

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: P321450

Luminaire Tested: **GLEON-SA6C-830-U-T2R-HSS**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P321450  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-9)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA6C-830-U-T2R-HSS  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(6) 80 CRI, 3000K, 1050mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE II  
ROADWAY OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 27135 lumens  
Efficiency: N/A  
Efficacy: 81.5 lumens/watt  
Luminous Opening: Rectangular (W 1.5' x L: 1' x H: 0')  
IES Classification: Type II - Medium  
BUG Rating: B1 - U0 - G3

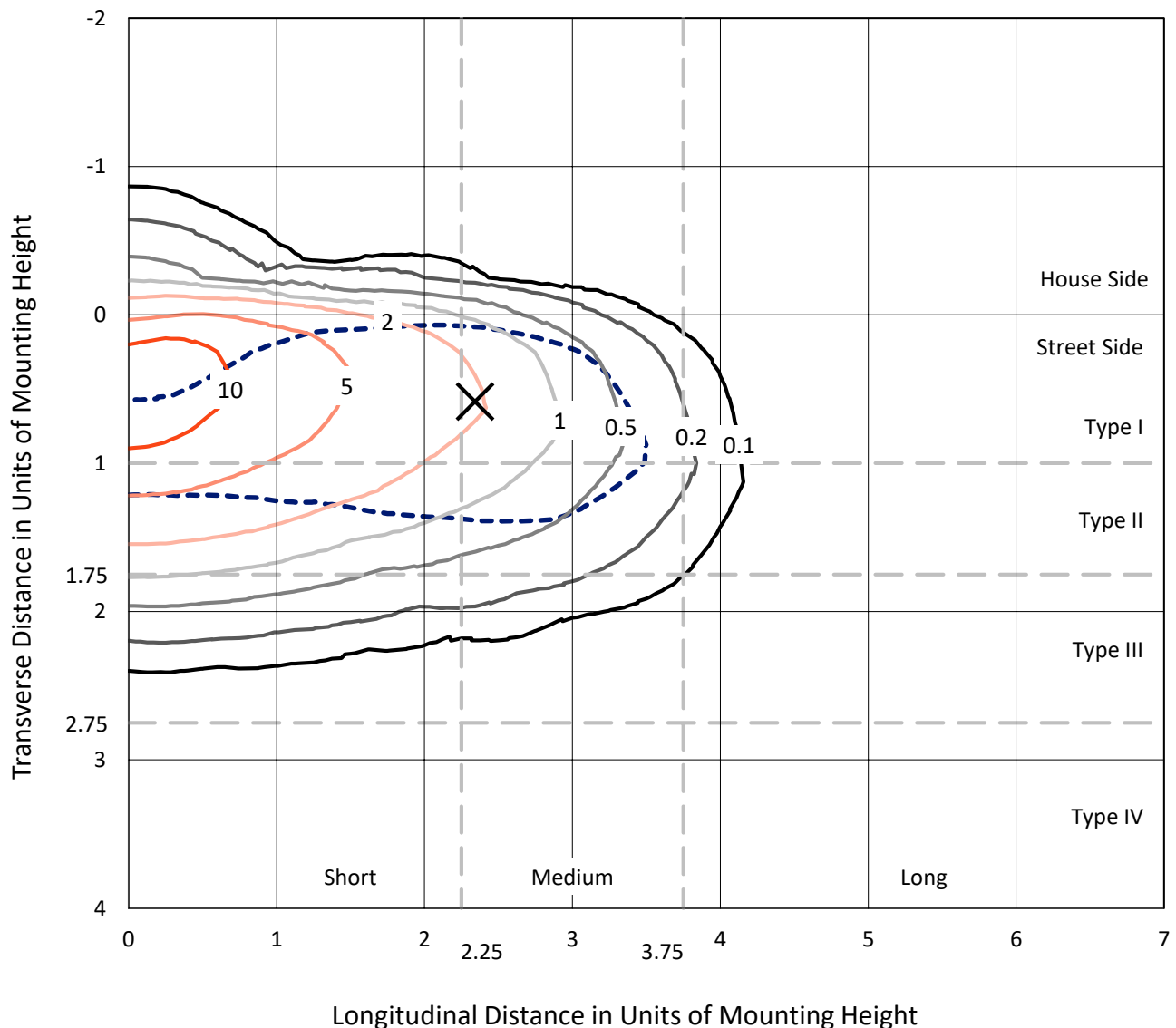
Input Watts (W): 333  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



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## Iso-Footcandle Lines of Horizontal Illumination

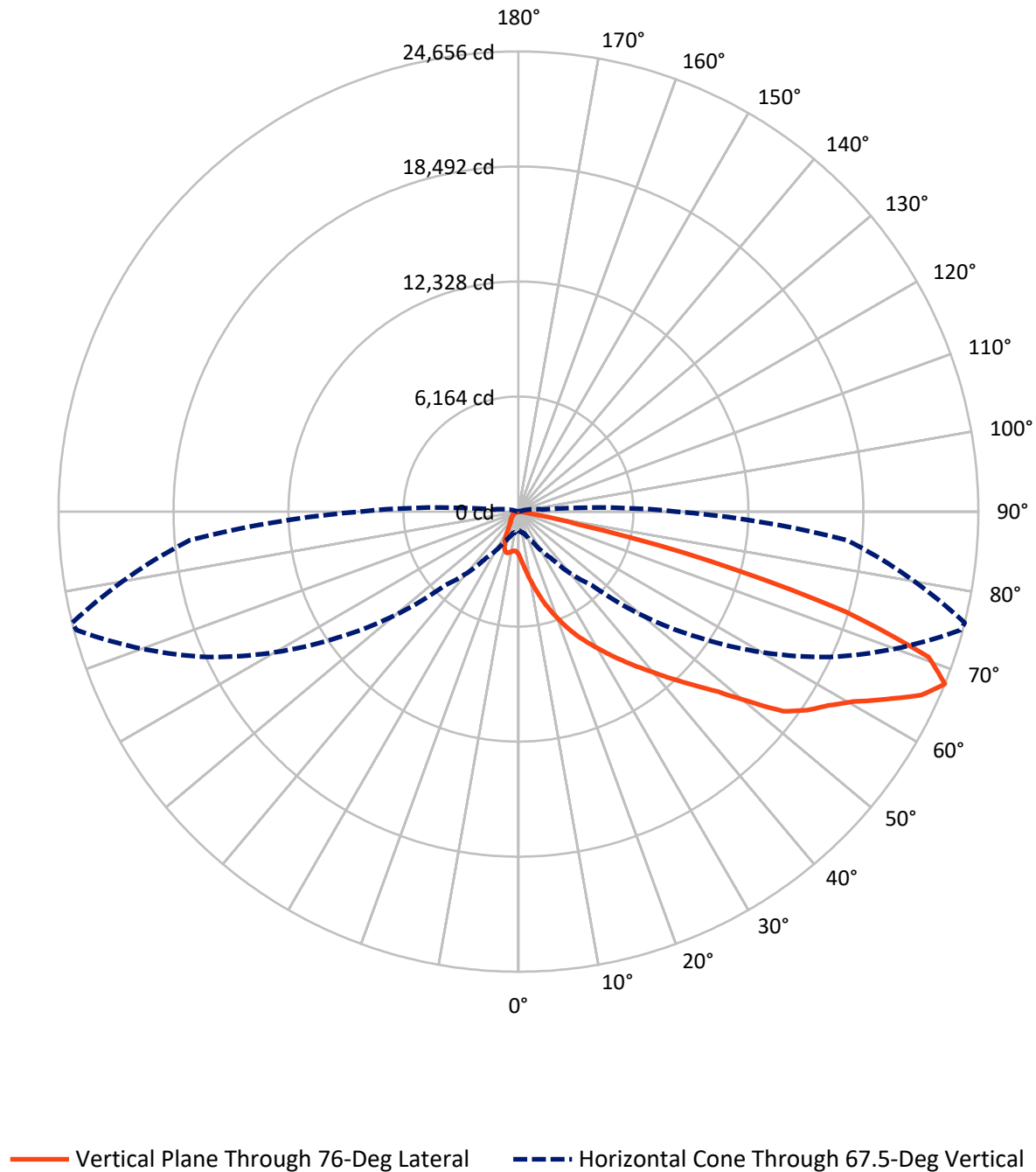
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 13 fc  
 Type II - 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    | 1347.4   | 0.0    | 1347.4  |
|                    | % Fixture | 5.0      | 0.0    | 5.0     |
| <b>Street Side</b> | Lumens    | 25787.5  | 0.0    | 25787.5 |
|                    | % Fixture | 95.0     | 0.0    | 95.0    |
| <b>Total</b>       | Lumens    | 27135.0  | 0.0    | 27135.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 286.2   | 1.1       |
| 10°-20°   | 1134.7  | 4.2       |
| 20°-30°   | 2308.6  | 8.5       |
| 30°-40°   | 4007.1  | 14.8      |
| 40°-50°   | 5661.5  | 20.9      |
| 50°-60°   | 6420.4  | 23.7      |
| 60°-70°   | 5325.1  | 19.6      |
| 70°-80°   | 1928.9  | 7.1       |
| 80°-90°   | 62.6    | 0.2       |
| 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°    | 27135.0 | 100.0     |
| 0°-180°   | 27135.0 | 100.0     |

**Coefficient of Utilization**



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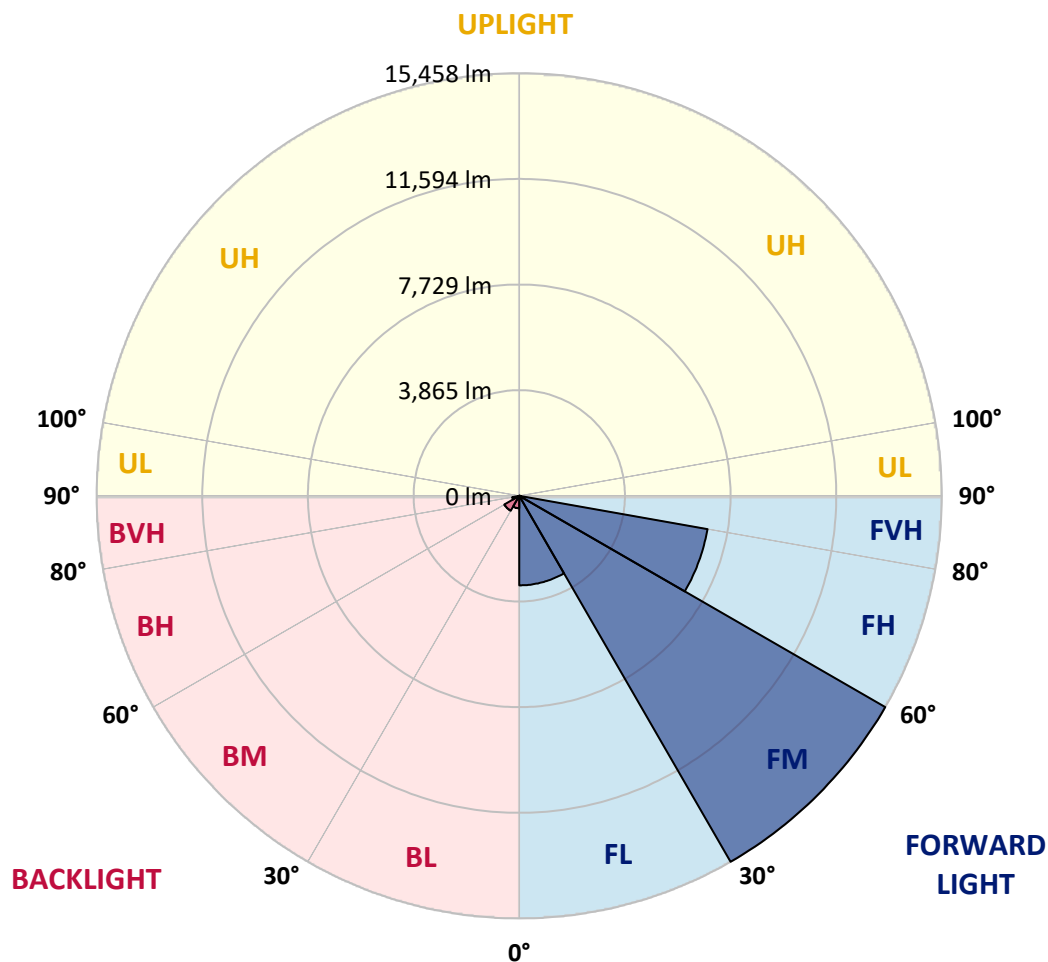
CATALOG NUMBER: GLEON-SA6C-830-U-T2R-HSS

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|---------|-----------|-------------------------|------|---------|
|      |             |         |           | B                       | U    | G       |
| FL   | (0°-30°)    | 3275.1  | 12.1      |                         |      |         |
| FM   | (30°-60°)   | 15458.3 | 57.0      |                         |      |         |
| FH   | (60°-80°)   | 6993.6  | 25.8      |                         |      | G3/7500 |
| FVH  | (80°-90°)   | 60.6    | 0.2       |                         |      | G1/100  |
| BL   | (0°-30°)    | 454.4   | 1.7       | B1/500                  |      |         |
| BM   | (30°-60°)   | 630.6   | 2.3       | B1/1000                 |      |         |
| BH   | (60°-80°)   | 260.4   | 1.0       | B1/500                  |      | G1/500  |
| 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: B1-U0-G3**

Type II Medium





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 55°     | 65°     | 75°     | 76°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 2301.8  | 2301.8  | 2301.8  | 2301.8  | 2301.8  | 2301.8  | 2301.8  | 2301.8  | 2301.8  | 2301.8  | 2301.8  |
| 2.5°  | 3436.1  | 3358.8  | 3376.7  | 3326.7  | 3236.4  | 3050.9  | 2892.7  | 2742.9  | 2568.2  | 2562.2  | 2418.4  |
| 5°    | 4633.4  | 4568.0  | 4559.7  | 4458.6  | 4294.5  | 3979.5  | 3672.7  | 3323.2  | 2933.2  | 2904.6  | 2599.1  |
| 7.5°  | 5720.1  | 5667.8  | 5648.8  | 5528.7  | 5223.1  | 4916.4  | 4516.9  | 4003.2  | 3393.3  | 3341.0  | 2842.8  |
| 10°   | 6554.8  | 6529.8  | 6534.5  | 6448.9  | 6187.4  | 5902.0  | 5377.7  | 4722.6  | 3915.3  | 3834.4  | 3135.3  |
| 12.5° | 7187.3  | 7193.2  | 7236.0  | 7183.7  | 7037.5  | 6825.8  | 6265.8  | 5489.4  | 4493.1  | 4382.5  | 3469.4  |
| 15°   | 7652.2  | 7681.9  | 7760.4  | 7825.8  | 7815.1  | 7632.0  | 7118.3  | 6268.2  | 5106.6  | 4984.1  | 3841.5  |
| 17.5° | 7953.0  | 7986.3  | 8100.4  | 8245.5  | 8378.6  | 8335.8  | 7941.1  | 7019.6  | 5727.2  | 5585.8  | 4239.8  |
| 20°   | 8216.9  | 8256.2  | 8378.6  | 8570.1  | 8818.5  | 8872.0  | 8612.9  | 7748.5  | 6346.7  | 6174.3  | 4651.2  |
| 22.5° | 8788.8  | 8787.6  | 8862.5  | 8974.3  | 9210.9  | 9348.8  | 9184.7  | 8425.0  | 6959.0  | 6779.5  | 5070.9  |
| 25°   | 9823.2  | 9784.0  | 9757.8  | 9669.8  | 9722.2  | 9807.8  | 9716.2  | 9057.5  | 7574.9  | 7393.0  | 5496.6  |
| 27.5° | 11052.6 | 11076.4 | 10864.8 | 10628.1 | 10445.0 | 10357.1 | 10207.3 | 9643.7  | 8167.0  | 7967.2  | 5912.7  |
| 30°   | 12349.8 | 12356.9 | 12107.2 | 11805.2 | 11402.2 | 11068.1 | 10808.9 | 10203.7 | 8775.7  | 8558.2  | 6317.0  |
| 32.5° | 13519.7 | 13473.3 | 13226.0 | 12814.7 | 12305.8 | 11930.1 | 11391.5 | 10829.1 | 9420.2  | 9209.7  | 6766.4  |
| 35°   | 14447.1 | 14392.4 | 14091.6 | 13717.1 | 13189.2 | 12811.1 | 12163.1 | 11453.3 | 10097.9 | 9892.2  | 7217.0  |
| 37.5° | 15124.8 | 15060.6 | 14751.5 | 14366.2 | 13910.9 | 13690.9 | 13058.4 | 12132.2 | 10837.4 | 10616.3 | 7691.4  |
| 40°   | 15360.2 | 15304.3 | 15110.5 | 14828.8 | 14462.6 | 14412.6 | 14008.4 | 12913.3 | 11642.3 | 11406.9 | 8228.8  |
| 42.5° | 15219.9 | 15165.2 | 15096.3 | 15001.2 | 14849.0 | 14896.5 | 14904.9 | 13803.9 | 12536.4 | 12304.6 | 8822.1  |
| 45°   | 14663.5 | 14614.7 | 14686.1 | 14825.2 | 15014.2 | 15249.6 | 15722.9 | 14761.0 | 13535.2 | 13287.9 | 9508.1  |
| 47.5° | 13844.3 | 13808.6 | 14006.0 | 14353.2 | 14906.0 | 15555.2 | 16470.7 | 15766.8 | 14656.4 | 14426.9 | 10364.2 |
| 50°   | 12679.1 | 12673.2 | 13067.9 | 13701.6 | 14551.7 | 15702.6 | 17243.5 | 16910.6 | 16213.9 | 15972.5 | 11554.4 |
| 52.5° | 10864.8 | 10876.6 | 11653.0 | 12667.2 | 13929.9 | 15602.8 | 17740.5 | 18380.2 | 18025.9 | 17775.0 | 12585.2 |
| 55°   | 9137.2  | 9208.5  | 9759.0  | 11221.4 | 12976.4 | 15231.8 | 17911.7 | 19066.2 | 19025.8 | 18788.0 | 13158.3 |
| 57.5° | 7445.3  | 7574.9  | 8105.2  | 9471.3  | 11584.1 | 14377.0 | 17817.8 | 19363.5 | 19770.1 | 19588.2 | 13914.4 |
| 60°   | 5611.9  | 5671.4  | 6282.5  | 7559.4  | 9797.1  | 12817.0 | 17136.5 | 19525.2 | 20787.8 | 20661.8 | 15011.9 |
| 62.5° | 3570.5  | 3719.1  | 4261.2  | 5493.0  | 7628.4  | 10650.7 | 15988.0 | 19522.8 | 22061.2 | 22130.2 | 16427.9 |
| 65°   | 1880.9  | 2054.5  | 2342.3  | 3404.0  | 5242.1  | 8231.2  | 14260.4 | 19339.7 | 23623.5 | 23719.8 | 17534.8 |
| 67.5° | 1014.2  | 1064.1  | 1216.3  | 1766.8  | 3040.2  | 5576.2  | 11722.0 | 18436.1 | 24528.3 | 24655.5 | 17689.4 |
| 70°   | 741.9   | 769.3   | 826.3   | 977.3   | 1530.2  | 3238.7  | 8553.4  | 16387.5 | 23361.9 | 23314.4 | 15716.9 |
| 72.5° | 569.5   | 612.3   | 655.1   | 715.8   | 879.8   | 1728.8  | 5325.4  | 12832.5 | 18640.6 | 18326.7 | 11748.2 |
| 75°   | 449.4   | 456.6   | 517.2   | 571.9   | 659.9   | 984.5   | 2364.8  | 7473.8  | 11377.2 | 10634.1 | 6092.3  |
| 77.5° | 359.1   | 363.8   | 399.5   | 447.1   | 530.3   | 646.8   | 732.4   | 2940.3  | 3632.3  | 3241.1  | 1322.1  |
| 80°   | 212.8   | 224.7   | 297.2   | 344.8   | 439.9   | 407.8   | 267.5   | 638.5   | 567.1   | 513.6   | 222.3   |
| 82.5° | 118.9   | 128.4   | 167.6   | 272.3   | 306.8   | 195.0   | 133.2   | 172.4   | 133.2   | 129.6   | 63.0    |
| 85°   | 0.0     | 5.9     | 108.2   | 168.8   | 124.8   | 42.8    | 55.9    | 57.1    | 39.2    | 36.9    | 25.0    |
| 87.5° | 0.0     | 0.0     | 33.3    | 32.1    | 4.8     | 7.1     | 13.1    | 19.0    | 15.5    | 15.5    | 13.1    |
| 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: P321450

CATALOG NUMBER: GLEON-SA6C-830-U-T2R-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 2301.8 | 2301.8 | 2301.8 | 2301.8 | 2301.8 | 2301.8 | 2301.8 | 2301.8 | 2301.8 | 2301.8 | 2301.8 |
| 2.5°  | 2347.0 | 2282.8 | 2161.5 | 2042.6 | 1942.8 | 1860.7 | 1787.0 | 1757.3 | 1733.5 | 1729.9 | 1710.9 |
| 5°    | 2451.6 | 2322.0 | 2090.2 | 1900.0 | 1772.7 | 1682.4 | 1605.1 | 1557.5 | 1520.7 | 1506.4 | 1493.3 |
| 7.5°  | 2609.8 | 2413.6 | 2080.7 | 1861.9 | 1709.7 | 1557.5 | 1414.9 | 1260.3 | 1164.0 | 1127.1 | 1105.7 |
| 10°   | 2802.4 | 2534.9 | 2116.4 | 1851.2 | 1584.9 | 1263.9 | 1027.3 | 831.1  | 751.4  | 725.3  | 718.1  |
| 12.5° | 3027.1 | 2685.9 | 2178.2 | 1784.6 | 1318.6 | 897.7  | 708.6  | 642.0  | 624.2  | 615.9  | 615.9  |
| 15°   | 3285.1 | 2851.1 | 2222.2 | 1592.0 | 975.0  | 678.9  | 613.5  | 582.6  | 563.6  | 552.9  | 554.1  |
| 17.5° | 3549.1 | 3012.8 | 2200.8 | 1312.6 | 719.3  | 604.0  | 555.2  | 522.0  | 495.8  | 485.1  | 482.7  |
| 20°   | 3815.4 | 3162.6 | 2081.9 | 977.3  | 608.7  | 548.1  | 493.4  | 456.6  | 430.4  | 419.7  | 417.3  |
| 22.5° | 4091.2 | 3289.9 | 1872.6 | 716.9  | 546.9  | 486.3  | 432.8  | 395.9  | 371.0  | 361.4  | 356.7  |
| 25°   | 4359.9 | 3393.3 | 1580.1 | 580.2  | 488.7  | 428.0  | 376.9  | 342.4  | 319.8  | 310.3  | 309.1  |
| 27.5° | 4610.8 | 3458.7 | 1241.3 | 512.4  | 437.5  | 375.7  | 329.3  | 298.4  | 279.4  | 272.3  | 271.1  |
| 30°   | 4836.7 | 3464.6 | 917.9  | 462.5  | 392.4  | 330.5  | 287.7  | 260.4  | 243.7  | 236.6  | 234.2  |
| 32.5° | 5065.0 | 3414.7 | 668.2  | 417.3  | 350.7  | 291.3  | 249.7  | 228.3  | 216.4  | 210.4  | 210.4  |
| 35°   | 5280.2 | 3299.4 | 520.8  | 378.1  | 310.3  | 253.2  | 220.0  | 204.5  | 197.4  | 191.4  | 191.4  |
| 37.5° | 5490.6 | 3134.1 | 442.3  | 343.6  | 272.3  | 221.1  | 193.8  | 184.3  | 178.3  | 172.4  | 172.4  |
| 40°   | 5704.6 | 2926.0 | 401.9  | 311.5  | 241.4  | 196.2  | 172.4  | 164.1  | 158.1  | 153.4  | 152.2  |
| 42.5° | 5967.4 | 2685.9 | 375.7  | 281.8  | 214.0  | 173.6  | 152.2  | 142.7  | 137.9  | 133.2  | 130.8  |
| 45°   | 6271.8 | 2479.0 | 354.3  | 252.1  | 191.4  | 154.6  | 132.0  | 122.5  | 115.3  | 109.4  | 108.2  |
| 47.5° | 6710.5 | 2329.2 | 325.8  | 220.0  | 170.0  | 134.4  | 114.1  | 103.4  | 92.7   | 86.8   | 85.6   |
| 50°   | 7270.5 | 2205.5 | 288.9  | 191.4  | 148.6  | 114.1  | 95.1   | 82.0   | 72.5   | 66.6   | 66.6   |
| 52.5° | 7548.7 | 2043.8 | 255.6  | 166.5  | 124.8  | 96.3   | 77.3   | 61.8   | 57.1   | 51.1   | 51.1   |
| 55°   | 7660.5 | 1920.2 | 222.3  | 141.5  | 103.4  | 79.7   | 60.6   | 47.6   | 44.0   | 40.4   | 39.2   |
| 57.5° | 7974.4 | 1884.5 | 193.8  | 120.1  | 85.6   | 63.0   | 46.4   | 35.7   | 33.3   | 28.5   | 28.5   |
| 60°   | 8479.7 | 1902.3 | 167.6  | 102.3  | 69.0   | 48.7   | 34.5   | 27.3   | 25.0   | 20.2   | 20.2   |
| 62.5° | 9025.4 | 1879.8 | 141.5  | 88.0   | 53.5   | 35.7   | 23.8   | 20.2   | 20.2   | 11.9   | 10.7   |
| 65°   | 9130.1 | 1674.1 | 121.3  | 72.5   | 41.6   | 26.2   | 15.5   | 13.1   | 17.8   | 2.4    | 0.0    |
| 67.5° | 8473.7 | 1298.3 | 104.6  | 55.9   | 30.9   | 20.2   | 11.9   | 5.9    | 15.5   | 0.0    | 0.0    |
| 70°   | 6775.9 | 825.1  | 84.4   | 40.4   | 23.8   | 16.6   | 9.5    | 2.4    | 11.9   | 0.0    | 0.0    |
| 72.5° | 4791.5 | 479.2  | 66.6   | 28.5   | 20.2   | 13.1   | 7.1    | 0.0    | 7.1    | 0.0    | 0.0    |
| 75°   | 2423.1 | 255.6  | 41.6   | 21.4   | 15.5   | 9.5    | 4.8    | 0.0    | 1.2    | 0.0    | 0.0    |
| 77.5° | 524.3  | 118.9  | 26.2   | 15.5   | 10.7   | 5.9    | 2.4    | 0.0    | 0.0    | 0.0    | 0.0    |
| 80°   | 114.1  | 52.3   | 16.6   | 9.5    | 5.9    | 3.6    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 82.5° | 41.6   | 27.3   | 8.3    | 4.8    | 2.4    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 85°   | 22.6   | 14.3   | 4.8    | 2.4    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 87.5° | 11.9   | 4.8    | 1.2    | 1.2    | 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  
 Rf: 81.5  
 Rg: 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

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### 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>^</sup> /nm | Lumens (Φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (Φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (Φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (Φ/nm) | λ (nm) | Power W <sup>^</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

$R_f = 81.5$   
 $R_g = 99.2$   
 $CIE R_a = 81.0$   
 $R_9 = 7.1$



### 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)