

Signify Classified - Internal  
Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269



Scaled data based on original data using  
LM-79-08 Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Test Report Prepared for  
Cooper Lighting Solutions  
(formerly Eaton)

Brand: McGRAW-EDISON

Report Number: P321819

Luminaire Tested: **GLEON-SA5D-722-U-T3R-HSS**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P321819  
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-SA5D-722-U-T3R-HSS  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(5) 70 CRI, 2200K, 1200mA 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: 21926 lumens  
Efficiency: N/A  
Efficacy: 68.5 lumens/watt  
Luminous Opening: Rectangular (W 1.5' x L: 1' x H: 0')  
IES Classification: Type III - Medium  
BUG Rating: B2 - U0 - G4

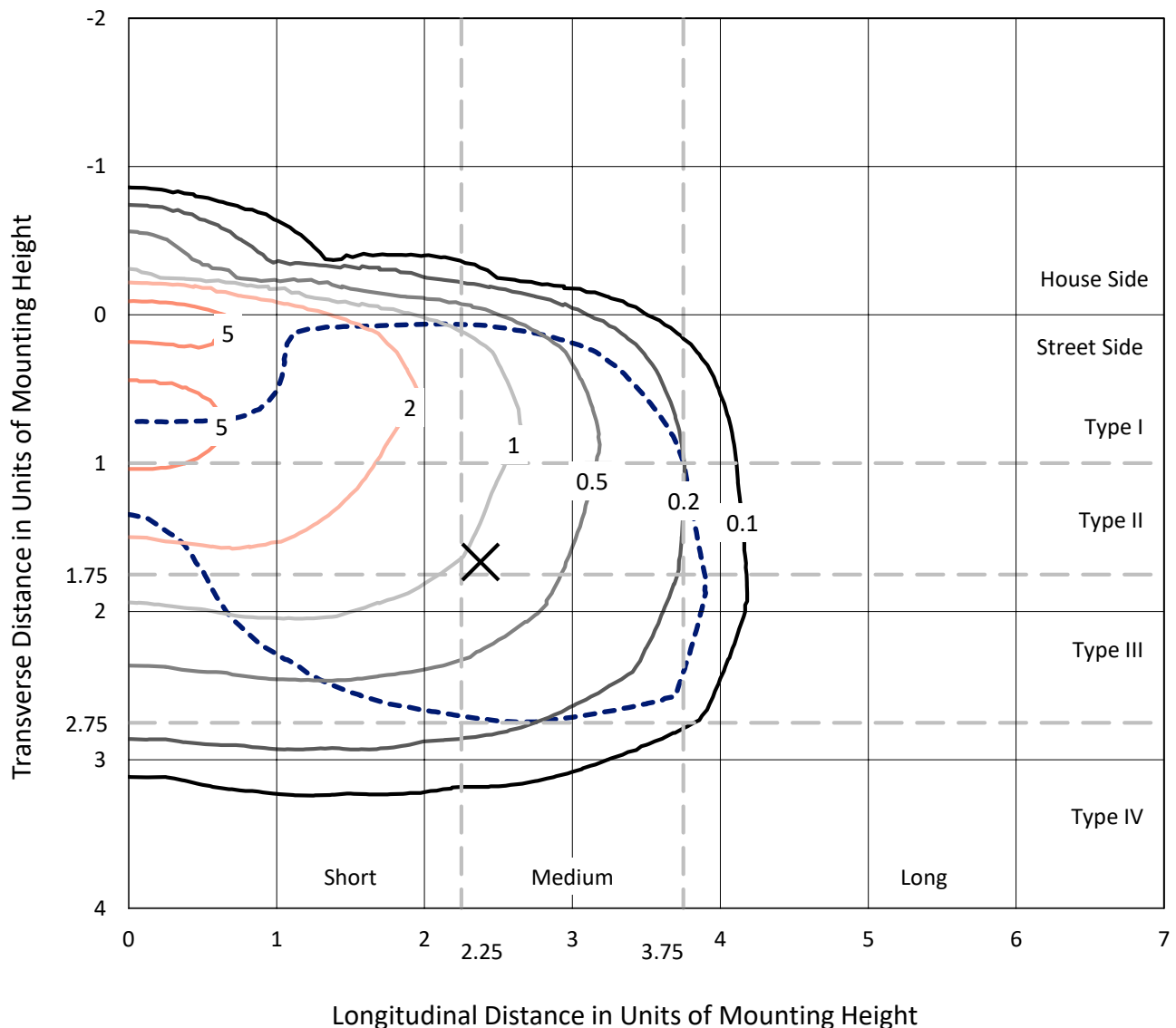
Input Watts (W): 320  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



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## Iso-Footcandle Lines of Horizontal Illumination

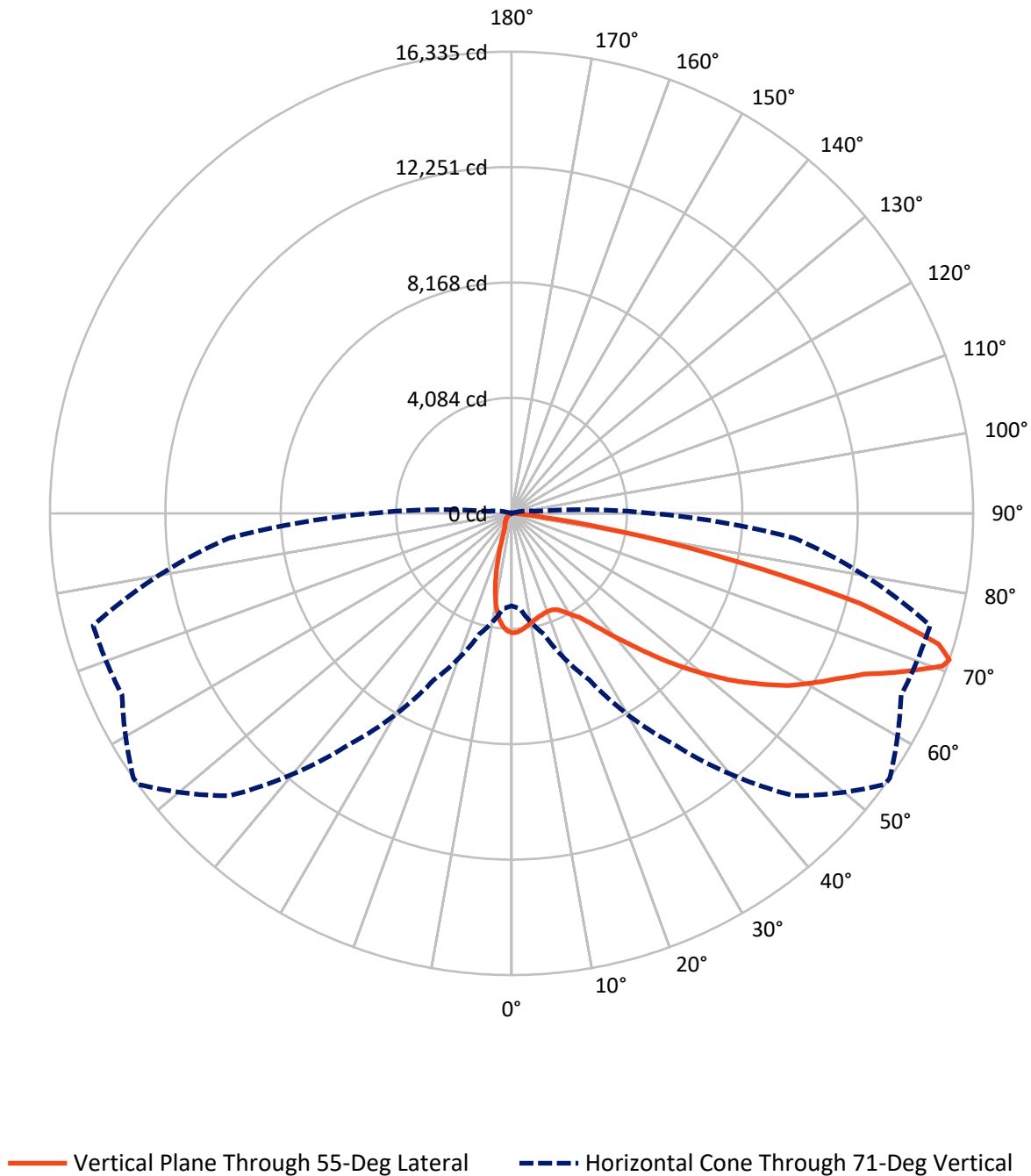
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 6.9 fc  
 Type III - Medium - N/A

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## Luminous Intensity Polar Plot



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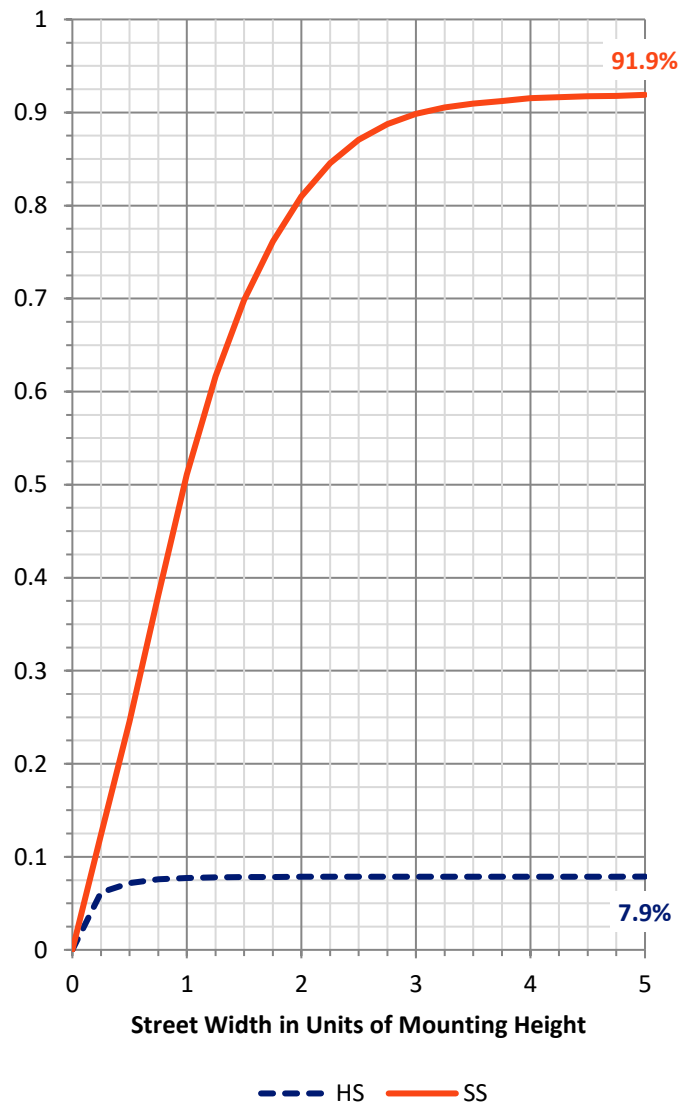
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 1735.9   | 0.0    | 1735.9  |
|                    | % Fixture | 7.9      | 0.0    | 7.9     |
| <b>Street Side</b> | Lumens    | 20190.1  | 0.0    | 20190.1 |
|                    | % Fixture | 92.1     | 0.0    | 92.1    |
| <b>Total</b>       | Lumens    | 21926.0  | 0.0    | 21926.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 360.5   | 1.6       |
| 10°-20°   | 813.9   | 3.7       |
| 20°-30°   | 1308.0  | 6.0       |
| 30°-40°   | 2222.4  | 10.1      |
| 40°-50°   | 3449.5  | 15.7      |
| 50°-60°   | 4637.7  | 21.2      |
| 60°-70°   | 5673.4  | 25.9      |
| 70°-80°   | 3317.1  | 15.1      |
| 80°-90°   | 143.4   | 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°    | 21926.0 | 100.0     |
| 0°-180°   | 21926.0 | 100.0     |

**Coefficient of Utilization**



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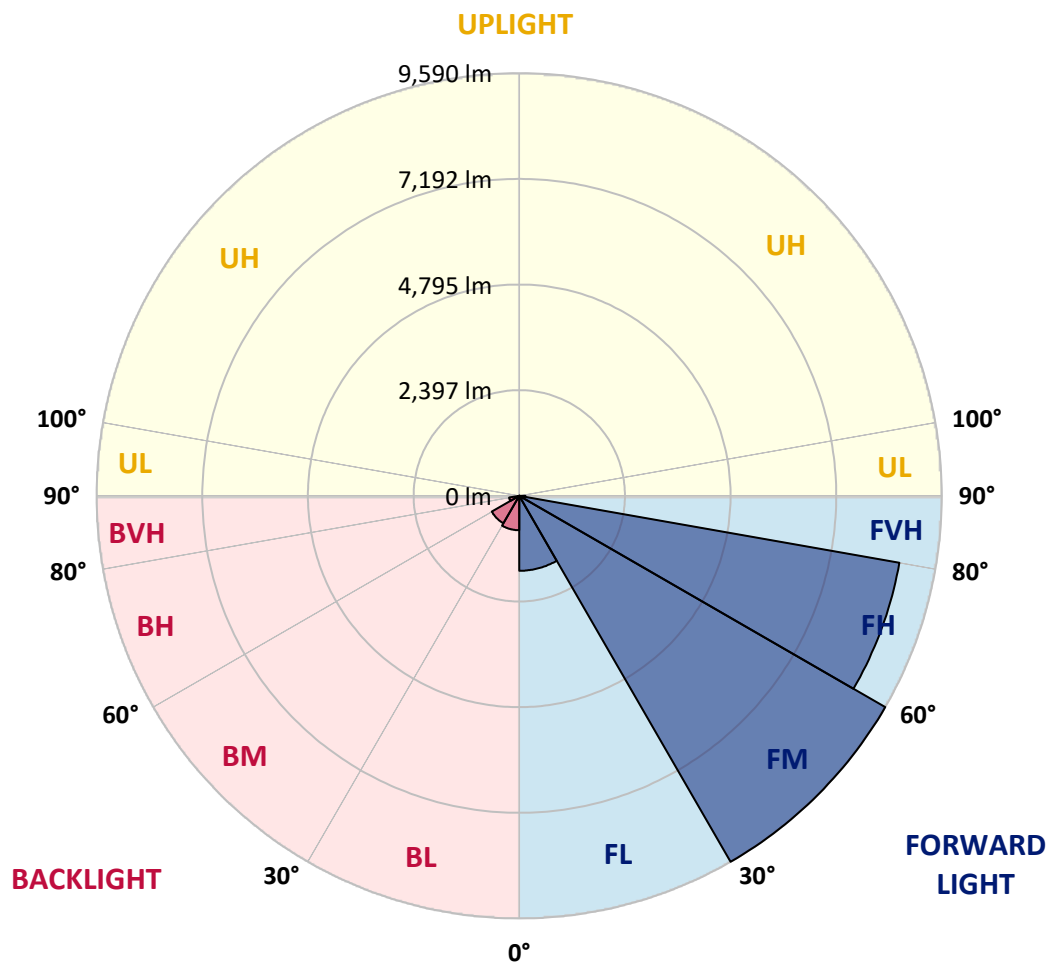
CATALOG NUMBER: GLEON-SA5D-722-U-T3R-HSS

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |          |
|------|-------------|--------|-----------|-------------------------|------|----------|
|      |             |        |           | B                       | U    | G        |
| FL   | (0°-30°)    | 1701.2 | 7.8       |                         |      |          |
| FM   | (30°-60°)   | 9589.8 | 43.7      |                         |      |          |
| FH   | (60°-80°)   | 8758.0 | 39.9      |                         |      | G4/12000 |
| FVH  | (80°-90°)   | 141.1  | 0.6       |                         |      | G2/225   |
| BL   | (0°-30°)    | 781.4  | 3.6       | B2/1000                 |      |          |
| BM   | (30°-60°)   | 719.8  | 3.3       | B1/1000                 |      |          |
| BH   | (60°-80°)   | 232.6  | 1.1       | B1/500                  |      | G1/500   |
| BVH  | (80°-90°)   | 2.3    | 0.0       |                         |      | G0/10    |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |          |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |          |

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

Type III Medium



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°     | 35°     | 45°     | 54°     | 55°     | 65°     | 75°     | 85°     |
|-------|--------|--------|--------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 4228.5 | 4228.5 | 4228.5 | 4228.5  | 4228.5  | 4228.5  | 4228.5  | 4228.5  | 4228.5  | 4228.5  | 4228.5  |
| 2.5°  | 4104.5 | 4109.4 | 4127.1 | 4135.0  | 4153.7  | 4185.2  | 4200.9  | 4201.9  | 4227.5  | 4237.4  | 4245.2  |
| 5°    | 3814.0 | 3843.6 | 3873.1 | 3904.6  | 3961.7  | 4037.5  | 4112.3  | 4119.2  | 4201.9  | 4263.0  | 4295.5  |
| 7.5°  | 3564.0 | 3590.5 | 3626.0 | 3676.2  | 3756.9  | 3876.1  | 4001.1  | 4015.9  | 4172.4  | 4311.2  | 4384.1  |
| 10°   | 3307.0 | 3328.7 | 3379.9 | 3453.7  | 3564.9  | 3724.4  | 3892.8  | 3917.4  | 4145.8  | 4376.2  | 4504.2  |
| 12.5° | 3032.3 | 3045.1 | 3107.1 | 3213.5  | 3376.9  | 3579.7  | 3801.2  | 3833.7  | 4129.1  | 4451.0  | 4645.9  |
| 15°   | 2823.6 | 2829.5 | 2888.6 | 2998.8  | 3185.9  | 3449.8  | 3730.3  | 3769.7  | 4133.0  | 4540.6  | 4800.5  |
| 17.5° | 2770.4 | 2773.4 | 2804.9 | 2880.7  | 3046.1  | 3333.6  | 3674.2  | 3722.5  | 4144.8  | 4628.2  | 4956.1  |
| 20°   | 2986.0 | 2965.4 | 2932.9 | 2921.1  | 2992.0  | 3263.7  | 3640.8  | 3694.9  | 4160.6  | 4706.0  | 5095.9  |
| 22.5° | 3577.7 | 3516.7 | 3381.8 | 3201.7  | 3092.4  | 3268.6  | 3649.6  | 3703.8  | 4210.8  | 4801.5  | 5257.3  |
| 25°   | 4455.9 | 4371.3 | 4141.9 | 3787.4  | 3446.8  | 3410.4  | 3723.4  | 3778.6  | 4308.3  | 4915.7  | 5411.9  |
| 27.5° | 5455.2 | 5371.5 | 5090.9 | 4584.9  | 4004.0  | 3691.0  | 3892.8  | 3944.0  | 4453.0  | 5017.1  | 5530.0  |
| 30°   | 6412.2 | 6388.5 | 6057.7 | 5482.8  | 4705.0  | 4145.8  | 4111.4  | 4154.7  | 4560.3  | 5078.1  | 5623.6  |
| 32.5° | 7223.4 | 7186.0 | 6920.2 | 6361.0  | 5507.4  | 4692.2  | 4368.3  | 4381.1  | 4641.0  | 5156.9  | 5745.7  |
| 35°   | 7975.6 | 7929.3 | 7696.0 | 7167.3  | 6330.5  | 5359.7  | 4764.1  | 4745.4  | 4817.2  | 5315.4  | 5922.9  |
| 37.5° | 8632.3 | 8674.6 | 8415.7 | 7912.6  | 7068.8  | 6053.8  | 5297.7  | 5241.6  | 5092.9  | 5573.4  | 6179.8  |
| 40°   | 9181.6 | 9181.6 | 9046.7 | 8627.3  | 7866.3  | 6771.5  | 5901.2  | 5827.4  | 5507.4  | 5971.1  | 6505.7  |
| 42.5° | 9379.5 | 9421.8 | 9472.1 | 9234.8  | 8580.1  | 7517.8  | 6573.6  | 6496.8  | 6091.2  | 6535.2  | 6917.2  |
| 45°   | 9391.3 | 9458.3 | 9715.2 | 9714.2  | 9224.9  | 8259.1  | 7331.7  | 7295.3  | 6839.5  | 7259.8  | 7427.2  |
| 47.5° | 9224.9 | 9308.6 | 9732.0 | 9972.2  | 9735.9  | 8949.3  | 8160.7  | 8115.4  | 7718.6  | 8147.9  | 7960.8  |
| 50°   | 8968.0 | 9060.5 | 9552.8 | 10073.6 | 10083.4 | 9549.8  | 9033.9  | 8966.0  | 8686.4  | 9162.9  | 8512.1  |
| 52.5° | 8508.2 | 8687.4 | 9392.3 | 10097.2 | 10311.8 | 10068.7 | 9864.9  | 9835.3  | 9769.4  | 10140.5 | 8951.2  |
| 55°   | 7524.7 | 7723.5 | 8989.6 | 10105.1 | 10523.5 | 10528.4 | 10643.6 | 10651.5 | 10784.4 | 11054.2 | 9278.1  |
| 57.5° | 7060.0 | 7172.2 | 8286.7 | 10142.5 | 10837.6 | 11050.2 | 11437.2 | 11498.2 | 11704.0 | 11921.5 | 9651.2  |
| 60°   | 6767.6 | 6900.5 | 7940.1 | 10091.3 | 11330.8 | 11734.5 | 12172.6 | 12193.3 | 12413.8 | 12816.5 | 10156.3 |
| 62.5° | 6534.3 | 6665.2 | 7721.6 | 9894.4  | 11885.1 | 12557.5 | 12891.3 | 12893.3 | 13058.7 | 13882.7 | 10730.3 |
| 65°   | 5958.3 | 6068.6 | 7279.5 | 9672.9  | 12251.4 | 13371.7 | 13726.2 | 13713.4 | 13848.2 | 15007.0 | 11396.8 |
| 67.5° | 5125.4 | 5210.1 | 6376.7 | 8833.1  | 12113.5 | 14112.1 | 14986.3 | 14944.0 | 14780.6 | 15978.7 | 11658.7 |
| 70°   | 3962.7 | 3993.2 | 5026.0 | 7361.2  | 10821.8 | 14396.6 | 16204.2 | 16182.5 | 15352.6 | 15804.5 | 10698.8 |
| 71°   | 3275.5 | 3375.9 | 4429.3 | 6496.8  | 9956.4  | 14133.8 | 16322.3 | 16335.1 | 15208.8 | 15329.9 | 10038.2 |
| 72.5° | 1902.1 | 1987.7 | 3210.5 | 4989.5  | 8453.1  | 13037.0 | 15710.0 | 15802.5 | 14537.4 | 13943.7 | 8574.2  |
| 75°   | 407.6  | 436.1  | 1190.3 | 2415.0  | 4649.9  | 9137.3  | 12400.0 | 12729.8 | 11848.7 | 9485.8  | 5167.7  |
| 77.5° | 283.5  | 306.2  | 510.0  | 1095.8  | 1536.8  | 4515.0  | 7702.9  | 8075.0  | 7078.7  | 3564.9  | 1654.0  |
| 80°   | 224.5  | 250.1  | 397.7  | 541.5   | 415.5   | 1456.1  | 3608.3  | 3835.7  | 2360.9  | 795.5   | 278.6   |
| 82.5° | 125.0  | 148.7  | 310.1  | 292.4   | 159.5   | 276.6   | 1010.1  | 1142.0  | 472.6   | 160.5   | 66.0    |
| 85°   | 36.4   | 44.3   | 199.9  | 212.7   | 67.9    | 53.2    | 172.3   | 213.6   | 89.6    | 42.3    | 29.5    |
| 87.5° | 0.0    | 0.0    | 96.5   | 81.7    | 19.7    | 7.9     | 15.8    | 17.7    | 17.7    | 17.7    | 19.7    |
| 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: P321819

CATALOG NUMBER: GLEON-SA5D-722-U-T3R-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 4228.5 | 4228.5 | 4228.5 | 4228.5 | 4228.5 | 4228.5 | 4228.5 | 4228.5 | 4228.5 | 4228.5 | 4228.5 |
| 2.5°  | 4245.2 | 4252.1 | 4227.5 | 4195.0 | 4160.6 | 4118.2 | 4073.9 | 4039.5 | 4038.5 | 4021.8 | 4005.0 |
| 5°    | 4297.4 | 4293.5 | 4225.6 | 4122.2 | 4000.1 | 3873.1 | 3752.0 | 3615.2 | 3569.9 | 3513.7 | 3495.0 |
| 7.5°  | 4393.9 | 4366.3 | 4222.6 | 3996.2 | 3728.4 | 3462.6 | 3187.9 | 2911.2 | 2793.1 | 2686.8 | 2668.0 |
| 10°   | 4515.0 | 4462.8 | 4203.9 | 3807.1 | 3315.9 | 2825.6 | 2411.1 | 2035.0 | 1869.6 | 1742.6 | 1736.7 |
| 12.5° | 4641.0 | 4561.3 | 4151.7 | 3521.6 | 2775.4 | 2086.2 | 1608.7 | 1238.5 | 1100.7 | 1012.1 | 1020.0 |
| 15°   | 4772.9 | 4653.8 | 4039.5 | 3136.7 | 2160.0 | 1415.7 | 988.5  | 770.9  | 715.7  | 693.1  | 699.0  |
| 17.5° | 4907.8 | 4717.8 | 3882.9 | 2673.0 | 1552.6 | 913.6  | 684.2  | 623.2  | 623.2  | 628.1  | 630.1  |
| 20°   | 5025.0 | 4752.3 | 3652.6 | 2153.1 | 1052.5 | 665.5  | 598.6  | 589.7  | 594.6  | 602.5  | 603.5  |
| 22.5° | 5141.2 | 4754.2 | 3352.3 | 1626.4 | 736.4  | 582.8  | 570.0  | 566.1  | 569.1  | 577.9  | 578.9  |
| 25°   | 5235.7 | 4730.6 | 2976.2 | 1156.8 | 587.8  | 549.4  | 543.5  | 541.5  | 543.5  | 554.3  | 554.3  |
| 27.5° | 5274.1 | 4645.0 | 2517.4 | 813.2  | 526.7  | 511.9  | 510.0  | 511.9  | 514.9  | 522.8  | 523.8  |
| 30°   | 5278.0 | 4495.3 | 2017.3 | 588.7  | 477.5  | 461.7  | 465.7  | 472.6  | 469.6  | 467.6  | 469.6  |
| 32.5° | 5287.8 | 4322.0 | 1529.9 | 484.4  | 436.1  | 411.5  | 406.6  | 406.6  | 394.8  | 387.9  | 384.0  |
| 35°   | 5320.3 | 4118.2 | 1109.6 | 435.2  | 393.8  | 365.3  | 346.6  | 324.9  | 302.2  | 290.4  | 287.5  |
| 37.5° | 5371.5 | 3904.6 | 794.5  | 402.7  | 356.4  | 323.9  | 288.5  | 250.1  | 217.6  | 208.7  | 208.7  |
| 40°   | 5465.1 | 3684.1 | 587.8  | 377.1  | 326.9  | 286.5  | 233.3  | 183.1  | 153.6  | 148.7  | 148.7  |
| 42.5° | 5612.7 | 3451.7 | 468.6  | 354.4  | 301.3  | 248.1  | 178.2  | 132.9  | 111.3  | 108.3  | 107.3  |
| 45°   | 5766.3 | 3195.7 | 409.6  | 332.8  | 273.7  | 203.8  | 131.9  | 98.5   | 85.7   | 82.7   | 82.7   |
| 47.5° | 5919.9 | 2923.0 | 381.0  | 312.1  | 247.1  | 158.5  | 98.5   | 77.8   | 71.9   | 71.9   | 72.9   |
| 50°   | 6049.9 | 2638.5 | 360.3  | 289.4  | 212.7  | 120.1  | 77.8   | 66.0   | 64.0   | 67.9   | 68.9   |
| 52.5° | 6082.4 | 2358.9 | 334.7  | 260.9  | 170.3  | 91.6   | 64.0   | 58.1   | 58.1   | 58.1   | 58.1   |
| 55°   | 6062.7 | 2142.3 | 301.3  | 225.5  | 126.0  | 72.9   | 55.1   | 51.2   | 50.2   | 50.2   | 50.2   |
| 57.5° | 6129.6 | 2014.3 | 241.2  | 175.2  | 90.6   | 59.1   | 48.2   | 45.3   | 43.3   | 42.3   | 42.3   |
| 60°   | 6264.5 | 1930.6 | 172.3  | 126.0  | 67.9   | 49.2   | 41.3   | 38.4   | 35.4   | 33.5   | 33.5   |
| 62.5° | 6443.7 | 1857.8 | 128.0  | 93.5   | 52.2   | 39.4   | 34.5   | 31.5   | 27.6   | 25.6   | 25.6   |
| 65°   | 6581.5 | 1727.8 | 97.5   | 69.9   | 39.4   | 31.5   | 26.6   | 25.6   | 19.7   | 17.7   | 16.7   |
| 67.5° | 6370.8 | 1442.3 | 78.8   | 51.2   | 29.5   | 24.6   | 20.7   | 19.7   | 11.8   | 9.8    | 9.8    |
| 70°   | 5464.1 | 1004.2 | 63.0   | 37.4   | 21.7   | 19.7   | 16.7   | 12.8   | 8.9    | 7.9    | 7.9    |
| 71°   | 4955.1 | 838.8  | 57.1   | 31.5   | 18.7   | 18.7   | 15.8   | 10.8   | 7.9    | 6.9    | 6.9    |
| 72.5° | 4116.3 | 595.6  | 48.2   | 24.6   | 16.7   | 19.7   | 16.7   | 9.8    | 7.9    | 6.9    | 5.9    |
| 75°   | 2389.4 | 249.1  | 33.5   | 16.7   | 12.8   | 23.6   | 21.7   | 8.9    | 5.9    | 4.9    | 4.9    |
| 77.5° | 718.7  | 91.6   | 18.7   | 10.8   | 9.8    | 20.7   | 24.6   | 7.9    | 3.0    | 1.0    | 1.0    |
| 80°   | 130.9  | 39.4   | 11.8   | 6.9    | 6.9    | 12.8   | 18.7   | 3.9    | 0.0    | 0.0    | 0.0    |
| 82.5° | 46.3   | 19.7   | 6.9    | 3.9    | 3.0    | 5.9    | 8.9    | 0.0    | 0.0    | 0.0    | 0.0    |
| 85°   | 26.6   | 13.8   | 3.9    | 2.0    | 0.0    | 1.0    | 2.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 87.5° | 17.7   | 3.9    | 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: SP1-1908-441-10-R4

Test Date: 10/25/2019

Luminaire Tested: SA1C-722-U-5WQ

Data in this report applies to families of products SA1C-722-U-5WQ.

### Test Information

Test Method: LM-79-2008 Report  
 Number: SP1-1908-441-10-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-722-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):                  | 2237    | CRI (Ra): | 72.0 |      |       |
| CIE u':                   | 0.2876  | R1:       | 68.9 | R9:  | -17.4 |
| CIE v':                   | 0.5346  | R2:       | 83.0 | R10: | 61.3  |
| Duv:                      | -0.0006 | R3:       | 95.2 | R11: | 59.8  |
| CIE x:                    | 0.5005  | R4:       | 66.2 | R12: | 50.5  |
| CIE y:                    | 0.4134  | R5:       | 65.9 | R13: | 71.1  |
| CIE z:                    | 0.0860  | R6:       | 76.3 | R14: | 96.9  |
| Peak Wavelength (nm):     | 603     | R7:       | 76.7 |      |       |
| Dominant Wavelength (nm): | 587     | R8:       | 43.8 |      |       |
| Purity:                   | 74.5    |           |      |      |       |
| Rf:                       | 69.8    |           |      |      |       |
| Rg:                       | 99.2    |           |      |      |       |



### Test Conditions

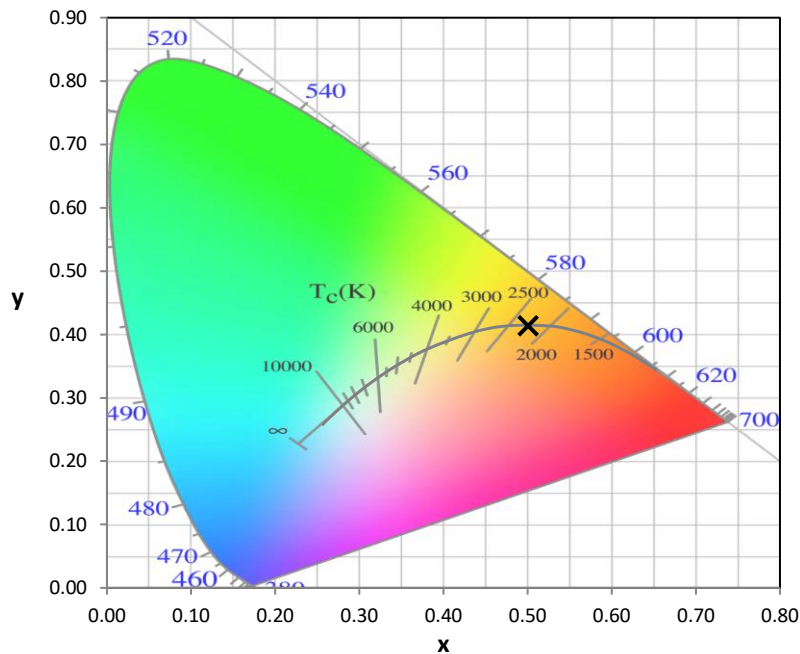
Stabilization Time: 71M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.7/41%  
 Sphere Temperature (°C): 25.6

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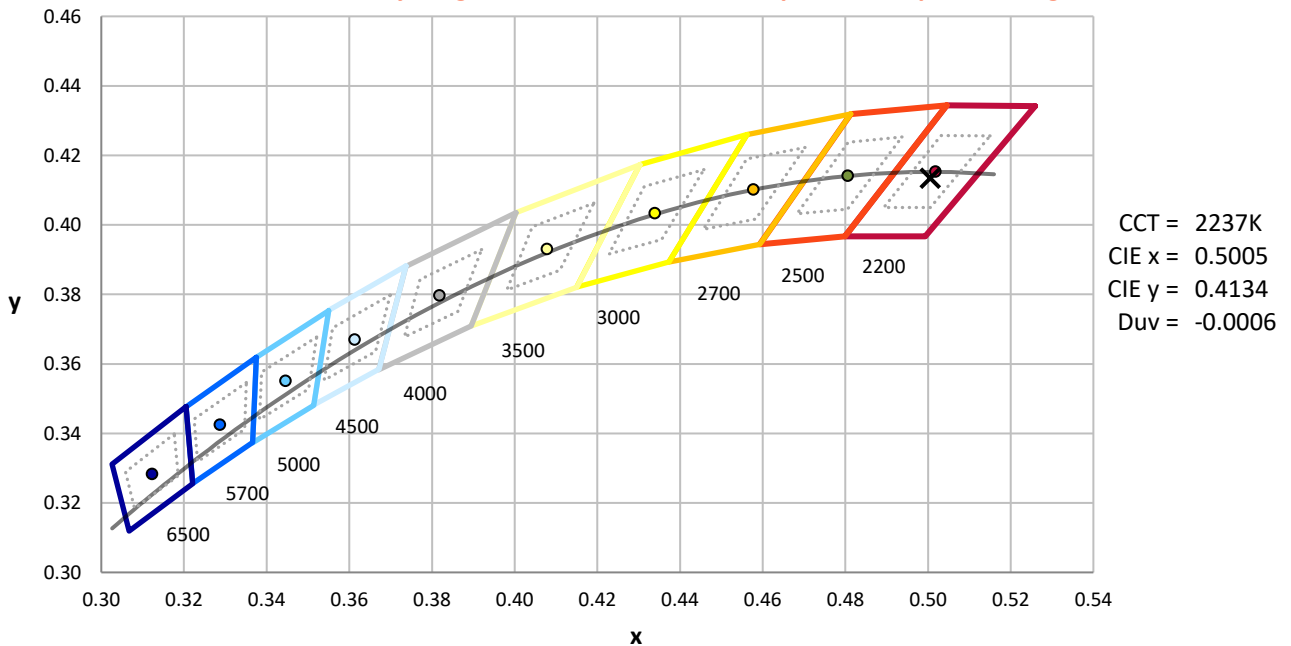
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| 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 2200K 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       | 1768             | NR               | 490       | 5206             | NR               | 620       | 130919           | NR               | 750       | 8553             | NR               | 880       | 2713             | NR               |
| 365       | 1569             | NR               | 495       | 7286             | NR               | 625       | 125335           | NR               | 755       | 7696             | NR               | 885       | 2316             | NR               |
| 370       | 1594             | NR               | 500       | 10654            | NR               | 630       | 118388           | NR               | 760       | 6978             | NR               | 890       | 2539             | NR               |
| 375       | 1744             | NR               | 505       | 15189            | NR               | 635       | 111855           | NR               | 765       | 6377             | NR               | 895       | 1933             | NR               |
| 380       | 1659             | NR               | 510       | 20541            | NR               | 640       | 104062           | NR               | 770       | 5600             | NR               | 900       | 2216             | NR               |
| 385       | 1504             | NR               | 515       | 26492            | NR               | 645       | 96365            | NR               | 775       | 5000             | NR               | 905       | 2067             | NR               |
| 390       | 1541             | NR               | 520       | 32294            | NR               | 650       | 88651            | NR               | 780       | 4709             | NR               | 910       | 1959             | NR               |
| 395       | 1355             | NR               | 525       | 38123            | NR               | 655       | 81152            | NR               | 785       | 4305             | NR               | 915       | 1874             | NR               |
| 400       | 1243             | NR               | 530       | 43232            | NR               | 660       | 73523            | NR               | 790       | 4040             | NR               | 920       | 1484             | NR               |
| 405       | 1417             | NR               | 535       | 48012            | NR               | 665       | 66123            | NR               | 795       | 3642             | NR               | 925       | 1914             | NR               |
| 410       | 2147             | NR               | 540       | 52623            | NR               | 670       | 58677            | NR               | 800       | 3594             | NR               | 930       | 1948             | NR               |
| 415       | 3837             | NR               | 545       | 57516            | NR               | 675       | 52349            | NR               | 805       | 3190             | NR               | 935       | 2079             | NR               |
| 420       | 7159             | NR               | 550       | 62613            | NR               | 680       | 46159            | NR               | 810       | 3241             | NR               | 940       | 2263             | NR               |
| 425       | 12599            | NR               | 555       | 68554            | NR               | 685       | 40525            | NR               | 815       | 2732             | NR               | 945       | 1688             | NR               |
| 430       | 19019            | NR               | 560       | 75325            | NR               | 690       | 35615            | NR               | 820       | 2612             | NR               | 950       | 1560             | NR               |
| 435       | 24875            | NR               | 565       | 82533            | NR               | 695       | 31158            | NR               | 825       | 2966             | NR               | 955       | 2826             | NR               |
| 440       | 29103            | NR               | 570       | 90909            | NR               | 700       | 27409            | NR               | 830       | 2574             | NR               | 960       | 1477             | NR               |
| 445       | 29901            | NR               | 575       | 99621            | NR               | 705       | 24204            | NR               | 835       | 2633             | NR               | 965       | 1568             | NR               |
| 450       | 24862            | NR               | 580       | 108484           | NR               | 710       | 21558            | NR               | 840       | 2526             | NR               | 970       | 2030             | NR               |
| 455       | 15942            | NR               | 585       | 116679           | NR               | 715       | 19222            | NR               | 845       | 2631             | NR               | 975       | 1986             | NR               |
| 460       | 9916             | NR               | 590       | 123752           | NR               | 720       | 17310            | NR               | 850       | 2079             | NR               | 980       | 2540             | NR               |
| 465       | 7051             | NR               | 595       | 129324           | NR               | 725       | 15280            | NR               | 855       | 2309             | NR               | 985       | 1139             | NR               |
| 470       | 5227             | NR               | 600       | 134082           | NR               | 730       | 13282            | NR               | 860       | 2528             | NR               | 990       | 2018             | NR               |
| 475       | 4257             | NR               | 605       | 135698           | NR               | 735       | 11753            | NR               | 865       | 2121             | NR               | 995       | 3445             | NR               |
| 480       | 4052             | NR               | 610       | 135144           | NR               | 740       | 10654            | NR               | 870       | 2751             | NR               | 1000      | 3704             | NR               |
| 485       | 4298             | NR               | 615       | 134180           | NR               | 745       | 9451             | NR               | 875       | 2317             | NR               |           |                  |                  |

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Scotopic Flux vs. Wavelength



Scotopic Lumens: 4696.9

S/P: 0.85

| 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       | 1768             | NR               | 490       | 5206             | NR               | 620       | 130919           | NR               | 750       | 8553             | NR               | 880       | 2713             | NR               |
| 365       | 1569             | NR               | 495       | 7286             | NR               | 625       | 125335           | NR               | 755       | 7696             | NR               | 885       | 2316             | NR               |
| 370       | 1594             | NR               | 500       | 10654            | NR               | 630       | 118388           | NR               | 760       | 6978             | NR               | 890       | 2539             | NR               |
| 375       | 1744             | NR               | 505       | 15189            | NR               | 635       | 111855           | NR               | 765       | 6377             | NR               | 895       | 1933             | NR               |
| 380       | 1659             | NR               | 510       | 20541            | NR               | 640       | 104062           | NR               | 770       | 5600             | NR               | 900       | 2216             | NR               |
| 385       | 1504             | NR               | 515       | 26492            | NR               | 645       | 96365            | NR               | 775       | 5000             | NR               | 905       | 2067             | NR               |
| 390       | 1541             | NR               | 520       | 32294            | NR               | 650       | 88651            | NR               | 780       | 4709             | NR               | 910       | 1959             | NR               |
| 395       | 1355             | NR               | 525       | 38123            | NR               | 655       | 81152            | NR               | 785       | 4305             | NR               | 915       | 1874             | NR               |
| 400       | 1243             | NR               | 530       | 43232            | NR               | 660       | 73523            | NR               | 790       | 4040             | NR               | 920       | 1484             | NR               |
| 405       | 1417             | NR               | 535       | 48012            | NR               | 665       | 66123            | NR               | 795       | 3642             | NR               | 925       | 1914             | NR               |
| 410       | 2147             | NR               | 540       | 52623            | NR               | 670       | 58677            | NR               | 800       | 3594             | NR               | 930       | 1948             | NR               |
| 415       | 3837             | NR               | 545       | 57516            | NR               | 675       | 52349            | NR               | 805       | 3190             | NR               | 935       | 2079             | NR               |
| 420       | 7159             | NR               | 550       | 62613            | NR               | 680       | 46159            | NR               | 810       | 3241             | NR               | 940       | 2263             | NR               |
| 425       | 12599            | NR               | 555       | 68554            | NR               | 685       | 40525            | NR               | 815       | 2732             | NR               | 945       | 1688             | NR               |
| 430       | 19019            | NR               | 560       | 75325            | NR               | 690       | 35615            | NR               | 820       | 2612             | NR               | 950       | 1560             | NR               |
| 435       | 24875            | NR               | 565       | 82533            | NR               | 695       | 31158            | NR               | 825       | 2966             | NR               | 955       | 2826             | NR               |
| 440       | 29103            | NR               | 570       | 90909            | NR               | 700       | 27409            | NR               | 830       | 2574             | NR               | 960       | 1477             | NR               |
| 445       | 29901            | NR               | 575       | 99621            | NR               | 705       | 24204            | NR               | 835       | 2633             | NR               | 965       | 1568             | NR               |
| 450       | 24862            | NR               | 580       | 108484           | NR               | 710       | 21558            | NR               | 840       | 2526             | NR               | 970       | 2030             | NR               |
| 455       | 15942            | NR               | 585       | 116679           | NR               | 715       | 19222            | NR               | 845       | 2631             | NR               | 975       | 1986             | NR               |
| 460       | 9916             | NR               | 590       | 123752           | NR               | 720       | 17310            | NR               | 850       | 2079             | NR               | 980       | 2540             | NR               |
| 465       | 7051             | NR               | 595       | 129324           | NR               | 725       | 15280            | NR               | 855       | 2309             | NR               | 985       | 1139             | NR               |
| 470       | 5227             | NR               | 600       | 134082           | NR               | 730       | 13282            | NR               | 860       | 2528             | NR               | 990       | 2018             | NR               |
| 475       | 4257             | NR               | 605       | 135698           | NR               | 735       | 11753            | NR               | 865       | 2121             | NR               | 995       | 3445             | NR               |
| 480       | 4052             | NR               | 610       | 135144           | NR               | 740       | 10654            | NR               | 870       | 2751             | NR               | 1000      | 3704             | NR               |
| 485       | 4298             | NR               | 615       | 134180           | NR               | 745       | 9451             | NR               | 875       | 2317             | NR               |           |                  |                  |

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**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 1470.8 M/P: 0.27**

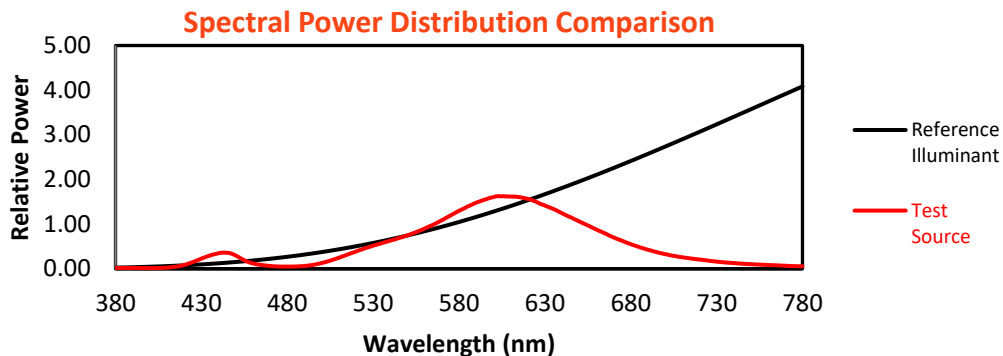
| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 1768             | NR               | 490       | 5206             | NR               | 620       | 130919           | NR               | 750       | 8553             | NR               | 880       | 2713             | NR               |
| 365       | 1569             | NR               | 495       | 7286             | NR               | 625       | 125335           | NR               | 755       | 7696             | NR               | 885       | 2316             | NR               |
| 370       | 1594             | NR               | 500       | 10654            | NR               | 630       | 118388           | NR               | 760       | 6978             | NR               | 890       | 2539             | NR               |
| 375       | 1744             | NR               | 505       | 15189            | NR               | 635       | 111855           | NR               | 765       | 6377             | NR               | 895       | 1933             | NR               |
| 380       | 1659             | NR               | 510       | 20541            | NR               | 640       | 104062           | NR               | 770       | 5600             | NR               | 900       | 2216             | NR               |
| 385       | 1504             | NR               | 515       | 26492            | NR               | 645       | 96365            | NR               | 775       | 5000             | NR               | 905       | 2067             | NR               |
| 390       | 1541             | NR               | 520       | 32294            | NR               | 650       | 88651            | NR               | 780       | 4709             | NR               | 910       | 1959             | NR               |
| 395       | 1355             | NR               | 525       | 38123            | NR               | 655       | 81152            | NR               | 785       | 4305             | NR               | 915       | 1874             | NR               |
| 400       | 1243             | NR               | 530       | 43232            | NR               | 660       | 73523            | NR               | 790       | 4040             | NR               | 920       | 1484             | NR               |
| 405       | 1417             | NR               | 535       | 48012            | NR               | 665       | 66123            | NR               | 795       | 3642             | NR               | 925       | 1914             | NR               |
| 410       | 2147             | NR               | 540       | 52623            | NR               | 670       | 58677            | NR               | 800       | 3594             | NR               | 930       | 1948             | NR               |
| 415       | 3837             | NR               | 545       | 57516            | NR               | 675       | 52349            | NR               | 805       | 3190             | NR               | 935       | 2079             | NR               |
| 420       | 7159             | NR               | 550       | 62613            | NR               | 680       | 46159            | NR               | 810       | 3241             | NR               | 940       | 2263             | NR               |
| 425       | 12599            | NR               | 555       | 68554            | NR               | 685       | 40525            | NR               | 815       | 2732             | NR               | 945       | 1688             | NR               |
| 430       | 19019            | NR               | 560       | 75325            | NR               | 690       | 35615            | NR               | 820       | 2612             | NR               | 950       | 1560             | NR               |
| 435       | 24875            | NR               | 565       | 82533            | NR               | 695       | 31158            | NR               | 825       | 2966             | NR               | 955       | 2826             | NR               |
| 440       | 29103            | NR               | 570       | 90909            | NR               | 700       | 27409            | NR               | 830       | 2574             | NR               | 960       | 1477             | NR               |
| 445       | 29901            | NR               | 575       | 99621            | NR               | 705       | 24204            | NR               | 835       | 2633             | NR               | 965       | 1568             | NR               |
| 450       | 24862            | NR               | 580       | 108484           | NR               | 710       | 21558            | NR               | 840       | 2526             | NR               | 970       | 2030             | NR               |
| 455       | 15942            | NR               | 585       | 116679           | NR               | 715       | 19222            | NR               | 845       | 2631             | NR               | 975       | 1986             | NR               |
| 460       | 9916             | NR               | 590       | 123752           | NR               | 720       | 17310            | NR               | 850       | 2079             | NR               | 980       | 2540             | NR               |
| 465       | 7051             | NR               | 595       | 129324           | NR               | 725       | 15280            | NR               | 855       | 2309             | NR               | 985       | 1139             | NR               |
| 470       | 5227             | NR               | 600       | 134082           | NR               | 730       | 13282            | NR               | 860       | 2528             | NR               | 990       | 2018             | NR               |
| 475       | 4257             | NR               | 605       | 135698           | NR               | 735       | 11753            | NR               | 865       | 2121             | NR               | 995       | 3445             | NR               |
| 480       | 4052             | NR               | 610       | 135144           | NR               | 740       | 10654            | NR               | 870       | 2751             | NR               | 1000      | 3704             | NR               |
| 485       | 4298             | NR               | 615       | 134180           | NR               | 745       | 9451             | NR               | 875       | 2317             | NR               |           |                  |                  |

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### Summary

$R_f = 69.8$   
 $R_g = 99.2$   
 CIE  $R_a = 72.0$   
 $R_g = -17.4$



### Color Vector Graphics





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**TM-30-18**

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

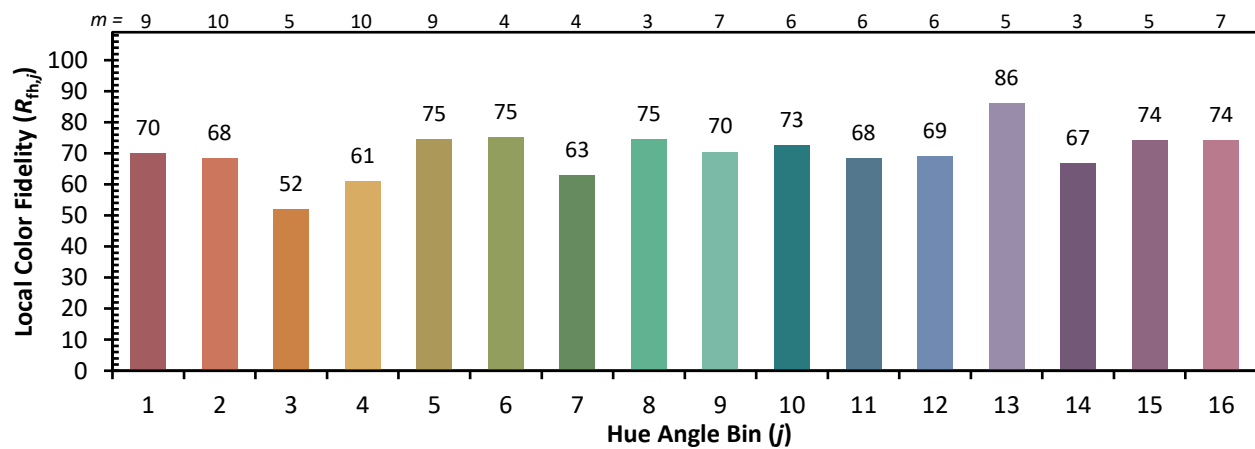
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 87 | CES26 = 56 | CES51 = 74 | CES76 = 56 |
| CES02 = 65 | CES27 = 76 | CES52 = 76 | CES77 = 81 |
| CES03 = 32 | CES28 = 83 | CES53 = 65 | CES78 = 63 |
| CES04 = 72 | CES29 = 46 | CES54 = 78 | CES79 = 84 |
| CES05 = 52 | CES30 = 48 | CES55 = 75 | CES80 = 84 |
| CES06 = 52 | CES31 = 51 | CES56 = 65 | CES81 = 63 |
| CES07 = 44 | CES32 = 51 | CES57 = 62 | CES82 = 92 |
| CES08 = 42 | CES33 = 53 | CES58 = 66 | CES83 = 83 |
| CES09 = 29 | CES34 = 70 | CES59 = 84 | CES84 = 92 |
| CES10 = 78 | CES35 = 85 | CES60 = 90 | CES85 = 81 |
| CES11 = 61 | CES36 = 78 | CES61 = 84 | CES86 = 56 |
| CES12 = 68 | CES37 = 80 | CES62 = 70 | CES87 = 78 |
| CES13 = 45 | CES38 = 53 | CES63 = 68 | CES88 = 72 |
| CES14 = 75 | CES39 = 90 | CES64 = 69 | CES89 = 62 |
| CES15 = 72 | CES40 = 84 | CES65 = 67 | CES90 = 67 |
| CES16 = 49 | CES41 = 75 | CES66 = 64 | CES91 = 90 |
| CES17 = 51 | CES42 = 79 | CES67 = 63 | CES92 = 67 |
| CES18 = 57 | CES43 = 64 | CES68 = 69 | CES93 = 79 |
| CES19 = 74 | CES44 = 98 | CES69 = 80 | CES94 = 52 |
| CES20 = 68 | CES45 = 73 | CES70 = 63 | CES95 = 76 |
| CES21 = 89 | CES46 = 67 | CES71 = 63 | CES96 = 78 |
| CES22 = 81 | CES47 = 60 | CES72 = 87 | CES97 = 77 |
| CES23 = 92 | CES48 = 48 | CES73 = 56 | CES98 = 71 |
| CES24 = 92 | CES49 = 64 | CES74 = 87 | CES99 = 65 |
| CES25 = 74 | CES50 = 74 | CES75 = 66 |            |



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Color Rendition by Hue-Angle Bin



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**Measure Comparisons**



(END OF REPORT)