

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: P323478

Luminaire Tested: **GLEON-SA4B-730-U-SL3-HSS**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P323478  
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-730-U-SL3-HSS  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(4) 70 CRI, 3000K, 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: 17935 lumens  
Efficiency: N/A  
Efficacy: 104.9 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 1' x H: 0')  
IES Classification: Type III - Medium  
BUG Rating: B2 - U0 - G3

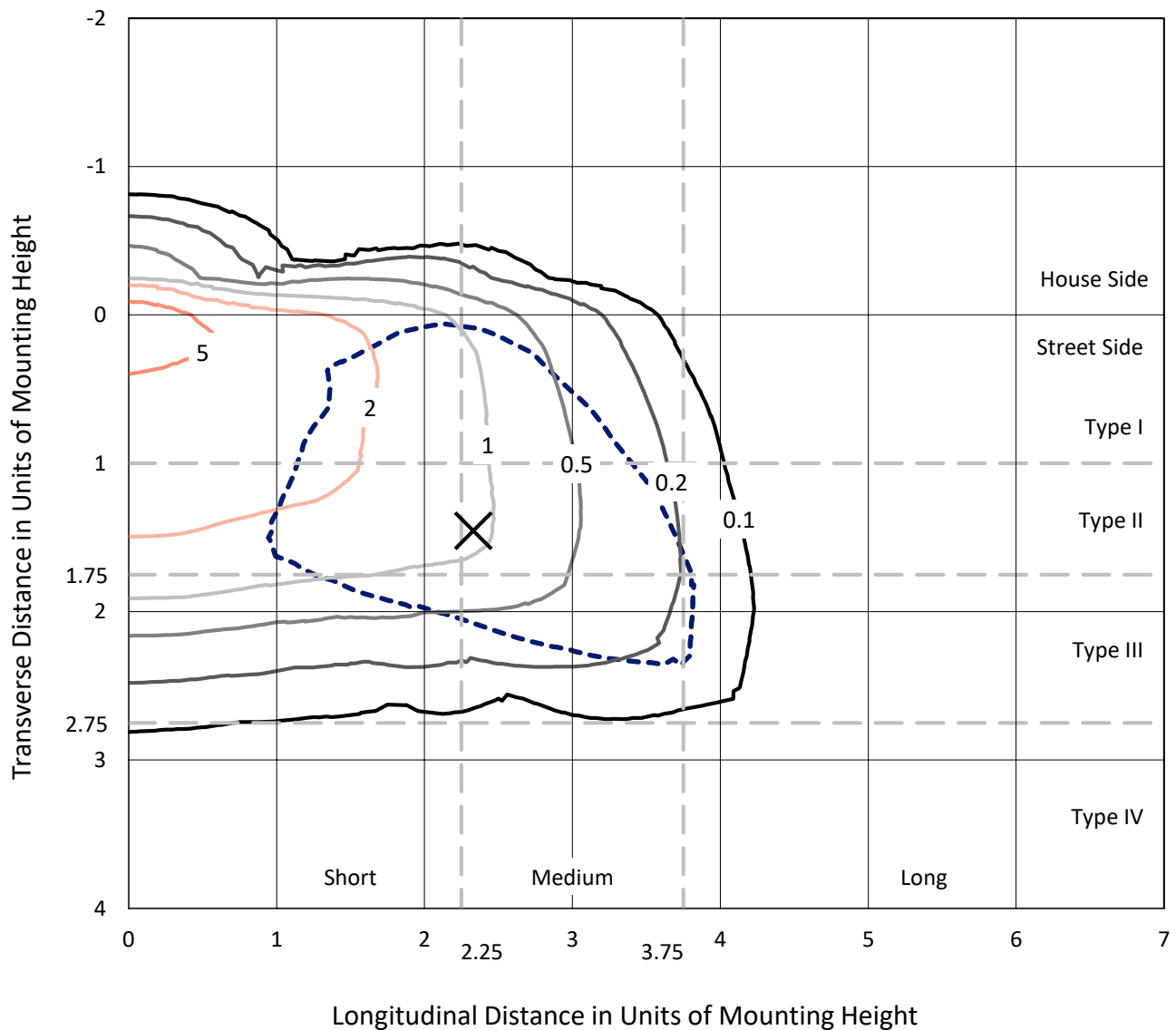
Input Watts (W): 171  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



REPORT NUMBER: P323478  
 CATALOG NUMBER: GLEON-SA4B-730-U-SL3-HSS

## Iso-Footcandle Lines of Horizontal Illumination

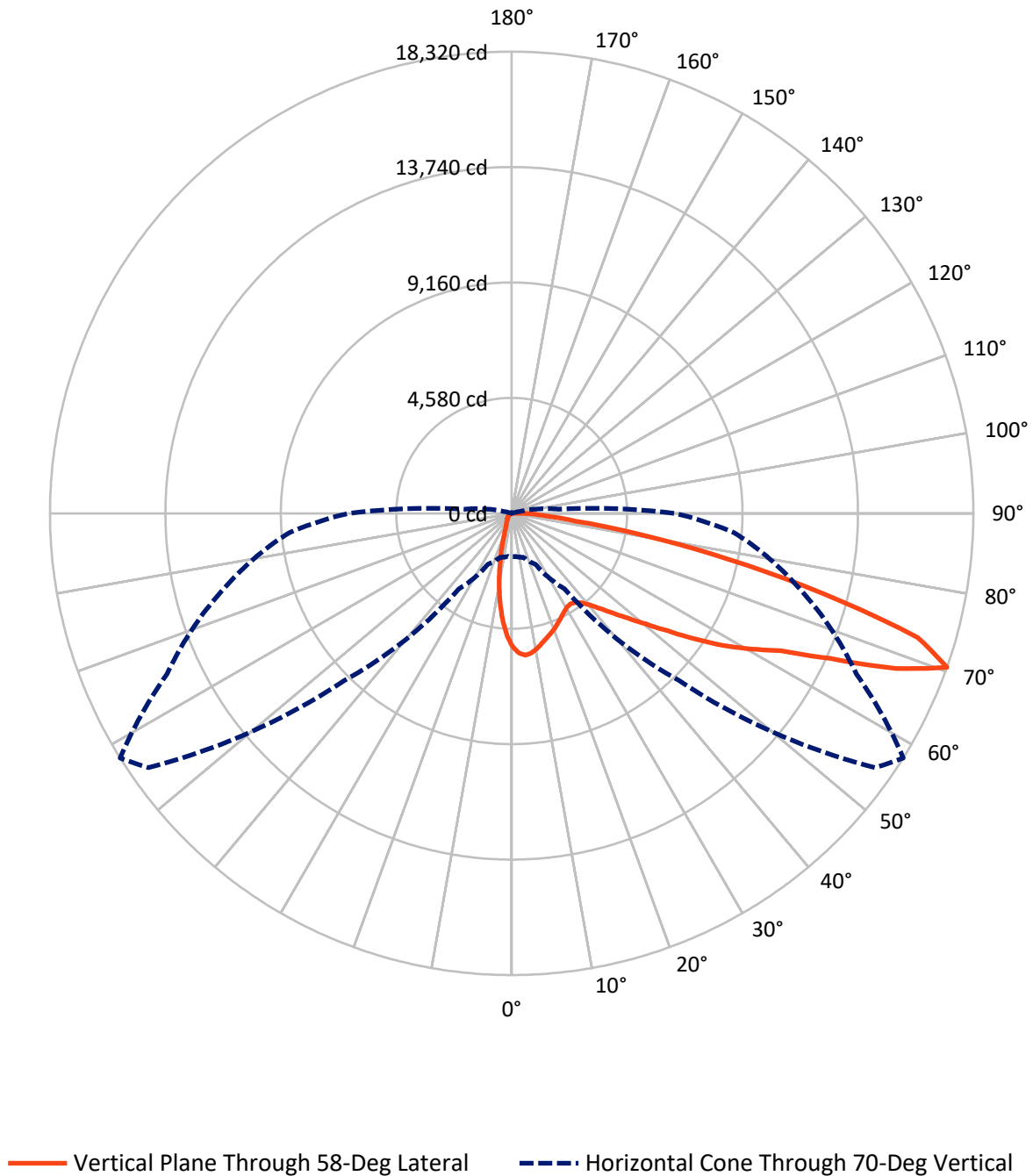
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 8.6 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    | 1534.8   | 0.0    | 1534.8  |
|                    | % Fixture | 8.6      | 0.0    | 8.6     |
| <b>Street Side</b> | Lumens    | 16400.2  | 0.0    | 16400.2 |
|                    | % Fixture | 91.4     | 0.0    | 91.4    |
| <b>Total</b>       | Lumens    | 17935.0  | 0.0    | 17935.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 433.2   | 2.4       |
| 10°-20°   | 909.3   | 5.1       |
| 20°-30°   | 1195.4  | 6.7       |
| 30°-40°   | 1583.1  | 8.8       |
| 40°-50°   | 2366.3  | 13.2      |
| 50°-60°   | 3790.7  | 21.1      |
| 60°-70°   | 4778.1  | 26.6      |
| 70°-80°   | 2577.3  | 14.4      |
| 80°-90°   | 301.7   | 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°    | 17935.0 | 100.0     |
| 0°-180°   | 17935.0 | 100.0     |

**Coefficient of Utilization**



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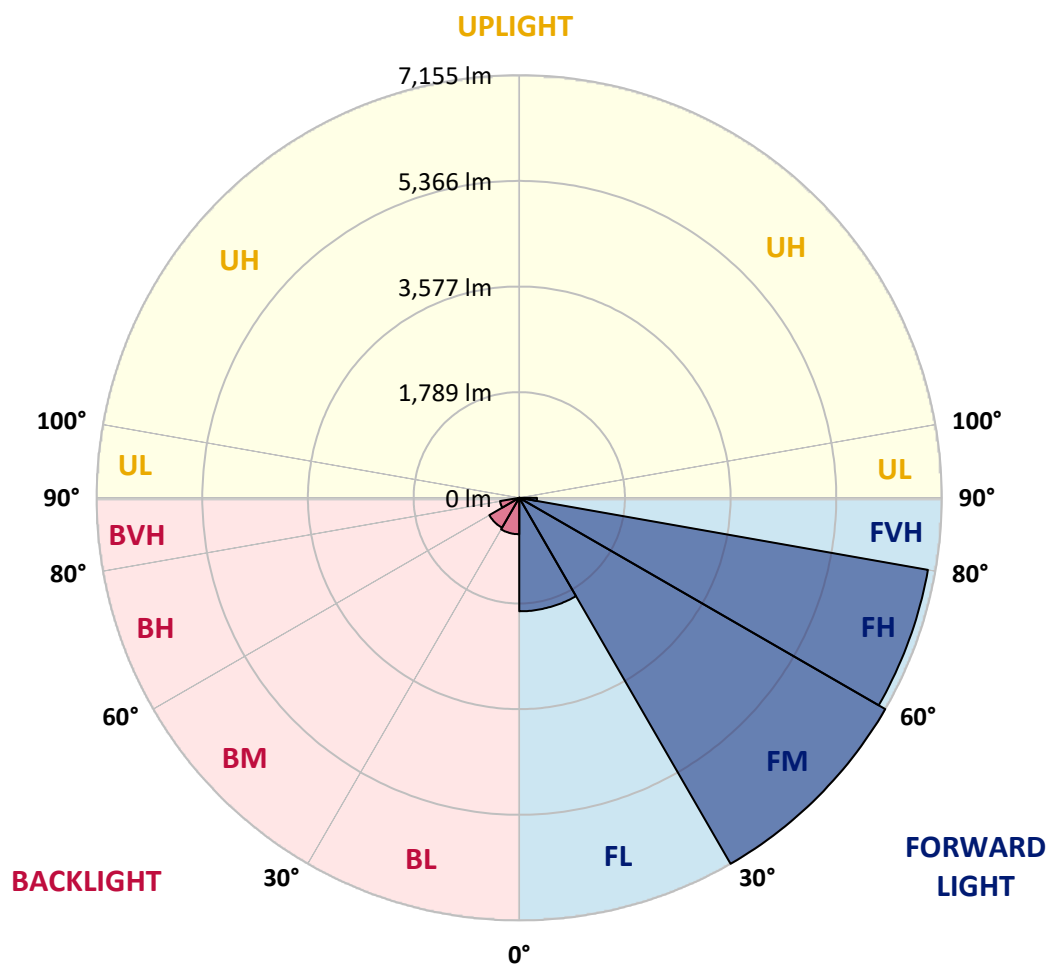
CATALOG NUMBER: GLEON-SA4B-730-U-SL3-HSS

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 1921.2 | 10.7      |                         |      |         |
| FM   | (30°-60°)   | 7154.5 | 39.9      |                         |      |         |
| FH   | (60°-80°)   | 7025.3 | 39.2      |                         |      | G3/7500 |
| FVH  | (80°-90°)   | 299.1  | 1.7       |                         |      | G3/500  |
| BL   | (0°-30°)    | 616.6  | 3.4       | B2/1000                 |      |         |
| BM   | (30°-60°)   | 585.5  | 3.3       | B1/1000                 |      |         |
| BH   | (60°-80°)   | 330.1  | 1.8       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 2.6    | 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-G3**

Type III Medium





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CATALOG NUMBER: GLEON-SA4B-730-U-SL3-HSS

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°     | 55°     | 58°     | 65°     | 75°     | 85°     |
|-------|--------|--------|--------|--------|--------|---------|---------|---------|---------|---------|---------|
| 0°    | 5297.9 | 5297.9 | 5297.9 | 5297.9 | 5297.9 | 5297.9  | 5297.9  | 5297.9  | 5297.9  | 5297.9  | 5297.9  |
| 2.5°  | 5737.2 | 5723.0 | 5717.8 | 5708.8 | 5674.5 | 5641.0  | 5574.6  | 5555.9  | 5514.2  | 5415.0  | 5309.8  |
| 5°    | 5741.6 | 5740.9 | 5756.6 | 5752.8 | 5740.9 | 5725.2  | 5677.5  | 5652.9  | 5582.1  | 5440.4  | 5247.9  |
| 7.5°  | 5465.0 | 5479.1 | 5514.2 | 5542.5 | 5575.3 | 5617.8  | 5623.8  | 5599.9  | 5541.8  | 5388.9  | 5133.8  |
| 10°   | 5093.6 | 5115.9 | 5165.2 | 5221.1 | 5306.9 | 5391.9  | 5467.9  | 5465.0  | 5444.8  | 5294.2  | 4996.6  |
| 12.5° | 4721.4 | 4747.5 | 4804.2 | 4887.0 | 5008.6 | 5147.3  | 5283.0  | 5301.6  | 5335.2  | 5209.2  | 4869.8  |
| 15°   | 4395.5 | 4417.9 | 4473.8 | 4575.3 | 4725.9 | 4912.4  | 5111.5  | 5145.8  | 5232.3  | 5142.8  | 4763.9  |
| 17.5° | 4118.9 | 4133.0 | 4174.0 | 4286.7 | 4461.2 | 4687.1  | 4945.9  | 5013.0  | 5142.0  | 5090.6  | 4672.2  |
| 20°   | 3925.7 | 3927.9 | 3954.8 | 4033.8 | 4208.4 | 4461.2  | 4774.4  | 4870.6  | 5046.6  | 5045.8  | 4577.5  |
| 22.5° | 3830.2 | 3822.8 | 3828.0 | 3873.5 | 4001.8 | 4245.6  | 4602.9  | 4717.0  | 4960.8  | 5007.8  | 4481.3  |
| 25°   | 3812.4 | 3806.4 | 3791.5 | 3797.4 | 3875.0 | 4057.0  | 4429.8  | 4561.8  | 4885.5  | 4984.7  | 4397.8  |
| 27.5° | 3868.3 | 3874.2 | 3848.9 | 3822.0 | 3828.0 | 3934.7  | 4276.2  | 4429.1  | 4824.4  | 4984.7  | 4338.9  |
| 30°   | 3980.9 | 3983.9 | 3965.2 | 3930.2 | 3883.2 | 3900.4  | 4169.6  | 4322.5  | 4793.8  | 5019.0  | 4301.6  |
| 32.5° | 4105.4 | 4121.8 | 4119.6 | 4091.3 | 4024.1 | 3954.8  | 4144.2  | 4283.7  | 4791.5  | 5095.1  | 4297.8  |
| 35°   | 4259.8 | 4278.5 | 4309.8 | 4303.8 | 4233.7 | 4119.6  | 4230.7  | 4340.4  | 4835.5  | 5220.4  | 4338.1  |
| 37.5° | 4423.9 | 4452.2 | 4519.3 | 4551.4 | 4505.9 | 4376.9  | 4424.6  | 4502.9  | 4953.4  | 5423.2  | 4440.3  |
| 40°   | 4582.7 | 4614.8 | 4737.1 | 4863.1 | 4828.8 | 4696.1  | 4718.5  | 4781.1  | 5162.9  | 5714.8  | 4634.2  |
| 42.5° | 4738.6 | 4786.3 | 4966.0 | 5173.4 | 5214.4 | 5108.5  | 5120.4  | 5170.4  | 5473.9  | 6116.0  | 4951.1  |
| 45°   | 4925.0 | 4978.7 | 5245.0 | 5500.8 | 5610.4 | 5564.2  | 5614.9  | 5647.7  | 5880.4  | 6646.3  | 5378.5  |
| 47.5° | 5198.7 | 5260.6 | 5587.3 | 5878.9 | 6071.3 | 6101.1  | 6203.3  | 6224.9  | 6394.2  | 7263.8  | 5935.5  |
| 50°   | 5732.7 | 5749.8 | 6045.2 | 6309.9 | 6587.3 | 6766.3  | 6882.7  | 6899.1  | 7016.2  | 7938.7  | 6631.3  |
| 52.5° | 6404.6 | 6415.8 | 6582.9 | 6760.4 | 7075.8 | 7441.2  | 7713.4  | 7736.6  | 7761.2  | 8596.4  | 7318.2  |
| 55°   | 7072.1 | 7070.6 | 7181.0 | 7285.4 | 7646.3 | 8177.3  | 8768.0  | 8782.1  | 8605.4  | 9220.6  | 7843.2  |
| 57.5° | 7489.0 | 7529.2 | 7697.0 | 7831.3 | 8335.4 | 9016.3  | 9835.9  | 9888.1  | 9492.1  | 9683.0  | 8362.3  |
| 60°   | 7356.2 | 7375.6 | 7747.8 | 8244.4 | 9193.8 | 10208.8 | 10916.5 | 10929.9 | 10158.8 | 10144.6 | 9018.5  |
| 62.5° | 6267.4 | 6277.8 | 6862.5 | 7886.5 | 9628.6 | 11755.5 | 12220.1 | 12001.6 | 10925.5 | 10785.3 | 9803.8  |
| 65°   | 4295.6 | 4363.5 | 4851.9 | 6117.5 | 8829.9 | 12725.7 | 14238.1 | 13876.4 | 12094.1 | 11708.5 | 10513.8 |
| 67.5° | 2529.6 | 2515.5 | 2757.1 | 3689.3 | 6485.2 | 12081.4 | 16790.9 | 16431.4 | 13687.8 | 12326.7 | 10305.7 |
| 70°   | 1727.9 | 1718.2 | 1810.7 | 2233.6 | 3661.0 | 9372.0  | 17594.1 | 18319.7 | 15095.0 | 11910.6 | 8869.4  |
| 72.5° | 1233.5 | 1238.7 | 1375.2 | 1735.4 | 2298.4 | 5460.5  | 15130.1 | 16847.6 | 14654.3 | 10383.3 | 6741.7  |
| 75°   | 837.5  | 851.7  | 1047.1 | 1423.7 | 2015.1 | 2778.0  | 10736.8 | 12807.0 | 11933.0 | 7546.4  | 3875.0  |
| 77.5° | 450.4  | 466.1  | 696.5  | 1147.0 | 1821.9 | 1930.0  | 6906.5  | 8814.2  | 7495.7  | 3392.5  | 1123.1  |
| 80°   | 187.9  | 196.9  | 325.9  | 833.8  | 1574.3 | 1695.1  | 4063.7  | 5344.9  | 3194.1  | 669.0   | 250.6   |
| 82.5° | 81.3   | 85.8   | 135.7  | 497.4  | 1176.8 | 1431.1  | 2151.5  | 2571.4  | 968.0   | 146.9   | 126.0   |
| 85°   | 15.7   | 16.4   | 55.9   | 263.3  | 751.0  | 807.7   | 1394.6  | 1367.0  | 434.8   | 63.4    | 91.7    |
| 87.5° | 0.0    | 0.0    | 13.4   | 82.8   | 220.7  | 440.0   | 850.9   | 840.5   | 147.7   | 30.6    | 34.3    |
| 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: P323478

CATALOG NUMBER: GLEON-SA4B-730-U-SL3-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 5297.9 | 5297.9 | 5297.9 | 5297.9 | 5297.9 | 5297.9 | 5297.9 | 5297.9 | 5297.9 | 5297.9 | 5297.9 |
| 2.5°  | 5256.2 | 5204.7 | 5096.6 | 4963.1 | 4860.9 | 4748.3 | 4658.8 | 4545.4 | 4496.2 | 4498.5 | 4471.6 |
| 5°    | 5138.3 | 5032.4 | 4793.0 | 4491.0 | 4258.3 | 4018.2 | 3811.6 | 3605.8 | 3484.2 | 3444.7 | 3407.4 |
| 7.5°  | 4969.8 | 4802.0 | 4420.1 | 3954.8 | 3561.0 | 3176.2 | 2841.4 | 2546.8 | 2360.3 | 2269.4 | 2235.8 |
| 10°   | 4779.6 | 4543.9 | 3991.3 | 3378.3 | 2816.0 | 2295.5 | 1861.4 | 1484.1 | 1333.4 | 1231.3 | 1205.2 |
| 12.5° | 4612.6 | 4293.4 | 3572.2 | 2786.9 | 2119.5 | 1491.5 | 1077.6 | 842.7  | 740.5  | 700.3  | 693.6  |
| 15°   | 4455.2 | 4059.2 | 3168.8 | 2251.5 | 1467.7 | 918.0  | 685.4  | 605.6  | 581.7  | 575.0  | 575.0  |
| 17.5° | 4306.8 | 3836.2 | 2774.2 | 1724.2 | 971.0  | 643.6  | 567.5  | 549.6  | 542.2  | 541.4  | 542.2  |
| 20°   | 4151.7 | 3613.2 | 2386.4 | 1263.3 | 677.9  | 545.2  | 524.3  | 514.6  | 512.3  | 512.3  | 512.3  |
| 22.5° | 4003.3 | 3390.2 | 2009.1 | 902.4  | 543.7  | 497.4  | 487.0  | 480.3  | 478.0  | 477.3  | 475.8  |
| 25°   | 3860.8 | 3178.5 | 1640.7 | 637.6  | 477.3  | 455.7  | 446.7  | 437.8  | 431.1  | 427.3  | 425.1  |
| 27.5° | 3743.7 | 2989.8 | 1297.6 | 511.6  | 431.1  | 412.4  | 401.2  | 387.8  | 371.4  | 363.9  | 361.0  |
| 30°   | 3650.5 | 2817.5 | 1000.1 | 431.8  | 387.8  | 369.2  | 352.0  | 328.9  | 305.0  | 292.3  | 291.6  |
| 32.5° | 3577.4 | 2648.2 | 759.2  | 381.8  | 349.0  | 325.9  | 301.3  | 272.2  | 244.6  | 230.4  | 229.7  |
| 35°   | 3541.6 | 2499.1 | 580.2  | 345.3  | 314.7  | 285.6  | 255.1  | 223.0  | 196.1  | 182.7  | 181.2  |
| 37.5° | 3565.5 | 2373.0 | 452.7  | 314.7  | 285.6  | 252.1  | 216.3  | 182.7  | 158.8  | 146.9  | 146.2  |
| 40°   | 3652.8 | 2292.5 | 367.7  | 288.6  | 261.0  | 220.0  | 181.2  | 149.9  | 129.8  | 120.1  | 119.3  |
| 42.5° | 3838.5 | 2262.7 | 314.0  | 267.0  | 237.2  | 190.2  | 150.6  | 123.8  | 105.2  | 98.4   | 96.9   |
| 45°   | 4148.7 | 2306.7 | 277.4  | 246.1  | 212.5  | 161.8  | 124.5  | 101.4  | 85.0   | 79.8   | 79.1   |
| 47.5° | 4561.8 | 2422.2 | 251.3  | 226.0  | 190.2  | 136.5  | 103.7  | 82.0   | 69.4   | 64.1   | 63.4   |
| 50°   | 5094.3 | 2605.7 | 229.7  | 205.8  | 169.3  | 115.6  | 85.8   | 64.9   | 53.7   | 50.0   | 50.0   |
| 52.5° | 5673.8 | 2824.2 | 210.3  | 187.2  | 148.4  | 96.2   | 69.4   | 50.0   | 42.5   | 38.0   | 38.0   |
| 55°   | 6152.6 | 3015.1 | 189.4  | 173.0  | 123.1  | 79.8   | 52.9   | 38.0   | 31.3   | 29.1   | 29.1   |
| 57.5° | 6630.6 | 3218.7 | 165.6  | 148.4  | 98.4   | 64.9   | 40.3   | 28.3   | 23.1   | 21.6   | 21.6   |
| 60°   | 7250.3 | 3467.8 | 142.4  | 120.8  | 77.6   | 49.2   | 29.8   | 20.1   | 17.2   | 16.4   | 16.4   |
| 62.5° | 7932.0 | 3614.0 | 121.6  | 96.9   | 60.4   | 36.5   | 21.6   | 13.4   | 12.7   | 12.7   | 11.9   |
| 65°   | 8348.8 | 3407.4 | 102.2  | 77.6   | 47.0   | 27.6   | 14.2   | 9.7    | 11.2   | 10.4   | 8.9    |
| 67.5° | 7817.1 | 2667.6 | 83.5   | 60.4   | 36.5   | 20.9   | 8.9    | 6.7    | 11.9   | 9.7    | 7.5    |
| 70°   | 6472.5 | 1867.4 | 64.9   | 42.5   | 29.1   | 17.9   | 6.0    | 4.5    | 12.7   | 9.7    | 6.0    |
| 72.5° | 4843.7 | 1249.9 | 51.5   | 28.3   | 21.6   | 15.7   | 5.2    | 2.2    | 11.2   | 8.2    | 5.2    |
| 75°   | 2646.7 | 503.4  | 41.0   | 17.9   | 13.4   | 11.2   | 3.7    | 1.5    | 7.5    | 6.0    | 3.7    |
| 77.5° | 696.5  | 132.7  | 29.8   | 11.9   | 7.5    | 4.5    | 2.2    | 0.7    | 3.7    | 3.0    | 1.5    |
| 80°   | 177.5  | 51.5   | 19.4   | 8.2    | 5.2    | 2.2    | 0.0    | 0.0    | 0.7    | 0.0    | 0.0    |
| 82.5° | 94.7   | 21.6   | 11.9   | 6.0    | 3.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 85°   | 71.6   | 14.2   | 6.7    | 3.7    | 0.7    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 87.5° | 27.6   | 4.5    | 2.2    | 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: SP1-1908-441-2-R4

Test Date: 10/03/2019

Luminaire Tested: SA1C-730-U-5WQ

Data in this report applies to families of products SA1C-730-U-5WQ .

### Test Information

Test Method: LM-79-2008  
 Report Number: SP1-1908-441-2-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-730-U-5WQ**  
 Description: MCGRAW EDISON ROADWAY AND AREA LUMINAIRE

\*\*\*THIS IS A REVISION OF SP1-1908-441-2-R3. TO UPDATE THE CATALOG INFORMATION.\*\*\*TESTED IN SITU. (1) 70 CRI, 3000K, 1050MA LIGHTSQUARE WITH 16 LEDS AND TYPE V WIDE OPTICS.

### Spectral Parameters

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 2993   | CRI (Ra): | 71.8 |      |       |
| CIE u':                   | 0.2508 | R1:       | 67.5 | R9:  | -38.3 |
| CIE v':                   | 0.5215 | R2:       | 82.9 | R10: | 62.5  |
| Duv:                      | 0.0000 | R3:       | 94.7 | R11: | 63.7  |
| CIE x:                    | 0.4374 | R4:       | 67.7 | R12: | 57.8  |
| CIE y:                    | 0.4043 | R5:       | 67.9 | R13: | 70.4  |
| CIE z:                    | 0.1583 | R6:       | 77.6 | R14: | 97.3  |
| Peak Wavelength (nm):     | 593    | R7:       | 76.0 |      |       |
| Dominant Wavelength (nm): | 582    | R8:       | 40.5 |      |       |
| Purity:                   | 53     |           |      |      |       |
| Rf:                       | 75.7   |           |      |      |       |
| Rg:                       | 93.9   |           |      |      |       |



### Test Conditions

Stabilization Time: 53M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.0./44%  
 Sphere Temperature (°C): 25.7

REPORT NUMBER: SP1-1908-441-2-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 3000K 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       | 2397             | NR               | 490       | 24908            | NR               | 620       | 118784           | NR               | 750       | 5037             | NR               | 880       | 2677             | NR               |
| 365       | 2084             | NR               | 495       | 30998            | NR               | 625       | 108951           | NR               | 755       | 4413             | NR               | 885       | 2940             | NR               |
| 370       | 2143             | NR               | 500       | 37103            | NR               | 630       | 99573            | NR               | 760       | 4189             | NR               | 890       | 3116             | NR               |
| 375       | 2413             | NR               | 505       | 42987            | NR               | 635       | 90444            | NR               | 765       | 3677             | NR               | 895       | 3345             | NR               |
| 380       | 2172             | NR               | 510       | 48702            | NR               | 640       | 80749            | NR               | 770       | 3366             | NR               | 900       | 2312             | NR               |
| 385       | 1997             | NR               | 515       | 53741            | NR               | 645       | 71664            | NR               | 775       | 3211             | NR               | 905       | 2829             | NR               |
| 390       | 1830             | NR               | 520       | 57283            | NR               | 650       | 63936            | NR               | 780       | 2682             | NR               | 910       | 2783             | NR               |
| 395       | 1861             | NR               | 525       | 61876            | NR               | 655       | 56611            | NR               | 785       | 2804             | NR               | 915       | 2662             | NR               |
| 400       | 1717             | NR               | 530       | 65398            | NR               | 660       | 49763            | NR               | 790       | 2581             | NR               | 920       | 3047             | NR               |
| 405       | 1761             | NR               | 535       | 69597            | NR               | 665       | 42891            | NR               | 795       | 2711             | NR               | 925       | 2256             | NR               |
| 410       | 2680             | NR               | 540       | 74214            | NR               | 670       | 36939            | NR               | 800       | 2609             | NR               | 930       | 2976             | NR               |
| 415       | 4374             | NR               | 545       | 79911            | NR               | 675       | 31946            | NR               | 805       | 2581             | NR               | 935       | 3503             | NR               |
| 420       | 8071             | NR               | 550       | 86153            | NR               | 680       | 27385            | NR               | 810       | 2404             | NR               | 940       | 4226             | NR               |
| 425       | 15169            | NR               | 555       | 93952            | NR               | 685       | 23504            | NR               | 815       | 2556             | NR               | 945       | 2930             | NR               |
| 430       | 26038            | NR               | 560       | 102904           | NR               | 690       | 20210            | NR               | 820       | 2742             | NR               | 950       | 2115             | NR               |
| 435       | 41316            | NR               | 565       | 112009           | NR               | 695       | 17459            | NR               | 825       | 2014             | NR               | 955       | 2634             | NR               |
| 440       | 59674            | NR               | 570       | 121662           | NR               | 700       | 15207            | NR               | 830       | 2488             | NR               | 960       | 4200             | NR               |
| 445       | 72751            | NR               | 575       | 130476           | NR               | 705       | 13322            | NR               | 835       | 2625             | NR               | 965       | 1982             | NR               |
| 450       | 65091            | NR               | 580       | 137926           | NR               | 710       | 11676            | NR               | 840       | 2754             | NR               | 970       | 3613             | NR               |
| 455       | 44894            | NR               | 585       | 143406           | NR               | 715       | 10626            | NR               | 845       | 2708             | NR               | 975       | 4034             | NR               |
| 460       | 32712            | NR               | 590       | 147039           | NR               | 720       | 9416             | NR               | 850       | 2608             | NR               | 980       | 3922             | NR               |
| 465       | 25296            | NR               | 595       | 147365           | NR               | 725       | 8333             | NR               | 855       | 2605             | NR               | 985       | 1909             | NR               |
| 470       | 19318            | NR               | 600       | 145800           | NR               | 730       | 7134             | NR               | 860       | 1765             | NR               | 990       | 3617             | NR               |
| 475       | 17265            | NR               | 605       | 141363           | NR               | 735       | 6437             | NR               | 865       | 2581             | NR               | 995       | 4767             | NR               |
| 480       | 18260            | NR               | 610       | 134199           | NR               | 740       | 5834             | NR               | 870       | 3016             | NR               | 1000      | 2528             | NR               |
| 485       | 20845            | NR               | 615       | 127683           | NR               | 745       | 5500             | NR               | 875       | 3952             | NR               |           |                  |                  |

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Scotopic Flux vs. Wavelength



Scotopic Lumens: 8494.8

S/P: 1.23

| 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       | 2397             | NR               | 490       | 24908            | NR               | 620       | 118784           | NR               | 750       | 5037             | NR               | 880       | 2677             | NR               |
| 365       | 2084             | NR               | 495       | 30998            | NR               | 625       | 108951           | NR               | 755       | 4413             | NR               | 885       | 2940             | NR               |
| 370       | 2143             | NR               | 500       | 37103            | NR               | 630       | 99573            | NR               | 760       | 4189             | NR               | 890       | 3116             | NR               |
| 375       | 2413             | NR               | 505       | 42987            | NR               | 635       | 90444            | NR               | 765       | 3677             | NR               | 895       | 3345             | NR               |
| 380       | 2172             | NR               | 510       | 48702            | NR               | 640       | 80749            | NR               | 770       | 3366             | NR               | 900       | 2312             | NR               |
| 385       | 1997             | NR               | 515       | 53741            | NR               | 645       | 71664            | NR               | 775       | 3211             | NR               | 905       | 2829             | NR               |
| 390       | 1830             | NR               | 520       | 57283            | NR               | 650       | 63936            | NR               | 780       | 2682             | NR               | 910       | 2783             | NR               |
| 395       | 1861             | NR               | 525       | 61876            | NR               | 655       | 56611            | NR               | 785       | 2804             | NR               | 915       | 2662             | NR               |
| 400       | 1717             | NR               | 530       | 65398            | NR               | 660       | 49763            | NR               | 790       | 2581             | NR               | 920       | 3047             | NR               |
| 405       | 1761             | NR               | 535       | 69597            | NR               | 665       | 42891            | NR               | 795       | 2711             | NR               | 925       | 2256             | NR               |
| 410       | 2680             | NR               | 540       | 74214            | NR               | 670       | 36939            | NR               | 800       | 2609             | NR               | 930       | 2976             | NR               |
| 415       | 4374             | NR               | 545       | 79911            | NR               | 675       | 31946            | NR               | 805       | 2581             | NR               | 935       | 3503             | NR               |
| 420       | 8071             | NR               | 550       | 86153            | NR               | 680       | 27385            | NR               | 810       | 2404             | NR               | 940       | 4226             | NR               |
| 425       | 15169            | NR               | 555       | 93952            | NR               | 685       | 23504            | NR               | 815       | 2556             | NR               | 945       | 2930             | NR               |
| 430       | 26038            | NR               | 560       | 102904           | NR               | 690       | 20210            | NR               | 820       | 2742             | NR               | 950       | 2115             | NR               |
| 435       | 41316            | NR               | 565       | 112009           | NR               | 695       | 17459            | NR               | 825       | 2014             | NR               | 955       | 2634             | NR               |
| 440       | 59674            | NR               | 570       | 121662           | NR               | 700       | 15207            | NR               | 830       | 2488             | NR               | 960       | 4200             | NR               |
| 445       | 72751            | NR               | 575       | 130476           | NR               | 705       | 13322            | NR               | 835       | 2625             | NR               | 965       | 1982             | NR               |
| 450       | 65091            | NR               | 580       | 137926           | NR               | 710       | 11676            | NR               | 840       | 2754             | NR               | 970       | 3613             | NR               |
| 455       | 44894            | NR               | 585       | 143406           | NR               | 715       | 10626            | NR               | 845       | 2708             | NR               | 975       | 4034             | NR               |
| 460       | 32712            | NR               | 590       | 147039           | NR               | 720       | 9416             | NR               | 850       | 2608             | NR               | 980       | 3922             | NR               |
| 465       | 25296            | NR               | 595       | 147365           | NR               | 725       | 8333             | NR               | 855       | 2605             | NR               | 985       | 1909             | NR               |
| 470       | 19318            | NR               | 600       | 145800           | NR               | 730       | 7134             | NR               | 860       | 1765             | NR               | 990       | 3617             | NR               |
| 475       | 17265            | NR               | 605       | 141363           | NR               | 735       | 6437             | NR               | 865       | 2581             | NR               | 995       | 4767             | NR               |
| 480       | 18260            | NR               | 610       | 134199           | NR               | 740       | 5834             | NR               | 870       | 3016             | NR               | 1000      | 2528             | NR               |
| 485       | 20845            | NR               | 615       | 127683           | NR               | 745       | 5500             | NR               | 875       | 3952             | NR               |           |                  |                  |

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**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 3101.5 M/P: 0.45**

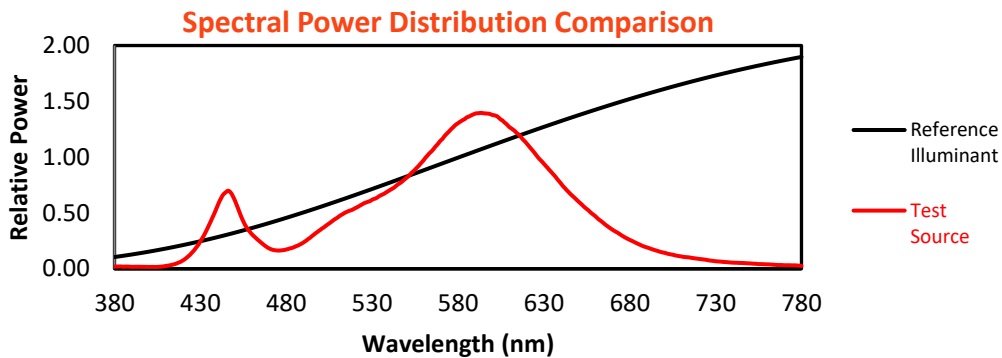
| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 2397             | NR               | 490       | 24908            | NR               | 620       | 118784           | NR               | 750       | 5037             | NR               | 880       | 2677             | NR               |
| 365       | 2084             | NR               | 495       | 30998            | NR               | 625       | 108951           | NR               | 755       | 4413             | NR               | 885       | 2940             | NR               |
| 370       | 2143             | NR               | 500       | 37103            | NR               | 630       | 99573            | NR               | 760       | 4189             | NR               | 890       | 3116             | NR               |
| 375       | 2413             | NR               | 505       | 42987            | NR               | 635       | 90444            | NR               | 765       | 3677             | NR               | 895       | 3345             | NR               |
| 380       | 2172             | NR               | 510       | 48702            | NR               | 640       | 80749            | NR               | 770       | 3366             | NR               | 900       | 2312             | NR               |
| 385       | 1997             | NR               | 515       | 53741            | NR               | 645       | 71664            | NR               | 775       | 3211             | NR               | 905       | 2829             | NR               |
| 390       | 1830             | NR               | 520       | 57283            | NR               | 650       | 63936            | NR               | 780       | 2682             | NR               | 910       | 2783             | NR               |
| 395       | 1861             | NR               | 525       | 61876            | NR               | 655       | 56611            | NR               | 785       | 2804             | NR               | 915       | 2662             | NR               |
| 400       | 1717             | NR               | 530       | 65398            | NR               | 660       | 49763            | NR               | 790       | 2581             | NR               | 920       | 3047             | NR               |
| 405       | 1761             | NR               | 535       | 69597            | NR               | 665       | 42891            | NR               | 795       | 2711             | NR               | 925       | 2256             | NR               |
| 410       | 2680             | NR               | 540       | 74214            | NR               | 670       | 36939            | NR               | 800       | 2609             | NR               | 930       | 2976             | NR               |
| 415       | 4374             | NR               | 545       | 79911            | NR               | 675       | 31946            | NR               | 805       | 2581             | NR               | 935       | 3503             | NR               |
| 420       | 8071             | NR               | 550       | 86153            | NR               | 680       | 27385            | NR               | 810       | 2404             | NR               | 940       | 4226             | NR               |
| 425       | 15169            | NR               | 555       | 93952            | NR               | 685       | 23504            | NR               | 815       | 2556             | NR               | 945       | 2930             | NR               |
| 430       | 26038            | NR               | 560       | 102904           | NR               | 690       | 20210            | NR               | 820       | 2742             | NR               | 950       | 2115             | NR               |
| 435       | 41316            | NR               | 565       | 112009           | NR               | 695       | 17459            | NR               | 825       | 2014             | NR               | 955       | 2634             | NR               |
| 440       | 59674            | NR               | 570       | 121662           | NR               | 700       | 15207            | NR               | 830       | 2488             | NR               | 960       | 4200             | NR               |
| 445       | 72751            | NR               | 575       | 130476           | NR               | 705       | 13322            | NR               | 835       | 2625             | NR               | 965       | 1982             | NR               |
| 450       | 65091            | NR               | 580       | 137926           | NR               | 710       | 11676            | NR               | 840       | 2754             | NR               | 970       | 3613             | NR               |
| 455       | 44894            | NR               | 585       | 143406           | NR               | 715       | 10626            | NR               | 845       | 2708             | NR               | 975       | 4034             | NR               |
| 460       | 32712            | NR               | 590       | 147039           | NR               | 720       | 9416             | NR               | 850       | 2608             | NR               | 980       | 3922             | NR               |
| 465       | 25296            | NR               | 595       | 147365           | NR               | 725       | 8333             | NR               | 855       | 2605             | NR               | 985       | 1909             | NR               |
| 470       | 19318            | NR               | 600       | 145800           | NR               | 730       | 7134             | NR               | 860       | 1765             | NR               | 990       | 3617             | NR               |
| 475       | 17265            | NR               | 605       | 141363           | NR               | 735       | 6437             | NR               | 865       | 2581             | NR               | 995       | 4767             | NR               |
| 480       | 18260            | NR               | 610       | 134199           | NR               | 740       | 5834             | NR               | 870       | 3016             | NR               | 1000      | 2528             | NR               |
| 485       | 20845            | NR               | 615       | 127683           | NR               | 745       | 5500             | NR               | 875       | 3952             | NR               |           |                  |                  |

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### Summary

$R_f = 75.7$   
 $R_g = 93.9$   
 CIE  $R_a = 71.8$   
 $R_g = -38.3$



### Color Vector Graphics



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

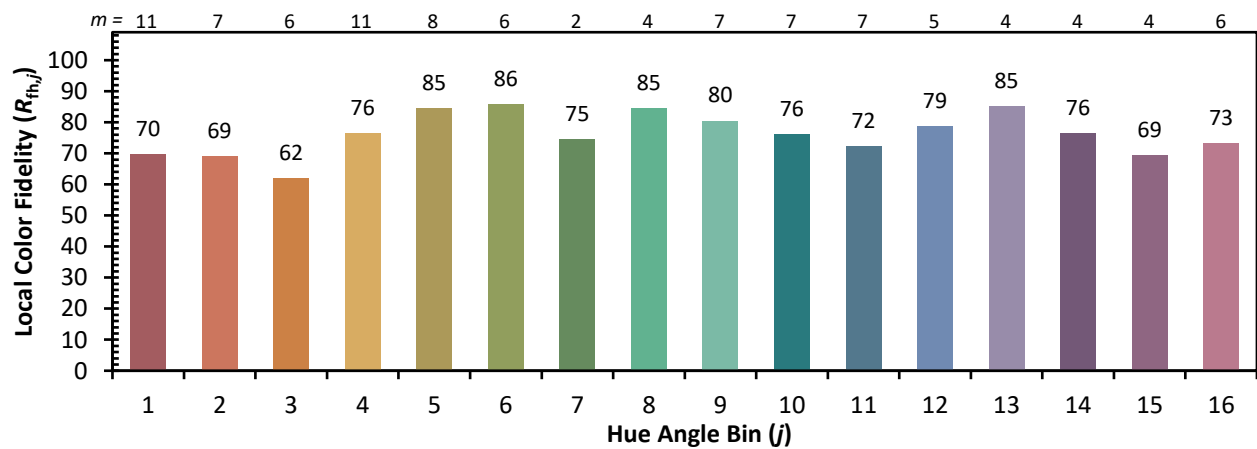
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 67 | CES51 = 87 | CES76 = 63 |
| CES02 = 63 | CES27 = 88 | CES52 = 86 | CES77 = 80 |
| CES03 = 31 | CES28 = 87 | CES53 = 78 | CES78 = 67 |
| CES04 = 71 | CES29 = 66 | CES54 = 84 | CES79 = 87 |
| CES05 = 49 | CES30 = 73 | CES55 = 84 | CES80 = 86 |
| CES06 = 51 | CES31 = 70 | CES56 = 75 | CES81 = 71 |
| CES07 = 41 | CES32 = 65 | CES57 = 74 | CES82 = 94 |
| CES08 = 40 | CES33 = 73 | CES58 = 76 | CES83 = 90 |
| CES09 = 29 | CES34 = 79 | CES59 = 85 | CES84 = 89 |
| CES10 = 76 | CES35 = 89 | CES60 = 93 | CES85 = 77 |
| CES11 = 59 | CES36 = 97 | CES61 = 84 | CES86 = 61 |
| CES12 = 65 | CES37 = 87 | CES62 = 91 | CES87 = 78 |
| CES13 = 43 | CES38 = 81 | CES63 = 77 | CES88 = 77 |
| CES14 = 74 | CES39 = 95 | CES64 = 72 | CES89 = 67 |
| CES15 = 71 | CES40 = 92 | CES65 = 68 | CES90 = 76 |
| CES16 = 47 | CES41 = 88 | CES66 = 69 | CES91 = 89 |
| CES17 = 50 | CES42 = 89 | CES67 = 67 | CES92 = 58 |
| CES18 = 56 | CES43 = 79 | CES68 = 72 | CES93 = 74 |
| CES19 = 73 | CES44 = 99 | CES69 = 81 | CES94 = 49 |
| CES20 = 66 | CES45 = 85 | CES70 = 66 | CES95 = 68 |
| CES21 = 87 | CES46 = 80 | CES71 = 67 | CES96 = 76 |
| CES22 = 79 | CES47 = 82 | CES72 = 88 | CES97 = 82 |
| CES23 = 92 | CES48 = 69 | CES73 = 59 | CES98 = 75 |
| CES24 = 91 | CES49 = 80 | CES74 = 95 | CES99 = 62 |
| CES25 = 73 | CES50 = 87 | CES75 = 69 |            |



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**Color Rendition by Hue-Angle Bin**



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**Measure Comparisons**



(END OF REPORT)