

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: P383432

Luminaire Tested: **GLEON-SA7B-735-U-T3R-HSS**

Issue Date: 3/3/2020

### Test Information

Test Method: LM-79-08  
Report Number: P383432  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-11)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA7B-735-U-T3R-HSS  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(7) 70 CRI, 3500K, 800mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE III  
ROADWAY OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

### Summary

Lumens per Lamp: N/A  
Luminaire Lumens: 28959 lumens  
Efficiency: N/A  
Efficacy: 98.2 lumens/watt  
Luminous Opening: Rectangular (W 2' x L: 1' x H: 0')  
IES Classification: Type III - Medium  
BUG Rating: B3 - U0 - G4

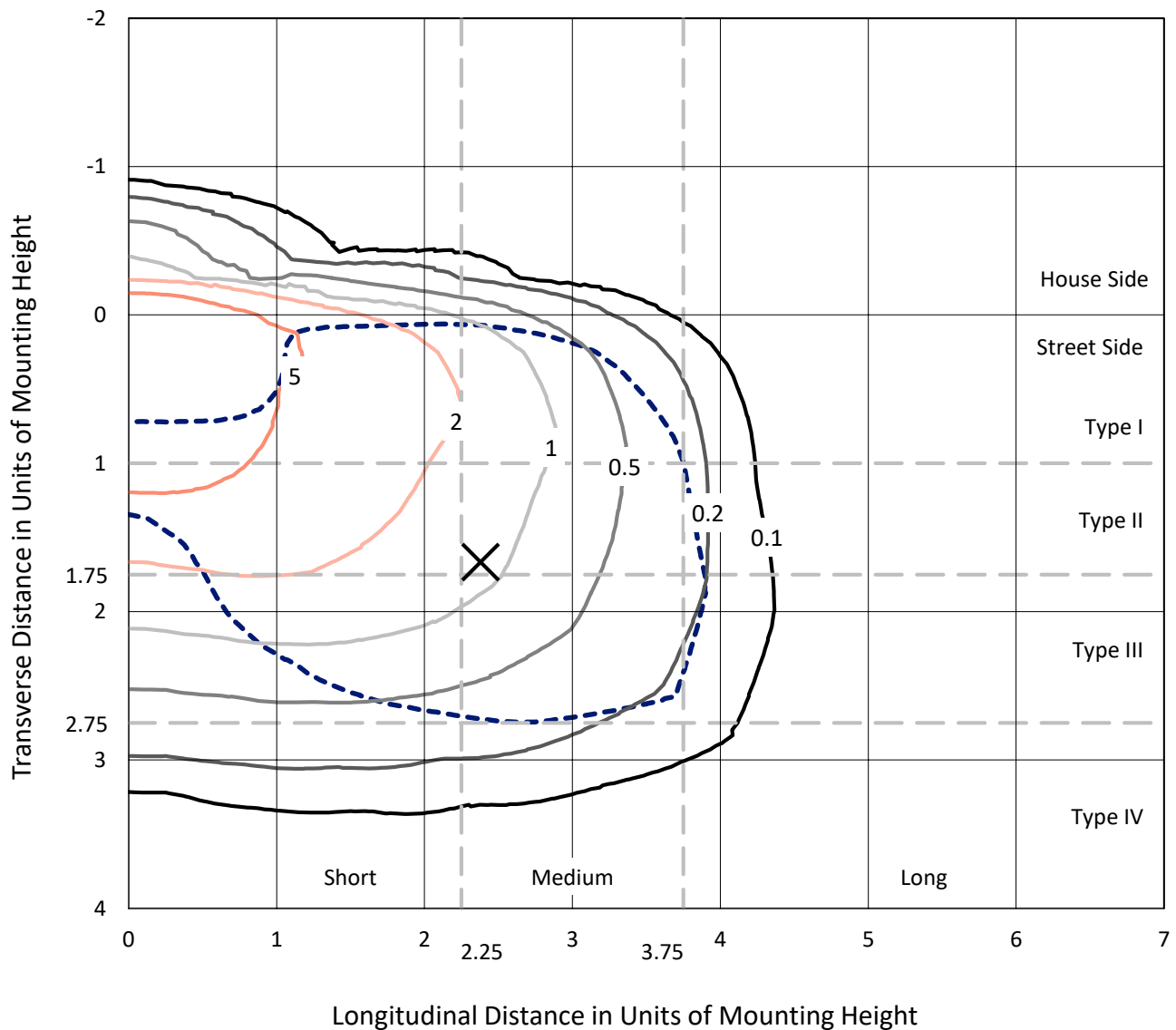
Input Watts (W): 295  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



REPORT NUMBER: P383432  
 CATALOG NUMBER: GLEON-SA7B-735-U-T3R-HSS

## Iso-Footcandle Lines of Horizontal Illumination

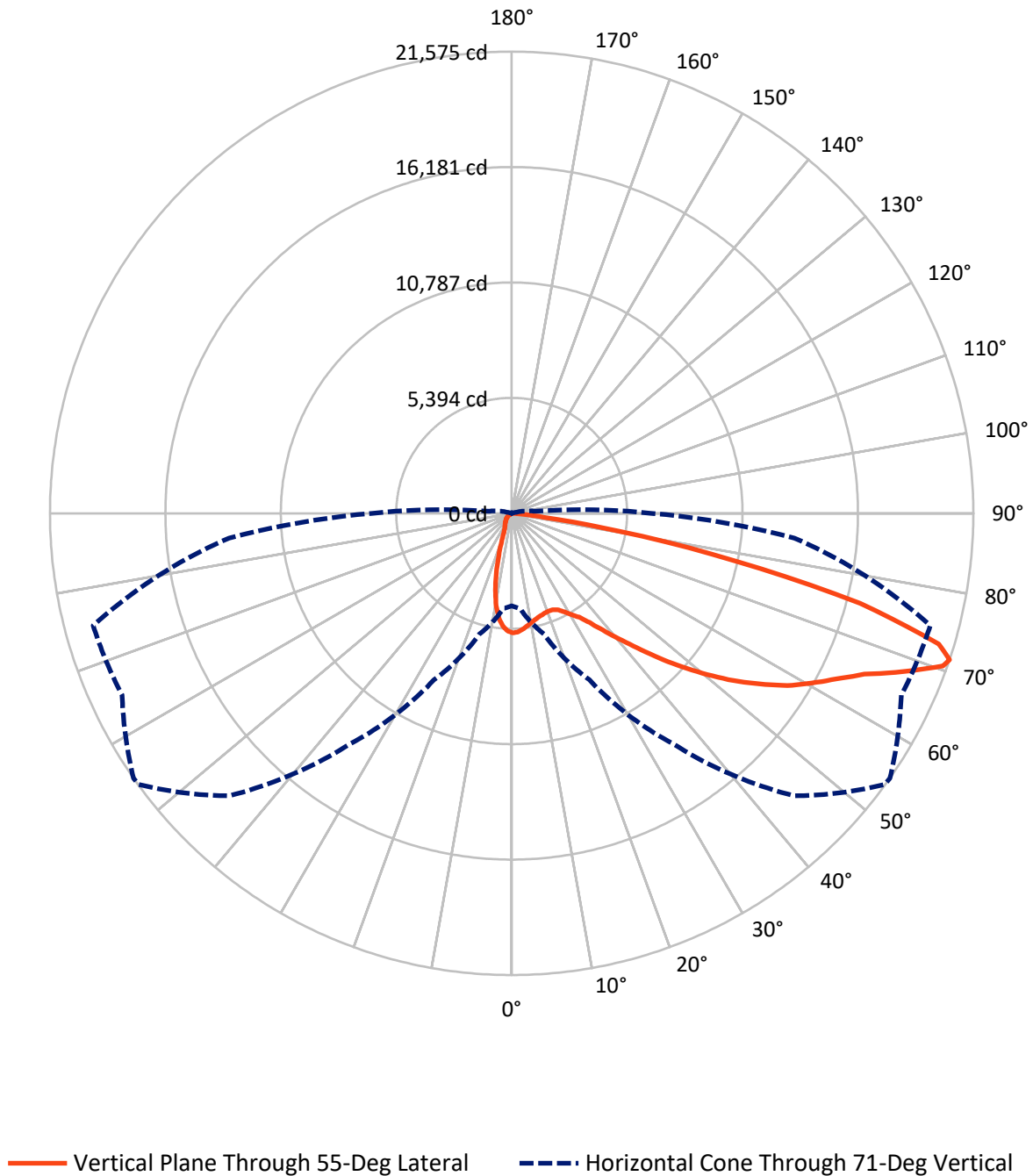
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 9.2 fc  
 Type III - Medium - N/A

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## Luminous Intensity Polar Plot



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**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 2292.8   | 0.0    | 2292.8  |
|                    | % Fixture | 7.9      | 0.0    | 7.9     |
| <b>Street Side</b> | Lumens    | 26666.3  | 0.0    | 26666.3 |
|                    | % Fixture | 92.1     | 0.0    | 92.1    |
| <b>Total</b>       | Lumens    | 28959.0  | 0.0    | 28959.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 476.2   | 1.6       |
| 10°-20°   | 1075.0  | 3.7       |
| 20°-30°   | 1727.6  | 6.0       |
| 30°-40°   | 2935.3  | 10.1      |
| 40°-50°   | 4555.9  | 15.7      |
| 50°-60°   | 6125.3  | 21.2      |
| 60°-70°   | 7493.2  | 25.9      |
| 70°-80°   | 4381.1  | 15.1      |
| 80°-90°   | 189.4   | 0.7       |
| 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°    | 28959.0 | 100.0     |
| 0°-180°   | 28959.0 | 100.0     |

**Coefficient of Utilization**



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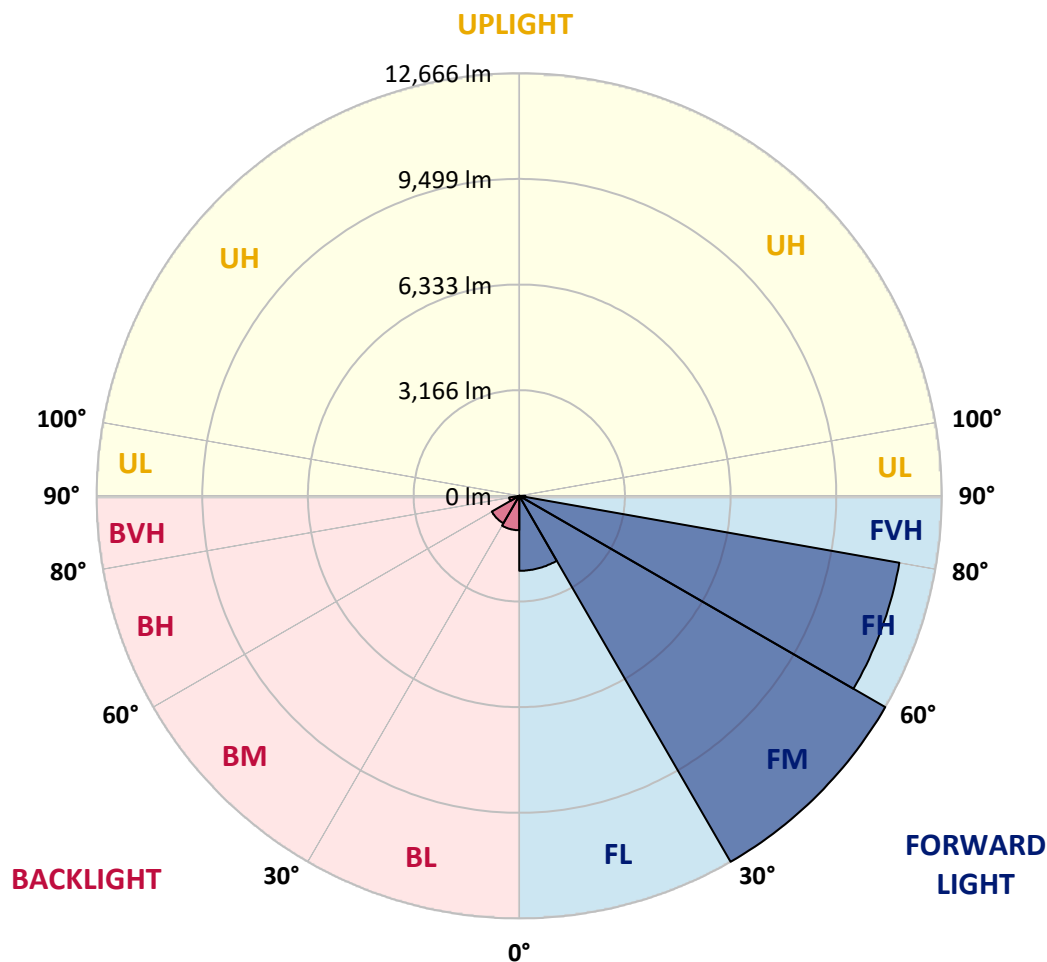
CATALOG NUMBER: GLEON-SA7B-735-U-T3R-HSS

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |          |
|------|-------------|---------|-----------|-------------------------|------|----------|
|      |             |         |           | B                       | U    | G        |
| FL   | (0°-30°)    | 2246.8  | 7.8       |                         |      |          |
| FM   | (30°-60°)   | 12665.8 | 43.7      |                         |      |          |
| FH   | (60°-80°)   | 11567.2 | 39.9      |                         |      | G4/12000 |
| FVH  | (80°-90°)   | 186.4   | 0.6       |                         |      | G2/225   |
| BL   | (0°-30°)    | 1032.0  | 3.6       | B3/2500                 |      |          |
| BM   | (30°-60°)   | 950.6   | 3.3       | B1/1000                 |      |          |
| BH   | (60°-80°)   | 307.2   | 1.1       | B1/500                  |      | G1/500   |
| BVH  | (80°-90°)   | 3.0     | 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 Medium





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 54°     | 55°     | 65°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 5584.8  | 5584.8  | 5584.8  | 5584.8  | 5584.8  | 5584.8  | 5584.8  | 5584.8  | 5584.8  | 5584.8  | 5584.8  |
| 2.5°  | 5421.0  | 5427.5  | 5451.0  | 5461.3  | 5486.1  | 5527.6  | 5548.5  | 5549.8  | 5583.5  | 5596.6  | 5607.0  |
| 5°    | 5037.4  | 5076.5  | 5115.4  | 5157.0  | 5232.5  | 5332.6  | 5431.4  | 5440.5  | 5549.8  | 5630.4  | 5673.3  |
| 7.5°  | 4707.1  | 4742.2  | 4789.1  | 4855.4  | 4962.0  | 5119.3  | 5284.5  | 5304.0  | 5510.8  | 5694.1  | 5790.3  |
| 10°   | 4367.7  | 4396.3  | 4464.0  | 4561.5  | 4708.4  | 4919.1  | 5141.4  | 5173.9  | 5475.6  | 5779.9  | 5949.0  |
| 12.5° | 4005.0  | 4021.9  | 4103.7  | 4244.2  | 4460.1  | 4728.0  | 5020.5  | 5063.4  | 5453.6  | 5878.7  | 6136.2  |
| 15°   | 3729.3  | 3737.1  | 3815.2  | 3960.8  | 4207.8  | 4556.3  | 4926.9  | 4978.9  | 5458.7  | 5997.0  | 6340.3  |
| 17.5° | 3659.1  | 3663.0  | 3704.6  | 3804.7  | 4023.2  | 4402.9  | 4852.8  | 4916.5  | 5474.3  | 6112.8  | 6545.8  |
| 20°   | 3943.9  | 3916.5  | 3873.7  | 3858.0  | 3951.6  | 4310.6  | 4808.6  | 4880.1  | 5495.1  | 6215.5  | 6730.4  |
| 22.5° | 4725.4  | 4644.7  | 4466.6  | 4228.7  | 4084.3  | 4317.1  | 4820.3  | 4891.7  | 5561.4  | 6341.6  | 6943.7  |
| 25°   | 5885.2  | 5773.4  | 5470.4  | 5002.3  | 4552.4  | 4504.3  | 4917.8  | 4990.6  | 5690.2  | 6492.5  | 7147.9  |
| 27.5° | 7205.1  | 7094.5  | 6723.9  | 6055.5  | 5288.4  | 4874.9  | 5141.4  | 5209.0  | 5881.3  | 6626.4  | 7303.9  |
| 30°   | 8469.0  | 8437.8  | 8000.9  | 7241.5  | 6214.2  | 5475.6  | 5430.1  | 5487.3  | 6023.0  | 6707.0  | 7427.4  |
| 32.5° | 9540.4  | 9491.0  | 9139.9  | 8401.3  | 7274.0  | 6197.3  | 5769.5  | 5786.4  | 6129.7  | 6811.0  | 7588.7  |
| 35°   | 10533.8 | 10472.7 | 10164.6 | 9466.3  | 8361.0  | 7078.9  | 6292.2  | 6267.5  | 6362.5  | 7020.4  | 7822.7  |
| 37.5° | 11401.1 | 11457.1 | 11115.1 | 10450.7 | 9336.2  | 7995.7  | 6996.9  | 6922.9  | 6726.5  | 7361.1  | 8162.0  |
| 40°   | 12126.7 | 12126.7 | 11948.6 | 11394.7 | 10389.6 | 8943.6  | 7794.1  | 7696.5  | 7274.0  | 7886.4  | 8592.5  |
| 42.5° | 12388.1 | 12444.0 | 12510.3 | 12196.9 | 11332.3 | 9929.2  | 8682.2  | 8580.8  | 8045.0  | 8631.5  | 9136.0  |
| 45°   | 12403.7 | 12492.1 | 12831.5 | 12830.2 | 12184.0 | 10908.3 | 9683.4  | 9635.4  | 9033.3  | 9588.5  | 9809.6  |
| 47.5° | 12184.0 | 12294.5 | 12853.6 | 13170.9 | 12858.8 | 11819.8 | 10778.3 | 10718.5 | 10194.5 | 10761.4 | 10514.4 |
| 50°   | 11844.5 | 11966.8 | 12617.0 | 13304.8 | 13317.8 | 12613.1 | 11931.7 | 11841.9 | 11472.7 | 12102.0 | 11242.5 |
| 52.5° | 11237.4 | 11474.0 | 12405.0 | 13336.0 | 13619.5 | 13298.3 | 13029.2 | 12990.2 | 12903.1 | 13393.2 | 11822.5 |
| 55°   | 9938.3  | 10201.0 | 11873.1 | 13346.5 | 13899.1 | 13905.6 | 14057.7 | 14068.1 | 14243.6 | 14600.0 | 12254.1 |
| 57.5° | 9324.5  | 9472.8  | 10944.8 | 13395.8 | 14313.9 | 14594.7 | 15105.8 | 15186.4 | 15458.1 | 15745.5 | 12747.0 |
| 60°   | 8938.4  | 9113.9  | 10487.0 | 13328.2 | 14965.3 | 15498.4 | 16077.1 | 16104.4 | 16395.7 | 16927.5 | 13414.0 |
| 62.5° | 8630.2  | 8803.1  | 10198.4 | 13068.1 | 15697.4 | 16585.6 | 17026.4 | 17028.9 | 17247.4 | 18335.7 | 14172.1 |
| 65°   | 7869.5  | 8015.1  | 9614.5  | 12775.6 | 16181.1 | 17660.8 | 18128.9 | 18112.1 | 18290.2 | 19820.7 | 15052.4 |
| 67.5° | 6769.5  | 6881.2  | 8422.1  | 11666.4 | 15999.1 | 18638.7 | 19793.4 | 19737.4 | 19521.6 | 21104.1 | 15398.3 |
| 70°   | 5233.8  | 5274.0  | 6638.1  | 9722.5  | 14293.0 | 19014.5 | 21401.8 | 21373.2 | 20277.1 | 20873.9 | 14130.6 |
| 71°   | 4326.1  | 4458.8  | 5850.1  | 8580.8  | 13150.1 | 18667.3 | 21557.9 | 21574.8 | 20087.2 | 20247.2 | 13258.0 |
| 72.5° | 2512.2  | 2625.4  | 4240.3  | 6590.0  | 11164.5 | 17218.7 | 20749.1 | 20871.3 | 19200.4 | 18416.3 | 11324.5 |
| 75°   | 538.3   | 576.1   | 1572.1  | 3189.7  | 6141.4  | 12068.2 | 16377.4 | 16813.0 | 15649.3 | 12528.6 | 6825.4  |
| 77.5° | 374.5   | 404.4   | 673.6   | 1447.3  | 2029.7  | 5963.2  | 10173.6 | 10665.2 | 9349.3  | 4708.4  | 2184.6  |
| 80°   | 296.5   | 330.2   | 525.3   | 715.1   | 548.8   | 1923.2  | 4765.6  | 5066.0  | 3118.2  | 1050.7  | 368.0   |
| 82.5° | 165.2   | 196.4   | 409.6   | 386.2   | 210.6   | 365.4   | 1334.2  | 1508.4  | 624.1   | 211.9   | 87.1    |
| 85°   | 48.1    | 58.5    | 264.0   | 280.9   | 89.7    | 70.2    | 227.6   | 282.2   | 118.3   | 55.9    | 39.0    |
| 87.5° | 0.0     | 0.0     | 127.4   | 108.0   | 26.0    | 10.4    | 20.8    | 23.4    | 23.4    | 23.4    | 26.0    |
| 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: P383432

CATALOG NUMBER: GLEON-SA7B-735-U-T3R-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 5584.8 | 5584.8 | 5584.8 | 5584.8 | 5584.8 | 5584.8 | 5584.8 | 5584.8 | 5584.8 | 5584.8 | 5584.8 |
| 2.5°  | 5607.0 | 5616.0 | 5583.5 | 5540.7 | 5495.1 | 5439.2 | 5380.7 | 5335.2 | 5333.9 | 5311.8 | 5289.7 |
| 5°    | 5675.9 | 5670.7 | 5581.0 | 5444.4 | 5283.2 | 5115.4 | 4955.5 | 4774.7 | 4714.9 | 4640.8 | 4616.1 |
| 7.5°  | 5803.3 | 5766.9 | 5577.1 | 5278.0 | 4924.3 | 4573.2 | 4210.4 | 3845.1 | 3689.0 | 3548.5 | 3523.9 |
| 10°   | 5963.2 | 5894.4 | 5552.3 | 5028.3 | 4379.5 | 3731.9 | 3184.5 | 2687.8 | 2469.3 | 2301.6 | 2293.7 |
| 12.5° | 6129.7 | 6024.3 | 5483.5 | 4651.2 | 3665.5 | 2755.3 | 2124.7 | 1635.8 | 1453.8 | 1336.7 | 1347.1 |
| 15°   | 6304.0 | 6146.6 | 5335.2 | 4142.8 | 2852.9 | 1869.9 | 1305.5 | 1018.2 | 945.3  | 915.4  | 923.3  |
| 17.5° | 6482.1 | 6231.1 | 5128.4 | 3530.4 | 2050.6 | 1206.7 | 903.7  | 823.1  | 823.1  | 829.6  | 832.2  |
| 20°   | 6636.8 | 6276.6 | 4824.2 | 2843.8 | 1390.1 | 879.0  | 790.6  | 778.9  | 785.4  | 795.8  | 797.1  |
| 22.5° | 6790.2 | 6279.2 | 4427.6 | 2148.1 | 972.6  | 769.8  | 752.9  | 747.7  | 751.6  | 763.3  | 764.6  |
| 25°   | 6915.1 | 6248.0 | 3930.9 | 1527.8 | 776.3  | 725.6  | 717.8  | 715.1  | 717.8  | 732.1  | 732.1  |
| 27.5° | 6965.7 | 6134.9 | 3324.9 | 1074.1 | 695.7  | 676.1  | 673.6  | 676.1  | 680.0  | 690.5  | 691.8  |
| 30°   | 6971.0 | 5937.2 | 2664.3 | 777.6  | 630.7  | 609.9  | 615.0  | 624.1  | 620.2  | 617.6  | 620.2  |
| 32.5° | 6984.0 | 5708.3 | 2020.7 | 639.8  | 576.1  | 543.6  | 537.0  | 537.0  | 521.4  | 512.4  | 507.1  |
| 35°   | 7026.9 | 5439.2 | 1465.4 | 574.8  | 520.1  | 482.4  | 457.7  | 429.1  | 399.2  | 383.6  | 379.7  |
| 37.5° | 7094.5 | 5157.0 | 1049.4 | 531.8  | 470.7  | 427.8  | 381.0  | 330.2  | 287.4  | 275.6  | 275.6  |
| 40°   | 7218.0 | 4865.8 | 776.3  | 498.0  | 431.7  | 378.4  | 308.2  | 241.8  | 202.9  | 196.4  | 196.4  |
| 42.5° | 7413.1 | 4558.9 | 618.9  | 468.1  | 397.9  | 327.7  | 235.4  | 175.5  | 146.9  | 143.0  | 141.7  |
| 45°   | 7616.0 | 4220.8 | 540.9  | 439.5  | 361.5  | 269.1  | 174.2  | 130.0  | 113.1  | 109.3  | 109.3  |
| 47.5° | 7818.8 | 3860.6 | 503.2  | 412.2  | 326.4  | 209.3  | 130.0  | 102.7  | 94.9   | 94.9   | 96.2   |
| 50°   | 7990.4 | 3484.8 | 475.9  | 382.3  | 280.9  | 158.6  | 102.7  | 87.1   | 84.5   | 89.7   | 91.0   |
| 52.5° | 8033.4 | 3115.6 | 442.1  | 344.6  | 225.0  | 120.9  | 84.5   | 76.8   | 76.8   | 76.8   | 76.8   |
| 55°   | 8007.3 | 2829.5 | 397.9  | 297.8  | 166.5  | 96.2   | 72.8   | 67.6   | 66.3   | 66.3   | 66.3   |
| 57.5° | 8095.8 | 2660.4 | 318.6  | 231.5  | 119.6  | 78.1   | 63.7   | 59.8   | 57.2   | 55.9   | 55.9   |
| 60°   | 8273.9 | 2549.9 | 227.6  | 166.5  | 89.7   | 65.0   | 54.6   | 50.7   | 46.9   | 44.2   | 44.2   |
| 62.5° | 8510.5 | 2453.7 | 169.1  | 123.5  | 68.9   | 52.0   | 45.6   | 41.6   | 36.4   | 33.8   | 33.8   |
| 65°   | 8692.6 | 2282.0 | 128.7  | 92.3   | 52.0   | 41.6   | 35.1   | 33.8   | 26.0   | 23.4   | 22.1   |
| 67.5° | 8414.3 | 1904.9 | 104.1  | 67.6   | 39.0   | 32.5   | 27.3   | 26.0   | 15.6   | 13.0   | 13.0   |
| 70°   | 7216.7 | 1326.3 | 83.2   | 49.4   | 28.6   | 26.0   | 22.1   | 16.9   | 11.7   | 10.4   | 10.4   |
| 71°   | 6544.5 | 1107.9 | 75.5   | 41.6   | 24.7   | 24.7   | 20.8   | 14.3   | 10.4   | 9.1    | 9.1    |
| 72.5° | 5436.6 | 786.7  | 63.7   | 32.5   | 22.1   | 26.0   | 22.1   | 13.0   | 10.4   | 9.1    | 7.8    |
| 75°   | 3155.9 | 329.0  | 44.2   | 22.1   | 16.9   | 31.2   | 28.6   | 11.7   | 7.8    | 6.5    | 6.5    |
| 77.5° | 949.2  | 120.9  | 24.7   | 14.3   | 13.0   | 27.3   | 32.5   | 10.4   | 3.9    | 1.3    | 1.3    |
| 80°   | 173.0  | 52.0   | 15.6   | 9.1    | 9.1    | 16.9   | 24.7   | 5.2    | 0.0    | 0.0    | 0.0    |
| 82.5° | 61.1   | 26.0   | 9.1    | 5.2    | 3.9    | 7.8    | 11.7   | 0.0    | 0.0    | 0.0    | 0.0    |
| 85°   | 35.1   | 18.2   | 5.2    | 2.6    | 0.0    | 1.3    | 2.6    | 0.0    | 0.0    | 0.0    | 0.0    |
| 87.5° | 23.4   | 5.2    | 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)