

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: McGRAW-EDISON

Report Number: P322584

Luminaire Tested: **GLEON-SA0D-740-U-T4FT-HSS**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P322584  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-17)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA0D-740-U-T4FT-HSS  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(10) 70 CRI, 4000K, 1200mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE IV  
FORWARD THROW OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 54539 lumens  
Efficiency: N/A  
Efficacy: 85.2 lumens/watt  
Luminous Opening: Rectangular (W 2.5' x L: 1' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B3 - U0 - G5

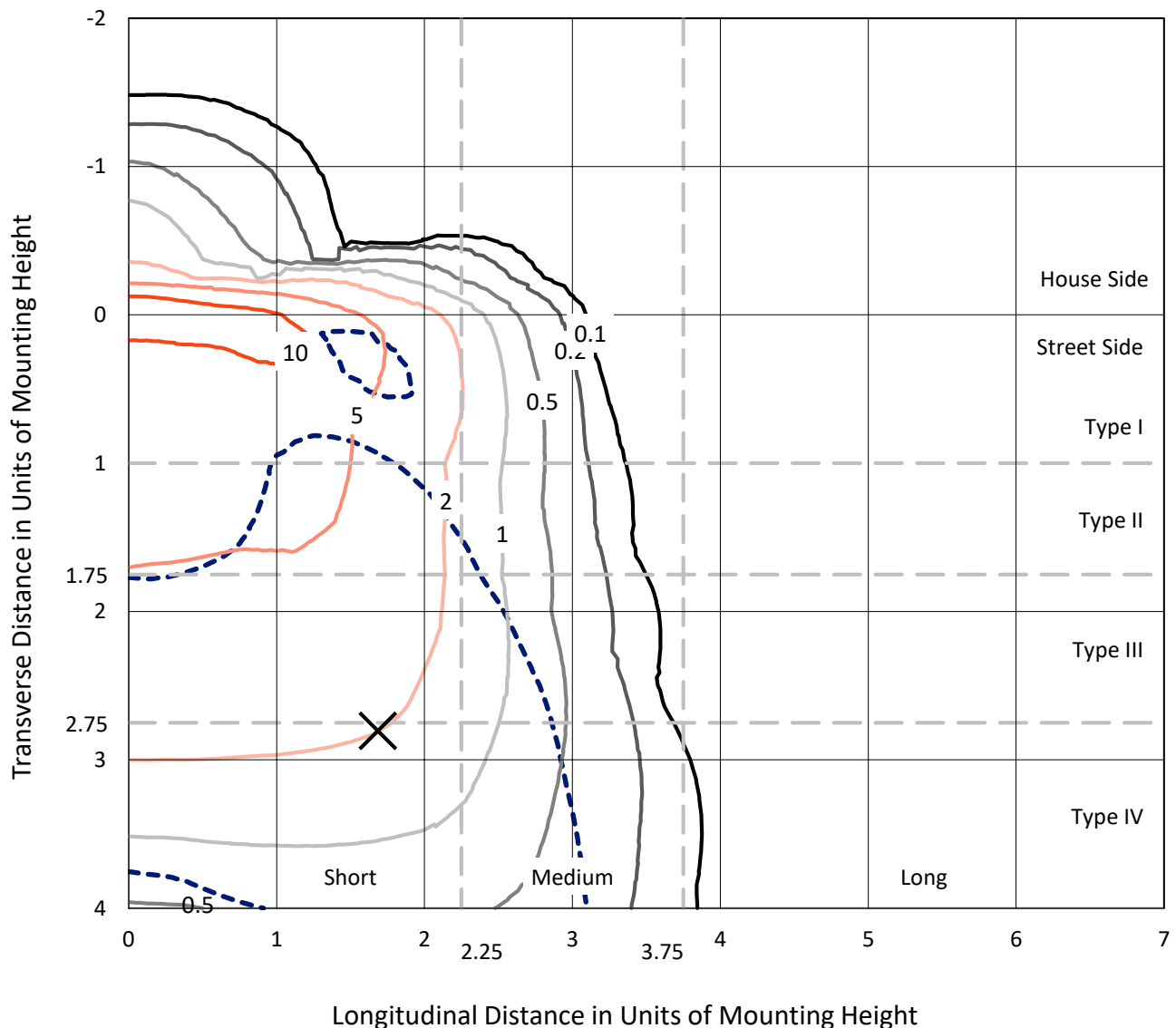
Input Watts (W): 640  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



REPORT NUMBER: P322584  
 CATALOG NUMBER: GLEON-SA0D-740-U-T4FT-HSS

## Iso-Footcandle Lines of Horizontal Illumination

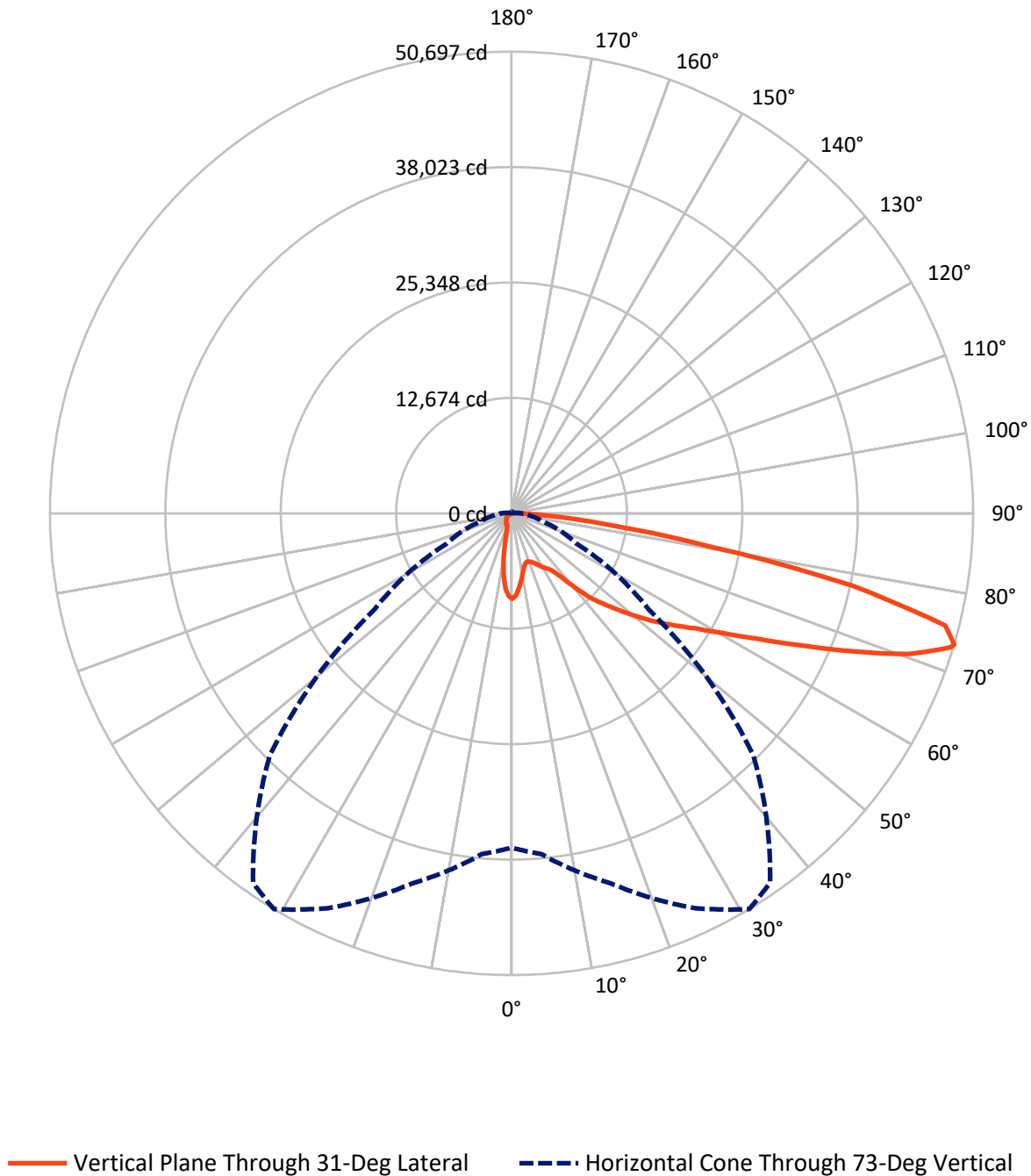
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 15 fc  
 Type IV - 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    | 4971.4   | 0.0    | 4971.4  |
|                    | % Fixture | 9.1      | 0.0    | 9.1     |
| <b>Street Side</b> | Lumens    | 49567.6  | 0.0    | 49567.6 |
|                    | % Fixture | 90.9     | 0.0    | 90.9    |
| <b>Total</b>       | Lumens    | 54539.0  | 0.0    | 54539.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 778.0   | 1.4       |
| 10°-20°   | 1689.3  | 3.1       |
| 20°-30°   | 2531.1  | 4.6       |
| 30°-40°   | 4027.0  | 7.4       |
| 40°-50°   | 7191.1  | 13.2      |
| 50°-60°   | 11158.5 | 20.5      |
| 60°-70°   | 14833.7 | 27.2      |
| 70°-80°   | 11157.9 | 20.5      |
| 80°-90°   | 1172.5  | 2.1       |
| 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°    | 54539.0 | 100.0     |
| 0°-180°   | 54539.0 | 100.0     |

**Coefficient of Utilization**



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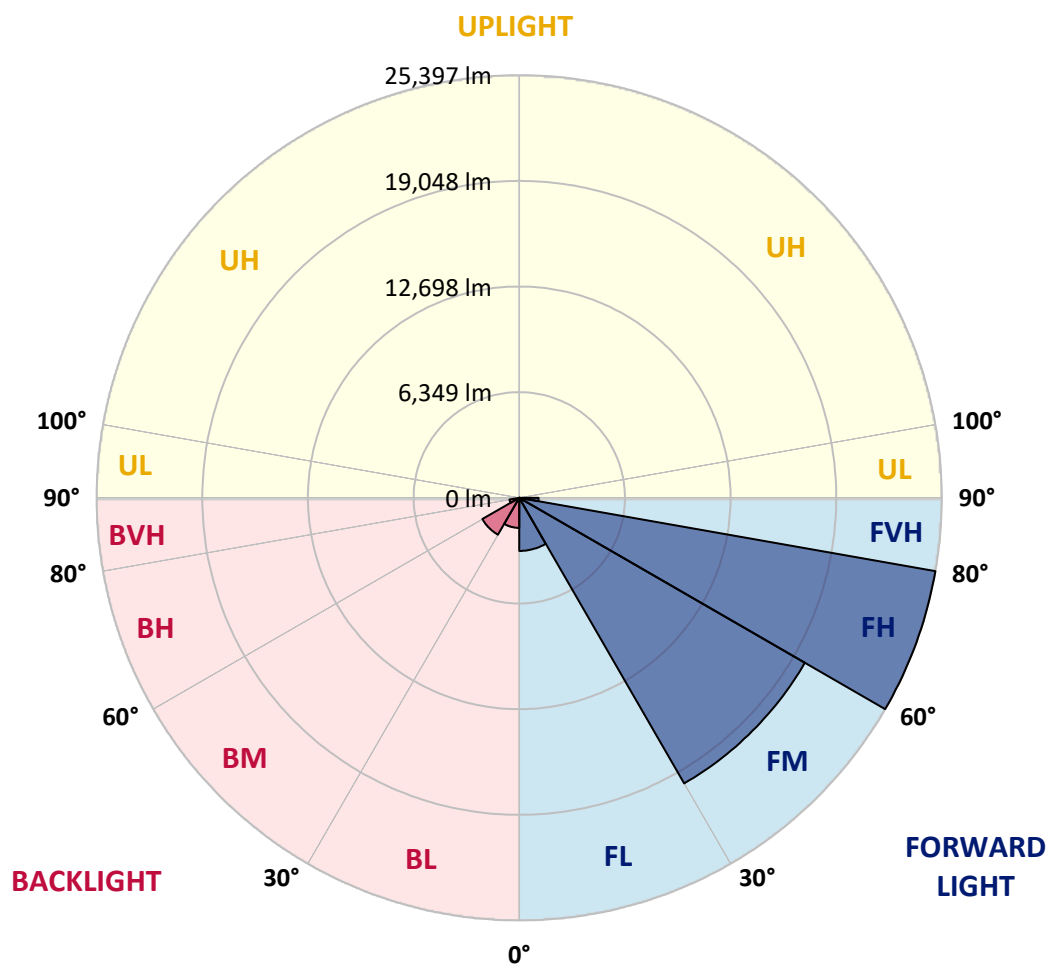
CATALOG NUMBER: GLEON-SA0D-740-U-T4FT-HSS

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|---------|-----------|-------------------------|------|---------|
|      |             |         |           | B                       | U    | G       |
| FL   | (0°-30°)    | 3190.6  | 5.9       |                         |      |         |
| FM   | (30°-60°)   | 19817.6 | 36.3      |                         |      |         |
| FH   | (60°-80°)   | 25396.8 | 46.6      |                         |      | G5      |
| FVH  | (80°-90°)   | 1162.6  | 2.1       |                         |      | G5      |
| BL   | (0°-30°)    | 1807.8  | 3.3       | B3/2500                 |      |         |
| BM   | (30°-60°)   | 2558.9  | 4.7       | B3/5000                 |      |         |
| BH   | (60°-80°)   | 594.8   | 1.1       | B2/1000                 |      | G2/1000 |
| BVH  | (80°-90°)   | 9.9     | 0.0       |                         |      | G0/10   |
| UL   | (90°-100°)  | 0.0     | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0     | 0.0       |                         | U0/0 |         |

**BUG Rating: B3-U0-G5**

Type IV Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 31°     | 35°     | 45°     | 55°     | 65°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 9383.5  | 9383.5  | 9383.5  | 9383.5  | 9383.5  | 9383.5  | 9383.5  | 9383.5  | 9383.5  | 9383.5  | 9383.5  |
| 2.5°  | 8892.5  | 8929.8  | 8969.9  | 8977.9  | 9044.6  | 9047.3  | 9143.4  | 9215.4  | 9287.5  | 9356.9  | 9380.9  |
| 5°    | 7979.8  | 8041.1  | 8113.2  | 8185.2  | 8326.7  | 8382.7  | 8617.6  | 8857.8  | 9087.3  | 9306.2  | 9412.9  |
| 7.5°  | 7005.6  | 7075.0  | 7176.4  | 7355.2  | 7512.7  | 7622.1  | 7993.1  | 8420.1  | 8847.1  | 9250.1  | 9482.3  |
| 10°   | 6116.9  | 6181.0  | 6287.7  | 6477.2  | 6720.1  | 6869.5  | 7368.6  | 7961.1  | 8588.2  | 9199.4  | 9586.4  |
| 12.5° | 5551.1  | 5585.8  | 5644.5  | 5847.4  | 6066.2  | 6234.3  | 6821.5  | 7555.4  | 8374.7  | 9196.7  | 9754.5  |
| 15°   | 5447.0  | 5457.7  | 5409.7  | 5500.4  | 5671.2  | 5834.0  | 6429.2  | 7227.1  | 8211.9  | 9239.4  | 9973.4  |
| 17.5° | 5612.5  | 5607.2  | 5447.0  | 5436.4  | 5572.5  | 5705.9  | 6237.0  | 7000.3  | 8097.2  | 9338.2  | 10256.2 |
| 20°   | 5863.4  | 5844.7  | 5567.1  | 5516.4  | 5660.6  | 5786.0  | 6223.7  | 6914.9  | 8054.5  | 9503.6  | 10600.5 |
| 22.5° | 6197.0  | 6165.0  | 5729.9  | 5676.6  | 5831.4  | 5962.1  | 6389.1  | 6997.6  | 8091.8  | 9725.2  | 11000.8 |
| 25°   | 6610.6  | 6562.6  | 6010.2  | 5951.5  | 6108.9  | 6239.7  | 6685.4  | 7235.2  | 8203.9  | 9994.7  | 11507.9 |
| 27.5° | 7077.7  | 7008.3  | 6458.5  | 6306.4  | 6485.2  | 6621.3  | 7080.4  | 7598.1  | 8380.1  | 10280.3 | 12129.8 |
| 30°   | 7518.0  | 7427.3  | 6930.9  | 6680.0  | 6898.9  | 7051.0  | 7507.4  | 8030.5  | 8663.0  | 10720.6 | 12981.1 |
| 32.5° | 7961.1  | 7859.7  | 7352.6  | 7053.7  | 7251.2  | 7416.6  | 7947.7  | 8625.6  | 9194.1  | 11393.2 | 14112.7 |
| 35°   | 8980.6  | 8873.8  | 8252.0  | 7758.2  | 7755.6  | 7849.0  | 8564.2  | 9439.6  | 9896.0  | 12329.9 | 15463.1 |
| 37.5° | 10696.6 | 10635.2 | 10042.7 | 9106.0  | 8855.1  | 8751.0  | 9404.9  | 10411.0 | 10904.8 | 13619.0 | 16987.0 |
| 40°   | 12575.4 | 12522.1 | 11857.5 | 11008.9 | 10627.2 | 10371.0 | 10611.2 | 11764.1 | 12329.9 | 15193.6 | 18542.9 |
| 42.5° | 14697.2 | 14443.6 | 13258.7 | 13005.1 | 12663.5 | 12468.7 | 12252.5 | 13432.1 | 14080.7 | 16906.9 | 20085.5 |
| 45°   | 16624.0 | 16197.0 | 14659.8 | 14275.5 | 14198.1 | 14246.1 | 14366.2 | 15673.9 | 16050.2 | 18943.2 | 21622.7 |
| 47.5° | 17771.6 | 17435.4 | 16255.7 | 15887.4 | 15866.1 | 16183.7 | 17091.1 | 18206.6 | 18011.8 | 20718.0 | 22975.8 |
| 50°   | 18863.2 | 18558.9 | 17579.5 | 17670.2 | 17769.0 | 18201.3 | 20184.2 | 20811.4 | 19802.6 | 22327.3 | 24216.8 |
| 52.5° | 19746.5 | 19282.2 | 18769.8 | 19279.5 | 19765.2 | 20461.8 | 23376.1 | 23149.3 | 21072.9 | 23608.3 | 25279.0 |
| 55°   | 20256.3 | 20045.5 | 20293.7 | 20806.1 | 21718.8 | 22850.4 | 26389.2 | 25094.8 | 22001.7 | 24777.3 | 25986.2 |
| 57.5° | 22124.5 | 21710.8 | 22204.5 | 22647.5 | 23837.8 | 25420.4 | 28970.0 | 26544.0 | 22671.6 | 25500.5 | 26149.0 |
| 60°   | 24384.9 | 24051.3 | 24342.2 | 25078.8 | 26685.5 | 28545.6 | 31382.6 | 27726.3 | 23021.2 | 25964.9 | 25727.4 |
| 62.5° | 27982.5 | 27542.2 | 27360.7 | 28185.3 | 30315.0 | 32346.0 | 33213.4 | 28545.6 | 22943.8 | 25759.4 | 24280.9 |
| 65°   | 32802.4 | 32346.0 | 31534.7 | 32282.0 | 34990.8 | 36424.0 | 35260.4 | 28719.1 | 22410.0 | 24096.7 | 20624.6 |
| 67.5° | 37739.7 | 37408.8 | 36714.9 | 37974.5 | 40419.2 | 40880.9 | 37424.8 | 28297.4 | 20691.3 | 19538.4 | 14571.7 |
| 70°   | 41001.0 | 40859.5 | 41310.6 | 44096.8 | 46277.2 | 46143.8 | 39410.4 | 26031.6 | 16127.6 | 12015.0 | 7208.5  |
| 72.5° | 38649.8 | 39327.6 | 42658.3 | 47710.4 | 50373.8 | 49285.0 | 38390.9 | 19989.4 | 9218.1  | 4622.4  | 2084.3  |
| 73°   | 36701.5 | 37568.9 | 42052.5 | 47846.5 | 50696.8 | 49503.8 | 37534.2 | 18348.1 | 7857.0  | 3648.3  | 1579.9  |
| 75°   | 25532.5 | 26597.4 | 34814.7 | 44561.2 | 49186.2 | 47165.9 | 31286.5 | 11230.4 | 3640.3  | 1617.3  | 637.8   |
| 77.5° | 12396.6 | 13183.9 | 19170.1 | 32196.6 | 38252.1 | 36851.0 | 19477.0 | 4184.7  | 1644.0  | 1011.5  | 293.6   |
| 80°   | 4627.7  | 5145.5  | 8321.4  | 16386.5 | 22105.8 | 22684.9 | 8566.9  | 1582.6  | 1094.2  | 814.0   | 149.5   |
| 82.5° | 1211.6  | 1350.4  | 3069.1  | 7307.2  | 11329.1 | 11857.5 | 2700.8  | 798.0   | 800.6   | 669.9   | 90.7    |
| 85°   | 387.0   | 443.0   | 958.1   | 3280.0  | 5337.6  | 4686.4  | 704.6   | 387.0   | 581.8   | 499.1   | 50.7    |
| 87.5° | 48.0    | 61.4    | 304.2   | 771.3   | 1176.9  | 653.9   | 109.4   | 114.8   | 248.2   | 277.6   | 29.4    |
| 90°   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |



REPORT NUMBER: P322584

CATALOG NUMBER: GLEON-SA0D-740-U-T4FT-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°     | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|---------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 9383.5  | 9383.5  | 9383.5 | 9383.5 | 9383.5 | 9383.5 | 9383.5 | 9383.5 | 9383.5 | 9383.5 | 9383.5 |
| 2.5°  | 9404.9  | 9391.6  | 9394.2 | 9324.8 | 9279.5 | 9188.7 | 9095.3 | 9052.6 | 9007.2 | 8988.6 | 9007.2 |
| 5°    | 9452.9  | 9428.9  | 9359.5 | 9146.0 | 8919.2 | 8625.6 | 8350.7 | 8142.5 | 7881.0 | 7808.9 | 7883.7 |
| 7.5°  | 9527.7  | 9479.6  | 9276.8 | 8841.8 | 8337.4 | 7776.9 | 7147.1 | 6688.0 | 6311.7 | 6068.9 | 6157.0 |
| 10°   | 9637.1  | 9546.3  | 9138.0 | 8398.8 | 7496.7 | 6503.9 | 5609.8 | 4913.3 | 4419.6 | 4216.7 | 4208.7 |
| 12.5° | 9821.2  | 9650.4  | 8967.2 | 7822.3 | 6469.2 | 5145.5 | 3973.9 | 3218.6 | 2818.3 | 2559.4 | 2554.1 |
| 15°   | 10024.1 | 9773.2  | 8751.0 | 7131.1 | 5273.6 | 3685.6 | 2559.4 | 1985.6 | 1726.7 | 1644.0 | 1633.3 |
| 17.5° | 10272.3 | 9914.6  | 8470.8 | 6279.7 | 4021.9 | 2442.0 | 1670.7 | 1505.2 | 1494.5 | 1486.5 | 1486.5 |
| 20°   | 10584.5 | 10082.8 | 8110.5 | 5305.6 | 2853.0 | 1630.6 | 1419.8 | 1430.5 | 1435.8 | 1425.1 | 1427.8 |
| 22.5° | 10947.5 | 10253.6 | 7680.8 | 4259.4 | 1929.6 | 1363.8 | 1358.4 | 1371.8 | 1377.1 | 1371.8 | 1374.4 |
| 25°   | 11369.1 | 10451.1 | 7157.8 | 3162.5 | 1393.1 | 1294.4 | 1307.7 | 1326.4 | 1339.7 | 1339.7 | 1339.7 |
| 27.5° | 11892.2 | 10691.3 | 6527.9 | 2207.1 | 1203.6 | 1222.3 | 1259.7 | 1294.4 | 1313.1 | 1318.4 | 1318.4 |
| 30°   | 12572.8 | 10990.2 | 5772.6 | 1513.2 | 1094.2 | 1126.2 | 1195.6 | 1262.3 | 1297.0 | 1302.4 | 1305.0 |
| 32.5° | 13432.1 | 11326.4 | 4897.3 | 1118.2 | 1000.8 | 1024.8 | 1099.6 | 1211.6 | 1278.4 | 1289.0 | 1289.0 |
| 35°   | 14416.9 | 11716.1 | 3955.2 | 974.1  | 934.1  | 942.1  | 1000.8 | 1128.9 | 1246.3 | 1275.7 | 1278.4 |
| 37.5° | 15495.1 | 12100.4 | 3007.8 | 910.1  | 878.0  | 878.0  | 920.7  | 1030.2 | 1168.9 | 1259.7 | 1270.4 |
| 40°   | 16501.3 | 12332.6 | 2108.4 | 859.4  | 827.3  | 827.3  | 864.7  | 944.8  | 1075.5 | 1211.6 | 1241.0 |
| 42.5° | 17430.0 | 12412.6 | 1467.8 | 811.3  | 779.3  | 787.3  | 819.3  | 883.4  | 982.1  | 1118.2 | 1144.9 |
| 45°   | 18385.5 | 12399.3 | 1070.2 | 755.3  | 731.3  | 755.3  | 779.3  | 827.3  | 899.4  | 976.8  | 982.1  |
| 47.5° | 19106.0 | 12287.2 | 848.7  | 701.9  | 685.9  | 717.9  | 739.3  | 771.3  | 811.3  | 806.0  | 806.0  |
| 50°   | 19781.2 | 12015.0 | 683.2  | 629.8  | 640.5  | 677.9  | 688.6  | 699.2  | 701.9  | 651.2  | 645.9  |
| 52.5° | 20293.7 | 11590.7 | 547.1  | 552.4  | 595.1  | 632.5  | 621.8  | 605.8  | 579.1  | 517.7  | 507.1  |
| 55°   | 20464.5 | 10774.0 | 429.7  | 456.4  | 528.4  | 576.5  | 536.4  | 501.7  | 451.0  | 400.3  | 389.6  |
| 57.5° | 20154.9 | 9719.8  | 349.6  | 355.0  | 445.7  | 485.7  | 440.4  | 400.3  | 344.3  | 301.6  | 293.6  |
| 60°   | 19498.3 | 8548.2  | 288.2  | 266.9  | 344.3  | 379.0  | 349.6  | 309.6  | 258.9  | 226.8  | 224.2  |
| 62.5° | 18196.0 | 7299.2  | 237.5  | 208.2  | 261.5  | 290.9  | 272.2  | 242.9  | 200.2  | 178.8  | 176.1  |
| 65°   | 15457.8 | 5839.4  | 192.2  | 168.1  | 202.8  | 226.8  | 210.8  | 189.5  | 157.5  | 141.4  | 138.8  |
| 67.5° | 10790.0 | 3947.2  | 157.5  | 138.8  | 160.1  | 178.8  | 165.5  | 154.8  | 125.4  | 122.8  | 125.4  |
| 70°   | 5204.2  | 1902.9  | 130.8  | 112.1  | 125.4  | 138.8  | 133.4  | 125.4  | 120.1  | 138.8  | 160.1  |
| 72.5° | 1491.9  | 637.8   | 104.1  | 93.4   | 101.4  | 109.4  | 114.8  | 112.1  | 130.8  | 168.1  | 194.8  |
| 73°   | 1147.6  | 515.1   | 98.7   | 88.1   | 96.1   | 106.8  | 112.1  | 109.4  | 133.4  | 170.8  | 194.8  |
| 75°   | 491.1   | 248.2   | 74.7   | 72.1   | 80.1   | 93.4   | 98.7   | 98.7   | 133.4  | 173.5  | 186.8  |
| 77.5° | 221.5   | 133.4   | 48.0   | 56.0   | 69.4   | 74.7   | 82.7   | 82.7   | 106.8  | 133.4  | 133.4  |
| 80°   | 125.4   | 72.1    | 37.4   | 42.7   | 50.7   | 50.7   | 50.7   | 45.4   | 48.0   | 53.4   | 58.7   |
| 82.5° | 80.1    | 48.0    | 29.4   | 34.7   | 32.0   | 26.7   | 21.4   | 21.4   | 18.7   | 21.4   | 26.7   |
| 85°   | 45.4    | 26.7    | 26.7   | 21.4   | 13.3   | 10.7   | 13.3   | 10.7   | 2.7    | 0.0    | 2.7    |
| 87.5° | 26.7    | 16.0    | 8.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 90°   | 0.0     | 0.0     | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

LM-79-08: Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Report Prepared for

Cooper Lighting Solutions

MCGRAW, INVUE, LUMARK AND STREETWORKS

DATA VALID FOR LUMINAIRES UTILIZING SA LIGHT ENGINES

Report Number: SP1-2101-121-2

Luminaire Tested: IFLD-S-SA2A-740-U-T3R-HSS

Test Date: 03/05/2021

### Test Information

Test Method: LM-79-08  
 Report Number: SP1-2101-121-2  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1  
 Measurement Geometry:  $4\pi$   
 Issue Date: 03/05/2021  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: STREETWORKS  
 Catalog Number: **IFLD-S-SA2A-740-U-T3R-HSS**  
 Description: STREETWORKS INF FLOOD

SHIELD, DRIVER PROGRAMMED @ 615mA.

### Spectral Parameters

|                           |         |           |      |      |       |
|---------------------------|---------|-----------|------|------|-------|
| CCT (K):                  | 3905    | CRI (Ra): | 71.2 |      |       |
| CIE u':                   | 0.2273  | R1:       | 68.9 | R9:  | -29.7 |
| CIE v':                   | 0.5024  | R2:       | 77.0 | R10: | 46.2  |
| Duv:                      | -0.0008 | R3:       | 84.0 | R11: | 68.8  |
| CIE x:                    | 0.3841  | R4:       | 71.6 | R12: | 45.6  |
| CIE y:                    | 0.3774  | R5:       | 68.9 | R13: | 69.5  |
| CIE z:                    | 0.2385  | R6:       | 68.3 | R14: | 90.7  |
| Peak Wavelength (nm):     | 443     | R7:       | 78.7 |      |       |
| Dominant Wavelength (nm): | 579     | R8:       | 52.2 |      |       |
| Purity:                   | 28.7    |           |      |      |       |
| Rf:                       | 71.7    |           |      |      |       |
| Rg:                       | 96.9    |           |      |      |       |



### Test Conditions

Stabilization Time: 211M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.8/312%  
 Sphere Temperature (°C): 24.1

REPORT NUMBER: SP1-2101-121-2

| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 1/31/2021        | 7/31/2021            |
| Power Meter                    | IN0071                | 12/1/2020        | 12/1/2021            |
| AC Power Source                | IN0063                | 12/1/2020        | 12/1/2021            |
| DC Power Source                | IN0208                | 12/1/2020        | 12/1/2021            |
| Sphere Thermometer             | IN0085                | 12/1/2020        | 12/1/2021            |
| Room Thermometer               | IN0046                | 12/1/2020        | 12/1/2021            |

REPORT NUMBER: SP1-2101-121-2

**CIE 1931 Chromaticity Diagram**



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



Point lies inside the ANSI 4000K 4-step quadrangle

REPORT NUMBER: SP1-2101-121-2

### Photopic Flux vs. Wavelength



#####

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 2304             | 0.0              | 490       | 19043            | 2.7              | 620       | 97577            | 25.4             | 750       | 4830             | 0.0              | 880       | 3505             | 0.0              |
| 365       | 2150             | 0.0              | 495       | 26606            | 4.8              | 625       | 90158            | 19.9             | 755       | 4664             | 0.0              | 885       | 2991             | 0.0              |
| 370       | 2146             | 0.0              | 500       | 36376            | 8.0              | 630       | 82240            | 14.9             | 760       | 4006             | 0.0              | 890       | 2327             | 0.0              |
| 375       | 2332             | 0.0              | 505       | 47714            | 13.3             | 635       | 74361            | 11.2             | 765       | 3715             | 0.0              | 895       | 2775             | 0.0              |
| 380       | 2527             | 0.0              | 510       | 58741            | 20.2             | 640       | 66994            | 8.0              | 770       | 3696             | 0.0              | 900       | 2141             | 0.0              |
| 385       | 2304             | 0.0              | 515       | 68716            | 28.5             | 645       | 60405            | 5.8              | 775       | 3117             | 0.0              | 905       | 2421             | 0.0              |
| 390       | 2064             | 0.0              | 520       | 77136            | 37.4             | 650       | 53806            | 3.9              | 780       | 3062             | 0.0              | 910       | 2200             | 0.0              |
| 395       | 1856             | 0.0              | 525       | 83567            | 44.9             | 655       | 47610            | 2.7              | 785       | 2907             | 0.0              | 915       | 2716             | 0.0              |
| 400       | 1856             | 0.0              | 530       | 89283            | 52.6             | 660       | 42018            | 1.8              | 790       | 2655             | 0.0              | 920       | 2656             | 0.0              |
| 405       | 2374             | 0.0              | 535       | 94097            | 58.4             | 665       | 36742            | 1.2              | 795       | 2467             | 0.0              | 925       | 2671             | 0.0              |
| 410       | 4084             | 0.0              | 540       | 96845            | 63.1             | 670       | 32105            | 0.7              | 800       | 2609             | 0.0              | 930       | 3292             | 0.0              |
| 415       | 8543             | 0.0              | 545       | 100829           | 67.1             | 675       | 27946            | 0.5              | 805       | 2293             | 0.0              | 935       | 3188             | 0.0              |
| 420       | 18394            | 0.1              | 550       | 105648           | 71.8             | 680       | 24146            | 0.3              | 810       | 2188             | 0.0              | 940       | 1997             | 0.0              |
| 425       | 37987            | 0.2              | 555       | 110017           | 75.1             | 685       | 21191            | 0.2              | 815       | 2386             | 0.0              | 945       | 2623             | 0.0              |
| 430       | 67605            | 0.5              | 560       | 114586           | 77.9             | 690       | 18544            | 0.1              | 820       | 2712             | 0.0              | 950       | 2969             | 0.0              |
| 435       | 102160           | 1.2              | 565       | 118987           | 79.1             | 695       | 16058            | 0.1              | 825       | 2473             | 0.0              | 955       | 2277             | 0.0              |
| 440       | 135103           | 2.1              | 570       | 122326           | 79.5             | 700       | 14133            | 0.0              | 830       | 1969             | 0.0              | 960       | 4267             | 0.0              |
| 445       | 140126           | 2.9              | 575       | 125968           | 78.4             | 705       | 12309            | 0.0              | 835       | 1917             | 0.0              | 965       | 2034             | 0.0              |
| 450       | 102339           | 2.7              | 580       | 127613           | 75.8             | 710       | 11142            | 0.0              | 840       | 2248             | 0.0              | 970       | 3586             | 0.0              |
| 455       | 58751            | 2.0              | 585       | 129466           | 71.9             | 715       | 10143            | 0.0              | 845       | 2266             | 0.0              | 975       | 2505             | 0.0              |
| 460       | 36892            | 1.5              | 590       | 128813           | 66.6             | 720       | 9072             | 0.0              | 850       | 2558             | 0.0              | 980       | 2666             | 0.0              |
| 465       | 24637            | 1.3              | 595       | 126387           | 59.9             | 725       | 8130             | 0.0              | 855       | 2767             | 0.0              | 985       | 2934             | 0.0              |
| 470       | 16738            | 1.0              | 600       | 123477           | 53.2             | 730       | 7149             | 0.0              | 860       | 2826             | 0.0              | 990       | 4120             | 0.0              |
| 475       | 13456            | 1.1              | 605       | 118718           | 46.0             | 735       | 6311             | 0.0              | 865       | 2385             | 0.0              | 995       | 3858             | 0.0              |
| 480       | 13081            | 1.2              | 610       | 112091           | 38.5             | 740       | 5711             | 0.0              | 870       | 3194             | 0.0              | 1000      | 3405             | 0.0              |
| 485       | 14734            | 1.7              | 615       | 105039           | 31.7             | 745       | 5111             | 0.0              | 875       | 3189             | 0.0              |           |                  |                  |

REPORT NUMBER: SP1-2101-121-2

### Scotopic Flux vs. Wavelength



Scotopic Lumens: 10425.8

S/P: 1.47

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 2304             | 0.0              | 490       | 19043            | 29.3             | 620       | 97577            | 1.2              | 750       | 4830             | 0.0              | 880       | 3505             | 0.0              |
| 365       | 2150             | 0.0              | 495       | 26606            | 43.0             | 625       | 90158            | 0.8              | 755       | 4664             | 0.0              | 885       | 2991             | 0.0              |
| 370       | 2146             | 0.0              | 500       | 36376            | 60.8             | 630       | 82240            | 0.5              | 760       | 4006             | 0.0              | 890       | 2327             | 0.0              |
| 375       | 2332             | 0.0              | 505       | 47714            | 81.1             | 635       | 74361            | 0.3              | 765       | 3715             | 0.0              | 895       | 2775             | 0.0              |
| 380       | 2527             | 0.0              | 510       | 58741            | 99.6             | 640       | 66994            | 0.2              | 770       | 3696             | 0.0              | 900       | 2141             | 0.0              |
| 385       | 2304             | 0.0              | 515       | 68716            | 113.9            | 645       | 60405            | 0.1              | 775       | 3117             | 0.0              | 905       | 2421             | 0.0              |
| 390       | 2064             | 0.0              | 520       | 77136            | 122.6            | 650       | 53806            | 0.1              | 780       | 3062             | 0.0              | 910       | 2200             | 0.0              |
| 395       | 1856             | 0.0              | 525       | 83567            | 125.0            | 655       | 47610            | 0.0              | 785       | 2907             | 0.0              | 915       | 2716             | 0.0              |
| 400       | 1856             | 0.0              | 530       | 89283            | 123.1            | 660       | 42018            | 0.0              | 790       | 2655             | 0.0              | 920       | 2656             | 0.0              |
| 405       | 2374             | 0.1              | 535       | 94097            | 117.3            | 665       | 36742            | 0.0              | 795       | 2467             | 0.0              | 925       | 2671             | 0.0              |
| 410       | 4084             | 0.2              | 540       | 96845            | 107.0            | 670       | 32105            | 0.0              | 800       | 2609             | 0.0              | 930       | 3292             | 0.0              |
| 415       | 8543             | 0.9              | 545       | 100829           | 96.7             | 675       | 27946            | 0.0              | 805       | 2293             | 0.0              | 935       | 3188             | 0.0              |
| 420       | 18394            | 3.0              | 550       | 105648           | 86.4             | 680       | 24146            | 0.0              | 810       | 2188             | 0.0              | 940       | 1997             | 0.0              |
| 425       | 37987            | 9.3              | 555       | 110017           | 75.2             | 685       | 21191            | 0.0              | 815       | 2386             | 0.0              | 945       | 2623             | 0.0              |
| 430       | 67605            | 23.0             | 560       | 114586           | 64.0             | 690       | 18544            | 0.0              | 820       | 2712             | 0.0              | 950       | 2969             | 0.0              |
| 435       | 102160           | 45.7             | 565       | 118987           | 53.4             | 695       | 16058            | 0.0              | 825       | 2473             | 0.0              | 955       | 2277             | 0.0              |
| 440       | 135103           | 75.5             | 570       | 122326           | 43.2             | 700       | 14133            | 0.0              | 830       | 1969             | 0.0              | 960       | 4267             | 0.0              |
| 445       | 140126           | 93.8             | 575       | 125968           | 34.3             | 705       | 12309            | 0.0              | 835       | 1917             | 0.0              | 965       | 2034             | 0.0              |
| 450       | 102339           | 79.3             | 580       | 127613           | 26.3             | 710       | 11142            | 0.0              | 840       | 2248             | 0.0              | 970       | 3586             | 0.0              |
| 455       | 58751            | 51.3             | 585       | 129466           | 19.8             | 715       | 10143            | 0.0              | 845       | 2266             | 0.0              | 975       | 2505             | 0.0              |
| 460       | 36892            | 35.6             | 590       | 128813           | 14.3             | 720       | 9072             | 0.0              | 850       | 2558             | 0.0              | 980       | 2666             | 0.0              |
| 465       | 24637            | 26.0             | 595       | 126387           | 10.1             | 725       | 8130             | 0.0              | 855       | 2767             | 0.0              | 985       | 2934             | 0.0              |
| 470       | 16738            | 19.3             | 600       | 123477           | 7.0              | 730       | 7149             | 0.0              | 860       | 2826             | 0.0              | 990       | 4120             | 0.0              |
| 475       | 13456            | 16.8             | 605       | 118718           | 4.7              | 735       | 6311             | 0.0              | 865       | 2385             | 0.0              | 995       | 3858             | 0.0              |
| 480       | 13081            | 17.7             | 610       | 112091           | 3.0              | 740       | 5711             | 0.0              | 870       | 3194             | 0.0              | 1000      | 3405             | 0.0              |
| 485       | 14734            | 21.4             | 615       | 105039           | 1.9              | 745       | 5111             | 0.0              | 875       | 3189             | 0.0              |           |                  |                  |

REPORT NUMBER: SP1-2101-121-2

### Melanopic Flux vs. Wavelength



Melanopic Lumens: 3927.2

M/P: 0.55

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 2304             | 0.0              | 490       | 19043            | 15.8             | 620       | 97577            | 0.1              | 750       | 4830             | 0.0              | 880       | 3505             | 0.0              |
| 365       | 2150             | 0.0              | 495       | 26606            | 22.0             | 625       | 90158            | 0.0              | 755       | 4664             | 0.0              | 885       | 2991             | 0.0              |
| 370       | 2146             | 0.0              | 500       | 36376            | 29.2             | 630       | 82240            | 0.0              | 760       | 4006             | 0.0              | 890       | 2327             | 0.0              |
| 375       | 2332             | 0.0              | 505       | 47714            | 36.6             | 635       | 74361            | 0.0              | 765       | 3715             | 0.0              | 895       | 2775             | 0.0              |
| 380       | 2527             | 0.0              | 510       | 58741            | 42.2             | 640       | 66994            | 0.0              | 770       | 3696             | 0.0              | 900       | 2141             | 0.0              |
| 385       | 2304             | 0.0              | 515       | 68716            | 44.9             | 645       | 60405            | 0.0              | 775       | 3117             | 0.0              | 905       | 2421             | 0.0              |
| 390       | 2064             | 0.0              | 520       | 77136            | 44.9             | 650       | 53806            | 0.0              | 780       | 3062             | 0.0              | 910       | 2200             | 0.0              |
| 395       | 1856             | 0.0              | 525       | 83567            | 42.4             | 655       | 47610            | 0.0              | 785       | 2907             | 0.0              | 915       | 2716             | 0.0              |
| 400       | 1856             | 0.0              | 530       | 89283            | 38.6             | 660       | 42018            | 0.0              | 790       | 2655             | 0.0              | 920       | 2656             | 0.0              |
| 405       | 2374             | 0.0              | 535       | 94097            | 33.9             | 665       | 36742            | 0.0              | 795       | 2467             | 0.0              | 925       | 2671             | 0.0              |
| 410       | 4084             | 0.2              | 540       | 96845            | 28.3             | 670       | 32105            | 0.0              | 800       | 2609             | 0.0              | 930       | 3292             | 0.0              |
| 415       | 8543             | 0.6              | 545       | 100829           | 23.4             | 675       | 27946            | 0.0              | 805       | 2293             | 0.0              | 935       | 3188             | 0.0              |
| 420       | 18394            | 2.1              | 550       | 105648           | 19.0             | 680       | 24146            | 0.0              | 810       | 2188             | 0.0              | 940       | 1997             | 0.0              |
| 425       | 37987            | 5.9              | 555       | 110017           | 14.8             | 685       | 21191            | 0.0              | 815       | 2386             | 0.0              | 945       | 2623             | 0.0              |
| 430       | 67605            | 14.3             | 560       | 114586           | 11.3             | 690       | 18544            | 0.0              | 820       | 2712             | 0.0              | 950       | 2969             | 0.0              |
| 435       | 102160           | 27.3             | 565       | 118987           | 8.4              | 695       | 16058            | 0.0              | 825       | 2473             | 0.0              | 955       | 2277             | 0.0              |
| 440       | 135103           | 45.1             | 570       | 122326           | 6.0              | 700       | 14133            | 0.0              | 830       | 1969             | 0.0              | 960       | 4267             | 0.0              |
| 445       | 140126           | 55.3             | 575       | 125968           | 4.2              | 705       | 12309            | 0.0              | 835       | 1917             | 0.0              | 965       | 2034             | 0.0              |
| 450       | 102339           | 47.2             | 580       | 127613           | 2.9              | 710       | 11142            | 0.0              | 840       | 2248             | 0.0              | 970       | 3586             | 0.0              |
| 455       | 58751            | 30.8             | 585       | 129466           | 1.9              | 715       | 10143            | 0.0              | 845       | 2266             | 0.0              | 975       | 2505             | 0.0              |
| 460       | 36892            | 21.7             | 590       | 128813           | 1.3              | 720       | 9072             | 0.0              | 850       | 2558             | 0.0              | 980       | 2666             | 0.0              |
| 465       | 24637            | 16.1             | 595       | 126387           | 0.8              | 725       | 8130             | 0.0              | 855       | 2767             | 0.0              | 985       | 2934             | 0.0              |
| 470       | 16738            | 12.0             | 600       | 123477           | 0.5              | 730       | 7149             | 0.0              | 860       | 2826             | 0.0              | 990       | 4120             | 0.0              |
| 475       | 13456            | 10.3             | 605       | 118718           | 0.3              | 735       | 6311             | 0.0              | 865       | 2385             | 0.0              | 995       | 3858             | 0.0              |
| 480       | 13081            | 10.5             | 610       | 112091           | 0.2              | 740       | 5711             | 0.0              | 870       | 3194             | 0.0              | 1000      | 3405             | 0.0              |
| 485       | 14734            | 12.1             | 615       | 105039           | 0.1              | 745       | 5111             | 0.0              | 875       | 3189             | 0.0              |           |                  |                  |

### Summary

$R_f = 71.7$   
 $R_g = 96.9$   
 CIE  $R_a = 71.2$   
 $R_g = -29.7$



### Color Vector Graphics



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 55 | CES51 = 86 | CES76 = 45 |
| CES02 = 61 | CES27 = 80 | CES52 = 87 | CES77 = 68 |
| CES03 = 30 | CES28 = 79 | CES53 = 74 | CES78 = 49 |
| CES04 = 70 | CES29 = 51 | CES54 = 81 | CES79 = 77 |
| CES05 = 47 | CES30 = 60 | CES55 = 80 | CES80 = 75 |
| CES06 = 50 | CES31 = 56 | CES56 = 69 | CES81 = 75 |
| CES07 = 40 | CES32 = 52 | CES57 = 67 | CES82 = 90 |
| CES08 = 39 | CES33 = 62 | CES58 = 69 | CES83 = 85 |
| CES09 = 29 | CES34 = 65 | CES59 = 86 | CES84 = 87 |
| CES10 = 74 | CES35 = 81 | CES60 = 91 | CES85 = 83 |
| CES11 = 57 | CES36 = 92 | CES61 = 85 | CES86 = 72 |
| CES12 = 63 | CES37 = 74 | CES62 = 81 | CES87 = 77 |
| CES13 = 42 | CES38 = 69 | CES63 = 72 | CES88 = 77 |
| CES14 = 74 | CES39 = 92 | CES64 = 69 | CES89 = 72 |
| CES15 = 71 | CES40 = 86 | CES65 = 64 | CES90 = 75 |
| CES16 = 46 | CES41 = 84 | CES66 = 63 | CES91 = 91 |
| CES17 = 49 | CES42 = 75 | CES67 = 60 | CES92 = 66 |
| CES18 = 56 | CES43 = 70 | CES68 = 67 | CES93 = 80 |
| CES19 = 72 | CES44 = 98 | CES69 = 77 | CES94 = 56 |
| CES20 = 65 | CES45 = 80 | CES70 = 57 | CES95 = 72 |
| CES21 = 86 | CES46 = 77 | CES71 = 53 | CES96 = 78 |
| CES22 = 78 | CES47 = 74 | CES72 = 84 | CES97 = 83 |
| CES23 = 92 | CES48 = 66 | CES73 = 47 | CES98 = 73 |
| CES24 = 91 | CES49 = 76 | CES74 = 96 | CES99 = 63 |
| CES25 = 72 | CES50 = 85 | CES75 = 52 |            |



**Color Rendition by Hue-Angle Bin**


REPORT NUMBER: SP1-2101-121-2

**TM-30-18**

**Measure Comparisons**



(END OF REPORT)