

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: McGRAW-EDISON

Report Number: P635451

Luminaire Tested: GWS-SA3D-827-U-SL3-W

Issue Date: 1/10/2023

Test Information

Test Method: LM-79-2019
Report Number: P635451
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-31)
Test Lab: COOPER LIGHTING SOLUTIONS
Issue Date: 1/10/2023
Manufacturer: COOPER LIGHTING SOLUTIONS
Product Line: McGRAW-EDISON
Catalog Number: GWS-SA3D-827-U-SL3-W
Description: GALLEON WALL SLIM LUMINAIRE. (3) LIGHTSQUARES WITH 16 LEDS EACH AND TYPE III SPILL LIGHT ELIMINATOR OPTICS
Light Source: (48) 2700K CCT, 80 CRI LEDS
Ballast/Driver: -

Summary

Lumens per Lamp: N/A
Luminaire Lumens: 12675.6 lumens
Efficiency: N/A
Efficacy: 104.9 lumens/watt
Luminous Opening: Rectangular (W 1.5' x L: 0.5' x H: 0')
IES Classification: Type III - Medium
BUG Rating: B2 - U0 - G2

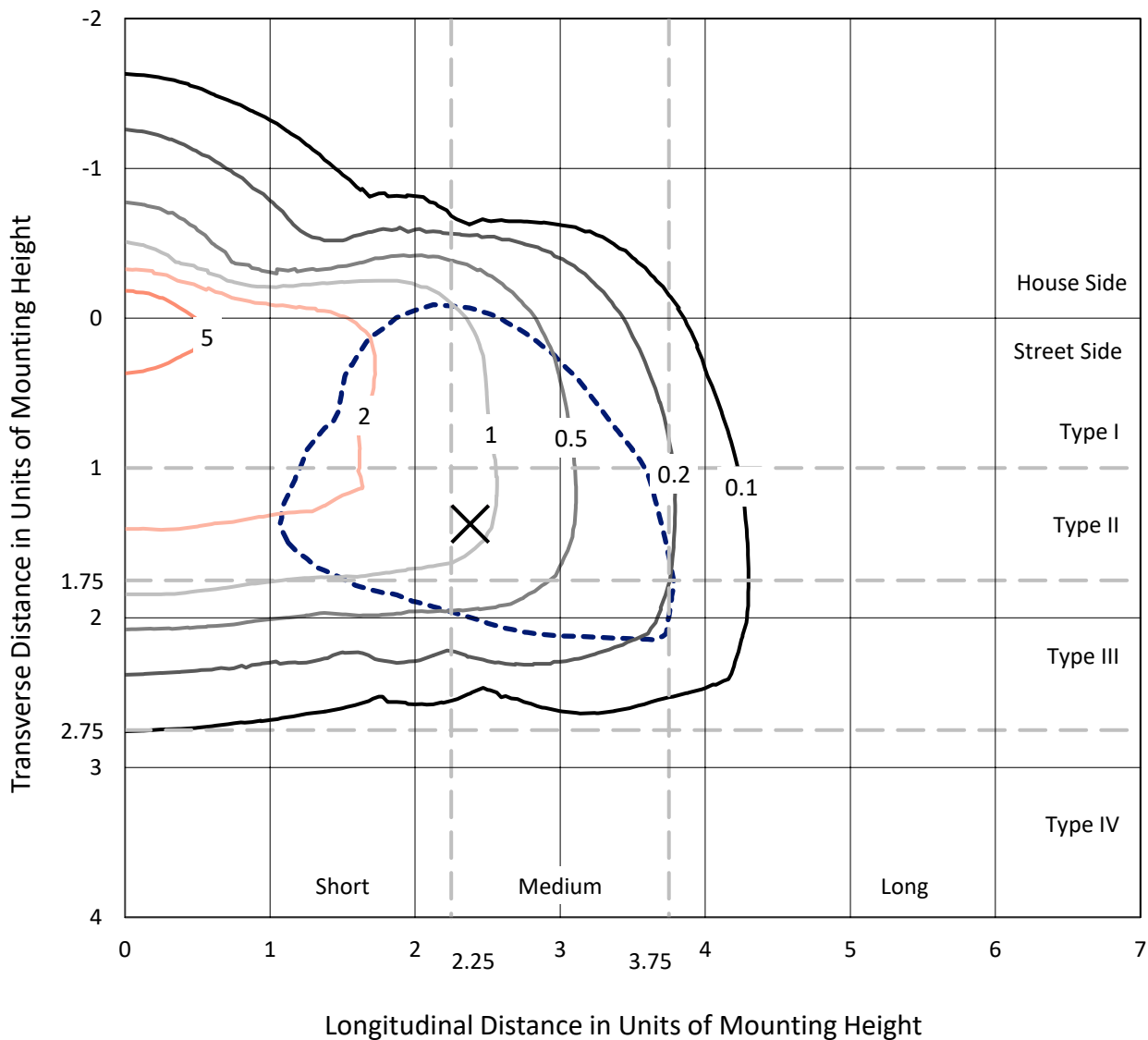
Input Watts (W): 120.8
Input Voltage (V): 120
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 0
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 28.75 FT



REPORT NUMBER: P635451
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Iso-Footcandle Lines of Horizontal Illumination

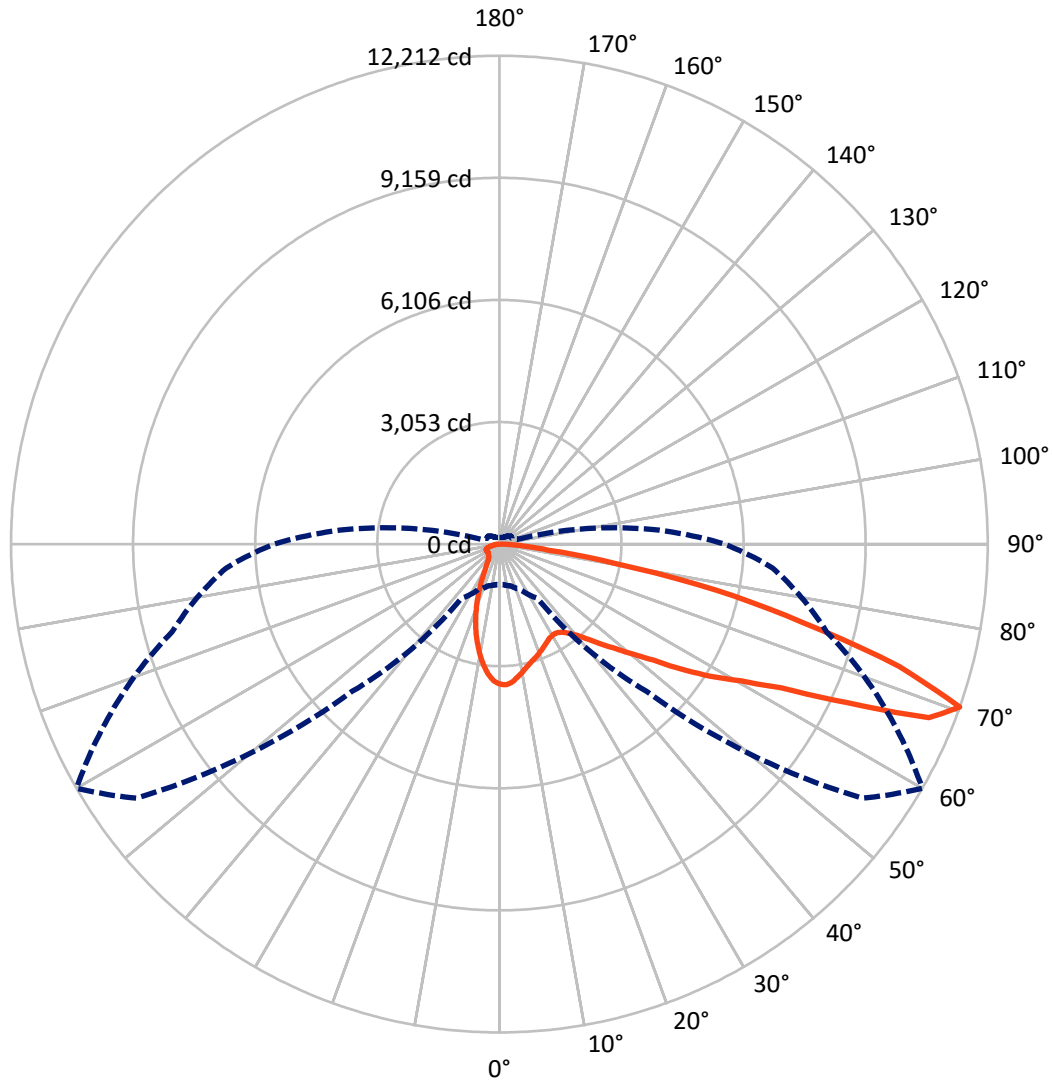
✕ Max cd
 - - - 1/2 Max cd



Based on 20 foot mounting height. Maximum calculated value = 8.8 fc
 Type III - Medium - N/A

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Luminous Intensity Polar Plot



— Vertical Plane Through 60-Deg Lateral - - - Horizontal Cone Through 70-Deg Vertical

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FLUX DISTRIBUTION:

| | | Downward | Upward | Total |
|--------------------|-----------|----------|--------|---------|
| House Side | Lumens | 2167.8 | 0.0 | 2167.8 |
| | % Fixture | 17.1 | 0.0 | 17.1 |
| Street Side | Lumens | 10507.8 | 0.0 | 10507.8 |
| | % Fixture | 82.9 | 0.0 | 82.9 |
| Total | Lumens | 12675.6 | 0.0 | 12675.6 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|---------|-----------|
| 0°-10° | 302.3 | 2.4 |
| 10°-20° | 677.3 | 5.3 |
| 20°-30° | 867.4 | 6.8 |
| 30°-40° | 1140.0 | 9.0 |
| 40°-50° | 1654.0 | 13.0 |
| 50°-60° | 2580.6 | 20.4 |
| 60°-70° | 3378.5 | 26.7 |
| 70°-80° | 1868.2 | 14.7 |
| 80°-90° | 207.3 | 1.6 |
| 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° | 12675.6 | 100.0 |
| 0°-180° | 12675.6 | 100.0 |

Coefficient of Utilization



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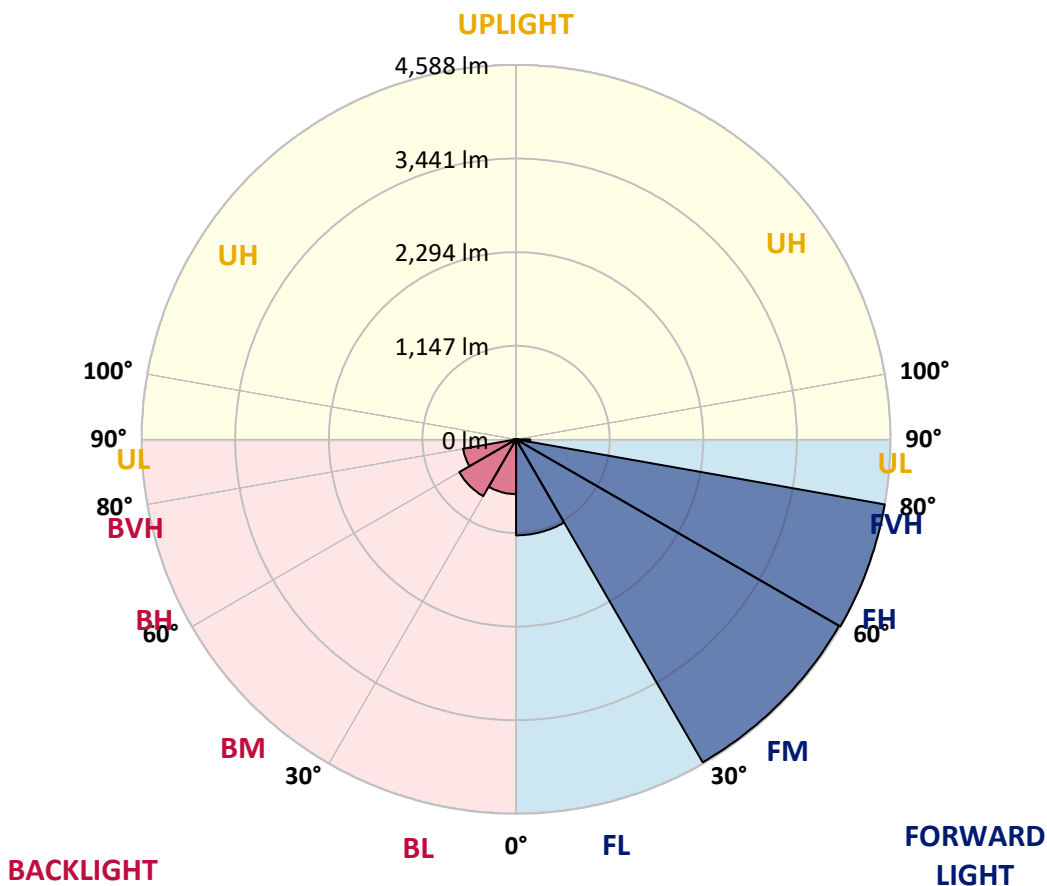
CATALOG NUMBER: GWS-SA3D-827-U-SL3-W

LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | Lumens | % Fixture | Zone Rating/Lumen Limit | | |
|----------------|--------|-----------|-------------------------|------|---------|
| | | | B | U | G |
| FL (0°-30°) | 1176.4 | 9.3 | | | |
| FM (30°-60°) | 4570.8 | 36.1 | | | |
| FH (60°-80°) | 4587.9 | 36.2 | | | G2/5000 |
| FVH (80°-90°) | 172.8 | 1.4 | | | G2/225 |
| BL (0°-30°) | 670.7 | 5.3 | B2/1000 | | |
| BM (30°-60°) | 803.8 | 6.3 | B1/1000 | | |
| BH (60°-80°) | 658.8 | 5.2 | B2/1000 | | G2/1000 |
| BVH (80°-90°) | 34.6 | 0.3 | | | G1/100 |
| UL (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH (100°-180°) | 0.0 | 0.0 | | U0/0 | |

BUG Rating: B2-U0-G2

Type III Medium





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CANDELA DISTRIBUTION (FULL):

| | 0° | 5° | 15° | 25° | 35° | 45° | 55° | 60° | 65° | 75° | 85° |
|-------|--------|--------|--------|--------|--------|--------|---------|---------|---------|--------|--------|
| 0° | 3507.5 | 3507.5 | 3507.5 | 3507.5 | 3507.5 | 3507.5 | 3507.5 | 3507.5 | 3507.5 | 3507.5 | 3507.5 |
| 2.5° | 3458.3 | 3462.1 | 3472.3 | 3487.1 | 3501.9 | 3509.4 | 3527.9 | 3522.3 | 3518.6 | 3511.2 | 3501.9 |
| 5° | 3305.3 | 3312.7 | 3322.0 | 3350.8 | 3383.2 | 3409.2 | 3450.9 | 3455.6 | 3457.4 | 3461.1 | 3446.3 |
| 7.5° | 3110.6 | 3112.4 | 3134.7 | 3172.7 | 3215.4 | 3259.9 | 3329.4 | 3348.9 | 3365.6 | 3384.2 | 3372.1 |
| 10° | 2895.4 | 2900.0 | 2916.7 | 2971.5 | 3044.7 | 3110.6 | 3204.2 | 3236.7 | 3271.9 | 3312.7 | 3296.1 |
| 12.5° | 2719.2 | 2720.1 | 2747.0 | 2805.4 | 2885.2 | 2974.2 | 3091.1 | 3130.0 | 3176.4 | 3240.4 | 3225.6 |
| 15° | 2579.2 | 2579.2 | 2604.2 | 2654.3 | 2746.1 | 2850.9 | 2990.0 | 3040.1 | 3103.1 | 3189.4 | 3163.4 |
| 17.5° | 2467.9 | 2468.8 | 2484.6 | 2537.4 | 2619.0 | 2735.0 | 2900.0 | 2967.7 | 3037.3 | 3151.4 | 3112.4 |
| 20° | 2409.4 | 2404.8 | 2407.6 | 2440.0 | 2509.6 | 2621.8 | 2810.1 | 2888.9 | 2982.6 | 3125.4 | 3066.1 |
| 22.5° | 2406.7 | 2398.3 | 2386.3 | 2389.0 | 2429.8 | 2522.6 | 2713.6 | 2809.2 | 2926.9 | 3104.1 | 3018.8 |
| 25° | 2454.0 | 2444.7 | 2423.3 | 2399.2 | 2395.5 | 2451.2 | 2622.7 | 2731.3 | 2869.4 | 3094.8 | 2973.3 |
| 27.5° | 2533.7 | 2527.2 | 2499.4 | 2463.2 | 2425.2 | 2423.3 | 2554.1 | 2667.3 | 2827.7 | 3104.1 | 2940.8 |
| 30° | 2639.4 | 2628.3 | 2610.7 | 2564.3 | 2506.8 | 2447.5 | 2527.2 | 2632.9 | 2799.9 | 3133.8 | 2926.9 |
| 32.5° | 2759.1 | 2752.6 | 2735.9 | 2689.5 | 2628.3 | 2533.7 | 2548.6 | 2640.4 | 2799.9 | 3185.7 | 2929.7 |
| 35° | 2886.1 | 2885.2 | 2885.2 | 2854.6 | 2786.9 | 2669.1 | 2632.9 | 2703.4 | 2842.5 | 3269.2 | 2959.4 |
| 37.5° | 3009.5 | 3008.6 | 3038.2 | 3049.4 | 2972.4 | 2845.3 | 2776.7 | 2829.6 | 2936.2 | 3392.5 | 3032.7 |
| 40° | 3109.6 | 3113.3 | 3178.3 | 3233.9 | 3191.3 | 3073.5 | 2977.0 | 3003.9 | 3088.3 | 3567.8 | 3160.6 |
| 42.5° | 3210.7 | 3220.9 | 3318.3 | 3416.6 | 3433.3 | 3331.3 | 3233.9 | 3249.7 | 3306.3 | 3799.6 | 3351.7 |
| 45° | 3321.1 | 3325.7 | 3462.1 | 3599.3 | 3680.0 | 3619.7 | 3540.0 | 3561.3 | 3574.3 | 4086.2 | 3636.4 |
| 47.5° | 3427.7 | 3439.8 | 3616.0 | 3804.3 | 3957.3 | 3951.7 | 3907.2 | 3900.7 | 3903.5 | 4434.9 | 3973.1 |
| 50° | 3573.3 | 3591.0 | 3797.8 | 4025.0 | 4249.4 | 4352.4 | 4365.4 | 4316.2 | 4295.8 | 4822.6 | 4392.3 |
| 52.5° | 3849.7 | 3849.7 | 4035.2 | 4258.7 | 4560.1 | 4815.2 | 4902.3 | 4821.7 | 4756.7 | 5232.5 | 4837.4 |
| 55° | 4195.6 | 4210.5 | 4357.9 | 4538.8 | 4920.9 | 5302.1 | 5597.0 | 5507.9 | 5324.3 | 5678.6 | 5303.9 |
| 57.5° | 4349.6 | 4368.1 | 4601.9 | 4882.9 | 5392.9 | 5855.7 | 6264.7 | 6233.2 | 5965.2 | 6142.3 | 5788.0 |
| 60° | 4071.4 | 4110.3 | 4432.1 | 4903.3 | 5820.5 | 6748.8 | 7037.3 | 6945.4 | 6562.4 | 6629.2 | 6312.9 |
| 62.5° | 3396.2 | 3438.9 | 3795.9 | 4453.5 | 5761.1 | 7714.3 | 8255.0 | 7916.5 | 7308.1 | 7244.1 | 7012.2 |
| 65° | 2026.4 | 2024.6 | 2454.0 | 3325.7 | 5029.4 | 7982.3 | 10182.1 | 9550.6 | 8459.9 | 8088.0 | 7731.9 |
| 67.5° | 1288.2 | 1285.4 | 1375.4 | 1762.1 | 3347.1 | 7325.7 | 11421.2 | 11585.3 | 10024.5 | 8708.5 | 7791.3 |
| 70° | 1016.5 | 1015.5 | 1080.4 | 1256.7 | 1655.4 | 5213.0 | 11076.2 | 12212.3 | 10969.5 | 8472.0 | 6860.1 |
| 72.5° | 741.0 | 742.9 | 843.0 | 1052.6 | 1277.1 | 2617.2 | 8969.1 | 10449.2 | 10089.4 | 7478.7 | 5569.2 |
| 75° | 532.3 | 535.1 | 595.4 | 805.9 | 1177.8 | 1431.0 | 5964.2 | 7857.1 | 7676.3 | 5994.8 | 3831.2 |
| 77.5° | 338.5 | 342.2 | 395.1 | 564.8 | 951.5 | 1155.6 | 3616.0 | 5546.9 | 5107.3 | 3377.7 | 1362.4 |
| 80° | 206.8 | 218.9 | 263.4 | 421.0 | 760.5 | 867.1 | 1807.5 | 2922.3 | 2557.8 | 926.5 | 458.1 |
| 82.5° | 106.7 | 115.9 | 158.6 | 260.6 | 524.0 | 761.4 | 1022.9 | 1227.9 | 792.0 | 387.7 | 243.9 |
| 85° | 33.4 | 39.0 | 55.6 | 105.7 | 249.5 | 472.1 | 677.0 | 610.2 | 363.5 | 182.7 | 113.1 |
| 87.5° | 8.3 | 8.3 | 9.3 | 9.3 | 10.2 | 21.3 | 130.8 | 138.2 | 96.5 | 57.5 | 46.4 |
| 90° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |



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 CATALOG NUMBER: GWS-SA3D-827-U-SL3-W

CANDELA DISTRIBUTION (continued):

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0° | 3507.5 | 3507.5 | 3507.5 | 3507.5 | 3507.5 | 3507.5 | 3507.5 | 3507.5 | 3507.5 | 3507.5 | 3507.5 |
| 2.5° | 3483.4 | 3461.1 | 3451.9 | 3450.9 | 3427.7 | 3394.4 | 3372.1 | 3356.3 | 3347.1 | 3345.2 | 3345.2 |
| 5° | 3421.3 | 3392.5 | 3354.5 | 3325.7 | 3263.6 | 3200.5 | 3147.7 | 3118.0 | 3083.7 | 3079.0 | 3078.1 |
| 7.5° | 3338.7 | 3297.0 | 3224.6 | 3144.0 | 3035.4 | 2930.6 | 2841.6 | 2781.3 | 2721.1 | 2709.9 | 2706.2 |
| 10° | 3249.7 | 3193.1 | 3069.8 | 2927.9 | 2765.6 | 2608.8 | 2472.5 | 2365.8 | 2295.4 | 2245.3 | 2236.0 |
| 12.5° | 3161.6 | 3086.5 | 2905.6 | 2694.2 | 2471.6 | 2257.3 | 2052.4 | 1878.0 | 1751.9 | 1678.6 | 1665.6 |
| 15° | 3079.0 | 2974.2 | 2726.6 | 2456.7 | 2167.4 | 1874.3 | 1584.0 | 1357.7 | 1180.6 | 1117.5 | 1102.7 |
| 17.5° | 3003.9 | 2873.1 | 2553.2 | 2211.0 | 1850.2 | 1467.2 | 1137.0 | 935.8 | 831.9 | 800.4 | 792.9 |
| 20° | 2928.8 | 2769.3 | 2377.0 | 1952.2 | 1513.5 | 1084.2 | 831.0 | 736.4 | 697.4 | 685.4 | 681.7 |
| 22.5° | 2848.1 | 2655.2 | 2185.0 | 1697.2 | 1173.2 | 811.5 | 679.8 | 638.1 | 626.0 | 626.9 | 626.0 |
| 25° | 2767.4 | 2539.3 | 1983.8 | 1419.9 | 873.6 | 658.5 | 593.5 | 577.8 | 580.6 | 588.9 | 590.8 |
| 27.5° | 2700.6 | 2436.3 | 1786.2 | 1115.7 | 682.6 | 566.7 | 536.0 | 535.1 | 545.3 | 556.5 | 558.3 |
| 30° | 2652.4 | 2344.5 | 1591.5 | 857.9 | 562.0 | 503.6 | 491.5 | 497.1 | 509.2 | 517.5 | 520.3 |
| 32.5° | 2618.1 | 2265.7 | 1383.7 | 674.2 | 492.5 | 459.1 | 453.5 | 459.1 | 466.5 | 474.8 | 476.7 |
| 35° | 2606.1 | 2208.2 | 1179.7 | 550.0 | 445.2 | 426.6 | 422.9 | 425.7 | 429.4 | 434.0 | 435.9 |
| 37.5° | 2632.9 | 2179.4 | 966.4 | 478.5 | 416.4 | 405.3 | 399.7 | 397.9 | 398.8 | 400.6 | 401.6 |
| 40° | 2712.7 | 2192.4 | 792.0 | 436.8 | 397.9 | 387.7 | 378.4 | 374.7 | 373.8 | 375.6 | 374.7 |
| 42.5° | 2850.0 | 2247.1 | 665.9 | 412.7 | 383.0 | 368.2 | 358.0 | 354.3 | 354.3 | 358.9 | 358.9 |
| 45° | 3051.2 | 2354.7 | 575.0 | 395.1 | 370.0 | 351.5 | 340.4 | 338.5 | 342.2 | 349.6 | 350.6 |
| 47.5° | 3346.1 | 2512.4 | 520.3 | 382.1 | 358.0 | 336.7 | 325.5 | 324.6 | 332.0 | 344.1 | 345.0 |
| 50° | 3695.8 | 2739.6 | 490.6 | 372.8 | 349.6 | 324.6 | 313.5 | 314.4 | 322.7 | 335.7 | 338.5 |
| 52.5° | 4116.8 | 3049.4 | 492.5 | 369.1 | 345.0 | 317.2 | 306.0 | 304.2 | 312.5 | 325.5 | 328.3 |
| 55° | 4551.8 | 3425.9 | 528.6 | 370.0 | 338.5 | 313.5 | 298.6 | 292.1 | 299.6 | 308.8 | 309.8 |
| 57.5° | 5030.3 | 3850.6 | 618.6 | 368.2 | 330.2 | 309.8 | 292.1 | 277.3 | 281.9 | 287.5 | 290.3 |
| 60° | 5570.1 | 4350.5 | 812.4 | 371.9 | 326.5 | 301.4 | 279.2 | 259.7 | 258.8 | 262.5 | 263.4 |
| 62.5° | 6291.6 | 5030.3 | 1030.4 | 378.4 | 334.8 | 291.2 | 259.7 | 239.3 | 235.6 | 237.4 | 238.3 |
| 65° | 6843.4 | 5354.9 | 961.7 | 372.8 | 352.4 | 283.8 | 241.1 | 219.8 | 212.4 | 210.5 | 210.5 |
| 67.5° | 6619.0 | 4925.5 | 669.6 | 358.0 | 360.8 | 284.7 | 226.3 | 199.4 | 190.1 | 185.5 | 184.6 |
| 70° | 5632.2 | 4000.9 | 465.6 | 343.1 | 351.5 | 282.9 | 210.5 | 182.7 | 170.6 | 164.2 | 163.2 |
| 72.5° | 4449.8 | 3054.9 | 376.5 | 313.5 | 319.0 | 255.0 | 187.3 | 164.2 | 154.0 | 145.6 | 145.6 |
| 75° | 2863.9 | 1864.1 | 314.4 | 279.2 | 260.6 | 198.5 | 162.3 | 146.5 | 136.3 | 128.0 | 128.0 |
| 77.5° | 963.6 | 691.9 | 243.9 | 236.5 | 194.8 | 149.3 | 136.3 | 126.1 | 117.8 | 110.4 | 109.4 |
| 80° | 391.4 | 328.3 | 179.0 | 179.0 | 136.3 | 114.1 | 106.7 | 102.0 | 96.5 | 87.2 | 87.2 |
| 82.5° | 227.2 | 199.4 | 125.2 | 108.5 | 90.9 | 78.8 | 74.2 | 69.6 | 69.6 | 63.1 | 63.1 |
| 85° | 109.4 | 110.4 | 75.1 | 66.8 | 51.9 | 45.4 | 43.6 | 40.8 | 39.9 | 36.2 | 35.2 |
| 87.5° | 59.4 | 60.3 | 38.0 | 29.7 | 20.4 | 17.6 | 14.8 | 13.9 | 13.0 | 12.1 | 12.1 |
| 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

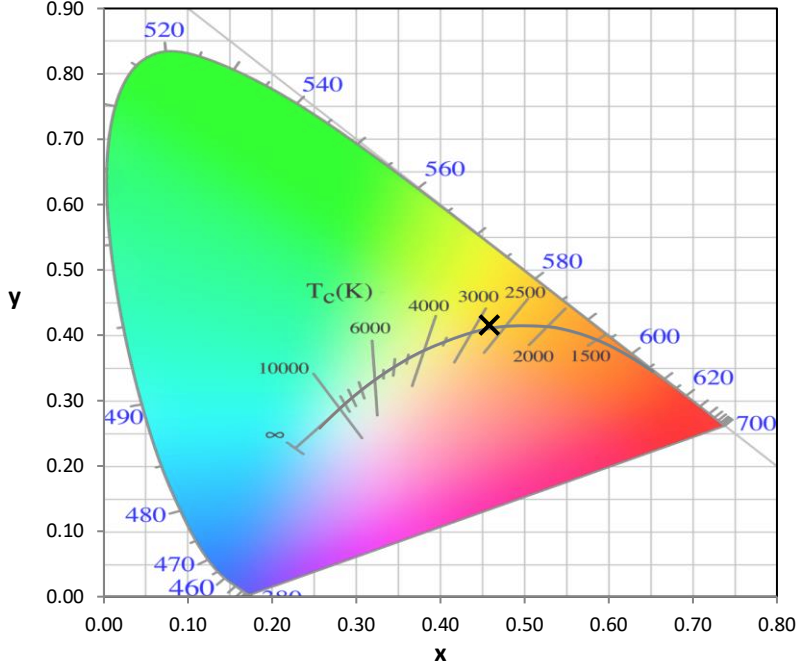
Stabilization Time: 81M
 Operation Time: 2H 21M
 Sphere Temperature (°C): 25.2

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 (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 | 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 $R_a = 80.9$
 $R_9 = -1.5$



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)