

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: P319259

Luminaire Tested: **GLEON-SA5D-722-U-T4W**

Issue Date: 3/3/2020

### Test Information

Test Method: LM-79-08  
Report Number: P319259  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-18)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA5D-722-U-T4W  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(5) 70 CRI, 2200K, 1200mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE IV WIDE OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

### Summary

Lumens per Lamp: N/A  
Luminaire Lumens: 28309 lumens  
Efficiency: N/A  
Efficacy: 88.5 lumens/watt  
Luminous Opening: Rectangular (W 1.5' x L: 1' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B3 - U0 - G4

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

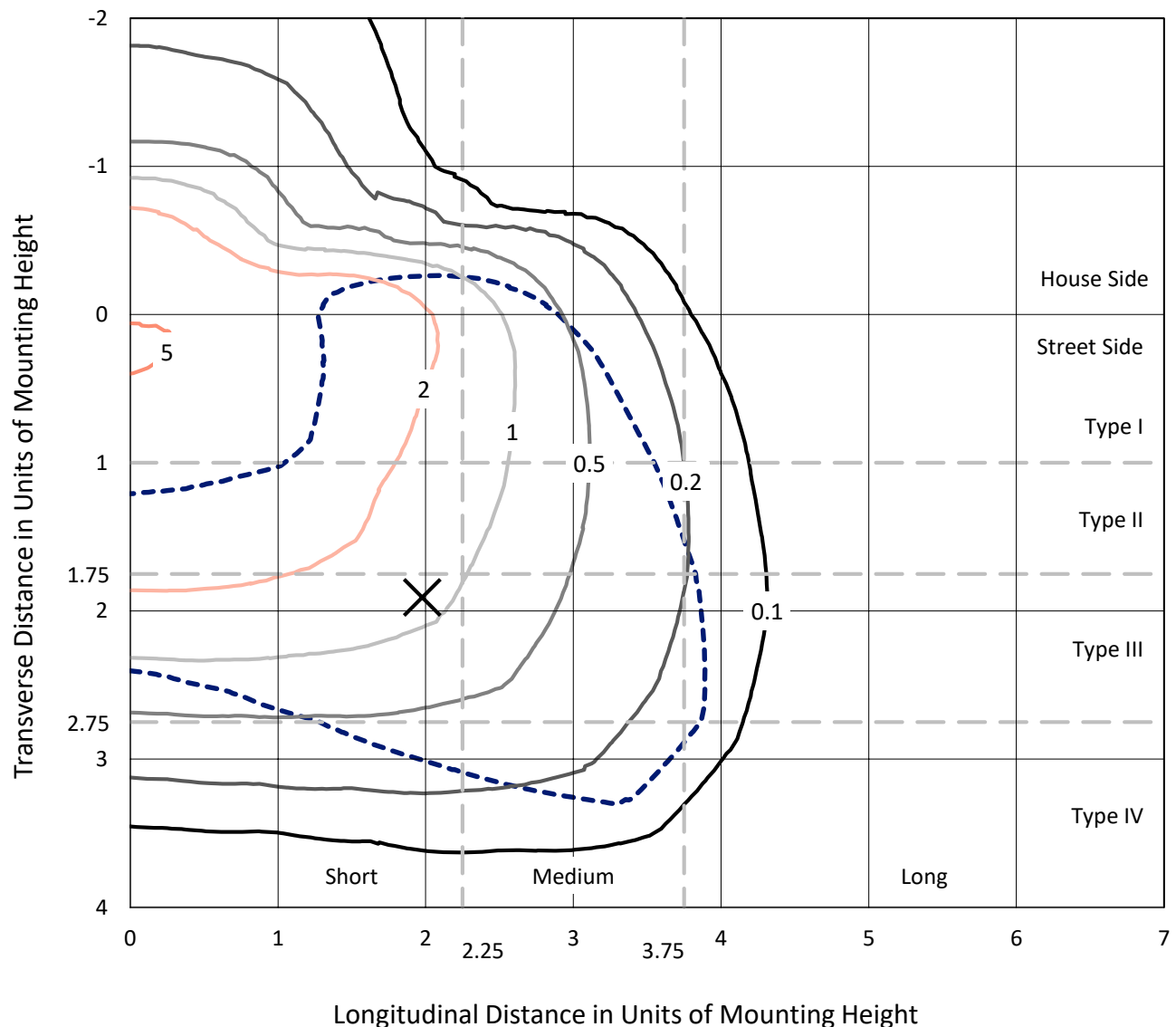


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## Iso-Footcandle Lines of Horizontal Illumination

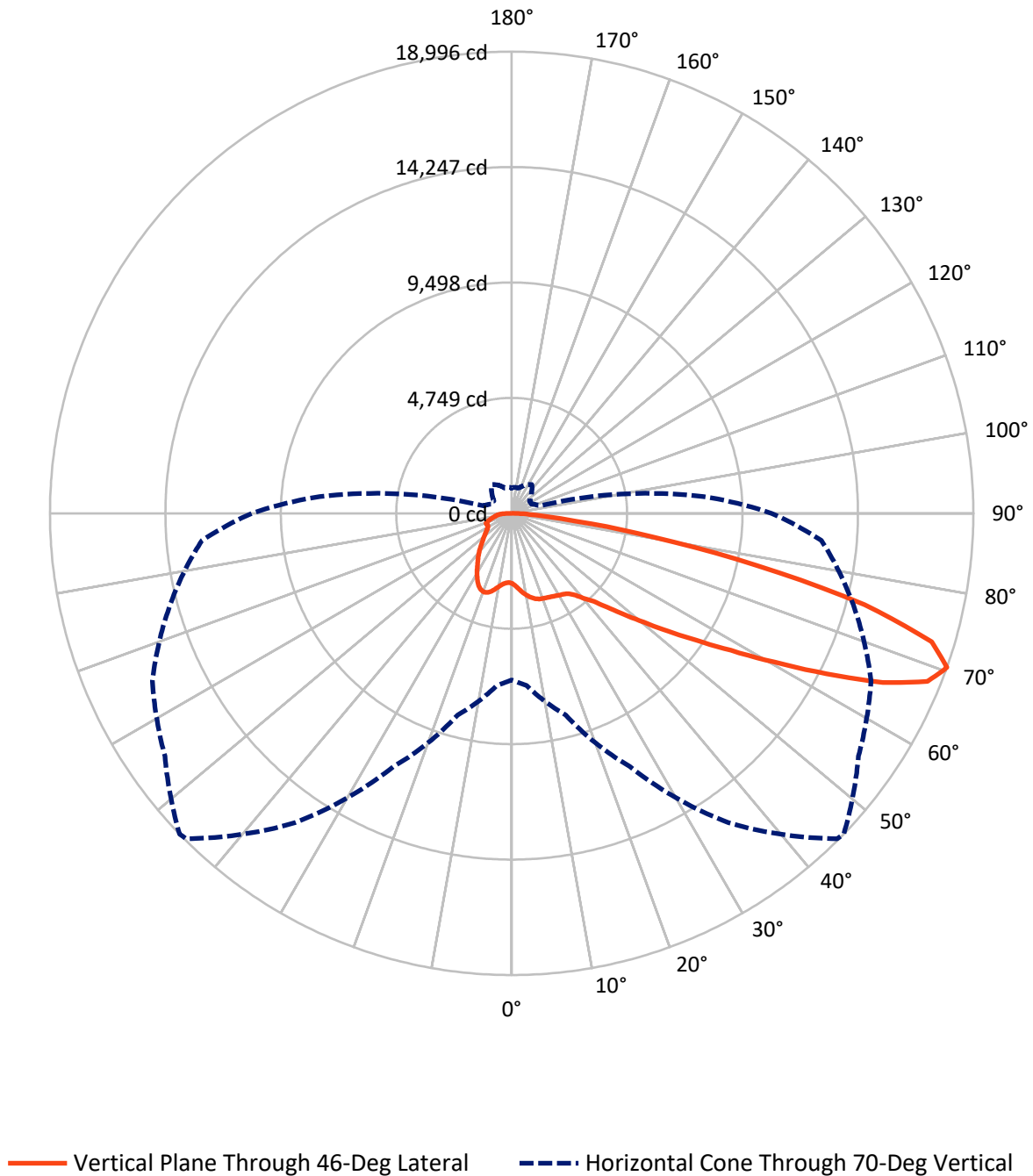
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 5.8 fc  
 Type IV - Short - N/A

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## Luminous Intensity Polar Plot



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CATALOG NUMBER: GLEON-SA5D-722-U-T4W

**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 6488.3   | 0.0    | 6488.3  |
|                    | % Fixture | 22.9     | 0.0    | 22.9    |
| <b>Street Side</b> | Lumens    | 21820.7  | 0.0    | 21820.7 |
|                    | % Fixture | 77.1     | 0.0    | 77.1    |
| <b>Total</b>       | Lumens    | 28309.0  | 0.0    | 28309.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 294.0   | 1.0       |
| 10°-20°   | 979.6   | 3.5       |
| 20°-30°   | 1633.3  | 5.8       |
| 30°-40°   | 2317.8  | 8.2       |
| 40°-50°   | 3409.3  | 12.0      |
| 50°-60°   | 5773.7  | 20.4      |
| 60°-70°   | 8195.7  | 29.0      |
| 70°-80°   | 4978.9  | 17.6      |
| 80°-90°   | 726.6   | 2.6       |
| 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°    | 28309.0 | 100.0     |
| 0°-180°   | 28309.0 | 100.0     |

**Coefficient of Utilization**



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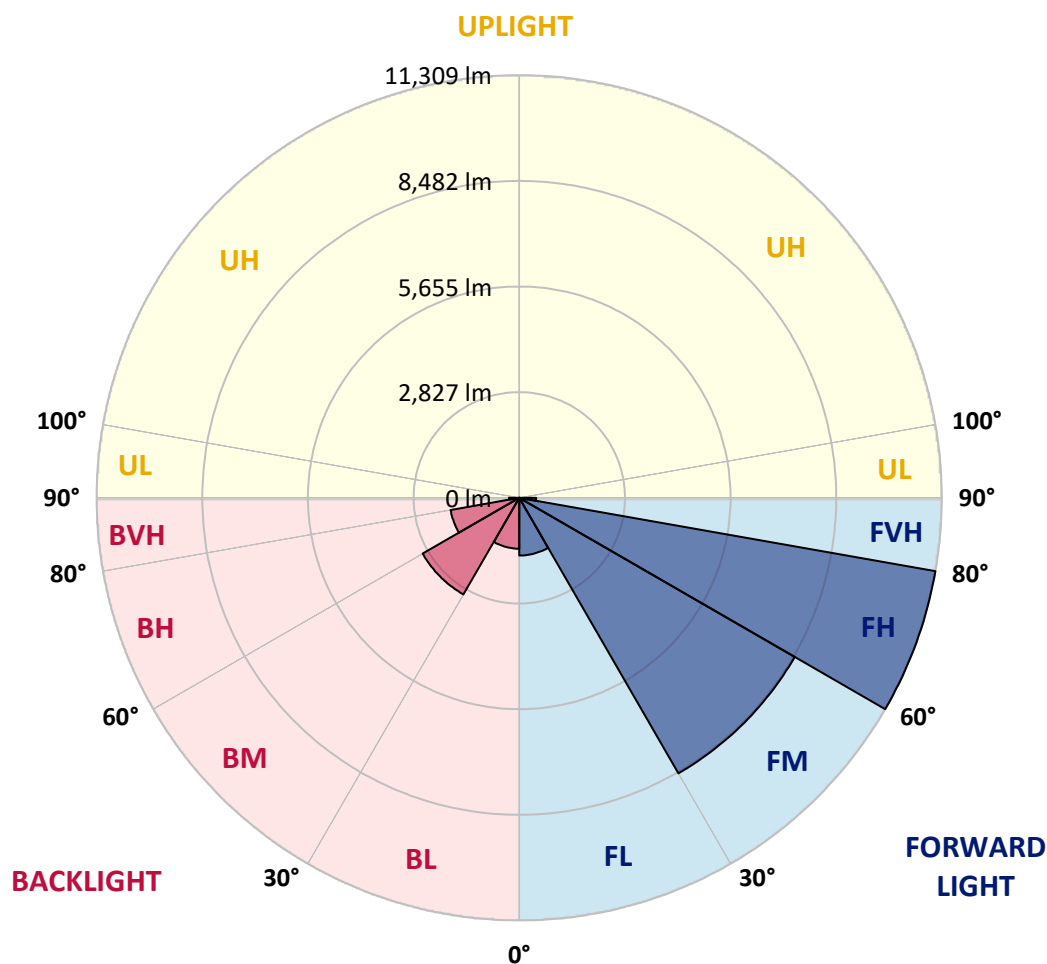
CATALOG NUMBER: GLEON-SA5D-722-U-T4W

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |          |
|------|-------------|---------|-----------|-------------------------|------|----------|
|      |             |         |           | B                       | U    | G        |
| FL   | (0°-30°)    | 1544.7  | 5.5       |                         |      |          |
| FM   | (30°-60°)   | 8514.1  | 30.1      |                         |      |          |
| FH   | (60°-80°)   | 11309.3 | 39.9      |                         |      | G4/12000 |
| FVH  | (80°-90°)   | 452.6   | 1.6       |                         |      | G3/500   |
| BL   | (0°-30°)    | 1362.2  | 4.8       | B3/2500                 |      |          |
| BM   | (30°-60°)   | 2986.8  | 10.6      | B3/5000                 |      |          |
| BH   | (60°-80°)   | 1865.3  | 6.6       | B3/2500                 |      | G3/2500  |
| BVH  | (80°-90°)   | 274.0   | 1.0       |                         |      | G3/500   |
| UL   | (90°-100°)  | 0.0     | 0.0       |                         | U0/0 |          |
| UH   | (100°-180°) | 0.0     | 0.0       |                         | U0/0 |          |

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

Type IV Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 46°     | 55°     | 65°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 2884.1  | 2884.1  | 2884.1  | 2884.1  | 2884.1  | 2884.1  | 2884.1  | 2884.1  | 2884.1  | 2884.1  | 2884.1  |
| 2.5°  | 3028.5  | 3030.4  | 3034.3  | 3024.6  | 2997.5  | 2989.7  | 2986.8  | 2958.7  | 2940.3  | 2913.2  | 2889.9  |
| 5°    | 3270.7  | 3272.6  | 3266.8  | 3239.7  | 3179.6  | 3135.1  | 3131.2  | 3067.2  | 3009.1  | 2947.1  | 2900.6  |
| 7.5°  | 3523.5  | 3526.5  | 3508.0  | 3456.7  | 3372.4  | 3294.9  | 3290.1  | 3202.9  | 3114.7  | 3020.7  | 2951.0  |
| 10°   | 3747.3  | 3735.7  | 3705.7  | 3634.0  | 3534.2  | 3439.3  | 3435.4  | 3344.3  | 3242.6  | 3129.2  | 3036.2  |
| 12.5° | 3896.5  | 3886.8  | 3848.1  | 3760.9  | 3651.4  | 3564.2  | 3556.5  | 3472.2  | 3373.4  | 3249.4  | 3138.0  |
| 15°   | 3978.9  | 3985.7  | 3933.3  | 3834.5  | 3728.0  | 3654.3  | 3647.6  | 3587.5  | 3499.3  | 3374.3  | 3246.5  |
| 17.5° | 3989.5  | 3995.4  | 3945.0  | 3847.1  | 3759.9  | 3709.6  | 3706.6  | 3666.9  | 3603.0  | 3482.9  | 3349.2  |
| 20°   | 3927.5  | 3931.4  | 3889.8  | 3809.3  | 3752.2  | 3736.7  | 3735.7  | 3718.3  | 3670.8  | 3564.2  | 3434.4  |
| 22.5° | 3837.4  | 3840.3  | 3810.3  | 3752.2  | 3732.8  | 3757.0  | 3763.8  | 3757.0  | 3723.1  | 3623.3  | 3501.3  |
| 25°   | 3815.2  | 3813.2  | 3782.2  | 3723.1  | 3739.6  | 3790.9  | 3799.7  | 3802.6  | 3779.3  | 3692.1  | 3586.5  |
| 27.5° | 3922.7  | 3915.9  | 3856.8  | 3761.9  | 3772.5  | 3834.5  | 3846.2  | 3874.3  | 3859.7  | 3783.2  | 3683.4  |
| 30°   | 4233.7  | 4222.1  | 4101.0  | 3909.1  | 3856.8  | 3888.8  | 3903.3  | 3947.9  | 3950.8  | 3886.8  | 3812.2  |
| 32.5° | 4758.8  | 4744.2  | 4527.2  | 4184.3  | 3999.2  | 3944.0  | 3957.6  | 4024.4  | 4060.3  | 4010.9  | 3930.4  |
| 35°   | 5422.4  | 5405.9  | 5121.1  | 4652.2  | 4237.6  | 4049.6  | 4059.3  | 4112.6  | 4184.3  | 4114.5  | 4007.9  |
| 37.5° | 6114.1  | 6074.4  | 5800.2  | 5202.5  | 4616.4  | 4275.3  | 4275.3  | 4282.1  | 4316.0  | 4170.7  | 4099.0  |
| 40°   | 6802.0  | 6762.3  | 6514.2  | 5849.6  | 5106.6  | 4630.9  | 4608.6  | 4458.4  | 4431.3  | 4306.3  | 4282.1  |
| 42.5° | 7441.4  | 7429.8  | 7283.5  | 6581.1  | 5682.0  | 4980.6  | 4949.6  | 4694.8  | 4700.6  | 4623.1  | 4624.1  |
| 45°   | 8121.5  | 8121.5  | 8002.3  | 7319.3  | 6352.5  | 5542.5  | 5511.5  | 5136.6  | 5194.7  | 5158.9  | 5245.1  |
| 47.5° | 8676.6  | 8694.1  | 8677.6  | 8088.6  | 7132.3  | 6256.5  | 6200.4  | 5748.9  | 5911.6  | 6034.7  | 6285.6  |
| 50°   | 9243.4  | 9270.5  | 9273.4  | 8932.4  | 8075.0  | 7105.2  | 7041.3  | 6561.7  | 6925.0  | 7277.7  | 7770.8  |
| 52.5° | 10065.9 | 10126.9 | 9883.8  | 9774.3  | 9229.8  | 8112.8  | 8049.8  | 7607.1  | 8213.5  | 8708.6  | 9558.2  |
| 55°   | 10828.3 | 10775.1 | 10601.6 | 10669.5 | 10466.0 | 9259.8  | 9212.4  | 8823.9  | 9649.3  | 10292.6 | 11396.1 |
| 57.5° | 11241.0 | 11237.2 | 11411.6 | 11702.2 | 11799.1 | 10674.3 | 10634.6 | 10256.7 | 11268.2 | 11751.6 | 13121.5 |
| 60°   | 11725.4 | 11732.2 | 12164.3 | 12824.1 | 13223.2 | 12435.6 | 12418.1 | 12131.4 | 12840.5 | 13113.7 | 14474.9 |
| 62.5° | 11793.3 | 11915.3 | 12659.4 | 13794.8 | 14556.3 | 14493.3 | 14532.1 | 13820.0 | 14247.2 | 14200.7 | 15485.4 |
| 65°   | 11013.4 | 11174.2 | 12520.8 | 14088.4 | 15881.6 | 16743.9 | 16779.7 | 15518.3 | 15356.5 | 15129.8 | 15846.7 |
| 67.5° | 9414.8  | 9653.2  | 11116.1 | 13449.9 | 16318.6 | 18407.3 | 18457.7 | 16834.9 | 16276.9 | 15444.7 | 14976.8 |
| 70°   | 6851.4  | 7115.9  | 8588.5  | 11487.1 | 15539.6 | 18939.2 | 18996.3 | 17417.2 | 16311.8 | 14548.5 | 12785.3 |
| 72.5° | 4138.7  | 4346.1  | 5560.0  | 8456.7  | 13115.7 | 17970.4 | 18072.1 | 16678.9 | 14892.5 | 12323.2 | 9441.0  |
| 75°   | 1817.5  | 1953.1  | 2688.4  | 4873.1  | 9389.7  | 14868.3 | 14995.2 | 14276.3 | 12100.4 | 8955.6  | 5580.3  |
| 77.5° | 774.1   | 812.8   | 1102.5  | 2116.8  | 5308.1  | 10159.9 | 10334.2 | 10431.1 | 8209.7  | 4873.1  | 2358.1  |
| 80°   | 482.5   | 498.0   | 623.9   | 958.1   | 2484.0  | 5706.3  | 5894.2  | 6137.4  | 4076.7  | 1791.3  | 823.5   |
| 82.5° | 293.5   | 311.0   | 414.6   | 579.3   | 1293.4  | 2586.7  | 2676.8  | 2848.3  | 1582.1  | 774.1   | 426.3   |
| 85°   | 176.3   | 188.9   | 253.8   | 366.2   | 736.3   | 1017.2  | 1016.3  | 1123.8  | 745.0   | 498.0   | 224.8   |
| 87.5° | 84.3    | 94.0    | 135.6   | 189.9   | 371.1   | 381.7   | 357.5   | 405.0   | 452.4   | 326.5   | 113.4   |
| 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: P319259

CATALOG NUMBER: GLEON-SA5D-722-U-T4W

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°     | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|---------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 2884.1  | 2884.1  | 2884.1 | 2884.1 | 2884.1 | 2884.1 | 2884.1 | 2884.1 | 2884.1 | 2884.1 | 2884.1 |
| 2.5°  | 2882.2  | 2878.3  | 2865.7 | 2856.0 | 2854.1 | 2848.3 | 2843.4 | 2846.3 | 2850.2 | 2851.2 | 2851.2 |
| 5°    | 2881.2  | 2870.6  | 2854.1 | 2847.3 | 2856.0 | 2867.7 | 2882.2 | 2901.6 | 2913.2 | 2921.9 | 2927.7 |
| 7.5°  | 2927.7  | 2907.4  | 2889.0 | 2885.1 | 2902.5 | 2933.5 | 2966.5 | 3007.2 | 3035.3 | 3054.6 | 3058.5 |
| 10°   | 3005.2  | 2980.0  | 2961.6 | 2965.5 | 2996.5 | 3041.1 | 3087.6 | 3139.9 | 3182.5 | 3208.7 | 3210.6 |
| 12.5° | 3094.4  | 3070.1  | 3052.7 | 3069.2 | 3120.5 | 3174.8 | 3223.2 | 3268.7 | 3307.5 | 3333.7 | 3333.7 |
| 15°   | 3197.1  | 3179.6  | 3159.3 | 3197.1 | 3266.8 | 3315.3 | 3335.6 | 3357.9 | 3379.2 | 3398.6 | 3394.7 |
| 17.5° | 3295.9  | 3279.4  | 3268.7 | 3313.3 | 3386.0 | 3408.3 | 3394.7 | 3378.2 | 3378.2 | 3388.9 | 3390.8 |
| 20°   | 3381.1  | 3366.6  | 3373.4 | 3417.0 | 3454.8 | 3431.5 | 3381.1 | 3328.8 | 3307.5 | 3313.3 | 3319.1 |
| 22.5° | 3455.7  | 3448.9  | 3469.3 | 3489.6 | 3462.5 | 3381.1 | 3288.1 | 3217.4 | 3191.2 | 3189.3 | 3191.2 |
| 25°   | 3542.9  | 3542.0  | 3567.1 | 3530.3 | 3410.2 | 3260.0 | 3135.1 | 3066.3 | 3051.7 | 3063.4 | 3082.7 |
| 27.5° | 3651.4  | 3662.1  | 3674.7 | 3540.0 | 3303.6 | 3076.9 | 2950.0 | 2902.5 | 2917.1 | 2945.2 | 2963.6 |
| 30°   | 3790.0  | 3819.0  | 3791.9 | 3515.8 | 3150.6 | 2867.7 | 2746.6 | 2733.0 | 2772.7 | 2812.4 | 2831.8 |
| 32.5° | 3924.6  | 3970.2  | 3904.3 | 3452.8 | 2952.9 | 2645.8 | 2551.8 | 2548.0 | 2596.4 | 2635.2 | 2662.3 |
| 35°   | 4033.1  | 4123.2  | 3988.6 | 3327.8 | 2724.3 | 2441.4 | 2372.6 | 2346.4 | 2363.9 | 2409.4 | 2440.4 |
| 37.5° | 4174.6  | 4324.7  | 4046.7 | 3137.0 | 2476.3 | 2272.8 | 2192.4 | 2132.3 | 2116.8 | 2135.2 | 2150.7 |
| 40°   | 4433.3  | 4631.9  | 4073.8 | 2870.6 | 2234.1 | 2104.2 | 2022.9 | 1934.7 | 1873.7 | 1829.1 | 1830.1 |
| 42.5° | 4855.7  | 5032.0  | 4056.4 | 2547.0 | 2010.3 | 1939.5 | 1847.5 | 1745.8 | 1647.0 | 1546.2 | 1538.5 |
| 45°   | 5541.6  | 5626.8  | 4004.1 | 2204.0 | 1813.6 | 1767.1 | 1680.9 | 1579.2 | 1447.4 | 1333.1 | 1322.4 |
| 47.5° | 6639.2  | 6450.3  | 3922.7 | 1904.7 | 1640.2 | 1620.8 | 1541.4 | 1424.1 | 1284.6 | 1192.6 | 1184.8 |
| 50°   | 8136.0  | 7639.0  | 3883.0 | 1666.3 | 1487.1 | 1492.9 | 1428.0 | 1304.0 | 1172.3 | 1104.4 | 1096.7 |
| 52.5° | 9926.4  | 9023.5  | 3959.5 | 1482.3 | 1364.1 | 1384.4 | 1336.0 | 1219.7 | 1109.3 | 1056.0 | 1048.2 |
| 55°   | 11783.6 | 10457.3 | 4041.9 | 1348.6 | 1247.8 | 1287.5 | 1271.1 | 1175.2 | 1075.4 | 1026.0 | 1019.2 |
| 57.5° | 13373.4 | 11527.8 | 3877.2 | 1240.1 | 1144.2 | 1206.2 | 1220.7 | 1147.1 | 1057.9 | 1013.4 | 1005.6 |
| 60°   | 14374.2 | 11958.9 | 3445.1 | 1138.3 | 1061.8 | 1141.3 | 1191.6 | 1139.3 | 1064.7 | 1060.8 | 1055.0 |
| 62.5° | 14848.9 | 11921.1 | 2796.9 | 1057.9 | 1010.5 | 1113.2 | 1212.9 | 1182.9 | 1142.2 | 1177.1 | 1180.0 |
| 65°   | 14635.7 | 11351.5 | 2082.9 | 1004.7 | 973.6  | 1123.8 | 1276.9 | 1265.3 | 1164.5 | 1199.4 | 1204.2 |
| 67.5° | 13232.9 | 9992.3  | 1542.3 | 958.1  | 933.0  | 1153.8 | 1393.1 | 1292.4 | 1120.9 | 1146.1 | 1130.6 |
| 70°   | 10695.6 | 7921.9  | 1189.7 | 905.8  | 891.3  | 1150.0 | 1445.5 | 1275.9 | 1073.4 | 1079.2 | 1037.6 |
| 72.5° | 7375.5  | 5402.1  | 967.8  | 857.4  | 831.2  | 1048.2 | 1408.6 | 1235.2 | 1033.7 | 989.2  | 933.9  |
| 75°   | 4010.9  | 2899.6  | 822.5  | 807.0  | 725.6  | 920.4  | 1340.8 | 1206.2 | 997.9  | 938.8  | 907.8  |
| 77.5° | 1578.2  | 1203.3  | 714.0  | 738.2  | 634.6  | 812.8  | 1265.3 | 1150.9 | 948.5  | 871.0  | 855.5  |
| 80°   | 644.3   | 614.2   | 591.9  | 638.4  | 545.4  | 711.1  | 1174.2 | 1086.0 | 889.4  | 808.0  | 777.0  |
| 82.5° | 365.2   | 381.7   | 460.2  | 503.8  | 442.7  | 654.9  | 1130.6 | 1033.7 | 818.6  | 723.7  | 686.9  |
| 85°   | 187.0   | 223.8   | 320.7  | 361.4  | 325.5  | 557.1  | 1041.5 | 904.9  | 656.8  | 554.2  | 557.1  |
| 87.5° | 90.1    | 125.0   | 202.5  | 226.7  | 211.2  | 403.0  | 778.0  | 655.9  | 511.5  | 405.0  | 392.4  |
| 90°   | 0.0     | 0.0     | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

LM-79-2008: Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Report Prepared for

Cooper Lighting Solutions

McGRAW-EDISON

Report Number: SP1-1908-441-10-R4

Test Date: 10/25/2019

Luminaire Tested: SA1C-722-U-5WQ

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

### Test Information

Test Method: LM-79-2008 Report  
 Number: SP1-1908-441-10-R4  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry:  $4\pi$   
 Issue Date: 10/28/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: MCGRAW-EDISON  
 Catalog Number: **SA1C-722-U-5WQ**  
 Description: MCGRAW EDISON ROADWAY AND AREA LUMINAIRE

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

### Spectral Parameters

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



### Test Conditions

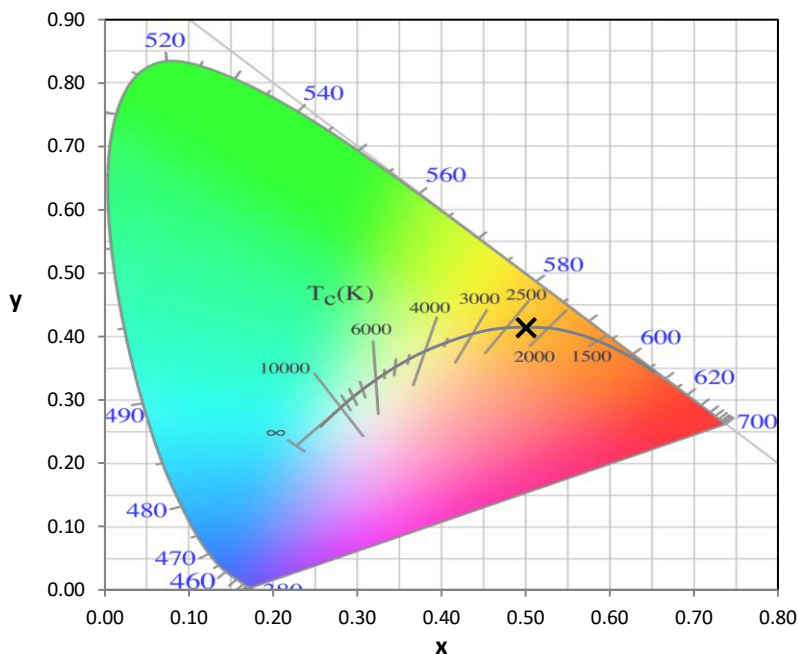
Stabilization Time: 71M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.7/41%  
 Sphere Temperature (°C): 25.6

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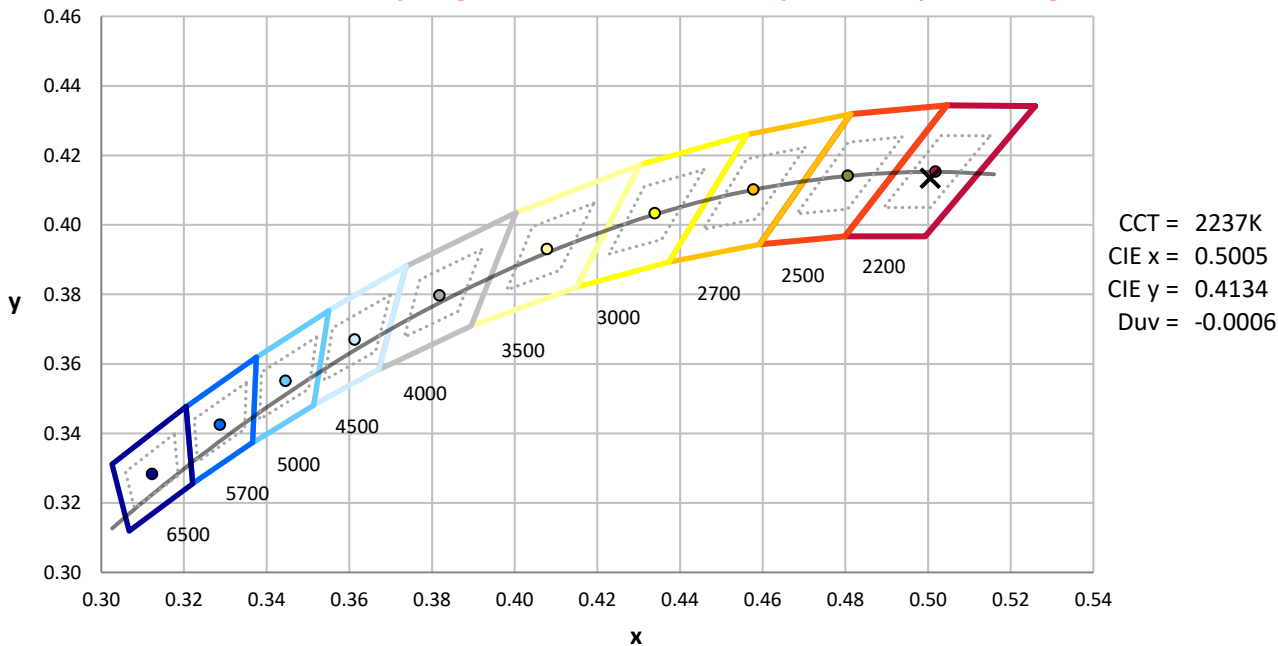
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 6/28/2019        | 12/28/2019           |
| Power Meter                    | IN0071                | 12/5/2018        | 12/5/2019            |
| AC Power Source                | IN0063                | 12/5/2018        | 12/5/2019            |
| DC Power Source                | IN0208                | 12/5/2018        | 12/5/2019            |
| Sphere Thermometer             | IN0085                | 12/5/2018        | 12/5/2019            |
| Room Thermometer               | IN0046                | 12/5/2018        | 12/5/2019            |

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CIE 1931 Chromaticity Diagram



CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies inside the ANSI 2200K 4-step quadrangle

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**Photopic Flux vs. Wavelength**



#####

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

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Scotopic Flux vs. Wavelength



Scotopic Lumens: 4696.9

S/P: 0.85

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

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**Melanopic Flux vs. Wavelength**



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

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

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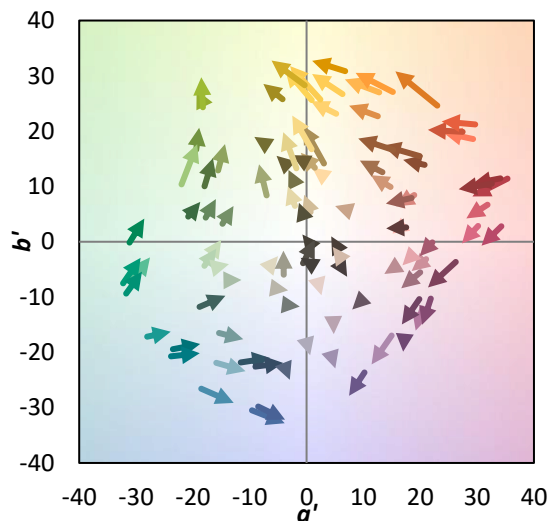
**TM-30-18**

### Summary

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



### Color Vector Graphics



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**TM-30-18**

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

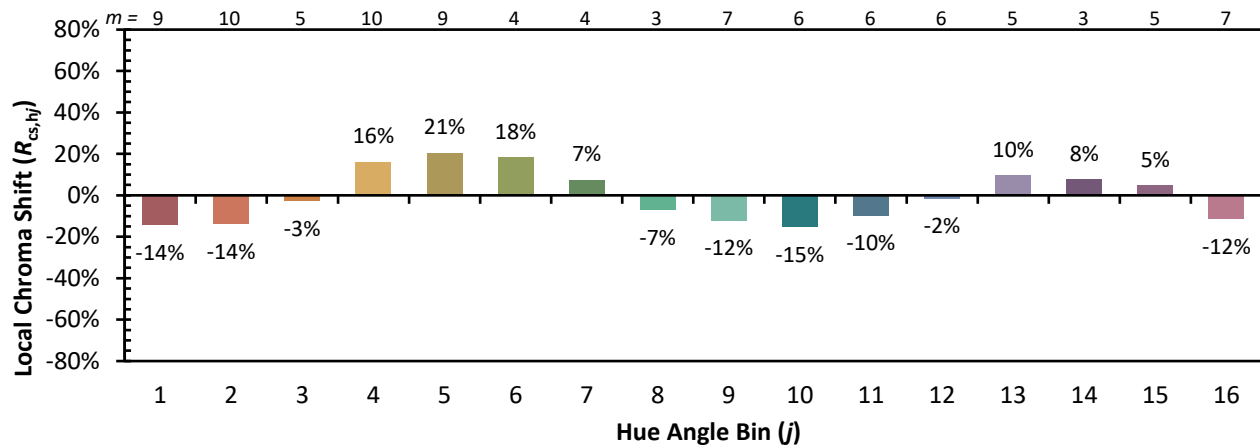
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 87 | CES26 = 56 | CES51 = 74 | CES76 = 56 |
| CES02 = 65 | CES27 = 76 | CES52 = 76 | CES77 = 81 |
| CES03 = 32 | CES28 = 83 | CES53 = 65 | CES78 = 63 |
| CES04 = 72 | CES29 = 46 | CES54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



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Color Rendition by Hue-Angle Bin



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**Measure Comparisons**



(END OF REPORT)