

Signify Classified - Internal  
Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269



Scaled data based on original data using  
LM-79-08 Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Test Report Prepared for  
Cooper Lighting Solutions  
(formerly Eaton)

Brand: LUMARK

Report Number: P1067111

Luminaire Tested: **NAV-SA3C-830-U-T3BC**

Issue Date: 08/07/2025

**Test Information**

Test Method: LM-79-08  
Report Number: P1067111  
Test Lab: INNOVATION CENTER(G3)  
Issue Date: 08/07/2025  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: LUMARK  
Catalog Number: NAV-SA3C-830-U-T3BC  
Description: Navion AREA AND ROADWAY LUMINAIRE 1050mA 3xLight Square PACKAGE  
80CRI 3000K FIXTURE w/ TYPE III ANGLED BACKLIGHT CONTROL  
Light Source: (42) 3000K CCT, 80 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 13763.1 lumens  
Efficiency: N/A  
Efficacy: 98.0 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 1.5' x H: 0')  
IES Classification: Type III - Short  
BUG Rating: B0 - U0 - G3

Input Watts (W): 140.4  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.97  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT

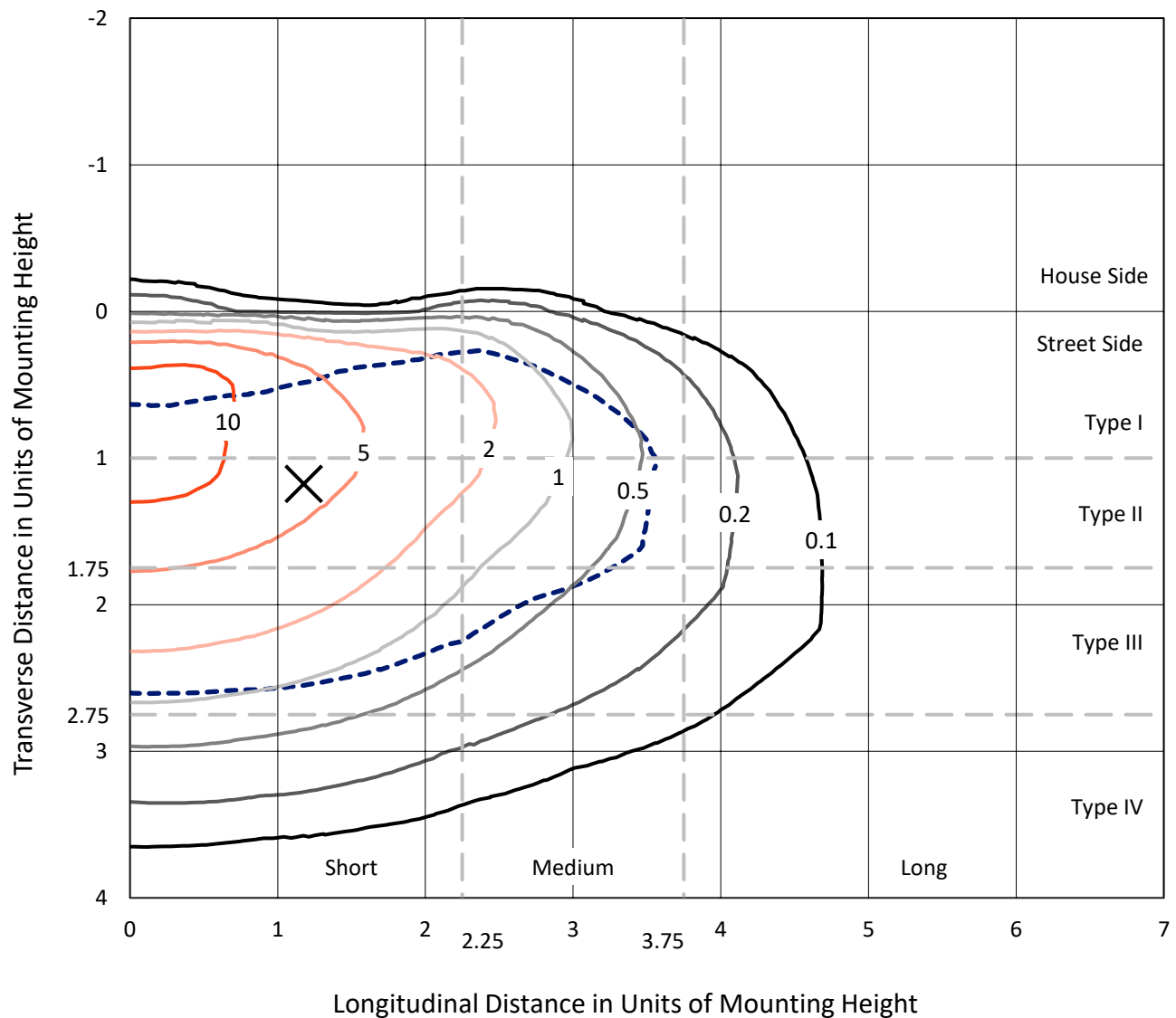


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## Iso-Footcandle Lines of Horizontal Illumination

× Max cd  
- - - 1/2 Max cd

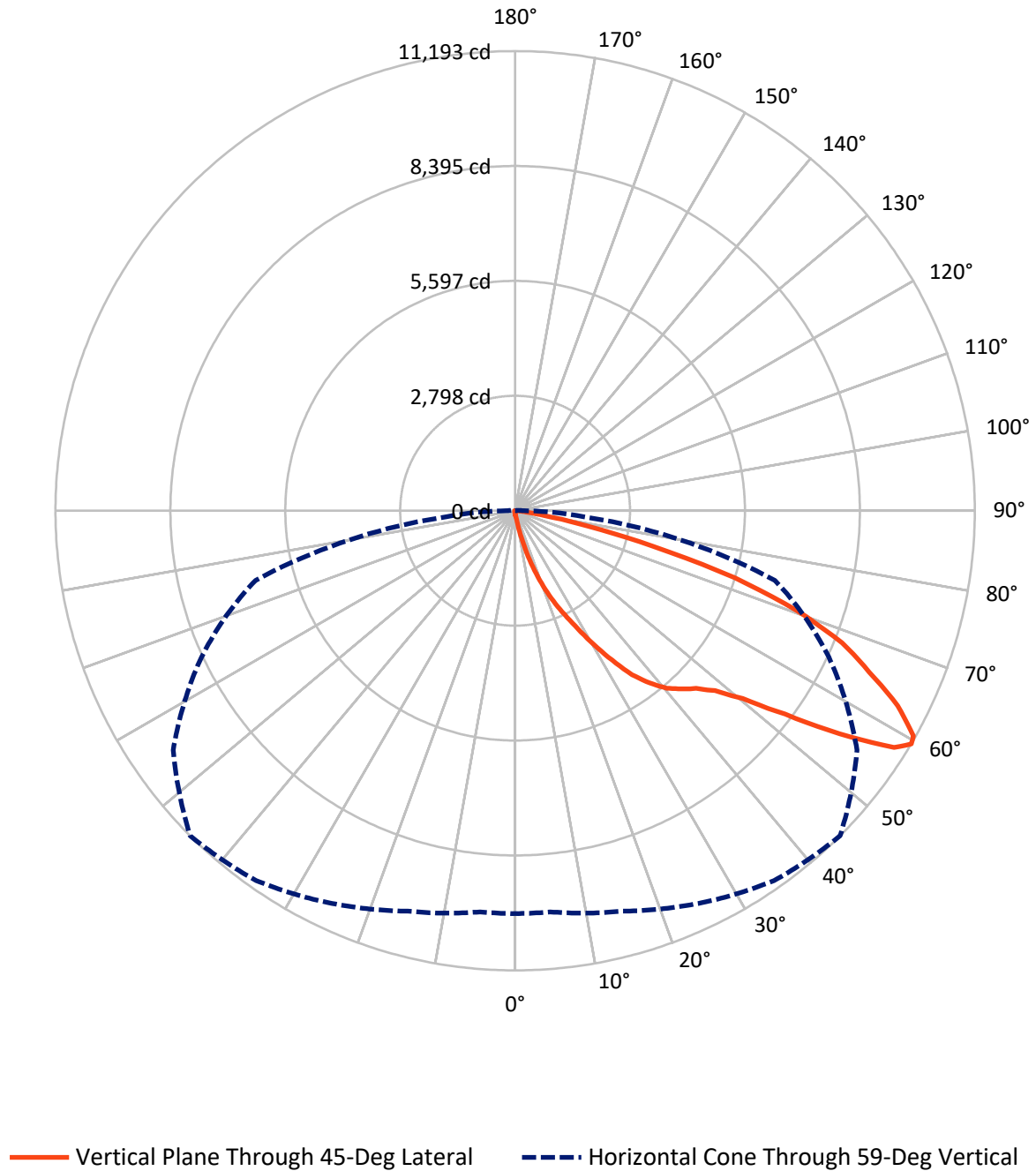


Based on 15 foot mounting height. Maximum calculated value = 15 fc  
Type III - Short - N/A

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## Luminous Intensity Polar Plot



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**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 48.9     | 0.0    | 48.9    |
|                    | % Fixture | 0.4      | 0.0    | 0.4     |
| <b>Street Side</b> | Lumens    | 13714.2  | 0.0    | 13714.2 |
|                    | % Fixture | 99.6     | 0.0    | 99.6    |
| <b>Total</b>       | Lumens    | 13763.1  | 0.0    | 13763.1 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 12.8    | 0.1       |
| 10°-20°   | 152.1   | 1.1       |
| 20°-30°   | 546.6   | 4.0       |
| 30°-40°   | 1270.1  | 9.2       |
| 40°-50°   | 2164.9  | 15.7      |
| 50°-60°   | 3567.1  | 25.9      |
| 60°-70°   | 4124.4  | 30.0      |
| 70°-80°   | 1772.0  | 12.9      |
| 80°-90°   | 153.1   | 1.1       |
| 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°    | 13763.1 | 100.0     |
| 0°-180°   | 13763.1 | 100.0     |



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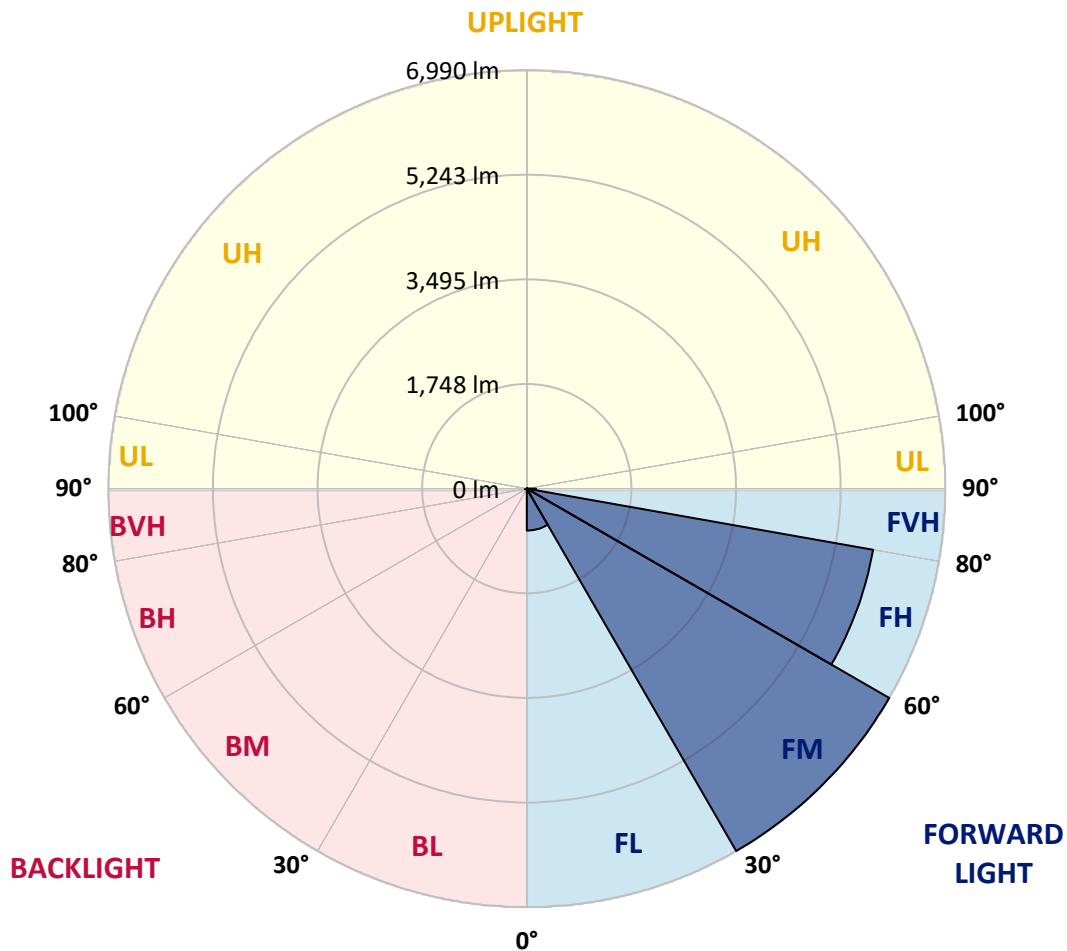
CATALOG NUMBER: NAV-SA3C-830-U-T3BC

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 699.5  | 5.1       |                         |      |         |
| FM   | (30°-60°)   | 6990.3 | 50.8      |                         |      |         |
| FH   | (60°-80°)   | 5873.3 | 42.7      |                         |      | G3/7500 |
| FVH  | (80°-90°)   | 151.1  | 1.1       |                         |      | G2/225  |
| BL   | (0°-30°)    | 12.1   | 0.1       | B0/110                  |      |         |
| BM   | (30°-60°)   | 11.8   | 0.1       | B0/220                  |      |         |
| BH   | (60°-80°)   | 23.0   | 0.2       | B0/110                  |      | G0/110  |
| BVH  | (80°-90°)   | 2.0    | 0.0       |                         |      | G0/10   |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B0-U0-G3**

Type III Short



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 44°     | 45°     | 55°     | 65°     | 75°    | 85°    |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--------|--------|
| 0°    | 87.0    | 87.0    | 87.0    | 87.0    | 87.0    | 87.0    | 87.0    | 87.0    | 87.0    | 87.0   | 87.0   |
| 2.5°  | 112.9   | 112.9   | 110.1   | 106.4   | 105.5   | 102.7   | 102.7   | 99.9    | 96.2    | 93.5   | 89.8   |
| 5°    | 163.8   | 162.9   | 155.5   | 146.2   | 134.2   | 126.8   | 126.8   | 116.6   | 107.4   | 99.0   | 91.6   |
| 7.5°  | 358.1   | 349.8   | 323.0   | 278.6   | 220.3   | 181.4   | 178.6   | 145.3   | 123.1   | 106.4  | 92.5   |
| 10°   | 821.8   | 793.1   | 755.2   | 648.7   | 479.4   | 335.0   | 328.5   | 211.9   | 147.1   | 114.8  | 94.4   |
| 12.5° | 1346.5  | 1369.6  | 1293.8  | 1126.3  | 928.2   | 690.4   | 644.1   | 357.2   | 194.3   | 125.9  | 96.2   |
| 15°   | 1824.0  | 1818.5  | 1775.9  | 1638.9  | 1410.4  | 1093.9  | 1065.2  | 621.0   | 278.6   | 143.4  | 98.1   |
| 17.5° | 2181.2  | 2174.8  | 2134.0  | 2046.1  | 1870.3  | 1553.8  | 1528.8  | 990.2   | 436.8   | 168.4  | 99.9   |
| 20°   | 2557.9  | 2549.6  | 2492.2  | 2421.9  | 2268.2  | 1998.9  | 1969.3  | 1403.0  | 683.9   | 209.1  | 99.9   |
| 22.5° | 3009.5  | 2993.8  | 2932.7  | 2813.3  | 2651.4  | 2417.2  | 2390.4  | 1825.0  | 990.2   | 275.8  | 104.6  |
| 25°   | 3555.5  | 3528.7  | 3444.5  | 3337.1  | 3141.8  | 2830.9  | 2802.2  | 2295.1  | 1359.5  | 376.7  | 109.2  |
| 27.5° | 4178.3  | 4183.0  | 4069.1  | 3887.7  | 3625.8  | 3308.4  | 3254.7  | 2716.1  | 1741.7  | 521.0  | 114.8  |
| 30°   | 4917.8  | 4871.5  | 4711.4  | 4500.4  | 4245.9  | 3841.5  | 3789.6  | 3135.4  | 2171.1  | 733.9  | 124.0  |
| 32.5° | 5610.0  | 5560.0  | 5344.4  | 5078.8  | 4805.8  | 4379.1  | 4336.6  | 3606.4  | 2561.6  | 985.6  | 140.7  |
| 35°   | 6204.1  | 6168.9  | 5867.2  | 5543.3  | 5300.9  | 4919.6  | 4906.6  | 4132.1  | 3020.6  | 1256.7 | 159.2  |
| 37.5° | 6727.0  | 6663.1  | 6275.4  | 5939.4  | 5693.3  | 5351.8  | 5324.0  | 4613.3  | 3463.0  | 1571.4 | 186.9  |
| 40°   | 7173.0  | 7137.9  | 6665.0  | 6223.5  | 6023.6  | 5718.3  | 5683.1  | 5035.3  | 3920.1  | 1936.9 | 221.2  |
| 42.5° | 7650.6  | 7604.3  | 7145.3  | 6650.2  | 6281.8  | 5955.2  | 5932.0  | 5383.2  | 4327.3  | 2338.6 | 272.1  |
| 45°   | 8190.1  | 8104.0  | 7701.5  | 7257.2  | 6697.4  | 6200.4  | 6174.5  | 5693.3  | 4744.7  | 2769.8 | 334.1  |
| 47.5° | 8766.6  | 8691.7  | 8365.9  | 8054.0  | 7409.9  | 6604.8  | 6549.3  | 5957.0  | 5159.3  | 3267.7 | 412.7  |
| 50°   | 9353.4  | 9355.2  | 9110.9  | 8961.0  | 8280.8  | 7261.9  | 7183.2  | 6344.8  | 5595.2  | 3800.8 | 529.3  |
| 52.5° | 10036.3 | 10053.9 | 10050.2 | 9939.2  | 9411.7  | 8336.3  | 8230.8  | 6933.3  | 6101.4  | 4422.6 | 690.4  |
| 55°   | 10322.3 | 10353.7 | 10558.3 | 10804.4 | 10661.0 | 9698.5  | 9585.6  | 7948.5  | 6772.3  | 5115.8 | 929.1  |
| 57.5° | 10088.1 | 10123.3 | 10405.6 | 10836.8 | 11166.3 | 10891.4 | 10878.5 | 9270.1  | 7656.1  | 5956.1 | 1319.7 |
| 59°   | 9809.6  | 9805.0  | 10094.6 | 10551.8 | 10996.0 | 11174.6 | 11193.1 | 10164.0 | 8426.1  | 6545.6 | 1656.5 |
| 60°   | 9624.5  | 9628.2  | 9820.7  | 10289.9 | 10761.9 | 11071.9 | 11144.1 | 10690.6 | 8875.8  | 6969.4 | 1945.3 |
| 62.5° | 8910.1  | 8952.6  | 9105.3  | 9541.2  | 9989.1  | 10335.2 | 10458.3 | 11159.8 | 10163.1 | 7970.8 | 2949.4 |
| 65°   | 8133.6  | 8136.4  | 8353.9  | 8726.8  | 9156.2  | 9399.6  | 9477.4  | 10429.6 | 11022.8 | 8990.6 | 4266.2 |
| 67.5° | 6748.3  | 6804.7  | 7051.8  | 7656.1  | 8223.4  | 8531.6  | 8590.8  | 9078.5  | 10666.5 | 9655.0 | 4926.1 |
| 70°   | 4722.5  | 4796.5  | 5149.1  | 5933.0  | 6777.9  | 7284.1  | 7280.4  | 7546.9  | 9387.6  | 9358.9 | 4176.5 |
| 72.5° | 2358.0  | 2485.7  | 2773.5  | 3612.9  | 4636.4  | 5431.4  | 5598.9  | 6070.8  | 7541.4  | 7773.6 | 3115.9 |
| 75°   | 1042.0  | 1049.4  | 1213.2  | 1636.2  | 2304.3  | 3314.0  | 3463.9  | 4818.7  | 5785.8  | 5402.7 | 2250.7 |
| 77.5° | 606.2   | 611.7   | 641.3   | 734.8   | 933.8   | 1624.1  | 1792.6  | 3160.4  | 4088.6  | 3140.0 | 1467.7 |
| 80°   | 220.3   | 225.8   | 224.9   | 278.6   | 409.0   | 639.5   | 712.6   | 1531.6  | 2727.3  | 1653.7 | 769.0  |
| 82.5° | 135.1   | 135.1   | 130.5   | 131.4   | 149.0   | 245.2   | 268.4   | 652.4   | 1328.0  | 814.4  | 220.3  |
| 85°   | 66.6    | 70.3    | 75.0    | 84.2    | 99.9    | 121.2   | 128.6   | 186.9   | 447.0   | 197.1  | 52.7   |
| 87.5° | 39.8    | 40.7    | 44.4    | 53.7    | 66.6    | 87.0    | 92.5    | 126.8   | 160.1   | 132.3  | 13.0   |
| 90°   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0    | 0.0    |

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**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°  | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|-------|--------|------|------|------|------|------|------|------|------|------|------|
| 0°    | 87.0   | 87.0 | 87.0 | 87.0 | 87.0 | 87.0 | 87.0 | 87.0 | 87.0 | 87.0 | 87.0 |
| 2.5°  | 87.9   | 87.0 | 82.4 | 78.7 | 75.0 | 71.3 | 68.5 | 65.7 | 65.7 | 66.6 | 65.7 |
| 5°    | 87.9   | 84.2 | 76.8 | 70.3 | 64.8 | 60.2 | 55.5 | 51.8 | 50.9 | 50.9 | 51.8 |
| 7.5°  | 87.0   | 82.4 | 72.2 | 63.9 | 56.5 | 50.0 | 45.3 | 40.7 | 39.8 | 40.7 | 39.8 |
| 10°   | 86.1   | 80.5 | 68.5 | 58.3 | 48.1 | 41.6 | 35.2 | 30.5 | 30.5 | 30.5 | 31.5 |
| 12.5° | 86.1   | 77.7 | 64.8 | 52.7 | 41.6 | 34.2 | 27.8 | 23.1 | 22.2 | 22.2 | 22.2 |
| 15°   | 85.1   | 75.9 | 61.1 | 46.3 | 35.2 | 25.9 | 20.4 | 15.7 | 15.7 | 15.7 | 15.7 |
| 17.5° | 83.3   | 73.1 | 56.5 | 40.7 | 27.8 | 19.4 | 13.9 | 9.3  | 9.3  | 11.1 | 11.1 |
| 20°   | 81.4   | 70.3 | 50.9 | 33.3 | 23.1 | 14.8 | 9.3  | 5.6  | 5.6  | 8.3  | 9.3  |
| 22.5° | 82.4   | 70.3 | 47.2 | 29.6 | 18.5 | 11.1 | 7.4  | 4.6  | 3.7  | 6.5  | 8.3  |
| 25°   | 83.3   | 68.5 | 42.6 | 25.9 | 13.9 | 8.3  | 5.6  | 1.9  | 0.9  | 1.9  | 2.8  |
| 27.5° | 83.3   | 66.6 | 37.0 | 20.4 | 10.2 | 6.5  | 2.8  | 0.0  | 0.0  | 0.0  | 0.0  |
| 30°   | 82.4   | 63.9 | 32.4 | 16.7 | 7.4  | 3.7  | 0.9  | 0.0  | 0.0  | 0.0  | 0.0  |
| 32.5° | 81.4   | 61.1 | 29.6 | 13.0 | 6.5  | 1.9  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 35°   | 82.4   | 57.4 | 25.9 | 10.2 | 3.7  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 1.9  |
| 37.5° | 85.1   | 53.7 | 22.2 | 8.3  | 2.8  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 40°   | 88.8   | 50.9 | 18.5 | 6.5  | 0.9  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 42.5° | 96.2   | 50.9 | 16.7 | 4.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 45°   | 105.5  | 50.9 | 13.9 | 3.7  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 47.5° | 117.5  | 51.8 | 12.0 | 3.7  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 50°   | 132.3  | 53.7 | 11.1 | 2.8  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 52.5° | 143.4  | 51.8 | 10.2 | 2.8  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 55°   | 162.9  | 50.0 | 9.3  | 1.9  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 57.5° | 188.8  | 47.2 | 9.3  | 0.9  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 59°   | 214.7  | 43.5 | 9.3  | 0.9  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 60°   | 244.3  | 41.6 | 8.3  | 0.9  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 62.5° | 403.5  | 37.0 | 7.4  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 65°   | 779.2  | 35.2 | 6.5  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 67.5° | 1259.5 | 35.2 | 4.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 70°   | 1324.3 | 35.2 | 3.7  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 72.5° | 881.0  | 28.7 | 2.8  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 75°   | 472.0  | 25.9 | 2.8  | 0.9  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 77.5° | 254.5  | 24.1 | 3.7  | 1.9  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 80°   | 112.0  | 17.6 | 4.6  | 2.8  | 1.9  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 82.5° | 44.4   | 12.0 | 5.6  | 4.6  | 3.7  | 1.9  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 85°   | 21.3   | 9.3  | 7.4  | 6.5  | 4.6  | 2.8  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 87.5° | 10.2   | 9.3  | 8.3  | 7.4  | 6.5  | 4.6  | 0.9  | 0.0  | 0.0  | 0.0  | 0.0  |
| 90°   | 0.0    | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |

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

Report Prepared for

Cooper Lighting Solutions

McGraw-Edison

Report Number: SP1-2407-184-9

Test Date: 10/10/2024

Luminaire Tested: GSS-SB1A-830-U-5WQ

Data in this report applies to families of products including GSS-SB1A-830-U-5WQ

### Test Information

Test Method: LM-79-2019  
 Report Number: SP1-2407-184-9  
 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-830-U-5WQ**  
 Description: GALLEON II SITE SLIM 1SQ 350MA 5WQ HIGH DENSITY LIGHTSQUARE WITH 80 CRI  
 3000K CCT 26 LEDS

### Spectral Parameters

CCT (K): 3055  
 CIE  $u'$ : 0.2475  
 CIE  $v'$ : 0.5247  
 Duv: 0.0032  
 CIE x: 0.4377  
 CIE y: 0.4124  
 CIE z: 0.1499  
 Peak Wavelength (nm): 604  
 Dominant Wavelength (nm): 581  
 Purity: 55.16339  
 R<sub>f</sub>: 81.5  
 R<sub>g</sub>: 99.2

CRI (Ra): 80.9  
 R1: 79.5  
 R2: 85.6  
 R3: 92.1  
 R4: 82.4  
 R5: 78.9  
 R6: 81.7  
 R7: 85.1  
 R8: 61.9  
 R9: 6.8  
 R10: 67.1  
 R11: 82.5  
 R12: 63.4  
 R13: 80.2  
 R14: 95.1  
 R15: 71.7



### Test Conditions

Stabilization Time: 20M  
 Operation Time: 1H 20M  
 Sphere Temperature (°C): 25.2

REPORT NUMBER: SP1-2407-184-9

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

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**CIE 1931 Chromaticity Diagram**



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



Point lies inside the ANSI 3000K 4-step quadrangle

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### Photopic Flux vs. Wavelength



### Photopic Lumens: NR

| 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    | 170                      | NR            | 620    | 938                      | NR            | 750    | 35                       | NR            | 880    | 1                        | NR            |
| 365    | 0                        | NR            | 495    | 234                      | NR            | 625    | 894                      | NR            | 755    | 30                       | NR            | 885    | 1                        | NR            |
| 370    | 0                        | NR            | 500    | 302                      | NR            | 630    | 847                      | NR            | 760    | 26                       | NR            | 890    | 1                        | NR            |
| 375    | 0                        | NR            | 505    | 371                      | NR            | 635    | 788                      | NR            | 765    | 22                       | NR            | 895    | 1                        | NR            |
| 380    | 0                        | NR            | 510    | 431                      | NR            | 640    | 728                      | NR            | 770    | 19                       | NR            | 900    | 1                        | NR            |
| 385    | 0                        | NR            | 515    | 482                      | NR            | 645    | 665                      | NR            | 775    | 16                       | NR            | 905    | 1                        | NR            |
| 390    | 0                        | NR            | 520    | 523                      | NR            | 650    | 603                      | NR            | 780    | 14                       | NR            | 910    | 0                        | NR            |
| 395    | 2                        | NR            | 525    | 553                      | NR            | 655    | 542                      | NR            | 785    | 12                       | NR            | 915    | 0                        | NR            |
| 400    | 4                        | NR            | 530    | 580                      | NR            | 660    | 484                      | NR            | 790    | 11                       | NR            | 920    | 0                        | NR            |
| 405    | 8                        | NR            | 535    | 603                      | NR            | 665    | 430                      | NR            | 795    | 9                        | NR            | 925    | 0                        | NR            |
| 410    | 18                       | NR            | 540    | 622                      | NR            | 670    | 377                      | NR            | 800    | 8                        | NR            | 930    | 0                        | NR            |
| 415    | 36                       | NR            | 545    | 644                      | NR            | 675    | 330                      | NR            | 805    | 7                        | NR            | 935    | 0                        | NR            |
| 420    | 71                       | NR            | 550    | 668                      | NR            | 680    | 289                      | NR            | 810    | 6                        | NR            | 940    | 0                        | NR            |
| 425    | 131                      | NR            | 555    | 693                      | NR            | 685    | 250                      | NR            | 815    | 5                        | NR            | 945    | 0                        | NR            |
| 430    | 215                      | NR            | 560    | 720                      | NR            | 690    | 218                      | NR            | 820    | 4                        | NR            | 950    | 0                        | NR            |
| 435    | 341                      | NR            | 565    | 754                      | NR            | 695    | 188                      | NR            | 825    | 4                        | NR            | 955    | 0                        | NR            |
| 440    | 514                      | NR            | 570    | 792                      | NR            | 700    | 161                      | NR            | 830    | 3                        | NR            | 960    | 0                        | NR            |
| 445    | 576                      | NR            | 575    | 832                      | NR            | 705    | 139                      | NR            | 835    | 3                        | NR            | 965    | 0                        | NR            |
| 450    | 358                      | NR            | 580    | 875                      | NR            | 710    | 119                      | NR            | 840    | 3                        | NR            | 970    | 0                        | NR            |
| 455    | 222                      | NR            | 585    | 913                      | NR            | 715    | 102                      | NR            | 845    | 2                        | NR            | 975    | 0                        | NR            |
| 460    | 170                      | NR            | 590    | 950                      | NR            | 720    | 88                       | NR            | 850    | 2                        | NR            | 980    | 0                        | NR            |
| 465    | 115                      | NR            | 595    | 977                      | NR            | 725    | 76                       | NR            | 855    | 2                        | NR            | 985    | 0                        | NR            |
| 470    | 88                       | NR            | 600    | 994                      | NR            | 730    | 65                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 87                       | NR            | 605    | 997                      | NR            | 735    | 56                       | NR            | 865    | 1                        | NR            | 995    | 0                        | NR            |
| 480    | 96                       | NR            | 610    | 990                      | NR            | 740    | 47                       | NR            | 870    | 1                        | NR            | 1000   | 0                        | NR            |
| 485    | 122                      | NR            | 615    | 971                      | NR            | 745    | 41                       | NR            | 875    | 1                        | NR            |        |                          |               |

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### Scotopic Flux vs. Wavelength



Scotopic Lumens: NR

S/P: 1.28

| λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) |
|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|
| 360       | 0                           | NR               | 490       | 170                         | NR               | 620       | 938                         | NR               | 750       | 35                          | NR               | 880       | 1                           | NR               |
| 365       | 0                           | NR               | 495       | 234                         | NR               | 625       | 894                         | NR               | 755       | 30                          | NR               | 885       | 1                           | NR               |
| 370       | 0                           | NR               | 500       | 302                         | NR               | 630       | 847                         | NR               | 760       | 26                          | NR               | 890       | 1                           | NR               |
| 375       | 0                           | NR               | 505       | 371                         | NR               | 635       | 788                         | NR               | 765       | 22                          | NR               | 895       | 1                           | NR               |
| 380       | 0                           | NR               | 510       | 431                         | NR               | 640       | 728                         | NR               | 770       | 19                          | NR               | 900       | 1                           | NR               |
| 385       | 0                           | NR               | 515       | 482                         | NR               | 645       | 665                         | NR               | 775       | 16                          | NR               | 905       | 1                           | NR               |
| 390       | 0                           | NR               | 520       | 523                         | NR               | 650       | 603                         | NR               | 780       | 14                          | NR               | 910       | 0                           | NR               |
| 395       | 2                           | NR               | 525       | 553                         | NR               | 655       | 542                         | NR               | 785       | 12                          | NR               | 915       | 0                           | NR               |
| 400       | 4                           | NR               | 530       | 580                         | NR               | 660       | 484                         | NR               | 790       | 11                          | NR               | 920       | 0                           | NR               |
| 405       | 8                           | NR               | 535       | 603                         | NR               | 665       | 430                         | NR               | 795       | 9                           | NR               | 925       | 0                           | NR               |
| 410       | 18                          | NR               | 540       | 622                         | NR               | 670       | 377                         | NR               | 800       | 8                           | NR               | 930       | 0                           | NR               |
| 415       | 36                          | NR               | 545       | 644                         | NR               | 675       | 330                         | NR               | 805       | 7                           | NR               | 935       | 0                           | NR               |
| 420       | 71                          | NR               | 550       | 668                         | NR               | 680       | 289                         | NR               | 810       | 6                           | NR               | 940       | 0                           | NR               |
| 425       | 131                         | NR               | 555       | 693                         | NR               | 685       | 250                         | NR               | 815       | 5                           | NR               | 945       | 0                           | NR               |
| 430       | 215                         | NR               | 560       | 720                         | NR               | 690       | 218                         | NR               | 820       | 4                           | NR               | 950       | 0                           | NR               |
| 435       | 341                         | NR               | 565       | 754                         | NR               | 695       | 188                         | NR               | 825       | 4                           | NR               | 955       | 0                           | NR               |
| 440       | 514                         | NR               | 570       | 792                         | NR               | 700       | 161                         | NR               | 830       | 3                           | NR               | 960       | 0                           | NR               |
| 445       | 576                         | NR               | 575       | 832                         | NR               | 705       | 139                         | NR               | 835       | 3                           | NR               | 965       | 0                           | NR               |
| 450       | 358                         | NR               | 580       | 875                         | NR               | 710       | 119                         | NR               | 840       | 3                           | NR               | 970       | 0                           | NR               |
| 455       | 222                         | NR               | 585       | 913                         | NR               | 715       | 102                         | NR               | 845       | 2                           | NR               | 975       | 0                           | NR               |
| 460       | 170                         | NR               | 590       | 950                         | NR               | 720       | 88                          | NR               | 850       | 2                           | NR               | 980       | 0                           | NR               |
| 465       | 115                         | NR               | 595       | 977                         | NR               | 725       | 76                          | NR               | 855       | 2                           | NR               | 985       | 0                           | NR               |
| 470       | 88                          | NR               | 600       | 994                         | NR               | 730       | 65                          | NR               | 860       | 1                           | NR               | 990       | 0                           | NR               |
| 475       | 87                          | NR               | 605       | 997                         | NR               | 735       | 56                          | NR               | 865       | 1                           | NR               | 995       | 0                           | NR               |
| 480       | 96                          | NR               | 610       | 990                         | NR               | 740       | 47                          | NR               | 870       | 1                           | NR               | 1000      | 0                           | NR               |
| 485       | 122                         | NR               | 615       | 971                         | NR               | 745       | 41                          | NR               | 875       | 1                           | NR               |           |                             |                  |

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### Melanopic Flux vs. Wavelength


**Melanopic Lumens: NR**
**M/P: 2.33**

| $\lambda$<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               | 170                                  | NR                             | 620               | 938                                  | NR                             | 750               | 35                                   | NR                             | 880               | 1                                    | NR                             |
| 365               | 0                                    | NR                             | 495               | 234                                  | NR                             | 625               | 894                                  | NR                             | 755               | 30                                   | NR                             | 885               | 1                                    | NR                             |
| 370               | 0                                    | NR                             | 500               | 302                                  | NR                             | 630               | 847                                  | NR                             | 760               | 26                                   | NR                             | 890               | 1                                    | NR                             |
| 375               | 0                                    | NR                             | 505               | 371                                  | NR                             | 635               | 788                                  | NR                             | 765               | 22                                   | NR                             | 895               | 1                                    | NR                             |
| 380               | 0                                    | NR                             | 510               | 431                                  | NR                             | 640               | 728                                  | NR                             | 770               | 19                                   | NR                             | 900               | 1                                    | NR                             |
| 385               | 0                                    | NR                             | 515               | 482                                  | NR                             | 645               | 665                                  | NR                             | 775               | 16                                   | NR                             | 905               | 1                                    | NR                             |
| 390               | 0                                    | NR                             | 520               | 523                                  | NR                             | 650               | 603                                  | NR                             | 780               | 14                                   | NR                             | 910               | 0                                    | NR                             |
| 395               | 2                                    | NR                             | 525               | 553                                  | NR                             | 655               | 542                                  | NR                             | 785               | 12                                   | NR                             | 915               | 0                                    | NR                             |
| 400               | 4                                    | NR                             | 530               | 580                                  | NR                             | 660               | 484                                  | NR                             | 790               | 11                                   | NR                             | 920               | 0                                    | NR                             |
| 405               | 8                                    | NR                             | 535               | 603                                  | NR                             | 665               | 430                                  | NR                             | 795               | 9                                    | NR                             | 925               | 0                                    | NR                             |
| 410               | 18                                   | NR                             | 540               | 622                                  | NR                             | 670               | 377                                  | NR                             | 800               | 8                                    | NR                             | 930               | 0                                    | NR                             |
| 415               | 36                                   | NR                             | 545               | 644                                  | NR                             | 675               | 330                                  | NR                             | 805               | 7                                    | NR                             | 935               | 0                                    | NR                             |
| 420               | 71                                   | NR                             | 550               | 668                                  | NR                             | 680               | 289                                  | NR                             | 810               | 6                                    | NR                             | 940               | 0                                    | NR                             |
| 425               | 131                                  | NR                             | 555               | 693                                  | NR                             | 685               | 250                                  | NR                             | 815               | 5                                    | NR                             | 945               | 0                                    | NR                             |
| 430               | 215                                  | NR                             | 560               | 720                                  | NR                             | 690               | 218                                  | NR                             | 820               | 4                                    | NR                             | 950               | 0                                    | NR                             |
| 435               | 341                                  | NR                             | 565               | 754                                  | NR                             | 695               | 188                                  | NR                             | 825               | 4                                    | NR                             | 955               | 0                                    | NR                             |
| 440               | 514                                  | NR                             | 570               | 792                                  | NR                             | 700               | 161                                  | NR                             | 830               | 3                                    | NR                             | 960               | 0                                    | NR                             |
| 445               | 576                                  | NR                             | 575               | 832                                  | NR                             | 705               | 139                                  | NR                             | 835               | 3                                    | NR                             | 965               | 0                                    | NR                             |
| 450               | 358                                  | NR                             | 580               | 875                                  | NR                             | 710               | 119                                  | NR                             | 840               | 3                                    | NR                             | 970               | 0                                    | NR                             |
| 455               | 222                                  | NR                             | 585               | 913                                  | NR                             | 715               | 102                                  | NR                             | 845               | 2                                    | NR                             | 975               | 0                                    | NR                             |
| 460               | 170                                  | NR                             | 590               | 950                                  | NR                             | 720               | 88                                   | NR                             | 850               | 2                                    | NR                             | 980               | 0                                    | NR                             |
| 465               | 115                                  | NR                             | 595               | 977                                  | NR                             | 725               | 76                                   | NR                             | 855               | 2                                    | NR                             | 985               | 0                                    | NR                             |
| 470               | 88                                   | NR                             | 600               | 994                                  | NR                             | 730               | 65                                   | NR                             | 860               | 1                                    | NR                             | 990               | 0                                    | NR                             |
| 475               | 87                                   | NR                             | 605               | 997                                  | NR                             | 735               | 56                                   | NR                             | 865               | 1                                    | NR                             | 995               | 0                                    | NR                             |
| 480               | 96                                   | NR                             | 610               | 990                                  | NR                             | 740               | 47                                   | NR                             | 870               | 1                                    | NR                             | 1000              | 0                                    | NR                             |
| 485               | 122                                  | NR                             | 615               | 971                                  | NR                             | 745               | 41                                   | NR                             | 875               | 1                                    | NR                             |                   |                                      |                                |

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TM-30-18

### Summary

$R_f = 81.5$   
 $R_g = 99.2$   
 $CIE R_a = 80.9$   
 $R_9 = 6.8$



### Color Vector Graphics



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 74 | CES51 = 89 | CES76 = 70 |
| CES02 = 63 | CES27 = 88 | CES52 = 91 | CES77 = 86 |
| CES03 = 31 | CES28 = 89 | CES53 = 81 | CES78 = 72 |
| CES04 = 70 | CES29 = 67 | CES54 = 87 | CES79 = 90 |
| CES05 = 50 | CES30 = 68 | CES55 = 85 | CES80 = 88 |
| CES06 = 51 | CES31 = 71 | CES56 = 78 | CES81 = 78 |
| CES07 = 42 | CES32 = 70 | CES57 = 76 | CES82 = 95 |
| CES08 = 41 | CES33 = 71 | CES58 = 78 | CES83 = 90 |
| CES09 = 29 | CES34 = 82 | CES59 = 92 | CES84 = 93 |
| CES10 = 76 | CES35 = 90 | CES60 = 95 | CES85 = 86 |
| CES11 = 59 | CES36 = 93 | CES61 = 93 | CES86 = 72 |
| CES12 = 65 | CES37 = 87 | CES62 = 83 | CES87 = 85 |
| CES13 = 43 | CES38 = 75 | CES63 = 77 | CES88 = 83 |
| CES14 = 74 | CES39 = 94 | CES64 = 83 | CES89 = 75 |
| CES15 = 71 | CES40 = 89 | CES65 = 77 | CES90 = 81 |
| CES16 = 47 | CES41 = 85 | CES66 = 80 | CES91 = 96 |
| CES17 = 50 | CES42 = 86 | CES67 = 79 | CES92 = 73 |
| CES18 = 56 | CES43 = 81 | CES68 = 84 | CES93 = 84 |
| CES19 = 72 | CES44 = 99 | CES69 = 90 | CES94 = 64 |
| CES20 = 66 | CES45 = 87 | CES70 = 77 | CES95 = 80 |
| CES21 = 87 | CES46 = 82 | CES71 = 76 | CES96 = 84 |
| CES22 = 79 | CES47 = 77 | CES72 = 92 | CES97 = 87 |
| CES23 = 92 | CES48 = 71 | CES73 = 71 | CES98 = 81 |
| CES24 = 91 | CES49 = 81 | CES74 = 93 | CES99 = 74 |
| CES25 = 72 | CES50 = 89 | CES75 = 74 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**


(END OF REPORT)