

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: P323321

Luminaire Tested: **GLEON-SA7B-827-U-SL2-HSS**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P323321  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-21)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA7B-827-U-SL2-HSS  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(7) 80 CRI, 2700K, 800mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE II SPILL  
LIGHT ELIMINATOR OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 24612 lumens  
Efficiency: N/A  
Efficacy: 83.4 lumens/watt  
Luminous Opening: Rectangular (W 2' x L: 1' x H: 0')  
IES Classification: Type III - Medium  
BUG Rating: B2 - U0 - G4

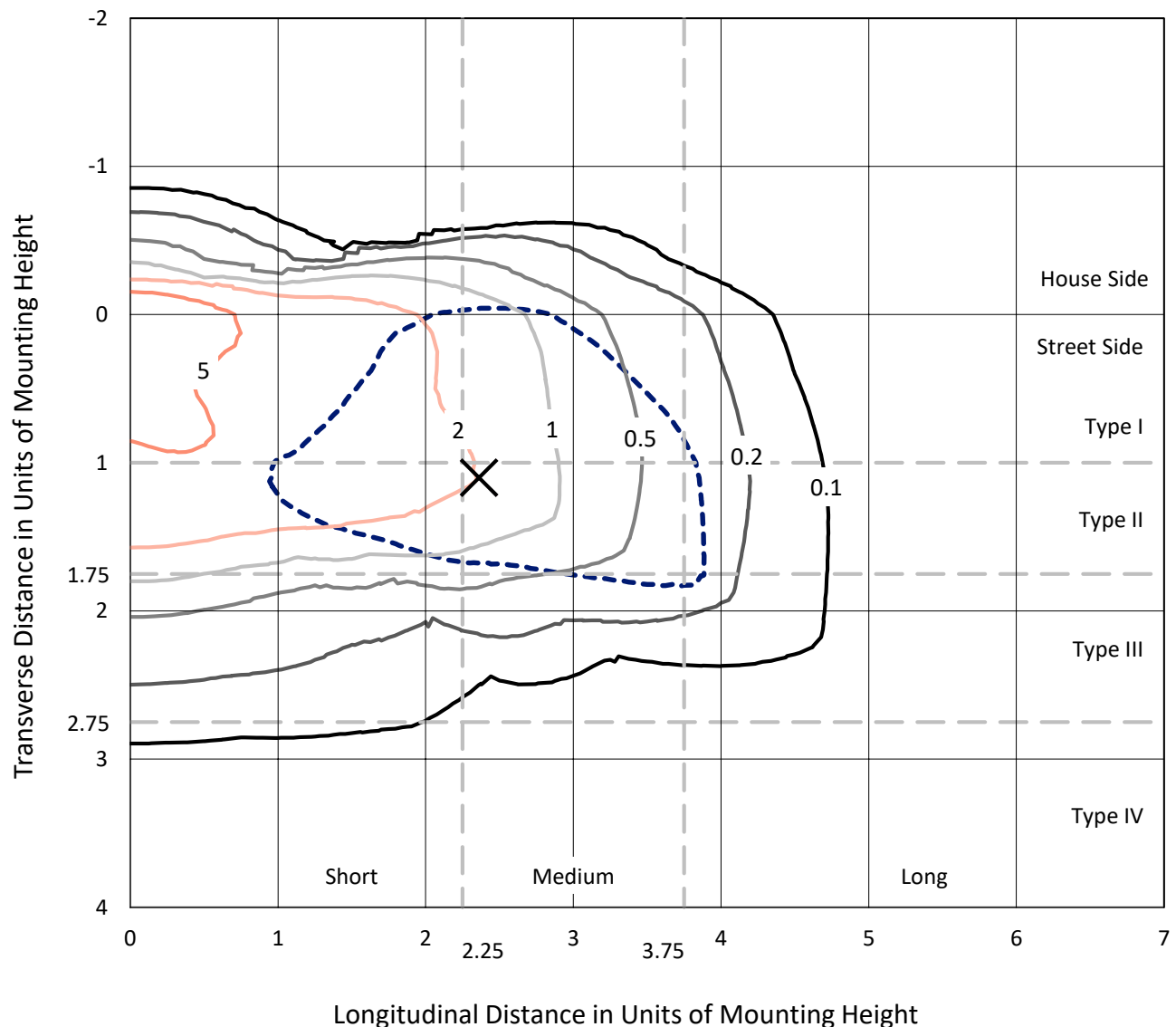
Input Watts (W): 295  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



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## Iso-Footcandle Lines of Horizontal Illumination

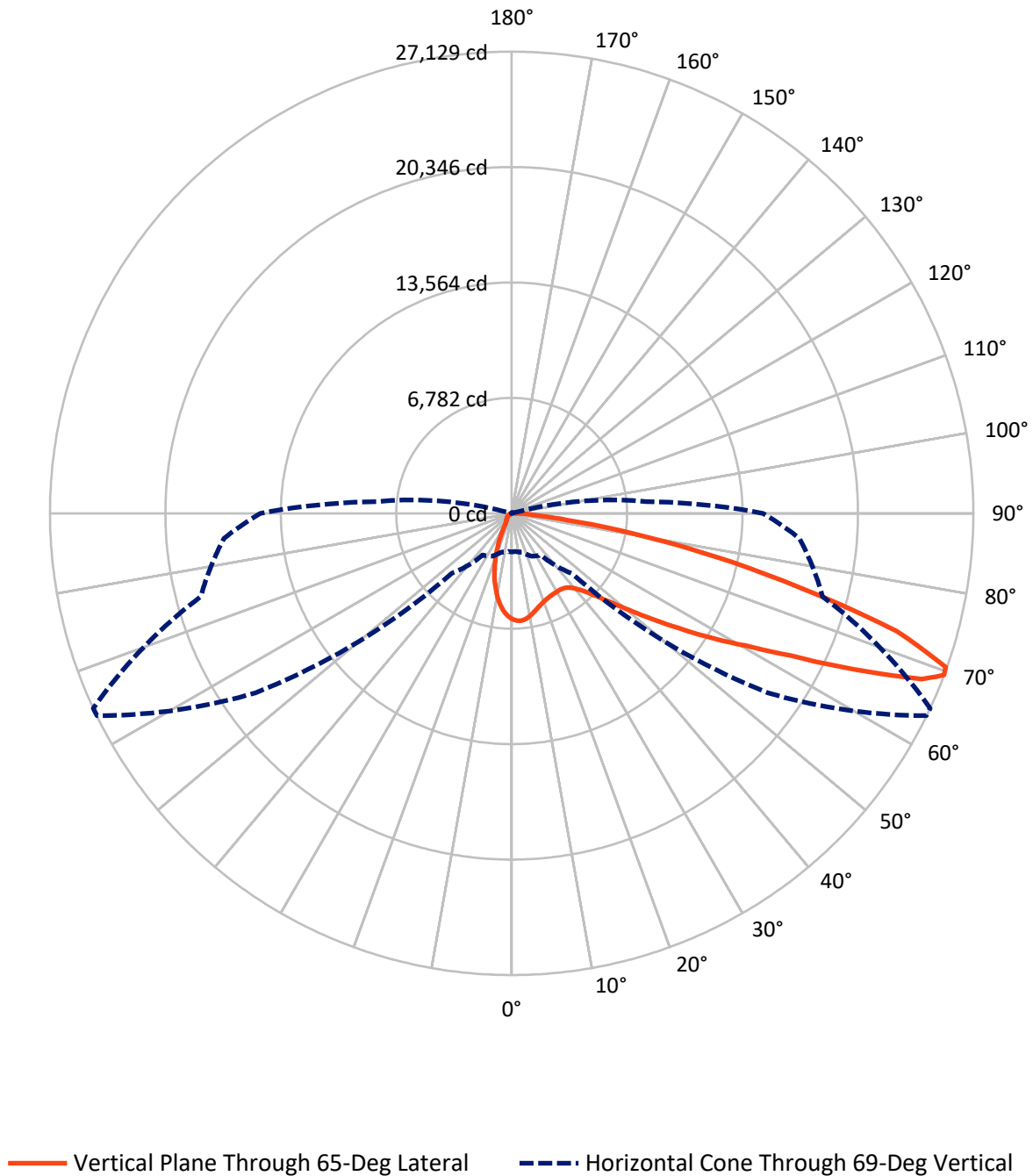
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 10 fc  
 Type III - Medium - N/A

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## Luminous Intensity Polar Plot



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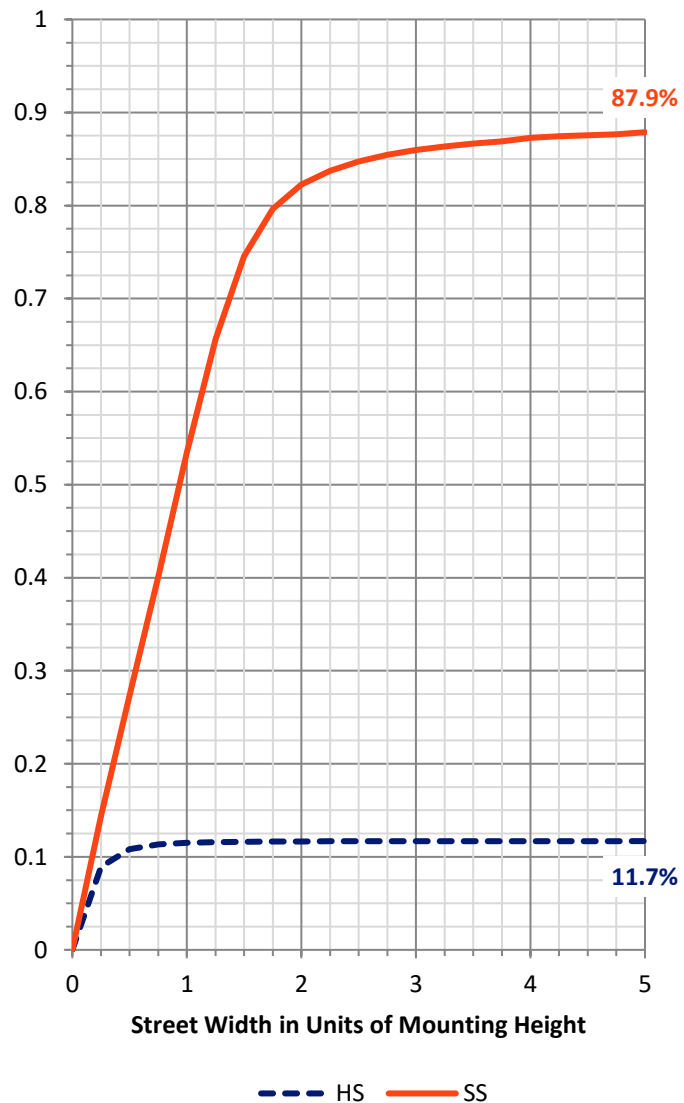
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 2901.2   | 0.0    | 2901.2  |
|                    | % Fixture | 11.8     | 0.0    | 11.8    |
| <b>Street Side</b> | Lumens    | 21710.8  | 0.0    | 21710.8 |
|                    | % Fixture | 88.2     | 0.0    | 88.2    |
| <b>Total</b>       | Lumens    | 24612.0  | 0.0    | 24612.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 520.1   | 2.1       |
| 10°-20°   | 1138.5  | 4.6       |
| 20°-30°   | 1576.8  | 6.4       |
| 30°-40°   | 2198.6  | 8.9       |
| 40°-50°   | 3417.4  | 13.9      |
| 50°-60°   | 5486.2  | 22.3      |
| 60°-70°   | 6205.8  | 25.2      |
| 70°-80°   | 3644.7  | 14.8      |
| 80°-90°   | 424.0   | 1.7       |
| 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°    | 24612.0 | 100.0     |
| 0°-180°   | 24612.0 | 100.0     |

**Coefficient of Utilization**



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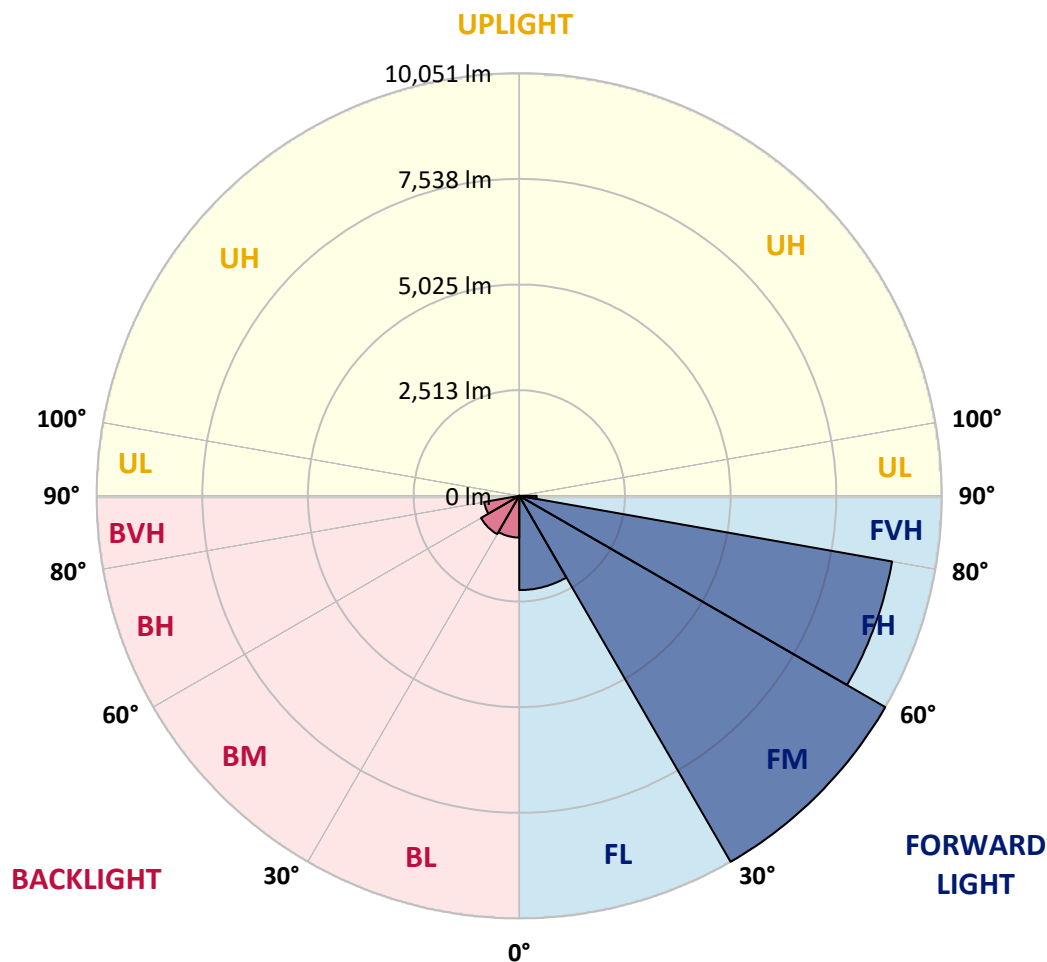
CATALOG NUMBER: GLEON-SA7B-827-U-SL2-HSS

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |          |
|------|-------------|---------|-----------|-------------------------|------|----------|
|      |             |         |           | B                       | U    | G        |
| FL   | (0°-30°)    | 2242.7  | 9.1       |                         |      |          |
| FM   | (30°-60°)   | 10050.8 | 40.8      |                         |      |          |
| FH   | (60°-80°)   | 9002.8  | 36.6      |                         |      | G4/12000 |
| FVH  | (80°-90°)   | 414.4   | 1.7       |                         |      | G3/500   |
| BL   | (0°-30°)    | 992.7   | 4.0       | B2/1000                 |      |          |
| BM   | (30°-60°)   | 1051.3  | 4.3       | B2/2500                 |      |          |
| BH   | (60°-80°)   | 847.7   | 3.4       | B2/1000                 |      | G2/1000  |
| BVH  | (80°-90°)   | 9.5     | 0.0       |                         |      | G0/10    |
| UL   | (90°-100°)  | 0.0     | 0.0       |                         | U0/0 |          |
| UH   | (100°-180°) | 0.0     | 0.0       |                         | U0/0 |          |

**BUG Rating: B2-U0-G4**

Type III Medium



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 55°     | 64°     | 65°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 6219.5  | 6219.5  | 6219.5  | 6219.5  | 6219.5  | 6219.5  | 6219.5  | 6219.5  | 6219.5  | 6219.5  | 6219.5  |
| 2.5°  | 6274.7  | 6259.1  | 6271.6  | 6298.6  | 6312.2  | 6312.2  | 6322.6  | 6310.1  | 6314.3  | 6284.1  | 6240.3  |
| 5°    | 5882.1  | 5858.1  | 5892.5  | 5968.5  | 6062.2  | 6142.4  | 6261.2  | 6323.6  | 6329.9  | 6330.9  | 6279.9  |
| 7.5°  | 5459.2  | 5437.4  | 5488.4  | 5578.0  | 5698.8  | 5847.7  | 6054.9  | 6236.2  | 6246.6  | 6344.5  | 6307.0  |
| 10°   | 5115.6  | 5099.9  | 5159.3  | 5255.1  | 5396.8  | 5563.4  | 5817.5  | 6069.5  | 6099.7  | 6316.3  | 6302.8  |
| 12.5° | 4842.7  | 4830.2  | 4886.4  | 4996.8  | 5141.6  | 5325.9  | 5591.5  | 5884.2  | 5924.8  | 6252.8  | 6282.0  |
| 15°   | 4643.8  | 4641.7  | 4688.6  | 4794.8  | 4955.2  | 5127.0  | 5398.8  | 5712.3  | 5759.2  | 6184.1  | 6278.9  |
| 17.5° | 4539.6  | 4542.8  | 4577.1  | 4667.7  | 4805.2  | 4976.0  | 5236.4  | 5567.6  | 5618.6  | 6122.6  | 6294.5  |
| 20°   | 4529.2  | 4532.4  | 4551.1  | 4602.1  | 4713.6  | 4864.6  | 5104.1  | 5445.7  | 5498.8  | 6076.8  | 6319.5  |
| 22.5° | 4620.9  | 4618.8  | 4624.0  | 4618.8  | 4681.3  | 4795.8  | 5016.6  | 5352.0  | 5413.4  | 6046.6  | 6339.3  |
| 25°   | 4796.9  | 4793.8  | 4791.7  | 4753.1  | 4711.5  | 4772.9  | 4980.2  | 5298.9  | 5357.2  | 6024.7  | 6350.7  |
| 27.5° | 5041.6  | 5039.5  | 5036.4  | 4972.9  | 4847.9  | 4809.4  | 4984.3  | 5279.1  | 5328.0  | 6007.0  | 6348.6  |
| 30°   | 5363.4  | 5378.0  | 5373.8  | 5285.3  | 5090.6  | 4920.8  | 5028.1  | 5268.7  | 5311.4  | 5972.7  | 6326.8  |
| 32.5° | 5741.5  | 5770.6  | 5793.5  | 5698.8  | 5455.1  | 5141.6  | 5129.1  | 5280.1  | 5311.4  | 5946.6  | 6287.2  |
| 35°   | 6134.1  | 6171.6  | 6255.9  | 6222.6  | 5901.9  | 5473.8  | 5303.0  | 5348.8  | 5374.9  | 5961.2  | 6268.4  |
| 37.5° | 6520.5  | 6565.3  | 6748.5  | 6845.4  | 6487.1  | 5913.3  | 5573.8  | 5518.6  | 5532.1  | 6049.7  | 6289.3  |
| 40°   | 6969.3  | 7037.0  | 7315.1  | 7471.3  | 7186.0  | 6501.7  | 5978.9  | 5810.2  | 5815.4  | 6244.5  | 6386.1  |
| 42.5° | 7558.8  | 7628.6  | 7929.5  | 8174.3  | 7973.3  | 7245.3  | 6528.8  | 6255.9  | 6250.7  | 6609.0  | 6614.2  |
| 45°   | 8277.4  | 8350.3  | 8661.7  | 8933.5  | 8842.9  | 8126.4  | 7232.8  | 6906.8  | 6900.6  | 7183.9  | 7046.4  |
| 47.5° | 9091.8  | 9163.7  | 9441.7  | 9721.9  | 9819.8  | 9155.3  | 8129.5  | 7795.2  | 7780.6  | 7982.7  | 7714.0  |
| 50°   | 9790.6  | 9837.5  | 10093.7 | 10470.7 | 10912.2 | 10419.6 | 9244.9  | 8923.1  | 8907.5  | 9043.9  | 8694.0  |
| 52.5° | 10044.7 | 10071.8 | 10332.2 | 10860.2 | 11962.0 | 12131.8 | 10710.2 | 10295.7 | 10284.2 | 10343.6 | 9998.9  |
| 55°   | 9530.2  | 9579.2  | 9898.9  | 10682.1 | 12530.6 | 14066.8 | 12559.8 | 11995.3 | 11908.9 | 11780.8 | 11363.2 |
| 57.5° | 8128.5  | 8206.6  | 8550.2  | 9591.7  | 12265.1 | 15601.9 | 15278.0 | 13917.8 | 13790.8 | 13007.6 | 12472.3 |
| 60°   | 6090.4  | 6186.2  | 6471.5  | 7595.2  | 10847.7 | 16148.6 | 18248.2 | 16060.1 | 15773.7 | 13984.5 | 13491.9 |
| 62.5° | 4179.3  | 4227.2  | 4420.9  | 5153.1  | 7988.9  | 15253.0 | 20733.0 | 18929.3 | 18406.5 | 15046.8 | 14594.8 |
| 65°   | 3192.0  | 3208.7  | 3287.8  | 3539.9  | 4757.3  | 12390.0 | 21721.4 | 22714.9 | 22082.8 | 16317.3 | 15739.3 |
| 67.5° | 2572.4  | 2558.8  | 2668.2  | 3028.5  | 3185.8  | 7558.8  | 20568.5 | 26296.4 | 26000.7 | 18015.9 | 16891.2 |
| 69°   | 2268.3  | 2249.5  | 2361.0  | 2779.6  | 2992.1  | 4996.8  | 18387.7 | 27109.8 | 27128.5 | 18912.6 | 16970.3 |
| 70°   | 2041.2  | 2053.7  | 2164.1  | 2631.7  | 2926.5  | 3922.1  | 16304.8 | 26902.5 | 27050.4 | 19247.9 | 16495.4 |
| 72.5° | 1363.2  | 1396.6  | 1618.4  | 2184.9  | 2814.0  | 2968.1  | 9844.8  | 23085.7 | 23654.3 | 18492.9 | 14152.2 |
| 75°   | 768.6   | 793.6   | 1057.1  | 1647.6  | 2651.5  | 2826.5  | 5199.9  | 17007.8 | 17557.7 | 15464.4 | 10913.3 |
| 77.5° | 377.0   | 390.5   | 597.8   | 1063.3  | 2217.2  | 2693.2  | 2949.4  | 11552.7 | 12180.7 | 10093.7 | 6172.6  |
| 80°   | 159.3   | 166.6   | 298.9   | 656.1   | 1585.1  | 2570.3  | 2190.2  | 7109.9  | 7188.0  | 3954.4  | 1644.4  |
| 82.5° | 61.4    | 63.5    | 126.0   | 409.3   | 1007.1  | 2003.7  | 1831.9  | 3371.1  | 3289.9  | 744.6   | 374.9   |
| 85°   | 7.3     | 8.3     | 45.8    | 245.8   | 560.3   | 1031.0  | 1488.2  | 1452.8  | 1344.5  | 147.9   | 192.7   |
| 87.5° | 0.0     | 0.0     | 3.1     | 75.0    | 166.6   | 483.2   | 773.8   | 603.0   | 543.6   | 47.9    | 100.0   |
| 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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**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 6219.5  | 6219.5 | 6219.5 | 6219.5 | 6219.5 | 6219.5 | 6219.5 | 6219.5 | 6219.5 | 6219.5 | 6219.5 |
| 2.5°  | 6203.9  | 6193.5 | 6137.2 | 6056.0 | 5978.9 | 5883.1 | 5791.5 | 5736.3 | 5692.5 | 5663.4 | 5697.7 |
| 5°    | 6220.5  | 6174.7 | 6003.9 | 5785.2 | 5570.7 | 5329.1 | 5104.1 | 4913.5 | 4838.5 | 4755.2 | 4792.7 |
| 7.5°  | 6215.3  | 6128.9 | 5821.7 | 5432.2 | 5038.5 | 4631.3 | 4246.0 | 3949.2 | 3795.0 | 3644.0 | 3682.5 |
| 10°   | 6189.3  | 6043.5 | 5578.0 | 5001.0 | 4411.6 | 3826.3 | 3279.5 | 2864.0 | 2631.7 | 2421.4 | 2451.6 |
| 12.5° | 6132.0  | 5928.9 | 5290.5 | 4507.4 | 3719.0 | 2947.3 | 2306.8 | 1774.6 | 1489.3 | 1363.2 | 1378.9 |
| 15°   | 6097.6  | 5817.5 | 4986.4 | 4007.5 | 2979.6 | 2052.7 | 1410.1 | 1048.7 | 918.6  | 876.9  | 882.1  |
| 17.5° | 6081.0  | 5710.2 | 4671.9 | 3435.7 | 2223.5 | 1307.0 | 911.3  | 804.0  | 775.9  | 768.6  | 770.7  |
| 20°   | 6064.3  | 5601.9 | 4348.0 | 2870.2 | 1532.0 | 879.0  | 748.8  | 717.6  | 707.1  | 697.8  | 699.8  |
| 22.5° | 6036.2  | 5497.8 | 4000.2 | 2297.4 | 1033.1 | 713.4  | 674.9  | 644.7  | 622.8  | 611.3  | 613.4  |
| 25°   | 6001.8  | 5388.4 | 3645.0 | 1711.1 | 754.0  | 636.3  | 599.9  | 557.2  | 531.1  | 510.3  | 511.3  |
| 27.5° | 5946.6  | 5254.1 | 3278.5 | 1245.6 | 633.2  | 569.7  | 520.7  | 473.9  | 430.1  | 406.2  | 406.2  |
| 30°   | 5869.6  | 5102.0 | 2871.3 | 891.5  | 567.6  | 504.1  | 444.7  | 386.4  | 339.5  | 317.6  | 315.6  |
| 32.5° | 5784.2  | 4943.7 | 2459.9 | 675.9  | 515.5  | 442.6  | 374.9  | 313.5  | 271.8  | 254.1  | 253.1  |
| 35°   | 5711.3  | 4772.9 | 2049.6 | 566.5  | 463.4  | 383.3  | 309.3  | 257.2  | 223.9  | 209.3  | 208.3  |
| 37.5° | 5664.4  | 4602.1 | 1649.6 | 506.1  | 416.6  | 328.1  | 259.3  | 212.5  | 188.5  | 177.0  | 176.0  |
| 40°   | 5657.1  | 4475.1 | 1284.1 | 460.3  | 372.8  | 279.1  | 216.6  | 180.2  | 158.3  | 145.8  | 144.8  |
| 42.5° | 5751.9  | 4402.2 | 985.2  | 421.8  | 328.1  | 236.4  | 184.3  | 154.1  | 131.2  | 118.7  | 117.7  |
| 45°   | 6000.8  | 4425.1 | 758.2  | 387.4  | 283.3  | 200.0  | 156.2  | 128.1  | 107.3  | 97.9   | 95.8   |
| 47.5° | 6454.9  | 4583.4 | 603.0  | 353.0  | 240.6  | 169.8  | 133.3  | 106.2  | 88.5   | 79.1   | 78.1   |
| 50°   | 7263.0  | 4955.2 | 504.1  | 315.6  | 201.0  | 144.8  | 110.4  | 86.4   | 71.9   | 63.5   | 62.5   |
| 52.5° | 8335.7  | 5617.5 | 449.9  | 279.1  | 166.6  | 122.9  | 90.6   | 68.7   | 56.2   | 50.0   | 48.9   |
| 55°   | 9518.8  | 6419.5 | 414.5  | 239.5  | 136.4  | 102.1  | 71.9   | 54.2   | 43.7   | 38.5   | 36.5   |
| 57.5° | 10673.7 | 7114.1 | 381.2  | 201.0  | 113.5  | 83.3   | 57.3   | 42.7   | 34.4   | 29.2   | 28.1   |
| 60°   | 11735.0 | 7752.5 | 342.6  | 161.4  | 92.7   | 65.6   | 44.8   | 33.3   | 27.1   | 21.9   | 21.9   |
| 62.5° | 12871.2 | 8246.1 | 289.5  | 126.0  | 76.0   | 50.0   | 36.5   | 30.2   | 21.9   | 18.7   | 17.7   |
| 65°   | 14075.1 | 8612.7 | 227.0  | 97.9   | 59.4   | 37.5   | 30.2   | 31.2   | 17.7   | 13.5   | 12.5   |
| 67.5° | 14964.5 | 8539.8 | 167.7  | 77.1   | 45.8   | 29.2   | 29.2   | 33.3   | 15.6   | 10.4   | 9.4    |
| 69°   | 14768.7 | 7947.2 | 140.6  | 66.7   | 39.6   | 25.0   | 27.1   | 33.3   | 14.6   | 9.4    | 8.3    |
| 70°   | 14201.1 | 7291.1 | 123.9  | 59.4   | 35.4   | 22.9   | 26.0   | 32.3   | 13.5   | 9.4    | 8.3    |
| 72.5° | 11826.6 | 5491.5 | 96.9   | 44.8   | 28.1   | 18.7   | 21.9   | 28.1   | 13.5   | 9.4    | 7.3    |
| 75°   | 8896.0  | 3514.9 | 73.9   | 32.3   | 20.8   | 14.6   | 16.7   | 20.8   | 13.5   | 8.3    | 7.3    |
| 77.5° | 4840.6  | 1267.4 | 53.1   | 21.9   | 14.6   | 11.5   | 11.5   | 15.6   | 12.5   | 6.2    | 4.2    |
| 80°   | 1244.5  | 318.7  | 33.3   | 14.6   | 11.5   | 8.3    | 7.3    | 10.4   | 7.3    | 1.0    | 0.0    |
| 82.5° | 307.2   | 71.9   | 17.7   | 10.4   | 8.3    | 3.1    | 3.1    | 5.2    | 3.1    | 0.0    | 0.0    |
| 85°   | 168.7   | 35.4   | 11.5   | 7.3    | 4.2    | 0.0    | 0.0    | 1.0    | 0.0    | 0.0    | 0.0    |
| 87.5° | 86.4    | 10.4   | 3.1    | 2.1    | 1.0    | 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    |

LM-79-2019: Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Report Prepared for

Cooper Lighting Solutions

Invue

Report Number: SP1-2407-157-9

Test Date: 10/03/2024

Luminaire Tested: EMM2-HTN-SA1A-827-U-5WQ

Data applicable to all product families utilizing light square engine

### Test Information

Test Method: LM-79-2019  
 Report Number: SP1-2407-157-9  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry:  $4\pi$   
 Issue Date: 10/03/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: Invue  
 Catalog Number: **EMM2-HTN-SA1A-827-U-5WQ**  
 Description: Epic Modern Light Square 40W 5WQ Optic

### Spectral Parameters

CCT (K): 2764  
 CIE  $u'$ : 0.2591  
 CIE  $v'$ : 0.5290  
 Duv: 0.0020  
 CIE x: 0.4581  
 CIE y: 0.4156  
 CIE z: 0.1263  
 Peak Wavelength (nm): 603  
 Dominant Wavelength (nm): 583  
 Purity: 62.2537  
 R<sub>f</sub>: 84.7  
 R<sub>g</sub>: 94.6

CRI (Ra): 80.9  
 R1: 78.8  
 R2: 89.9  
 R3: 96.2  
 R4: 79.1  
 R5: 79.1  
 R6: 88.8  
 R7: 81.3  
 R8: 54.3  
 R9: -1.5  
 R10: 77.9  
 R11: 78.9  
 R12: 71.6  
 R13: 81.2  
 R14: 98.5  
 R15: 69.9



### Test Conditions

Stabilization Time: 81M  
 Operation Time: 2H 21M  
 Sphere Temperature (°C): 25.2

REPORT NUMBER: SP1-2407-157-9

| 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 2700K 4-step quadrangle

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### Photopic Flux vs. Wavelength



**Photopic Lumens: 4337.9**

| λ (nm) | Power (μW/nm) | Lumens (Φ/nm) | λ (nm) | Power (μW/nm) | Lumens (Φ/nm) | λ (nm) | Power (μW/nm) | Lumens (Φ/nm) | λ (nm) | Power (μW/nm) | Lumens (Φ/nm) | λ (nm) | Power (μW/nm) | Lumens (Φ/nm) |
|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|
| 360    | 0             | 0.0           | 490    | 18018         | 2.6           | 620    | 87426         | 22.8          | 750    | 2680          | 0.0           | 880    | 58            | 0.0           |
| 365    | 0             | 0.0           | 495    | 22295         | 3.9           | 625    | 83013         | 18.2          | 755    | 2287          | 0.0           | 885    | 46            | 0.0           |
| 370    | 0             | 0.0           | 500    | 26478         | 5.8           | 630    | 78077         | 14.1          | 760    | 1944          | 0.0           | 890    | 45            | 0.0           |
| 375    | 0             | 0.0           | 505    | 30524         | 8.5           | 635    | 72080         | 10.7          | 765    | 1653          | 0.0           | 895    | 41            | 0.0           |
| 380    | 0             | 0.0           | 510    | 33611         | 11.5          | 640    | 66249         | 7.9           | 770    | 1413          | 0.0           | 900    | 38            | 0.0           |
| 385    | 0             | 0.0           | 515    | 36490         | 15.2          | 645    | 59973         | 5.7           | 775    | 1198          | 0.0           | 905    | 33            | 0.0           |
| 390    | 0             | 0.0           | 520    | 38610         | 18.7          | 650    | 53972         | 3.9           | 780    | 1025          | 0.0           | 910    | 30            | 0.0           |
| 395    | 0             | 0.0           | 525    | 40511         | 21.9          | 655    | 48369         | 2.7           | 785    | 874           | 0.0           | 915    | 23            | 0.0           |
| 400    | 48            | 0.0           | 530    | 42223         | 24.9          | 660    | 42641         | 1.8           | 790    | 747           | 0.0           | 920    | 24            | 0.0           |
| 405    | 201           | 0.0           | 535    | 44137         | 27.6          | 665    | 37602         | 1.1           | 795    | 639           | 0.0           | 925    | 22            | 0.0           |
| 410    | 457           | 0.0           | 540    | 46032         | 30.0          | 670    | 32798         | 0.7           | 800    | 547           | 0.0           | 930    | 22            | 0.0           |
| 415    | 925           | 0.0           | 545    | 48553         | 32.5          | 675    | 28558         | 0.5           | 805    | 473           | 0.0           | 935    | 17            | 0.0           |
| 420    | 1816          | 0.0           | 550    | 51408         | 34.9          | 680    | 24782         | 0.3           | 810    | 401           | 0.0           | 940    | 13            | 0.0           |
| 425    | 3217          | 0.0           | 555    | 54711         | 37.4          | 685    | 21386         | 0.2           | 815    | 351           | 0.0           | 945    | 6             | 0.0           |
| 430    | 5520          | 0.0           | 560    | 58847         | 40.0          | 690    | 18413         | 0.1           | 820    | 307           | 0.0           | 950    | 10            | 0.0           |
| 435    | 9225          | 0.1           | 565    | 63386         | 42.4          | 695    | 15721         | 0.1           | 825    | 261           | 0.0           | 955    | 11            | 0.0           |
| 440    | 15522         | 0.2           | 570    | 68196         | 44.3          | 700    | 13432         | 0.0           | 830    | 228           | 0.0           | 960    | 8             | 0.0           |
| 445    | 27642         | 0.6           | 575    | 73613         | 46.0          | 705    | 11513         | 0.0           | 835    | 193           | 0.0           | 965    | 12            | 0.0           |
| 450    | 36602         | 0.9           | 580    | 79207         | 47.1          | 710    | 9780          | 0.0           | 840    | 174           | 0.0           | 970    | 3             | 0.0           |
| 455    | 28292         | 0.9           | 585    | 84248         | 47.0          | 715    | 8356          | 0.0           | 845    | 151           | 0.0           | 975    | 8             | 0.0           |
| 460    | 21166         | 0.9           | 590    | 88397         | 45.7          | 720    | 7161          | 0.0           | 850    | 123           | 0.0           | 980    | 2             | 0.0           |
| 465    | 19092         | 1.0           | 595    | 91428         | 43.4          | 725    | 6067          | 0.0           | 855    | 106           | 0.0           | 985    | 13            | 0.0           |
| 470    | 14951         | 0.9           | 600    | 93452         | 40.3          | 730    | 5164          | 0.0           | 860    | 95            | 0.0           | 990    | 16            | 0.0           |
| 475    | 12606         | 1.0           | 605    | 93959         | 36.4          | 735    | 4393          | 0.0           | 865    | 82            | 0.0           | 995    | 20            | 0.0           |
| 480    | 13323         | 1.3           | 610    | 93079         | 32.0          | 740    | 3694          | 0.0           | 870    | 77            | 0.0           | 1000   | 0             | 0.0           |
| 485    | 15164         | 1.8           | 615    | 90707         | 27.3          | 745    | 3157          | 0.0           | 875    | 65            | 0.0           |        |               |               |

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### Scotopic Flux vs. Wavelength



Scotopic Lumens: 5286.7

S/P: 1.22

| 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       | 0                | 0.0              | 490       | 18018            | 75.9             | 620       | 87426            | 0.4              | 750       | 2680             | 0.0              | 880       | 58               | 0.0              |
| 365       | 0                | 0.0              | 495       | 22295            | 93.2             | 625       | 83013            | 0.2              | 755       | 2287             | 0.0              | 885       | 46               | 0.0              |
| 370       | 0                | 0.0              | 500       | 26478            | 107.8            | 630       | 78077            | 0.1              | 760       | 1944             | 0.0              | 890       | 45               | 0.0              |
| 375       | 0                | 0.0              | 505       | 30524            | 118.7            | 635       | 72080            | 0.1              | 765       | 1653             | 0.0              | 895       | 41               | 0.0              |
| 380       | 0                | 0.0              | 510       | 33611            | 122.2            | 640       | 66249            | 0.1              | 770       | 1413             | 0.0              | 900       | 38               | 0.0              |
| 385       | 0                | 0.0              | 515       | 36490            | 120.8            | 645       | 59973            | 0.0              | 775       | 1198             | 0.0              | 905       | 33               | 0.0              |
| 390       | 0                | 0.0              | 520       | 38610            | 113.9            | 650       | 53972            | 0.0              | 780       | 1025             | 0.0              | 910       | 30               | 0.0              |
| 395       | 0                | 0.0              | 525       | 40511            | 104.1            | 655       | 48369            | 0.0              | 785       | 874              | 0.0              | 915       | 23               | 0.0              |
| 400       | 48               | 0.0              | 530       | 42223            | 92.4             | 660       | 42641            | 0.0              | 790       | 747              | 0.0              | 920       | 24               | 0.0              |
| 405       | 201              | 0.0              | 535       | 44137            | 80.5             | 665       | 37602            | 0.0              | 795       | 639              | 0.0              | 925       | 22               | 0.0              |
| 410       | 457              | 0.1              | 540       | 46032            | 68.2             | 670       | 32798            | 0.0              | 800       | 547              | 0.0              | 930       | 22               | 0.0              |
| 415       | 925              | 0.3              | 545       | 48553            | 57.1             | 675       | 28558            | 0.0              | 805       | 473              | 0.0              | 935       | 17               | 0.0              |
| 420       | 1816             | 1.1              | 550       | 51408            | 46.7             | 680       | 24782            | 0.0              | 810       | 401              | 0.0              | 940       | 13               | 0.0              |
| 425       | 3217             | 2.5              | 555       | 54711            | 37.4             | 685       | 21386            | 0.0              | 815       | 351              | 0.0              | 945       | 6                | 0.0              |
| 430       | 5520             | 5.9              | 560       | 58847            | 29.4             | 690       | 18413            | 0.0              | 820       | 307              | 0.0              | 950       | 10               | 0.0              |
| 435       | 9225             | 12.5             | 565       | 63386            | 22.5             | 695       | 15721            | 0.0              | 825       | 261              | 0.0              | 955       | 11               | 0.0              |
| 440       | 15522            | 26.3             | 570       | 68196            | 16.9             | 700       | 13432            | 0.0              | 830       | 228              | 0.0              | 960       | 8                | 0.0              |
| 445       | 27642            | 55.2             | 575       | 73613            | 12.4             | 705       | 11513            | 0.0              | 835       | 193              | 0.0              | 965       | 12               | 0.0              |
| 450       | 36602            | 85.4             | 580       | 79207            | 9.0              | 710       | 9780             | 0.0              | 840       | 174              | 0.0              | 970       | 3                | 0.0              |
| 455       | 28292            | 75.1             | 585       | 84248            | 6.3              | 715       | 8356             | 0.0              | 845       | 151              | 0.0              | 975       | 8                | 0.0              |
| 460       | 21166            | 63.2             | 590       | 88397            | 4.4              | 720       | 7161             | 0.0              | 850       | 123              | 0.0              | 980       | 2                | 0.0              |
| 465       | 19092            | 63.2             | 595       | 91428            | 3.0              | 725       | 6067             | 0.0              | 855       | 106              | 0.0              | 985       | 13               | 0.0              |
| 470       | 14951            | 54.2             | 600       | 93452            | 2.0              | 730       | 5164             | 0.0              | 860       | 95               | 0.0              | 990       | 16               | 0.0              |
| 475       | 12606            | 48.8             | 605       | 93959            | 1.3              | 735       | 4393             | 0.0              | 865       | 82               | 0.0              | 995       | 20               | 0.0              |
| 480       | 13323            | 54.2             | 610       | 93079            | 0.9              | 740       | 3694             | 0.0              | 870       | 77               | 0.0              | 1000      | 0                | 0.0              |
| 485       | 15164            | 63.3             | 615       | 90707            | 0.5              | 745       | 3157             | 0.0              | 875       | 65               | 0.0              |           |                  |                  |

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### Melanopic Flux vs. Wavelength



**Melanopic Lumens: 9797**

**M/P: 2.26**

| 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       | 0                | 0.0              | 490       | 18018            | 27.7             | 620       | 87426            | 1.1              | 750       | 2680             | 0.0              | 880       | 58               | 0.0              |
| 365       | 0                | 0.0              | 495       | 22295            | 36.0             | 625       | 83013            | 0.7              | 755       | 2287             | 0.0              | 885       | 46               | 0.0              |
| 370       | 0                | 0.0              | 500       | 26478            | 44.2             | 630       | 78077            | 0.4              | 760       | 1944             | 0.0              | 890       | 45               | 0.0              |
| 375       | 0                | 0.0              | 505       | 30524            | 51.8             | 635       | 72080            | 0.3              | 765       | 1653             | 0.0              | 895       | 41               | 0.0              |
| 380       | 0                | 0.0              | 510       | 33611            | 57.0             | 640       | 66249            | 0.2              | 770       | 1413             | 0.0              | 900       | 38               | 0.0              |
| 385       | 0                | 0.0              | 515       | 36490            | 60.5             | 645       | 59973            | 0.1              | 775       | 1198             | 0.0              | 905       | 33               | 0.0              |
| 390       | 0                | 0.0              | 520       | 38610            | 61.4             | 650       | 53972            | 0.1              | 780       | 1025             | 0.0              | 910       | 30               | 0.0              |
| 395       | 0                | 0.0              | 525       | 40511            | 60.6             | 655       | 48369            | 0.0              | 785       | 874              | 0.0              | 915       | 23               | 0.0              |
| 400       | 48               | 0.0              | 530       | 42223            | 58.2             | 660       | 42641            | 0.0              | 790       | 747              | 0.0              | 920       | 24               | 0.0              |
| 405       | 201              | 0.0              | 535       | 44137            | 55.0             | 665       | 37602            | 0.0              | 795       | 639              | 0.0              | 925       | 22               | 0.0              |
| 410       | 457              | 0.0              | 540       | 46032            | 50.9             | 670       | 32798            | 0.0              | 800       | 547              | 0.0              | 930       | 22               | 0.0              |
| 415       | 925              | 0.1              | 545       | 48553            | 46.6             | 675       | 28558            | 0.0              | 805       | 473              | 0.0              | 935       | 17               | 0.0              |
| 420       | 1816             | 0.3              | 550       | 51408            | 42.0             | 680       | 24782            | 0.0              | 810       | 401              | 0.0              | 940       | 13               | 0.0              |
| 425       | 3217             | 0.8              | 555       | 54711            | 37.4             | 685       | 21386            | 0.0              | 815       | 351              | 0.0              | 945       | 6                | 0.0              |
| 430       | 5520             | 1.9              | 560       | 58847            | 32.9             | 690       | 18413            | 0.0              | 820       | 307              | 0.0              | 950       | 10               | 0.0              |
| 435       | 9225             | 4.1              | 565       | 63386            | 28.4             | 695       | 15721            | 0.0              | 825       | 261              | 0.0              | 955       | 11               | 0.0              |
| 440       | 15522            | 8.7              | 570       | 68196            | 24.1             | 700       | 13432            | 0.0              | 830       | 228              | 0.0              | 960       | 8                | 0.0              |
| 445       | 27642            | 18.5             | 575       | 73613            | 20.0             | 705       | 11513            | 0.0              | 835       | 193              | 0.0              | 965       | 12               | 0.0              |
| 450       | 36602            | 28.3             | 580       | 79207            | 16.3             | 710       | 9780             | 0.0              | 840       | 174              | 0.0              | 970       | 3                | 0.0              |
| 455       | 28292            | 24.7             | 585       | 84248            | 12.9             | 715       | 8356             | 0.0              | 845       | 151              | 0.0              | 975       | 8                | 0.0              |
| 460       | 21166            | 20.4             | 590       | 88397            | 9.8              | 720       | 7161             | 0.0              | 850       | 123              | 0.0              | 980       | 2                | 0.0              |
| 465       | 19092            | 20.1             | 595       | 91428            | 7.3              | 725       | 6067             | 0.0              | 855       | 106              | 0.0              | 985       | 13               | 0.0              |
| 470       | 14951            | 17.2             | 600       | 93452            | 5.3              | 730       | 5164             | 0.0              | 860       | 95               | 0.0              | 990       | 16               | 0.0              |
| 475       | 12606            | 15.7             | 605       | 93959            | 3.7              | 735       | 4393             | 0.0              | 865       | 82               | 0.0              | 995       | 20               | 0.0              |
| 480       | 13323            | 18.0             | 610       | 93079            | 2.5              | 740       | 3694             | 0.0              | 870       | 77               | 0.0              | 1000      | 0                | 0.0              |
| 485       | 15164            | 21.9             | 615       | 90707            | 1.7              | 745       | 3157             | 0.0              | 875       | 65               | 0.0              |           |                  |                  |

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TM-30-18

### Summary

$R_f = 84.7$   
 $R_g = 94.6$   
 $CIE R_a = 80.9$   
 $R_g = -1.5$

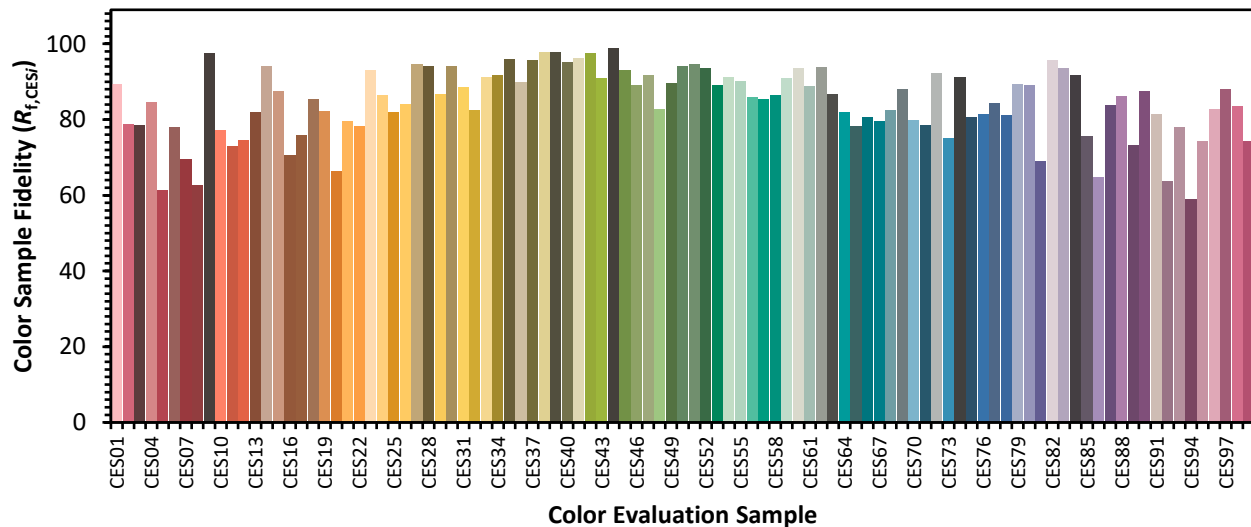


### Color Vector Graphics



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 84 | CES51 = 95 | CES76 = 81 |
| CES02 = 63 | CES27 = 95 | CES52 = 94 | CES77 = 84 |
| CES03 = 31 | CES28 = 94 | CES53 = 89 | CES78 = 81 |
| CES04 = 71 | CES29 = 87 | CES54 = 91 | CES79 = 89 |
| CES05 = 50 | CES30 = 94 | CES55 = 90 | CES80 = 89 |
| CES06 = 52 | CES31 = 89 | CES56 = 86 | CES81 = 69 |
| CES07 = 43 | CES32 = 82 | CES57 = 85 | CES82 = 96 |
| CES08 = 41 | CES33 = 91 | CES58 = 86 | CES83 = 93 |
| CES09 = 29 | CES34 = 92 | CES59 = 91 | CES84 = 92 |
| CES10 = 77 | CES35 = 96 | CES60 = 94 | CES85 = 76 |
| CES11 = 60 | CES36 = 90 | CES61 = 89 | CES86 = 65 |
| CES12 = 66 | CES37 = 96 | CES62 = 94 | CES87 = 84 |
| CES13 = 44 | CES38 = 98 | CES63 = 87 | CES88 = 86 |
| CES14 = 74 | CES39 = 98 | CES64 = 82 | CES89 = 73 |
| CES15 = 72 | CES40 = 95 | CES65 = 78 | CES90 = 88 |
| CES16 = 48 | CES41 = 96 | CES66 = 81 | CES91 = 82 |
| CES17 = 50 | CES42 = 97 | CES67 = 80 | CES92 = 64 |
| CES18 = 57 | CES43 = 91 | CES68 = 83 | CES93 = 78 |
| CES19 = 73 | CES44 = 99 | CES69 = 88 | CES94 = 59 |
| CES20 = 67 | CES45 = 93 | CES70 = 80 | CES95 = 74 |
| CES21 = 87 | CES46 = 89 | CES71 = 79 | CES96 = 83 |
| CES22 = 79 | CES47 = 92 | CES72 = 92 | CES97 = 88 |
| CES23 = 92 | CES48 = 83 | CES73 = 75 | CES98 = 83 |
| CES24 = 91 | CES49 = 90 | CES74 = 91 | CES99 = 74 |
| CES25 = 72 | CES50 = 94 | CES75 = 81 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)