

Signify Classified - Internal  
Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269



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: P1437988

Luminaire Tested: **GALN-SB6D-940-U-T3LG-HSS**

Issue Date: 03/27/202

This test was performed under the Supervised Manufacturer's Testing Program. The results of this test have not been influenced by sources from within Cooper Lighting Solutions or from external interests.

Report Generated By 670245763



**Test Information**

Test Method: LM-79-08  
Report Number: P1437988  
Test Lab: INNOVATION CENTER(G1)  
Issue Date: 03/27/202  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GALN-SB6D-940-U-T3LG-HSS  
Description: GALLEON II AREA AND ROADWAY HIGH DENSITY LUMINAIRE 900mA 6xLight  
Square PACKAGE 90CRI 4000K FIXTURE w/ TYPE III LOW GLARE WITH HOUSE SIDE  
SHIELD  
Light Source: (156) 4000K CCT, 90 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER  
Luminaire Equipment: 

| <u>Sample No.</u> | <u>Condition</u> | <u>Description</u> |
|-------------------|------------------|--------------------|
| a                 | good             | reflector          |
| b                 | good             | lens               |
| c                 | good             | housing            |
| d                 | good             | cord               |

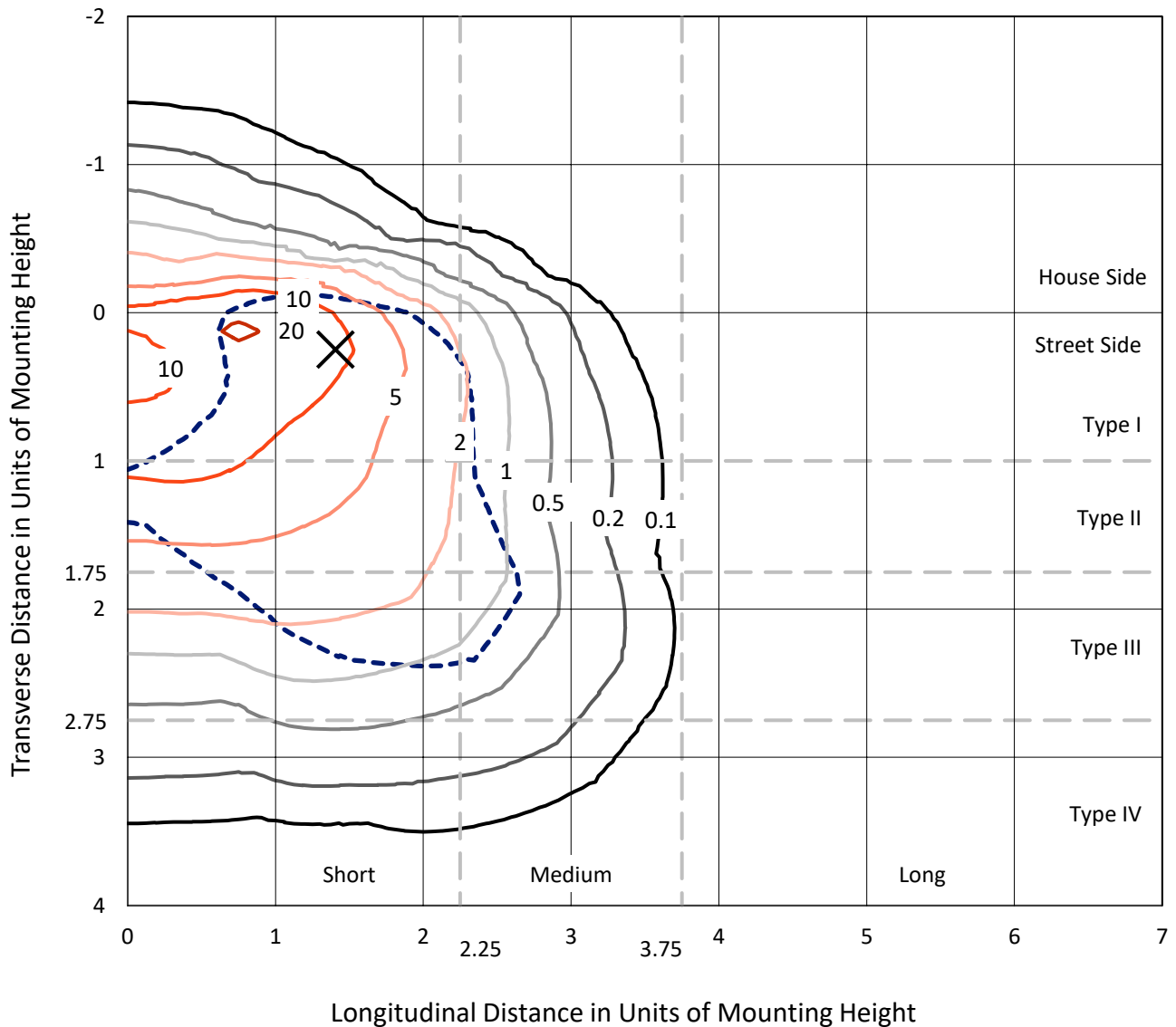
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 34180.7 lumens  
Efficiency: N/A  
Efficacy: 77.7 lumens/watt  
Luminous Opening: Rectangular (W 1.5' x L: 1' x H: 0')  
IES Classification: Type III - Short  
BUG Rating: B3 - U0 - G4  
  
Input Watts (W): 440.1  
Input Voltage (V): 120  
Input Current (A<sub>in</sub>): NR  
Voltage Rise (V): NR  
Power Factor: 0.97  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT

REPORT NUMBER: P1437988  
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### Iso-Footcandle Lines of Horizontal Illumination

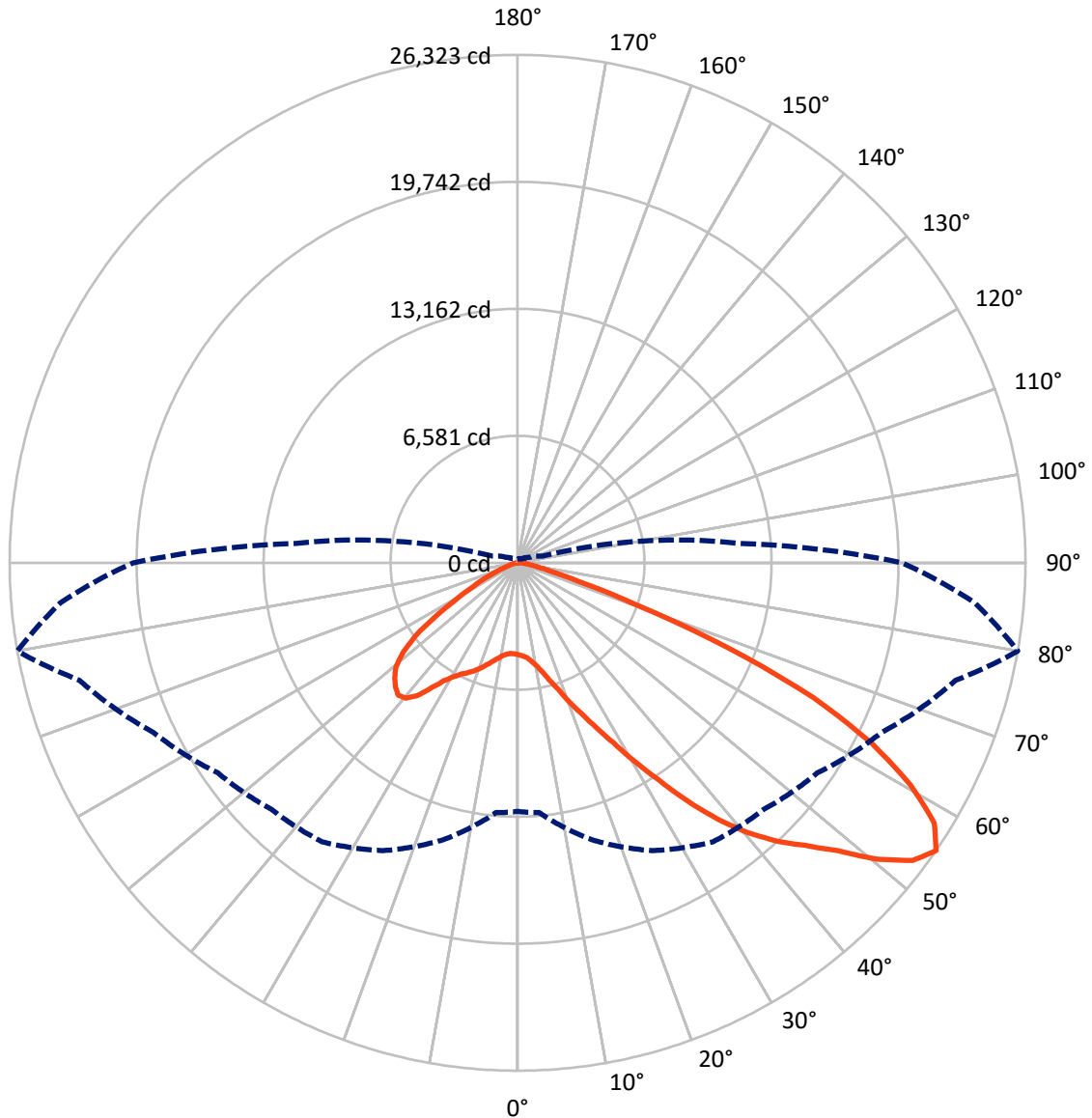
✕ Max cd  
 - - - 1/2 Max cd



Based on 20 foot mounting height. Maximum calculated value = 21.1 fc  
 Type III - Short - N/A

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### Luminous Intensity Polar Plot



— Vertical Plane Through 80-Deg Lateral    - - - Horizontal Cone Through 55-Deg Vertical

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**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 4155.0   | 0.0    | 4155.0  |
|                    | % Fixture | 12.2     | 0.0    | 12.2    |
| <b>Street Side</b> | Lumens    | 30025.7  | 0.0    | 30025.7 |
|                    | % Fixture | 87.8     | 0.0    | 87.8    |
| <b>Total</b>       | Lumens    | 34180.7  | 0.0    | 34180.7 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 399.6   | 1.2       |
| 10°-20°   | 1053.4  | 3.1       |
| 20°-30°   | 2062.3  | 6.0       |
| 30°-40°   | 4195.6  | 12.3      |
| 40°-50°   | 7073.1  | 20.7      |
| 50°-60°   | 9037.3  | 26.4      |
| 60°-70°   | 7715.7  | 22.6      |
| 70°-80°   | 2465.6  | 7.2       |
| 80°-90°   | 178.0   | 0.5       |
| 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°    | 34180.7 | 100.0     |
| 0°-180°   | 34180.7 | 100.0     |

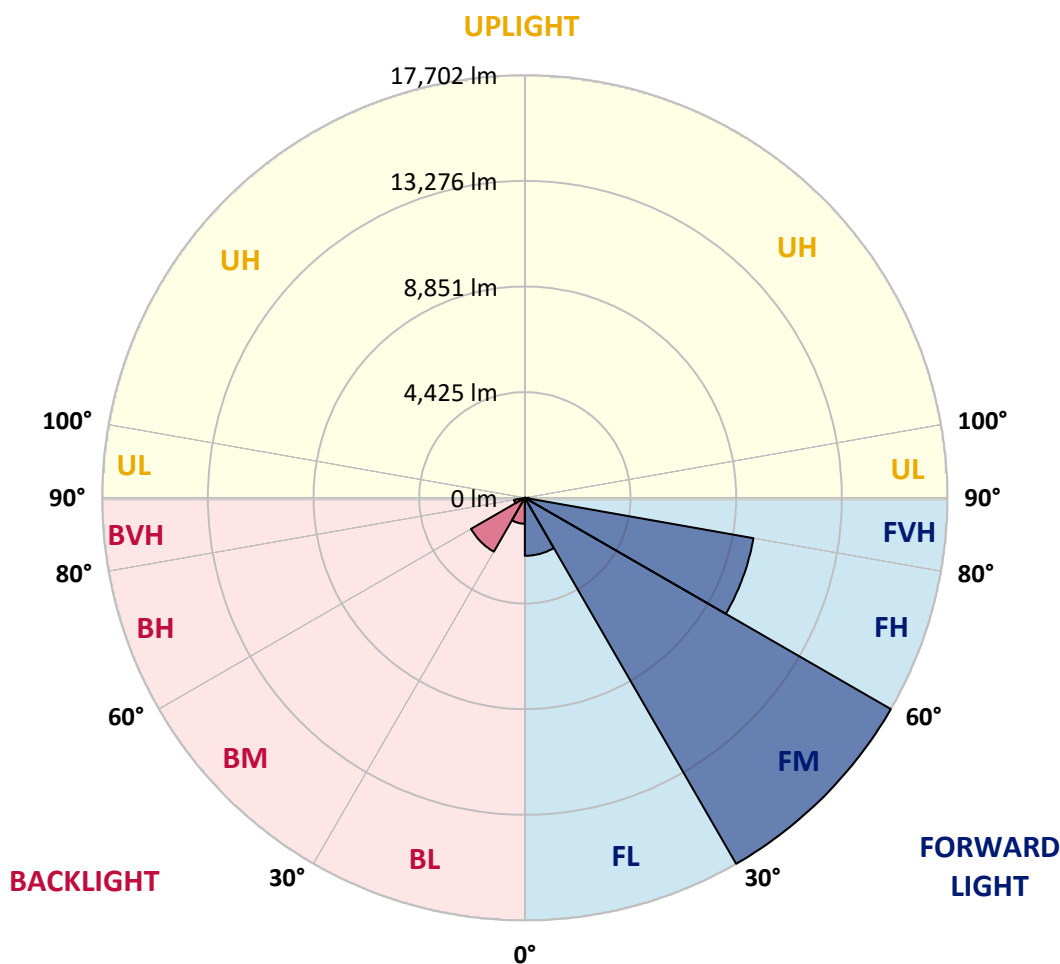


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**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone           | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |          |
|----------------|---------|-----------|-------------------------|------|----------|
|                |         |           | B                       | U    | G        |
| FL (0°-30°)    | 2430.3  | 7.1       |                         |      |          |
| FM (30°-60°)   | 17701.9 | 51.8      |                         |      |          |
| FH (60°-80°)   | 9724.7  | 28.5      |                         |      | G4/12000 |
| FVH (80°-90°)  | 168.8   | 0.5       |                         |      | G2/225   |
| BL (0°-30°)    | 1085.0  | 3.2       | B3/2500                 |      |          |
| BM (30°-60°)   | 2604.1  | 7.6       | B3/5000                 |      |          |
| BH (60°-80°)   | 456.7   | 1.3       | B1/500                  |      | G1/500   |
| BVH (80°-90°)  | 9.3     | 0.0       |                         |      | G0/10    |
| UL (90°-100°)  | 0.0     | 0.0       |                         | U0/0 |          |
| UH (100°-180°) | 0.0     | 0.0       |                         | U0/0 |          |

**BUG Rating: B3-U0-G4**  
 Type III Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 55°     | 65°     | 75°     | 80°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 4761.3  | 4761.3  | 4761.3  | 4761.3  | 4761.3  | 4761.3  | 4761.3  | 4761.3  | 4761.3  | 4761.3  | 4761.3  |
| 2.5°  | 4790.5  | 4800.2  | 4790.5  | 4800.2  | 4819.6  | 4809.9  | 4848.8  | 4839.1  | 4839.1  | 4829.3  | 4790.5  |
| 5°    | 4518.4  | 4528.1  | 4547.5  | 4596.1  | 4664.2  | 4732.2  | 4819.6  | 4877.9  | 4936.2  | 4926.5  | 4887.6  |
| 7.5°  | 3984.0  | 4003.4  | 4081.1  | 4178.3  | 4401.8  | 4605.9  | 4829.3  | 4975.1  | 5101.4  | 5140.3  | 5111.1  |
| 10°   | 3682.7  | 3702.2  | 3750.8  | 3847.9  | 4052.0  | 4392.1  | 4829.3  | 5130.6  | 5354.1  | 5431.8  | 5441.5  |
| 12.5° | 3653.6  | 3663.3  | 3702.2  | 3809.1  | 3984.0  | 4275.5  | 4819.6  | 5334.6  | 5713.6  | 5830.2  | 5869.1  |
| 15°   | 3673.0  | 3692.5  | 3731.3  | 3818.8  | 4022.8  | 4353.2  | 4897.4  | 5655.3  | 6189.7  | 6354.9  | 6364.6  |
| 17.5° | 3750.8  | 3770.2  | 3818.8  | 3915.9  | 4139.4  | 4557.3  | 5140.3  | 5985.7  | 6763.0  | 6947.6  | 7054.5  |
| 20°   | 3906.2  | 3915.9  | 3974.2  | 4100.6  | 4353.2  | 4809.9  | 5499.8  | 6432.6  | 7452.9  | 7725.0  | 7802.7  |
| 22.5° | 4110.3  | 4139.4  | 4217.2  | 4372.6  | 4693.3  | 5159.7  | 5995.4  | 6976.8  | 8210.9  | 8492.6  | 8628.7  |
| 25°   | 4333.8  | 4372.6  | 4489.2  | 4741.9  | 5150.0  | 5694.2  | 6607.5  | 7695.9  | 9104.8  | 9444.9  | 9629.5  |
| 27.5° | 4790.5  | 4800.2  | 4877.9  | 5198.6  | 5723.3  | 6393.8  | 7384.9  | 8619.0  | 10154.2 | 10552.6 | 10756.7 |
| 30°   | 5791.3  | 5801.0  | 5733.0  | 5820.5  | 6354.9  | 7219.7  | 8298.3  | 9697.6  | 11378.6 | 11932.5 | 12097.6 |
| 32.5° | 7015.7  | 7064.2  | 7054.5  | 6996.2  | 7239.2  | 8045.7  | 9386.6  | 10989.9 | 12816.7 | 13399.7 | 13555.2 |
| 35°   | 8405.2  | 8521.8  | 8492.6  | 8473.2  | 8502.4  | 9104.8  | 10630.4 | 12418.3 | 14449.2 | 15158.5 | 15284.8 |
| 37.5° | 9765.6  | 9794.7  | 9930.8  | 10095.9 | 10115.4 | 10533.2 | 12068.5 | 13934.2 | 15965.0 | 16868.7 | 17063.0 |
| 40°   | 10815.0 | 10912.2 | 11252.3 | 11582.6 | 11922.7 | 12253.1 | 13254.0 | 15158.5 | 17169.9 | 18384.5 | 18472.0 |
| 42.5° | 11631.2 | 11864.4 | 12360.0 | 12875.0 | 13564.9 | 13934.2 | 14381.1 | 16023.3 | 18151.3 | 19735.2 | 19696.3 |
| 45°   | 12622.4 | 12719.5 | 13419.2 | 14099.3 | 14799.0 | 15362.6 | 15352.8 | 16752.1 | 18919.0 | 20891.5 | 20648.6 |
| 47.5° | 13292.8 | 13409.4 | 14361.7 | 15158.5 | 15877.6 | 16159.3 | 16217.6 | 17539.2 | 19978.1 | 22290.8 | 21717.5 |
| 50°   | 13652.4 | 13856.4 | 14896.1 | 15906.7 | 16684.1 | 16771.5 | 17033.9 | 18569.2 | 21367.6 | 24146.7 | 23068.1 |
| 52.5° | 13691.2 | 13885.6 | 15080.8 | 16382.8 | 17228.2 | 17403.1 | 17850.1 | 19735.2 | 22718.3 | 25633.4 | 23845.5 |
| 55°   | 12884.7 | 13001.3 | 14857.3 | 16460.6 | 17655.8 | 18063.9 | 18977.3 | 20813.8 | 23505.4 | 26323.3 | 23777.5 |
| 57.5° | 12126.8 | 12243.4 | 13856.4 | 16324.5 | 18093.0 | 18928.7 | 20182.2 | 21552.3 | 22893.2 | 25468.2 | 22261.6 |
| 60°   | 11475.8 | 11534.1 | 13001.3 | 15692.9 | 18258.2 | 19774.1 | 21221.9 | 20823.5 | 21309.3 | 23417.9 | 19667.2 |
| 62.5° | 10251.4 | 10290.3 | 12029.6 | 14556.0 | 17927.8 | 20425.1 | 21581.4 | 19278.5 | 19570.0 | 20590.3 | 16616.0 |
| 65°   | 7744.4  | 7890.2  | 9483.8  | 13700.9 | 17383.7 | 20726.3 | 20745.8 | 17393.4 | 17092.2 | 16849.3 | 13069.3 |
| 67.5° | 5256.9  | 5422.1  | 6384.1  | 12321.1 | 16499.4 | 20852.6 | 19123.0 | 14954.4 | 13020.8 | 11767.3 | 8560.7  |
| 70°   | 4197.7  | 4197.7  | 4528.1  | 9901.6  | 14400.6 | 19239.6 | 17111.6 | 11291.1 | 8269.2  | 6500.7  | 4586.4  |
| 72.5° | 2759.6  | 2769.3  | 3080.3  | 6286.9  | 10212.6 | 14672.6 | 13953.6 | 6529.8  | 4294.9  | 3313.5  | 2264.1  |
| 75°   | 1000.8  | 1000.8  | 1350.7  | 2516.7  | 5402.6  | 8735.6  | 8502.4  | 3119.2  | 2332.1  | 1807.4  | 1370.1  |
| 77.5° | 534.4   | 553.9   | 651.0   | 1039.7  | 2069.7  | 3556.4  | 3323.2  | 1593.6  | 1321.5  | 1127.2  | 855.1   |
| 80°   | 359.5   | 369.2   | 437.3   | 641.3   | 1000.8  | 1370.1  | 1068.9  | 894.0   | 894.0   | 757.9   | 573.3   |
| 82.5° | 194.3   | 204.1   | 291.5   | 417.8   | 534.4   | 641.3   | 515.0   | 524.7   | 631.6   | 515.0   | 330.4   |
| 85°   | 136.0   | 136.0   | 223.5   | 301.2   | 301.2   | 310.9   | 223.5   | 330.4   | 369.2   | 320.7   | 223.5   |
| 87.5° | 77.7    | 77.7    | 126.3   | 145.8   | 145.8   | 136.0   | 68.0    | 116.6   | 145.8   | 165.2   | 97.2    |
| 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: P1437988

CATALOG NUMBER: GALN-SB6D-940-U-T3LG-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°     | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|---------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 4761.3  | 4761.3  | 4761.3 | 4761.3 | 4761.3 | 4761.3 | 4761.3 | 4761.3 | 4761.3 | 4761.3 | 4761.3 |
| 2.5°  | 4780.8  | 4751.6  | 4693.3 | 4576.7 | 4518.4 | 4440.7 | 4372.6 | 4285.2 | 4265.8 | 4256.0 | 4217.2 |
| 5°    | 4858.5  | 4800.2  | 4625.3 | 4372.6 | 4158.9 | 3954.8 | 3750.8 | 3634.2 | 3537.0 | 3488.4 | 3478.7 |
| 7.5°  | 5052.8  | 4936.2  | 4615.6 | 4168.6 | 3770.2 | 3420.4 | 3119.2 | 2856.8 | 2720.8 | 2604.2 | 2613.9 |
| 10°   | 5344.3  | 5159.7  | 4635.0 | 3974.2 | 3381.5 | 2817.9 | 2380.7 | 2001.7 | 1729.6 | 1603.3 | 1593.6 |
| 12.5° | 5733.0  | 5470.7  | 4703.0 | 3779.9 | 2905.4 | 2118.3 | 1564.4 | 1340.9 | 1282.6 | 1272.9 | 1263.2 |
| 15°   | 6209.2  | 5839.9  | 4771.0 | 3527.3 | 2264.1 | 1467.3 | 1272.9 | 1224.3 | 1214.6 | 1204.9 | 1204.9 |
| 17.5° | 6782.5  | 6267.5  | 4809.9 | 3099.7 | 1651.9 | 1263.2 | 1195.2 | 1166.0 | 1156.3 | 1146.6 | 1146.6 |
| 20°   | 7501.5  | 6743.6  | 4858.5 | 2555.6 | 1399.2 | 1214.6 | 1136.9 | 1098.0 | 1088.3 | 1088.3 | 1078.6 |
| 22.5° | 8210.9  | 7278.0  | 4819.6 | 2079.4 | 1350.7 | 1156.3 | 1068.9 | 1030.0 | 1010.6 | 1010.6 | 1000.8 |
| 25°   | 9027.1  | 7822.2  | 4703.0 | 1875.4 | 1340.9 | 1107.7 | 1000.8 | 942.5  | 913.4  | 903.7  | 903.7  |
| 27.5° | 9959.9  | 8444.1  | 4518.4 | 1885.1 | 1340.9 | 1068.9 | 913.4  | 835.7  | 816.2  | 796.8  | 796.8  |
| 30°   | 11028.8 | 9202.0  | 4382.4 | 2011.4 | 1360.4 | 1030.0 | 835.7  | 738.5  | 709.3  | 689.9  | 699.6  |
| 32.5° | 12253.1 | 10047.4 | 4372.6 | 2215.5 | 1389.5 | 971.7  | 748.2  | 641.3  | 612.2  | 602.5  | 612.2  |
| 35°   | 13642.6 | 11096.8 | 4596.1 | 2370.9 | 1311.8 | 845.4  | 641.3  | 553.9  | 524.7  | 524.7  | 534.4  |
| 37.5° | 15187.6 | 12301.7 | 4897.4 | 2332.1 | 1059.2 | 670.5  | 553.9  | 485.8  | 456.7  | 466.4  | 476.1  |
| 40°   | 16596.6 | 13244.2 | 4945.9 | 1992.0 | 796.8  | 573.3  | 476.1  | 427.5  | 408.1  | 417.8  | 427.5  |
| 42.5° | 17665.5 | 14002.2 | 4479.5 | 1545.0 | 670.5  | 485.8  | 408.1  | 369.2  | 359.5  | 379.0  | 379.0  |
| 45°   | 18530.3 | 14303.4 | 3741.0 | 1146.6 | 592.7  | 417.8  | 359.5  | 340.1  | 320.7  | 330.4  | 330.4  |
| 47.5° | 19434.0 | 14352.0 | 3051.1 | 923.1  | 524.7  | 379.0  | 330.4  | 310.9  | 291.5  | 291.5  | 291.5  |
| 50°   | 20308.5 | 14235.4 | 2332.1 | 816.2  | 485.8  | 340.1  | 301.2  | 281.8  | 262.4  | 252.6  | 252.6  |
| 52.5° | 20522.3 | 13302.6 | 1710.2 | 757.9  | 447.0  | 320.7  | 281.8  | 262.4  | 242.9  | 233.2  | 233.2  |
| 55°   | 19929.5 | 11534.1 | 1340.9 | 680.2  | 408.1  | 291.5  | 262.4  | 242.9  | 213.8  | 204.1  | 204.1  |
| 57.5° | 17976.4 | 8793.9  | 1068.9 | 583.0  | 369.2  | 281.8  | 242.9  | 223.5  | 194.3  | 184.6  | 184.6  |
| 60°   | 15440.3 | 6238.3  | 864.8  | 476.1  | 340.1  | 252.6  | 223.5  | 194.3  | 174.9  | 155.5  | 155.5  |
| 62.5° | 12632.1 | 4479.5  | 699.6  | 398.4  | 320.7  | 223.5  | 204.1  | 174.9  | 136.0  | 106.9  | 106.9  |
| 65°   | 9687.8  | 3216.3  | 544.2  | 320.7  | 291.5  | 194.3  | 174.9  | 145.8  | 106.9  | 77.7   | 77.7   |
| 67.5° | 6267.5  | 2079.4  | 408.1  | 281.8  | 223.5  | 165.2  | 136.0  | 116.6  | 97.2   | 68.0   | 58.3   |
| 70°   | 3303.8  | 1214.6  | 301.2  | 242.9  | 165.2  | 126.3  | 116.6  | 97.2   | 77.7   | 48.6   | 48.6   |
| 72.5° | 1710.2  | 796.8   | 223.5  | 213.8  | 126.3  | 87.5   | 97.2   | 77.7   | 58.3   | 29.2   | 29.2   |
| 75°   | 1098.0  | 534.4   | 165.2  | 174.9  | 77.7   | 68.0   | 68.0   | 48.6   | 29.2   | 19.4   | 9.7    |
| 77.5° | 709.3   | 359.5   | 116.6  | 145.8  | 48.6   | 38.9   | 38.9   | 19.4   | 9.7    | 0.0    | 0.0    |
| 80°   | 417.8   | 223.5   | 77.7   | 97.2   | 19.4   | 19.4   | 9.7    | 0.0    | 0.0    | 0.0    | 0.0    |
| 82.5° | 213.8   | 116.6   | 38.9   | 38.9   | 9.7    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 85°   | 136.0   | 58.3    | 9.7    | 9.7    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 87.5° | 68.0    | 19.4    | 9.7    | 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    |

Signify Classified - Internal  
Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269



LM-79-08: Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

McGRAW-EDISON

Report Number: SP1-2106-271-4

Luminaire Tested: GFLD-SA1-A-940-U-WR-X-BK

Test Date: 06/15/2021

**Test Information**

Test Method: LM-79-08  
 Report Number: SP1-2106-271-4  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1  
 Measurement Geometry: 4π  
 Issue Date: 06/15/2021  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: MCGRAW-EDISON  
 Catalog Number: **GFLD-SA1-A-940-U-WR-X-BK**  
 Description: MCGRAW EDISON

N6, BLACK

**Spectral Parameters**

CCT (K): 3952  
 CIE u': 0.2242  
 CIE v': 0.5064  
 Duv: 0.0032  
 CIE x: 0.3848  
 CIE y: 0.3864  
 CIE z: 0.2287  
 Peak Wavelength (nm): 614  
 Dominant Wavelength (nm): 577  
 Purity: 31.6  
 Rf: 92.2  
 Rg: 98.9

CRI (Ra): 92.2

|          |           |
|----------|-----------|
| R1: 92.0 | R9: 63.3  |
| R2: 93.7 | R10: 84.3 |
| R3: 94.4 | R11: 92.7 |
| R4: 93.1 | R12: 75.6 |
| R5: 91.2 | R13: 92.2 |
| R6: 91.1 | R14: 96.5 |
| R7: 95.4 |           |
| R8: 86.5 |           |



**Test Conditions**  
 Stabilization Time: 72M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.8/42%  
 Sphere Temperature (°C): 24.9

REPORT NUMBER: SP1-2106-271-4

| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | 76INCH SPHERE IN0058  | 1/31/2021        | 7/31/2021            |
| Power Meter                    | XITRON 2801 IN0071    | 12/1/2020        | 12/1/2021            |
| AC Power Source                | CHROMA 61603 IN0063   | 12/1/2020        | 12/1/2021            |
| DC Power Source                | AGILENT E3634A IN0208 | 12/1/2020        | 12/1/2021            |
| Sphere Thermometer             | ONSET IN0085          | 12/1/2020        | 12/1/2021            |
| Room Thermometer               | ONSET IN0046          | 12/1/2020        | 12/1/2021            |

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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 4000K 4-step quadrangle

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**Photopic Flux vs. Wavelength**



#####

| λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) |
|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|
| 360    | 910           | NR            | 490    | 17463         | NR            | 620    | 33665         | NR            | 750    | 3275          | NR            | 880    | 1122          | NR            |
| 365    | 784           | NR            | 495    | 18986         | NR            | 625    | 33477         | NR            | 755    | 2901          | NR            | 885    | 1170          | NR            |
| 370    | 741           | NR            | 500    | 20627         | NR            | 630    | 32742         | NR            | 760    | 2665          | NR            | 890    | 751           | NR            |
| 375    | 805           | NR            | 505    | 21980         | NR            | 635    | 31767         | NR            | 765    | 2371          | NR            | 895    | 990           | NR            |
| 380    | 830           | NR            | 510    | 23346         | NR            | 640    | 30561         | NR            | 770    | 2039          | NR            | 900    | 982           | NR            |
| 385    | 690           | NR            | 515    | 24600         | NR            | 645    | 29699         | NR            | 775    | 1676          | NR            | 905    | 936           | NR            |
| 390    | 625           | NR            | 520    | 25854         | NR            | 650    | 28202         | NR            | 780    | 1616          | NR            | 910    | 888           | NR            |
| 395    | 599           | NR            | 525    | 26952         | NR            | 655    | 26484         | NR            | 785    | 1573          | NR            | 915    | 1068          | NR            |
| 400    | 568           | NR            | 530    | 28081         | NR            | 660    | 24930         | NR            | 790    | 1452          | NR            | 920    | 1179          | NR            |
| 405    | 577           | NR            | 535    | 28884         | NR            | 665    | 23070         | NR            | 795    | 1263          | NR            | 925    | 1008          | NR            |
| 410    | 720           | NR            | 540    | 29271         | NR            | 670    | 20926         | NR            | 800    | 1203          | NR            | 930    | 927           | NR            |
| 415    | 1084          | NR            | 545    | 29657         | NR            | 675    | 19011         | NR            | 805    | 1175          | NR            | 935    | 1185          | NR            |
| 420    | 1884          | NR            | 550    | 30152         | NR            | 680    | 17237         | NR            | 810    | 1108          | NR            | 940    | 1166          | NR            |
| 425    | 3574          | NR            | 555    | 30445         | NR            | 685    | 15540         | NR            | 815    | 1125          | NR            | 945    | 779           | NR            |
| 430    | 6636          | NR            | 560    | 30559         | NR            | 690    | 13894         | NR            | 820    | 988           | NR            | 950    | 905           | NR            |
| 435    | 12267         | NR            | 565    | 30663         | NR            | 695    | 12196         | NR            | 825    | 1070          | NR            | 955    | 1369          | NR            |
| 440    | 21326         | NR            | 570    | 30877         | NR            | 700    | 10840         | NR            | 830    | 1219          | NR            | 960    | 1280          | NR            |
| 445    | 30150         | NR            | 575    | 30916         | NR            | 705    | 9613          | NR            | 835    | 944           | NR            | 965    | 1177          | NR            |
| 450    | 29740         | NR            | 580    | 31248         | NR            | 710    | 8583          | NR            | 840    | 983           | NR            | 970    | 868           | NR            |
| 455    | 22827         | NR            | 585    | 31581         | NR            | 715    | 7631          | NR            | 845    | 1097          | NR            | 975    | 843           | NR            |
| 460    | 19023         | NR            | 590    | 32218         | NR            | 720    | 6779          | NR            | 850    | 856           | NR            | 980    | 744           | NR            |
| 465    | 16163         | NR            | 595    | 32417         | NR            | 725    | 5950          | NR            | 855    | 949           | NR            | 985    | 1113          | NR            |
| 470    | 13739         | NR            | 600    | 32976         | NR            | 730    | 5282          | NR            | 860    | 954           | NR            | 990    | 1002          | NR            |
| 475    | 13571         | NR            | 605    | 33620         | NR            | 735    | 4673          | NR            | 865    | 1019          | NR            | 995    | 1732          | NR            |
| 480    | 14597         | NR            | 610    | 33704         | NR            | 740    | 4087          | NR            | 870    | 1089          | NR            | 1000   | 1390          | NR            |
| 485    | 15964         | NR            | 615    | 33846         | NR            | 745    | 3658          | NR            | 875    | 1089          | NR            |        |               |               |

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**Scotopic Flux vs. Wavelength**



**Scotopic Lumens: 3705.7**

**S/P: 1.75**

| $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) |
|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|
| 360               | 910                                  | NR                             | 490               | 17463                                | NR                             | 620               | 33665                                | NR                             | 750               | 3275                                 | NR                             | 880               | 1122                                 | NR                             |
| 365               | 784                                  | NR                             | 495               | 18986                                | NR                             | 625               | 33477                                | NR                             | 755               | 2901                                 | NR                             | 885               | 1170                                 | NR                             |
| 370               | 741                                  | NR                             | 500               | 20627                                | NR                             | 630               | 32742                                | NR                             | 760               | 2665                                 | NR                             | 890               | 751                                  | NR                             |
| 375               | 805                                  | NR                             | 505               | 21980                                | NR                             | 635               | 31767                                | NR                             | 765               | 2371                                 | NR                             | 895               | 990                                  | NR                             |
| 380               | 830                                  | NR                             | 510               | 23346                                | NR                             | 640               | 30561                                | NR                             | 770               | 2039                                 | NR                             | 900               | 982                                  | NR                             |
| 385               | 690                                  | NR                             | 515               | 24600                                | NR                             | 645               | 29699                                | NR                             | 775               | 1676                                 | NR                             | 905               | 936                                  | NR                             |
| 390               | 625                                  | NR                             | 520               | 25854                                | NR                             | 650               | 28202                                | NR                             | 780               | 1616                                 | NR                             | 910               | 888                                  | NR                             |
| 395               | 599                                  | NR                             | 525               | 26952                                | NR                             | 655               | 26484                                | NR                             | 785               | 1573                                 | NR                             | 915               | 1068                                 | NR                             |
| 400               | 568                                  | NR                             | 530               | 28081                                | NR                             | 660               | 24930                                | NR                             | 790               | 1452                                 | NR                             | 920               | 1179                                 | NR                             |
| 405               | 577                                  | NR                             | 535               | 28884                                | NR                             | 665               | 23070                                | NR                             | 795               | 1263                                 | NR                             | 925               | 1008                                 | NR                             |
| 410               | 720                                  | NR                             | 540               | 29271                                | NR                             | 670               | 20926                                | NR                             | 800               | 1203                                 | NR                             | 930               | 927                                  | NR                             |
| 415               | 1084                                 | NR                             | 545               | 29657                                | NR                             | 675               | 19011                                | NR                             | 805               | 1175                                 | NR                             | 935               | 1185                                 | NR                             |
| 420               | 1884                                 | NR                             | 550               | 30152                                | NR                             | 680               | 17237                                | NR                             | 810               | 1108                                 | NR                             | 940               | 1166                                 | NR                             |
| 425               | 3574                                 | NR                             | 555               | 30445                                | NR                             | 685               | 15540                                | NR                             | 815               | 1125                                 | NR                             | 945               | 779                                  | NR                             |
| 430               | 6636                                 | NR                             | 560               | 30559                                | NR                             | 690               | 13894                                | NR                             | 820               | 988                                  | NR                             | 950               | 905                                  | NR                             |
| 435               | 12267                                | NR                             | 565               | 30663                                | NR                             | 695               | 12196                                | NR                             | 825               | 1070                                 | NR                             | 955               | 1369                                 | NR                             |
| 440               | 21326                                | NR                             | 570               | 30877                                | NR                             | 700               | 10840                                | NR                             | 830               | 1219                                 | NR                             | 960               | 1280                                 | NR                             |
| 445               | 30150                                | NR                             | 575               | 30916                                | NR                             | 705               | 9613                                 | NR                             | 835               | 944                                  | NR                             | 965               | 1177                                 | NR                             |
| 450               | 29740                                | NR                             | 580               | 31248                                | NR                             | 710               | 8583                                 | NR                             | 840               | 983                                  | NR                             | 970               | 868                                  | NR                             |
| 455               | 22827                                | NR                             | 585               | 31581                                | NR                             | 715               | 7631                                 | NR                             | 845               | 1097                                 | NR                             | 975               | 843                                  | NR                             |
| 460               | 19023                                | NR                             | 590               | 32218                                | NR                             | 720               | 6779                                 | NR                             | 850               | 856                                  | NR                             | 980               | 744                                  | NR                             |
| 465               | 16163                                | NR                             | 595               | 32417                                | NR                             | 725               | 5950                                 | NR                             | 855               | 949                                  | NR                             | 985               | 1113                                 | NR                             |
| 470               | 13739                                | NR                             | 600               | 32976                                | NR                             | 730               | 5282                                 | NR                             | 860               | 954                                  | NR                             | 990               | 1002                                 | NR                             |
| 475               | 13571                                | NR                             | 605               | 33620                                | NR                             | 735               | 4673                                 | NR                             | 865               | 1019                                 | NR                             | 995               | 1732                                 | NR                             |
| 480               | 14597                                | NR                             | 610               | 33704                                | NR                             | 740               | 4087                                 | NR                             | 870               | 1089                                 | NR                             | 1000              | 1390                                 | NR                             |
| 485               | 15964                                | NR                             | 615               | 33846                                | NR                             | 745               | 3658                                 | NR                             | 875               | 1089                                 | NR                             |                   |                                      |                                |

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**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 1498.3 S/P: 0.71**

| λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) |
|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|
| 360    | 910           | NR            | 490    | 17463         | NR            | 620    | 33665         | NR            | 750    | 3275          | NR            | 880    | 1122          | NR            |
| 365    | 784           | NR            | 495    | 18986         | NR            | 625    | 33477         | NR            | 755    | 2901          | NR            | 885    | 1170          | NR            |
| 370    | 741           | NR            | 500    | 20627         | NR            | 630    | 32742         | NR            | 760    | 2665          | NR            | 890    | 751           | NR            |
| 375    | 805           | NR            | 505    | 21980         | NR            | 635    | 31767         | NR            | 765    | 2371          | NR            | 895    | 990           | NR            |
| 380    | 830           | NR            | 510    | 23346         | NR            | 640    | 30561         | NR            | 770    | 2039          | NR            | 900    | 982           | NR            |
| 385    | 690           | NR            | 515    | 24600         | NR            | 645    | 29699         | NR            | 775    | 1676          | NR            | 905    | 936           | NR            |
| 390    | 625           | NR            | 520    | 25854         | NR            | 650    | 28202         | NR            | 780    | 1616          | NR            | 910    | 888           | NR            |
| 395    | 599           | NR            | 525    | 26952         | NR            | 655    | 26484         | NR            | 785    | 1573          | NR            | 915    | 1068          | NR            |
| 400    | 568           | NR            | 530    | 28081         | NR            | 660    | 24930         | NR            | 790    | 1452          | NR            | 920    | 1179          | NR            |
| 405    | 577           | NR            | 535    | 28884         | NR            | 665    | 23070         | NR            | 795    | 1263          | NR            | 925    | 1008          | NR            |
| 410    | 720           | NR            | 540    | 29271         | NR            | 670    | 20926         | NR            | 800    | 1203          | NR            | 930    | 927           | NR            |
| 415    | 1084          | NR            | 545    | 29657         | NR            | 675    | 19011         | NR            | 805    | 1175          | NR            | 935    | 1185          | NR            |
| 420    | 1884          | NR            | 550    | 30152         | NR            | 680    | 17237         | NR            | 810    | 1108          | NR            | 940    | 1166          | NR            |
| 425    | 3574          | NR            | 555    | 30445         | NR            | 685    | 15540         | NR            | 815    | 1125          | NR            | 945    | 779           | NR            |
| 430    | 6636          | NR            | 560    | 30559         | NR            | 690    | 13894         | NR            | 820    | 988           | NR            | 950    | 905           | NR            |
| 435    | 12267         | NR            | 565    | 30663         | NR            | 695    | 12196         | NR            | 825    | 1070          | NR            | 955    | 1369          | NR            |
| 440    | 21326         | NR            | 570    | 30877         | NR            | 700    | 10840         | NR            | 830    | 1219          | NR            | 960    | 1280          | NR            |
| 445    | 30150         | NR            | 575    | 30916         | NR            | 705    | 9613          | NR            | 835    | 944           | NR            | 965    | 1177          | NR            |
| 450    | 29740         | NR            | 580    | 31248         | NR            | 710    | 8583          | NR            | 840    | 983           | NR            | 970    | 868           | NR            |
| 455    | 22827         | NR            | 585    | 31581         | NR            | 715    | 7631          | NR            | 845    | 1097          | NR            | 975    | 843           | NR            |
| 460    | 19023         | NR            | 590    | 32218         | NR            | 720    | 6779          | NR            | 850    | 856           | NR            | 980    | 744           | NR            |
| 465    | 16163         | NR            | 595    | 32417         | NR            | 725    | 5950          | NR            | 855    | 949           | NR            | 985    | 1113          | NR            |
| 470    | 13739         | NR            | 600    | 32976         | NR            | 730    | 5282          | NR            | 860    | 954           | NR            | 990    | 1002          | NR            |
| 475    | 13571         | NR            | 605    | 33620         | NR            | 735    | 4673          | NR            | 865    | 1019          | NR            | 995    | 1732          | NR            |
| 480    | 14597         | NR            | 610    | 33704         | NR            | 740    | 4087          | NR            | 870    | 1089          | NR            | 1000   | 1390          | NR            |
| 485    | 15964         | NR            | 615    | 33846         | NR            | 745    | 3658          | NR            | 875    | 1089          | NR            |        |               |               |

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**Summary**

$R_f = 92.2$   
 $R_g = 98.9$   
 CIE  $R_a = 92.2$   
 $R_9 = 63.3$



**Color Vector Graphics**



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

|            |             |            |            |
|------------|-------------|------------|------------|
| CES01 = 85 | CES26 = 93  | CES51 = 97 | CES76 = 86 |
| CES02 = 61 | CES27 = 92  | CES52 = 98 | CES77 = 90 |
| CES03 = 31 | CES28 = 96  | CES53 = 95 | CES78 = 84 |
| CES04 = 69 | CES29 = 95  | CES54 = 95 | CES79 = 97 |
| CES05 = 49 | CES30 = 97  | CES55 = 94 | CES80 = 94 |
| CES06 = 50 | CES31 = 96  | CES56 = 94 | CES81 = 91 |
| CES07 = 42 | CES32 = 91  | CES57 = 93 | CES82 = 97 |
| CES08 = 41 | CES33 = 98  | CES58 = 93 | CES83 = 98 |
| CES09 = 29 | CES34 = 93  | CES59 = 96 | CES84 = 94 |
| CES10 = 74 | CES35 = 96  | CES60 = 94 | CES85 = 86 |
| CES11 = 57 | CES36 = 85  | CES61 = 93 | CES86 = 90 |
| CES12 = 63 | CES37 = 94  | CES62 = 90 | CES87 = 92 |
| CES13 = 43 | CES38 = 91  | CES63 = 92 | CES88 = 96 |
| CES14 = 74 | CES39 = 99  | CES64 = 90 | CES89 = 88 |
| CES15 = 71 | CES40 = 98  | CES65 = 88 | CES90 = 96 |
| CES16 = 47 | CES41 = 98  | CES66 = 88 | CES91 = 76 |
| CES17 = 49 | CES42 = 95  | CES67 = 87 | CES92 = 82 |
| CES18 = 56 | CES43 = 95  | CES68 = 88 | CES93 = 89 |
| CES19 = 71 | CES44 = 100 | CES69 = 90 | CES94 = 83 |
| CES20 = 66 | CES45 = 97  | CES70 = 86 | CES95 = 84 |
| CES21 = 85 | CES46 = 97  | CES71 = 82 | CES96 = 92 |
| CES22 = 78 | CES47 = 98  | CES72 = 94 | CES97 = 95 |
| CES23 = 91 | CES48 = 93  | CES73 = 81 | CES98 = 93 |
| CES24 = 90 | CES49 = 96  | CES74 = 94 | CES99 = 92 |
| CES25 = 71 | CES50 = 98  | CES75 = 83 |            |



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Color Rendition by Hue-Angle Bin



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Measure Comparisons



(END OF REPORT)