

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: P321681

Luminaire Tested: **GLEON-SA7B-760-U-T3R-HSS**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P321681  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-11)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA7B-760-U-T3R-HSS  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(7) 70 CRI, 5700K, 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: 31087 lumens  
Efficiency: N/A  
Efficacy: 105.4 lumens/watt  
Luminous Opening: Rectangular (W 2' x L: 1' x H: 0')  
IES Classification: Type III - Medium  
BUG Rating: B3 - U0 - G5

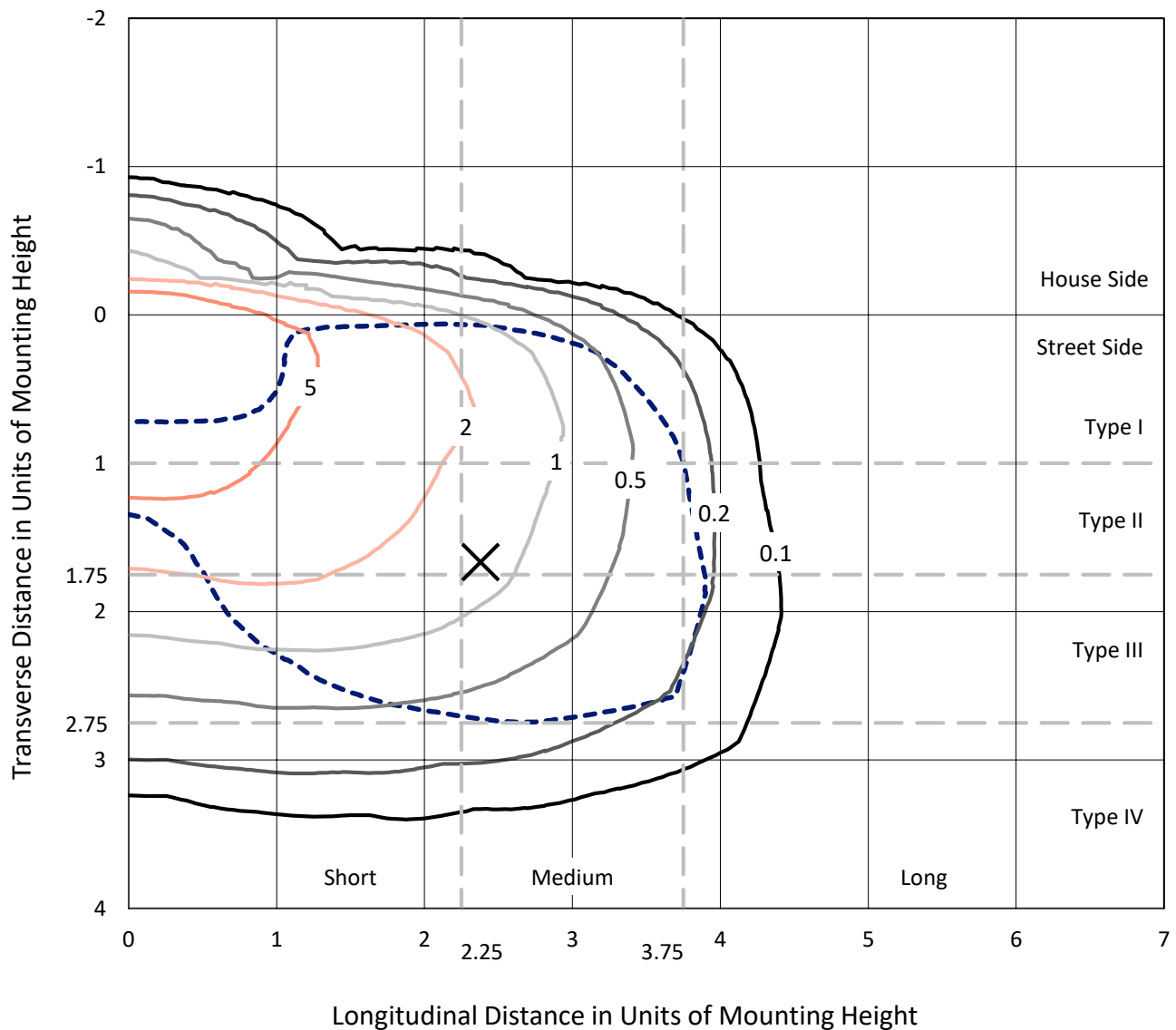
Input Watts (W): 295  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



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## Iso-Footcandle Lines of Horizontal Illumination

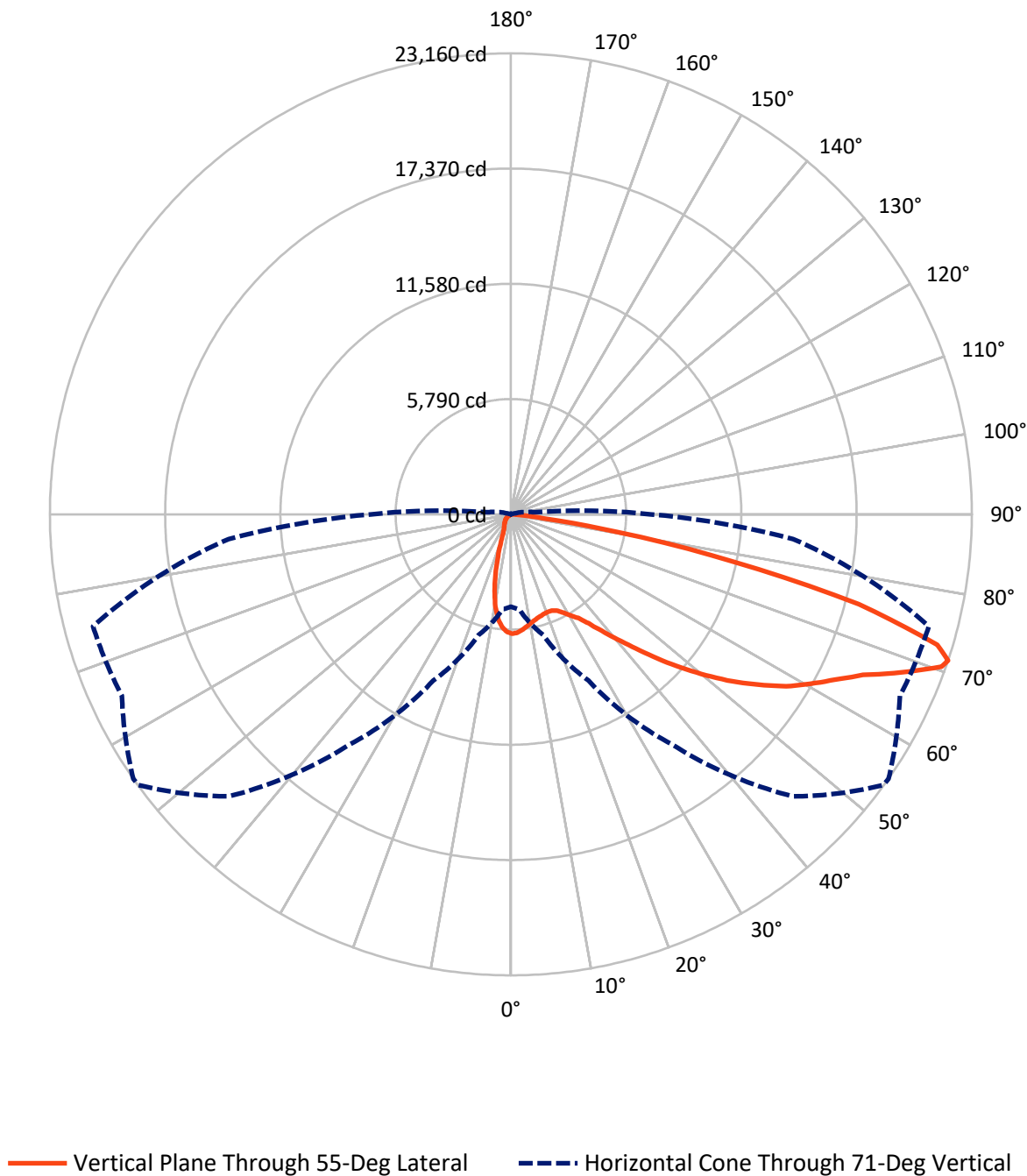
× Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 9.8 fc  
 Type III - Medium - N/A

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## Luminous Intensity Polar Plot



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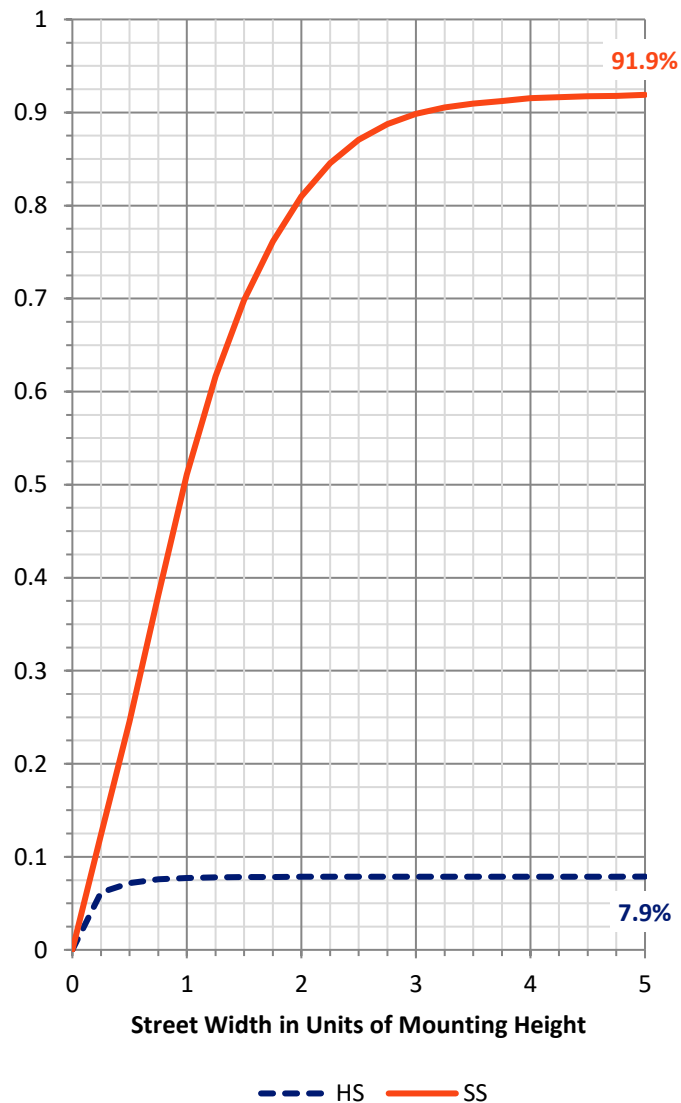
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 2461.2   | 0.0    | 2461.2  |
|                    | % Fixture | 7.9      | 0.0    | 7.9     |
| <b>Street Side</b> | Lumens    | 28625.8  | 0.0    | 28625.8 |
|                    | % Fixture | 92.1     | 0.0    | 92.1    |
| <b>Total</b>       | Lumens    | 31087.0  | 0.0    | 31087.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 511.2   | 1.6       |
| 10°-20°   | 1154.0  | 3.7       |
| 20°-30°   | 1854.5  | 6.0       |
| 30°-40°   | 3151.0  | 10.1      |
| 40°-50°   | 4890.7  | 15.7      |
| 50°-60°   | 6575.4  | 21.2      |
| 60°-70°   | 8043.9  | 25.9      |
| 70°-80°   | 4703.1  | 15.1      |
| 80°-90°   | 203.3   | 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°    | 31087.0 | 100.0     |
| 0°-180°   | 31087.0 | 100.0     |

**Coefficient of Utilization**



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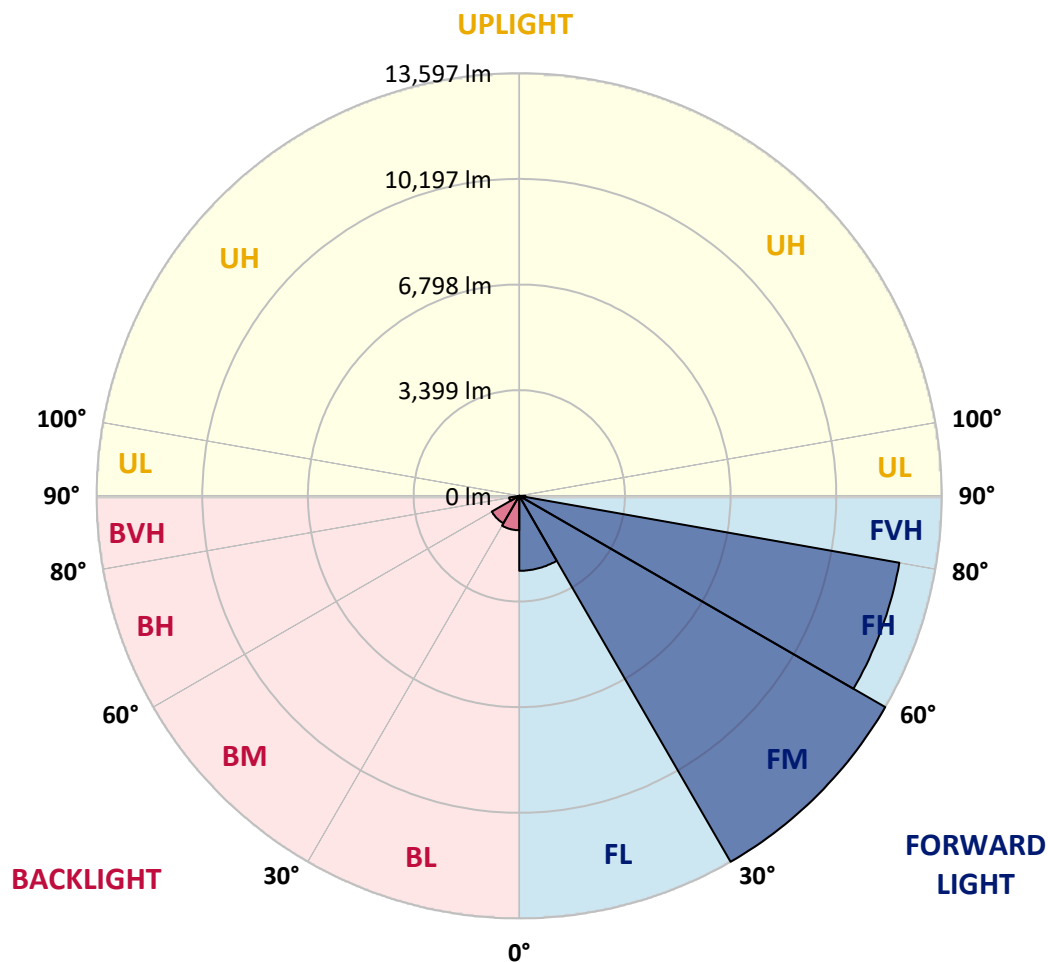
CATALOG NUMBER: GLEON-SA7B-760-U-T3R-HSS

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |        |
|------|-------------|---------|-----------|-------------------------|------|--------|
|      |             |         |           | B                       | U    | G      |
| FL   | (0°-30°)    | 2411.9  | 7.8       |                         |      |        |
| FM   | (30°-60°)   | 13596.6 | 43.7      |                         |      |        |
| FH   | (60°-80°)   | 12417.2 | 39.9      |                         |      | G5     |
| FVH  | (80°-90°)   | 200.1   | 0.6       |                         |      | G2/225 |
| BL   | (0°-30°)    | 1107.8  | 3.6       | B3/2500                 |      |        |
| BM   | (30°-60°)   | 1020.5  | 3.3       | B2/2500                 |      |        |
| BH   | (60°-80°)   | 329.8   | 1.1       | B1/500                  |      | G1/500 |
| BVH  | (80°-90°)   | 3.2     | 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°    | 5995.2  | 5995.2  | 5995.2  | 5995.2  | 5995.2  | 5995.2  | 5995.2  | 5995.2  | 5995.2  | 5995.2  | 5995.2  |
| 2.5°  | 5819.4  | 5826.3  | 5851.5  | 5862.6  | 5889.2  | 5933.8  | 5956.2  | 5957.6  | 5993.8  | 6007.8  | 6019.0  |
| 5°    | 5407.6  | 5449.5  | 5491.3  | 5536.0  | 5617.0  | 5724.4  | 5830.5  | 5840.3  | 5957.6  | 6044.1  | 6090.2  |
| 7.5°  | 5053.0  | 5090.7  | 5141.0  | 5212.2  | 5326.6  | 5495.5  | 5672.8  | 5693.7  | 5915.7  | 6112.5  | 6215.8  |
| 10°   | 4688.7  | 4719.4  | 4792.0  | 4896.7  | 5054.4  | 5280.6  | 5519.2  | 5554.1  | 5878.0  | 6204.6  | 6386.1  |
| 12.5° | 4299.3  | 4317.4  | 4405.3  | 4556.1  | 4787.8  | 5075.4  | 5389.4  | 5435.5  | 5854.3  | 6310.7  | 6587.1  |
| 15°   | 4003.3  | 4011.7  | 4095.5  | 4251.8  | 4517.0  | 4891.1  | 5288.9  | 5344.8  | 5859.8  | 6437.7  | 6806.2  |
| 17.5° | 3928.0  | 3932.2  | 3976.8  | 4084.3  | 4318.8  | 4726.4  | 5209.4  | 5277.8  | 5876.6  | 6562.0  | 7026.8  |
| 20°   | 4233.7  | 4204.3  | 4158.3  | 4141.5  | 4242.0  | 4627.3  | 5161.9  | 5238.7  | 5898.9  | 6672.2  | 7225.0  |
| 22.5° | 5072.6  | 4986.0  | 4794.8  | 4539.4  | 4384.4  | 4634.3  | 5174.5  | 5251.2  | 5970.1  | 6807.6  | 7453.9  |
| 25°   | 6317.7  | 6197.6  | 5872.4  | 5369.9  | 4886.9  | 4835.3  | 5279.2  | 5357.3  | 6108.3  | 6969.6  | 7673.1  |
| 27.5° | 7734.5  | 7615.8  | 7218.0  | 6500.5  | 5677.0  | 5233.1  | 5519.2  | 5591.8  | 6313.5  | 7113.3  | 7840.6  |
| 30°   | 9091.3  | 9057.8  | 8588.8  | 7773.6  | 6670.8  | 5878.0  | 5829.1  | 5890.5  | 6465.6  | 7199.9  | 7973.2  |
| 32.5° | 10241.5 | 10188.4 | 9811.5  | 9018.7  | 7808.5  | 6652.7  | 6193.5  | 6211.6  | 6580.1  | 7311.5  | 8146.3  |
| 35°   | 11307.9 | 11242.3 | 10911.5 | 10161.9 | 8975.4  | 7599.1  | 6754.6  | 6728.1  | 6830.0  | 7536.3  | 8397.5  |
| 37.5° | 12238.9 | 12299.0 | 11931.9 | 11218.6 | 10022.3 | 8583.2  | 7511.1  | 7431.6  | 7220.8  | 7902.0  | 8761.8  |
| 40°   | 13017.8 | 13017.8 | 12826.6 | 12232.0 | 11153.0 | 9600.8  | 8366.8  | 8262.1  | 7808.5  | 8465.9  | 9223.9  |
| 42.5° | 13298.4 | 13358.4 | 13429.6 | 13093.2 | 12165.0 | 10658.8 | 9320.2  | 9211.3  | 8636.2  | 9265.8  | 9807.3  |
| 45°   | 13315.2 | 13410.1 | 13774.4 | 13773.0 | 13079.3 | 11709.9 | 10395.0 | 10343.4 | 9697.1  | 10293.1 | 10530.4 |
| 47.5° | 13079.3 | 13197.9 | 13798.1 | 14138.7 | 13803.7 | 12688.4 | 11570.3 | 11506.1 | 10943.6 | 11552.2 | 11287.0 |
| 50°   | 12714.9 | 12846.1 | 13544.1 | 14282.5 | 14296.4 | 13539.9 | 12808.5 | 12712.1 | 12315.7 | 12991.3 | 12068.6 |
| 52.5° | 12063.1 | 12317.1 | 13316.6 | 14316.0 | 14620.3 | 14275.5 | 13986.6 | 13944.7 | 13851.2 | 14377.4 | 12691.2 |
| 55°   | 10668.6 | 10950.6 | 12745.6 | 14327.2 | 14920.4 | 14927.4 | 15090.7 | 15101.9 | 15290.3 | 15672.8 | 13154.6 |
| 57.5° | 10009.7 | 10168.9 | 11749.0 | 14380.2 | 15365.7 | 15667.2 | 16215.8 | 16302.3 | 16594.0 | 16902.5 | 13683.7 |
| 60°   | 9595.2  | 9783.6  | 11257.6 | 14307.6 | 16065.0 | 16637.3 | 17258.5 | 17287.8 | 17600.5 | 18171.4 | 14399.7 |
| 62.5° | 9264.4  | 9450.0  | 10947.8 | 14028.4 | 16850.9 | 17804.3 | 18277.5 | 18280.2 | 18514.8 | 19683.1 | 15213.5 |
| 65°   | 8447.8  | 8604.1  | 10321.0 | 13714.4 | 17370.1 | 18958.6 | 19461.1 | 19443.0 | 19634.2 | 21277.2 | 16158.5 |
| 67.5° | 7266.9  | 7386.9  | 9041.0  | 12523.7 | 17174.7 | 20008.3 | 21247.9 | 21187.8 | 20956.1 | 22654.9 | 16529.8 |
| 70°   | 5618.4  | 5661.6  | 7125.9  | 10436.9 | 15343.3 | 20411.7 | 22974.5 | 22943.8 | 21767.1 | 22407.8 | 15168.9 |
| 71°   | 4644.0  | 4786.4  | 6280.0  | 9211.3  | 14116.4 | 20039.0 | 23142.0 | 23160.2 | 21563.3 | 21735.0 | 14232.2 |
| 72.5° | 2696.8  | 2818.3  | 4551.9  | 7074.2  | 11984.9 | 18484.0 | 22273.8 | 22405.0 | 20611.3 | 19769.6 | 12156.6 |
| 75°   | 577.9   | 618.4   | 1687.6  | 3424.1  | 6592.7  | 12955.0 | 17580.9 | 18048.5 | 16799.2 | 13449.2 | 7326.9  |
| 77.5° | 402.0   | 434.1   | 723.1   | 1553.6  | 2178.9  | 6401.4  | 10921.2 | 11448.9 | 10036.3 | 5054.4  | 2345.1  |
| 80°   | 318.3   | 354.5   | 563.9   | 767.7   | 589.1   | 2064.5  | 5115.8  | 5438.3  | 3347.3  | 1127.9  | 395.0   |
| 82.5° | 177.3   | 210.8   | 439.7   | 414.6   | 226.1   | 392.2   | 1432.2  | 1619.2  | 670.0   | 227.5   | 93.5    |
| 85°   | 51.6    | 62.8    | 283.4   | 301.5   | 96.3    | 75.4    | 244.3   | 302.9   | 127.0   | 60.0    | 41.9    |
| 87.5° | 0.0     | 0.0     | 136.8   | 115.9   | 27.9    | 11.2    | 22.3    | 25.1    | 25.1    | 25.1    | 27.9    |
| 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-SA7B-760-U-T3R-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 5995.2 | 5995.2 | 5995.2 | 5995.2 | 5995.2 | 5995.2 | 5995.2 | 5995.2 | 5995.2 | 5995.2 | 5995.2 |
| 2.5°  | 6019.0 | 6028.7 | 5993.8 | 5947.8 | 5898.9 | 5838.9 | 5776.1 | 5727.2 | 5725.8 | 5702.1 | 5678.4 |
| 5°    | 6093.0 | 6087.4 | 5991.1 | 5844.5 | 5671.4 | 5491.3 | 5319.6 | 5125.6 | 5061.4 | 4981.8 | 4955.3 |
| 7.5°  | 6229.7 | 6190.7 | 5986.9 | 5665.8 | 5286.1 | 4909.3 | 4519.8 | 4127.6 | 3960.1 | 3809.3 | 3782.8 |
| 10°   | 6401.4 | 6327.5 | 5960.3 | 5397.8 | 4701.3 | 4006.1 | 3418.5 | 2885.3 | 2650.7 | 2470.7 | 2462.3 |
| 12.5° | 6580.1 | 6467.0 | 5886.4 | 4993.0 | 3934.9 | 2957.8 | 2280.8 | 1756.0 | 1560.6 | 1434.9 | 1446.1 |
| 15°   | 6767.2 | 6598.3 | 5727.2 | 4447.2 | 3062.5 | 2007.3 | 1401.4 | 1093.0 | 1014.8 | 982.7  | 991.1  |
| 17.5° | 6958.4 | 6689.0 | 5505.3 | 3789.8 | 2201.3 | 1295.4 | 970.1  | 883.6  | 883.6  | 890.6  | 893.4  |
| 20°   | 7124.5 | 6737.8 | 5178.7 | 3052.8 | 1492.2 | 943.6  | 848.7  | 836.1  | 843.1  | 854.3  | 855.7  |
| 22.5° | 7289.2 | 6740.6 | 4752.9 | 2306.0 | 1044.1 | 826.4  | 808.2  | 802.6  | 806.8  | 819.4  | 820.8  |
| 25°   | 7423.2 | 6707.1 | 4219.7 | 1640.1 | 833.3  | 778.9  | 770.5  | 767.7  | 770.5  | 785.9  | 785.9  |
| 27.5° | 7477.6 | 6585.7 | 3569.2 | 1153.0 | 746.8  | 725.8  | 723.1  | 725.8  | 730.0  | 741.2  | 742.6  |
| 30°   | 7483.2 | 6373.5 | 2860.1 | 834.7  | 677.0  | 654.7  | 660.2  | 670.0  | 665.8  | 663.0  | 665.8  |
| 32.5° | 7497.2 | 6127.8 | 2169.2 | 686.8  | 618.4  | 583.5  | 576.5  | 576.5  | 559.7  | 550.0  | 544.4  |
| 35°   | 7543.3 | 5838.9 | 1573.1 | 617.0  | 558.3  | 517.9  | 491.3  | 460.6  | 428.5  | 411.8  | 407.6  |
| 37.5° | 7615.8 | 5536.0 | 1126.5 | 570.9  | 505.3  | 459.2  | 409.0  | 354.5  | 308.5  | 295.9  | 295.9  |
| 40°   | 7748.4 | 5223.3 | 833.3  | 534.6  | 463.4  | 406.2  | 330.8  | 259.6  | 217.8  | 210.8  | 210.8  |
| 42.5° | 7957.8 | 4893.9 | 664.4  | 502.5  | 427.1  | 351.8  | 252.7  | 188.4  | 157.7  | 153.5  | 152.1  |
| 45°   | 8175.6 | 4531.0 | 580.7  | 471.8  | 388.1  | 288.9  | 187.0  | 139.6  | 121.4  | 117.3  | 117.3  |
| 47.5° | 8393.3 | 4144.3 | 540.2  | 442.5  | 350.4  | 224.7  | 139.6  | 110.3  | 101.9  | 101.9  | 103.3  |
| 50°   | 8577.6 | 3740.9 | 510.9  | 410.4  | 301.5  | 170.3  | 110.3  | 93.5   | 90.7   | 96.3   | 97.7   |
| 52.5° | 8623.7 | 3344.5 | 474.6  | 369.9  | 241.5  | 129.8  | 90.7   | 82.4   | 82.4   | 82.4   | 82.4   |
| 55°   | 8595.7 | 3037.4 | 427.1  | 319.7  | 178.7  | 103.3  | 78.2   | 72.6   | 71.2   | 71.2   | 71.2   |
| 57.5° | 8690.7 | 2855.9 | 342.0  | 248.5  | 128.4  | 83.8   | 68.4   | 64.2   | 61.4   | 60.0   | 60.0   |
| 60°   | 8881.9 | 2737.3 | 244.3  | 178.7  | 96.3   | 69.8   | 58.6   | 54.4   | 50.3   | 47.5   | 47.5   |
| 62.5° | 9135.9 | 2634.0 | 181.5  | 132.6  | 74.0   | 55.8   | 48.9   | 44.7   | 39.1   | 36.3   | 36.3   |
| 65°   | 9331.4 | 2449.7 | 138.2  | 99.1   | 55.8   | 44.7   | 37.7   | 36.3   | 27.9   | 25.1   | 23.7   |
| 67.5° | 9032.6 | 2044.9 | 111.7  | 72.6   | 41.9   | 34.9   | 29.3   | 27.9   | 16.8   | 14.0   | 14.0   |
| 70°   | 7747.0 | 1423.8 | 89.3   | 53.0   | 30.7   | 27.9   | 23.7   | 18.1   | 12.6   | 11.2   | 11.2   |
| 71°   | 7025.4 | 1189.3 | 81.0   | 44.7   | 26.5   | 26.5   | 22.3   | 15.4   | 11.2   | 9.8    | 9.8    |
| 72.5° | 5836.1 | 844.5  | 68.4   | 34.9   | 23.7   | 27.9   | 23.7   | 14.0   | 11.2   | 9.8    | 8.4    |
| 75°   | 3387.8 | 353.2  | 47.5   | 23.7   | 18.1   | 33.5   | 30.7   | 12.6   | 8.4    | 7.0    | 7.0    |
| 77.5° | 1019.0 | 129.8  | 26.5   | 15.4   | 14.0   | 29.3   | 34.9   | 11.2   | 4.2    | 1.4    | 1.4    |
| 80°   | 185.7  | 55.8   | 16.8   | 9.8    | 9.8    | 18.1   | 26.5   | 5.6    | 0.0    | 0.0    | 0.0    |
| 82.5° | 65.6   | 27.9   | 9.8    | 5.6    | 4.2    | 8.4    | 12.6   | 0.0    | 0.0    | 0.0    | 0.0    |
| 85°   | 37.7   | 19.5   | 5.6    | 2.8    | 0.0    | 1.4    | 2.8    | 0.0    | 0.0    | 0.0    | 0.0    |
| 87.5° | 25.1   | 5.6    | 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-79-2008: Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Report Prepared for

Cooper Lighting Solutions

McGRAW-EDISON

Report Number: SP1-1908-441-9-R4

Test Date: 10/23/2019

Luminaire Tested: SA1C-760-U-5WQ

Data in this report applies to families of products SA1C-760-U-5WQ .

### Test Information

Test Method: LM-79-2008  
 Report Number: SP1-1908-441-9-R4  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry:  $4\pi$   
 Issue Date: 10/28/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: MCGRAW-EDISON  
 Catalog Number: **SA1C-760-U-5WQ**  
 Description: MCGRAW EDISON ROADWAY AND AREA LUMINAIRE

\*\*\*THIS IS A REVISION OF SP1-1908-441-4-R3. TO UPDATE THE CATALOG INFORMATION.\*\*\*TESTED IN SITU. ROADWAY AND AREA LUMINAIRE. (1) 70 CRI, 5000K, 1050MA LIGHTSQUARE WITH 16 LEDS AND TYPE V WIDE OPTICS.

### Spectral Parameters

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 5474   | CRI (Ra): | 71.7 |      |       |
| CIE u':                   | 0.2052 | R1:       | 70.6 | R9:  | -27.1 |
| CIE v':                   | 0.4804 | R2:       | 74.6 | R10: | 40.8  |
| Duv:                      | 0.0025 | R3:       | 78.3 | R11: | 74.6  |
| CIE x:                    | 0.3330 | R4:       | 73.8 | R12: | 50.4  |
| CIE y:                    | 0.3466 | R5:       | 72.4 | R13: | 70.0  |
| CIE z:                    | 0.3204 | R6:       | 67.5 | R14: | 87.8  |
| Peak Wavelength (nm):     | 442    | R7:       | 77.5 |      |       |
| Dominant Wavelength (nm): | 554    | R8:       | 58.9 |      |       |
| Purity:                   | 4.1    |           |      |      |       |
| Rf:                       | 72.1   |           |      |      |       |
| Rg:                       | 97.2   |           |      |      |       |



### Test Conditions

Stabilization Time: 240M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.6/31%  
 Sphere Temperature (°C): 25.9

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| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 6/28/2019        | 12/28/2019           |
| Power Meter                    | IN0071                | 12/5/2018        | 12/5/2019            |
| AC Power Source                | IN0063                | 12/5/2018        | 12/5/2019            |
| DC Power Source                | IN0208                | 12/5/2018        | 12/5/2019            |
| Sphere Thermometer             | IN0085                | 12/5/2018        | 12/5/2019            |
| Room Thermometer               | IN0046                | 12/5/2018        | 12/5/2019            |

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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 5700K 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       | 3540             | NR               | 490       | 33363            | NR               | 620       | 80193            | NR               | 750       | 4663             | NR               | 880       | 4678             | NR               |
| 365       | 2862             | NR               | 495       | 44177            | NR               | 625       | 73091            | NR               | 755       | 4147             | NR               | 885       | 4128             | NR               |
| 370       | 2865             | NR               | 500       | 57019            | NR               | 630       | 66269            | NR               | 760       | 4040             | NR               | 890       | 4504             | NR               |
| 375       | 3254             | NR               | 505       | 70030            | NR               | 635       | 60012            | NR               | 765       | 3474             | NR               | 895       | 4371             | NR               |
| 380       | 3076             | NR               | 510       | 81972            | NR               | 640       | 53914            | NR               | 770       | 3469             | NR               | 900       | 4082             | NR               |
| 385       | 2904             | NR               | 515       | 92590            | NR               | 645       | 48385            | NR               | 775       | 3181             | NR               | 905       | 2982             | NR               |
| 390       | 2689             | NR               | 520       | 100305           | NR               | 650       | 43219            | NR               | 780       | 2969             | NR               | 910       | 4351             | NR               |
| 395       | 2619             | NR               | 525       | 107452           | NR               | 655       | 38562            | NR               | 785       | 3132             | NR               | 915       | 3365             | NR               |
| 400       | 2679             | NR               | 530       | 111373           | NR               | 660       | 34110            | NR               | 790       | 2507             | NR               | 920       | 3430             | NR               |
| 405       | 3515             | NR               | 535       | 114505           | NR               | 665       | 30085            | NR               | 795       | 2968             | NR               | 925       | 4264             | NR               |
| 410       | 6934             | NR               | 540       | 116408           | NR               | 670       | 26205            | NR               | 800       | 2758             | NR               | 930       | 4095             | NR               |
| 415       | 14943            | NR               | 545       | 118700           | NR               | 675       | 22906            | NR               | 805       | 2872             | NR               | 935       | 5048             | NR               |
| 420       | 31939            | NR               | 550       | 119209           | NR               | 680       | 20058            | NR               | 810       | 3094             | NR               | 940       | 4074             | NR               |
| 425       | 64701            | NR               | 555       | 120742           | NR               | 685       | 17413            | NR               | 815       | 3222             | NR               | 945       | 4949             | NR               |
| 430       | 110939           | NR               | 560       | 121594           | NR               | 690       | 15447            | NR               | 820       | 3238             | NR               | 950       | 4387             | NR               |
| 435       | 164597           | NR               | 565       | 121913           | NR               | 695       | 13398            | NR               | 825       | 3524             | NR               | 955       | 4978             | NR               |
| 440       | 207696           | NR               | 570       | 122147           | NR               | 700       | 11777            | NR               | 830       | 2921             | NR               | 960       | 4706             | NR               |
| 445       | 201830           | NR               | 575       | 121605           | NR               | 705       | 10412            | NR               | 835       | 3595             | NR               | 965       | 5083             | NR               |
| 450       | 145410           | NR               | 580       | 120248           | NR               | 710       | 9544             | NR               | 840       | 3016             | NR               | 970       | 4522             | NR               |
| 455       | 89594            | NR               | 585       | 117717           | NR               | 715       | 8940             | NR               | 845       | 4032             | NR               | 975       | 4740             | NR               |
| 460       | 58321            | NR               | 590       | 114359           | NR               | 720       | 7897             | NR               | 850       | 3579             | NR               | 980       | 6122             | NR               |
| 465       | 39318            | NR               | 595       | 109974           | NR               | 725       | 7045             | NR               | 855       | 4571             | NR               | 985       | 6450             | NR               |
| 470       | 27693            | NR               | 600       | 105269           | NR               | 730       | 6483             | NR               | 860       | 4485             | NR               | 990       | 4875             | NR               |
| 475       | 23081            | NR               | 605       | 99453            | NR               | 735       | 5838             | NR               | 865       | 3978             | NR               | 995       | 4764             | NR               |
| 480       | 23002            | NR               | 610       | 92921            | NR               | 740       | 5261             | NR               | 870       | 4298             | NR               | 1000      | 3640             | NR               |
| 485       | 26201            | NR               | 615       | 86989            | NR               | 745       | 4760             | NR               | 875       | 4356             | NR               |           |                  |                  |

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Scotopic Flux vs. Wavelength



Scotopic Lumens: 13759.3

S/P: 1.85

| 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       | 3540             | NR               | 490       | 33363            | NR               | 620       | 80193            | NR               | 750       | 4663             | NR               | 880       | 4678             | NR               |
| 365       | 2862             | NR               | 495       | 44177            | NR               | 625       | 73091            | NR               | 755       | 4147             | NR               | 885       | 4128             | NR               |
| 370       | 2865             | NR               | 500       | 57019            | NR               | 630       | 66269            | NR               | 760       | 4040             | NR               | 890       | 4504             | NR               |
| 375       | 3254             | NR               | 505       | 70030            | NR               | 635       | 60012            | NR               | 765       | 3474             | NR               | 895       | 4371             | NR               |
| 380       | 3076             | NR               | 510       | 81972            | NR               | 640       | 53914            | NR               | 770       | 3469             | NR               | 900       | 4082             | NR               |
| 385       | 2904             | NR               | 515       | 92590            | NR               | 645       | 48385            | NR               | 775       | 3181             | NR               | 905       | 2982             | NR               |
| 390       | 2689             | NR               | 520       | 100305           | NR               | 650       | 43219            | NR               | 780       | 2969             | NR               | 910       | 4351             | NR               |
| 395       | 2619             | NR               | 525       | 107452           | NR               | 655       | 38562            | NR               | 785       | 3132             | NR               | 915       | 3365             | NR               |
| 400       | 2679             | NR               | 530       | 111373           | NR               | 660       | 34110            | NR               | 790       | 2507             | NR               | 920       | 3430             | NR               |
| 405       | 3515             | NR               | 535       | 114505           | NR               | 665       | 30085            | NR               | 795       | 2968             | NR               | 925       | 4264             | NR               |
| 410       | 6934             | NR               | 540       | 116408           | NR               | 670       | 26205            | NR               | 800       | 2758             | NR               | 930       | 4095             | NR               |
| 415       | 14943            | NR               | 545       | 118700           | NR               | 675       | 22906            | NR               | 805       | 2872             | NR               | 935       | 5048             | NR               |
| 420       | 31939            | NR               | 550       | 119209           | NR               | 680       | 20058            | NR               | 810       | 3094             | NR               | 940       | 4074             | NR               |
| 425       | 64701            | NR               | 555       | 120742           | NR               | 685       | 17413            | NR               | 815       | 3222             | NR               | 945       | 4949             | NR               |
| 430       | 110939           | NR               | 560       | 121594           | NR               | 690       | 15447            | NR               | 820       | 3238             | NR               | 950       | 4387             | NR               |
| 435       | 164597           | NR               | 565       | 121913           | NR               | 695       | 13398            | NR               | 825       | 3524             | NR               | 955       | 4978             | NR               |
| 440       | 207696           | NR               | 570       | 122147           | NR               | 700       | 11777            | NR               | 830       | 2921             | NR               | 960       | 4706             | NR               |
| 445       | 201830           | NR               | 575       | 121605           | NR               | 705       | 10412            | NR               | 835       | 3595             | NR               | 965       | 5083             | NR               |
| 450       | 145410           | NR               | 580       | 120248           | NR               | 710       | 9544             | NR               | 840       | 3016             | NR               | 970       | 4522             | NR               |
| 455       | 89594            | NR               | 585       | 117717           | NR               | 715       | 8940             | NR               | 845       | 4032             | NR               | 975       | 4740             | NR               |
| 460       | 58321            | NR               | 590       | 114359           | NR               | 720       | 7897             | NR               | 850       | 3579             | NR               | 980       | 6122             | NR               |
| 465       | 39318            | NR               | 595       | 109974           | NR               | 725       | 7045             | NR               | 855       | 4571             | NR               | 985       | 6450             | NR               |
| 470       | 27693            | NR               | 600       | 105269           | NR               | 730       | 6483             | NR               | 860       | 4485             | NR               | 990       | 4875             | NR               |
| 475       | 23081            | NR               | 605       | 99453            | NR               | 735       | 5838             | NR               | 865       | 3978             | NR               | 995       | 4764             | NR               |
| 480       | 23002            | NR               | 610       | 92921            | NR               | 740       | 5261             | NR               | 870       | 4298             | NR               | 1000      | 3640             | NR               |
| 485       | 26201            | NR               | 615       | 86989            | NR               | 745       | 4760             | NR               | 875       | 4356             | NR               |           |                  |                  |

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**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 5527.6 M/P: 0.74**

| 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       | 3540             | NR               | 490       | 33363            | NR               | 620       | 80193            | NR               | 750       | 4663             | NR               | 880       | 4678             | NR               |
| 365       | 2862             | NR               | 495       | 44177            | NR               | 625       | 73091            | NR               | 755       | 4147             | NR               | 885       | 4128             | NR               |
| 370       | 2865             | NR               | 500       | 57019            | NR               | 630       | 66269            | NR               | 760       | 4040             | NR               | 890       | 4504             | NR               |
| 375       | 3254             | NR               | 505       | 70030            | NR               | 635       | 60012            | NR               | 765       | 3474             | NR               | 895       | 4371             | NR               |
| 380       | 3076             | NR               | 510       | 81972            | NR               | 640       | 53914            | NR               | 770       | 3469             | NR               | 900       | 4082             | NR               |
| 385       | 2904             | NR               | 515       | 92590            | NR               | 645       | 48385            | NR               | 775       | 3181             | NR               | 905       | 2982             | NR               |
| 390       | 2689             | NR               | 520       | 100305           | NR               | 650       | 43219            | NR               | 780       | 2969             | NR               | 910       | 4351             | NR               |
| 395       | 2619             | NR               | 525       | 107452           | NR               | 655       | 38562            | NR               | 785       | 3132             | NR               | 915       | 3365             | NR               |
| 400       | 2679             | NR               | 530       | 111373           | NR               | 660       | 34110            | NR               | 790       | 2507             | NR               | 920       | 3430             | NR               |
| 405       | 3515             | NR               | 535       | 114505           | NR               | 665       | 30085            | NR               | 795       | 2968             | NR               | 925       | 4264             | NR               |
| 410       | 6934             | NR               | 540       | 116408           | NR               | 670       | 26205            | NR               | 800       | 2758             | NR               | 930       | 4095             | NR               |
| 415       | 14943            | NR               | 545       | 118700           | NR               | 675       | 22906            | NR               | 805       | 2872             | NR               | 935       | 5048             | NR               |
| 420       | 31939            | NR               | 550       | 119209           | NR               | 680       | 20058            | NR               | 810       | 3094             | NR               | 940       | 4074             | NR               |
| 425       | 64701            | NR               | 555       | 120742           | NR               | 685       | 17413            | NR               | 815       | 3222             | NR               | 945       | 4949             | NR               |
| 430       | 110939           | NR               | 560       | 121594           | NR               | 690       | 15447            | NR               | 820       | 3238             | NR               | 950       | 4387             | NR               |
| 435       | 164597           | NR               | 565       | 121913           | NR               | 695       | 13398            | NR               | 825       | 3524             | NR               | 955       | 4978             | NR               |
| 440       | 207696           | NR               | 570       | 122147           | NR               | 700       | 11777            | NR               | 830       | 2921             | NR               | 960       | 4706             | NR               |
| 445       | 201830           | NR               | 575       | 121605           | NR               | 705       | 10412            | NR               | 835       | 3595             | NR               | 965       | 5083             | NR               |
| 450       | 145410           | NR               | 580       | 120248           | NR               | 710       | 9544             | NR               | 840       | 3016             | NR               | 970       | 4522             | NR               |
| 455       | 89594            | NR               | 585       | 117717           | NR               | 715       | 8940             | NR               | 845       | 4032             | NR               | 975       | 4740             | NR               |
| 460       | 58321            | NR               | 590       | 114359           | NR               | 720       | 7897             | NR               | 850       | 3579             | NR               | 980       | 6122             | NR               |
| 465       | 39318            | NR               | 595       | 109974           | NR               | 725       | 7045             | NR               | 855       | 4571             | NR               | 985       | 6450             | NR               |
| 470       | 27693            | NR               | 600       | 105269           | NR               | 730       | 6483             | NR               | 860       | 4485             | NR               | 990       | 4875             | NR               |
| 475       | 23081            | NR               | 605       | 99453            | NR               | 735       | 5838             | NR               | 865       | 3978             | NR               | 995       | 4764             | NR               |
| 480       | 23002            | NR               | 610       | 92921            | NR               | 740       | 5261             | NR               | 870       | 4298             | NR               | 1000      | 3640             | NR               |
| 485       | 26201            | NR               | 615       | 86989            | NR               | 745       | 4760             | NR               | 875       | 4356             | NR               |           |                  |                  |

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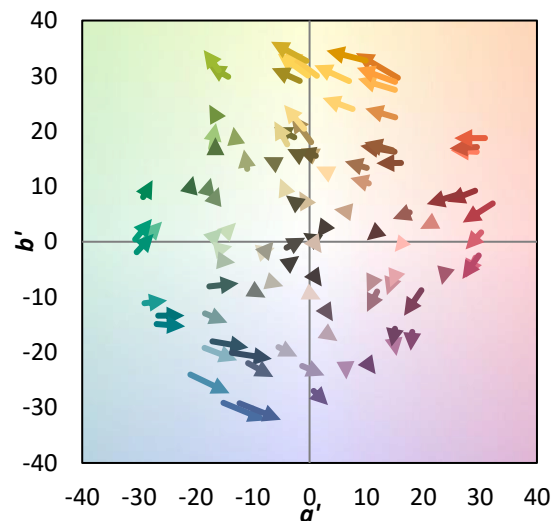
**TM-30-18**

### Summary

$R_f = 72.1$   
 $R_g = 97.2$   
 CIE  $R_a = 71.7$   
 $R_g = -27.1$



### Color Vector Graphics





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

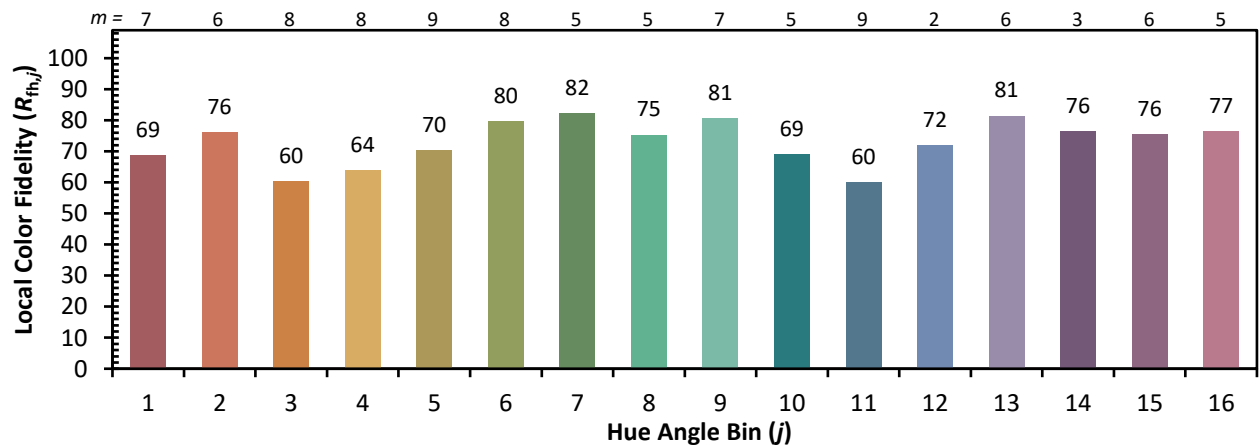
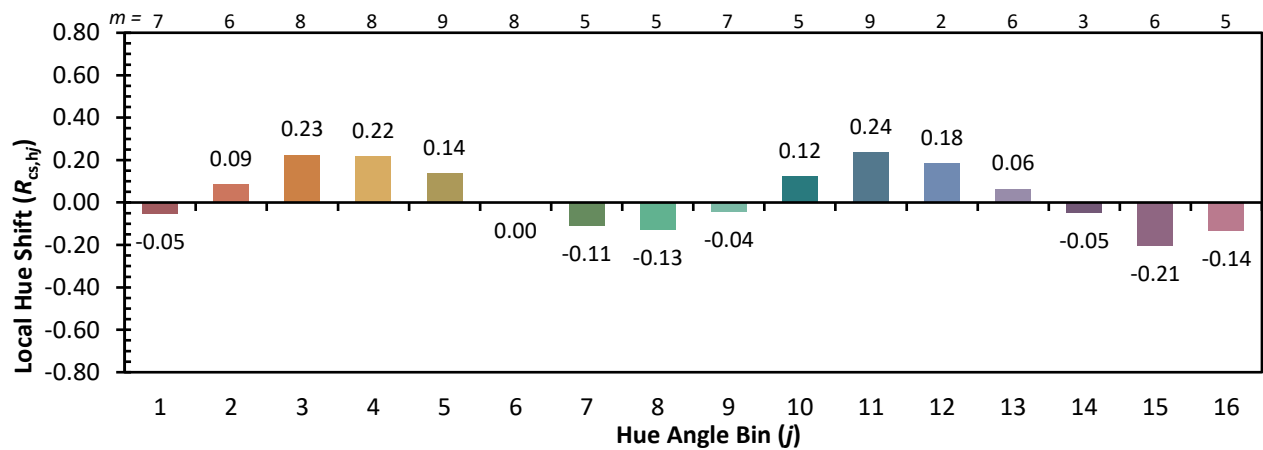
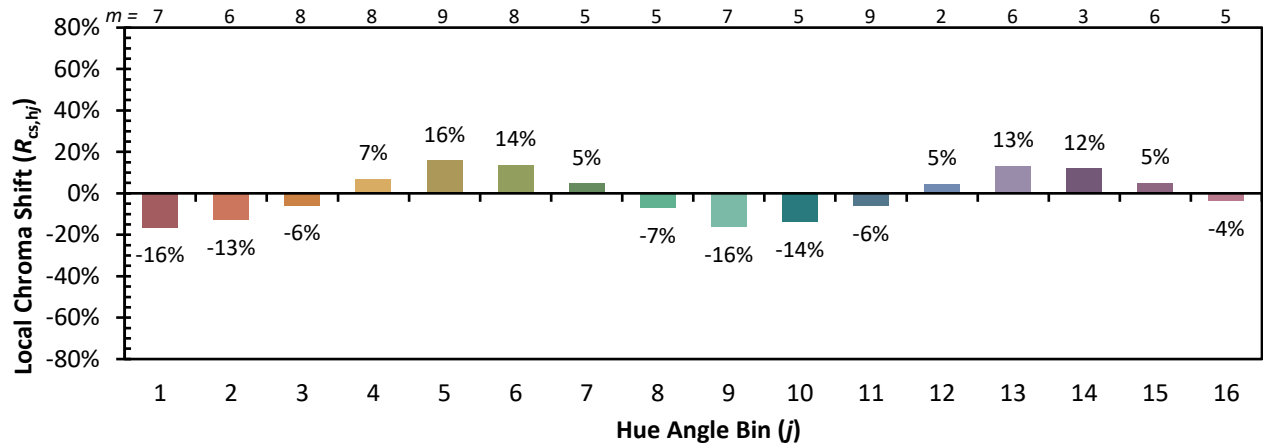
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 54 | CES51 = 88 | CES76 = 43 |
| CES02 = 59 | CES27 = 79 | CES52 = 90 | CES77 = 64 |
| CES03 = 30 | CES28 = 77 | CES53 = 77 | CES78 = 46 |
| CES04 = 69 | CES29 = 50 | CES54 = 81 | CES79 = 74 |
| CES05 = 46 | CES30 = 59 | CES55 = 80 | CES80 = 70 |
| CES06 = 50 | CES31 = 55 | CES56 = 70 | CES81 = 71 |
| CES07 = 38 | CES32 = 52 | CES57 = 68 | CES82 = 88 |
| CES08 = 38 | CES33 = 63 | CES58 = 70 | CES83 = 82 |
| CES09 = 29 | CES34 = 63 | CES59 = 88 | CES84 = 87 |
| CES10 = 72 | CES35 = 79 | CES60 = 92 | CES85 = 84 |
| CES11 = 55 | CES36 = 90 | CES61 = 88 | CES86 = 76 |
| CES12 = 61 | CES37 = 72 | CES62 = 81 | CES87 = 75 |
| CES13 = 41 | CES38 = 68 | CES63 = 75 | CES88 = 77 |
| CES14 = 74 | CES39 = 91 | CES64 = 72 | CES89 = 76 |
| CES15 = 70 | CES40 = 83 | CES65 = 65 | CES90 = 76 |
| CES16 = 46 | CES41 = 84 | CES66 = 66 | CES91 = 92 |
| CES17 = 48 | CES42 = 70 | CES67 = 64 | CES92 = 70 |
| CES18 = 55 | CES43 = 69 | CES68 = 71 | CES93 = 83 |
| CES19 = 70 | CES44 = 98 | CES69 = 80 | CES94 = 60 |
| CES20 = 64 | CES45 = 79 | CES70 = 58 | CES95 = 73 |
| CES21 = 85 | CES46 = 78 | CES71 = 55 | CES96 = 79 |
| CES22 = 77 | CES47 = 76 | CES72 = 84 | CES97 = 84 |
| CES23 = 91 | CES48 = 68 | CES73 = 47 | CES98 = 73 |
| CES24 = 90 | CES49 = 78 | CES74 = 94 | CES99 = 62 |
| CES25 = 71 | CES50 = 87 | CES75 = 51 |            |



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Color Rendition by Hue-Angle Bin



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**Measure Comparisons**



(END OF REPORT)