

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: P383487

Luminaire Tested: **GLEON-SA7D-735-U-T3**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P383487  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-14)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA7D-735-U-T3  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(7) 70 CRI, 3500K, 1200mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE III OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 51135.4 lumens  
Efficiency: N/A  
Efficacy: 114.1 lumens/watt  
Luminous Opening: Rectangular (W 2' x L: 1' x H: 0')  
IES Classification: Type III - Short  
BUG Rating: B4 - U0 - G5

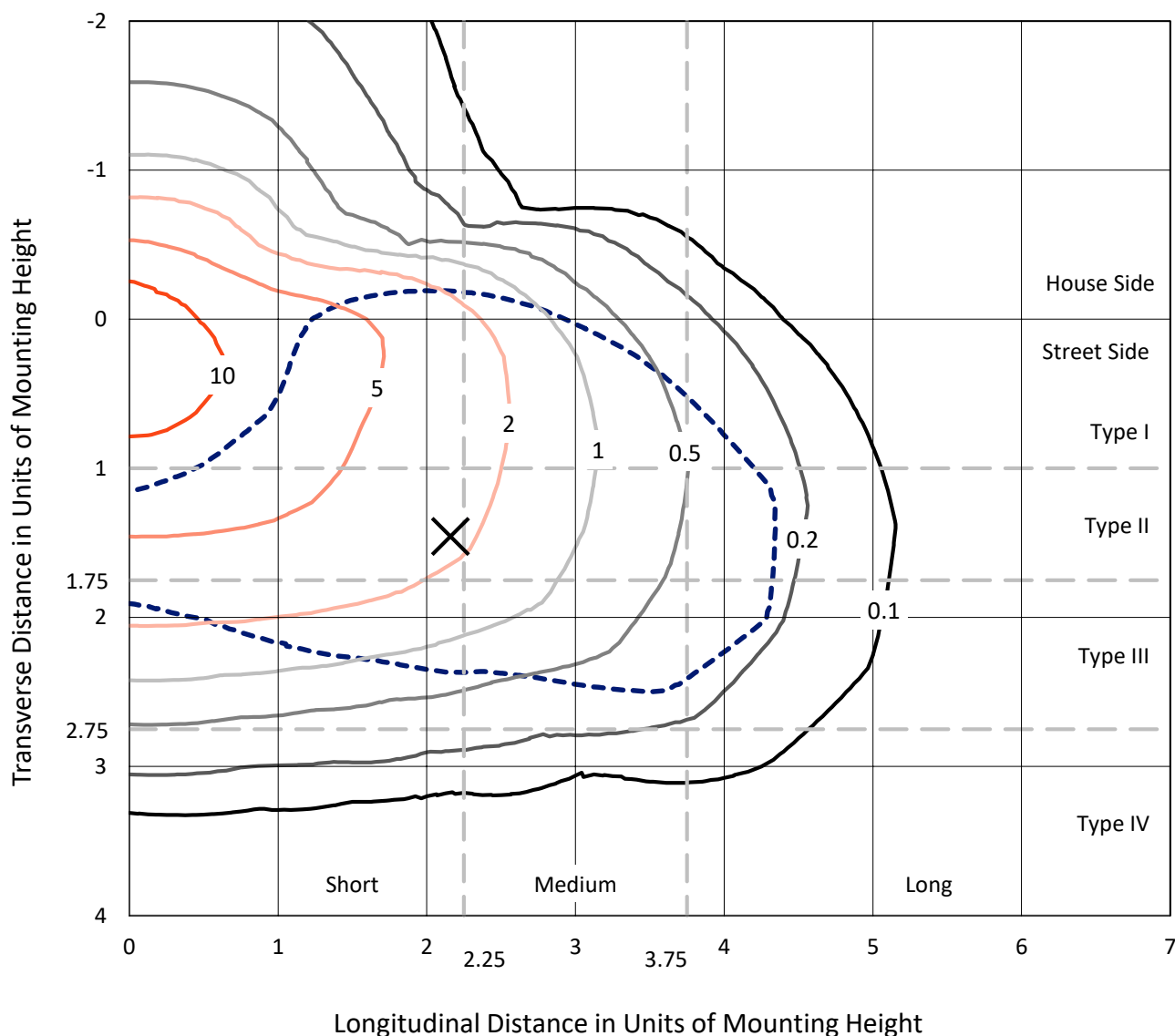
Input Watts (W): 448  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



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## Iso-Footcandle Lines of Horizontal Illumination

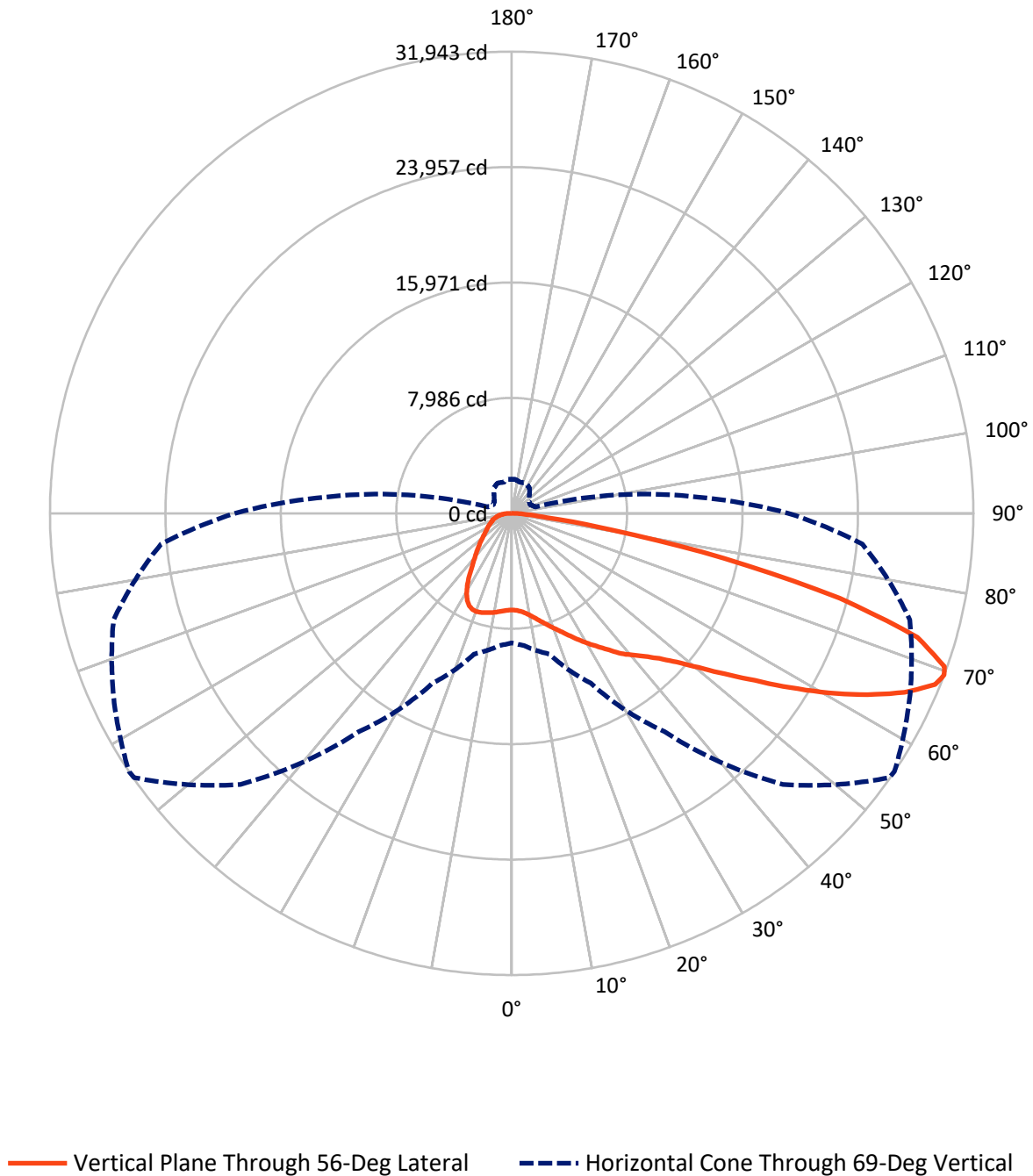
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 11.6 fc  
 Type III - Short - N/A

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## Luminous Intensity Polar Plot



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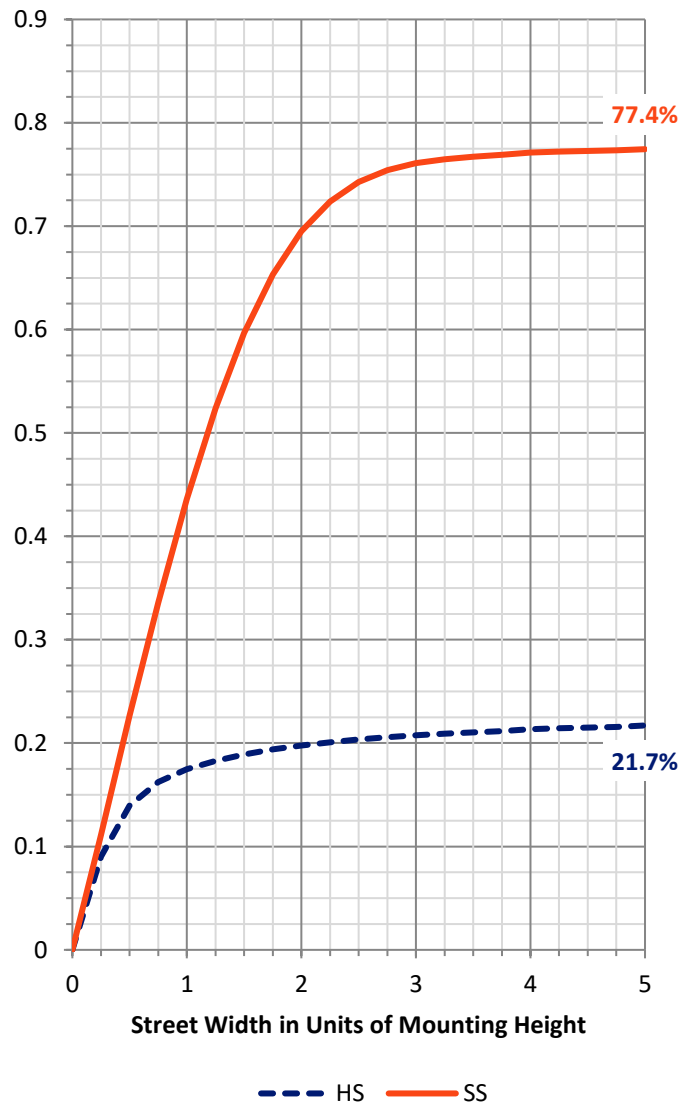
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 11387.8  | 0.0    | 11387.8 |
|                    | % Fixture | 22.3     | 0.0    | 22.3    |
| <b>Street Side</b> | Lumens    | 39747.7  | 0.0    | 39747.7 |
|                    | % Fixture | 77.7     | 0.0    | 77.7    |
| <b>Total</b>       | Lumens    | 51135.4  | 0.0    | 51135.4 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 656.6   | 1.3       |
| 10°-20°   | 2111.3  | 4.1       |
| 20°-30°   | 3685.6  | 7.2       |
| 30°-40°   | 5294.2  | 10.4      |
| 40°-50°   | 7326.9  | 14.3      |
| 50°-60°   | 10734.9 | 21.0      |
| 60°-70°   | 13087.9 | 25.6      |
| 70°-80°   | 7235.8  | 14.2      |
| 80°-90°   | 1002.2  | 2.0       |
| 90°-100°  | 0.0     | 0.0       |
| 100°-110° | 0.0     | 0.0       |
| 110°-120° | 0.0     | 0.0       |
| 120°-130° | 0.0     | 0.0       |
| 130°-140° | 0.0     | 0.0       |
| 140°-150° | 0.0     | 0.0       |
| 150°-160° | 0.0     | 0.0       |
| 160°-170° | 0.0     | 0.0       |
| 170°-180° | 0.0     | 0.0       |
| 0°-90°    | 51135.4 | 100.0     |
| 0°-180°   | 51135.4 | 100.0     |

**Coefficient of Utilization**



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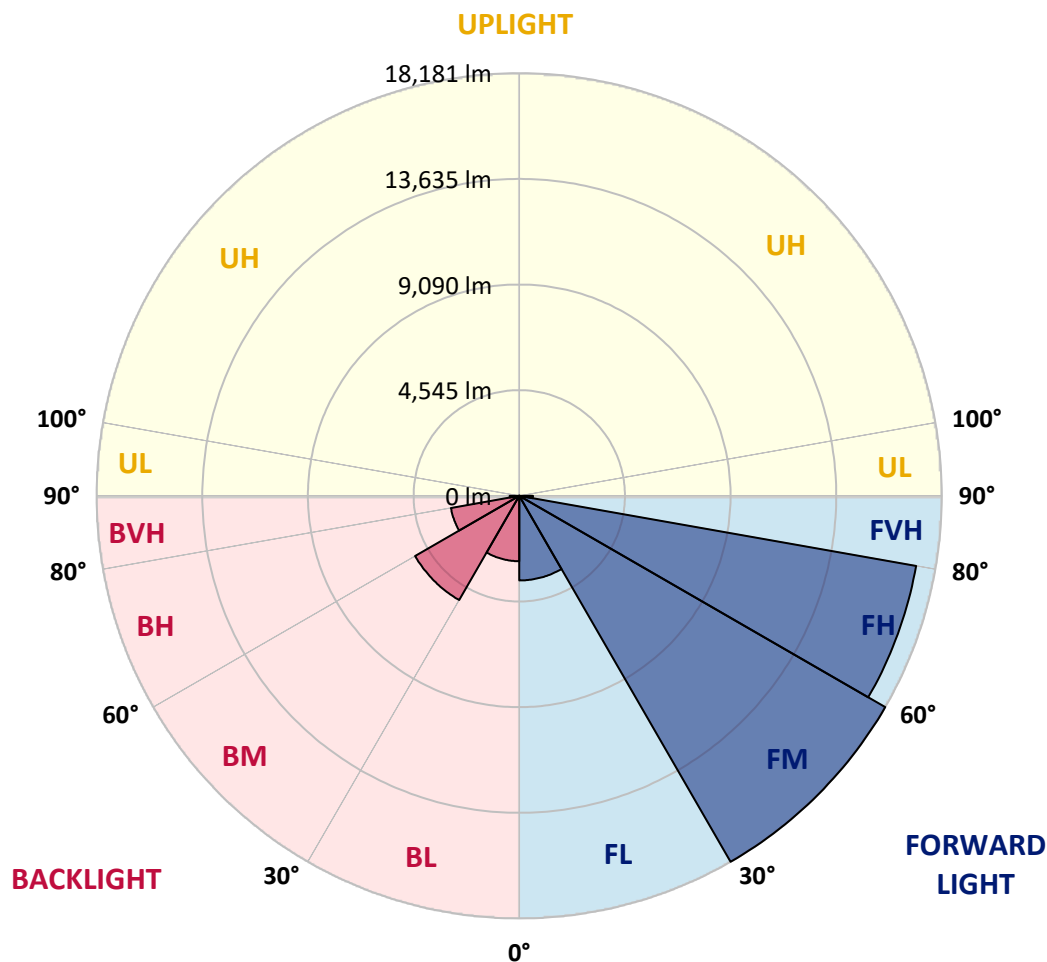
CATALOG NUMBER: GLEON-SA7D-735-U-T3

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|---------|-----------|-------------------------|------|---------|
|      |             |         |           | B                       | U    | G       |
| FL   | (0°-30°)    | 3639.3  | 7.1       |                         |      |         |
| FM   | (30°-60°)   | 18180.6 | 35.6      |                         |      |         |
| FH   | (60°-80°)   | 17337.5 | 33.9      |                         |      | G5      |
| FVH  | (80°-90°)   | 590.3   | 1.2       |                         |      | G4/750  |
| BL   | (0°-30°)    | 2814.2  | 5.5       | B4/5000                 |      |         |
| BM   | (30°-60°)   | 5175.5  | 10.1      | B4/8500                 |      |         |
| BH   | (60°-80°)   | 2986.2  | 5.8       | B4/5000                 |      | G4/5000 |
| BVH  | (80°-90°)   | 411.9   | 0.8       |                         |      | G3/500  |
| 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 Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 55°     | 56°     | 65°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 6685.2  | 6685.2  | 6685.2  | 6685.2  | 6685.2  | 6685.2  | 6685.2  | 6685.2  | 6685.2  | 6685.2  | 6685.2  |
| 2.5°  | 6727.5  | 6734.5  | 6729.2  | 6743.3  | 6727.5  | 6738.1  | 6729.2  | 6729.2  | 6723.9  | 6708.1  | 6690.5  |
| 5°    | 6833.2  | 6847.2  | 6838.5  | 6852.6  | 6833.2  | 6836.7  | 6820.8  | 6820.8  | 6805.0  | 6771.5  | 6736.3  |
| 7.5°  | 6998.7  | 7014.6  | 7007.6  | 7021.6  | 6995.3  | 6995.3  | 6974.1  | 6972.4  | 6940.6  | 6886.0  | 6845.5  |
| 10°   | 7196.0  | 7217.2  | 7210.2  | 7231.3  | 7210.2  | 7217.2  | 7196.0  | 7196.0  | 7153.7  | 7076.2  | 7025.2  |
| 12.5° | 7483.2  | 7509.6  | 7490.2  | 7488.4  | 7479.7  | 7493.7  | 7476.1  | 7472.6  | 7433.8  | 7328.2  | 7257.7  |
| 15°   | 7867.2  | 7895.4  | 7854.9  | 7851.4  | 7802.0  | 7796.8  | 7796.8  | 7791.5  | 7766.8  | 7640.0  | 7523.7  |
| 17.5° | 8309.4  | 8318.2  | 8282.9  | 8226.6  | 8163.2  | 8122.6  | 8117.3  | 8131.5  | 8131.5  | 7983.5  | 7798.5  |
| 20°   | 8742.7  | 8758.6  | 8730.4  | 8666.9  | 8585.9  | 8526.1  | 8483.8  | 8511.9  | 8510.2  | 8334.0  | 8071.6  |
| 22.5° | 9214.8  | 9251.9  | 9209.6  | 9128.5  | 9033.4  | 8966.4  | 8892.5  | 8917.1  | 8918.9  | 8702.2  | 8339.3  |
| 25°   | 9826.1  | 9792.6  | 9766.2  | 9651.7  | 9516.0  | 9447.4  | 9378.6  | 9403.3  | 9396.2  | 9098.5  | 8615.9  |
| 27.5° | 10366.9 | 10373.9 | 10338.7 | 10217.1 | 10060.3 | 9908.9  | 9905.3  | 9921.2  | 9894.8  | 9510.7  | 8876.6  |
| 30°   | 10995.8 | 10999.2 | 10950.0 | 10840.8 | 10669.9 | 10474.3 | 10428.6 | 10454.9 | 10398.6 | 9901.8  | 9151.4  |
| 32.5° | 11621.1 | 11638.8 | 11584.2 | 11452.0 | 11314.6 | 11076.8 | 10985.2 | 11002.8 | 10861.8 | 10301.7 | 9435.0  |
| 35°   | 12169.0 | 12193.7 | 12176.1 | 12087.9 | 11938.2 | 11733.9 | 11624.7 | 11614.1 | 11439.7 | 10791.4 | 9810.2  |
| 37.5° | 12727.4 | 12750.3 | 12730.9 | 12656.9 | 12597.0 | 12380.4 | 12322.2 | 12322.2 | 12019.3 | 11291.8 | 10287.6 |
| 40°   | 13301.7 | 13336.9 | 13314.1 | 13211.9 | 13160.7 | 13062.1 | 12922.9 | 12889.5 | 12561.8 | 11892.4 | 11066.2 |
| 42.5° | 13835.4 | 13881.3 | 13972.8 | 13912.9 | 13809.0 | 13823.1 | 13543.0 | 13525.4 | 13285.8 | 12780.3 | 12043.9 |
| 45°   | 14592.9 | 14659.9 | 14814.9 | 14769.0 | 14747.9 | 14670.4 | 14337.4 | 14321.6 | 14230.0 | 13974.6 | 13257.6 |
| 47.5° | 15419.1 | 15510.7 | 15790.8 | 15799.6 | 16026.8 | 15880.7 | 15427.9 | 15373.3 | 15394.5 | 15405.0 | 14739.1 |
| 50°   | 16180.1 | 16280.5 | 16740.3 | 16957.0 | 17492.5 | 17524.2 | 16800.2 | 16750.8 | 16833.6 | 17076.8 | 16465.5 |
| 52.5° | 16787.9 | 16914.7 | 17489.0 | 18158.4 | 19076.1 | 19336.9 | 18489.5 | 18452.6 | 18514.2 | 18933.4 | 18417.3 |
| 55°   | 17233.5 | 17370.9 | 17996.3 | 19215.3 | 20680.9 | 21140.7 | 20434.3 | 20399.0 | 20437.9 | 20971.6 | 20540.0 |
| 57.5° | 17337.5 | 17370.9 | 18278.2 | 19927.0 | 22035.6 | 23140.1 | 22814.2 | 22743.7 | 22553.5 | 23018.5 | 22882.9 |
| 60°   | 16849.5 | 16983.4 | 18045.6 | 20177.1 | 23083.7 | 25111.3 | 25301.6 | 25213.5 | 24679.7 | 25060.2 | 24951.0 |
| 62.5° | 15859.5 | 16099.1 | 17177.2 | 19796.6 | 23494.2 | 26721.3 | 27741.3 | 27635.7 | 26716.1 | 26962.7 | 26437.8 |
| 65°   | 14242.3 | 14344.5 | 15477.2 | 18484.2 | 22972.7 | 27751.9 | 29916.8 | 29864.0 | 28706.7 | 28320.9 | 26712.6 |
| 67.5° | 11349.9 | 11541.9 | 12503.7 | 15741.5 | 20839.5 | 27630.4 | 31599.2 | 31593.9 | 30006.7 | 28824.7 | 25738.4 |
| 69°   | 8966.4  | 9165.5  | 10081.5 | 12967.0 | 18440.2 | 26518.8 | 31881.0 | 31942.7 | 30373.1 | 28518.2 | 24346.7 |
| 70°   | 7148.5  | 7379.3  | 8008.1  | 10921.7 | 16310.5 | 25053.1 | 31646.7 | 31757.8 | 30302.7 | 28012.7 | 23062.6 |
| 72.5° | 3042.2  | 3228.9  | 3676.4  | 5630.0  | 9940.5  | 18708.0 | 28935.6 | 29354.9 | 28669.7 | 25638.1 | 19060.3 |
| 75°   | 1328.2  | 1386.3  | 1588.9  | 2295.3  | 4412.7  | 10181.9 | 22668.0 | 23443.0 | 24514.1 | 21671.0 | 14198.3 |
| 77.5° | 972.3   | 997.0   | 1108.1  | 1347.6  | 1980.0  | 3845.5  | 14577.0 | 15028.0 | 17679.2 | 15769.6 | 8709.2  |
| 80°   | 752.2   | 769.8   | 856.1   | 990.0   | 1293.0  | 1555.5  | 6648.2  | 7035.7  | 9940.5  | 8099.7  | 3627.1  |
| 82.5° | 598.9   | 611.3   | 671.2   | 729.3   | 893.1   | 942.4   | 2207.3  | 2448.6  | 3669.4  | 2237.2  | 960.1   |
| 85°   | 556.7   | 570.8   | 591.9   | 532.0   | 572.5   | 553.2   | 954.7   | 998.8   | 1108.1  | 879.0   | 401.7   |
| 87.5° | 251.9   | 297.7   | 586.6   | 414.0   | 304.7   | 243.1   | 391.1   | 408.7   | 459.8   | 461.5   | 177.9   |
| 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-SA7D-735-U-T3

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°     | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|---------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 6685.2  | 6685.2  | 6685.2 | 6685.2 | 6685.2 | 6685.2 | 6685.2 | 6685.2 | 6685.2 | 6685.2 | 6685.2 |
| 2.5°  | 6701.1  | 6695.8  | 6704.5 | 6683.4 | 6709.8 | 6708.1 | 6699.3 | 6702.8 | 6720.5 | 6718.7 | 6720.5 |
| 5°    | 6741.5  | 6738.1  | 6748.6 | 6732.8 | 6764.4 | 6775.1 | 6776.8 | 6792.7 | 6812.0 | 6817.3 | 6817.3 |
| 7.5°  | 6843.7  | 6843.7  | 6849.0 | 6827.9 | 6849.0 | 6847.2 | 6838.5 | 6854.3 | 6873.7 | 6875.5 | 6873.7 |
| 10°   | 7019.9  | 7021.6  | 7012.9 | 6958.2 | 6940.6 | 6893.1 | 6849.0 | 6850.8 | 6875.5 | 6894.8 | 6900.1 |
| 12.5° | 7241.9  | 7234.8  | 7196.0 | 7095.6 | 7021.6 | 6924.8 | 6878.9 | 6877.2 | 6901.8 | 6917.7 | 6923.0 |
| 15°   | 7495.5  | 7476.1  | 7375.7 | 7211.9 | 7081.5 | 6986.4 | 6912.5 | 6894.8 | 6880.7 | 6863.1 | 6864.9 |
| 17.5° | 7735.1  | 7691.0  | 7523.7 | 7296.4 | 7159.0 | 7032.3 | 6889.5 | 6775.1 | 6695.8 | 6649.9 | 6635.9 |
| 20°   | 7978.1  | 7891.9  | 7650.5 | 7375.7 | 7201.3 | 6970.6 | 6695.8 | 6463.3 | 6318.8 | 6251.8 | 6239.5 |
| 22.5° | 8200.1  | 8061.0  | 7768.5 | 7458.5 | 7167.9 | 6762.7 | 6331.1 | 5992.9 | 5792.1 | 5702.2 | 5709.3 |
| 25°   | 8416.8  | 8223.1  | 7891.9 | 7516.7 | 6998.7 | 6396.3 | 5823.8 | 5408.0 | 5175.5 | 5075.1 | 5071.6 |
| 27.5° | 8607.0  | 8386.9  | 8025.7 | 7469.1 | 6683.4 | 5874.9 | 5223.1 | 4817.9 | 4624.1 | 4537.8 | 4523.7 |
| 30°   | 8825.5  | 8593.0  | 8203.7 | 7287.7 | 6221.9 | 5272.4 | 4636.5 | 4351.1 | 4213.7 | 4127.4 | 4111.5 |
| 32.5° | 9091.5  | 8873.1  | 8349.9 | 6958.2 | 5631.8 | 4643.5 | 4178.5 | 3979.4 | 3854.4 | 3757.5 | 3739.8 |
| 35°   | 9479.1  | 9243.0  | 8386.9 | 6486.1 | 4983.5 | 4146.8 | 3842.0 | 3637.7 | 3468.5 | 3343.5 | 3331.1 |
| 37.5° | 9965.2  | 9706.3  | 8302.3 | 5874.9 | 4354.6 | 3824.4 | 3561.9 | 3310.0 | 3089.9 | 2913.7 | 2885.5 |
| 40°   | 10666.3 | 10275.2 | 8068.0 | 5170.3 | 3891.4 | 3576.0 | 3288.8 | 3001.7 | 2728.7 | 2522.5 | 2482.1 |
| 42.5° | 11508.4 | 10942.9 | 7708.6 | 4469.1 | 3551.3 | 3324.1 | 3017.6 | 2661.7 | 2401.1 | 2254.8 | 2233.7 |
| 45°   | 12579.4 | 11637.0 | 7210.2 | 3856.1 | 3216.6 | 3072.2 | 2725.1 | 2397.5 | 2235.4 | 2128.0 | 2110.3 |
| 47.5° | 13802.0 | 12415.6 | 6686.9 | 3357.6 | 2933.1 | 2836.1 | 2490.9 | 2279.5 | 2150.9 | 2066.4 | 2050.5 |
| 50°   | 15304.6 | 13294.7 | 6132.1 | 2948.9 | 2647.6 | 2552.5 | 2379.9 | 2214.3 | 2112.1 | 2047.0 | 2031.1 |
| 52.5° | 16999.3 | 14286.4 | 5732.2 | 2626.5 | 2411.6 | 2342.9 | 2321.8 | 2179.1 | 2096.3 | 2047.0 | 2031.1 |
| 55°   | 18824.2 | 15295.8 | 5300.6 | 2355.2 | 2207.3 | 2226.7 | 2283.0 | 2182.6 | 2126.3 | 2066.4 | 2043.4 |
| 57.5° | 20651.0 | 16338.6 | 4819.6 | 2126.3 | 2045.2 | 2140.3 | 2256.6 | 2189.6 | 2142.1 | 2084.0 | 2062.8 |
| 60°   | 22095.5 | 16999.3 | 4074.5 | 1934.2 | 1916.6 | 2045.2 | 2193.1 | 2136.8 | 2075.1 | 2076.9 | 2073.3 |
| 62.5° | 22770.2 | 16964.0 | 3251.8 | 1763.3 | 1788.0 | 1916.6 | 2091.0 | 2054.0 | 2002.9 | 2071.6 | 2076.9 |
| 65°   | 22391.4 | 16118.5 | 2531.4 | 1608.3 | 1650.6 | 1782.7 | 1985.3 | 2013.4 | 2031.1 | 2163.2 | 2180.8 |
| 67.5° | 20802.5 | 14473.1 | 1960.6 | 1472.7 | 1525.5 | 1691.1 | 1995.8 | 2193.1 | 2216.1 | 2355.2 | 2353.5 |
| 69°   | 19159.0 | 12930.0 | 1703.4 | 1402.3 | 1463.8 | 1714.0 | 2133.2 | 2307.6 | 2221.4 | 2369.3 | 2348.2 |
| 70°   | 17781.4 | 11709.2 | 1566.0 | 1354.7 | 1435.7 | 1754.6 | 2224.9 | 2305.9 | 2194.9 | 2321.8 | 2286.5 |
| 72.5° | 13694.5 | 8423.9  | 1328.2 | 1266.5 | 1340.6 | 1678.7 | 2251.3 | 2254.8 | 2133.2 | 2157.9 | 2098.0 |
| 75°   | 9392.7  | 5323.5  | 1159.1 | 1146.8 | 1196.1 | 1513.2 | 2166.8 | 2154.4 | 1972.9 | 1937.7 | 1888.4 |
| 77.5° | 5179.0  | 2704.0  | 984.7  | 1032.2 | 1065.8 | 1340.6 | 1969.5 | 1951.9 | 1802.1 | 1728.1 | 1710.5 |
| 80°   | 1997.6  | 1183.8  | 831.5  | 917.8  | 938.9  | 1160.9 | 1726.3 | 1710.5 | 1585.4 | 1490.3 | 1463.8 |
| 82.5° | 754.0   | 620.0   | 687.0  | 794.5  | 787.4  | 958.3  | 1462.1 | 1453.3 | 1331.7 | 1192.6 | 1150.3 |
| 85°   | 348.8   | 371.7   | 544.3  | 655.3  | 604.2  | 709.9  | 1169.7 | 1185.6 | 1037.6 | 872.0  | 872.0  |
| 87.5° | 147.9   | 207.8   | 385.8  | 495.0  | 406.9  | 479.2  | 857.9  | 819.1  | 752.2  | 521.4  | 489.7  |
| 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

| $\lambda$<br>(nm) | Power<br>( $\mu\text{W/nm}$ ) | Lumens<br>( $\Phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W/nm}$ ) | Lumens<br>( $\Phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W/nm}$ ) | Lumens<br>( $\Phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W/nm}$ ) | Lumens<br>( $\Phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W/nm}$ ) | Lumens<br>( $\Phi/\text{nm}$ ) |
|-------------------|-------------------------------|--------------------------------|-------------------|-------------------------------|--------------------------------|-------------------|-------------------------------|--------------------------------|-------------------|-------------------------------|--------------------------------|-------------------|-------------------------------|--------------------------------|
| 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

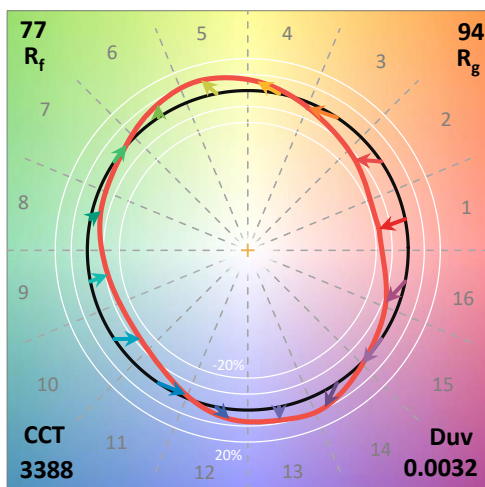
### Summary

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

### Spectral Power Distribution Comparison



### Color Vector Graphics

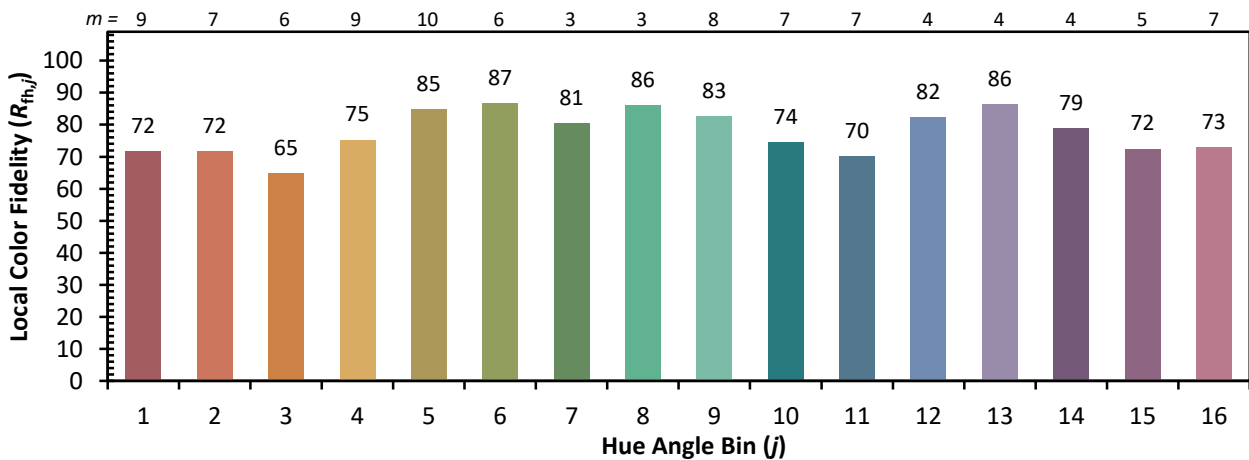
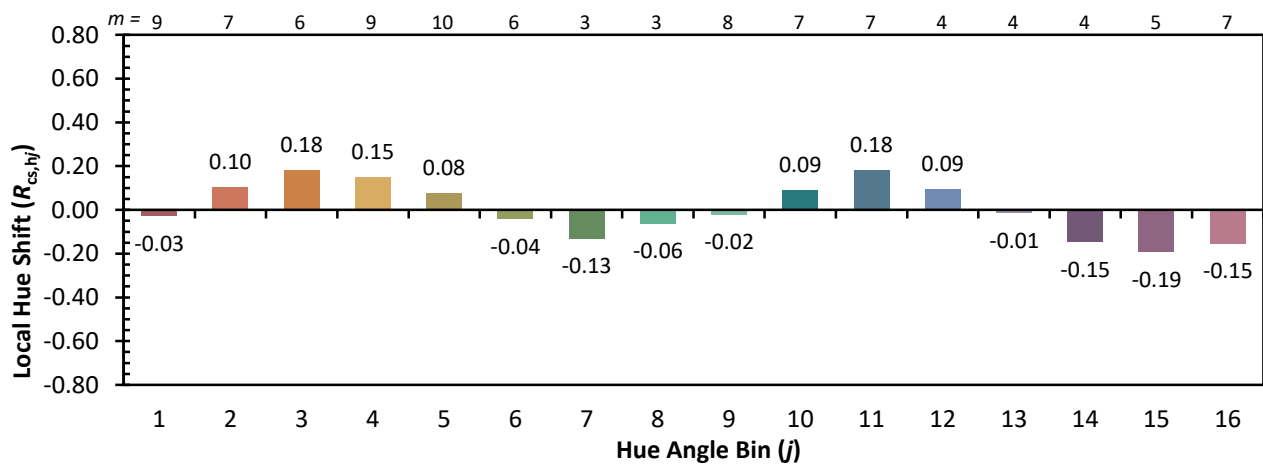




**Individual Sample Fidelity Index ( $R_{f,i}$ )**

|            |            |            |            |
|------------|------------|------------|------------|
| 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)