

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: P383542

Luminaire Tested: **GLEON-SA8B-735-U-T3-HSS**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P383542  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-15)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA8B-735-U-T3-HSS  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(8) 70 CRI, 3500K, 800mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE III  
OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 31090.4 lumens  
Efficiency: N/A  
Efficacy: 93.1 lumens/watt  
Luminous Opening: Rectangular (W 2' x L: 1' x H: 0')  
IES Classification: Type III - Short  
BUG Rating: B3 - U0 - G4

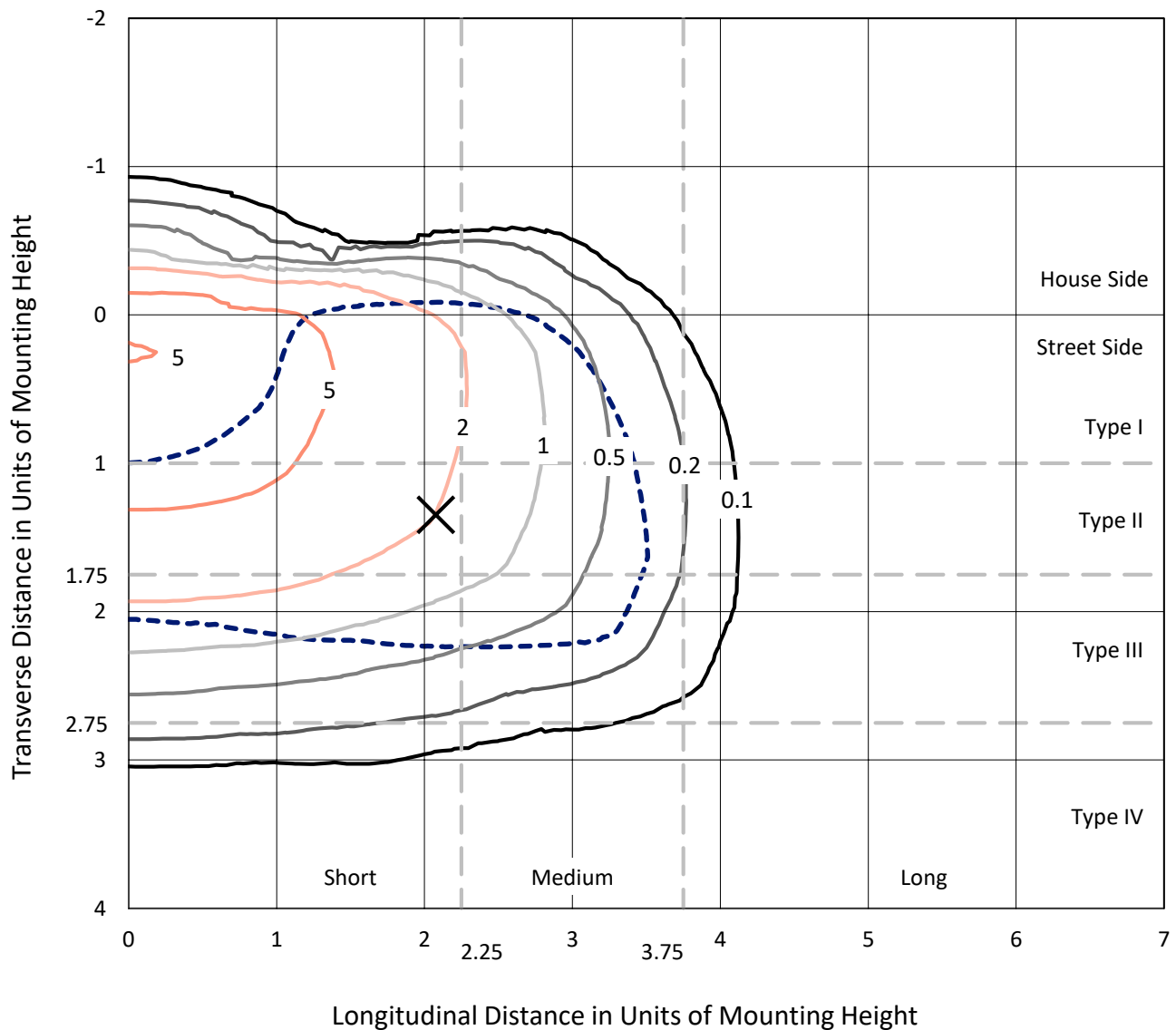
Input Watts (W): 334  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



REPORT NUMBER: P383542  
CATALOG NUMBER: GLEON-SA8B-735-U-T3-HSS

## Iso-Footcandle Lines of Horizontal Illumination

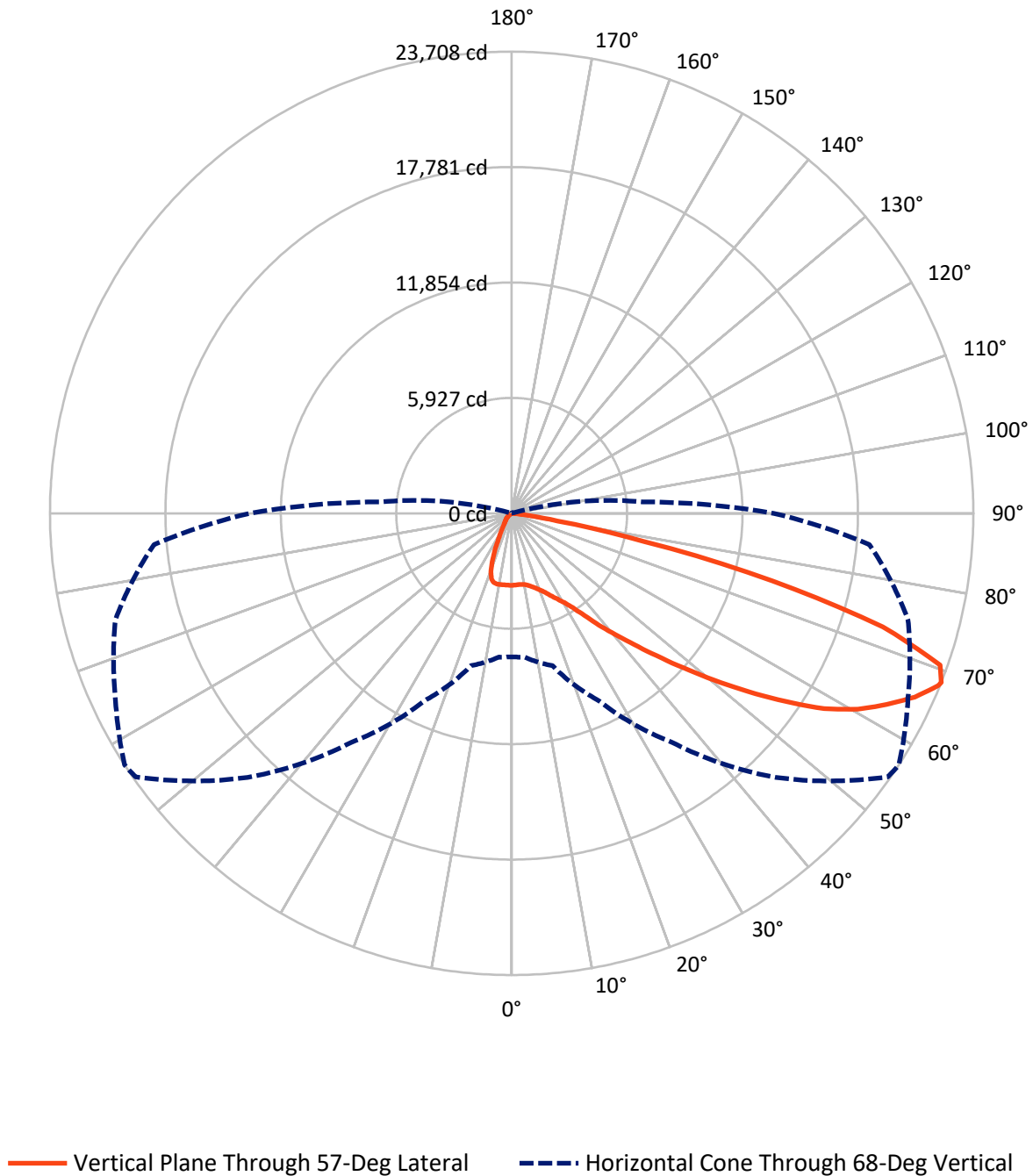
× Max cd  
- - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 7.6 fc  
Type III - 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    | 3409.3   | 0.0    | 3409.3  |
|                    | % Fixture | 11.0     | 0.0    | 11.0    |
| <b>Street Side</b> | Lumens    | 27681.2  | 0.0    | 27681.2 |
|                    | % Fixture | 89.0     | 0.0    | 89.0    |
| <b>Total</b>       | Lumens    | 31090.4  | 0.0    | 31090.4 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 345.7   | 1.1       |
| 10°-20°   | 958.1   | 3.1       |
| 20°-30°   | 1652.8  | 5.3       |
| 30°-40°   | 2852.6  | 9.2       |
| 40°-50°   | 4879.4  | 15.7      |
| 50°-60°   | 7806.5  | 25.1      |
| 60°-70°   | 9019.6  | 29.0      |
| 70°-80°   | 3446.5  | 11.1      |
| 80°-90°   | 129.2   | 0.4       |
| 90°-100°  | 0.0     | 0.0       |
| 100°-110° | 0.0     | 0.0       |
| 110°-120° | 0.0     | 0.0       |
| 120°-130° | 0.0     | 0.0       |
| 130°-140° | 0.0     | 0.0       |
| 140°-150° | 0.0     | 0.0       |
| 150°-160° | 0.0     | 0.0       |
| 160°-170° | 0.0     | 0.0       |
| 170°-180° | 0.0     | 0.0       |
| 0°-90°    | 31090.4 | 100.0     |
| 0°-180°   | 31090.4 | 100.0     |

**Coefficient of Utilization**



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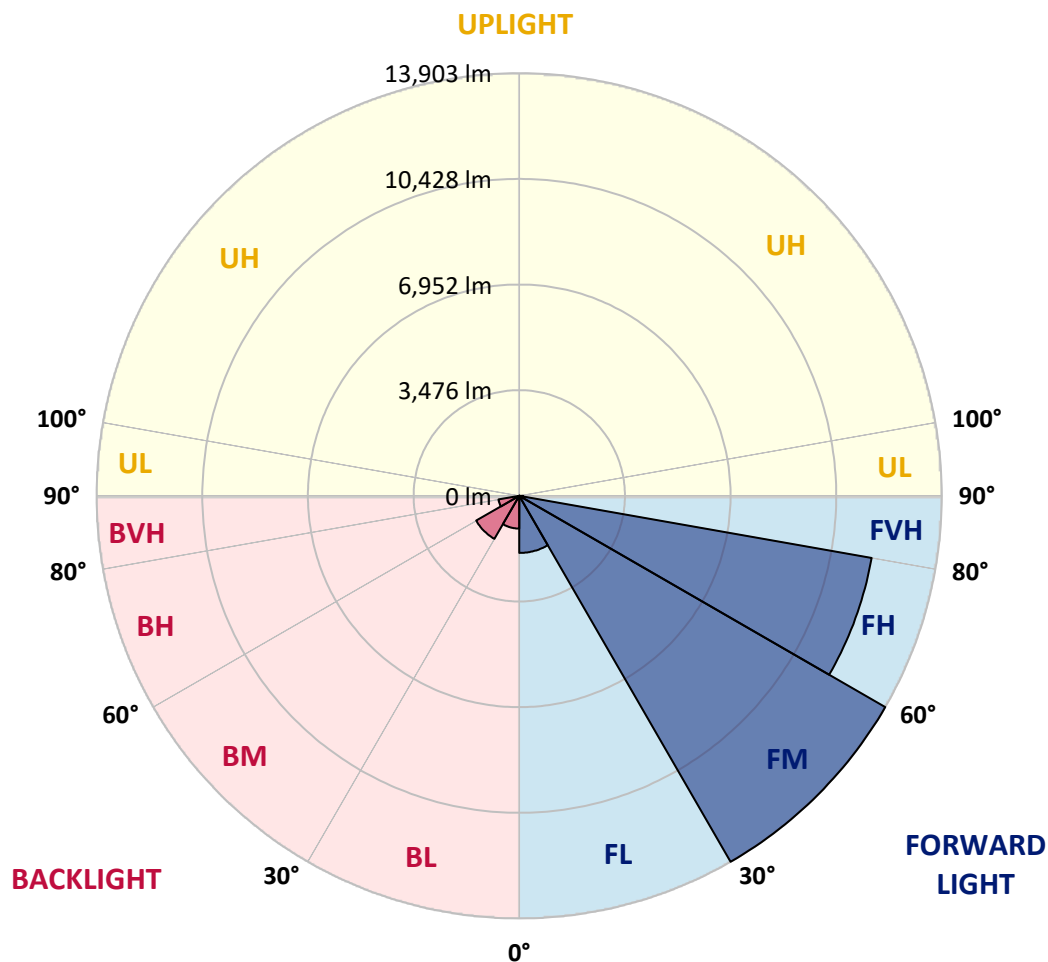
CATALOG NUMBER: GLEON-SA8B-735-U-T3-HSS

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |          |
|------|-------------|---------|-----------|-------------------------|------|----------|
|      |             |         |           | B                       | U    | G        |
| FL   | (0°-30°)    | 1879.1  | 6.0       |                         |      |          |
| FM   | (30°-60°)   | 13903.4 | 44.7      |                         |      |          |
| FH   | (60°-80°)   | 11771.8 | 37.9      |                         |      | G4/12000 |
| FVH  | (80°-90°)   | 126.8   | 0.4       |                         |      | G2/225   |
| BL   | (0°-30°)    | 1077.4  | 3.5       | B3/2500                 |      |          |
| BM   | (30°-60°)   | 1635.1  | 5.3       | B2/2500                 |      |          |
| BH   | (60°-80°)   | 694.3   | 2.2       | B2/1000                 |      | G2/1000  |
| BVH  | (80°-90°)   | 2.4     | 0.0       |                         |      | G0/10    |
| UL   | (90°-100°)  | 0.0     | 0.0       |                         | U0/0 |          |
| UH   | (100°-180°) | 0.0     | 0.0       |                         | U0/0 |          |

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

Type III Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 55°     | 57°     | 65°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 3694.3  | 3694.3  | 3694.3  | 3694.3  | 3694.3  | 3694.3  | 3694.3  | 3694.3  | 3694.3  | 3694.3  | 3694.3  |
| 2.5°  | 3607.6  | 3623.8  | 3635.6  | 3642.9  | 3651.8  | 3670.9  | 3676.7  | 3685.6  | 3690.0  | 3690.0  | 3700.2  |
| 5°    | 3465.0  | 3482.7  | 3507.6  | 3528.2  | 3569.4  | 3622.3  | 3660.5  | 3675.2  | 3701.7  | 3725.3  | 3738.5  |
| 7.5°  | 3332.7  | 3353.3  | 3382.7  | 3431.2  | 3501.8  | 3587.0  | 3666.4  | 3687.0  | 3738.5  | 3788.4  | 3813.5  |
| 10°   | 3247.5  | 3263.6  | 3301.9  | 3370.9  | 3463.6  | 3582.6  | 3694.3  | 3719.4  | 3807.5  | 3891.4  | 3938.4  |
| 12.5° | 3218.0  | 3232.7  | 3272.4  | 3350.3  | 3465.0  | 3604.7  | 3759.1  | 3795.8  | 3925.2  | 4047.2  | 4113.3  |
| 15°   | 3260.7  | 3263.6  | 3306.2  | 3379.7  | 3492.9  | 3659.1  | 3866.4  | 3910.5  | 4073.7  | 4232.4  | 4314.7  |
| 17.5° | 3425.3  | 3412.1  | 3434.2  | 3466.5  | 3556.2  | 3731.1  | 3979.6  | 4045.7  | 4263.3  | 4450.0  | 4527.9  |
| 20°   | 3837.0  | 3837.0  | 3787.0  | 3698.8  | 3700.2  | 3842.8  | 4132.4  | 4207.4  | 4473.5  | 4689.6  | 4760.2  |
| 22.5° | 4541.1  | 4527.9  | 4427.9  | 4211.8  | 4013.4  | 4035.5  | 4319.1  | 4416.2  | 4726.4  | 4957.1  | 4980.7  |
| 25°   | 5387.9  | 5371.8  | 5217.4  | 4913.1  | 4569.1  | 4347.1  | 4572.0  | 4683.7  | 5027.7  | 5232.0  | 5183.6  |
| 27.5° | 6284.7  | 6271.5  | 6118.6  | 5740.8  | 5251.2  | 4844.0  | 4873.4  | 4979.2  | 5335.0  | 5536.4  | 5382.0  |
| 30°   | 7153.5  | 7157.9  | 7006.4  | 6618.4  | 6064.2  | 5477.6  | 5255.6  | 5317.4  | 5633.4  | 5837.7  | 5617.2  |
| 32.5° | 7979.7  | 7985.6  | 7854.7  | 7421.1  | 6903.6  | 6214.1  | 5784.8  | 5768.7  | 5980.3  | 6181.7  | 5928.9  |
| 35°   | 8716.2  | 8730.9  | 8641.2  | 8304.6  | 7756.3  | 7034.4  | 6471.4  | 6433.2  | 6472.9  | 6700.7  | 6406.7  |
| 37.5° | 9426.2  | 9435.1  | 9367.5  | 9083.7  | 8625.1  | 7935.6  | 7338.7  | 7284.3  | 7199.1  | 7374.0  | 7037.4  |
| 40°   | 10204.0 | 10181.9 | 10104.0 | 9846.7  | 9452.7  | 8930.8  | 8270.7  | 8176.7  | 8028.2  | 8184.0  | 7866.5  |
| 42.5° | 10927.2 | 10902.3 | 10915.5 | 10624.4 | 10292.2 | 9954.1  | 9357.2  | 9195.5  | 9108.8  | 9288.1  | 8883.8  |
| 45°   | 11831.4 | 11818.2 | 11862.2 | 11609.4 | 11340.4 | 11094.8 | 10602.3 | 10426.0 | 10387.7 | 10597.9 | 10114.3 |
| 47.5° | 12723.7 | 12756.1 | 12892.8 | 12785.5 | 12676.7 | 12460.6 | 11921.0 | 11841.6 | 11865.2 | 12119.5 | 11412.4 |
| 50°   | 13467.6 | 13505.8 | 13880.7 | 14004.1 | 14161.5 | 14035.1 | 13494.0 | 13445.5 | 13538.2 | 13767.4 | 12809.0 |
| 52.5° | 14005.6 | 14083.5 | 14549.6 | 15118.5 | 15691.8 | 15777.1 | 15237.6 | 15193.4 | 15318.5 | 15353.7 | 13888.1 |
| 55°   | 14379.0 | 14448.1 | 14975.9 | 16016.7 | 17184.0 | 17551.5 | 17216.3 | 17045.8 | 17022.3 | 16673.9 | 15023.0 |
| 57.5° | 14445.2 | 14437.9 | 15196.4 | 16597.4 | 18354.2 | 19302.4 | 19090.7 | 18923.1 | 18440.9 | 17894.0 | 16324.0 |
| 60°   | 14071.8 | 14114.4 | 14995.0 | 16798.8 | 19089.3 | 20627.0 | 20643.1 | 20425.6 | 19674.4 | 19080.4 | 17585.3 |
| 62.5° | 12922.1 | 13095.6 | 13985.0 | 16271.1 | 19080.4 | 21160.6 | 21781.0 | 21614.9 | 20716.6 | 20052.1 | 18864.3 |
| 65°   | 11058.1 | 11119.8 | 11968.1 | 14462.8 | 17791.2 | 20937.2 | 22805.7 | 22743.9 | 21656.1 | 20996.0 | 19521.4 |
| 67.5° | 8075.2  | 7941.4  | 8832.4  | 11388.8 | 15062.7 | 19634.6 | 23540.7 | 23618.6 | 22380.8 | 21190.0 | 18821.6 |
| 68°   | 7369.6  | 7409.3  | 8103.2  | 10628.8 | 14348.2 | 19174.5 | 23589.2 | 23708.3 | 22452.8 | 21063.6 | 18439.4 |
| 70°   | 4392.6  | 4469.1  | 5088.0  | 7318.1  | 10915.5 | 16570.9 | 23065.9 | 23337.8 | 22023.6 | 19759.6 | 15949.1 |
| 72.5° | 1121.7  | 1212.9  | 1797.9  | 3275.4  | 6234.7  | 11675.6 | 19471.5 | 19931.6 | 19121.6 | 16030.0 | 10767.0 |
| 75°   | 461.6   | 485.1   | 642.4   | 1079.0  | 2322.7  | 5260.0  | 12833.9 | 13818.9 | 13255.9 | 9596.8  | 4866.0  |
| 77.5° | 319.1   | 335.2   | 413.1   | 598.3   | 1005.5  | 1783.3  | 6292.0  | 7003.6  | 6309.7  | 3275.4  | 1061.4  |
| 80°   | 229.3   | 242.6   | 295.5   | 398.4   | 577.7   | 636.5   | 2050.8  | 2371.3  | 1883.2  | 718.9   | 263.2   |
| 82.5° | 136.8   | 147.0   | 220.5   | 283.7   | 351.4   | 304.3   | 510.1   | 579.2   | 545.4   | 357.2   | 117.7   |
| 85°   | 67.6    | 79.4    | 148.5   | 202.9   | 189.7   | 127.9   | 155.8   | 173.5   | 214.6   | 217.6   | 63.3    |
| 87.5° | 4.4     | 8.8     | 86.7    | 122.0   | 52.9    | 29.4    | 45.6    | 55.9    | 76.5    | 107.3   | 26.5    |
| 90°   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |



REPORT NUMBER: P383542

CATALOG NUMBER: GLEON-SA8B-735-U-T3-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 3694.3  | 3694.3 | 3694.3 | 3694.3 | 3694.3 | 3694.3 | 3694.3 | 3694.3 | 3694.3 | 3694.3 | 3694.3 |
| 2.5°  | 3704.7  | 3706.2 | 3695.8 | 3691.4 | 3694.3 | 3676.7 | 3669.4 | 3672.3 | 3672.3 | 3676.7 | 3669.4 |
| 5°    | 3741.4  | 3741.4 | 3723.8 | 3700.2 | 3687.0 | 3653.2 | 3631.2 | 3625.3 | 3620.8 | 3617.9 | 3612.1 |
| 7.5°  | 3820.7  | 3812.0 | 3781.1 | 3729.6 | 3685.6 | 3612.1 | 3556.2 | 3526.7 | 3512.0 | 3506.2 | 3501.8 |
| 10°   | 3948.6  | 3932.5 | 3881.1 | 3785.5 | 3684.1 | 3553.2 | 3431.2 | 3344.4 | 3272.4 | 3243.0 | 3225.4 |
| 12.5° | 4120.7  | 4097.1 | 4010.4 | 3851.7 | 3673.7 | 3432.7 | 3168.1 | 2913.7 | 2677.1 | 2580.0 | 2531.5 |
| 15°   | 4319.1  | 4285.3 | 4148.6 | 3907.6 | 3613.5 | 3160.7 | 2585.9 | 2140.5 | 1812.6 | 1689.2 | 1636.3 |
| 17.5° | 4520.5  | 4476.5 | 4269.2 | 3942.8 | 3432.7 | 2597.6 | 1814.1 | 1370.1 | 1151.1 | 1092.2 | 1071.7 |
| 20°   | 4723.4  | 4658.8 | 4373.5 | 3916.3 | 3024.0 | 1872.9 | 1196.7 | 1001.1 | 937.9  | 920.3  | 914.4  |
| 22.5° | 4916.1  | 4816.0 | 4467.6 | 3813.5 | 2394.8 | 1256.9 | 946.7  | 885.0  | 864.4  | 854.1  | 851.2  |
| 25°   | 5083.6  | 4943.9 | 4550.0 | 3495.9 | 1695.0 | 949.7  | 852.6  | 832.1  | 805.6  | 786.5  | 788.0  |
| 27.5° | 5240.9  | 5071.8 | 4600.0 | 2972.6 | 1130.5 | 811.5  | 789.5  | 761.5  | 713.0  | 685.1  | 685.1  |
| 30°   | 5430.5  | 5242.4 | 4636.7 | 2287.5 | 832.1  | 717.4  | 699.8  | 657.1  | 591.0  | 554.3  | 554.3  |
| 32.5° | 5715.8  | 5501.1 | 4613.2 | 1605.3 | 689.4  | 630.7  | 589.5  | 530.7  | 458.7  | 423.4  | 421.9  |
| 35°   | 6152.4  | 5901.0 | 4445.6 | 1052.6 | 608.6  | 548.3  | 482.2  | 410.2  | 346.9  | 317.6  | 316.1  |
| 37.5° | 6740.4  | 6436.1 | 4069.3 | 752.7  | 545.4  | 471.9  | 392.6  | 313.1  | 266.0  | 247.0  | 245.5  |
| 40°   | 7503.4  | 7058.0 | 3531.2 | 610.1  | 486.6  | 398.4  | 302.8  | 242.6  | 210.3  | 195.5  | 197.0  |
| 42.5° | 8419.2  | 7723.9 | 2885.8 | 526.3  | 429.3  | 327.8  | 236.7  | 191.2  | 170.6  | 160.2  | 157.3  |
| 45°   | 9436.6  | 8381.0 | 2209.5 | 468.9  | 372.0  | 264.7  | 185.2  | 151.4  | 135.3  | 129.4  | 129.4  |
| 47.5° | 10555.3 | 9020.5 | 1617.1 | 419.0  | 310.2  | 204.4  | 148.5  | 123.5  | 110.3  | 105.8  | 104.3  |
| 50°   | 11571.1 | 9464.5 | 1165.8 | 366.1  | 254.3  | 161.7  | 120.5  | 102.9  | 94.1   | 88.2   | 88.2   |
| 52.5° | 12417.9 | 9604.2 | 858.5  | 308.7  | 205.8  | 129.4  | 100.0  | 88.2   | 79.4   | 75.0   | 75.0   |
| 55°   | 13163.2 | 9546.8 | 638.0  | 254.3  | 166.1  | 105.8  | 85.2   | 75.0   | 67.6   | 63.3   | 63.3   |
| 57.5° | 13877.7 | 9361.6 | 476.3  | 207.3  | 133.8  | 85.2   | 72.0   | 63.3   | 55.9   | 52.9   | 52.9   |
| 60°   | 14461.3 | 9052.9 | 354.3  | 167.6  | 107.3  | 69.1   | 60.3   | 51.4   | 45.6   | 41.2   | 41.2   |
| 62.5° | 14934.8 | 8711.8 | 260.2  | 138.1  | 85.2   | 54.4   | 47.0   | 42.7   | 33.8   | 29.4   | 29.4   |
| 65°   | 14937.6 | 8145.8 | 195.5  | 114.7  | 66.1   | 42.7   | 35.3   | 33.8   | 22.1   | 17.6   | 16.2   |
| 67.5° | 13857.1 | 7022.7 | 150.0  | 98.5   | 51.4   | 32.3   | 26.5   | 27.9   | 11.7   | 7.4    | 5.9    |
| 68°   | 13464.7 | 6737.5 | 141.1  | 97.1   | 48.5   | 30.8   | 25.0   | 27.9   | 10.2   | 5.9    | 4.4    |
| 70°   | 11352.1 | 5359.9 | 113.2  | 94.1   | 42.7   | 23.6   | 20.6   | 27.9   | 8.8    | 4.4    | 3.0    |
| 72.5° | 7260.9  | 3110.7 | 83.8   | 75.0   | 32.3   | 17.6   | 13.2   | 25.0   | 8.8    | 3.0    | 1.5    |
| 75°   | 3090.1  | 964.4  | 57.3   | 52.9   | 19.1   | 13.2   | 8.8    | 16.2   | 5.9    | 1.5    | 0.0    |
| 77.5° | 651.2   | 217.6  | 33.8   | 32.3   | 13.2   | 8.8    | 5.9    | 4.4    | 1.5    | 0.0    | 0.0    |
| 80°   | 167.6   | 63.3   | 17.6   | 16.2   | 7.4    | 4.4    | 3.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 82.5° | 52.9    | 25.0   | 10.2   | 7.4    | 3.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 85°   | 26.5    | 14.7   | 5.9    | 3.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 87.5° | 14.7    | 4.4    | 1.5    | 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)