

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: P322402

Luminaire Tested: **GLEON-SA8B-830-U-T3-HSS**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P322402  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-15)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA8B-830-U-T3-HSS  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(8) 80 CRI, 3000K, 800mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE III  
OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 26521 lumens  
Efficiency: N/A  
Efficacy: 79.4 lumens/watt  
Luminous Opening: Rectangular (W 2' x L: 1' x H: 0')  
IES Classification: Type III - Short  
BUG Rating: B2 - U0 - G4

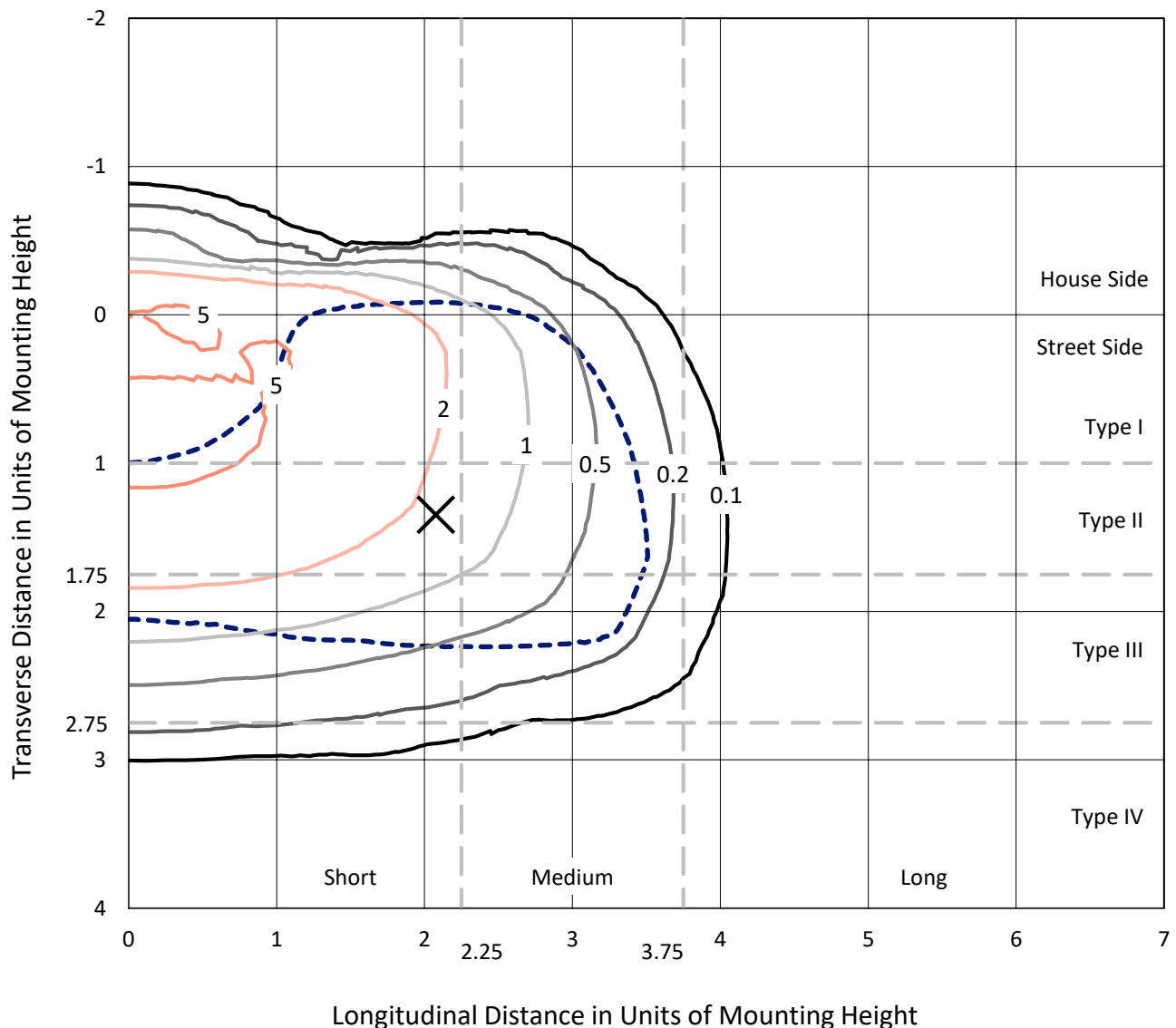
Input Watts (W): 334  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



REPORT NUMBER: P322402  
 CATALOG NUMBER: GLEON-SA8B-830-U-T3-HSS

## Iso-Footcandle Lines of Horizontal Illumination

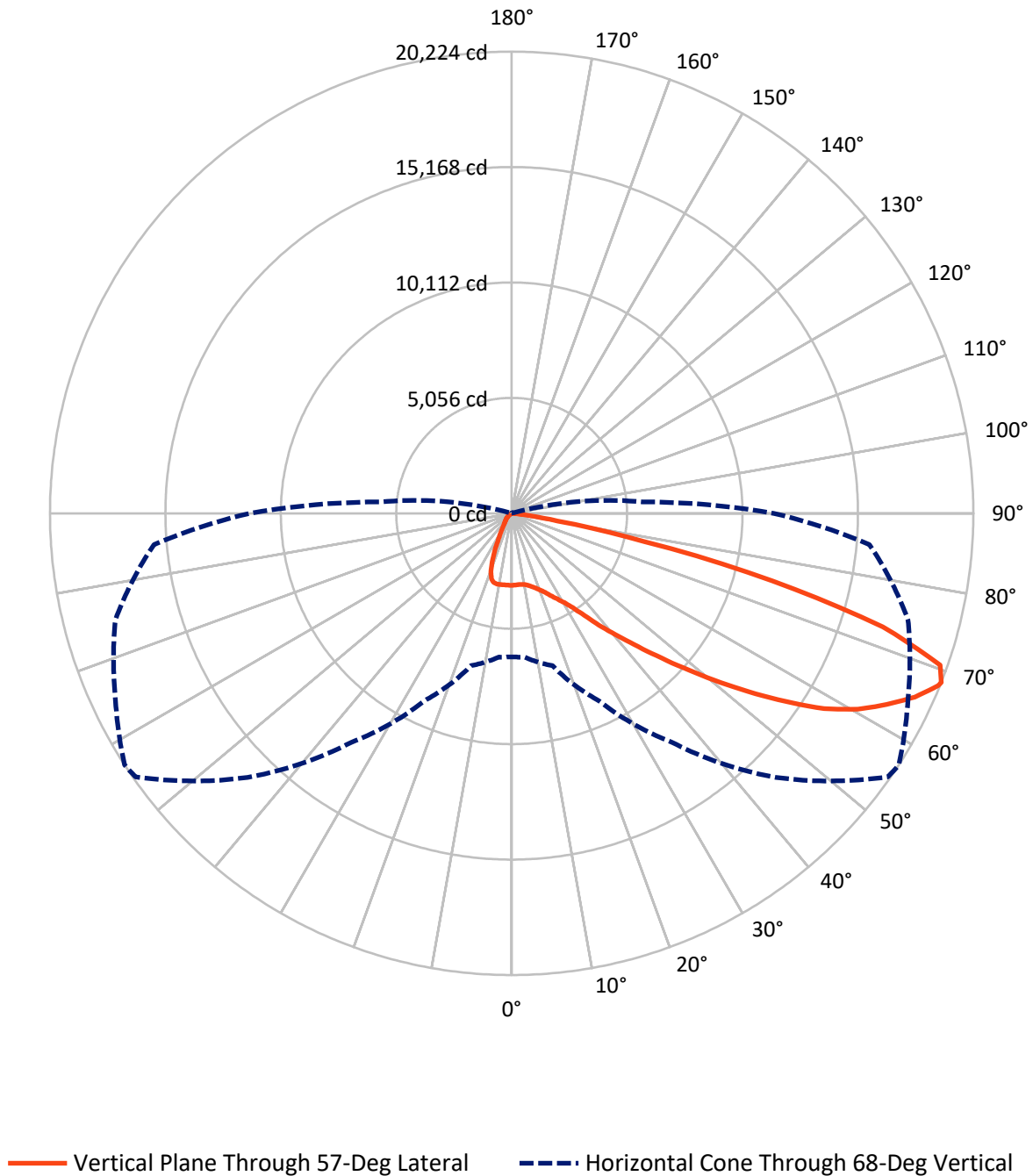
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 6.5 fc  
 Type III - Short - N/A

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## Luminous Intensity Polar Plot



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**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 2908.2   | 0.0    | 2908.2  |
|                    | % Fixture | 11.0     | 0.0    | 11.0    |
| <b>Street Side</b> | Lumens    | 23612.8  | 0.0    | 23612.8 |
|                    | % Fixture | 89.0     | 0.0    | 89.0    |
| <b>Total</b>       | Lumens    | 26521.0  | 0.0    | 26521.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 294.9   | 1.1       |
| 10°-20°   | 817.3   | 3.1       |
| 20°-30°   | 1409.8  | 5.3       |
| 30°-40°   | 2433.3  | 9.2       |
| 40°-50°   | 4162.3  | 15.7      |
| 50°-60°   | 6659.2  | 25.1      |
| 60°-70°   | 7694.0  | 29.0      |
| 70°-80°   | 2940.0  | 11.1      |
| 80°-90°   | 110.2   | 0.4       |
| 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°    | 26521.0 | 100.0     |
| 0°-180°   | 26521.0 | 100.0     |

**Coefficient of Utilization**



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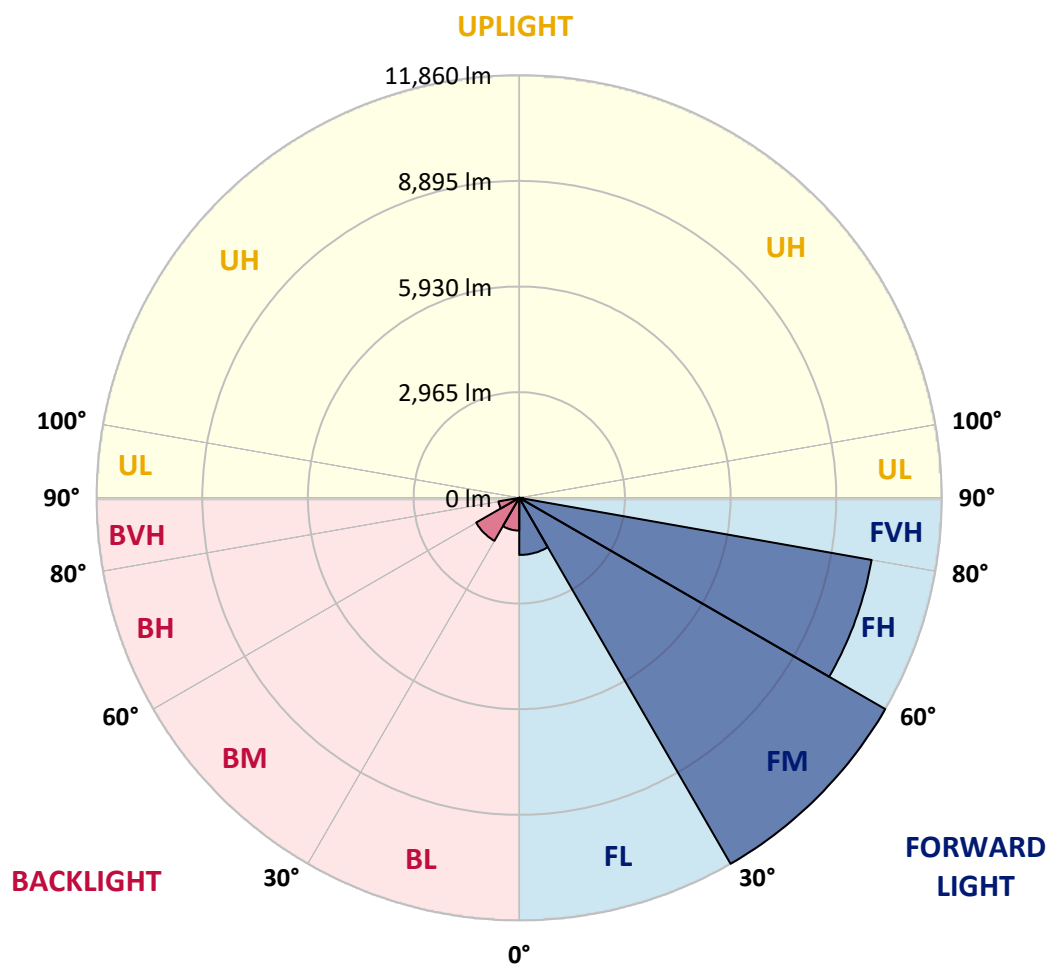
CATALOG NUMBER: GLEON-SA8B-830-U-T3-HSS

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |          |
|------|-------------|---------|-----------|-------------------------|------|----------|
|      |             |         |           | B                       | U    | G        |
| FL   | (0°-30°)    | 1602.9  | 6.0       |                         |      |          |
| FM   | (30°-60°)   | 11860.0 | 44.7      |                         |      |          |
| FH   | (60°-80°)   | 10041.7 | 37.9      |                         |      | G4/12000 |
| FVH  | (80°-90°)   | 108.2   | 0.4       |                         |      | G2/225   |
| BL   | (0°-30°)    | 919.1   | 3.5       | B2/1000                 |      |          |
| BM   | (30°-60°)   | 1394.8  | 5.3       | B2/2500                 |      |          |
| BH   | (60°-80°)   | 592.3   | 2.2       | B2/1000                 |      | G2/1000  |
| BVH  | (80°-90°)   | 2.0     | 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 Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 55°     | 57°     | 65°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 3151.4  | 3151.4  | 3151.4  | 3151.4  | 3151.4  | 3151.4  | 3151.4  | 3151.4  | 3151.4  | 3151.4  | 3151.4  |
| 2.5°  | 3077.4  | 3091.2  | 3101.2  | 3107.5  | 3115.0  | 3131.3  | 3136.3  | 3143.9  | 3147.6  | 3147.6  | 3156.4  |
| 5°    | 2955.8  | 2970.8  | 2992.1  | 3009.7  | 3044.8  | 3089.9  | 3122.6  | 3135.1  | 3157.7  | 3177.7  | 3189.0  |
| 7.5°  | 2842.9  | 2860.5  | 2885.5  | 2926.9  | 2987.1  | 3059.8  | 3127.6  | 3145.1  | 3189.0  | 3231.7  | 3253.0  |
| 10°   | 2770.2  | 2784.0  | 2816.6  | 2875.5  | 2954.5  | 3056.1  | 3151.4  | 3172.7  | 3248.0  | 3319.4  | 3359.6  |
| 12.5° | 2745.1  | 2757.6  | 2791.5  | 2857.9  | 2955.8  | 3074.9  | 3206.6  | 3237.9  | 3348.3  | 3452.4  | 3508.8  |
| 15°   | 2781.5  | 2784.0  | 2820.3  | 2883.0  | 2979.6  | 3121.3  | 3298.1  | 3335.7  | 3474.9  | 3610.4  | 3680.6  |
| 17.5° | 2921.9  | 2910.6  | 2929.4  | 2957.0  | 3033.5  | 3182.7  | 3394.7  | 3451.1  | 3636.7  | 3796.0  | 3862.4  |
| 20°   | 3273.0  | 3273.0  | 3230.4  | 3155.2  | 3156.4  | 3278.1  | 3525.1  | 3589.1  | 3816.0  | 4000.4  | 4060.6  |
| 22.5° | 3873.7  | 3862.4  | 3777.2  | 3592.8  | 3423.5  | 3442.3  | 3684.4  | 3767.1  | 4031.7  | 4228.6  | 4248.7  |
| 25°   | 4596.0  | 4582.2  | 4450.6  | 4191.0  | 3897.5  | 3708.2  | 3900.1  | 3995.4  | 4288.8  | 4463.1  | 4421.7  |
| 27.5° | 5361.0  | 5349.7  | 5219.3  | 4897.0  | 4479.4  | 4132.1  | 4157.1  | 4247.4  | 4550.9  | 4722.7  | 4591.0  |
| 30°   | 6102.1  | 6105.9  | 5976.7  | 5645.7  | 5172.9  | 4672.5  | 4483.2  | 4535.9  | 4805.5  | 4979.8  | 4791.7  |
| 32.5° | 6806.9  | 6811.9  | 6700.3  | 6330.4  | 5889.0  | 5300.8  | 4934.6  | 4920.8  | 5101.4  | 5273.2  | 5057.5  |
| 35°   | 7435.2  | 7447.7  | 7371.2  | 7084.1  | 6616.3  | 6000.6  | 5520.3  | 5487.7  | 5521.5  | 5715.9  | 5465.1  |
| 37.5° | 8040.9  | 8048.4  | 7990.7  | 7748.7  | 7357.4  | 6769.3  | 6260.2  | 6213.8  | 6141.0  | 6290.2  | 6003.1  |
| 40°   | 8704.3  | 8685.5  | 8619.0  | 8399.5  | 8063.5  | 7618.3  | 7055.2  | 6975.0  | 6848.3  | 6981.2  | 6710.3  |
| 42.5° | 9321.3  | 9299.9  | 9311.2  | 9062.9  | 8779.5  | 8491.1  | 7981.9  | 7844.0  | 7770.0  | 7923.0  | 7578.1  |
| 45°   | 10092.5 | 10081.2 | 10118.8 | 9903.1  | 9673.6  | 9464.2  | 9044.1  | 8893.6  | 8861.0  | 9040.3  | 8627.8  |
| 47.5° | 10853.7 | 10881.3 | 10997.9 | 10906.4 | 10813.6 | 10629.2 | 10169.0 | 10101.3 | 10121.3 | 10338.3 | 9735.1  |
| 50°   | 11488.2 | 11520.8 | 11840.6 | 11946.0 | 12080.1 | 11972.3 | 11510.8 | 11469.4 | 11548.4 | 11744.1 | 10926.4 |
| 52.5° | 11947.2 | 12013.7 | 12411.2 | 12896.5 | 13385.6 | 13458.3 | 12998.1 | 12960.5 | 13067.1 | 13097.2 | 11846.9 |
| 55°   | 12265.7 | 12324.7 | 12774.9 | 13662.7 | 14658.4 | 14971.9 | 14686.0 | 14540.6 | 14520.5 | 14223.3 | 12815.0 |
| 57.5° | 12322.2 | 12315.9 | 12963.0 | 14158.1 | 15656.6 | 16465.5 | 16284.9 | 16142.0 | 15730.6 | 15264.1 | 13924.8 |
| 60°   | 12003.6 | 12040.0 | 12791.2 | 14329.9 | 16283.7 | 17595.4 | 17609.2 | 17423.6 | 16782.8 | 16276.1 | 15000.8 |
| 62.5° | 11023.0 | 11171.0 | 11929.7 | 13879.7 | 16276.1 | 18050.6 | 18579.8 | 18438.1 | 17671.9 | 17105.1 | 16091.8 |
| 65°   | 9432.9  | 9485.5  | 10209.1 | 12337.2 | 15176.4 | 17860.0 | 19453.9 | 19401.2 | 18473.2 | 17910.2 | 16652.4 |
| 67.5° | 6888.4  | 6774.3  | 7534.3  | 9715.0  | 12848.9 | 16748.9 | 20080.9 | 20147.4 | 19091.5 | 18075.7 | 16055.4 |
| 68°   | 6286.5  | 6320.3  | 6912.2  | 9066.7  | 12239.4 | 16356.4 | 20122.3 | 20223.8 | 19152.9 | 17967.8 | 15729.4 |
| 70°   | 3747.1  | 3812.3  | 4340.2  | 6242.6  | 9311.2  | 14135.5 | 19675.8 | 19907.8 | 18786.7 | 16855.5 | 13605.0 |
| 72.5° | 956.8   | 1034.6  | 1533.7  | 2794.0  | 5318.4  | 9959.6  | 16609.7 | 17002.2 | 16311.3 | 13674.0 | 9184.6  |
| 75°   | 393.8   | 413.8   | 548.0   | 920.5   | 1981.4  | 4486.9  | 10947.7 | 11787.9 | 11307.6 | 8186.4  | 4150.9  |
| 77.5° | 272.1   | 285.9   | 352.4   | 510.4   | 857.8   | 1521.1  | 5367.3  | 5974.2  | 5382.3  | 2794.0  | 905.4   |
| 80°   | 195.6   | 206.9   | 252.1   | 339.8   | 492.8   | 543.0   | 1749.4  | 2022.8  | 1606.4  | 613.2   | 224.5   |
| 82.5° | 116.6   | 125.4   | 188.1   | 242.0   | 299.7   | 259.6   | 435.2   | 494.1   | 465.2   | 304.7   | 100.3   |
| 85°   | 57.7    | 67.7    | 126.7   | 173.1   | 161.8   | 109.1   | 132.9   | 148.0   | 183.1   | 185.6   | 53.9    |
| 87.5° | 3.8     | 7.5     | 74.0    | 104.1   | 45.1    | 25.1    | 38.9    | 47.7    | 65.2    | 91.5    | 22.6    |
| 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: P322402

CATALOG NUMBER: GLEON-SA8B-830-U-T3-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 3151.4  | 3151.4 | 3151.4 | 3151.4 | 3151.4 | 3151.4 | 3151.4 | 3151.4 | 3151.4 | 3151.4 | 3151.4 |
| 2.5°  | 3160.2  | 3161.4 | 3152.6 | 3148.9 | 3151.4 | 3136.3 | 3130.1 | 3132.6 | 3132.6 | 3136.3 | 3130.1 |
| 5°    | 3191.5  | 3191.5 | 3176.5 | 3156.4 | 3145.1 | 3116.3 | 3097.5 | 3092.5 | 3088.7 | 3086.2 | 3081.2 |
| 7.5°  | 3259.2  | 3251.7 | 3225.4 | 3181.5 | 3143.9 | 3081.2 | 3033.5 | 3008.4 | 2995.9 | 2990.9 | 2987.1 |
| 10°   | 3368.3  | 3354.5 | 3310.7 | 3229.1 | 3142.6 | 3031.0 | 2926.9 | 2852.9 | 2791.5 | 2766.4 | 2751.4 |
| 12.5° | 3515.1  | 3495.0 | 3421.0 | 3285.6 | 3133.8 | 2928.2 | 2702.4 | 2485.5 | 2283.6 | 2200.8 | 2159.5 |
| 15°   | 3684.4  | 3655.5 | 3538.9 | 3333.2 | 3082.4 | 2696.2 | 2205.9 | 1825.9 | 1546.2 | 1440.9 | 1395.7 |
| 17.5° | 3856.2  | 3818.5 | 3641.7 | 3363.3 | 2928.2 | 2215.9 | 1547.5 | 1168.8 | 981.9  | 931.7  | 914.2  |
| 20°   | 4029.2  | 3974.0 | 3730.8 | 3340.8 | 2579.6 | 1597.6 | 1020.8 | 854.0  | 800.1  | 785.0  | 780.0  |
| 22.5° | 4193.5  | 4108.2 | 3811.0 | 3253.0 | 2042.8 | 1072.2 | 807.6  | 754.9  | 737.4  | 728.6  | 726.1  |
| 25°   | 4336.5  | 4217.3 | 3881.2 | 2982.1 | 1445.9 | 810.1  | 727.3  | 709.8  | 687.2  | 670.9  | 672.2  |
| 27.5° | 4470.6  | 4326.4 | 3923.9 | 2535.7 | 964.4  | 692.2  | 673.4  | 649.6  | 608.2  | 584.4  | 584.4  |
| 30°   | 4632.4  | 4471.9 | 3955.2 | 1951.3 | 709.8  | 612.0  | 596.9  | 560.6  | 504.1  | 472.8  | 472.8  |
| 32.5° | 4875.7  | 4692.6 | 3935.2 | 1369.4 | 588.1  | 538.0  | 502.9  | 452.7  | 391.3  | 361.2  | 359.9  |
| 35°   | 5248.1  | 5033.7 | 3792.2 | 897.9  | 519.2  | 467.8  | 411.3  | 349.9  | 296.0  | 270.9  | 269.6  |
| 37.5° | 5749.8  | 5490.2 | 3471.2 | 642.1  | 465.2  | 402.5  | 334.8  | 267.1  | 227.0  | 210.7  | 209.4  |
| 40°   | 6400.6  | 6020.6 | 3012.2 | 520.4  | 415.1  | 339.8  | 258.3  | 206.9  | 179.3  | 166.8  | 168.0  |
| 42.5° | 7181.9  | 6588.7 | 2461.7 | 448.9  | 366.2  | 279.7  | 201.9  | 163.0  | 145.5  | 136.7  | 134.2  |
| 45°   | 8049.7  | 7149.3 | 1884.8 | 400.0  | 317.3  | 225.7  | 158.0  | 129.2  | 115.4  | 110.4  | 110.4  |
| 47.5° | 9004.0  | 7694.8 | 1379.4 | 357.4  | 264.6  | 174.3  | 126.7  | 105.3  | 94.1   | 90.3   | 89.0   |
| 50°   | 9870.5  | 8073.5 | 994.5  | 312.3  | 216.9  | 137.9  | 102.8  | 87.8   | 80.3   | 75.2   | 75.2   |
| 52.5° | 10592.8 | 8192.6 | 732.4  | 263.3  | 175.6  | 110.4  | 85.3   | 75.2   | 67.7   | 64.0   | 64.0   |
| 55°   | 11228.6 | 8143.7 | 544.3  | 216.9  | 141.7  | 90.3   | 72.7   | 64.0   | 57.7   | 53.9   | 53.9   |
| 57.5° | 11838.1 | 7985.7 | 406.3  | 176.8  | 114.1  | 72.7   | 61.4   | 53.9   | 47.7   | 45.1   | 45.1   |
| 60°   | 12336.0 | 7722.4 | 302.2  | 143.0  | 91.5   | 58.9   | 51.4   | 43.9   | 38.9   | 35.1   | 35.1   |
| 62.5° | 12739.8 | 7431.4 | 222.0  | 117.9  | 72.7   | 46.4   | 40.1   | 36.4   | 28.8   | 25.1   | 25.1   |
| 65°   | 12742.3 | 6948.6 | 166.8  | 97.8   | 56.4   | 36.4   | 30.1   | 28.8   | 18.8   | 15.0   | 13.8   |
| 67.5° | 11820.5 | 5990.5 | 127.9  | 84.0   | 43.9   | 27.6   | 22.6   | 23.8   | 10.0   | 6.3    | 5.0    |
| 68°   | 11485.7 | 5747.2 | 120.4  | 82.8   | 41.4   | 26.3   | 21.3   | 23.8   | 8.8    | 5.0    | 3.8    |
| 70°   | 9683.7  | 4572.2 | 96.6   | 80.3   | 36.4   | 20.1   | 17.6   | 23.8   | 7.5    | 3.8    | 2.5    |
| 72.5° | 6193.7  | 2653.5 | 71.5   | 64.0   | 27.6   | 15.0   | 11.3   | 21.3   | 7.5    | 2.5    | 1.3    |
| 75°   | 2636.0  | 822.6  | 48.9   | 45.1   | 16.3   | 11.3   | 7.5    | 13.8   | 5.0    | 1.3    | 0.0    |
| 77.5° | 555.5   | 185.6  | 28.8   | 27.6   | 11.3   | 7.5    | 5.0    | 3.8    | 1.3    | 0.0    | 0.0    |
| 80°   | 143.0   | 53.9   | 15.0   | 13.8   | 6.3    | 3.8    | 2.5    | 0.0    | 0.0    | 0.0    | 0.0    |
| 82.5° | 45.1    | 21.3   | 8.8    | 6.3    | 2.5    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 85°   | 22.6    | 12.5   | 5.0    | 2.5    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 87.5° | 12.5    | 3.8    | 1.3    | 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-79-2019: Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Report Prepared for

Cooper Lighting Solutions

MCGRAW EDISON

Report Number: SP1-2408-195-9

Test Date: 08/07/2024

Luminaire Tested: GALN-SB1A-830-U-5WQ

Data in this report applies to families of products including GALN-SB1A-830-U-5WQ.

### Test Information

Test Method: LM-79-2019  
 Report Number: SP1-2408-195-9  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry:  $4\pi$   
 Issue Date: 08/07/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: MCGRAW EDISON  
 Catalog Number: **GALN-SB1A-830-U-5WQ**  
 Description: GALLEON AREA AND ROADWAY LUMINAIRE. (1) 80 CRI, 3000K, 350MA HIGH DENSITY LIGHTSQUARE WITH 26 LEDS AND TYPE V WIDE OPTICS

### Spectral Parameters

CCT (K): 3050  
 CIE  $u'$ : 0.2476  
 CIE  $v'$ : 0.5251  
 Duv: 0.0034  
 CIE x: 0.4383  
 CIE y: 0.4131  
 CIE z: 0.1487  
 Peak Wavelength (nm): 603  
 Dominant Wavelength (nm): 581  
 Purity: 55.55201  
 R<sub>f</sub>: 81.5  
 R<sub>g</sub>: 99.2

CRI (Ra): 81.0  
 R1: 79.6  
 R2: 85.6  
 R3: 92.0  
 R4: 82.6  
 R5: 78.9  
 R6: 81.7  
 R7: 85.2  
 R8: 62.0  
 R9: 7.1  
 R10: 67.0  
 R11: 82.7  
 R12: 63.2  
 R13: 80.3  
 R14: 95.0  
 R15: 71.7



### Test Conditions

Stabilization Time: 20M  
 Operation Time: 1H 20M  
 Sphere Temperature (°C): 24.2

REPORT NUMBER: SP1-2408-195-9

| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 6/18/2024        | 12/18/2024           |
| Power Meter                    | INXT2011004           | 2/8/2024         | 2/8/2025             |
| AC Power Source                | IN0063                | 10/24/2023       | 10/24/2024           |
| DC Power Source                | IN0208                | 10/24/2023       | 10/24/2024           |
| Sphere Thermometer             | IN0085                | 10/24/2023       | 10/24/2024           |
| Room Thermometer               | IN0046                | 10/24/2023       | 10/24/2024           |

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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

REPORT NUMBER: SP1-2408-195-9

### Photopic Flux vs. Wavelength



### Photopic Lumens: NR

| λ (nm) | Power W <sup>λ</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>λ</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>λ</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>λ</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>λ</sup> /nm | Lumens (φ/nm) |
|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|
| 360    | 0                        | NR            | 490    | 168                      | NR            | 620    | 940                      | NR            | 750    | 35                       | NR            | 880    | 1                        | NR            |
| 365    | 0                        | NR            | 495    | 233                      | NR            | 625    | 897                      | NR            | 755    | 30                       | NR            | 885    | 1                        | NR            |
| 370    | 0                        | NR            | 500    | 300                      | NR            | 630    | 847                      | NR            | 760    | 26                       | NR            | 890    | 1                        | NR            |
| 375    | 0                        | NR            | 505    | 372                      | NR            | 635    | 790                      | NR            | 765    | 22                       | NR            | 895    | 1                        | NR            |
| 380    | 0                        | NR            | 510    | 430                      | NR            | 640    | 730                      | NR            | 770    | 19                       | NR            | 900    | 1                        | NR            |
| 385    | 0                        | NR            | 515    | 483                      | NR            | 645    | 668                      | NR            | 775    | 16                       | NR            | 905    | 1                        | NR            |
| 390    | 0                        | NR            | 520    | 524                      | NR            | 650    | 605                      | NR            | 780    | 14                       | NR            | 910    | 0                        | NR            |
| 395    | 2                        | NR            | 525    | 555                      | NR            | 655    | 545                      | NR            | 785    | 12                       | NR            | 915    | 0                        | NR            |
| 400    | 4                        | NR            | 530    | 581                      | NR            | 660    | 485                      | NR            | 790    | 10                       | NR            | 920    | 0                        | NR            |
| 405    | 7                        | NR            | 535    | 604                      | NR            | 665    | 430                      | NR            | 795    | 9                        | NR            | 925    | 0                        | NR            |
| 410    | 17                       | NR            | 540    | 623                      | NR            | 670    | 378                      | NR            | 800    | 8                        | NR            | 930    | 0                        | NR            |
| 415    | 34                       | NR            | 545    | 645                      | NR            | 675    | 331                      | NR            | 805    | 7                        | NR            | 935    | 0                        | NR            |
| 420    | 68                       | NR            | 550    | 667                      | NR            | 680    | 290                      | NR            | 810    | 6                        | NR            | 940    | 0                        | NR            |
| 425    | 128                      | NR            | 555    | 693                      | NR            | 685    | 251                      | NR            | 815    | 5                        | NR            | 945    | 0                        | NR            |
| 430    | 214                      | NR            | 560    | 719                      | NR            | 690    | 218                      | NR            | 820    | 4                        | NR            | 950    | 0                        | NR            |
| 435    | 339                      | NR            | 565    | 754                      | NR            | 695    | 188                      | NR            | 825    | 4                        | NR            | 955    | 0                        | NR            |
| 440    | 507                      | NR            | 570    | 791                      | NR            | 700    | 162                      | NR            | 830    | 3                        | NR            | 960    | 0                        | NR            |
| 445    | 573                      | NR            | 575    | 830                      | NR            | 705    | 139                      | NR            | 835    | 3                        | NR            | 965    | 0                        | NR            |
| 450    | 356                      | NR            | 580    | 873                      | NR            | 710    | 119                      | NR            | 840    | 3                        | NR            | 970    | 0                        | NR            |
| 455    | 217                      | NR            | 585    | 913                      | NR            | 715    | 102                      | NR            | 845    | 2                        | NR            | 975    | 0                        | NR            |
| 460    | 168                      | NR            | 590    | 948                      | NR            | 720    | 88                       | NR            | 850    | 2                        | NR            | 980    | 0                        | NR            |
| 465    | 113                      | NR            | 595    | 974                      | NR            | 725    | 76                       | NR            | 855    | 2                        | NR            | 985    | 0                        | NR            |
| 470    | 85                       | NR            | 600    | 994                      | NR            | 730    | 65                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 85                       | NR            | 605    | 998                      | NR            | 735    | 55                       | NR            | 865    | 1                        | NR            | 995    | 0                        | NR            |
| 480    | 94                       | NR            | 610    | 994                      | NR            | 740    | 47                       | NR            | 870    | 1                        | NR            | 1000   | 0                        | NR            |
| 485    | 120                      | NR            | 615    | 973                      | NR            | 745    | 41                       | NR            | 875    | 1                        | NR            |        |                          |               |

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### Scotopic Flux vs. Wavelength



Scotopic Lumens: NR

S/P: 1.27

| λ (nm) | Power W <sup>Λ</sup> /nm | Lumens (Φ/nm) | λ (nm) | Power W <sup>Λ</sup> /nm | Lumens (Φ/nm) | λ (nm) | Power W <sup>Λ</sup> /nm | Lumens (Φ/nm) | λ (nm) | Power W <sup>Λ</sup> /nm | Lumens (Φ/nm) | λ (nm) | Power W <sup>Λ</sup> /nm | Lumens (Φ/nm) |
|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|
| 360    | 0                        | NR            | 490    | 168                      | NR            | 620    | 940                      | NR            | 750    | 35                       | NR            | 880    | 1                        | NR            |
| 365    | 0                        | NR            | 495    | 233                      | NR            | 625    | 897                      | NR            | 755    | 30                       | NR            | 885    | 1                        | NR            |
| 370    | 0                        | NR            | 500    | 300                      | NR            | 630    | 847                      | NR            | 760    | 26                       | NR            | 890    | 1                        | NR            |
| 375    | 0                        | NR            | 505    | 372                      | NR            | 635    | 790                      | NR            | 765    | 22                       | NR            | 895    | 1                        | NR            |
| 380    | 0                        | NR            | 510    | 430                      | NR            | 640    | 730                      | NR            | 770    | 19                       | NR            | 900    | 1                        | NR            |
| 385    | 0                        | NR            | 515    | 483                      | NR            | 645    | 668                      | NR            | 775    | 16                       | NR            | 905    | 1                        | NR            |
| 390    | 0                        | NR            | 520    | 524                      | NR            | 650    | 605                      | NR            | 780    | 14                       | NR            | 910    | 0                        | NR            |
| 395    | 2                        | NR            | 525    | 555                      | NR            | 655    | 545                      | NR            | 785    | 12                       | NR            | 915    | 0                        | NR            |
| 400    | 4                        | NR            | 530    | 581                      | NR            | 660    | 485                      | NR            | 790    | 10                       | NR            | 920    | 0                        | NR            |
| 405    | 7                        | NR            | 535    | 604                      | NR            | 665    | 430                      | NR            | 795    | 9                        | NR            | 925    | 0                        | NR            |
| 410    | 17                       | NR            | 540    | 623                      | NR            | 670    | 378                      | NR            | 800    | 8                        | NR            | 930    | 0                        | NR            |
| 415    | 34                       | NR            | 545    | 645                      | NR            | 675    | 331                      | NR            | 805    | 7                        | NR            | 935    | 0                        | NR            |
| 420    | 68                       | NR            | 550    | 667                      | NR            | 680    | 290                      | NR            | 810    | 6                        | NR            | 940    | 0                        | NR            |
| 425    | 128                      | NR            | 555    | 693                      | NR            | 685    | 251                      | NR            | 815    | 5                        | NR            | 945    | 0                        | NR            |
| 430    | 214                      | NR            | 560    | 719                      | NR            | 690    | 218                      | NR            | 820    | 4                        | NR            | 950    | 0                        | NR            |
| 435    | 339                      | NR            | 565    | 754                      | NR            | 695    | 188                      | NR            | 825    | 4                        | NR            | 955    | 0                        | NR            |
| 440    | 507                      | NR            | 570    | 791                      | NR            | 700    | 162                      | NR            | 830    | 3                        | NR            | 960    | 0                        | NR            |
| 445    | 573                      | NR            | 575    | 830                      | NR            | 705    | 139                      | NR            | 835    | 3                        | NR            | 965    | 0                        | NR            |
| 450    | 356                      | NR            | 580    | 873                      | NR            | 710    | 119                      | NR            | 840    | 3                        | NR            | 970    | 0                        | NR            |
| 455    | 217                      | NR            | 585    | 913                      | NR            | 715    | 102                      | NR            | 845    | 2                        | NR            | 975    | 0                        | NR            |
| 460    | 168                      | NR            | 590    | 948                      | NR            | 720    | 88                       | NR            | 850    | 2                        | NR            | 980    | 0                        | NR            |
| 465    | 113                      | NR            | 595    | 974                      | NR            | 725    | 76                       | NR            | 855    | 2                        | NR            | 985    | 0                        | NR            |
| 470    | 85                       | NR            | 600    | 994                      | NR            | 730    | 65                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 85                       | NR            | 605    | 998                      | NR            | 735    | 55                       | NR            | 865    | 1                        | NR            | 995    | 0                        | NR            |
| 480    | 94                       | NR            | 610    | 994                      | NR            | 740    | 47                       | NR            | 870    | 1                        | NR            | 1000   | 0                        | NR            |
| 485    | 120                      | NR            | 615    | 973                      | NR            | 745    | 41                       | NR            | 875    | 1                        | NR            |        |                          |               |

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### Melanopic Flux vs. Wavelength


**Melanopic Lumens: NR**
**M/P: 2.32**

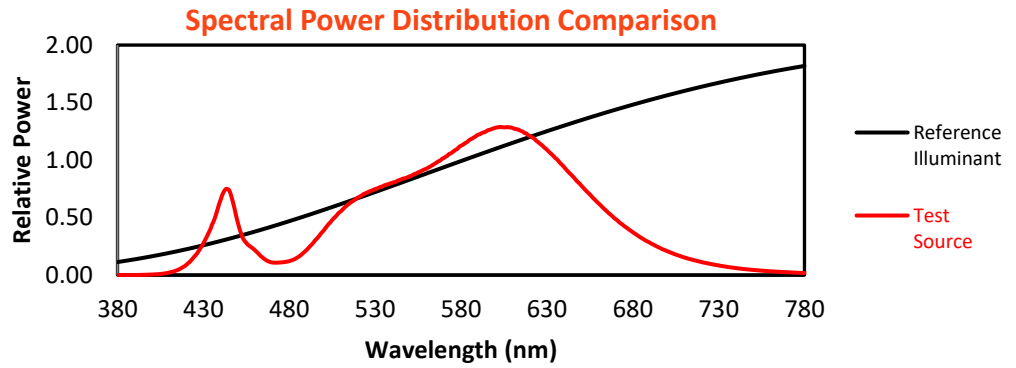
| $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) |
|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|
| 360               | 0                                    | NR                             | 490               | 168                                  | NR                             | 620               | 940                                  | NR                             | 750               | 35                                   | NR                             | 880               | 1                                    | NR                             |
| 365               | 0                                    | NR                             | 495               | 233                                  | NR                             | 625               | 897                                  | NR                             | 755               | 30                                   | NR                             | 885               | 1                                    | NR                             |
| 370               | 0                                    | NR                             | 500               | 300                                  | NR                             | 630               | 847                                  | NR                             | 760               | 26                                   | NR                             | 890               | 1                                    | NR                             |
| 375               | 0                                    | NR                             | 505               | 372                                  | NR                             | 635               | 790                                  | NR                             | 765               | 22                                   | NR                             | 895               | 1                                    | NR                             |
| 380               | 0                                    | NR                             | 510               | 430                                  | NR                             | 640               | 730                                  | NR                             | 770               | 19                                   | NR                             | 900               | 1                                    | NR                             |
| 385               | 0                                    | NR                             | 515               | 483                                  | NR                             | 645               | 668                                  | NR                             | 775               | 16                                   | NR                             | 905               | 1                                    | NR                             |
| 390               | 0                                    | NR                             | 520               | 524                                  | NR                             | 650               | 605                                  | NR                             | 780               | 14                                   | NR                             | 910               | 0                                    | NR                             |
| 395               | 2                                    | NR                             | 525               | 555                                  | NR                             | 655               | 545                                  | NR                             | 785               | 12                                   | NR                             | 915               | 0                                    | NR                             |
| 400               | 4                                    | NR                             | 530               | 581                                  | NR                             | 660               | 485                                  | NR                             | 790               | 10                                   | NR                             | 920               | 0                                    | NR                             |
| 405               | 7                                    | NR                             | 535               | 604                                  | NR                             | 665               | 430                                  | NR                             | 795               | 9                                    | NR                             | 925               | 0                                    | NR                             |
| 410               | 17                                   | NR                             | 540               | 623                                  | NR                             | 670               | 378                                  | NR                             | 800               | 8                                    | NR                             | 930               | 0                                    | NR                             |
| 415               | 34                                   | NR                             | 545               | 645                                  | NR                             | 675               | 331                                  | NR                             | 805               | 7                                    | NR                             | 935               | 0                                    | NR                             |
| 420               | 68                                   | NR                             | 550               | 667                                  | NR                             | 680               | 290                                  | NR                             | 810               | 6                                    | NR                             | 940               | 0                                    | NR                             |
| 425               | 128                                  | NR                             | 555               | 693                                  | NR                             | 685               | 251                                  | NR                             | 815               | 5                                    | NR                             | 945               | 0                                    | NR                             |
| 430               | 214                                  | NR                             | 560               | 719                                  | NR                             | 690               | 218                                  | NR                             | 820               | 4                                    | NR                             | 950               | 0                                    | NR                             |
| 435               | 339                                  | NR                             | 565               | 754                                  | NR                             | 695               | 188                                  | NR                             | 825               | 4                                    | NR                             | 955               | 0                                    | NR                             |
| 440               | 507                                  | NR                             | 570               | 791                                  | NR                             | 700               | 162                                  | NR                             | 830               | 3                                    | NR                             | 960               | 0                                    | NR                             |
| 445               | 573                                  | NR                             | 575               | 830                                  | NR                             | 705               | 139                                  | NR                             | 835               | 3                                    | NR                             | 965               | 0                                    | NR                             |
| 450               | 356                                  | NR                             | 580               | 873                                  | NR                             | 710               | 119                                  | NR                             | 840               | 3                                    | NR                             | 970               | 0                                    | NR                             |
| 455               | 217                                  | NR                             | 585               | 913                                  | NR                             | 715               | 102                                  | NR                             | 845               | 2                                    | NR                             | 975               | 0                                    | NR                             |
| 460               | 168                                  | NR                             | 590               | 948                                  | NR                             | 720               | 88                                   | NR                             | 850               | 2                                    | NR                             | 980               | 0                                    | NR                             |
| 465               | 113                                  | NR                             | 595               | 974                                  | NR                             | 725               | 76                                   | NR                             | 855               | 2                                    | NR                             | 985               | 0                                    | NR                             |
| 470               | 85                                   | NR                             | 600               | 994                                  | NR                             | 730               | 65                                   | NR                             | 860               | 1                                    | NR                             | 990               | 0                                    | NR                             |
| 475               | 85                                   | NR                             | 605               | 998                                  | NR                             | 735               | 55                                   | NR                             | 865               | 1                                    | NR                             | 995               | 0                                    | NR                             |
| 480               | 94                                   | NR                             | 610               | 994                                  | NR                             | 740               | 47                                   | NR                             | 870               | 1                                    | NR                             | 1000              | 0                                    | NR                             |
| 485               | 120                                  | NR                             | 615               | 973                                  | NR                             | 745               | 41                                   | NR                             | 875               | 1                                    | NR                             |                   |                                      |                                |

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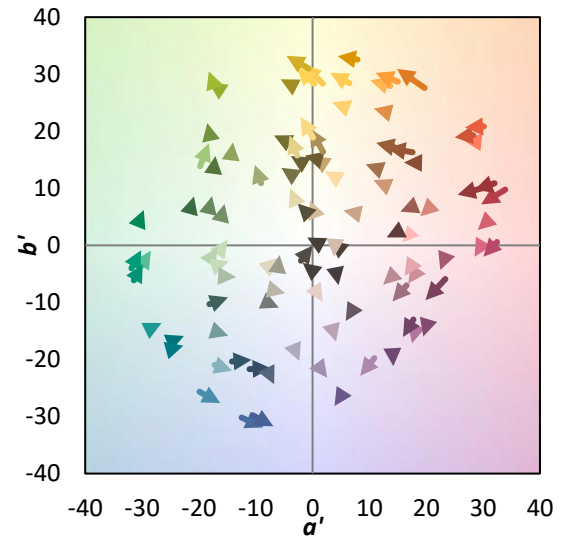
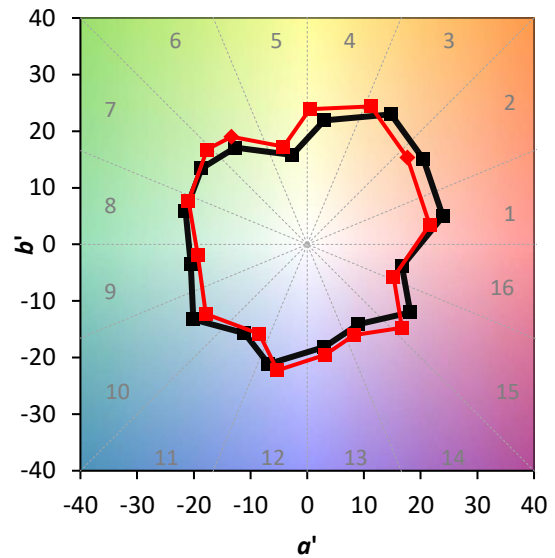
TM-30-18

### Summary

$R_f = 81.5$   
 $R_g = 99.2$   
 $CIE R_a = 81.0$   
 $R_g = 7.1$



### Color Vector Graphics



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 74 | CES51 = 89 | CES76 = 70 |
| CES02 = 63 | CES27 = 88 | CES52 = 92 | CES77 = 86 |
| CES03 = 31 | CES28 = 89 | CES53 = 81 | CES78 = 72 |
| CES04 = 70 | CES29 = 67 | CES54 = 87 | CES79 = 90 |
| CES05 = 50 | CES30 = 68 | CES55 = 85 | CES80 = 88 |
| CES06 = 51 | CES31 = 71 | CES56 = 78 | CES81 = 78 |
| CES07 = 42 | CES32 = 70 | CES57 = 76 | CES82 = 95 |
| CES08 = 41 | CES33 = 71 | CES58 = 78 | CES83 = 90 |
| CES09 = 29 | CES34 = 82 | CES59 = 92 | CES84 = 94 |
| CES10 = 76 | CES35 = 90 | CES60 = 95 | CES85 = 86 |
| CES11 = 59 | CES36 = 93 | CES61 = 93 | CES86 = 72 |
| CES12 = 65 | CES37 = 87 | CES62 = 83 | CES87 = 85 |
| CES13 = 43 | CES38 = 75 | CES63 = 77 | CES88 = 83 |
| CES14 = 74 | CES39 = 94 | CES64 = 83 | CES89 = 75 |
| CES15 = 71 | CES40 = 89 | CES65 = 77 | CES90 = 81 |
| CES16 = 47 | CES41 = 85 | CES66 = 80 | CES91 = 96 |
| CES17 = 50 | CES42 = 86 | CES67 = 79 | CES92 = 73 |
| CES18 = 56 | CES43 = 81 | CES68 = 84 | CES93 = 84 |
| CES19 = 72 | CES44 = 99 | CES69 = 91 | CES94 = 64 |
| CES20 = 66 | CES45 = 87 | CES70 = 78 | CES95 = 80 |
| CES21 = 87 | CES46 = 82 | CES71 = 76 | CES96 = 84 |
| CES22 = 79 | CES47 = 77 | CES72 = 92 | CES97 = 87 |
| CES23 = 92 | CES48 = 71 | CES73 = 71 | CES98 = 81 |
| CES24 = 91 | CES49 = 81 | CES74 = 93 | CES99 = 74 |
| CES25 = 72 | CES50 = 89 | CES75 = 74 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)