

Signify Classified - Internal
Cooper Lighting Solutions Photometric Lab
1121 Highway 74 South
Peachtree City, GA 30269



Scaled data based on original data using
LM-79-2019 Approved Method: Electrical and Photometric Measurements of Solid-
State Lighting Products

Test Report Prepared for
Cooper Lighting Solutions

Brand: STREETWORKS

Report Number: P363376

Luminaire Tested: NVN-SA6B-827-U-T4W-HSS

Issue Date: 3/3/2020

Test Information

Test Method: LM-79-2019
Report Number: P363376
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-19)
Test Lab: INNOVATION CENTER
Issue Date: 3/3/2020
Manufacturer: COOPER LIGHTING SOLUTIONS
Product Line: STREETWORKS
Catalog Number: NVN-SA6B-827-U-T4W-HSS
Description: NAVION ROADWAY AND AREA LUMINAIRE
(6) 80 CRI, 2700K, 800mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE IV WIDE OPTICS WITH HOUSE SIDE SHIELD
Light Source: -
Ballast/Driver: ELECTRONIC DRIVER

Summary

Lumens per Lamp: N/A
Luminaire Lumens: 18336 lumens
Efficiency: N/A
Efficacy: 73.6 lumens/watt
Luminous Opening: Rectangular (W 1' x L: 1.5' x H: 0')
IES Classification: Type IV - Short
BUG Rating: B1 - U0 - G4

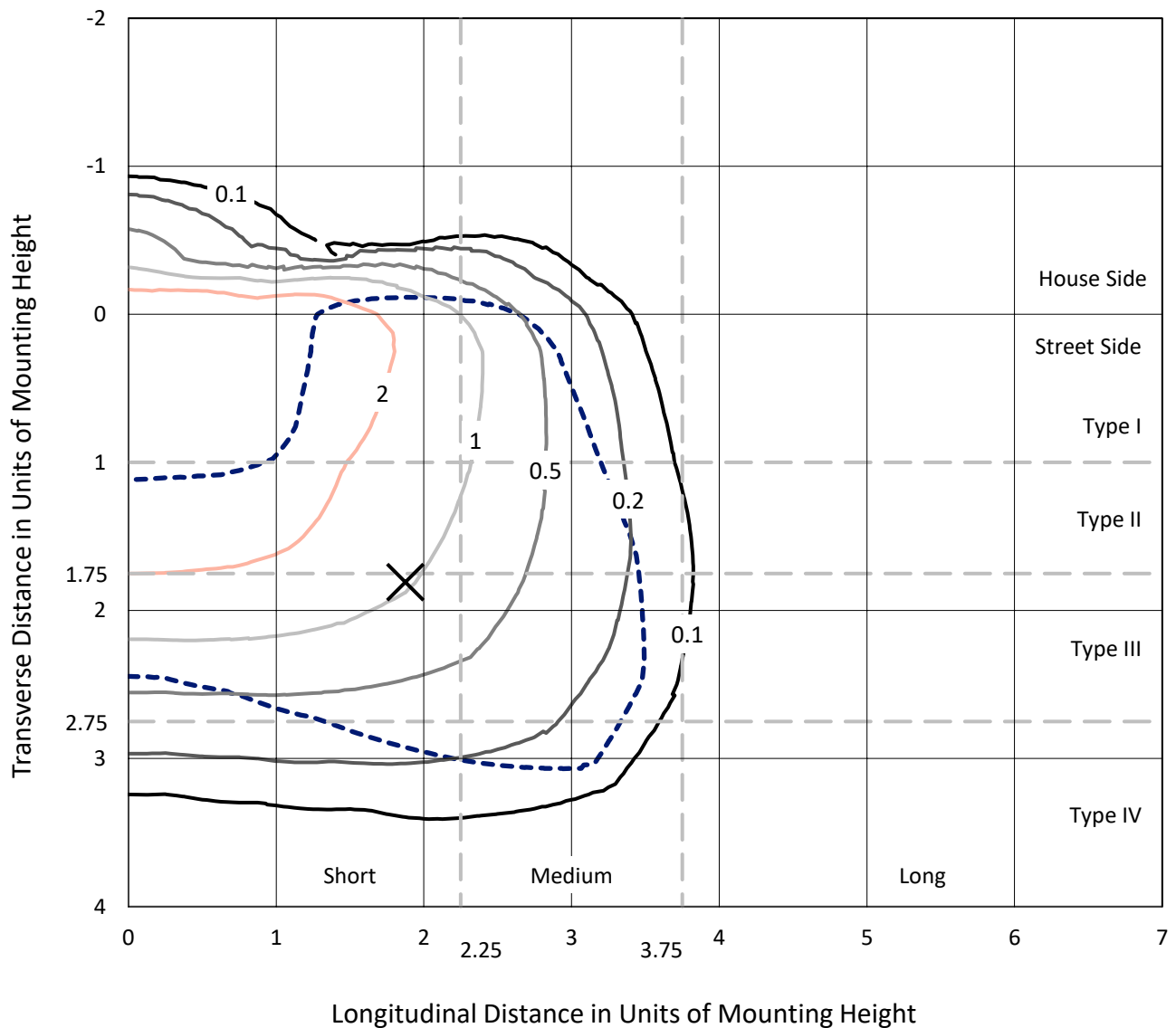
Input Watts (W): 249
Input Voltage (V): NR
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 28.75 FT



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Iso-Footcandle Lines of Horizontal Illumination

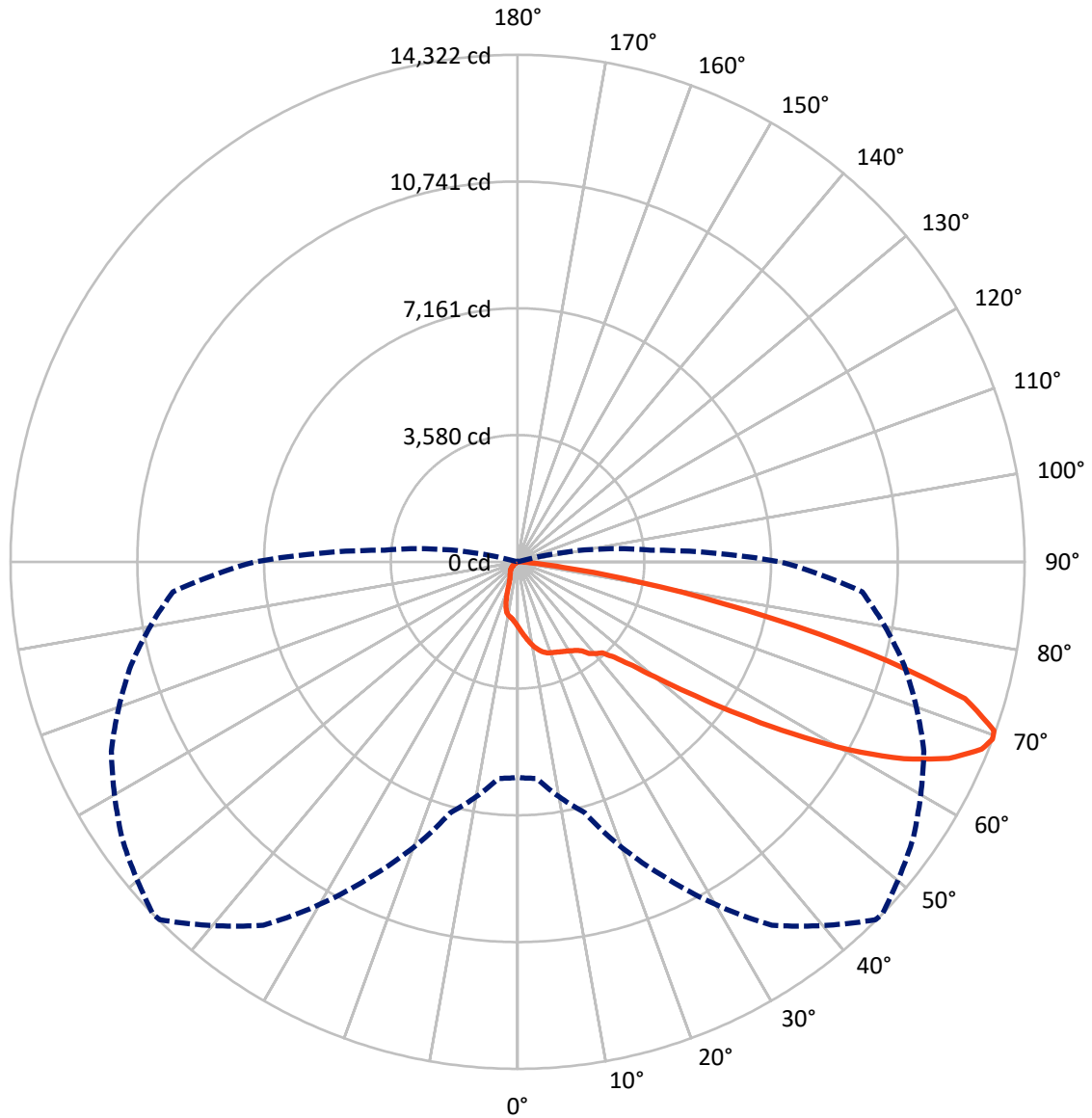
✕ Max cd
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 4.3 fc
 Type IV - Short - N/A

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Luminous Intensity Polar Plot



— Vertical Plane Through 46-Deg Lateral - - - Horizontal Cone Through 69-Deg Vertical

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FLUX DISTRIBUTION:

| | | Downward | Upward | Total |
|--------------------|-----------|----------|--------|---------|
| House Side | Lumens | 1881.8 | 0.0 | 1881.8 |
| | % Fixture | 10.3 | 0.0 | 10.3 |
| Street Side | Lumens | 16454.2 | 0.0 | 16454.2 |
| | % Fixture | 89.7 | 0.0 | 89.7 |
| Total | Lumens | 18336.0 | 0.0 | 18336.0 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|---------|-----------|
| 0°-10° | 182.9 | 1.0 |
| 10°-20° | 554.8 | 3.0 |
| 20°-30° | 872.5 | 4.8 |
| 30°-40° | 1251.1 | 6.8 |
| 40°-50° | 2162.4 | 11.8 |
| 50°-60° | 4272.0 | 23.3 |
| 60°-70° | 5970.5 | 32.6 |
| 70°-80° | 2884.4 | 15.7 |
| 80°-90° | 185.4 | 1.0 |
| 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° | 18336.0 | 100.0 |
| 0°-180° | 18336.0 | 100.0 |

Coefficient of Utilization

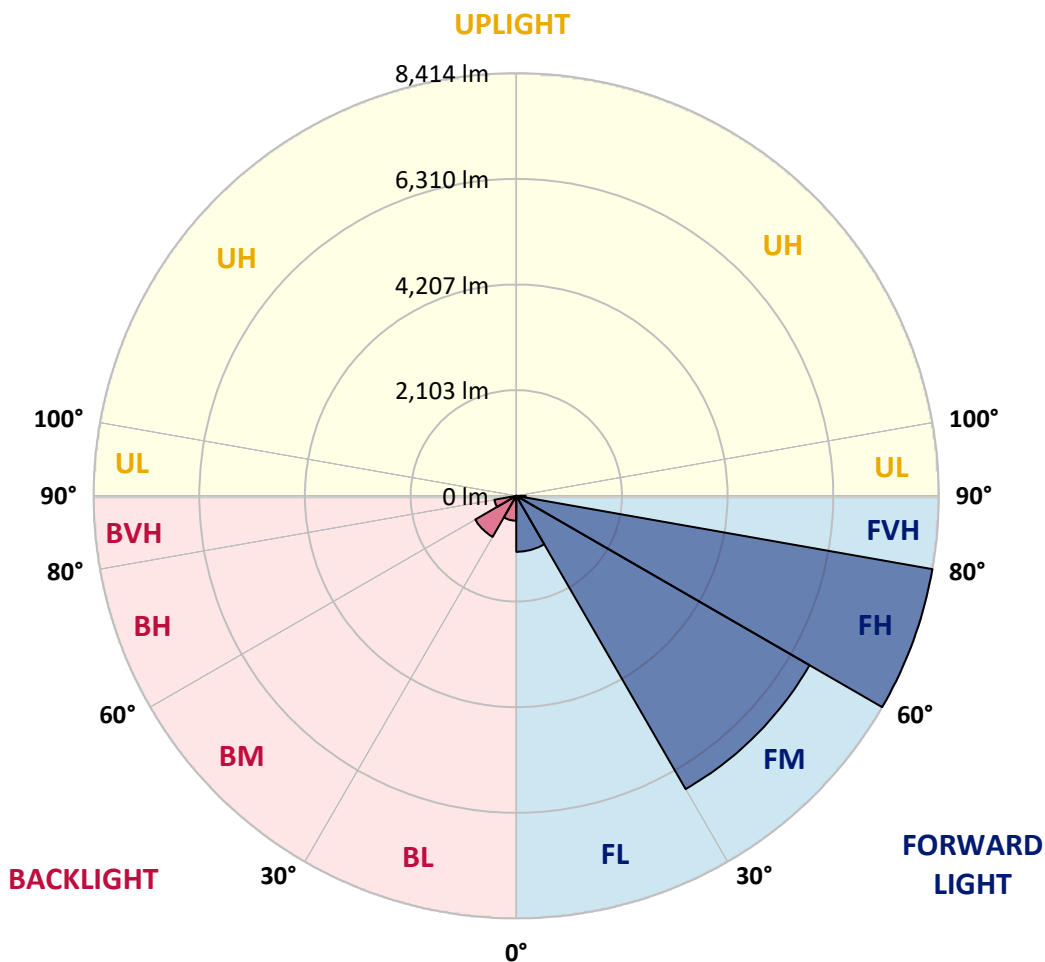


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LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | Lumens | % Fixture | Zone Rating/Lumen Limit | | |
|----------------|--------|-----------|-------------------------|------|----------|
| | | | B | U | G |
| FL (0°-30°) | 1114.1 | 6.1 | | | |
| FM (30°-60°) | 6742.6 | 36.8 | | | |
| FH (60°-80°) | 8413.7 | 45.9 | | | G4/12000 |
| FVH (80°-90°) | 183.8 | 1.0 | | | G2/225 |
| BL (0°-30°) | 496.0 | 2.7 | B1/500 | | |
| BM (30°-60°) | 943.0 | 5.1 | B1/1000 | | |
| BH (60°-80°) | 441.2 | 2.4 | B1/500 | | G1/500 |
| BVH (80°-90°) | 1.6 | 0.0 | | | G0/10 |
| UL (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH (100°-180°) | 0.0 | 0.0 | | U0/0 | |

BUG Rating: B1-U0-G4
 Type IV Short





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CANDELA DISTRIBUTION (FULL):

| | 0° | 5° | 15° | 25° | 35° | 45° | 46° | 55° | 65° | 75° | 85° |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0° | 1837.2 | 1837.2 | 1837.2 | 1837.2 | 1837.2 | 1837.2 | 1837.2 | 1837.2 | 1837.2 | 1837.2 | 1837.2 |
| 2.5° | 2040.9 | 2038.4 | 2026.3 | 2021.2 | 1991.9 | 1974.8 | 1967.9 | 1946.4 | 1915.4 | 1884.5 | 1850.1 |
| 5° | 2273.1 | 2272.2 | 2249.9 | 2228.4 | 2173.3 | 2121.8 | 2112.3 | 2062.4 | 1992.8 | 1927.5 | 1862.1 |
| 7.5° | 2510.4 | 2499.2 | 2476.8 | 2435.6 | 2355.6 | 2273.1 | 2265.3 | 2194.8 | 2096.0 | 2001.4 | 1907.7 |
| 10° | 2711.5 | 2704.6 | 2675.4 | 2612.7 | 2518.9 | 2425.2 | 2415.8 | 2329.0 | 2217.2 | 2101.1 | 1981.6 |
| 12.5° | 2868.0 | 2862.8 | 2824.1 | 2745.9 | 2646.2 | 2549.0 | 2536.1 | 2458.8 | 2339.3 | 2209.5 | 2068.5 |
| 15° | 2963.4 | 2960.8 | 2913.6 | 2830.2 | 2732.2 | 2647.9 | 2636.7 | 2568.8 | 2457.9 | 2322.1 | 2163.0 |
| 17.5° | 2985.8 | 2986.6 | 2937.6 | 2853.4 | 2772.6 | 2712.4 | 2703.8 | 2652.2 | 2559.4 | 2424.4 | 2257.6 |
| 20° | 2935.9 | 2946.2 | 2902.4 | 2829.3 | 2779.4 | 2747.6 | 2740.8 | 2709.8 | 2631.6 | 2504.3 | 2333.3 |
| 22.5° | 2865.4 | 2870.6 | 2840.5 | 2791.5 | 2770.8 | 2776.9 | 2773.4 | 2756.2 | 2690.0 | 2573.1 | 2408.0 |
| 25° | 2822.4 | 2822.4 | 2804.4 | 2763.1 | 2776.9 | 2813.8 | 2814.7 | 2811.2 | 2758.8 | 2657.4 | 2499.2 |
| 27.5° | 2820.7 | 2815.5 | 2794.9 | 2764.0 | 2801.8 | 2858.5 | 2862.0 | 2885.2 | 2852.5 | 2759.7 | 2612.7 |
| 30° | 2889.5 | 2883.5 | 2839.6 | 2799.2 | 2847.4 | 2908.4 | 2917.0 | 2967.7 | 2951.4 | 2870.6 | 2739.0 |
| 32.5° | 3050.2 | 3028.8 | 2931.6 | 2865.4 | 2901.5 | 2974.6 | 2985.8 | 3066.6 | 3092.4 | 3007.3 | 2861.1 |
| 35° | 3270.3 | 3202.4 | 3062.3 | 2990.9 | 2994.4 | 3070.9 | 3081.2 | 3199.8 | 3276.4 | 3132.8 | 2955.7 |
| 37.5° | 3573.8 | 3540.3 | 3312.5 | 3121.6 | 3137.1 | 3253.1 | 3283.2 | 3412.2 | 3390.7 | 3201.6 | 3063.1 |
| 40° | 4239.2 | 4186.8 | 3944.3 | 3487.8 | 3273.8 | 3401.0 | 3410.5 | 3479.2 | 3481.0 | 3357.2 | 3286.7 |
| 42.5° | 5145.4 | 5123.9 | 4868.5 | 4152.4 | 3542.9 | 3499.9 | 3517.1 | 3633.1 | 3762.9 | 3685.6 | 3682.1 |
| 45° | 6148.6 | 6137.5 | 5866.7 | 5034.5 | 4087.1 | 3824.0 | 3845.5 | 4001.1 | 4249.5 | 4266.7 | 4375.9 |
| 47.5° | 6955.9 | 6950.7 | 6795.1 | 6018.8 | 4920.1 | 4373.3 | 4380.2 | 4545.3 | 4982.0 | 5197.8 | 5372.3 |
| 50° | 7691.8 | 7716.8 | 7593.8 | 7084.0 | 6054.9 | 5233.9 | 5217.6 | 5327.6 | 6029.1 | 6382.5 | 6599.1 |
| 52.5° | 8714.9 | 8750.1 | 8405.4 | 8077.8 | 7245.6 | 6301.7 | 6288.8 | 6404.0 | 7287.8 | 7552.5 | 7591.2 |
| 55° | 9618.4 | 9558.2 | 9285.7 | 9191.2 | 8697.7 | 7620.5 | 7617.0 | 7718.5 | 8505.1 | 8617.7 | 8689.1 |
| 57.5° | 10017.3 | 9994.1 | 10125.7 | 10342.3 | 10218.5 | 9179.1 | 9171.4 | 9094.0 | 9594.4 | 9606.4 | 9825.6 |
| 60° | 10269.2 | 10297.6 | 10700.8 | 11368.8 | 11677.4 | 10856.4 | 10806.5 | 10334.6 | 10634.6 | 10608.0 | 10842.7 |
| 62.5° | 10080.1 | 10136.0 | 10861.6 | 11974.9 | 12769.3 | 12320.5 | 12250.0 | 11471.1 | 11523.5 | 11431.6 | 11649.9 |
| 65° | 9076.0 | 9162.8 | 10351.8 | 11860.5 | 13310.9 | 13464.8 | 13393.4 | 12474.4 | 12229.4 | 12078.1 | 11956.8 |
| 67.5° | 7369.4 | 7421.0 | 8662.4 | 10865.9 | 13066.7 | 14147.4 | 14132.8 | 13353.9 | 12762.4 | 11968.9 | 11028.4 |
| 69° | 6090.2 | 6140.9 | 7335.9 | 9818.7 | 12529.4 | 14293.5 | 14321.9 | 13635.8 | 12660.9 | 11305.2 | 9771.5 |
| 70° | 5158.3 | 5212.4 | 6325.7 | 8921.2 | 11906.1 | 14225.6 | 14276.3 | 13609.2 | 12370.4 | 10536.6 | 8668.4 |
| 72.5° | 2705.5 | 2751.9 | 3894.5 | 6146.1 | 9706.1 | 13062.4 | 13216.3 | 12458.9 | 10485.9 | 7652.3 | 5125.6 |
| 75° | 850.3 | 876.9 | 1520.8 | 3212.7 | 6645.6 | 10156.6 | 10191.9 | 9773.2 | 7445.9 | 4209.1 | 2134.7 |
| 77.5° | 324.1 | 316.4 | 506.4 | 1183.8 | 3359.7 | 6395.4 | 6611.2 | 6107.4 | 3907.4 | 1488.2 | 492.6 |
| 80° | 174.5 | 175.4 | 263.1 | 490.0 | 1437.4 | 3286.7 | 3468.9 | 2960.0 | 1388.4 | 464.2 | 113.5 |
| 82.5° | 75.7 | 79.1 | 147.9 | 259.6 | 660.3 | 1212.2 | 1303.3 | 1085.0 | 530.4 | 312.1 | 42.1 |
| 85° | 16.3 | 18.1 | 71.4 | 141.0 | 269.1 | 340.4 | 356.8 | 351.6 | 337.9 | 242.4 | 16.3 |
| 87.5° | 0.0 | 0.0 | 31.8 | 50.7 | 67.9 | 77.4 | 67.9 | 88.6 | 186.6 | 163.3 | 8.6 |
| 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: P363376

CATALOG NUMBER: NVN-SA6B-827-U-T4W-HSS

CANDELA DISTRIBUTION (continued):

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0° | 1837.2 | 1837.2 | 1837.2 | 1837.2 | 1837.2 | 1837.2 | 1837.2 | 1837.2 | 1837.2 | 1837.2 | 1837.2 |
| 2.5° | 1838.9 | 1823.4 | 1796.8 | 1767.6 | 1746.9 | 1725.4 | 1708.2 | 1700.5 | 1691.9 | 1685.9 | 1693.6 |
| 5° | 1835.5 | 1805.4 | 1753.8 | 1703.9 | 1667.8 | 1638.6 | 1614.5 | 1605.1 | 1595.6 | 1588.7 | 1587.9 |
| 7.5° | 1865.6 | 1823.4 | 1744.4 | 1671.3 | 1615.4 | 1575.8 | 1543.2 | 1529.4 | 1518.2 | 1513.1 | 1508.8 |
| 10° | 1923.2 | 1869.0 | 1763.3 | 1667.8 | 1595.6 | 1528.6 | 1458.1 | 1403.9 | 1368.7 | 1352.3 | 1346.3 |
| 12.5° | 1998.0 | 1930.0 | 1799.4 | 1685.9 | 1581.0 | 1452.0 | 1302.5 | 1173.5 | 1090.1 | 1062.6 | 1046.3 |
| 15° | 2085.7 | 2001.4 | 1846.7 | 1709.1 | 1527.7 | 1292.1 | 1038.5 | 870.0 | 792.7 | 777.2 | 760.0 |
| 17.5° | 2169.9 | 2077.1 | 1903.4 | 1713.4 | 1410.8 | 1032.5 | 760.8 | 646.5 | 616.4 | 626.7 | 629.3 |
| 20° | 2243.8 | 2151.9 | 1959.3 | 1675.6 | 1198.4 | 774.6 | 588.9 | 560.5 | 571.7 | 591.5 | 594.9 |
| 22.5° | 2318.6 | 2224.1 | 2010.9 | 1575.8 | 926.8 | 588.0 | 530.4 | 537.3 | 548.5 | 568.3 | 571.7 |
| 25° | 2409.8 | 2311.8 | 2059.0 | 1392.7 | 695.5 | 500.4 | 503.8 | 514.1 | 525.3 | 543.3 | 545.1 |
| 27.5° | 2514.6 | 2422.7 | 2090.8 | 1154.6 | 515.8 | 459.9 | 471.1 | 486.6 | 497.8 | 515.0 | 518.4 |
| 30° | 2653.9 | 2568.8 | 2101.1 | 907.9 | 432.4 | 423.8 | 429.0 | 447.9 | 464.2 | 479.7 | 482.3 |
| 32.5° | 2784.6 | 2713.2 | 2066.7 | 685.2 | 400.6 | 390.3 | 390.3 | 401.5 | 420.4 | 435.0 | 438.5 |
| 35° | 2905.0 | 2858.5 | 1956.7 | 501.2 | 376.6 | 359.4 | 350.8 | 350.8 | 362.8 | 374.8 | 378.3 |
| 37.5° | 3064.0 | 3062.3 | 1778.7 | 399.8 | 353.3 | 333.6 | 315.5 | 301.8 | 297.5 | 300.0 | 301.8 |
| 40° | 3336.5 | 3339.1 | 1546.6 | 358.5 | 333.6 | 306.9 | 279.4 | 254.5 | 231.3 | 223.5 | 222.7 |
| 42.5° | 3762.1 | 3723.4 | 1303.3 | 338.7 | 316.4 | 279.4 | 238.1 | 204.6 | 168.5 | 157.3 | 156.5 |
| 45° | 4437.8 | 4208.3 | 1045.4 | 320.7 | 298.3 | 248.5 | 196.9 | 151.3 | 122.1 | 113.5 | 113.5 |
| 47.5° | 5422.2 | 4845.3 | 809.8 | 300.9 | 274.2 | 213.2 | 148.7 | 109.2 | 89.4 | 85.1 | 86.0 |
| 50° | 6440.1 | 5469.5 | 620.7 | 276.0 | 245.0 | 176.2 | 110.0 | 79.1 | 67.9 | 67.9 | 68.8 |
| 52.5° | 7342.8 | 5926.8 | 484.0 | 249.3 | 208.9 | 138.4 | 83.4 | 61.9 | 56.7 | 55.9 | 56.7 |
| 55° | 8187.9 | 6221.7 | 370.5 | 218.4 | 165.9 | 103.2 | 63.6 | 50.7 | 47.3 | 45.6 | 44.7 |
| 57.5° | 9002.9 | 6367.9 | 277.7 | 176.2 | 120.4 | 74.8 | 50.7 | 43.0 | 39.5 | 37.0 | 36.1 |
| 60° | 9545.4 | 6249.2 | 190.9 | 129.8 | 83.4 | 54.2 | 42.1 | 37.0 | 32.7 | 30.1 | 29.2 |
| 62.5° | 9851.4 | 5925.1 | 122.9 | 93.7 | 59.3 | 40.4 | 33.5 | 30.9 | 24.9 | 22.4 | 22.4 |
| 65° | 9727.6 | 5390.4 | 86.0 | 67.1 | 43.0 | 30.1 | 24.9 | 24.9 | 18.1 | 14.6 | 13.8 |
| 67.5° | 8620.3 | 4553.9 | 65.3 | 49.9 | 30.9 | 22.4 | 18.9 | 21.5 | 11.2 | 6.9 | 6.9 |
| 69° | 7416.7 | 3774.1 | 55.9 | 41.3 | 25.8 | 18.1 | 16.3 | 19.8 | 7.7 | 5.2 | 4.3 |
| 70° | 6446.1 | 3255.7 | 50.7 | 36.1 | 21.5 | 15.5 | 14.6 | 18.9 | 7.7 | 4.3 | 3.4 |
| 72.5° | 3856.7 | 1815.7 | 38.7 | 25.8 | 13.8 | 12.0 | 12.0 | 21.5 | 7.7 | 4.3 | 3.4 |
| 75° | 1558.7 | 639.6 | 28.4 | 18.1 | 10.3 | 10.3 | 14.6 | 27.5 | 6.9 | 3.4 | 2.6 |
| 77.5° | 353.3 | 140.1 | 16.3 | 11.2 | 6.9 | 10.3 | 17.2 | 21.5 | 4.3 | 1.7 | 0.0 |
| 80° | 86.0 | 34.4 | 10.3 | 6.9 | 4.3 | 7.7 | 12.9 | 12.0 | 0.9 | 0.0 | 0.0 |
| 82.5° | 28.4 | 12.0 | 4.3 | 3.4 | 0.9 | 2.6 | 6.0 | 3.4 | 0.0 | 0.0 | 0.0 |
| 85° | 12.0 | 6.9 | 1.7 | 0.9 | 0.0 | 0.0 | 0.9 | 0.0 | 0.0 | 0.0 | 0.0 |
| 87.5° | 7.7 | 2.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 90° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

Cooper Lighting Solutions Photometric Lab
1121 Highway 74 South
Peachtree City, GA 30269



LM-79-2019: Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Report Prepared for

Cooper Lighting Solutions

Invue

Report Number: SP1-2407-157-9

Test Date: 10/03/2024

Luminaire Tested: EMM2-HTN-SA1A-827-U-5WQ

Data applicable to all product families utilizing light square engine

Test Information

Test Method: LM-79-2019
 Report Number: SP1-2407-157-9
 Test Lab: COOPER LIGHTING SOLUTIONS
 Photometer: SP1 - 76IN SPHERE
 Measurement Geometry: 4π
 Issue Date: 10/03/2024
 Manufacturer: COOPER LIGHTING SOLUTIONS
 Product Line: Invue
 Catalog Number: **EMM2-HTN-SA1A-827-U-5WQ**
 Description: Epic Modern Light Square 40W 5WQ Optic

Spectral Parameters

CCT (K): 2764
 CIE u': 0.2591
 CIE v': 0.5290
 Duv: 0.0020
 CIE x: 0.4581
 CIE y: 0.4156
 CIE z: 0.1263
 Peak Wavelength (nm): 603
 Dominant Wavelength (nm): 583
 Purity: 62.2537
 Rf: 84.7
 Rg: 94.6

| | | | |
|-----------|------|------|------|
| CRI (Ra): | 80.9 | | |
| R1: | 78.8 | R9: | -1.5 |
| R2: | 89.9 | R10: | 77.9 |
| R3: | 96.2 | R11: | 78.9 |
| R4: | 79.1 | R12: | 71.6 |
| R5: | 79.1 | R13: | 81.2 |
| R6: | 88.8 | R14: | 98.5 |
| R7: | 81.3 | R15: | 69.9 |
| R8: | 54.3 | | |



Test Conditions

Stabilization Time: 81M
 Operation Time: 2H 21M
 Sphere Temperature (°C): 25.2

REPORT NUMBER: SP1-2407-157-9

| 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: SP1-2407-157-9

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: 4337.9

| λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) | λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) | λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) | λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) | λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) |
|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|
| 360 | 0 | 0.0 | 490 | 18018 | 2.6 | 620 | 87426 | 22.8 | 750 | 2680 | 0.0 | 880 | 58 | 0.0 |
| 365 | 0 | 0.0 | 495 | 22295 | 3.9 | 625 | 83013 | 18.2 | 755 | 2287 | 0.0 | 885 | 46 | 0.0 |
| 370 | 0 | 0.0 | 500 | 26478 | 5.8 | 630 | 78077 | 14.1 | 760 | 1944 | 0.0 | 890 | 45 | 0.0 |
| 375 | 0 | 0.0 | 505 | 30524 | 8.5 | 635 | 72080 | 10.7 | 765 | 1653 | 0.0 | 895 | 41 | 0.0 |
| 380 | 0 | 0.0 | 510 | 33611 | 11.5 | 640 | 66249 | 7.9 | 770 | 1413 | 0.0 | 900 | 38 | 0.0 |
| 385 | 0 | 0.0 | 515 | 36490 | 15.2 | 645 | 59973 | 5.7 | 775 | 1198 | 0.0 | 905 | 33 | 0.0 |
| 390 | 0 | 0.0 | 520 | 38610 | 18.7 | 650 | 53972 | 3.9 | 780 | 1025 | 0.0 | 910 | 30 | 0.0 |
| 395 | 0 | 0.0 | 525 | 40511 | 21.9 | 655 | 48369 | 2.7 | 785 | 874 | 0.0 | 915 | 23 | 0.0 |
| 400 | 48 | 0.0 | 530 | 42223 | 24.9 | 660 | 42641 | 1.8 | 790 | 747 | 0.0 | 920 | 24 | 0.0 |
| 405 | 201 | 0.0 | 535 | 44137 | 27.6 | 665 | 37602 | 1.1 | 795 | 639 | 0.0 | 925 | 22 | 0.0 |
| 410 | 457 | 0.0 | 540 | 46032 | 30.0 | 670 | 32798 | 0.7 | 800 | 547 | 0.0 | 930 | 22 | 0.0 |
| 415 | 925 | 0.0 | 545 | 48553 | 32.5 | 675 | 28558 | 0.5 | 805 | 473 | 0.0 | 935 | 17 | 0.0 |
| 420 | 1816 | 0.0 | 550 | 51408 | 34.9 | 680 | 24782 | 0.3 | 810 | 401 | 0.0 | 940 | 13 | 0.0 |
| 425 | 3217 | 0.0 | 555 | 54711 | 37.4 | 685 | 21386 | 0.2 | 815 | 351 | 0.0 | 945 | 6 | 0.0 |
| 430 | 5520 | 0.0 | 560 | 58847 | 40.0 | 690 | 18413 | 0.1 | 820 | 307 | 0.0 | 950 | 10 | 0.0 |
| 435 | 9225 | 0.1 | 565 | 63386 | 42.4 | 695 | 15721 | 0.1 | 825 | 261 | 0.0 | 955 | 11 | 0.0 |
| 440 | 15522 | 0.2 | 570 | 68196 | 44.3 | 700 | 13432 | 0.0 | 830 | 228 | 0.0 | 960 | 8 | 0.0 |
| 445 | 27642 | 0.6 | 575 | 73613 | 46.0 | 705 | 11513 | 0.0 | 835 | 193 | 0.0 | 965 | 12 | 0.0 |
| 450 | 36602 | 0.9 | 580 | 79207 | 47.1 | 710 | 9780 | 0.0 | 840 | 174 | 0.0 | 970 | 3 | 0.0 |
| 455 | 28292 | 0.9 | 585 | 84248 | 47.0 | 715 | 8356 | 0.0 | 845 | 151 | 0.0 | 975 | 8 | 0.0 |
| 460 | 21166 | 0.9 | 590 | 88397 | 45.7 | 720 | 7161 | 0.0 | 850 | 123 | 0.0 | 980 | 2 | 0.0 |
| 465 | 19092 | 1.0 | 595 | 91428 | 43.4 | 725 | 6067 | 0.0 | 855 | 106 | 0.0 | 985 | 13 | 0.0 |
| 470 | 14951 | 0.9 | 600 | 93452 | 40.3 | 730 | 5164 | 0.0 | 860 | 95 | 0.0 | 990 | 16 | 0.0 |
| 475 | 12606 | 1.0 | 605 | 93959 | 36.4 | 735 | 4393 | 0.0 | 865 | 82 | 0.0 | 995 | 20 | 0.0 |
| 480 | 13323 | 1.3 | 610 | 93079 | 32.0 | 740 | 3694 | 0.0 | 870 | 77 | 0.0 | 1000 | 0 | 0.0 |
| 485 | 15164 | 1.8 | 615 | 90707 | 27.3 | 745 | 3157 | 0.0 | 875 | 65 | 0.0 | | | |

REPORT NUMBER: SP1-2407-157-9

Scotopic Flux vs. Wavelength



Scotopic Lumens: 5286.7

S/P: 1.22

| λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) |
|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|
| 360 | 0 | 0.0 | 490 | 18018 | 75.9 | 620 | 87426 | 0.4 | 750 | 2680 | 0.0 | 880 | 58 | 0.0 |
| 365 | 0 | 0.0 | 495 | 22295 | 93.2 | 625 | 83013 | 0.2 | 755 | 2287 | 0.0 | 885 | 46 | 0.0 |
| 370 | 0 | 0.0 | 500 | 26478 | 107.8 | 630 | 78077 | 0.1 | 760 | 1944 | 0.0 | 890 | 45 | 0.0 |
| 375 | 0 | 0.0 | 505 | 30524 | 118.7 | 635 | 72080 | 0.1 | 765 | 1653 | 0.0 | 895 | 41 | 0.0 |
| 380 | 0 | 0.0 | 510 | 33611 | 122.2 | 640 | 66249 | 0.1 | 770 | 1413 | 0.0 | 900 | 38 | 0.0 |
| 385 | 0 | 0.0 | 515 | 36490 | 120.8 | 645 | 59973 | 0.0 | 775 | 1198 | 0.0 | 905 | 33 | 0.0 |
| 390 | 0 | 0.0 | 520 | 38610 | 113.9 | 650 | 53972 | 0.0 | 780 | 1025 | 0.0 | 910 | 30 | 0.0 |
| 395 | 0 | 0.0 | 525 | 40511 | 104.1 | 655 | 48369 | 0.0 | 785 | 874 | 0.0 | 915 | 23 | 0.0 |
| 400 | 48 | 0.0 | 530 | 42223 | 92.4 | 660 | 42641 | 0.0 | 790 | 747 | 0.0 | 920 | 24 | 0.0 |
| 405 | 201 | 0.0 | 535 | 44137 | 80.5 | 665 | 37602 | 0.0 | 795 | 639 | 0.0 | 925 | 22 | 0.0 |
| 410 | 457 | 0.1 | 540 | 46032 | 68.2 | 670 | 32798 | 0.0 | 800 | 547 | 0.0 | 930 | 22 | 0.0 |
| 415 | 925 | 0.3 | 545 | 48553 | 57.1 | 675 | 28558 | 0.0 | 805 | 473 | 0.0 | 935 | 17 | 0.0 |
| 420 | 1816 | 1.1 | 550 | 51408 | 46.7 | 680 | 24782 | 0.0 | 810 | 401 | 0.0 | 940 | 13 | 0.0 |
| 425 | 3217 | 2.5 | 555 | 54711 | 37.4 | 685 | 21386 | 0.0 | 815 | 351 | 0.0 | 945 | 6 | 0.0 |
| 430 | 5520 | 5.9 | 560 | 58847 | 29.4 | 690 | 18413 | 0.0 | 820 | 307 | 0.0 | 950 | 10 | 0.0 |
| 435 | 9225 | 12.5 | 565 | 63386 | 22.5 | 695 | 15721 | 0.0 | 825 | 261 | 0.0 | 955 | 11 | 0.0 |
| 440 | 15522 | 26.3 | 570 | 68196 | 16.9 | 700 | 13432 | 0.0 | 830 | 228 | 0.0 | 960 | 8 | 0.0 |
| 445 | 27642 | 55.2 | 575 | 73613 | 12.4 | 705 | 11513 | 0.0 | 835 | 193 | 0.0 | 965 | 12 | 0.0 |
| 450 | 36602 | 85.4 | 580 | 79207 | 9.0 | 710 | 9780 | 0.0 | 840 | 174 | 0.0 | 970 | 3 | 0.0 |
| 455 | 28292 | 75.1 | 585 | 84248 | 6.3 | 715 | 8356 | 0.0 | 845 | 151 | 0.0 | 975 | 8 | 0.0 |
| 460 | 21166 | 63.2 | 590 | 88397 | 4.4 | 720 | 7161 | 0.0 | 850 | 123 | 0.0 | 980 | 2 | 0.0 |
| 465 | 19092 | 63.2 | 595 | 91428 | 3.0 | 725 | 6067 | 0.0 | 855 | 106 | 0.0 | 985 | 13 | 0.0 |
| 470 | 14951 | 54.2 | 600 | 93452 | 2.0 | 730 | 5164 | 0.0 | 860 | 95 | 0.0 | 990 | 16 | 0.0 |
| 475 | 12606 | 48.8 | 605 | 93959 | 1.3 | 735 | 4393 | 0.0 | 865 | 82 | 0.0 | 995 | 20 | 0.0 |
| 480 | 13323 | 54.2 | 610 | 93079 | 0.9 | 740 | 3694 | 0.0 | 870 | 77 | 0.0 | 1000 | 0 | 0.0 |
| 485 | 15164 | 63.3 | 615 | 90707 | 0.5 | 745 | 3157 | 0.0 | 875 | 65 | 0.0 | | | |

REPORT NUMBER: SP1-2407-157-9

Melanopic Flux vs. Wavelength



Melanopic Lumens: 9797

M/P: 2.26

| λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) |
|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|
| 360 | 0 | 0.0 | 490 | 18018 | 27.7 | 620 | 87426 | 1.1 | 750 | 2680 | 0.0 | 880 | 58 | 0.0 |
| 365 | 0 | 0.0 | 495 | 22295 | 36.0 | 625 | 83013 | 0.7 | 755 | 2287 | 0.0 | 885 | 46 | 0.0 |
| 370 | 0 | 0.0 | 500 | 26478 | 44.2 | 630 | 78077 | 0.4 | 760 | 1944 | 0.0 | 890 | 45 | 0.0 |
| 375 | 0 | 0.0 | 505 | 30524 | 51.8 | 635 | 72080 | 0.3 | 765 | 1653 | 0.0 | 895 | 41 | 0.0 |
| 380 | 0 | 0.0 | 510 | 33611 | 57.0 | 640 | 66249 | 0.2 | 770 | 1413 | 0.0 | 900 | 38 | 0.0 |
| 385 | 0 | 0.0 | 515 | 36490 | 60.5 | 645 | 59973 | 0.1 | 775 | 1198 | 0.0 | 905 | 33 | 0.0 |
| 390 | 0 | 0.0 | 520 | 38610 | 61.4 | 650 | 53972 | 0.1 | 780 | 1025 | 0.0 | 910 | 30 | 0.0 |
| 395 | 0 | 0.0 | 525 | 40511 | 60.6 | 655 | 48369 | 0.0 | 785 | 874 | 0.0 | 915 | 23 | 0.0 |
| 400 | 48 | 0.0 | 530 | 42223 | 58.2 | 660 | 42641 | 0.0 | 790 | 747 | 0.0 | 920 | 24 | 0.0 |
| 405 | 201 | 0.0 | 535 | 44137 | 55.0 | 665 | 37602 | 0.0 | 795 | 639 | 0.0 | 925 | 22 | 0.0 |
| 410 | 457 | 0.0 | 540 | 46032 | 50.9 | 670 | 32798 | 0.0 | 800 | 547 | 0.0 | 930 | 22 | 0.0 |
| 415 | 925 | 0.1 | 545 | 48553 | 46.6 | 675 | 28558 | 0.0 | 805 | 473 | 0.0 | 935 | 17 | 0.0 |
| 420 | 1816 | 0.3 | 550 | 51408 | 42.0 | 680 | 24782 | 0.0 | 810 | 401 | 0.0 | 940 | 13 | 0.0 |
| 425 | 3217 | 0.8 | 555 | 54711 | 37.4 | 685 | 21386 | 0.0 | 815 | 351 | 0.0 | 945 | 6 | 0.0 |
| 430 | 5520 | 1.9 | 560 | 58847 | 32.9 | 690 | 18413 | 0.0 | 820 | 307 | 0.0 | 950 | 10 | 0.0 |
| 435 | 9225 | 4.1 | 565 | 63386 | 28.4 | 695 | 15721 | 0.0 | 825 | 261 | 0.0 | 955 | 11 | 0.0 |
| 440 | 15522 | 8.7 | 570 | 68196 | 24.1 | 700 | 13432 | 0.0 | 830 | 228 | 0.0 | 960 | 8 | 0.0 |
| 445 | 27642 | 18.5 | 575 | 73613 | 20.0 | 705 | 11513 | 0.0 | 835 | 193 | 0.0 | 965 | 12 | 0.0 |
| 450 | 36602 | 28.3 | 580 | 79207 | 16.3 | 710 | 9780 | 0.0 | 840 | 174 | 0.0 | 970 | 3 | 0.0 |
| 455 | 28292 | 24.7 | 585 | 84248 | 12.9 | 715 | 8356 | 0.0 | 845 | 151 | 0.0 | 975 | 8 | 0.0 |
| 460 | 21166 | 20.4 | 590 | 88397 | 9.8 | 720 | 7161 | 0.0 | 850 | 123 | 0.0 | 980 | 2 | 0.0 |
| 465 | 19092 | 20.1 | 595 | 91428 | 7.3 | 725 | 6067 | 0.0 | 855 | 106 | 0.0 | 985 | 13 | 0.0 |
| 470 | 14951 | 17.2 | 600 | 93452 | 5.3 | 730 | 5164 | 0.0 | 860 | 95 | 0.0 | 990 | 16 | 0.0 |
| 475 | 12606 | 15.7 | 605 | 93959 | 3.7 | 735 | 4393 | 0.0 | 865 | 82 | 0.0 | 995 | 20 | 0.0 |
| 480 | 13323 | 18.0 | 610 | 93079 | 2.5 | 740 | 3694 | 0.0 | 870 | 77 | 0.0 | 1000 | 0 | 0.0 |
| 485 | 15164 | 21.9 | 615 | 90707 | 1.7 | 745 | 3157 | 0.0 | 875 | 65 | 0.0 | | | |

Summary

$R_f = 84.7$
 $R_g = 94.6$
 CIE $R_a = 80.9$
 $R_g = -1.5$



Color Vector Graphics

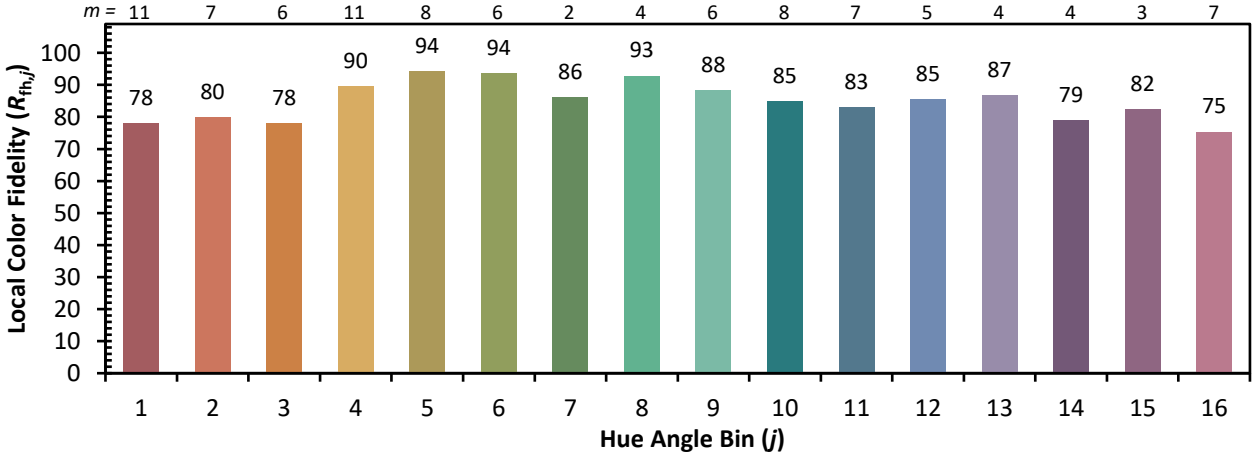


Individual Sample Fidelity Index ($R_{f,i}$)

| | | | |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 84 | CES51 = 95 | CES76 = 81 |
| CES02 = 63 | CES27 = 95 | CES52 = 94 | CES77 = 84 |
| CES03 = 31 | CES28 = 94 | CES53 = 89 | CES78 = 81 |
| CES04 = 71 | CES29 = 87 | CES54 = 91 | CES79 = 89 |
| CES05 = 50 | CES30 = 94 | CES55 = 90 | CES80 = 89 |
| CES06 = 52 | CES31 = 89 | CES56 = 86 | CES81 = 69 |
| CES07 = 43 | CES32 = 82 | CES57 = 85 | CES82 = 96 |
| CES08 = 41 | CES33 = 91 | CES58 = 86 | CES83 = 93 |
| CES09 = 29 | CES34 = 92 | CES59 = 91 | CES84 = 92 |
| CES10 = 77 | CES35 = 96 | CES60 = 94 | CES85 = 76 |
| CES11 = 60 | CES36 = 90 | CES61 = 89 | CES86 = 65 |
| CES12 = 66 | CES37 = 96 | CES62 = 94 | CES87 = 84 |
| CES13 = 44 | CES38 = 98 | CES63 = 87 | CES88 = 86 |
| CES14 = 74 | CES39 = 98 | CES64 = 82 | CES89 = 73 |
| CES15 = 72 | CES40 = 95 | CES65 = 78 | CES90 = 88 |
| CES16 = 48 | CES41 = 96 | CES66 = 81 | CES91 = 82 |
| CES17 = 50 | CES42 = 97 | CES67 = 80 | CES92 = 64 |
| CES18 = 57 | CES43 = 91 | CES68 = 83 | CES93 = 78 |
| CES19 = 73 | CES44 = 99 | CES69 = 88 | CES94 = 59 |
| CES20 = 67 | CES45 = 93 | CES70 = 80 | CES95 = 74 |
| CES21 = 87 | CES46 = 89 | CES71 = 79 | CES96 = 83 |
| CES22 = 79 | CES47 = 92 | CES72 = 92 | CES97 = 88 |
| CES23 = 92 | CES48 = 83 | CES73 = 75 | CES98 = 83 |
| CES24 = 91 | CES49 = 90 | CES74 = 91 | CES99 = 74 |
| CES25 = 72 | CES50 = 94 | CES75 = 81 | |



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)