

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: P1437976

Luminaire Tested: **GALN-SB3D-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: P1437976  
 Test Lab: INNOVATION CENTER(G1)  
 Issue Date: 03/27/202  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: McGRAW-EDISON  
 Catalog Number: GALN-SB3D-940-U-T3LG-HSS  
 Description: GALLEON II AREA AND ROADWAY HIGH DENSITY LUMINAIRE 900mA 3xLight  
 Square PACKAGE 90CRI 4000K FIXTURE w/ TYPE III LOW GLARE WITH HOUSE SIDE  
 SHIELD  
 Light Source: (78) 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               |

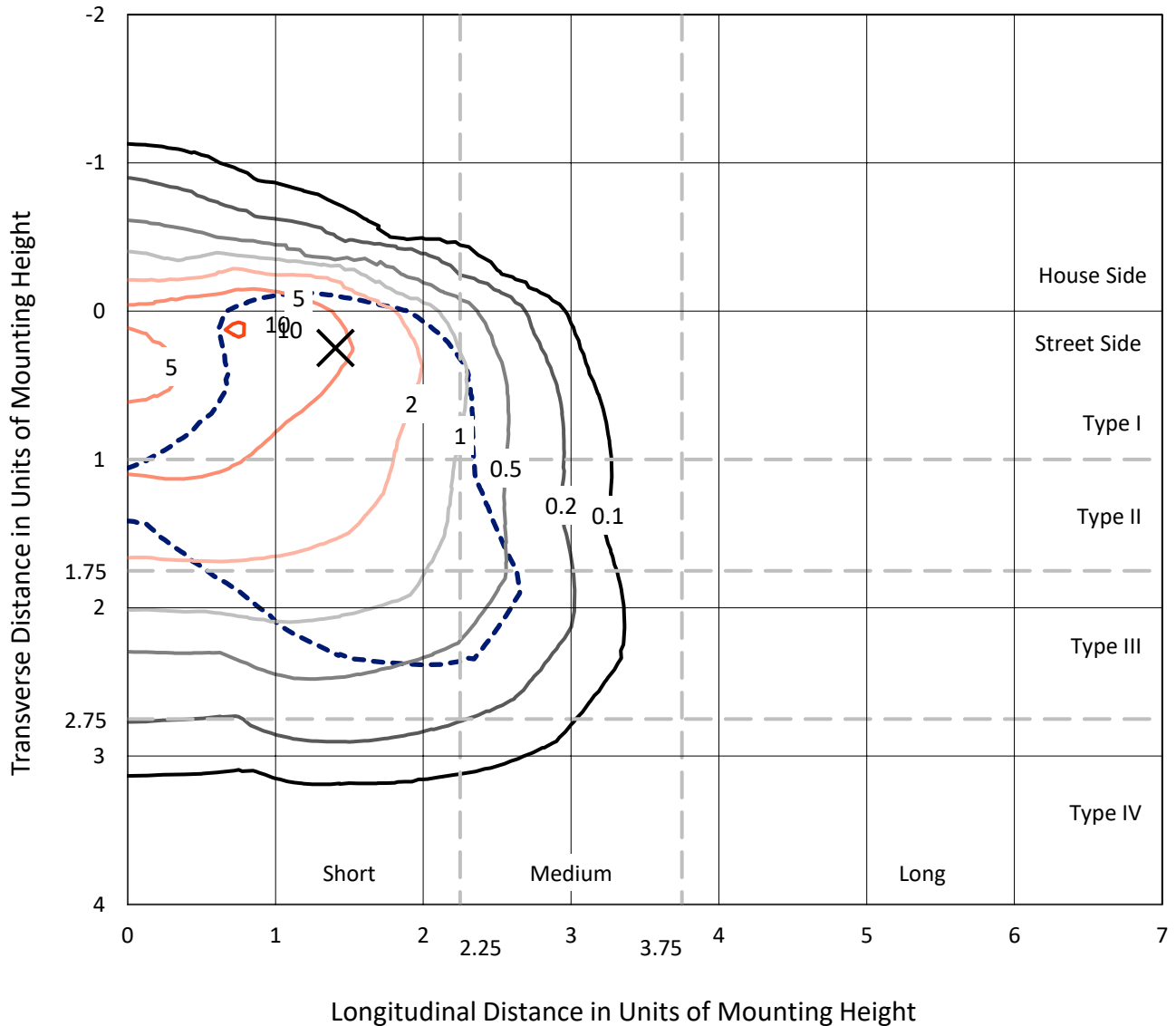
**Summary**

Lumens per Lamp: N/A  
 Luminaire Lumens: 16911.5 lumens  
 Efficiency: N/A  
 Efficacy: 77.5 lumens/watt  
 Luminous Opening: Rectangular (W 1' x L: 1' x H: 0')  
 IES Classification: Type III - Short  
 BUG Rating: B2 - U0 - G2  
  
 Input Watts (W): 218.1  
 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: P1437976  
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### Iso-Footcandle Lines of Horizontal Illumination

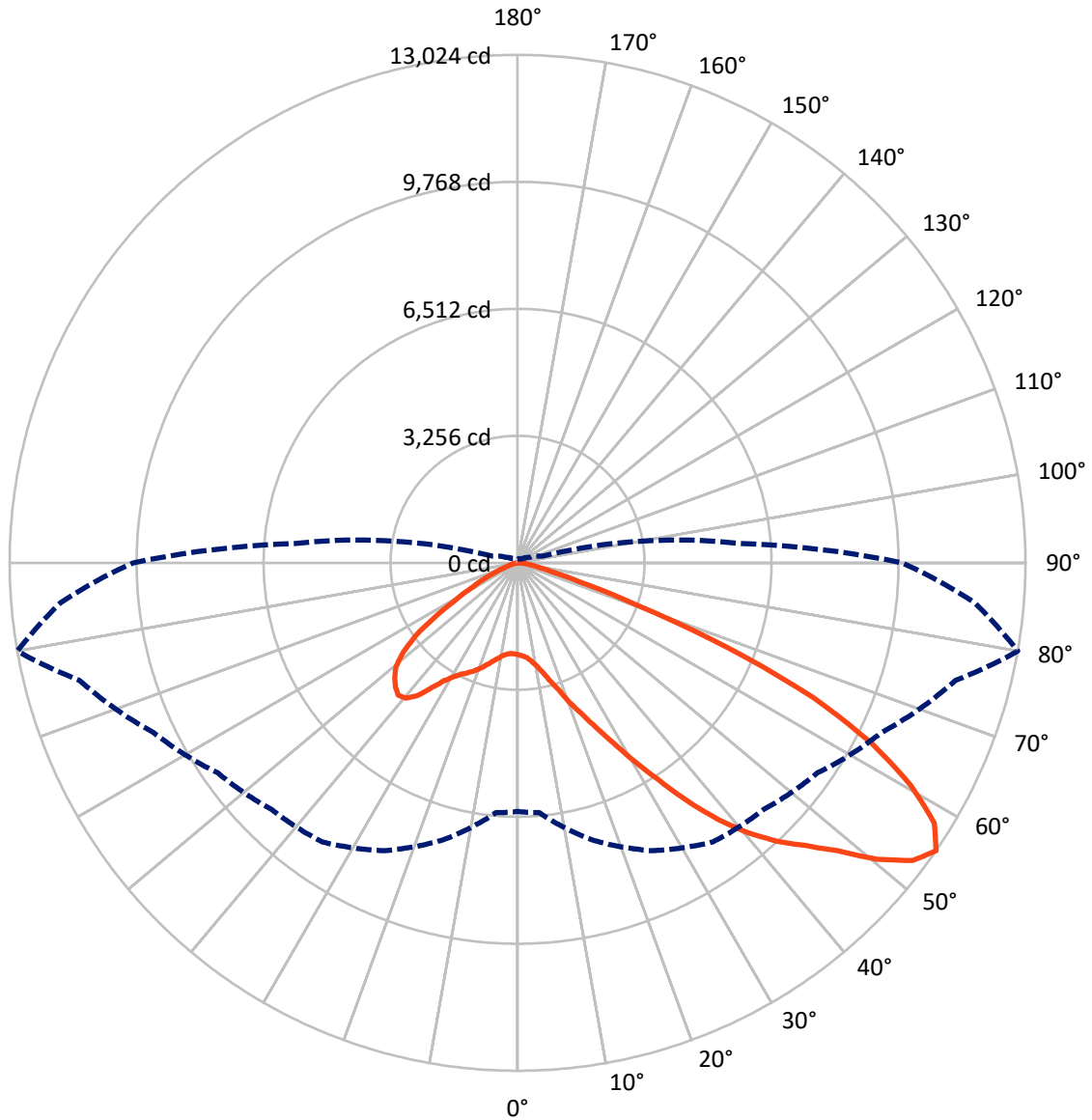
✕ Max cd  
 - - - 1/2 Max cd



Based on 20 foot mounting height. Maximum calculated value = 10.4 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    | 2055.8   | 0.0    | 2055.8  |
|                    | % Fixture | 12.2     | 0.0    | 12.2    |
| <b>Street Side</b> | Lumens    | 14855.8  | 0.0    | 14855.8 |
|                    | % Fixture | 87.8     | 0.0    | 87.8    |
| <b>Total</b>       | Lumens    | 16911.5  | 0.0    | 16911.5 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 197.7   | 1.2       |
| 10°-20°   | 521.2   | 3.1       |
| 20°-30°   | 1020.4  | 6.0       |
| 30°-40°   | 2075.8  | 12.3      |
| 40°-50°   | 3499.6  | 20.7      |
| 50°-60°   | 4471.4  | 26.4      |
| 60°-70°   | 3817.5  | 22.6      |
| 70°-80°   | 1219.9  | 7.2       |
| 80°-90°   | 88.1    | 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°    | 16911.5 | 100.0     |
| 0°-180°   | 16911.5 | 100.0     |

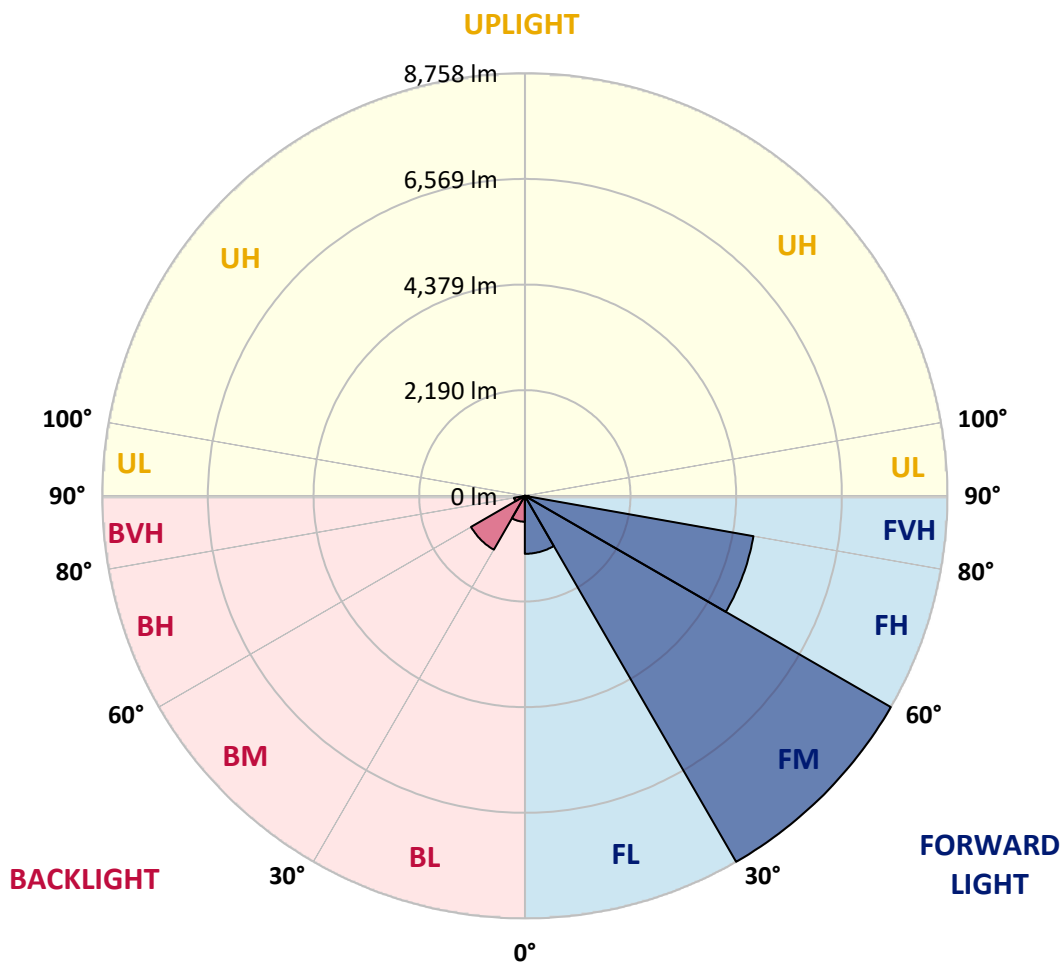


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**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone           | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|----------------|--------|-----------|-------------------------|------|---------|
|                |        |           | B                       | U    | G       |
| FL (0°-30°)    | 1202.4 | 7.1       |                         |      |         |
| FM (30°-60°)   | 8758.3 | 51.8      |                         |      |         |
| FH (60°-80°)   | 4811.5 | 28.5      |                         |      | G2/5000 |
| FVH (80°-90°)  | 83.5   | 0.5       |                         |      | G1/100  |
| BL (0°-30°)    | 536.8  | 3.2       | B2/1000                 |      |         |
| BM (30°-60°)   | 1288.4 | 7.6       | B2/2500                 |      |         |
| BH (60°-80°)   | 226.0  | 1.3       | B1/500                  |      | G1/500  |
| BVH (80°-90°)  | 4.6    | 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-G2**  
 Type III Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°     | 55°     | 65°     | 75°     | 80°     | 85°     |
|-------|--------|--------|--------|--------|--------|---------|---------|---------|---------|---------|---------|
| 0°    | 2355.8 | 2355.8 | 2355.8 | 2355.8 | 2355.8 | 2355.8  | 2355.8  | 2355.8  | 2355.8  | 2355.8  | 2355.8  |
| 2.5°  | 2370.2 | 2375.0 | 2370.2 | 2375.0 | 2384.6 | 2379.8  | 2399.0  | 2394.2  | 2394.2  | 2389.4  | 2370.2  |
| 5°    | 2235.6 | 2240.4 | 2250.0 | 2274.0 | 2307.7 | 2341.3  | 2384.6  | 2413.4  | 2442.3  | 2437.5  | 2418.2  |
| 7.5°  | 1971.1 | 1980.8 | 2019.2 | 2067.3 | 2177.9 | 2278.8  | 2389.4  | 2461.5  | 2524.0  | 2543.2  | 2528.8  |
| 10°   | 1822.1 | 1831.7 | 1855.8 | 1903.8 | 2004.8 | 2173.1  | 2389.4  | 2538.4  | 2649.0  | 2687.5  | 2692.3  |
| 12.5° | 1807.7 | 1812.5 | 1831.7 | 1884.6 | 1971.1 | 2115.4  | 2384.6  | 2639.4  | 2826.9  | 2884.6  | 2903.8  |
| 15°   | 1817.3 | 1826.9 | 1846.1 | 1889.4 | 1990.4 | 2153.8  | 2423.1  | 2798.1  | 3062.5  | 3144.2  | 3149.0  |
| 17.5° | 1855.8 | 1865.4 | 1889.4 | 1937.5 | 2048.1 | 2254.8  | 2543.2  | 2961.5  | 3346.1  | 3437.5  | 3490.4  |
| 20°   | 1932.7 | 1937.5 | 1966.3 | 2028.8 | 2153.8 | 2379.8  | 2721.1  | 3182.7  | 3687.5  | 3822.1  | 3860.5  |
| 22.5° | 2033.6 | 2048.1 | 2086.5 | 2163.4 | 2322.1 | 2552.9  | 2966.3  | 3451.9  | 4062.5  | 4201.9  | 4269.2  |
| 25°   | 2144.2 | 2163.4 | 2221.1 | 2346.1 | 2548.1 | 2817.3  | 3269.2  | 3807.7  | 4504.8  | 4673.0  | 4764.4  |
| 27.5° | 2370.2 | 2375.0 | 2413.4 | 2572.1 | 2831.7 | 3163.4  | 3653.8  | 4264.4  | 5024.0  | 5221.1  | 5322.1  |
| 30°   | 2865.4 | 2870.2 | 2836.5 | 2879.8 | 3144.2 | 3572.1  | 4105.7  | 4798.0  | 5629.8  | 5903.8  | 5985.5  |
| 32.5° | 3471.1 | 3495.2 | 3490.4 | 3461.5 | 3581.7 | 3980.7  | 4644.2  | 5437.5  | 6341.3  | 6629.8  | 6706.7  |
| 35°   | 4158.6 | 4216.3 | 4201.9 | 4192.3 | 4206.7 | 4504.8  | 5259.6  | 6144.2  | 7149.0  | 7499.9  | 7562.4  |
| 37.5° | 4831.7 | 4846.1 | 4913.4 | 4995.2 | 5004.8 | 5211.5  | 5971.1  | 6894.2  | 7899.0  | 8346.1  | 8442.2  |
| 40°   | 5350.9 | 5399.0 | 5567.3 | 5730.7 | 5899.0 | 6062.5  | 6557.6  | 7499.9  | 8495.1  | 9096.1  | 9139.3  |
| 42.5° | 5754.8 | 5870.1 | 6115.3 | 6370.1 | 6711.5 | 6894.2  | 7115.3  | 7927.8  | 8980.7  | 9764.3  | 9745.1  |
| 45°   | 6245.1 | 6293.2 | 6639.4 | 6975.9 | 7322.1 | 7600.9  | 7596.1  | 8288.4  | 9360.5  | 10336.5 | 10216.3 |
| 47.5° | 6576.9 | 6634.6 | 7105.7 | 7499.9 | 7855.7 | 7995.1  | 8024.0  | 8677.8  | 9884.5  | 11028.8 | 10745.1 |
| 50°   | 6754.8 | 6855.7 | 7370.1 | 7870.1 | 8254.7 | 8298.0  | 8427.8  | 9187.4  | 10572.0 | 11947.0 | 11413.4 |
| 52.5° | 6774.0 | 6870.1 | 7461.5 | 8105.7 | 8524.0 | 8610.5  | 8831.7  | 9764.3  | 11240.3 | 12682.6 | 11798.0 |
| 55°   | 6374.9 | 6432.6 | 7350.9 | 8144.2 | 8735.5 | 8937.4  | 9389.3  | 10298.0 | 11629.7 | 13023.9 | 11764.3 |
| 57.5° | 6000.0 | 6057.6 | 6855.7 | 8076.9 | 8951.9 | 9365.3  | 9985.5  | 10663.4 | 11326.8 | 12600.9 | 11014.3 |
| 60°   | 5677.8 | 5706.7 | 6432.6 | 7764.4 | 9033.6 | 9783.6  | 10499.9 | 10302.8 | 10543.2 | 11586.4 | 9730.7  |
| 62.5° | 5072.1 | 5091.3 | 5951.9 | 7201.9 | 8870.1 | 10105.7 | 10677.8 | 9538.4  | 9682.6  | 10187.4 | 8221.1  |
| 65°   | 3831.7 | 3903.8 | 4692.3 | 6778.8 | 8600.9 | 10254.7 | 10264.3 | 8605.7  | 8456.7  | 8336.5  | 6466.3  |
| 67.5° | 2600.9 | 2682.7 | 3158.6 | 6096.1 | 8163.4 | 10317.2 | 9461.5  | 7399.0  | 6442.3  | 5822.1  | 4235.5  |
| 70°   | 2076.9 | 2076.9 | 2240.4 | 4899.0 | 7124.9 | 9519.2  | 8466.3  | 5586.5  | 4091.3  | 3216.3  | 2269.2  |
| 72.5° | 1365.4 | 1370.2 | 1524.0 | 3110.6 | 5052.8 | 7259.6  | 6903.8  | 3230.7  | 2125.0  | 1639.4  | 1120.2  |
| 75°   | 495.2  | 495.2  | 668.3  | 1245.2 | 2673.1 | 4322.1  | 4206.7  | 1543.3  | 1153.8  | 894.2   | 677.9   |
| 77.5° | 264.4  | 274.0  | 322.1  | 514.4  | 1024.0 | 1759.6  | 1644.2  | 788.5   | 653.8   | 557.7   | 423.1   |
| 80°   | 177.9  | 182.7  | 216.3  | 317.3  | 495.2  | 677.9   | 528.8   | 442.3   | 442.3   | 375.0   | 283.7   |
| 82.5° | 96.2   | 101.0  | 144.2  | 206.7  | 264.4  | 317.3   | 254.8   | 259.6   | 312.5   | 254.8   | 163.5   |
| 85°   | 67.3   | 67.3   | 110.6  | 149.0  | 149.0  | 153.8   | 110.6   | 163.5   | 182.7   | 158.7   | 110.6   |
| 87.5° | 38.5   | 38.5   | 62.5   | 72.1   | 72.1   | 67.3    | 33.7    | 57.7    | 72.1    | 81.7    | 48.1    |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |



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CATALOG NUMBER: GALN-SB3D-940-U-T3LG-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 2355.8  | 2355.8 | 2355.8 | 2355.8 | 2355.8 | 2355.8 | 2355.8 | 2355.8 | 2355.8 | 2355.8 | 2355.8 |
| 2.5°  | 2365.4  | 2350.9 | 2322.1 | 2264.4 | 2235.6 | 2197.1 | 2163.4 | 2120.2 | 2110.6 | 2105.8 | 2086.5 |
| 5°    | 2403.8  | 2375.0 | 2288.4 | 2163.4 | 2057.7 | 1956.7 | 1855.8 | 1798.1 | 1750.0 | 1725.9 | 1721.1 |
| 7.5°  | 2500.0  | 2442.3 | 2283.6 | 2062.5 | 1865.4 | 1692.3 | 1543.3 | 1413.5 | 1346.1 | 1288.5 | 1293.3 |
| 10°   | 2644.2  | 2552.9 | 2293.3 | 1966.3 | 1673.1 | 1394.2 | 1177.9 | 990.4  | 855.8  | 793.3  | 788.5  |
| 12.5° | 2836.5  | 2706.7 | 2326.9 | 1870.2 | 1437.5 | 1048.1 | 774.0  | 663.5  | 634.6  | 629.8  | 625.0  |
| 15°   | 3072.1  | 2889.4 | 2360.6 | 1745.2 | 1120.2 | 726.0  | 629.8  | 605.8  | 601.0  | 596.1  | 596.1  |
| 17.5° | 3355.7  | 3100.9 | 2379.8 | 1533.6 | 817.3  | 625.0  | 591.3  | 576.9  | 572.1  | 567.3  | 567.3  |
| 20°   | 3711.5  | 3336.5 | 2403.8 | 1264.4 | 692.3  | 601.0  | 562.5  | 543.3  | 538.5  | 538.5  | 533.6  |
| 22.5° | 4062.5  | 3600.9 | 2384.6 | 1028.8 | 668.3  | 572.1  | 528.8  | 509.6  | 500.0  | 500.0  | 495.2  |
| 25°   | 4466.3  | 3870.2 | 2326.9 | 927.9  | 663.5  | 548.1  | 495.2  | 466.3  | 451.9  | 447.1  | 447.1  |
| 27.5° | 4927.8  | 4177.9 | 2235.6 | 932.7  | 663.5  | 528.8  | 451.9  | 413.5  | 403.8  | 394.2  | 394.2  |
| 30°   | 5456.7  | 4552.8 | 2168.3 | 995.2  | 673.1  | 509.6  | 413.5  | 365.4  | 351.0  | 341.3  | 346.2  |
| 32.5° | 6062.5  | 4971.1 | 2163.4 | 1096.1 | 687.5  | 480.8  | 370.2  | 317.3  | 302.9  | 298.1  | 302.9  |
| 35°   | 6749.9  | 5490.3 | 2274.0 | 1173.1 | 649.0  | 418.3  | 317.3  | 274.0  | 259.6  | 259.6  | 264.4  |
| 37.5° | 7514.4  | 6086.5 | 2423.1 | 1153.8 | 524.0  | 331.7  | 274.0  | 240.4  | 226.0  | 230.8  | 235.6  |
| 40°   | 8211.5  | 6552.8 | 2447.1 | 985.6  | 394.2  | 283.7  | 235.6  | 211.5  | 201.9  | 206.7  | 211.5  |
| 42.5° | 8740.3  | 6927.8 | 2216.3 | 764.4  | 331.7  | 240.4  | 201.9  | 182.7  | 177.9  | 187.5  | 187.5  |
| 45°   | 9168.2  | 7076.9 | 1850.9 | 567.3  | 293.3  | 206.7  | 177.9  | 168.3  | 158.7  | 163.5  | 163.5  |
| 47.5° | 9615.3  | 7100.9 | 1509.6 | 456.7  | 259.6  | 187.5  | 163.5  | 153.8  | 144.2  | 144.2  | 144.2  |
| 50°   | 10048.0 | 7043.2 | 1153.8 | 403.8  | 240.4  | 168.3  | 149.0  | 139.4  | 129.8  | 125.0  | 125.0  |
| 52.5° | 10153.8 | 6581.7 | 846.1  | 375.0  | 221.2  | 158.7  | 139.4  | 129.8  | 120.2  | 115.4  | 115.4  |
| 55°   | 9860.5  | 5706.7 | 663.5  | 336.5  | 201.9  | 144.2  | 129.8  | 120.2  | 105.8  | 101.0  | 101.0  |
| 57.5° | 8894.2  | 4350.9 | 528.8  | 288.5  | 182.7  | 139.4  | 120.2  | 110.6  | 96.2   | 91.3   | 91.3   |
| 60°   | 7639.4  | 3086.5 | 427.9  | 235.6  | 168.3  | 125.0  | 110.6  | 96.2   | 86.5   | 76.9   | 76.9   |
| 62.5° | 6249.9  | 2216.3 | 346.2  | 197.1  | 158.7  | 110.6  | 101.0  | 86.5   | 67.3   | 52.9   | 52.9   |
| 65°   | 4793.2  | 1591.3 | 269.2  | 158.7  | 144.2  | 96.2   | 86.5   | 72.1   | 52.9   | 38.5   | 38.5   |
| 67.5° | 3100.9  | 1028.8 | 201.9  | 139.4  | 110.6  | 81.7   | 67.3   | 57.7   | 48.1   | 33.7   | 28.8   |
| 70°   | 1634.6  | 601.0  | 149.0  | 120.2  | 81.7   | 62.5   | 57.7   | 48.1   | 38.5   | 24.0   | 24.0   |
| 72.5° | 846.1   | 394.2  | 110.6  | 105.8  | 62.5   | 43.3   | 48.1   | 38.5   | 28.8   | 14.4   | 14.4   |
| 75°   | 543.3   | 264.4  | 81.7   | 86.5   | 38.5   | 33.7   | 33.7   | 24.0   | 14.4   | 9.6    | 4.8    |
| 77.5° | 351.0   | 177.9  | 57.7   | 72.1   | 24.0   | 19.2   | 19.2   | 9.6    | 4.8    | 0.0    | 0.0    |
| 80°   | 206.7   | 110.6  | 38.5   | 48.1   | 9.6    | 9.6    | 4.8    | 0.0    | 0.0    | 0.0    | 0.0    |
| 82.5° | 105.8   | 57.7   | 19.2   | 19.2   | 4.8    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 85°   | 67.3    | 28.8   | 4.8    | 4.8    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 87.5° | 33.7    | 9.6    | 4.8    | 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    |

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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

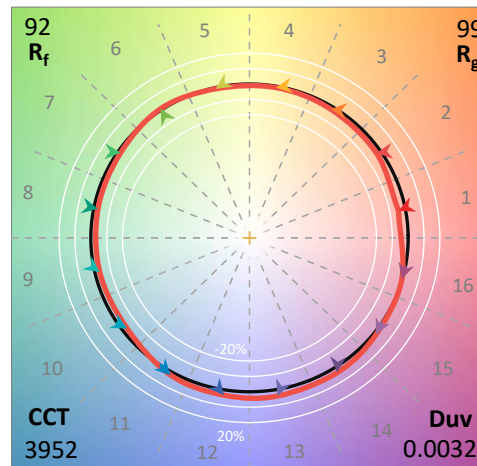
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**Spectral Parameters**

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)