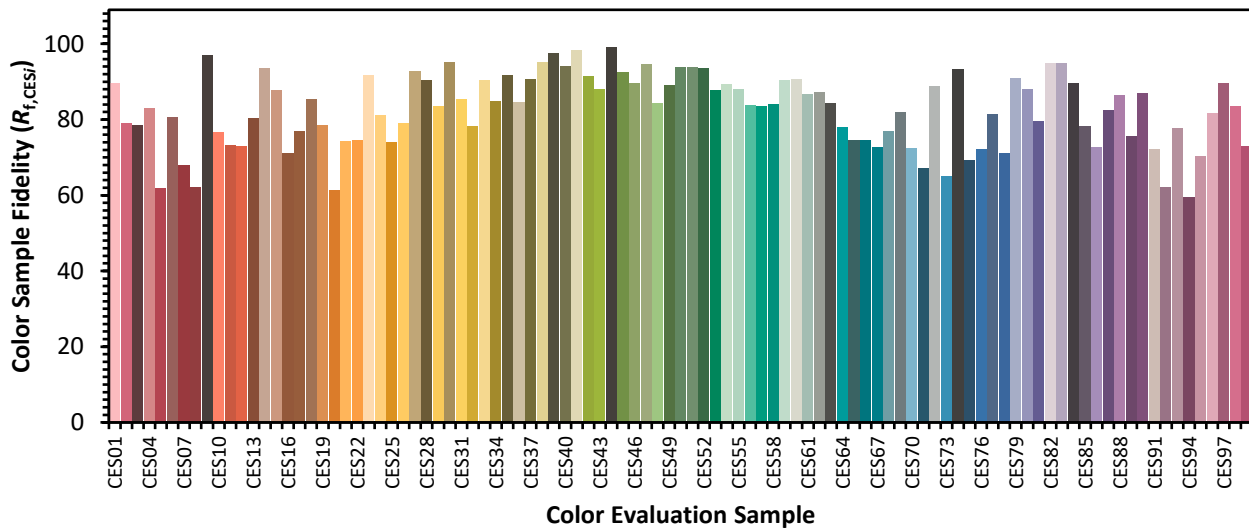


Color Vector Graphics

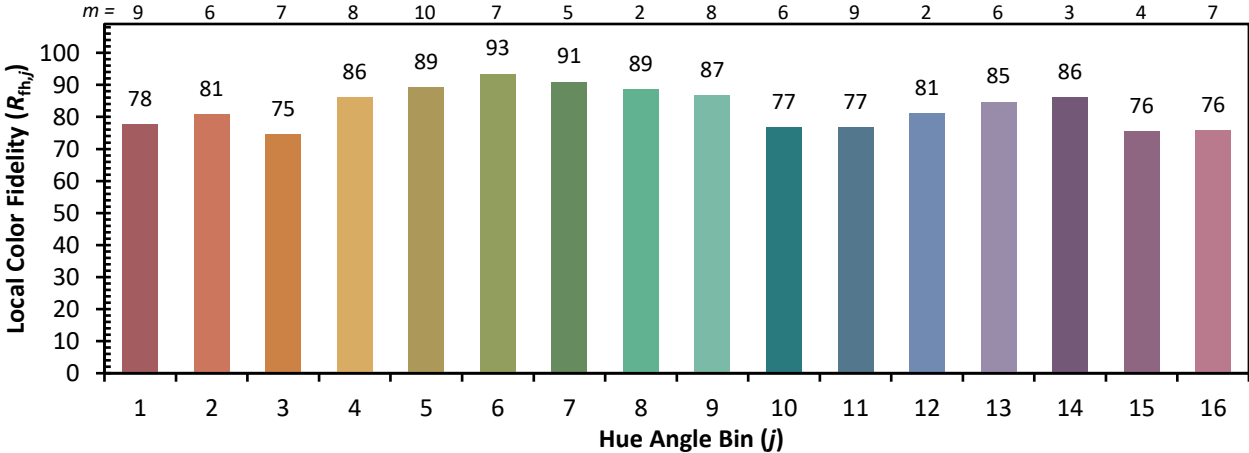


Individual Sample Fidelity Index ($R_{f,i}$)

| | | | |
|------------|------------|------------|------------|
| 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)