

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: P1384174

Luminaire Tested: **VAL-T-SB4D-730-U-SL3**

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: P1384174  
 Test Lab: INNOVATION CENTER(G1)  
 Issue Date: 02/18/2026  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: STREETWORKS  
 Catalog Number: VAL-T-SB4D-730-U-SL3  
 Description: GALLEON II WALL SLIM HIGH DENSITY LED ARRAYS 45 SQUARE 238W 70CRI  
 3000K FIXTURE w/ TYPE III SPILL CONTROL DISTRIBUTION OPTIC  
 Light Source: (104) 3000K 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               |

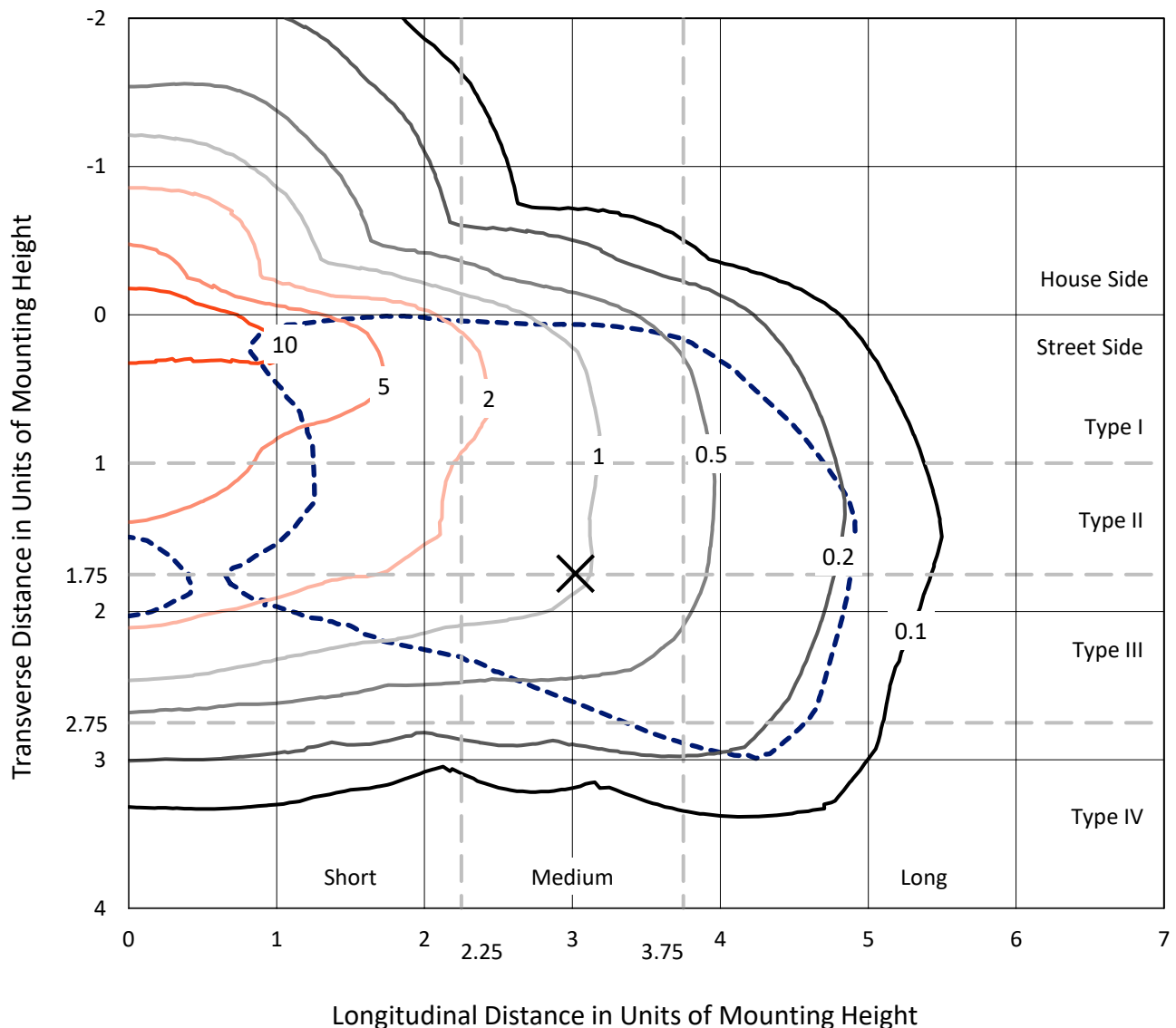
**Summary**

Lumens per Lamp: N/A  
 Luminaire Lumens: 29848.6 lumens  
 Efficiency: N/A  
 Efficacy: 125.4 lumens/watt  
 Luminous Opening: Rectangular (W 1.5' x L: 1' x H: 0')  
 IES Classification: Type III - Medium  
 BUG Rating: B3 - U0 - G4  
  
 Input Watts (W): 238  
 Input Voltage (V): 120  
 Input Current (Ain): NR  
 Voltage Rise (V): NR  
 Power Factor: 0.98  
 Total Harmonic Distortion (THDi): --  
 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

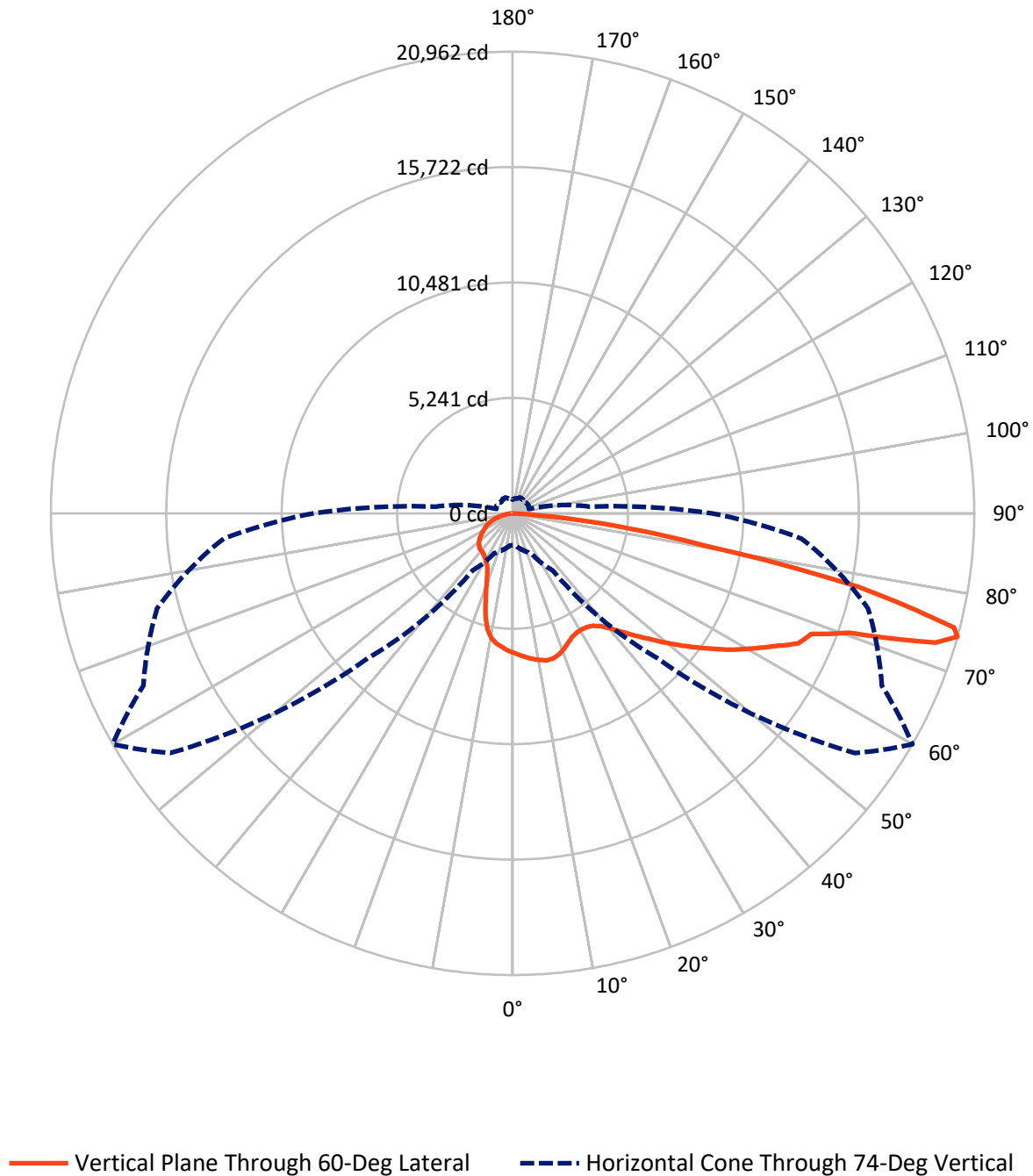
× Max cd  
 - - - 1/2 Max cd



Based on 20 foot mounting height. Maximum calculated value = 15.8 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    | 5826.4   | 0.0    | 5826.4  |
|                    | % Fixture | 19.5     | 0.0    | 19.5    |
| <b>Street Side</b> | Lumens    | 24022.2  | 0.0    | 24022.2 |
|                    | % Fixture | 80.5     | 0.0    | 80.5    |
| <b>Total</b>       | Lumens    | 29848.6  | 0.0    | 29848.6 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 582.6   | 2.0       |
| 10°-20°   | 1429.5  | 4.8       |
| 20°-30°   | 2137.2  | 7.2       |
| 30°-40°   | 3046.6  | 10.2      |
| 40°-50°   | 4380.7  | 14.7      |
| 50°-60°   | 5865.5  | 19.7      |
| 60°-70°   | 6887.7  | 23.1      |
| 70°-80°   | 4912.7  | 16.5      |
| 80°-90°   | 606.3   | 2.0       |
| 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°    | 29848.6 | 100.0     |
| 0°-180°   | 29848.6 | 100.0     |

**Coefficient of Utilization**



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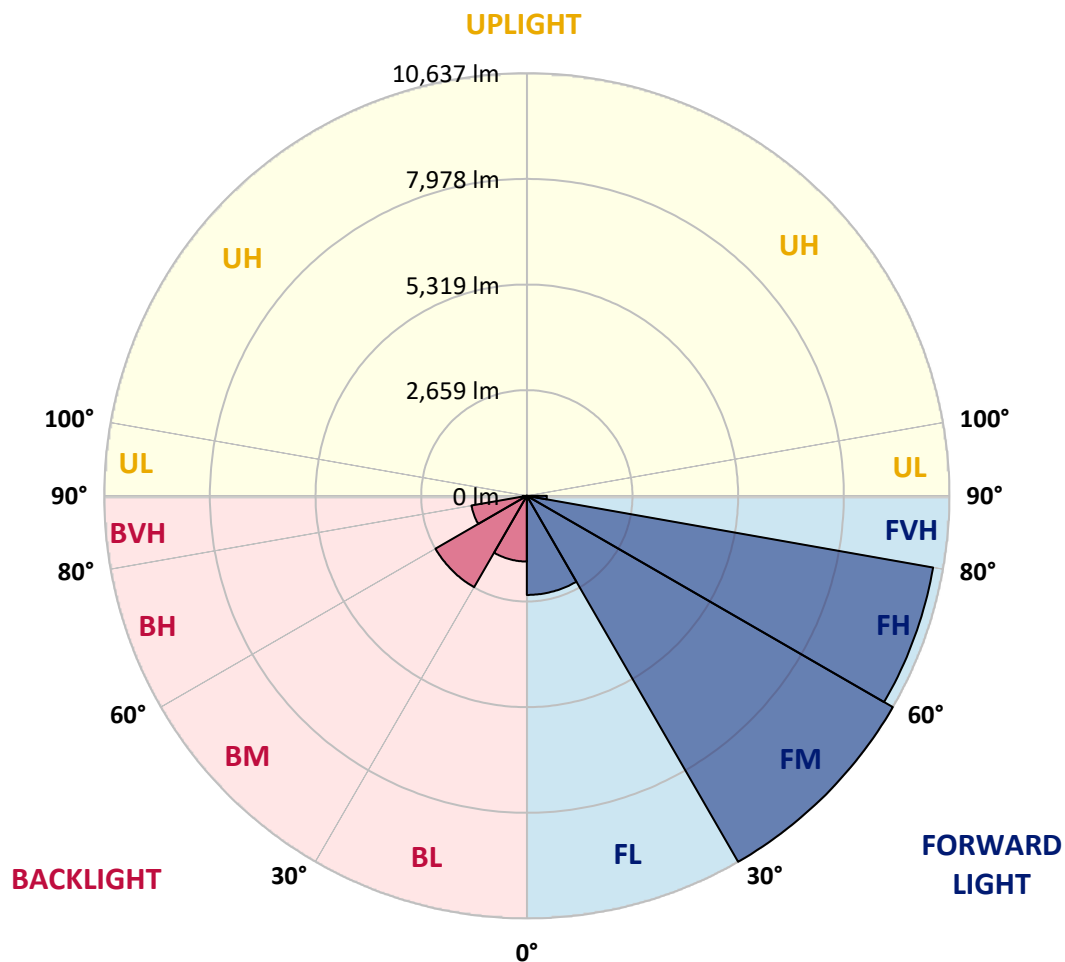
CATALOG NUMBER: VAL-T-SB4D-730-U-SL3

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |          |
|------|-------------|---------|-----------|-------------------------|------|----------|
|      |             |         |           | B                       | U    | G        |
| FL   | (0°-30°)    | 2495.7  | 8.4       |                         |      |          |
| FM   | (30°-60°)   | 10637.3 | 35.6      |                         |      |          |
| FH   | (60°-80°)   | 10385.3 | 34.8      |                         |      | G4/12000 |
| FVH  | (80°-90°)   | 503.9   | 1.7       |                         |      | G4/750   |
| BL   | (0°-30°)    | 1653.5  | 5.5       | B3/2500                 |      |          |
| BM   | (30°-60°)   | 2655.4  | 8.9       | B3/5000                 |      |          |
| BH   | (60°-80°)   | 1415.1  | 4.7       | B3/2500                 |      | G3/2500  |
| BVH  | (80°-90°)   | 102.4   | 0.3       |                         |      | G2/225   |
| UL   | (90°-100°)  | 0.0     | 0.0       |                         | U0/0 |          |
| UH   | (100°-180°) | 0.0     | 0.0       |                         | U0/0 |          |

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

Type III Medium



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 55°     | 60°     | 65°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 6331.1  | 6331.1  | 6331.1  | 6331.1  | 6331.1  | 6331.1  | 6331.1  | 6331.1  | 6331.1  | 6331.1  | 6331.1  |
| 2.5°  | 6531.7  | 6539.1  | 6509.4  | 6487.1  | 6487.1  | 6450.0  | 6450.0  | 6450.0  | 6412.8  | 6405.4  | 6353.4  |
| 5°    | 6606.0  | 6598.6  | 6583.7  | 6591.2  | 6598.6  | 6583.7  | 6591.2  | 6568.9  | 6516.8  | 6502.0  | 6420.2  |
| 7.5°  | 6398.0  | 6398.0  | 6435.1  | 6509.4  | 6613.4  | 6665.5  | 6695.2  | 6680.3  | 6658.0  | 6613.4  | 6494.6  |
| 10°   | 5647.4  | 5699.5  | 5810.9  | 6056.1  | 6360.8  | 6613.4  | 6776.9  | 6769.5  | 6776.9  | 6717.5  | 6583.7  |
| 12.5° | 4986.1  | 5008.4  | 5112.4  | 5327.9  | 5766.3  | 6308.8  | 6762.1  | 6851.2  | 6873.5  | 6836.4  | 6672.9  |
| 15°   | 4629.4  | 4622.0  | 4703.7  | 4874.6  | 5209.0  | 5803.5  | 6598.6  | 6843.8  | 6977.6  | 6970.1  | 6799.2  |
| 17.5° | 4473.4  | 4480.8  | 4525.4  | 4636.8  | 4882.1  | 5372.5  | 6308.8  | 6754.6  | 7029.6  | 7118.7  | 6918.1  |
| 20°   | 4547.7  | 4525.4  | 4547.7  | 4570.0  | 4703.7  | 5090.1  | 5996.7  | 6598.6  | 7074.2  | 7259.9  | 7051.9  |
| 22.5° | 4703.7  | 4681.4  | 4674.0  | 4659.1  | 4688.9  | 4926.6  | 5714.3  | 6405.4  | 7111.3  | 7445.7  | 7207.9  |
| 25°   | 4978.7  | 4956.4  | 4889.5  | 4807.8  | 4770.6  | 4874.6  | 5528.5  | 6241.9  | 7148.5  | 7705.8  | 7408.5  |
| 27.5° | 5372.5  | 5342.8  | 5246.2  | 5053.0  | 4934.1  | 4948.9  | 5469.1  | 6152.7  | 7215.3  | 7958.4  | 7601.7  |
| 30°   | 5959.5  | 5944.7  | 5729.2  | 5417.1  | 5171.9  | 5082.7  | 5498.8  | 6130.4  | 7289.7  | 8248.2  | 7794.9  |
| 32.5° | 6487.1  | 6472.3  | 6308.8  | 5959.5  | 5550.8  | 5298.2  | 5573.1  | 6160.2  | 7386.3  | 8619.8  | 8077.3  |
| 35°   | 6918.1  | 6888.4  | 6754.6  | 6487.1  | 6071.0  | 5625.1  | 5736.6  | 6264.2  | 7594.3  | 9110.2  | 8419.1  |
| 37.5° | 7356.5  | 7334.2  | 7148.5  | 6866.1  | 6606.0  | 6078.4  | 6011.5  | 6502.0  | 7876.7  | 9779.0  | 8917.0  |
| 40°   | 7884.1  | 7854.4  | 7631.5  | 7297.1  | 7066.7  | 6695.2  | 6405.4  | 6881.0  | 8307.7  | 10544.4 | 9481.7  |
| 42.5° | 8389.4  | 8359.7  | 8099.6  | 7809.8  | 7520.0  | 7289.7  | 6962.7  | 7386.3  | 8842.7  | 11517.8 | 10150.5 |
| 45°   | 8976.5  | 8976.5  | 8612.3  | 8292.8  | 7988.2  | 7705.8  | 7490.3  | 7965.9  | 9466.9  | 12617.6 | 10893.6 |
| 47.5° | 9526.3  | 9474.3  | 9117.6  | 8768.4  | 8471.2  | 7936.1  | 7995.6  | 8575.2  | 10165.4 | 13732.2 | 11696.1 |
| 50°   | 9704.7  | 9689.8  | 9452.0  | 9139.9  | 8887.3  | 8218.5  | 8515.7  | 9303.4  | 10953.1 | 14794.8 | 12454.1 |
| 52.5° | 9912.7  | 9845.9  | 9504.0  | 9459.5  | 9169.7  | 8575.2  | 9154.8  | 10053.9 | 11673.8 | 15760.8 | 13063.4 |
| 55°   | 10172.8 | 10098.5 | 9630.4  | 9541.2  | 9385.1  | 8976.5  | 9883.0  | 10826.7 | 12357.5 | 16511.3 | 13635.6 |
| 57.5° | 10648.4 | 10559.2 | 9897.9  | 9704.7  | 9578.4  | 9481.7  | 10707.8 | 11681.3 | 13048.6 | 17098.4 | 14126.0 |
| 60°   | 10923.3 | 10849.0 | 10284.3 | 10143.1 | 9957.3  | 10180.2 | 11592.1 | 12468.9 | 13702.5 | 17551.6 | 14505.0 |
| 62.5° | 10782.1 | 10730.1 | 10336.3 | 10603.8 | 10752.4 | 11101.7 | 12602.7 | 13286.3 | 14222.6 | 17893.5 | 14519.9 |
| 65°   | 10053.9 | 9949.9  | 9682.4  | 10492.3 | 11666.4 | 12654.7 | 13888.2 | 14244.9 | 14564.4 | 16972.0 | 13643.0 |
| 67.5° | 8307.7  | 8203.6  | 8359.7  | 9191.9  | 11146.3 | 15047.4 | 15656.8 | 14631.3 | 13947.7 | 16132.3 | 13516.7 |
| 70°   | 3774.9  | 3604.0  | 4547.7  | 6502.0  | 9221.7  | 14527.3 | 18116.4 | 16236.4 | 14571.9 | 16058.0 | 13264.0 |
| 72.5° | 1850.3  | 1924.6  | 2221.8  | 2920.3  | 5640.0  | 11153.7 | 19974.1 | 20078.1 | 16689.7 | 16251.2 | 13442.4 |
| 74°   | 1449.0  | 1471.3  | 1716.5  | 2006.3  | 3150.7  | 9310.8  | 18978.4 | 20962.4 | 18495.4 | 16712.0 | 13167.4 |
| 75°   | 1248.4  | 1278.1  | 1523.3  | 1671.9  | 2028.6  | 7839.5  | 17715.1 | 20694.9 | 19320.2 | 16622.8 | 12558.1 |
| 77.5° | 914.0   | 906.6   | 1084.9  | 1330.1  | 951.1   | 3492.5  | 14348.9 | 16035.7 | 16474.2 | 13539.0 | 8374.6  |
| 80°   | 564.7   | 587.0   | 750.5   | 928.9   | 631.6   | 1330.1  | 8434.0  | 8761.0  | 7794.9  | 7839.5  | 4064.7  |
| 82.5° | 341.8   | 356.7   | 401.3   | 483.0   | 349.2   | 468.1   | 3819.5  | 4763.2  | 3945.8  | 2563.6  | 683.6   |
| 85°   | 104.0   | 111.5   | 133.8   | 170.9   | 126.3   | 170.9   | 1285.5  | 1159.2  | 824.8   | 341.8   | 200.6   |
| 87.5° | 7.4     | 7.4     | 14.9    | 14.9    | 22.3    | 37.2    | 52.0    | 59.4    | 66.9    | 74.3    | 74.3    |
| 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-SB4D-730-U-SL3

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 6331.1  | 6331.1 | 6331.1 | 6331.1 | 6331.1 | 6331.1 | 6331.1 | 6331.1 | 6331.1 | 6331.1 | 6331.1 |
| 2.5°  | 6353.4  | 6331.1 | 6301.4 | 6249.3 | 6212.2 | 6175.0 | 6130.4 | 6063.6 | 6041.3 | 6048.7 | 6063.6 |
| 5°    | 6405.4  | 6345.9 | 6256.8 | 6137.9 | 6048.7 | 5974.4 | 5855.5 | 5758.9 | 5699.5 | 5699.5 | 5669.7 |
| 7.5°  | 6457.4  | 6375.7 | 6234.5 | 6033.8 | 5877.8 | 5669.7 | 5446.8 | 5223.9 | 5067.8 | 5001.0 | 4941.5 |
| 10°   | 6546.6  | 6420.2 | 6189.9 | 5922.4 | 5588.0 | 5171.9 | 4718.6 | 4257.9 | 3968.1 | 3819.5 | 3812.0 |
| 12.5° | 6606.0  | 6479.7 | 6167.6 | 5736.6 | 5105.0 | 4317.3 | 3626.2 | 3247.3 | 3128.4 | 3076.4 | 3061.5 |
| 15°   | 6702.6  | 6531.7 | 6115.6 | 5394.8 | 4361.9 | 3418.2 | 3039.2 | 2927.8 | 2920.3 | 2927.8 | 2935.2 |
| 17.5° | 6784.4  | 6576.3 | 5981.8 | 4852.3 | 3499.9 | 2972.3 | 2875.7 | 2868.3 | 2920.3 | 2942.6 | 2964.9 |
| 20°   | 6873.5  | 6613.4 | 5744.0 | 4094.4 | 3016.9 | 2838.6 | 2823.7 | 2868.3 | 2942.6 | 3002.1 | 3009.5 |
| 22.5° | 6999.8  | 6643.2 | 5327.9 | 3343.9 | 2786.6 | 2764.3 | 2801.4 | 2846.0 | 2890.6 | 2942.6 | 2957.5 |
| 25°   | 7133.6  | 6643.2 | 4755.7 | 2831.1 | 2667.7 | 2727.1 | 2764.3 | 2727.1 | 2712.3 | 2756.8 | 2756.8 |
| 27.5° | 7237.6  | 6591.2 | 3945.8 | 2556.2 | 2585.9 | 2682.5 | 2660.2 | 2578.5 | 2563.6 | 2593.4 | 2585.9 |
| 30°   | 7311.9  | 6398.0 | 3128.4 | 2407.6 | 2504.2 | 2585.9 | 2526.5 | 2481.9 | 2452.2 | 2459.6 | 2467.0 |
| 32.5° | 7423.4  | 6100.7 | 2563.6 | 2303.6 | 2437.3 | 2429.9 | 2422.5 | 2377.9 | 2340.7 | 2348.1 | 2355.6 |
| 35°   | 7557.2  | 5610.3 | 2244.1 | 2229.3 | 2377.9 | 2318.4 | 2325.9 | 2273.8 | 2229.3 | 2229.3 | 2236.7 |
| 37.5° | 7728.1  | 5023.2 | 2110.4 | 2199.5 | 2281.3 | 2273.8 | 2251.5 | 2184.7 | 2117.8 | 2102.9 | 2102.9 |
| 40°   | 7913.8  | 4302.5 | 2043.5 | 2184.7 | 2236.7 | 2259.0 | 2214.4 | 2132.7 | 1954.3 | 1842.8 | 1835.4 |
| 42.5° | 8032.7  | 3708.0 | 2021.2 | 2162.4 | 2229.3 | 2251.5 | 2192.1 | 1939.4 | 1768.5 | 1694.2 | 1686.8 |
| 45°   | 8203.6  | 3381.0 | 2021.2 | 2102.9 | 2199.5 | 2221.8 | 2013.8 | 1842.8 | 1746.2 | 1709.1 | 1716.5 |
| 47.5° | 8374.6  | 3381.0 | 2021.2 | 2058.3 | 2117.8 | 2147.5 | 1872.6 | 1798.3 | 1709.1 | 1709.1 | 1738.8 |
| 50°   | 8612.3  | 3566.8 | 2006.3 | 1991.5 | 2013.8 | 1902.3 | 1783.4 | 1724.0 | 1605.1 | 1560.5 | 1567.9 |
| 52.5° | 8969.0  | 3849.2 | 1946.9 | 1894.9 | 1902.3 | 1761.1 | 1724.0 | 1634.8 | 1515.9 | 1426.7 | 1404.4 |
| 55°   | 9355.4  | 4153.8 | 1828.0 | 1783.4 | 1776.0 | 1671.9 | 1657.1 | 1560.5 | 1449.0 | 1330.1 | 1307.8 |
| 57.5° | 9779.0  | 4399.1 | 1679.4 | 1671.9 | 1649.6 | 1582.8 | 1605.1 | 1538.2 | 1382.1 | 1226.1 | 1203.8 |
| 60°   | 10180.2 | 4674.0 | 1538.2 | 1553.0 | 1515.9 | 1501.0 | 1530.8 | 1486.2 | 1293.0 | 1122.1 | 1107.2 |
| 62.5° | 10180.2 | 4666.6 | 1411.9 | 1426.7 | 1419.3 | 1382.1 | 1434.2 | 1404.4 | 1174.1 | 1032.9 | 1018.0 |
| 65°   | 9622.9  | 4458.5 | 1263.2 | 1300.4 | 1330.1 | 1255.8 | 1322.7 | 1270.7 | 1070.0 | 958.6  | 936.3  |
| 67.5° | 9548.6  | 4376.8 | 1114.6 | 1151.8 | 1203.8 | 1122.1 | 1166.6 | 1114.6 | 973.4  | 876.8  | 862.0  |
| 70°   | 9400.0  | 4191.0 | 980.9  | 1025.5 | 1047.7 | 958.6  | 1018.0 | 980.9  | 876.8  | 802.5  | 787.7  |
| 72.5° | 9474.3  | 4027.5 | 839.7  | 891.7  | 899.1  | 817.4  | 876.8  | 862.0  | 772.8  | 720.8  | 691.1  |
| 74°   | 9058.2  | 3485.1 | 757.9  | 802.5  | 787.7  | 728.2  | 780.2  | 780.2  | 698.5  | 661.3  | 624.2  |
| 75°   | 8508.3  | 3091.2 | 698.5  | 743.1  | 705.9  | 668.8  | 720.8  | 728.2  | 646.5  | 646.5  | 587.0  |
| 77.5° | 5588.0  | 2073.2 | 549.9  | 579.6  | 564.7  | 542.5  | 572.2  | 564.7  | 505.3  | 490.4  | 453.3  |
| 80°   | 2734.5  | 1136.9 | 416.1  | 401.3  | 408.7  | 401.3  | 423.6  | 416.1  | 386.4  | 371.5  | 364.1  |
| 82.5° | 512.7   | 379.0  | 274.9  | 267.5  | 252.6  | 237.8  | 267.5  | 267.5  | 356.7  | 401.3  | 401.3  |
| 85°   | 156.0   | 148.6  | 133.8  | 133.8  | 126.3  | 111.5  | 118.9  | 170.9  | 208.1  | 141.2  | 133.8  |
| 87.5° | 66.9    | 66.9   | 59.4   | 52.0   | 37.2   | 37.2   | 29.7   | 29.7   | 29.7   | 29.7   | 29.7   |
| 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: SP1-2407-184-4

Test Date: 10/10/2024

Luminaire Tested: GSS-SB1A-730-U-5WQ

Data in this report applies to families of products including GSS-SB1A-730-U-5WQ

### Test Information

Test Method: LM-79-2019  
 Report Number: SP1-2407-184-4  
 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-730-U-5WQ**  
 Description: GALLEON II SITE SLIM 1SQ 350MA 5WQ HIGH DENSITY LIGHTSQUARE WITH 70 CRI  
 3000K CCT 26 LEDS

### Spectral Parameters

CCT (K): 2985  
 CIE  $u'$ : 0.2504  
 CIE  $v'$ : 0.5243  
 Duv: 0.0019  
 CIE x: 0.4408  
 CIE y: 0.4101  
 CIE z: 0.1491  
 Peak Wavelength (nm): 595  
 Dominant Wavelength (nm): 582  
 Purity: 55.41818  
 R<sub>f</sub>: 73.8  
 R<sub>g</sub>: 94.4

CRI (Ra): 70.8  
 R1: 66.3  
 R2: 80.6  
 R3: 94.5  
 R4: 68.2  
 R5: 66.5  
 R6: 74.7  
 R7: 76.2  
 R8: 39.6  
 R9: -43.2  
 R10: 57.6  
 R11: 64.8  
 R12: 53.5  
 R13: 68.7  
 R14: 97.0  
 R15: 56.4



### Test Conditions

Stabilization Time: 36M  
 Operation Time: 1H 36M  
 Sphere Temperature (°C): 25.2

REPORT NUMBER: SP1-2407-184-4

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

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**CIE 1931 Chromaticity Diagram**



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



Point lies inside the ANSI 3000K 4-step quadrangle

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### Photopic Flux vs. Wavelength



### Photopic Lumens: NR

| $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | 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               | 142                                  | NR                             | 620               | 803                                  | NR                             | 750               | 17                                   | NR                             | 880               | 0                                    | NR                             |
| 365               | 0                                    | NR                             | 495               | 189                                  | NR                             | 625               | 734                                  | NR                             | 755               | 15                                   | NR                             | 885               | 0                                    | NR                             |
| 370               | 0                                    | NR                             | 500               | 240                                  | NR                             | 630               | 670                                  | NR                             | 760               | 13                                   | NR                             | 890               | 0                                    | NR                             |
| 375               | 0                                    | NR                             | 505               | 290                                  | NR                             | 635               | 600                                  | NR                             | 765               | 11                                   | NR                             | 895               | 0                                    | NR                             |
| 380               | 0                                    | NR                             | 510               | 335                                  | NR                             | 640               | 535                                  | NR                             | 770               | 9                                    | NR                             | 900               | 0                                    | NR                             |
| 385               | 0                                    | NR                             | 515               | 375                                  | NR                             | 645               | 473                                  | NR                             | 775               | 8                                    | NR                             | 905               | 0                                    | NR                             |
| 390               | 1                                    | NR                             | 520               | 408                                  | NR                             | 650               | 415                                  | NR                             | 780               | 7                                    | NR                             | 910               | 0                                    | NR                             |
| 395               | 2                                    | NR                             | 525               | 434                                  | NR                             | 655               | 362                                  | NR                             | 785               | 6                                    | NR                             | 915               | 0                                    | NR                             |
| 400               | 4                                    | NR                             | 530               | 461                                  | NR                             | 660               | 313                                  | NR                             | 790               | 5                                    | NR                             | 920               | 0                                    | NR                             |
| 405               | 8                                    | NR                             | 535               | 486                                  | NR                             | 665               | 271                                  | NR                             | 795               | 4                                    | NR                             | 925               | 0                                    | NR                             |
| 410               | 16                                   | NR                             | 540               | 514                                  | NR                             | 670               | 231                                  | NR                             | 800               | 4                                    | NR                             | 930               | 0                                    | NR                             |
| 415               | 33                                   | NR                             | 545               | 549                                  | NR                             | 675               | 198                                  | NR                             | 805               | 3                                    | NR                             | 935               | 0                                    | NR                             |
| 420               | 69                                   | NR                             | 550               | 591                                  | NR                             | 680               | 169                                  | NR                             | 810               | 3                                    | NR                             | 940               | 0                                    | NR                             |
| 425               | 131                                  | NR                             | 555               | 640                                  | NR                             | 685               | 144                                  | NR                             | 815               | 2                                    | NR                             | 945               | 0                                    | NR                             |
| 430               | 227                                  | NR                             | 560               | 695                                  | NR                             | 690               | 123                                  | NR                             | 820               | 2                                    | NR                             | 950               | 0                                    | NR                             |
| 435               | 369                                  | NR                             | 565               | 757                                  | NR                             | 695               | 104                                  | NR                             | 825               | 2                                    | NR                             | 955               | 0                                    | NR                             |
| 440               | 517                                  | NR                             | 570               | 822                                  | NR                             | 700               | 88                                   | NR                             | 830               | 2                                    | NR                             | 960               | 0                                    | NR                             |
| 445               | 498                                  | NR                             | 575               | 882                                  | NR                             | 705               | 75                                   | NR                             | 835               | 1                                    | NR                             | 965               | 0                                    | NR                             |
| 450               | 315                                  | NR                             | 580               | 935                                  | NR                             | 710               | 63                                   | NR                             | 840               | 1                                    | NR                             | 970               | 0                                    | NR                             |
| 455               | 204                                  | NR                             | 585               | 972                                  | NR                             | 715               | 54                                   | NR                             | 845               | 1                                    | NR                             | 975               | 0                                    | NR                             |
| 460               | 145                                  | NR                             | 590               | 996                                  | NR                             | 720               | 46                                   | NR                             | 850               | 1                                    | NR                             | 980               | 0                                    | NR                             |
| 465               | 100                                  | NR                             | 595               | 1000                                 | NR                             | 725               | 39                                   | NR                             | 855               | 1                                    | NR                             | 985               | 0                                    | NR                             |
| 470               | 78                                   | NR                             | 600               | 989                                  | NR                             | 730               | 33                                   | NR                             | 860               | 1                                    | NR                             | 990               | 0                                    | NR                             |
| 475               | 76                                   | NR                             | 605               | 960                                  | NR                             | 735               | 28                                   | NR                             | 865               | 1                                    | NR                             | 995               | 0                                    | NR                             |
| 480               | 83                                   | NR                             | 610               | 918                                  | NR                             | 740               | 24                                   | NR                             | 870               | 1                                    | NR                             | 1000              | 0                                    | NR                             |
| 485               | 105                                  | NR                             | 615               | 864                                  | NR                             | 745               | 20                                   | NR                             | 875               | 1                                    | NR                             |                   |                                      |                                |

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### Scotopic Flux vs. Wavelength



Scotopic Lumens: NR

S/P: 1.19

| $\lambda$<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               | 142                                  | NR                             | 620               | 803                                  | NR                             | 750               | 17                                   | NR                             | 880               | 0                                    | NR                             |
| 365               | 0                                    | NR                             | 495               | 189                                  | NR                             | 625               | 734                                  | NR                             | 755               | 15                                   | NR                             | 885               | 0                                    | NR                             |
| 370               | 0                                    | NR                             | 500               | 240                                  | NR                             | 630               | 670                                  | NR                             | 760               | 13                                   | NR                             | 890               | 0                                    | NR                             |
| 375               | 0                                    | NR                             | 505               | 290                                  | NR                             | 635               | 600                                  | NR                             | 765               | 11                                   | NR                             | 895               | 0                                    | NR                             |
| 380               | 0                                    | NR                             | 510               | 335                                  | NR                             | 640               | 535                                  | NR                             | 770               | 9                                    | NR                             | 900               | 0                                    | NR                             |
| 385               | 0                                    | NR                             | 515               | 375                                  | NR                             | 645               | 473                                  | NR                             | 775               | 8                                    | NR                             | 905               | 0                                    | NR                             |
| 390               | 1                                    | NR                             | 520               | 408                                  | NR                             | 650               | 415                                  | NR                             | 780               | 7                                    | NR                             | 910               | 0                                    | NR                             |
| 395               | 2                                    | NR                             | 525               | 434                                  | NR                             | 655               | 362                                  | NR                             | 785               | 6                                    | NR                             | 915               | 0                                    | NR                             |
| 400               | 4                                    | NR                             | 530               | 461                                  | NR                             | 660               | 313                                  | NR                             | 790               | 5                                    | NR                             | 920               | 0                                    | NR                             |
| 405               | 8                                    | NR                             | 535               | 486                                  | NR                             | 665               | 271                                  | NR                             | 795               | 4                                    | NR                             | 925               | 0                                    | NR                             |
| 410               | 16                                   | NR                             | 540               | 514                                  | NR                             | 670               | 231                                  | NR                             | 800               | 4                                    | NR                             | 930               | 0                                    | NR                             |
| 415               | 33                                   | NR                             | 545               | 549                                  | NR                             | 675               | 198                                  | NR                             | 805               | 3                                    | NR                             | 935               | 0                                    | NR                             |
| 420               | 69                                   | NR                             | 550               | 591                                  | NR                             | 680               | 169                                  | NR                             | 810               | 3                                    | NR                             | 940               | 0                                    | NR                             |
| 425               | 131                                  | NR                             | 555               | 640                                  | NR                             | 685               | 144                                  | NR                             | 815               | 2                                    | NR                             | 945               | 0                                    | NR                             |
| 430               | 227                                  | NR                             | 560               | 695                                  | NR                             | 690               | 123                                  | NR                             | 820               | 2                                    | NR                             | 950               | 0                                    | NR                             |
| 435               | 369                                  | NR                             | 565               | 757                                  | NR                             | 695               | 104                                  | NR                             | 825               | 2                                    | NR                             | 955               | 0                                    | NR                             |
| 440               | 517                                  | NR                             | 570               | 822                                  | NR                             | 700               | 88                                   | NR                             | 830               | 2                                    | NR                             | 960               | 0                                    | NR                             |
| 445               | 498                                  | NR                             | 575               | 882                                  | NR                             | 705               | 75                                   | NR                             | 835               | 1                                    | NR                             | 965               | 0                                    | NR                             |
| 450               | 315                                  | NR                             | 580               | 935                                  | NR                             | 710               | 63                                   | NR                             | 840               | 1                                    | NR                             | 970               | 0                                    | NR                             |
| 455               | 204                                  | NR                             | 585               | 972                                  | NR                             | 715               | 54                                   | NR                             | 845               | 1                                    | NR                             | 975               | 0                                    | NR                             |
| 460               | 145                                  | NR                             | 590               | 996                                  | NR                             | 720               | 46                                   | NR                             | 850               | 1                                    | NR                             | 980               | 0                                    | NR                             |
| 465               | 100                                  | NR                             | 595               | 1000                                 | NR                             | 725               | 39                                   | NR                             | 855               | 1                                    | NR                             | 985               | 0                                    | NR                             |
| 470               | 78                                   | NR                             | 600               | 989                                  | NR                             | 730               | 33                                   | NR                             | 860               | 1                                    | NR                             | 990               | 0                                    | NR                             |
| 475               | 76                                   | NR                             | 605               | 960                                  | NR                             | 735               | 28                                   | NR                             | 865               | 1                                    | NR                             | 995               | 0                                    | NR                             |
| 480               | 83                                   | NR                             | 610               | 918                                  | NR                             | 740               | 24                                   | NR                             | 870               | 1                                    | NR                             | 1000              | 0                                    | NR                             |
| 485               | 105                                  | NR                             | 615               | 864                                  | NR                             | 745               | 20                                   | NR                             | 875               | 1                                    | NR                             |                   |                                      |                                |

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### Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 2.13

| $\lambda$<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               | 142                                  | NR                             | 620               | 803                                  | NR                             | 750               | 17                                   | NR                             | 880               | 0                                    | NR                             |
| 365               | 0                                    | NR                             | 495               | 189                                  | NR                             | 625               | 734                                  | NR                             | 755               | 15                                   | NR                             | 885               | 0                                    | NR                             |
| 370               | 0                                    | NR                             | 500               | 240                                  | NR                             | 630               | 670                                  | NR                             | 760               | 13                                   | NR                             | 890               | 0                                    | NR                             |
| 375               | 0                                    | NR                             | 505               | 290                                  | NR                             | 635               | 600                                  | NR                             | 765               | 11                                   | NR                             | 895               | 0                                    | NR                             |
| 380               | 0                                    | NR                             | 510               | 335                                  | NR                             | 640               | 535                                  | NR                             | 770               | 9                                    | NR                             | 900               | 0                                    | NR                             |
| 385               | 0                                    | NR                             | 515               | 375                                  | NR                             | 645               | 473                                  | NR                             | 775               | 8                                    | NR                             | 905               | 0                                    | NR                             |
| 390               | 1                                    | NR                             | 520               | 408                                  | NR                             | 650               | 415                                  | NR                             | 780               | 7                                    | NR                             | 910               | 0                                    | NR                             |
| 395               | 2                                    | NR                             | 525               | 434                                  | NR                             | 655               | 362                                  | NR                             | 785               | 6                                    | NR                             | 915               | 0                                    | NR                             |
| 400               | 4                                    | NR                             | 530               | 461                                  | NR                             | 660               | 313                                  | NR                             | 790               | 5                                    | NR                             | 920               | 0                                    | NR                             |
| 405               | 8                                    | NR                             | 535               | 486                                  | NR                             | 665               | 271                                  | NR                             | 795               | 4                                    | NR                             | 925               | 0                                    | NR                             |
| 410               | 16                                   | NR                             | 540               | 514                                  | NR                             | 670               | 231                                  | NR                             | 800               | 4                                    | NR                             | 930               | 0                                    | NR                             |
| 415               | 33                                   | NR                             | 545               | 549                                  | NR                             | 675               | 198                                  | NR                             | 805               | 3                                    | NR                             | 935               | 0                                    | NR                             |
| 420               | 69                                   | NR                             | 550               | 591                                  | NR                             | 680               | 169                                  | NR                             | 810               | 3                                    | NR                             | 940               | 0                                    | NR                             |
| 425               | 131                                  | NR                             | 555               | 640                                  | NR                             | 685               | 144                                  | NR                             | 815               | 2                                    | NR                             | 945               | 0                                    | NR                             |
| 430               | 227                                  | NR                             | 560               | 695                                  | NR                             | 690               | 123                                  | NR                             | 820               | 2                                    | NR                             | 950               | 0                                    | NR                             |
| 435               | 369                                  | NR                             | 565               | 757                                  | NR                             | 695               | 104                                  | NR                             | 825               | 2                                    | NR                             | 955               | 0                                    | NR                             |
| 440               | 517                                  | NR                             | 570               | 822                                  | NR                             | 700               | 88                                   | NR                             | 830               | 2                                    | NR                             | 960               | 0                                    | NR                             |
| 445               | 498                                  | NR                             | 575               | 882                                  | NR                             | 705               | 75                                   | NR                             | 835               | 1                                    | NR                             | 965               | 0                                    | NR                             |
| 450               | 315                                  | NR                             | 580               | 935                                  | NR                             | 710               | 63                                   | NR                             | 840               | 1                                    | NR                             | 970               | 0                                    | NR                             |
| 455               | 204                                  | NR                             | 585               | 972                                  | NR                             | 715               | 54                                   | NR                             | 845               | 1                                    | NR                             | 975               | 0                                    | NR                             |
| 460               | 145                                  | NR                             | 590               | 996                                  | NR                             | 720               | 46                                   | NR                             | 850               | 1                                    | NR                             | 980               | 0                                    | NR                             |
| 465               | 100                                  | NR                             | 595               | 1000                                 | NR                             | 725               | 39                                   | NR                             | 855               | 1                                    | NR                             | 985               | 0                                    | NR                             |
| 470               | 78                                   | NR                             | 600               | 989                                  | NR                             | 730               | 33                                   | NR                             | 860               | 1                                    | NR                             | 990               | 0                                    | NR                             |
| 475               | 76                                   | NR                             | 605               | 960                                  | NR                             | 735               | 28                                   | NR                             | 865               | 1                                    | NR                             | 995               | 0                                    | NR                             |
| 480               | 83                                   | NR                             | 610               | 918                                  | NR                             | 740               | 24                                   | NR                             | 870               | 1                                    | NR                             | 1000              | 0                                    | NR                             |
| 485               | 105                                  | NR                             | 615               | 864                                  | NR                             | 745               | 20                                   | NR                             | 875               | 1                                    | NR                             |                   |                                      |                                |

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TM-30-18

### Summary

$R_f = 73.8$   
 $R_g = 94.4$   
 $CIE R_a = 70.8$   
 $R_g = -43.2$



### Color Vector Graphics



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 63 | CES51 = 86 | CES76 = 61 |
| CES02 = 62 | CES27 = 83 | CES52 = 86 | CES77 = 81 |
| CES03 = 31 | CES28 = 86 | CES53 = 75 | CES78 = 64 |
| CES04 = 71 | CES29 = 58 | CES54 = 81 | CES79 = 86 |
| CES05 = 49 | CES30 = 61 | CES55 = 80 | CES80 = 86 |
| CES06 = 51 | CES31 = 63 | CES56 = 71 | CES81 = 70 |
| CES07 = 41 | CES32 = 61 | CES57 = 69 | CES82 = 94 |
| CES08 = 40 | CES33 = 65 | CES58 = 72 | CES83 = 88 |
| CES09 = 29 | CES34 = 77 | CES59 = 85 | CES84 = 90 |
| CES10 = 76 | CES35 = 88 | CES60 = 93 | CES85 = 80 |
| CES11 = 59 | CES36 = 89 | CES61 = 86 | CES86 = 60 |
| CES12 = 65 | CES37 = 85 | CES62 = 81 | CES87 = 78 |
| CES13 = 43 | CES38 = 69 | CES63 = 73 | CES88 = 75 |
| CES14 = 74 | CES39 = 93 | CES64 = 72 | CES89 = 66 |
| CES15 = 71 | CES40 = 89 | CES65 = 67 | CES90 = 72 |
| CES16 = 47 | CES41 = 83 | CES66 = 70 | CES91 = 95 |
| CES17 = 50 | CES42 = 87 | CES67 = 68 | CES92 = 59 |
| CES18 = 56 | CES43 = 77 | CES68 = 73 | CES93 = 76 |
| CES19 = 73 | CES44 = 99 | CES69 = 83 | CES94 = 48 |
| CES20 = 66 | CES45 = 83 | CES70 = 66 | CES95 = 70 |
| CES21 = 87 | CES46 = 77 | CES71 = 66 | CES96 = 76 |
| CES22 = 79 | CES47 = 74 | CES72 = 88 | CES97 = 82 |
| CES23 = 92 | CES48 = 62 | CES73 = 59 | CES98 = 73 |
| CES24 = 91 | CES49 = 77 | CES74 = 93 | CES99 = 60 |
| CES25 = 73 | CES50 = 85 | CES75 = 67 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)