

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: P383258

Luminaire Tested: **GLEON-SA5D-735-U-T2-HSS**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P383258  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-13)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA5D-735-U-T2-HSS  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(5) 70 CRI, 3500K, 1200mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE II  
OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 25698.6 lumens  
Efficiency: N/A  
Efficacy: 80.3 lumens/watt  
Luminous Opening: Rectangular (W 1.5' x L: 1' x H: 0')  
IES Classification: Type II - Medium  
BUG Rating: B2 - U0 - G4

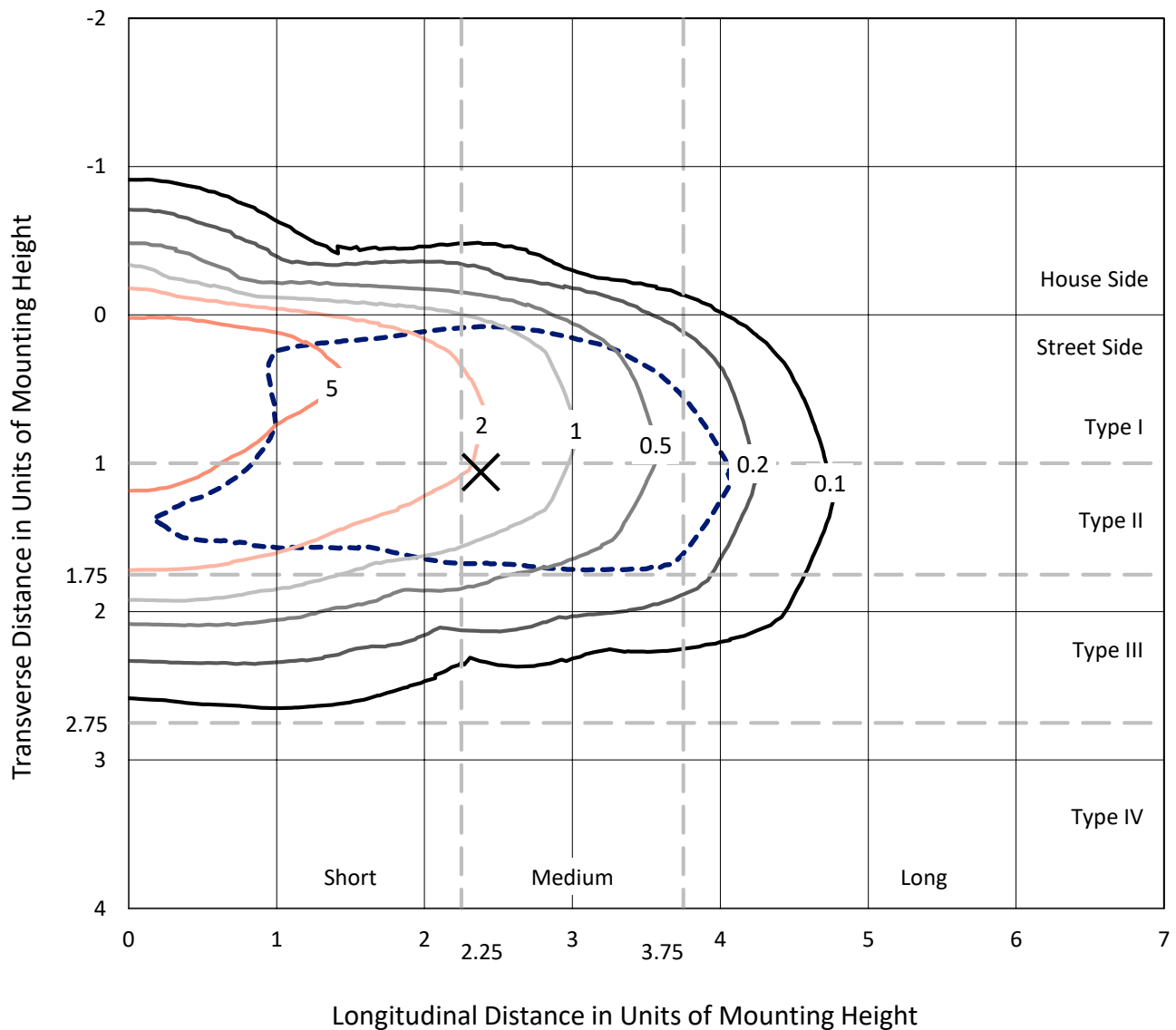
Input Watts (W): 320  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



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## Iso-Footcandle Lines of Horizontal Illumination

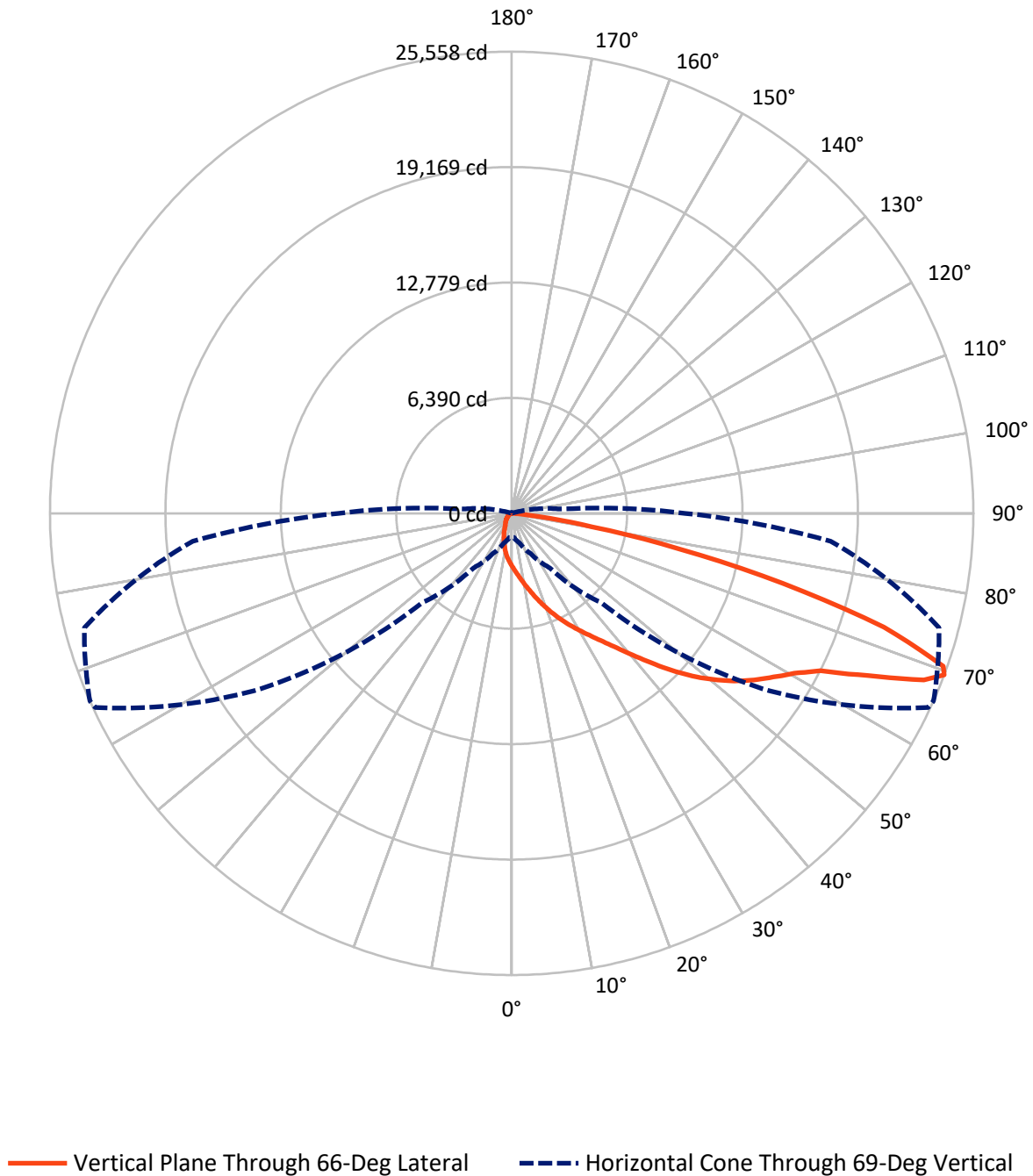
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 7.7 fc  
 Type II - Medium - N/A

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## Luminous Intensity Polar Plot



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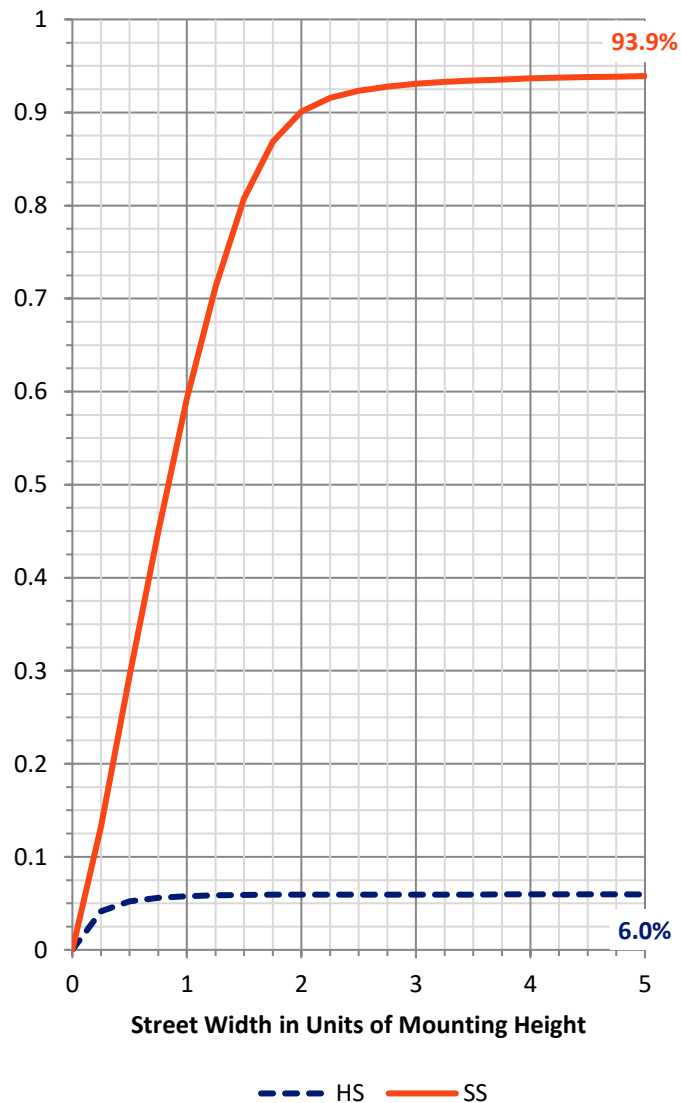
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 1541.6   | 0.0    | 1541.6  |
|                    | % Fixture | 6.0      | 0.0    | 6.0     |
| <b>Street Side</b> | Lumens    | 24157.1  | 0.0    | 24157.1 |
|                    | % Fixture | 94.0     | 0.0    | 94.0    |
| <b>Total</b>       | Lumens    | 25698.6  | 0.0    | 25698.6 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 282.7   | 1.1       |
| 10°-20°   | 841.4   | 3.3       |
| 20°-30°   | 1465.1  | 5.7       |
| 30°-40°   | 2570.6  | 10.0      |
| 40°-50°   | 4302.7  | 16.7      |
| 50°-60°   | 6324.6  | 24.6      |
| 60°-70°   | 6493.8  | 25.3      |
| 70°-80°   | 3205.8  | 12.5      |
| 80°-90°   | 212.0   | 0.8       |
| 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°    | 25698.6 | 100.0     |
| 0°-180°   | 25698.6 | 100.0     |

**Coefficient of Utilization**



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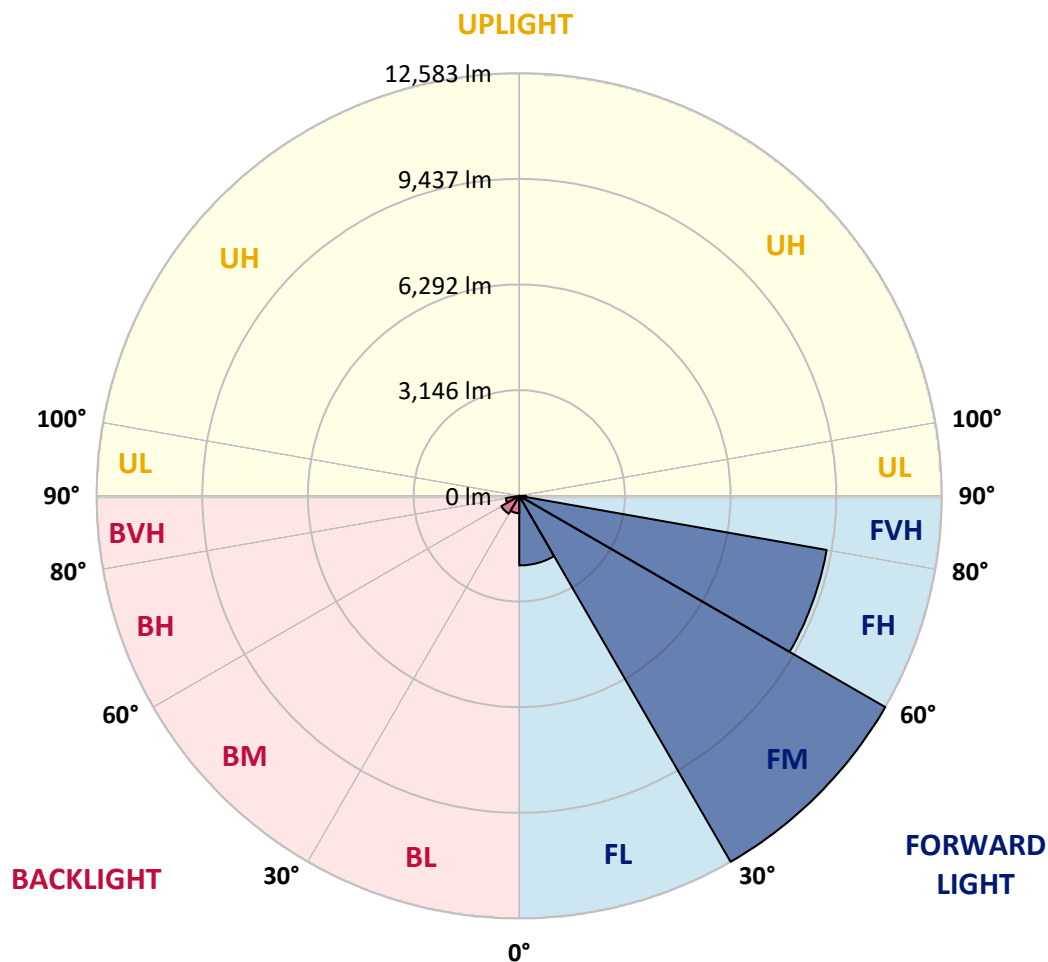
CATALOG NUMBER: GLEON-SA5D-735-U-T2-HSS

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |          |
|------|-------------|---------|-----------|-------------------------|------|----------|
|      |             |         |           | B                       | U    | G        |
| FL   | (0°-30°)    | 2073.6  | 8.1       |                         |      |          |
| FM   | (30°-60°)   | 12583.3 | 49.0      |                         |      |          |
| FH   | (60°-80°)   | 9293.3  | 36.2      |                         |      | G4/12000 |
| FVH  | (80°-90°)   | 206.9   | 0.8       |                         |      | G2/225   |
| BL   | (0°-30°)    | 515.6   | 2.0       | B2/1000                 |      |          |
| BM   | (30°-60°)   | 614.6   | 2.4       | B1/1000                 |      |          |
| BH   | (60°-80°)   | 406.2   | 1.6       | B1/500                  |      | G1/500   |
| BVH  | (80°-90°)   | 5.1     | 0.0       |                         |      | G0/10    |
| UL   | (90°-100°)  | 0.0     | 0.0       |                         | U0/0 |          |
| UH   | (100°-180°) | 0.0     | 0.0       |                         | U0/0 |          |

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

Type II Medium





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 55°     | 65°     | 66°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 2924.6  | 2924.6  | 2924.6  | 2924.6  | 2924.6  | 2924.6  | 2924.6  | 2924.6  | 2924.6  | 2924.6  | 2924.6  |
| 2.5°  | 3442.2  | 3427.4  | 3421.4  | 3394.6  | 3348.2  | 3312.8  | 3244.4  | 3165.0  | 3150.4  | 3073.5  | 2979.6  |
| 5°    | 3888.8  | 3876.6  | 3868.2  | 3830.2  | 3782.6  | 3693.6  | 3569.0  | 3421.4  | 3393.3  | 3246.8  | 3058.8  |
| 7.5°  | 4200.2  | 4222.1  | 4222.1  | 4197.6  | 4137.8  | 4070.8  | 3918.2  | 3716.8  | 3681.4  | 3456.8  | 3165.0  |
| 10°   | 4382.0  | 4408.8  | 4429.6  | 4450.4  | 4441.8  | 4415.0  | 4271.0  | 4043.8  | 4001.2  | 3703.4  | 3288.4  |
| 12.5° | 4399.0  | 4426.0  | 4484.6  | 4571.2  | 4655.4  | 4716.4  | 4626.2  | 4406.4  | 4357.6  | 3989.0  | 3434.8  |
| 15°   | 4303.8  | 4332.0  | 4422.2  | 4590.8  | 4794.6  | 4972.8  | 5002.0  | 4808.0  | 4758.0  | 4329.5  | 3617.9  |
| 17.5° | 4137.8  | 4156.2  | 4285.6  | 4518.7  | 4838.5  | 5165.6  | 5342.6  | 5238.8  | 5192.4  | 4718.8  | 3821.8  |
| 20°   | 4014.6  | 4028.0  | 4141.6  | 4391.8  | 4811.6  | 5286.4  | 5664.8  | 5696.6  | 5647.8  | 5136.4  | 4042.6  |
| 22.5° | 4225.8  | 4250.2  | 4253.8  | 4372.2  | 4738.4  | 5346.2  | 5948.0  | 6147.0  | 6110.4  | 5579.4  | 4260.0  |
| 25°   | 4803.1  | 4831.2  | 4738.4  | 4665.2  | 4800.6  | 5373.2  | 6191.0  | 6608.4  | 6579.1  | 6056.6  | 4478.4  |
| 27.5° | 5566.0  | 5595.2  | 5475.6  | 5257.2  | 5126.6  | 5474.4  | 6407.0  | 7077.1  | 7075.8  | 6562.0  | 4714.0  |
| 30°   | 6315.4  | 6344.8  | 6222.6  | 6004.2  | 5704.0  | 5761.2  | 6593.8  | 7567.8  | 7575.1  | 7083.2  | 4964.2  |
| 32.5° | 7101.6  | 7138.2  | 7012.4  | 6731.6  | 6418.0  | 6256.8  | 6856.2  | 8060.9  | 8102.4  | 7687.4  | 5246.2  |
| 35°   | 7995.0  | 7999.9  | 7822.9  | 7528.8  | 7167.4  | 6919.6  | 7277.2  | 8613.8  | 8712.8  | 8435.6  | 5603.8  |
| 37.5° | 8871.4  | 8906.8  | 8761.6  | 8297.7  | 7965.7  | 7685.0  | 7903.4  | 9304.7  | 9445.1  | 9349.9  | 6071.4  |
| 40°   | 9520.8  | 9595.2  | 9574.4  | 9074.0  | 8759.1  | 8559.0  | 8681.0  | 10126.2 | 10304.4 | 10414.2 | 6660.8  |
| 42.5° | 9928.4  | 9984.6  | 10079.8 | 9778.3  | 9492.7  | 9525.6  | 9598.9  | 11083.2 | 11302.8 | 11627.6 | 7338.3  |
| 45°   | 10396.0 | 10422.8 | 10502.2 | 10369.1 | 10176.2 | 10508.2 | 10573.0 | 12161.0 | 12391.6 | 12932.4 | 8090.2  |
| 47.5° | 10967.2 | 11030.6 | 11052.6 | 10930.6 | 10842.7 | 11377.3 | 11511.6 | 13141.1 | 13464.6 | 14330.0 | 8886.0  |
| 50°   | 11694.6 | 11711.8 | 11749.6 | 11670.2 | 11582.4 | 12124.4 | 12353.8 | 14170.1 | 14464.2 | 15732.4 | 9670.9  |
| 52.5° | 12406.3 | 12467.3 | 12599.2 | 12549.1 | 12513.7 | 12760.2 | 13104.5 | 15097.8 | 15426.1 | 16901.8 | 10454.6 |
| 55°   | 12611.4 | 12663.8 | 13119.2 | 13430.4 | 13718.4 | 13543.9 | 13822.2 | 15929.0 | 16284.2 | 17946.6 | 11208.8 |
| 57.5° | 11792.4 | 11898.5 | 12687.0 | 13497.5 | 14692.5 | 14762.0 | 14808.4 | 16782.2 | 17100.8 | 18747.4 | 11993.8 |
| 60°   | 9722.2  | 9742.9  | 11036.8 | 12427.0 | 14531.4 | 15825.2 | 16248.8 | 17698.8 | 17966.2 | 19493.2 | 12933.6 |
| 62.5° | 6183.6  | 6394.8  | 7814.4  | 9777.1  | 12827.4 | 15671.4 | 17990.6 | 19085.5 | 19183.1 | 20387.9 | 14281.2 |
| 65°   | 2945.4  | 3082.0  | 4105.0  | 6040.8  | 9291.3  | 13702.6 | 19192.9 | 21593.8 | 21637.8 | 22161.4 | 16081.6 |
| 67.5° | 1630.8  | 1696.6  | 2183.6  | 3251.8  | 5431.8  | 9690.4  | 18707.1 | 24564.8 | 24606.3 | 23972.8 | 17661.0 |
| 69°   | 1275.6  | 1331.6  | 1715.0  | 2451.0  | 3682.6  | 6964.8  | 16928.6 | 25435.1 | 25558.4 | 24491.6 | 17717.2 |
| 70°   | 1082.6  | 1137.6  | 1477.0  | 2070.2  | 2961.2  | 5381.6  | 15068.4 | 25219.0 | 25349.6 | 24442.7 | 17298.5 |
| 72.5° | 662.8   | 694.6   | 983.8   | 1457.4  | 1984.8  | 2707.4  | 9292.5  | 21327.7 | 21548.7 | 22421.4 | 14867.0 |
| 75°   | 446.8   | 463.8   | 615.2   | 1005.8  | 1419.6  | 1394.0  | 4827.6  | 15033.0 | 15511.5 | 17441.3 | 10980.6 |
| 77.5° | 319.8   | 335.6   | 412.6   | 650.6   | 994.8   | 920.4   | 2186.2  | 9342.6  | 9445.1  | 10460.6 | 5988.4  |
| 80°   | 181.8   | 196.6   | 291.8   | 387.0   | 675.0   | 614.0   | 869.0   | 4462.6  | 4513.8  | 4485.8  | 1999.4  |
| 82.5° | 95.2    | 107.4   | 159.9   | 255.2   | 433.4   | 401.6   | 361.3   | 1494.0  | 1501.4  | 1248.6  | 438.2   |
| 85°   | 18.4    | 22.0    | 79.4    | 174.6   | 223.4   | 174.6   | 147.7   | 350.4   | 357.6   | 316.2   | 108.6   |
| 87.5° | 0.0     | 1.2     | 31.8    | 39.0    | 44.0    | 45.2    | 47.6    | 68.4    | 73.2    | 98.8    | 29.3    |
| 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-SA5D-735-U-T2-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 2924.6 | 2924.6 | 2924.6 | 2924.6 | 2924.6 | 2924.6 | 2924.6 | 2924.6 | 2924.6 | 2924.6 | 2924.6 |
| 2.5°  | 2938.0 | 2894.0 | 2809.8 | 2712.2 | 2636.6 | 2562.0 | 2503.4 | 2442.4 | 2420.4 | 2409.4 | 2408.2 |
| 5°    | 2967.3 | 2874.6 | 2696.4 | 2513.2 | 2363.1 | 2221.6 | 2120.2 | 2023.8 | 1978.6 | 1957.8 | 1949.4 |
| 7.5°  | 3016.2 | 2867.2 | 2580.4 | 2300.8 | 2084.8 | 1907.8 | 1767.4 | 1662.4 | 1610.0 | 1588.0 | 1579.4 |
| 10°   | 3073.5 | 2857.4 | 2444.8 | 2076.2 | 1800.4 | 1617.4 | 1478.2 | 1374.4 | 1317.0 | 1292.6 | 1280.4 |
| 12.5° | 3140.6 | 2840.4 | 2288.6 | 1849.2 | 1557.5 | 1374.4 | 1206.0 | 1077.8 | 1011.8 | 983.8  | 970.4  |
| 15°   | 3223.6 | 2823.2 | 2125.0 | 1635.6 | 1343.9 | 1120.6 | 936.2  | 849.6  | 836.2  | 831.2  | 832.4  |
| 17.5° | 3305.4 | 2796.4 | 1946.8 | 1424.4 | 1119.3 | 875.2  | 781.2  | 776.4  | 778.8  | 778.8  | 778.8  |
| 20°   | 3378.6 | 2735.4 | 1752.8 | 1243.8 | 905.7  | 738.4  | 719.0  | 710.4  | 704.2  | 699.4  | 693.4  |
| 22.5° | 3436.0 | 2653.6 | 1566.0 | 1064.4 | 739.6  | 676.2  | 645.7  | 618.8  | 596.8  | 582.2  | 575.0  |
| 25°   | 3475.0 | 2545.0 | 1395.2 | 892.2  | 665.2  | 615.2  | 560.2  | 515.1  | 481.0  | 460.2  | 451.6  |
| 27.5° | 3504.4 | 2427.8 | 1242.6 | 747.0  | 614.0  | 544.4  | 472.4  | 418.6  | 383.2  | 365.0  | 357.6  |
| 30°   | 3525.2 | 2294.8 | 1108.4 | 656.6  | 556.6  | 470.0  | 393.0  | 340.6  | 315.0  | 305.2  | 300.2  |
| 32.5° | 3544.6 | 2147.0 | 981.4  | 614.0  | 502.8  | 401.6  | 329.6  | 289.2  | 273.4  | 261.2  | 257.6  |
| 35°   | 3593.4 | 2010.4 | 860.6  | 568.8  | 448.0  | 343.0  | 283.2  | 253.8  | 238.0  | 230.7  | 228.2  |
| 37.5° | 3709.4 | 1909.0 | 744.6  | 522.4  | 393.0  | 296.6  | 247.8  | 227.0  | 212.4  | 205.0  | 202.6  |
| 40°   | 3896.2 | 1857.8 | 647.0  | 472.4  | 339.4  | 261.2  | 224.6  | 205.0  | 189.2  | 178.2  | 175.8  |
| 42.5° | 4170.8 | 1865.1 | 578.6  | 422.4  | 296.6  | 233.2  | 202.6  | 179.4  | 162.4  | 152.6  | 150.2  |
| 45°   | 4504.0 | 1918.8 | 531.0  | 373.6  | 261.2  | 211.2  | 178.2  | 153.8  | 138.0  | 129.4  | 127.0  |
| 47.5° | 4865.4 | 2005.4 | 492.0  | 329.6  | 233.2  | 190.4  | 153.8  | 128.2  | 114.8  | 107.4  | 106.2  |
| 50°   | 5246.2 | 2089.6 | 451.6  | 286.8  | 208.8  | 169.6  | 129.4  | 106.2  | 95.2   | 89.1   | 86.6   |
| 52.5° | 5631.9 | 2187.4 | 415.0  | 247.8  | 188.0  | 145.2  | 107.4  | 86.6   | 78.2   | 73.2   | 70.8   |
| 55°   | 6046.9 | 2260.6 | 379.6  | 217.2  | 167.2  | 123.2  | 89.1   | 72.0   | 64.6   | 58.6   | 57.4   |
| 57.5° | 6535.2 | 2374.0 | 343.0  | 188.0  | 142.8  | 102.6  | 73.2   | 57.4   | 51.2   | 45.2   | 44.0   |
| 60°   | 7194.2 | 2507.2 | 304.0  | 166.0  | 117.2  | 84.2   | 59.8   | 46.4   | 39.0   | 34.2   | 33.0   |
| 62.5° | 8063.4 | 2654.8 | 255.2  | 145.2  | 95.2   | 68.4   | 47.6   | 36.6   | 28.0   | 22.0   | 22.0   |
| 65°   | 9165.6 | 2895.2 | 208.8  | 122.0  | 78.2   | 56.2   | 36.6   | 26.8   | 15.8   | 9.8    | 9.8    |
| 67.5° | 9808.8 | 2936.8 | 168.4  | 100.0  | 63.4   | 47.6   | 30.6   | 18.4   | 4.8    | 1.2    | 0.0    |
| 69°   | 9602.6 | 2696.4 | 142.8  | 85.4   | 55.0   | 45.2   | 28.0   | 13.4   | 2.4    | 0.0    | 0.0    |
| 70°   | 9214.4 | 2465.6 | 125.8  | 75.6   | 50.0   | 42.8   | 26.8   | 9.8    | 2.4    | 0.0    | 0.0    |
| 72.5° | 7614.2 | 1755.2 | 95.2   | 56.2   | 36.6   | 37.8   | 24.4   | 6.1    | 2.4    | 0.0    | 0.0    |
| 75°   | 5546.4 | 1066.8 | 68.4   | 39.0   | 23.2   | 28.0   | 17.0   | 2.4    | 1.2    | 0.0    | 0.0    |
| 77.5° | 3085.7 | 502.8  | 42.8   | 22.0   | 14.6   | 17.0   | 8.6    | 0.0    | 0.0    | 0.0    | 0.0    |
| 80°   | 1002.2 | 136.8  | 19.6   | 12.2   | 8.6    | 9.8    | 3.6    | 0.0    | 0.0    | 0.0    | 0.0    |
| 82.5° | 185.6  | 39.0   | 11.0   | 6.1    | 2.4    | 2.4    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 85°   | 40.2   | 15.8   | 6.1    | 2.4    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 87.5° | 13.4   | 4.8    | 1.2    | 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**

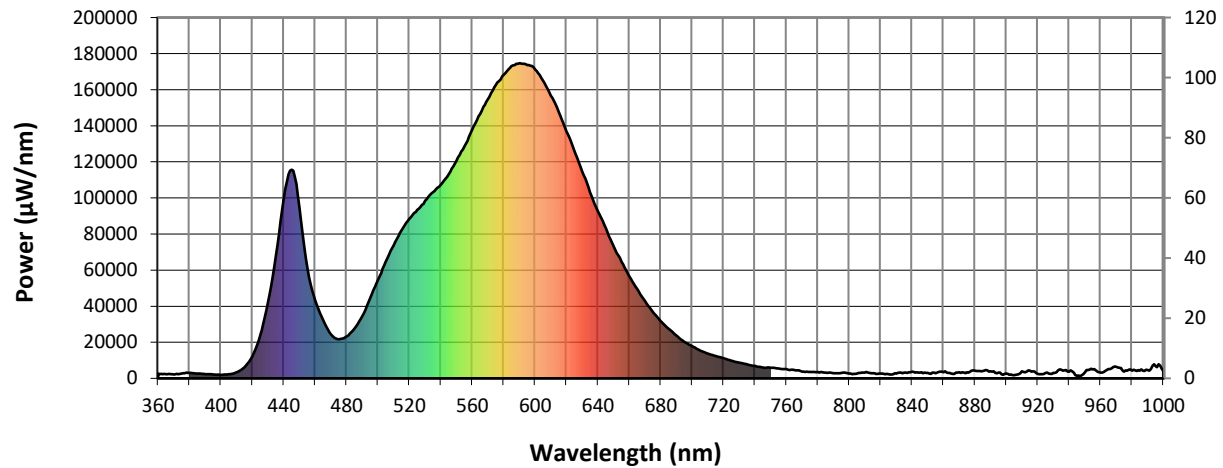


**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



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### Photopic Flux vs. Wavelength

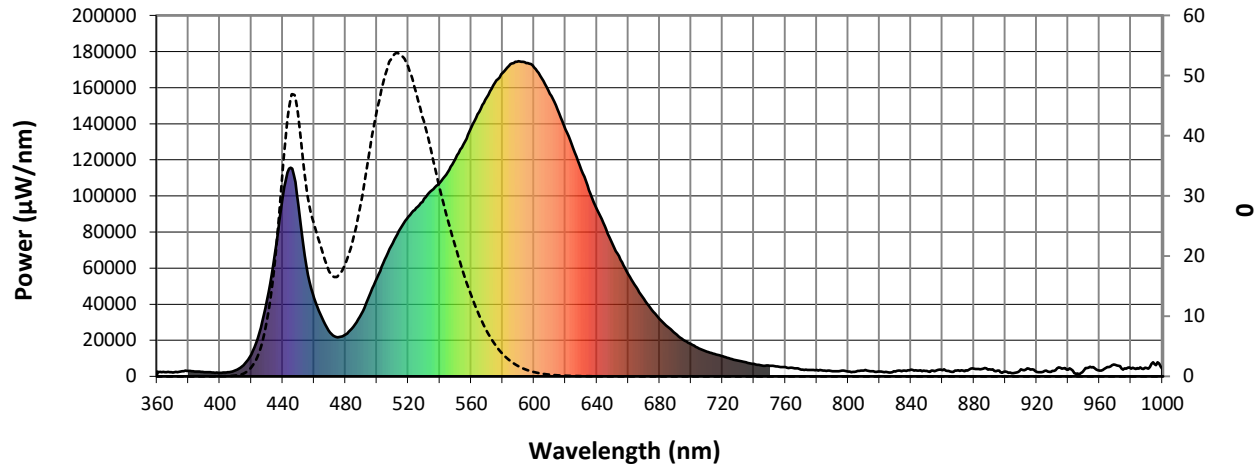


#####

| 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



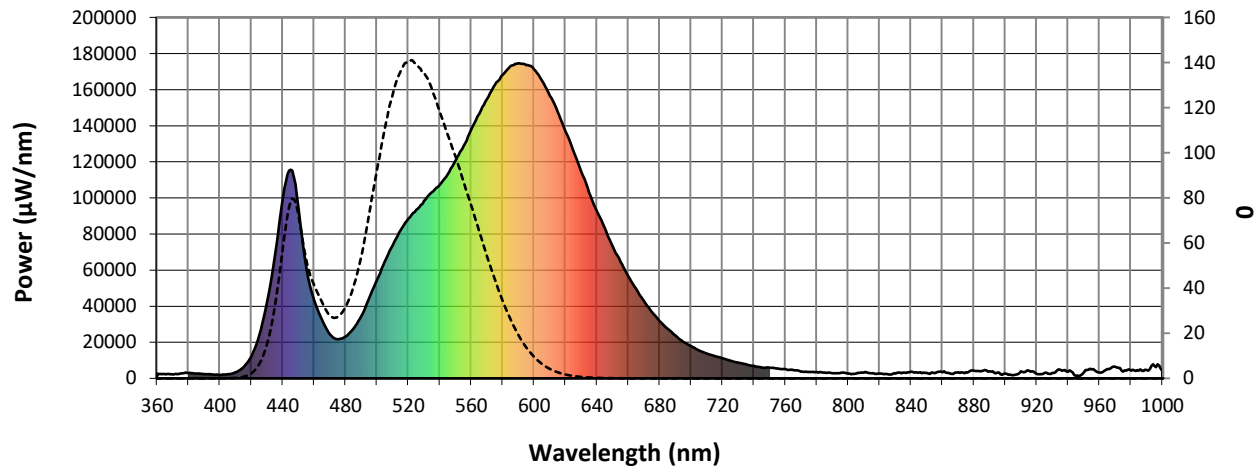
Scotopic Lumens: 12126

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

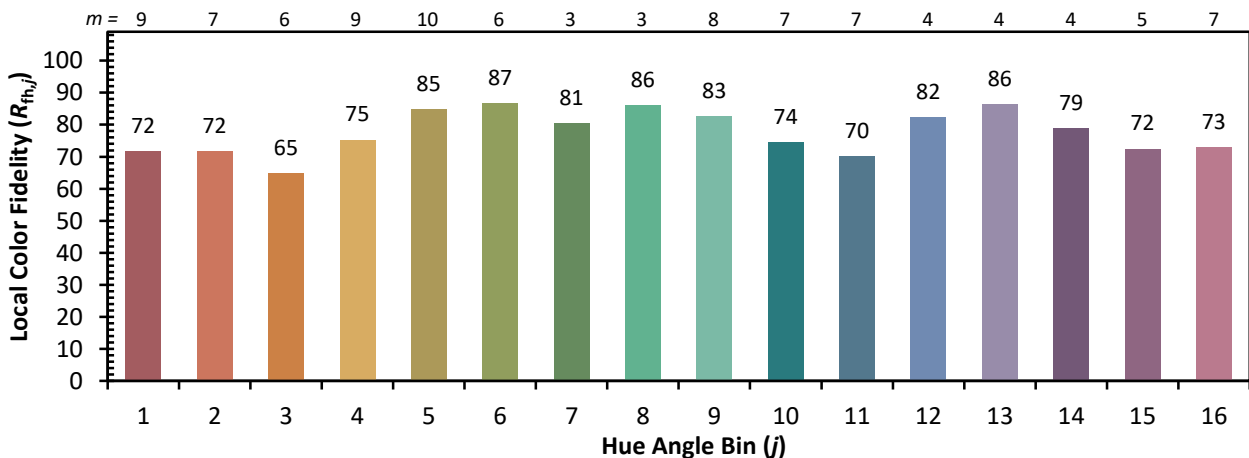
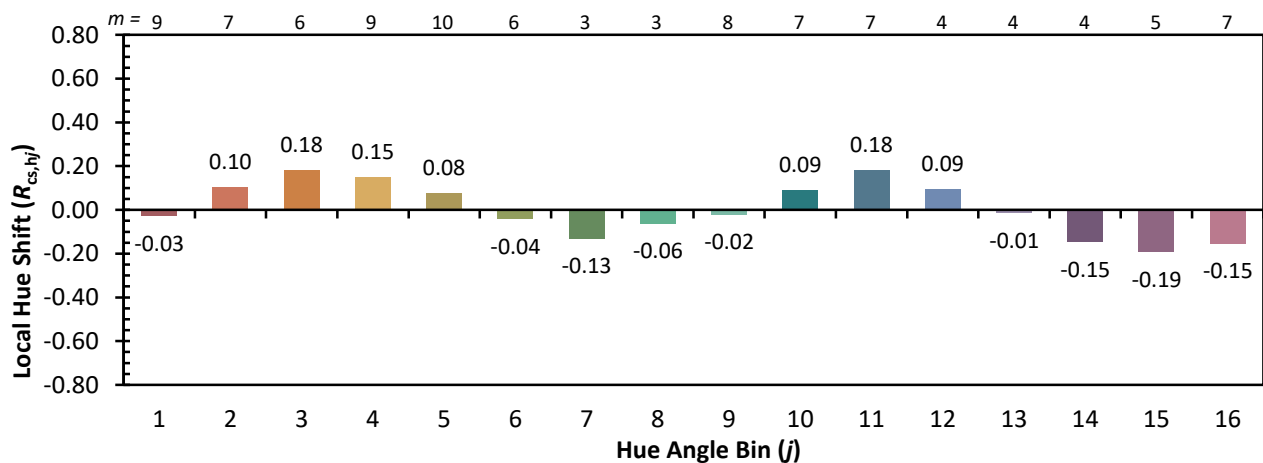




**Individual Sample Fidelity Index ( $R_{f,i}$ )**

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