

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: STREETWORKS

Report Number: P1386835

Luminaire Tested: **VAL-T-SB4A-727-U-T2R-HSS**

Issue Date: 02/18/2026

This test was performed under the Supervised Manufacturer's Testing Program. The results of this test have not been  
influenced by sources from within Cooper Lighting Solutions or from external interests.

**Test Information**

Test Method: LM-79-08  
Report Number: P1386835  
Test Lab: INNOVATION CENTER(G1)  
Issue Date: 02/18/2026  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: STREETWORKS  
Catalog Number: VAL-T-SB4A-727-U-T2R-HSS  
Description: GALLEON II WALL SLIM HIGH DENSITY LED ARRAYS 45 SQUARE 114W 70CRI  
2700K FIXTURE w/ TYPE II ROADWAY DISTRIBUTION OPTIC AND HOUSE SIDE SHIELD  
Light Source: (104) 2700K CCT, 70 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER  
Luminaire Equipment: 

| <u>Sample No.</u> | <u>Condition</u> | <u>Description</u> |
|-------------------|------------------|--------------------|
| a                 | good             | reflector          |
| b                 | good             | lens               |
| c                 | good             | housing            |
| d                 | good             | cord               |

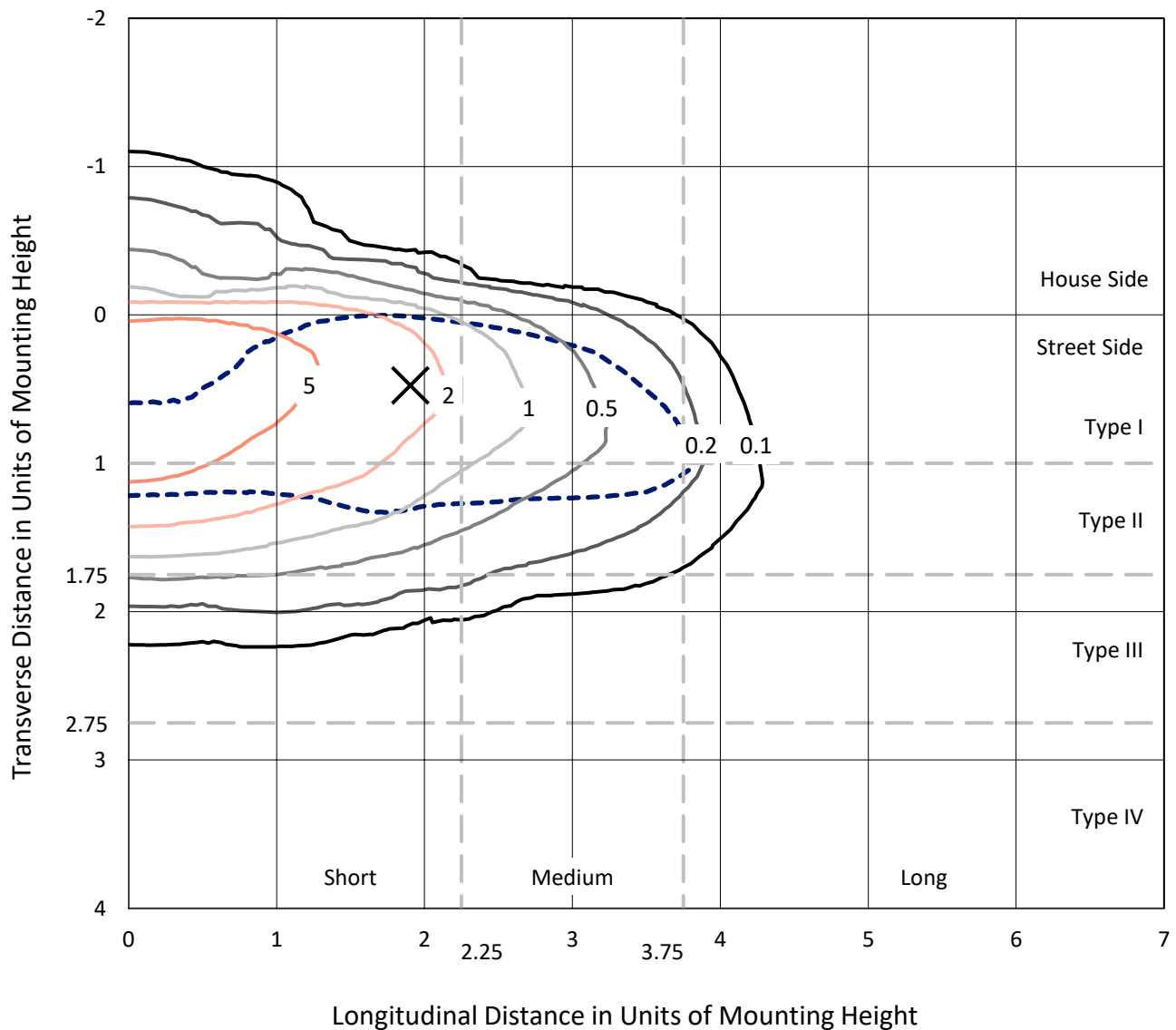
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 13618.2 lumens  
Efficiency: N/A  
Efficacy: 119.5 lumens/watt  
Luminous Opening: Rectangular (W 1.5' x L: 1' x H: 0')  
IES Classification: Type II - Short  
BUG Rating: B1 - U0 - G2  
  
Input Watts (W): 114  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.98  
Total Harmonic Distortion (THDi): 8.2%  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT

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## Iso-Footcandle Lines of Horizontal Illumination

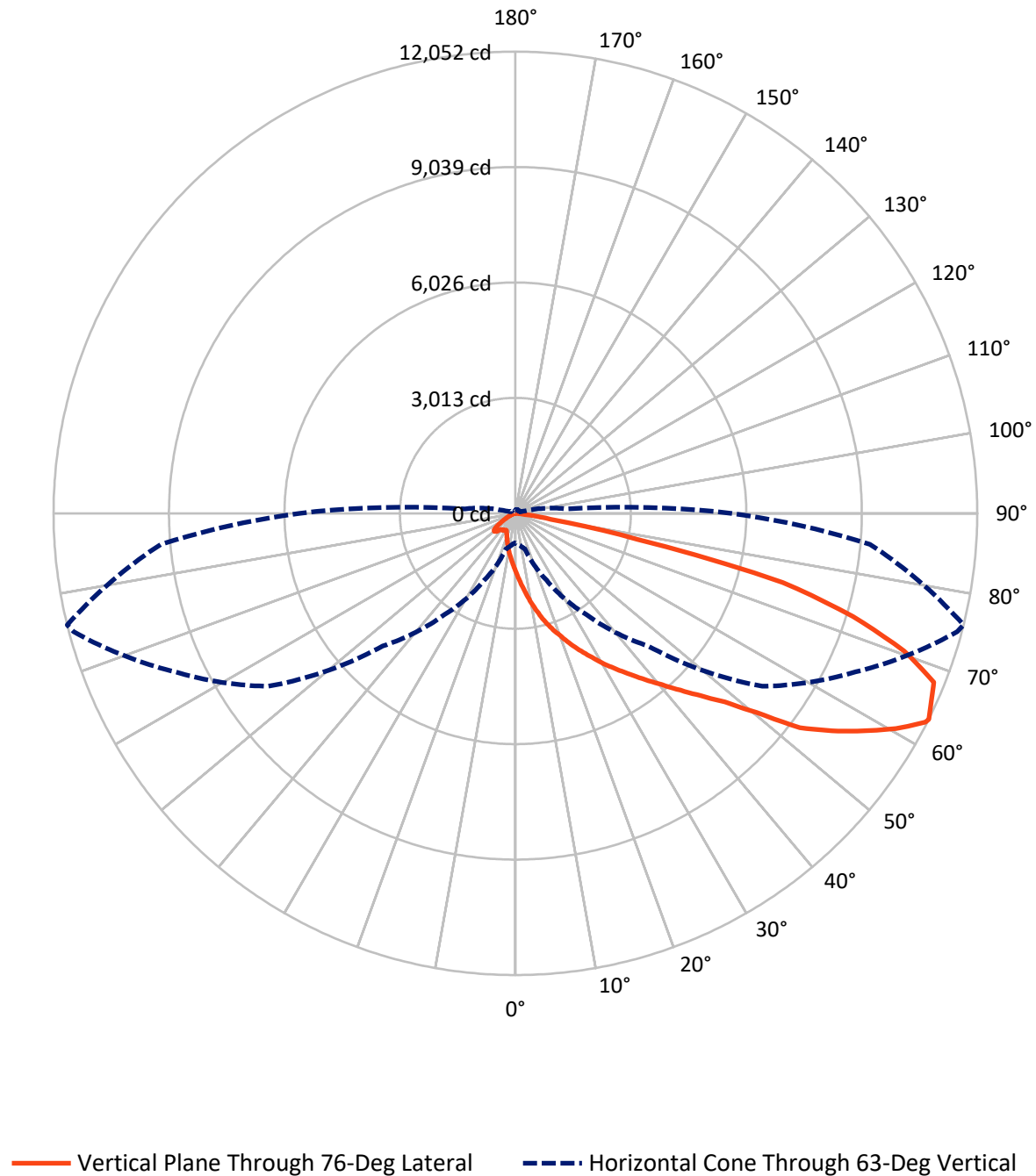
× Max cd  
- - - 1/2 Max cd



Based on 20 foot mounting height. Maximum calculated value = 9.6 fc  
Type II - Short - N/A

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## Luminous Intensity Polar Plot



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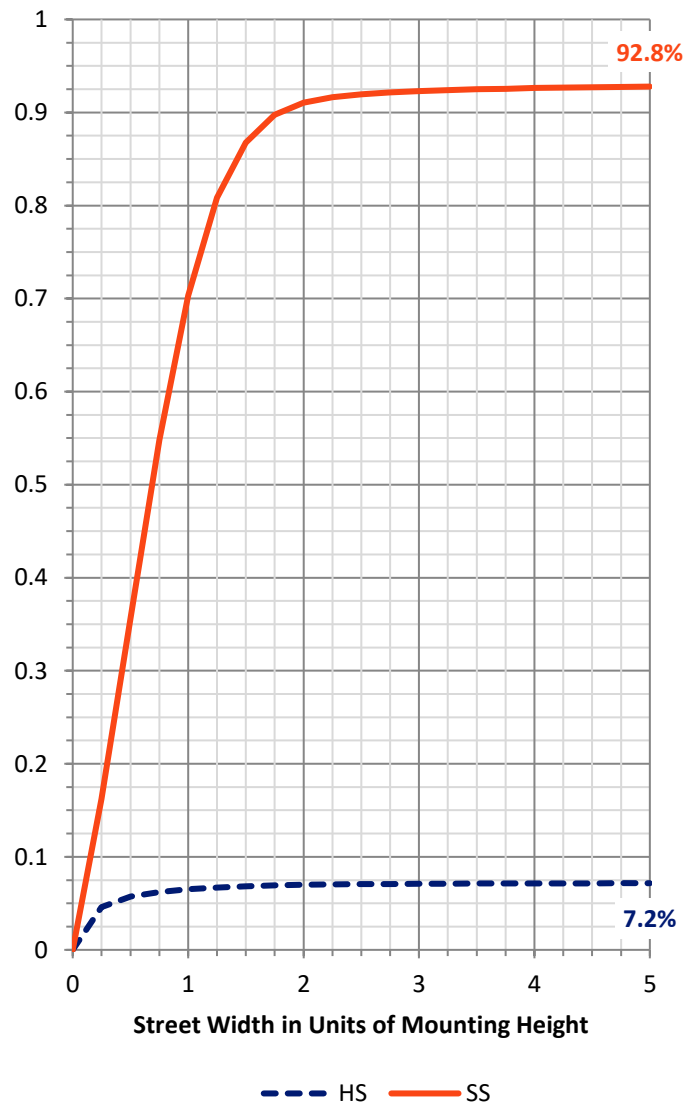
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 981.3    | 0.0    | 981.3   |
|                    | % Fixture | 7.2      | 0.0    | 7.2     |
| <b>Street Side</b> | Lumens    | 12637.0  | 0.0    | 12637.0 |
|                    | % Fixture | 92.8     | 0.0    | 92.8    |
| <b>Total</b>       | Lumens    | 13618.2  | 0.0    | 13618.2 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 158.8   | 1.2       |
| 10°-20°   | 568.3   | 4.2       |
| 20°-30°   | 1108.0  | 8.1       |
| 30°-40°   | 1946.1  | 14.3      |
| 40°-50°   | 2847.4  | 20.9      |
| 50°-60°   | 3304.0  | 24.3      |
| 60°-70°   | 2604.0  | 19.1      |
| 70°-80°   | 1035.0  | 7.6       |
| 80°-90°   | 46.7    | 0.3       |
| 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°    | 13618.2 | 100.0     |
| 0°-180°   | 13618.2 | 100.0     |

**Coefficient of Utilization**



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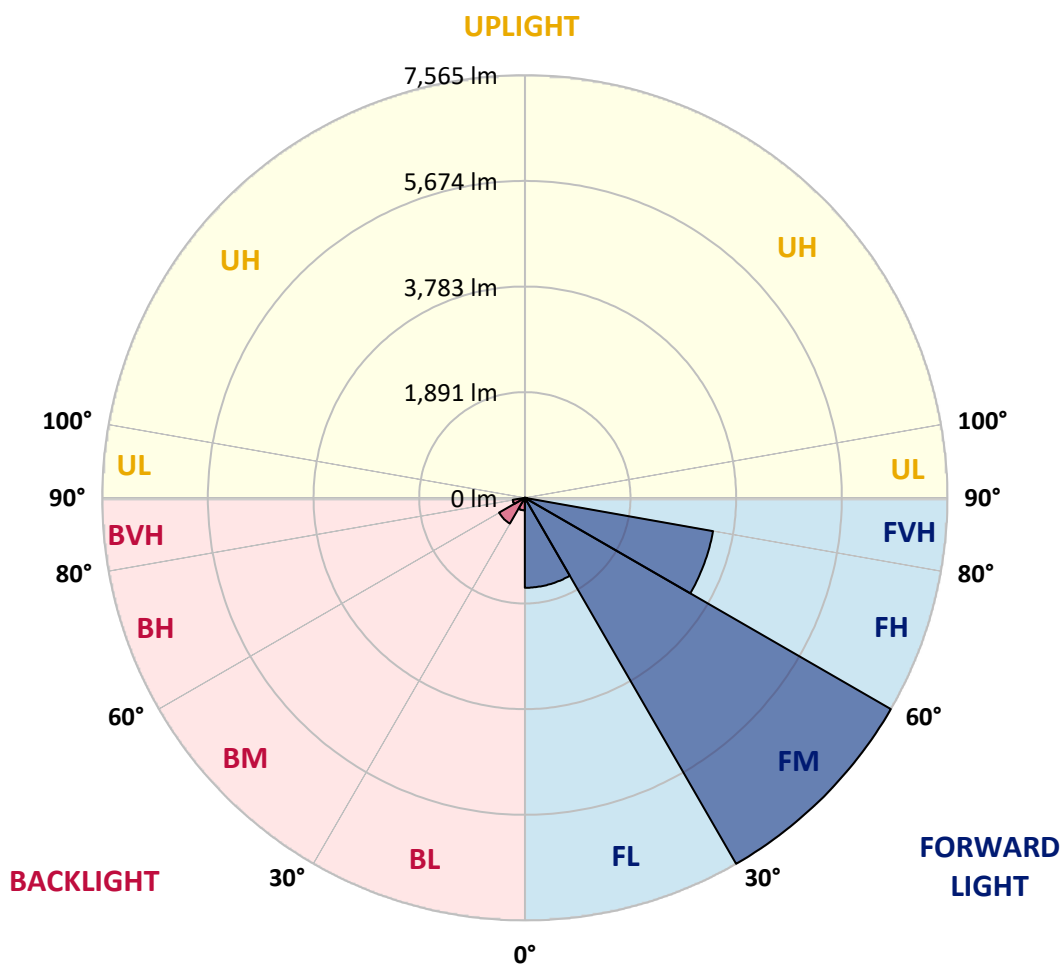
CATALOG NUMBER: VAL-T-SB4A-727-U-T2R-HSS

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 1610.4 | 11.8      |                         |      |         |
| FM   | (30°-60°)   | 7565.2 | 55.6      |                         |      |         |
| FH   | (60°-80°)   | 3420.6 | 25.1      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 40.8   | 0.3       |                         |      | G1/100  |
| BL   | (0°-30°)    | 224.7  | 1.7       | B1/500                  |      |         |
| BM   | (30°-60°)   | 532.3  | 3.9       | B1/1000                 |      |         |
| BH   | (60°-80°)   | 218.4  | 1.6       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 5.9    | 0.0       |                         |      | G0/10   |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

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

Type II Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 75°     | 76°     | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|---------|---------|--------|
| 0°    | 1522.4 | 1522.4 | 1522.4 | 1522.4 | 1522.4 | 1522.4 | 1522.4 | 1522.4 | 1522.4  | 1522.4  | 1522.4 |
| 2.5°  | 2182.4 | 2171.1 | 2171.1 | 2129.9 | 2069.9 | 2006.2 | 1916.2 | 1814.9 | 1713.7  | 1709.9  | 1597.4 |
| 5°    | 2707.4 | 2692.4 | 2673.6 | 2624.9 | 2546.1 | 2441.1 | 2321.1 | 2144.9 | 1934.9  | 1927.4  | 1706.2 |
| 7.5°  | 3048.6 | 3052.4 | 3026.1 | 3003.6 | 2951.1 | 2838.6 | 2684.9 | 2467.4 | 2193.6  | 2159.9  | 1848.7 |
| 10°   | 3356.1 | 3337.3 | 3333.6 | 3329.8 | 3292.3 | 3183.6 | 3037.4 | 2782.4 | 2448.6  | 2414.9  | 2006.2 |
| 12.5° | 3547.3 | 3539.8 | 3566.1 | 3588.6 | 3581.1 | 3536.1 | 3367.3 | 3112.4 | 2718.6  | 2677.4  | 2163.7 |
| 15°   | 3607.3 | 3614.8 | 3678.6 | 3749.8 | 3809.8 | 3824.8 | 3682.3 | 3419.8 | 2973.6  | 2947.4  | 2343.6 |
| 17.5° | 3562.3 | 3573.6 | 3663.6 | 3791.1 | 3937.3 | 4049.8 | 3986.1 | 3708.6 | 3247.4  | 3198.6  | 2504.9 |
| 20°   | 3581.1 | 3592.3 | 3674.8 | 3794.8 | 3986.1 | 4177.3 | 4233.6 | 4016.1 | 3491.1  | 3438.6  | 2692.4 |
| 22.5° | 3896.1 | 3911.1 | 3929.8 | 3929.8 | 4061.1 | 4267.3 | 4394.8 | 4304.8 | 3768.6  | 3716.1  | 2898.6 |
| 25°   | 4586.0 | 4574.8 | 4473.5 | 4308.6 | 4312.3 | 4402.3 | 4541.0 | 4544.8 | 4049.8  | 3986.1  | 3086.1 |
| 27.5° | 5272.3 | 5302.3 | 5171.0 | 4927.3 | 4736.0 | 4649.8 | 4709.8 | 4758.5 | 4319.8  | 4256.1  | 3296.1 |
| 30°   | 5906.0 | 5887.2 | 5748.5 | 5497.2 | 5257.3 | 5058.5 | 4931.0 | 4957.3 | 4608.5  | 4559.8  | 3506.1 |
| 32.5° | 6404.7 | 6412.2 | 6254.7 | 5977.2 | 5714.7 | 5542.2 | 5279.8 | 5171.0 | 4889.8  | 4852.3  | 3731.1 |
| 35°   | 6824.7 | 6802.2 | 6610.9 | 6341.0 | 6097.2 | 5984.7 | 5707.2 | 5403.5 | 5212.3  | 5163.5  | 3967.3 |
| 37.5° | 7225.9 | 7210.9 | 6974.7 | 6614.7 | 6393.5 | 6341.0 | 6183.5 | 5711.0 | 5546.0  | 5508.5  | 4267.3 |
| 40°   | 7495.9 | 7480.9 | 7278.4 | 6925.9 | 6659.7 | 6614.7 | 6607.2 | 6093.5 | 5906.0  | 5879.7  | 4574.8 |
| 42.5° | 7559.7 | 7540.9 | 7398.4 | 7135.9 | 6899.7 | 6850.9 | 7012.2 | 6509.7 | 6356.0  | 6311.0  | 4934.8 |
| 45°   | 7432.2 | 7450.9 | 7353.4 | 7195.9 | 7083.4 | 7027.2 | 7345.9 | 6963.4 | 6817.2  | 6790.9  | 5321.0 |
| 47.5° | 7064.7 | 7072.2 | 7064.7 | 7113.4 | 7135.9 | 7237.2 | 7653.4 | 7454.7 | 7353.4  | 7357.2  | 5816.0 |
| 50°   | 6397.2 | 6386.0 | 6502.2 | 6772.2 | 7038.4 | 7387.2 | 8050.9 | 8095.9 | 8193.4  | 8170.9  | 6554.7 |
| 52.5° | 5092.3 | 5111.0 | 5613.5 | 6108.5 | 6757.2 | 7372.2 | 8350.9 | 8898.3 | 9295.8  | 9295.8  | 7353.4 |
| 55°   | 4106.1 | 4121.1 | 4451.0 | 5287.3 | 6187.2 | 7210.9 | 8515.9 | 9310.8 | 10023.3 | 10019.5 | 7923.4 |
| 57.5° | 3356.1 | 3382.3 | 3644.8 | 4304.8 | 5336.0 | 6745.9 | 8583.4 | 9633.3 | 10649.5 | 10717.0 | 8508.4 |
| 60°   | 1878.7 | 2024.9 | 2546.1 | 3412.3 | 4394.8 | 6022.2 | 8478.4 | 9907.0 | 11332.0 | 11410.7 | 9104.6 |
| 62.5° | 851.2  | 870.0  | 1106.2 | 2107.4 | 3423.6 | 5099.8 | 7990.9 | 9839.5 | 11946.9 | 12006.9 | 9299.6 |
| 63°   | 772.5  | 802.5  | 960.0  | 1927.4 | 3228.6 | 4893.5 | 7867.1 | 9790.8 | 11935.7 | 12051.9 | 9284.6 |
| 65°   | 607.5  | 626.2  | 667.5  | 1244.9 | 2163.7 | 4016.1 | 7034.7 | 8988.3 | 11778.2 | 11917.0 | 8954.6 |
| 67.5° | 498.7  | 498.7  | 532.5  | 776.2  | 1196.2 | 2763.6 | 5216.0 | 7848.4 | 11613.2 | 11774.5 | 8534.6 |
| 70°   | 423.7  | 423.7  | 446.2  | 547.5  | 712.5  | 1334.9 | 3753.6 | 6715.9 | 10630.8 | 10762.0 | 7428.4 |
| 72.5° | 307.5  | 322.5  | 356.2  | 427.5  | 491.2  | 753.7  | 1927.4 | 5156.0 | 9097.1  | 9213.3  | 6232.2 |
| 75°   | 251.2  | 258.7  | 288.7  | 326.2  | 337.5  | 453.7  | 678.7  | 3839.8 | 7158.4  | 7203.4  | 4323.6 |
| 77.5° | 131.2  | 142.5  | 236.2  | 266.2  | 258.7  | 277.5  | 330.0  | 2092.4 | 3479.8  | 3243.6  | 1402.4 |
| 80°   | 56.2   | 56.2   | 168.7  | 172.5  | 183.7  | 131.2  | 157.5  | 480.0  | 997.5   | 930.0   | 285.0  |
| 82.5° | 15.0   | 18.7   | 135.0  | 120.0  | 123.7  | 60.0   | 67.5   | 153.7  | 255.0   | 240.0   | 82.5   |
| 85°   | 7.5    | 11.2   | 33.7   | 30.0   | 37.5   | 22.5   | 30.0   | 60.0   | 45.0    | 45.0    | 33.7   |
| 87.5° | 0.0    | 0.0    | 3.7    | 3.7    | 3.7    | 7.5    | 11.2   | 18.7   | 22.5    | 22.5    | 22.5   |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0     | 0.0     | 0.0    |



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CATALOG NUMBER: VAL-T-SB4A-727-U-T2R-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1522.4 | 1522.4 | 1522.4 | 1522.4 | 1522.4 | 1522.4 | 1522.4 | 1522.4 | 1522.4 | 1522.4 | 1522.4 |
| 2.5°  | 1537.4 | 1473.7 | 1357.4 | 1252.4 | 1147.4 | 1050.0 | 971.2  | 933.7  | 881.2  | 888.7  | 881.2  |
| 5°    | 1578.7 | 1451.2 | 1207.4 | 990.0  | 828.7  | 701.2  | 618.7  | 573.7  | 536.2  | 528.7  | 536.2  |
| 7.5°  | 1642.4 | 1443.7 | 1080.0 | 791.2  | 607.5  | 525.0  | 491.2  | 476.2  | 465.0  | 461.2  | 465.0  |
| 10°   | 1724.9 | 1447.4 | 963.7  | 641.2  | 513.7  | 476.2  | 453.7  | 438.7  | 427.5  | 427.5  | 423.7  |
| 12.5° | 1814.9 | 1451.2 | 847.5  | 543.7  | 468.7  | 442.5  | 420.0  | 405.0  | 393.7  | 390.0  | 390.0  |
| 15°   | 1901.2 | 1451.2 | 750.0  | 487.5  | 438.7  | 412.5  | 393.7  | 375.0  | 363.7  | 356.2  | 360.0  |
| 17.5° | 1987.4 | 1443.7 | 656.2  | 453.7  | 412.5  | 386.2  | 363.7  | 345.0  | 333.7  | 326.2  | 326.2  |
| 20°   | 2084.9 | 1436.2 | 573.7  | 423.7  | 386.2  | 360.0  | 333.7  | 318.7  | 307.5  | 300.0  | 300.0  |
| 22.5° | 2186.1 | 1421.2 | 510.0  | 393.7  | 356.2  | 330.0  | 307.5  | 288.7  | 277.5  | 270.0  | 270.0  |
| 25°   | 2283.6 | 1406.2 | 453.7  | 367.5  | 333.7  | 303.7  | 281.2  | 262.5  | 247.5  | 243.7  | 243.7  |
| 27.5° | 2388.6 | 1387.4 | 412.5  | 341.2  | 307.5  | 281.2  | 255.0  | 236.2  | 225.0  | 221.2  | 221.2  |
| 30°   | 2516.1 | 1398.7 | 397.5  | 315.0  | 285.0  | 258.7  | 236.2  | 217.5  | 206.2  | 206.2  | 206.2  |
| 32.5° | 2636.1 | 1406.2 | 416.2  | 303.7  | 262.5  | 236.2  | 213.7  | 198.7  | 191.2  | 191.2  | 191.2  |
| 35°   | 2771.1 | 1421.2 | 435.0  | 315.0  | 247.5  | 217.5  | 198.7  | 187.5  | 176.2  | 176.2  | 176.2  |
| 37.5° | 2928.6 | 1424.9 | 450.0  | 330.0  | 243.7  | 202.5  | 191.2  | 176.2  | 168.7  | 168.7  | 168.7  |
| 40°   | 3198.6 | 1484.9 | 450.0  | 341.2  | 243.7  | 187.5  | 172.5  | 161.2  | 153.7  | 153.7  | 153.7  |
| 42.5° | 3532.3 | 1672.4 | 442.5  | 345.0  | 247.5  | 183.7  | 161.2  | 153.7  | 146.2  | 146.2  | 146.2  |
| 45°   | 3884.8 | 1889.9 | 491.2  | 326.2  | 247.5  | 183.7  | 150.0  | 150.0  | 138.7  | 138.7  | 138.7  |
| 47.5° | 4297.3 | 2107.4 | 540.0  | 296.2  | 251.2  | 183.7  | 146.2  | 135.0  | 131.2  | 131.2  | 131.2  |
| 50°   | 4833.5 | 2249.9 | 555.0  | 262.5  | 243.7  | 183.7  | 138.7  | 131.2  | 123.7  | 127.5  | 127.5  |
| 52.5° | 5249.8 | 2246.1 | 536.2  | 228.7  | 228.7  | 180.0  | 131.2  | 127.5  | 123.7  | 123.7  | 123.7  |
| 55°   | 5594.7 | 2186.1 | 438.7  | 195.0  | 202.5  | 153.7  | 127.5  | 127.5  | 120.0  | 120.0  | 120.0  |
| 57.5° | 5864.7 | 1998.7 | 315.0  | 165.0  | 168.7  | 127.5  | 123.7  | 123.7  | 120.0  | 116.2  | 116.2  |
| 60°   | 5988.5 | 1694.9 | 217.5  | 142.5  | 138.7  | 116.2  | 116.2  | 116.2  | 112.5  | 108.7  | 108.7  |
| 62.5° | 5767.2 | 1387.4 | 157.5  | 123.7  | 112.5  | 105.0  | 108.7  | 108.7  | 101.2  | 93.7   | 90.0   |
| 63°   | 5643.5 | 1323.7 | 150.0  | 120.0  | 108.7  | 105.0  | 108.7  | 108.7  | 101.2  | 90.0   | 86.2   |
| 65°   | 5234.8 | 1068.7 | 131.2  | 108.7  | 97.5   | 93.7   | 101.2  | 97.5   | 86.2   | 67.5   | 67.5   |
| 67.5° | 4683.5 | 708.7  | 112.5  | 97.5   | 86.2   | 82.5   | 86.2   | 86.2   | 75.0   | 60.0   | 56.2   |
| 70°   | 3993.6 | 446.2  | 93.7   | 78.7   | 71.2   | 63.7   | 67.5   | 75.0   | 63.7   | 48.7   | 45.0   |
| 72.5° | 3277.3 | 311.2  | 75.0   | 63.7   | 56.2   | 45.0   | 56.2   | 63.7   | 52.5   | 37.5   | 37.5   |
| 75°   | 2208.6 | 198.7  | 60.0   | 48.7   | 41.2   | 37.5   | 45.0   | 48.7   | 41.2   | 26.2   | 26.2   |
| 77.5° | 697.5  | 101.2  | 48.7   | 37.5   | 30.0   | 26.2   | 30.0   | 33.7   | 22.5   | 15.0   | 15.0   |
| 80°   | 153.7  | 60.0   | 33.7   | 26.2   | 22.5   | 18.7   | 18.7   | 11.2   | 7.5    | 7.5    | 3.7    |
| 82.5° | 56.2   | 37.5   | 26.2   | 18.7   | 15.0   | 11.2   | 7.5    | 7.5    | 3.7    | 0.0    | 0.0    |
| 85°   | 30.0   | 22.5   | 15.0   | 11.2   | 11.2   | 7.5    | 7.5    | 3.7    | 0.0    | 0.0    | 0.0    |
| 87.5° | 18.7   | 15.0   | 11.2   | 11.2   | 7.5    | 7.5    | 3.7    | 3.7    | 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

McGraw-Edison

Report Number: SP1-2407-184-3

Test Date: 10/09/2024

Luminaire Tested: GSS-SB1A-727-U-5WQ

Data in this report applies to families of products including GSS-SB1A-727-U-5WQ

### Test Information

Test Method: LM-79-2019  
 Report Number: SP1-2407-184-3  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry:  $4\pi$   
 Issue Date: 10/15/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: McGraw-Edison  
 Catalog Number: **GSS-SB1A-727-U-5WQ**  
 Description: GALLEON II SITE SLIM 1SQ 350MA 5WQ HIGH DENSITY LIGHTSQUARE WITH 70 CRI  
 2700K CCT 26 LEDS

### Spectral Parameters

|                           |          |           |      |      |       |
|---------------------------|----------|-----------|------|------|-------|
| CCT (K):                  | 2672     | CRI (Ra): | 71.1 |      |       |
| CIE u':                   | 0.2638   | R1:       | 68.3 | R9:  | -27.8 |
| CIE v':                   | 0.5276   | R2:       | 79.8 | R10: | 54.4  |
| Duv:                      | -0.0002  | R3:       | 91.2 | R11: | 65.8  |
| CIE x:                    | 0.4619   | R4:       | 69.4 | R12: | 45.6  |
| CIE y:                    | 0.4106   | R5:       | 66.5 | R13: | 69.8  |
| CIE z:                    | 0.1275   | R6:       | 72.6 | R14: | 94.5  |
| Peak Wavelength (nm):     | 601      | R7:       | 77.0 | R15: | 60.1  |
| Dominant Wavelength (nm): | 584      | R8:       | 44.1 |      |       |
| Purity:                   | 61.88407 |           |      |      |       |
| Rf:                       | 67.9     |           |      |      |       |
| Rg:                       | 98.6     |           |      |      |       |



### Test Conditions

Stabilization Time: 21M  
 Operation Time: 1H 21M  
 Sphere Temperature (°C): 25.2

REPORT NUMBER: SP1-2407-184-3

| 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           |



REPORT NUMBER: SP1-2407-184-3

### Photopic Flux vs. Wavelength



### Photopic Lumens: NR

| $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) |
|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|
| 360               | 0                                    | NR                             | 490               | 52                                   | NR                             | 620               | 888                                  | NR                             | 750               | 27                                   | NR                             | 880               | 1                                    | NR                             |
| 365               | 0                                    | NR                             | 495               | 87                                   | NR                             | 625               | 834                                  | NR                             | 755               | 23                                   | NR                             | 885               | 1                                    | NR                             |
| 370               | 0                                    | NR                             | 500               | 135                                  | NR                             | 630               | 776                                  | NR                             | 760               | 20                                   | NR                             | 890               | 1                                    | NR                             |
| 375               | 0                                    | NR                             | 505               | 196                                  | NR                             | 635               | 712                                  | NR                             | 765               | 17                                   | NR                             | 895               | 0                                    | NR                             |
| 380               | 0                                    | NR                             | 510               | 258                                  | NR                             | 640               | 648                                  | NR                             | 770               | 15                                   | NR                             | 900               | 0                                    | NR                             |
| 385               | 1                                    | NR                             | 515               | 317                                  | NR                             | 645               | 583                                  | NR                             | 775               | 12                                   | NR                             | 905               | 0                                    | NR                             |
| 390               | 2                                    | NR                             | 520               | 368                                  | NR                             | 650               | 523                                  | NR                             | 780               | 11                                   | NR                             | 910               | 0                                    | NR                             |
| 395               | 4                                    | NR                             | 525               | 408                                  | NR                             | 655               | 465                                  | NR                             | 785               | 9                                    | NR                             | 915               | 0                                    | NR                             |
| 400               | 6                                    | NR                             | 530               | 443                                  | NR                             | 660               | 410                                  | NR                             | 790               | 8                                    | NR                             | 920               | 0                                    | NR                             |
| 405               | 11                                   | NR                             | 535               | 473                                  | NR                             | 665               | 360                                  | NR                             | 795               | 7                                    | NR                             | 925               | 0                                    | NR                             |
| 410               | 23                                   | NR                             | 540               | 498                                  | NR                             | 670               | 313                                  | NR                             | 800               | 6                                    | NR                             | 930               | 0                                    | NR                             |
| 415               | 51                                   | NR                             | 545               | 530                                  | NR                             | 675               | 272                                  | NR                             | 805               | 5                                    | NR                             | 935               | 0                                    | NR                             |
| 420               | 111                                  | NR                             | 550               | 563                                  | NR                             | 680               | 236                                  | NR                             | 810               | 4                                    | NR                             | 940               | 0                                    | NR                             |
| 425               | 214                                  | NR                             | 555               | 605                                  | NR                             | 685               | 203                                  | NR                             | 815               | 4                                    | NR                             | 945               | 0                                    | NR                             |
| 430               | 339                                  | NR                             | 560               | 651                                  | NR                             | 690               | 175                                  | NR                             | 820               | 3                                    | NR                             | 950               | 0                                    | NR                             |
| 435               | 467                                  | NR                             | 565               | 705                                  | NR                             | 695               | 150                                  | NR                             | 825               | 3                                    | NR                             | 955               | 0                                    | NR                             |
| 440               | 535                                  | NR                             | 570               | 765                                  | NR                             | 700               | 128                                  | NR                             | 830               | 3                                    | NR                             | 960               | 0                                    | NR                             |
| 445               | 372                                  | NR                             | 575               | 824                                  | NR                             | 705               | 110                                  | NR                             | 835               | 2                                    | NR                             | 965               | 0                                    | NR                             |
| 450               | 160                                  | NR                             | 580               | 882                                  | NR                             | 710               | 94                                   | NR                             | 840               | 2                                    | NR                             | 970               | 0                                    | NR                             |
| 455               | 89                                   | NR                             | 585               | 930                                  | NR                             | 715               | 80                                   | NR                             | 845               | 2                                    | NR                             | 975               | 0                                    | NR                             |
| 460               | 53                                   | NR                             | 590               | 968                                  | NR                             | 720               | 69                                   | NR                             | 850               | 1                                    | NR                             | 980               | 0                                    | NR                             |
| 465               | 31                                   | NR                             | 595               | 991                                  | NR                             | 725               | 59                                   | NR                             | 855               | 1                                    | NR                             | 985               | 0                                    | NR                             |
| 470               | 23                                   | NR                             | 600               | 999                                  | NR                             | 730               | 50                                   | NR                             | 860               | 1                                    | NR                             | 990               | 0                                    | NR                             |
| 475               | 21                                   | NR                             | 605               | 992                                  | NR                             | 735               | 43                                   | NR                             | 865               | 1                                    | NR                             | 995               | 0                                    | NR                             |
| 480               | 23                                   | NR                             | 610               | 969                                  | NR                             | 740               | 36                                   | NR                             | 870               | 1                                    | NR                             | 1000              | 0                                    | NR                             |
| 485               | 32                                   | NR                             | 615               | 935                                  | NR                             | 745               | 31                                   | NR                             | 875               | 1                                    | NR                             |                   |                                      |                                |

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### Scotopic Flux vs. Wavelength



Scotopic Lumens: NR

S/P: 1.02

| $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>$(\phi/\text{nm})$ | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>$(\phi/\text{nm})$ | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>$(\phi/\text{nm})$ | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>$(\phi/\text{nm})$ | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>$(\phi/\text{nm})$ |
|-------------------|--------------------------------------|------------------------------|-------------------|--------------------------------------|------------------------------|-------------------|--------------------------------------|------------------------------|-------------------|--------------------------------------|------------------------------|-------------------|--------------------------------------|------------------------------|
| 360               | 0                                    | NR                           | 490               | 52                                   | NR                           | 620               | 888                                  | NR                           | 750               | 27                                   | NR                           | 880               | 1                                    | NR                           |
| 365               | 0                                    | NR                           | 495               | 87                                   | NR                           | 625               | 834                                  | NR                           | 755               | 23                                   | NR                           | 885               | 1                                    | NR                           |
| 370               | 0                                    | NR                           | 500               | 135                                  | NR                           | 630               | 776                                  | NR                           | 760               | 20                                   | NR                           | 890               | 1                                    | NR                           |
| 375               | 0                                    | NR                           | 505               | 196                                  | NR                           | 635               | 712                                  | NR                           | 765               | 17                                   | NR                           | 895               | 0                                    | NR                           |
| 380               | 0                                    | NR                           | 510               | 258                                  | NR                           | 640               | 648                                  | NR                           | 770               | 15                                   | NR                           | 900               | 0                                    | NR                           |
| 385               | 1                                    | NR                           | 515               | 317                                  | NR                           | 645               | 583                                  | NR                           | 775               | 12                                   | NR                           | 905               | 0                                    | NR                           |
| 390               | 2                                    | NR                           | 520               | 368                                  | NR                           | 650               | 523                                  | NR                           | 780               | 11                                   | NR                           | 910               | 0                                    | NR                           |
| 395               | 4                                    | NR                           | 525               | 408                                  | NR                           | 655               | 465                                  | NR                           | 785               | 9                                    | NR                           | 915               | 0                                    | NR                           |
| 400               | 6                                    | NR                           | 530               | 443                                  | NR                           | 660               | 410                                  | NR                           | 790               | 8                                    | NR                           | 920               | 0                                    | NR                           |
| 405               | 11                                   | NR                           | 535               | 473                                  | NR                           | 665               | 360                                  | NR                           | 795               | 7                                    | NR                           | 925               | 0                                    | NR                           |
| 410               | 23                                   | NR                           | 540               | 498                                  | NR                           | 670               | 313                                  | NR                           | 800               | 6                                    | NR                           | 930               | 0                                    | NR                           |
| 415               | 51                                   | NR                           | 545               | 530                                  | NR                           | 675               | 272                                  | NR                           | 805               | 5                                    | NR                           | 935               | 0                                    | NR                           |
| 420               | 111                                  | NR                           | 550               | 563                                  | NR                           | 680               | 236                                  | NR                           | 810               | 4                                    | NR                           | 940               | 0                                    | NR                           |
| 425               | 214                                  | NR                           | 555               | 605                                  | NR                           | 685               | 203                                  | NR                           | 815               | 4                                    | NR                           | 945               | 0                                    | NR                           |
| 430               | 339                                  | NR                           | 560               | 651                                  | NR                           | 690               | 175                                  | NR                           | 820               | 3                                    | NR                           | 950               | 0                                    | NR                           |
| 435               | 467                                  | NR                           | 565               | 705                                  | NR                           | 695               | 150                                  | NR                           | 825               | 3                                    | NR                           | 955               | 0                                    | NR                           |
| 440               | 535                                  | NR                           | 570               | 765                                  | NR                           | 700               | 128                                  | NR                           | 830               | 3                                    | NR                           | 960               | 0                                    | NR                           |
| 445               | 372                                  | NR                           | 575               | 824                                  | NR                           | 705               | 110                                  | NR                           | 835               | 2                                    | NR                           | 965               | 0                                    | NR                           |
| 450               | 160                                  | NR                           | 580               | 882                                  | NR                           | 710               | 94                                   | NR                           | 840               | 2                                    | NR                           | 970               | 0                                    | NR                           |
| 455               | 89                                   | NR                           | 585               | 930                                  | NR                           | 715               | 80                                   | NR                           | 845               | 2                                    | NR                           | 975               | 0                                    | NR                           |
| 460               | 53                                   | NR                           | 590               | 968                                  | NR                           | 720               | 69                                   | NR                           | 850               | 1                                    | NR                           | 980               | 0                                    | NR                           |
| 465               | 31                                   | NR                           | 595               | 991                                  | NR                           | 725               | 59                                   | NR                           | 855               | 1                                    | NR                           | 985               | 0                                    | NR                           |
| 470               | 23                                   | NR                           | 600               | 999                                  | NR                           | 730               | 50                                   | NR                           | 860               | 1                                    | NR                           | 990               | 0                                    | NR                           |
| 475               | 21                                   | NR                           | 605               | 992                                  | NR                           | 735               | 43                                   | NR                           | 865               | 1                                    | NR                           | 995               | 0                                    | NR                           |
| 480               | 23                                   | NR                           | 610               | 969                                  | NR                           | 740               | 36                                   | NR                           | 870               | 1                                    | NR                           | 1000              | 0                                    | NR                           |
| 485               | 32                                   | NR                           | 615               | 935                                  | NR                           | 745               | 31                                   | NR                           | 875               | 1                                    | NR                           |                   |                                      |                              |

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### Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 1.71

| λ (nm) | Power W <sup>λ</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>λ</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>λ</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>λ</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>λ</sup> /nm | Lumens (φ/nm) |
|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|
| 360    | 0                        | NR            | 490    | 52                       | NR            | 620    | 888                      | NR            | 750    | 27                       | NR            | 880    | 1                        | NR            |
| 365    | 0                        | NR            | 495    | 87                       | NR            | 625    | 834                      | NR            | 755    | 23                       | NR            | 885    | 1                        | NR            |
| 370    | 0                        | NR            | 500    | 135                      | NR            | 630    | 776                      | NR            | 760    | 20                       | NR            | 890    | 1                        | NR            |
| 375    | 0                        | NR            | 505    | 196                      | NR            | 635    | 712                      | NR            | 765    | 17                       | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 258                      | NR            | 640    | 648                      | NR            | 770    | 15                       | NR            | 900    | 0                        | NR            |
| 385    | 1                        | NR            | 515    | 317                      | NR            | 645    | 583                      | NR            | 775    | 12                       | NR            | 905    | 0                        | NR            |
| 390    | 2                        | NR            | 520    | 368                      | NR            | 650    | 523                      | NR            | 780    | 11                       | NR            | 910    | 0                        | NR            |
| 395    | 4                        | NR            | 525    | 408                      | NR            | 655    | 465                      | NR            | 785    | 9                        | NR            | 915    | 0                        | NR            |
| 400    | 6                        | NR            | 530    | 443                      | NR            | 660    | 410                      | NR            | 790    | 8                        | NR            | 920    | 0                        | NR            |
| 405    | 11                       | NR            | 535    | 473                      | NR            | 665    | 360                      | NR            | 795    | 7                        | NR            | 925    | 0                        | NR            |
| 410    | 23                       | NR            | 540    | 498                      | NR            | 670    | 313                      | NR            | 800    | 6                        | NR            | 930    | 0                        | NR            |
| 415    | 51                       | NR            | 545    | 530                      | NR            | 675    | 272                      | NR            | 805    | 5                        | NR            | 935    | 0                        | NR            |
| 420    | 111                      | NR            | 550    | 563                      | NR            | 680    | 236                      | NR            | 810    | 4                        | NR            | 940    | 0                        | NR            |
| 425    | 214                      | NR            | 555    | 605                      | NR            | 685    | 203                      | NR            | 815    | 4                        | NR            | 945    | 0                        | NR            |
| 430    | 339                      | NR            | 560    | 651                      | NR            | 690    | 175                      | NR            | 820    | 3                        | NR            | 950    | 0                        | NR            |
| 435    | 467                      | NR            | 565    | 705                      | NR            | 695    | 150                      | NR            | 825    | 3                        | NR            | 955    | 0                        | NR            |
| 440    | 535                      | NR            | 570    | 765                      | NR            | 700    | 128                      | NR            | 830    | 3                        | NR            | 960    | 0                        | NR            |
| 445    | 372                      | NR            | 575    | 824                      | NR            | 705    | 110                      | NR            | 835    | 2                        | NR            | 965    | 0                        | NR            |
| 450    | 160                      | NR            | 580    | 882                      | NR            | 710    | 94                       | NR            | 840    | 2                        | NR            | 970    | 0                        | NR            |
| 455    | 89                       | NR            | 585    | 930                      | NR            | 715    | 80                       | NR            | 845    | 2                        | NR            | 975    | 0                        | NR            |
| 460    | 53                       | NR            | 590    | 968                      | NR            | 720    | 69                       | NR            | 850    | 1                        | NR            | 980    | 0                        | NR            |
| 465    | 31                       | NR            | 595    | 991                      | NR            | 725    | 59                       | NR            | 855    | 1                        | NR            | 985    | 0                        | NR            |
| 470    | 23                       | NR            | 600    | 999                      | NR            | 730    | 50                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 21                       | NR            | 605    | 992                      | NR            | 735    | 43                       | NR            | 865    | 1                        | NR            | 995    | 0                        | NR            |
| 480    | 23                       | NR            | 610    | 969                      | NR            | 740    | 36                       | NR            | 870    | 1                        | NR            | 1000   | 0                        | NR            |
| 485    | 32                       | NR            | 615    | 935                      | NR            | 745    | 31                       | NR            | 875    | 1                        | NR            |        |                          |               |

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TM-30-18

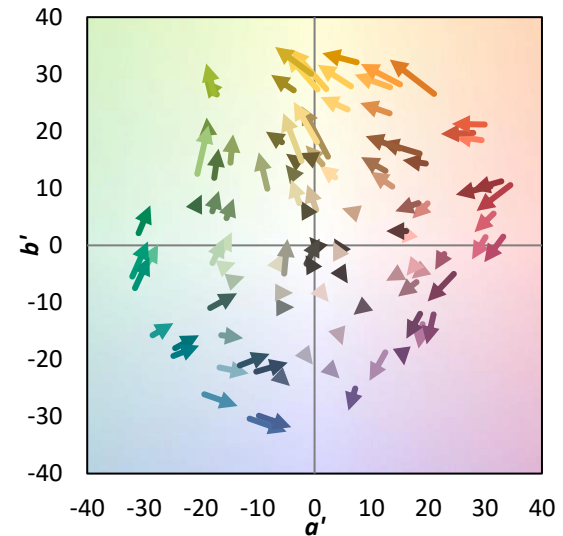
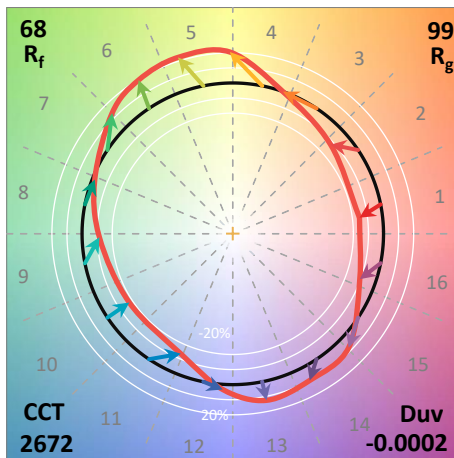
### Summary

$R_f = 67.9$   
 $R_g = 98.6$   
 $CIE R_a = 71.1$   
 $R_g = -27.8$

### Spectral Power Distribution Comparison

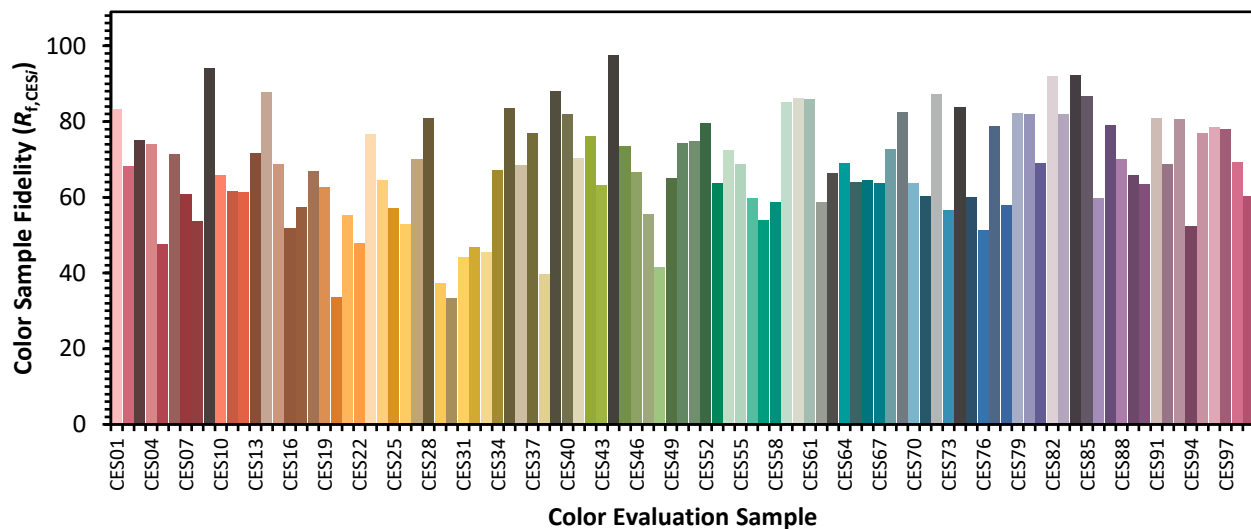


### Color Vector Graphics



**Individual Sample Fidelity Index ( $R_{fi}$ )**

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 53 | CES51 = 75 | CES76 = 51 |
| CES02 = 63 | CES27 = 70 | CES52 = 80 | CES77 = 79 |
| CES03 = 31 | CES28 = 81 | CES53 = 64 | CES78 = 58 |
| CES04 = 71 | CES29 = 37 | CES54 = 73 | CES79 = 82 |
| CES05 = 50 | CES30 = 33 | CES55 = 69 | CES80 = 82 |
| CES06 = 52 | CES31 = 44 | CES56 = 60 | CES81 = 69 |
| CES07 = 42 | CES32 = 47 | CES57 = 54 | CES82 = 92 |
| CES08 = 41 | CES33 = 45 | CES58 = 59 | CES83 = 82 |
| CES09 = 29 | CES34 = 67 | CES59 = 85 | CES84 = 92 |
| CES10 = 77 | CES35 = 84 | CES60 = 86 | CES85 = 87 |
| CES11 = 60 | CES36 = 68 | CES61 = 86 | CES86 = 60 |
| CES12 = 66 | CES37 = 77 | CES62 = 59 | CES87 = 79 |
| CES13 = 44 | CES38 = 40 | CES63 = 66 | CES88 = 70 |
| CES14 = 74 | CES39 = 88 | CES64 = 69 | CES89 = 66 |
| CES15 = 72 | CES40 = 82 | CES65 = 64 | CES90 = 64 |
| CES16 = 48 | CES41 = 70 | CES66 = 65 | CES91 = 81 |
| CES17 = 51 | CES42 = 76 | CES67 = 64 | CES92 = 69 |
| CES18 = 57 | CES43 = 63 | CES68 = 73 | CES93 = 81 |
| CES19 = 73 | CES44 = 97 | CES69 = 83 | CES94 = 53 |
| CES20 = 67 | CES45 = 74 | CES70 = 64 | CES95 = 77 |
| CES21 = 88 | CES46 = 67 | CES71 = 60 | CES96 = 79 |
| CES22 = 80 | CES47 = 55 | CES72 = 87 | CES97 = 78 |
| CES23 = 92 | CES48 = 42 | CES73 = 57 | CES98 = 69 |
| CES24 = 92 | CES49 = 65 | CES74 = 84 | CES99 = 60 |
| CES25 = 73 | CES50 = 74 | CES75 = 60 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)