

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: P319097

Luminaire Tested: **GLEON-SA3D-750-U-T4W**

Issue Date: 3/3/2020

### Test Information

Test Method: LM-79-08  
Report Number: P319097  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-18)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA3D-750-U-T4W  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(3) 70 CRI, 5000K, 1200mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE IV WIDE OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

### Summary

Lumens per Lamp: N/A  
Luminaire Lumens: 23521 lumens  
Efficiency: N/A  
Efficacy: 123.1 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 1' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B3 - U0 - G4

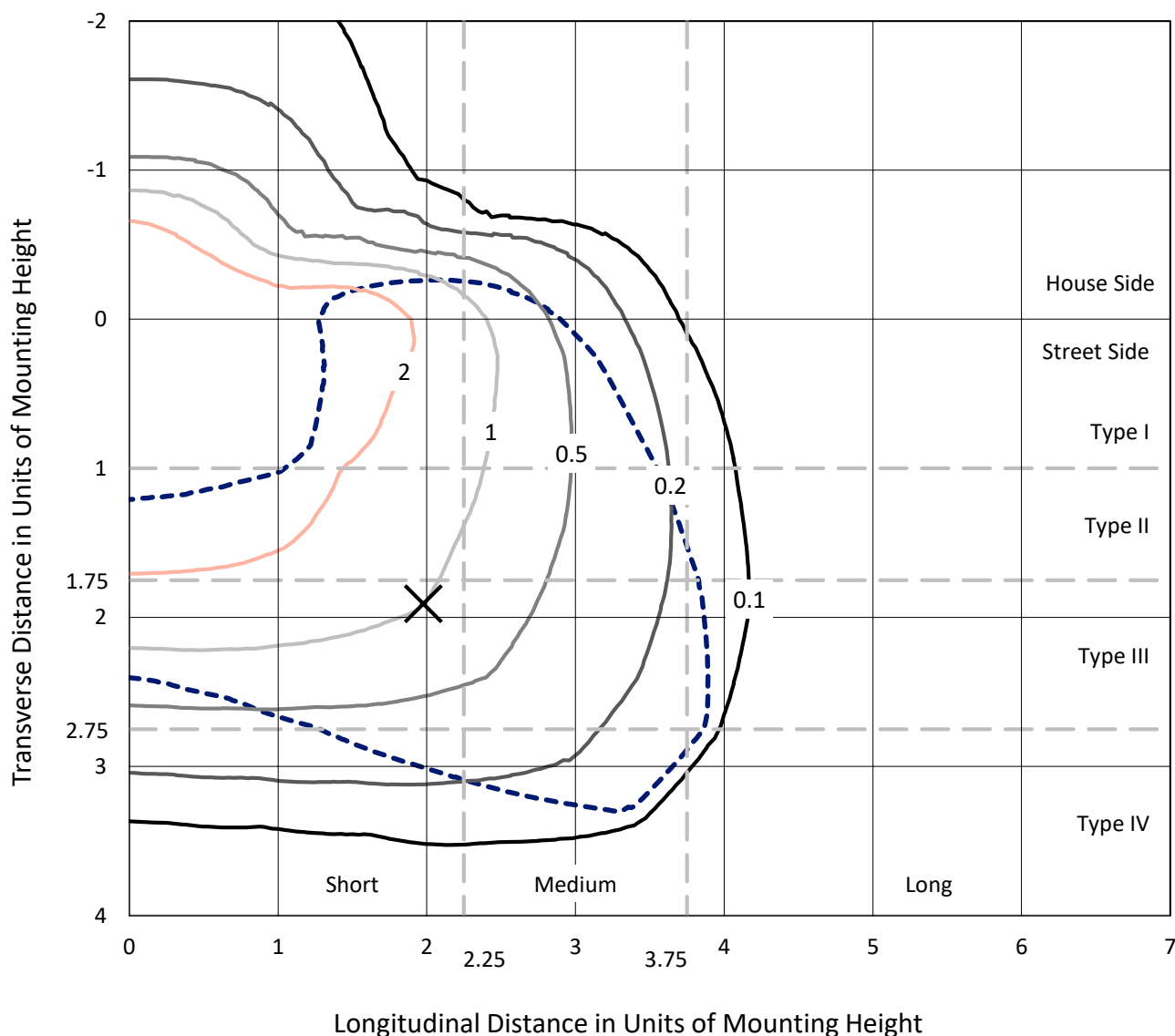
Input Watts (W): 191  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



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## Iso-Footcandle Lines of Horizontal Illumination

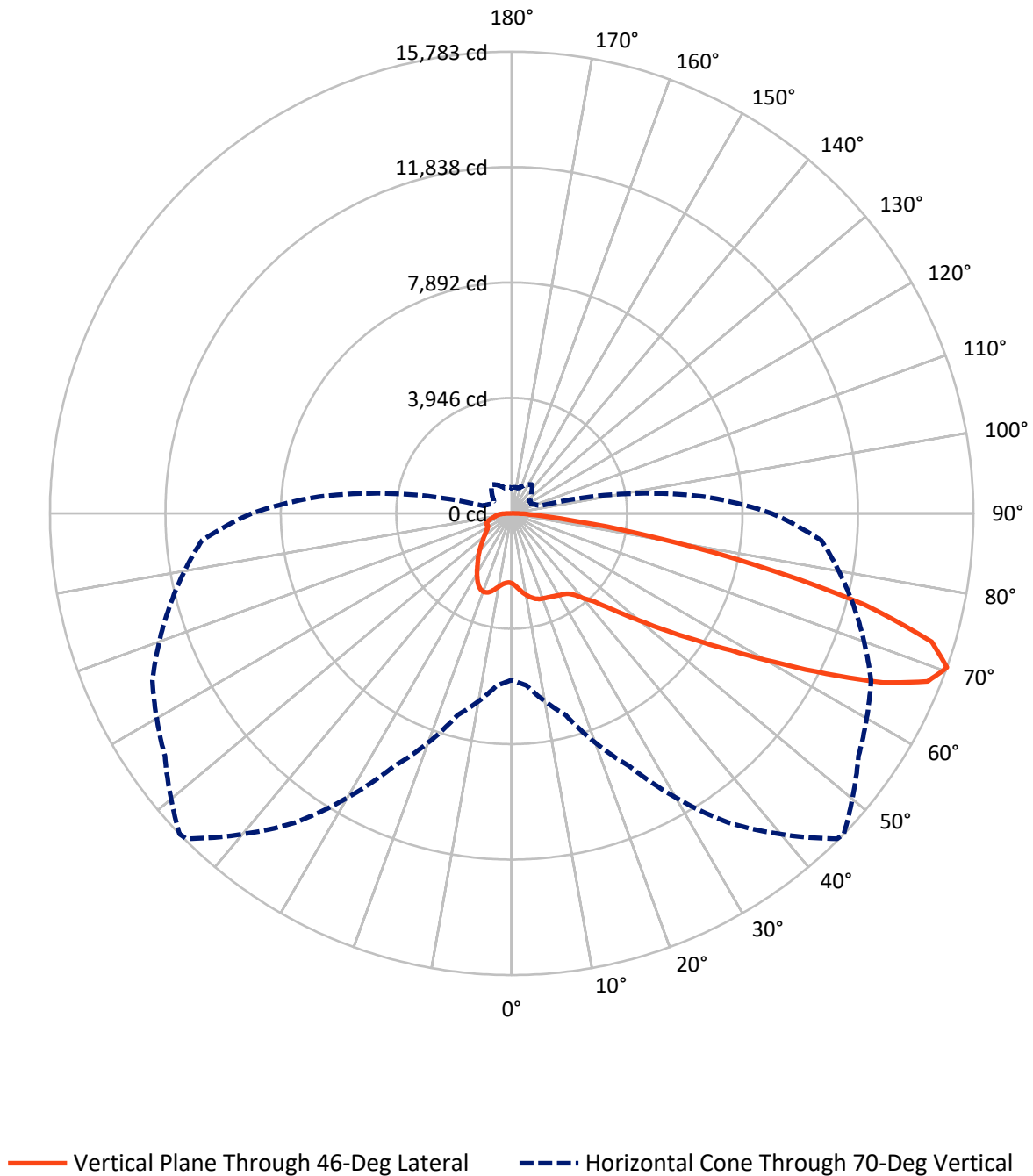
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 4.8 fc  
 Type IV - Short - N/A

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## Luminous Intensity Polar Plot



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CATALOG NUMBER: GLEON-SA3D-750-U-T4W

**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 5390.9   | 0.0    | 5390.9  |
|                    | % Fixture | 22.9     | 0.0    | 22.9    |
| <b>Street Side</b> | Lumens    | 18130.1  | 0.0    | 18130.1 |
|                    | % Fixture | 77.1     | 0.0    | 77.1    |
| <b>Total</b>       | Lumens    | 23521.0  | 0.0    | 23521.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 244.3   | 1.0       |
| 10°-20°   | 813.9   | 3.5       |
| 20°-30°   | 1357.1  | 5.8       |
| 30°-40°   | 1925.8  | 8.2       |
| 40°-50°   | 2832.7  | 12.0      |
| 50°-60°   | 4797.2  | 20.4      |
| 60°-70°   | 6809.5  | 29.0      |
| 70°-80°   | 4136.8  | 17.6      |
| 80°-90°   | 603.7   | 2.6       |
| 90°-100°  | 0.0     | 0.0       |
| 100°-110° | 0.0     | 0.0       |
| 110°-120° | 0.0     | 0.0       |
| 120°-130° | 0.0     | 0.0       |
| 130°-140° | 0.0     | 0.0       |
| 140°-150° | 0.0     | 0.0       |
| 150°-160° | 0.0     | 0.0       |
| 160°-170° | 0.0     | 0.0       |
| 170°-180° | 0.0     | 0.0       |
| 0°-90°    | 23521.0 | 100.0     |
| 0°-180°   | 23521.0 | 100.0     |

**Coefficient of Utilization**



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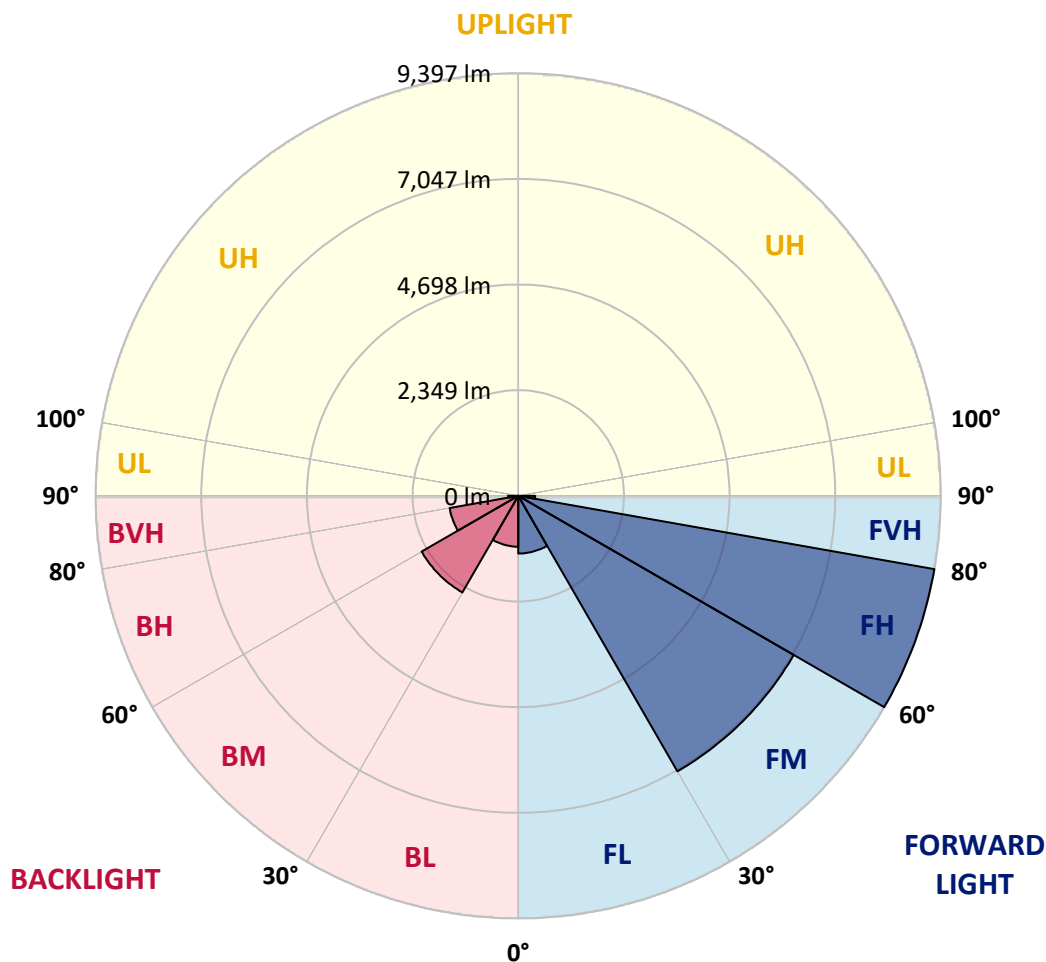
CATALOG NUMBER: GLEON-SA3D-750-U-T4W

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |          |
|------|-------------|--------|-----------|-------------------------|------|----------|
|      |             |        |           | B                       | U    | G        |
| FL   | (0°-30°)    | 1283.4 | 5.5       |                         |      |          |
| FM   | (30°-60°)   | 7074.1 | 30.1      |                         |      |          |
| FH   | (60°-80°)   | 9396.5 | 39.9      |                         |      | G4/12000 |
| FVH  | (80°-90°)   | 376.1  | 1.6       |                         |      | G3/500   |
| BL   | (0°-30°)    | 1131.8 | 4.8       | B3/2500                 |      |          |
| BM   | (30°-60°)   | 2481.6 | 10.6      | B2/2500                 |      |          |
| BH   | (60°-80°)   | 1549.8 | 6.6       | B3/2500                 |      | G3/2500  |
| BVH  | (80°-90°)   | 227.7  | 1.0       |                         |      | G3/500   |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |          |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |          |

**BUG Rating: B3-U0-G4**

Type IV Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°     | 25°     | 35°     | 45°     | 46°     | 55°     | 65°     | 75°     | 85°     |
|-------|--------|--------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 2396.3 | 2396.3 | 2396.3  | 2396.3  | 2396.3  | 2396.3  | 2396.3  | 2396.3  | 2396.3  | 2396.3  | 2396.3  |
| 2.5°  | 2516.3 | 2517.9 | 2521.1  | 2513.0  | 2490.5  | 2484.1  | 2481.7  | 2458.3  | 2443.0  | 2420.5  | 2401.2  |
| 5°    | 2717.5 | 2719.1 | 2714.3  | 2691.7  | 2641.8  | 2604.8  | 2601.6  | 2548.5  | 2500.2  | 2448.7  | 2410.0  |
| 7.5°  | 2927.6 | 2930.0 | 2914.7  | 2872.1  | 2802.0  | 2737.6  | 2733.6  | 2661.2  | 2587.9  | 2509.8  | 2451.9  |
| 10°   | 3113.5 | 3103.9 | 3078.9  | 3019.4  | 2936.4  | 2857.6  | 2854.3  | 2778.7  | 2694.2  | 2600.0  | 2522.7  |
| 12.5° | 3237.5 | 3229.5 | 3197.3  | 3124.8  | 3033.8  | 2961.4  | 2955.0  | 2884.9  | 2802.8  | 2699.8  | 2607.2  |
| 15°   | 3305.9 | 3311.6 | 3268.1  | 3186.0  | 3097.4  | 3036.3  | 3030.6  | 2980.7  | 2907.5  | 2803.6  | 2697.4  |
| 17.5° | 3314.8 | 3319.6 | 3277.7  | 3196.4  | 3124.0  | 3082.1  | 3079.7  | 3046.7  | 2993.6  | 2893.8  | 2782.7  |
| 20°   | 3263.3 | 3266.5 | 3231.9  | 3165.1  | 3117.6  | 3104.7  | 3103.9  | 3089.4  | 3049.9  | 2961.4  | 2853.5  |
| 22.5° | 3188.4 | 3190.8 | 3165.9  | 3117.6  | 3101.5  | 3121.6  | 3127.2  | 3121.6  | 3093.4  | 3010.5  | 2909.1  |
| 25°   | 3169.9 | 3168.3 | 3142.5  | 3093.4  | 3107.1  | 3149.8  | 3157.0  | 3159.4  | 3140.1  | 3067.7  | 2979.9  |
| 27.5° | 3259.2 | 3253.6 | 3204.5  | 3125.6  | 3134.5  | 3186.0  | 3195.6  | 3219.0  | 3206.9  | 3143.3  | 3060.4  |
| 30°   | 3517.6 | 3508.0 | 3407.3  | 3248.0  | 3204.5  | 3231.1  | 3243.1  | 3280.2  | 3282.6  | 3229.5  | 3167.5  |
| 32.5° | 3953.9 | 3941.8 | 3761.5  | 3476.6  | 3322.8  | 3276.9  | 3288.2  | 3343.8  | 3373.5  | 3332.5  | 3265.7  |
| 35°   | 4505.3 | 4491.6 | 4255.0  | 3865.4  | 3520.8  | 3364.7  | 3372.7  | 3417.0  | 3476.6  | 3418.6  | 3330.1  |
| 37.5° | 5080.0 | 5047.0 | 4819.2  | 4322.6  | 3835.6  | 3552.2  | 3552.2  | 3557.9  | 3586.0  | 3465.3  | 3405.7  |
| 40°   | 5651.5 | 5618.5 | 5412.5  | 4860.3  | 4242.9  | 3847.7  | 3829.1  | 3704.4  | 3681.8  | 3578.0  | 3557.9  |
| 42.5° | 6182.8 | 6173.1 | 6051.6  | 5468.0  | 4721.0  | 4138.2  | 4112.5  | 3900.8  | 3905.6  | 3841.2  | 3842.0  |
| 45°   | 6747.9 | 6747.9 | 6648.9  | 6081.4  | 5278.0  | 4605.1  | 4579.3  | 4267.8  | 4316.1  | 4286.3  | 4358.0  |
| 47.5° | 7209.1 | 7223.6 | 7209.9  | 6720.5  | 5926.0  | 5198.4  | 5151.7  | 4776.6  | 4911.8  | 5014.0  | 5222.5  |
| 50°   | 7680.0 | 7702.5 | 7705.0  | 7421.6  | 6709.2  | 5903.5  | 5850.4  | 5451.9  | 5753.8  | 6046.8  | 6456.5  |
| 52.5° | 8363.4 | 8414.1 | 8212.1  | 8121.1  | 7668.7  | 6740.6  | 6688.3  | 6320.4  | 6824.3  | 7235.7  | 7941.6  |
| 55°   | 8996.9 | 8952.6 | 8808.5  | 8864.9  | 8695.9  | 7693.7  | 7654.2  | 7331.5  | 8017.3  | 8551.8  | 9468.6  |
| 57.5° | 9339.8 | 9336.6 | 9481.5  | 9723.0  | 9803.5  | 8868.9  | 8835.9  | 8522.0  | 9362.3  | 9764.0  | 10902.2 |
| 60°   | 9742.3 | 9747.9 | 10106.9 | 10655.1 | 10986.7 | 10332.3 | 10317.8 | 10079.6 | 10668.8 | 10895.8 | 12026.7 |
| 62.5° | 9798.6 | 9900.1 | 10518.3 | 11461.7 | 12094.3 | 12042.0 | 12074.2 | 11482.6 | 11837.6 | 11798.9 | 12866.3 |
| 65°   | 9150.6 | 9284.3 | 10403.1 | 11705.6 | 13195.5 | 13911.9 | 13941.7 | 12893.7 | 12759.2 | 12570.9 | 13166.5 |
| 67.5° | 7822.5 | 8020.5 | 9236.0  | 11175.1 | 13558.5 | 15294.0 | 15335.9 | 13987.6 | 13523.9 | 12832.5 | 12443.7 |
| 70°   | 5692.6 | 5912.3 | 7135.9  | 9544.3  | 12911.4 | 15735.9 | 15783.4 | 14471.4 | 13552.9 | 12087.9 | 10622.9 |
| 72.5° | 3438.7 | 3611.0 | 4619.6  | 7026.4  | 10897.4 | 14931.0 | 15015.5 | 13858.0 | 12373.7 | 10238.9 | 7844.2  |
| 75°   | 1510.1 | 1622.8 | 2233.7  | 4048.9  | 7801.6  | 12353.5 | 12459.0 | 11861.7 | 10053.8 | 7440.9  | 4636.5  |
| 77.5° | 643.2  | 675.4  | 916.0   | 1758.8  | 4410.3  | 8441.5  | 8586.4  | 8666.9  | 6821.1  | 4048.9  | 1959.2  |
| 80°   | 400.9  | 413.7  | 518.4   | 796.1   | 2063.9  | 4741.1  | 4897.3  | 5099.3  | 3387.2  | 1488.3  | 684.2   |
| 82.5° | 243.9  | 258.4  | 344.5   | 481.4   | 1074.6  | 2149.2  | 2224.1  | 2366.5  | 1314.5  | 643.2   | 354.2   |
| 85°   | 146.5  | 157.0  | 210.9   | 304.3   | 611.8   | 845.2   | 844.4   | 933.7   | 619.0   | 413.7   | 186.7   |
| 87.5° | 70.0   | 78.1   | 112.7   | 157.8   | 308.3   | 317.1   | 297.0   | 336.5   | 375.9   | 271.3   | 94.2    |
| 90°   | 0.0    | 0.0    | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |



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CATALOG NUMBER: GLEON-SA3D-750-U-T4W

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 2396.3  | 2396.3 | 2396.3 | 2396.3 | 2396.3 | 2396.3 | 2396.3 | 2396.3 | 2396.3 | 2396.3 | 2396.3 |
| 2.5°  | 2394.7  | 2391.5 | 2381.0 | 2373.0 | 2371.4 | 2366.5 | 2362.5 | 2364.9 | 2368.2 | 2369.0 | 2369.0 |
| 5°    | 2393.9  | 2385.1 | 2371.4 | 2365.7 | 2373.0 | 2382.6 | 2394.7 | 2410.8 | 2420.5 | 2427.7 | 2432.6 |
| 7.5°  | 2432.6  | 2415.6 | 2400.4 | 2397.1 | 2411.6 | 2437.4 | 2464.8 | 2498.6 | 2521.9 | 2538.0 | 2541.2 |
| 10°   | 2496.9  | 2476.0 | 2460.7 | 2463.9 | 2489.7 | 2526.7 | 2565.4 | 2608.8 | 2644.3 | 2666.0 | 2667.6 |
| 12.5° | 2571.0  | 2550.9 | 2536.4 | 2550.1 | 2592.7 | 2637.8 | 2678.1 | 2715.9 | 2748.1 | 2769.8 | 2769.8 |
| 15°   | 2656.3  | 2641.8 | 2624.9 | 2656.3 | 2714.3 | 2754.5 | 2771.4 | 2789.9 | 2807.7 | 2823.8 | 2820.5 |
| 17.5° | 2738.4  | 2724.7 | 2715.9 | 2752.9 | 2813.3 | 2831.8 | 2820.5 | 2806.9 | 2806.9 | 2815.7 | 2817.3 |
| 20°   | 2809.3  | 2797.2 | 2802.8 | 2839.1 | 2870.4 | 2851.1 | 2809.3 | 2765.8 | 2748.1 | 2752.9 | 2757.8 |
| 22.5° | 2871.2  | 2865.6 | 2882.5 | 2899.4 | 2876.9 | 2809.3 | 2732.0 | 2673.2 | 2651.5 | 2649.9 | 2651.5 |
| 25°   | 2943.7  | 2942.9 | 2963.8 | 2933.2 | 2833.4 | 2708.6 | 2604.8 | 2547.7 | 2535.6 | 2545.2 | 2561.3 |
| 27.5° | 3033.8  | 3042.7 | 3053.2 | 2941.3 | 2744.9 | 2556.5 | 2451.1 | 2411.6 | 2423.7 | 2447.0 | 2462.3 |
| 30°   | 3149.0  | 3173.1 | 3150.6 | 2921.2 | 2617.7 | 2382.6 | 2282.0 | 2270.8 | 2303.8 | 2336.8 | 2352.9 |
| 32.5° | 3260.8  | 3298.7 | 3243.9 | 2868.8 | 2453.5 | 2198.3 | 2120.2 | 2117.0 | 2157.3 | 2189.5 | 2212.0 |
| 35°   | 3351.0  | 3425.9 | 3314.0 | 2765.0 | 2263.5 | 2028.5 | 1971.3 | 1949.6 | 1964.1 | 2001.9 | 2027.7 |
| 37.5° | 3468.5  | 3593.3 | 3362.3 | 2606.4 | 2057.4 | 1888.4 | 1821.6 | 1771.7 | 1758.8 | 1774.1 | 1787.0 |
| 40°   | 3683.4  | 3848.5 | 3384.8 | 2385.1 | 1856.2 | 1748.3 | 1680.7 | 1607.5 | 1556.8 | 1519.7 | 1520.5 |
| 42.5° | 4034.4  | 4180.9 | 3370.3 | 2116.2 | 1670.3 | 1611.5 | 1535.0 | 1450.5 | 1368.4 | 1284.7 | 1278.3 |
| 45°   | 4604.3  | 4675.1 | 3326.8 | 1831.3 | 1506.9 | 1468.2 | 1396.6 | 1312.1 | 1202.6 | 1107.6 | 1098.8 |
| 47.5° | 5516.3  | 5359.3 | 3259.2 | 1582.5 | 1362.8 | 1346.7 | 1280.7 | 1183.3 | 1067.4 | 990.9  | 984.5  |
| 50°   | 6760.0  | 6347.0 | 3226.2 | 1384.5 | 1235.6 | 1240.4 | 1186.5 | 1083.5 | 974.0  | 917.6  | 911.2  |
| 52.5° | 8247.5  | 7497.3 | 3289.8 | 1231.6 | 1133.4 | 1150.3 | 1110.0 | 1013.4 | 921.7  | 877.4  | 871.0  |
| 55°   | 9790.6  | 8688.6 | 3358.2 | 1120.5 | 1036.8 | 1069.8 | 1056.1 | 976.4  | 893.5  | 852.4  | 846.8  |
| 57.5° | 11111.5 | 9578.1 | 3221.4 | 1030.3 | 950.6  | 1002.2 | 1014.2 | 953.1  | 879.0  | 842.0  | 835.5  |
| 60°   | 11943.0 | 9936.3 | 2862.4 | 945.8  | 882.2  | 948.2  | 990.1  | 946.6  | 884.6  | 881.4  | 876.6  |
| 62.5° | 12337.4 | 9904.9 | 2323.9 | 879.0  | 839.6  | 924.9  | 1007.8 | 982.8  | 949.0  | 978.0  | 980.4  |
| 65°   | 12160.3 | 9431.6 | 1730.6 | 834.7  | 809.0  | 933.7  | 1060.9 | 1051.3 | 967.5  | 996.5  | 1000.6 |
| 67.5° | 10994.8 | 8302.2 | 1281.5 | 796.1  | 775.2  | 958.7  | 1157.5 | 1073.8 | 931.3  | 952.3  | 939.4  |
| 70°   | 8886.6  | 6582.1 | 988.5  | 752.6  | 740.6  | 955.5  | 1201.0 | 1060.1 | 891.9  | 896.7  | 862.1  |
| 72.5° | 6128.1  | 4488.4 | 804.1  | 712.4  | 690.6  | 871.0  | 1170.4 | 1026.3 | 858.9  | 821.9  | 776.0  |
| 75°   | 3332.5  | 2409.2 | 683.4  | 670.5  | 602.9  | 764.7  | 1114.0 | 1002.2 | 829.1  | 780.0  | 754.2  |
| 77.5° | 1311.3  | 999.7  | 593.2  | 613.4  | 527.2  | 675.4  | 1051.3 | 956.3  | 788.0  | 723.6  | 710.8  |
| 80°   | 535.3   | 510.3  | 491.8  | 530.5  | 453.2  | 590.8  | 975.6  | 902.3  | 738.9  | 671.3  | 645.6  |
| 82.5° | 303.5   | 317.1  | 382.4  | 418.6  | 367.9  | 544.1  | 939.4  | 858.9  | 680.2  | 601.3  | 570.7  |
| 85°   | 155.4   | 185.9  | 266.4  | 300.2  | 270.5  | 462.8  | 865.3  | 751.8  | 545.8  | 460.4  | 462.8  |
| 87.5° | 74.9    | 103.8  | 168.2  | 188.4  | 175.5  | 334.9  | 646.4  | 544.9  | 425.0  | 336.5  | 326.0  |
| 90°   | 0.0     | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

LM-79-2008: Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Report Prepared for

Cooper Lighting Solutions

McGRAW-EDISON

Report Number: SP1-1908-441-4-R4

Test Date: 10/02/2019

Luminaire Tested: SA1C-750-U-5WQ

Data in this report applies to families of products SA1C-760-U-5WQ .

### Test Information

Test Method: LM-79-2008  
 Report Number: SP1-1908-441-4-R4  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry:  $4\pi$   
 Issue Date: 10/28/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: MCGRAW-EDISON  
 Catalog Number: **SA1C-750-U-5WQ**  
 Description: MCGRAW EDISON ROADWAY AND AREA LUMINAIRE

\*\*\*THIS IS A REVISION OF SP1-1908-441-4-R3. TO UPDATE THE CATALOG INFORMATION.\*\*\*TESTED IN SITU. ROADWAY AND AREA LUMINAIRE. (1) 70 CRI, 5000K, 1050MA LIGHTSQUARE WITH 16 LEDS AND TYPE V WIDE OPTICS.

### Spectral Parameters

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 4884   | CRI (Ra): | 73.5 |      |       |
| CIE u':                   | 0.2101 | R1:       | 70.5 | R9:  | -28.4 |
| CIE v':                   | 0.4904 | R2:       | 77.7 | R10: | 48.6  |
| Duv:                      | 0.0037 | R3:       | 84.6 | R11: | 73.2  |
| CIE x:                    | 0.3493 | R4:       | 74.7 | R12: | 50.7  |
| CIE y:                    | 0.3624 | R5:       | 71.9 | R13: | 71.2  |
| CIE z:                    | 0.2884 | R6:       | 70.7 | R14: | 91.4  |
| Peak Wavelength (nm):     | 444    | R7:       | 81.2 |      |       |
| Dominant Wavelength (nm): | 571    | R8:       | 56.9 |      |       |
| Purity:                   | 13.7   |           |      |      |       |
| Rf:                       | 74.9   |           |      |      |       |
| Rg:                       | 96.3   |           |      |      |       |



REPORT NUMBER: SP1-1908-441-4-R4

| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 6/28/2019        | 12/28/2019           |
| Power Meter                    | IN0071                | 12/5/2018        | 12/5/2019            |
| AC Power Source                | IN0063                | 12/5/2018        | 12/5/2019            |
| DC Power Source                | IN0208                | 12/5/2018        | 12/5/2019            |
| Sphere Thermometer             | IN0085                | 12/5/2018        | 12/5/2019            |
| Room Thermometer               | IN0046                | 12/5/2018        | 12/5/2019            |

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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 5000K 4-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       | 2945             | NR               | 490       | 37941            | NR               | 620       | 88803            | NR               | 750       | 3908             | NR               | 880       | 2997             | NR               |
| 365       | 2596             | NR               | 495       | 48525            | NR               | 625       | 80578            | NR               | 755       | 3988             | NR               | 885       | 2927             | NR               |
| 370       | 2732             | NR               | 500       | 60609            | NR               | 630       | 73127            | NR               | 760       | 3335             | NR               | 890       | 2649             | NR               |
| 375       | 2894             | NR               | 505       | 72036            | NR               | 635       | 66244            | NR               | 765       | 3438             | NR               | 895       | 2828             | NR               |
| 380       | 2822             | NR               | 510       | 82168            | NR               | 640       | 59440            | NR               | 770       | 3427             | NR               | 900       | 1407             | NR               |
| 385       | 2394             | NR               | 515       | 90898            | NR               | 645       | 52864            | NR               | 775       | 2759             | NR               | 905       | 2224             | NR               |
| 390       | 2370             | NR               | 520       | 97142            | NR               | 650       | 47085            | NR               | 780       | 2340             | NR               | 910       | 2905             | NR               |
| 395       | 2267             | NR               | 525       | 103255           | NR               | 655       | 41789            | NR               | 785       | 2412             | NR               | 915       | 3350             | NR               |
| 400       | 2262             | NR               | 530       | 106697           | NR               | 660       | 37064            | NR               | 790       | 1999             | NR               | 920       | 3114             | NR               |
| 405       | 3000             | NR               | 535       | 110081           | NR               | 665       | 32299            | NR               | 795       | 2054             | NR               | 925       | 2834             | NR               |
| 410       | 5324             | NR               | 540       | 112494           | NR               | 670       | 28142            | NR               | 800       | 2331             | NR               | 930       | 2271             | NR               |
| 415       | 10725            | NR               | 545       | 115513           | NR               | 675       | 24505            | NR               | 805       | 2648             | NR               | 935       | 2228             | NR               |
| 420       | 22128            | NR               | 550       | 117203           | NR               | 680       | 21162            | NR               | 810       | 2485             | NR               | 940       | 2833             | NR               |
| 425       | 44095            | NR               | 555       | 119753           | NR               | 685       | 18400            | NR               | 815       | 2409             | NR               | 945       | 2941             | NR               |
| 430       | 77002            | NR               | 560       | 122602           | NR               | 690       | 16065            | NR               | 820       | 2221             | NR               | 950       | 2323             | NR               |
| 435       | 119881           | NR               | 565       | 124314           | NR               | 695       | 13860            | NR               | 825       | 1562             | NR               | 955       | 1667             | NR               |
| 440       | 164454           | NR               | 570       | 126775           | NR               | 700       | 12177            | NR               | 830       | 2249             | NR               | 960       | 749              | NR               |
| 445       | 179997           | NR               | 575       | 127511           | NR               | 705       | 10757            | NR               | 835       | 2573             | NR               | 965       | 2669             | NR               |
| 450       | 142822           | NR               | 580       | 127577           | NR               | 710       | 9601             | NR               | 840       | 2764             | NR               | 970       | 3968             | NR               |
| 455       | 90008            | NR               | 585       | 126153           | NR               | 715       | 8944             | NR               | 845       | 3109             | NR               | 975       | 3886             | NR               |
| 460       | 60557            | NR               | 590       | 123678           | NR               | 720       | 7947             | NR               | 850       | 2963             | NR               | 980       | 2788             | NR               |
| 465       | 43305            | NR               | 595       | 119774           | NR               | 725       | 7062             | NR               | 855       | 2336             | NR               | 985       | 3496             | NR               |
| 470       | 31089            | NR               | 600       | 115733           | NR               | 730       | 6004             | NR               | 860       | 2118             | NR               | 990       | 2913             | NR               |
| 475       | 26278            | NR               | 605       | 109231           | NR               | 735       | 5594             | NR               | 865       | 3144             | NR               | 995       | 4659             | NR               |
| 480       | 27060            | NR               | 610       | 102408           | NR               | 740       | 5165             | NR               | 870       | 3069             | NR               | 1000      | 1308             | NR               |
| 485       | 30698            | NR               | 615       | 96015            | NR               | 745       | 4687             | NR               | 875       | 3311             | NR               |           |                  |                  |

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Scotopic Flux vs. Wavelength



Scotopic Lumens: 13493.5

S/P: 1.77

| 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       | 2945             | NR               | 490       | 37941            | NR               | 620       | 88803            | NR               | 750       | 3908             | NR               | 880       | 2997             | NR               |
| 365       | 2596             | NR               | 495       | 48525            | NR               | 625       | 80578            | NR               | 755       | 3988             | NR               | 885       | 2927             | NR               |
| 370       | 2732             | NR               | 500       | 60609            | NR               | 630       | 73127            | NR               | 760       | 3335             | NR               | 890       | 2649             | NR               |
| 375       | 2894             | NR               | 505       | 72036            | NR               | 635       | 66244            | NR               | 765       | 3438             | NR               | 895       | 2828             | NR               |
| 380       | 2822             | NR               | 510       | 82168            | NR               | 640       | 59440            | NR               | 770       | 3427             | NR               | 900       | 1407             | NR               |
| 385       | 2394             | NR               | 515       | 90898            | NR               | 645       | 52864            | NR               | 775       | 2759             | NR               | 905       | 2224             | NR               |
| 390       | 2370             | NR               | 520       | 97142            | NR               | 650       | 47085            | NR               | 780       | 2340             | NR               | 910       | 2905             | NR               |
| 395       | 2267             | NR               | 525       | 103255           | NR               | 655       | 41789            | NR               | 785       | 2412             | NR               | 915       | 3350             | NR               |
| 400       | 2262             | NR               | 530       | 106697           | NR               | 660       | 37064            | NR               | 790       | 1999             | NR               | 920       | 3114             | NR               |
| 405       | 3000             | NR               | 535       | 110081           | NR               | 665       | 32299            | NR               | 795       | 2054             | NR               | 925       | 2834             | NR               |
| 410       | 5324             | NR               | 540       | 112494           | NR               | 670       | 28142            | NR               | 800       | 2331             | NR               | 930       | 2271             | NR               |
| 415       | 10725            | NR               | 545       | 115513           | NR               | 675       | 24505            | NR               | 805       | 2648             | NR               | 935       | 2228             | NR               |
| 420       | 22128            | NR               | 550       | 117203           | NR               | 680       | 21162            | NR               | 810       | 2485             | NR               | 940       | 2833             | NR               |
| 425       | 44095            | NR               | 555       | 119753           | NR               | 685       | 18400            | NR               | 815       | 2409             | NR               | 945       | 2941             | NR               |
| 430       | 77002            | NR               | 560       | 122602           | NR               | 690       | 16065            | NR               | 820       | 2221             | NR               | 950       | 2323             | NR               |
| 435       | 119881           | NR               | 565       | 124314           | NR               | 695       | 13860            | NR               | 825       | 1562             | NR               | 955       | 1667             | NR               |
| 440       | 164454           | NR               | 570       | 126775           | NR               | 700       | 12177            | NR               | 830       | 2249             | NR               | 960       | 749              | NR               |
| 445       | 179997           | NR               | 575       | 127511           | NR               | 705       | 10757            | NR               | 835       | 2573             | NR               | 965       | 2669             | NR               |
| 450       | 142822           | NR               | 580       | 127577           | NR               | 710       | 9601             | NR               | 840       | 2764             | NR               | 970       | 3968             | NR               |
| 455       | 90008            | NR               | 585       | 126153           | NR               | 715       | 8944             | NR               | 845       | 3109             | NR               | 975       | 3886             | NR               |
| 460       | 60557            | NR               | 590       | 123678           | NR               | 720       | 7947             | NR               | 850       | 2963             | NR               | 980       | 2788             | NR               |
| 465       | 43305            | NR               | 595       | 119774           | NR               | 725       | 7062             | NR               | 855       | 2336             | NR               | 985       | 3496             | NR               |
| 470       | 31089            | NR               | 600       | 115733           | NR               | 730       | 6004             | NR               | 860       | 2118             | NR               | 990       | 2913             | NR               |
| 475       | 26278            | NR               | 605       | 109231           | NR               | 735       | 5594             | NR               | 865       | 3144             | NR               | 995       | 4659             | NR               |
| 480       | 27060            | NR               | 610       | 102408           | NR               | 740       | 5165             | NR               | 870       | 3069             | NR               | 1000      | 1308             | NR               |
| 485       | 30698            | NR               | 615       | 96015            | NR               | 745       | 4687             | NR               | 875       | 3311             | NR               |           |                  |                  |

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**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 5378.9**

**M/P: 0.71**

| 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       | 2945             | NR               | 490       | 37941            | NR               | 620       | 88803            | NR               | 750       | 3908             | NR               | 880       | 2997             | NR               |
| 365       | 2596             | NR               | 495       | 48525            | NR               | 625       | 80578            | NR               | 755       | 3988             | NR               | 885       | 2927             | NR               |
| 370       | 2732             | NR               | 500       | 60609            | NR               | 630       | 73127            | NR               | 760       | 3335             | NR               | 890       | 2649             | NR               |
| 375       | 2894             | NR               | 505       | 72036            | NR               | 635       | 66244            | NR               | 765       | 3438             | NR               | 895       | 2828             | NR               |
| 380       | 2822             | NR               | 510       | 82168            | NR               | 640       | 59440            | NR               | 770       | 3427             | NR               | 900       | 1407             | NR               |
| 385       | 2394             | NR               | 515       | 90898            | NR               | 645       | 52864            | NR               | 775       | 2759             | NR               | 905       | 2224             | NR               |
| 390       | 2370             | NR               | 520       | 97142            | NR               | 650       | 47085            | NR               | 780       | 2340             | NR               | 910       | 2905             | NR               |
| 395       | 2267             | NR               | 525       | 103255           | NR               | 655       | 41789            | NR               | 785       | 2412             | NR               | 915       | 3350             | NR               |
| 400       | 2262             | NR               | 530       | 106697           | NR               | 660       | 37064            | NR               | 790       | 1999             | NR               | 920       | 3114             | NR               |
| 405       | 3000             | NR               | 535       | 110081           | NR               | 665       | 32299            | NR               | 795       | 2054             | NR               | 925       | 2834             | NR               |
| 410       | 5324             | NR               | 540       | 112494           | NR               | 670       | 28142            | NR               | 800       | 2331             | NR               | 930       | 2271             | NR               |
| 415       | 10725            | NR               | 545       | 115513           | NR               | 675       | 24505            | NR               | 805       | 2648             | NR               | 935       | 2228             | NR               |
| 420       | 22128            | NR               | 550       | 117203           | NR               | 680       | 21162            | NR               | 810       | 2485             | NR               | 940       | 2833             | NR               |
| 425       | 44095            | NR               | 555       | 119753           | NR               | 685       | 18400            | NR               | 815       | 2409             | NR               | 945       | 2941             | NR               |
| 430       | 77002            | NR               | 560       | 122602           | NR               | 690       | 16065            | NR               | 820       | 2221             | NR               | 950       | 2323             | NR               |
| 435       | 119881           | NR               | 565       | 124314           | NR               | 695       | 13860            | NR               | 825       | 1562             | NR               | 955       | 1667             | NR               |
| 440       | 164454           | NR               | 570       | 126775           | NR               | 700       | 12177            | NR               | 830       | 2249             | NR               | 960       | 749              | NR               |
| 445       | 179997           | NR               | 575       | 127511           | NR               | 705       | 10757            | NR               | 835       | 2573             | NR               | 965       | 2669             | NR               |
| 450       | 142822           | NR               | 580       | 127577           | NR               | 710       | 9601             | NR               | 840       | 2764             | NR               | 970       | 3968             | NR               |
| 455       | 90008            | NR               | 585       | 126153           | NR               | 715       | 8944             | NR               | 845       | 3109             | NR               | 975       | 3886             | NR               |
| 460       | 60557            | NR               | 590       | 123678           | NR               | 720       | 7947             | NR               | 850       | 2963             | NR               | 980       | 2788             | NR               |
| 465       | 43305            | NR               | 595       | 119774           | NR               | 725       | 7062             | NR               | 855       | 2336             | NR               | 985       | 3496             | NR               |
| 470       | 31089            | NR               | 600       | 115733           | NR               | 730       | 6004             | NR               | 860       | 2118             | NR               | 990       | 2913             | NR               |
| 475       | 26278            | NR               | 605       | 109231           | NR               | 735       | 5594             | NR               | 865       | 3144             | NR               | 995       | 4659             | NR               |
| 480       | 27060            | NR               | 610       | 102408           | NR               | 740       | 5165             | NR               | 870       | 3069             | NR               | 1000      | 1308             | NR               |
| 485       | 30698            | NR               | 615       | 96015            | NR               | 745       | 4687             | NR               | 875       | 3311             | NR               |           |                  |                  |

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**TM-30-18**

**Summary**

$R_f = 74.9$   
 $R_g = 96.3$   
 CIE  $R_a = 73.5$   
 $R_g = -28.4$

**Spectral Power Distribution Comparison**



**Color Vector Graphics**



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 61 | CES51 = 90 | CES76 = 52 |
| CES02 = 60 | CES27 = 84 | CES52 = 91 | CES77 = 71 |
| CES03 = 30 | CES28 = 81 | CES53 = 79 | CES78 = 54 |
| CES04 = 69 | CES29 = 58 | CES54 = 83 | CES79 = 80 |
| CES05 = 46 | CES30 = 67 | CES55 = 83 | CES80 = 77 |
| CES06 = 50 | CES31 = 63 | CES56 = 73 | CES81 = 77 |
| CES07 = 39 | CES32 = 59 | CES57 = 72 | CES82 = 90 |
| CES08 = 38 | CES33 = 69 | CES58 = 73 | CES83 = 86 |
| CES09 = 29 | CES34 = 69 | CES59 = 88 | CES84 = 88 |
| CES10 = 73 | CES35 = 83 | CES60 = 93 | CES85 = 84 |
| CES11 = 56 | CES36 = 95 | CES61 = 88 | CES86 = 75 |
| CES12 = 61 | CES37 = 78 | CES62 = 85 | CES87 = 78 |
| CES13 = 41 | CES38 = 76 | CES63 = 77 | CES88 = 79 |
| CES14 = 74 | CES39 = 93 | CES64 = 74 | CES89 = 75 |
| CES15 = 70 | CES40 = 86 | CES65 = 67 | CES90 = 77 |
| CES16 = 46 | CES41 = 87 | CES66 = 69 | CES91 = 89 |
| CES17 = 49 | CES42 = 78 | CES67 = 67 | CES92 = 66 |
| CES18 = 55 | CES43 = 75 | CES68 = 73 | CES93 = 80 |
| CES19 = 71 | CES44 = 99 | CES69 = 81 | CES94 = 57 |
| CES20 = 64 | CES45 = 83 | CES70 = 63 | CES95 = 71 |
| CES21 = 85 | CES46 = 81 | CES71 = 60 | CES96 = 78 |
| CES22 = 77 | CES47 = 80 | CES72 = 86 | CES97 = 85 |
| CES23 = 91 | CES48 = 72 | CES73 = 53 | CES98 = 75 |
| CES24 = 90 | CES49 = 81 | CES74 = 96 | CES99 = 62 |
| CES25 = 71 | CES50 = 89 | CES75 = 58 |            |



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**Color Rendition by Hue-Angle Bin**



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**Measure Comparisons**



(END OF REPORT)