

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: P321343

Luminaire Tested: **GLEON-SA9D-750-U-T2R-HSS**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P321343  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-9)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA9D-750-U-T2R-HSS  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(9) 70 CRI, 5000K, 1200mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE II  
ROADWAY OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 55989 lumens  
Efficiency: N/A  
Efficacy: 97.4 lumens/watt  
Luminous Opening: Rectangular (W 2.5' x L: 1' x H: 0')  
IES Classification: Type II - Medium  
BUG Rating: B2 - U0 - G5

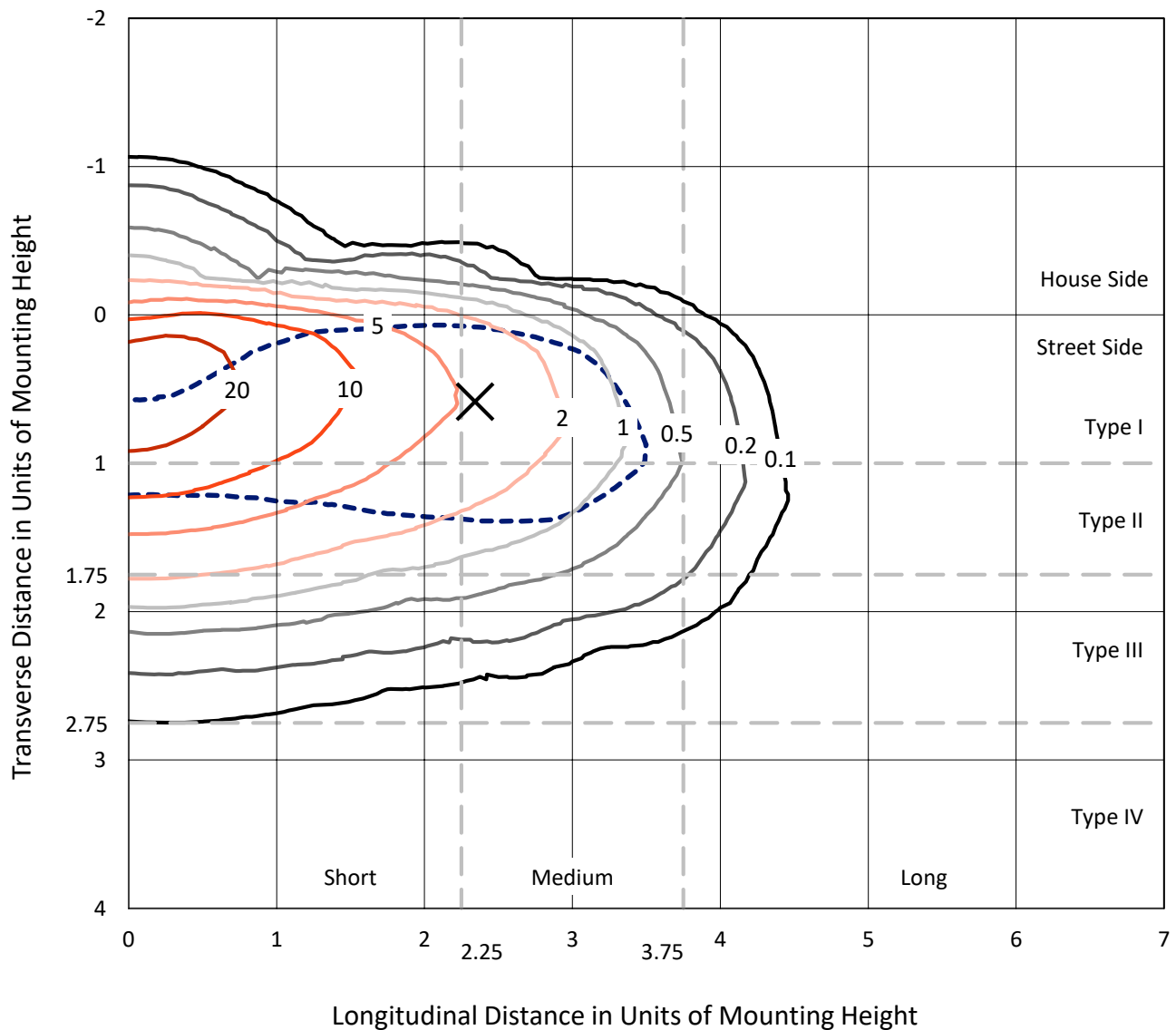
Input Watts (W): 575  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



REPORT NUMBER: P321343  
 CATALOG NUMBER: GLEON-SA9D-750-U-T2R-HSS

## Iso-Footcandle Lines of Horizontal Illumination

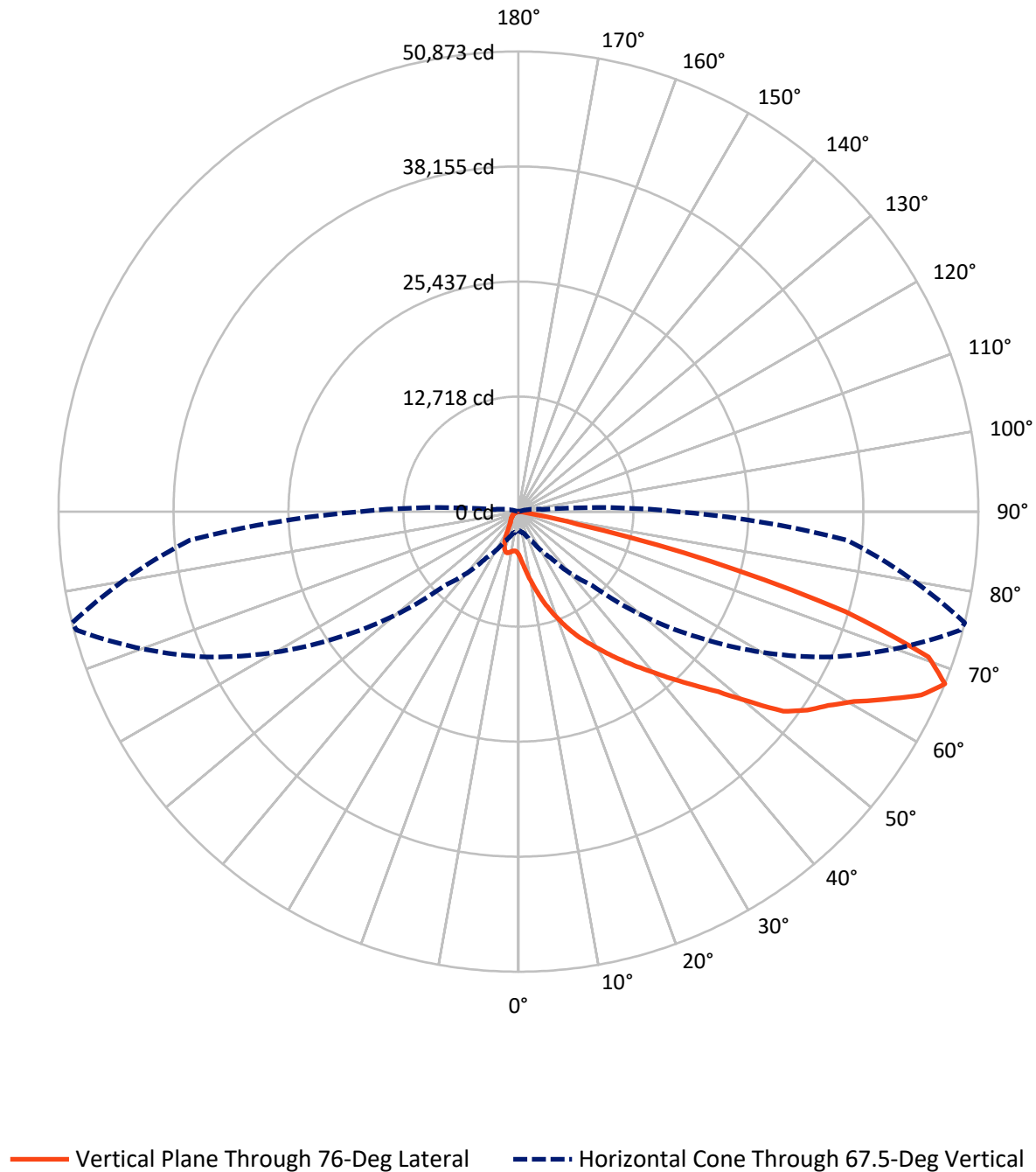
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 26.8 fc  
 Type II - Medium - N/A

REPORT NUMBER: P321343  
CATALOG NUMBER: GLEON-SA9D-750-U-T2R-HSS

## Luminous Intensity Polar Plot



REPORT NUMBER: P321343  
 CATALOG NUMBER: GLEON-SA9D-750-U-T2R-HSS

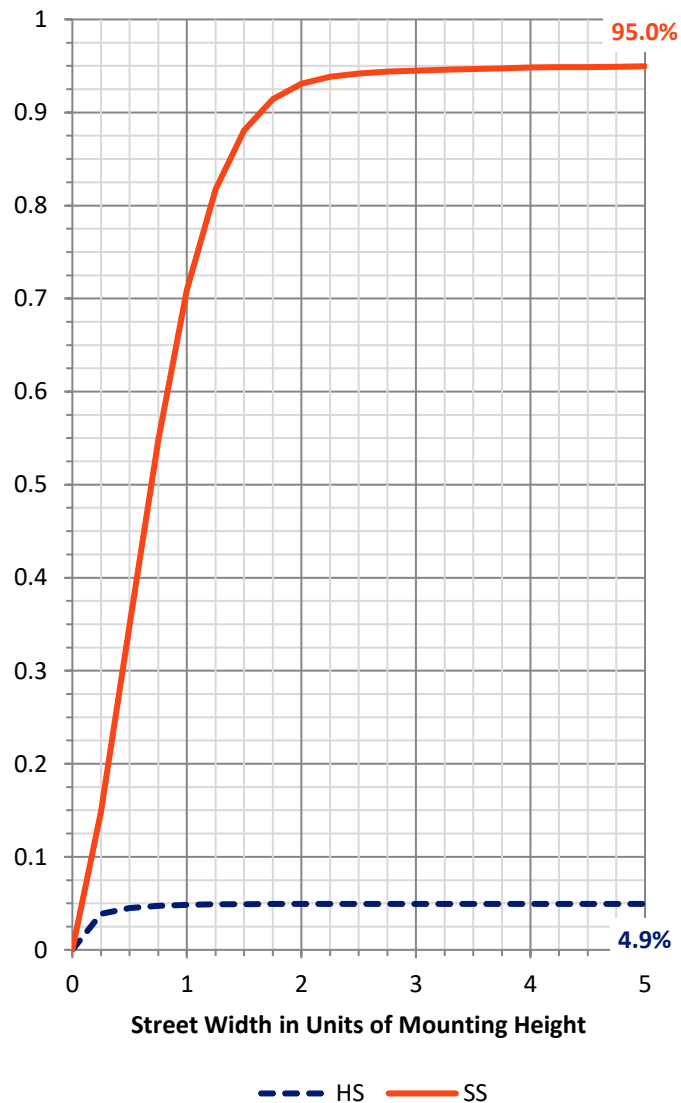
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 2780.3   | 0.0    | 2780.3  |
|                    | % Fixture | 5.0      | 0.0    | 5.0     |
| <b>Street Side</b> | Lumens    | 53208.7  | 0.0    | 53208.7 |
|                    | % Fixture | 95.0     | 0.0    | 95.0    |
| <b>Total</b>       | Lumens    | 55989.0  | 0.0    | 55989.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 590.6   | 1.1       |
| 10°-20°   | 2341.2  | 4.2       |
| 20°-30°   | 4763.6  | 8.5       |
| 30°-40°   | 8268.0  | 14.8      |
| 40°-50°   | 11681.6 | 20.9      |
| 50°-60°   | 13247.5 | 23.7      |
| 60°-70°   | 10987.5 | 19.6      |
| 70°-80°   | 3980.0  | 7.1       |
| 80°-90°   | 129.1   | 0.2       |
| 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°    | 55989.0 | 100.0     |
| 0°-180°   | 55989.0 | 100.0     |

**Coefficient of Utilization**



REPORT NUMBER: P321343

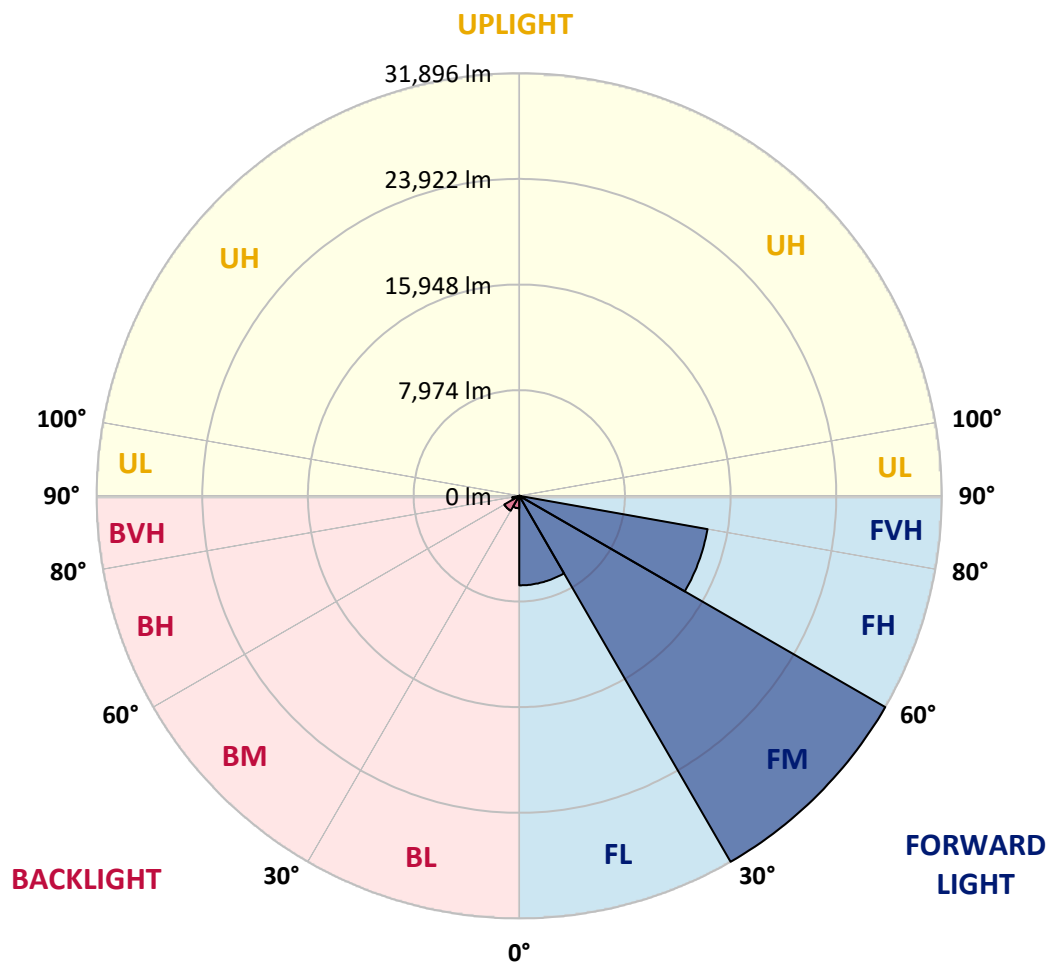
CATALOG NUMBER: GLEON-SA9D-750-U-T2R-HSS

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|---------|-----------|-------------------------|------|---------|
|      |             |         |           | B                       | U    | G       |
| FL   | (0°-30°)    | 6757.7  | 12.1      |                         |      |         |
| FM   | (30°-60°)   | 31895.8 | 57.0      |                         |      |         |
| FH   | (60°-80°)   | 14430.2 | 25.8      |                         |      | G5      |
| FVH  | (80°-90°)   | 125.0   | 0.2       |                         |      | G2/225  |
| BL   | (0°-30°)    | 937.6   | 1.7       | B2/1000                 |      |         |
| BM   | (30°-60°)   | 1301.3  | 2.3       | B2/2500                 |      |         |
| BH   | (60°-80°)   | 537.3   | 1.0       | B2/1000                 |      | G2/1000 |
| BVH  | (80°-90°)   | 4.1     | 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-G5**

Type II Medium





REPORT NUMBER: P321343

CATALOG NUMBER: GLEON-SA9D-750-U-T2R-HSS

**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 55°     | 65°     | 75°     | 76°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 4749.5  | 4749.5  | 4749.5  | 4749.5  | 4749.5  | 4749.5  | 4749.5  | 4749.5  | 4749.5  | 4749.5  | 4749.5  |
| 2.5°  | 7089.9  | 6930.4  | 6967.2  | 6864.2  | 6677.7  | 6295.0  | 5968.8  | 5659.6  | 5299.0  | 5286.8  | 4989.9  |
| 5°    | 9560.3  | 9425.4  | 9408.2  | 9199.7  | 8861.1  | 8211.0  | 7578.1  | 6856.8  | 6052.2  | 5993.3  | 5362.8  |
| 7.5°  | 11802.6 | 11694.6 | 11655.4 | 11407.6 | 10777.1 | 10144.2 | 9319.9  | 8260.1  | 7001.6  | 6893.6  | 5865.7  |
| 10°   | 13524.8 | 13473.2 | 13483.1 | 13306.4 | 12766.7 | 12177.9 | 11096.0 | 9744.3  | 8078.5  | 7911.7  | 6469.2  |
| 12.5° | 14829.9 | 14842.2 | 14930.5 | 14822.5 | 14520.8 | 14084.1 | 12928.6 | 11326.6 | 9270.8  | 9042.7  | 7158.6  |
| 15°   | 15789.1 | 15850.4 | 16012.4 | 16147.3 | 16125.2 | 15747.4 | 14687.6 | 12933.5 | 10536.7 | 10284.0 | 7926.4  |
| 17.5° | 16409.8 | 16478.5 | 16714.0 | 17013.3 | 17288.0 | 17199.7 | 16385.2 | 14484.0 | 11817.3 | 11525.4 | 8748.3  |
| 20°   | 16954.4 | 17035.4 | 17288.0 | 17683.0 | 18195.7 | 18306.1 | 17771.3 | 15987.8 | 13095.4 | 12739.7 | 9597.1  |
| 22.5° | 18134.4 | 18132.0 | 18286.5 | 18517.1 | 19005.3 | 19289.9 | 18951.3 | 17383.7 | 14358.9 | 13988.4 | 10463.1 |
| 25°   | 20268.7 | 20187.8 | 20133.8 | 19952.3 | 20060.2 | 20236.8 | 20047.9 | 18688.8 | 15629.6 | 15254.3 | 11341.4 |
| 27.5° | 22805.4 | 22854.5 | 22417.8 | 21929.6 | 21551.8 | 21370.2 | 21061.1 | 19898.3 | 16851.4 | 16439.2 | 12200.0 |
| 30°   | 25481.9 | 25496.6 | 24981.4 | 24358.3 | 23526.7 | 22837.3 | 22302.5 | 21053.8 | 18107.4 | 17658.5 | 13034.1 |
| 32.5° | 27895.9 | 27800.2 | 27289.9 | 26441.1 | 25391.1 | 24615.9 | 23504.6 | 22344.2 | 19437.1 | 19002.9 | 13961.4 |
| 35°   | 29809.4 | 29696.6 | 29075.9 | 28303.1 | 27213.9 | 26433.8 | 25096.7 | 23632.1 | 20835.4 | 20411.0 | 14891.2 |
| 37.5° | 31207.8 | 31075.3 | 30437.5 | 29642.6 | 28703.0 | 28249.2 | 26944.0 | 25032.9 | 22361.4 | 21905.1 | 15870.1 |
| 40°   | 31693.5 | 31578.2 | 31178.3 | 30596.9 | 29841.3 | 29738.3 | 28904.2 | 26644.7 | 24022.2 | 23536.5 | 16978.9 |
| 42.5° | 31404.0 | 31291.2 | 31148.9 | 30952.6 | 30638.6 | 30736.7 | 30753.9 | 28482.2 | 25867.1 | 25388.7 | 18203.1 |
| 45°   | 30255.9 | 30155.3 | 30302.5 | 30589.6 | 30979.6 | 31465.4 | 32441.8 | 30457.1 | 27927.8 | 27417.5 | 19618.6 |
| 47.5° | 28565.6 | 28492.0 | 28899.3 | 29615.6 | 30756.4 | 32095.8 | 33984.8 | 32532.5 | 30241.2 | 29767.7 | 21385.0 |
| 50°   | 26161.4 | 26149.2 | 26963.7 | 28271.2 | 30025.3 | 32400.1 | 35579.5 | 34892.6 | 33454.9 | 32956.9 | 23840.7 |
| 52.5° | 22417.8 | 22442.3 | 24044.3 | 26136.9 | 28742.3 | 32194.0 | 36604.9 | 37924.8 | 37193.7 | 36676.1 | 25967.6 |
| 55°   | 18853.2 | 19000.4 | 20136.3 | 23153.8 | 26774.8 | 31428.6 | 36958.2 | 39340.3 | 39256.9 | 38766.2 | 27150.1 |
| 57.5° | 15362.2 | 15629.6 | 16723.8 | 19542.6 | 23902.0 | 29664.7 | 36764.4 | 39953.6 | 40792.6 | 40417.3 | 28710.4 |
| 60°   | 11579.3 | 11702.0 | 12963.0 | 15597.8 | 20214.8 | 26446.0 | 35358.7 | 40287.2 | 42892.6 | 42632.5 | 30974.7 |
| 62.5° | 7367.1  | 7673.8  | 8792.4  | 11334.0 | 15740.0 | 21976.2 | 32988.8 | 40282.3 | 45520.0 | 45662.3 | 33896.5 |
| 65°   | 3881.0  | 4239.2  | 4832.9  | 7023.6  | 10816.4 | 16983.8 | 29424.3 | 39904.5 | 48743.6 | 48942.3 | 36180.5 |
| 67.5° | 2092.6  | 2195.7  | 2509.7  | 3645.5  | 6273.0  | 11505.7 | 24186.6 | 38040.1 | 50610.5 | 50873.0 | 36499.4 |
| 70°   | 1530.8  | 1587.3  | 1705.0  | 2016.6  | 3157.3  | 6682.6  | 17648.7 | 33813.1 | 48203.9 | 48105.7 | 32429.5 |
| 72.5° | 1175.1  | 1263.4  | 1351.7  | 1476.9  | 1815.4  | 3567.0  | 10988.1 | 26477.9 | 38462.0 | 37814.4 | 24240.5 |
| 75°   | 927.3   | 942.0   | 1067.2  | 1180.0  | 1361.6  | 2031.3  | 4879.5  | 15421.1 | 23475.1 | 21941.9 | 12570.4 |
| 77.5° | 740.9   | 750.7   | 824.3   | 922.4   | 1094.1  | 1334.6  | 1511.2  | 6066.9  | 7494.7  | 6687.6  | 2728.0  |
| 80°   | 439.1   | 463.7   | 613.3   | 711.4   | 907.7   | 841.5   | 552.0   | 1317.4  | 1170.2  | 1059.8  | 458.8   |
| 82.5° | 245.3   | 265.0   | 345.9   | 561.8   | 632.9   | 402.3   | 274.8   | 355.7   | 274.8   | 267.4   | 130.0   |
| 85°   | 0.0     | 12.3    | 223.2   | 348.4   | 257.6   | 88.3    | 115.3   | 117.8   | 81.0    | 76.1    | 51.5    |
| 87.5° | 0.0     | 0.0     | 68.7    | 66.2    | 9.8     | 14.7    | 27.0    | 39.3    | 31.9    | 31.9    | 27.0    |
| 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: P321343

CATALOG NUMBER: GLEON-SA9D-750-U-T2R-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 4749.5  | 4749.5 | 4749.5 | 4749.5 | 4749.5 | 4749.5 | 4749.5 | 4749.5 | 4749.5 | 4749.5 | 4749.5 |
| 2.5°  | 4842.7  | 4710.2 | 4460.0 | 4214.7 | 4008.6 | 3839.3 | 3687.2 | 3625.9 | 3576.8 | 3569.5 | 3530.2 |
| 5°    | 5058.6  | 4791.2 | 4312.8 | 3920.3 | 3657.8 | 3471.3 | 3311.9 | 3213.8 | 3137.7 | 3108.3 | 3081.3 |
| 7.5°  | 5384.9  | 4980.1 | 4293.2 | 3841.8 | 3527.8 | 3213.8 | 2919.4 | 2600.4 | 2401.7 | 2325.7 | 2281.5 |
| 10°   | 5782.3  | 5230.3 | 4366.8 | 3819.7 | 3270.2 | 2607.8 | 2119.6 | 1714.8 | 1550.5 | 1496.5 | 1481.8 |
| 12.5° | 6246.0  | 5541.9 | 4494.4 | 3682.3 | 2720.7 | 1852.2 | 1462.1 | 1324.8 | 1288.0 | 1270.8 | 1270.8 |
| 15°   | 6778.3  | 5882.9 | 4585.1 | 3284.9 | 2011.7 | 1400.8 | 1265.9 | 1202.1 | 1162.8 | 1140.8 | 1143.2 |
| 17.5° | 7322.9  | 6216.5 | 4541.0 | 2708.4 | 1484.2 | 1246.3 | 1145.7 | 1077.0 | 1023.0 | 1000.9 | 996.0  |
| 20°   | 7872.5  | 6525.6 | 4295.6 | 2016.6 | 1256.1 | 1130.9 | 1018.1 | 942.0  | 888.1  | 866.0  | 861.1  |
| 22.5° | 8441.6  | 6788.1 | 3863.9 | 1479.3 | 1128.5 | 1003.4 | 893.0  | 816.9  | 765.4  | 745.8  | 736.0  |
| 25°   | 8996.1  | 7001.6 | 3260.4 | 1197.2 | 1008.3 | 883.2  | 777.7  | 706.5  | 659.9  | 640.3  | 637.8  |
| 27.5° | 9513.7  | 7136.5 | 2561.2 | 1057.4 | 902.8  | 775.2  | 679.5  | 615.8  | 576.5  | 561.8  | 559.3  |
| 30°   | 9979.8  | 7148.8 | 1893.9 | 954.3  | 809.6  | 682.0  | 593.7  | 537.3  | 502.9  | 488.2  | 483.3  |
| 32.5° | 10450.8 | 7045.7 | 1378.7 | 861.1  | 723.7  | 601.0  | 515.2  | 471.0  | 446.5  | 434.2  | 434.2  |
| 35°   | 10894.9 | 6807.8 | 1074.5 | 780.1  | 640.3  | 522.5  | 453.9  | 422.0  | 407.2  | 395.0  | 395.0  |
| 37.5° | 11329.1 | 6466.8 | 912.6  | 709.0  | 561.8  | 456.3  | 399.9  | 380.3  | 368.0  | 355.7  | 355.7  |
| 40°   | 11770.7 | 6037.4 | 829.2  | 642.8  | 498.0  | 404.8  | 355.7  | 338.5  | 326.3  | 316.5  | 314.0  |
| 42.5° | 12312.9 | 5541.9 | 775.2  | 581.4  | 441.6  | 358.2  | 314.0  | 294.4  | 284.6  | 274.8  | 269.9  |
| 45°   | 12940.9 | 5115.0 | 731.1  | 520.1  | 395.0  | 318.9  | 272.3  | 252.7  | 238.0  | 225.7  | 223.2  |
| 47.5° | 13846.1 | 4805.9 | 672.2  | 453.9  | 350.8  | 277.2  | 235.5  | 213.4  | 191.4  | 179.1  | 176.6  |
| 50°   | 15001.6 | 4550.8 | 596.1  | 395.0  | 306.7  | 235.5  | 196.3  | 169.3  | 149.6  | 137.4  | 137.4  |
| 52.5° | 15575.7 | 4217.1 | 527.4  | 343.5  | 257.6  | 198.7  | 159.5  | 127.6  | 117.8  | 105.5  | 105.5  |
| 55°   | 15806.3 | 3962.0 | 458.8  | 291.9  | 213.4  | 164.4  | 125.1  | 98.1   | 90.8   | 83.4   | 81.0   |
| 57.5° | 16453.9 | 3888.4 | 399.9  | 247.8  | 176.6  | 130.0  | 95.7   | 73.6   | 68.7   | 58.9   | 58.9   |
| 60°   | 17496.6 | 3925.2 | 345.9  | 211.0  | 142.3  | 100.6  | 71.1   | 56.4   | 51.5   | 41.7   | 41.7   |
| 62.5° | 18622.6 | 3878.6 | 291.9  | 181.5  | 110.4  | 73.6   | 49.1   | 41.7   | 41.7   | 24.5   | 22.1   |
| 65°   | 18838.5 | 3454.2 | 250.2  | 149.6  | 85.9   | 54.0   | 31.9   | 27.0   | 36.8   | 4.9    | 0.0    |
| 67.5° | 17484.3 | 2678.9 | 215.9  | 115.3  | 63.8   | 41.7   | 24.5   | 12.3   | 31.9   | 0.0    | 0.0    |
| 70°   | 13981.1 | 1702.6 | 174.2  | 83.4   | 49.1   | 34.3   | 19.6   | 4.9    | 24.5   | 0.0    | 0.0    |
| 72.5° | 9886.6  | 988.7  | 137.4  | 58.9   | 41.7   | 27.0   | 14.7   | 0.0    | 14.7   | 0.0    | 0.0    |
| 75°   | 4999.7  | 527.4  | 85.9   | 44.2   | 31.9   | 19.6   | 9.8    | 0.0    | 2.5    | 0.0    | 0.0    |
| 77.5° | 1081.9  | 245.3  | 54.0   | 31.9   | 22.1   | 12.3   | 4.9    | 0.0    | 0.0    | 0.0    | 0.0    |
| 80°   | 235.5   | 107.9  | 34.3   | 19.6   | 12.3   | 7.4    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 82.5° | 85.9    | 56.4   | 17.2   | 9.8    | 4.9    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 85°   | 46.6    | 29.4   | 9.8    | 4.9    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 87.5° | 24.5    | 9.8    | 2.5    | 2.5    | 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: SP1-1908-441-4-R4

Test Date: 10/02/2019

Luminaire Tested: SA1C-750-U-5WQ

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

### Test Information

Test Method: LM-79-2008  
Report Number: SP1-1908-441-4-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-750-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):                  | 4884   | CRI (Ra): | 73.5 |      |       |
| CIE u':                   | 0.2101 | R1:       | 70.5 | R9:  | -28.4 |
| CIE v':                   | 0.4904 | R2:       | 77.7 | R10: | 48.6  |
| Duv:                      | 0.0037 | R3:       | 84.6 | R11: | 73.2  |
| CIE x:                    | 0.3493 | R4:       | 74.7 | R12: | 50.7  |
| CIE y:                    | 0.3624 | R5:       | 71.9 | R13: | 71.2  |
| CIE z:                    | 0.2884 | R6:       | 70.7 | R14: | 91.4  |
| Peak Wavelength (nm):     | 444    | R7:       | 81.2 |      |       |
| Dominant Wavelength (nm): | 571    | R8:       | 56.9 |      |       |
| Purity:                   | 13.7   |           |      |      |       |
| Rf:                       | 74.9   |           |      |      |       |
| Rg:                       | 96.3   |           |      |      |       |



### Test Conditions

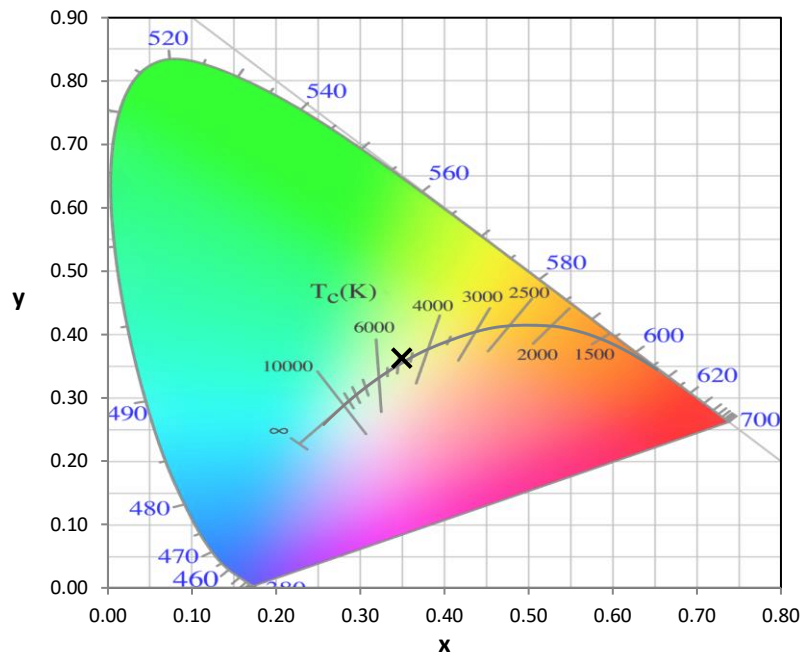
Stabilization Time: 240M  
Operation Time: 12H  
Room Temperature (°C) / RH%: 25.0./44%  
Sphere Temperature (°C): 25.7

REPORT NUMBER: SP1-1908-441-4-R4

| 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            |

REPORT NUMBER: SP1-1908-441-4-R4

**CIE 1931 Chromaticity Diagram**



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



Point lies inside the ANSI 5000K 4-step quadrangle

REPORT NUMBER: SP1-1908-441-4-R4

**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       | 2945             | NR               | 490       | 37941            | NR               | 620       | 88803            | NR               | 750       | 3908             | NR               | 880       | 2997             | NR               |
| 365       | 2596             | NR               | 495       | 48525            | NR               | 625       | 80578            | NR               | 755       | 3988             | NR               | 885       | 2927             | NR               |
| 370       | 2732             | NR               | 500       | 60609            | NR               | 630       | 73127            | NR               | 760       | 3335             | NR               | 890       | 2649             | NR               |
| 375       | 2894             | NR               | 505       | 72036            | NR               | 635       | 66244            | NR               | 765       | 3438             | NR               | 895       | 2828             | NR               |
| 380       | 2822             | NR               | 510       | 82168            | NR               | 640       | 59440            | NR               | 770       | 3427             | NR               | 900       | 1407             | NR               |
| 385       | 2394             | NR               | 515       | 90898            | NR               | 645       | 52864            | NR               | 775       | 2759             | NR               | 905       | 2224             | NR               |
| 390       | 2370             | NR               | 520       | 97142            | NR               | 650       | 47085            | NR               | 780       | 2340             | NR               | 910       | 2905             | NR               |
| 395       | 2267             | NR               | 525       | 103255           | NR               | 655       | 41789            | NR               | 785       | 2412             | NR               | 915       | 3350             | NR               |
| 400       | 2262             | NR               | 530       | 106697           | NR               | 660       | 37064            | NR               | 790       | 1999             | NR               | 920       | 3114             | NR               |
| 405       | 3000             | NR               | 535       | 110081           | NR               | 665       | 32299            | NR               | 795       | 2054             | NR               | 925       | 2834             | NR               |
| 410       | 5324             | NR               | 540       | 112494           | NR               | 670       | 28142            | NR               | 800       | 2331             | NR               | 930       | 2271             | NR               |
| 415       | 10725            | NR               | 545       | 115513           | NR               | 675       | 24505            | NR               | 805       | 2648             | NR               | 935       | 2228             | NR               |
| 420       | 22128            | NR               | 550       | 117203           | NR               | 680       | 21162            | NR               | 810       | 2485             | NR               | 940       | 2833             | NR               |
| 425       | 44095            | NR               | 555       | 119753           | NR               | 685       | 18400            | NR               | 815       | 2409             | NR               | 945       | 2941             | NR               |
| 430       | 77002            | NR               | 560       | 122602           | NR               | 690       | 16065            | NR               | 820       | 2221             | NR               | 950       | 2323             | NR               |
| 435       | 119881           | NR               | 565       | 124314           | NR               | 695       | 13860            | NR               | 825       | 1562             | NR               | 955       | 1667             | NR               |
| 440       | 164454           | NR               | 570       | 126775           | NR               | 700       | 12177            | NR               | 830       | 2249             | NR               | 960       | 749              | NR               |
| 445       | 179997           | NR               | 575       | 127511           | NR               | 705       | 10757            | NR               | 835       | 2573             | NR               | 965       | 2669             | NR               |
| 450       | 142822           | NR               | 580       | 127577           | NR               | 710       | 9601             | NR               | 840       | 2764             | NR               | 970       | 3968             | NR               |
| 455       | 90008            | NR               | 585       | 126153           | NR               | 715       | 8944             | NR               | 845       | 3109             | NR               | 975       | 3886             | NR               |
| 460       | 60557            | NR               | 590       | 123678           | NR               | 720       | 7947             | NR               | 850       | 2963             | NR               | 980       | 2788             | NR               |
| 465       | 43305            | NR               | 595       | 119774           | NR               | 725       | 7062             | NR               | 855       | 2336             | NR               | 985       | 3496             | NR               |
| 470       | 31089            | NR               | 600       | 115733           | NR               | 730       | 6004             | NR               | 860       | 2118             | NR               | 990       | 2913             | NR               |
| 475       | 26278            | NR               | 605       | 109231           | NR               | 735       | 5594             | NR               | 865       | 3144             | NR               | 995       | 4659             | NR               |
| 480       | 27060            | NR               | 610       | 102408           | NR               | 740       | 5165             | NR               | 870       | 3069             | NR               | 1000      | 1308             | NR               |
| 485       | 30698            | NR               | 615       | 96015            | NR               | 745       | 4687             | NR               | 875       | 3311             | NR               |           |                  |                  |

REPORT NUMBER: SP1-1908-441-4-R4

Scotopic Flux vs. Wavelength



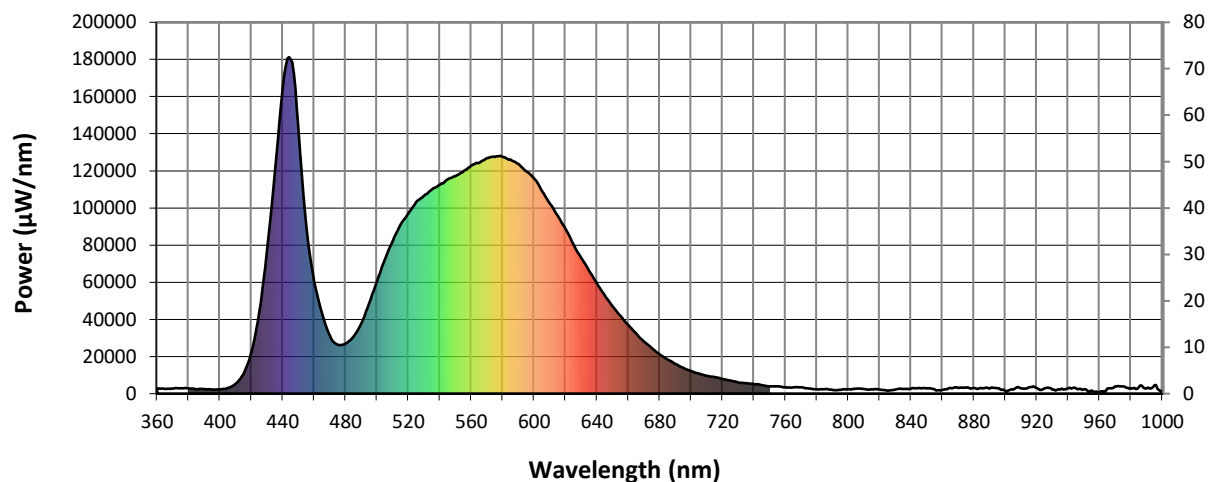
Scotopic Lumens: 13493.5

S/P: 1.77

| 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       | 2945             | NR               | 490       | 37941            | NR               | 620       | 88803            | NR               | 750       | 3908             | NR               | 880       | 2997             | NR               |
| 365       | 2596             | NR               | 495       | 48525            | NR               | 625       | 80578            | NR               | 755       | 3988             | NR               | 885       | 2927             | NR               |
| 370       | 2732             | NR               | 500       | 60609            | NR               | 630       | 73127            | NR               | 760       | 3335             | NR               | 890       | 2649             | NR               |
| 375       | 2894             | NR               | 505       | 72036            | NR               | 635       | 66244            | NR               | 765       | 3438             | NR               | 895       | 2828             | NR               |
| 380       | 2822             | NR               | 510       | 82168            | NR               | 640       | 59440            | NR               | 770       | 3427             | NR               | 900       | 1407             | NR               |
| 385       | 2394             | NR               | 515       | 90898            | NR               | 645       | 52864            | NR               | 775       | 2759             | NR               | 905       | 2224             | NR               |
| 390       | 2370             | NR               | 520       | 97142            | NR               | 650       | 47085            | NR               | 780       | 2340             | NR               | 910       | 2905             | NR               |
| 395       | 2267             | NR               | 525       | 103255           | NR               | 655       | 41789            | NR               | 785       | 2412             | NR               | 915       | 3350             | NR               |
| 400       | 2262             | NR               | 530       | 106697           | NR               | 660       | 37064            | NR               | 790       | 1999             | NR               | 920       | 3114             | NR               |
| 405       | 3000             | NR               | 535       | 110081           | NR               | 665       | 32299            | NR               | 795       | 2054             | NR               | 925       | 2834             | NR               |
| 410       | 5324             | NR               | 540       | 112494           | NR               | 670       | 28142            | NR               | 800       | 2331             | NR               | 930       | 2271             | NR               |
| 415       | 10725            | NR               | 545       | 115513           | NR               | 675       | 24505            | NR               | 805       | 2648             | NR               | 935       | 2228             | NR               |
| 420       | 22128            | NR               | 550       | 117203           | NR               | 680       | 21162            | NR               | 810       | 2485             | NR               | 940       | 2833             | NR               |
| 425       | 44095            | NR               | 555       | 119753           | NR               | 685       | 18400            | NR               | 815       | 2409             | NR               | 945       | 2941             | NR               |
| 430       | 77002            | NR               | 560       | 122602           | NR               | 690       | 16065            | NR               | 820       | 2221             | NR               | 950       | 2323             | NR               |
| 435       | 119881           | NR               | 565       | 124314           | NR               | 695       | 13860            | NR               | 825       | 1562             | NR               | 955       | 1667             | NR               |
| 440       | 164454           | NR               | 570       | 126775           | NR               | 700       | 12177            | NR               | 830       | 2249             | NR               | 960       | 749              | NR               |
| 445       | 179997           | NR               | 575       | 127511           | NR               | 705       | 10757            | NR               | 835       | 2573             | NR               | 965       | 2669             | NR               |
| 450       | 142822           | NR               | 580       | 127577           | NR               | 710       | 9601             | NR               | 840       | 2764             | NR               | 970       | 3968             | NR               |
| 455       | 90008            | NR               | 585       | 126153           | NR               | 715       | 8944             | NR               | 845       | 3109             | NR               | 975       | 3886             | NR               |
| 460       | 60557            | NR               | 590       | 123678           | NR               | 720       | 7947             | NR               | 850       | 2963             | NR               | 980       | 2788             | NR               |
| 465       | 43305            | NR               | 595       | 119774           | NR               | 725       | 7062             | NR               | 855       | 2336             | NR               | 985       | 3496             | NR               |
| 470       | 31089            | NR               | 600       | 115733           | NR               | 730       | 6004             | NR               | 860       | 2118             | NR               | 990       | 2913             | NR               |
| 475       | 26278            | NR               | 605       | 109231           | NR               | 735       | 5594             | NR               | 865       | 3144             | NR               | 995       | 4659             | NR               |
| 480       | 27060            | NR               | 610       | 102408           | NR               | 740       | 5165             | NR               | 870       | 3069             | NR               | 1000      | 1308             | NR               |
| 485       | 30698            | NR               | 615       | 96015            | NR               | 745       | 4687             | NR               | 875       | 3311             | NR               |           |                  |                  |

REPORT NUMBER: SP1-1908-441-4-R4

**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 5378.9**

**M/P: 0.71**

| 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       | 2945             | NR               | 490       | 37941            | NR               | 620       | 88803            | NR               | 750       | 3908             | NR               | 880       | 2997             | NR               |
| 365       | 2596             | NR               | 495       | 48525            | NR               | 625       | 80578            | NR               | 755       | 3988             | NR               | 885       | 2927             | NR               |
| 370       | 2732             | NR               | 500       | 60609            | NR               | 630       | 73127            | NR               | 760       | 3335             | NR               | 890       | 2649             | NR               |
| 375       | 2894             | NR               | 505       | 72036            | NR               | 635       | 66244            | NR               | 765       | 3438             | NR               | 895       | 2828             | NR               |
| 380       | 2822             | NR               | 510       | 82168            | NR               | 640       | 59440            | NR               | 770       | 3427             | NR               | 900       | 1407             | NR               |
| 385       | 2394             | NR               | 515       | 90898            | NR               | 645       | 52864            | NR               | 775       | 2759             | NR               | 905       | 2224             | NR               |
| 390       | 2370             | NR               | 520       | 97142            | NR               | 650       | 47085            | NR               | 780       | 2340             | NR               | 910       | 2905             | NR               |
| 395       | 2267             | NR               | 525       | 103255           | NR               | 655       | 41789            | NR               | 785       | 2412             | NR               | 915       | 3350             | NR               |
| 400       | 2262             | NR               | 530       | 106697           | NR               | 660       | 37064            | NR               | 790       | 1999             | NR               | 920       | 3114             | NR               |
| 405       | 3000             | NR               | 535       | 110081           | NR               | 665       | 32299            | NR               | 795       | 2054             | NR               | 925       | 2834             | NR               |
| 410       | 5324             | NR               | 540       | 112494           | NR               | 670       | 28142            | NR               | 800       | 2331             | NR               | 930       | 2271             | NR               |
| 415       | 10725            | NR               | 545       | 115513           | NR               | 675       | 24505            | NR               | 805       | 2648             | NR               | 935       | 2228             | NR               |
| 420       | 22128            | NR               | 550       | 117203           | NR               | 680       | 21162            | NR               | 810       | 2485             | NR               | 940       | 2833             | NR               |
| 425       | 44095            | NR               | 555       | 119753           | NR               | 685       | 18400            | NR               | 815       | 2409             | NR               | 945       | 2941             | NR               |
| 430       | 77002            | NR               | 560       | 122602           | NR               | 690       | 16065            | NR               | 820       | 2221             | NR               | 950       | 2323             | NR               |
| 435       | 119881           | NR               | 565       | 124314           | NR               | 695       | 13860            | NR               | 825       | 1562             | NR               | 955       | 1667             | NR               |
| 440       | 164454           | NR               | 570       | 126775           | NR               | 700       | 12177            | NR               | 830       | 2249             | NR               | 960       | 749              | NR               |
| 445       | 179997           | NR               | 575       | 127511           | NR               | 705       | 10757            | NR               | 835       | 2573             | NR               | 965       | 2669             | NR               |
| 450       | 142822           | NR               | 580       | 127577           | NR               | 710       | 9601             | NR               | 840       | 2764             | NR               | 970       | 3968             | NR               |
| 455       | 90008            | NR               | 585       | 126153           | NR               | 715       | 8944             | NR               | 845       | 3109             | NR               | 975       | 3886             | NR               |
| 460       | 60557            | NR               | 590       | 123678           | NR               | 720       | 7947             | NR               | 850       | 2963             | NR               | 980       | 2788             | NR               |
| 465       | 43305            | NR               | 595       | 119774           | NR               | 725       | 7062             | NR               | 855       | 2336             | NR               | 985       | 3496             | NR               |
| 470       | 31089            | NR               | 600       | 115733           | NR               | 730       | 6004             | NR               | 860       | 2118             | NR               | 990       | 2913             | NR               |
| 475       | 26278            | NR               | 605       | 109231           | NR               | 735       | 5594             | NR               | 865       | 3144             | NR               | 995       | 4659             | NR               |
| 480       | 27060            | NR               | 610       | 102408           | NR               | 740       | 5165             | NR               | 870       | 3069             | NR               | 1000      | 1308             | NR               |
| 485       | 30698            | NR               | 615       | 96015            | NR               | 745       | 4687             | NR               | 875       | 3311             | NR               |           |                  |                  |

REPORT NUMBER: SP1-1908-441-4-R4

**TM-30-18**

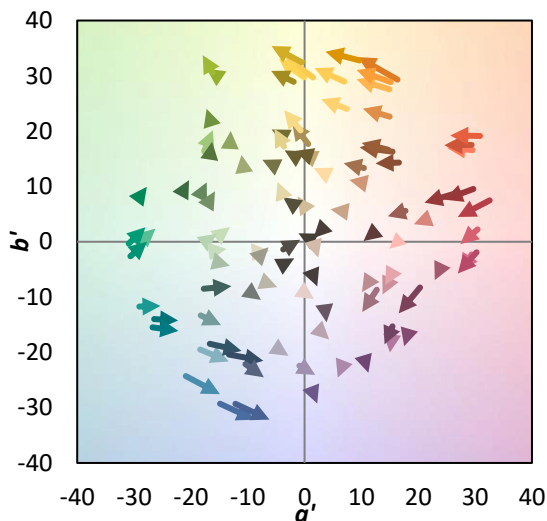
**Summary**

$R_f = 74.9$   
 $R_g = 96.3$   
 CIE  $R_a = 73.5$   
 $R_g = -28.4$

**Spectral Power Distribution Comparison**



**Color Vector Graphics**



REPORT NUMBER: SP1-1908-441-4-R4

**TM-30-18**

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

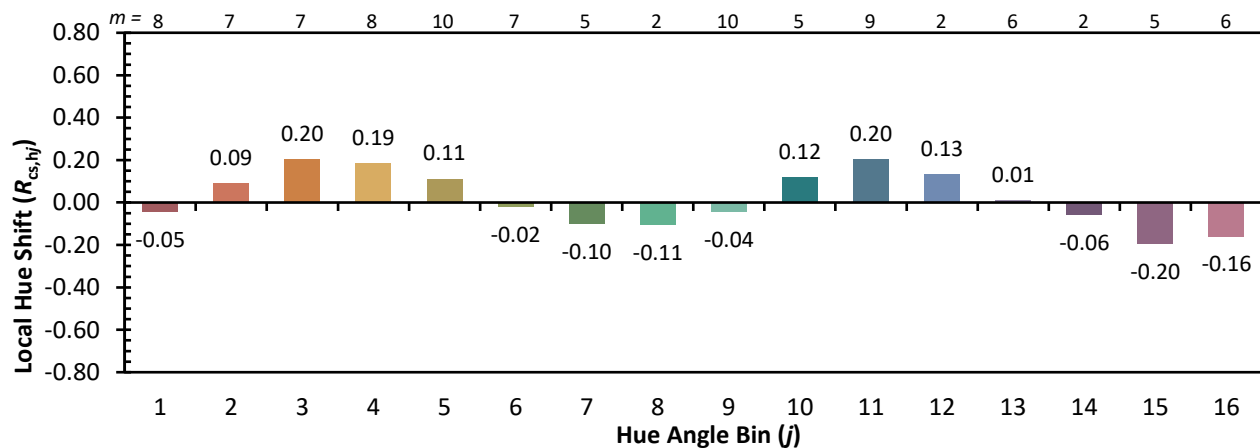
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 61 | CES51 = 90 | CES76 = 52 |
| CES02 = 60 | CES27 = 84 | CES52 = 91 | CES77 = 71 |
| CES03 = 30 | CES28 = 81 | CES53 = 79 | CES78 = 54 |
| CES04 = 69 | CES29 = 58 | CES54 = 83 | CES79 = 80 |
| CES05 = 46 | CES30 = 67 | CES55 = 83 | CES80 = 77 |
| CES06 = 50 | CES31 = 63 | CES56 = 73 | CES81 = 77 |
| CES07 = 39 | CES32 = 59 | CES57 = 72 | CES82 = 90 |
| CES08 = 38 | CES33 = 69 | CES58 = 73 | CES83 = 86 |
| CES09 = 29 | CES34 = 69 | CES59 = 88 | CES84 = 88 |
| CES10 = 73 | CES35 = 83 | CES60 = 93 | CES85 = 84 |
| CES11 = 56 | CES36 = 95 | CES61 = 88 | CES86 = 75 |
| CES12 = 61 | CES37 = 78 | CES62 = 85 | CES87 = 78 |
| CES13 = 41 | CES38 = 76 | CES63 = 77 | CES88 = 79 |
| CES14 = 74 | CES39 = 93 | CES64 = 74 | CES89 = 75 |
| CES15 = 70 | CES40 = 86 | CES65 = 67 | CES90 = 77 |
| CES16 = 46 | CES41 = 87 | CES66 = 69 | CES91 = 89 |
| CES17 = 49 | CES42 = 78 | CES67 = 67 | CES92 = 66 |
| CES18 = 55 | CES43 = 75 | CES68 = 73 | CES93 = 80 |
| CES19 = 71 | CES44 = 99 | CES69 = 81 | CES94 = 57 |
| CES20 = 64 | CES45 = 83 | CES70 = 63 | CES95 = 71 |
| CES21 = 85 | CES46 = 81 | CES71 = 60 | CES96 = 78 |
| CES22 = 77 | CES47 = 80 | CES72 = 86 | CES97 = 85 |
| CES23 = 91 | CES48 = 72 | CES73 = 53 | CES98 = 75 |
| CES24 = 90 | CES49 = 81 | CES74 = 96 | CES99 = 62 |
| CES25 = 71 | CES50 = 89 | CES75 = 58 |            |



REPORT NUMBER: SP1-1908-441-4-R4

**TM-30-18**

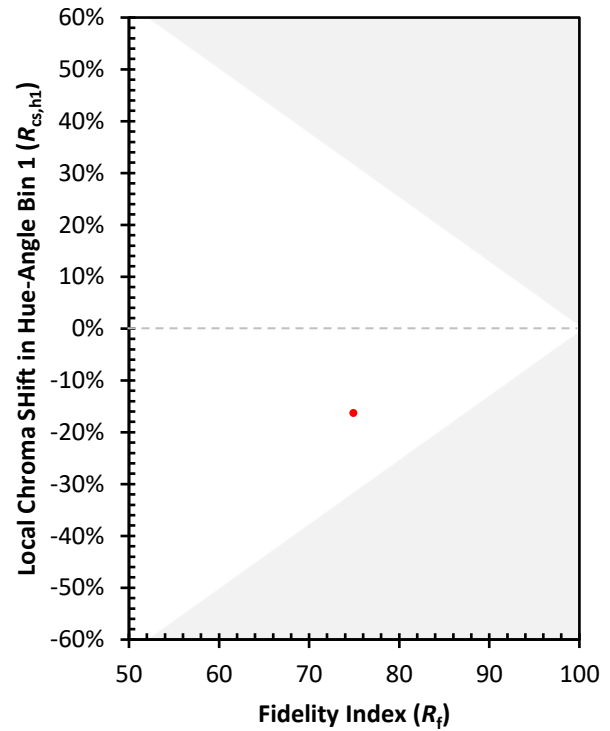
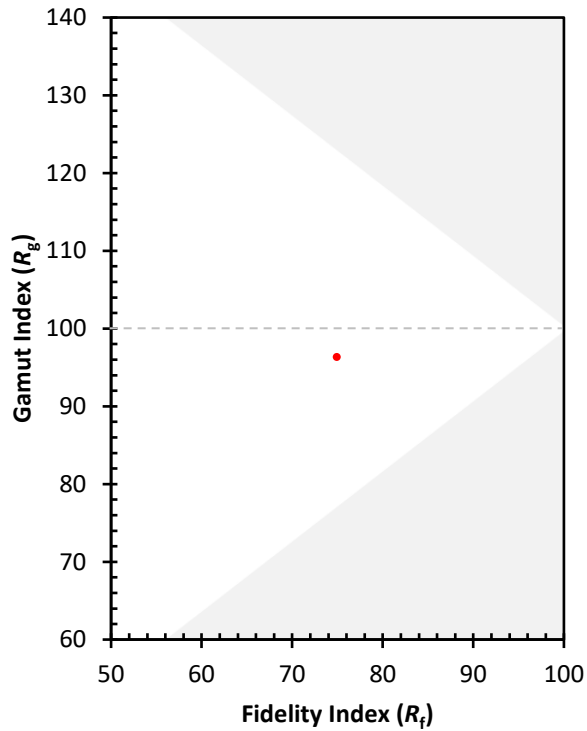
**Color Rendition by Hue-Angle Bin**



REPORT NUMBER: SP1-1908-441-4-R4

**TM-30-18**

**Measure Comparisons**



(END OF REPORT)