

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: P319388

Luminaire Tested: **GLEON-SA4A-750-U-SL2**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P319388  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-20)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: MCGRAW-EDISON  
Catalog Number: GLEON-SA4A-750-U-SL2  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(4) 70 CRI, 5000K, 615mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE II SPILL  
LIGHT ELIMINATOR OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 18416 lumens  
Efficiency: N/A  
Efficacy: 142.8 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 1' x H: 0')  
IES Classification: Type III - Medium  
BUG Rating: B3 - U0 - G4

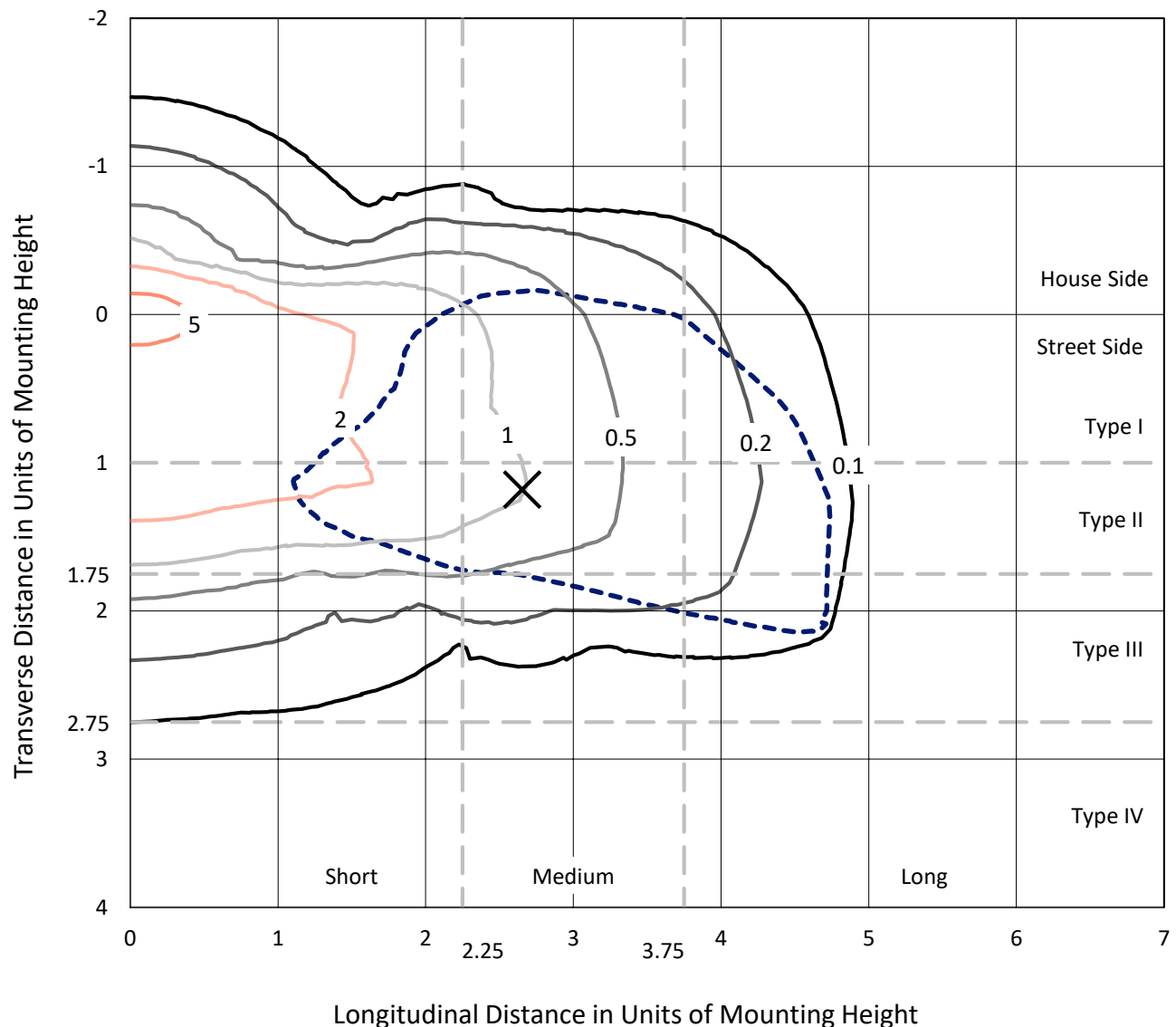
Input Watts (W): 129  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



REPORT NUMBER: P319388  
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## Iso-Footcandle Lines of Horizontal Illumination

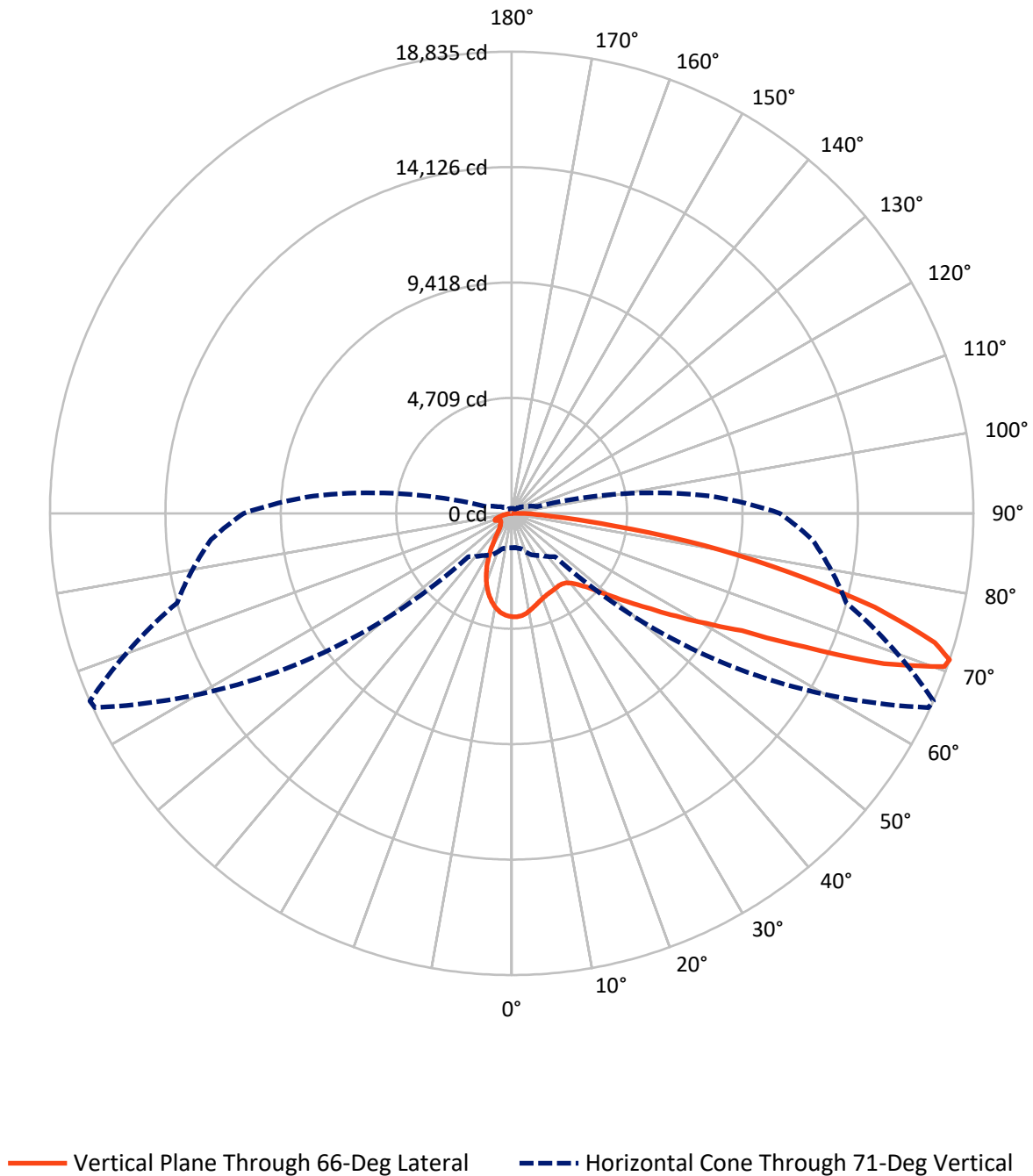
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 6.7 fc  
 Type III - Medium - N/A

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## Luminous Intensity Polar Plot



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CATALOG NUMBER: GLEON-SA4A-750-U-SL2

**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 3413.0   | 0.0    | 3413.0  |
|                    | % Fixture | 18.5     | 0.0    | 18.5    |
| <b>Street Side</b> | Lumens    | 15003.0  | 0.0    | 15003.0 |
|                    | % Fixture | 81.5     | 0.0    | 81.5    |
| <b>Total</b>       | Lumens    | 18416.0  | 0.0    | 18416.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 371.3   | 2.0       |
| 10°-20°   | 890.7   | 4.8       |
| 20°-30°   | 1196.4  | 6.5       |
| 30°-40°   | 1573.8  | 8.5       |
| 40°-50°   | 2289.5  | 12.4      |
| 50°-60°   | 3576.4  | 19.4      |
| 60°-70°   | 4480.1  | 24.3      |
| 70°-80°   | 3417.3  | 18.6      |
| 80°-90°   | 620.5   | 3.4       |
| 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°    | 18416.0 | 100.0     |
| 0°-180°   | 18416.0 | 100.0     |

**Coefficient of Utilization**



REPORT NUMBER: P319388

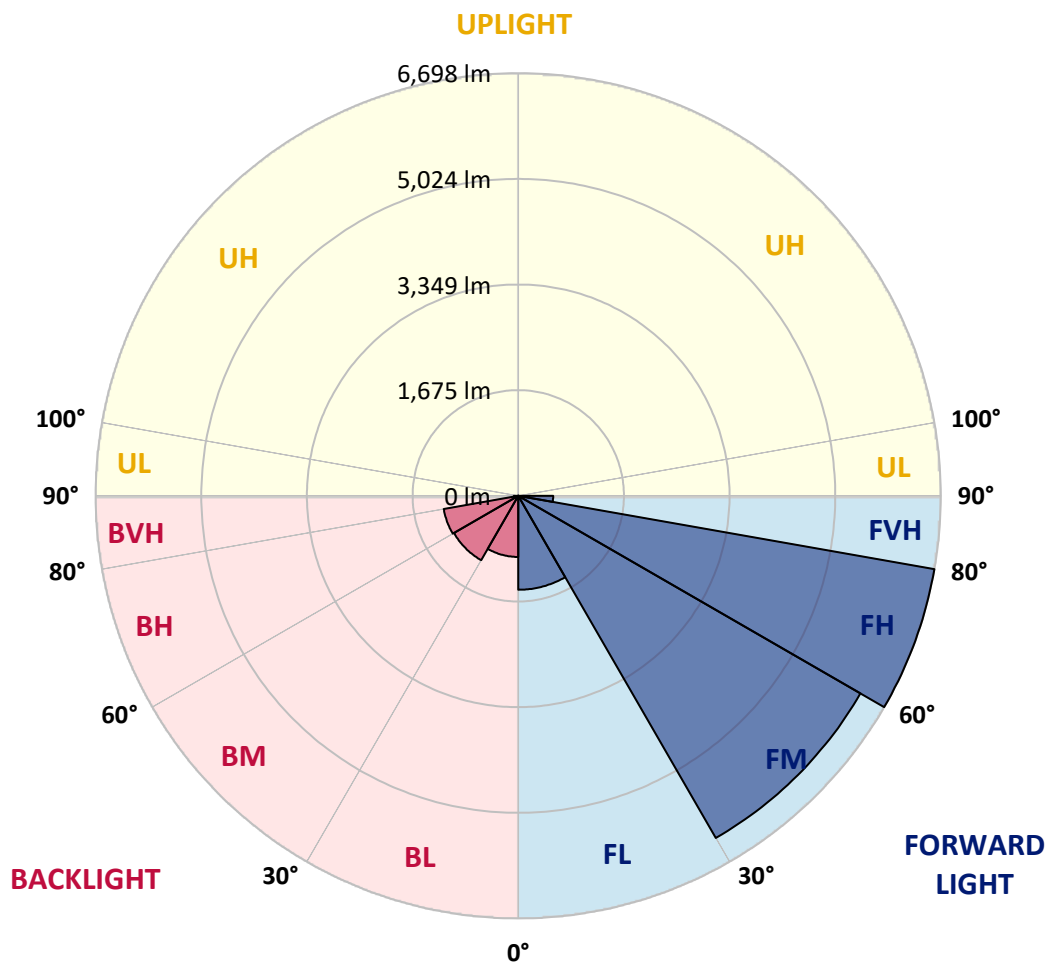
CATALOG NUMBER: GLEON-SA4A-750-U-SL2

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 1489.2 | 8.1       |                         |      |         |
| FM   | (30°-60°)   | 6262.4 | 34.0      |                         |      |         |
| FH   | (60°-80°)   | 6698.1 | 36.4      |                         |      | G3/7500 |
| FVH  | (80°-90°)   | 553.4  | 3.0       |                         |      | G4/750  |
| BL   | (0°-30°)    | 969.2  | 5.3       | B2/1000                 |      |         |
| BM   | (30°-60°)   | 1177.4 | 6.4       | B2/2500                 |      |         |
| BH   | (60°-80°)   | 1199.2 | 6.5       | B3/2500                 |      | G3/2500 |
| BVH  | (80°-90°)   | 67.2   | 0.4       |                         |      | G1/100  |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B3-U0-G4**

Type III Medium





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°     | 55°     | 65°     | 66°     | 75°     | 85°     |
|-------|--------|--------|--------|--------|--------|---------|---------|---------|---------|---------|---------|
| 0°    | 4218.7 | 4218.7 | 4218.7 | 4218.7 | 4218.7 | 4218.7  | 4218.7  | 4218.7  | 4218.7  | 4218.7  | 4218.7  |
| 2.5°  | 4140.5 | 4134.2 | 4153.3 | 4173.0 | 4180.6 | 4193.3  | 4212.4  | 4223.2  | 4222.6  | 4224.5  | 4218.1  |
| 5°    | 3865.9 | 3857.6 | 3895.7 | 3926.9 | 3986.7 | 4054.1  | 4136.1  | 4194.6  | 4195.9  | 4228.9  | 4237.8  |
| 7.5°  | 3605.8 | 3600.1 | 3644.0 | 3694.2 | 3763.5 | 3866.5  | 3999.4  | 4125.3  | 4132.9  | 4222.6  | 4253.7  |
| 10°   | 3397.3 | 3396.0 | 3438.6 | 3493.3 | 3574.0 | 3689.1  | 3841.7  | 4026.1  | 4037.5  | 4192.0  | 4256.3  |
| 12.5° | 3234.5 | 3237.0 | 3273.9 | 3336.2 | 3421.4 | 3541.6  | 3706.9  | 3914.8  | 3933.3  | 4143.7  | 4241.6  |
| 15°   | 3114.3 | 3124.5 | 3154.4 | 3217.3 | 3301.2 | 3423.3  | 3593.1  | 3811.8  | 3839.8  | 4089.7  | 4233.4  |
| 17.5° | 3045.6 | 3057.1 | 3078.1 | 3130.2 | 3209.0 | 3326.7  | 3487.5  | 3727.3  | 3752.7  | 4048.3  | 4234.0  |
| 20°   | 3025.3 | 3034.8 | 3046.9 | 3078.7 | 3145.5 | 3252.3  | 3404.2  | 3651.0  | 3678.3  | 4015.3  | 4240.4  |
| 22.5° | 3065.3 | 3072.3 | 3073.6 | 3071.1 | 3111.8 | 3198.9  | 3343.8  | 3595.0  | 3624.2  | 3993.7  | 4244.8  |
| 25°   | 3151.2 | 3160.7 | 3153.7 | 3130.2 | 3116.9 | 3170.3  | 3312.7  | 3558.1  | 3587.4  | 3977.8  | 4235.9  |
| 27.5° | 3280.3 | 3281.5 | 3275.8 | 3245.3 | 3182.3 | 3173.4  | 3303.2  | 3536.5  | 3564.5  | 3959.3  | 4217.5  |
| 30°   | 3455.7 | 3464.0 | 3453.8 | 3412.5 | 3309.5 | 3224.3  | 3314.6  | 3515.5  | 3541.0  | 3935.8  | 4187.6  |
| 32.5° | 3661.1 | 3681.5 | 3680.8 | 3637.6 | 3490.1 | 3338.1  | 3361.6  | 3502.8  | 3522.5  | 3911.0  | 4151.4  |
| 35°   | 3874.1 | 3902.1 | 3954.2 | 3935.8 | 3753.3 | 3518.1  | 3451.9  | 3523.1  | 3536.5  | 3907.8  | 4125.9  |
| 37.5° | 4095.4 | 4123.4 | 4230.8 | 4280.4 | 4066.8 | 3775.6  | 3594.4  | 3595.0  | 3601.4  | 3946.6  | 4124.0  |
| 40°   | 4326.8 | 4356.7 | 4518.2 | 4647.3 | 4473.1 | 4101.8  | 3823.9  | 3745.1  | 3738.1  | 4042.0  | 4161.5  |
| 42.5° | 4651.1 | 4677.8 | 4871.7 | 5036.4 | 4923.9 | 4519.5  | 4141.2  | 3976.5  | 3961.9  | 4228.9  | 4281.7  |
| 45°   | 5061.2 | 5084.1 | 5290.1 | 5466.3 | 5408.4 | 4996.4  | 4539.8  | 4295.0  | 4292.5  | 4540.5  | 4525.2  |
| 47.5° | 5548.9 | 5566.7 | 5751.7 | 5922.1 | 5943.1 | 5545.1  | 5040.9  | 4786.5  | 4745.2  | 4967.8  | 4902.3  |
| 50°   | 6056.9 | 6076.7 | 6202.5 | 6385.7 | 6541.4 | 6279.5  | 5685.6  | 5388.7  | 5333.4  | 5531.7  | 5436.4  |
| 52.5° | 6393.3 | 6419.4 | 6528.7 | 6760.8 | 7214.2 | 7084.4  | 6448.0  | 6118.6  | 6034.7  | 6215.3  | 6142.1  |
| 55°   | 6243.2 | 6301.7 | 6469.0 | 6840.9 | 7752.1 | 8314.1  | 7388.4  | 6970.0  | 6875.3  | 7025.3  | 6982.1  |
| 57.5° | 5561.0 | 5641.1 | 5869.4 | 6443.5 | 7827.7 | 9397.6  | 8810.1  | 7972.7  | 7905.9  | 7862.7  | 7882.4  |
| 60°   | 4314.1 | 4391.1 | 4674.0 | 5422.4 | 7300.6 | 10188.6 | 10949.7 | 9208.8  | 9112.1  | 8703.3  | 8721.1  |
| 62.5° | 3053.3 | 3014.5 | 3208.4 | 3755.9 | 5932.3 | 10281.4 | 13384.3 | 10861.9 | 10544.0 | 9590.9  | 9512.7  |
| 65°   | 2328.4 | 2319.5 | 2406.6 | 2580.8 | 3593.1 | 9170.6  | 14834.6 | 13640.5 | 13143.9 | 10634.9 | 10450.5 |
| 67.5° | 1913.2 | 1897.3 | 1983.2 | 2236.9 | 2313.8 | 5916.4  | 14866.4 | 16864.2 | 16376.5 | 11934.6 | 11535.3 |
| 70°   | 1573.0 | 1555.2 | 1635.4 | 1962.8 | 2138.3 | 3000.5  | 12511.9 | 18752.0 | 18725.9 | 13580.1 | 12354.2 |
| 71°   | 1410.3 | 1397.6 | 1493.6 | 1857.3 | 2100.8 | 2500.7  | 10802.8 | 18757.1 | 18835.3 | 14137.1 | 12305.9 |
| 72.5° | 1148.3 | 1152.8 | 1254.5 | 1653.2 | 2072.8 | 2208.2  | 7939.6  | 17882.8 | 18048.1 | 14668.0 | 11866.5 |
| 75°   | 763.0  | 766.8  | 900.3  | 1271.7 | 2009.9 | 2160.6  | 4363.7  | 15005.6 | 15309.6 | 14350.1 | 10828.2 |
| 77.5° | 512.5  | 511.2  | 602.1  | 872.4  | 1751.1 | 2160.6  | 2558.6  | 11223.1 | 11556.9 | 11418.3 | 8347.8  |
| 80°   | 352.9  | 350.3  | 414.6  | 602.1  | 1325.7 | 2186.6  | 1978.1  | 7865.2  | 7966.3  | 6166.3  | 3392.8  |
| 82.5° | 216.2  | 218.1  | 270.9  | 425.4  | 902.2  | 1967.9  | 1867.4  | 4288.7  | 4178.7  | 1729.5  | 847.6   |
| 85°   | 124.0  | 123.4  | 172.9  | 288.0  | 579.2  | 1660.8  | 1821.0  | 1845.8  | 1693.2  | 520.7   | 306.5   |
| 87.5° | 44.5   | 47.7   | 92.8   | 159.6  | 331.9  | 1156.6  | 1545.1  | 960.1   | 865.4   | 235.3   | 138.6   |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |



REPORT NUMBER: P319388

CATALOG NUMBER: GLEON-SA4A-750-U-SL2

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 4218.7  | 4218.7 | 4218.7 | 4218.7 | 4218.7 | 4218.7 | 4218.7 | 4218.7 | 4218.7 | 4218.7 | 4218.7 |
| 2.5°  | 4213.7  | 4217.5 | 4213.0 | 4187.6 | 4166.0 | 4131.0 | 4111.3 | 4084.0 | 4075.7 | 4071.9 | 4082.0 |
| 5°    | 4229.6  | 4230.8 | 4193.3 | 4126.6 | 4051.5 | 3963.1 | 3899.6 | 3821.4 | 3784.5 | 3768.6 | 3778.8 |
| 7.5°  | 4244.2  | 4238.5 | 4156.4 | 4028.6 | 3890.0 | 3736.2 | 3599.4 | 3474.2 | 3401.1 | 3371.2 | 3373.7 |
| 10°   | 4246.1  | 4221.9 | 4090.3 | 3892.6 | 3677.7 | 3451.9 | 3242.1 | 3048.8 | 2926.7 | 2847.3 | 2871.4 |
| 12.5° | 4226.4  | 4185.7 | 3993.0 | 3716.4 | 3418.2 | 3110.5 | 2826.9 | 2537.0 | 2362.8 | 2282.0 | 2284.5 |
| 15°   | 4211.1  | 4137.4 | 3873.5 | 3509.2 | 3108.6 | 2701.0 | 2313.8 | 1973.0 | 1787.3 | 1704.7 | 1665.9 |
| 17.5° | 4198.4  | 4085.2 | 3734.9 | 3275.8 | 2743.0 | 2226.0 | 1760.6 | 1456.7 | 1355.0 | 1330.8 | 1320.6 |
| 20°   | 4180.6  | 4029.9 | 3580.4 | 3005.6 | 2326.5 | 1694.5 | 1285.7 | 1135.6 | 1136.2 | 1164.2 | 1168.0 |
| 22.5° | 4155.8  | 3967.0 | 3415.7 | 2702.3 | 1879.5 | 1234.2 | 1007.8 | 964.6  | 1008.4 | 1061.8 | 1071.4 |
| 25°   | 4118.9  | 3892.6 | 3232.6 | 2367.2 | 1433.2 | 948.7  | 860.9  | 859.0  | 912.4  | 968.4  | 976.6  |
| 27.5° | 4066.8  | 3795.3 | 3029.1 | 2007.3 | 1056.1 | 806.2  | 771.3  | 784.6  | 824.0  | 864.7  | 867.9  |
| 30°   | 3996.8  | 3682.1 | 2804.7 | 1627.7 | 827.9  | 717.9  | 714.0  | 726.1  | 750.3  | 778.9  | 781.4  |
| 32.5° | 3919.9  | 3567.0 | 2564.9 | 1260.2 | 709.0  | 670.2  | 674.0  | 679.7  | 691.1  | 702.6  | 705.1  |
| 35°   | 3850.0  | 3449.4 | 2319.5 | 957.6  | 652.4  | 639.0  | 636.5  | 635.2  | 636.5  | 632.7  | 633.3  |
| 37.5° | 3804.8  | 3352.1 | 2063.9 | 762.4  | 619.9  | 611.7  | 604.0  | 594.5  | 583.7  | 577.3  | 578.6  |
| 40°   | 3788.3  | 3279.6 | 1805.1 | 658.7  | 593.2  | 587.5  | 572.9  | 552.5  | 539.8  | 536.0  | 536.0  |
| 42.5° | 3832.8  | 3242.1 | 1555.2 | 606.6  | 571.0  | 561.4  | 537.3  | 513.8  | 504.2  | 503.6  | 502.9  |
| 45°   | 3968.9  | 3257.4 | 1317.4 | 578.0  | 550.6  | 532.2  | 500.4  | 480.7  | 474.3  | 475.6  | 475.0  |
| 47.5° | 4213.0  | 3353.4 | 1114.0 | 558.9  | 530.3  | 506.1  | 470.5  | 454.6  | 447.0  | 447.0  | 447.6  |
| 50°   | 4628.2  | 3577.8 | 951.8  | 543.0  | 513.1  | 482.0  | 448.9  | 429.2  | 419.0  | 418.4  | 418.4  |
| 52.5° | 5232.9  | 3979.7 | 850.7  | 529.6  | 494.0  | 460.3  | 427.3  | 402.5  | 390.4  | 387.9  | 386.6  |
| 55°   | 5990.8  | 4555.7 | 822.8  | 520.7  | 468.6  | 436.8  | 401.2  | 376.4  | 363.1  | 357.3  | 356.7  |
| 57.5° | 6838.4  | 5256.4 | 878.1  | 509.9  | 442.5  | 408.8  | 372.6  | 349.1  | 335.1  | 328.1  | 327.5  |
| 60°   | 7696.1  | 6021.3 | 1103.8 | 494.7  | 420.9  | 378.3  | 343.3  | 321.7  | 307.7  | 300.1  | 298.8  |
| 62.5° | 8555.1  | 6827.6 | 1564.8 | 493.4  | 405.7  | 349.1  | 313.5  | 295.0  | 281.7  | 273.4  | 271.5  |
| 65°   | 9524.1  | 7710.1 | 2088.7 | 527.1  | 400.6  | 322.4  | 282.9  | 268.3  | 256.9  | 249.2  | 248.6  |
| 67.5° | 10636.8 | 8706.5 | 2038.5 | 596.4  | 417.7  | 298.2  | 254.3  | 242.9  | 234.6  | 228.3  | 227.6  |
| 70°   | 11158.9 | 8550.7 | 1267.2 | 645.4  | 441.9  | 274.7  | 227.0  | 218.7  | 212.4  | 207.9  | 206.0  |
| 71°   | 10940.1 | 8118.9 | 1062.5 | 639.6  | 439.4  | 264.5  | 216.2  | 209.8  | 203.5  | 199.7  | 197.7  |
| 72.5° | 10343.7 | 7404.3 | 886.4  | 595.1  | 410.7  | 246.1  | 202.2  | 195.8  | 190.1  | 185.7  | 184.4  |
| 75°   | 9281.9  | 6612.7 | 709.6  | 475.6  | 327.5  | 207.9  | 177.4  | 170.4  | 166.0  | 163.4  | 160.9  |
| 77.5° | 6823.1  | 4719.1 | 548.7  | 375.8  | 241.0  | 169.8  | 151.3  | 146.2  | 141.8  | 138.0  | 136.1  |
| 80°   | 2613.9  | 1828.0 | 369.4  | 280.4  | 176.8  | 134.2  | 122.1  | 119.5  | 115.1  | 112.5  | 112.5  |
| 82.5° | 703.9   | 546.2  | 197.1  | 169.8  | 118.3  | 97.9   | 93.5   | 92.2   | 88.4   | 83.3   | 83.9   |
| 85°   | 284.9   | 241.0  | 110.6  | 93.5   | 72.5   | 57.9   | 62.9   | 63.6   | 59.1   | 52.8   | 53.4   |
| 87.5° | 125.3   | 102.4  | 61.7   | 41.3   | 31.8   | 22.3   | 28.6   | 28.6   | 26.1   | 21.6   | 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    |

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

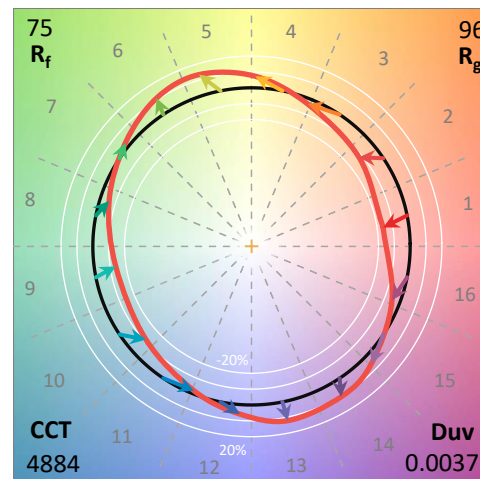
\*\*\*THIS IS A REVISION OF SP1-1908-441-4-R3. TO UPDATE THE CATALOG INFORMATION.\*\*\*TESTED IN SITU. ROADWAY AND AREA LUMINAIRE. (1) 70 CRI, 5000K, 1050MA LIGHTSQUARE WITH 16 LEDS AND TYPE V WIDE OPTICS.

### 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



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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 5000K 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       | 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               |           |                  |                  |

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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               |           |                  |                  |

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**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               |           |                  |                  |

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**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**



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**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 |            |



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**Color Rendition by Hue-Angle Bin**



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**Measure Comparisons**



(END OF REPORT)