

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: P321602

Luminaire Tested: **GLEON-SA8B-740-U-T3R-HSS**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P321602  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-11)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA8B-740-U-T3R-HSS  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(8) 70 CRI, 4000K, 800mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE III  
ROADWAY OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 35225 lumens  
Efficiency: N/A  
Efficacy: 105.5 lumens/watt  
Luminous Opening: Rectangular (W 2' x L: 1' x H: 0')  
IES Classification: Type III - Medium  
BUG Rating: B3 - U0 - G5

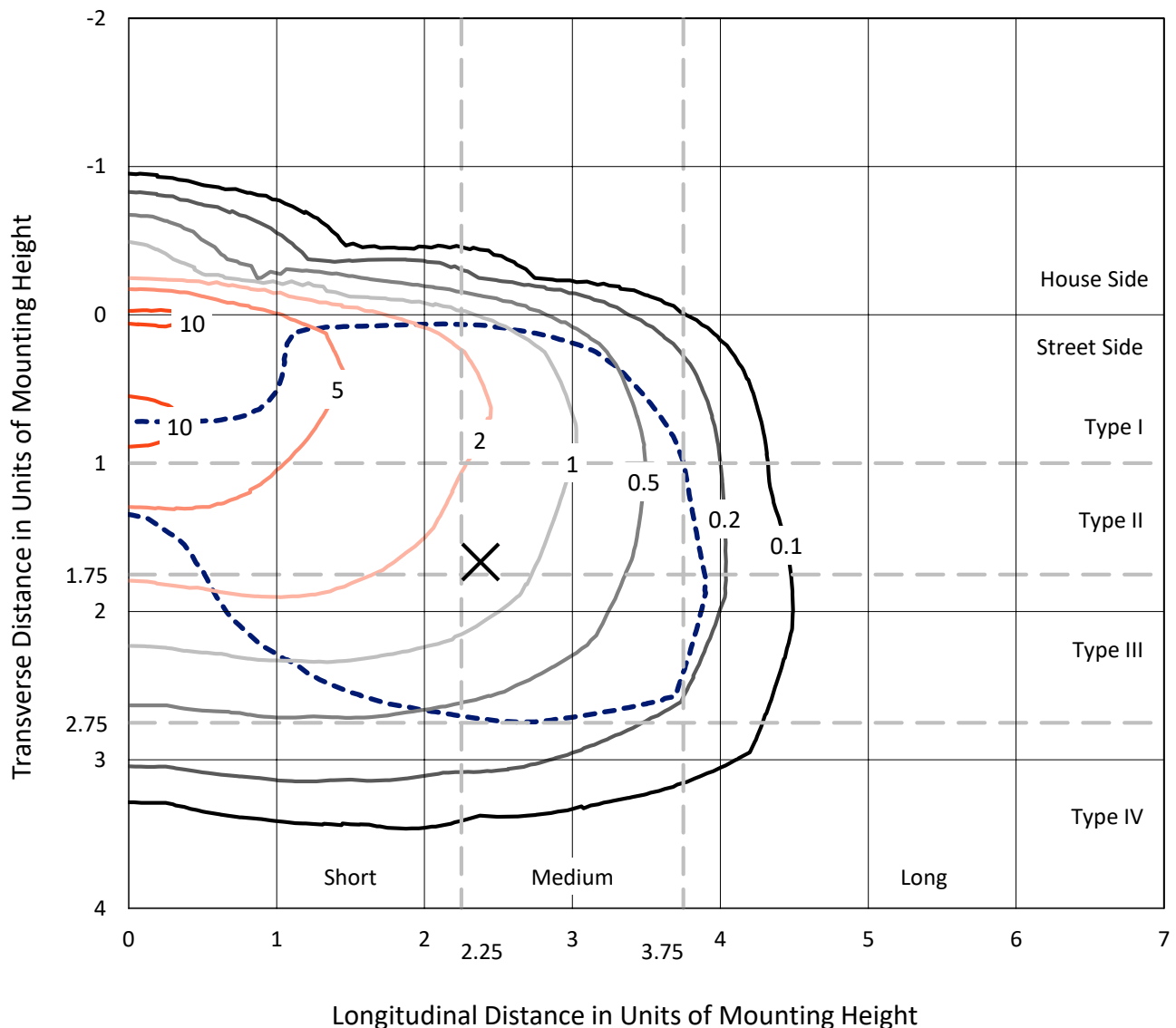
Input Watts (W): 334  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



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## Iso-Footcandle Lines of Horizontal Illumination

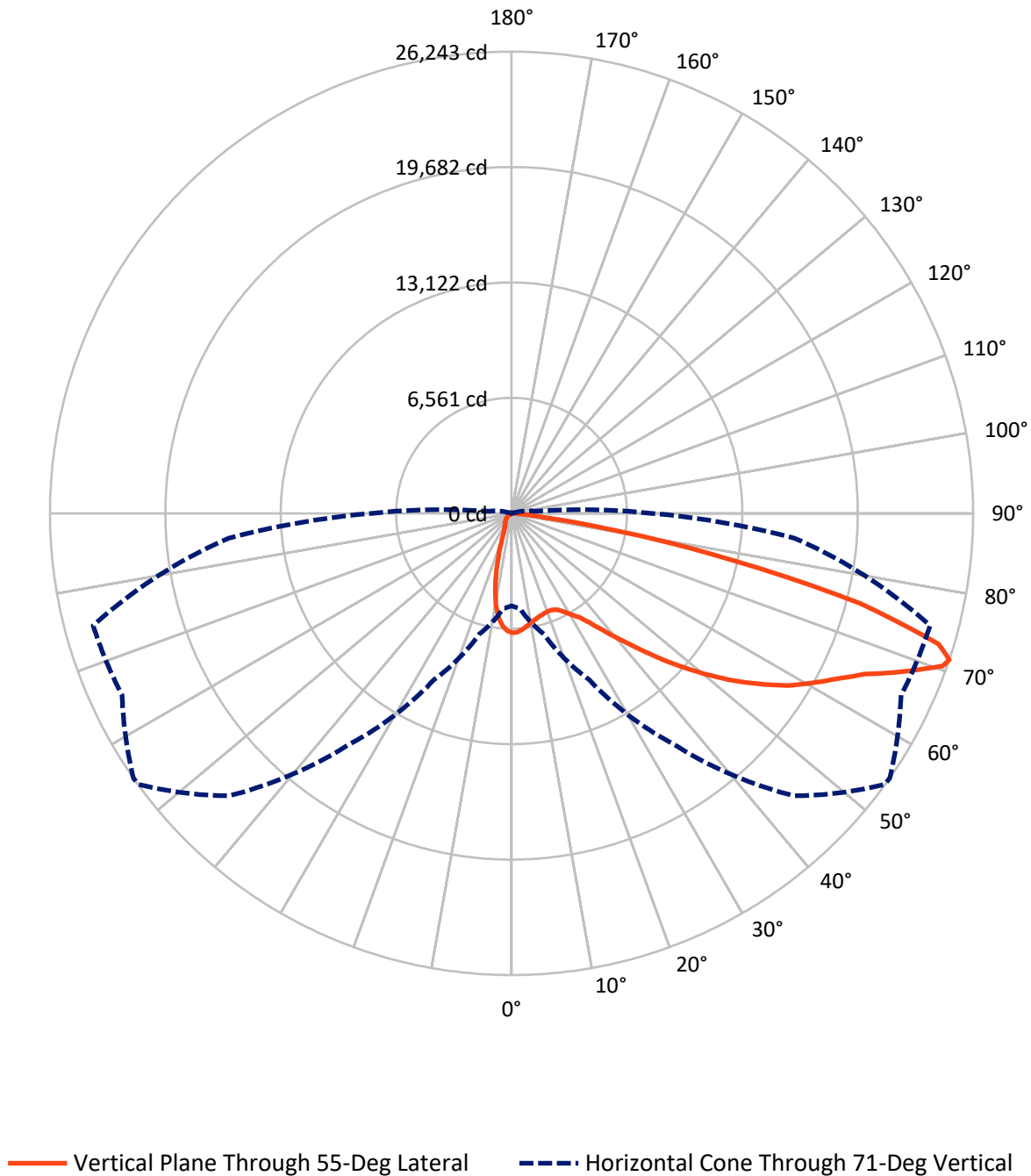
× Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 11.1 fc  
 Type III - Medium - N/A

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## Luminous Intensity Polar Plot



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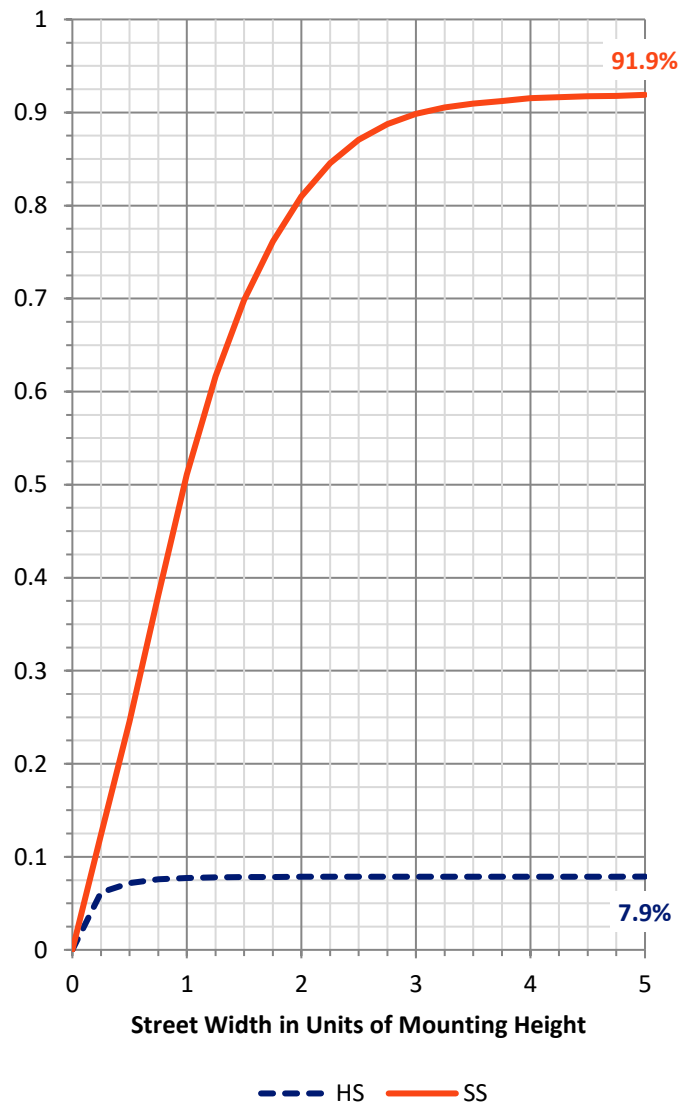
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 2788.9   | 0.0    | 2788.9  |
|                    | % Fixture | 7.9      | 0.0    | 7.9     |
| <b>Street Side</b> | Lumens    | 32436.1  | 0.0    | 32436.1 |
|                    | % Fixture | 92.1     | 0.0    | 92.1    |
| <b>Total</b>       | Lumens    | 35225.0  | 0.0    | 35225.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 579.2   | 1.6       |
| 10°-20°   | 1307.6  | 3.7       |
| 20°-30°   | 2101.4  | 6.0       |
| 30°-40°   | 3570.4  | 10.1      |
| 40°-50°   | 5541.7  | 15.7      |
| 50°-60°   | 7450.6  | 21.2      |
| 60°-70°   | 9114.6  | 25.9      |
| 70°-80°   | 5329.1  | 15.1      |
| 80°-90°   | 230.4   | 0.7       |
| 90°-100°  | 0.0     | 0.0       |
| 100°-110° | 0.0     | 0.0       |
| 110°-120° | 0.0     | 0.0       |
| 120°-130° | 0.0     | 0.0       |
| 130°-140° | 0.0     | 0.0       |
| 140°-150° | 0.0     | 0.0       |
| 150°-160° | 0.0     | 0.0       |
| 160°-170° | 0.0     | 0.0       |
| 170°-180° | 0.0     | 0.0       |
| 0°-90°    | 35225.0 | 100.0     |
| 0°-180°   | 35225.0 | 100.0     |

**Coefficient of Utilization**



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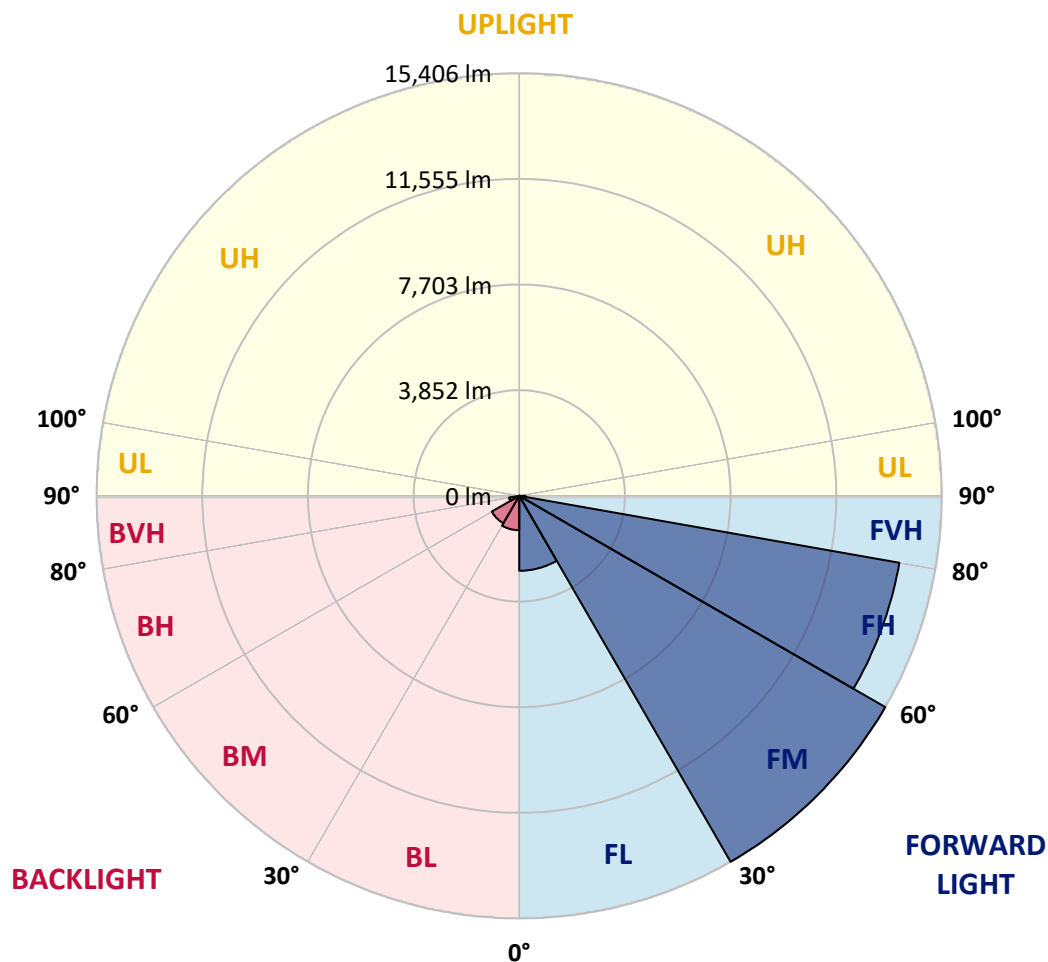
CATALOG NUMBER: GLEON-SA8B-740-U-T3R-HSS

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |        |
|------|-------------|---------|-----------|-------------------------|------|--------|
|      |             |         |           | B                       | U    | G      |
| FL   | (0°-30°)    | 2733.0  | 7.8       |                         |      |        |
| FM   | (30°-60°)   | 15406.4 | 43.7      |                         |      |        |
| FH   | (60°-80°)   | 14070.1 | 39.9      |                         |      | G5     |
| FVH  | (80°-90°)   | 226.7   | 0.6       |                         |      | G3/500 |
| BL   | (0°-30°)    | 1255.3  | 3.6       | B3/2500                 |      |        |
| BM   | (30°-60°)   | 1156.3  | 3.3       | B2/2500                 |      |        |
| BH   | (60°-80°)   | 373.6   | 1.1       | B1/500                  |      | G1/500 |
| BVH  | (80°-90°)   | 3.6     | 0.0       |                         |      | G0/10  |
| UL   | (90°-100°)  | 0.0     | 0.0       |                         | U0/0 |        |
| UH   | (100°-180°) | 0.0     | 0.0       |                         | U0/0 |        |

**BUG Rating: B3-U0-G5**

Type III Medium





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 54°     | 55°     | 65°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 6793.3  | 6793.3  | 6793.3  | 6793.3  | 6793.3  | 6793.3  | 6793.3  | 6793.3  | 6793.3  | 6793.3  | 6793.3  |
| 2.5°  | 6594.0  | 6601.9  | 6630.4  | 6643.0  | 6673.1  | 6723.7  | 6749.0  | 6750.6  | 6791.7  | 6807.5  | 6820.2  |
| 5°    | 6127.4  | 6174.8  | 6222.3  | 6272.9  | 6364.6  | 6486.4  | 6606.6  | 6617.7  | 6750.6  | 6848.6  | 6900.8  |
| 7.5°  | 5725.6  | 5768.3  | 5825.3  | 5906.0  | 6035.6  | 6227.0  | 6427.9  | 6451.6  | 6703.1  | 6926.1  | 7043.2  |
| 10°   | 5312.8  | 5347.6  | 5429.9  | 5548.5  | 5727.2  | 5983.5  | 6253.9  | 6293.5  | 6660.4  | 7030.5  | 7236.1  |
| 12.5° | 4871.5  | 4892.1  | 4991.7  | 5162.6  | 5425.1  | 5750.9  | 6106.8  | 6159.0  | 6633.5  | 7150.7  | 7463.9  |
| 15°   | 4536.2  | 4545.7  | 4640.6  | 4817.8  | 5118.3  | 5542.2  | 5992.9  | 6056.2  | 6639.8  | 7294.7  | 7712.2  |
| 17.5° | 4450.8  | 4455.6  | 4506.2  | 4628.0  | 4893.7  | 5355.5  | 5902.8  | 5980.3  | 6658.8  | 7435.4  | 7962.1  |
| 20°   | 4797.2  | 4764.0  | 4711.8  | 4692.8  | 4806.7  | 5243.2  | 5849.0  | 5936.0  | 6684.1  | 7560.4  | 8186.7  |
| 22.5° | 5747.8  | 5649.7  | 5433.0  | 5143.6  | 4968.0  | 5251.1  | 5863.2  | 5950.2  | 6764.8  | 7713.8  | 8446.1  |
| 25°   | 7158.6  | 7022.6  | 6654.1  | 6084.7  | 5537.4  | 5478.9  | 5981.9  | 6070.4  | 6921.4  | 7897.3  | 8694.4  |
| 27.5° | 8764.0  | 8629.6  | 8178.8  | 7365.8  | 6432.6  | 5929.7  | 6253.9  | 6336.2  | 7153.9  | 8060.2  | 8884.2  |
| 30°   | 10301.4 | 10263.4 | 9732.0  | 8808.3  | 7558.8  | 6660.4  | 6605.0  | 6674.6  | 7326.3  | 8158.2  | 9034.5  |
| 32.5° | 11604.7 | 11544.6 | 11117.6 | 10219.2 | 8847.9  | 7538.2  | 7017.9  | 7038.4  | 7456.0  | 8284.8  | 9230.6  |
| 35°   | 12813.1 | 12738.8 | 12363.9 | 11514.5 | 10170.1 | 8610.6  | 7653.7  | 7623.6  | 7739.1  | 8539.4  | 9515.3  |
| 37.5° | 13868.1 | 13936.1 | 13520.1 | 12711.9 | 11356.4 | 9725.7  | 8511.0  | 8420.8  | 8182.0  | 8953.8  | 9928.1  |
| 40°   | 14750.6 | 14750.6 | 14534.0 | 13860.2 | 12637.5 | 10878.7 | 9480.5  | 9361.9  | 8847.9  | 9592.8  | 10451.7 |
| 42.5° | 15068.6 | 15136.6 | 15217.2 | 14836.1 | 13784.2 | 12077.6 | 10560.8 | 10437.4 | 9785.8  | 10499.1 | 11112.8 |
| 45°   | 15087.5 | 15195.1 | 15607.9 | 15606.3 | 14820.2 | 13268.6 | 11778.7 | 11720.2 | 10987.9 | 11663.2 | 11932.1 |
| 47.5° | 14820.2 | 14954.7 | 15634.8 | 16020.7 | 15641.1 | 14377.4 | 13110.5 | 13037.7 | 12400.3 | 13089.9 | 12789.4 |
| 50°   | 14407.4 | 14556.1 | 15346.9 | 16183.6 | 16199.5 | 15342.2 | 14513.4 | 14404.3 | 13955.1 | 14720.6 | 13675.1 |
| 52.5° | 13668.8 | 13956.6 | 15089.1 | 16221.6 | 16566.4 | 16175.7 | 15848.3 | 15800.9 | 15694.9 | 16291.2 | 14380.5 |
| 55°   | 12088.7 | 12408.2 | 14442.2 | 16234.2 | 16906.5 | 16914.4 | 17099.4 | 17112.1 | 17325.6 | 17759.0 | 14905.6 |
| 57.5° | 11342.1 | 11522.5 | 13312.9 | 16294.4 | 17411.0 | 17752.7 | 18374.2 | 18472.3 | 18802.9 | 19152.4 | 15505.1 |
| 60°   | 10872.4 | 11085.9 | 12756.2 | 16212.1 | 18203.4 | 18851.9 | 19555.8 | 19589.0 | 19943.3 | 20590.2 | 16316.5 |
| 62.5° | 10497.5 | 10707.9 | 12405.0 | 15895.8 | 19093.9 | 20174.2 | 20710.4 | 20713.5 | 20979.3 | 22303.1 | 17238.6 |
| 65°   | 9572.3  | 9749.4  | 11694.9 | 15539.9 | 19682.3 | 21482.2 | 22051.6 | 22031.1 | 22247.8 | 24109.4 | 18309.4 |
| 67.5° | 8234.2  | 8370.2  | 10244.5 | 14190.7 | 19460.9 | 22671.6 | 24076.2 | 24008.2 | 23745.6 | 25670.5 | 18730.1 |
| 70°   | 6366.2  | 6415.2  | 8074.4  | 11826.1 | 17385.7 | 23128.7 | 26032.7 | 25997.9 | 24664.5 | 25390.5 | 17188.0 |
| 71°   | 5262.2  | 5423.5  | 7115.9  | 10437.4 | 15995.4 | 22706.4 | 26222.5 | 26243.0 | 24433.6 | 24628.2 | 16126.7 |
| 72.5° | 3055.8  | 3193.4  | 5157.8  | 8015.9  | 13580.2 | 20944.5 | 25238.7 | 25387.4 | 23354.9 | 22401.2 | 13774.8 |
| 75°   | 654.8   | 700.7   | 1912.2  | 3879.8  | 7470.2  | 14679.5 | 19921.1 | 20451.0 | 19035.4 | 15239.4 | 8302.2  |
| 77.5° | 455.5   | 491.9   | 819.3   | 1760.4  | 2469.0  | 7253.5  | 12375.0 | 12972.8 | 11372.2 | 5727.2  | 2657.2  |
| 80°   | 360.6   | 401.7   | 639.0   | 869.9   | 667.5   | 2339.3  | 5796.8  | 6162.2  | 3792.8  | 1278.0  | 447.6   |
| 82.5° | 200.9   | 238.8   | 498.2   | 469.8   | 256.2   | 444.4   | 1622.8  | 1834.7  | 759.2   | 257.8   | 106.0   |
| 85°   | 58.5    | 71.2    | 321.1   | 341.6   | 109.1   | 85.4    | 276.8   | 343.2   | 143.9   | 68.0    | 47.5    |
| 87.5° | 0.0     | 0.0     | 155.0   | 131.3   | 31.6    | 12.7    | 25.3    | 28.5    | 28.5    | 28.5    | 31.6    |
| 90°   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |



REPORT NUMBER: P321602

CATALOG NUMBER: GLEON-SA8B-740-U-T3R-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 6793.3  | 6793.3 | 6793.3 | 6793.3 | 6793.3 | 6793.3 | 6793.3 | 6793.3 | 6793.3 | 6793.3 | 6793.3 |
| 2.5°  | 6820.2  | 6831.2 | 6791.7 | 6739.5 | 6684.1 | 6616.1 | 6544.9 | 6489.6 | 6488.0 | 6461.1 | 6434.2 |
| 5°    | 6904.0  | 6897.7 | 6788.5 | 6622.4 | 6426.3 | 6222.3 | 6027.7 | 5807.9 | 5735.1 | 5645.0 | 5614.9 |
| 7.5°  | 7059.0  | 7014.7 | 6783.8 | 6420.0 | 5989.8 | 5562.7 | 5121.4 | 4677.0 | 4487.2 | 4316.4 | 4286.3 |
| 10°   | 7253.5  | 7169.7 | 6753.7 | 6116.3 | 5327.1 | 4539.4 | 3873.5 | 3269.3 | 3003.6 | 2799.6 | 2790.1 |
| 12.5° | 7456.0  | 7327.9 | 6669.9 | 5657.6 | 4458.7 | 3351.6 | 2584.4 | 1989.7 | 1768.3 | 1626.0 | 1638.6 |
| 15°   | 7667.9  | 7476.5 | 6489.6 | 5039.2 | 3470.2 | 2274.4 | 1588.0 | 1238.4 | 1149.9 | 1113.5 | 1123.0 |
| 17.5° | 7884.6  | 7579.4 | 6238.1 | 4294.2 | 2494.3 | 1467.8 | 1099.3 | 1001.2 | 1001.2 | 1009.1 | 1012.3 |
| 20°   | 8072.8  | 7634.7 | 5868.0 | 3459.1 | 1690.8 | 1069.2 | 961.7  | 947.4  | 955.3  | 968.0  | 969.6  |
| 22.5° | 8259.5  | 7637.9 | 5385.6 | 2612.9 | 1183.1 | 936.3  | 915.8  | 909.5  | 914.2  | 928.4  | 930.0  |
| 25°   | 8411.3  | 7599.9 | 4781.4 | 1858.5 | 944.3  | 882.6  | 873.1  | 869.9  | 873.1  | 890.5  | 890.5  |
| 27.5° | 8473.0  | 7462.3 | 4044.3 | 1306.5 | 846.2  | 822.5  | 819.3  | 822.5  | 827.2  | 839.9  | 841.4  |
| 30°   | 8479.3  | 7221.9 | 3240.8 | 945.8  | 767.1  | 741.8  | 748.1  | 759.2  | 754.5  | 751.3  | 754.5  |
| 32.5° | 8495.1  | 6943.5 | 2457.9 | 778.2  | 700.7  | 661.1  | 653.2  | 653.2  | 634.2  | 623.2  | 616.9  |
| 35°   | 8547.3  | 6616.1 | 1782.5 | 699.1  | 632.7  | 586.8  | 556.7  | 522.0  | 485.6  | 466.6  | 461.8  |
| 37.5° | 8629.6  | 6272.9 | 1276.4 | 646.9  | 572.6  | 520.4  | 463.4  | 401.7  | 349.5  | 335.3  | 335.3  |
| 40°   | 8779.8  | 5918.6 | 944.3  | 605.8  | 525.1  | 460.3  | 374.9  | 294.2  | 246.7  | 238.8  | 238.8  |
| 42.5° | 9017.1  | 5545.3 | 752.9  | 569.4  | 484.0  | 398.6  | 286.3  | 213.5  | 178.7  | 174.0  | 172.4  |
| 45°   | 9263.8  | 5134.1 | 658.0  | 534.6  | 439.7  | 327.4  | 211.9  | 158.2  | 137.6  | 132.9  | 132.9  |
| 47.5° | 9510.6  | 4696.0 | 612.1  | 501.4  | 397.0  | 254.6  | 158.2  | 125.0  | 115.5  | 115.5  | 117.0  |
| 50°   | 9719.4  | 4238.9 | 578.9  | 465.0  | 341.6  | 193.0  | 125.0  | 106.0  | 102.8  | 109.1  | 110.7  |
| 52.5° | 9771.6  | 3789.7 | 537.8  | 419.1  | 273.6  | 147.1  | 102.8  | 93.3   | 93.3   | 93.3   | 93.3   |
| 55°   | 9739.9  | 3441.7 | 484.0  | 362.2  | 202.5  | 117.0  | 88.6   | 82.2   | 80.7   | 80.7   | 80.7   |
| 57.5° | 9847.5  | 3236.1 | 387.5  | 281.5  | 145.5  | 94.9   | 77.5   | 72.8   | 69.6   | 68.0   | 68.0   |
| 60°   | 10064.2 | 3101.7 | 276.8  | 202.5  | 109.1  | 79.1   | 66.4   | 61.7   | 56.9   | 53.8   | 53.8   |
| 62.5° | 10352.0 | 2984.6 | 205.6  | 150.3  | 83.8   | 63.3   | 55.4   | 50.6   | 44.3   | 41.1   | 41.1   |
| 65°   | 10573.5 | 2775.8 | 156.6  | 112.3  | 63.3   | 50.6   | 42.7   | 41.1   | 31.6   | 28.5   | 26.9   |
| 67.5° | 10235.0 | 2317.1 | 126.5  | 82.2   | 47.5   | 39.5   | 33.2   | 31.6   | 19.0   | 15.8   | 15.8   |
| 70°   | 8778.3  | 1613.3 | 101.2  | 60.1   | 34.8   | 31.6   | 26.9   | 20.6   | 14.2   | 12.7   | 12.7   |
| 71°   | 7960.5  | 1347.6 | 91.7   | 50.6   | 30.1   | 30.1   | 25.3   | 17.4   | 12.7   | 11.1   | 11.1   |
| 72.5° | 6613.0  | 956.9  | 77.5   | 39.5   | 26.9   | 31.6   | 26.9   | 15.8   | 12.7   | 11.1   | 9.5    |
| 75°   | 3838.7  | 400.2  | 53.8   | 26.9   | 20.6   | 38.0   | 34.8   | 14.2   | 9.5    | 7.9    | 7.9    |
| 77.5° | 1154.6  | 147.1  | 30.1   | 17.4   | 15.8   | 33.2   | 39.5   | 12.7   | 4.7    | 1.6    | 1.6    |
| 80°   | 210.4   | 63.3   | 19.0   | 11.1   | 11.1   | 20.6   | 30.1   | 6.3    | 0.0    | 0.0    | 0.0    |
| 82.5° | 74.3    | 31.6   | 11.1   | 6.3    | 4.7    | 9.5    | 14.2   | 0.0    | 0.0    | 0.0    | 0.0    |
| 85°   | 42.7    | 22.1   | 6.3    | 3.2    | 0.0    | 1.6    | 3.2    | 0.0    | 0.0    | 0.0    | 0.0    |
| 87.5° | 28.5    | 6.3    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 90°   | 0.0     | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |



LM-79-08: Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Report Prepared for

Cooper Lighting Solutions

MCGRAW, INVUE, LUMARK AND STREETWORKS

DATA VALID FOR LUMINAIRES UTILIZING SA LIGHT ENGINES

Report Number: SP1-2101-121-2

Luminaire Tested: IFLD-S-SA2A-740-U-T3R-HSS

Test Date: 03/05/2021

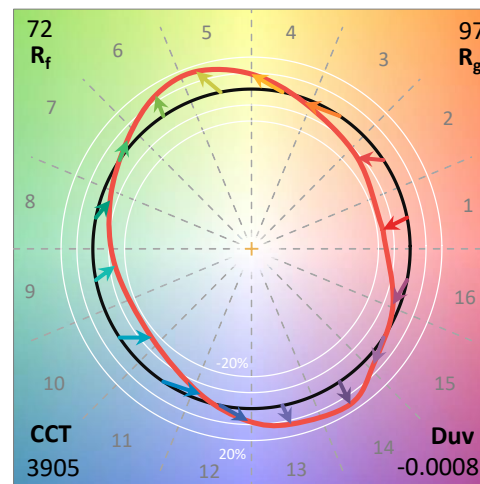
### Test Information

Test Method: LM-79-08  
 Report Number: SP1-2101-121-2  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1  
 Measurement Geometry:  $4\pi$   
 Issue Date: 03/05/2021  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: STREETWORKS  
 Catalog Number: **IFLD-S-SA2A-740-U-T3R-HSS**  
 Description: STREETWORKS INF FLOOD

SHIELD, DRIVER PROGRAMMED @ 615mA.

### Spectral Parameters

|                           |         |           |      |      |       |
|---------------------------|---------|-----------|------|------|-------|
| CCT (K):                  | 3905    | CRI (Ra): | 71.2 |      |       |
| CIE u':                   | 0.2273  | R1:       | 68.9 | R9:  | -29.7 |
| CIE v':                   | 0.5024  | R2:       | 77.0 | R10: | 46.2  |
| Duv:                      | -0.0008 | R3:       | 84.0 | R11: | 68.8  |
| CIE x:                    | 0.3841  | R4:       | 71.6 | R12: | 45.6  |
| CIE y:                    | 0.3774  | R5:       | 68.9 | R13: | 69.5  |
| CIE z:                    | 0.2385  | R6:       | 68.3 | R14: | 90.7  |
| Peak Wavelength (nm):     | 443     | R7:       | 78.7 |      |       |
| Dominant Wavelength (nm): | 579     | R8:       | 52.2 |      |       |
| Purity:                   | 28.7    |           |      |      |       |
| Rf:                       | 71.7    |           |      |      |       |
| Rg:                       | 96.9    |           |      |      |       |



### Test Conditions

Stabilization Time: 211M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.8/312%  
 Sphere Temperature (°C): 24.1

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| 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 4000K 4-step quadrangle

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### Photopic Flux vs. Wavelength

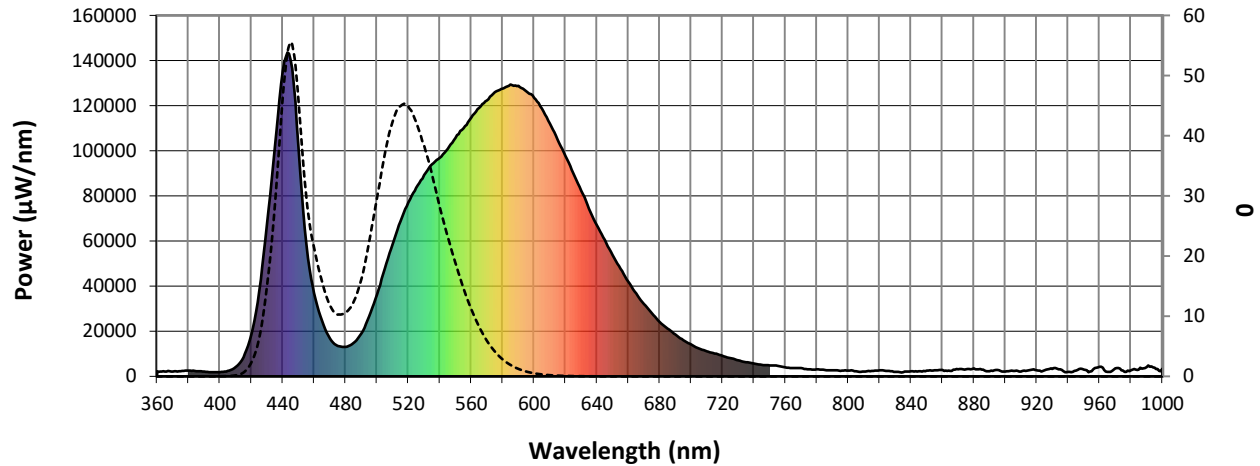


#####

| 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       | 2304             | 0.0              | 490       | 19043            | 2.7              | 620       | 97577            | 25.4             | 750       | 4830             | 0.0              | 880       | 3505             | 0.0              |
| 365       | 2150             | 0.0              | 495       | 26606            | 4.8              | 625       | 90158            | 19.9             | 755       | 4664             | 0.0              | 885       | 2991             | 0.0              |
| 370       | 2146             | 0.0              | 500       | 36376            | 8.0              | 630       | 82240            | 14.9             | 760       | 4006             | 0.0              | 890       | 2327             | 0.0              |
| 375       | 2332             | 0.0              | 505       | 47714            | 13.3             | 635       | 74361            | 11.2             | 765       | 3715             | 0.0              | 895       | 2775             | 0.0              |
| 380       | 2527             | 0.0              | 510       | 58741            | 20.2             | 640       | 66994            | 8.0              | 770       | 3696             | 0.0              | 900       | 2141             | 0.0              |
| 385       | 2304             | 0.0              | 515       | 68716            | 28.5             | 645       | 60405            | 5.8              | 775       | 3117             | 0.0              | 905       | 2421             | 0.0              |
| 390       | 2064             | 0.0              | 520       | 77136            | 37.4             | 650       | 53806            | 3.9              | 780       | 3062             | 0.0              | 910       | 2200             | 0.0              |
| 395       | 1856             | 0.0              | 525       | 83567            | 44.9             | 655       | 47610            | 2.7              | 785       | 2907             | 0.0              | 915       | 2716             | 0.0              |
| 400       | 1856             | 0.0              | 530       | 89283            | 52.6             | 660       | 42018            | 1.8              | 790       | 2655             | 0.0              | 920       | 2656             | 0.0              |
| 405       | 2374             | 0.0              | 535       | 94097            | 58.4             | 665       | 36742            | 1.2              | 795       | 2467             | 0.0              | 925       | 2671             | 0.0              |
| 410       | 4084             | 0.0              | 540       | 96845            | 63.1             | 670       | 32105            | 0.7              | 800       | 2609             | 0.0              | 930       | 3292             | 0.0              |
| 415       | 8543             | 0.0              | 545       | 100829           | 67.1             | 675       | 27946            | 0.5              | 805       | 2293             | 0.0              | 935       | 3188             | 0.0              |
| 420       | 18394            | 0.1              | 550       | 105648           | 71.8             | 680       | 24146            | 0.3              | 810       | 2188             | 0.0              | 940       | 1997             | 0.0              |
| 425       | 37987            | 0.2              | 555       | 110017           | 75.1             | 685       | 21191            | 0.2              | 815       | 2386             | 0.0              | 945       | 2623             | 0.0              |
| 430       | 67605            | 0.5              | 560       | 114586           | 77.9             | 690       | 18544            | 0.1              | 820       | 2712             | 0.0              | 950       | 2969             | 0.0              |
| 435       | 102160           | 1.2              | 565       | 118987           | 79.1             | 695       | 16058            | 0.1              | 825       | 2473             | 0.0              | 955       | 2277             | 0.0              |
| 440       | 135103           | 2.1              | 570       | 122326           | 79.5             | 700       | 14133            | 0.0              | 830       | 1969             | 0.0              | 960       | 4267             | 0.0              |
| 445       | 140126           | 2.9              | 575       | 125968           | 78.4             | 705       | 12309            | 0.0              | 835       | 1917             | 0.0              | 965       | 2034             | 0.0              |
| 450       | 102339           | 2.7              | 580       | 127613           | 75.8             | 710       | 11142            | 0.0              | 840       | 2248             | 0.0              | 970       | 3586             | 0.0              |
| 455       | 58751            | 2.0              | 585       | 129466           | 71.9             | 715       | 10143            | 0.0              | 845       | 2266             | 0.0              | 975       | 2505             | 0.0              |
| 460       | 36892            | 1.5              | 590       | 128813           | 66.6             | 720       | 9072             | 0.0              | 850       | 2558             | 0.0              | 980       | 2666             | 0.0              |
| 465       | 24637            | 1.3              | 595       | 126387           | 59.9             | 725       | 8130             | 0.0              | 855       | 2767             | 0.0              | 985       | 2934             | 0.0              |
| 470       | 16738            | 1.0              | 600       | 123477           | 53.2             | 730       | 7149             | 0.0              | 860       | 2826             | 0.0              | 990       | 4120             | 0.0              |
| 475       | 13456            | 1.1              | 605       | 118718           | 46.0             | 735       | 6311             | 0.0              | 865       | 2385             | 0.0              | 995       | 3858             | 0.0              |
| 480       | 13081            | 1.2              | 610       | 112091           | 38.5             | 740       | 5711             | 0.0              | 870       | 3194             | 0.0              | 1000      | 3405             | 0.0              |
| 485       | 14734            | 1.7              | 615       | 105039           | 31.7             | 745       | 5111             | 0.0              | 875       | 3189             | 0.0              |           |                  |                  |

REPORT NUMBER: SP1-2101-121-2

### Scotopic Flux vs. Wavelength



Scotopic Lumens: 10425.8

S/P: 1.47

| 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       | 2304             | 0.0              | 490       | 19043            | 29.3             | 620       | 97577            | 1.2              | 750       | 4830             | 0.0              | 880       | 3505             | 0.0              |
| 365       | 2150             | 0.0              | 495       | 26606            | 43.0             | 625       | 90158            | 0.8              | 755       | 4664             | 0.0              | 885       | 2991             | 0.0              |
| 370       | 2146             | 0.0              | 500       | 36376            | 60.8             | 630       | 82240            | 0.5              | 760       | 4006             | 0.0              | 890       | 2327             | 0.0              |
| 375       | 2332             | 0.0              | 505       | 47714            | 81.1             | 635       | 74361            | 0.3              | 765       | 3715             | 0.0              | 895       | 2775             | 0.0              |
| 380       | 2527             | 0.0              | 510       | 58741            | 99.6             | 640       | 66994            | 0.2              | 770       | 3696             | 0.0              | 900       | 2141             | 0.0              |
| 385       | 2304             | 0.0              | 515       | 68716            | 113.9            | 645       | 60405            | 0.1              | 775       | 3117             | 0.0              | 905       | 2421             | 0.0              |
| 390       | 2064             | 0.0              | 520       | 77136            | 122.6            | 650       | 53806            | 0.1              | 780       | 3062             | 0.0              | 910       | 2200             | 0.0              |
| 395       | 1856             | 0.0              | 525       | 83567            | 125.0            | 655       | 47610            | 0.0              | 785       | 2907             | 0.0              | 915       | 2716             | 0.0              |
| 400       | 1856             | 0.0              | 530       | 89283            | 123.1            | 660       | 42018            | 0.0              | 790       | 2655             | 0.0              | 920       | 2656             | 0.0              |
| 405       | 2374             | 0.1              | 535       | 94097            | 117.3            | 665       | 36742            | 0.0              | 795       | 2467             | 0.0              | 925       | 2671             | 0.0              |
| 410       | 4084             | 0.2              | 540       | 96845            | 107.0            | 670       | 32105            | 0.0              | 800       | 2609             | 0.0              | 930       | 3292             | 0.0              |
| 415       | 8543             | 0.9              | 545       | 100829           | 96.7             | 675       | 27946            | 0.0              | 805       | 2293             | 0.0              | 935       | 3188             | 0.0              |
| 420       | 18394            | 3.0              | 550       | 105648           | 86.4             | 680       | 24146            | 0.0              | 810       | 2188             | 0.0              | 940       | 1997             | 0.0              |
| 425       | 37987            | 9.3              | 555       | 110017           | 75.2             | 685       | 21191            | 0.0              | 815       | 2386             | 0.0              | 945       | 2623             | 0.0              |
| 430       | 67605            | 23.0             | 560       | 114586           | 64.0             | 690       | 18544            | 0.0              | 820       | 2712             | 0.0              | 950       | 2969             | 0.0              |
| 435       | 102160           | 45.7             | 565       | 118987           | 53.4             | 695       | 16058            | 0.0              | 825       | 2473             | 0.0              | 955       | 2277             | 0.0              |
| 440       | 135103           | 75.5             | 570       | 122326           | 43.2             | 700       | 14133            | 0.0              | 830       | 1969             | 0.0              | 960       | 4267             | 0.0              |
| 445       | 140126           | 93.8             | 575       | 125968           | 34.3             | 705       | 12309            | 0.0              | 835       | 1917             | 0.0              | 965       | 2034             | 0.0              |
| 450       | 102339           | 79.3             | 580       | 127613           | 26.3             | 710       | 11142            | 0.0              | 840       | 2248             | 0.0              | 970       | 3586             | 0.0              |
| 455       | 58751            | 51.3             | 585       | 129466           | 19.8             | 715       | 10143            | 0.0              | 845       | 2266             | 0.0              | 975       | 2505             | 0.0              |
| 460       | 36892            | 35.6             | 590       | 128813           | 14.3             | 720       | 9072             | 0.0              | 850       | 2558             | 0.0              | 980       | 2666             | 0.0              |
| 465       | 24637            | 26.0             | 595       | 126387           | 10.1             | 725       | 8130             | 0.0              | 855       | 2767             | 0.0              | 985       | 2934             | 0.0              |
| 470       | 16738            | 19.3             | 600       | 123477           | 7.0              | 730       | 7149             | 0.0              | 860       | 2826             | 0.0              | 990       | 4120             | 0.0              |
| 475       | 13456            | 16.8             | 605       | 118718           | 4.7              | 735       | 6311             | 0.0              | 865       | 2385             | 0.0              | 995       | 3858             | 0.0              |
| 480       | 13081            | 17.7             | 610       | 112091           | 3.0              | 740       | 5711             | 0.0              | 870       | 3194             | 0.0              | 1000      | 3405             | 0.0              |
| 485       | 14734            | 21.4             | 615       | 105039           | 1.9              | 745       | 5111             | 0.0              | 875       | 3189             | 0.0              |           |                  |                  |

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### Melanopic Flux vs. Wavelength



**Melanopic Lumens: 3927.2**

**M/P: 0.55**

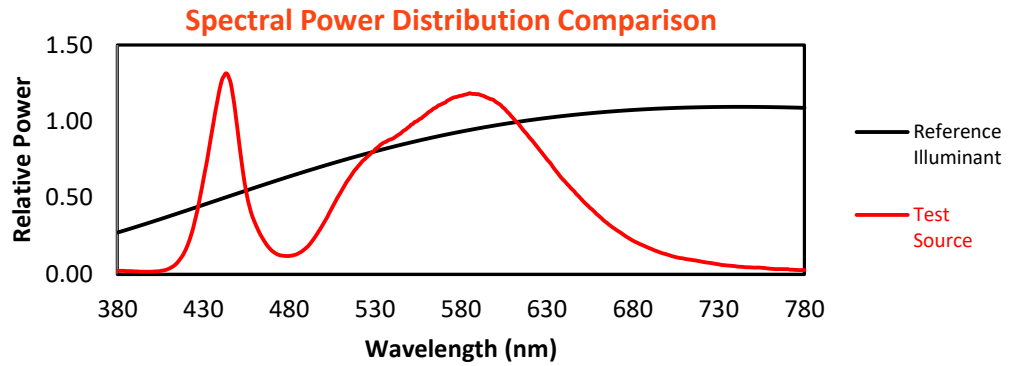
| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 2304             | 0.0              | 490       | 19043            | 15.8             | 620       | 97577            | 0.1              | 750       | 4830             | 0.0              | 880       | 3505             | 0.0              |
| 365       | 2150             | 0.0              | 495       | 26606            | 22.0             | 625       | 90158            | 0.0              | 755       | 4664             | 0.0              | 885       | 2991             | 0.0              |
| 370       | 2146             | 0.0              | 500       | 36376            | 29.2             | 630       | 82240            | 0.0              | 760       | 4006             | 0.0              | 890       | 2327             | 0.0              |
| 375       | 2332             | 0.0              | 505       | 47714            | 36.6             | 635       | 74361            | 0.0              | 765       | 3715             | 0.0              | 895       | 2775             | 0.0              |
| 380       | 2527             | 0.0              | 510       | 58741            | 42.2             | 640       | 66994            | 0.0              | 770       | 3696             | 0.0              | 900       | 2141             | 0.0              |
| 385       | 2304             | 0.0              | 515       | 68716            | 44.9             | 645       | 60405            | 0.0              | 775       | 3117             | 0.0              | 905       | 2421             | 0.0              |
| 390       | 2064             | 0.0              | 520       | 77136            | 44.9             | 650       | 53806            | 0.0              | 780       | 3062             | 0.0              | 910       | 2200             | 0.0              |
| 395       | 1856             | 0.0              | 525       | 83567            | 42.4             | 655       | 47610            | 0.0              | 785       | 2907             | 0.0              | 915       | 2716             | 0.0              |
| 400       | 1856             | 0.0              | 530       | 89283            | 38.6             | 660       | 42018            | 0.0              | 790       | 2655             | 0.0              | 920       | 2656             | 0.0              |
| 405       | 2374             | 0.0              | 535       | 94097            | 33.9             | 665       | 36742            | 0.0              | 795       | 2467             | 0.0              | 925       | 2671             | 0.0              |
| 410       | 4084             | 0.2              | 540       | 96845            | 28.3             | 670       | 32105            | 0.0              | 800       | 2609             | 0.0              | 930       | 3292             | 0.0              |
| 415       | 8543             | 0.6              | 545       | 100829           | 23.4             | 675       | 27946            | 0.0              | 805       | 2293             | 0.0              | 935       | 3188             | 0.0              |
| 420       | 18394            | 2.1              | 550       | 105648           | 19.0             | 680       | 24146            | 0.0              | 810       | 2188             | 0.0              | 940       | 1997             | 0.0              |
| 425       | 37987            | 5.9              | 555       | 110017           | 14.8             | 685       | 21191            | 0.0              | 815       | 2386             | 0.0              | 945       | 2623             | 0.0              |
| 430       | 67605            | 14.3             | 560       | 114586           | 11.3             | 690       | 18544            | 0.0              | 820       | 2712             | 0.0              | 950       | 2969             | 0.0              |
| 435       | 102160           | 27.3             | 565       | 118987           | 8.4              | 695       | 16058            | 0.0              | 825       | 2473             | 0.0              | 955       | 2277             | 0.0              |
| 440       | 135103           | 45.1             | 570       | 122326           | 6.0              | 700       | 14133            | 0.0              | 830       | 1969             | 0.0              | 960       | 4267             | 0.0              |
| 445       | 140126           | 55.3             | 575       | 125968           | 4.2              | 705       | 12309            | 0.0              | 835       | 1917             | 0.0              | 965       | 2034             | 0.0              |
| 450       | 102339           | 47.2             | 580       | 127613           | 2.9              | 710       | 11142            | 0.0              | 840       | 2248             | 0.0              | 970       | 3586             | 0.0              |
| 455       | 58751            | 30.8             | 585       | 129466           | 1.9              | 715       | 10143            | 0.0              | 845       | 2266             | 0.0              | 975       | 2505             | 0.0              |
| 460       | 36892            | 21.7             | 590       | 128813           | 1.3              | 720       | 9072             | 0.0              | 850       | 2558             | 0.0              | 980       | 2666             | 0.0              |
| 465       | 24637            | 16.1             | 595       | 126387           | 0.8              | 725       | 8130             | 0.0              | 855       | 2767             | 0.0              | 985       | 2934             | 0.0              |
| 470       | 16738            | 12.0             | 600       | 123477           | 0.5              | 730       | 7149             | 0.0              | 860       | 2826             | 0.0              | 990       | 4120             | 0.0              |
| 475       | 13456            | 10.3             | 605       | 118718           | 0.3              | 735       | 6311             | 0.0              | 865       | 2385             | 0.0              | 995       | 3858             | 0.0              |
| 480       | 13081            | 10.5             | 610       | 112091           | 0.2              | 740       | 5711             | 0.0              | 870       | 3194             | 0.0              | 1000      | 3405             | 0.0              |
| 485       | 14734            | 12.1             | 615       | 105039           | 0.1              | 745       | 5111             | 0.0              | 875       | 3189             | 0.0              |           |                  |                  |

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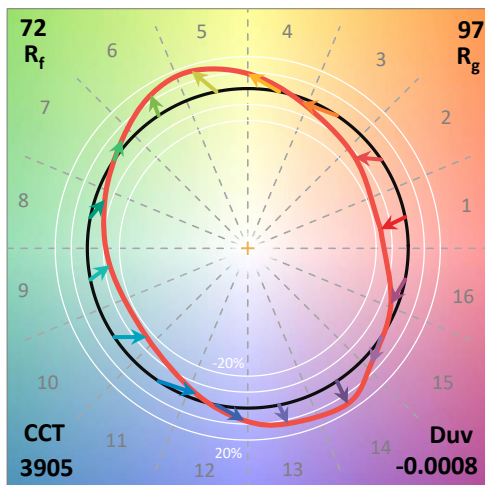
TM-30-18

### Summary

$R_f = 71.7$   
 $R_g = 96.9$   
 CIE  $R_a = 71.2$   
 $R_g = -29.7$



### Color Vector Graphics



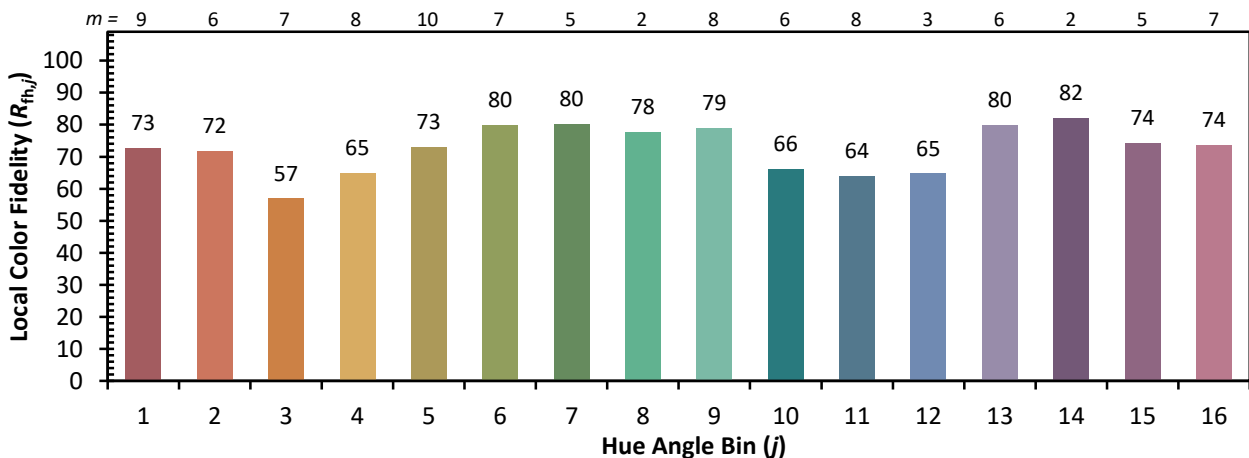
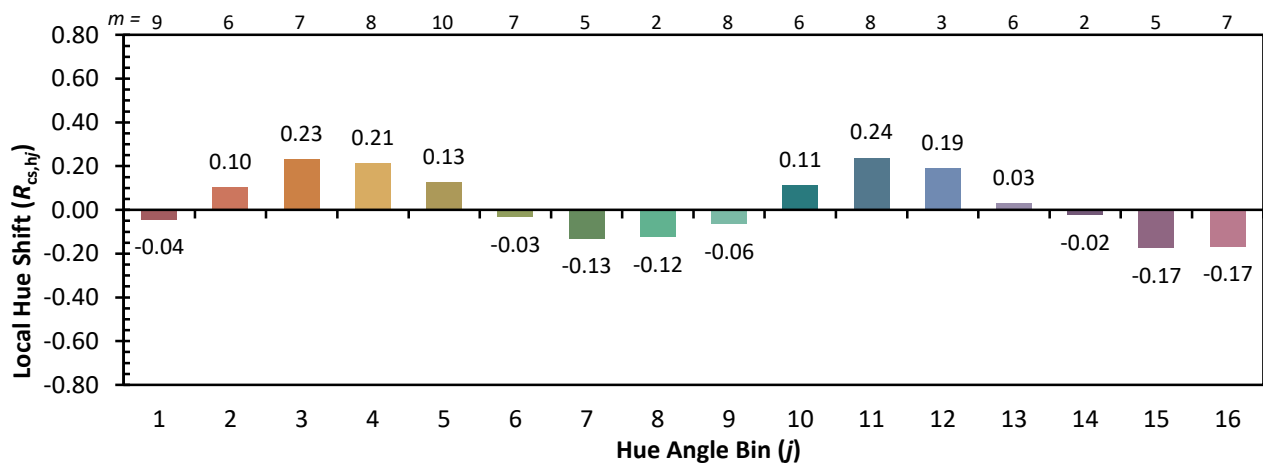
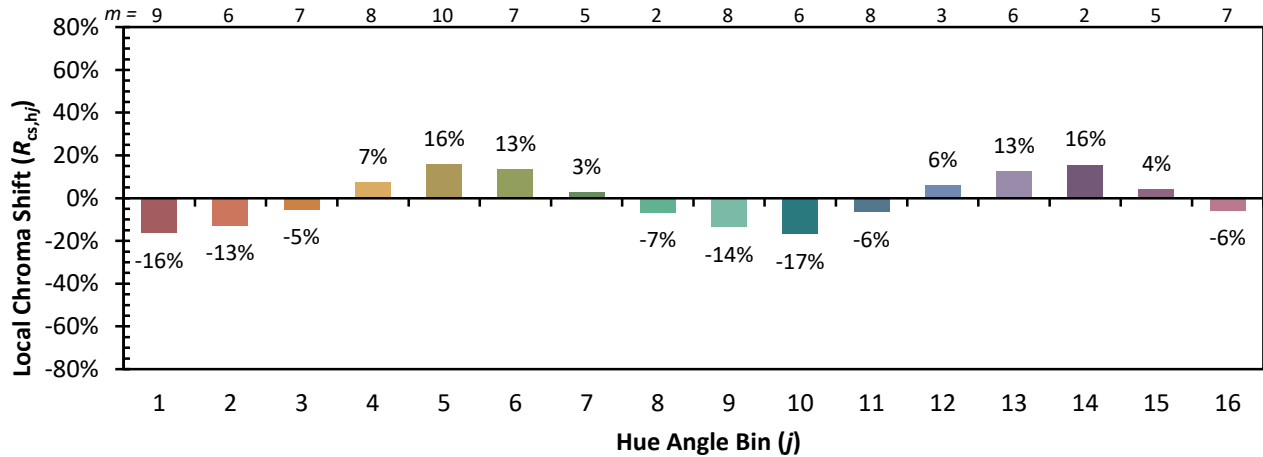


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 55 | CES51 = 86 | CES76 = 45 |
| CES02 = 61 | CES27 = 80 | CES52 = 87 | CES77 = 68 |
| CES03 = 30 | CES28 = 79 | CES53 = 74 | CES78 = 49 |
| CES04 = 70 | CES29 = 51 | CES54 = 81 | CES79 = 77 |
| CES05 = 47 | CES30 = 60 | CES55 = 80 | CES80 = 75 |
| CES06 = 50 | CES31 = 56 | CES56 = 69 | CES81 = 75 |
| CES07 = 40 | CES32 = 52 | CES57 = 67 | CES82 = 90 |
| CES08 = 39 | CES33 = 62 | CES58 = 69 | CES83 = 85 |
| CES09 = 29 | CES34 = 65 | CES59 = 86 | CES84 = 87 |
| CES10 = 74 | CES35 = 81 | CES60 = 91 | CES85 = 83 |
| CES11 = 57 | CES36 = 92 | CES61 = 85 | CES86 = 72 |
| CES12 = 63 | CES37 = 74 | CES62 = 81 | CES87 = 77 |
| CES13 = 42 | CES38 = 69 | CES63 = 72 | CES88 = 77 |
| CES14 = 74 | CES39 = 92 | CES64 = 69 | CES89 = 72 |
| CES15 = 71 | CES40 = 86 | CES65 = 64 | CES90 = 75 |
| CES16 = 46 | CES41 = 84 | CES66 = 63 | CES91 = 91 |
| CES17 = 49 | CES42 = 75 | CES67 = 60 | CES92 = 66 |
| CES18 = 56 | CES43 = 70 | CES68 = 67 | CES93 = 80 |
| CES19 = 72 | CES44 = 98 | CES69 = 77 | CES94 = 56 |
| CES20 = 65 | CES45 = 80 | CES70 = 57 | CES95 = 72 |
| CES21 = 86 | CES46 = 77 | CES71 = 53 | CES96 = 78 |
| CES22 = 78 | CES47 = 74 | CES72 = 84 | CES97 = 83 |
| CES23 = 92 | CES48 = 66 | CES73 = 47 | CES98 = 73 |
| CES24 = 91 | CES49 = 76 | CES74 = 96 | CES99 = 63 |
| CES25 = 72 | CES50 = 85 | CES75 = 52 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)