

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: P1437997

Luminaire Tested: **GALN-SB9A-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: P1437997  
 Test Lab: INNOVATION CENTER(G1)  
 Issue Date: 03/27/202  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: McGRAW-EDISON  
 Catalog Number: GALN-SB9A-940-U-T3LG-HSS  
 Description: GALLEON II AREA AND ROADWAY HIGH DENSITY LUMINAIRE 350ma 9xLight Square PACKAGE 90CRI 4000K FIXTURE w/ TYPE III LOW GLARE WITH HOUSE SIDE SHIELD  
 Light Source: (234) 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**

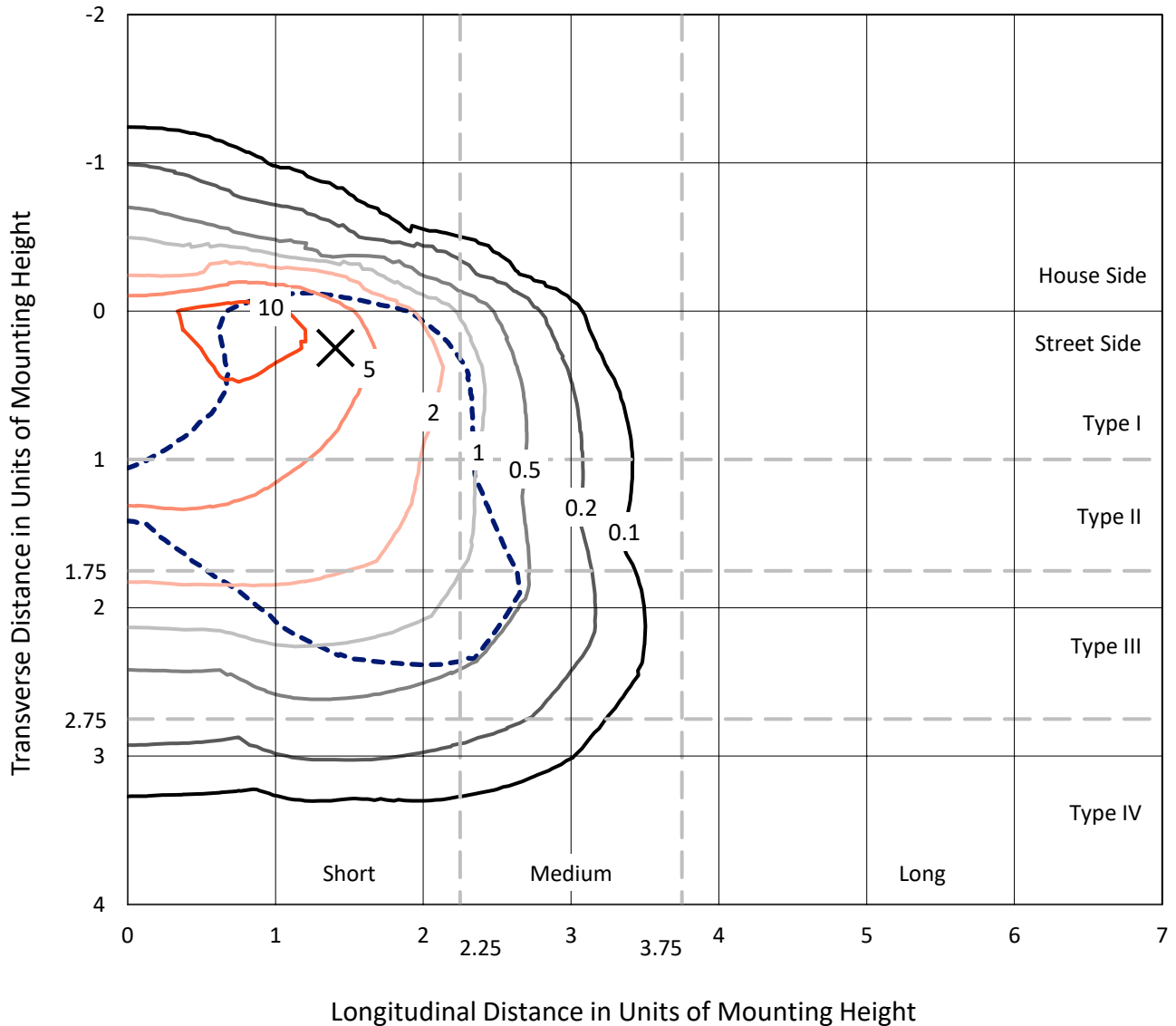
Lumens per Lamp: N/A  
 Luminaire Lumens: 22631.5 lumens  
 Efficiency: N/A  
 Efficacy: 88.6 lumens/watt  
 Luminous Opening: Rectangular (W 1.5' x L: 1.5' x H: 0')  
 IES Classification: Type III - Short  
 BUG Rating: B2 - U0 - G3

Input Watts (W): 255.5  
 Input Voltage (V): 120  
 Input Current (Ain): 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

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### Iso-Footcandle Lines of Horizontal Illumination

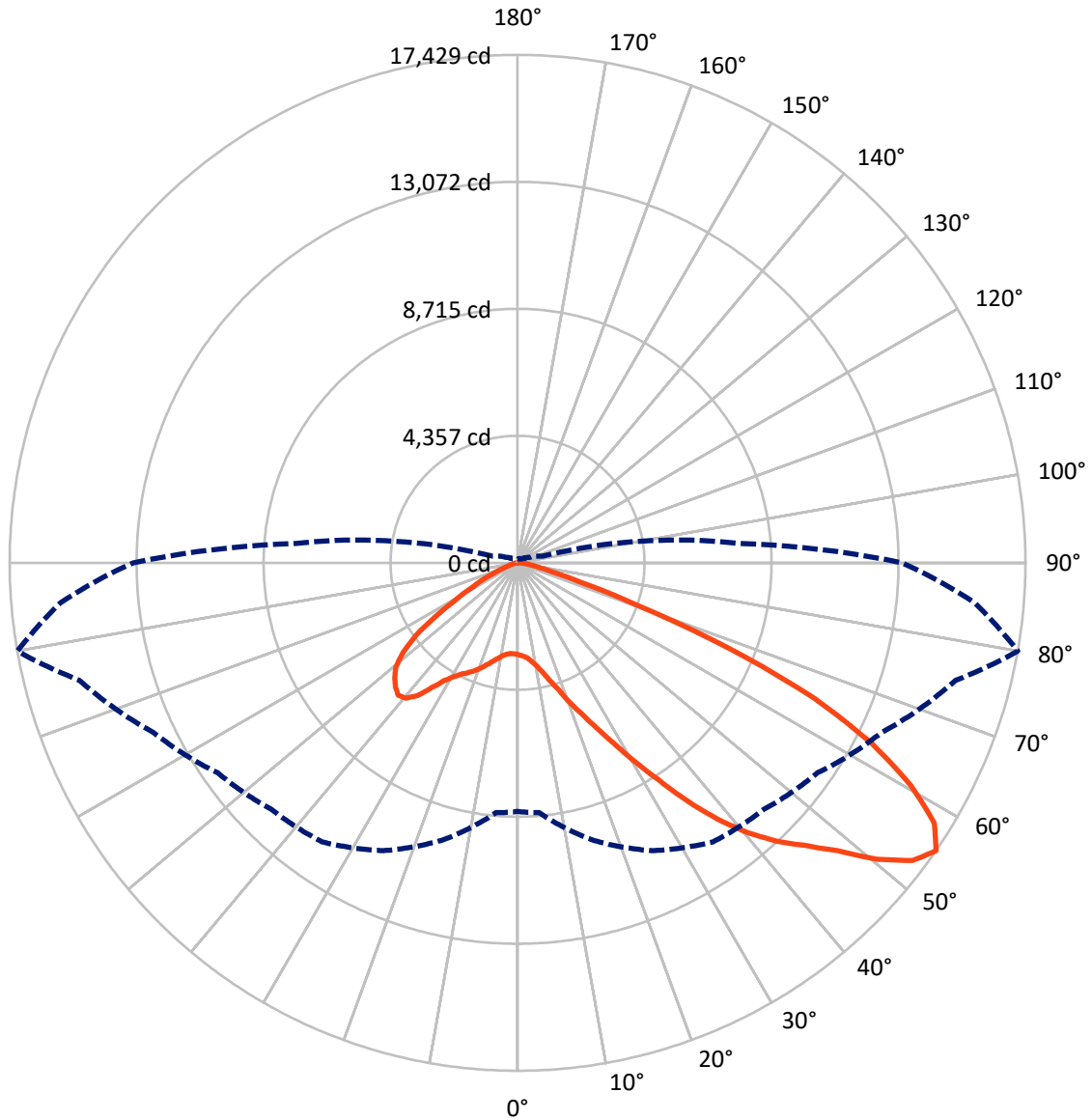
× Max cd  
 - - - 1/2 Max cd



Based on 20 foot mounting height. Maximum calculated value = 14 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    | 2751.1   | 0.0    | 2751.1  |
|                    | % Fixture | 12.2     | 0.0    | 12.2    |
| <b>Street Side</b> | Lumens    | 19880.4  | 0.0    | 19880.4 |
|                    | % Fixture | 87.8     | 0.0    | 87.8    |
| <b>Total</b>       | Lumens    | 22631.5  | 0.0    | 22631.5 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 264.6   | 1.2       |
| 10°-20°   | 697.5   | 3.1       |
| 20°-30°   | 1365.5  | 6.0       |
| 30°-40°   | 2778.0  | 12.3      |
| 40°-50°   | 4683.2  | 20.7      |
| 50°-60°   | 5983.7  | 26.4      |
| 60°-70°   | 5108.7  | 22.6      |
| 70°-80°   | 1632.5  | 7.2       |
| 80°-90°   | 117.9   | 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°    | 22631.5 | 100.0     |
| 0°-180°   | 22631.5 | 100.0     |

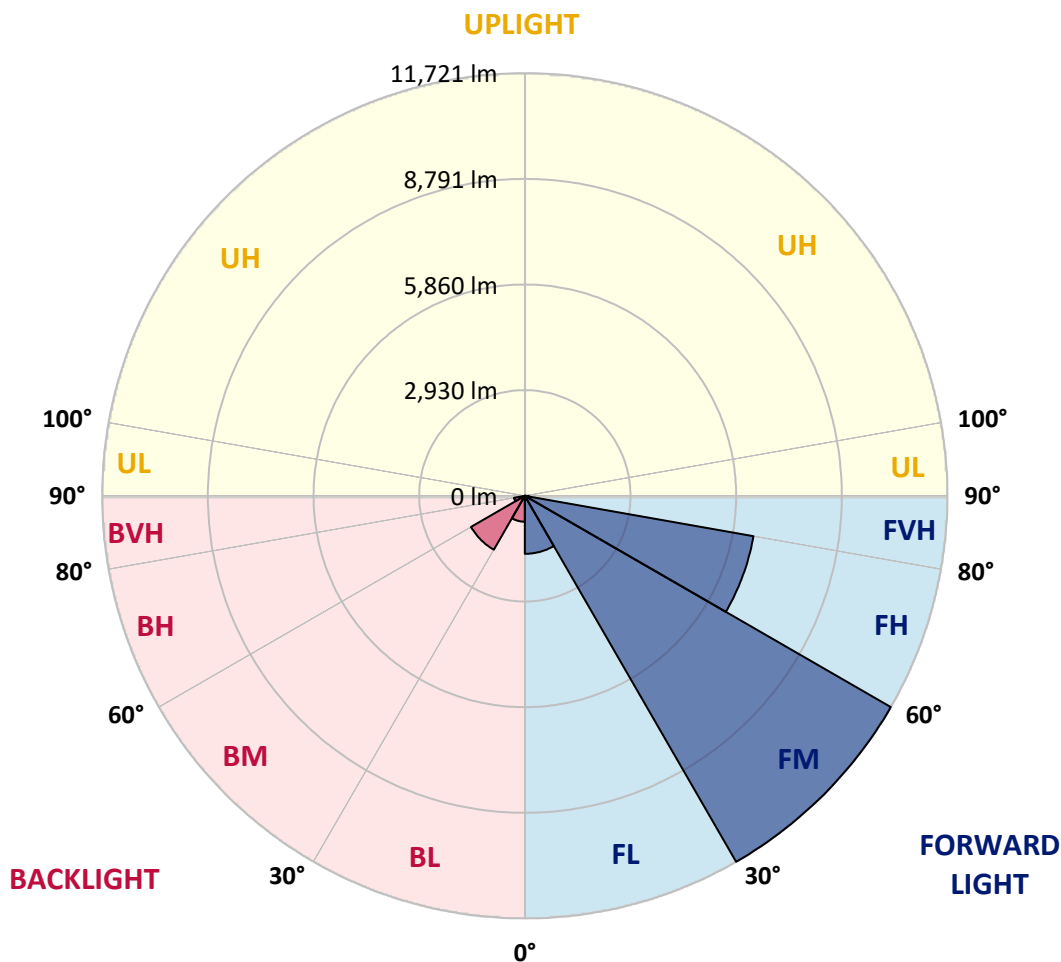


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**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone           | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |         |
|----------------|---------|-----------|-------------------------|------|---------|
|                |         |           | B                       | U    | G       |
| FL (0°-30°)    | 1609.1  | 7.1       |                         |      |         |
| FM (30°-60°)   | 11720.7 | 51.8      |                         |      |         |
| FH (60°-80°)   | 6438.9  | 28.5      |                         |      | G3/7500 |
| FVH (80°-90°)  | 111.7   | 0.5       |                         |      | G2/225  |
| BL (0°-30°)    | 718.4   | 3.2       | B2/1000                 |      |         |
| BM (30°-60°)   | 1724.2  | 7.6       | B2/2500                 |      |         |
| BH (60°-80°)   | 302.4   | 1.3       | B1/500                  |      | G1/500  |
| BVH (80°-90°)  | 6.1     | 0.0       |                         |      | G0/10   |
| UL (90°-100°)  | 0.0     | 0.0       |                         | U0/0 |         |
| UH (100°-180°) | 0.0     | 0.0       |                         | U0/0 |         |

**BUG Rating: B2-U0-G3**  
 Type III Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°     | 35°     | 45°     | 55°     | 65°     | 75°     | 80°     | 85°     |
|-------|--------|--------|--------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 3152.5 | 3152.5 | 3152.5 | 3152.5  | 3152.5  | 3152.5  | 3152.5  | 3152.5  | 3152.5  | 3152.5  | 3152.5  |
| 2.5°  | 3171.8 | 3178.3 | 3171.8 | 3178.3  | 3191.1  | 3184.7  | 3210.4  | 3204.0  | 3204.0  | 3197.6  | 3171.8  |
| 5°    | 2991.7 | 2998.1 | 3011.0 | 3043.2  | 3088.2  | 3133.2  | 3191.1  | 3229.7  | 3268.3  | 3261.9  | 3236.2  |
| 7.5°  | 2637.8 | 2650.7 | 2702.2 | 2766.5  | 2914.5  | 3049.6  | 3197.6  | 3294.1  | 3377.7  | 3403.5  | 3384.2  |
| 10°   | 2438.4 | 2451.3 | 2483.4 | 2547.8  | 2682.9  | 2908.1  | 3197.6  | 3397.0  | 3545.0  | 3596.5  | 3602.9  |
| 12.5° | 2419.1 | 2425.5 | 2451.3 | 2522.0  | 2637.8  | 2830.8  | 3191.1  | 3532.1  | 3783.0  | 3860.2  | 3886.0  |
| 15°   | 2432.0 | 2444.8 | 2470.6 | 2528.5  | 2663.6  | 2882.3  | 3242.6  | 3744.4  | 4098.3  | 4207.7  | 4214.1  |
| 17.5° | 2483.4 | 2496.3 | 2528.5 | 2592.8  | 2740.8  | 3017.4  | 3403.5  | 3963.2  | 4477.9  | 4600.1  | 4670.9  |
| 20°   | 2586.4 | 2592.8 | 2631.4 | 2715.0  | 2882.3  | 3184.7  | 3641.5  | 4259.1  | 4934.7  | 5114.8  | 5166.3  |
| 22.5° | 2721.5 | 2740.8 | 2792.2 | 2895.2  | 3107.5  | 3416.3  | 3969.6  | 4619.4  | 5436.5  | 5623.1  | 5713.2  |
| 25°   | 2869.5 | 2895.2 | 2972.4 | 3139.7  | 3409.9  | 3770.2  | 4374.9  | 5095.5  | 6028.4  | 6253.6  | 6375.8  |
| 27.5° | 3171.8 | 3178.3 | 3229.7 | 3442.1  | 3789.5  | 4233.4  | 4889.6  | 5706.7  | 6723.3  | 6987.1  | 7122.2  |
| 30°   | 3834.5 | 3840.9 | 3795.9 | 3853.8  | 4207.7  | 4780.3  | 5494.4  | 6420.9  | 7533.9  | 7900.6  | 8010.0  |
| 32.5° | 4645.2 | 4677.3 | 4670.9 | 4632.3  | 4793.1  | 5327.1  | 6215.0  | 7276.6  | 8486.1  | 8872.1  | 8975.1  |
| 35°   | 5565.2 | 5642.4 | 5623.1 | 5610.2  | 5629.5  | 6028.4  | 7038.5  | 8222.3  | 9567.0  | 10036.6 | 10120.3 |
| 37.5° | 6465.9 | 6485.2 | 6575.3 | 6684.7  | 6697.5  | 6974.2  | 7990.7  | 9226.0  | 10570.6 | 11169.0 | 11297.7 |
| 40°   | 7160.8 | 7225.1 | 7450.3 | 7669.0  | 7894.2  | 8113.0  | 8775.6  | 10036.6 | 11368.4 | 12172.7 | 12230.6 |
| 42.5° | 7701.2 | 7855.6 | 8183.7 | 8524.7  | 8981.5  | 9226.0  | 9521.9  | 10609.3 | 12018.2 | 13066.9 | 13041.2 |
| 45°   | 8357.4 | 8421.8 | 8885.0 | 9335.4  | 9798.6  | 10171.8 | 10165.3 | 11091.8 | 12526.5 | 13832.6 | 13671.7 |
| 47.5° | 8801.4 | 8878.6 | 9509.1 | 10036.6 | 10512.7 | 10699.3 | 10737.9 | 11612.9 | 13227.8 | 14759.0 | 14379.4 |
| 50°   | 9039.4 | 9174.5 | 9862.9 | 10532.0 | 11046.7 | 11104.6 | 11278.4 | 12294.9 | 14147.8 | 15987.9 | 15273.7 |
| 52.5° | 9065.2 | 9193.8 | 9985.2 | 10847.3 | 11407.0 | 11522.8 | 11818.8 | 13066.9 | 15042.1 | 16972.2 | 15788.4 |
| 55°   | 8531.1 | 8608.4 | 9837.2 | 10898.8 | 11690.1 | 11960.3 | 12565.1 | 13781.1 | 15563.2 | 17429.0 | 15743.4 |
| 57.5° | 8029.3 | 8106.5 | 9174.5 | 10808.7 | 11979.6 | 12532.9 | 13362.9 | 14270.1 | 15157.9 | 16862.9 | 14739.7 |
| 60°   | 7598.3 | 7636.9 | 8608.4 | 10390.5 | 12089.0 | 13092.7 | 14051.3 | 13787.5 | 14109.2 | 15505.3 | 13021.9 |
| 62.5° | 6787.6 | 6813.3 | 7965.0 | 9637.8  | 11870.3 | 13523.7 | 14289.4 | 12764.6 | 12957.6 | 13633.1 | 11001.7 |
| 65°   | 5127.7 | 5224.2 | 6279.3 | 9071.6  | 11510.0 | 13723.2 | 13736.1 | 11516.4 | 11317.0 | 11156.1 | 8653.4  |
| 67.5° | 3480.7 | 3590.0 | 4227.0 | 8158.0  | 10924.5 | 13806.8 | 12661.6 | 9901.5  | 8621.2  | 7791.3  | 5668.1  |
| 70°   | 2779.4 | 2779.4 | 2998.1 | 6556.0  | 9534.8  | 12738.8 | 11329.8 | 7476.0  | 5475.1  | 4304.2  | 3036.7  |
| 72.5° | 1827.2 | 1833.6 | 2039.5 | 4162.6  | 6761.9  | 9715.0  | 9238.9  | 4323.5  | 2843.7  | 2193.9  | 1499.1  |
| 75°   | 662.7  | 662.7  | 894.3  | 1666.3  | 3577.2  | 5783.9  | 5629.5  | 2065.2  | 1544.1  | 1196.7  | 907.2   |
| 77.5° | 353.9  | 366.7  | 431.1  | 688.4   | 1370.4  | 2354.8  | 2200.3  | 1055.1  | 875.0   | 746.3   | 566.2   |
| 80°   | 238.0  | 244.5  | 289.5  | 424.6   | 662.7   | 907.2   | 707.7   | 591.9   | 591.9   | 501.8   | 379.6   |
| 82.5° | 128.7  | 135.1  | 193.0  | 276.7   | 353.9   | 424.6   | 341.0   | 347.4   | 418.2   | 341.0   | 218.7   |
| 85°   | 90.1   | 90.1   | 148.0  | 199.4   | 199.4   | 205.9   | 148.0   | 218.7   | 244.5   | 212.3   | 148.0   |
| 87.5° | 51.5   | 51.5   | 83.6   | 96.5    | 96.5    | 90.1    | 45.0    | 77.2    | 96.5    | 109.4   | 64.3    |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |



REPORT NUMBER: P1437997

CATALOG NUMBER: GALN-SB9A-940-U-T3LG-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 3152.5  | 3152.5 | 3152.5 | 3152.5 | 3152.5 | 3152.5 | 3152.5 | 3152.5 | 3152.5 | 3152.5 | 3152.5 |
| 2.5°  | 3165.4  | 3146.1 | 3107.5 | 3030.3 | 2991.7 | 2940.2 | 2895.2 | 2837.3 | 2824.4 | 2818.0 | 2792.2 |
| 5°    | 3216.9  | 3178.3 | 3062.5 | 2895.2 | 2753.6 | 2618.5 | 2483.4 | 2406.2 | 2341.9 | 2309.7 | 2303.3 |
| 7.5°  | 3345.5  | 3268.3 | 3056.0 | 2760.1 | 2496.3 | 2264.7 | 2065.2 | 1891.5 | 1801.4 | 1724.2 | 1730.7 |
| 10°   | 3538.6  | 3416.3 | 3068.9 | 2631.4 | 2238.9 | 1865.8 | 1576.3 | 1325.4 | 1145.2 | 1061.6 | 1055.1 |
| 12.5° | 3795.9  | 3622.2 | 3113.9 | 2502.7 | 1923.7 | 1402.6 | 1035.8 | 887.9  | 849.3  | 842.8  | 836.4  |
| 15°   | 4111.2  | 3866.7 | 3159.0 | 2335.5 | 1499.1 | 971.5  | 842.8  | 810.7  | 804.2  | 797.8  | 797.8  |
| 17.5° | 4490.8  | 4149.8 | 3184.7 | 2052.4 | 1093.7 | 836.4  | 791.4  | 772.0  | 765.6  | 759.2  | 759.2  |
| 20°   | 4966.9  | 4465.0 | 3216.9 | 1692.1 | 926.5  | 804.2  | 752.7  | 727.0  | 720.6  | 720.6  | 714.1  |
| 22.5° | 5436.5  | 4818.9 | 3191.1 | 1376.8 | 894.3  | 765.6  | 707.7  | 682.0  | 669.1  | 669.1  | 662.7  |
| 25°   | 5977.0  | 5179.2 | 3113.9 | 1241.7 | 887.9  | 733.4  | 662.7  | 624.1  | 604.8  | 598.3  | 598.3  |
| 27.5° | 6594.6  | 5590.9 | 2991.7 | 1248.1 | 887.9  | 707.7  | 604.8  | 553.3  | 540.4  | 527.6  | 527.6  |
| 30°   | 7302.3  | 6092.8 | 2901.6 | 1331.8 | 900.7  | 682.0  | 553.3  | 489.0  | 469.7  | 456.8  | 463.2  |
| 32.5° | 8113.0  | 6652.5 | 2895.2 | 1466.9 | 920.0  | 643.4  | 495.4  | 424.6  | 405.3  | 398.9  | 405.3  |
| 35°   | 9033.0  | 7347.3 | 3043.2 | 1569.8 | 868.6  | 559.7  | 424.6  | 366.7  | 347.4  | 347.4  | 353.9  |
| 37.5° | 10055.9 | 8145.1 | 3242.6 | 1544.1 | 701.3  | 443.9  | 366.7  | 321.7  | 302.4  | 308.8  | 315.3  |
| 40°   | 10988.8 | 8769.2 | 3274.8 | 1318.9 | 527.6  | 379.6  | 315.3  | 283.1  | 270.2  | 276.7  | 283.1  |
| 42.5° | 11696.6 | 9271.0 | 2966.0 | 1023.0 | 443.9  | 321.7  | 270.2  | 244.5  | 238.0  | 250.9  | 250.9  |
| 45°   | 12269.2 | 9470.5 | 2477.0 | 759.2  | 392.5  | 276.7  | 238.0  | 225.2  | 212.3  | 218.7  | 218.7  |
| 47.5° | 12867.5 | 9502.6 | 2020.2 | 611.2  | 347.4  | 250.9  | 218.7  | 205.9  | 193.0  | 193.0  | 193.0  |
| 50°   | 13446.5 | 9425.4 | 1544.1 | 540.4  | 321.7  | 225.2  | 199.4  | 186.6  | 173.7  | 167.3  | 167.3  |
| 52.5° | 13588.1 | 8807.8 | 1132.3 | 501.8  | 296.0  | 212.3  | 186.6  | 173.7  | 160.8  | 154.4  | 154.4  |
| 55°   | 13195.6 | 7636.9 | 887.9  | 450.4  | 270.2  | 193.0  | 173.7  | 160.8  | 141.5  | 135.1  | 135.1  |
| 57.5° | 11902.4 | 5822.5 | 707.7  | 386.0  | 244.5  | 186.6  | 160.8  | 148.0  | 128.7  | 122.2  | 122.2  |
| 60°   | 10223.2 | 4130.5 | 572.6  | 315.3  | 225.2  | 167.3  | 148.0  | 128.7  | 115.8  | 102.9  | 102.9  |
| 62.5° | 8363.9  | 2966.0 | 463.2  | 263.8  | 212.3  | 148.0  | 135.1  | 115.8  | 90.1   | 70.8   | 70.8   |
| 65°   | 6414.4  | 2129.6 | 360.3  | 212.3  | 193.0  | 128.7  | 115.8  | 96.5   | 70.8   | 51.5   | 51.5   |
| 67.5° | 4149.8  | 1376.8 | 270.2  | 186.6  | 148.0  | 109.4  | 90.1   | 77.2   | 64.3   | 45.0   | 38.6   |
| 70°   | 2187.5  | 804.2  | 199.4  | 160.8  | 109.4  | 83.6   | 77.2   | 64.3   | 51.5   | 32.2   | 32.2   |
| 72.5° | 1132.3  | 527.6  | 148.0  | 141.5  | 83.6   | 57.9   | 64.3   | 51.5   | 38.6   | 19.3   | 19.3   |
| 75°   | 727.0   | 353.9  | 109.4  | 115.8  | 51.5   | 45.0   | 45.0   | 32.2   | 19.3   | 12.9   | 6.4    |
| 77.5° | 469.7   | 238.0  | 77.2   | 96.5   | 32.2   | 25.7   | 25.7   | 12.9   | 6.4    | 0.0    | 0.0    |
| 80°   | 276.7   | 148.0  | 51.5   | 64.3   | 12.9   | 12.9   | 6.4    | 0.0    | 0.0    | 0.0    | 0.0    |
| 82.5° | 141.5   | 77.2   | 25.7   | 25.7   | 6.4    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 85°   | 90.1    | 38.6   | 6.4    | 6.4    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 87.5° | 45.0    | 12.9   | 6.4    | 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  
 R2: 93.7  
 R3: 94.4  
 R4: 93.1  
 R5: 91.2  
 R6: 91.1  
 R7: 95.4  
 R8: 86.5  
 R9: 63.3  
 R10: 84.3  
 R11: 92.7  
 R12: 75.6  
 R13: 92.2  
 R14: 96.5



**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**

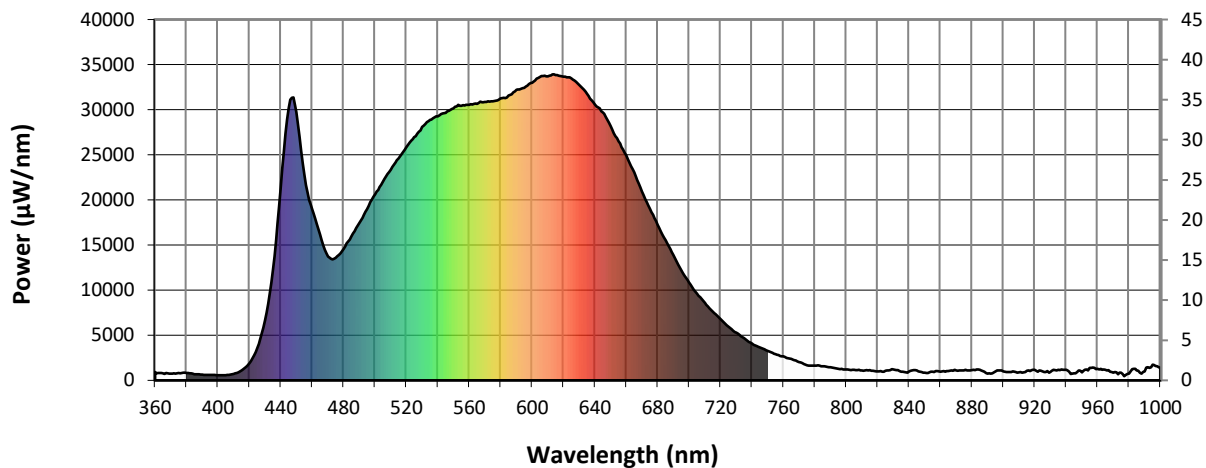


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| λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) |
|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|
| 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**

| 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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**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)