

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: P363812

Luminaire Tested: NVN-SA4C-827-U-SL4-HSS

Issue Date: 3/3/2020

Test Information

Test Method: LM-79-2019
Report Number: P363812
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-25)
Test Lab: INNOVATION CENTER
Issue Date: 3/3/2020
Manufacturer: COOPER LIGHTING SOLUTIONS
Product Line: STREETWORKS
Catalog Number: NVN-SA4C-827-U-SL4-HSS
Description: NAVION ROADWAY AND AREA LUMINAIRE
(4) 80 CRI, 2700K, 1050mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE IV
SPILL LIGHT ELIMINATOR OPTICS WITH HOUSE SIDE SHIELD
Light Source: -
Ballast/Driver: ELECTRONIC DRIVER

Summary

Lumens per Lamp: N/A
Luminaire Lumens: 17361 lumens
Efficiency: N/A
Efficacy: 77.2 lumens/watt
Luminous Opening: Rectangular (W 1' x L: 1.5' x H: 0')
IES Classification: Type IV - Short
BUG Rating: B2 - U0 - G3

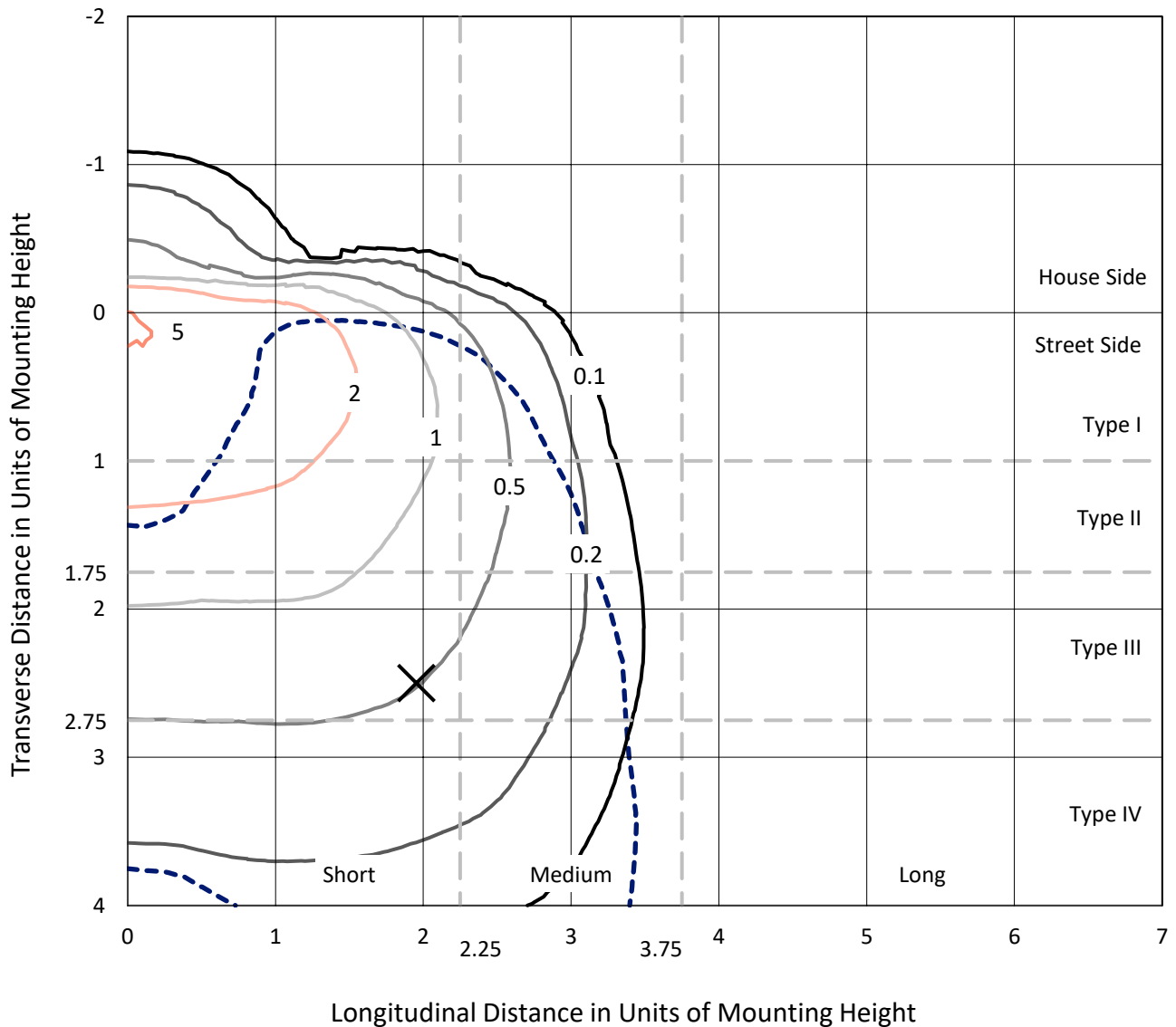
Input Watts (W): 225
Input Voltage (V): NR
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 28.75 FT



REPORT NUMBER: P363812
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Iso-Footcandle Lines of Horizontal Illumination

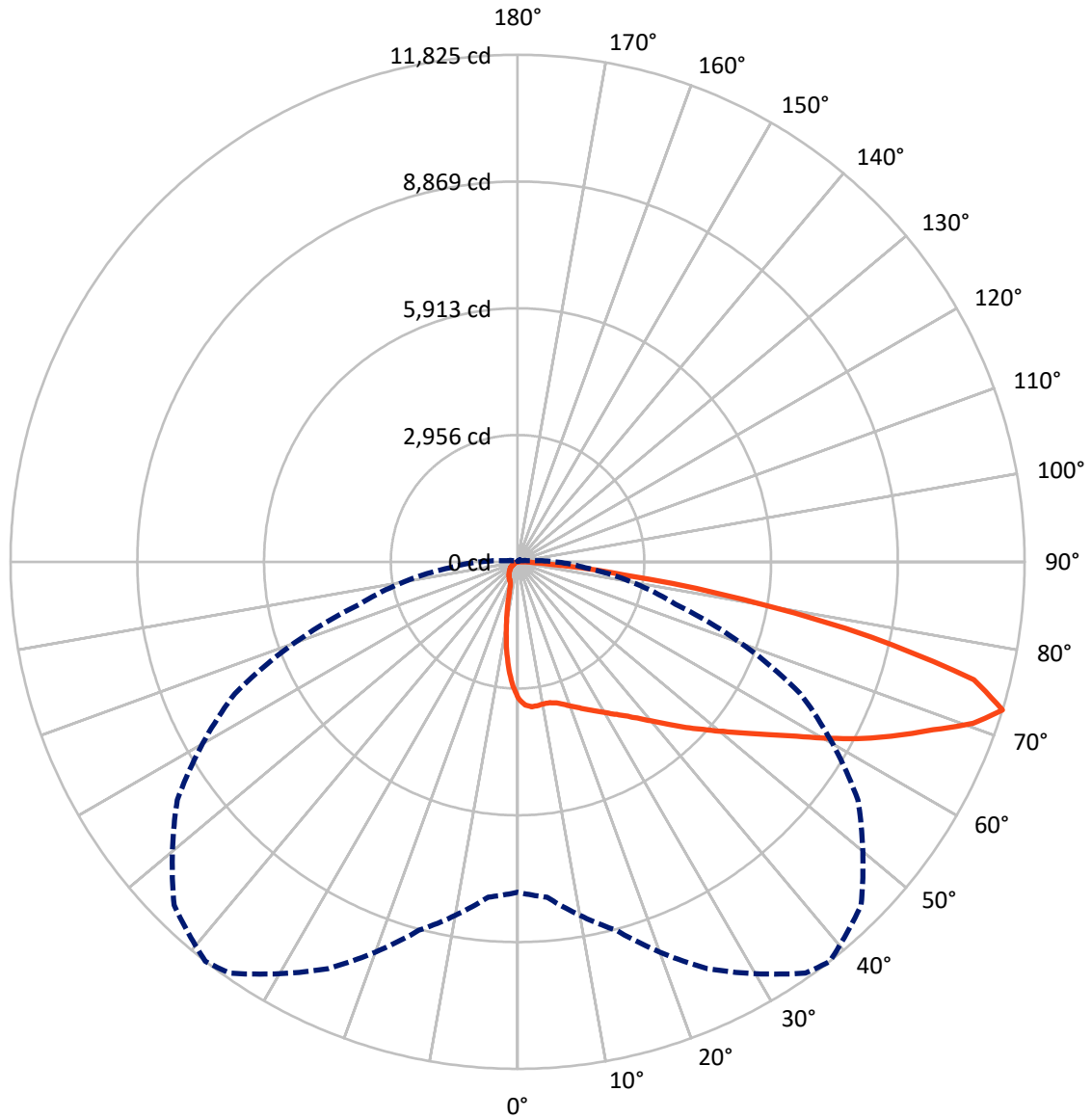
× Max cd
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 5.4 fc
 Type IV - Short - N/A

REPORT NUMBER: P363812
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Luminous Intensity Polar Plot



— Vertical Plane Through 38-Deg Lateral - - - Horizontal Cone Through 72.5-Deg Vertical

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FLUX DISTRIBUTION:

| | | Downward | Upward | Total |
|--------------------|-----------|----------|--------|---------|
| House Side | Lumens | 1461.0 | 0.0 | 1461.0 |
| | % Fixture | 8.4 | 0.0 | 8.4 |
| Street Side | Lumens | 15900.0 | 0.0 | 15900.0 |
| | % Fixture | 91.6 | 0.0 | 91.6 |
| Total | Lumens | 17361.0 | 0.0 | 17361.0 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|---------|-----------|
| 0°-10° | 272.1 | 1.6 |
| 10°-20° | 665.3 | 3.8 |
| 20°-30° | 1058.1 | 6.1 |
| 30°-40° | 1590.8 | 9.2 |
| 40°-50° | 2426.8 | 14.0 |
| 50°-60° | 3429.9 | 19.8 |
| 60°-70° | 4302.3 | 24.8 |
| 70°-80° | 3216.9 | 18.5 |
| 80°-90° | 398.9 | 2.3 |
| 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° | 17361.0 | 100.0 |
| 0°-180° | 17361.0 | 100.0 |

Coefficient of Utilization

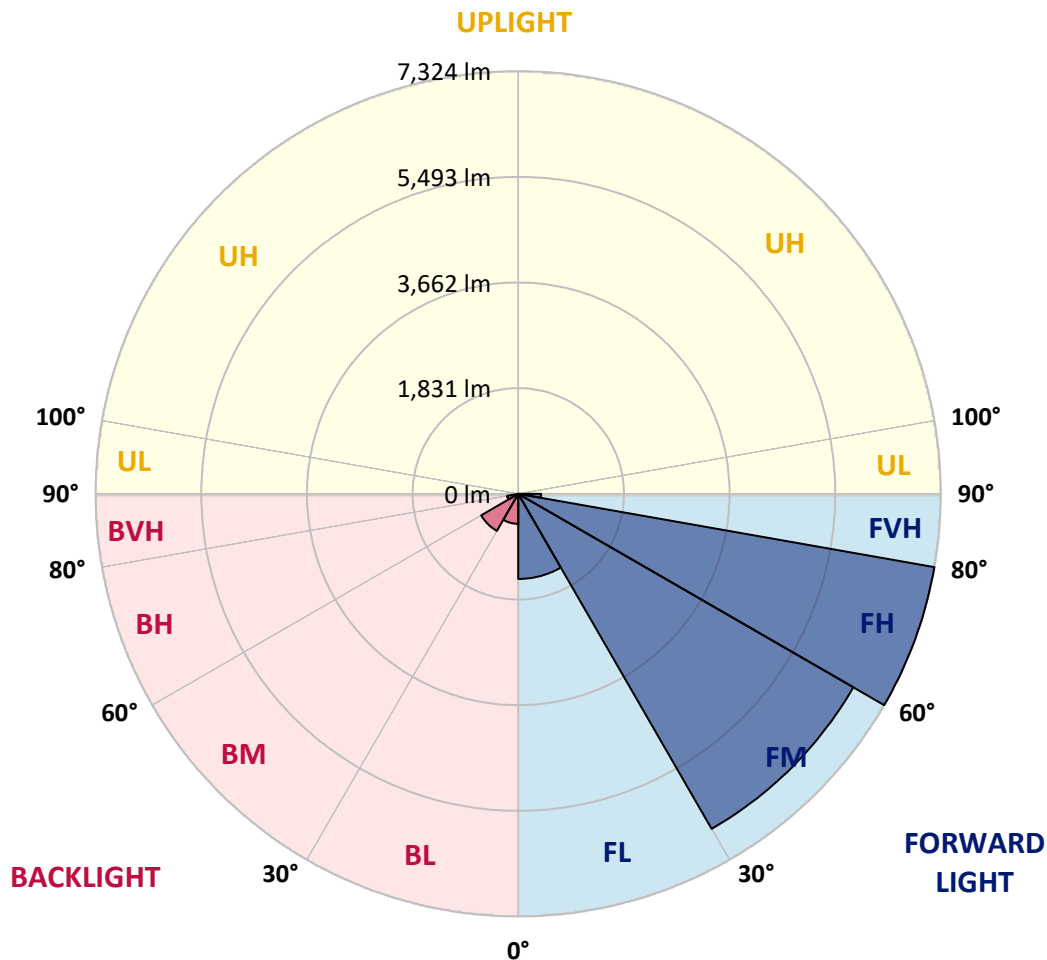


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LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | Lumens | % Fixture | Zone Rating/Lumen Limit | | |
|----------------|--------|-----------|-------------------------|------|---------|
| | | | B | U | G |
| FL (0°-30°) | 1475.3 | 8.5 | | | |
| FM (30°-60°) | 6705.6 | 38.6 | | | |
| FH (60°-80°) | 7324.0 | 42.2 | | | G3/7500 |
| FVH (80°-90°) | 395.2 | 2.3 | | | G3/500 |
| BL (0°-30°) | 520.2 | 3.0 | B2/1000 | | |
| BM (30°-60°) | 741.9 | 4.3 | B1/1000 | | |
| BH (60°-80°) | 195.2 | 1.1 | B1/500 | | G1/500 |
| BVH (80°-90°) | 3.7 | 0.0 | | | G0/10 |
| UL (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH (100°-180°) | 0.0 | 0.0 | | U0/0 | |

BUG Rating: B2-U0-G3
 Type IV Short





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CANDELA DISTRIBUTION (FULL):

| | 0° | 5° | 15° | 25° | 35° | 38° | 45° | 55° | 65° | 75° | 85° |
|-------|--------|--------|--------|---------|---------|---------|---------|---------|--------|--------|--------|
| 0° | 3192.6 | 3192.6 | 3192.6 | 3192.6 | 3192.6 | 3192.6 | 3192.6 | 3192.6 | 3192.6 | 3192.6 | 3192.6 |
| 2.5° | 3388.7 | 3389.5 | 3381.5 | 3368.6 | 3352.0 | 3343.3 | 3328.9 | 3305.8 | 3281.3 | 3237.3 | 3189.7 |
| 5° | 3458.0 | 3458.0 | 3447.9 | 3430.6 | 3403.9 | 3396.0 | 3368.6 | 3331.8 | 3281.3 | 3209.9 | 3129.9 |
| 7.5° | 3450.8 | 3452.2 | 3438.5 | 3420.5 | 3393.8 | 3386.6 | 3353.4 | 3312.3 | 3249.6 | 3163.1 | 3060.7 |
| 10° | 3413.3 | 3416.9 | 3406.0 | 3397.4 | 3372.9 | 3365.0 | 3333.9 | 3292.9 | 3230.1 | 3137.8 | 3020.3 |
| 12.5° | 3375.0 | 3378.7 | 3382.3 | 3390.2 | 3375.0 | 3372.2 | 3347.6 | 3313.0 | 3253.2 | 3157.3 | 3024.6 |
| 15° | 3350.5 | 3357.7 | 3383.7 | 3414.7 | 3418.3 | 3415.4 | 3399.6 | 3367.1 | 3306.6 | 3207.1 | 3055.6 |
| 17.5° | 3350.5 | 3362.1 | 3416.1 | 3475.3 | 3496.2 | 3498.3 | 3484.6 | 3439.2 | 3367.1 | 3260.4 | 3084.5 |
| 20° | 3378.7 | 3394.5 | 3478.9 | 3562.5 | 3597.1 | 3597.1 | 3570.4 | 3507.0 | 3422.6 | 3308.7 | 3103.9 |
| 22.5° | 3450.8 | 3471.7 | 3577.6 | 3674.3 | 3711.0 | 3703.1 | 3667.1 | 3574.8 | 3480.3 | 3363.5 | 3128.5 |
| 25° | 3592.8 | 3608.7 | 3719.0 | 3816.3 | 3838.7 | 3820.6 | 3775.2 | 3657.0 | 3553.9 | 3437.8 | 3173.2 |
| 27.5° | 3775.9 | 3778.1 | 3892.0 | 3974.2 | 3960.5 | 3948.2 | 3891.3 | 3760.1 | 3659.8 | 3543.8 | 3250.3 |
| 30° | 3977.1 | 3977.1 | 4077.3 | 4140.0 | 4098.2 | 4088.1 | 4031.2 | 3884.8 | 3795.4 | 3688.0 | 3359.9 |
| 32.5° | 4171.8 | 4180.4 | 4261.9 | 4301.5 | 4254.7 | 4244.6 | 4189.1 | 4042.7 | 3975.6 | 3907.9 | 3530.8 |
| 35° | 4359.9 | 4366.4 | 4443.6 | 4465.2 | 4420.5 | 4423.4 | 4383.7 | 4259.7 | 4234.5 | 4225.8 | 3788.2 |
| 37.5° | 4542.4 | 4543.8 | 4622.4 | 4636.1 | 4613.7 | 4638.3 | 4641.9 | 4532.3 | 4579.1 | 4649.1 | 4150.9 |
| 40° | 4708.9 | 4710.4 | 4788.2 | 4823.6 | 4861.8 | 4893.5 | 4921.6 | 4863.2 | 5018.2 | 5180.5 | 4582.7 |
| 42.5° | 4842.3 | 4857.4 | 4956.2 | 5023.3 | 5124.2 | 5184.8 | 5261.2 | 5258.3 | 5541.0 | 5784.7 | 5104.7 |
| 45° | 4959.8 | 4985.8 | 5123.5 | 5241.0 | 5414.1 | 5510.7 | 5630.4 | 5724.1 | 6129.3 | 6457.4 | 5633.2 |
| 47.5° | 5114.8 | 5139.4 | 5296.5 | 5489.0 | 5719.8 | 5846.7 | 6044.9 | 6247.5 | 6776.0 | 7117.8 | 6149.5 |
| 50° | 5333.3 | 5322.5 | 5477.5 | 5753.7 | 6050.0 | 6216.5 | 6499.2 | 6802.7 | 7417.7 | 7693.2 | 6453.0 |
| 52.5° | 5566.2 | 5561.9 | 5676.5 | 6041.3 | 6439.3 | 6634.0 | 7007.5 | 7376.6 | 8031.3 | 8089.7 | 6592.2 |
| 55° | 5854.6 | 5823.6 | 5920.2 | 6369.4 | 6901.5 | 7110.6 | 7550.4 | 7944.8 | 8520.2 | 8313.2 | 6662.1 |
| 57.5° | 6156.7 | 6105.5 | 6197.8 | 6735.0 | 7422.8 | 7670.1 | 8151.7 | 8498.5 | 8845.3 | 8466.1 | 6661.4 |
| 60° | 6468.9 | 6408.3 | 6517.9 | 7192.1 | 8070.3 | 8356.5 | 8803.5 | 8872.7 | 9148.9 | 8543.2 | 6612.4 |
| 62.5° | 6729.9 | 6693.9 | 6856.8 | 7680.9 | 8793.4 | 9074.6 | 9296.0 | 9213.1 | 9404.8 | 8603.1 | 6497.7 |
| 65° | 7006.1 | 7008.2 | 7271.4 | 8251.2 | 9562.0 | 9751.7 | 9770.4 | 9654.3 | 9619.0 | 8590.8 | 6109.8 |
| 67.5° | 7379.5 | 7414.1 | 7853.2 | 9025.6 | 10309.7 | 10456.1 | 10454.6 | 10132.3 | 9775.4 | 8103.4 | 5249.7 |
| 70° | 7774.6 | 7856.1 | 8523.8 | 9911.7 | 11125.9 | 11274.4 | 11198.0 | 10436.6 | 9204.4 | 6552.5 | 3715.4 |
| 72.5° | 7708.3 | 7849.6 | 8896.5 | 10470.5 | 11712.1 | 11825.3 | 11328.5 | 9688.9 | 7275.0 | 3808.4 | 1581.9 |
| 75° | 5946.9 | 6110.6 | 8157.5 | 9916.8 | 11097.1 | 10995.4 | 9733.6 | 7539.6 | 3975.6 | 1062.8 | 356.2 |
| 77.5° | 3141.4 | 3228.7 | 5388.8 | 7554.7 | 8652.8 | 8440.1 | 6856.8 | 4182.6 | 1212.0 | 263.2 | 160.1 |
| 80° | 1645.3 | 1665.5 | 2348.3 | 4286.4 | 5340.5 | 5342.0 | 4063.6 | 1837.1 | 499.7 | 134.8 | 107.4 |
| 82.5° | 881.1 | 898.4 | 1240.9 | 1980.6 | 2798.2 | 2536.5 | 1555.9 | 1010.9 | 290.6 | 76.4 | 103.1 |
| 85° | 212.0 | 215.6 | 703.7 | 904.9 | 1100.3 | 785.9 | 462.2 | 848.6 | 78.6 | 44.7 | 83.6 |
| 87.5° | 81.5 | 82.9 | 261.0 | 391.5 | 280.5 | 181.7 | 216.3 | 316.5 | 10.1 | 17.3 | 13.0 |
| 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: P363812
 CATALOG NUMBER: NVN-SA4C-827-U-SL4-HSS

CANDELA DISTRIBUTION (continued):

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0° | 3192.6 | 3192.6 | 3192.6 | 3192.6 | 3192.6 | 3192.6 | 3192.6 | 3192.6 | 3192.6 | 3192.6 | 3192.6 |
| 2.5° | 3160.9 | 3142.2 | 3096.0 | 3037.6 | 2985.7 | 2948.2 | 2892.0 | 2855.2 | 2830.7 | 2830.0 | 2820.6 |
| 5° | 3080.9 | 3042.7 | 2943.2 | 2824.9 | 2717.5 | 2620.9 | 2507.0 | 2416.8 | 2349.8 | 2339.0 | 2315.9 |
| 7.5° | 2995.1 | 2932.3 | 2779.5 | 2594.9 | 2414.7 | 2231.5 | 2018.8 | 1886.9 | 1773.7 | 1719.6 | 1713.8 |
| 10° | 2942.4 | 2854.5 | 2637.5 | 2370.7 | 2088.0 | 1790.3 | 1512.0 | 1319.4 | 1180.3 | 1140.6 | 1111.1 |
| 12.5° | 2931.6 | 2815.5 | 2527.9 | 2160.1 | 1756.4 | 1362.7 | 1054.8 | 850.1 | 739.0 | 703.7 | 694.3 |
| 15° | 2942.4 | 2797.5 | 2435.6 | 1951.8 | 1420.4 | 966.9 | 708.0 | 589.1 | 547.2 | 537.2 | 536.4 |
| 17.5° | 2948.9 | 2775.9 | 2331.0 | 1720.3 | 1094.5 | 690.7 | 542.2 | 507.6 | 501.1 | 500.4 | 501.8 |
| 20° | 2948.2 | 2742.7 | 2206.3 | 1462.2 | 814.0 | 542.9 | 490.3 | 483.1 | 481.6 | 482.4 | 481.6 |
| 22.5° | 2943.2 | 2703.8 | 2069.3 | 1196.2 | 615.0 | 485.2 | 467.9 | 463.6 | 462.9 | 462.9 | 462.9 |
| 25° | 2952.5 | 2672.8 | 1918.6 | 941.6 | 506.9 | 458.6 | 447.7 | 444.1 | 443.4 | 443.4 | 442.0 |
| 27.5° | 2986.4 | 2655.5 | 1753.5 | 724.6 | 457.8 | 434.8 | 426.1 | 425.4 | 423.2 | 422.5 | 424.0 |
| 30° | 3041.2 | 2655.5 | 1572.5 | 563.8 | 428.3 | 410.3 | 403.8 | 402.3 | 401.6 | 400.9 | 401.6 |
| 32.5° | 3137.8 | 2675.7 | 1375.0 | 468.7 | 400.2 | 382.9 | 378.5 | 380.7 | 378.5 | 378.5 | 378.5 |
| 35° | 3312.3 | 2736.2 | 1168.0 | 408.8 | 370.6 | 356.2 | 351.9 | 354.7 | 353.3 | 353.3 | 352.6 |
| 37.5° | 3566.8 | 2848.7 | 959.7 | 372.8 | 344.6 | 329.5 | 323.7 | 328.1 | 326.6 | 326.6 | 325.9 |
| 40° | 3876.9 | 3012.4 | 761.4 | 345.4 | 319.4 | 303.5 | 298.5 | 300.7 | 297.1 | 297.1 | 298.5 |
| 42.5° | 4259.7 | 3220.0 | 588.3 | 318.7 | 294.2 | 279.0 | 276.1 | 274.0 | 267.5 | 263.9 | 264.6 |
| 45° | 4685.1 | 3436.3 | 458.6 | 292.7 | 270.4 | 258.1 | 253.8 | 248.0 | 237.2 | 230.0 | 230.7 |
| 47.5° | 5065.1 | 3602.9 | 372.8 | 267.5 | 248.7 | 239.4 | 232.9 | 222.1 | 206.2 | 197.6 | 198.3 |
| 50° | 5264.8 | 3628.1 | 317.2 | 242.3 | 228.6 | 219.2 | 209.8 | 193.2 | 174.5 | 165.1 | 164.4 |
| 52.5° | 5316.0 | 3509.9 | 276.1 | 219.2 | 208.4 | 197.6 | 185.3 | 162.9 | 142.0 | 131.9 | 130.5 |
| 55° | 5334.8 | 3329.6 | 239.4 | 197.6 | 186.7 | 174.5 | 158.6 | 133.4 | 113.9 | 103.8 | 103.1 |
| 57.5° | 5272.7 | 3060.7 | 210.5 | 178.1 | 165.1 | 150.0 | 130.5 | 106.7 | 88.0 | 80.0 | 80.0 |
| 60° | 5135.0 | 2696.6 | 188.2 | 157.2 | 142.8 | 125.5 | 105.3 | 82.9 | 65.6 | 59.1 | 59.1 |
| 62.5° | 4860.3 | 2225.0 | 167.3 | 135.5 | 121.9 | 103.8 | 85.1 | 62.7 | 46.1 | 42.5 | 43.3 |
| 65° | 4341.9 | 1687.9 | 146.4 | 116.1 | 103.8 | 85.8 | 66.3 | 44.7 | 31.0 | 31.0 | 32.4 |
| 67.5° | 3540.9 | 1172.4 | 124.7 | 98.8 | 89.4 | 69.9 | 50.5 | 31.0 | 21.6 | 24.5 | 27.4 |
| 70° | 2344.0 | 657.6 | 106.7 | 81.5 | 76.4 | 55.5 | 37.5 | 20.9 | 17.3 | 23.1 | 28.1 |
| 72.5° | 884.7 | 256.0 | 89.4 | 65.6 | 66.3 | 42.5 | 26.7 | 15.9 | 15.9 | 25.2 | 33.2 |
| 75° | 246.6 | 125.5 | 64.2 | 48.3 | 51.9 | 31.0 | 19.5 | 13.7 | 15.1 | 28.8 | 38.9 |
| 77.5° | 144.9 | 92.3 | 41.8 | 28.1 | 35.3 | 21.6 | 13.0 | 10.8 | 13.0 | 24.5 | 37.5 |
| 80° | 116.8 | 49.0 | 24.5 | 14.4 | 19.5 | 12.3 | 8.7 | 6.5 | 3.6 | 9.4 | 19.5 |
| 82.5° | 116.8 | 29.6 | 11.5 | 10.1 | 10.1 | 6.5 | 4.3 | 2.9 | 0.7 | 0.0 | 5.0 |
| 85° | 78.6 | 12.3 | 7.2 | 6.5 | 5.0 | 2.2 | 1.4 | 0.7 | 0.0 | 0.0 | 0.0 |
| 87.5° | 13.0 | 5.0 | 2.9 | 1.4 | 0.7 | 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 |

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CIE 1931 Chromaticity Diagram



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



Point lies inside the ANSI 2700K 4-step quadrangle

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Photopic Flux vs. Wavelength



Photopic Lumens: 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 ($\mu\text{W}/\text{nm}$) | 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 | 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

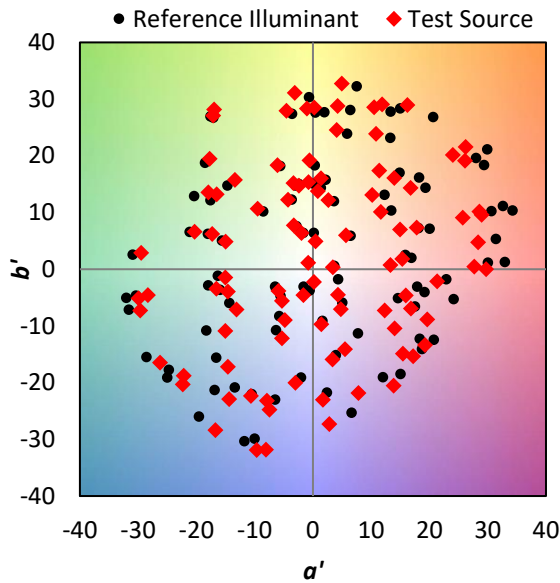
| λ (nm) | Power (μ W/nm) | Lumens (ϕ /nm) | λ (nm) | Power (μ W/nm) | Lumens (ϕ /nm) | λ (nm) | Power (μ W/nm) | Lumens (ϕ /nm) | λ (nm) | Power (μ W/nm) | Lumens (ϕ /nm) | λ (nm) | Power (μ W/nm) | Lumens (ϕ /nm) |
|-------------------|------------------------|-------------------------|-------------------|------------------------|-------------------------|-------------------|------------------------|-------------------------|-------------------|------------------------|-------------------------|-------------------|------------------------|-------------------------|
| 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 $R_a = 80.9$
 $R_9 = -1.5$



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)