

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: STREETWORKS

Report Number: P1379150

Luminaire Tested: **VAL-T-SB2D-727-U-SL4**

Issue Date: 02/18/2026

This test was performed under the Supervised Manufacturer's Testing Program. The results of this test have not been  
influenced by sources from within Cooper Lighting Solutions or from external interests.

**Test Information**

Test Method: LM-79-08  
 Report Number: P1379150  
 Test Lab: INNOVATION CENTER(G3)  
 Issue Date: 02/18/2026  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: STREETWORKS  
 Catalog Number: VAL-T-SB2D-727-U-SL4  
 Description: GALLEON II WALL SLIM HIGH DENSITY LED ARRAYS 25 SQUARE 147W 70CRI  
 2700K FIXTURE w/ TYPE IV SPILL CONTROL DISTRIBUTION OPTIC  
 Light Source: (52) 2700K CCT, 70 CRI LEDS  
 Ballast/Driver: ELECTRONIC DRIVER  
 Luminaire Equipment:

| <u>Sample No.</u> | <u>Condition</u> | <u>Description</u> |
|-------------------|------------------|--------------------|
| a                 | good             | reflector          |
| b                 | good             | lens               |
| c                 | good             | housing            |
| d                 | good             | cord               |

**Summary**

Lumens per Lamp: N/A  
 Luminaire Lumens: 16894 lumens  
 Efficiency: N/A  
 Efficacy: 114.9 lumens/watt  
 Luminous Opening: Rectangular (W 1' x L: 0.5' x H: 0')  
 IES Classification: Type IV - Short  
 BUG Rating: B3 - U0 - G3  
  
 Input Watts (W): 147  
 Input Voltage (V): 120  
 Input Current (Ain): NR  
 Voltage Rise (V): NR  
 Power Factor: 0.98  
 Total Harmonic Distortion (THDi): 3.1%  
 Frequency (hertz): 60  
 Stabilization Time: NR  
 Operation Time: NR  
 Ambient Temperature (°C): NR  
 Test Distance: 28.75 FT

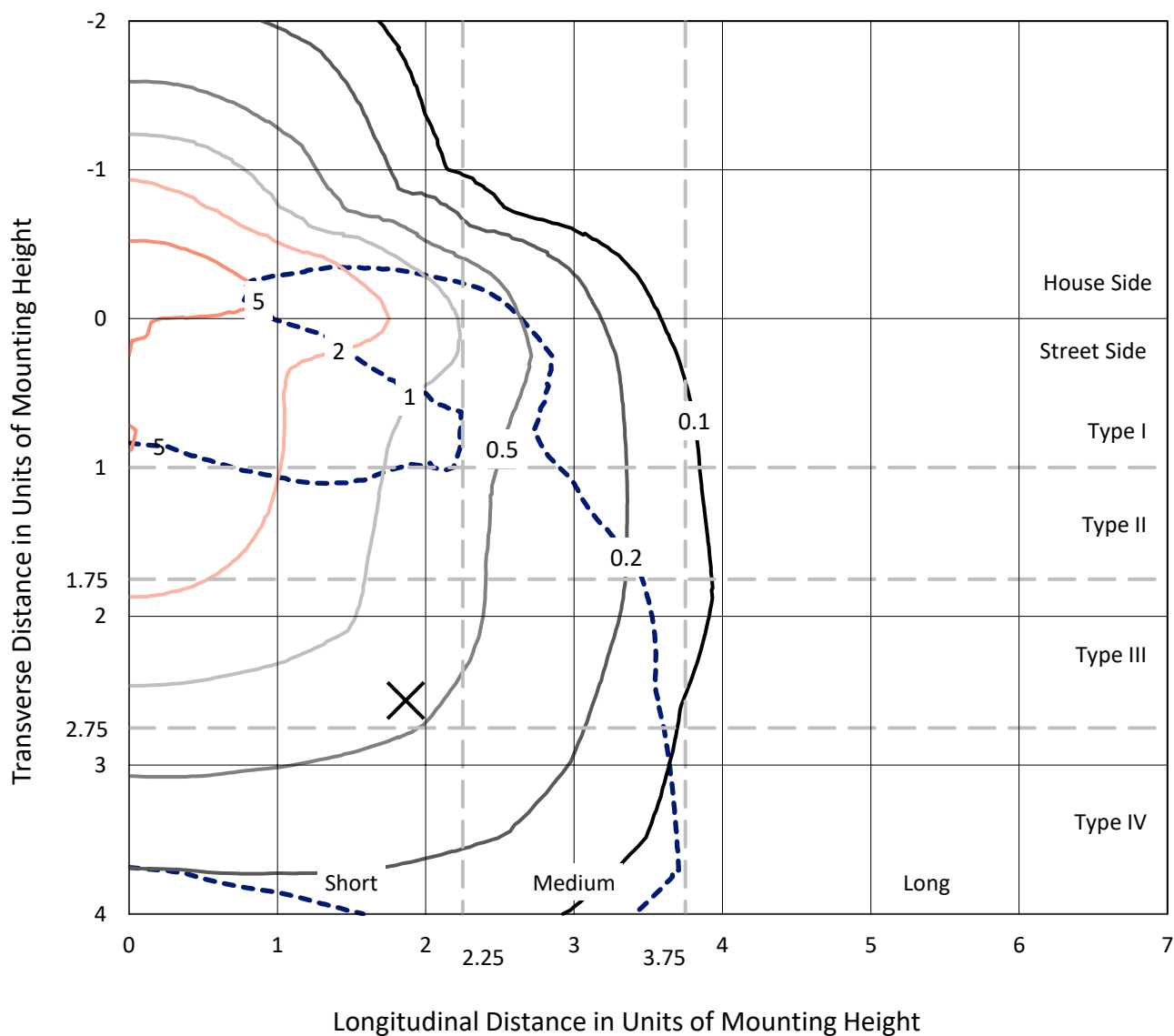
REPORT NUMBER: P1379150

CATALOG NUMBER: VAL-T-SB2D-727-U-SL4

## Iso-Footcandle Lines of Horizontal Illumination

× Max cd

--- 1/2 Max cd

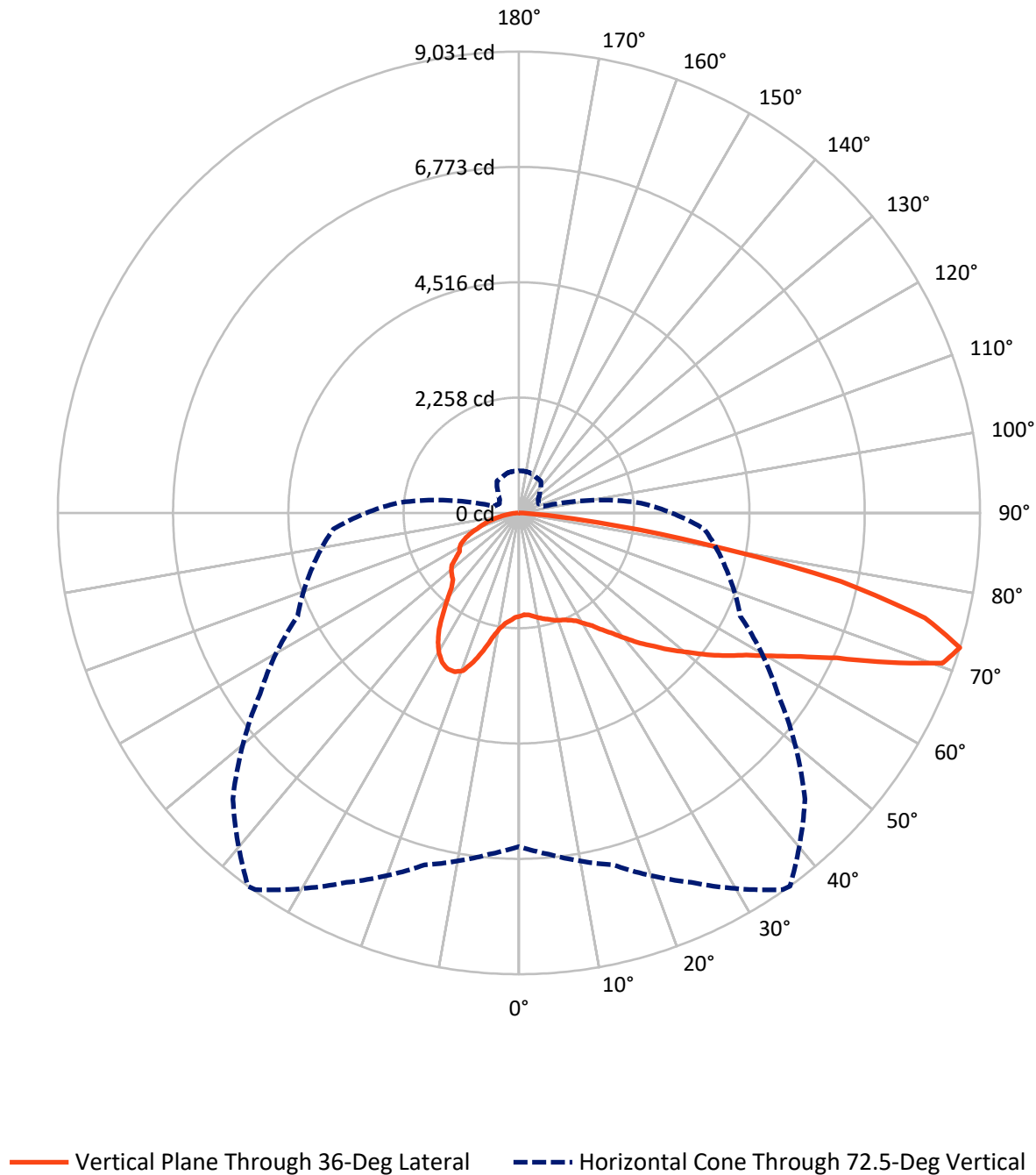


Based on 20 foot mounting height. Maximum calculated value = 6.8 fc

Type IV - Short - N/A

REPORT NUMBER: P1379150  
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## Luminous Intensity Polar Plot



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CATALOG NUMBER: VAL-T-SB2D-727-U-SL4

**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 5559.6   | 0.0    | 5559.6  |
|                    | % Fixture | 32.9     | 0.0    | 32.9    |
| <b>Street Side</b> | Lumens    | 11334.3  | 0.0    | 11334.3 |
|                    | % Fixture | 67.1     | 0.0    | 67.1    |
| <b>Total</b>       | Lumens    | 16894.0  | 0.0    | 16894.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 200.3   | 1.2       |
| 10°-20°   | 690.4   | 4.1       |
| 20°-30°   | 1311.0  | 7.8       |
| 30°-40°   | 1914.2  | 11.3      |
| 40°-50°   | 2546.1  | 15.1      |
| 50°-60°   | 3264.4  | 19.3      |
| 60°-70°   | 3840.0  | 22.7      |
| 70°-80°   | 2876.5  | 17.0      |
| 80°-90°   | 251.1   | 1.5       |
| 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°    | 16894.0 | 100.0     |
| 0°-180°   | 16894.0 | 100.0     |



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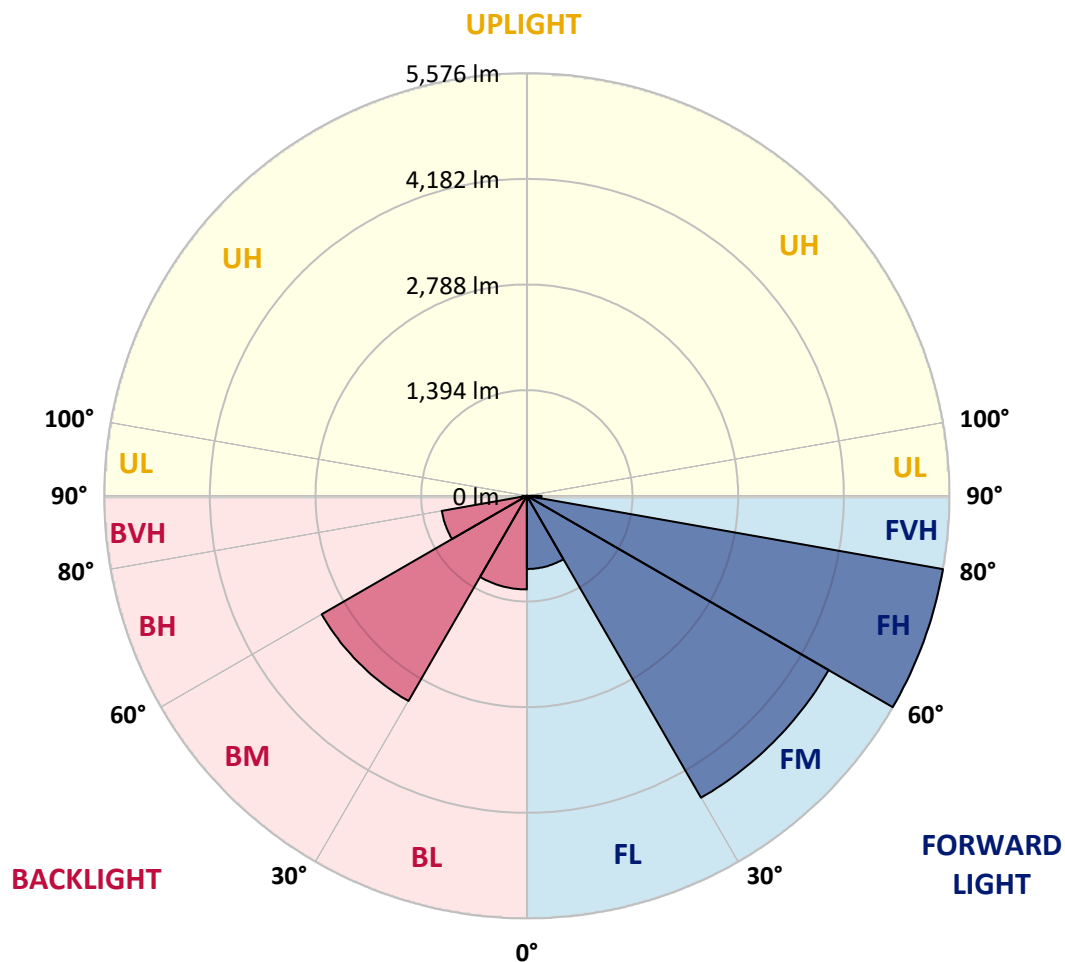
CATALOG NUMBER: VAL-T-SB2D-727-U-SL4

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 965.8  | 5.7       |                         |      |         |
| FM   | (30°-60°)   | 4599.1 | 27.2      |                         |      |         |
| FH   | (60°-80°)   | 5576.0 | 33.0      |                         |      | G3/7500 |
| FVH  | (80°-90°)   | 193.4  | 1.1       |                         |      | G2/225  |
| BL   | (0°-30°)    | 1235.9 | 7.3       | B3/2500                 |      |         |
| BM   | (30°-60°)   | 3125.6 | 18.5      | B3/5000                 |      |         |
| BH   | (60°-80°)   | 1140.5 | 6.8       | B3/2500                 |      | G3/2500 |
| BVH  | (80°-90°)   | 57.7   | 0.3       |                         |      | G1/100  |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B3-U0-G3**

Type IV Short





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CATALOG NUMBER: VAL-T-SB2D-727-U-SL4

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 36°    | 45°    | 55°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 2023.1 | 2023.1 | 2023.1 | 2023.1 | 2023.1 | 2023.1 | 2023.1 | 2023.1 | 2023.1 | 2023.1 | 2023.1 |
| 2.5°  | 2007.7 | 1996.2 | 2003.9 | 1996.2 | 1996.2 | 1996.2 | 2003.9 | 2003.9 | 2015.4 | 2015.4 | 2015.4 |
| 5°    | 2023.1 | 2019.2 | 2023.1 | 2019.2 | 2007.7 | 2007.7 | 2015.4 | 2007.7 | 2026.9 | 2019.2 | 2030.7 |
| 7.5°  | 2065.2 | 2057.5 | 2057.5 | 2046.0 | 2049.9 | 2042.2 | 2049.9 | 2038.4 | 2049.9 | 2042.2 | 2042.2 |
| 10°   | 2115.0 | 2103.5 | 2107.4 | 2092.0 | 2080.5 | 2084.4 | 2092.0 | 2080.5 | 2084.4 | 2088.2 | 2088.2 |
| 12.5° | 2157.2 | 2149.5 | 2149.5 | 2118.8 | 2126.5 | 2126.5 | 2134.2 | 2122.7 | 2130.3 | 2126.5 | 2141.8 |
| 15°   | 2210.8 | 2199.3 | 2191.6 | 2168.7 | 2164.8 | 2161.0 | 2172.5 | 2161.0 | 2180.1 | 2176.3 | 2195.5 |
| 17.5° | 2260.6 | 2249.1 | 2241.5 | 2203.1 | 2195.5 | 2207.0 | 2210.8 | 2203.1 | 2222.3 | 2230.0 | 2268.3 |
| 20°   | 2306.6 | 2310.4 | 2283.6 | 2237.6 | 2237.6 | 2241.5 | 2241.5 | 2241.5 | 2272.1 | 2283.6 | 2325.7 |
| 22.5° | 2387.1 | 2379.4 | 2352.6 | 2298.9 | 2275.9 | 2275.9 | 2310.4 | 2287.4 | 2306.6 | 2333.4 | 2406.2 |
| 25°   | 2490.5 | 2475.2 | 2429.2 | 2360.2 | 2321.9 | 2325.7 | 2337.2 | 2321.9 | 2344.9 | 2375.6 | 2486.7 |
| 27.5° | 2674.4 | 2655.3 | 2574.8 | 2436.9 | 2390.9 | 2394.7 | 2398.5 | 2356.4 | 2352.6 | 2402.4 | 2555.6 |
| 30°   | 2942.6 | 2919.6 | 2797.0 | 2624.6 | 2502.0 | 2509.7 | 2467.5 | 2390.9 | 2364.1 | 2417.7 | 2636.1 |
| 32.5° | 3233.8 | 3203.2 | 3080.6 | 2835.3 | 2670.6 | 2632.3 | 2551.8 | 2417.7 | 2375.6 | 2433.0 | 2708.9 |
| 35°   | 3582.5 | 3555.7 | 3406.2 | 3061.4 | 2835.3 | 2812.4 | 2651.4 | 2475.2 | 2406.2 | 2444.5 | 2777.9 |
| 37.5° | 4076.8 | 4007.8 | 3827.7 | 3352.6 | 3034.6 | 3000.1 | 2781.7 | 2555.6 | 2410.0 | 2436.9 | 2873.7 |
| 40°   | 4502.1 | 4433.1 | 4237.7 | 3720.4 | 3287.5 | 3233.8 | 2973.3 | 2651.4 | 2448.4 | 2452.2 | 2996.3 |
| 42.5° | 4946.5 | 4881.4 | 4670.7 | 4030.8 | 3513.5 | 3486.7 | 3141.9 | 2766.4 | 2498.2 | 2494.3 | 3134.2 |
| 45°   | 5414.0 | 5417.8 | 5092.1 | 4402.4 | 3781.7 | 3728.1 | 3348.8 | 2919.6 | 2590.1 | 2544.1 | 3360.3 |
| 47.5° | 6073.0 | 6000.2 | 5601.7 | 4758.8 | 4080.6 | 4011.6 | 3567.2 | 3080.6 | 2728.1 | 2659.1 | 3613.1 |
| 50°   | 6605.6 | 6551.9 | 6069.2 | 5168.8 | 4360.3 | 4287.5 | 3823.9 | 3256.8 | 2850.7 | 2820.0 | 3950.3 |
| 52.5° | 7050.0 | 6958.1 | 6513.6 | 5555.7 | 4674.5 | 4609.3 | 4034.6 | 3429.2 | 3023.1 | 3007.8 | 4345.0 |
| 55°   | 7295.3 | 7199.5 | 6820.2 | 5915.9 | 5030.8 | 4931.2 | 4272.2 | 3636.1 | 3230.0 | 3237.7 | 4785.6 |
| 57.5° | 7486.8 | 7387.2 | 7015.6 | 6187.9 | 5383.3 | 5249.2 | 4532.7 | 3862.2 | 3475.2 | 3548.0 | 5387.2 |
| 60°   | 7555.8 | 7456.2 | 7180.3 | 6548.1 | 5762.6 | 5678.4 | 4827.7 | 4141.9 | 3758.7 | 3912.0 | 5973.4 |
| 62.5° | 7655.4 | 7678.4 | 7483.0 | 6988.7 | 6256.9 | 6184.1 | 5207.1 | 4486.7 | 4107.4 | 4230.0 | 6180.3 |
| 65°   | 7735.9 | 7724.4 | 7747.4 | 7598.0 | 6946.6 | 6843.1 | 5770.3 | 4935.0 | 4341.1 | 4337.3 | 6076.8 |
| 67.5° | 7548.1 | 7559.6 | 7682.2 | 8050.1 | 7904.5 | 7804.9 | 6498.3 | 5348.8 | 4452.3 | 4540.4 | 5747.3 |
| 70°   | 7406.4 | 7440.9 | 7605.6 | 8065.4 | 8793.4 | 8804.9 | 7513.7 | 5701.3 | 4770.3 | 4540.4 | 4827.7 |
| 72.5° | 6532.8 | 6709.0 | 7134.3 | 7981.1 | 9004.1 | 9031.0 | 7923.6 | 6195.6 | 4781.8 | 4195.5 | 3647.6 |
| 75°   | 4325.8 | 4463.8 | 5597.9 | 7161.2 | 8257.0 | 8214.8 | 7337.4 | 5958.1 | 4475.2 | 3421.6 | 2321.9 |
| 77.5° | 1275.9 | 1536.4 | 2620.8 | 4440.8 | 6180.3 | 6448.5 | 6019.4 | 4076.8 | 3318.1 | 1605.4 | 827.6  |
| 80°   | 364.0  | 406.1  | 731.8  | 1559.4 | 3337.3 | 3624.6 | 3739.6 | 1950.3 | 984.7  | 425.3  | 275.9  |
| 82.5° | 176.3  | 183.9  | 264.4  | 436.8  | 1429.2 | 1563.3 | 1310.4 | 590.1  | 264.4  | 153.3  | 107.3  |
| 85°   | 30.7   | 38.3   | 65.1   | 130.3  | 256.7  | 310.4  | 291.2  | 118.8  | 80.5   | 69.0   | 49.8   |
| 87.5° | 7.7    | 7.7    | 11.5   | 11.5   | 15.3   | 15.3   | 15.3   | 19.2   | 19.2   | 19.2   | 19.2   |
| 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: P1379150

CATALOG NUMBER: VAL-T-SB2D-727-U-SL4

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 2023.1 | 2023.1 | 2023.1 | 2023.1 | 2023.1 | 2023.1 | 2023.1 | 2023.1 | 2023.1 | 2023.1 | 2023.1 |
| 2.5°  | 2034.6 | 2034.6 | 2049.9 | 2057.5 | 2057.5 | 2046.0 | 2046.0 | 2080.5 | 2065.2 | 2072.9 | 2069.0 |
| 5°    | 2038.4 | 2053.7 | 2053.7 | 2076.7 | 2088.2 | 2107.4 | 2115.0 | 2130.3 | 2145.7 | 2145.7 | 2141.8 |
| 7.5°  | 2061.4 | 2072.9 | 2092.0 | 2107.4 | 2138.0 | 2168.7 | 2180.1 | 2226.1 | 2233.8 | 2252.9 | 2245.3 |
| 10°   | 2095.9 | 2115.0 | 2145.7 | 2187.8 | 2226.1 | 2275.9 | 2298.9 | 2348.7 | 2375.6 | 2406.2 | 2387.1 |
| 12.5° | 2149.5 | 2172.5 | 2222.3 | 2279.8 | 2364.1 | 2440.7 | 2502.0 | 2551.8 | 2590.1 | 2624.6 | 2613.1 |
| 15°   | 2207.0 | 2252.9 | 2318.1 | 2421.5 | 2571.0 | 2708.9 | 2789.4 | 2873.7 | 2892.8 | 2923.5 | 2919.6 |
| 17.5° | 2306.6 | 2337.2 | 2467.5 | 2674.4 | 2869.8 | 2988.6 | 3057.6 | 3099.7 | 3088.2 | 3099.7 | 3092.1 |
| 20°   | 2387.1 | 2463.7 | 2697.4 | 3000.1 | 3191.7 | 3268.3 | 3276.0 | 3237.7 | 3157.2 | 3141.9 | 3111.2 |
| 22.5° | 2505.8 | 2620.8 | 2996.3 | 3310.5 | 3463.7 | 3456.1 | 3344.9 | 3230.0 | 3126.5 | 3084.4 | 3069.1 |
| 25°   | 2620.8 | 2827.7 | 3310.5 | 3605.5 | 3647.6 | 3513.5 | 3344.9 | 3195.5 | 3057.6 | 3015.4 | 2980.9 |
| 27.5° | 2766.4 | 3065.2 | 3666.8 | 3854.5 | 3728.1 | 3521.2 | 3272.1 | 3103.6 | 2973.3 | 2904.3 | 2889.0 |
| 30°   | 2915.8 | 3341.1 | 3965.6 | 3973.3 | 3751.1 | 3440.7 | 3138.0 | 2988.6 | 2839.2 | 2770.2 | 2774.0 |
| 32.5° | 3118.9 | 3643.8 | 4218.5 | 4061.4 | 3685.9 | 3279.8 | 2958.0 | 2797.0 | 2666.8 | 2632.3 | 2624.6 |
| 35°   | 3318.1 | 3984.8 | 4421.6 | 4069.1 | 3532.7 | 3053.7 | 2720.4 | 2540.3 | 2459.9 | 2425.4 | 2440.7 |
| 37.5° | 3601.7 | 4333.5 | 4540.4 | 3996.3 | 3310.5 | 2751.0 | 2440.7 | 2298.9 | 2237.6 | 2226.1 | 2241.5 |
| 40°   | 3912.0 | 4655.3 | 4617.0 | 3912.0 | 3007.8 | 2429.2 | 2172.5 | 2084.4 | 2046.0 | 2053.7 | 2080.5 |
| 42.5° | 4245.4 | 4919.7 | 4674.5 | 3720.4 | 2651.4 | 2134.2 | 1957.9 | 1919.6 | 1977.1 | 2011.6 | 2034.6 |
| 45°   | 4601.7 | 5161.1 | 4693.6 | 3448.4 | 2318.1 | 1908.1 | 1835.3 | 1908.1 | 1996.2 | 2011.6 | 2023.1 |
| 47.5° | 4954.2 | 5371.8 | 4693.6 | 3088.2 | 2000.1 | 1758.7 | 1797.0 | 1892.8 | 1961.8 | 1934.9 | 1938.8 |
| 50°   | 5291.4 | 5540.4 | 4682.1 | 2670.6 | 1777.8 | 1682.0 | 1747.2 | 1808.5 | 1777.8 | 1701.2 | 1708.9 |
| 52.5° | 5597.9 | 5689.8 | 4601.7 | 2241.5 | 1593.9 | 1662.9 | 1666.7 | 1590.1 | 1521.1 | 1482.8 | 1490.5 |
| 55°   | 5938.9 | 5827.8 | 4364.1 | 1858.3 | 1475.1 | 1613.1 | 1505.8 | 1406.2 | 1440.7 | 1429.2 | 1425.3 |
| 57.5° | 6295.2 | 5988.7 | 4038.4 | 1528.8 | 1364.0 | 1494.3 | 1375.5 | 1367.9 | 1364.0 | 1348.7 | 1329.5 |
| 60°   | 6601.8 | 6119.0 | 3551.8 | 1203.1 | 1199.3 | 1314.2 | 1348.7 | 1329.5 | 1310.4 | 1279.7 | 1264.4 |
| 62.5° | 6425.5 | 5793.3 | 2839.2 | 973.2  | 1030.7 | 1172.5 | 1298.9 | 1260.6 | 1264.4 | 1237.6 | 1226.1 |
| 65°   | 5927.4 | 5149.6 | 1934.9 | 812.3  | 869.8  | 1046.0 | 1180.1 | 1145.6 | 1126.5 | 1118.8 | 1111.1 |
| 67.5° | 5283.7 | 4459.9 | 1275.9 | 643.7  | 728.0  | 915.7  | 1042.2 | 1000.0 | 1026.9 | 1026.9 | 1023.0 |
| 70°   | 4157.2 | 3410.1 | 804.6  | 524.9  | 578.6  | 758.6  | 865.9  | 885.1  | 923.4  | 927.2  | 923.4  |
| 72.5° | 2988.6 | 2333.4 | 501.9  | 421.5  | 459.8  | 578.6  | 754.8  | 774.0  | 816.1  | 823.8  | 823.8  |
| 75°   | 1762.5 | 1314.2 | 337.2  | 337.2  | 356.3  | 471.3  | 624.5  | 685.8  | 705.0  | 712.7  | 705.0  |
| 77.5° | 708.8  | 505.8  | 222.2  | 249.1  | 275.9  | 379.3  | 478.9  | 555.6  | 547.9  | 544.1  | 524.9  |
| 80°   | 252.9  | 218.4  | 153.3  | 164.8  | 199.2  | 283.5  | 356.3  | 379.3  | 402.3  | 390.8  | 379.3  |
| 82.5° | 103.5  | 99.6   | 95.8   | 107.3  | 118.8  | 172.4  | 249.1  | 249.1  | 252.9  | 249.1  | 245.2  |
| 85°   | 38.3   | 38.3   | 46.0   | 53.6   | 65.1   | 80.5   | 111.1  | 141.8  | 118.8  | 84.3   | 88.1   |
| 87.5° | 19.2   | 19.2   | 15.3   | 15.3   | 19.2   | 26.8   | 26.8   | 34.5   | 34.5   | 19.2   | 11.5   |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

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

Report Prepared for

Cooper Lighting Solutions

McGraw-Edison

Report Number: SP1-2407-184-3

Test Date: 10/09/2024

Luminaire Tested: GSS-SB1A-727-U-5WQ

Data in this report applies to families of products including GSS-SB1A-727-U-5WQ

### Test Information

Test Method: LM-79-2019  
 Report Number: SP1-2407-184-3  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry:  $4\pi$   
 Issue Date: 10/15/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: McGraw-Edison  
 Catalog Number: **GSS-SB1A-727-U-5WQ**  
 Description: GALLEON II SITE SLIM 1SQ 350MA 5WQ HIGH DENSITY LIGHTSQUARE WITH 70 CRI  
 2700K CCT 26 LEDS

### Spectral Parameters

|                           |          |           |      |      |       |
|---------------------------|----------|-----------|------|------|-------|
| CCT (K):                  | 2672     | CRI (Ra): | 71.1 |      |       |
| CIE u':                   | 0.2638   | R1:       | 68.3 | R9:  | -27.8 |
| CIE v':                   | 0.5276   | R2:       | 79.8 | R10: | 54.4  |
| Duv:                      | -0.0002  | R3:       | 91.2 | R11: | 65.8  |
| CIE x:                    | 0.4619   | R4:       | 69.4 | R12: | 45.6  |
| CIE y:                    | 0.4106   | R5:       | 66.5 | R13: | 69.8  |
| CIE z:                    | 0.1275   | R6:       | 72.6 | R14: | 94.5  |
| Peak Wavelength (nm):     | 601      | R7:       | 77.0 | R15: | 60.1  |
| Dominant Wavelength (nm): | 584      | R8:       | 44.1 |      |       |
| Purity:                   | 61.88407 |           |      |      |       |
| Rf:                       | 67.9     |           |      |      |       |
| Rg:                       | 98.6     |           |      |      |       |



### Test Conditions

Stabilization Time: 21M  
 Operation Time: 1H 21M  
 Sphere Temperature (°C): 25.2

REPORT NUMBER: SP1-2407-184-3

| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 6/18/2024        | 12/18/2024           |
| Power Meter                    | INXT2011004           | 2/8/2024         | 2/8/2025             |
| AC Power Source                | IN0063                | 10/24/2023       | 10/24/2024           |
| DC Power Source                | IN0208                | 10/24/2023       | 10/24/2024           |
| Sphere Thermometer             | IN0085                | 10/24/2023       | 10/24/2024           |
| Room Thermometer               | IN0046                | 10/24/2023       | 10/24/2024           |

REPORT NUMBER: SP1-2407-184-3

**CIE 1931 Chromaticity Diagram**



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



REPORT NUMBER: SP1-2407-184-3

### Photopic Flux vs. Wavelength



### Photopic Lumens: NR

| $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) |
|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|
| 360               | 0                                    | NR                             | 490               | 52                                   | NR                             | 620               | 888                                  | NR                             | 750               | 27                                   | NR                             | 880               | 1                                    | NR                             |
| 365               | 0                                    | NR                             | 495               | 87                                   | NR                             | 625               | 834                                  | NR                             | 755               | 23                                   | NR                             | 885               | 1                                    | NR                             |
| 370               | 0                                    | NR                             | 500               | 135                                  | NR                             | 630               | 776                                  | NR                             | 760               | 20                                   | NR                             | 890               | 1                                    | NR                             |
| 375               | 0                                    | NR                             | 505               | 196                                  | NR                             | 635               | 712                                  | NR                             | 765               | 17                                   | NR                             | 895               | 0                                    | NR                             |
| 380               | 0                                    | NR                             | 510               | 258                                  | NR                             | 640               | 648                                  | NR                             | 770               | 15                                   | NR                             | 900               | 0                                    | NR                             |
| 385               | 1                                    | NR                             | 515               | 317                                  | NR                             | 645               | 583                                  | NR                             | 775               | 12                                   | NR                             | 905               | 0                                    | NR                             |
| 390               | 2                                    | NR                             | 520               | 368                                  | NR                             | 650               | 523                                  | NR                             | 780               | 11                                   | NR                             | 910               | 0                                    | NR                             |
| 395               | 4                                    | NR                             | 525               | 408                                  | NR                             | 655               | 465                                  | NR                             | 785               | 9                                    | NR                             | 915               | 0                                    | NR                             |
| 400               | 6                                    | NR                             | 530               | 443                                  | NR                             | 660               | 410                                  | NR                             | 790               | 8                                    | NR                             | 920               | 0                                    | NR                             |
| 405               | 11                                   | NR                             | 535               | 473                                  | NR                             | 665               | 360                                  | NR                             | 795               | 7                                    | NR                             | 925               | 0                                    | NR                             |
| 410               | 23                                   | NR                             | 540               | 498                                  | NR                             | 670               | 313                                  | NR                             | 800               | 6                                    | NR                             | 930               | 0                                    | NR                             |
| 415               | 51                                   | NR                             | 545               | 530                                  | NR                             | 675               | 272                                  | NR                             | 805               | 5                                    | NR                             | 935               | 0                                    | NR                             |
| 420               | 111                                  | NR                             | 550               | 563                                  | NR                             | 680               | 236                                  | NR                             | 810               | 4                                    | NR                             | 940               | 0                                    | NR                             |
| 425               | 214                                  | NR                             | 555               | 605                                  | NR                             | 685               | 203                                  | NR                             | 815               | 4                                    | NR                             | 945               | 0                                    | NR                             |
| 430               | 339                                  | NR                             | 560               | 651                                  | NR                             | 690               | 175                                  | NR                             | 820               | 3                                    | NR                             | 950               | 0                                    | NR                             |
| 435               | 467                                  | NR                             | 565               | 705                                  | NR                             | 695               | 150                                  | NR                             | 825               | 3                                    | NR                             | 955               | 0                                    | NR                             |
| 440               | 535                                  | NR                             | 570               | 765                                  | NR                             | 700               | 128                                  | NR                             | 830               | 3                                    | NR                             | 960               | 0                                    | NR                             |
| 445               | 372                                  | NR                             | 575               | 824                                  | NR                             | 705               | 110                                  | NR                             | 835               | 2                                    | NR                             | 965               | 0                                    | NR                             |
| 450               | 160                                  | NR                             | 580               | 882                                  | NR                             | 710               | 94                                   | NR                             | 840               | 2                                    | NR                             | 970               | 0                                    | NR                             |
| 455               | 89                                   | NR                             | 585               | 930                                  | NR                             | 715               | 80                                   | NR                             | 845               | 2                                    | NR                             | 975               | 0                                    | NR                             |
| 460               | 53                                   | NR                             | 590               | 968                                  | NR                             | 720               | 69                                   | NR                             | 850               | 1                                    | NR                             | 980               | 0                                    | NR                             |
| 465               | 31                                   | NR                             | 595               | 991                                  | NR                             | 725               | 59                                   | NR                             | 855               | 1                                    | NR                             | 985               | 0                                    | NR                             |
| 470               | 23                                   | NR                             | 600               | 999                                  | NR                             | 730               | 50                                   | NR                             | 860               | 1                                    | NR                             | 990               | 0                                    | NR                             |
| 475               | 21                                   | NR                             | 605               | 992                                  | NR                             | 735               | 43                                   | NR                             | 865               | 1                                    | NR                             | 995               | 0                                    | NR                             |
| 480               | 23                                   | NR                             | 610               | 969                                  | NR                             | 740               | 36                                   | NR                             | 870               | 1                                    | NR                             | 1000              | 0                                    | NR                             |
| 485               | 32                                   | NR                             | 615               | 935                                  | NR                             | 745               | 31                                   | NR                             | 875               | 1                                    | NR                             |                   |                                      |                                |

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### Scotopic Flux vs. Wavelength



Scotopic Lumens: NR

S/P: 1.02

| λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(Φ/nm) |
|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|
| 360       | 0                           | NR               | 490       | 52                          | NR               | 620       | 888                         | NR               | 750       | 27                          | NR               | 880       | 1                           | NR               |
| 365       | 0                           | NR               | 495       | 87                          | NR               | 625       | 834                         | NR               | 755       | 23                          | NR               | 885       | 1                           | NR               |
| 370       | 0                           | NR               | 500       | 135                         | NR               | 630       | 776                         | NR               | 760       | 20                          | NR               | 890       | 1                           | NR               |
| 375       | 0                           | NR               | 505       | 196                         | NR               | 635       | 712                         | NR               | 765       | 17                          | NR               | 895       | 0                           | NR               |
| 380       | 0                           | NR               | 510       | 258                         | NR               | 640       | 648                         | NR               | 770       | 15                          | NR               | 900       | 0                           | NR               |
| 385       | 1                           | NR               | 515       | 317                         | NR               | 645       | 583                         | NR               | 775       | 12                          | NR               | 905       | 0                           | NR               |
| 390       | 2                           | NR               | 520       | 368                         | NR               | 650       | 523                         | NR               | 780       | 11                          | NR               | 910       | 0                           | NR               |
| 395       | 4                           | NR               | 525       | 408                         | NR               | 655       | 465                         | NR               | 785       | 9                           | NR               | 915       | 0                           | NR               |
| 400       | 6                           | NR               | 530       | 443                         | NR               | 660       | 410                         | NR               | 790       | 8                           | NR               | 920       | 0                           | NR               |
| 405       | 11                          | NR               | 535       | 473                         | NR               | 665       | 360                         | NR               | 795       | 7                           | NR               | 925       | 0                           | NR               |
| 410       | 23                          | NR               | 540       | 498                         | NR               | 670       | 313                         | NR               | 800       | 6                           | NR               | 930       | 0                           | NR               |
| 415       | 51                          | NR               | 545       | 530                         | NR               | 675       | 272                         | NR               | 805       | 5                           | NR               | 935       | 0                           | NR               |
| 420       | 111                         | NR               | 550       | 563                         | NR               | 680       | 236                         | NR               | 810       | 4                           | NR               | 940       | 0                           | NR               |
| 425       | 214                         | NR               | 555       | 605                         | NR               | 685       | 203                         | NR               | 815       | 4                           | NR               | 945       | 0                           | NR               |
| 430       | 339                         | NR               | 560       | 651                         | NR               | 690       | 175                         | NR               | 820       | 3                           | NR               | 950       | 0                           | NR               |
| 435       | 467                         | NR               | 565       | 705                         | NR               | 695       | 150                         | NR               | 825       | 3                           | NR               | 955       | 0                           | NR               |
| 440       | 535                         | NR               | 570       | 765                         | NR               | 700       | 128                         | NR               | 830       | 3                           | NR               | 960       | 0                           | NR               |
| 445       | 372                         | NR               | 575       | 824                         | NR               | 705       | 110                         | NR               | 835       | 2                           | NR               | 965       | 0                           | NR               |
| 450       | 160                         | NR               | 580       | 882                         | NR               | 710       | 94                          | NR               | 840       | 2                           | NR               | 970       | 0                           | NR               |
| 455       | 89                          | NR               | 585       | 930                         | NR               | 715       | 80                          | NR               | 845       | 2                           | NR               | 975       | 0                           | NR               |
| 460       | 53                          | NR               | 590       | 968                         | NR               | 720       | 69                          | NR               | 850       | 1                           | NR               | 980       | 0                           | NR               |
| 465       | 31                          | NR               | 595       | 991                         | NR               | 725       | 59                          | NR               | 855       | 1                           | NR               | 985       | 0                           | NR               |
| 470       | 23                          | NR               | 600       | 999                         | NR               | 730       | 50                          | NR               | 860       | 1                           | NR               | 990       | 0                           | NR               |
| 475       | 21                          | NR               | 605       | 992                         | NR               | 735       | 43                          | NR               | 865       | 1                           | NR               | 995       | 0                           | NR               |
| 480       | 23                          | NR               | 610       | 969                         | NR               | 740       | 36                          | NR               | 870       | 1                           | NR               | 1000      | 0                           | NR               |
| 485       | 32                          | NR               | 615       | 935                         | NR               | 745       | 31                          | NR               | 875       | 1                           | NR               |           |                             |                  |

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### Melanopic Flux vs. Wavelength


**Melanopic Lumens: NR**
**M/P: 1.71**

| $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) |
|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|
| 360               | 0                                    | NR                             | 490               | 52                                   | NR                             | 620               | 888                                  | NR                             | 750               | 27                                   | NR                             | 880               | 1                                    | NR                             |
| 365               | 0                                    | NR                             | 495               | 87                                   | NR                             | 625               | 834                                  | NR                             | 755               | 23                                   | NR                             | 885               | 1                                    | NR                             |
| 370               | 0                                    | NR                             | 500               | 135                                  | NR                             | 630               | 776                                  | NR                             | 760               | 20                                   | NR                             | 890               | 1                                    | NR                             |
| 375               | 0                                    | NR                             | 505               | 196                                  | NR                             | 635               | 712                                  | NR                             | 765               | 17                                   | NR                             | 895               | 0                                    | NR                             |
| 380               | 0                                    | NR                             | 510               | 258                                  | NR                             | 640               | 648                                  | NR                             | 770               | 15                                   | NR                             | 900               | 0                                    | NR                             |
| 385               | 1                                    | NR                             | 515               | 317                                  | NR                             | 645               | 583                                  | NR                             | 775               | 12                                   | NR                             | 905               | 0                                    | NR                             |
| 390               | 2                                    | NR                             | 520               | 368                                  | NR                             | 650               | 523                                  | NR                             | 780               | 11                                   | NR                             | 910               | 0                                    | NR                             |
| 395               | 4                                    | NR                             | 525               | 408                                  | NR                             | 655               | 465                                  | NR                             | 785               | 9                                    | NR                             | 915               | 0                                    | NR                             |
| 400               | 6                                    | NR                             | 530               | 443                                  | NR                             | 660               | 410                                  | NR                             | 790               | 8                                    | NR                             | 920               | 0                                    | NR                             |
| 405               | 11                                   | NR                             | 535               | 473                                  | NR                             | 665               | 360                                  | NR                             | 795               | 7                                    | NR                             | 925               | 0                                    | NR                             |
| 410               | 23                                   | NR                             | 540               | 498                                  | NR                             | 670               | 313                                  | NR                             | 800               | 6                                    | NR                             | 930               | 0                                    | NR                             |
| 415               | 51                                   | NR                             | 545               | 530                                  | NR                             | 675               | 272                                  | NR                             | 805               | 5                                    | NR                             | 935               | 0                                    | NR                             |
| 420               | 111                                  | NR                             | 550               | 563                                  | NR                             | 680               | 236                                  | NR                             | 810               | 4                                    | NR                             | 940               | 0                                    | NR                             |
| 425               | 214                                  | NR                             | 555               | 605                                  | NR                             | 685               | 203                                  | NR                             | 815               | 4                                    | NR                             | 945               | 0                                    | NR                             |
| 430               | 339                                  | NR                             | 560               | 651                                  | NR                             | 690               | 175                                  | NR                             | 820               | 3                                    | NR                             | 950               | 0                                    | NR                             |
| 435               | 467                                  | NR                             | 565               | 705                                  | NR                             | 695               | 150                                  | NR                             | 825               | 3                                    | NR                             | 955               | 0                                    | NR                             |
| 440               | 535                                  | NR                             | 570               | 765                                  | NR                             | 700               | 128                                  | NR                             | 830               | 3                                    | NR                             | 960               | 0                                    | NR                             |
| 445               | 372                                  | NR                             | 575               | 824                                  | NR                             | 705               | 110                                  | NR                             | 835               | 2                                    | NR                             | 965               | 0                                    | NR                             |
| 450               | 160                                  | NR                             | 580               | 882                                  | NR                             | 710               | 94                                   | NR                             | 840               | 2                                    | NR                             | 970               | 0                                    | NR                             |
| 455               | 89                                   | NR                             | 585               | 930                                  | NR                             | 715               | 80                                   | NR                             | 845               | 2                                    | NR                             | 975               | 0                                    | NR                             |
| 460               | 53                                   | NR                             | 590               | 968                                  | NR                             | 720               | 69                                   | NR                             | 850               | 1                                    | NR                             | 980               | 0                                    | NR                             |
| 465               | 31                                   | NR                             | 595               | 991                                  | NR                             | 725               | 59                                   | NR                             | 855               | 1                                    | NR                             | 985               | 0                                    | NR                             |
| 470               | 23                                   | NR                             | 600               | 999                                  | NR                             | 730               | 50                                   | NR                             | 860               | 1                                    | NR                             | 990               | 0                                    | NR                             |
| 475               | 21                                   | NR                             | 605               | 992                                  | NR                             | 735               | 43                                   | NR                             | 865               | 1                                    | NR                             | 995               | 0                                    | NR                             |
| 480               | 23                                   | NR                             | 610               | 969                                  | NR                             | 740               | 36                                   | NR                             | 870               | 1                                    | NR                             | 1000              | 0                                    | NR                             |
| 485               | 32                                   | NR                             | 615               | 935                                  | NR                             | 745               | 31                                   | NR                             | 875               | 1                                    | NR                             |                   |                                      |                                |

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TM-30-18

### Summary

$R_f = 67.9$   
 $R_g = 98.6$   
 $CIE R_a = 71.1$   
 $R_g = -27.8$

### Spectral Power Distribution Comparison



### Color Vector Graphics



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 53 | CES51 = 75 | CES76 = 51 |
| CES02 = 63 | CES27 = 70 | CES52 = 80 | CES77 = 79 |
| CES03 = 31 | CES28 = 81 | CES53 = 64 | CES78 = 58 |
| CES04 = 71 | CES29 = 37 | CES54 = 73 | CES79 = 82 |
| CES05 = 50 | CES30 = 33 | CES55 = 69 | CES80 = 82 |
| CES06 = 52 | CES31 = 44 | CES56 = 60 | CES81 = 69 |
| CES07 = 42 | CES32 = 47 | CES57 = 54 | CES82 = 92 |
| CES08 = 41 | CES33 = 45 | CES58 = 59 | CES83 = 82 |
| CES09 = 29 | CES34 = 67 | CES59 = 85 | CES84 = 92 |
| CES10 = 77 | CES35 = 84 | CES60 = 86 | CES85 = 87 |
| CES11 = 60 | CES36 = 68 | CES61 = 86 | CES86 = 60 |
| CES12 = 66 | CES37 = 77 | CES62 = 59 | CES87 = 79 |
| CES13 = 44 | CES38 = 40 | CES63 = 66 | CES88 = 70 |
| CES14 = 74 | CES39 = 88 | CES64 = 69 | CES89 = 66 |
| CES15 = 72 | CES40 = 82 | CES65 = 64 | CES90 = 64 |
| CES16 = 48 | CES41 = 70 | CES66 = 65 | CES91 = 81 |
| CES17 = 51 | CES42 = 76 | CES67 = 64 | CES92 = 69 |
| CES18 = 57 | CES43 = 63 | CES68 = 73 | CES93 = 81 |
| CES19 = 73 | CES44 = 97 | CES69 = 83 | CES94 = 53 |
| CES20 = 67 | CES45 = 74 | CES70 = 64 | CES95 = 77 |
| CES21 = 88 | CES46 = 67 | CES71 = 60 | CES96 = 79 |
| CES22 = 80 | CES47 = 55 | CES72 = 87 | CES97 = 78 |
| CES23 = 92 | CES48 = 42 | CES73 = 57 | CES98 = 69 |
| CES24 = 92 | CES49 = 65 | CES74 = 84 | CES99 = 60 |
| CES25 = 73 | CES50 = 74 | CES75 = 60 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)