

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: P437936

Luminaire Tested: **ISC-SA1F-830-U-SL4-HSS**

Issue Date: 12/9/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P437936  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-2011-074-19)  
Test Lab: INNOVATION CENTER  
Issue Date: 12/9/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: ISC-SA1F-830-U-SL4-HSS  
Description: IMPACT ELITE LED CYLINDER LUMINAIRE  
(1) 80 CRI, 3000K, 1200mA LIGHTSQUARE WITH 16 LEDS AND TYPE IV SPILL  
LIGHT ELIMINATOR OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 5087 lumens  
Efficiency: N/A  
Efficacy: 77.1 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 0.5' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B1 - U0 - G2

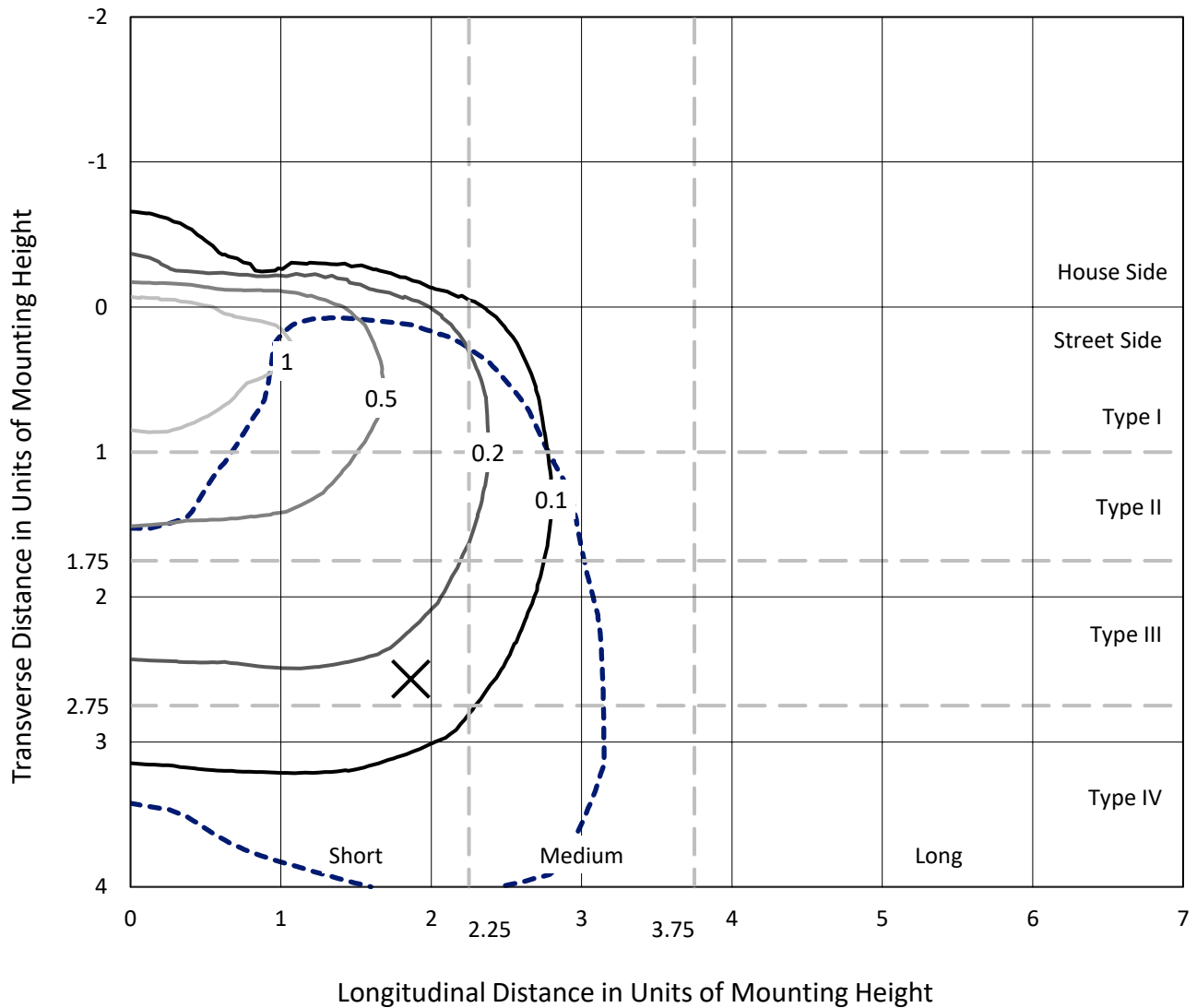
Input Watts (W): 66  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT



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### Iso-Footcandle Lines of Horizontal Illumination

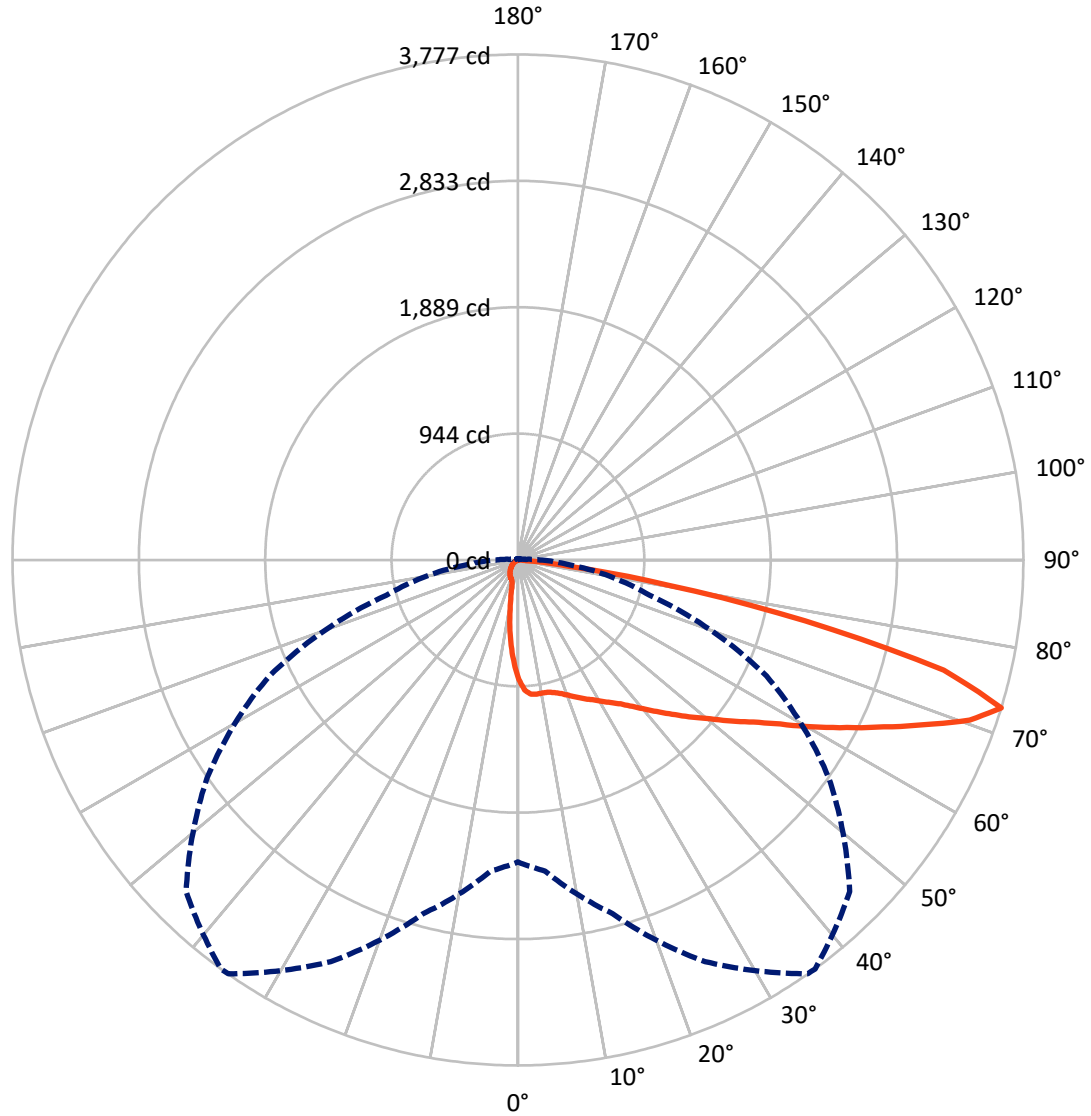
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 1.6 fc  
 Type IV - Short - N/A

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### Luminous Intensity Polar Plot



— Vertical Plane Through 36-Deg Lateral    - - - Horizontal Cone Through 72.5-Deg Vertical

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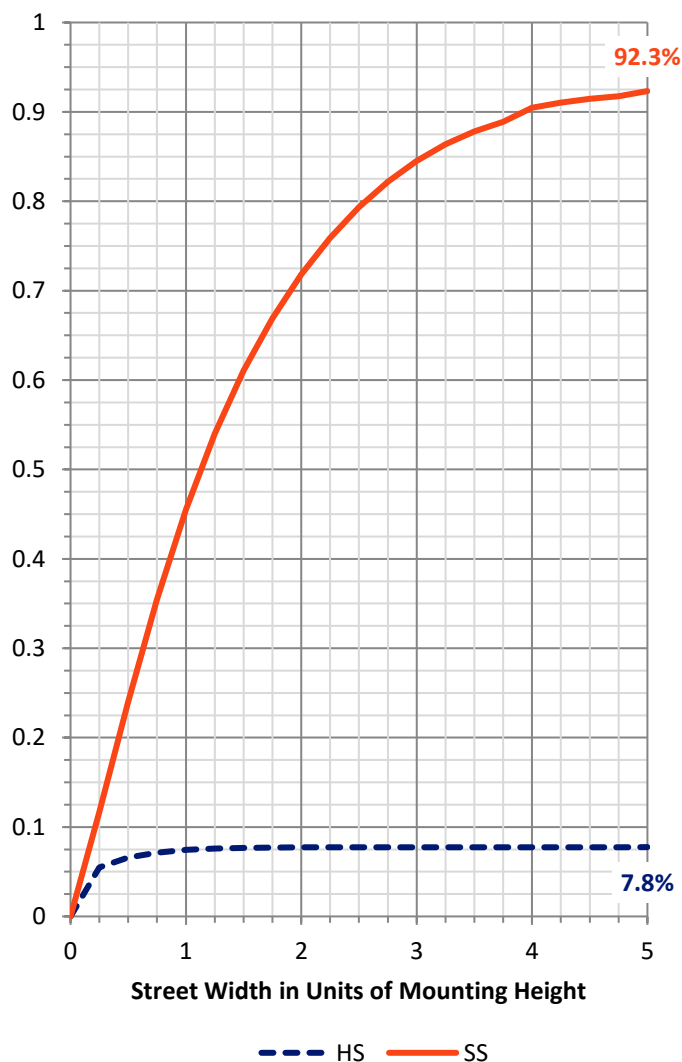
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 396.9    | 0.0    | 396.9  |
|                    | % Fixture | 7.8      | 0.0    | 7.8    |
| <b>Street Side</b> | Lumens    | 4690.1   | 0.0    | 4690.1 |
|                    | % Fixture | 92.2     | 0.0    | 92.2   |
| <b>Total</b>       | Lumens    | 5087.0   | 0.0    | 5087.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 76.3   | 1.5       |
| 10°-20°   | 191.5  | 3.8       |
| 20°-30°   | 312.8  | 6.1       |
| 30°-40°   | 475.6  | 9.3       |
| 40°-50°   | 727.3  | 14.3      |
| 50°-60°   | 1034.1 | 20.3      |
| 60°-70°   | 1311.4 | 25.8      |
| 70°-80°   | 897.9  | 17.7      |
| 80°-90°   | 60.1   | 1.2       |
| 90°-100°  | 0.0    | 0.0       |
| 100°-110° | 0.0    | 0.0       |
| 110°-120° | 0.0    | 0.0       |
| 120°-130° | 0.0    | 0.0       |
| 130°-140° | 0.0    | 0.0       |
| 140°-150° | 0.0    | 0.0       |
| 150°-160° | 0.0    | 0.0       |
| 160°-170° | 0.0    | 0.0       |
| 170°-180° | 0.0    | 0.0       |
| 0°-90°    | 5087.0 | 100.0     |
| 0°-180°   | 5087.0 | 100.0     |

**Coefficient of Utilization**



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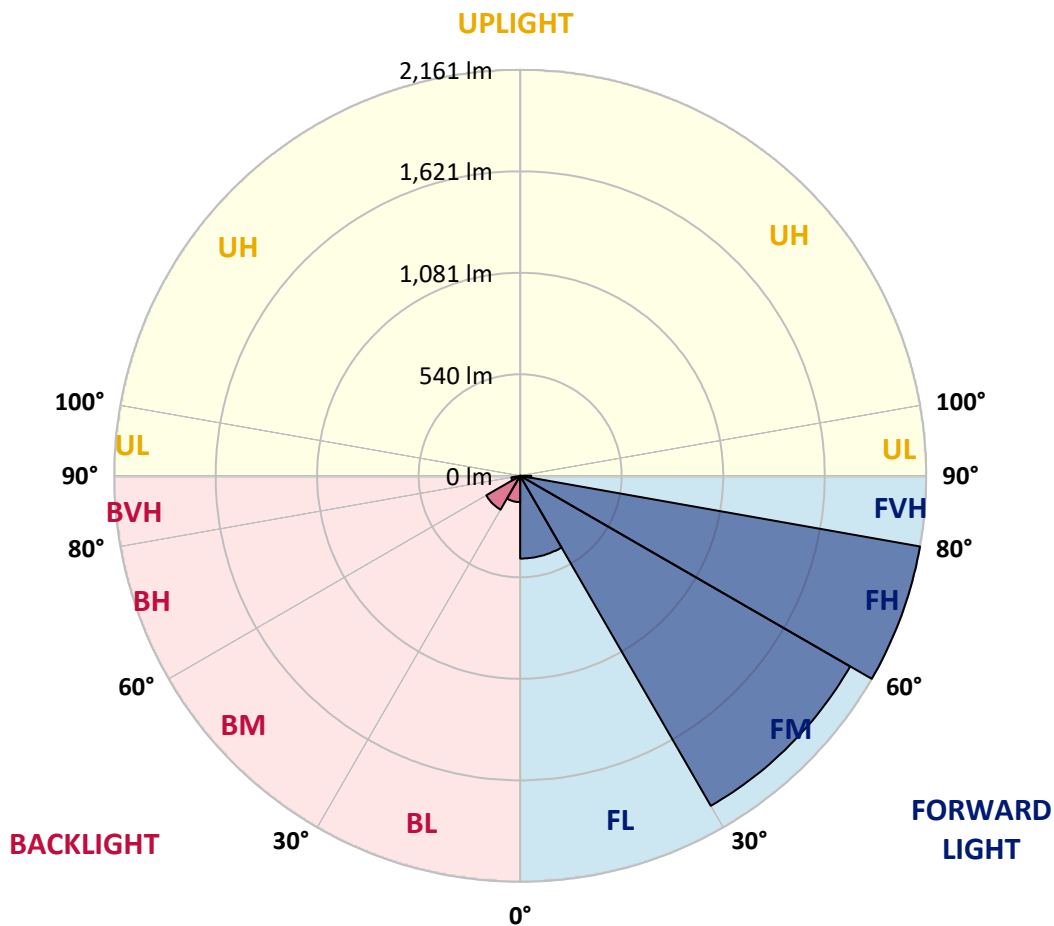
CATALOG NUMBER: ISC-SA1F-830-U-SL4-HSS

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

| Zone           | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|----------------|--------|-----------|-------------------------|------|---------|
|                |        |           | B                       | U    | G       |
| FL (0°-30°)    | 440.6  | 8.7       |                         |      |         |
| FM (30°-60°)   | 2028.8 | 39.9      |                         |      |         |
| FH (60°-80°)   | 2161.4 | 42.5      |                         |      | G2/5000 |
| FVH (80°-90°)  | 59.3   | 1.2       |                         |      | G1/100  |
| BL (0°-30°)    | 140.1  | 2.8       | B1/500                  |      |         |
| BM (30°-60°)   | 208.1  | 4.1       | B0/220                  |      |         |
| BH (60°-80°)   | 47.8   | 0.9       | B0/110                  |      | G0/110  |
| BVH (80°-90°)  | 0.9    | 0.0       |                         |      | G0/10   |
| UL (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B1-U0-G2**

Type IV Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 36°    | 45°    | 55°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 893.4  | 893.4  | 893.4  | 893.4  | 893.4  | 893.4  | 893.4  | 893.4  | 893.4  | 893.4  | 893.4  |
| 2.5°  | 1000.8 | 994.1  | 989.6  | 985.2  | 971.7  | 974.0  | 960.5  | 947.1  | 926.9  | 918.0  | 904.5  |
| 5°    | 1025.5 | 1023.2 | 1021.0 | 1014.3 | 1003.1 | 1007.5 | 994.1  | 980.7  | 951.6  | 924.7  | 895.6  |
| 7.5°  | 1021.0 | 1025.5 | 1023.2 | 1018.7 | 1009.8 | 1012.0 | 1000.8 | 987.4  | 962.8  | 926.9  | 886.6  |
| 10°   | 1012.0 | 1014.3 | 1014.3 | 1012.0 | 1009.8 | 1009.8 | 1000.8 | 989.6  | 967.2  | 935.9  | 884.4  |
| 12.5° | 994.1  | 998.6  | 1005.3 | 1009.8 | 1012.0 | 1014.3 | 1007.5 | 998.6  | 978.4  | 944.8  | 891.1  |
| 15°   | 987.4  | 991.9  | 1005.3 | 1018.7 | 1025.5 | 1027.7 | 1021.0 | 1009.8 | 991.9  | 962.8  | 902.3  |
| 17.5° | 987.4  | 991.9  | 1014.3 | 1034.4 | 1047.8 | 1050.1 | 1041.1 | 1029.9 | 1007.5 | 978.4  | 915.7  |
| 20°   | 1000.8 | 1005.3 | 1032.2 | 1068.0 | 1074.7 | 1079.2 | 1065.8 | 1050.1 | 1025.5 | 996.3  | 931.4  |
| 22.5° | 1023.2 | 1029.9 | 1063.5 | 1097.1 | 1110.5 | 1112.8 | 1097.1 | 1068.0 | 1045.6 | 1016.5 | 944.8  |
| 25°   | 1061.3 | 1076.9 | 1108.3 | 1144.1 | 1146.4 | 1148.6 | 1124.0 | 1094.9 | 1068.0 | 1038.9 | 960.5  |
| 27.5° | 1115.0 | 1128.4 | 1155.3 | 1195.6 | 1182.2 | 1182.2 | 1162.0 | 1124.0 | 1097.1 | 1070.2 | 987.4  |
| 30°   | 1184.4 | 1193.4 | 1224.7 | 1240.4 | 1222.5 | 1224.7 | 1200.1 | 1164.3 | 1141.9 | 1115.0 | 1027.7 |
| 32.5° | 1249.4 | 1256.1 | 1289.7 | 1291.9 | 1271.7 | 1269.5 | 1251.6 | 1209.0 | 1191.1 | 1182.2 | 1083.7 |
| 35°   | 1309.8 | 1318.8 | 1345.6 | 1343.4 | 1323.2 | 1321.0 | 1312.0 | 1274.0 | 1274.0 | 1282.9 | 1166.5 |
| 37.5° | 1354.6 | 1377.0 | 1410.6 | 1401.6 | 1388.2 | 1388.2 | 1381.5 | 1352.3 | 1374.7 | 1408.3 | 1276.2 |
| 40°   | 1412.8 | 1426.2 | 1471.0 | 1464.3 | 1466.5 | 1466.5 | 1468.8 | 1450.9 | 1491.2 | 1547.1 | 1403.8 |
| 42.5° | 1444.1 | 1471.0 | 1524.7 | 1533.7 | 1553.9 | 1553.9 | 1571.8 | 1567.3 | 1643.4 | 1715.1 | 1551.6 |
| 45°   | 1493.4 | 1522.5 | 1580.7 | 1614.3 | 1638.9 | 1650.1 | 1681.5 | 1706.1 | 1813.6 | 1903.1 | 1708.3 |
| 47.5° | 1556.1 | 1580.7 | 1630.0 | 1692.7 | 1737.4 | 1755.4 | 1818.1 | 1858.4 | 2001.6 | 2093.4 | 1856.1 |
| 50°   | 1641.2 | 1645.7 | 1681.5 | 1775.5 | 1853.9 | 1865.1 | 1963.6 | 2030.8 | 2192.0 | 2277.0 | 1961.3 |
| 52.5° | 1733.0 | 1724.0 | 1744.2 | 1871.8 | 1981.5 | 2001.6 | 2113.6 | 2216.6 | 2377.8 | 2395.7 | 2003.9 |
| 55°   | 1804.6 | 1804.6 | 1820.3 | 1977.0 | 2124.8 | 2136.0 | 2292.7 | 2402.4 | 2548.0 | 2465.1 | 2030.8 |
| 57.5° | 1896.4 | 1887.5 | 1912.1 | 2084.5 | 2303.9 | 2312.9 | 2494.2 | 2579.3 | 2642.0 | 2509.9 | 2026.3 |
| 60°   | 1963.6 | 1974.8 | 2012.8 | 2223.3 | 2489.7 | 2530.0 | 2682.3 | 2709.2 | 2740.5 | 2525.6 | 2012.8 |
| 62.5° | 2057.6 | 2055.4 | 2129.3 | 2377.8 | 2731.6 | 2758.4 | 2863.7 | 2818.9 | 2816.6 | 2552.4 | 1994.9 |
| 65°   | 2136.0 | 2153.9 | 2265.8 | 2563.6 | 2989.0 | 3007.0 | 3042.8 | 2984.6 | 2921.9 | 2581.5 | 1838.2 |
| 67.5° | 2256.9 | 2292.7 | 2433.8 | 2807.7 | 3264.4 | 3284.6 | 3315.9 | 3188.3 | 2951.0 | 2375.6 | 1531.5 |
| 70°   | 2393.5 | 2440.5 | 2668.9 | 3132.3 | 3560.0 | 3582.4 | 3589.1 | 3208.5 | 2673.3 | 1865.1 | 1038.9 |
| 72.5° | 2256.9 | 2333.0 | 2736.0 | 3311.5 | 3774.9 | 3777.2 | 3506.2 | 2834.5 | 2048.7 | 1018.7 | 367.2  |
| 75°   | 1453.1 | 1549.4 | 2265.8 | 2937.5 | 3251.0 | 3286.8 | 2749.5 | 1981.5 | 956.0  | 228.4  | 103.0  |
| 77.5° | 492.6  | 526.2  | 1112.8 | 1853.9 | 2180.8 | 2194.2 | 1809.1 | 1003.1 | 302.3  | 91.8   | 56.0   |
| 80°   | 284.4  | 282.1  | 389.6  | 810.5  | 1088.1 | 1130.7 | 911.3  | 400.8  | 141.1  | 47.0   | 38.1   |
| 82.5° | 67.2   | 69.4   | 203.7  | 295.5  | 432.1  | 389.6  | 192.6  | 241.8  | 64.9   | 26.9   | 33.6   |
| 85°   | 0.0    | 0.0    | 33.6   | 71.6   | 51.5   | 60.5   | 17.9   | 73.9   | 11.2   | 11.2   | 22.4   |
| 87.5° | 0.0    | 0.0    | 0.0    | 0.0    | 2.2    | 2.2    | 2.2    | 2.2    | 2.2    | 2.2    | 2.2    |
| 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: ISC-SA1F-830-U-SL4-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 893.4  | 893.4  | 893.4 | 893.4 | 893.4 | 893.4 | 893.4 | 893.4 | 893.4 | 893.4 | 893.4 |
| 2.5°  | 891.1  | 879.9  | 857.5 | 839.6 | 815.0 | 794.8 | 774.7 | 765.7 | 750.1 | 745.6 | 747.8 |
| 5°    | 877.7  | 859.8  | 817.2 | 774.7 | 727.7 | 682.9 | 635.9 | 609.0 | 597.8 | 577.7 | 573.2 |
| 7.5°  | 862.0  | 835.1  | 774.7 | 705.3 | 624.7 | 559.7 | 494.8 | 450.0 | 409.7 | 394.1 | 387.3 |
| 10°   | 855.3  | 821.7  | 736.6 | 631.4 | 521.7 | 416.5 | 335.8 | 277.6 | 241.8 | 228.4 | 223.9 |
| 12.5° | 855.3  | 815.0  | 700.8 | 559.7 | 414.2 | 293.3 | 219.4 | 185.8 | 174.6 | 172.4 | 170.2 |
| 15°   | 864.2  | 812.7  | 667.2 | 483.6 | 313.5 | 203.7 | 167.9 | 163.4 | 161.2 | 161.2 | 163.4 |
| 17.5° | 868.7  | 808.3  | 631.4 | 409.7 | 230.6 | 163.4 | 156.7 | 156.7 | 156.7 | 156.7 | 156.7 |
| 20°   | 879.9  | 806.0  | 591.1 | 331.4 | 174.6 | 152.3 | 150.0 | 150.0 | 150.0 | 150.0 | 152.3 |
| 22.5° | 882.2  | 806.0  | 541.8 | 255.2 | 154.5 | 145.5 | 143.3 | 143.3 | 143.3 | 145.5 | 145.5 |
| 25°   | 895.6  | 801.6  | 494.8 | 194.8 | 145.5 | 136.6 | 136.6 | 134.3 | 136.6 | 136.6 | 136.6 |
| 27.5° | 913.5  | 803.8  | 436.6 | 161.2 | 136.6 | 129.9 | 127.6 | 127.6 | 127.6 | 127.6 | 127.6 |
| 30°   | 933.7  | 808.3  | 376.1 | 143.3 | 127.6 | 123.1 | 120.9 | 118.7 | 118.7 | 118.7 | 118.7 |
| 32.5° | 971.7  | 812.7  | 311.2 | 129.9 | 118.7 | 114.2 | 111.9 | 109.7 | 109.7 | 109.7 | 109.7 |
| 35°   | 1029.9 | 837.4  | 255.2 | 120.9 | 109.7 | 105.2 | 103.0 | 100.8 | 100.8 | 100.8 | 98.5  |
| 37.5° | 1108.3 | 875.4  | 201.5 | 111.9 | 100.8 | 96.3  | 94.0  | 91.8  | 89.6  | 89.6  | 89.6  |
| 40°   | 1202.3 | 915.7  | 167.9 | 100.8 | 91.8  | 87.3  | 85.1  | 82.8  | 80.6  | 78.4  | 78.4  |
| 42.5° | 1314.3 | 965.0  | 134.3 | 91.8  | 82.8  | 78.4  | 76.1  | 73.9  | 69.4  | 67.2  | 69.4  |
| 45°   | 1439.7 | 1012.0 | 114.2 | 85.1  | 76.1  | 71.6  | 69.4  | 64.9  | 60.5  | 58.2  | 58.2  |
| 47.5° | 1549.4 | 1023.2 | 100.8 | 76.1  | 69.4  | 64.9  | 62.7  | 56.0  | 51.5  | 47.0  | 47.0  |
| 50°   | 1623.3 | 1003.1 | 89.6  | 69.4  | 62.7  | 60.5  | 56.0  | 47.0  | 40.3  | 38.1  | 35.8  |
| 52.5° | 1632.2 | 949.3  | 78.4  | 62.7  | 58.2  | 53.7  | 47.0  | 40.3  | 33.6  | 29.1  | 29.1  |
| 55°   | 1623.3 | 859.8  | 69.4  | 58.2  | 51.5  | 47.0  | 40.3  | 31.3  | 24.6  | 22.4  | 20.2  |
| 57.5° | 1594.2 | 765.7  | 62.7  | 51.5  | 47.0  | 40.3  | 31.3  | 24.6  | 17.9  | 15.7  | 13.4  |
| 60°   | 1540.4 | 651.5  | 56.0  | 47.0  | 40.3  | 33.6  | 24.6  | 17.9  | 11.2  | 9.0   | 9.0   |
| 62.5° | 1439.7 | 526.2  | 49.3  | 40.3  | 33.6  | 26.9  | 20.2  | 11.2  | 6.7   | 4.5   | 4.5   |
| 65°   | 1240.4 | 394.1  | 42.5  | 33.6  | 26.9  | 22.4  | 13.4  | 6.7   | 2.2   | 0.0   | 0.0   |
| 67.5° | 965.0  | 266.4  | 33.6  | 26.9  | 22.4  | 17.9  | 11.2  | 2.2   | 0.0   | 0.0   | 0.0   |
| 70°   | 568.7  | 141.1  | 26.9  | 20.2  | 17.9  | 13.4  | 6.7   | 2.2   | 0.0   | 0.0   | 0.0   |
| 72.5° | 163.4  | 56.0   | 20.2  | 15.7  | 13.4  | 9.0   | 4.5   | 2.2   | 0.0   | 0.0   | 0.0   |
| 75°   | 67.2   | 33.6   | 13.4  | 11.2  | 11.2  | 6.7   | 2.2   | 2.2   | 0.0   | 0.0   | 0.0   |
| 77.5° | 44.8   | 24.6   | 9.0   | 6.7   | 6.7   | 4.5   | 2.2   | 0.0   | 0.0   | 0.0   | 0.0   |
| 80°   | 35.8   | 13.4   | 4.5   | 4.5   | 4.5   | 2.2   | 2.2   | 0.0   | 0.0   | 0.0   | 0.0   |
| 82.5° | 31.3   | 9.0    | 2.2   | 2.2   | 2.2   | 2.2   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 85°   | 15.7   | 4.5    | 2.2   | 2.2   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 87.5° | 2.2    | 2.2    | 2.2   | 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-79-2019: Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Report Prepared for

Cooper Lighting Solutions

MCGRAW EDISON

Report Number: SP1-2408-195-9

Test Date: 08/07/2024

Luminaire Tested: GALN-SB1A-830-U-5WQ

Data in this report applies to families of products including GALN-SB1A-830-U-5WQ.

**Test Information**

Test Method: LM-79-2019  
 Report Number: SP1-2408-195-9  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry: 4π  
 Issue Date: 08/07/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: MCGRAW EDISON  
 Catalog Number: **GALN-SB1A-830-U-5WQ**  
 Description: GALLEON AREA AND ROADWAY LUMINAIRE. (1) 80 CRI, 3000K, 350MA HIGH DENSITY LIGHTSQUARE WITH 26 LEDS AND TYPE V WIDE OPTICS

**Spectral Parameters**

CCT (K): 3050  
 CIE u': 0.2476  
 CIE v': 0.5251  
 Duv: 0.0034  
 CIE x: 0.4383  
 CIE y: 0.4131  
 CIE z: 0.1487  
 Peak Wavelength (nm): 603  
 Dominant Wavelength (nm): 581  
 Purity: 55.55201  
 Rf: 81.5  
 Rg: 99.2

|           |      |      |      |
|-----------|------|------|------|
| CRI (Ra): | 81.0 |      |      |
| R1:       | 79.6 | R9:  | 7.1  |
| R2:       | 85.6 | R10: | 67.0 |
| R3:       | 92.0 | R11: | 82.7 |
| R4:       | 82.6 | R12: | 63.2 |
| R5:       | 78.9 | R13: | 80.3 |
| R6:       | 81.7 | R14: | 95.0 |
| R7:       | 85.2 | R15: | 71.7 |
| R8:       | 62.0 |      |      |



**Test Conditions**

Stabilization Time: 20M  
 Operation Time: 1H 20M  
 Sphere Temperature (°C): 24.2

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| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 6/18/2024        | 12/18/2024           |
| Power Meter                    | INXT2011004           | 2/8/2024         | 2/8/2025             |
| AC Power Source                | IN0063                | 10/24/2023       | 10/24/2024           |
| DC Power Source                | IN0208                | 10/24/2023       | 10/24/2024           |
| Sphere Thermometer             | IN0085                | 10/24/2023       | 10/24/2024           |
| Room Thermometer               | IN0046                | 10/24/2023       | 10/24/2024           |

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CIE 1931 Chromaticity Diagram



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



Point lies inside the ANSI 3000K 4-step quadrangle

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**Photopic Flux vs. Wavelength**



**Photopic Lumens: NR**

| $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) | $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) | $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) | $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) | $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) |
|-------------------|-----------------------------|-------------------------|-------------------|-----------------------------|-------------------------|-------------------|-----------------------------|-------------------------|-------------------|-----------------------------|-------------------------|-------------------|-----------------------------|-------------------------|
| 360               | 0                           | NR                      | 490               | 168                         | NR                      | 620               | 940                         | NR                      | 750               | 35                          | NR                      | 880               | 1                           | NR                      |
| 365               | 0                           | NR                      | 495               | 233                         | NR                      | 625               | 897                         | NR                      | 755               | 30                          | NR                      | 885               | 1                           | NR                      |
| 370               | 0                           | NR                      | 500               | 300                         | NR                      | 630               | 847                         | NR                      | 760               | 26                          | NR                      | 890               | 1                           | NR                      |
| 375               | 0                           | NR                      | 505               | 372                         | NR                      | 635               | 790                         | NR                      | 765               | 22                          | NR                      | 895               | 1                           | NR                      |
| 380               | 0                           | NR                      | 510               | 430                         | NR                      | 640               | 730                         | NR                      | 770               | 19                          | NR                      | 900               | 1                           | NR                      |
| 385               | 0                           | NR                      | 515               | 483                         | NR                      | 645               | 668                         | NR                      | 775               | 16                          | NR                      | 905               | 1                           | NR                      |
| 390               | 0                           | NR                      | 520               | 524                         | NR                      | 650               | 605                         | NR                      | 780               | 14                          | NR                      | 910               | 0                           | NR                      |
| 395               | 2                           | NR                      | 525               | 555                         | NR                      | 655               | 545                         | NR                      | 785               | 12                          | NR                      | 915               | 0                           | NR                      |
| 400               | 4                           | NR                      | 530               | 581                         | NR                      | 660               | 485                         | NR                      | 790               | 10                          | NR                      | 920               | 0                           | NR                      |
| 405               | 7                           | NR                      | 535               | 604                         | NR                      | 665               | 430                         | NR                      | 795               | 9                           | NR                      | 925               | 0                           | NR                      |
| 410               | 17                          | NR                      | 540               | 623                         | NR                      | 670               | 378                         | NR                      | 800               | 8                           | NR                      | 930               | 0                           | NR                      |
| 415               | 34                          | NR                      | 545               | 645                         | NR                      | 675               | 331                         | NR                      | 805               | 7                           | NR                      | 935               | 0                           | NR                      |
| 420               | 68                          | NR                      | 550               | 667                         | NR                      | 680               | 290                         | NR                      | 810               | 6                           | NR                      | 940               | 0                           | NR                      |
| 425               | 128                         | NR                      | 555               | 693                         | NR                      | 685               | 251                         | NR                      | 815               | 5                           | NR                      | 945               | 0                           | NR                      |
| 430               | 214                         | NR                      | 560               | 719                         | NR                      | 690               | 218                         | NR                      | 820               | 4                           | NR                      | 950               | 0                           | NR                      |
| 435               | 339                         | NR                      | 565               | 754                         | NR                      | 695               | 188                         | NR                      | 825               | 4                           | NR                      | 955               | 0                           | NR                      |
| 440               | 507                         | NR                      | 570               | 791                         | NR                      | 700               | 162                         | NR                      | 830               | 3                           | NR                      | 960               | 0                           | NR                      |
| 445               | 573                         | NR                      | 575               | 830                         | NR                      | 705               | 139                         | NR                      | 835               | 3                           | NR                      | 965               | 0                           | NR                      |
| 450               | 356                         | NR                      | 580               | 873                         | NR                      | 710               | 119                         | NR                      | 840               | 3                           | NR                      | 970               | 0                           | NR                      |
| 455               | 217                         | NR                      | 585               | 913                         | NR                      | 715               | 102                         | NR                      | 845               | 2                           | NR                      | 975               | 0                           | NR                      |
| 460               | 168                         | NR                      | 590               | 948                         | NR                      | 720               | 88                          | NR                      | 850               | 2                           | NR                      | 980               | 0                           | NR                      |
| 465               | 113                         | NR                      | 595               | 974                         | NR                      | 725               | 76                          | NR                      | 855               | 2                           | NR                      | 985               | 0                           | NR                      |
| 470               | 85                          | NR                      | 600               | 994                         | NR                      | 730               | 65                          | NR                      | 860               | 1                           | NR                      | 990               | 0                           | NR                      |
| 475               | 85                          | NR                      | 605               | 998                         | NR                      | 735               | 55                          | NR                      | 865               | 1                           | NR                      | 995               | 0                           | NR                      |
| 480               | 94                          | NR                      | 610               | 994                         | NR                      | 740               | 47                          | NR                      | 870               | 1                           | NR                      | 1000              | 0                           | NR                      |
| 485               | 120                         | NR                      | 615               | 973                         | NR                      | 745               | 41                          | NR                      | 875               | 1                           | NR                      |                   |                             |                         |

REPORT NUMBER: SP1-2408-195-9

**Scotopic Flux vs. Wavelength**



**Scotopic Lumens: NR**

**S/P: 1.27**

| $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) | $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) | $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) | $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) | $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) |
|-------------------|-----------------------------|-------------------------|-------------------|-----------------------------|-------------------------|-------------------|-----------------------------|-------------------------|-------------------|-----------------------------|-------------------------|-------------------|-----------------------------|-------------------------|
| 360               | 0                           | NR                      | 490               | 168                         | NR                      | 620               | 940                         | NR                      | 750               | 35                          | NR                      | 880               | 1                           | NR                      |
| 365               | 0                           | NR                      | 495               | 233                         | NR                      | 625               | 897                         | NR                      | 755               | 30                          | NR                      | 885               | 1                           | NR                      |
| 370               | 0                           | NR                      | 500               | 300                         | NR                      | 630               | 847                         | NR                      | 760               | 26                          | NR                      | 890               | 1                           | NR                      |
| 375               | 0                           | NR                      | 505               | 372                         | NR                      | 635               | 790                         | NR                      | 765               | 22                          | NR                      | 895               | 1                           | NR                      |
| 380               | 0                           | NR                      | 510               | 430                         | NR                      | 640               | 730                         | NR                      | 770               | 19                          | NR                      | 900               | 1                           | NR                      |
| 385               | 0                           | NR                      | 515               | 483                         | NR                      | 645               | 668                         | NR                      | 775               | 16                          | NR                      | 905               | 1                           | NR                      |
| 390               | 0                           | NR                      | 520               | 524                         | NR                      | 650               | 605                         | NR                      | 780               | 14                          | NR                      | 910               | 0                           | NR                      |
| 395               | 2                           | NR                      | 525               | 555                         | NR                      | 655               | 545                         | NR                      | 785               | 12                          | NR                      | 915               | 0                           | NR                      |
| 400               | 4                           | NR                      | 530               | 581                         | NR                      | 660               | 485                         | NR                      | 790               | 10                          | NR                      | 920               | 0                           | NR                      |
| 405               | 7                           | NR                      | 535               | 604                         | NR                      | 665               | 430                         | NR                      | 795               | 9                           | NR                      | 925               | 0                           | NR                      |
| 410               | 17                          | NR                      | 540               | 623                         | NR                      | 670               | 378                         | NR                      | 800               | 8                           | NR                      | 930               | 0                           | NR                      |
| 415               | 34                          | NR                      | 545               | 645                         | NR                      | 675               | 331                         | NR                      | 805               | 7                           | NR                      | 935               | 0                           | NR                      |
| 420               | 68                          | NR                      | 550               | 667                         | NR                      | 680               | 290                         | NR                      | 810               | 6                           | NR                      | 940               | 0                           | NR                      |
| 425               | 128                         | NR                      | 555               | 693                         | NR                      | 685               | 251                         | NR                      | 815               | 5                           | NR                      | 945               | 0                           | NR                      |
| 430               | 214                         | NR                      | 560               | 719                         | NR                      | 690               | 218                         | NR                      | 820               | 4                           | NR                      | 950               | 0                           | NR                      |
| 435               | 339                         | NR                      | 565               | 754                         | NR                      | 695               | 188                         | NR                      | 825               | 4                           | NR                      | 955               | 0                           | NR                      |
| 440               | 507                         | NR                      | 570               | 791                         | NR                      | 700               | 162                         | NR                      | 830               | 3                           | NR                      | 960               | 0                           | NR                      |
| 445               | 573                         | NR                      | 575               | 830                         | NR                      | 705               | 139                         | NR                      | 835               | 3                           | NR                      | 965               | 0                           | NR                      |
| 450               | 356                         | NR                      | 580               | 873                         | NR                      | 710               | 119                         | NR                      | 840               | 3                           | NR                      | 970               | 0                           | NR                      |
| 455               | 217                         | NR                      | 585               | 913                         | NR                      | 715               | 102                         | NR                      | 845               | 2                           | NR                      | 975               | 0                           | NR                      |
| 460               | 168                         | NR                      | 590               | 948                         | NR                      | 720               | 88                          | NR                      | 850               | 2                           | NR                      | 980               | 0                           | NR                      |
| 465               | 113                         | NR                      | 595               | 974                         | NR                      | 725               | 76                          | NR                      | 855               | 2                           | NR                      | 985               | 0                           | NR                      |
| 470               | 85                          | NR                      | 600               | 994                         | NR                      | 730               | 65                          | NR                      | 860               | 1                           | NR                      | 990               | 0                           | NR                      |
| 475               | 85                          | NR                      | 605               | 998                         | NR                      | 735               | 55                          | NR                      | 865               | 1                           | NR                      | 995               | 0                           | NR                      |
| 480               | 94                          | NR                      | 610               | 994                         | NR                      | 740               | 47                          | NR                      | 870               | 1                           | NR                      | 1000              | 0                           | NR                      |
| 485               | 120                         | NR                      | 615               | 973                         | NR                      | 745               | 41                          | NR                      | 875               | 1                           | NR                      |                   |                             |                         |

REPORT NUMBER: SP1-2408-195-9

**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: NR**

**M/P: 2.32**

| λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) |
|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|
| 360    | 0                        | NR            | 490    | 168                      | NR            | 620    | 940                      | NR            | 750    | 35                       | NR            | 880    | 1                        | NR            |
| 365    | 0                        | NR            | 495    | 233                      | NR            | 625    | 897                      | NR            | 755    | 30                       | NR            | 885    | 1                        | NR            |
| 370    | 0                        | NR            | 500    | 300                      | NR            | 630    | 847                      | NR            | 760    | 26                       | NR            | 890    | 1                        | NR            |
| 375    | 0                        | NR            | 505    | 372                      | NR            | 635    | 790                      | NR            | 765    | 22                       | NR            | 895    | 1                        | NR            |
| 380    | 0                        | NR            | 510    | 430                      | NR            | 640    | 730                      | NR            | 770    | 19                       | NR            | 900    | 1                        | NR            |
| 385    | 0                        | NR            | 515    | 483                      | NR            | 645    | 668                      | NR            | 775    | 16                       | NR            | 905    | 1                        | NR            |
| 390    | 0                        | NR            | 520    | 524                      | NR            | 650    | 605                      | NR            | 780    | 14                       | NR            | 910    | 0                        | NR            |
| 395    | 2                        | NR            | 525    | 555                      | NR            | 655    | 545                      | NR            | 785    | 12                       | NR            | 915    | 0                        | NR            |
| 400    | 4                        | NR            | 530    | 581                      | NR            | 660    | 485                      | NR            | 790    | 10                       | NR            | 920    | 0                        | NR            |
| 405    | 7                        | NR            | 535    | 604                      | NR            | 665    | 430                      | NR            | 795    | 9                        | NR            | 925    | 0                        | NR            |
| 410    | 17                       | NR            | 540    | 623                      | NR            | 670    | 378                      | NR            | 800    | 8                        | NR            | 930    | 0                        | NR            |
| 415    | 34                       | NR            | 545    | 645                      | NR            | 675    | 331                      | NR            | 805    | 7                        | NR            | 935    | 0                        | NR            |
| 420    | 68                       | NR            | 550    | 667                      | NR            | 680    | 290                      | NR            | 810    | 6                        | NR            | 940    | 0                        | NR            |
| 425    | 128                      | NR            | 555    | 693                      | NR            | 685    | 251                      | NR            | 815    | 5                        | NR            | 945    | 0                        | NR            |
| 430    | 214                      | NR            | 560    | 719                      | NR            | 690    | 218                      | NR            | 820    | 4                        | NR            | 950    | 0                        | NR            |
| 435    | 339                      | NR            | 565    | 754                      | NR            | 695    | 188                      | NR            | 825    | 4                        | NR            | 955    | 0                        | NR            |
| 440    | 507                      | NR            | 570    | 791                      | NR            | 700    | 162                      | NR            | 830    | 3                        | NR            | 960    | 0                        | NR            |
| 445    | 573                      | NR            | 575    | 830                      | NR            | 705    | 139                      | NR            | 835    | 3                        | NR            | 965    | 0                        | NR            |
| 450    | 356                      | NR            | 580    | 873                      | NR            | 710    | 119                      | NR            | 840    | 3                        | NR            | 970    | 0                        | NR            |
| 455    | 217                      | NR            | 585    | 913                      | NR            | 715    | 102                      | NR            | 845    | 2                        | NR            | 975    | 0                        | NR            |
| 460    | 168                      | NR            | 590    | 948                      | NR            | 720    | 88                       | NR            | 850    | 2                        | NR            | 980    | 0                        | NR            |
| 465    | 113                      | NR            | 595    | 974                      | NR            | 725    | 76                       | NR            | 855    | 2                        | NR            | 985    | 0                        | NR            |
| 470    | 85                       | NR            | 600    | 994                      | NR            | 730    | 65                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 85                       | NR            | 605    | 998                      | NR            | 735    | 55                       | NR            | 865    | 1                        | NR            | 995    | 0                        | NR            |
| 480    | 94                       | NR            | 610    | 994                      | NR            | 740    | 47                       | NR            | 870    | 1                        | NR            | 1000   | 0                        | NR            |
| 485    | 120                      | NR            | 615    | 973                      | NR            | 745    | 41                       | NR            | 875    | 1                        | NR            |        |                          |               |

**Summary**

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



**Color Vector Graphics**





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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 74 | CES51 = 89 | CES76 = 70 |
| CES02 = 63 | CES27 = 88 | CES52 = 92 | CES77 = 86 |
| CES03 = 31 | CES28 = 89 | CES53 = 81 | CES78 = 72 |
| CES04 = 70 | CES29 = 67 | CES54 = 87 | CES79 = 90 |
| CES05 = 50 | CES30 = 68 | CES55 = 85 | CES80 = 88 |
| CES06 = 51 | CES31 = 71 | CES56 = 78 | CES81 = 78 |
| CES07 = 42 | CES32 = 70 | CES57 = 76 | CES82 = 95 |
| CES08 = 41 | CES33 = 71 | CES58 = 78 | CES83 = 90 |
| CES09 = 29 | CES34 = 82 | CES59 = 92 | CES84 = 94 |
| CES10 = 76 | CES35 = 90 | CES60 = 95 | CES85 = 86 |
| CES11 = 59 | CES36 = 93 | CES61 = 93 | CES86 = 72 |
| CES12 = 65 | CES37 = 87 | CES62 = 83 | CES87 = 85 |
| CES13 = 43 | CES38 = 75 | CES63 = 77 | CES88 = 83 |
| CES14 = 74 | CES39 = 94 | CES64 = 83 | CES89 = 75 |
| CES15 = 71 | CES40 = 89 | CES65 = 77 | CES90 = 81 |
| CES16 = 47 | CES41 = 85 | CES66 = 80 | CES91 = 96 |
| CES17 = 50 | CES42 = 86 | CES67 = 79 | CES92 = 73 |
| CES18 = 56 | CES43 = 81 | CES68 = 84 | CES93 = 84 |
| CES19 = 72 | CES44 = 99 | CES69 = 91 | CES94 = 64 |
| CES20 = 66 | CES45 = 87 | CES70 = 78 | CES95 = 80 |
| CES21 = 87 | CES46 = 82 | CES71 = 76 | CES96 = 84 |
| CES22 = 79 | CES47 = 77 | CES72 = 92 | CES97 = 87 |
| CES23 = 92 | CES48 = 71 | CES73 = 71 | CES98 = 81 |
| CES24 = 91 | CES49 = 81 | CES74 = 93 | CES99 = 74 |
| CES25 = 72 | CES50 = 89 | CES75 = 74 |            |



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)