

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: P868855

Luminaire Tested: **EMM2-HSN-SA2C-740-U-T2R-HSS**

Issue Date: 08/22/2024



Test Information

Test Method: LM-79-08
Report Number: P868855
Test Lab: INNOVATION CENTER(G3)
Issue Date: 08/22/2024
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: INVUE
Catalog Number: EMM2-HSN-SA2C-740-U-T2R-HSS
Description: EPIC MODERN SHORT HOUSING DISCRETE LED ARRAYS 120W 70CRI 4000K
FITXURE w/ TYPE II ROADWAY DISTRIBUTION OPTIC AND HOUSE SIDE SHIELD
Light Source: (20) 4000K CCT, 70 CRI LEDS
Ballast/Driver: ELECTRONIC DRIVER

Summary

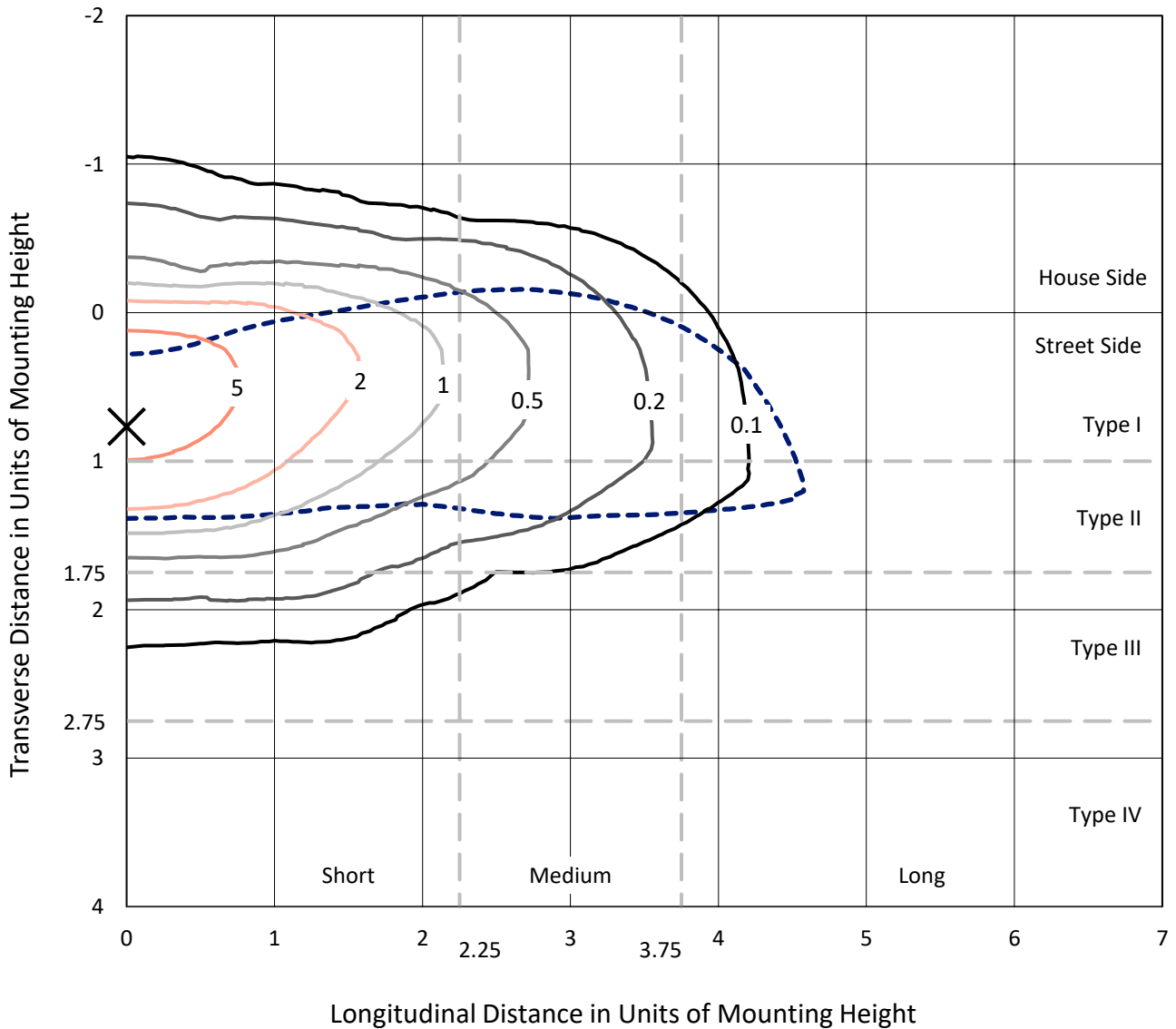
Lumens per Lamp: N/A
Luminaire Lumens: 9826.6 lumens
Efficiency: N/A
Efficacy: 97.3 lumens/watt
Luminous Opening: Rectangular (W 0.67' x L: 0.33' x H: 0')
IES Classification: Type II - Short
BUG Rating: B1 - U0 - G2

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

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Iso-Footcandle Lines of Horizontal Illumination

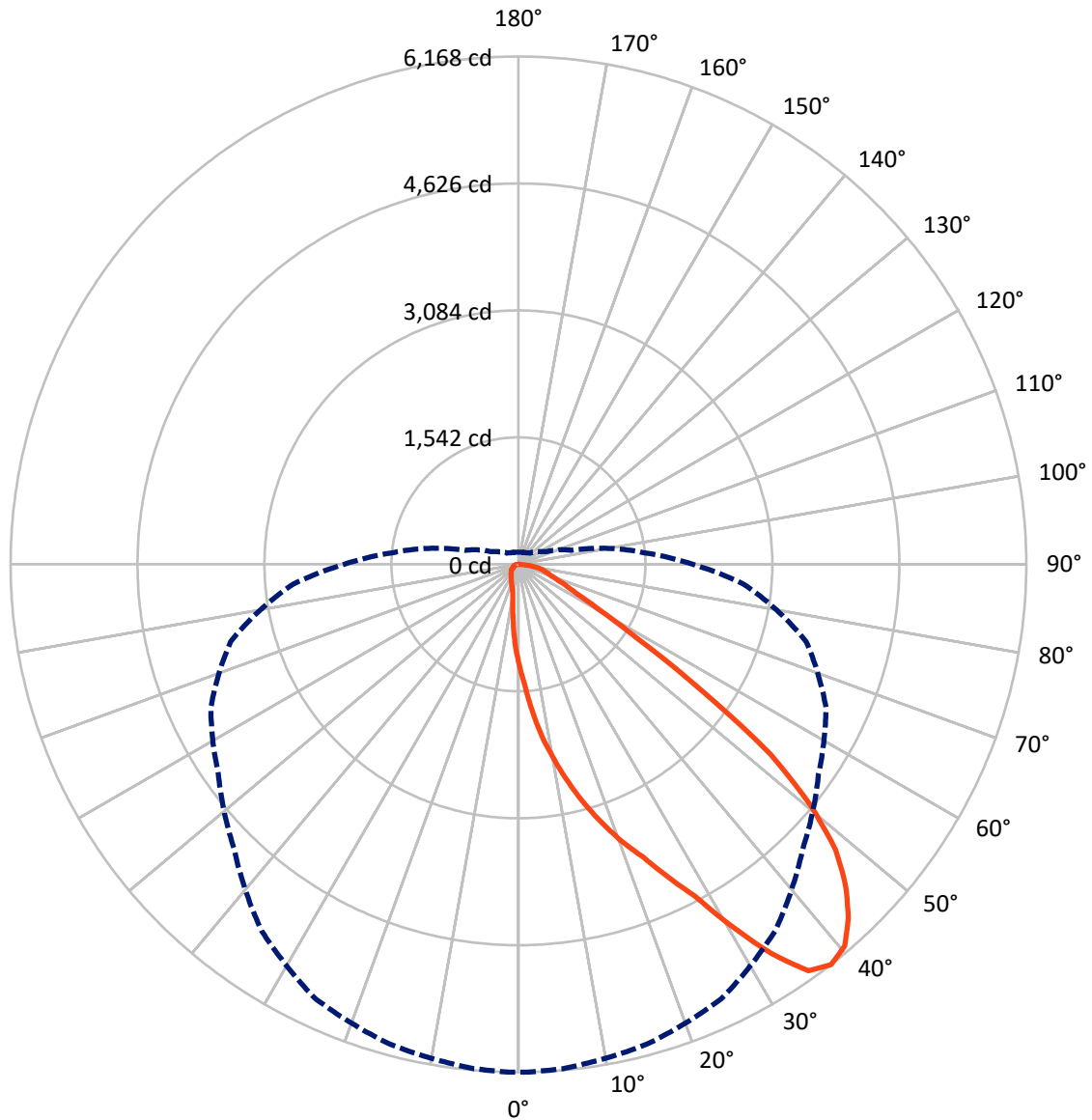
× Max cd
 - - - 1/2 Max cd



Based on 20 foot mounting height. Maximum calculated value = 8.4 fc
 Type II - Short - N/A

REPORT NUMBER: P868855
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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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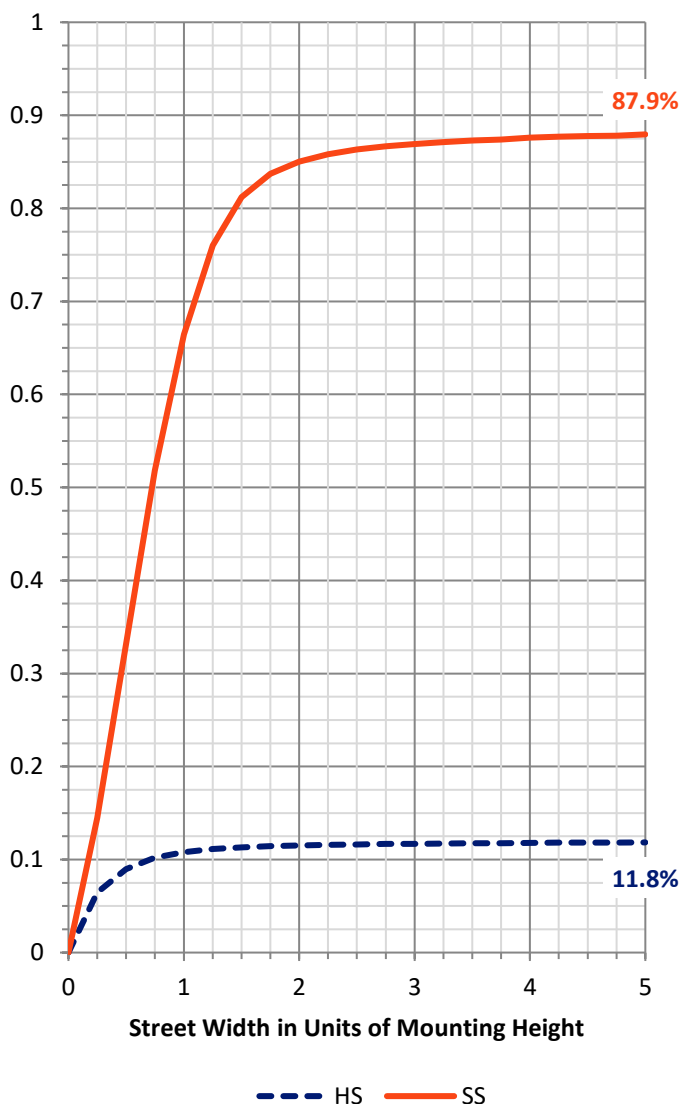
FLUX DISTRIBUTION:

| | | Downward | Upward | Total |
|--------------------|-----------|----------|--------|--------|
| House Side | Lumens | 1172.0 | 0.0 | 1172.0 |
| | % Fixture | 11.9 | 0.0 | 11.9 |
| Street Side | Lumens | 8654.6 | 0.0 | 8654.6 |
| | % Fixture | 88.1 | 0.0 | 88.1 |
| Total | Lumens | 9826.6 | 0.0 | 9826.6 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10° | 122.2 | 1.2 |
| 10°-20° | 427.0 | 4.3 |
| 20°-30° | 881.1 | 9.0 |
| 30°-40° | 1550.2 | 15.8 |
| 40°-50° | 2104.9 | 21.4 |
| 50°-60° | 2085.5 | 21.2 |
| 60°-70° | 1605.5 | 16.3 |
| 70°-80° | 931.8 | 9.5 |
| 80°-90° | 118.5 | 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° | 9826.6 | 100.0 |
| 0°-180° | 9826.6 | 100.0 |

Coefficient of Utilization



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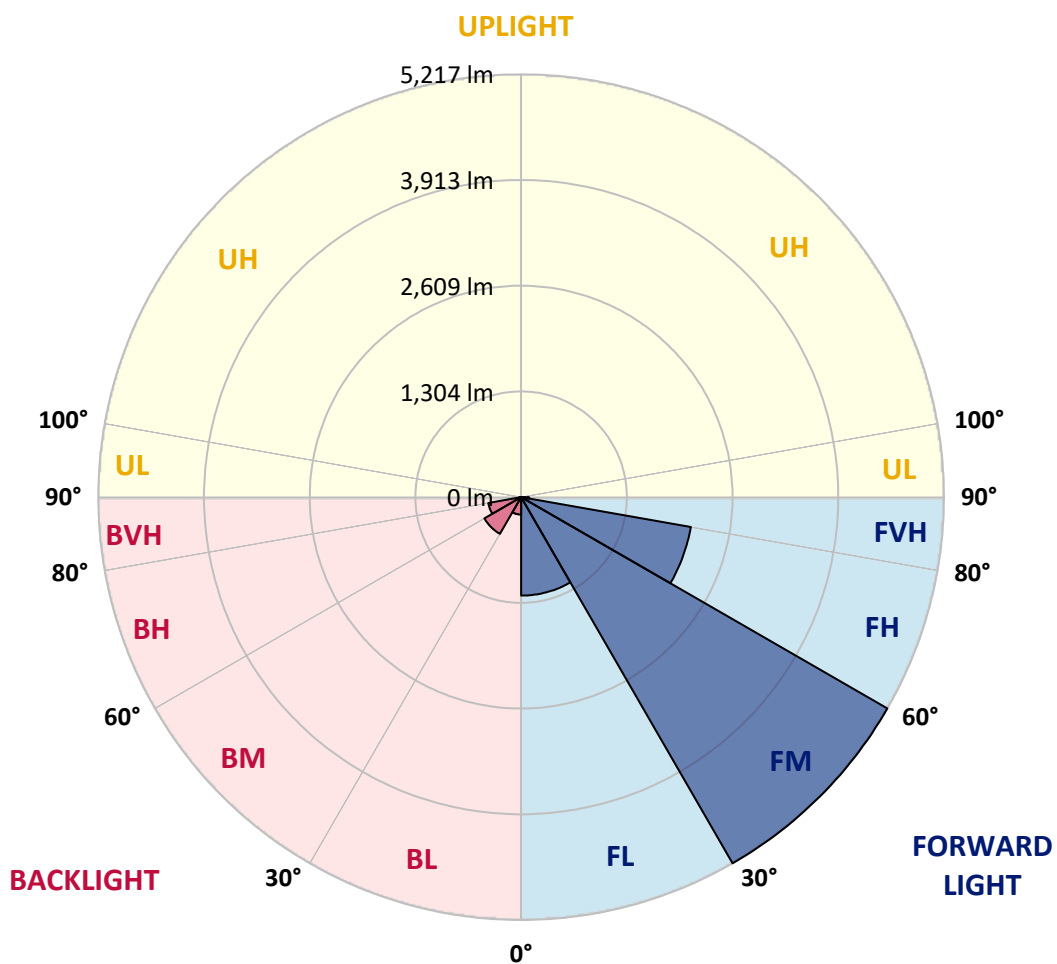
CATALOG NUMBER: EMM2-HSN-SA2C-740-U-T2R-HSS

LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | Lumens | % Fixture | Zone Rating/Lumen Limit | | |
|----------------|--------|-----------|-------------------------|------|---------|
| | | | B | U | G |
| FL (0°-30°) | 1214.8 | 12.4 | | | |
| FM (30°-60°) | 5217.1 | 53.1 | | | |
| FH (60°-80°) | 2126.1 | 21.6 | | | G2/5000 |
| FVH (80°-90°) | 96.7 | 1.0 | | | G1/100 |
| BL (0°-30°) | 215.5 | 2.2 | B1/500 | | |
| BM (30°-60°) | 523.5 | 5.3 | B1/1000 | | |
| BH (60°-80°) | 411.2 | 4.2 | B1/500 | | G1/500 |
| BVH (80°-90°) | 21.9 | 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-G2

Type II Short





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CANDELA DISTRIBUTION (FULL):

| | 0° | 1° | 5° | 15° | 25° | 35° | 45° | 55° | 65° | 75° | 85° |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0° | 1217.7 | 1217.7 | 1217.7 | 1217.7 | 1217.7 | 1217.7 | 1217.7 | 1217.7 | 1217.7 | 1217.7 | 1217.7 |
| 2.5° | 1467.2 | 1489.2 | 1472.7 | 1459.0 | 1439.8 | 1420.6 | 1393.2 | 1363.0 | 1324.6 | 1278.0 | 1236.9 |
| 5° | 1799.1 | 1810.0 | 1804.5 | 1796.3 | 1736.0 | 1678.4 | 1620.8 | 1549.5 | 1450.8 | 1363.0 | 1269.8 |
| 7.5° | 2130.9 | 2125.4 | 2111.7 | 2087.0 | 2032.2 | 1966.3 | 1862.1 | 1744.2 | 1604.3 | 1450.8 | 1305.4 |
| 10° | 2421.6 | 2429.8 | 2418.9 | 2380.5 | 2311.9 | 2221.4 | 2095.2 | 1960.9 | 1771.6 | 1557.7 | 1354.8 |
| 12.5° | 2726.0 | 2731.5 | 2731.5 | 2649.2 | 2602.6 | 2462.7 | 2328.4 | 2147.4 | 1936.2 | 1689.4 | 1412.4 |
| 15° | 3024.9 | 3014.0 | 3014.0 | 2959.1 | 2876.8 | 2720.5 | 2569.7 | 2350.3 | 2111.7 | 1812.8 | 1478.2 |
| 17.5° | 3310.2 | 3315.6 | 3291.0 | 3230.6 | 3151.1 | 3000.3 | 2813.8 | 2572.4 | 2284.5 | 1960.9 | 1546.8 |
| 20° | 3592.6 | 3576.2 | 3565.2 | 3504.9 | 3419.9 | 3241.6 | 3063.3 | 2789.1 | 2487.4 | 2128.2 | 1642.7 |
| 22.5° | 3855.9 | 3864.1 | 3836.7 | 3740.7 | 3661.2 | 3499.4 | 3296.4 | 3044.1 | 2701.3 | 2295.4 | 1747.0 |
| 25° | 4196.0 | 4168.5 | 4193.2 | 4078.0 | 3954.6 | 3762.7 | 3532.3 | 3282.7 | 2934.4 | 2501.1 | 1875.8 |
| 27.5° | 4558.0 | 4574.4 | 4560.7 | 4434.6 | 4267.3 | 4009.5 | 3768.1 | 3502.1 | 3170.3 | 2695.8 | 2021.2 |
| 30° | 5098.2 | 5090.0 | 5092.8 | 4903.5 | 4626.5 | 4319.4 | 4023.2 | 3732.5 | 3406.1 | 2934.4 | 2191.2 |
| 32.5° | 5633.0 | 5663.2 | 5589.1 | 5421.9 | 5103.7 | 4640.3 | 4278.2 | 3954.6 | 3633.8 | 3140.1 | 2364.0 |
| 35° | 6063.6 | 6055.4 | 6025.2 | 5838.7 | 5523.3 | 5073.6 | 4568.9 | 4201.5 | 3875.1 | 3392.4 | 2556.0 |
| 37.5° | 6167.8 | 6167.8 | 6148.6 | 6033.4 | 5825.0 | 5435.6 | 4884.3 | 4448.3 | 4121.9 | 3617.3 | 2742.5 |
| 40° | 6099.2 | 6085.5 | 6074.6 | 5997.8 | 5885.3 | 5655.0 | 5216.2 | 4703.3 | 4385.2 | 3908.0 | 2948.2 |
| 42.5° | 5874.4 | 5877.1 | 5863.4 | 5819.5 | 5759.2 | 5671.4 | 5421.9 | 4974.8 | 4643.0 | 4182.3 | 3151.1 |
| 45° | 5572.7 | 5578.2 | 5561.7 | 5556.2 | 5526.1 | 5526.1 | 5468.5 | 5188.7 | 4887.1 | 4462.0 | 3373.2 |
| 47.5° | 5186.0 | 5183.3 | 5175.0 | 5161.3 | 5221.7 | 5287.5 | 5339.6 | 5309.4 | 5103.7 | 4763.7 | 3573.4 |
| 50° | 4596.4 | 4590.9 | 4615.6 | 4684.1 | 4832.2 | 4977.6 | 5131.2 | 5273.8 | 5260.0 | 5043.4 | 3814.8 |
| 52.5° | 3831.2 | 3795.6 | 3823.0 | 4034.2 | 4338.6 | 4662.2 | 4878.8 | 5103.7 | 5339.6 | 5339.6 | 4053.4 |
| 55° | 2679.4 | 2709.6 | 2726.0 | 3035.9 | 3636.5 | 4193.2 | 4574.4 | 4865.1 | 5309.4 | 5575.4 | 4316.6 |
| 57.5° | 1705.8 | 1716.8 | 1766.1 | 2100.7 | 2805.5 | 3502.1 | 4176.8 | 4654.0 | 5197.0 | 5772.9 | 4579.9 |
| 60° | 1149.1 | 1110.7 | 1149.1 | 1341.1 | 2018.5 | 2748.0 | 3592.6 | 4387.9 | 5035.2 | 5915.5 | 4870.6 |
| 62.5° | 811.8 | 809.0 | 820.0 | 932.4 | 1439.8 | 2065.1 | 2860.4 | 4028.7 | 4906.3 | 5923.7 | 5087.3 |
| 65° | 655.4 | 636.3 | 644.5 | 707.6 | 965.3 | 1513.8 | 2098.0 | 3378.7 | 4791.1 | 5778.4 | 5194.2 |
| 67.5° | 526.6 | 518.3 | 523.8 | 564.9 | 724.0 | 1138.1 | 1478.2 | 2569.7 | 4547.0 | 5531.6 | 5133.9 |
| 70° | 430.6 | 433.3 | 436.1 | 477.2 | 575.9 | 861.1 | 1055.8 | 1763.4 | 4025.9 | 5251.8 | 4862.4 |
| 72.5° | 373.0 | 373.0 | 375.7 | 403.1 | 482.7 | 682.9 | 798.1 | 1146.4 | 3258.0 | 4950.1 | 4363.3 |
| 75° | 329.1 | 329.1 | 329.1 | 353.8 | 411.4 | 548.5 | 619.8 | 784.3 | 2339.3 | 4390.7 | 3609.1 |
| 77.5° | 285.2 | 288.0 | 288.0 | 309.9 | 353.8 | 427.8 | 477.2 | 543.0 | 1491.9 | 3392.4 | 2731.5 |
| 80° | 219.4 | 219.4 | 222.1 | 246.8 | 301.7 | 334.6 | 351.0 | 383.9 | 784.3 | 2130.9 | 1733.2 |
| 82.5° | 153.6 | 156.3 | 156.3 | 159.1 | 202.9 | 205.7 | 189.2 | 192.0 | 285.2 | 707.6 | 658.2 |
| 85° | 16.5 | 19.2 | 21.9 | 21.9 | 35.7 | 43.9 | 46.6 | 43.9 | 46.6 | 82.3 | 82.3 |
| 87.5° | 0.0 | 0.0 | 0.0 | 0.0 | 2.7 | 5.5 | 5.5 | 8.2 | 8.2 | 8.2 | 8.2 |
| 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: P868855

CATALOG NUMBER: EMM2-HSN-SA2C-740-U-T2R-HSS

CANDELA DISTRIBUTION (continued):

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0° | 1217.7 | 1217.7 | 1217.7 | 1217.7 | 1217.7 | 1217.7 | 1217.7 | 1217.7 | 1217.7 | 1217.7 | 1217.7 |
| 2.5° | 1214.9 | 1195.7 | 1154.6 | 1118.9 | 1086.0 | 1058.6 | 1039.4 | 1014.7 | 995.5 | 995.5 | 1006.5 |
| 5° | 1223.1 | 1179.3 | 1094.2 | 1014.7 | 951.6 | 891.3 | 836.5 | 800.8 | 773.4 | 756.9 | 756.9 |
| 7.5° | 1234.1 | 1168.3 | 1039.4 | 918.7 | 820.0 | 724.0 | 639.0 | 597.9 | 556.7 | 543.0 | 545.8 |
| 10° | 1256.0 | 1162.8 | 990.0 | 833.7 | 685.6 | 564.9 | 482.7 | 438.8 | 416.9 | 405.9 | 405.9 |
| 12.5° | 1280.7 | 1162.8 | 937.9 | 737.7 | 564.9 | 441.5 | 392.2 | 359.3 | 348.3 | 342.8 | 337.3 |
| 15° | 1313.6 | 1168.3 | 894.0 | 636.3 | 460.7 | 373.0 | 337.3 | 318.1 | 307.2 | 301.7 | 301.7 |
| 17.5° | 1352.0 | 1173.8 | 847.4 | 554.0 | 392.2 | 329.1 | 301.7 | 288.0 | 277.0 | 271.5 | 271.5 |
| 20° | 1401.4 | 1187.5 | 800.8 | 479.9 | 342.8 | 301.7 | 277.0 | 263.3 | 252.3 | 249.6 | 246.8 |
| 22.5° | 1461.7 | 1209.4 | 754.2 | 419.6 | 309.9 | 274.2 | 252.3 | 241.3 | 233.1 | 227.6 | 227.6 |
| 25° | 1533.0 | 1236.9 | 718.5 | 375.7 | 285.2 | 255.0 | 235.9 | 222.1 | 213.9 | 211.2 | 211.2 |
| 27.5° | 1631.8 | 1283.5 | 682.9 | 342.8 | 266.0 | 235.9 | 216.7 | 205.7 | 197.5 | 194.7 | 192.0 |
| 30° | 1725.0 | 1341.1 | 666.4 | 334.6 | 252.3 | 219.4 | 205.7 | 192.0 | 183.7 | 181.0 | 178.3 |
| 32.5° | 1845.7 | 1406.9 | 655.4 | 334.6 | 246.8 | 208.4 | 192.0 | 181.0 | 172.8 | 170.0 | 167.3 |
| 35° | 1974.6 | 1483.7 | 655.4 | 345.6 | 249.6 | 200.2 | 181.0 | 170.0 | 161.8 | 156.3 | 156.3 |
| 37.5° | 2114.4 | 1560.5 | 660.9 | 362.0 | 257.8 | 194.7 | 170.0 | 159.1 | 150.8 | 148.1 | 148.1 |
| 40° | 2262.5 | 1664.7 | 671.9 | 375.7 | 266.0 | 192.0 | 159.1 | 150.8 | 142.6 | 137.1 | 137.1 |
| 42.5° | 2399.7 | 1747.0 | 691.1 | 392.2 | 271.5 | 189.2 | 150.8 | 142.6 | 134.4 | 131.6 | 131.6 |
| 45° | 2558.7 | 1837.5 | 707.6 | 403.1 | 271.5 | 181.0 | 142.6 | 134.4 | 128.9 | 126.2 | 123.4 |
| 47.5° | 2684.9 | 1911.5 | 715.8 | 408.6 | 266.0 | 172.8 | 134.4 | 128.9 | 123.4 | 117.9 | 120.7 |
| 50° | 2838.5 | 1991.0 | 729.5 | 411.4 | 255.0 | 161.8 | 128.9 | 120.7 | 115.2 | 112.4 | 112.4 |
| 52.5° | 2986.5 | 2070.6 | 740.5 | 405.9 | 241.3 | 148.1 | 120.7 | 115.2 | 109.7 | 104.2 | 104.2 |
| 55° | 3162.1 | 2158.3 | 756.9 | 397.7 | 219.4 | 134.4 | 112.4 | 107.0 | 98.7 | 96.0 | 93.2 |
| 57.5° | 3362.3 | 2273.5 | 770.6 | 381.2 | 192.0 | 120.7 | 107.0 | 98.7 | 87.8 | 82.3 | 82.3 |
| 60° | 3546.0 | 2405.1 | 781.6 | 340.1 | 167.3 | 112.4 | 98.7 | 90.5 | 79.5 | 76.8 | 76.8 |
| 62.5° | 3743.5 | 2542.3 | 781.6 | 268.8 | 142.6 | 101.5 | 93.2 | 85.0 | 74.0 | 71.3 | 71.3 |
| 65° | 3880.6 | 2665.7 | 756.9 | 200.2 | 120.7 | 96.0 | 90.5 | 79.5 | 68.6 | 65.8 | 65.8 |
| 67.5° | 3919.0 | 2742.5 | 688.4 | 142.6 | 104.2 | 90.5 | 85.0 | 74.0 | 65.8 | 60.3 | 60.3 |
| 70° | 3795.6 | 2682.1 | 562.2 | 109.7 | 90.5 | 82.3 | 76.8 | 68.6 | 60.3 | 57.6 | 57.6 |
| 72.5° | 3441.8 | 2451.8 | 419.6 | 93.2 | 79.5 | 76.8 | 71.3 | 63.1 | 57.6 | 54.8 | 54.8 |
| 75° | 2882.3 | 2037.7 | 296.2 | 82.3 | 74.0 | 68.6 | 63.1 | 57.6 | 52.1 | 52.1 | 52.1 |
| 77.5° | 2183.0 | 1472.7 | 183.7 | 74.0 | 63.1 | 63.1 | 57.6 | 52.1 | 49.4 | 46.6 | 46.6 |
| 80° | 1409.6 | 929.7 | 104.2 | 52.1 | 43.9 | 46.6 | 41.1 | 35.7 | 35.7 | 32.9 | 32.9 |
| 82.5° | 597.9 | 367.5 | 54.8 | 30.2 | 21.9 | 19.2 | 13.7 | 13.7 | 11.0 | 11.0 | 11.0 |
| 85° | 60.3 | 21.9 | 11.0 | 8.2 | 8.2 | 5.5 | 5.5 | 5.5 | 5.5 | 2.7 | 2.7 |
| 87.5° | 8.2 | 8.2 | 8.2 | 5.5 | 5.5 | 5.5 | 2.7 | 2.7 | 2.7 | 2.7 | 2.7 |
| 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: SP1-2407-157-5

Test Date: 08/07/2024

Luminaire Tested: MEM2-HTN-SA-40-740-U-5WQ-2

Data in this report applies to families of products including MEM2-HTN-SA-40-740-U-5WQ-2

Test Information

Test Method: LM-79-2019
 Report Number: SP1-2407-157-5
 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-40-740-U-5WQ-2**
 Description: Epic Modern Light Square 40W 5WQ Optic and Flare Trim

Spectral Parameters

CCT (K): 3915
 CIE u': 0.2262
 CIE v': 0.5044
 Duv: 0.0010
 CIE x: 0.3850
 CIE y: 0.3816
 CIE z: 0.2334
 Peak Wavelength (nm): 449
 Dominant Wavelength (nm): 578
 Purity: 30.05482
 R_f: 73.2
 R_g: 93.9

| | | | |
|-----------|------|------|-------|
| CRI (Ra): | 71.0 | | |
| R1: | 67.6 | R9: | -38.4 |
| R2: | 78.3 | R10: | 48.9 |
| R3: | 87.1 | R11: | 65.3 |
| R4: | 69.7 | R12: | 40.4 |
| R5: | 67.4 | R13: | 69.3 |
| R6: | 69.3 | R14: | 92.6 |
| R7: | 79.7 | R15: | 59.9 |
| R8: | 48.7 | | |



Test Conditions

Stabilization Time: 21M
 Operation Time: 1H 21M
 Sphere Temperature (°C): 24.2

REPORT NUMBER: SP1-2407-157-5

| 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



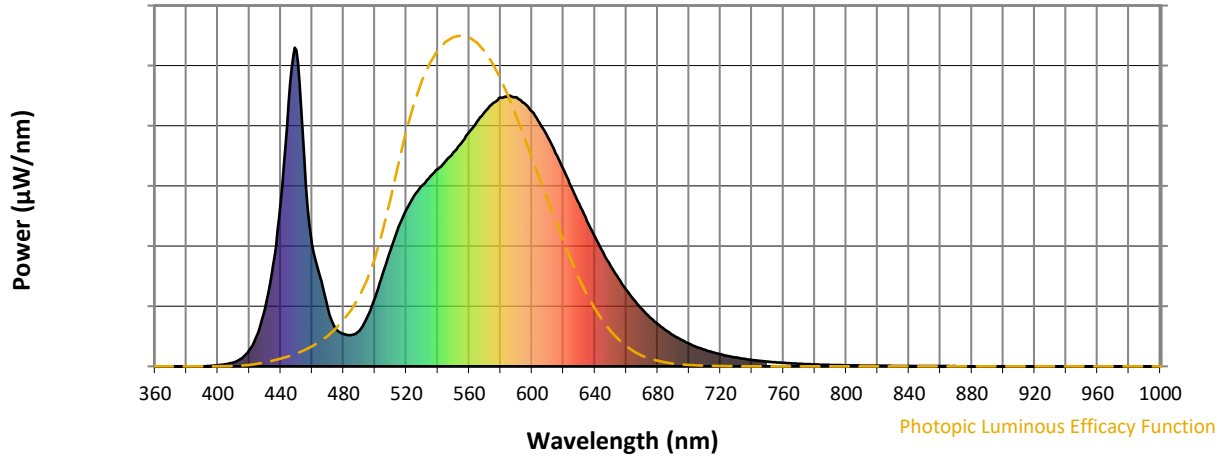
CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies inside the ANSI 4000K 4-step quadrangle

REPORT NUMBER: SP1-2407-157-5

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 | 112 | NR | 620 | 618 | NR | 750 | 15 | NR | 880 | 0 | NR |
| 365 | 0 | NR | 495 | 153 | NR | 625 | 563 | NR | 755 | 13 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 216 | NR | 630 | 510 | NR | 760 | 11 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 291 | NR | 635 | 456 | NR | 765 | 9 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 366 | NR | 640 | 407 | NR | 770 | 8 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 436 | NR | 645 | 359 | NR | 775 | 7 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 492 | NR | 650 | 316 | NR | 780 | 6 | NR | 910 | 0 | NR |
| 395 | 2 | NR | 525 | 536 | NR | 655 | 277 | NR | 785 | 5 | NR | 915 | 0 | NR |
| 400 | 4 | NR | 530 | 567 | NR | 660 | 240 | NR | 790 | 4 | NR | 920 | 0 | NR |
| 405 | 7 | NR | 535 | 596 | NR | 665 | 208 | NR | 795 | 4 | NR | 925 | 0 | NR |
| 410 | 12 | NR | 540 | 619 | NR | 670 | 179 | NR | 800 | 3 | NR | 930 | 0 | NR |
| 415 | 25 | NR | 545 | 644 | NR | 675 | 154 | NR | 805 | 3 | NR | 935 | 0 | NR |
| 420 | 51 | NR | 550 | 671 | NR | 680 | 133 | NR | 810 | 3 | NR | 940 | 0 | NR |
| 425 | 100 | NR | 555 | 701 | NR | 685 | 114 | NR | 815 | 2 | NR | 945 | 0 | NR |
| 430 | 180 | NR | 560 | 735 | NR | 690 | 98 | NR | 820 | 2 | NR | 950 | 0 | NR |
| 435 | 315 | NR | 565 | 768 | NR | 695 | 83 | NR | 825 | 2 | NR | 955 | 0 | NR |
| 440 | 514 | NR | 570 | 798 | NR | 700 | 71 | NR | 830 | 1 | NR | 960 | 0 | NR |
| 445 | 828 | NR | 575 | 825 | NR | 705 | 61 | NR | 835 | 1 | NR | 965 | 0 | NR |
| 450 | 992 | NR | 580 | 843 | NR | 710 | 52 | NR | 840 | 1 | NR | 970 | 0 | NR |
| 455 | 652 | NR | 585 | 848 | NR | 715 | 44 | NR | 845 | 1 | NR | 975 | 0 | NR |
| 460 | 382 | NR | 590 | 844 | NR | 720 | 38 | NR | 850 | 1 | NR | 980 | 0 | NR |
| 465 | 282 | NR | 595 | 826 | NR | 725 | 32 | NR | 855 | 1 | NR | 985 | 0 | NR |
| 470 | 180 | NR | 600 | 800 | NR | 730 | 28 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 119 | NR | 605 | 762 | NR | 735 | 24 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 101 | NR | 610 | 719 | NR | 740 | 20 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 98 | NR | 615 | 669 | NR | 745 | 17 | NR | 875 | 0 | NR | | | |

REPORT NUMBER: SP1-2407-157-5

Scotopic Flux vs. Wavelength



Scotopic Lumens: NR

S/P: 1.49

| 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 | 112 | NR | 620 | 618 | NR | 750 | 15 | NR | 880 | 0 | NR |
| 365 | 0 | NR | 495 | 153 | NR | 625 | 563 | NR | 755 | 13 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 216 | NR | 630 | 510 | NR | 760 | 11 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 291 | NR | 635 | 456 | NR | 765 | 9 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 366 | NR | 640 | 407 | NR | 770 | 8 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 436 | NR | 645 | 359 | NR | 775 | 7 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 492 | NR | 650 | 316 | NR | 780 | 6 | NR | 910 | 0 | NR |
| 395 | 2 | NR | 525 | 536 | NR | 655 | 277 | NR | 785 | 5 | NR | 915 | 0 | NR |
| 400 | 4 | NR | 530 | 567 | NR | 660 | 240 | NR | 790 | 4 | NR | 920 | 0 | NR |
| 405 | 7 | NR | 535 | 596 | NR | 665 | 208 | NR | 795 | 4 | NR | 925 | 0 | NR |
| 410 | 12 | NR | 540 | 619 | NR | 670 | 179 | NR | 800 | 3 | NR | 930 | 0 | NR |
| 415 | 25 | NR | 545 | 644 | NR | 675 | 154 | NR | 805 | 3 | NR | 935 | 0 | NR |
| 420 | 51 | NR | 550 | 671 | NR | 680 | 133 | NR | 810 | 3 | NR | 940 | 0 | NR |
| 425 | 100 | NR | 555 | 701 | NR | 685 | 114 | NR | 815 | 2 | NR | 945 | 0 | NR |
| 430 | 180 | NR | 560 | 735 | NR | 690 | 98 | NR | 820 | 2 | NR | 950 | 0 | NR |
| 435 | 315 | NR | 565 | 768 | NR | 695 | 83 | NR | 825 | 2 | NR | 955 | 0 | NR |
| 440 | 514 | NR | 570 | 798 | NR | 700 | 71 | NR | 830 | 1 | NR | 960 | 0 | NR |
| 445 | 828 | NR | 575 | 825 | NR | 705 | 61 | NR | 835 | 1 | NR | 965 | 0 | NR |
| 450 | 992 | NR | 580 | 843 | NR | 710 | 52 | NR | 840 | 1 | NR | 970 | 0 | NR |
| 455 | 652 | NR | 585 | 848 | NR | 715 | 44 | NR | 845 | 1 | NR | 975 | 0 | NR |
| 460 | 382 | NR | 590 | 844 | NR | 720 | 38 | NR | 850 | 1 | NR | 980 | 0 | NR |
| 465 | 282 | NR | 595 | 826 | NR | 725 | 32 | NR | 855 | 1 | NR | 985 | 0 | NR |
| 470 | 180 | NR | 600 | 800 | NR | 730 | 28 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 119 | NR | 605 | 762 | NR | 735 | 24 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 101 | NR | 610 | 719 | NR | 740 | 20 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 98 | NR | 615 | 669 | NR | 745 | 17 | NR | 875 | 0 | NR | | | |

REPORT NUMBER: SP1-2407-157-5

Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 2.88

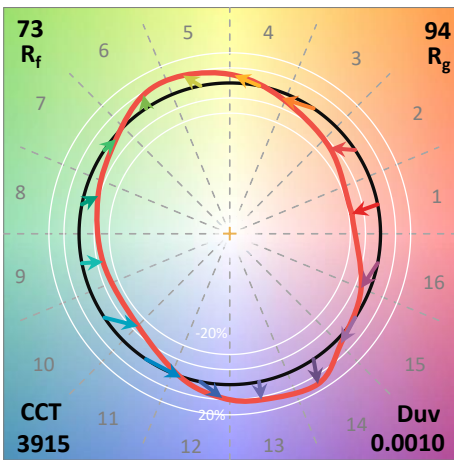
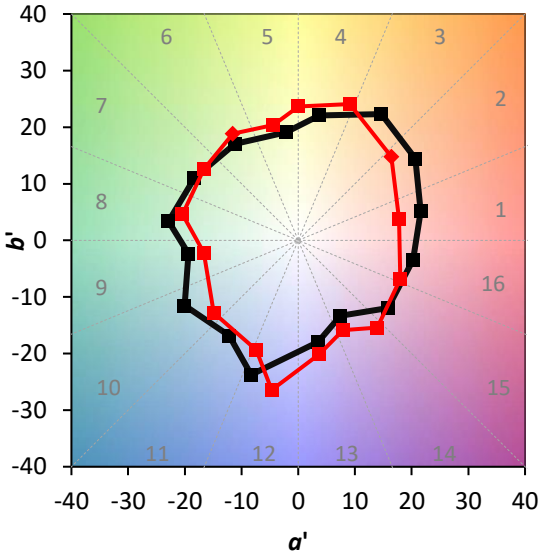
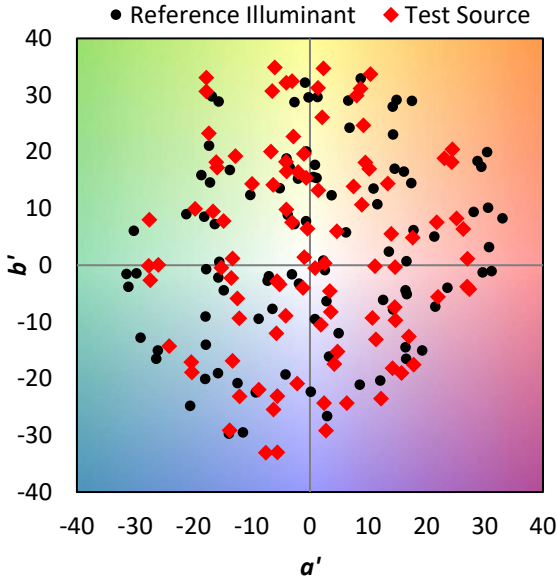
| λ (nm) | Power W [^] /nm | Lumens (φ/nm) | λ (nm) | Power W [^] /nm | Lumens (φ/nm) | λ (nm) | Power W [^] /nm | Lumens (φ/nm) | λ (nm) | Power W [^] /nm | Lumens (φ/nm) | λ (nm) | Power W [^] /nm | Lumens (φ/nm) |
|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|
| 360 | 0 | NR | 490 | 112 | NR | 620 | 618 | NR | 750 | 15 | NR | 880 | 0 | NR |
| 365 | 0 | NR | 495 | 153 | NR | 625 | 563 | NR | 755 | 13 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 216 | NR | 630 | 510 | NR | 760 | 11 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 291 | NR | 635 | 456 | NR | 765 | 9 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 366 | NR | 640 | 407 | NR | 770 | 8 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 436 | NR | 645 | 359 | NR | 775 | 7 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 492 | NR | 650 | 316 | NR | 780 | 6 | NR | 910 | 0 | NR |
| 395 | 2 | NR | 525 | 536 | NR | 655 | 277 | NR | 785 | 5 | NR | 915 | 0 | NR |
| 400 | 4 | NR | 530 | 567 | NR | 660 | 240 | NR | 790 | 4 | NR | 920 | 0 | NR |
| 405 | 7 | NR | 535 | 596 | NR | 665 | 208 | NR | 795 | 4 | NR | 925 | 0 | NR |
| 410 | 12 | NR | 540 | 619 | NR | 670 | 179 | NR | 800 | 3 | NR | 930 | 0 | NR |
| 415 | 25 | NR | 545 | 644 | NR | 675 | 154 | NR | 805 | 3 | NR | 935 | 0 | NR |
| 420 | 51 | NR | 550 | 671 | NR | 680 | 133 | NR | 810 | 3 | NR | 940 | 0 | NR |
| 425 | 100 | NR | 555 | 701 | NR | 685 | 114 | NR | 815 | 2 | NR | 945 | 0 | NR |
| 430 | 180 | NR | 560 | 735 | NR | 690 | 98 | NR | 820 | 2 | NR | 950 | 0 | NR |
| 435 | 315 | NR | 565 | 768 | NR | 695 | 83 | NR | 825 | 2 | NR | 955 | 0 | NR |
| 440 | 514 | NR | 570 | 798 | NR | 700 | 71 | NR | 830 | 1 | NR | 960 | 0 | NR |
| 445 | 828 | NR | 575 | 825 | NR | 705 | 61 | NR | 835 | 1 | NR | 965 | 0 | NR |
| 450 | 992 | NR | 580 | 843 | NR | 710 | 52 | NR | 840 | 1 | NR | 970 | 0 | NR |
| 455 | 652 | NR | 585 | 848 | NR | 715 | 44 | NR | 845 | 1 | NR | 975 | 0 | NR |
| 460 | 382 | NR | 590 | 844 | NR | 720 | 38 | NR | 850 | 1 | NR | 980 | 0 | NR |
| 465 | 282 | NR | 595 | 826 | NR | 725 | 32 | NR | 855 | 1 | NR | 985 | 0 | NR |
| 470 | 180 | NR | 600 | 800 | NR | 730 | 28 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 119 | NR | 605 | 762 | NR | 735 | 24 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 101 | NR | 610 | 719 | NR | 740 | 20 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 98 | NR | 615 | 669 | NR | 745 | 17 | NR | 875 | 0 | NR | | | |

Summary

$R_f = 73.2$
 $R_g = 93.9$
 $CIE R_a = 71.0$
 $R_g = -38.4$



Color Vector Graphics

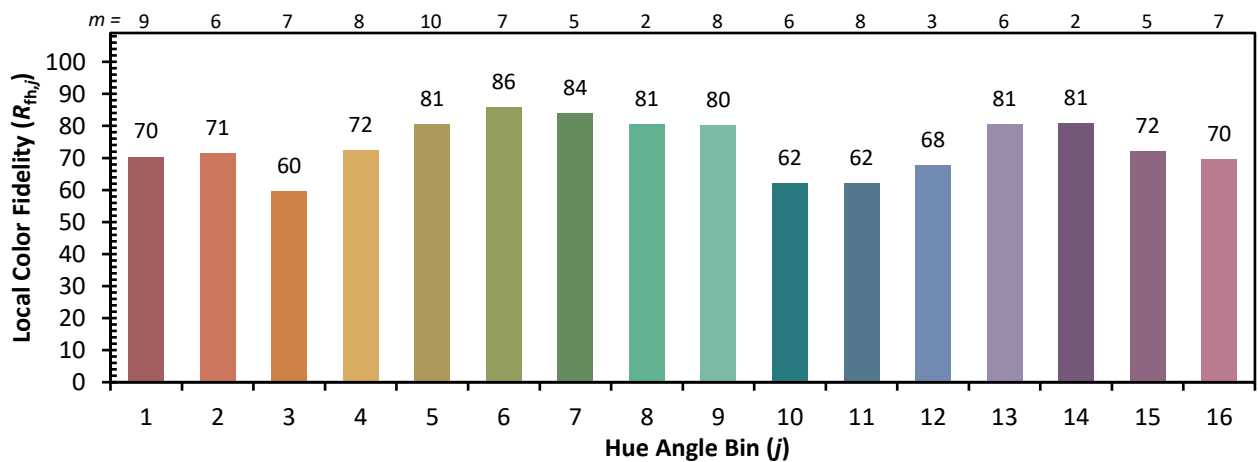
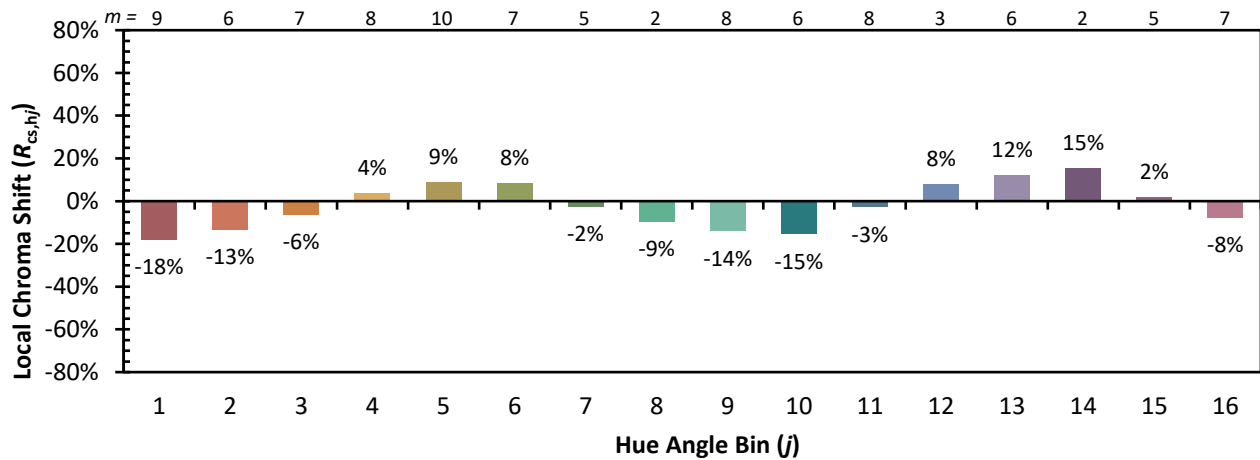


Individual Sample Fidelity Index ($R_{f,i}$)

| | | | |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 61 | CES51 = 88 | CES76 = 50 |
| CES02 = 61 | CES27 = 88 | CES52 = 87 | CES77 = 69 |
| CES03 = 30 | CES28 = 81 | CES53 = 77 | CES78 = 53 |
| CES04 = 70 | CES29 = 65 | CES54 = 84 | CES79 = 81 |
| CES05 = 47 | CES30 = 81 | CES55 = 83 | CES80 = 78 |
| CES06 = 50 | CES31 = 69 | CES56 = 73 | CES81 = 77 |
| CES07 = 40 | CES32 = 60 | CES57 = 72 | CES82 = 91 |
| CES08 = 39 | CES33 = 76 | CES58 = 73 | CES83 = 89 |
| CES09 = 29 | CES34 = 70 | CES59 = 85 | CES84 = 86 |
| CES10 = 74 | CES35 = 83 | CES60 = 89 | CES85 = 77 |
| CES11 = 57 | CES36 = 91 | CES61 = 81 | CES86 = 71 |
| CES12 = 63 | CES37 = 79 | CES62 = 85 | CES87 = 76 |
| CES13 = 42 | CES38 = 92 | CES63 = 72 | CES88 = 80 |
| CES14 = 74 | CES39 = 96 | CES64 = 64 | CES89 = 70 |
| CES15 = 71 | CES40 = 91 | CES65 = 61 | CES90 = 79 |
| CES16 = 46 | CES41 = 93 | CES66 = 57 | CES91 = 74 |
| CES17 = 49 | CES42 = 80 | CES67 = 54 | CES92 = 57 |
| CES18 = 56 | CES43 = 76 | CES68 = 63 | CES93 = 74 |
| CES19 = 72 | CES44 = 99 | CES69 = 73 | CES94 = 51 |
| CES20 = 65 | CES45 = 85 | CES70 = 55 | CES95 = 65 |
| CES21 = 86 | CES46 = 82 | CES71 = 48 | CES96 = 76 |
| CES22 = 78 | CES47 = 86 | CES72 = 83 | CES97 = 84 |
| CES23 = 92 | CES48 = 77 | CES73 = 45 | CES98 = 75 |
| CES24 = 91 | CES49 = 80 | CES74 = 93 | CES99 = 62 |
| CES25 = 72 | CES50 = 88 | CES75 = 51 | |



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)