

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: P383520

Luminaire Tested: **GLEON-SA8A-735-U-T4W-HSS**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P383520  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-19)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA8A-735-U-T4W-HSS  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(8) 70 CRI, 3500K, 615mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE IV WIDE OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 25217 lumens  
Efficiency: N/A  
Efficacy: 98.1 lumens/watt  
Luminous Opening: Rectangular (W 2' x L: 1' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B2 - U0 - G4

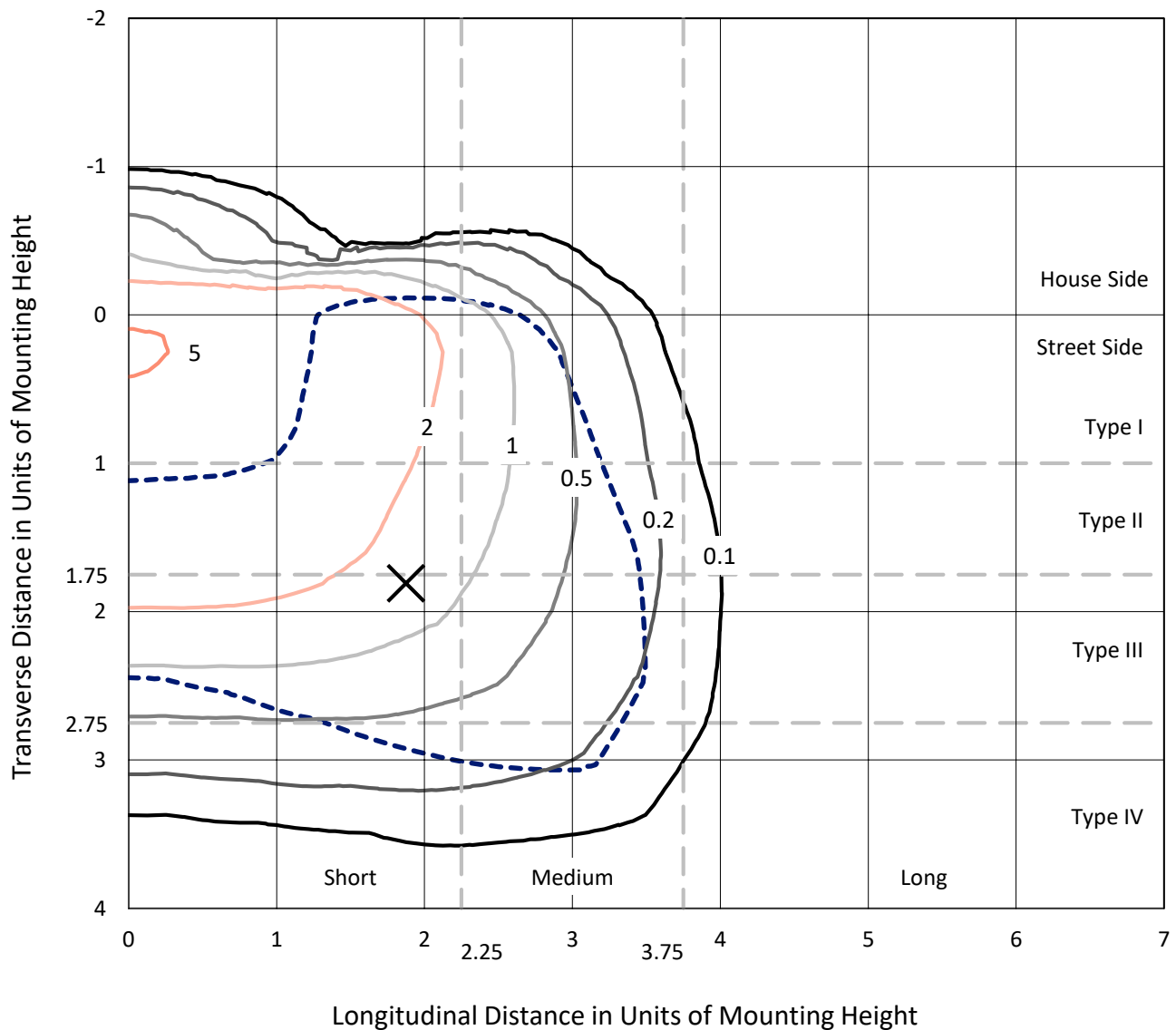
Input Watts (W): 257  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



REPORT NUMBER: P383520  
 CATALOG NUMBER: GLEON-SA8A-735-U-T4W-HSS

## Iso-Footcandle Lines of Horizontal Illumination

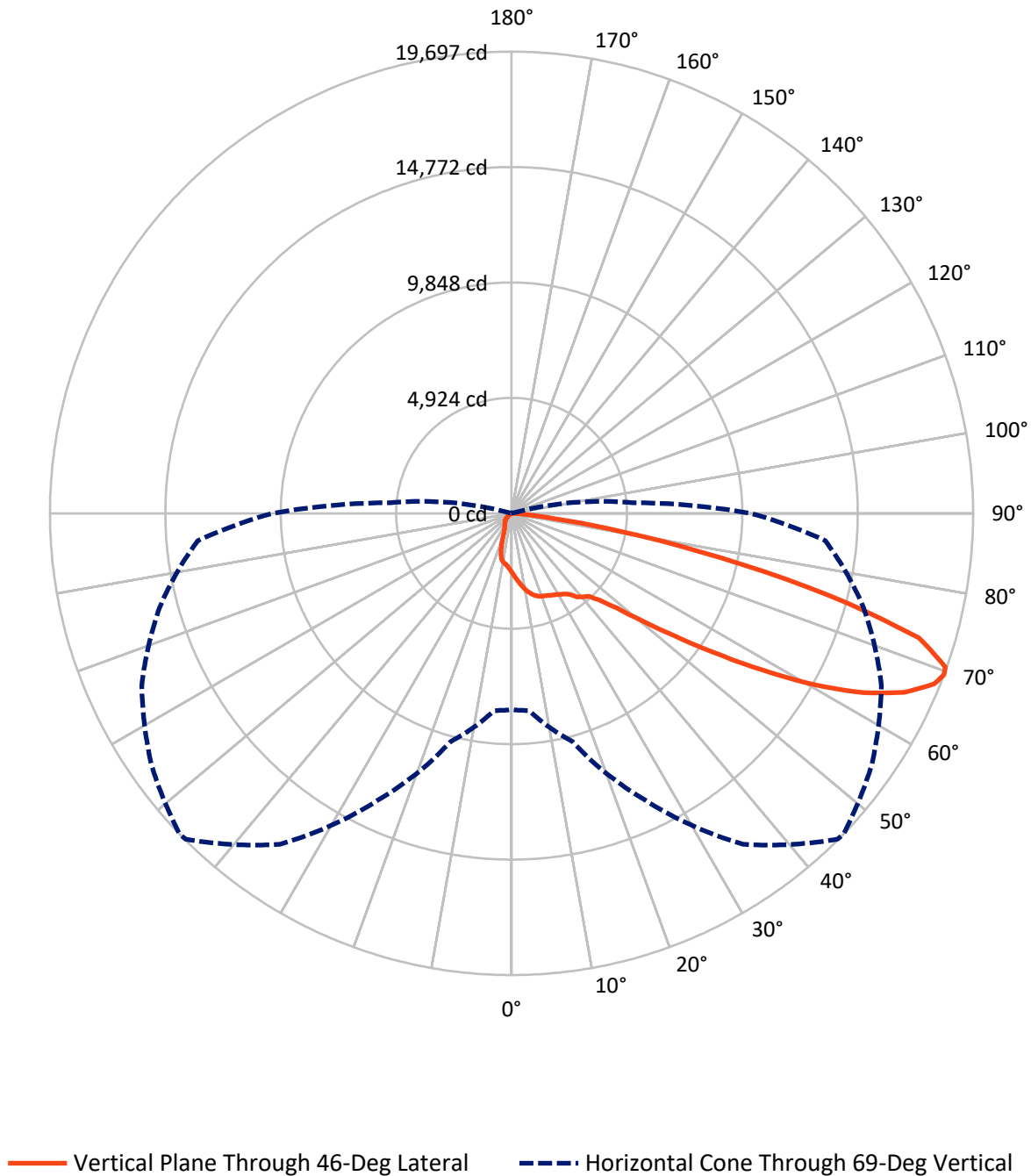
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 5.9 fc  
 Type IV - Short - N/A

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## Luminous Intensity Polar Plot



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**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 2588.0   | 0.0    | 2588.0  |
|                    | % Fixture | 10.3     | 0.0    | 10.3    |
| <b>Street Side</b> | Lumens    | 22629.1  | 0.0    | 22629.1 |
|                    | % Fixture | 89.7     | 0.0    | 89.7    |
| <b>Total</b>       | Lumens    | 25217.0  | 0.0    | 25217.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 251.5   | 1.0       |
| 10°-20°   | 763.0   | 3.0       |
| 20°-30°   | 1199.9  | 4.8       |
| 30°-40°   | 1720.6  | 6.8       |
| 40°-50°   | 2973.9  | 11.8      |
| 50°-60°   | 5875.2  | 23.3      |
| 60°-70°   | 8211.1  | 32.6      |
| 70°-80°   | 3966.9  | 15.7      |
| 80°-90°   | 255.0   | 1.0       |
| 90°-100°  | 0.0     | 0.0       |
| 100°-110° | 0.0     | 0.0       |
| 110°-120° | 0.0     | 0.0       |
| 120°-130° | 0.0     | 0.0       |
| 130°-140° | 0.0     | 0.0       |
| 140°-150° | 0.0     | 0.0       |
| 150°-160° | 0.0     | 0.0       |
| 160°-170° | 0.0     | 0.0       |
| 170°-180° | 0.0     | 0.0       |
| 0°-90°    | 25217.0 | 100.0     |
| 0°-180°   | 25217.0 | 100.0     |

**Coefficient of Utilization**



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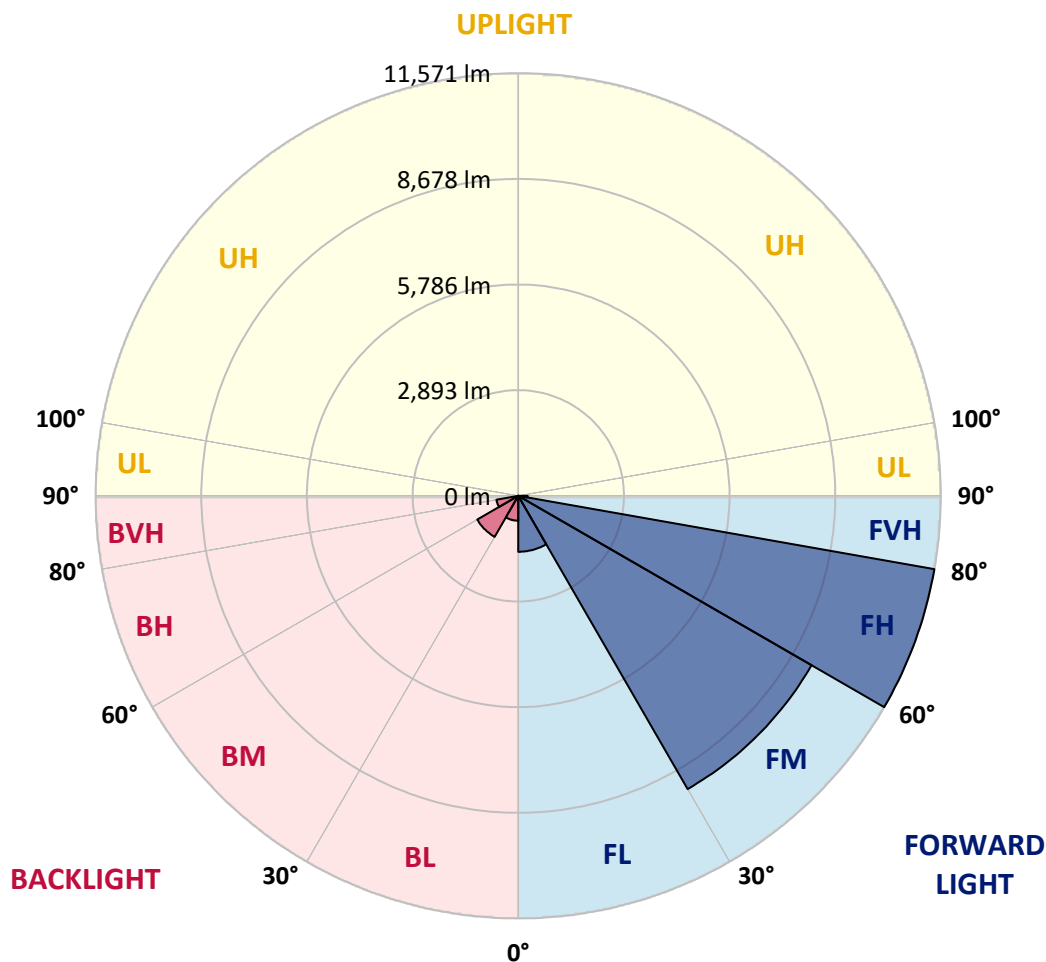
CATALOG NUMBER: GLEON-SA8A-735-U-T4W-HSS

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |          |
|------|-------------|---------|-----------|-------------------------|------|----------|
|      |             |         |           | B                       | U    | G        |
| FL   | (0°-30°)    | 1532.2  | 6.1       |                         |      |          |
| FM   | (30°-60°)   | 9272.8  | 36.8      |                         |      |          |
| FH   | (60°-80°)   | 11571.1 | 45.9      |                         |      | G4/12000 |
| FVH  | (80°-90°)   | 252.8   | 1.0       |                         |      | G3/500   |
| BL   | (0°-30°)    | 682.1   | 2.7       | B2/1000                 |      |          |
| BM   | (30°-60°)   | 1296.9  | 5.1       | B2/2500                 |      |          |
| BH   | (60°-80°)   | 606.8   | 2.4       | B2/1000                 |      | G2/1000  |
| BVH  | (80°-90°)   | 2.1     | 0.0       |                         |      | G0/10    |
| UL   | (90°-100°)  | 0.0     | 0.0       |                         | U0/0 |          |
| UH   | (100°-180°) | 0.0     | 0.0       |                         | U0/0 |          |

**BUG Rating: B2-U0-G4**

Type IV Short



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 46°     | 55°     | 65°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 2526.6  | 2526.6  | 2526.6  | 2526.6  | 2526.6  | 2526.6  | 2526.6  | 2526.6  | 2526.6  | 2526.6  | 2526.6  |
| 2.5°  | 2806.8  | 2803.3  | 2786.7  | 2779.6  | 2739.5  | 2715.8  | 2706.3  | 2676.8  | 2634.2  | 2591.7  | 2544.4  |
| 5°    | 3126.1  | 3124.9  | 3094.1  | 3064.6  | 2989.0  | 2918.0  | 2905.0  | 2836.4  | 2740.6  | 2650.8  | 2560.9  |
| 7.5°  | 3452.4  | 3437.0  | 3406.3  | 3349.6  | 3239.5  | 3126.1  | 3115.5  | 3018.5  | 2882.5  | 2752.4  | 2623.6  |
| 10°   | 3729.1  | 3719.7  | 3679.4  | 3593.1  | 3464.2  | 3335.4  | 3322.4  | 3202.9  | 3049.2  | 2889.7  | 2725.2  |
| 12.5° | 3944.3  | 3937.2  | 3884.0  | 3776.4  | 3639.2  | 3505.6  | 3487.9  | 3381.5  | 3217.1  | 3038.6  | 2844.7  |
| 15°   | 4075.5  | 4072.0  | 4007.0  | 3892.3  | 3757.5  | 3641.6  | 3626.2  | 3532.8  | 3380.3  | 3193.5  | 2974.7  |
| 17.5° | 4106.3  | 4107.5  | 4040.0  | 3924.1  | 3813.0  | 3730.3  | 3718.5  | 3647.5  | 3519.9  | 3334.2  | 3104.8  |
| 20°   | 4037.7  | 4051.9  | 3991.6  | 3891.1  | 3822.5  | 3778.7  | 3769.3  | 3726.7  | 3619.2  | 3444.1  | 3208.8  |
| 22.5° | 3940.7  | 3947.8  | 3906.4  | 3839.0  | 3810.7  | 3819.0  | 3814.2  | 3790.6  | 3699.5  | 3538.8  | 3311.7  |
| 25°   | 3881.6  | 3881.6  | 3856.8  | 3800.1  | 3819.0  | 3869.7  | 3871.0  | 3866.2  | 3794.1  | 3654.6  | 3437.0  |
| 27.5° | 3879.2  | 3872.2  | 3843.8  | 3801.2  | 3853.3  | 3931.2  | 3936.0  | 3967.9  | 3923.0  | 3795.3  | 3593.1  |
| 30°   | 3973.8  | 3965.5  | 3905.2  | 3849.7  | 3915.9  | 3999.9  | 4011.6  | 4081.4  | 4058.9  | 3947.8  | 3766.9  |
| 32.5° | 4194.9  | 4165.3  | 4031.7  | 3940.7  | 3990.4  | 4090.9  | 4106.3  | 4217.4  | 4252.9  | 4135.8  | 3934.8  |
| 35°   | 4497.6  | 4404.2  | 4211.4  | 4113.3  | 4118.1  | 4223.3  | 4237.5  | 4400.6  | 4505.9  | 4308.4  | 4064.9  |
| 37.5° | 4914.9  | 4868.8  | 4555.5  | 4293.0  | 4314.4  | 4473.9  | 4515.3  | 4692.7  | 4663.1  | 4403.1  | 4212.6  |
| 40°   | 5830.1  | 5758.0  | 5424.6  | 4796.7  | 4502.4  | 4677.3  | 4690.3  | 4784.9  | 4787.3  | 4617.0  | 4520.1  |
| 42.5° | 7076.3  | 7046.7  | 6695.6  | 5710.7  | 4872.4  | 4813.3  | 4837.0  | 4996.5  | 5175.1  | 5068.6  | 5063.9  |
| 45°   | 8456.0  | 8440.7  | 8068.2  | 6923.7  | 5620.8  | 5259.1  | 5288.6  | 5502.6  | 5844.3  | 5867.9  | 6018.1  |
| 47.5° | 9566.2  | 9559.2  | 9345.2  | 8277.5  | 6766.5  | 6014.5  | 6024.0  | 6251.0  | 6851.6  | 7148.4  | 7388.4  |
| 50°   | 10578.4 | 10612.7 | 10443.6 | 9742.4  | 8327.2  | 7198.1  | 7175.6  | 7326.9  | 8291.7  | 8777.7  | 9075.6  |
| 52.5° | 11985.3 | 12033.8 | 11559.7 | 11109.2 | 9964.7  | 8666.5  | 8648.8  | 8807.2  | 10022.6 | 10386.8 | 10440.0 |
| 55°   | 13228.0 | 13145.2 | 12770.4 | 12640.4 | 11961.6 | 10480.2 | 10475.4 | 10615.0 | 11696.8 | 11851.7 | 11949.9 |
| 57.5° | 13776.6 | 13744.6 | 13925.5 | 14223.5 | 14053.2 | 12623.8 | 12613.2 | 12506.8 | 13194.8 | 13211.4 | 13512.9 |
| 60°   | 14123.0 | 14162.0 | 14716.5 | 15635.2 | 16059.6 | 14930.5 | 14861.9 | 14212.8 | 14625.5 | 14588.8 | 14911.6 |
| 62.5° | 13862.8 | 13939.7 | 14937.6 | 16468.7 | 17561.3 | 16944.0 | 16847.0 | 15775.9 | 15848.0 | 15721.5 | 16021.8 |
| 65°   | 12481.9 | 12601.3 | 14236.5 | 16311.5 | 18306.1 | 18517.7 | 18419.6 | 17155.7 | 16818.7 | 16610.6 | 16443.9 |
| 67.5° | 10135.0 | 10205.9 | 11913.2 | 14943.5 | 17970.3 | 19456.5 | 19436.4 | 18365.2 | 17551.8 | 16460.4 | 15167.0 |
| 69°   | 8375.6  | 8445.4  | 10088.8 | 13503.4 | 17231.3 | 19657.5 | 19696.5 | 18753.0 | 17412.2 | 15547.7 | 13438.4 |
| 70°   | 7094.0  | 7168.5  | 8699.6  | 12269.0 | 16374.2 | 19564.1 | 19633.9 | 18716.4 | 17012.6 | 14490.7 | 11921.5 |
| 72.5° | 3720.8  | 3784.7  | 5355.9  | 8452.5  | 13348.5 | 17964.4 | 18176.0 | 17134.4 | 14420.9 | 10524.0 | 7049.1  |
| 75°   | 1169.4  | 1206.0  | 2091.5  | 4418.4  | 9139.4  | 13968.1 | 14016.5 | 13440.7 | 10240.2 | 5788.7  | 2935.8  |
| 77.5° | 445.7   | 435.1   | 696.4   | 1628.1  | 4620.6  | 8795.4  | 9092.2  | 8399.3  | 5373.7  | 2046.6  | 677.5   |
| 80°   | 240.1   | 241.2   | 361.8   | 674.0   | 1976.8  | 4520.1  | 4770.7  | 4070.8  | 1909.5  | 638.5   | 156.0   |
| 82.5° | 104.1   | 108.8   | 203.4   | 357.1   | 908.1   | 1667.1  | 1792.4  | 1492.1  | 729.5   | 429.2   | 57.9    |
| 85°   | 22.5    | 24.9    | 98.1    | 193.9   | 370.1   | 468.2   | 490.6   | 483.6   | 464.7   | 333.4   | 22.5    |
| 87.5° | 0.0     | 0.0     | 43.8    | 69.8    | 93.4    | 106.4   | 93.4    | 121.8   | 256.5   | 224.7   | 11.8    |
| 90°   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |

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**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 2526.6  | 2526.6 | 2526.6 | 2526.6 | 2526.6 | 2526.6 | 2526.6 | 2526.6 | 2526.6 | 2526.6 | 2526.6 |
| 2.5°  | 2529.1  | 2507.7 | 2471.1 | 2430.9 | 2402.5 | 2372.9 | 2349.3 | 2338.7 | 2326.8 | 2318.5 | 2329.2 |
| 5°    | 2524.3  | 2482.9 | 2412.0 | 2343.4 | 2293.7 | 2253.5 | 2220.4 | 2207.4 | 2194.4 | 2184.9 | 2183.7 |
| 7.5°  | 2565.7  | 2507.7 | 2398.9 | 2298.5 | 2221.6 | 2167.2 | 2122.3 | 2103.3 | 2088.0 | 2080.9 | 2075.0 |
| 10°   | 2644.8  | 2570.4 | 2425.0 | 2293.7 | 2194.4 | 2102.2 | 2005.2 | 1930.7 | 1882.3 | 1859.8 | 1851.5 |
| 12.5° | 2747.8  | 2654.4 | 2474.7 | 2318.5 | 2174.3 | 1997.0 | 1791.3 | 1613.9 | 1499.2 | 1461.3 | 1438.9 |
| 15°   | 2868.3  | 2752.4 | 2539.7 | 2350.5 | 2101.0 | 1777.0 | 1428.2 | 1196.5 | 1090.1 | 1068.9 | 1045.2 |
| 17.5° | 2984.2  | 2856.5 | 2617.6 | 2356.3 | 1940.2 | 1420.0 | 1046.4 | 889.1  | 847.7  | 862.0  | 865.5  |
| 20°   | 3085.9  | 2959.3 | 2694.5 | 2304.4 | 1648.2 | 1065.3 | 809.9  | 770.9  | 786.2  | 813.4  | 818.2  |
| 22.5° | 3188.8  | 3058.7 | 2765.5 | 2167.2 | 1274.5 | 808.7  | 729.5  | 739.0  | 754.4  | 781.6  | 786.2  |
| 25°   | 3314.1  | 3179.3 | 2831.7 | 1915.4 | 956.5  | 688.1  | 692.9  | 707.0  | 722.4  | 747.2  | 749.6  |
| 27.5° | 3458.4  | 3331.8 | 2875.4 | 1587.9 | 709.4  | 632.5  | 647.9  | 669.2  | 684.6  | 708.3  | 712.9  |
| 30°   | 3649.9  | 3532.8 | 2889.7 | 1248.6 | 594.7  | 582.9  | 589.9  | 616.0  | 638.5  | 659.7  | 663.3  |
| 32.5° | 3829.6  | 3731.4 | 2842.3 | 942.4  | 551.0  | 536.8  | 536.8  | 552.1  | 578.1  | 598.2  | 603.0  |
| 35°   | 3995.1  | 3931.2 | 2691.0 | 689.3  | 517.8  | 494.2  | 482.4  | 482.4  | 498.9  | 515.5  | 520.3  |
| 37.5° | 4213.9  | 4211.4 | 2446.2 | 549.8  | 485.9  | 458.8  | 433.9  | 415.0  | 409.0  | 412.7  | 415.0  |
| 40°   | 4588.6  | 4592.2 | 2127.0 | 493.1  | 458.8  | 422.1  | 384.3  | 350.0  | 318.0  | 307.4  | 306.2  |
| 42.5° | 5173.9  | 5120.7 | 1792.4 | 465.9  | 435.1  | 384.3  | 327.5  | 281.4  | 231.8  | 216.4  | 215.2  |
| 45°   | 6103.2  | 5787.5 | 1437.8 | 441.0  | 410.3  | 341.7  | 270.8  | 208.1  | 167.9  | 156.0  | 156.0  |
| 47.5° | 7456.9  | 6663.6 | 1113.8 | 413.8  | 377.2  | 293.3  | 204.6  | 150.2  | 123.0  | 117.1  | 118.2  |
| 50°   | 8856.9  | 7522.0 | 853.7  | 379.5  | 336.9  | 242.4  | 151.4  | 108.8  | 93.4   | 93.4   | 94.6   |
| 52.5° | 10098.3 | 8151.0 | 665.7  | 342.9  | 287.3  | 190.3  | 114.7  | 85.1   | 78.1   | 76.9   | 78.1   |
| 55°   | 11260.5 | 8556.5 | 509.6  | 300.3  | 228.2  | 141.9  | 87.5   | 69.8   | 65.0   | 62.7   | 61.5   |
| 57.5° | 12381.4 | 8757.6 | 381.9  | 242.4  | 165.5  | 102.8  | 69.8   | 59.2   | 54.4   | 50.9   | 49.7   |
| 60°   | 13127.5 | 8594.4 | 262.5  | 178.6  | 114.7  | 74.5   | 57.9   | 50.9   | 44.9   | 41.4   | 40.2   |
| 62.5° | 13548.3 | 8148.6 | 169.1  | 128.8  | 81.6   | 55.6   | 46.1   | 42.6   | 34.3   | 30.7   | 30.7   |
| 65°   | 13378.1 | 7413.3 | 118.2  | 92.2   | 59.2   | 41.4   | 34.3   | 34.3   | 24.9   | 20.1   | 18.9   |
| 67.5° | 11855.2 | 6262.8 | 89.9   | 68.6   | 42.6   | 30.7   | 26.0   | 29.5   | 15.4   | 9.5    | 9.5    |
| 69°   | 10200.0 | 5190.5 | 76.9   | 56.7   | 35.5   | 24.9   | 22.5   | 27.2   | 10.6   | 7.1    | 5.9    |
| 70°   | 8865.2  | 4477.5 | 69.8   | 49.7   | 29.5   | 21.2   | 20.1   | 26.0   | 10.6   | 5.9    | 4.8    |
| 72.5° | 5304.0  | 2497.1 | 53.2   | 35.5   | 18.9   | 16.6   | 16.6   | 29.5   | 10.6   | 5.9    | 4.8    |
| 75°   | 2143.6  | 879.7  | 39.0   | 24.9   | 14.2   | 14.2   | 20.1   | 37.8   | 9.5    | 4.8    | 3.5    |
| 77.5° | 485.9   | 192.7  | 22.5   | 15.4   | 9.5    | 14.2   | 23.7   | 29.5   | 5.9    | 2.3    | 0.0    |
| 80°   | 118.2   | 47.3   | 14.2   | 9.5    | 5.9    | 10.6   | 17.7   | 16.6   | 1.2    | 0.0    | 0.0    |
| 82.5° | 39.0    | 16.6   | 5.9    | 4.8    | 1.2    | 3.5    | 8.3    | 4.8    | 0.0    | 0.0    | 0.0    |
| 85°   | 16.6    | 9.5    | 2.3    | 1.2    | 0.0    | 0.0    | 1.2    | 0.0    | 0.0    | 0.0    | 0.0    |
| 87.5° | 10.6    | 3.5    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 90°   | 0.0     | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

LM-79-08: Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Report Prepared for

Cooper Lighting Solutions

All Brands

Data applicable to all product families using SA light engines

Report Number: SP1-2101-121-7

Luminaire Tested: IFLD-S-SA2A-735-U-T2

Test Date: 03/04/2021

### Test Information

Test Method: LM-79-08  
 Report Number: SP1-2101-121-7  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1  
 Measurement Geometry:  $4\pi$   
 Issue Date: 03/04/2021  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: STREETWORKS  
 Catalog Number: **IFLD-S-SA2A-735-U-T2**  
 Description: STREETWORKS INF FLOOD

PROGRAMMED @ 615mA.

### Spectral Parameters

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 3388   | CRI (Ra): | 73.1 |      |       |
| CIE u':                   | 0.2371 | R1:       | 68.9 | R9:  | -34.6 |
| CIE v':                   | 0.5177 | R2:       | 81.1 | R10: | 57.8  |
| Duv:                      | 0.0032 | R3:       | 93.1 | R11: | 68.6  |
| CIE x:                    | 0.4153 | R4:       | 71.6 | R12: | 53.9  |
| CIE y:                    | 0.4030 | R5:       | 69.4 | R13: | 70.9  |
| CIE z:                    | 0.1817 | R6:       | 75.0 | R14: | 96.2  |
| Peak Wavelength (nm):     | 590    | R7:       | 79.5 |      |       |
| Dominant Wavelength (nm): | 580    | R8:       | 46.4 |      |       |
| Purity:                   | 45.7   |           |      |      |       |
| Rf:                       | 76.9   |           |      |      |       |
| Rg:                       | 94.4   |           |      |      |       |



### Test Conditions

Stabilization Time: 81M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.0/30%  
 Sphere Temperature (°C): 24.1

REPORT NUMBER: SP1-2101-121-7

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

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**CIE 1931 Chromaticity Diagram**



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



Point lies inside the ANSI 3500K 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       | 2672             | 0.0              | 490       | 34553            | 4.9              | 620       | 136720           | 35.6             | 750       | 5870             | 0.0              | 880       | 4216             | 0.0              |
| 365       | 2252             | 0.0              | 495       | 44336            | 8.0              | 625       | 126308           | 27.9             | 755       | 5421             | 0.0              | 885       | 4132             | 0.0              |
| 370       | 2217             | 0.0              | 500       | 54643            | 12.1             | 630       | 114625           | 20.7             | 760       | 5097             | 0.0              | 890       | 3992             | 0.0              |
| 375       | 2697             | 0.0              | 505       | 64676            | 18.1             | 635       | 103216           | 15.5             | 765       | 4626             | 0.0              | 895       | 3214             | 0.0              |
| 380       | 3039             | 0.0              | 510       | 73825            | 25.4             | 640       | 92605            | 11.1             | 770       | 3782             | 0.0              | 900       | 2580             | 0.0              |
| 385       | 2655             | 0.0              | 515       | 81872            | 33.9             | 645       | 83234            | 8.0              | 775       | 3506             | 0.0              | 905       | 1776             | 0.0              |
| 390       | 2357             | 0.0              | 520       | 88574            | 43.0             | 650       | 73263            | 5.4              | 780       | 3507             | 0.0              | 910       | 3995             | 0.0              |
| 395       | 2186             | 0.0              | 525       | 93289            | 50.1             | 655       | 64627            | 3.7              | 785       | 3267             | 0.0              | 915       | 4288             | 0.0              |
| 400       | 2015             | 0.0              | 530       | 98393            | 57.9             | 660       | 56614            | 2.4              | 790       | 2849             | 0.0              | 920       | 2446             | 0.0              |
| 405       | 2234             | 0.0              | 535       | 103269           | 64.0             | 665       | 49537            | 1.6              | 795       | 3037             | 0.0              | 925       | 3009             | 0.0              |
| 410       | 3412             | 0.0              | 540       | 107316           | 69.9             | 670       | 42866            | 0.9              | 800       | 2716             | 0.0              | 930       | 3026             | 0.0              |
| 415       | 6135             | 0.0              | 545       | 113101           | 75.3             | 675       | 36708            | 0.6              | 805       | 2648             | 0.0              | 935       | 4734             | 0.0              |
| 420       | 12146            | 0.0              | 550       | 120690           | 82.0             | 680       | 31814            | 0.4              | 810       | 3187             | 0.0              | 940       | 3719             | 0.0              |
| 425       | 23983            | 0.1              | 555       | 128583           | 87.8             | 685       | 27485            | 0.2              | 815       | 2931             | 0.0              | 945       | 1480             | 0.0              |
| 430       | 42142            | 0.3              | 560       | 137796           | 93.6             | 690       | 23698            | 0.1              | 820       | 2717             | 0.0              | 950       | 3450             | 0.0              |
| 435       | 68228            | 0.8              | 565       | 146577           | 97.5             | 695       | 20309            | 0.1              | 825       | 2236             | 0.0              | 955       | 5051             | 0.0              |
| 440       | 99323            | 1.6              | 570       | 154581           | 100.5            | 700       | 17890            | 0.1              | 830       | 2628             | 0.0              | 960       | 3176             | 0.0              |
| 445       | 115584           | 2.4              | 575       | 162633           | 101.2            | 705       | 15500            | 0.0              | 835       | 3140             | 0.0              | 965       | 5178             | 0.0              |
| 450       | 94997            | 2.5              | 580       | 168101           | 99.9             | 710       | 13699            | 0.0              | 840       | 3675             | 0.0              | 970       | 6385             | 0.0              |
| 455       | 61433            | 2.1              | 585       | 173145           | 96.2             | 715       | 12398            | 0.0              | 845       | 3283             | 0.0              | 975       | 3810             | 0.0              |
| 460       | 43373            | 1.8              | 590       | 174675           | 90.3             | 720       | 11147            | 0.0              | 850       | 3055             | 0.0              | 980       | 4322             | 0.0              |
| 465       | 32472            | 1.7              | 595       | 173724           | 82.3             | 725       | 9761             | 0.0              | 855       | 2932             | 0.0              | 985       | 4200             | 0.0              |
| 470       | 24257            | 1.5              | 600       | 171241           | 73.8             | 730       | 8651             | 0.0              | 860       | 3382             | 0.0              | 990       | 4661             | 0.0              |
| 475       | 21690            | 1.7              | 605       | 165134           | 64.0             | 735       | 7730             | 0.0              | 865       | 2605             | 0.0              | 995       | 6746             | 0.0              |
| 480       | 23173            | 2.2              | 610       | 156652           | 53.8             | 740       | 6847             | 0.0              | 870       | 3325             | 0.0              | 1000      | 4150             | 0.0              |
| 485       | 27564            | 3.3              | 615       | 147879           | 44.6             | 745       | 6124             | 0.0              | 875       | 3325             | 0.0              |           |                  |                  |

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### Scotopic Flux vs. Wavelength


**Scotopic Lumens: 12126**
**S/P: 1.36**

| 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       | 2672             | 0.0              | 490       | 34553            | 53.2             | 620       | 136720           | 1.7              | 750       | 5870             | 0.0              | 880       | 4216             | 0.0              |
| 365       | 2252             | 0.0              | 495       | 44336            | 71.7             | 625       | 126308           | 1.1              | 755       | 5421             | 0.0              | 885       | 4132             | 0.0              |
| 370       | 2217             | 0.0              | 500       | 54643            | 91.4             | 630       | 114625           | 0.6              | 760       | 5097             | 0.0              | 890       | 3992             | 0.0              |
| 375       | 2697             | 0.0              | 505       | 64676            | 110.0            | 635       | 103216           | 0.4              | 765       | 4626             | 0.0              | 895       | 3214             | 0.0              |
| 380       | 3039             | 0.0              | 510       | 73825            | 125.1            | 640       | 92605            | 0.2              | 770       | 3782             | 0.0              | 900       | 2580             | 0.0              |
| 385       | 2655             | 0.0              | 515       | 81872            | 135.7            | 645       | 83234            | 0.1              | 775       | 3506             | 0.0              | 905       | 1776             | 0.0              |
| 390       | 2357             | 0.0              | 520       | 88574            | 140.8            | 650       | 73263            | 0.1              | 780       | 3507             | 0.0              | 910       | 3995             | 0.0              |
| 395       | 2186             | 0.0              | 525       | 93289            | 139.6            | 655       | 64627            | 0.1              | 785       | 3267             | 0.0              | 915       | 4288             | 0.0              |
| 400       | 2015             | 0.0              | 530       | 98393            | 135.7            | 660       | 56614            | 0.0              | 790       | 2849             | 0.0              | 920       | 2446             | 0.0              |
| 405       | 2234             | 0.1              | 535       | 103269           | 128.7            | 665       | 49537            | 0.0              | 795       | 3037             | 0.0              | 925       | 3009             | 0.0              |
| 410       | 3412             | 0.2              | 540       | 107316           | 118.6            | 670       | 42866            | 0.0              | 800       | 2716             | 0.0              | 930       | 3026             | 0.0              |
| 415       | 6135             | 0.6              | 545       | 113101           | 108.4            | 675       | 36708            | 0.0              | 805       | 2648             | 0.0              | 935       | 4734             | 0.0              |
| 420       | 12146            | 2.0              | 550       | 120690           | 98.7             | 680       | 31814            | 0.0              | 810       | 3187             | 0.0              | 940       | 3719             | 0.0              |
| 425       | 23983            | 5.9              | 555       | 128583           | 87.9             | 685       | 27485            | 0.0              | 815       | 2931             | 0.0              | 945       | 1480             | 0.0              |
| 430       | 42142            | 14.3             | 560       | 137796           | 77.0             | 690       | 23698            | 0.0              | 820       | 2717             | 0.0              | 950       | 3450             | 0.0              |
| 435       | 68228            | 30.5             | 565       | 146577           | 65.8             | 695       | 20309            | 0.0              | 825       | 2236             | 0.0              | 955       | 5051             | 0.0              |
| 440       | 99323            | 55.5             | 570       | 154581           | 54.6             | 700       | 17890            | 0.0              | 830       | 2628             | 0.0              | 960       | 3176             | 0.0              |
| 445       | 115584           | 77.4             | 575       | 162633           | 44.3             | 705       | 15500            | 0.0              | 835       | 3140             | 0.0              | 965       | 5178             | 0.0              |
| 450       | 94997            | 73.6             | 580       | 168101           | 34.6             | 710       | 13699            | 0.0              | 840       | 3675             | 0.0              | 970       | 6385             | 0.0              |
| 455       | 61433            | 53.7             | 585       | 173145           | 26.5             | 715       | 12398            | 0.0              | 845       | 3283             | 0.0              | 975       | 3810             | 0.0              |
| 460       | 43373            | 41.9             | 590       | 174675           | 19.5             | 720       | 11147            | 0.0              | 850       | 3055             | 0.0              | 980       | 4322             | 0.0              |
| 465       | 32472            | 34.3             | 595       | 173724           | 13.9             | 725       | 9761             | 0.0              | 855       | 2932             | 0.0              | 985       | 4200             | 0.0              |
| 470       | 24257            | 27.9             | 600       | 171241           | 9.7              | 730       | 8651             | 0.0              | 860       | 3382             | 0.0              | 990       | 4661             | 0.0              |
| 475       | 21690            | 27.1             | 605       | 165134           | 6.5              | 735       | 7730             | 0.0              | 865       | 2605             | 0.0              | 995       | 6746             | 0.0              |
| 480       | 23173            | 31.3             | 610       | 156652           | 4.2              | 740       | 6847             | 0.0              | 870       | 3325             | 0.0              | 1000      | 4150             | 0.0              |
| 485       | 27564            | 40.0             | 615       | 147879           | 2.7              | 745       | 6124             | 0.0              | 875       | 3325             | 0.0              |           |                  |                  |

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### Melanopic Flux vs. Wavelength



Melanopic Lumens: 4490.7

M/P: 0.5

| 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       | 2672             | 0.0              | 490       | 34553            | 28.8             | 620       | 136720           | 0.1              | 750       | 5870             | 0.0              | 880       | 4216             | 0.0              |
| 365       | 2252             | 0.0              | 495       | 44336            | 36.6             | 625       | 126308           | 0.1              | 755       | 5421             | 0.0              | 885       | 4132             | 0.0              |
| 370       | 2217             | 0.0              | 500       | 54643            | 43.9             | 630       | 114625           | 0.0              | 760       | 5097             | 0.0              | 890       | 3992             | 0.0              |
| 375       | 2697             | 0.0              | 505       | 64676            | 49.6             | 635       | 103216           | 0.0              | 765       | 4626             | 0.0              | 895       | 3214             | 0.0              |
| 380       | 3039             | 0.0              | 510       | 73825            | 53.0             | 640       | 92605            | 0.0              | 770       | 3782             | 0.0              | 900       | 2580             | 0.0              |
| 385       | 2655             | 0.0              | 515       | 81872            | 53.5             | 645       | 83234            | 0.0              | 775       | 3506             | 0.0              | 905       | 1776             | 0.0              |
| 390       | 2357             | 0.0              | 520       | 88574            | 51.6             | 650       | 73263            | 0.0              | 780       | 3507             | 0.0              | 910       | 3995             | 0.0              |
| 395       | 2186             | 0.0              | 525       | 93289            | 47.3             | 655       | 64627            | 0.0              | 785       | 3267             | 0.0              | 915       | 4288             | 0.0              |
| 400       | 2015             | 0.0              | 530       | 98393            | 42.5             | 660       | 56614            | 0.0              | 790       | 2849             | 0.0              | 920       | 2446             | 0.0              |
| 405       | 2234             | 0.0              | 535       | 103269           | 37.2             | 665       | 49537            | 0.0              | 795       | 3037             | 0.0              | 925       | 3009             | 0.0              |
| 410       | 3412             | 0.1              | 540       | 107316           | 31.4             | 670       | 42866            | 0.0              | 800       | 2716             | 0.0              | 930       | 3026             | 0.0              |
| 415       | 6135             | 0.4              | 545       | 113101           | 26.3             | 675       | 36708            | 0.0              | 805       | 2648             | 0.0              | 935       | 4734             | 0.0              |
| 420       | 12146            | 1.4              | 550       | 120690           | 21.7             | 680       | 31814            | 0.0              | 810       | 3187             | 0.0              | 940       | 3719             | 0.0              |
| 425       | 23983            | 3.7              | 555       | 128583           | 17.3             | 685       | 27485            | 0.0              | 815       | 2931             | 0.0              | 945       | 1480             | 0.0              |
| 430       | 42142            | 8.9              | 560       | 137796           | 13.6             | 690       | 23698            | 0.0              | 820       | 2717             | 0.0              | 950       | 3450             | 0.0              |
| 435       | 68228            | 18.2             | 565       | 146577           | 10.3             | 695       | 20309            | 0.0              | 825       | 2236             | 0.0              | 955       | 5051             | 0.0              |
| 440       | 99323            | 33.2             | 570       | 154581           | 7.6              | 700       | 17890            | 0.0              | 830       | 2628             | 0.0              | 960       | 3176             | 0.0              |
| 445       | 115584           | 45.6             | 575       | 162633           | 5.4              | 705       | 15500            | 0.0              | 835       | 3140             | 0.0              | 965       | 5178             | 0.0              |
| 450       | 94997            | 43.8             | 580       | 168101           | 3.8              | 710       | 13699            | 0.0              | 840       | 3675             | 0.0              | 970       | 6385             | 0.0              |
| 455       | 61433            | 32.2             | 585       | 173145           | 2.6              | 715       | 12398            | 0.0              | 845       | 3283             | 0.0              | 975       | 3810             | 0.0              |
| 460       | 43373            | 25.6             | 590       | 174675           | 1.7              | 720       | 11147            | 0.0              | 850       | 3055             | 0.0              | 980       | 4322             | 0.0              |
| 465       | 32472            | 21.2             | 595       | 173724           | 1.1              | 725       | 9761             | 0.0              | 855       | 2932             | 0.0              | 985       | 4200             | 0.0              |
| 470       | 24257            | 17.4             | 600       | 171241           | 0.7              | 730       | 8651             | 0.0              | 860       | 3382             | 0.0              | 990       | 4661             | 0.0              |
| 475       | 21690            | 16.6             | 605       | 165134           | 0.5              | 735       | 7730             | 0.0              | 865       | 2605             | 0.0              | 995       | 6746             | 0.0              |
| 480       | 23173            | 18.6             | 610       | 156652           | 0.3              | 740       | 6847             | 0.0              | 870       | 3325             | 0.0              | 1000      | 4150             | 0.0              |
| 485       | 27564            | 22.7             | 615       | 147879           | 0.2              | 745       | 6124             | 0.0              | 875       | 3325             | 0.0              |           |                  |                  |

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TM-30-18

### Summary

$R_f = 76.9$   
 $R_g = 94.4$   
 CIE  $R_a = 73.1$   
 $R_g = -34.6$

### Spectral Power Distribution Comparison



### Color Vector Graphics



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 68 | CES51 = 90 | CES76 = 63 |
| CES02 = 62 | CES27 = 88 | CES52 = 89 | CES77 = 80 |
| CES03 = 31 | CES28 = 87 | CES53 = 80 | CES78 = 65 |
| CES04 = 70 | CES29 = 67 | CES54 = 84 | CES79 = 87 |
| CES05 = 48 | CES30 = 74 | CES55 = 84 | CES80 = 86 |
| CES06 = 51 | CES31 = 71 | CES56 = 75 | CES81 = 75 |
| CES07 = 40 | CES32 = 67 | CES57 = 74 | CES82 = 94 |
| CES08 = 39 | CES33 = 74 | CES58 = 76 | CES83 = 91 |
| CES09 = 29 | CES34 = 78 | CES59 = 87 | CES84 = 89 |
| CES10 = 75 | CES35 = 89 | CES60 = 93 | CES85 = 80 |
| CES11 = 58 | CES36 = 98 | CES61 = 86 | CES86 = 66 |
| CES12 = 64 | CES37 = 86 | CES62 = 89 | CES87 = 79 |
| CES13 = 43 | CES38 = 82 | CES63 = 77 | CES88 = 79 |
| CES14 = 74 | CES39 = 95 | CES64 = 74 | CES89 = 70 |
| CES15 = 71 | CES40 = 91 | CES65 = 68 | CES90 = 77 |
| CES16 = 47 | CES41 = 89 | CES66 = 71 | CES91 = 88 |
| CES17 = 50 | CES42 = 88 | CES67 = 69 | CES92 = 60 |
| CES18 = 56 | CES43 = 82 | CES68 = 74 | CES93 = 77 |
| CES19 = 72 | CES44 = 99 | CES69 = 82 | CES94 = 52 |
| CES20 = 65 | CES45 = 87 | CES70 = 67 | CES95 = 69 |
| CES21 = 86 | CES46 = 82 | CES71 = 66 | CES96 = 78 |
| CES22 = 79 | CES47 = 82 | CES72 = 88 | CES97 = 85 |
| CES23 = 92 | CES48 = 72 | CES73 = 59 | CES98 = 76 |
| CES24 = 91 | CES49 = 82 | CES74 = 97 | CES99 = 63 |
| CES25 = 72 | CES50 = 88 | CES75 = 66 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)