

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: P323558

Luminaire Tested: **GLEON-SA4B-750-U-SL3-HSS**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P323558  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-23)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA4B-750-U-SL3-HSS  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(4) 70 CRI, 5000K, 800mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE III  
SPILL LIGHT ELIMINATOR OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 19694 lumens  
Efficiency: N/A  
Efficacy: 115.2 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 1' x H: 0')  
IES Classification: Type III - Medium  
BUG Rating: B2 - U0 - G4

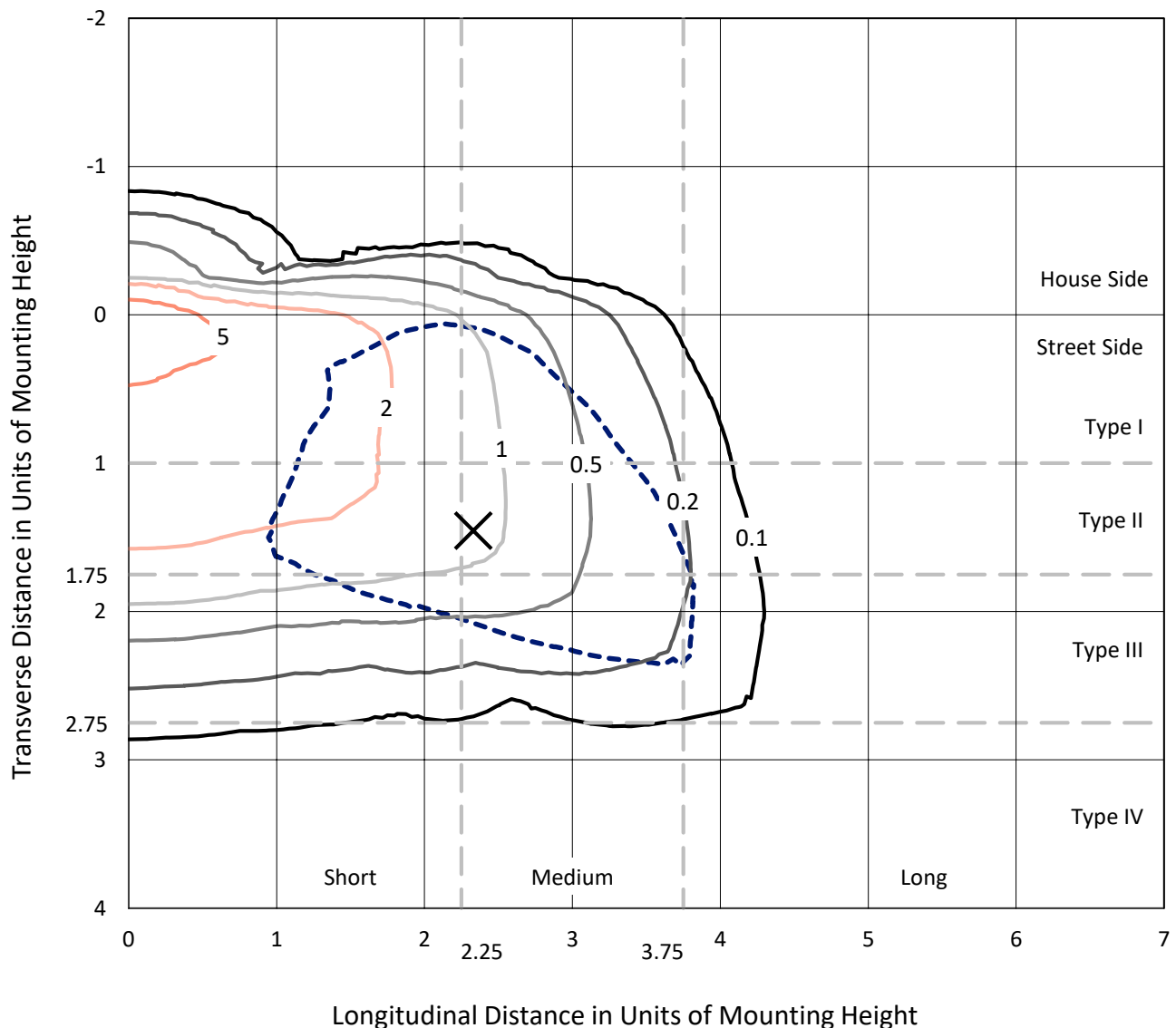
Input Watts (W): 171  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



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## Iso-Footcandle Lines of Horizontal Illumination

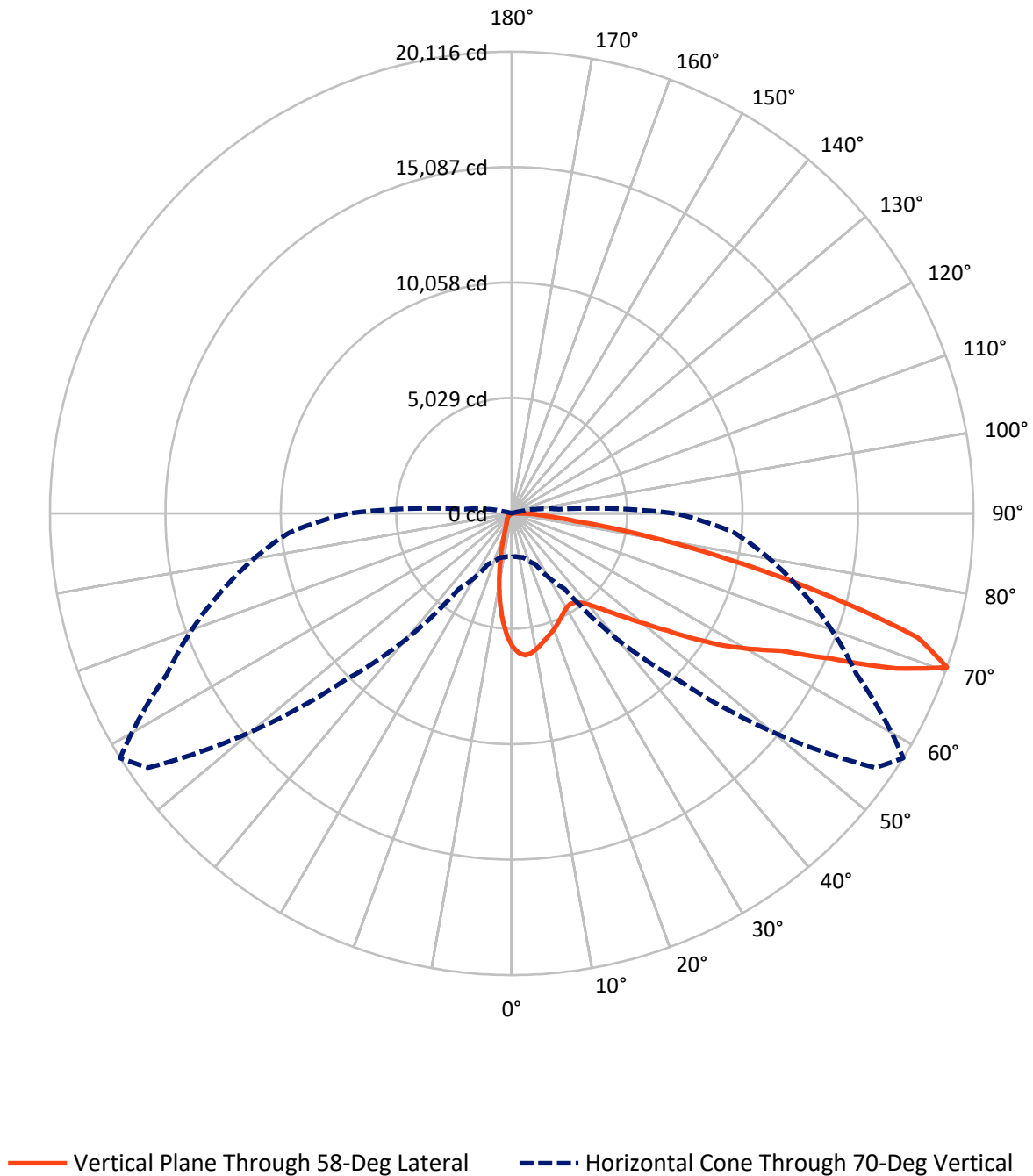
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 9.5 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    | 1685.4   | 0.0    | 1685.4  |
|                    | % Fixture | 8.6      | 0.0    | 8.6     |
| <b>Street Side</b> | Lumens    | 18008.6  | 0.0    | 18008.6 |
|                    | % Fixture | 91.4     | 0.0    | 91.4    |
| <b>Total</b>       | Lumens    | 19694.0  | 0.0    | 19694.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 475.7   | 2.4       |
| 10°-20°   | 998.4   | 5.1       |
| 20°-30°   | 1312.6  | 6.7       |
| 30°-40°   | 1738.4  | 8.8       |
| 40°-50°   | 2598.4  | 13.2      |
| 50°-60°   | 4162.5  | 21.1      |
| 60°-70°   | 5246.7  | 26.6      |
| 70°-80°   | 2830.1  | 14.4      |
| 80°-90°   | 331.3   | 1.7       |
| 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°    | 19694.0 | 100.0     |
| 0°-180°   | 19694.0 | 100.0     |

**Coefficient of Utilization**



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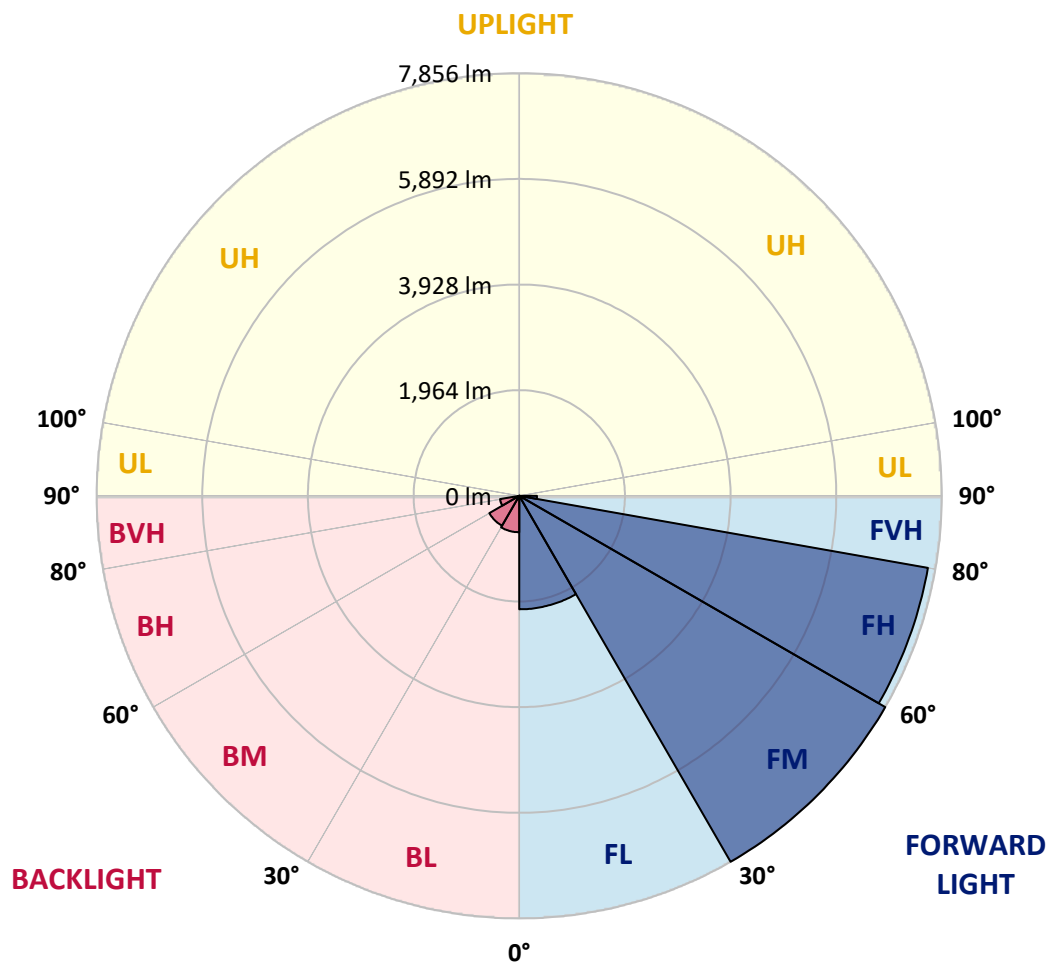
CATALOG NUMBER: GLEON-SA4B-750-U-SL3-HSS

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |          |
|------|-------------|--------|-----------|-------------------------|------|----------|
|      |             |        |           | B                       | U    | G        |
| FL   | (0°-30°)    | 2109.6 | 10.7      |                         |      |          |
| FM   | (30°-60°)   | 7856.2 | 39.9      |                         |      |          |
| FH   | (60°-80°)   | 7714.3 | 39.2      |                         |      | G4/12000 |
| FVH  | (80°-90°)   | 328.4  | 1.7       |                         |      | G3/500   |
| BL   | (0°-30°)    | 677.1  | 3.4       | B2/1000                 |      |          |
| BM   | (30°-60°)   | 642.9  | 3.3       | B1/1000                 |      |          |
| BH   | (60°-80°)   | 362.4  | 1.8       | B1/500                  |      | G1/500   |
| BVH  | (80°-90°)   | 2.9    | 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°     | 55°     | 58°     | 65°     | 75°     | 85°     |
|-------|--------|--------|--------|--------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 5817.5 | 5817.5 | 5817.5 | 5817.5 | 5817.5  | 5817.5  | 5817.5  | 5817.5  | 5817.5  | 5817.5  | 5817.5  |
| 2.5°  | 6299.9 | 6284.3 | 6278.6 | 6268.7 | 6231.1  | 6194.2  | 6121.3  | 6100.9  | 6055.0  | 5946.1  | 5830.6  |
| 5°    | 6304.8 | 6303.9 | 6321.1 | 6317.0 | 6303.9  | 6286.7  | 6234.3  | 6207.3  | 6129.5  | 5973.9  | 5762.6  |
| 7.5°  | 6000.9 | 6016.5 | 6055.0 | 6086.1 | 6122.1  | 6168.8  | 6175.4  | 6149.2  | 6085.3  | 5917.4  | 5637.4  |
| 10°   | 5593.1 | 5617.7 | 5671.7 | 5733.2 | 5827.3  | 5920.7  | 6004.2  | 6000.9  | 5978.8  | 5813.4  | 5486.7  |
| 12.5° | 5184.5 | 5213.2 | 5275.4 | 5366.3 | 5499.8  | 5652.1  | 5801.1  | 5821.6  | 5858.5  | 5720.1  | 5347.5  |
| 15°   | 4826.6 | 4851.2 | 4912.6 | 5024.0 | 5189.4  | 5394.1  | 5612.8  | 5650.5  | 5745.5  | 5647.2  | 5231.2  |
| 17.5° | 4522.8 | 4538.4 | 4583.4 | 4707.1 | 4898.7  | 5146.8  | 5431.0  | 5504.7  | 5646.4  | 5589.9  | 5130.5  |
| 20°   | 4310.7 | 4313.2 | 4342.7 | 4429.5 | 4621.1  | 4898.7  | 5242.6  | 5348.3  | 5541.5  | 5540.7  | 5026.5  |
| 22.5° | 4205.9 | 4197.7 | 4203.4 | 4253.4 | 4394.3  | 4662.0  | 5054.3  | 5179.6  | 5447.4  | 5499.0  | 4920.8  |
| 25°   | 4186.3 | 4179.7 | 4163.3 | 4169.9 | 4255.0  | 4454.9  | 4864.3  | 5009.3  | 5364.7  | 5473.6  | 4829.1  |
| 27.5° | 4247.7 | 4254.2 | 4226.4 | 4196.9 | 4203.4  | 4320.6  | 4695.6  | 4863.5  | 5297.5  | 5473.6  | 4764.4  |
| 30°   | 4371.3 | 4374.6 | 4354.1 | 4315.6 | 4264.0  | 4282.9  | 4578.5  | 4746.4  | 5263.9  | 5511.2  | 4723.5  |
| 32.5° | 4508.1 | 4526.1 | 4523.6 | 4492.5 | 4418.8  | 4342.7  | 4550.7  | 4703.8  | 5261.5  | 5594.8  | 4719.4  |
| 35°   | 4677.6 | 4698.1 | 4732.5 | 4725.9 | 4648.9  | 4523.6  | 4645.7  | 4766.0  | 5309.8  | 5732.3  | 4763.6  |
| 37.5° | 4857.8 | 4888.9 | 4962.6 | 4997.8 | 4947.8  | 4806.2  | 4858.6  | 4944.6  | 5439.2  | 5955.1  | 4875.8  |
| 40°   | 5032.2 | 5067.4 | 5201.7 | 5340.1 | 5302.4  | 5156.7  | 5181.2  | 5250.0  | 5669.3  | 6275.3  | 5088.7  |
| 42.5° | 5203.3 | 5255.7 | 5453.1 | 5680.8 | 5725.8  | 5609.5  | 5622.6  | 5677.5  | 6010.8  | 6715.9  | 5436.7  |
| 45°   | 5408.1 | 5467.0 | 5759.4 | 6040.3 | 6160.6  | 6109.9  | 6165.5  | 6201.6  | 6457.1  | 7298.1  | 5906.0  |
| 47.5° | 5708.6 | 5776.6 | 6135.3 | 6455.4 | 6666.7  | 6699.5  | 6811.7  | 6835.4  | 7021.3  | 7976.2  | 6517.7  |
| 50°   | 6294.9 | 6313.8 | 6638.1 | 6928.8 | 7233.4  | 7429.9  | 7557.7  | 7575.7  | 7704.3  | 8717.3  | 7281.7  |
| 52.5° | 7032.8 | 7045.1 | 7228.5 | 7423.4 | 7769.8  | 8171.1  | 8470.0  | 8495.3  | 8522.4  | 9439.5  | 8035.9  |
| 55°   | 7765.7 | 7764.1 | 7885.3 | 7999.9 | 8396.3  | 8979.3  | 9627.9  | 9643.4  | 9449.4  | 10125.0 | 8612.4  |
| 57.5° | 8223.5 | 8267.7 | 8451.9 | 8599.3 | 9152.9  | 9900.6  | 10800.6 | 10857.9 | 10423.0 | 10632.7 | 9182.4  |
| 60°   | 8077.7 | 8099.0 | 8507.6 | 9053.0 | 10095.5 | 11210.0 | 11987.2 | 12001.9 | 11155.1 | 11139.6 | 9903.0  |
| 62.5° | 6882.1 | 6893.6 | 7535.6 | 8659.9 | 10572.9 | 12908.4 | 13418.6 | 13178.7 | 11997.0 | 11843.0 | 10765.3 |
| 65°   | 4716.9 | 4791.4 | 5327.8 | 6717.5 | 9695.9  | 13973.8 | 15634.6 | 15237.4 | 13280.2 | 12856.8 | 11544.9 |
| 67.5° | 2777.7 | 2762.2 | 3027.5 | 4051.1 | 7121.2  | 13266.3 | 18437.7 | 18043.0 | 15030.2 | 13535.7 | 11316.5 |
| 70°   | 1897.4 | 1886.8 | 1988.3 | 2452.6 | 4020.0  | 10291.2 | 19319.7 | 20116.4 | 16575.5 | 13078.8 | 9739.3  |
| 72.5° | 1354.5 | 1360.2 | 1510.1 | 1905.6 | 2523.9  | 5996.0  | 16614.0 | 18499.9 | 16091.5 | 11401.6 | 7402.9  |
| 75°   | 919.6  | 935.2  | 1149.7 | 1563.3 | 2212.7  | 3050.4  | 11789.8 | 14063.1 | 13103.3 | 8286.5  | 4255.0  |
| 77.5° | 494.6  | 511.8  | 764.9  | 1259.5 | 2000.6  | 2119.3  | 7583.9  | 9678.7  | 8230.8  | 3725.2  | 1233.3  |
| 80°   | 206.4  | 216.2  | 357.9  | 915.5  | 1728.7  | 1861.4  | 4462.2  | 5869.1  | 3507.4  | 734.6   | 275.2   |
| 82.5° | 89.3   | 94.2   | 149.0  | 546.2  | 1292.2  | 1571.5  | 2362.5  | 2823.6  | 1062.9  | 161.3   | 138.4   |
| 85°   | 17.2   | 18.0   | 61.4   | 289.1  | 824.6   | 886.9   | 1531.4  | 1501.1  | 477.4   | 69.6    | 100.7   |
| 87.5° | 0.0    | 0.0    | 14.7   | 90.9   | 242.4   | 483.2   | 934.4   | 922.9   | 162.1   | 33.6    | 37.7    |
| 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: P323558

CATALOG NUMBER: GLEON-SA4B-750-U-SL3-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 5817.5 | 5817.5 | 5817.5 | 5817.5 | 5817.5 | 5817.5 | 5817.5 | 5817.5 | 5817.5 | 5817.5 | 5817.5 |
| 2.5°  | 5771.7 | 5715.2 | 5596.4 | 5449.8 | 5337.6 | 5214.0 | 5115.7 | 4991.2 | 4937.2 | 4939.6 | 4910.2 |
| 5°    | 5642.3 | 5526.0 | 5263.1 | 4931.5 | 4676.0 | 4412.3 | 4185.4 | 3959.4 | 3825.9 | 3782.5 | 3741.6 |
| 7.5°  | 5457.2 | 5272.9 | 4853.7 | 4342.7 | 3910.3 | 3487.7 | 3120.0 | 2796.6 | 2591.8 | 2491.9 | 2455.1 |
| 10°   | 5248.4 | 4989.6 | 4382.8 | 3709.6 | 3092.2 | 2520.6 | 2044.0 | 1629.6 | 1464.2 | 1352.0 | 1323.4 |
| 12.5° | 5064.9 | 4714.4 | 3922.6 | 3060.3 | 2327.3 | 1637.8 | 1183.3 | 925.4  | 813.2  | 769.0  | 761.6  |
| 15°   | 4892.1 | 4457.3 | 3479.5 | 2472.3 | 1611.6 | 1008.1 | 752.6  | 665.0  | 638.7  | 631.4  | 631.4  |
| 17.5° | 4729.2 | 4212.5 | 3046.3 | 1893.3 | 1066.2 | 706.7  | 623.2  | 603.5  | 595.3  | 594.5  | 595.3  |
| 20°   | 4558.9 | 3967.6 | 2620.5 | 1387.2 | 744.4  | 598.6  | 575.7  | 565.0  | 562.6  | 562.6  | 562.6  |
| 22.5° | 4395.9 | 3722.8 | 2206.1 | 990.9  | 597.0  | 546.2  | 534.7  | 527.4  | 524.9  | 524.1  | 522.5  |
| 25°   | 4239.5 | 3490.2 | 1801.6 | 700.2  | 524.1  | 500.4  | 490.5  | 480.7  | 473.3  | 469.2  | 466.8  |
| 27.5° | 4110.9 | 3283.0 | 1424.9 | 561.8  | 473.3  | 452.9  | 440.6  | 425.8  | 407.8  | 399.6  | 396.4  |
| 30°   | 4008.5 | 3093.8 | 1098.2 | 474.1  | 425.8  | 405.4  | 386.5  | 361.1  | 334.9  | 321.0  | 320.2  |
| 32.5° | 3928.3 | 2907.9 | 833.6  | 419.3  | 383.2  | 357.9  | 330.8  | 298.9  | 268.6  | 253.0  | 252.2  |
| 35°   | 3889.0 | 2744.2 | 637.1  | 379.2  | 345.6  | 313.6  | 280.1  | 244.9  | 215.4  | 200.6  | 199.0  |
| 37.5° | 3915.2 | 2605.8 | 497.1  | 345.6  | 313.6  | 276.8  | 237.5  | 200.6  | 174.4  | 161.3  | 160.5  |
| 40°   | 4011.0 | 2517.3 | 403.7  | 316.9  | 286.6  | 241.6  | 199.0  | 164.6  | 142.5  | 131.8  | 131.0  |
| 42.5° | 4214.9 | 2484.6 | 344.8  | 293.2  | 260.4  | 208.8  | 165.4  | 135.9  | 115.5  | 108.1  | 106.5  |
| 45°   | 4555.6 | 2532.9 | 304.6  | 270.2  | 233.4  | 177.7  | 136.8  | 111.4  | 93.4   | 87.6   | 86.8   |
| 47.5° | 5009.3 | 2659.8 | 276.0  | 248.1  | 208.8  | 149.9  | 113.8  | 90.1   | 76.2   | 70.4   | 69.6   |
| 50°   | 5594.0 | 2861.3 | 252.2  | 226.0  | 185.9  | 126.9  | 94.2   | 71.2   | 59.0   | 54.9   | 54.9   |
| 52.5° | 6230.2 | 3101.2 | 230.9  | 205.5  | 163.0  | 105.6  | 76.2   | 54.9   | 46.7   | 41.8   | 41.8   |
| 55°   | 6756.0 | 3310.8 | 208.0  | 190.0  | 135.1  | 87.6   | 58.1   | 41.8   | 34.4   | 31.9   | 31.9   |
| 57.5° | 7280.9 | 3534.4 | 181.8  | 163.0  | 108.1  | 71.2   | 44.2   | 31.1   | 25.4   | 23.7   | 23.7   |
| 60°   | 7961.4 | 3807.9 | 156.4  | 132.7  | 85.2   | 54.0   | 32.8   | 22.1   | 18.8   | 18.0   | 18.0   |
| 62.5° | 8709.9 | 3968.4 | 133.5  | 106.5  | 66.3   | 40.1   | 23.7   | 14.7   | 13.9   | 13.9   | 13.1   |
| 65°   | 9167.7 | 3741.6 | 112.2  | 85.2   | 51.6   | 30.3   | 15.6   | 10.6   | 12.3   | 11.5   | 9.8    |
| 67.5° | 8583.8 | 2929.2 | 91.7   | 66.3   | 40.1   | 22.9   | 9.8    | 7.4    | 13.1   | 10.6   | 8.2    |
| 70°   | 7107.3 | 2050.5 | 71.2   | 46.7   | 31.9   | 19.7   | 6.6    | 4.9    | 13.9   | 10.6   | 6.6    |
| 72.5° | 5318.8 | 1372.5 | 56.5   | 31.1   | 23.7   | 17.2   | 5.7    | 2.5    | 12.3   | 9.0    | 5.7    |
| 75°   | 2906.3 | 552.8  | 45.0   | 19.7   | 14.7   | 12.3   | 4.1    | 1.6    | 8.2    | 6.6    | 4.1    |
| 77.5° | 764.9  | 145.8  | 32.8   | 13.1   | 8.2    | 4.9    | 2.5    | 0.8    | 4.1    | 3.3    | 1.6    |
| 80°   | 194.9  | 56.5   | 21.3   | 9.0    | 5.7    | 2.5    | 0.0    | 0.0    | 0.8    | 0.0    | 0.0    |
| 82.5° | 104.0  | 23.7   | 13.1   | 6.6    | 3.3    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 85°   | 78.6   | 15.6   | 7.4    | 4.1    | 0.8    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 87.5° | 30.3   | 4.9    | 2.5    | 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: SP1-1908-441-4-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   |           |      |      |       |



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            |

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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**



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| 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)