

Scaled data based on original data using  
LM-79-2019 Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Test Report Prepared for

Cooper Lighting Solutions

Brand: McGRAW-EDISON

Report Number: P642491

Luminaire Tested: GWS-SA6D-722-U-SL3-W

Issue Date: 1/10/2023

**Test Information**

Test Method: LM-79-2019  
Report Number: P642491  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-31)  
Test Lab: COOPER LIGHTING SOLUTIONS  
Issue Date: 1/10/2023  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: McGRAW-EDISON  
Catalog Number: GWS-SA6D-722-U-SL3-W  
Description: GALLEON WALL SLIM LUMINAIRE. (6) LIGHTSQUARES WITH 16 LEDS EACH AND  
TYPE III SPILL LIGHT ELIMINATOR OPTICS  
Light Source: (96) 2200K CCT, 70 CRI LEDS  
Ballast/Driver: -

**Summary**

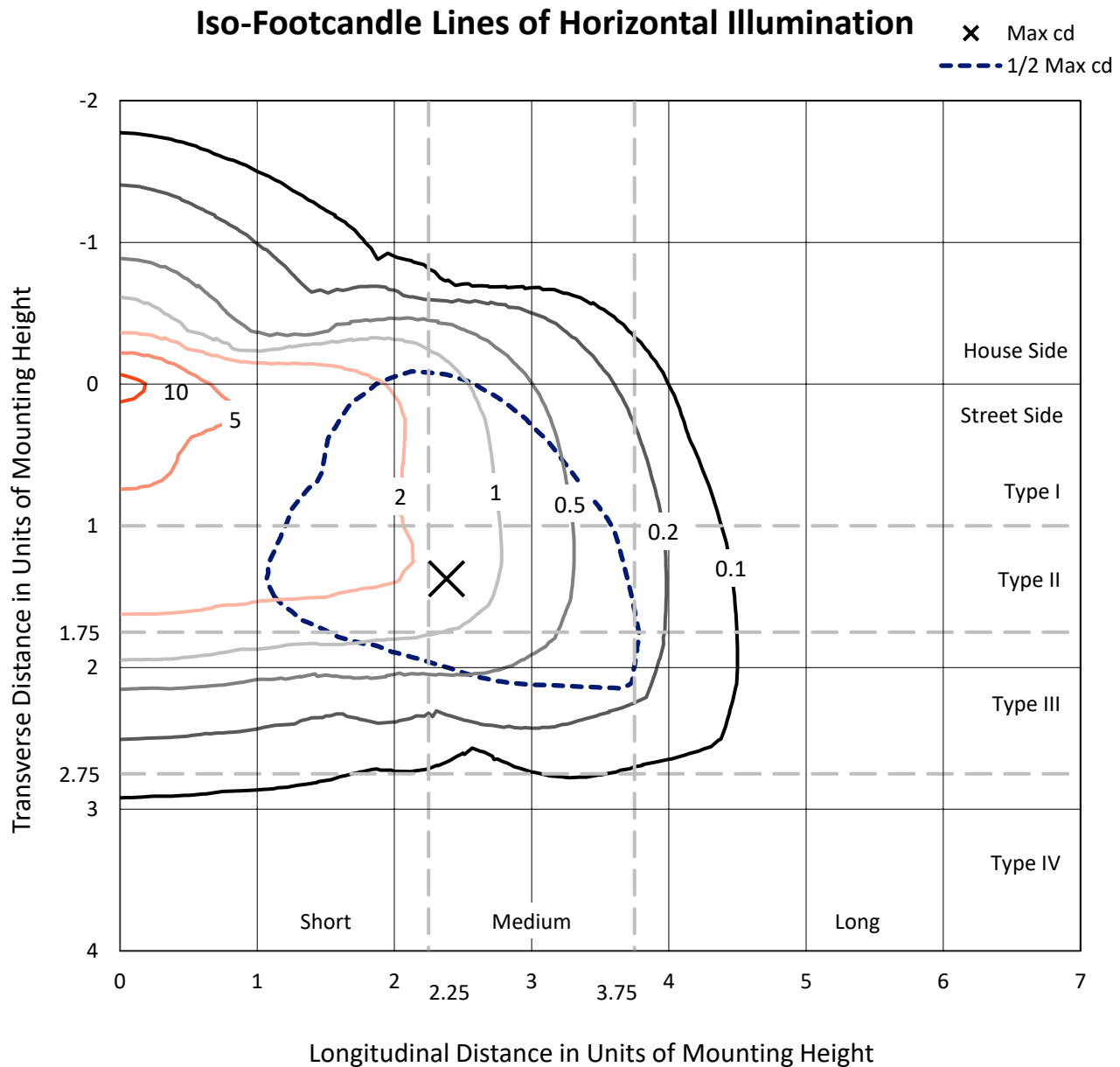
Lumens per Lamp: N/A  
Luminaire Lumens: 25853.6 lumens  
Efficiency: N/A  
Efficacy: 105.2 lumens/watt  
Luminous Opening: Rectangular (W 2' x L: 1' x H: 0')  
IES Classification: Type III - Medium  
BUG Rating: B3 - U0 - G4

Input Watts (W): 245.7  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 0  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT



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CATALOG NUMBER: GWS-SA6D-722-U-SL3-W

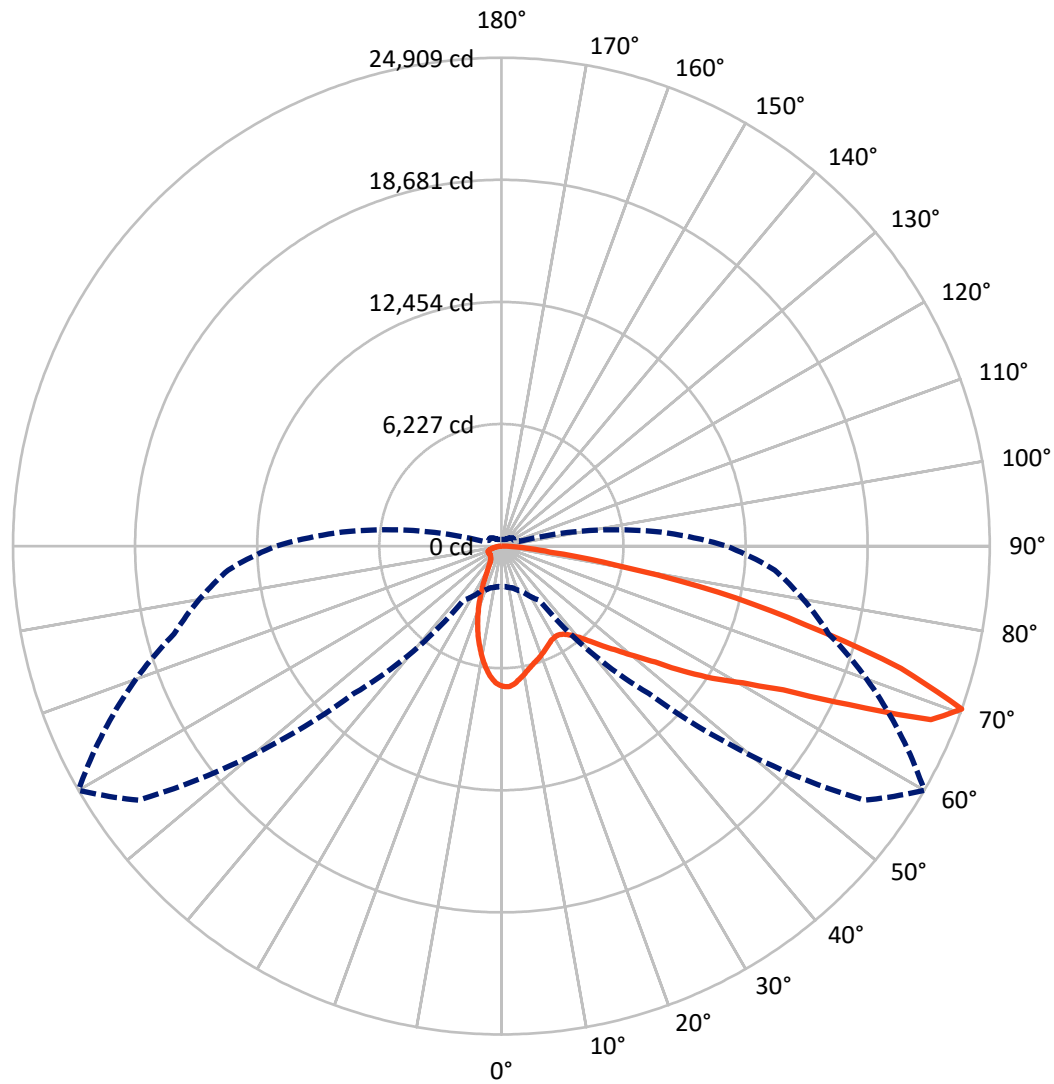


Based on 25 foot mounting height. Maximum calculated value = 11.4 fc  
 Type III - Medium - N/A

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## Luminous Intensity Polar Plot



— Vertical Plane Through 60-Deg Lateral    - - - Horizontal Cone Through 70-Deg Vertical

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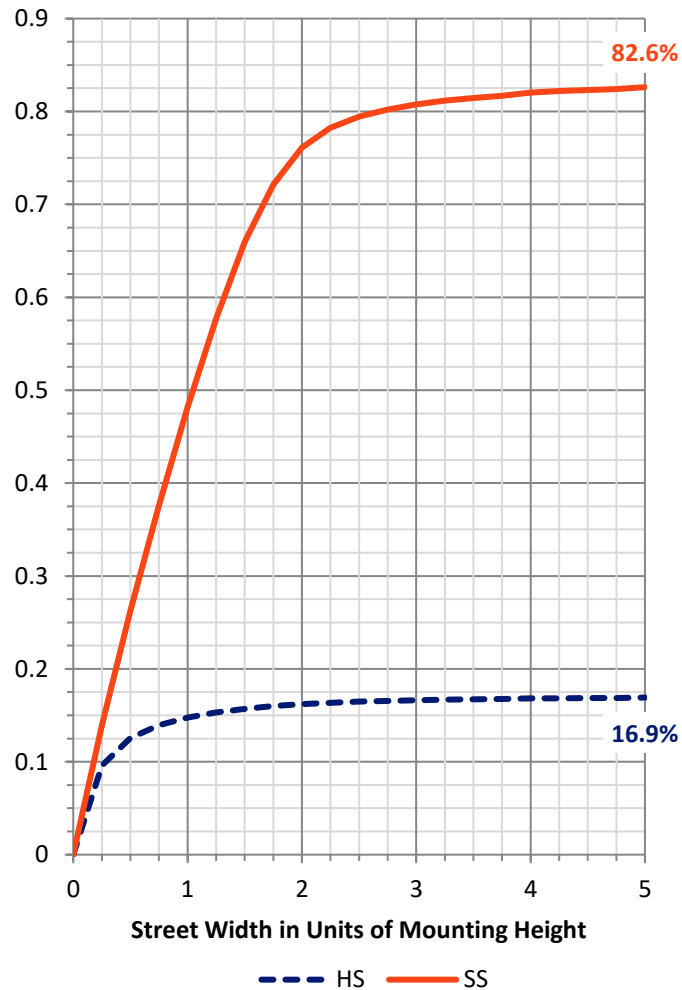
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 4421.6   | 0.0    | 4421.6  |
|                    | % Fixture | 17.1     | 0.0    | 17.1    |
| <b>Street Side</b> | Lumens    | 21432.0  | 0.0    | 21432.0 |
|                    | % Fixture | 82.9     | 0.0    | 82.9    |
| <b>Total</b>       | Lumens    | 25853.6  | 0.0    | 25853.6 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 616.6   | 2.4       |
| 10°-20°   | 1381.5  | 5.3       |
| 20°-30°   | 1769.2  | 6.8       |
| 30°-40°   | 2325.2  | 9.0       |
| 40°-50°   | 3373.5  | 13.0      |
| 50°-60°   | 5263.4  | 20.4      |
| 60°-70°   | 6890.9  | 26.7      |
| 70°-80°   | 3810.4  | 14.7      |
| 80°-90°   | 422.9   | 1.6       |
| 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°    | 25853.6 | 100.0     |
| 0°-180°   | 25853.6 | 100.0     |

**Coefficient of Utilization**



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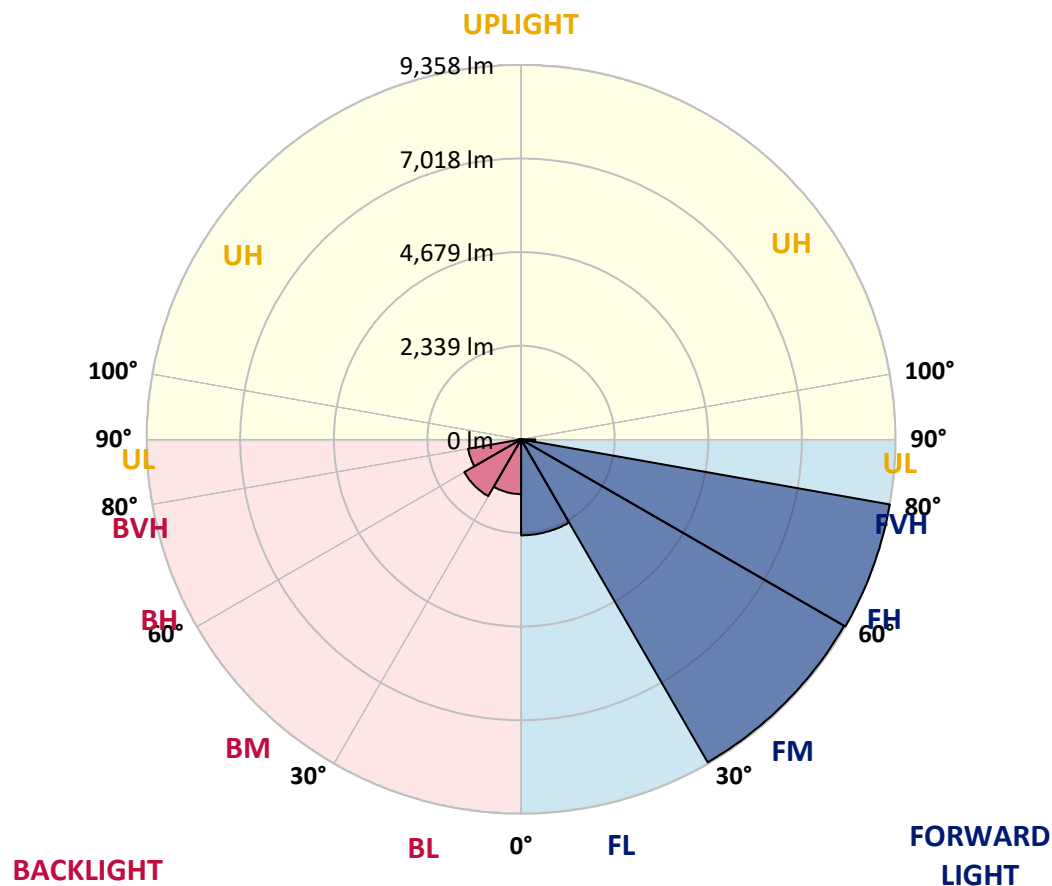
CATALOG NUMBER: GWS-SA6D-722-U-SL3-W

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |          |
|------|-------------|--------|-----------|-------------------------|------|----------|
|      |             |        |           | B                       | U    | G        |
| FL   | (0°-30°)    | 2399.4 | 9.3       |                         |      |          |
| FM   | (30°-60°)   | 9322.7 | 36.1      |                         |      |          |
| FH   | (60°-80°)   | 9357.6 | 36.2      |                         |      | G4/12000 |
| FVH  | (80°-90°)   | 352.4  | 1.4       |                         |      | G3/500   |
| BL   | (0°-30°)    | 1368.0 | 5.3       | B3/2500                 |      |          |
| BM   | (30°-60°)   | 1639.4 | 6.3       | B2/2500                 |      |          |
| BH   | (60°-80°)   | 1343.7 | 5.2       | B3/2500                 |      | G3/2500  |
| BVH  | (80°-90°)   | 70.5   | 0.3       |                         |      | G1/100   |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |          |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |          |

**BUG Rating: B3-U0-G4**

Type III Medium



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°     | 35°     | 45°     | 55°     | 60°     | 65°     | 75°     | 85°     |
|-------|--------|--------|--------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 7154.0 | 7154.0 | 7154.0 | 7154.0  | 7154.0  | 7154.0  | 7154.0  | 7154.0  | 7154.0  | 7154.0  | 7154.0  |
| 2.5°  | 7053.8 | 7061.3 | 7082.1 | 7112.4  | 7142.7  | 7157.8  | 7195.6  | 7184.3  | 7176.7  | 7161.6  | 7142.7  |
| 5°    | 6741.7 | 6756.8 | 6775.7 | 6834.3  | 6900.6  | 6953.5  | 7038.6  | 7048.1  | 7051.9  | 7059.4  | 7029.2  |
| 7.5°  | 6344.4 | 6348.2 | 6393.6 | 6471.2  | 6558.2  | 6649.0  | 6790.8  | 6830.6  | 6864.6  | 6902.4  | 6877.9  |
| 10°   | 5905.6 | 5915.0 | 5949.1 | 6060.7  | 6210.1  | 6344.4  | 6535.5  | 6601.7  | 6673.6  | 6756.8  | 6722.7  |
| 12.5° | 5546.2 | 5548.1 | 5602.9 | 5722.1  | 5884.8  | 6066.4  | 6304.7  | 6384.1  | 6478.7  | 6609.2  | 6579.0  |
| 15°   | 5260.5 | 5260.5 | 5311.6 | 5413.8  | 5601.0  | 5814.8  | 6098.5  | 6200.7  | 6329.3  | 6505.2  | 6452.2  |
| 17.5° | 5033.5 | 5035.4 | 5067.6 | 5175.4  | 5341.9  | 5578.3  | 5915.0  | 6053.1  | 6195.0  | 6427.7  | 6348.2  |
| 20°   | 4914.4 | 4904.9 | 4910.6 | 4976.8  | 5118.7  | 5347.5  | 5731.5  | 5892.3  | 6083.4  | 6374.7  | 6253.6  |
| 22.5° | 4908.7 | 4891.7 | 4867.1 | 4872.8  | 4956.0  | 5145.1  | 5534.8  | 5729.7  | 5969.9  | 6331.2  | 6157.2  |
| 25°   | 5005.2 | 4986.3 | 4942.7 | 4893.6  | 4886.0  | 4999.5  | 5349.4  | 5570.8  | 5852.6  | 6312.3  | 6064.5  |
| 27.5° | 5167.8 | 5154.6 | 5097.9 | 5024.1  | 4946.5  | 4942.7  | 5209.5  | 5440.2  | 5767.5  | 6331.2  | 5998.3  |
| 30°   | 5383.5 | 5360.8 | 5324.8 | 5230.3  | 5113.0  | 4991.9  | 5154.6  | 5370.2  | 5710.7  | 6391.7  | 5969.9  |
| 32.5° | 5627.5 | 5614.3 | 5580.2 | 5485.6  | 5360.8  | 5167.8  | 5198.1  | 5385.4  | 5710.7  | 6497.6  | 5975.6  |
| 35°   | 5886.7 | 5884.8 | 5884.8 | 5822.3  | 5684.3  | 5444.0  | 5370.2  | 5514.0  | 5797.7  | 6667.9  | 6036.1  |
| 37.5° | 6138.2 | 6136.3 | 6196.9 | 6219.6  | 6062.6  | 5803.4  | 5663.4  | 5771.3  | 5988.8  | 6919.5  | 6185.5  |
| 40°   | 6342.5 | 6350.1 | 6482.5 | 6596.0  | 6509.0  | 6268.8  | 6072.0  | 6126.9  | 6299.0  | 7277.0  | 6446.6  |
| 42.5° | 6548.7 | 6569.5 | 6768.1 | 6968.6  | 7002.7  | 6794.6  | 6596.0  | 6628.2  | 6743.5  | 7749.9  | 6836.2  |
| 45°   | 6773.8 | 6783.3 | 7061.3 | 7341.3  | 7505.9  | 7382.9  | 7220.2  | 7263.7  | 7290.2  | 8334.4  | 7417.0  |
| 47.5° | 6991.3 | 7015.9 | 7375.3 | 7759.3  | 8071.5  | 8060.1  | 7969.3  | 7956.1  | 7961.7  | 9045.6  | 8103.6  |
| 50°   | 7288.3 | 7324.3 | 7746.1 | 8209.5  | 8667.3  | 8877.3  | 8903.8  | 8803.5  | 8761.9  | 9836.3  | 8958.6  |
| 52.5° | 7852.0 | 7852.0 | 8230.3 | 8686.2  | 9301.0  | 9821.2  | 9999.0  | 9834.4  | 9702.0  | 10672.4 | 9866.6  |
| 55°   | 8557.6 | 8587.9 | 8888.6 | 9257.5  | 10036.8 | 10814.3 | 11415.8 | 11234.2 | 10859.7 | 11582.3 | 10818.1 |
| 57.5° | 8871.6 | 8909.4 | 9386.1 | 9959.3  | 10999.6 | 11943.6 | 12777.7 | 12713.4 | 12166.8 | 12528.1 | 11805.5 |
| 60°   | 8304.1 | 8383.6 | 9039.9 | 10000.9 | 11871.7 | 13765.2 | 14353.4 | 14166.2 | 13385.0 | 13521.1 | 12876.1 |
| 62.5° | 6927.0 | 7014.0 | 7742.3 | 9083.5  | 11750.6 | 15734.3 | 16837.1 | 16146.7 | 14905.8 | 14775.3 | 14302.4 |
| 65°   | 4133.1 | 4129.4 | 5005.2 | 6783.3  | 10258.1 | 16281.0 | 20767.9 | 19479.7 | 17255.2 | 16496.6 | 15770.3 |
| 67.5° | 2627.4 | 2621.8 | 2805.2 | 3594.0  | 6826.8  | 14941.7 | 23295.0 | 23629.8 | 20446.3 | 17762.1 | 15891.3 |
| 70°   | 2073.2 | 2071.3 | 2203.7 | 2563.1  | 3376.5  | 10632.7 | 22591.4 | 24908.6 | 22373.8 | 17279.8 | 13992.2 |
| 72.5° | 1511.4 | 1515.2 | 1719.5 | 2147.0  | 2604.7  | 5338.1  | 18293.6 | 21312.6 | 20578.7 | 15253.9 | 11359.0 |
| 75°   | 1085.8 | 1091.5 | 1214.4 | 1643.8  | 2402.3  | 2918.7  | 12164.9 | 16025.6 | 15656.8 | 12227.3 | 7814.2  |
| 77.5° | 690.4  | 698.0  | 805.8  | 1152.0  | 1940.8  | 2356.9  | 7375.3  | 11313.7 | 10417.0 | 6889.2  | 2778.8  |
| 80°   | 421.8  | 446.4  | 537.2  | 858.8   | 1551.1  | 1768.6  | 3686.7  | 5960.4  | 5217.0  | 1889.7  | 934.4   |
| 82.5° | 217.5  | 236.4  | 323.5  | 531.5   | 1068.8  | 1553.0  | 2086.4  | 2504.5  | 1615.4  | 790.7   | 497.5   |
| 85°   | 68.1   | 79.4   | 113.5  | 215.6   | 508.8   | 962.8   | 1380.9  | 1244.7  | 741.5   | 372.6   | 230.8   |
| 87.5° | 17.0   | 17.0   | 18.9   | 18.9    | 20.8    | 43.5    | 266.7   | 281.8   | 196.7   | 117.3   | 94.6    |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |



REPORT NUMBER: P642491

CATALOG NUMBER: GWS-SA6D-722-U-SL3-W

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°     | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|---------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 7154.0  | 7154.0  | 7154.0 | 7154.0 | 7154.0 | 7154.0 | 7154.0 | 7154.0 | 7154.0 | 7154.0 | 7154.0 |
| 2.5°  | 7104.8  | 7059.4  | 7040.5 | 7038.6 | 6991.3 | 6923.3 | 6877.9 | 6845.7 | 6826.8 | 6823.0 | 6823.0 |
| 5°    | 6978.1  | 6919.5  | 6841.9 | 6783.3 | 6656.5 | 6527.9 | 6420.1 | 6359.6 | 6289.6 | 6280.1 | 6278.2 |
| 7.5°  | 6809.8  | 6724.6  | 6577.1 | 6412.5 | 6191.2 | 5977.5 | 5795.9 | 5672.9 | 5550.0 | 5527.3 | 5519.7 |
| 10°   | 6628.2  | 6512.8  | 6261.2 | 5971.8 | 5640.7 | 5321.1 | 5043.0 | 4825.5 | 4681.7 | 4579.6 | 4560.6 |
| 12.5° | 6448.5  | 6295.2  | 5926.4 | 5495.1 | 5041.1 | 4604.2 | 4186.1 | 3830.5 | 3573.2 | 3423.8 | 3397.3 |
| 15°   | 6280.1  | 6066.4  | 5561.3 | 5010.8 | 4420.7 | 3822.9 | 3230.9 | 2769.3 | 2408.0 | 2279.4 | 2249.1 |
| 17.5° | 6126.9  | 5860.2  | 5207.6 | 4509.6 | 3773.7 | 2992.5 | 2319.1 | 1908.6 | 1696.8 | 1632.4 | 1617.3 |
| 20°   | 5973.7  | 5648.3  | 4848.2 | 3981.8 | 3087.1 | 2211.3 | 1694.9 | 1501.9 | 1422.5 | 1397.9 | 1390.3 |
| 22.5° | 5809.1  | 5415.6  | 4456.6 | 3461.6 | 2392.9 | 1655.1 | 1386.5 | 1301.4 | 1276.8 | 1278.7 | 1276.8 |
| 25°   | 5644.5  | 5179.2  | 4046.1 | 2896.0 | 1781.9 | 1343.0 | 1210.6 | 1178.5 | 1184.1 | 1201.2 | 1204.9 |
| 27.5° | 5508.3  | 4969.2  | 3643.2 | 2275.6 | 1392.2 | 1155.8 | 1093.3 | 1091.5 | 1112.3 | 1135.0 | 1138.7 |
| 30°   | 5410.0  | 4782.0  | 3246.0 | 1749.7 | 1146.3 | 1027.1 | 1002.5 | 1013.9 | 1038.5 | 1055.5 | 1061.2 |
| 32.5° | 5340.0  | 4621.2  | 2822.3 | 1375.2 | 1004.4 | 936.3  | 925.0  | 936.3  | 951.5  | 968.5  | 972.3  |
| 35°   | 5315.4  | 4503.9  | 2406.1 | 1121.7 | 908.0  | 870.1  | 862.6  | 868.2  | 875.8  | 885.3  | 889.1  |
| 37.5° | 5370.2  | 4445.3  | 1971.0 | 976.1  | 849.3  | 826.6  | 815.3  | 811.5  | 813.4  | 817.2  | 819.1  |
| 40°   | 5532.9  | 4471.7  | 1615.4 | 890.9  | 811.5  | 790.7  | 771.8  | 764.2  | 762.3  | 766.1  | 764.2  |
| 42.5° | 5812.9  | 4583.3  | 1358.2 | 841.8  | 781.2  | 751.0  | 730.2  | 722.6  | 722.6  | 732.0  | 732.0  |
| 45°   | 6223.4  | 4802.8  | 1172.8 | 805.8  | 754.7  | 716.9  | 694.2  | 690.4  | 698.0  | 713.1  | 715.0  |
| 47.5° | 6824.9  | 5124.3  | 1061.2 | 779.3  | 730.2  | 686.7  | 664.0  | 662.1  | 677.2  | 701.8  | 703.7  |
| 50°   | 7538.0  | 5587.8  | 1000.7 | 760.4  | 713.1  | 662.1  | 639.4  | 641.3  | 658.3  | 684.8  | 690.4  |
| 52.5° | 8396.8  | 6219.6  | 1004.4 | 752.9  | 703.7  | 646.9  | 624.2  | 620.4  | 637.5  | 664.0  | 669.6  |
| 55°   | 9284.0  | 6987.6  | 1078.2 | 754.7  | 690.4  | 639.4  | 609.1  | 595.9  | 611.0  | 629.9  | 631.8  |
| 57.5° | 10260.0 | 7853.9  | 1261.7 | 751.0  | 673.4  | 631.8  | 595.9  | 565.6  | 575.0  | 586.4  | 592.1  |
| 60°   | 11360.9 | 8873.5  | 1657.0 | 758.5  | 665.8  | 614.8  | 569.4  | 529.6  | 527.8  | 535.3  | 537.2  |
| 62.5° | 12832.6 | 10260.0 | 2101.6 | 771.8  | 682.9  | 594.0  | 529.6  | 488.0  | 480.5  | 484.2  | 486.1  |
| 65°   | 13958.1 | 10922.1 | 1961.6 | 760.4  | 718.8  | 578.8  | 491.8  | 448.3  | 433.2  | 429.4  | 429.4  |
| 67.5° | 13500.3 | 10046.3 | 1365.7 | 730.2  | 735.8  | 580.7  | 461.6  | 406.7  | 387.8  | 378.3  | 376.4  |
| 70°   | 11487.7 | 8160.4  | 949.6  | 699.9  | 716.9  | 576.9  | 429.4  | 372.6  | 348.1  | 334.8  | 332.9  |
| 72.5° | 9075.9  | 6230.9  | 768.0  | 639.4  | 650.7  | 520.2  | 382.1  | 334.8  | 314.0  | 297.0  | 297.0  |
| 75°   | 5841.3  | 3802.1  | 641.3  | 569.4  | 531.5  | 404.8  | 331.0  | 298.9  | 278.1  | 261.0  | 261.0  |
| 77.5° | 1965.4  | 1411.1  | 497.5  | 482.4  | 397.2  | 304.5  | 278.1  | 257.3  | 240.2  | 225.1  | 223.2  |
| 80°   | 798.3   | 669.6   | 365.1  | 365.1  | 278.1  | 232.7  | 217.5  | 208.1  | 196.7  | 177.8  | 177.8  |
| 82.5° | 463.4   | 406.7   | 255.4  | 221.3  | 185.4  | 160.8  | 151.3  | 141.9  | 141.9  | 128.6  | 128.6  |
| 85°   | 223.2   | 225.1   | 153.2  | 136.2  | 105.9  | 92.7   | 88.9   | 83.2   | 81.3   | 73.8   | 71.9   |
| 87.5° | 121.1   | 123.0   | 77.6   | 60.5   | 41.6   | 35.9   | 30.3   | 28.4   | 26.5   | 24.6   | 24.6   |
| 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)