

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



Scaled data based on original data using  
LM-79-08 Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Test Report Prepared for  
Cooper Lighting Solutions  
(formerly Eaton)

Brand: McGRAW-EDISON

Report Number: P386833

Luminaire Tested: **GWC-SA2C-740-U-SL2**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P386833  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-20)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GWC-SA2C-740-U-SL2  
Description: GALLEON WALL LUMINAIRE  
(2) 70 CRI, 4000K, 1050mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE II  
SPILL LIGHT ELIMINATOR OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 14461 lumens  
Efficiency: N/A  
Efficacy: 128.0 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 0.5' x H: 0')  
IES Classification: Type III - Medium  
BUG Rating: B2 - U0 - G3

Input Watts (W): 113  
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

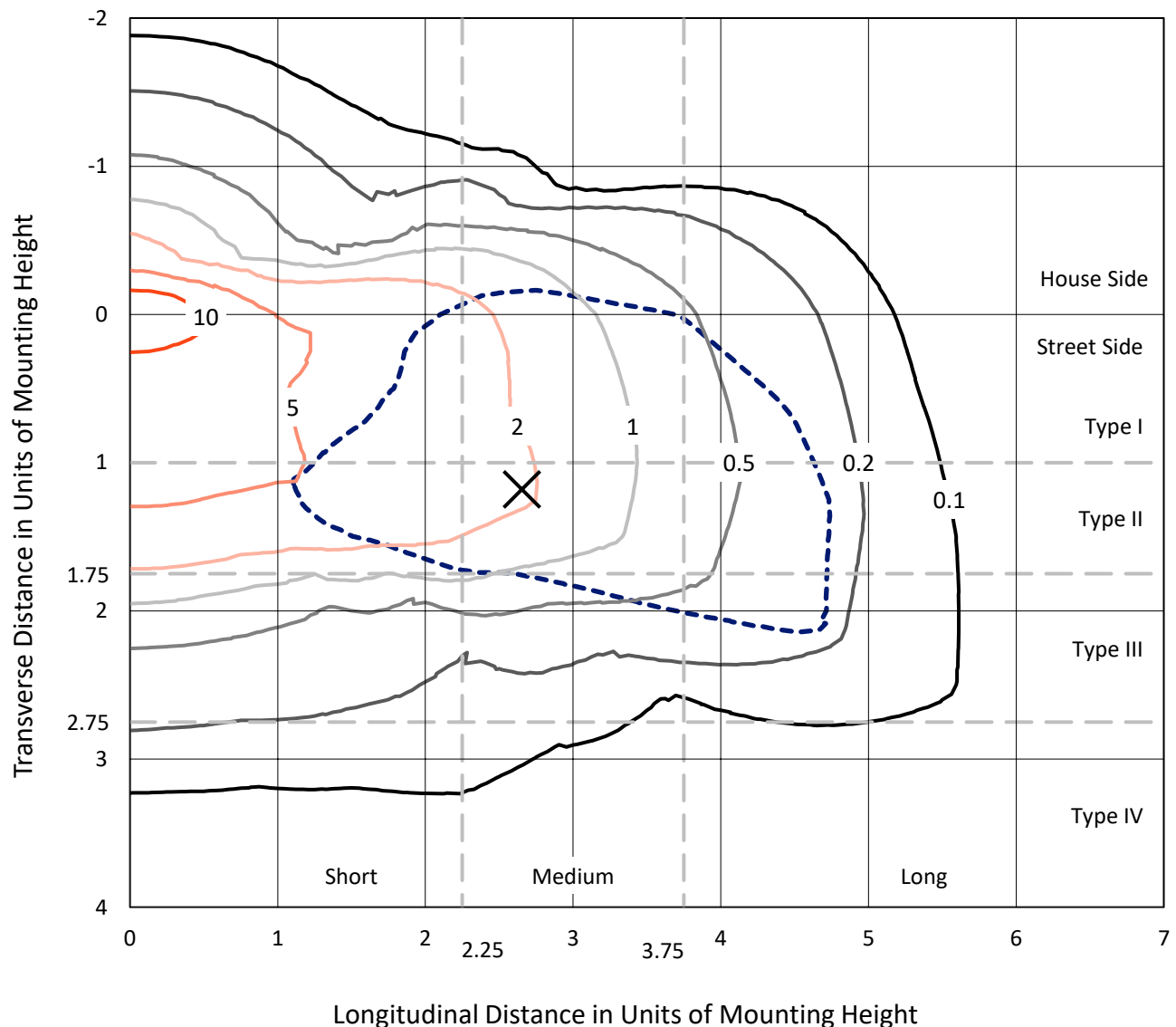


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## Iso-Footcandle Lines of Horizontal Illumination

× Max cd  
- - - 1/2 Max cd

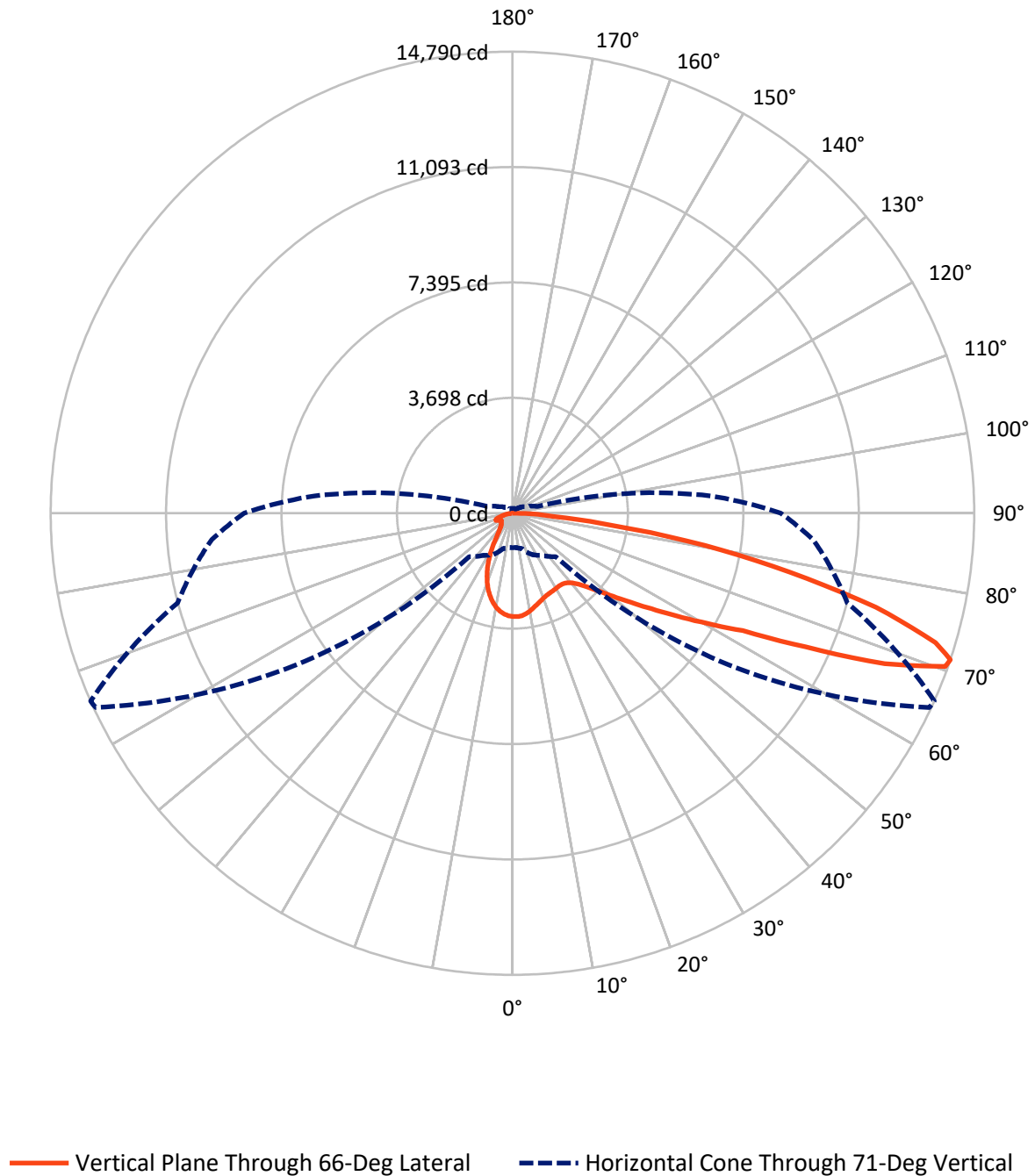


Based on 15 foot mounting height. Maximum calculated value = 14.7 fc  
Type III - Medium - N/A

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## Luminous Intensity Polar Plot



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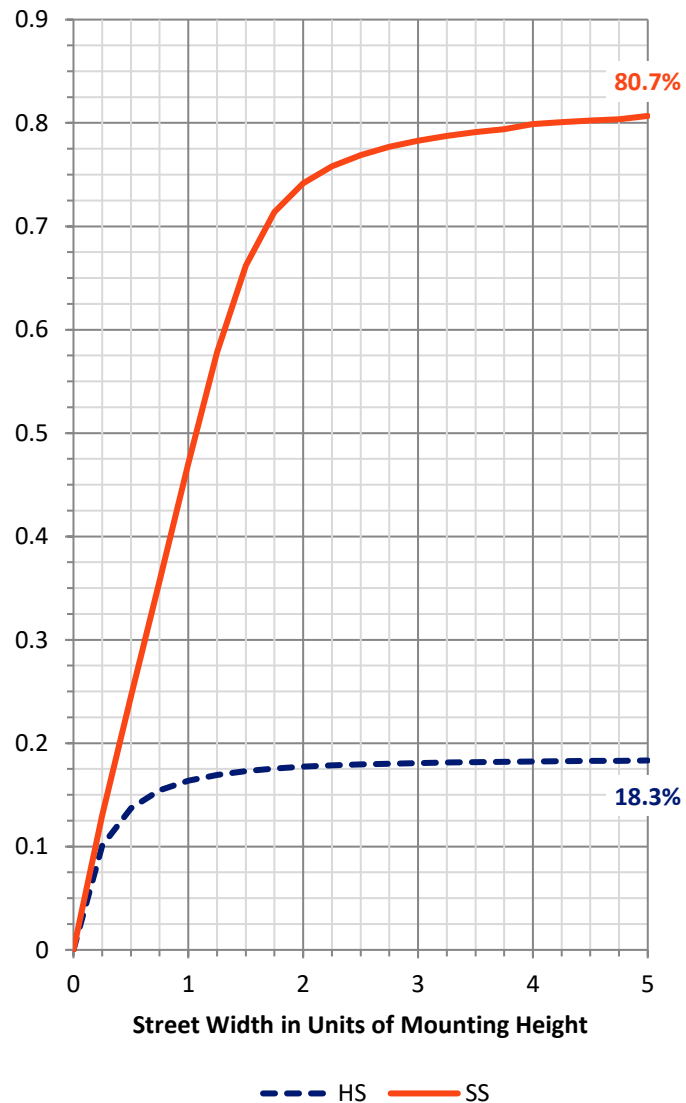
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 2680.0   | 0.0    | 2680.0  |
|                    | % Fixture | 18.5     | 0.0    | 18.5    |
| <b>Street Side</b> | Lumens    | 11781.0  | 0.0    | 11781.0 |
|                    | % Fixture | 81.5     | 0.0    | 81.5    |
| <b>Total</b>       | Lumens    | 14461.0  | 0.0    | 14461.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 291.6   | 2.0       |
| 10°-20°   | 699.4   | 4.8       |
| 20°-30°   | 939.4   | 6.5       |
| 30°-40°   | 1235.8  | 8.5       |
| 40°-50°   | 1797.8  | 12.4      |
| 50°-60°   | 2808.4  | 19.4      |
| 60°-70°   | 3517.9  | 24.3      |
| 70°-80°   | 2683.4  | 18.6      |
| 80°-90°   | 487.3   | 3.4       |
| 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°    | 14461.0 | 100.0     |
| 0°-180°   | 14461.0 | 100.0     |

**Coefficient of Utilization**



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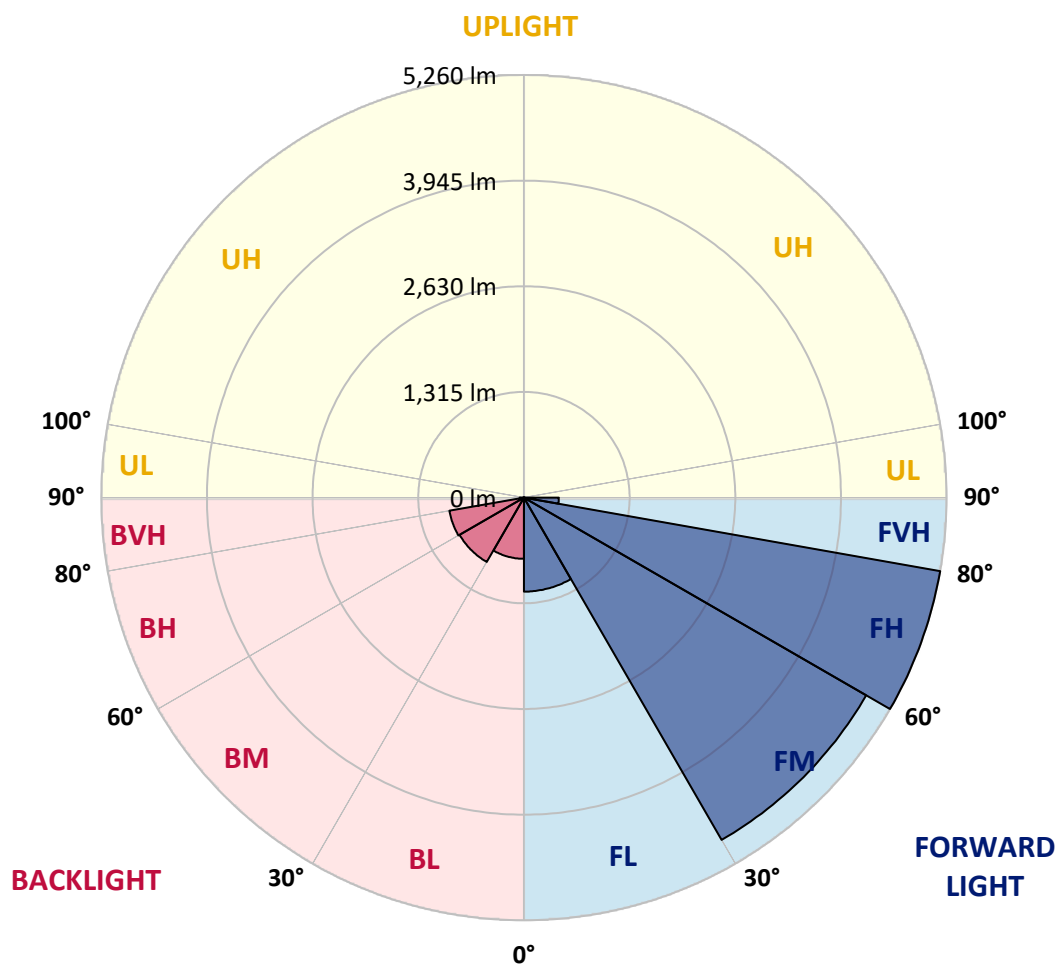
CATALOG NUMBER: GWC-SA2C-740-U-SL2

**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 1169.4 | 8.1       |                         |      |         |
| FM   | (30°-60°)   | 4917.5 | 34.0      |                         |      |         |
| FH   | (60°-80°)   | 5259.6 | 36.4      |                         |      | G3/7500 |
| FVH  | (80°-90°)   | 434.5  | 3.0       |                         |      | G3/500  |
| BL   | (0°-30°)    | 761.1  | 5.3       | B2/1000                 |      |         |
| BM   | (30°-60°)   | 924.5  | 6.4       | B1/1000                 |      |         |
| BH   | (60°-80°)   | 941.7  | 6.5       | B2/1000                 |      | G2/1000 |
| BVH  | (80°-90°)   | 52.7   | 0.4       |                         |      | G1/100  |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B2-U0-G3**

Type III Medium



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°     | 65°     | 66°     | 75°     | 85°    |
|-------|--------|--------|--------|--------|--------|--------|---------|---------|---------|---------|--------|
| 0°    | 3312.7 | 3312.7 | 3312.7 | 3312.7 | 3312.7 | 3312.7 | 3312.7  | 3312.7  | 3312.7  | 3312.7  | 3312.7 |
| 2.5°  | 3251.3 | 3246.3 | 3261.3 | 3276.8 | 3282.8 | 3292.8 | 3307.7  | 3316.2  | 3315.7  | 3317.2  | 3312.2 |
| 5°    | 3035.6 | 3029.1 | 3059.1 | 3083.6 | 3130.5 | 3183.4 | 3247.8  | 3293.8  | 3294.8  | 3320.7  | 3327.7 |
| 7.5°  | 2831.4 | 2826.9 | 2861.4 | 2900.8 | 2955.2 | 3036.1 | 3140.5  | 3239.3  | 3245.3  | 3315.7  | 3340.2 |
| 10°   | 2667.7 | 2666.7 | 2700.1 | 2743.1 | 2806.5 | 2896.8 | 3016.7  | 3161.5  | 3170.4  | 3291.8  | 3342.2 |
| 12.5° | 2539.8 | 2541.8 | 2570.8 | 2619.7 | 2686.6 | 2781.0 | 2910.8  | 3074.1  | 3088.6  | 3253.8  | 3330.7 |
| 15°   | 2445.5 | 2453.5 | 2476.9 | 2526.4 | 2592.3 | 2688.1 | 2821.4  | 2993.2  | 3015.2  | 3211.4  | 3324.2 |
| 17.5° | 2391.6 | 2400.5 | 2417.0 | 2458.0 | 2519.9 | 2612.2 | 2738.6  | 2926.8  | 2946.8  | 3178.9  | 3324.7 |
| 20°   | 2375.6 | 2383.1 | 2392.6 | 2417.5 | 2469.9 | 2553.8 | 2673.2  | 2866.9  | 2888.3  | 3153.0  | 3329.7 |
| 22.5° | 2407.0 | 2412.5 | 2413.5 | 2411.5 | 2443.5 | 2511.9 | 2625.7  | 2822.9  | 2845.9  | 3136.0  | 3333.2 |
| 25°   | 2474.4 | 2481.9 | 2476.4 | 2458.0 | 2447.5 | 2489.4 | 2601.3  | 2794.0  | 2816.9  | 3123.5  | 3326.2 |
| 27.5° | 2575.8 | 2576.8 | 2572.3 | 2548.3 | 2498.9 | 2491.9 | 2593.8  | 2777.0  | 2799.0  | 3109.0  | 3311.7 |
| 30°   | 2713.6 | 2720.1 | 2712.1 | 2679.6 | 2598.8 | 2531.9 | 2602.8  | 2760.5  | 2780.5  | 3090.6  | 3288.3 |
| 32.5° | 2874.9 | 2890.8 | 2890.3 | 2856.4 | 2740.6 | 2621.2 | 2639.7  | 2750.5  | 2766.0  | 3071.1  | 3259.8 |
| 35°   | 3042.1 | 3064.1 | 3105.0 | 3090.6 | 2947.3 | 2762.5 | 2710.6  | 2766.5  | 2777.0  | 3068.6  | 3239.8 |
| 37.5° | 3215.9 | 3237.8 | 3322.2 | 3361.2 | 3193.4 | 2964.7 | 2822.4  | 2822.9  | 2827.9  | 3099.0  | 3238.3 |
| 40°   | 3397.6 | 3421.1 | 3547.9 | 3649.3 | 3512.4 | 3220.9 | 3002.7  | 2940.8  | 2935.3  | 3173.9  | 3267.8 |
| 42.5° | 3652.2 | 3673.2 | 3825.5 | 3954.8 | 3866.4 | 3548.9 | 3251.8  | 3122.5  | 3111.0  | 3320.7  | 3362.2 |
| 45°   | 3974.3 | 3992.3 | 4154.0 | 4292.3 | 4246.9 | 3923.4 | 3564.9  | 3372.6  | 3370.7  | 3565.4  | 3553.4 |
| 47.5° | 4357.2 | 4371.2 | 4516.5 | 4650.3 | 4666.8 | 4354.2 | 3958.3  | 3758.6  | 3726.1  | 3900.9  | 3849.5 |
| 50°   | 4756.2 | 4771.6 | 4870.5 | 5014.3 | 5136.6 | 4930.9 | 4464.6  | 4231.4  | 4188.0  | 4343.8  | 4268.9 |
| 52.5° | 5020.3 | 5040.7 | 5126.6 | 5308.9 | 5664.9 | 5563.0 | 5063.2  | 4804.6  | 4738.7  | 4880.5  | 4823.1 |
| 55°   | 4902.4 | 4948.4 | 5079.7 | 5371.8 | 6087.2 | 6528.6 | 5801.7  | 5473.1  | 5398.7  | 5516.6  | 5482.6 |
| 57.5° | 4366.7 | 4429.6 | 4608.9 | 5059.7 | 6146.7 | 7379.4 | 6918.0  | 6260.5  | 6208.1  | 6174.1  | 6189.6 |
| 60°   | 3387.6 | 3448.0 | 3670.2 | 4257.9 | 5732.8 | 8000.5 | 8598.1  | 7231.1  | 7155.2  | 6834.2  | 6848.1 |
| 62.5° | 2397.6 | 2367.1 | 2519.4 | 2949.3 | 4658.3 | 8073.4 | 10509.9 | 8529.2  | 8279.6  | 7531.2  | 7469.8 |
| 65°   | 1828.4 | 1821.4 | 1889.8 | 2026.6 | 2821.4 | 7201.1 | 11648.7 | 10711.1 | 10321.2 | 8351.0  | 8206.2 |
| 67.5° | 1502.3 | 1489.9 | 1557.3 | 1756.5 | 1816.9 | 4645.8 | 11673.7 | 13242.5 | 12859.5 | 9371.5  | 9058.0 |
| 70°   | 1235.2 | 1221.2 | 1284.2 | 1541.3 | 1679.1 | 2356.1 | 9824.9  | 14724.8 | 14704.4 | 10663.7 | 9701.0 |
| 71°   | 1107.4 | 1097.4 | 1172.8 | 1458.4 | 1649.6 | 1963.7 | 8482.8  | 14728.8 | 14790.2 | 11101.0 | 9663.1 |
| 72.5° | 901.7  | 905.2  | 985.1  | 1298.1 | 1627.7 | 1734.0 | 6234.5  | 14042.3 | 14172.1 | 11517.9 | 9318.1 |
| 75°   | 599.1  | 602.1  | 707.0  | 998.6  | 1578.2 | 1696.6 | 3426.6  | 11783.1 | 12021.7 | 11268.3 | 8502.8 |
| 77.5° | 402.4  | 401.4  | 472.8  | 685.0  | 1375.0 | 1696.6 | 2009.1  | 8812.8  | 9074.9  | 8966.1  | 6555.1 |
| 80°   | 277.1  | 275.1  | 325.5  | 472.8  | 1041.0 | 1717.0 | 1553.3  | 6176.1  | 6255.5  | 4842.0  | 2664.2 |
| 82.5° | 169.8  | 171.3  | 212.7  | 334.0  | 708.5  | 1545.3 | 1466.4  | 3367.7  | 3281.3  | 1358.0  | 665.5  |
| 85°   | 97.4   | 96.9   | 135.8  | 226.2  | 454.8  | 1304.1 | 1429.9  | 1449.4  | 1329.6  | 408.9   | 240.7  |
| 87.5° | 34.9   | 37.4   | 72.9   | 125.3  | 260.6  | 908.2  | 1213.3  | 753.9   | 679.5   | 184.7   | 108.8  |
| 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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**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 3312.7 | 3312.7 | 3312.7 | 3312.7 | 3312.7 | 3312.7 | 3312.7 | 3312.7 | 3312.7 | 3312.7 | 3312.7 |
| 2.5°  | 3308.7 | 3311.7 | 3308.2 | 3288.3 | 3271.3 | 3243.8 | 3228.4 | 3206.9 | 3200.4 | 3197.4 | 3205.4 |
| 5°    | 3321.2 | 3322.2 | 3292.8 | 3240.3 | 3181.4 | 3112.0 | 3062.1 | 3000.7 | 2971.7 | 2959.2 | 2967.2 |
| 7.5°  | 3332.7 | 3328.2 | 3263.8 | 3163.4 | 3054.6 | 2933.8 | 2826.4 | 2728.1 | 2670.7 | 2647.2 | 2649.2 |
| 10°   | 3334.2 | 3315.2 | 3211.9 | 3056.6 | 2887.8 | 2710.6 | 2545.8 | 2394.1 | 2298.2 | 2235.8 | 2254.8 |
| 12.5° | 3318.7 | 3286.8 | 3135.5 | 2918.3 | 2684.1 | 2442.5 | 2219.8 | 1992.1 | 1855.3 | 1791.9 | 1793.9 |
| 15°   | 3306.7 | 3248.8 | 3041.6 | 2755.5 | 2441.0 | 2120.9 | 1816.9 | 1549.3 | 1403.5 | 1338.6 | 1308.1 |
| 17.5° | 3296.8 | 3207.9 | 2932.8 | 2572.3 | 2153.9 | 1748.0 | 1382.5 | 1143.9 | 1064.0 | 1045.0 | 1037.0 |
| 20°   | 3282.8 | 3164.4 | 2811.5 | 2360.1 | 1826.9 | 1330.6 | 1009.5 | 891.7  | 892.2  | 914.2  | 917.2  |
| 22.5° | 3263.3 | 3115.0 | 2682.1 | 2121.9 | 1475.9 | 969.1  | 791.4  | 757.4  | 791.9  | 833.8  | 841.3  |
| 25°   | 3234.3 | 3056.6 | 2538.3 | 1858.8 | 1125.4 | 744.9  | 676.0  | 674.5  | 716.5  | 760.4  | 766.9  |
| 27.5° | 3193.4 | 2980.2 | 2378.6 | 1576.2 | 829.3  | 633.1  | 605.6  | 616.1  | 647.1  | 679.0  | 681.5  |
| 30°   | 3138.5 | 2891.3 | 2202.3 | 1278.2 | 650.1  | 563.7  | 560.7  | 570.2  | 589.2  | 611.6  | 613.6  |
| 32.5° | 3078.1 | 2801.0 | 2014.1 | 989.6  | 556.7  | 526.2  | 529.2  | 533.7  | 542.7  | 551.7  | 553.7  |
| 35°   | 3023.2 | 2708.6 | 1821.4 | 751.9  | 512.3  | 501.8  | 499.8  | 498.8  | 499.8  | 496.8  | 497.3  |
| 37.5° | 2987.7 | 2632.2 | 1620.7 | 598.6  | 486.8  | 480.3  | 474.3  | 466.8  | 458.3  | 453.3  | 454.3  |
| 40°   | 2974.7 | 2575.3 | 1417.5 | 517.3  | 465.8  | 461.3  | 449.9  | 433.9  | 423.9  | 420.9  | 420.9  |
| 42.5° | 3009.7 | 2545.8 | 1221.2 | 476.3  | 448.4  | 440.9  | 421.9  | 403.4  | 395.9  | 395.4  | 394.9  |
| 45°   | 3116.5 | 2557.8 | 1034.5 | 453.8  | 432.4  | 417.9  | 392.9  | 377.5  | 372.5  | 373.5  | 373.0  |
| 47.5° | 3308.2 | 2633.2 | 874.7  | 438.9  | 416.4  | 397.4  | 369.5  | 357.0  | 351.0  | 351.0  | 351.5  |
| 50°   | 3634.3 | 2809.5 | 747.4  | 426.4  | 402.9  | 378.5  | 352.5  | 337.0  | 329.0  | 328.5  | 328.5  |
| 52.5° | 4109.1 | 3125.0 | 668.0  | 415.9  | 387.9  | 361.5  | 335.5  | 316.0  | 306.6  | 304.6  | 303.6  |
| 55°   | 4704.2 | 3577.4 | 646.1  | 408.9  | 368.0  | 343.0  | 315.0  | 295.6  | 285.1  | 280.6  | 280.1  |
| 57.5° | 5369.8 | 4127.6 | 689.5  | 400.4  | 347.5  | 321.0  | 292.6  | 274.1  | 263.1  | 257.6  | 257.1  |
| 60°   | 6043.3 | 4728.2 | 866.8  | 388.4  | 330.5  | 297.1  | 269.6  | 252.6  | 241.7  | 235.7  | 234.7  |
| 62.5° | 6717.8 | 5361.3 | 1228.7 | 387.4  | 318.5  | 274.1  | 246.1  | 231.7  | 221.2  | 214.7  | 213.2  |
| 65°   | 7478.7 | 6054.3 | 1640.1 | 413.9  | 314.5  | 253.1  | 222.2  | 210.7  | 201.7  | 195.7  | 195.2  |
| 67.5° | 8352.5 | 6836.7 | 1600.7 | 468.3  | 328.0  | 234.2  | 199.7  | 190.7  | 184.2  | 179.2  | 178.7  |
| 70°   | 8762.4 | 6714.3 | 995.1  | 506.8  | 347.0  | 215.7  | 178.2  | 171.8  | 166.8  | 163.3  | 161.8  |
| 71°   | 8590.6 | 6375.3 | 834.3  | 502.3  | 345.0  | 207.7  | 169.8  | 164.8  | 159.8  | 156.8  | 155.3  |
| 72.5° | 8122.3 | 5814.1 | 696.0  | 467.3  | 322.5  | 193.2  | 158.8  | 153.8  | 149.3  | 145.8  | 144.8  |
| 75°   | 7288.5 | 5192.5 | 557.2  | 373.5  | 257.1  | 163.3  | 139.3  | 133.8  | 130.3  | 128.3  | 126.3  |
| 77.5° | 5357.8 | 3705.7 | 430.9  | 295.1  | 189.2  | 133.3  | 118.8  | 114.8  | 111.3  | 108.3  | 106.8  |
| 80°   | 2052.5 | 1435.4 | 290.1  | 220.2  | 138.8  | 105.3  | 95.9   | 93.9   | 90.4   | 88.4   | 88.4   |
| 82.5° | 552.7  | 428.9  | 154.8  | 133.3  | 92.9   | 76.9   | 73.4   | 72.4   | 69.4   | 65.4   | 65.9   |
| 85°   | 223.7  | 189.2  | 86.9   | 73.4   | 56.9   | 45.4   | 49.4   | 49.9   | 46.4   | 41.4   | 41.9   |
| 87.5° | 98.4   | 80.4   | 48.4   | 32.5   | 25.0   | 17.5   | 22.5   | 22.5   | 20.5   | 17.0   | 15.5   |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

INVUE

Report Number: SP1-2104-224-3

Luminaire Tested: CCW-SA-2A-740-U-SL4

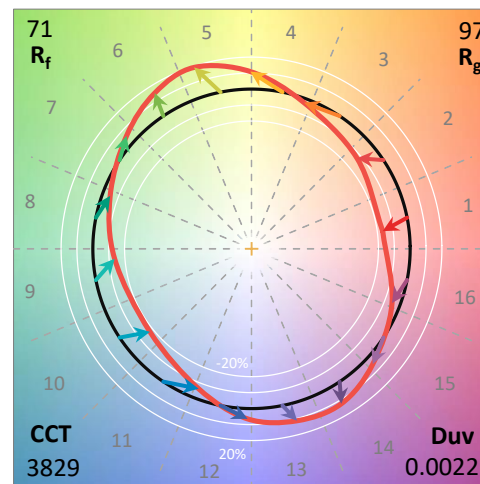
Test Date: 04/26/2021

### Test Information

Test Method: LM-79-08  
 Report Number: SP1-2104-224-3  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1  
 Measurement Geometry:  $4\pi$   
 Issue Date: 04/26/2021  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: INVUE  
 Catalog Number: **CCW-SA-2A-740-U-SL4**  
 Description: INVUE WALL PACK ClearCurve Light Square

### Spectral Parameters

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 3829   | CRI (Ra): | 69.8 |      |       |
| CIE u':                   | 0.2271 | R1:       | 67.2 | R9:  | -35.1 |
| CIE v':                   | 0.5076 | R2:       | 75.2 | R10: | 43.1  |
| Duv:                      | 0.0022 | R3:       | 83.2 | R11: | 69.0  |
| CIE x:                    | 0.3900 | R4:       | 71.0 | R12: | 44.3  |
| CIE y:                    | 0.3873 | R5:       | 67.4 | R13: | 67.6  |
| CIE z:                    | 0.2227 | R6:       | 66.8 | R14: | 90.3  |
| Peak Wavelength (nm):     | 440    | R7:       | 77.6 |      |       |
| Dominant Wavelength (nm): | 578    | R8:       | 50.3 |      |       |
| Purity:                   | 33.4   |           |      |      |       |
| Rf:                       | 70.6   |           |      |      |       |
| Rg:                       | 96.7   |           |      |      |       |



REPORT NUMBER: SP1-2104-224-3

| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 1/31/2021        | 7/31/2021            |
| Power Meter                    | IN0071                | 12/1/2020        | 12/1/2021            |
| AC Power Source                | IN0063                | 12/1/2020        | 12/1/2021            |
| DC Power Source                | IN0208                | 12/1/2020        | 12/1/2021            |
| Sphere Thermometer             | IN0085                | 12/1/2020        | 12/1/2021            |
| Room Thermometer               | IN0046                | 12/1/2020        | 12/1/2021            |

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**CIE 1931 Chromaticity Diagram**



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



Point lies inside the ANSI 4000K 7-step quadrangle

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### Photopic Flux vs. Wavelength



#####

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 1901             | 0.0              | 490       | 14057            | 2.0              | 620       | 73853            | 19.2             | 750       | 3678             | 0.0              | 880       | 2528             | 0.0              |
| 365       | 1585             | 0.0              | 495       | 20304            | 3.7              | 625       | 68653            | 15.1             | 755       | 3385             | 0.0              | 885       | 2638             | 0.0              |
| 370       | 1604             | 0.0              | 500       | 28346            | 6.3              | 630       | 62254            | 11.3             | 760       | 2963             | 0.0              | 890       | 2417             | 0.0              |
| 375       | 1905             | 0.0              | 505       | 37228            | 10.4             | 635       | 56177            | 8.4              | 765       | 2782             | 0.0              | 895       | 1902             | 0.0              |
| 380       | 1882             | 0.0              | 510       | 46037            | 15.8             | 640       | 50521            | 6.0              | 770       | 2657             | 0.0              | 900       | 2330             | 0.0              |
| 385       | 1693             | 0.0              | 515       | 53619            | 22.2             | 645       | 45727            | 4.4              | 775       | 2259             | 0.0              | 905       | 2456             | 0.0              |
| 390       | 1640             | 0.0              | 520       | 59890            | 29.0             | 650       | 40814            | 3.0              | 780       | 2169             | 0.0              | 910       | 2205             | 0.0              |
| 395       | 1513             | 0.0              | 525       | 64946            | 34.9             | 655       | 35925            | 2.1              | 785       | 2065             | 0.0              | 915       | 2002             | 0.0              |
| 400       | 1481             | 0.0              | 530       | 69048            | 40.7             | 660       | 31824            | 1.3              | 790       | 2054             | 0.0              | 920       | 2125             | 0.0              |
| 405       | 2044             | 0.0              | 535       | 72246            | 44.8             | 665       | 27860            | 0.9              | 795       | 1908             | 0.0              | 925       | 2266             | 0.0              |
| 410       | 3966             | 0.0              | 540       | 74621            | 48.6             | 670       | 24069            | 0.5              | 800       | 2026             | 0.0              | 930       | 2159             | 0.0              |
| 415       | 8943             | 0.0              | 545       | 77288            | 51.4             | 675       | 20926            | 0.4              | 805       | 1766             | 0.0              | 935       | 2581             | 0.0              |
| 420       | 19566            | 0.1              | 550       | 80334            | 54.6             | 680       | 18170            | 0.2              | 810       | 1913             | 0.0              | 940       | 2052             | 0.0              |
| 425       | 39243            | 0.2              | 555       | 83561            | 57.1             | 685       | 15785            | 0.1              | 815       | 2019             | 0.0              | 945       | 1631             | 0.0              |
| 430       | 66113            | 0.5              | 560       | 86964            | 59.1             | 690       | 13770            | 0.1              | 820       | 1876             | 0.0              | 950       | 2301             | 0.0              |
| 435       | 92550            | 1.1              | 565       | 90264            | 60.0             | 695       | 11953            | 0.1              | 825       | 1869             | 0.0              | 955       | 3077             | 0.0              |
| 440       | 106034           | 1.7              | 570       | 93519            | 60.8             | 700       | 10452            | 0.0              | 830       | 1862             | 0.0              | 960       | 2911             | 0.0              |
| 445       | 86383            | 1.8              | 575       | 95920            | 59.7             | 705       | 9162             | 0.0              | 835       | 1663             | 0.0              | 965       | 3163             | 0.0              |
| 450       | 49216            | 1.3              | 580       | 97650            | 58.0             | 710       | 8266             | 0.0              | 840       | 1843             | 0.0              | 970       | 1995             | 0.0              |
| 455       | 27376            | 0.9              | 585       | 98486            | 54.7             | 715       | 7583             | 0.0              | 845       | 1921             | 0.0              | 975       | 2418             | 0.0              |
| 460       | 17830            | 0.7              | 590       | 98332            | 50.8             | 720       | 6750             | 0.0              | 850       | 2105             | 0.0              | 980       | 2674             | 0.0              |
| 465       | 11374            | 0.6              | 595       | 96023            | 45.5             | 725       | 5965             | 0.0              | 855       | 2096             | 0.0              | 985       | 2850             | 0.0              |
| 470       | 8344             | 0.5              | 600       | 93650            | 40.4             | 730       | 5310             | 0.0              | 860       | 2601             | 0.0              | 990       | 1972             | 0.0              |
| 475       | 7639             | 0.6              | 605       | 90313            | 35.0             | 735       | 4838             | 0.0              | 865       | 2199             | 0.0              | 995       | 2443             | 0.0              |
| 480       | 7991             | 0.8              | 610       | 85305            | 29.3             | 740       | 4280             | 0.0              | 870       | 2491             | 0.0              | 1000      | 1979             | 0.0              |
| 485       | 9994             | 1.2              | 615       | 79870            | 24.1             | 745       | 3928             | 0.0              | 875       | 2370             | 0.0              |           |                  |                  |

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### Scotopic Flux vs. Wavelength



Scotopic Lumens: 7682.8

S/P: 1.42

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 1901             | 0.0              | 490       | 14057            | 21.6             | 620       | 73853            | 0.9              | 750       | 3678             | 0.0              | 880       | 2528             | 0.0              |
| 365       | 1585             | 0.0              | 495       | 20304            | 32.8             | 625       | 68653            | 0.6              | 755       | 3385             | 0.0              | 885       | 2638             | 0.0              |
| 370       | 1604             | 0.0              | 500       | 28346            | 47.4             | 630       | 62254            | 0.4              | 760       | 2963             | 0.0              | 890       | 2417             | 0.0              |
| 375       | 1905             | 0.0              | 505       | 37228            | 63.3             | 635       | 56177            | 0.2              | 765       | 2782             | 0.0              | 895       | 1902             | 0.0              |
| 380       | 1882             | 0.0              | 510       | 46037            | 78.0             | 640       | 50521            | 0.1              | 770       | 2657             | 0.0              | 900       | 2330             | 0.0              |
| 385       | 1693             | 0.0              | 515       | 53619            | 88.9             | 645       | 45727            | 0.1              | 775       | 2259             | 0.0              | 905       | 2456             | 0.0              |
| 390       | 1640             | 0.0              | 520       | 59890            | 95.2             | 650       | 40814            | 0.0              | 780       | 2169             | 0.0              | 910       | 2205             | 0.0              |
| 395       | 1513             | 0.0              | 525       | 64946            | 97.2             | 655       | 35925            | 0.0              | 785       | 2065             | 0.0              | 915       | 2002             | 0.0              |
| 400       | 1481             | 0.0              | 530       | 69048            | 95.2             | 660       | 31824            | 0.0              | 790       | 2054             | 0.0              | 920       | 2125             | 0.0              |
| 405       | 2044             | 0.1              | 535       | 72246            | 90.0             | 665       | 27860            | 0.0              | 795       | 1908             | 0.0              | 925       | 2266             | 0.0              |
| 410       | 3966             | 0.2              | 540       | 74621            | 82.5             | 670       | 24069            | 0.0              | 800       | 2026             | 0.0              | 930       | 2159             | 0.0              |
| 415       | 8943             | 0.9              | 545       | 77288            | 74.1             | 675       | 20926            | 0.0              | 805       | 1766             | 0.0              | 935       | 2581             | 0.0              |
| 420       | 19566            | 3.2              | 550       | 80334            | 65.7             | 680       | 18170            | 0.0              | 810       | 1913             | 0.0              | 940       | 2052             | 0.0              |
| 425       | 39243            | 9.6              | 555       | 83561            | 57.1             | 685       | 15785            | 0.0              | 815       | 2019             | 0.0              | 945       | 1631             | 0.0              |
| 430       | 66113            | 22.5             | 560       | 86964            | 48.6             | 690       | 13770            | 0.0              | 820       | 1876             | 0.0              | 950       | 2301             | 0.0              |
| 435       | 92550            | 41.4             | 565       | 90264            | 40.5             | 695       | 11953            | 0.0              | 825       | 1869             | 0.0              | 955       | 3077             | 0.0              |
| 440       | 106034           | 59.3             | 570       | 93519            | 33.0             | 700       | 10452            | 0.0              | 830       | 1862             | 0.0              | 960       | 2911             | 0.0              |
| 445       | 86383            | 57.8             | 575       | 95920            | 26.1             | 705       | 9162             | 0.0              | 835       | 1663             | 0.0              | 965       | 3163             | 0.0              |
| 450       | 49216            | 38.1             | 580       | 97650            | 20.1             | 710       | 8266             | 0.0              | 840       | 1843             | 0.0              | 970       | 1995             | 0.0              |
| 455       | 27376            | 23.9             | 585       | 98486            | 15.1             | 715       | 7583             | 0.0              | 845       | 1921             | 0.0              | 975       | 2418             | 0.0              |
| 460       | 17830            | 17.2             | 590       | 98332            | 10.9             | 720       | 6750             | 0.0              | 850       | 2105             | 0.0              | 980       | 2674             | 0.0              |
| 465       | 11374            | 12.0             | 595       | 96023            | 7.7              | 725       | 5965             | 0.0              | 855       | 2096             | 0.0              | 985       | 2850             | 0.0              |
| 470       | 8344             | 9.6              | 600       | 93650            | 5.3              | 730       | 5310             | 0.0              | 860       | 2601             | 0.0              | 990       | 1972             | 0.0              |
| 475       | 7639             | 9.6              | 605       | 90313            | 3.5              | 735       | 4838             | 0.0              | 865       | 2199             | 0.0              | 995       | 2443             | 0.0              |
| 480       | 7991             | 10.8             | 610       | 85305            | 2.3              | 740       | 4280             | 0.0              | 870       | 2491             | 0.0              | 1000      | 1979             | 0.0              |
| 485       | 9994             | 14.5             | 615       | 79870            | 1.5              | 745       | 3928             | 0.0              | 875       | 2370             | 0.0              |           |                  |                  |

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### Melanopic Flux vs. Wavelength



**Melanopic Lumens: 2823**

**M/P: 0.52**

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 1901             | 0.0              | 490       | 14057            | 11.7             | 620       | 73853            | 0.1              | 750       | 3678             | 0.0              | 880       | 2528             | 0.0              |
| 365       | 1585             | 0.0              | 495       | 20304            | 16.8             | 625       | 68653            | 0.0              | 755       | 3385             | 0.0              | 885       | 2638             | 0.0              |
| 370       | 1604             | 0.0              | 500       | 28346            | 22.8             | 630       | 62254            | 0.0              | 760       | 2963             | 0.0              | 890       | 2417             | 0.0              |
| 375       | 1905             | 0.0              | 505       | 37228            | 28.6             | 635       | 56177            | 0.0              | 765       | 2782             | 0.0              | 895       | 1902             | 0.0              |
| 380       | 1882             | 0.0              | 510       | 46037            | 33.1             | 640       | 50521            | 0.0              | 770       | 2657             | 0.0              | 900       | 2330             | 0.0              |
| 385       | 1693             | 0.0              | 515       | 53619            | 35.0             | 645       | 45727            | 0.0              | 775       | 2259             | 0.0              | 905       | 2456             | 0.0              |
| 390       | 1640             | 0.0              | 520       | 59890            | 34.9             | 650       | 40814            | 0.0              | 780       | 2169             | 0.0              | 910       | 2205             | 0.0              |
| 395       | 1513             | 0.0              | 525       | 64946            | 32.9             | 655       | 35925            | 0.0              | 785       | 2065             | 0.0              | 915       | 2002             | 0.0              |
| 400       | 1481             | 0.0              | 530       | 69048            | 29.8             | 660       | 31824            | 0.0              | 790       | 2054             | 0.0              | 920       | 2125             | 0.0              |
| 405       | 2044             | 0.0              | 535       | 72246            | 26.0             | 665       | 27860            | 0.0              | 795       | 1908             | 0.0              | 925       | 2266             | 0.0              |
| 410       | 3966             | 0.2              | 540       | 74621            | 21.8             | 670       | 24069            | 0.0              | 800       | 2026             | 0.0              | 930       | 2159             | 0.0              |
| 415       | 8943             | 0.6              | 545       | 77288            | 18.0             | 675       | 20926            | 0.0              | 805       | 1766             | 0.0              | 935       | 2581             | 0.0              |
| 420       | 19566            | 2.2              | 550       | 80334            | 14.4             | 680       | 18170            | 0.0              | 810       | 1913             | 0.0              | 940       | 2052             | 0.0              |
| 425       | 39243            | 6.1              | 555       | 83561            | 11.3             | 685       | 15785            | 0.0              | 815       | 2019             | 0.0              | 945       | 1631             | 0.0              |
| 430       | 66113            | 14.0             | 560       | 86964            | 8.6              | 690       | 13770            | 0.0              | 820       | 1876             | 0.0              | 950       | 2301             | 0.0              |
| 435       | 92550            | 24.7             | 565       | 90264            | 6.3              | 695       | 11953            | 0.0              | 825       | 1869             | 0.0              | 955       | 3077             | 0.0              |
| 440       | 106034           | 35.4             | 570       | 93519            | 4.6              | 700       | 10452            | 0.0              | 830       | 1862             | 0.0              | 960       | 2911             | 0.0              |
| 445       | 86383            | 34.1             | 575       | 95920            | 3.2              | 705       | 9162             | 0.0              | 835       | 1663             | 0.0              | 965       | 3163             | 0.0              |
| 450       | 49216            | 22.7             | 580       | 97650            | 2.2              | 710       | 8266             | 0.0              | 840       | 1843             | 0.0              | 970       | 1995             | 0.0              |
| 455       | 27376            | 14.3             | 585       | 98486            | 1.5              | 715       | 7583             | 0.0              | 845       | 1921             | 0.0              | 975       | 2418             | 0.0              |
| 460       | 17830            | 10.5             | 590       | 98332            | 1.0              | 720       | 6750             | 0.0              | 850       | 2105             | 0.0              | 980       | 2674             | 0.0              |
| 465       | 11374            | 7.4              | 595       | 96023            | 0.6              | 725       | 5965             | 0.0              | 855       | 2096             | 0.0              | 985       | 2850             | 0.0              |
| 470       | 8344             | 6.0              | 600       | 93650            | 0.4              | 730       | 5310             | 0.0              | 860       | 2601             | 0.0              | 990       | 1972             | 0.0              |
| 475       | 7639             | 5.8              | 605       | 90313            | 0.2              | 735       | 4838             | 0.0              | 865       | 2199             | 0.0              | 995       | 2443             | 0.0              |
| 480       | 7991             | 6.4              | 610       | 85305            | 0.2              | 740       | 4280             | 0.0              | 870       | 2491             | 0.0              | 1000      | 1979             | 0.0              |
| 485       | 9994             | 8.2              | 615       | 79870            | 0.1              | 745       | 3928             | 0.0              | 875       | 2370             | 0.0              |           |                  |                  |

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TM-30-18

### Summary

$R_f = 70.6$   
 $R_g = 96.7$   
 CIE  $R_a = 69.8$   
 $R_g = -35.1$

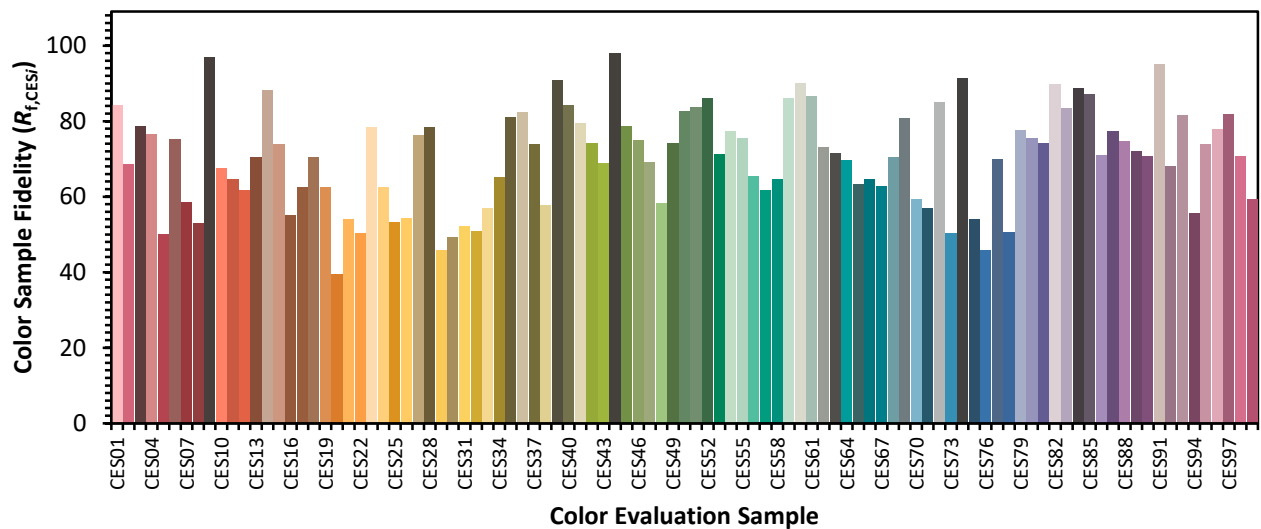


### Color Vector Graphics



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 54 | CES51 = 84 | CES76 = 46 |
| CES02 = 61 | CES27 = 76 | CES52 = 86 | CES77 = 70 |
| CES03 = 30 | CES28 = 78 | CES53 = 71 | CES78 = 50 |
| CES04 = 70 | CES29 = 46 | CES54 = 77 | CES79 = 77 |
| CES05 = 47 | CES30 = 49 | CES55 = 76 | CES80 = 75 |
| CES06 = 50 | CES31 = 52 | CES56 = 65 | CES81 = 74 |
| CES07 = 40 | CES32 = 51 | CES57 = 62 | CES82 = 90 |
| CES08 = 39 | CES33 = 57 | CES58 = 65 | CES83 = 84 |
| CES09 = 29 | CES34 = 65 | CES59 = 86 | CES84 = 89 |
| CES10 = 74 | CES35 = 81 | CES60 = 90 | CES85 = 87 |
| CES11 = 57 | CES36 = 82 | CES61 = 87 | CES86 = 71 |
| CES12 = 63 | CES37 = 74 | CES62 = 73 | CES87 = 77 |
| CES13 = 42 | CES38 = 58 | CES63 = 72 | CES88 = 75 |
| CES14 = 74 | CES39 = 91 | CES64 = 70 | CES89 = 72 |
| CES15 = 71 | CES40 = 84 | CES65 = 63 | CES90 = 71 |
| CES16 = 46 | CES41 = 79 | CES66 = 65 | CES91 = 95 |
| CES17 = 49 | CES42 = 74 | CES67 = 63 | CES92 = 68 |
| CES18 = 56 | CES43 = 69 | CES68 = 70 | CES93 = 82 |
| CES19 = 72 | CES44 = 98 | CES69 = 81 | CES94 = 56 |
| CES20 = 65 | CES45 = 79 | CES70 = 59 | CES95 = 74 |
| CES21 = 86 | CES46 = 75 | CES71 = 57 | CES96 = 78 |
| CES22 = 78 | CES47 = 69 | CES72 = 85 | CES97 = 82 |
| CES23 = 92 | CES48 = 58 | CES73 = 50 | CES98 = 71 |
| CES24 = 91 | CES49 = 74 | CES74 = 91 | CES99 = 59 |
| CES25 = 72 | CES50 = 83 | CES75 = 54 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)