

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: P321611

Luminaire Tested: **GLEON-SA7C-740-U-T3R-HSS**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P321611  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-11)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA7C-740-U-T3R-HSS  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(7) 70 CRI, 4000K, 1050mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE III  
ROADWAY OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 38478 lumens  
Efficiency: N/A  
Efficacy: 98.4 lumens/watt  
Luminous Opening: Rectangular (W 2' x L: 1' x H: 0')  
IES Classification: Type III - Medium  
BUG Rating: B3 - U0 - G5

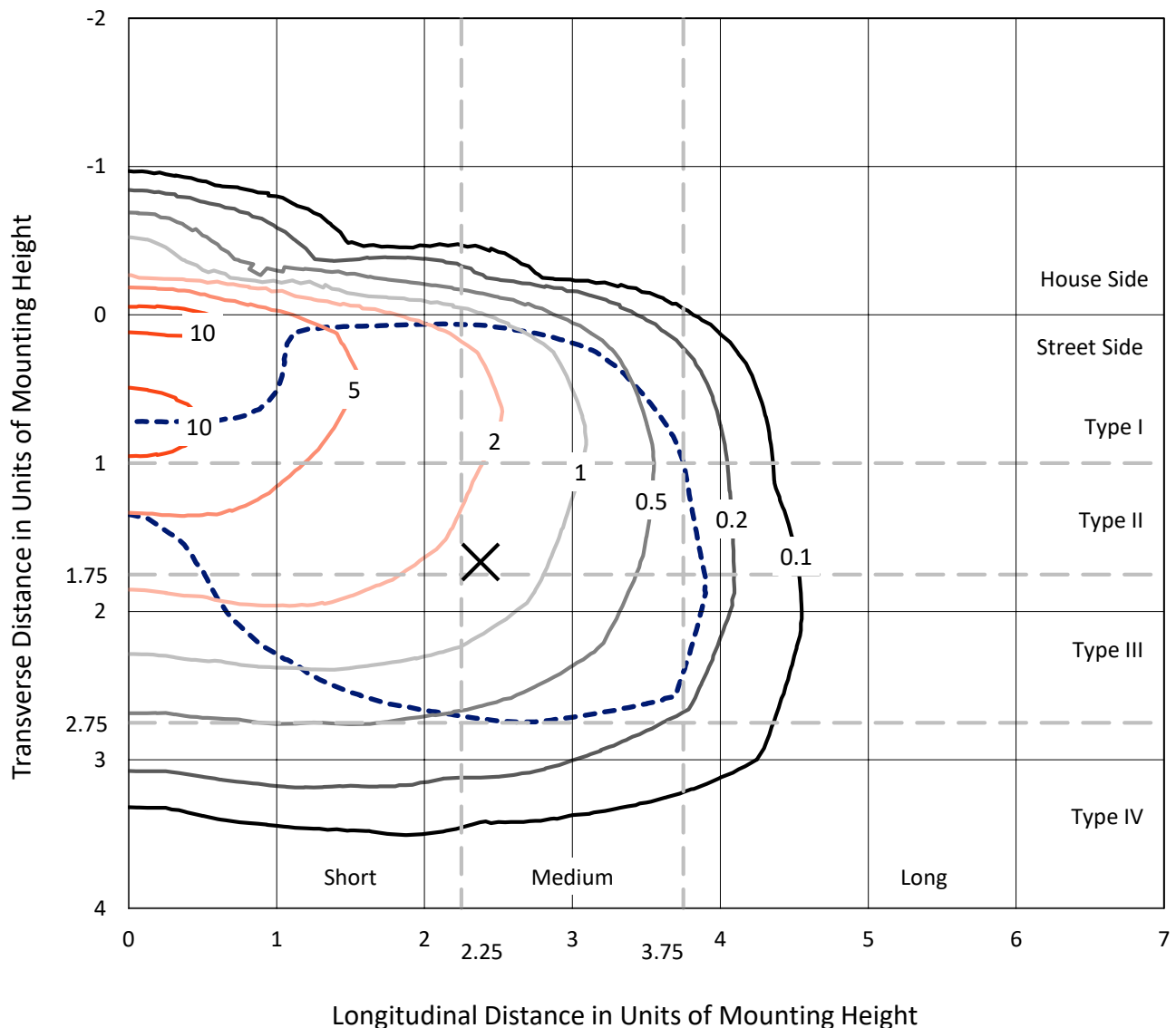
Input Watts (W): 391  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



REPORT NUMBER: P321611  
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## Iso-Footcandle Lines of Horizontal Illumination

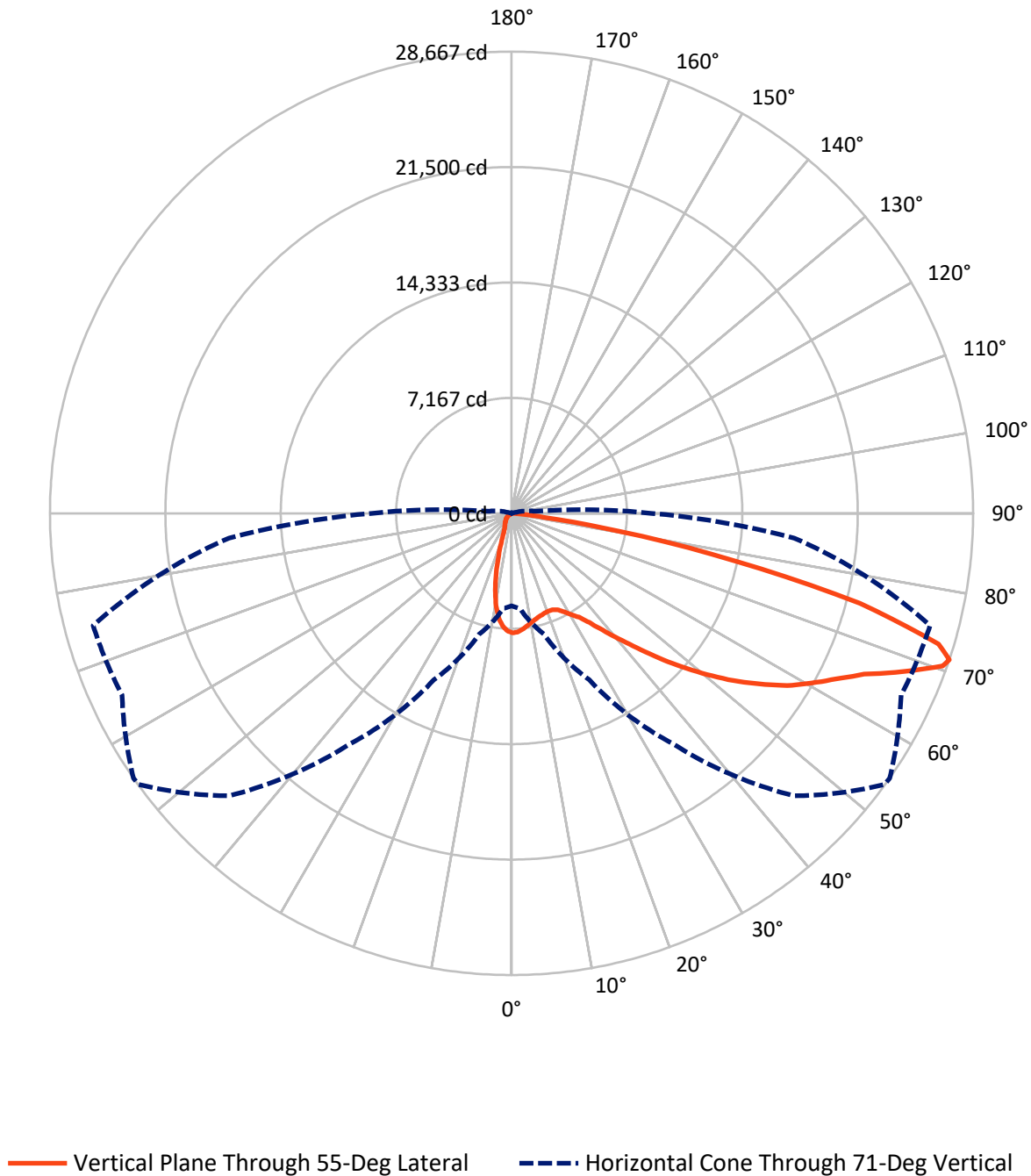
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 12.2 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    | 3046.4   | 0.0    | 3046.4  |
|                    | % Fixture | 7.9      | 0.0    | 7.9     |
| <b>Street Side</b> | Lumens    | 35431.6  | 0.0    | 35431.6 |
|                    | % Fixture | 92.1     | 0.0    | 92.1    |
| <b>Total</b>       | Lumens    | 38478.0  | 0.0    | 38478.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 632.7   | 1.6       |
| 10°-20°   | 1428.4  | 3.7       |
| 20°-30°   | 2295.5  | 6.0       |
| 30°-40°   | 3900.1  | 10.1      |
| 40°-50°   | 6053.5  | 15.7      |
| 50°-60°   | 8138.7  | 21.2      |
| 60°-70°   | 9956.3  | 25.9      |
| 70°-80°   | 5821.2  | 15.1      |
| 80°-90°   | 251.6   | 0.7       |
| 90°-100°  | 0.0     | 0.0       |
| 100°-110° | 0.0     | 0.0       |
| 110°-120° | 0.0     | 0.0       |
| 120°-130° | 0.0     | 0.0       |
| 130°-140° | 0.0     | 0.0       |
| 140°-150° | 0.0     | 0.0       |
| 150°-160° | 0.0     | 0.0       |
| 160°-170° | 0.0     | 0.0       |
| 170°-180° | 0.0     | 0.0       |
| 0°-90°    | 38478.0 | 100.0     |
| 0°-180°   | 38478.0 | 100.0     |

**Coefficient of Utilization**



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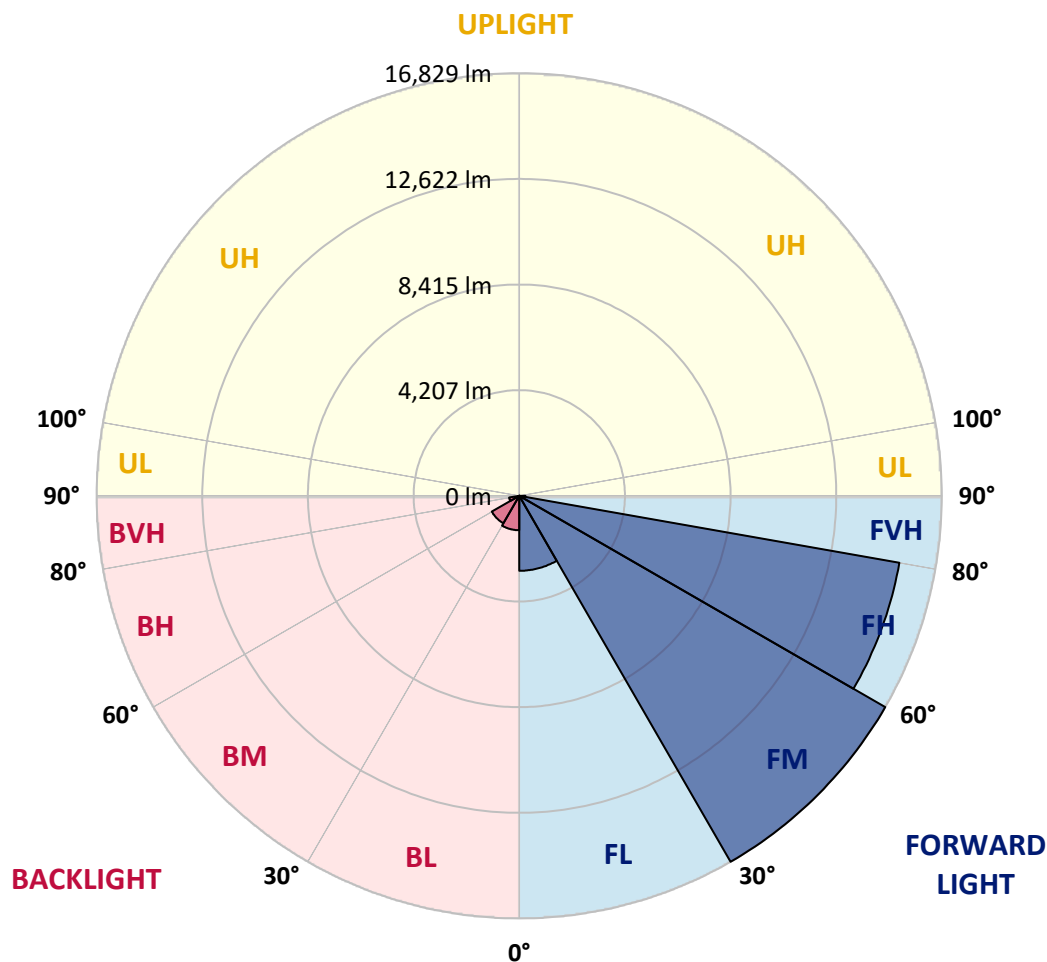
CATALOG NUMBER: GLEON-SA7C-740-U-T3R-HSS

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |        |
|------|-------------|---------|-----------|-------------------------|------|--------|
|      |             |         |           | B                       | U    | G      |
| FL   | (0°-30°)    | 2985.4  | 7.8       |                         |      |        |
| FM   | (30°-60°)   | 16829.2 | 43.7      |                         |      |        |
| FH   | (60°-80°)   | 15369.4 | 39.9      |                         |      | G5     |
| FVH  | (80°-90°)   | 247.7   | 0.6       |                         |      | G3/500 |
| BL   | (0°-30°)    | 1371.2  | 3.6       | B3/2500                 |      |        |
| BM   | (30°-60°)   | 1263.1  | 3.3       | B2/2500                 |      |        |
| BH   | (60°-80°)   | 408.1   | 1.1       | B1/500                  |      | G1/500 |
| BVH  | (80°-90°)   | 4.0     | 0.0       |                         |      | G0/10  |
| UL   | (90°-100°)  | 0.0     | 0.0       |                         | U0/0 |        |
| UH   | (100°-180°) | 0.0     | 0.0       |                         | U0/0 |        |

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

Type III Medium





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 54°     | 55°     | 65°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 7420.6  | 7420.6  | 7420.6  | 7420.6  | 7420.6  | 7420.6  | 7420.6  | 7420.6  | 7420.6  | 7420.6  | 7420.6  |
| 2.5°  | 7202.9  | 7211.6  | 7242.7  | 7256.5  | 7289.3  | 7344.6  | 7372.2  | 7374.0  | 7418.9  | 7436.2  | 7450.0  |
| 5°    | 6693.2  | 6745.1  | 6796.9  | 6852.2  | 6952.4  | 7085.4  | 7216.7  | 7228.8  | 7374.0  | 7481.1  | 7538.1  |
| 7.5°  | 6254.4  | 6301.0  | 6363.2  | 6451.4  | 6593.0  | 6802.1  | 7021.5  | 7047.4  | 7322.1  | 7565.8  | 7693.6  |
| 10°   | 5803.5  | 5841.5  | 5931.3  | 6060.9  | 6256.1  | 6536.0  | 6831.5  | 6874.7  | 7275.5  | 7679.8  | 7904.4  |
| 12.5° | 5321.4  | 5343.9  | 5452.7  | 5639.3  | 5926.1  | 6282.0  | 6670.8  | 6727.8  | 7246.1  | 7811.1  | 8153.2  |
| 15°   | 4955.1  | 4965.5  | 5069.2  | 5262.7  | 5590.9  | 6054.0  | 6546.4  | 6615.5  | 7253.0  | 7968.3  | 8424.4  |
| 17.5° | 4861.8  | 4867.0  | 4922.3  | 5055.4  | 5345.6  | 5850.1  | 6447.9  | 6532.6  | 7273.8  | 8122.1  | 8697.4  |
| 20°   | 5240.2  | 5203.9  | 5146.9  | 5126.2  | 5250.6  | 5727.4  | 6389.2  | 6484.2  | 7301.4  | 8258.6  | 8942.8  |
| 22.5° | 6278.6  | 6171.5  | 5934.8  | 5618.6  | 5426.8  | 5736.1  | 6404.7  | 6499.7  | 7389.5  | 8426.2  | 9226.1  |
| 25°   | 7819.7  | 7671.1  | 7268.6  | 6646.6  | 6048.8  | 5984.9  | 6534.3  | 6631.0  | 7560.6  | 8626.6  | 9497.4  |
| 27.5° | 9573.4  | 9426.5  | 8934.1  | 8046.1  | 7026.7  | 6477.3  | 6831.5  | 6921.3  | 7814.5  | 8804.5  | 9704.7  |
| 30°   | 11252.7 | 11211.3 | 10630.8 | 9621.8  | 8256.8  | 7275.5  | 7215.0  | 7291.0  | 8002.9  | 8911.7  | 9868.8  |
| 32.5° | 12676.4 | 12610.7 | 12144.2 | 11162.9 | 9664.9  | 8234.4  | 7666.0  | 7688.4  | 8144.5  | 9049.9  | 10083.1 |
| 35°   | 13996.4 | 13915.2 | 13505.7 | 12577.9 | 11109.3 | 9405.8  | 8360.5  | 8327.7  | 8453.8  | 9328.0  | 10394.1 |
| 37.5° | 15148.8 | 15223.1 | 14768.7 | 13885.8 | 12405.1 | 10623.8 | 9296.9  | 9198.5  | 8937.6  | 9780.7  | 10845.0 |
| 40°   | 16112.9 | 16112.9 | 15876.2 | 15140.1 | 13804.6 | 11883.4 | 10356.0 | 10226.5 | 9664.9  | 10478.7 | 11416.9 |
| 42.5° | 16460.1 | 16534.4 | 16622.5 | 16206.2 | 15057.2 | 13193.0 | 11536.1 | 11401.3 | 10689.5 | 11468.7 | 12139.1 |
| 45°   | 16480.9 | 16598.3 | 17049.3 | 17047.6 | 16188.9 | 14494.0 | 12866.4 | 12802.5 | 12002.6 | 12740.3 | 13034.0 |
| 47.5° | 16188.9 | 16335.7 | 17078.7 | 17500.2 | 17085.6 | 15705.1 | 14321.2 | 14241.7 | 13545.4 | 14298.7 | 13970.5 |
| 50°   | 15737.9 | 15900.3 | 16764.2 | 17678.2 | 17695.5 | 16759.0 | 15853.7 | 15734.5 | 15243.8 | 16080.0 | 14938.0 |
| 52.5° | 14931.1 | 15245.5 | 16482.6 | 17719.6 | 18096.3 | 17669.5 | 17311.9 | 17260.1 | 17144.3 | 17795.7 | 15708.6 |
| 55°   | 13205.1 | 13554.1 | 15775.9 | 17733.5 | 18467.8 | 18476.4 | 18678.5 | 18692.4 | 18925.6 | 19399.0 | 16282.2 |
| 57.5° | 12389.6 | 12586.5 | 14542.3 | 17799.1 | 19018.9 | 19392.1 | 20071.1 | 20178.2 | 20539.3 | 20921.1 | 16937.0 |
| 60°   | 11876.4 | 12109.7 | 13934.2 | 17709.3 | 19884.5 | 20592.9 | 21361.7 | 21398.0 | 21785.0 | 22491.6 | 17823.3 |
| 62.5° | 11467.0 | 11696.8 | 13550.6 | 17363.7 | 20857.2 | 22037.3 | 22623.0 | 22626.4 | 22916.7 | 24362.8 | 18830.6 |
| 65°   | 10456.3 | 10649.8 | 12774.9 | 16975.0 | 21499.9 | 23466.1 | 24088.1 | 24065.6 | 24302.3 | 26335.9 | 20000.3 |
| 67.5° | 8994.6  | 9143.2  | 11190.5 | 15501.2 | 21258.0 | 24765.3 | 26299.6 | 26225.3 | 25938.5 | 28041.1 | 20459.8 |
| 70°   | 6954.1  | 7007.7  | 8820.1  | 12918.3 | 18991.3 | 25264.7 | 28436.8 | 28398.8 | 26942.3 | 27735.3 | 18775.3 |
| 71°   | 5748.2  | 5924.4  | 7773.1  | 11401.3 | 17472.6 | 24803.4 | 28644.1 | 28666.6 | 26690.0 | 26902.6 | 17616.0 |
| 72.5° | 3338.0  | 3488.3  | 5634.1  | 8756.2  | 14834.3 | 22878.7 | 27569.5 | 27731.9 | 25511.7 | 24469.9 | 15046.8 |
| 75°   | 715.3   | 765.4   | 2088.8  | 4238.1  | 8160.1  | 16035.1 | 21760.8 | 22339.6 | 20793.3 | 16646.7 | 9068.9  |
| 77.5° | 497.6   | 537.3   | 895.0   | 1923.0  | 2697.0  | 7923.4  | 13517.8 | 14170.9 | 12422.4 | 6256.1  | 2902.6  |
| 80°   | 393.9   | 438.8   | 698.0   | 950.3   | 729.1   | 2555.3  | 6332.1  | 6731.3  | 4143.1  | 1396.0  | 488.9   |
| 82.5° | 219.4   | 260.9   | 544.2   | 513.1   | 279.9   | 485.5   | 1772.7  | 2004.2  | 829.3   | 281.6   | 115.8   |
| 85°   | 63.9    | 77.7    | 350.7   | 373.2   | 119.2   | 93.3    | 302.4   | 374.9   | 157.2   | 74.3    | 51.8    |
| 87.5° | 0.0     | 0.0     | 169.3   | 143.4   | 34.6    | 13.8    | 27.6    | 31.1    | 31.1    | 31.1    | 34.6    |
| 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: P321611

CATALOG NUMBER: GLEON-SA7C-740-U-T3R-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 7420.6  | 7420.6 | 7420.6 | 7420.6 | 7420.6 | 7420.6 | 7420.6 | 7420.6 | 7420.6 | 7420.6 | 7420.6 |
| 2.5°  | 7450.0  | 7462.1 | 7418.9 | 7361.9 | 7301.4 | 7227.1 | 7149.4 | 7088.9 | 7087.2 | 7057.8 | 7028.4 |
| 5°    | 7541.6  | 7534.7 | 7415.4 | 7234.0 | 7019.8 | 6796.9 | 6584.4 | 6344.2 | 6264.8 | 6166.3 | 6133.5 |
| 7.5°  | 7710.9  | 7662.5 | 7410.3 | 7012.9 | 6542.9 | 6076.4 | 5594.4 | 5108.9 | 4901.6 | 4715.0 | 4682.2 |
| 10°   | 7923.4  | 7831.8 | 7377.4 | 6681.1 | 5819.0 | 4958.6 | 4231.2 | 3571.2 | 3281.0 | 3058.1 | 3047.7 |
| 12.5° | 8144.5  | 8004.6 | 7285.9 | 6180.1 | 4870.5 | 3661.1 | 2823.1 | 2173.5 | 1931.6 | 1776.1 | 1789.9 |
| 15°   | 8376.1  | 8167.0 | 7088.9 | 5504.6 | 3790.6 | 2484.5 | 1734.6 | 1352.8 | 1256.1 | 1216.3 | 1226.7 |
| 17.5° | 8612.8  | 8279.3 | 6814.2 | 4690.8 | 2724.6 | 1603.3 | 1200.8 | 1093.7 | 1093.7 | 1102.3 | 1105.8 |
| 20°   | 8818.4  | 8339.8 | 6409.9 | 3778.6 | 1846.9 | 1167.9 | 1050.5 | 1034.9 | 1043.6 | 1057.4 | 1059.1 |
| 22.5° | 9022.2  | 8343.2 | 5882.9 | 2854.2 | 1292.3 | 1022.8 | 1000.4 | 993.4  | 998.6  | 1014.2 | 1015.9 |
| 25°   | 9188.1  | 8301.8 | 5222.9 | 2030.1 | 1031.5 | 964.1  | 953.7  | 950.3  | 953.7  | 972.7  | 972.7  |
| 27.5° | 9255.5  | 8151.5 | 4417.8 | 1427.1 | 924.3  | 898.4  | 895.0  | 898.4  | 903.6  | 917.4  | 919.2  |
| 30°   | 9262.4  | 7888.8 | 3540.1 | 1033.2 | 838.0  | 810.3  | 817.2  | 829.3  | 824.1  | 820.7  | 824.1  |
| 32.5° | 9279.7  | 7584.8 | 2684.9 | 850.0  | 765.4  | 722.2  | 713.6  | 713.6  | 692.8  | 680.7  | 673.8  |
| 35°   | 9336.7  | 7227.1 | 1947.2 | 763.7  | 691.1  | 641.0  | 608.2  | 570.2  | 530.4  | 509.7  | 504.5  |
| 37.5° | 9426.5  | 6852.2 | 1394.3 | 706.6  | 625.4  | 568.4  | 506.2  | 438.8  | 381.8  | 366.3  | 366.3  |
| 40°   | 9590.7  | 6465.2 | 1031.5 | 661.7  | 573.6  | 502.8  | 409.5  | 321.4  | 269.5  | 260.9  | 260.9  |
| 42.5° | 9849.8  | 6057.4 | 822.4  | 622.0  | 528.7  | 435.4  | 312.7  | 233.2  | 195.2  | 190.1  | 188.3  |
| 45°   | 10119.3 | 5608.2 | 718.7  | 584.0  | 480.3  | 357.6  | 231.5  | 172.8  | 150.3  | 145.1  | 145.1  |
| 47.5° | 10388.9 | 5129.6 | 668.6  | 547.7  | 433.7  | 278.2  | 172.8  | 136.5  | 126.1  | 126.1  | 127.9  |
| 50°   | 10616.9 | 4630.3 | 632.4  | 508.0  | 373.2  | 210.8  | 136.5  | 115.8  | 112.3  | 119.2  | 120.9  |
| 52.5° | 10673.9 | 4139.7 | 587.4  | 457.8  | 298.9  | 160.7  | 112.3  | 101.9  | 101.9  | 101.9  | 101.9  |
| 55°   | 10639.4 | 3759.6 | 528.7  | 395.7  | 221.2  | 127.9  | 96.8   | 89.8   | 88.1   | 88.1   | 88.1   |
| 57.5° | 10756.9 | 3534.9 | 423.3  | 307.5  | 159.0  | 103.7  | 84.7   | 79.5   | 76.0   | 74.3   | 74.3   |
| 60°   | 10993.6 | 3388.1 | 302.4  | 221.2  | 119.2  | 86.4   | 72.6   | 67.4   | 62.2   | 58.7   | 58.7   |
| 62.5° | 11308.0 | 3260.2 | 224.6  | 164.1  | 91.6   | 69.1   | 60.5   | 55.3   | 48.4   | 44.9   | 44.9   |
| 65°   | 11549.9 | 3032.2 | 171.0  | 122.7  | 69.1   | 55.3   | 46.6   | 44.9   | 34.6   | 31.1   | 29.4   |
| 67.5° | 11180.2 | 2531.1 | 138.2  | 89.8   | 51.8   | 43.2   | 36.3   | 34.6   | 20.7   | 17.3   | 17.3   |
| 70°   | 9588.9  | 1762.3 | 110.6  | 65.7   | 38.0   | 34.6   | 29.4   | 22.5   | 15.5   | 13.8   | 13.8   |
| 71°   | 8695.7  | 1472.0 | 100.2  | 55.3   | 32.8   | 32.8   | 27.6   | 19.0   | 13.8   | 12.1   | 12.1   |
| 72.5° | 7223.7  | 1045.3 | 84.7   | 43.2   | 29.4   | 34.6   | 29.4   | 17.3   | 13.8   | 12.1   | 10.4   |
| 75°   | 4193.2  | 437.1  | 58.7   | 29.4   | 22.5   | 41.5   | 38.0   | 15.5   | 10.4   | 8.6    | 8.6    |
| 77.5° | 1261.2  | 160.7  | 32.8   | 19.0   | 17.3   | 36.3   | 43.2   | 13.8   | 5.2    | 1.7    | 1.7    |
| 80°   | 229.8   | 69.1   | 20.7   | 12.1   | 12.1   | 22.5   | 32.8   | 6.9    | 0.0    | 0.0    | 0.0    |
| 82.5° | 81.2    | 34.6   | 12.1   | 6.9    | 5.2    | 10.4   | 15.5   | 0.0    | 0.0    | 0.0    | 0.0    |
| 85°   | 46.6    | 24.2   | 6.9    | 3.5    | 0.0    | 1.7    | 3.5    | 0.0    | 0.0    | 0.0    | 0.0    |
| 87.5° | 31.1    | 6.9    | 0.0    | 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**



CCT = 3905K  
 CIE  $x$  = 0.3841  
 CIE  $y$  = 0.3774  
 Duv = -0.0008

Point lies inside the ANSI 4000K 4-step quadrangle

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### 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



**Measure Comparisons**



(END OF REPORT)