

Signify Classified - Internal  
Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269



Scaled data based on original data using  
LM-79-08 Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Test Report Prepared for  
Cooper Lighting Solutions  
(formerly Eaton)

Brand: McGRAW-EDISON

Report Number: P383585

Luminaire Tested: **GLEON-SA8D-735-U-SL2**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P383585  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-20)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA8D-735-U-SL2  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(8) 70 CRI, 3500K, 1200mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE II  
SPILL LIGHT ELIMINATOR OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 56749.9 lumens  
Efficiency: N/A  
Efficacy: 111.1 lumens/watt  
Luminous Opening: Rectangular (W 2' x L: 1' x H: 0')  
IES Classification: Type III - Medium  
BUG Rating: B4 - U0 - G5

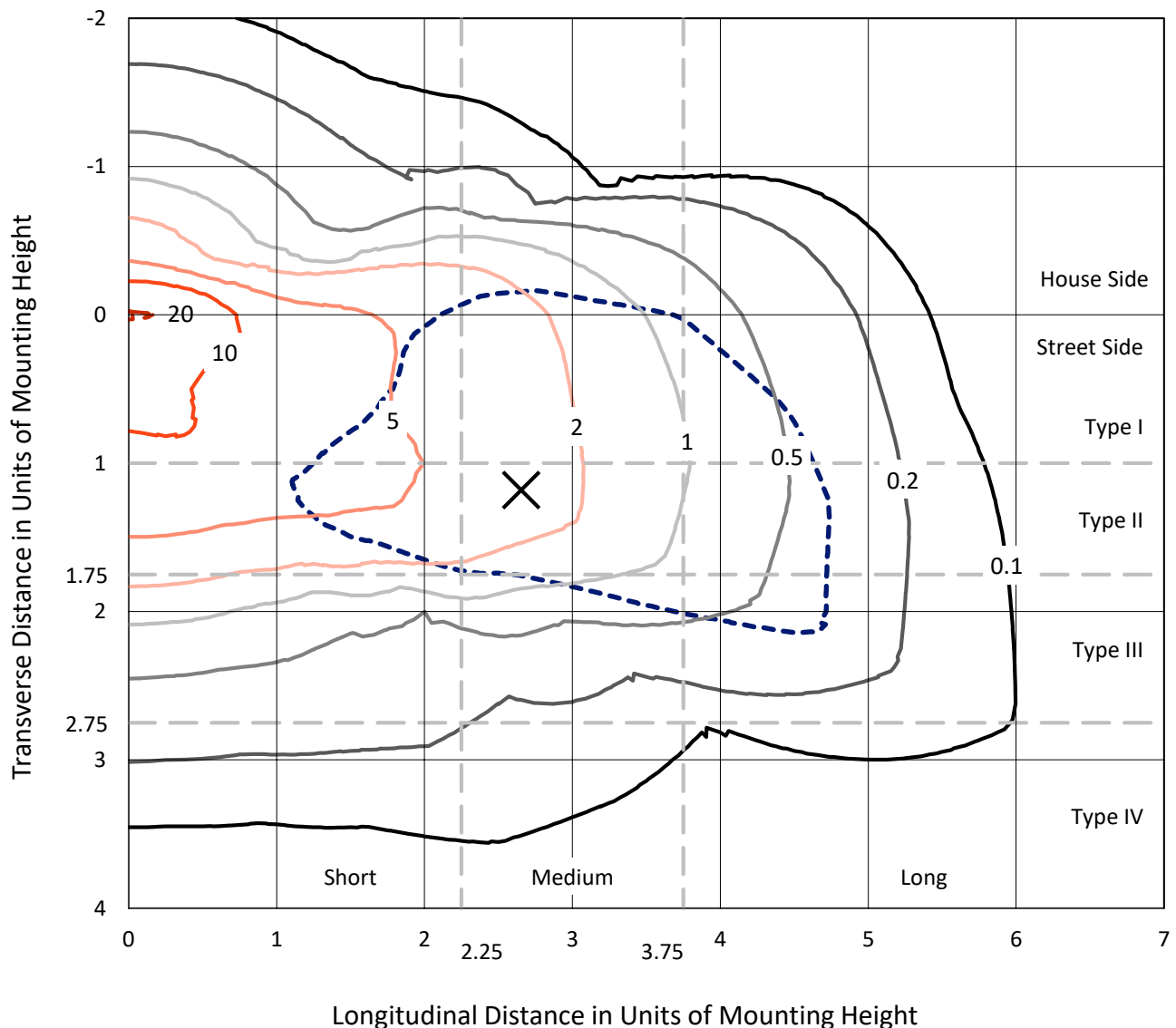
Input Watts (W): 511  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



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 CATALOG NUMBER: GLEON-SA8D-735-U-SL2

## Iso-Footcandle Lines of Horizontal Illumination

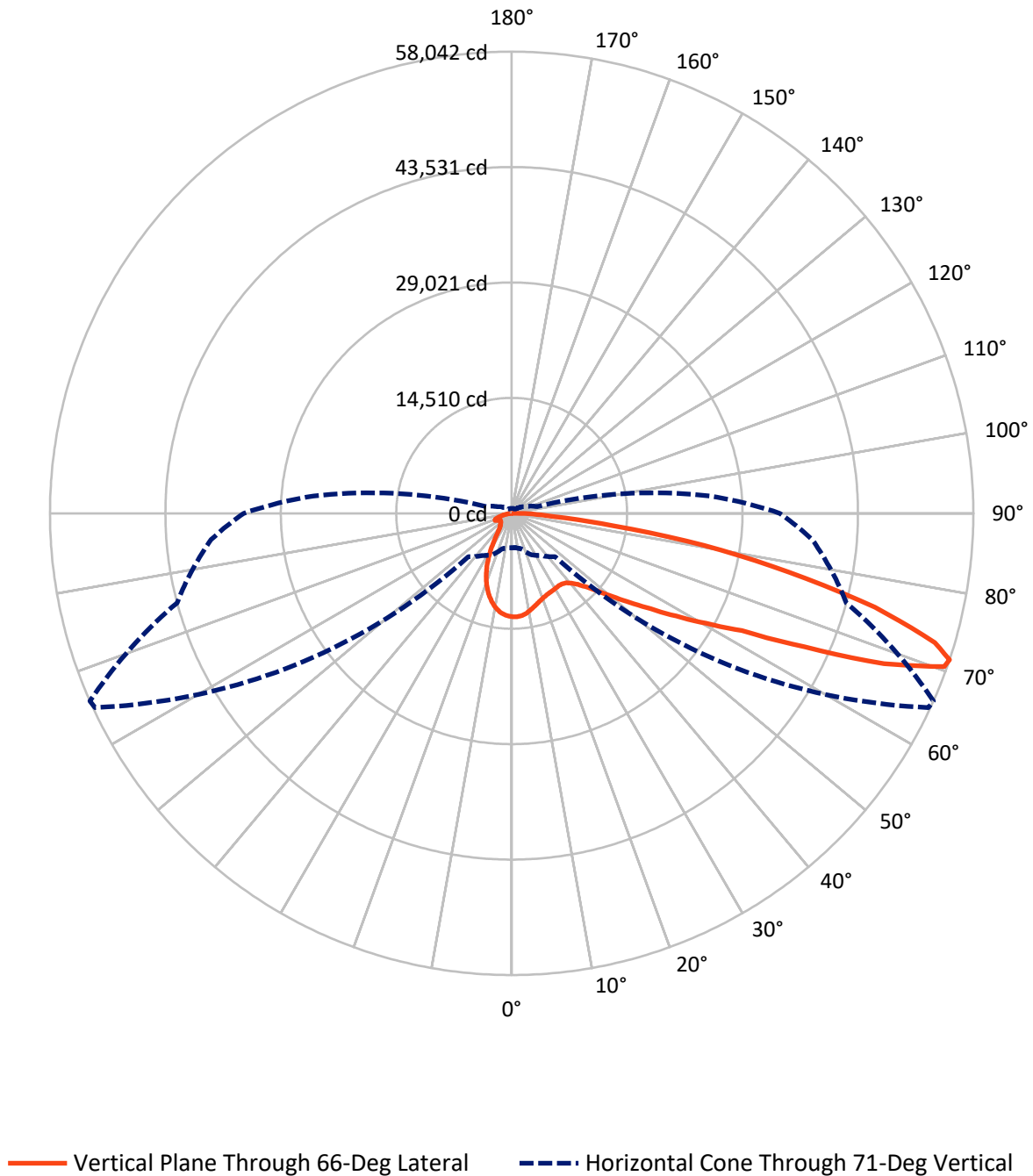
× Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 20.8 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    | 10517.3  | 0.0    | 10517.3 |
|                    | % Fixture | 18.5     | 0.0    | 18.5    |
| <b>Street Side</b> | Lumens    | 46232.6  | 0.0    | 46232.6 |
|                    | % Fixture | 81.5     | 0.0    | 81.5    |
| <b>Total</b>       | Lumens    | 56749.9  | 0.0    | 56749.9 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 1144.3  | 2.0       |
| 10°-20°   | 2744.6  | 4.8       |
| 20°-30°   | 3686.7  | 6.5       |
| 30°-40°   | 4849.8  | 8.5       |
| 40°-50°   | 7055.2  | 12.4      |
| 50°-60°   | 11020.9 | 19.4      |
| 60°-70°   | 13805.5 | 24.3      |
| 70°-80°   | 10530.5 | 18.6      |
| 80°-90°   | 1912.2  | 3.4       |
| 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°    | 56749.9 | 100.0     |
| 0°-180°   | 56749.9 | 100.0     |

**Coefficient of Utilization**



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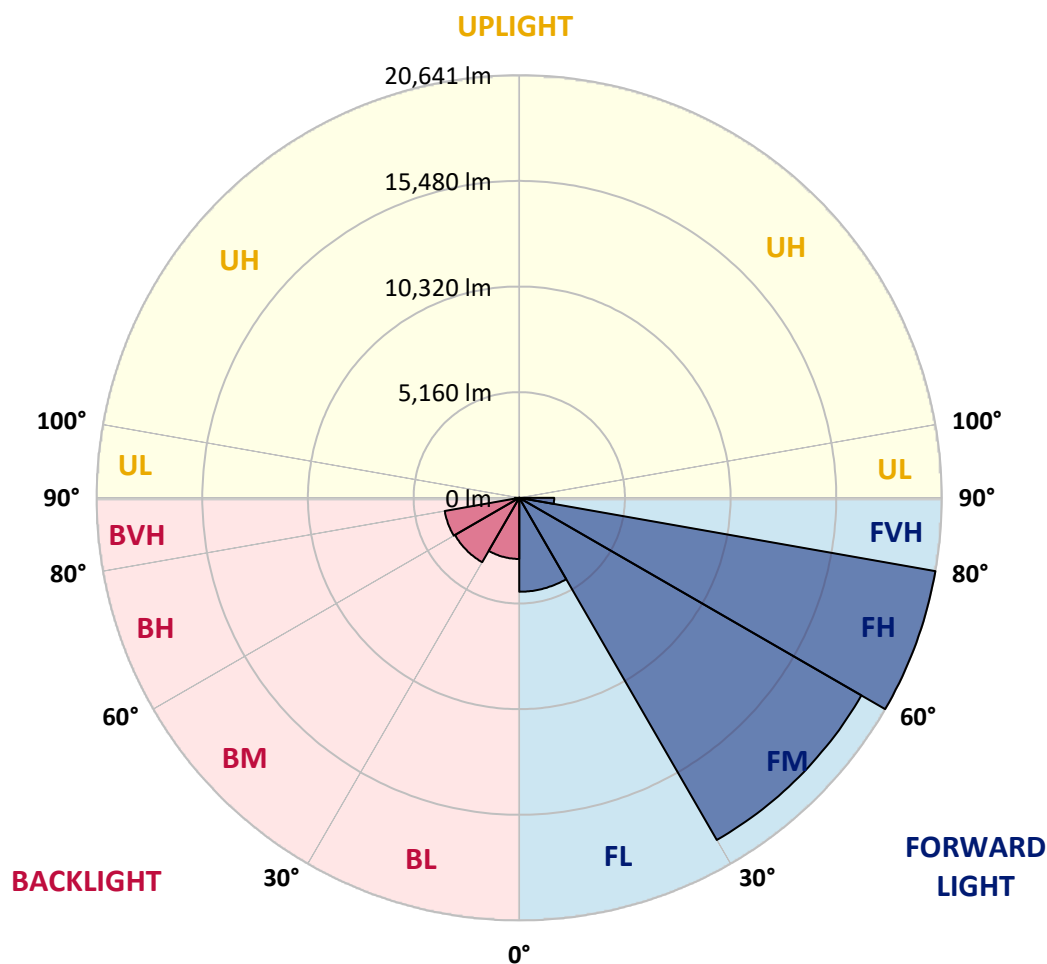
CATALOG NUMBER: GLEON-SA8D-735-U-SL2

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|---------|-----------|-------------------------|------|---------|
|      |             |         |           | B                       | U    | G       |
| FL   | (0°-30°)    | 4589.0  | 8.1       |                         |      |         |
| FM   | (30°-60°)   | 19297.8 | 34.0      |                         |      |         |
| FH   | (60°-80°)   | 20640.5 | 36.4      |                         |      | G5      |
| FVH  | (80°-90°)   | 1705.2  | 3.0       |                         |      | G5      |
| BL   | (0°-30°)    | 2986.6  | 5.3       | B4/5000                 |      |         |
| BM   | (30°-60°)   | 3628.1  | 6.4       | B3/5000                 |      |         |
| BH   | (60°-80°)   | 3695.5  | 6.5       | B4/5000                 |      | G4/5000 |
| BVH  | (80°-90°)   | 207.0   | 0.4       |                         |      | G2/225  |
| UL   | (90°-100°)  | 0.0     | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0     | 0.0       |                         | U0/0 |         |

**BUG Rating: B4-U0-G5**

Type III Medium





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 55°     | 65°     | 66°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 13000.3 | 13000.3 | 13000.3 | 13000.3 | 13000.3 | 13000.3 | 13000.3 | 13000.3 | 13000.3 | 13000.3 | 13000.3 |
| 2.5°  | 12759.3 | 12739.7 | 12798.4 | 12859.3 | 12882.7 | 12922.0 | 12980.7 | 13014.0 | 13012.0 | 13017.9 | 12998.3 |
| 5°    | 11912.8 | 11887.4 | 12004.9 | 12101.0 | 12285.2 | 12492.8 | 12745.6 | 12925.9 | 12929.8 | 13031.6 | 13059.1 |
| 7.5°  | 11111.5 | 11093.9 | 11229.1 | 11383.8 | 11597.4 | 11914.8 | 12324.3 | 12712.3 | 12735.7 | 13012.0 | 13108.1 |
| 10°   | 10468.8 | 10464.9 | 10596.2 | 10764.7 | 11013.5 | 11368.1 | 11838.4 | 12406.6 | 12441.8 | 12918.1 | 13115.9 |
| 12.5° | 9967.2  | 9975.1  | 10088.7 | 10280.7 | 10543.3 | 10913.5 | 11423.0 | 12063.7 | 12120.6 | 12769.1 | 13070.8 |
| 15°   | 9596.9  | 9628.3  | 9720.3  | 9914.3  | 10173.0 | 10549.1 | 11072.3 | 11746.3 | 11832.5 | 12602.5 | 13045.4 |
| 17.5° | 9385.2  | 9420.6  | 9485.2  | 9645.9  | 9888.8  | 10251.3 | 10747.1 | 11485.7 | 11564.1 | 12475.2 | 13047.3 |
| 20°   | 9322.6  | 9352.0  | 9389.3  | 9487.2  | 9692.9  | 10022.1 | 10490.3 | 11250.6 | 11334.9 | 12373.3 | 13066.9 |
| 22.5° | 9446.1  | 9467.6  | 9471.5  | 9463.7  | 9589.1  | 9857.5  | 10304.2 | 11078.2 | 11168.3 | 12306.7 | 13080.6 |
| 25°   | 9710.5  | 9740.0  | 9718.4  | 9645.9  | 9604.7  | 9769.3  | 10208.2 | 10964.5 | 11054.7 | 12257.7 | 13053.2 |
| 27.5° | 10108.3 | 10112.2 | 10094.6 | 10000.5 | 9806.6  | 9779.1  | 10178.8 | 10897.9 | 10984.2 | 12200.9 | 12996.4 |
| 30°   | 10649.1 | 10674.5 | 10643.2 | 10515.9 | 10198.4 | 9935.9  | 10214.1 | 10833.2 | 10911.6 | 12128.4 | 12904.3 |
| 32.5° | 11282.0 | 11344.7 | 11342.7 | 11209.4 | 10754.9 | 10286.6 | 10359.1 | 10794.0 | 10854.8 | 12052.0 | 12792.6 |
| 35°   | 11938.3 | 12024.5 | 12185.2 | 12128.4 | 11566.1 | 10841.1 | 10637.3 | 10856.7 | 10897.9 | 12042.2 | 12714.2 |
| 37.5° | 12620.1 | 12706.4 | 13037.6 | 13190.3 | 12532.0 | 11634.7 | 11076.2 | 11078.2 | 11097.8 | 12161.7 | 12708.4 |
| 40°   | 13333.4 | 13425.5 | 13923.2 | 14320.9 | 13784.0 | 12639.8 | 11783.5 | 11540.6 | 11519.1 | 12455.6 | 12824.0 |
| 42.5° | 14332.7 | 14415.0 | 15012.5 | 15520.0 | 15173.2 | 13927.1 | 12761.3 | 12253.8 | 12208.7 | 13031.6 | 13194.3 |
| 45°   | 15596.4 | 15667.0 | 16301.8 | 16844.5 | 16666.2 | 15396.6 | 13989.8 | 13235.4 | 13227.6 | 13991.8 | 13944.7 |
| 47.5° | 17099.3 | 17154.2 | 17724.3 | 18249.4 | 18314.0 | 17087.5 | 15533.7 | 14750.0 | 14622.6 | 15308.4 | 15106.6 |
| 50°   | 18664.8 | 18725.5 | 19113.5 | 19677.7 | 20157.9 | 19350.6 | 17520.5 | 16605.5 | 16435.0 | 17046.4 | 16752.5 |
| 52.5° | 19701.3 | 19781.6 | 20118.6 | 20833.8 | 22230.8 | 21831.1 | 19869.8 | 18854.8 | 18596.2 | 19152.6 | 18927.4 |
| 55°   | 19238.9 | 19419.1 | 19934.5 | 21080.6 | 23888.4 | 25620.4 | 22767.7 | 21478.4 | 21186.5 | 21648.9 | 21515.7 |
| 57.5° | 17136.5 | 17383.3 | 18086.7 | 19856.0 | 24121.6 | 28959.2 | 27148.7 | 24568.4 | 24362.6 | 24229.4 | 24290.1 |
| 60°   | 13294.2 | 13531.3 | 14403.2 | 16709.4 | 22497.2 | 31396.7 | 33742.0 | 28377.3 | 28079.5 | 26819.6 | 26874.5 |
| 62.5° | 9408.8  | 9289.3  | 9886.9  | 11573.9 | 18280.8 | 31682.7 | 41244.4 | 33471.6 | 32491.9 | 29554.8 | 29313.8 |
| 65°   | 7175.2  | 7147.7  | 7416.1  | 7953.0  | 11072.3 | 28259.7 | 45713.6 | 42033.9 | 40503.7 | 32772.1 | 32203.9 |
| 67.5° | 5895.7  | 5846.7  | 6111.2  | 6893.0  | 7130.1  | 18231.8 | 45811.6 | 51967.9 | 50465.1 | 36777.0 | 35546.6 |
| 70°   | 4847.4  | 4792.5  | 5039.5  | 6048.5  | 6589.3  | 9246.2  | 38556.1 | 57785.2 | 57704.9 | 41847.8 | 38070.2 |
| 71°   | 4345.9  | 4306.6  | 4602.5  | 5723.2  | 6473.7  | 7706.1  | 33289.4 | 57800.9 | 58041.8 | 43564.2 | 37921.3 |
| 72.5° | 3538.6  | 3552.3  | 3865.8  | 5094.4  | 6387.5  | 6804.9  | 24466.4 | 55106.7 | 55616.2 | 45200.3 | 36567.3 |
| 75°   | 2351.2  | 2363.0  | 2774.4  | 3918.7  | 6193.5  | 6657.9  | 13447.1 | 46240.7 | 47177.3 | 44220.6 | 33367.8 |
| 77.5° | 1579.3  | 1575.3  | 1855.5  | 2688.3  | 5396.1  | 6657.9  | 7884.4  | 34584.5 | 35613.2 | 35186.0 | 25724.3 |
| 80°   | 1087.4  | 1079.6  | 1277.5  | 1855.5  | 4085.2  | 6738.3  | 6095.6  | 24237.2 | 24548.7 | 19001.8 | 10455.1 |
| 82.5° | 666.1   | 672.0   | 834.7   | 1310.8  | 2780.3  | 6064.2  | 5754.6  | 13215.9 | 12876.9 | 5329.5  | 2611.8  |
| 85°   | 382.0   | 380.1   | 532.9   | 887.6   | 1784.9  | 5117.8  | 5611.5  | 5688.0  | 5217.8  | 1604.7  | 944.4   |
| 87.5° | 137.1   | 146.9   | 286.1   | 491.8   | 1022.7  | 3564.1  | 4761.2  | 2958.6  | 2666.6  | 724.9   | 427.1   |
| 90°   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |

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CATALOG NUMBER: GLEON-SA8D-735-U-SL2

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°     | 105°    | 115°    | 125°    | 135°    | 145°    | 155°    | 165°    | 175°    | 180°    |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 13000.3 | 13000.3 | 13000.3 | 13000.3 | 13000.3 | 13000.3 | 13000.3 | 13000.3 | 13000.3 | 13000.3 | 13000.3 |
| 2.5°  | 12984.7 | 12996.4 | 12982.7 | 12904.3 | 12837.7 | 12729.9 | 12669.1 | 12584.9 | 12559.4 | 12547.7 | 12579.1 |
| 5°    | 13033.6 | 13037.6 | 12922.0 | 12716.2 | 12485.0 | 12212.7 | 12016.7 | 11775.7 | 11662.0 | 11613.0 | 11644.4 |
| 7.5°  | 13078.6 | 13061.0 | 12808.3 | 12414.5 | 11987.3 | 11513.2 | 11091.8 | 10705.9 | 10480.6 | 10388.5 | 10396.4 |
| 10°   | 13084.5 | 13010.1 | 12604.5 | 11995.2 | 11332.9 | 10637.3 | 9990.8  | 9395.1  | 9018.9  | 8774.0  | 8848.4  |
| 12.5° | 13023.8 | 12898.4 | 12304.7 | 11452.4 | 10533.5 | 9585.2  | 8711.3  | 7817.8  | 7281.0  | 7032.2  | 7040.0  |
| 15°   | 12976.8 | 12749.5 | 11936.4 | 10813.7 | 9579.3  | 8323.3  | 7130.1  | 6079.8  | 5507.8  | 5253.0  | 5133.5  |
| 17.5° | 12937.6 | 12588.8 | 11509.3 | 10094.6 | 8452.7  | 6859.7  | 5425.4  | 4488.8  | 4175.4  | 4101.0  | 4069.6  |
| 20°   | 12882.7 | 12418.4 | 11033.1 | 9261.8  | 7169.3  | 5221.7  | 3961.8  | 3499.4  | 3501.4  | 3587.6  | 3599.3  |
| 22.5° | 12806.4 | 12224.4 | 10525.6 | 8327.3  | 5791.8  | 3803.1  | 3105.6  | 2972.4  | 3107.5  | 3272.2  | 3301.5  |
| 25°   | 12692.7 | 11995.2 | 9961.3  | 7294.7  | 4416.4  | 2923.4  | 2653.0  | 2647.1  | 2811.7  | 2984.1  | 3009.6  |
| 27.5° | 12532.0 | 11695.4 | 9334.4  | 6185.7  | 3254.5  | 2484.4  | 2376.7  | 2417.8  | 2539.3  | 2664.7  | 2674.5  |
| 30°   | 12316.5 | 11346.6 | 8642.7  | 5015.9  | 2551.0  | 2212.1  | 2200.3  | 2237.6  | 2312.0  | 2400.2  | 2408.1  |
| 32.5° | 12079.4 | 10992.0 | 7904.0  | 3883.4  | 2184.7  | 2065.1  | 2076.9  | 2094.6  | 2129.8  | 2165.1  | 2172.9  |
| 35°   | 11863.9 | 10629.5 | 7147.7  | 2950.8  | 2010.3  | 1969.1  | 1961.3  | 1957.4  | 1961.3  | 1949.5  | 1951.5  |
| 37.5° | 11724.7 | 10329.7 | 6360.0  | 2349.3  | 1910.3  | 1884.9  | 1861.4  | 1832.0  | 1798.7  | 1779.1  | 1783.0  |
| 40°   | 11673.8 | 10106.4 | 5562.6  | 2029.8  | 1828.1  | 1810.5  | 1765.4  | 1702.7  | 1663.5  | 1651.7  | 1651.7  |
| 42.5° | 11811.0 | 9990.8  | 4792.5  | 1869.2  | 1759.5  | 1730.1  | 1655.6  | 1583.2  | 1553.7  | 1551.8  | 1549.8  |
| 45°   | 12230.3 | 10037.8 | 4059.8  | 1781.0  | 1696.8  | 1640.0  | 1542.0  | 1481.3  | 1461.7  | 1465.6  | 1463.6  |
| 47.5° | 12982.7 | 10333.7 | 3432.8  | 1722.2  | 1634.1  | 1559.7  | 1450.0  | 1401.0  | 1377.4  | 1377.4  | 1379.3  |
| 50°   | 14262.1 | 11025.2 | 2933.2  | 1673.2  | 1581.2  | 1485.2  | 1383.3  | 1322.5  | 1291.2  | 1289.3  | 1289.3  |
| 52.5° | 16125.5 | 12263.5 | 2621.7  | 1632.2  | 1522.4  | 1418.6  | 1316.6  | 1240.3  | 1203.0  | 1195.2  | 1191.3  |
| 55°   | 18461.0 | 14038.8 | 2535.4  | 1604.7  | 1444.1  | 1346.1  | 1236.3  | 1160.0  | 1118.8  | 1101.2  | 1099.2  |
| 57.5° | 21072.8 | 16197.9 | 2705.9  | 1571.4  | 1363.7  | 1259.8  | 1148.2  | 1075.7  | 1032.6  | 1011.0  | 1009.1  |
| 60°   | 23716.0 | 18555.0 | 3401.5  | 1524.4  | 1297.1  | 1165.8  | 1058.1  | 991.4   | 948.3   | 924.8   | 920.9   |
| 62.5° | 26363.1 | 21039.6 | 4822.0  | 1520.5  | 1250.0  | 1075.7  | 965.9   | 909.1   | 868.0   | 842.5   | 836.6   |
| 65°   | 29349.2 | 23759.1 | 6436.4  | 1624.3  | 1234.4  | 993.4   | 871.9   | 826.8   | 791.5   | 768.1   | 766.1   |
| 67.5° | 32778.0 | 26829.4 | 6281.7  | 1837.9  | 1287.3  | 919.0   | 783.7   | 748.5   | 723.0   | 703.4   | 701.5   |
| 70°   | 34386.6 | 26349.4 | 3905.0  | 1988.8  | 1361.7  | 846.4   | 699.5   | 674.0   | 654.4   | 640.7   | 634.8   |
| 71°   | 33712.6 | 25018.9 | 3274.1  | 1971.1  | 1353.9  | 815.1   | 666.1   | 646.6   | 627.0   | 615.2   | 609.3   |
| 72.5° | 31874.8 | 22816.7 | 2731.3  | 1833.9  | 1265.8  | 758.3   | 623.1   | 603.5   | 585.9   | 572.2   | 568.2   |
| 75°   | 28602.6 | 20377.2 | 2186.6  | 1465.6  | 1009.1  | 640.7   | 546.6   | 525.1   | 511.4   | 503.6   | 495.7   |
| 77.5° | 21025.8 | 14542.3 | 1690.9  | 1158.0  | 742.6   | 523.2   | 466.3   | 450.7   | 436.9   | 425.2   | 419.3   |
| 80°   | 8054.9  | 5633.2  | 1138.4  | 864.1   | 544.7   | 413.4   | 376.2   | 368.3   | 354.6   | 346.8   | 346.8   |
| 82.5° | 2169.0  | 1683.1  | 607.4   | 523.2   | 364.4   | 301.7   | 288.0   | 284.1   | 272.4   | 256.6   | 258.6   |
| 85°   | 877.8   | 742.6   | 340.9   | 288.0   | 223.4   | 178.3   | 193.9   | 195.9   | 182.2   | 162.6   | 164.6   |
| 87.5° | 386.0   | 315.4   | 190.0   | 127.3   | 98.0    | 68.6    | 88.1    | 88.1    | 80.3    | 66.6    | 60.7    |
| 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)