

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: P363383

Luminaire Tested: NVN-SA1D-827-U-T4W-HSS

Issue Date: 3/3/2020

Test Information

Test Method: LM-79-2019
Report Number: P363383
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-SA1D-827-U-T4W-HSS
Description: NAVION ROADWAY AND AREA LUMINAIRE
(1) 80 CRI, 2700K, 1200mA LIGHTSQUARE WITH 16 LEDS AND TYPE IV WIDE OPTICS WITH HOUSE SIDE SHIELD
Light Source: -
Ballast/Driver: ELECTRONIC DRIVER

Summary

Lumens per Lamp: N/A
Luminaire Lumens: 4223 lumens
Efficiency: N/A
Efficacy: 63.0 lumens/watt
Luminous Opening: Rectangular (W 0.5' x L: 0.5' x H: 0')
IES Classification: Type IV - Short
BUG Rating: B1 - U0 - G2

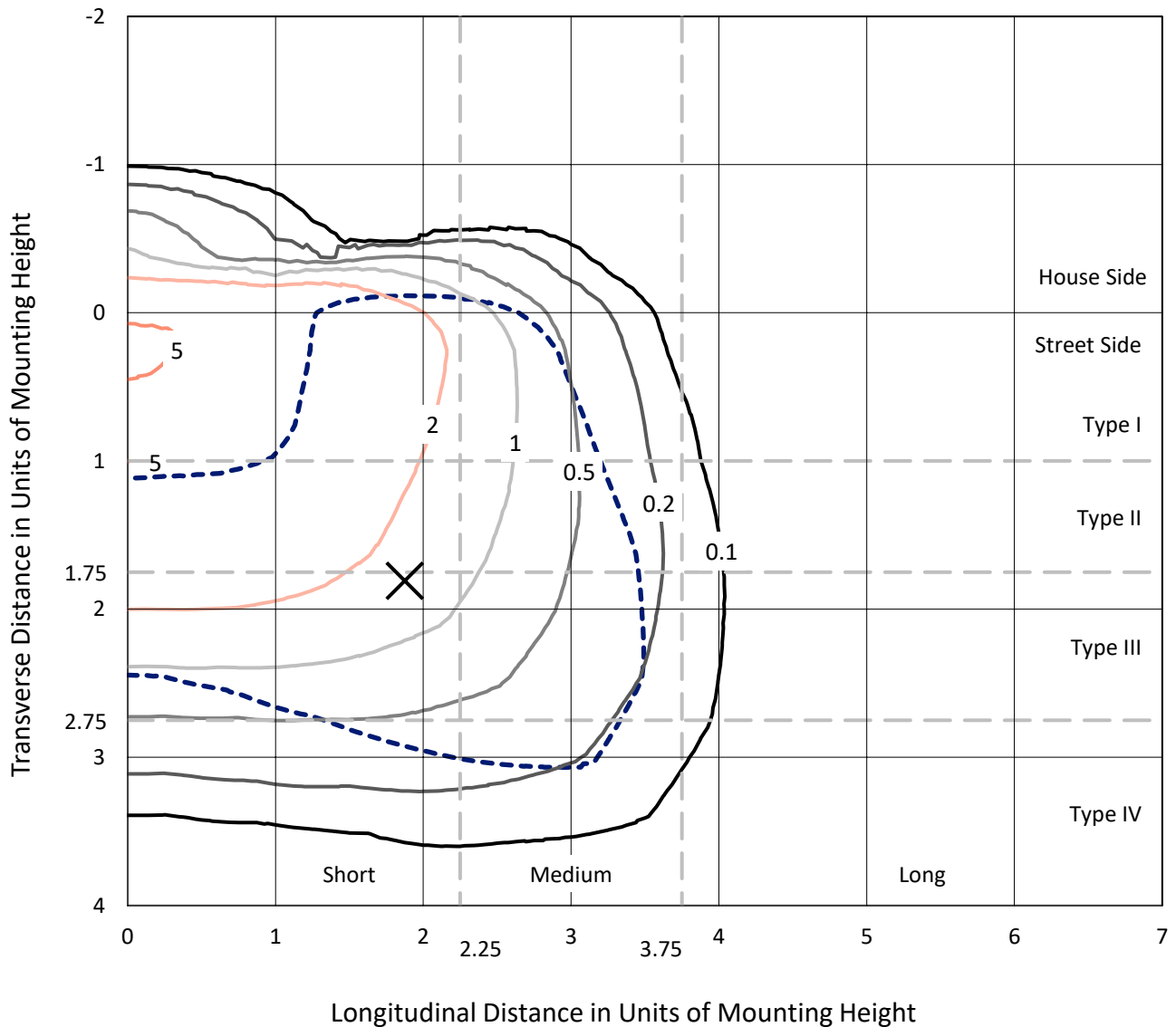
Input Watts (W): 67
Input Voltage (V): NR
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 28.75 FT



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Iso-Footcandle Lines of Horizontal Illumination

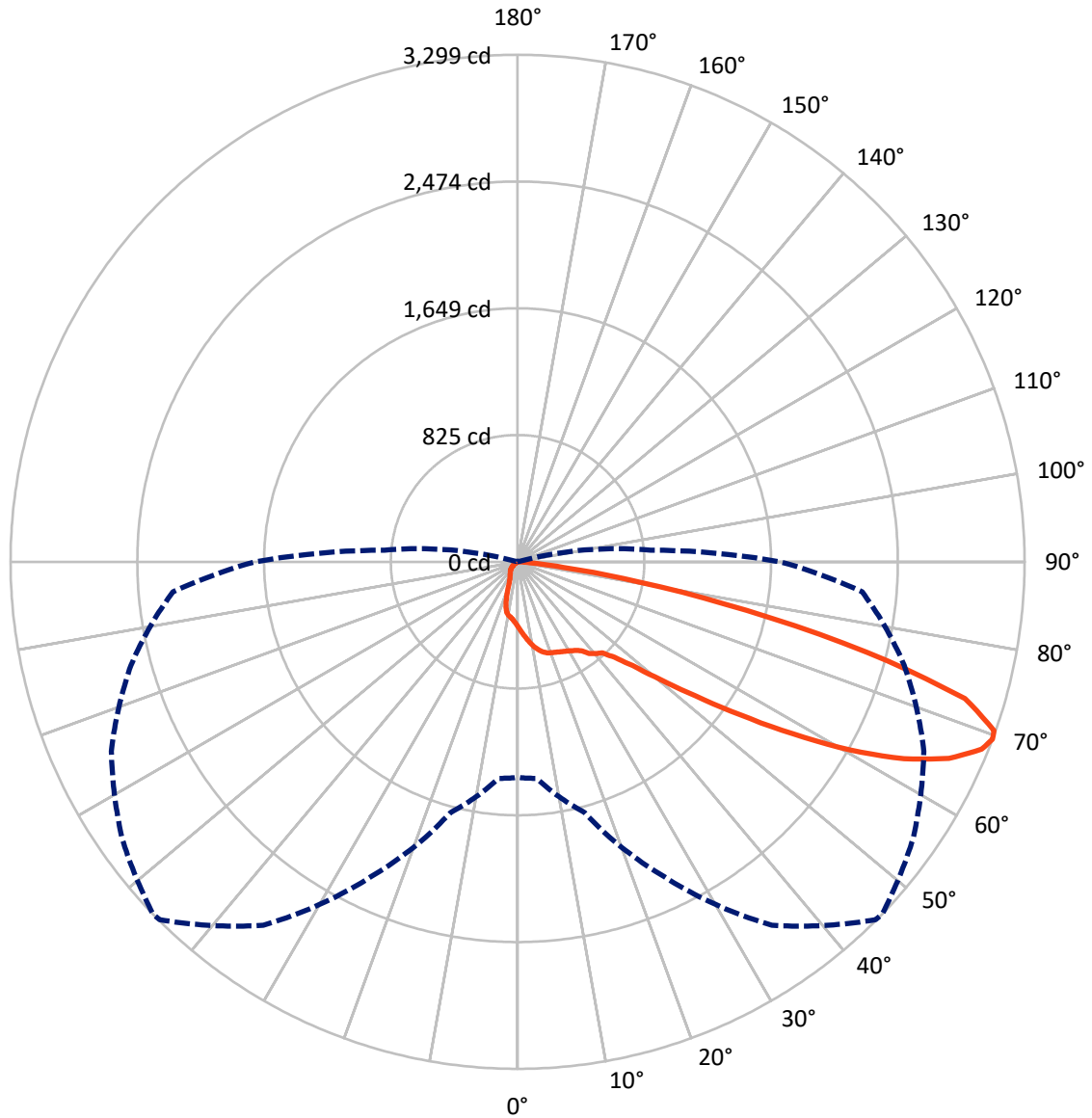
✕ Max cd
 - - - 1/2 Max cd



Based on 10 foot mounting height. Maximum calculated value = 6.2 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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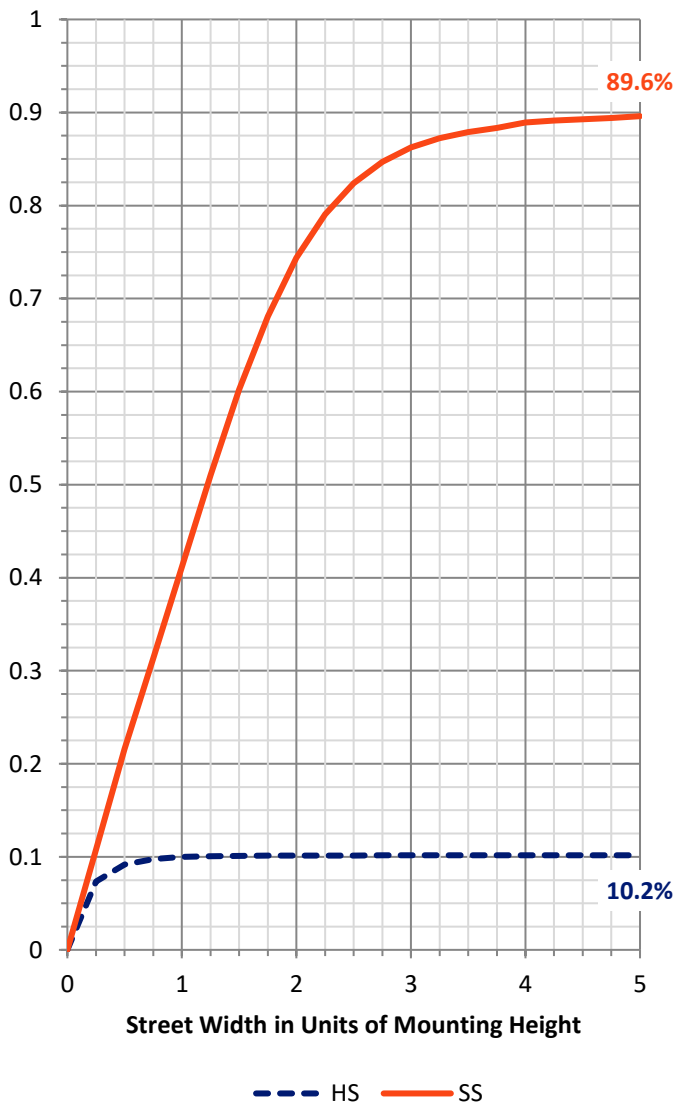
FLUX DISTRIBUTION:

| | | Downward | Upward | Total |
|--------------------|-----------|----------|--------|--------|
| House Side | Lumens | 433.4 | 0.0 | 433.4 |
| | % Fixture | 10.3 | 0.0 | 10.3 |
| Street Side | Lumens | 3789.6 | 0.0 | 3789.6 |
| | % Fixture | 89.7 | 0.0 | 89.7 |
| Total | Lumens | 4223.0 | 0.0 | 4223.0 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

Coefficient of Utilization

ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10° | 42.1 | 1.0 |
| 10°-20° | 127.8 | 3.0 |
| 20°-30° | 200.9 | 4.8 |
| 30°-40° | 288.2 | 6.8 |
| 40°-50° | 498.0 | 11.8 |
| 50°-60° | 983.9 | 23.3 |
| 60°-70° | 1375.1 | 32.6 |
| 70°-80° | 664.3 | 15.7 |
| 80°-90° | 42.7 | 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° | 4223.0 | 100.0 |
| 0°-180° | 4223.0 | 100.0 |

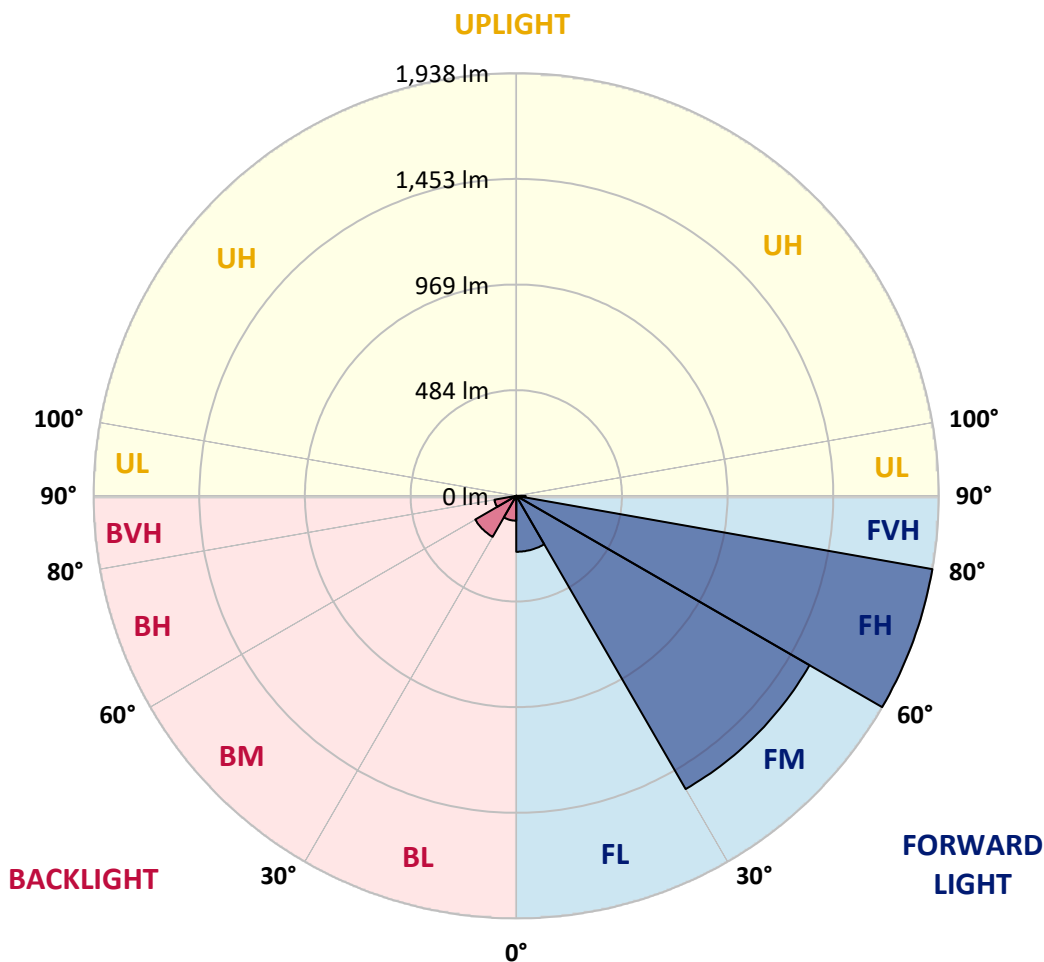


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LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | Lumens | % Fixture | Zone Rating/Lumen Limit | | |
|----------------|--------|-----------|-------------------------|------|---------|
| | | | B | U | G |
| FL (0°-30°) | 256.6 | 6.1 | | | |
| FM (30°-60°) | 1552.9 | 36.8 | | | |
| FH (60°-80°) | 1937.8 | 45.9 | | | G2/5000 |
| FVH (80°-90°) | 42.3 | 1.0 | | | G1/100 |
| BL (0°-30°) | 114.2 | 2.7 | B1/500 | | |
| BM (30°-60°) | 217.2 | 5.1 | B0/220 | | |
| BH (60°-80°) | 101.6 | 2.4 | B0/110 | | G0/110 |
| BVH (80°-90°) | 0.4 | 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-G2
 Type IV Short





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CANDELA DISTRIBUTION (FULL):

| | 0° | 5° | 15° | 25° | 35° | 45° | 46° | 55° | 65° | 75° | 85° |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0° | 423.1 | 423.1 | 423.1 | 423.1 | 423.1 | 423.1 | 423.1 | 423.1 | 423.1 | 423.1 | 423.1 |
| 2.5° | 470.1 | 469.5 | 466.7 | 465.5 | 458.8 | 454.8 | 453.2 | 448.3 | 441.1 | 434.0 | 426.1 |
| 5° | 523.5 | 523.3 | 518.2 | 513.2 | 500.5 | 488.7 | 486.5 | 475.0 | 459.0 | 443.9 | 428.9 |
| 7.5° | 578.2 | 575.6 | 570.4 | 560.9 | 542.5 | 523.5 | 521.7 | 505.5 | 482.7 | 460.9 | 439.4 |
| 10° | 624.5 | 622.9 | 616.2 | 601.7 | 580.1 | 558.6 | 556.4 | 536.4 | 510.6 | 483.9 | 456.4 |
| 12.5° | 660.5 | 659.3 | 650.4 | 632.4 | 609.4 | 587.1 | 584.1 | 566.3 | 538.8 | 508.9 | 476.4 |
| 15° | 682.5 | 681.9 | 671.0 | 651.8 | 629.2 | 609.8 | 607.3 | 591.6 | 566.1 | 534.8 | 498.2 |
| 17.5° | 687.7 | 687.9 | 676.6 | 657.2 | 638.6 | 624.7 | 622.7 | 610.8 | 589.4 | 558.4 | 520.0 |
| 20° | 676.2 | 678.6 | 668.5 | 651.6 | 640.1 | 632.8 | 631.2 | 624.1 | 606.1 | 576.8 | 537.4 |
| 22.5° | 659.9 | 661.1 | 654.2 | 642.9 | 638.2 | 639.5 | 638.8 | 634.8 | 619.5 | 592.6 | 554.6 |
| 25° | 650.0 | 650.0 | 645.9 | 636.4 | 639.5 | 648.1 | 648.3 | 647.5 | 635.4 | 612.0 | 575.6 |
| 27.5° | 649.6 | 648.5 | 643.7 | 636.6 | 645.3 | 658.4 | 659.1 | 664.5 | 657.0 | 635.6 | 601.7 |
| 30° | 665.5 | 664.1 | 654.0 | 644.7 | 655.8 | 669.8 | 671.8 | 683.5 | 679.7 | 661.1 | 630.8 |
| 32.5° | 702.5 | 697.6 | 675.2 | 659.9 | 668.3 | 685.1 | 687.7 | 706.3 | 712.2 | 692.6 | 658.9 |
| 35° | 753.2 | 737.6 | 705.3 | 688.8 | 689.6 | 707.3 | 709.6 | 737.0 | 754.6 | 721.5 | 680.7 |
| 37.5° | 823.1 | 815.4 | 762.9 | 718.9 | 722.5 | 749.2 | 756.2 | 785.9 | 780.9 | 737.4 | 705.5 |
| 40° | 976.3 | 964.3 | 908.4 | 803.3 | 754.0 | 783.3 | 785.5 | 801.3 | 801.7 | 773.2 | 757.0 |
| 42.5° | 1185.0 | 1180.1 | 1121.3 | 956.3 | 816.0 | 806.1 | 810.0 | 836.8 | 866.7 | 848.8 | 848.0 |
| 45° | 1416.1 | 1413.5 | 1351.2 | 1159.5 | 941.3 | 880.7 | 885.7 | 921.5 | 978.7 | 982.7 | 1007.8 |
| 47.5° | 1602.0 | 1600.8 | 1565.0 | 1386.2 | 1133.2 | 1007.2 | 1008.8 | 1046.8 | 1147.4 | 1197.1 | 1237.3 |
| 50° | 1771.5 | 1777.3 | 1748.9 | 1631.5 | 1394.5 | 1205.4 | 1201.7 | 1227.0 | 1388.6 | 1470.0 | 1519.9 |
| 52.5° | 2007.1 | 2015.3 | 1935.9 | 1860.4 | 1668.8 | 1451.3 | 1448.4 | 1474.9 | 1678.5 | 1739.4 | 1748.4 |
| 55° | 2215.2 | 2201.4 | 2138.6 | 2116.8 | 2003.2 | 1755.1 | 1754.3 | 1777.7 | 1958.8 | 1984.8 | 2001.2 |
| 57.5° | 2307.1 | 2301.8 | 2332.1 | 2382.0 | 2353.4 | 2114.1 | 2112.3 | 2094.5 | 2209.7 | 2212.5 | 2263.0 |
| 60° | 2365.1 | 2371.7 | 2464.5 | 2618.4 | 2689.5 | 2500.4 | 2488.9 | 2380.2 | 2449.3 | 2443.1 | 2497.2 |
| 62.5° | 2321.6 | 2334.4 | 2501.5 | 2758.0 | 2940.9 | 2837.6 | 2821.3 | 2641.9 | 2654.0 | 2632.8 | 2683.1 |
| 65° | 2090.3 | 2110.3 | 2384.1 | 2731.6 | 3065.7 | 3101.1 | 3084.7 | 2873.0 | 2816.6 | 2781.7 | 2753.8 |
| 67.5° | 1697.3 | 1709.1 | 1995.1 | 2502.5 | 3009.4 | 3258.3 | 3254.9 | 3075.6 | 2939.3 | 2756.6 | 2540.0 |
| 69° | 1402.6 | 1414.3 | 1689.5 | 2261.4 | 2885.7 | 3292.0 | 3298.5 | 3140.5 | 2916.0 | 2603.7 | 2250.5 |
| 70° | 1188.0 | 1200.5 | 1456.9 | 2054.7 | 2742.1 | 3276.3 | 3288.0 | 3134.4 | 2849.0 | 2426.7 | 1996.4 |
| 72.5° | 623.1 | 633.8 | 896.9 | 1415.5 | 2235.4 | 3008.4 | 3043.9 | 2869.4 | 2415.0 | 1762.4 | 1180.5 |
| 75° | 195.8 | 202.0 | 350.3 | 739.9 | 1530.6 | 2339.2 | 2347.3 | 2250.9 | 1714.9 | 969.4 | 491.6 |
| 77.5° | 74.6 | 72.9 | 116.6 | 272.6 | 773.8 | 1472.9 | 1522.6 | 1406.6 | 899.9 | 342.7 | 113.5 |
| 80° | 40.2 | 40.4 | 60.6 | 112.9 | 331.1 | 757.0 | 798.9 | 681.7 | 319.8 | 106.9 | 26.1 |
| 82.5° | 17.4 | 18.2 | 34.1 | 59.8 | 152.1 | 279.2 | 300.2 | 249.9 | 122.2 | 71.9 | 9.7 |
| 85° | 3.8 | 4.2 | 16.4 | 32.5 | 62.0 | 78.4 | 82.2 | 81.0 | 77.8 | 55.8 | 3.8 |
| 87.5° | 0.0 | 0.0 | 7.3 | 11.7 | 15.6 | 17.8 | 15.6 | 20.4 | 43.0 | 37.6 | 2.0 |
| 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: P363383

CATALOG NUMBER: NVN-SA1D-827-U-T4W-HSS

CANDELA DISTRIBUTION (continued):

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|-------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0° | 423.1 | 423.1 | 423.1 | 423.1 | 423.1 | 423.1 | 423.1 | 423.1 | 423.1 | 423.1 | 423.1 |
| 2.5° | 423.5 | 420.0 | 413.8 | 407.1 | 402.3 | 397.4 | 393.4 | 391.6 | 389.7 | 388.3 | 390.1 |
| 5° | 422.7 | 415.8 | 403.9 | 392.4 | 384.1 | 377.4 | 371.8 | 369.7 | 367.5 | 365.9 | 365.7 |
| 7.5° | 429.7 | 420.0 | 401.7 | 384.9 | 372.0 | 362.9 | 355.4 | 352.2 | 349.7 | 348.5 | 347.5 |
| 10° | 442.9 | 430.5 | 406.1 | 384.1 | 367.5 | 352.0 | 335.8 | 323.3 | 315.2 | 311.5 | 310.1 |
| 12.5° | 460.2 | 444.5 | 414.4 | 388.3 | 364.1 | 334.4 | 300.0 | 270.3 | 251.1 | 244.7 | 241.0 |
| 15° | 480.4 | 460.9 | 425.3 | 393.6 | 351.8 | 297.6 | 239.2 | 200.4 | 182.6 | 179.0 | 175.0 |
| 17.5° | 499.8 | 478.4 | 438.4 | 394.6 | 324.9 | 237.8 | 175.2 | 148.9 | 142.0 | 144.3 | 144.9 |
| 20° | 516.8 | 495.6 | 451.2 | 385.9 | 276.0 | 178.4 | 135.6 | 129.1 | 131.7 | 136.2 | 137.0 |
| 22.5° | 534.0 | 512.2 | 463.1 | 362.9 | 213.4 | 135.4 | 122.2 | 123.8 | 126.3 | 130.9 | 131.7 |
| 25° | 555.0 | 532.4 | 474.2 | 320.8 | 160.2 | 115.2 | 116.0 | 118.4 | 121.0 | 125.1 | 125.5 |
| 27.5° | 579.2 | 558.0 | 481.5 | 265.9 | 118.8 | 105.9 | 108.5 | 112.1 | 114.6 | 118.6 | 119.4 |
| 30° | 611.2 | 591.6 | 483.9 | 209.1 | 99.6 | 97.6 | 98.8 | 103.2 | 106.9 | 110.5 | 111.1 |
| 32.5° | 641.3 | 624.9 | 476.0 | 157.8 | 92.3 | 89.9 | 89.9 | 92.5 | 96.8 | 100.2 | 101.0 |
| 35° | 669.0 | 658.4 | 450.7 | 115.4 | 86.7 | 82.8 | 80.8 | 80.8 | 83.6 | 86.3 | 87.1 |
| 37.5° | 705.7 | 705.3 | 409.7 | 92.1 | 81.4 | 76.8 | 72.7 | 69.5 | 68.5 | 69.1 | 69.5 |
| 40° | 768.4 | 769.0 | 356.2 | 82.6 | 76.8 | 70.7 | 64.4 | 58.6 | 53.3 | 51.5 | 51.3 |
| 42.5° | 866.5 | 857.5 | 300.2 | 78.0 | 72.9 | 64.4 | 54.8 | 47.1 | 38.8 | 36.2 | 36.0 |
| 45° | 1022.1 | 969.2 | 240.8 | 73.9 | 68.7 | 57.2 | 45.3 | 34.8 | 28.1 | 26.1 | 26.1 |
| 47.5° | 1248.8 | 1115.9 | 186.5 | 69.3 | 63.2 | 49.1 | 34.3 | 25.1 | 20.6 | 19.6 | 19.8 |
| 50° | 1483.2 | 1259.7 | 143.0 | 63.6 | 56.4 | 40.6 | 25.3 | 18.2 | 15.6 | 15.6 | 15.8 |
| 52.5° | 1691.1 | 1365.0 | 111.5 | 57.4 | 48.1 | 31.9 | 19.2 | 14.3 | 13.1 | 12.9 | 13.1 |
| 55° | 1885.8 | 1432.9 | 85.3 | 50.3 | 38.2 | 23.8 | 14.7 | 11.7 | 10.9 | 10.5 | 10.3 |
| 57.5° | 2073.5 | 1466.6 | 64.0 | 40.6 | 27.7 | 17.2 | 11.7 | 9.9 | 9.1 | 8.5 | 8.3 |
| 60° | 2198.4 | 1439.3 | 44.0 | 29.9 | 19.2 | 12.5 | 9.7 | 8.5 | 7.5 | 6.9 | 6.7 |
| 62.5° | 2268.9 | 1364.6 | 28.3 | 21.6 | 13.7 | 9.3 | 7.7 | 7.1 | 5.7 | 5.1 | 5.1 |
| 65° | 2240.4 | 1241.5 | 19.8 | 15.4 | 9.9 | 6.9 | 5.7 | 5.7 | 4.2 | 3.4 | 3.2 |
| 67.5° | 1985.4 | 1048.8 | 15.0 | 11.5 | 7.1 | 5.1 | 4.4 | 5.0 | 2.6 | 1.6 | 1.6 |
| 69° | 1708.2 | 869.2 | 12.9 | 9.5 | 5.9 | 4.2 | 3.8 | 4.6 | 1.8 | 1.2 | 1.0 |
| 70° | 1484.6 | 749.8 | 11.7 | 8.3 | 5.0 | 3.6 | 3.4 | 4.4 | 1.8 | 1.0 | 0.8 |
| 72.5° | 888.2 | 418.2 | 8.9 | 5.9 | 3.2 | 2.8 | 2.8 | 5.0 | 1.8 | 1.0 | 0.8 |
| 75° | 359.0 | 147.3 | 6.5 | 4.2 | 2.4 | 2.4 | 3.4 | 6.3 | 1.6 | 0.8 | 0.6 |
| 77.5° | 81.4 | 32.3 | 3.8 | 2.6 | 1.6 | 2.4 | 4.0 | 5.0 | 1.0 | 0.4 | 0.0 |
| 80° | 19.8 | 7.9 | 2.4 | 1.6 | 1.0 | 1.8 | 3.0 | 2.8 | 0.2 | 0.0 | 0.0 |
| 82.5° | 6.5 | 2.8 | 1.0 | 0.8 | 0.2 | 0.6 | 1.4 | 0.8 | 0.0 | 0.0 | 0.0 |
| 85° | 2.8 | 1.6 | 0.4 | 0.2 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 |
| 87.5° | 1.8 | 0.6 | 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

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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 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 (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)