

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: P319255

Luminaire Tested: **GLEON-SA1D-722-U-T4W**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P319255  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-18)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA1D-722-U-T4W  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(1) 70 CRI, 2200K, 1200mA LIGHTSQUARE WITH 16 LEDS AND TYPE IV WIDE OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 5930 lumens  
Efficiency: N/A  
Efficacy: 88.5 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): 67  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

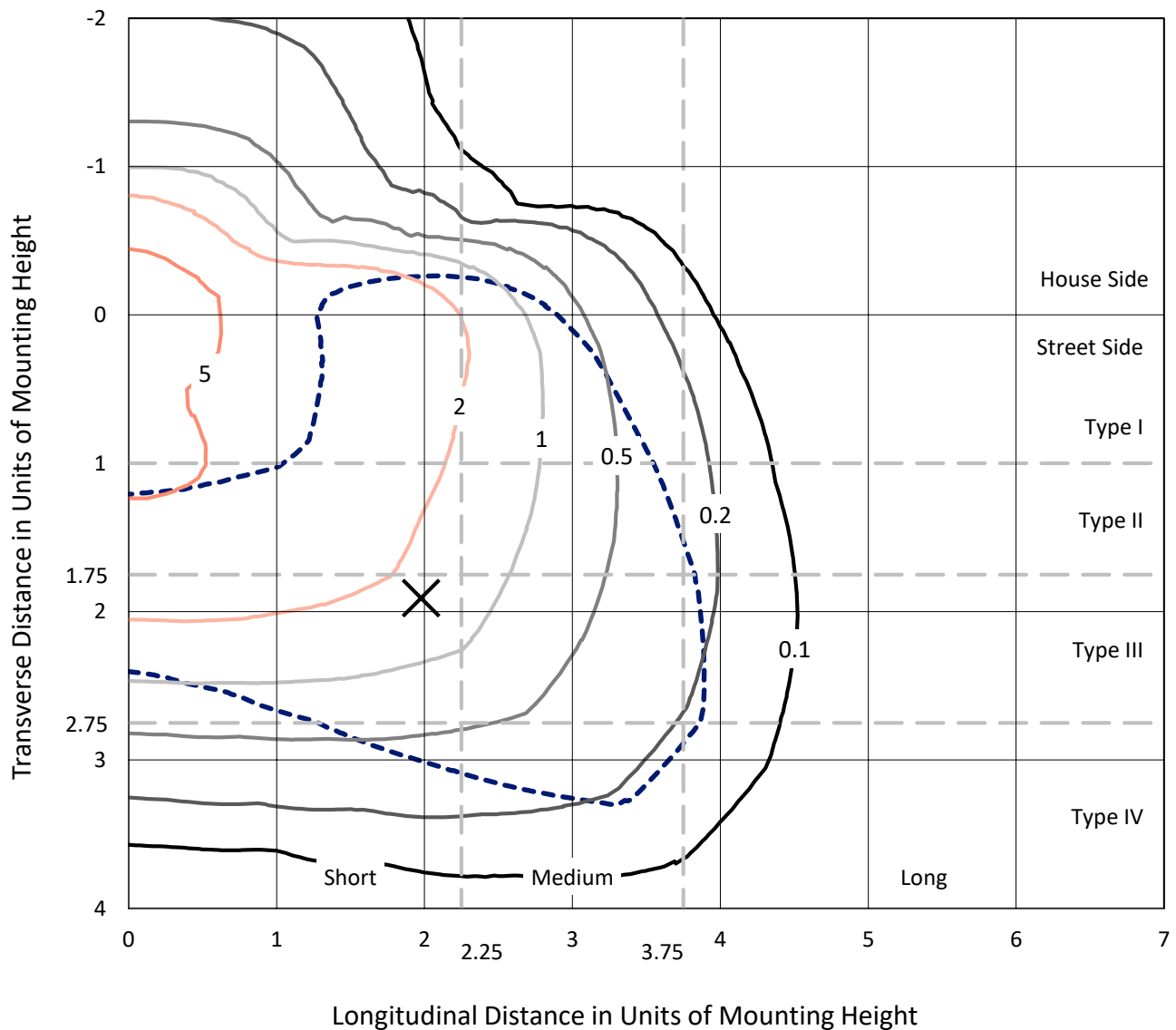


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## Iso-Footcandle Lines of Horizontal Illumination

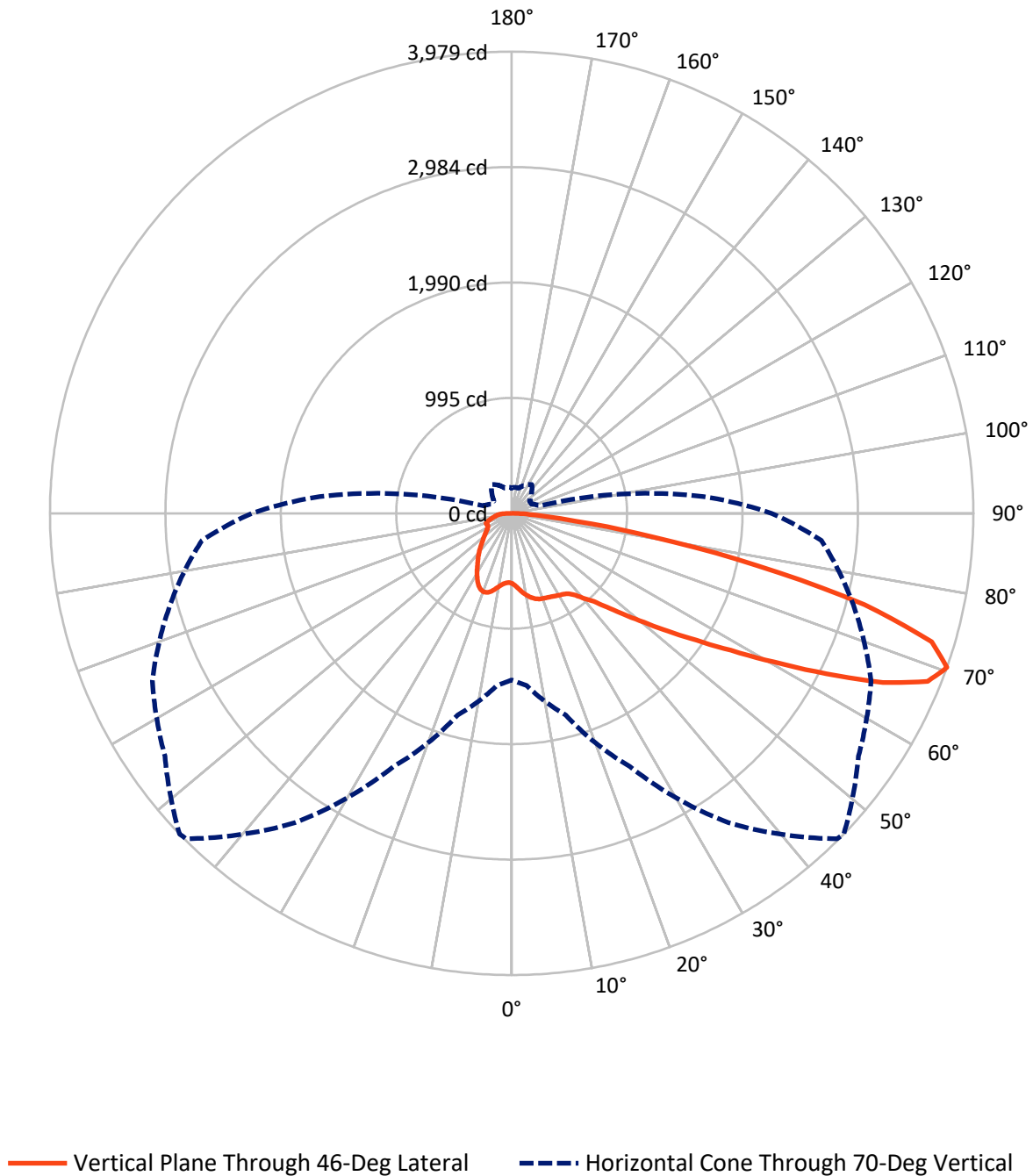
✕ Max cd  
 - - - 1/2 Max cd



Based on 10 foot mounting height. Maximum calculated value = 7.5 fc  
 Type IV - Short - N/A

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## Luminous Intensity Polar Plot



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CATALOG NUMBER: GLEON-SA1D-722-U-T4W

**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 1359.2   | 0.0    | 1359.2 |
|                    | % Fixture | 22.9     | 0.0    | 22.9   |
| <b>Street Side</b> | Lumens    | 4570.9   | 0.0    | 4570.9 |
|                    | % Fixture | 77.1     | 0.0    | 77.1   |
| <b>Total</b>       | Lumens    | 5930.0   | 0.0    | 5930.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 61.6   | 1.0       |
| 10°-20°   | 205.2  | 3.5       |
| 20°-30°   | 342.1  | 5.8       |
| 30°-40°   | 485.5  | 8.2       |
| 40°-50°   | 714.2  | 12.0      |
| 50°-60°   | 1209.5 | 20.4      |
| 60°-70°   | 1716.8 | 29.0      |
| 70°-80°   | 1043.0 | 17.6      |
| 80°-90°   | 152.2  | 2.6       |
| 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°    | 5930.0 | 100.0     |
| 0°-180°   | 5930.0 | 100.0     |

**Coefficient of Utilization**



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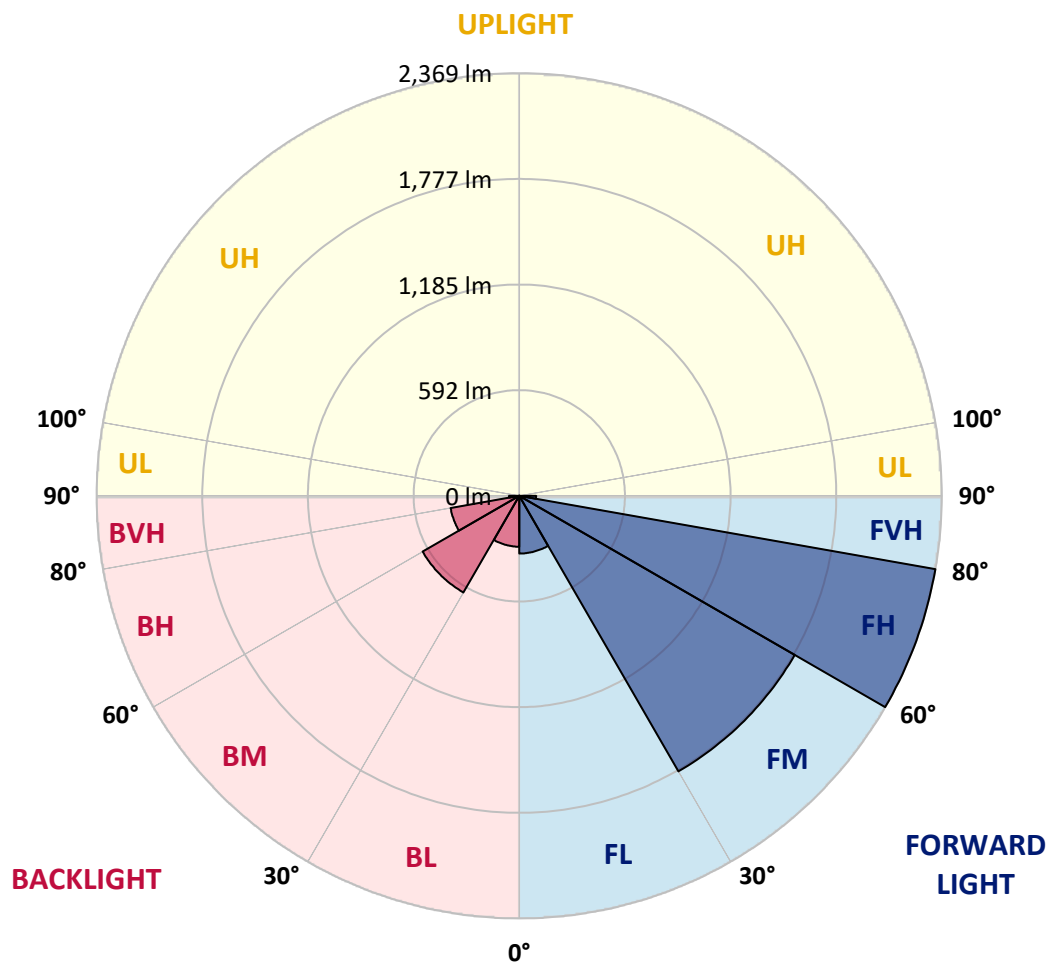
CATALOG NUMBER: GLEON-SA1D-722-U-T4W

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 323.6  | 5.5       |                         |      |         |
| FM   | (30°-60°)   | 1783.5 | 30.1      |                         |      |         |
| FH   | (60°-80°)   | 2369.0 | 39.9      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 94.8   | 1.6       |                         |      | G1/100  |
| BL   | (0°-30°)    | 285.4  | 4.8       | B1/500                  |      |         |
| BM   | (30°-60°)   | 625.7  | 10.6      | B1/1000                 |      |         |
| BH   | (60°-80°)   | 390.7  | 6.6       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 57.4   | 1.0       |                         |      | G1/100  |
| 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°    | 45°    | 46°    | 55°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 604.2  | 604.2  | 604.2  | 604.2  | 604.2  | 604.2  | 604.2  | 604.2  | 604.2  | 604.2  | 604.2  |
| 2.5°  | 634.4  | 634.8  | 635.6  | 633.6  | 627.9  | 626.3  | 625.7  | 619.8  | 615.9  | 610.2  | 605.4  |
| 5°    | 685.1  | 685.5  | 684.3  | 678.6  | 666.0  | 656.7  | 655.9  | 642.5  | 630.3  | 617.3  | 607.6  |
| 7.5°  | 738.1  | 738.7  | 734.8  | 724.1  | 706.4  | 690.2  | 689.2  | 670.9  | 652.5  | 632.8  | 618.2  |
| 10°   | 785.0  | 782.5  | 776.2  | 761.2  | 740.3  | 720.4  | 719.6  | 700.5  | 679.2  | 655.5  | 636.0  |
| 12.5° | 816.2  | 814.2  | 806.1  | 787.8  | 764.9  | 746.6  | 745.0  | 727.3  | 706.6  | 680.7  | 657.3  |
| 15°   | 833.5  | 834.9  | 823.9  | 803.2  | 780.9  | 765.5  | 764.1  | 751.5  | 733.0  | 706.8  | 680.1  |
| 17.5° | 835.7  | 836.9  | 826.4  | 805.9  | 787.6  | 777.1  | 776.4  | 768.1  | 754.7  | 729.6  | 701.6  |
| 20°   | 822.7  | 823.5  | 814.8  | 798.0  | 786.0  | 782.7  | 782.5  | 778.9  | 768.9  | 746.6  | 719.4  |
| 22.5° | 803.8  | 804.5  | 798.2  | 786.0  | 781.9  | 787.0  | 788.4  | 787.0  | 779.9  | 759.0  | 733.4  |
| 25°   | 799.2  | 798.8  | 792.3  | 779.9  | 783.3  | 794.1  | 795.9  | 796.5  | 791.7  | 773.4  | 751.3  |
| 27.5° | 821.7  | 820.3  | 807.9  | 788.0  | 790.2  | 803.2  | 805.7  | 811.6  | 808.5  | 792.5  | 771.6  |
| 30°   | 886.8  | 884.4  | 859.0  | 818.9  | 807.9  | 814.6  | 817.6  | 827.0  | 827.6  | 814.2  | 798.6  |
| 32.5° | 996.8  | 993.8  | 948.3  | 876.5  | 837.7  | 826.2  | 829.0  | 843.0  | 850.5  | 840.2  | 823.3  |
| 35°   | 1135.9 | 1132.4 | 1072.7 | 974.5  | 887.7  | 848.3  | 850.3  | 861.5  | 876.5  | 861.9  | 839.6  |
| 37.5° | 1280.8 | 1272.4 | 1215.0 | 1089.8 | 967.0  | 895.6  | 895.6  | 897.0  | 904.1  | 873.7  | 858.6  |
| 40°   | 1424.8 | 1416.5 | 1364.6 | 1225.3 | 1069.7 | 970.1  | 965.4  | 933.9  | 928.2  | 902.1  | 897.0  |
| 42.5° | 1558.8 | 1556.3 | 1525.7 | 1378.6 | 1190.2 | 1043.3 | 1036.8 | 983.4  | 984.7  | 968.4  | 968.6  |
| 45°   | 1701.2 | 1701.2 | 1676.3 | 1533.2 | 1330.7 | 1161.0 | 1154.5 | 1076.0 | 1088.2 | 1080.7 | 1098.7 |
| 47.5° | 1817.5 | 1821.2 | 1817.7 | 1694.3 | 1494.0 | 1310.6 | 1298.8 | 1204.2 | 1238.3 | 1264.1 | 1316.7 |
| 50°   | 1936.2 | 1941.9 | 1942.5 | 1871.1 | 1691.5 | 1488.4 | 1475.0 | 1374.5 | 1450.6 | 1524.5 | 1627.8 |
| 52.5° | 2108.5 | 2121.3 | 2070.4 | 2047.5 | 1933.4 | 1699.4 | 1686.2 | 1593.5 | 1720.5 | 1824.2 | 2002.2 |
| 55°   | 2268.3 | 2257.1 | 2220.8 | 2235.0 | 2192.4 | 1939.7 | 1929.8 | 1848.4 | 2021.3 | 2156.0 | 2387.2 |
| 57.5° | 2354.7 | 2353.9 | 2390.4 | 2451.3 | 2471.6 | 2236.0 | 2227.7 | 2148.5 | 2360.4 | 2461.7 | 2748.6 |
| 60°   | 2456.2 | 2457.6 | 2548.1 | 2686.3 | 2769.9 | 2604.9 | 2601.3 | 2541.2 | 2689.8 | 2747.0 | 3032.1 |
| 62.5° | 2470.4 | 2496.0 | 2651.8 | 2889.7 | 3049.2 | 3036.0 | 3044.1 | 2894.9 | 2984.4 | 2974.7 | 3243.8 |
| 65°   | 2307.0 | 2340.7 | 2622.8 | 2951.1 | 3326.8 | 3507.4 | 3514.9 | 3250.7 | 3216.8 | 3169.3 | 3319.5 |
| 67.5° | 1972.2 | 2022.1 | 2328.5 | 2817.4 | 3418.3 | 3855.9 | 3866.4 | 3526.5 | 3409.6 | 3235.3 | 3137.2 |
| 70°   | 1435.2 | 1490.6 | 1799.1 | 2406.3 | 3255.1 | 3967.3 | 3979.2 | 3648.4 | 3416.9 | 3047.5 | 2678.2 |
| 72.5° | 867.0  | 910.4  | 1164.7 | 1771.5 | 2747.4 | 3764.3 | 3785.6 | 3493.8 | 3119.6 | 2581.4 | 1977.6 |
| 75°   | 380.7  | 409.1  | 563.2  | 1020.8 | 1966.9 | 3114.5 | 3141.1 | 2990.5 | 2534.7 | 1876.0 | 1168.9 |
| 77.5° | 162.1  | 170.3  | 230.9  | 443.4  | 1111.9 | 2128.2 | 2164.8 | 2185.0 | 1719.7 | 1020.8 | 494.0  |
| 80°   | 101.1  | 104.3  | 130.7  | 200.7  | 520.3  | 1195.3 | 1234.7 | 1285.6 | 854.0  | 375.2  | 172.5  |
| 82.5° | 61.5   | 65.1   | 86.9   | 121.4  | 270.9  | 541.8  | 560.7  | 596.6  | 331.4  | 162.1  | 89.3   |
| 85°   | 36.9   | 39.6   | 53.2   | 76.7   | 154.2  | 213.1  | 212.9  | 235.4  | 156.1  | 104.3  | 47.1   |
| 87.5° | 17.7   | 19.7   | 28.4   | 39.8   | 77.7   | 80.0   | 74.9   | 84.8   | 94.8   | 68.4   | 23.7   |
| 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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**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 604.2  | 604.2  | 604.2 | 604.2 | 604.2 | 604.2 | 604.2 | 604.2 | 604.2 | 604.2 | 604.2 |
| 2.5°  | 603.7  | 602.9  | 600.3 | 598.3 | 597.9 | 596.6 | 595.6 | 596.2 | 597.0 | 597.3 | 597.3 |
| 5°    | 603.5  | 601.3  | 597.9 | 596.4 | 598.3 | 600.7 | 603.7 | 607.8 | 610.2 | 612.1 | 613.3 |
| 7.5°  | 613.3  | 609.0  | 605.2 | 604.4 | 608.0 | 614.5 | 621.4 | 629.9 | 635.8 | 639.9 | 640.7 |
| 10°   | 629.5  | 624.2  | 620.4 | 621.2 | 627.7 | 637.0 | 646.8 | 657.7 | 666.7 | 672.1 | 672.5 |
| 12.5° | 648.2  | 643.1  | 639.5 | 642.9 | 653.7 | 665.0 | 675.2 | 684.7 | 692.8 | 698.3 | 698.3 |
| 15°   | 669.7  | 666.0  | 661.8 | 669.7 | 684.3 | 694.5 | 698.7 | 703.4 | 707.9 | 711.9 | 711.1 |
| 17.5° | 690.4  | 687.0  | 684.7 | 694.1 | 709.3 | 713.9 | 711.1 | 707.7 | 707.7 | 709.9 | 710.3 |
| 20°   | 708.3  | 705.2  | 706.6 | 715.8 | 723.7 | 718.8 | 708.3 | 697.3 | 692.8 | 694.1 | 695.3 |
| 22.5° | 723.9  | 722.5  | 726.7 | 731.0 | 725.3 | 708.3 | 688.8 | 674.0 | 668.5 | 668.1 | 668.5 |
| 25°   | 742.1  | 741.9  | 747.2 | 739.5 | 714.3 | 682.9 | 656.7 | 642.3 | 639.3 | 641.7 | 645.8 |
| 27.5° | 764.9  | 767.1  | 769.7 | 741.5 | 692.0 | 644.5 | 618.0 | 608.0 | 611.1 | 616.9 | 620.8 |
| 30°   | 793.9  | 800.0  | 794.3 | 736.5 | 660.0 | 600.7 | 575.3 | 572.5 | 580.8 | 589.1 | 593.2 |
| 32.5° | 822.1  | 831.6  | 817.8 | 723.3 | 618.6 | 554.2 | 534.5 | 533.7 | 543.9 | 552.0 | 557.7 |
| 35°   | 844.8  | 863.7  | 835.5 | 697.1 | 570.7 | 511.4 | 497.0 | 491.5 | 495.2 | 504.7 | 511.2 |
| 37.5° | 874.5  | 905.9  | 847.7 | 657.1 | 518.7 | 476.1 | 459.3 | 446.7 | 443.4 | 447.3 | 450.5 |
| 40°   | 928.7  | 970.3  | 853.4 | 601.3 | 468.0 | 440.8 | 423.7 | 405.3 | 392.5 | 383.1 | 383.4 |
| 42.5° | 1017.1 | 1054.1 | 849.7 | 533.5 | 421.1 | 406.3 | 387.0 | 365.7 | 345.0 | 323.9 | 322.3 |
| 45°   | 1160.8 | 1178.7 | 838.7 | 461.7 | 379.9 | 370.2 | 352.1 | 330.8 | 303.2 | 279.2 | 277.0 |
| 47.5° | 1390.7 | 1351.2 | 821.7 | 399.0 | 343.6 | 339.5 | 322.9 | 298.3 | 269.1 | 249.8 | 248.2 |
| 50°   | 1704.3 | 1600.2 | 813.4 | 349.1 | 311.5 | 312.7 | 299.1 | 273.2 | 245.6 | 231.4 | 229.7 |
| 52.5° | 2079.3 | 1890.2 | 829.4 | 310.5 | 285.7 | 290.0 | 279.9 | 255.5 | 232.4 | 221.2 | 219.6 |
| 55°   | 2468.4 | 2190.5 | 846.7 | 282.5 | 261.4 | 269.7 | 266.3 | 246.2 | 225.3 | 214.9 | 213.5 |
| 57.5° | 2801.4 | 2414.8 | 812.2 | 259.8 | 239.7 | 252.7 | 255.7 | 240.3 | 221.6 | 212.3 | 210.7 |
| 60°   | 3011.0 | 2505.1 | 721.7 | 238.5 | 222.4 | 239.1 | 249.6 | 238.7 | 223.0 | 222.2 | 221.0 |
| 62.5° | 3110.5 | 2497.2 | 585.9 | 221.6 | 211.7 | 233.2 | 254.1 | 247.8 | 239.3 | 246.6 | 247.2 |
| 65°   | 3065.8 | 2377.8 | 436.3 | 210.4 | 204.0 | 235.4 | 267.5 | 265.0 | 243.9 | 251.2 | 252.3 |
| 67.5° | 2772.0 | 2093.1 | 323.1 | 200.7 | 195.4 | 241.7 | 291.8 | 270.7 | 234.8 | 240.1 | 236.8 |
| 70°   | 2240.5 | 1659.4 | 249.2 | 189.7 | 186.7 | 240.9 | 302.8 | 267.3 | 224.9 | 226.1 | 217.3 |
| 72.5° | 1545.0 | 1131.6 | 202.7 | 179.6 | 174.1 | 219.6 | 295.1 | 258.7 | 216.5 | 207.2 | 195.6 |
| 75°   | 840.2  | 607.4  | 172.3 | 169.0 | 152.0 | 192.8 | 280.9 | 252.7 | 209.0 | 196.6 | 190.2 |
| 77.5° | 330.6  | 252.1  | 149.6 | 154.6 | 132.9 | 170.3 | 265.0 | 241.1 | 198.7 | 182.4 | 179.2 |
| 80°   | 135.0  | 128.7  | 124.0 | 133.7 | 114.3 | 149.0 | 246.0 | 227.5 | 186.3 | 169.3 | 162.8 |
| 82.5° | 76.5   | 80.0   | 96.4  | 105.5 | 92.7  | 137.2 | 236.8 | 216.5 | 171.5 | 151.6 | 143.9 |
| 85°   | 39.2   | 46.9   | 67.2  | 75.7  | 68.2  | 116.7 | 218.2 | 189.5 | 137.6 | 116.1 | 116.7 |
| 87.5° | 18.9   | 26.2   | 42.4  | 47.5  | 44.2  | 84.4  | 163.0 | 137.4 | 107.2 | 84.8  | 82.2  |
| 90°   | 0.0    | 0.0    | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |

LM-79-2008: Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Report Prepared for

Cooper Lighting Solutions

McGRAW-EDISON

Report Number: SP1-1908-441-10-R4

Test Date: 10/25/2019

Luminaire Tested: SA1C-722-U-5WQ

Data in this report applies to families of products SA1C-722-U-5WQ.

### Test Information

Test Method: LM-79-2008 Report  
 Number: SP1-1908-441-10-R4  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry:  $4\pi$   
 Issue Date: 10/28/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: MCGRAW-EDISON  
 Catalog Number: **SA1C-722-U-5WQ**  
 Description: MCGRAW EDISON ROADWAY AND AREA LUMINAIRE

\*\*\*THIS IS A REVISION OF SP1-1908-441-4-R3. TO UPDATE THE CATALOG INFORMATION.\*\*\*TESTED IN SITU. ROADWAY AND AREA LUMINAIRE. (1) 70 CRI, 5000K, 1050MA LIGHTSQUARE WITH 16 LEDS AND TYPE V WIDE OPTICS.

### Spectral Parameters

|                           |         |           |      |      |       |
|---------------------------|---------|-----------|------|------|-------|
| CCT (K):                  | 2237    | CRI (Ra): | 72.0 |      |       |
| CIE u':                   | 0.2876  | R1:       | 68.9 | R9:  | -17.4 |
| CIE v':                   | 0.5346  | R2:       | 83.0 | R10: | 61.3  |
| Duv:                      | -0.0006 | R3:       | 95.2 | R11: | 59.8  |
| CIE x:                    | 0.5005  | R4:       | 66.2 | R12: | 50.5  |
| CIE y:                    | 0.4134  | R5:       | 65.9 | R13: | 71.1  |
| CIE z:                    | 0.0860  | R6:       | 76.3 | R14: | 96.9  |
| Peak Wavelength (nm):     | 603     | R7:       | 76.7 |      |       |
| Dominant Wavelength (nm): | 587     | R8:       | 43.8 |      |       |
| Purity:                   | 74.5    |           |      |      |       |
| Rf:                       | 69.8    |           |      |      |       |
| Rg:                       | 99.2    |           |      |      |       |



### Test Conditions

Stabilization Time: 71M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.7/41%  
 Sphere Temperature (°C): 25.6

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| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 6/28/2019        | 12/28/2019           |
| Power Meter                    | IN0071                | 12/5/2018        | 12/5/2019            |
| AC Power Source                | IN0063                | 12/5/2018        | 12/5/2019            |
| DC Power Source                | IN0208                | 12/5/2018        | 12/5/2019            |
| Sphere Thermometer             | IN0085                | 12/5/2018        | 12/5/2019            |
| Room Thermometer               | IN0046                | 12/5/2018        | 12/5/2019            |

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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 2200K 4-step quadrangle

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**Photopic Flux vs. Wavelength**



#####

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 1768             | NR               | 490       | 5206             | NR               | 620       | 130919           | NR               | 750       | 8553             | NR               | 880       | 2713             | NR               |
| 365       | 1569             | NR               | 495       | 7286             | NR               | 625       | 125335           | NR               | 755       | 7696             | NR               | 885       | 2316             | NR               |
| 370       | 1594             | NR               | 500       | 10654            | NR               | 630       | 118388           | NR               | 760       | 6978             | NR               | 890       | 2539             | NR               |
| 375       | 1744             | NR               | 505       | 15189            | NR               | 635       | 111855           | NR               | 765       | 6377             | NR               | 895       | 1933             | NR               |
| 380       | 1659             | NR               | 510       | 20541            | NR               | 640       | 104062           | NR               | 770       | 5600             | NR               | 900       | 2216             | NR               |
| 385       | 1504             | NR               | 515       | 26492            | NR               | 645       | 96365            | NR               | 775       | 5000             | NR               | 905       | 2067             | NR               |
| 390       | 1541             | NR               | 520       | 32294            | NR               | 650       | 88651            | NR               | 780       | 4709             | NR               | 910       | 1959             | NR               |
| 395       | 1355             | NR               | 525       | 38123            | NR               | 655       | 81152            | NR               | 785       | 4305             | NR               | 915       | 1874             | NR               |
| 400       | 1243             | NR               | 530       | 43232            | NR               | 660       | 73523            | NR               | 790       | 4040             | NR               | 920       | 1484             | NR               |
| 405       | 1417             | NR               | 535       | 48012            | NR               | 665       | 66123            | NR               | 795       | 3642             | NR               | 925       | 1914             | NR               |
| 410       | 2147             | NR               | 540       | 52623            | NR               | 670       | 58677            | NR               | 800       | 3594             | NR               | 930       | 1948             | NR               |
| 415       | 3837             | NR               | 545       | 57516            | NR               | 675       | 52349            | NR               | 805       | 3190             | NR               | 935       | 2079             | NR               |
| 420       | 7159             | NR               | 550       | 62613            | NR               | 680       | 46159            | NR               | 810       | 3241             | NR               | 940       | 2263             | NR               |
| 425       | 12599            | NR               | 555       | 68554            | NR               | 685       | 40525            | NR               | 815       | 2732             | NR               | 945       | 1688             | NR               |
| 430       | 19019            | NR               | 560       | 75325            | NR               | 690       | 35615            | NR               | 820       | 2612             | NR               | 950       | 1560             | NR               |
| 435       | 24875            | NR               | 565       | 82533            | NR               | 695       | 31158            | NR               | 825       | 2966             | NR               | 955       | 2826             | NR               |
| 440       | 29103            | NR               | 570       | 90909            | NR               | 700       | 27409            | NR               | 830       | 2574             | NR               | 960       | 1477             | NR               |
| 445       | 29901            | NR               | 575       | 99621            | NR               | 705       | 24204            | NR               | 835       | 2633             | NR               | 965       | 1568             | NR               |
| 450       | 24862            | NR               | 580       | 108484           | NR               | 710       | 21558            | NR               | 840       | 2526             | NR               | 970       | 2030             | NR               |
| 455       | 15942            | NR               | 585       | 116679           | NR               | 715       | 19222            | NR               | 845       | 2631             | NR               | 975       | 1986             | NR               |
| 460       | 9916             | NR               | 590       | 123752           | NR               | 720       | 17310            | NR               | 850       | 2079             | NR               | 980       | 2540             | NR               |
| 465       | 7051             | NR               | 595       | 129324           | NR               | 725       | 15280            | NR               | 855       | 2309             | NR               | 985       | 1139             | NR               |
| 470       | 5227             | NR               | 600       | 134082           | NR               | 730       | 13282            | NR               | 860       | 2528             | NR               | 990       | 2018             | NR               |
| 475       | 4257             | NR               | 605       | 135698           | NR               | 735       | 11753            | NR               | 865       | 2121             | NR               | 995       | 3445             | NR               |
| 480       | 4052             | NR               | 610       | 135144           | NR               | 740       | 10654            | NR               | 870       | 2751             | NR               | 1000      | 3704             | NR               |
| 485       | 4298             | NR               | 615       | 134180           | NR               | 745       | 9451             | NR               | 875       | 2317             | NR               |           |                  |                  |

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**Scotopic Flux vs. Wavelength**



**Scotopic Lumens: 4696.9**

**S/P: 0.85**

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 1768             | NR               | 490       | 5206             | NR               | 620       | 130919           | NR               | 750       | 8553             | NR               | 880       | 2713             | NR               |
| 365       | 1569             | NR               | 495       | 7286             | NR               | 625       | 125335           | NR               | 755       | 7696             | NR               | 885       | 2316             | NR               |
| 370       | 1594             | NR               | 500       | 10654            | NR               | 630       | 118388           | NR               | 760       | 6978             | NR               | 890       | 2539             | NR               |
| 375       | 1744             | NR               | 505       | 15189            | NR               | 635       | 111855           | NR               | 765       | 6377             | NR               | 895       | 1933             | NR               |
| 380       | 1659             | NR               | 510       | 20541            | NR               | 640       | 104062           | NR               | 770       | 5600             | NR               | 900       | 2216             | NR               |
| 385       | 1504             | NR               | 515       | 26492            | NR               | 645       | 96365            | NR               | 775       | 5000             | NR               | 905       | 2067             | NR               |
| 390       | 1541             | NR               | 520       | 32294            | NR               | 650       | 88651            | NR               | 780       | 4709             | NR               | 910       | 1959             | NR               |
| 395       | 1355             | NR               | 525       | 38123            | NR               | 655       | 81152            | NR               | 785       | 4305             | NR               | 915       | 1874             | NR               |
| 400       | 1243             | NR               | 530       | 43232            | NR               | 660       | 73523            | NR               | 790       | 4040             | NR               | 920       | 1484             | NR               |
| 405       | 1417             | NR               | 535       | 48012            | NR               | 665       | 66123            | NR               | 795       | 3642             | NR               | 925       | 1914             | NR               |
| 410       | 2147             | NR               | 540       | 52623            | NR               | 670       | 58677            | NR               | 800       | 3594             | NR               | 930       | 1948             | NR               |
| 415       | 3837             | NR               | 545       | 57516            | NR               | 675       | 52349            | NR               | 805       | 3190             | NR               | 935       | 2079             | NR               |
| 420       | 7159             | NR               | 550       | 62613            | NR               | 680       | 46159            | NR               | 810       | 3241             | NR               | 940       | 2263             | NR               |
| 425       | 12599            | NR               | 555       | 68554            | NR               | 685       | 40525            | NR               | 815       | 2732             | NR               | 945       | 1688             | NR               |
| 430       | 19019            | NR               | 560       | 75325            | NR               | 690       | 35615            | NR               | 820       | 2612             | NR               | 950       | 1560             | NR               |
| 435       | 24875            | NR               | 565       | 82533            | NR               | 695       | 31158            | NR               | 825       | 2966             | NR               | 955       | 2826             | NR               |
| 440       | 29103            | NR               | 570       | 90909            | NR               | 700       | 27409            | NR               | 830       | 2574             | NR               | 960       | 1477             | NR               |
| 445       | 29901            | NR               | 575       | 99621            | NR               | 705       | 24204            | NR               | 835       | 2633             | NR               | 965       | 1568             | NR               |
| 450       | 24862            | NR               | 580       | 108484           | NR               | 710       | 21558            | NR               | 840       | 2526             | NR               | 970       | 2030             | NR               |
| 455       | 15942            | NR               | 585       | 116679           | NR               | 715       | 19222            | NR               | 845       | 2631             | NR               | 975       | 1986             | NR               |
| 460       | 9916             | NR               | 590       | 123752           | NR               | 720       | 17310            | NR               | 850       | 2079             | NR               | 980       | 2540             | NR               |
| 465       | 7051             | NR               | 595       | 129324           | NR               | 725       | 15280            | NR               | 855       | 2309             | NR               | 985       | 1139             | NR               |
| 470       | 5227             | NR               | 600       | 134082           | NR               | 730       | 13282            | NR               | 860       | 2528             | NR               | 990       | 2018             | NR               |
| 475       | 4257             | NR               | 605       | 135698           | NR               | 735       | 11753            | NR               | 865       | 2121             | NR               | 995       | 3445             | NR               |
| 480       | 4052             | NR               | 610       | 135144           | NR               | 740       | 10654            | NR               | 870       | 2751             | NR               | 1000      | 3704             | NR               |
| 485       | 4298             | NR               | 615       | 134180           | NR               | 745       | 9451             | NR               | 875       | 2317             | NR               |           |                  |                  |

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**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 1470.8 M/P: 0.27**

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 1768             | NR               | 490       | 5206             | NR               | 620       | 130919           | NR               | 750       | 8553             | NR               | 880       | 2713             | NR               |
| 365       | 1569             | NR               | 495       | 7286             | NR               | 625       | 125335           | NR               | 755       | 7696             | NR               | 885       | 2316             | NR               |
| 370       | 1594             | NR               | 500       | 10654            | NR               | 630       | 118388           | NR               | 760       | 6978             | NR               | 890       | 2539             | NR               |
| 375       | 1744             | NR               | 505       | 15189            | NR               | 635       | 111855           | NR               | 765       | 6377             | NR               | 895       | 1933             | NR               |
| 380       | 1659             | NR               | 510       | 20541            | NR               | 640       | 104062           | NR               | 770       | 5600             | NR               | 900       | 2216             | NR               |
| 385       | 1504             | NR               | 515       | 26492            | NR               | 645       | 96365            | NR               | 775       | 5000             | NR               | 905       | 2067             | NR               |
| 390       | 1541             | NR               | 520       | 32294            | NR               | 650       | 88651            | NR               | 780       | 4709             | NR               | 910       | 1959             | NR               |
| 395       | 1355             | NR               | 525       | 38123            | NR               | 655       | 81152            | NR               | 785       | 4305             | NR               | 915       | 1874             | NR               |
| 400       | 1243             | NR               | 530       | 43232            | NR               | 660       | 73523            | NR               | 790       | 4040             | NR               | 920       | 1484             | NR               |
| 405       | 1417             | NR               | 535       | 48012            | NR               | 665       | 66123            | NR               | 795       | 3642             | NR               | 925       | 1914             | NR               |
| 410       | 2147             | NR               | 540       | 52623            | NR               | 670       | 58677            | NR               | 800       | 3594             | NR               | 930       | 1948             | NR               |
| 415       | 3837             | NR               | 545       | 57516            | NR               | 675       | 52349            | NR               | 805       | 3190             | NR               | 935       | 2079             | NR               |
| 420       | 7159             | NR               | 550       | 62613            | NR               | 680       | 46159            | NR               | 810       | 3241             | NR               | 940       | 2263             | NR               |
| 425       | 12599            | NR               | 555       | 68554            | NR               | 685       | 40525            | NR               | 815       | 2732             | NR               | 945       | 1688             | NR               |
| 430       | 19019            | NR               | 560       | 75325            | NR               | 690       | 35615            | NR               | 820       | 2612             | NR               | 950       | 1560             | NR               |
| 435       | 24875            | NR               | 565       | 82533            | NR               | 695       | 31158            | NR               | 825       | 2966             | NR               | 955       | 2826             | NR               |
| 440       | 29103            | NR               | 570       | 90909            | NR               | 700       | 27409            | NR               | 830       | 2574             | NR               | 960       | 1477             | NR               |
| 445       | 29901            | NR               | 575       | 99621            | NR               | 705       | 24204            | NR               | 835       | 2633             | NR               | 965       | 1568             | NR               |
| 450       | 24862            | NR               | 580       | 108484           | NR               | 710       | 21558            | NR               | 840       | 2526             | NR               | 970       | 2030             | NR               |
| 455       | 15942            | NR               | 585       | 116679           | NR               | 715       | 19222            | NR               | 845       | 2631             | NR               | 975       | 1986             | NR               |
| 460       | 9916             | NR               | 590       | 123752           | NR               | 720       | 17310            | NR               | 850       | 2079             | NR               | 980       | 2540             | NR               |
| 465       | 7051             | NR               | 595       | 129324           | NR               | 725       | 15280            | NR               | 855       | 2309             | NR               | 985       | 1139             | NR               |
| 470       | 5227             | NR               | 600       | 134082           | NR               | 730       | 13282            | NR               | 860       | 2528             | NR               | 990       | 2018             | NR               |
| 475       | 4257             | NR               | 605       | 135698           | NR               | 735       | 11753            | NR               | 865       | 2121             | NR               | 995       | 3445             | NR               |
| 480       | 4052             | NR               | 610       | 135144           | NR               | 740       | 10654            | NR               | 870       | 2751             | NR               | 1000      | 3704             | NR               |
| 485       | 4298             | NR               | 615       | 134180           | NR               | 745       | 9451             | NR               | 875       | 2317             | NR               |           |                  |                  |

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### Summary

$R_f = 69.8$   
 $R_g = 99.2$   
 CIE  $R_a = 72.0$   
 $R_g = -17.4$



### Color Vector Graphics



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 87 | CES26 = 56 | CES51 = 74 | CES76 = 56 |
| CES02 = 65 | CES27 = 76 | CES52 = 76 | CES77 = 81 |
| CES03 = 32 | CES28 = 83 | CES53 = 65 | CES78 = 63 |
| CES04 = 72 | CES29 = 46 | CES54 = 78 | CES79 = 84 |
| CES05 = 52 | CES30 = 48 | CES55 = 75 | CES80 = 84 |
| CES06 = 52 | CES31 = 51 | CES56 = 65 | CES81 = 63 |
| CES07 = 44 | CES32 = 51 | CES57 = 62 | CES82 = 92 |
| CES08 = 42 | CES33 = 53 | CES58 = 66 | CES83 = 83 |
| CES09 = 29 | CES34 = 70 | CES59 = 84 | CES84 = 92 |
| CES10 = 78 | CES35 = 85 | CES60 = 90 | CES85 = 81 |
| CES11 = 61 | CES36 = 78 | CES61 = 84 | CES86 = 56 |
| CES12 = 68 | CES37 = 80 | CES62 = 70 | CES87 = 78 |
| CES13 = 45 | CES38 = 53 | CES63 = 68 | CES88 = 72 |
| CES14 = 75 | CES39 = 90 | CES64 = 69 | CES89 = 62 |
| CES15 = 72 | CES40 = 84 | CES65 = 67 | CES90 = 67 |
| CES16 = 49 | CES41 = 75 | CES66 = 64 | CES91 = 90 |
| CES17 = 51 | CES42 = 79 | CES67 = 63 | CES92 = 67 |
| CES18 = 57 | CES43 = 64 | CES68 = 69 | CES93 = 79 |
| CES19 = 74 | CES44 = 98 | CES69 = 80 | CES94 = 52 |
| CES20 = 68 | CES45 = 73 | CES70 = 63 | CES95 = 76 |
| CES21 = 89 | CES46 = 67 | CES71 = 63 | CES96 = 78 |
| CES22 = 81 | CES47 = 60 | CES72 = 87 | CES97 = 77 |
| CES23 = 92 | CES48 = 48 | CES73 = 56 | CES98 = 71 |
| CES24 = 92 | CES49 = 64 | CES74 = 87 | CES99 = 65 |
| CES25 = 74 | CES50 = 74 | CES75 = 66 |            |



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Color Rendition by Hue-Angle Bin



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**Measure Comparisons**



(END OF REPORT)