

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: P321583

Luminaire Tested: **GLEON-SA9D-730-U-T3R-HSS**

Issue Date: 3/3/2020

### Test Information

Test Method: LM-79-08  
Report Number: P321583  
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-SA9D-730-U-T3R-HSS  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(9) 70 CRI, 3000K, 1200mA 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: 48585 lumens  
Efficiency: N/A  
Efficacy: 84.5 lumens/watt  
Luminous Opening: Rectangular (W 2.5' x L: 1' x H: 0')  
IES Classification: Type III - Medium  
BUG Rating: B3 - U0 - G5

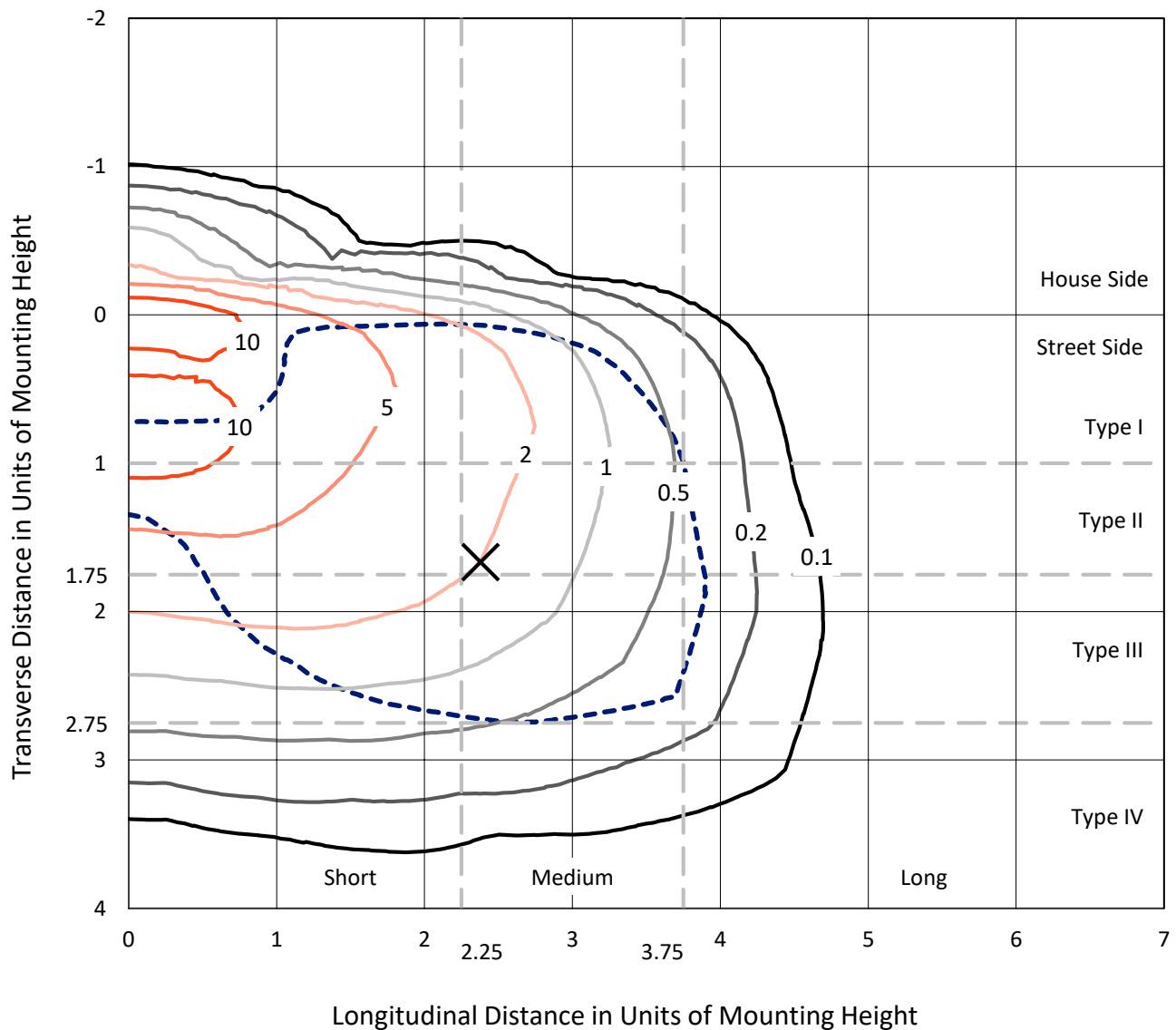
Input Watts (W): 575  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



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## Iso-Footcandle Lines of Horizontal Illumination

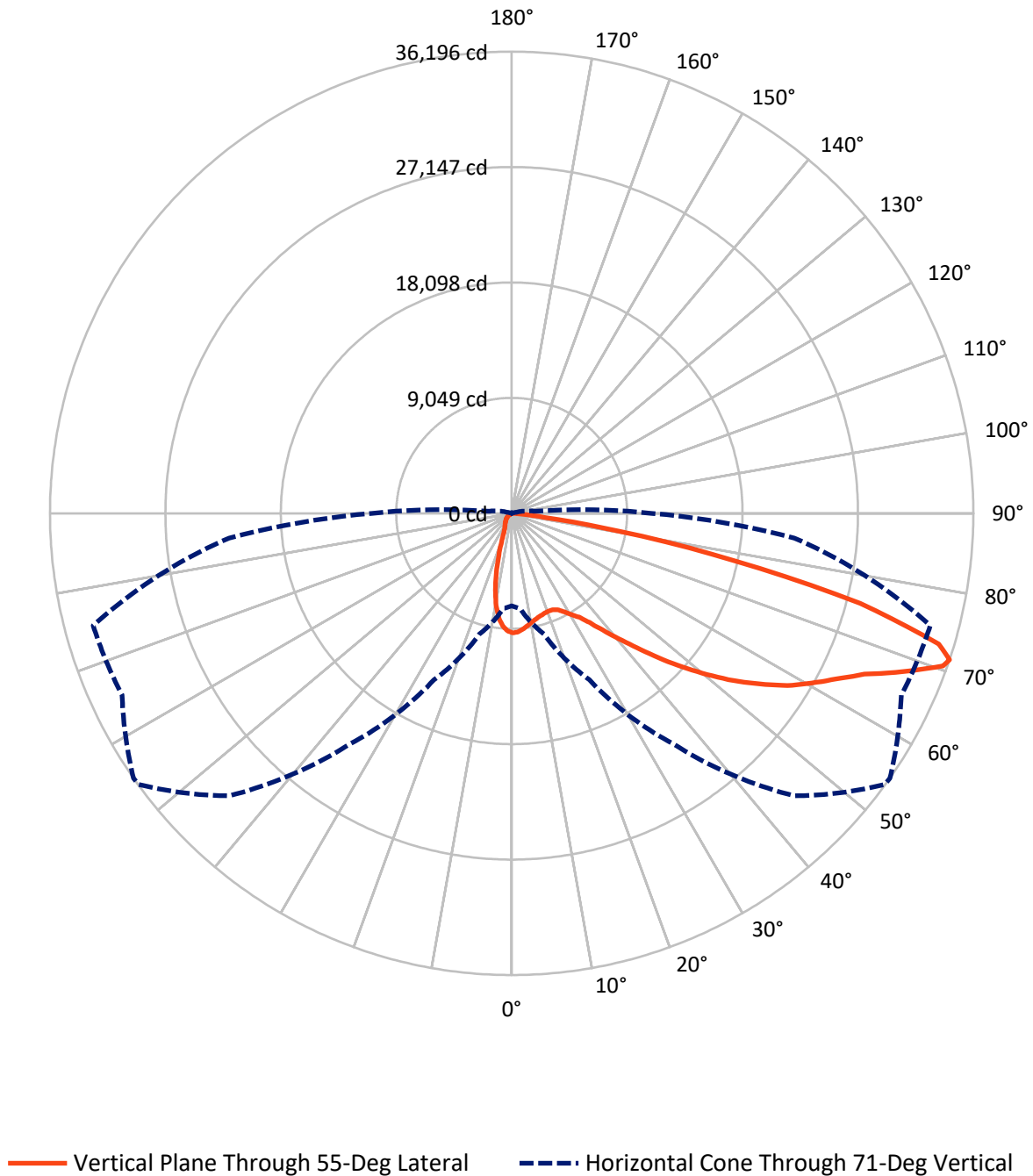
× Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 15.4 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    | 3846.6   | 0.0    | 3846.6  |
|                    | % Fixture | 7.9      | 0.0    | 7.9     |
| <b>Street Side</b> | Lumens    | 44738.4  | 0.0    | 44738.4 |
|                    | % Fixture | 92.1     | 0.0    | 92.1    |
| <b>Total</b>       | Lumens    | 48585.0  | 0.0    | 48585.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 798.9   | 1.6       |
| 10°-20°   | 1803.6  | 3.7       |
| 20°-30°   | 2898.4  | 6.0       |
| 30°-40°   | 4924.5  | 10.1      |
| 40°-50°   | 7643.5  | 15.7      |
| 50°-60°   | 10276.5 | 21.2      |
| 60°-70°   | 12571.5 | 25.9      |
| 70°-80°   | 7350.3  | 15.1      |
| 80°-90°   | 317.7   | 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°    | 48585.0 | 100.0     |
| 0°-180°   | 48585.0 | 100.0     |

**Coefficient of Utilization**



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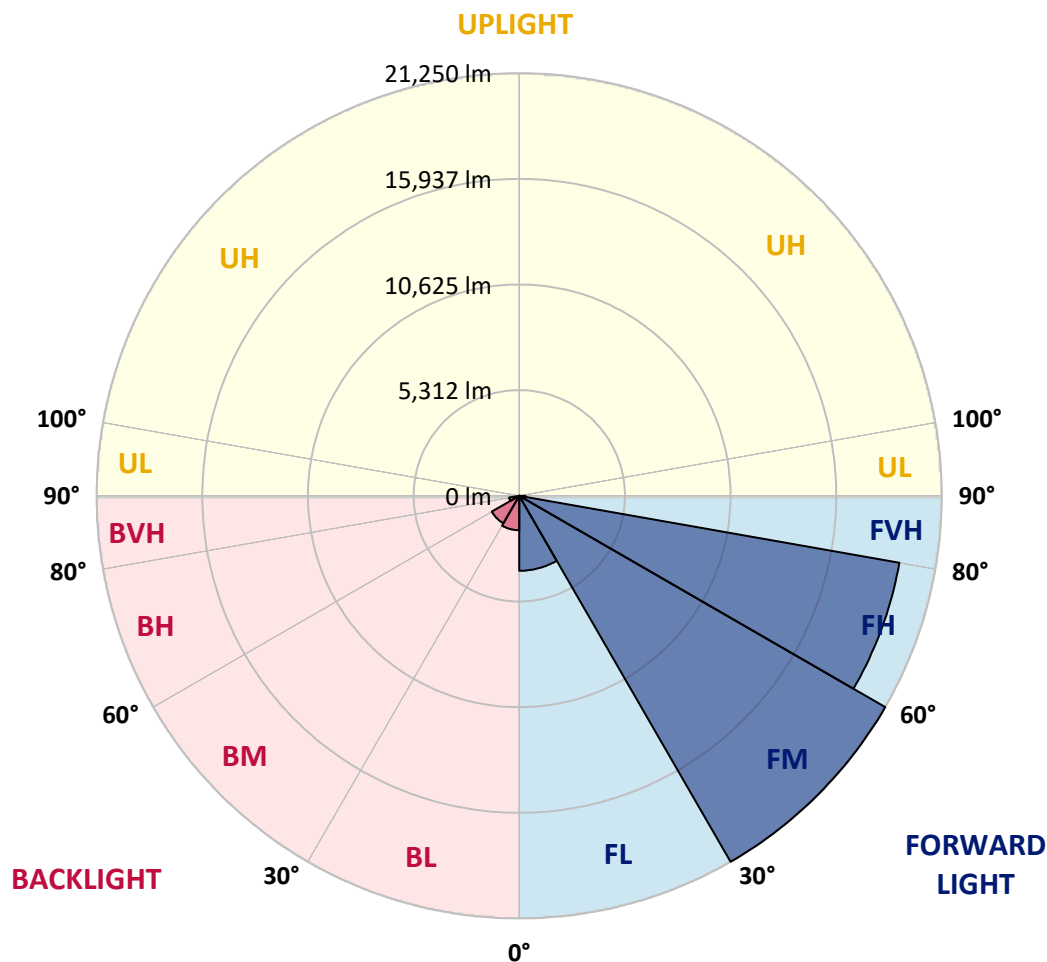
CATALOG NUMBER: GLEON-SA9D-730-U-T3R-HSS

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|---------|-----------|-------------------------|------|---------|
|      |             |         |           | B                       | U    | G       |
| FL   | (0°-30°)    | 3769.5  | 7.8       |                         |      |         |
| FM   | (30°-60°)   | 21249.7 | 43.7      |                         |      |         |
| FH   | (60°-80°)   | 19406.5 | 39.9      |                         |      | G5      |
| FVH  | (80°-90°)   | 312.7   | 0.6       |                         |      | G3/500  |
| BL   | (0°-30°)    | 1731.4  | 3.6       | B3/2500                 |      |         |
| BM   | (30°-60°)   | 1594.9  | 3.3       | B2/2500                 |      |         |
| BH   | (60°-80°)   | 515.4   | 1.1       | B2/1000                 |      | G2/1000 |
| BVH  | (80°-90°)   | 5.0     | 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°    | 9369.8  | 9369.8  | 9369.8  | 9369.8  | 9369.8  | 9369.8  | 9369.8  | 9369.8  | 9369.8  | 9369.8  | 9369.8  |
| 2.5°  | 9094.9  | 9105.8  | 9145.1  | 9162.5  | 9204.0  | 9273.8  | 9308.7  | 9310.9  | 9367.6  | 9389.4  | 9406.9  |
| 5°    | 8451.4  | 8516.8  | 8582.2  | 8652.1  | 8778.6  | 8946.6  | 9112.4  | 9127.6  | 9310.9  | 9446.1  | 9518.1  |
| 7.5°  | 7897.2  | 7956.1  | 8034.7  | 8145.9  | 8324.8  | 8588.8  | 8865.9  | 8898.6  | 9245.4  | 9553.0  | 9714.5  |
| 10°   | 7327.9  | 7375.8  | 7489.3  | 7652.9  | 7899.4  | 8252.8  | 8625.9  | 8680.4  | 9186.5  | 9697.0  | 9980.6  |
| 12.5° | 6719.2  | 6747.6  | 6885.0  | 7120.6  | 7482.7  | 7932.1  | 8423.0  | 8495.0  | 9149.5  | 9862.8  | 10294.8 |
| 15°   | 6256.7  | 6269.8  | 6400.7  | 6645.0  | 7059.5  | 7644.2  | 8265.9  | 8353.2  | 9158.2  | 10061.3 | 10637.3 |
| 17.5° | 6138.9  | 6145.4  | 6215.3  | 6383.2  | 6749.7  | 7386.8  | 8141.6  | 8248.5  | 9184.4  | 10255.5 | 10982.0 |
| 20°   | 6616.7  | 6570.9  | 6498.9  | 6472.7  | 6629.8  | 7231.9  | 8067.4  | 8187.4  | 9219.3  | 10427.8 | 11291.7 |
| 22.5° | 7927.8  | 7792.5  | 7493.7  | 7094.4  | 6852.3  | 7242.8  | 8087.0  | 8207.0  | 9330.5  | 10639.5 | 11649.5 |
| 25°   | 9873.7  | 9686.1  | 9177.8  | 8392.5  | 7637.6  | 7556.9  | 8250.7  | 8372.8  | 9546.5  | 10892.5 | 11992.0 |
| 27.5° | 12088.0 | 11902.6 | 11280.8 | 10159.5 | 8872.4  | 8178.7  | 8625.9  | 8739.3  | 9867.2  | 11117.2 | 12253.8 |
| 30°   | 14208.5 | 14156.1 | 13423.1 | 12149.1 | 10425.7 | 9186.5  | 9110.2  | 9206.2  | 10105.0 | 11252.5 | 12461.1 |
| 32.5° | 16006.1 | 15923.2 | 15334.2 | 14095.0 | 12203.6 | 10397.3 | 9679.6  | 9707.9  | 10283.9 | 11427.0 | 12731.6 |
| 35°   | 17672.8 | 17570.3 | 17053.2 | 15881.7 | 14027.4 | 11876.4 | 10556.6 | 10515.1 | 10674.4 | 11778.2 | 13124.3 |
| 37.5° | 19127.9 | 19221.7 | 18648.0 | 17533.2 | 15663.6 | 13414.4 | 11739.0 | 11614.6 | 11285.2 | 12349.8 | 13693.6 |
| 40°   | 20345.2 | 20345.2 | 20046.3 | 19117.0 | 17430.6 | 15004.8 | 13076.3 | 12912.6 | 12203.6 | 13231.1 | 14415.7 |
| 42.5° | 20783.7 | 20877.5 | 20988.8 | 20463.0 | 19012.3 | 16658.4 | 14566.3 | 14396.1 | 13497.3 | 14481.2 | 15327.6 |
| 45°   | 20809.9 | 20958.2 | 21527.6 | 21525.4 | 20441.2 | 18301.1 | 16246.1 | 16165.3 | 15155.3 | 16086.8 | 16457.7 |
| 47.5° | 20441.2 | 20626.6 | 21564.7 | 22097.0 | 21573.4 | 19830.4 | 18082.9 | 17982.6 | 17103.4 | 18054.6 | 17640.1 |
| 50°   | 19871.8 | 20076.9 | 21167.7 | 22321.7 | 22343.5 | 21161.1 | 20018.0 | 19867.4 | 19247.9 | 20303.8 | 18861.8 |
| 52.5° | 18853.0 | 19250.1 | 20812.1 | 22374.1 | 22849.6 | 22310.8 | 21859.2 | 21793.8 | 21647.6 | 22470.0 | 19834.7 |
| 55°   | 16673.6 | 17114.3 | 19919.8 | 22391.5 | 23318.7 | 23329.6 | 23584.8 | 23602.3 | 23896.8 | 24494.5 | 20559.0 |
| 57.5° | 15644.0 | 15892.6 | 18362.2 | 22474.4 | 24014.6 | 24485.8 | 25343.2 | 25478.4 | 25934.4 | 26416.5 | 21385.8 |
| 60°   | 14996.0 | 15290.5 | 17594.3 | 22361.0 | 25107.6 | 26002.0 | 26972.8 | 27018.6 | 27507.3 | 28399.5 | 22505.0 |
| 62.5° | 14479.0 | 14769.1 | 17110.0 | 21924.7 | 26335.8 | 27825.8 | 28565.3 | 28569.7 | 28936.2 | 30762.1 | 23776.8 |
| 65°   | 13202.8 | 13447.1 | 16130.4 | 21433.8 | 27147.3 | 29629.9 | 30415.3 | 30386.9 | 30685.8 | 33253.5 | 25253.7 |
| 67.5° | 11357.2 | 11544.8 | 14130.0 | 19572.9 | 26841.9 | 31270.5 | 33207.7 | 33113.9 | 32751.7 | 35406.7 | 25834.0 |
| 70°   | 8780.8  | 8848.4  | 11136.9 | 16311.5 | 23979.7 | 31900.9 | 35906.3 | 35858.3 | 34019.2 | 35020.6 | 23707.0 |
| 71°   | 7258.0  | 7480.6  | 9814.8  | 14396.1 | 22062.1 | 31318.4 | 36168.0 | 36196.4 | 33700.7 | 33969.0 | 22243.2 |
| 72.5° | 4214.8  | 4404.6  | 7114.1  | 11056.1 | 18730.9 | 28888.2 | 34811.1 | 35016.2 | 32212.9 | 30897.4 | 18999.2 |
| 75°   | 903.2   | 966.4   | 2637.5  | 5351.4  | 10303.5 | 20247.0 | 27476.7 | 28207.5 | 26255.1 | 21019.3 | 11451.0 |
| 77.5° | 628.3   | 678.5   | 1130.0  | 2428.1  | 3405.4  | 10004.6 | 17068.5 | 17893.1 | 15685.4 | 7899.4  | 3665.0  |
| 80°   | 497.4   | 554.1   | 881.3   | 1199.9  | 920.6   | 3226.5  | 7995.4  | 8499.3  | 5231.4  | 1762.7  | 617.4   |
| 82.5° | 277.1   | 329.4   | 687.2   | 647.9   | 353.4   | 613.0   | 2238.3  | 2530.6  | 1047.1  | 355.6   | 146.2   |
| 85°   | 80.7    | 98.2    | 442.9   | 471.2   | 150.5   | 117.8   | 381.8   | 473.4   | 198.5   | 93.8    | 65.4    |
| 87.5° | 0.0     | 0.0     | 213.8   | 181.1   | 43.6    | 17.5    | 34.9    | 39.3    | 39.3    | 39.3    | 43.6    |
| 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: P321583

CATALOG NUMBER: GLEON-SA9D-730-U-T3R-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°     | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|---------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 9369.8  | 9369.8  | 9369.8 | 9369.8 | 9369.8 | 9369.8 | 9369.8 | 9369.8 | 9369.8 | 9369.8 | 9369.8 |
| 2.5°  | 9406.9  | 9422.1  | 9367.6 | 9295.6 | 9219.3 | 9125.5 | 9027.3 | 8950.9 | 8948.8 | 8911.7 | 8874.6 |
| 5°    | 9522.5  | 9513.8  | 9363.2 | 9134.2 | 8863.7 | 8582.2 | 8313.9 | 8010.7 | 7910.3 | 7786.0 | 7744.5 |
| 7.5°  | 9736.3  | 9675.2  | 9356.7 | 8854.9 | 8261.6 | 7672.5 | 7063.9 | 6450.9 | 6189.1 | 5953.5 | 5912.0 |
| 10°   | 10004.6 | 9889.0  | 9315.3 | 8436.1 | 7347.5 | 6261.1 | 5342.6 | 4509.3 | 4142.8 | 3861.4 | 3848.3 |
| 12.5° | 10283.9 | 10107.2 | 9199.6 | 7803.4 | 6149.8 | 4622.7 | 3564.7 | 2744.4 | 2439.0 | 2242.6 | 2260.1 |
| 15°   | 10576.2 | 10312.2 | 8950.9 | 6950.4 | 4786.3 | 3137.1 | 2190.3 | 1708.2 | 1586.0 | 1535.8 | 1548.9 |
| 17.5° | 10875.1 | 10454.0 | 8604.1 | 5922.9 | 3440.3 | 2024.5 | 1516.2 | 1380.9 | 1380.9 | 1391.8 | 1396.2 |
| 20°   | 11134.7 | 10530.4 | 8093.6 | 4771.1 | 2332.1 | 1474.7 | 1326.4 | 1306.8 | 1317.7 | 1335.1 | 1337.3 |
| 22.5° | 11392.1 | 10534.7 | 7428.2 | 3603.9 | 1631.8 | 1291.5 | 1263.1 | 1254.4 | 1260.9 | 1280.6 | 1282.8 |
| 25°   | 11601.5 | 10482.4 | 6594.8 | 2563.3 | 1302.4 | 1217.3 | 1204.2 | 1199.9 | 1204.2 | 1228.2 | 1228.2 |
| 27.5° | 11686.6 | 10292.6 | 5578.2 | 1802.0 | 1167.1 | 1134.4 | 1130.0 | 1134.4 | 1141.0 | 1158.4 | 1160.6 |
| 30°   | 11695.3 | 9961.0  | 4470.0 | 1304.6 | 1058.1 | 1023.2 | 1031.9 | 1047.1 | 1040.6 | 1036.2 | 1040.6 |
| 32.5° | 11717.1 | 9577.0  | 3390.1 | 1073.3 | 966.4  | 911.9  | 901.0  | 901.0  | 874.8  | 859.5  | 850.8  |
| 35°   | 11789.1 | 9125.5  | 2458.6 | 964.2  | 872.6  | 809.4  | 767.9  | 719.9  | 669.7  | 643.6  | 637.0  |
| 37.5° | 11902.6 | 8652.1  | 1760.5 | 892.3  | 789.7  | 717.7  | 639.2  | 554.1  | 482.1  | 462.5  | 462.5  |
| 40°   | 12109.8 | 8163.4  | 1302.4 | 835.5  | 724.3  | 634.8  | 517.0  | 405.8  | 340.3  | 329.4  | 329.4  |
| 42.5° | 12437.1 | 7648.5  | 1038.4 | 785.4  | 667.6  | 549.8  | 394.9  | 294.5  | 246.5  | 240.0  | 237.8  |
| 45°   | 12777.4 | 7081.3  | 907.5  | 737.4  | 606.5  | 451.6  | 292.3  | 218.2  | 189.8  | 183.3  | 183.3  |
| 47.5° | 13117.7 | 6477.0  | 844.3  | 691.6  | 547.6  | 351.2  | 218.2  | 172.3  | 159.3  | 159.3  | 161.4  |
| 50°   | 13405.7 | 5846.6  | 798.5  | 641.4  | 471.2  | 266.2  | 172.3  | 146.2  | 141.8  | 150.5  | 152.7  |
| 52.5° | 13477.7 | 5227.0  | 741.7  | 578.1  | 377.4  | 202.9  | 141.8  | 128.7  | 128.7  | 128.7  | 128.7  |
| 55°   | 13434.0 | 4747.1  | 667.6  | 499.6  | 279.2  | 161.4  | 122.2  | 113.4  | 111.3  | 111.3  | 111.3  |
| 57.5° | 13582.4 | 4463.5  | 534.5  | 388.3  | 200.7  | 130.9  | 106.9  | 100.4  | 96.0   | 93.8   | 93.8   |
| 60°   | 13881.3 | 4278.0  | 381.8  | 279.2  | 150.5  | 109.1  | 91.6   | 85.1   | 78.5   | 74.2   | 74.2   |
| 62.5° | 14278.3 | 4116.6  | 283.6  | 207.2  | 115.6  | 87.3   | 76.4   | 69.8   | 61.1   | 56.7   | 56.7   |
| 65°   | 14583.7 | 3828.6  | 216.0  | 154.9  | 87.3   | 69.8   | 58.9   | 56.7   | 43.6   | 39.3   | 37.1   |
| 67.5° | 14116.9 | 3196.0  | 174.5  | 113.4  | 65.4   | 54.5   | 45.8   | 43.6   | 26.2   | 21.8   | 21.8   |
| 70°   | 12107.6 | 2225.2  | 139.6  | 82.9   | 48.0   | 43.6   | 37.1   | 28.4   | 19.6   | 17.5   | 17.5   |
| 71°   | 10979.8 | 1858.7  | 126.5  | 69.8   | 41.4   | 41.4   | 34.9   | 24.0   | 17.5   | 15.3   | 15.3   |
| 72.5° | 9121.1  | 1319.8  | 106.9  | 54.5   | 37.1   | 43.6   | 37.1   | 21.8   | 17.5   | 15.3   | 13.1   |
| 75°   | 5294.6  | 551.9   | 74.2   | 37.1   | 28.4   | 52.4   | 48.0   | 19.6   | 13.1   | 10.9   | 10.9   |
| 77.5° | 1592.5  | 202.9   | 41.4   | 24.0   | 21.8   | 45.8   | 54.5   | 17.5   | 6.5    | 2.2    | 2.2    |
| 80°   | 290.1   | 87.3    | 26.2   | 15.3   | 15.3   | 28.4   | 41.4   | 8.7    | 0.0    | 0.0    | 0.0    |
| 82.5° | 102.5   | 43.6    | 15.3   | 8.7    | 6.5    | 13.1   | 19.6   | 0.0    | 0.0    | 0.0    | 0.0    |
| 85°   | 58.9    | 30.5    | 8.7    | 4.4    | 0.0    | 2.2    | 4.4    | 0.0    | 0.0    | 0.0    | 0.0    |
| 87.5° | 39.3    | 8.7     | 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-79-2008: Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Report Prepared for

Cooper Lighting Solutions

McGRAW-EDISON

Report Number: SP1-1908-441-2-R4

Test Date: 10/03/2019

Luminaire Tested: SA1C-730-U-5WQ

Data in this report applies to families of products SA1C-730-U-5WQ .

### Test Information

Test Method: LM-79-2008  
Report Number: SP1-1908-441-2-R4  
Test Lab: COOPER LIGHTING SOLUTIONS  
Photometer: SP1 - 76IN SPHERE  
Measurement Geometry:  $4\pi$   
Issue Date: 10/28/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: MCGRAW-EDISON  
Catalog Number: **SA1C-730-U-5WQ**  
Description: MCGRAW EDISON ROADWAY AND AREA LUMINAIRE

\*\*\*THIS IS A REVISION OF SP1-1908-441-2-R3. TO UPDATE THE CATALOG INFORMATION.\*\*\*TESTED IN SITU. (1) 70 CRI, 3000K, 1050MA LIGHTSQUARE WITH 16 LEDS AND TYPE V WIDE OPTICS.

### Spectral Parameters

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 2993   | CRI (Ra): | 71.8 |      |       |
| CIE u':                   | 0.2508 | R1:       | 67.5 | R9:  | -38.3 |
| CIE v':                   | 0.5215 | R2:       | 82.9 | R10: | 62.5  |
| Duv:                      | 0.0000 | R3:       | 94.7 | R11: | 63.7  |
| CIE x:                    | 0.4374 | R4:       | 67.7 | R12: | 57.8  |
| CIE y:                    | 0.4043 | R5:       | 67.9 | R13: | 70.4  |
| CIE z:                    | 0.1583 | R6:       | 77.6 | R14: | 97.3  |
| Peak Wavelength (nm):     | 593    | R7:       | 76.0 |      |       |
| Dominant Wavelength (nm): | 582    | R8:       | 40.5 |      |       |
| Purity:                   | 53     |           |      |      |       |
| Rf:                       | 75.7   |           |      |      |       |
| Rg:                       | 93.9   |           |      |      |       |



### Test Conditions

Stabilization Time: 53M  
Operation Time: 12H  
Room Temperature (°C) / RH%: 25.0./44%  
Sphere Temperature (°C): 25.7

REPORT NUMBER: SP1-1908-441-2-R4

| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 6/28/2019        | 12/28/2019           |
| Power Meter                    | IN0071                | 12/5/2018        | 12/5/2019            |
| AC Power Source                | IN0063                | 12/5/2018        | 12/5/2019            |
| DC Power Source                | IN0208                | 12/5/2018        | 12/5/2019            |
| Sphere Thermometer             | IN0085                | 12/5/2018        | 12/5/2019            |
| Room Thermometer               | IN0046                | 12/5/2018        | 12/5/2019            |

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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**



#####

| 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       | 2397             | NR               | 490       | 24908            | NR               | 620       | 118784           | NR               | 750       | 5037             | NR               | 880       | 2677             | NR               |
| 365       | 2084             | NR               | 495       | 30998            | NR               | 625       | 108951           | NR               | 755       | 4413             | NR               | 885       | 2940             | NR               |
| 370       | 2143             | NR               | 500       | 37103            | NR               | 630       | 99573            | NR               | 760       | 4189             | NR               | 890       | 3116             | NR               |
| 375       | 2413             | NR               | 505       | 42987            | NR               | 635       | 90444            | NR               | 765       | 3677             | NR               | 895       | 3345             | NR               |
| 380       | 2172             | NR               | 510       | 48702            | NR               | 640       | 80749            | NR               | 770       | 3366             | NR               | 900       | 2312             | NR               |
| 385       | 1997             | NR               | 515       | 53741            | NR               | 645       | 71664            | NR               | 775       | 3211             | NR               | 905       | 2829             | NR               |
| 390       | 1830             | NR               | 520       | 57283            | NR               | 650       | 63936            | NR               | 780       | 2682             | NR               | 910       | 2783             | NR               |
| 395       | 1861             | NR               | 525       | 61876            | NR               | 655       | 56611            | NR               | 785       | 2804             | NR               | 915       | 2662             | NR               |
| 400       | 1717             | NR               | 530       | 65398            | NR               | 660       | 49763            | NR               | 790       | 2581             | NR               | 920       | 3047             | NR               |
| 405       | 1761             | NR               | 535       | 69597            | NR               | 665       | 42891            | NR               | 795       | 2711             | NR               | 925       | 2256             | NR               |
| 410       | 2680             | NR               | 540       | 74214            | NR               | 670       | 36939            | NR               | 800       | 2609             | NR               | 930       | 2976             | NR               |
| 415       | 4374             | NR               | 545       | 79911            | NR               | 675       | 31946            | NR               | 805       | 2581             | NR               | 935       | 3503             | NR               |
| 420       | 8071             | NR               | 550       | 86153            | NR               | 680       | 27385            | NR               | 810       | 2404             | NR               | 940       | 4226             | NR               |
| 425       | 15169            | NR               | 555       | 93952            | NR               | 685       | 23504            | NR               | 815       | 2556             | NR               | 945       | 2930             | NR               |
| 430       | 26038            | NR               | 560       | 102904           | NR               | 690       | 20210            | NR               | 820       | 2742             | NR               | 950       | 2115             | NR               |
| 435       | 41316            | NR               | 565       | 112009           | NR               | 695       | 17459            | NR               | 825       | 2014             | NR               | 955       | 2634             | NR               |
| 440       | 59674            | NR               | 570       | 121662           | NR               | 700       | 15207            | NR               | 830       | 2488             | NR               | 960       | 4200             | NR               |
| 445       | 72751            | NR               | 575       | 130476           | NR               | 705       | 13322            | NR               | 835       | 2625             | NR               | 965       | 1982             | NR               |
| 450       | 65091            | NR               | 580       | 137926           | NR               | 710       | 11676            | NR               | 840       | 2754             | NR               | 970       | 3613             | NR               |
| 455       | 44894            | NR               | 585       | 143406           | NR               | 715       | 10626            | NR               | 845       | 2708             | NR               | 975       | 4034             | NR               |
| 460       | 32712            | NR               | 590       | 147039           | NR               | 720       | 9416             | NR               | 850       | 2608             | NR               | 980       | 3922             | NR               |
| 465       | 25296            | NR               | 595       | 147365           | NR               | 725       | 8333             | NR               | 855       | 2605             | NR               | 985       | 1909             | NR               |
| 470       | 19318            | NR               | 600       | 145800           | NR               | 730       | 7134             | NR               | 860       | 1765             | NR               | 990       | 3617             | NR               |
| 475       | 17265            | NR               | 605       | 141363           | NR               | 735       | 6437             | NR               | 865       | 2581             | NR               | 995       | 4767             | NR               |
| 480       | 18260            | NR               | 610       | 134199           | NR               | 740       | 5834             | NR               | 870       | 3016             | NR               | 1000      | 2528             | NR               |
| 485       | 20845            | NR               | 615       | 127683           | NR               | 745       | 5500             | NR               | 875       | 3952             | NR               |           |                  |                  |

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Scotopic Flux vs. Wavelength



Scotopic Lumens: 8494.8

S/P: 1.23

| 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       | 2397             | NR               | 490       | 24908            | NR               | 620       | 118784           | NR               | 750       | 5037             | NR               | 880       | 2677             | NR               |
| 365       | 2084             | NR               | 495       | 30998            | NR               | 625       | 108951           | NR               | 755       | 4413             | NR               | 885       | 2940             | NR               |
| 370       | 2143             | NR               | 500       | 37103            | NR               | 630       | 99573            | NR               | 760       | 4189             | NR               | 890       | 3116             | NR               |
| 375       | 2413             | NR               | 505       | 42987            | NR               | 635       | 90444            | NR               | 765       | 3677             | NR               | 895       | 3345             | NR               |
| 380       | 2172             | NR               | 510       | 48702            | NR               | 640       | 80749            | NR               | 770       | 3366             | NR               | 900       | 2312             | NR               |
| 385       | 1997             | NR               | 515       | 53741            | NR               | 645       | 71664            | NR               | 775       | 3211             | NR               | 905       | 2829             | NR               |
| 390       | 1830             | NR               | 520       | 57283            | NR               | 650       | 63936            | NR               | 780       | 2682             | NR               | 910       | 2783             | NR               |
| 395       | 1861             | NR               | 525       | 61876            | NR               | 655       | 56611            | NR               | 785       | 2804             | NR               | 915       | 2662             | NR               |
| 400       | 1717             | NR               | 530       | 65398            | NR               | 660       | 49763            | NR               | 790       | 2581             | NR               | 920       | 3047             | NR               |
| 405       | 1761             | NR               | 535       | 69597            | NR               | 665       | 42891            | NR               | 795       | 2711             | NR               | 925       | 2256             | NR               |
| 410       | 2680             | NR               | 540       | 74214            | NR               | 670       | 36939            | NR               | 800       | 2609             | NR               | 930       | 2976             | NR               |
| 415       | 4374             | NR               | 545       | 79911            | NR               | 675       | 31946            | NR               | 805       | 2581             | NR               | 935       | 3503             | NR               |
| 420       | 8071             | NR               | 550       | 86153            | NR               | 680       | 27385            | NR               | 810       | 2404             | NR               | 940       | 4226             | NR               |
| 425       | 15169            | NR               | 555       | 93952            | NR               | 685       | 23504            | NR               | 815       | 2556             | NR               | 945       | 2930             | NR               |
| 430       | 26038            | NR               | 560       | 102904           | NR               | 690       | 20210            | NR               | 820       | 2742             | NR               | 950       | 2115             | NR               |
| 435       | 41316            | NR               | 565       | 112009           | NR               | 695       | 17459            | NR               | 825       | 2014             | NR               | 955       | 2634             | NR               |
| 440       | 59674            | NR               | 570       | 121662           | NR               | 700       | 15207            | NR               | 830       | 2488             | NR               | 960       | 4200             | NR               |
| 445       | 72751            | NR               | 575       | 130476           | NR               | 705       | 13322            | NR               | 835       | 2625             | NR               | 965       | 1982             | NR               |
| 450       | 65091            | NR               | 580       | 137926           | NR               | 710       | 11676            | NR               | 840       | 2754             | NR               | 970       | 3613             | NR               |
| 455       | 44894            | NR               | 585       | 143406           | NR               | 715       | 10626            | NR               | 845       | 2708             | NR               | 975       | 4034             | NR               |
| 460       | 32712            | NR               | 590       | 147039           | NR               | 720       | 9416             | NR               | 850       | 2608             | NR               | 980       | 3922             | NR               |
| 465       | 25296            | NR               | 595       | 147365           | NR               | 725       | 8333             | NR               | 855       | 2605             | NR               | 985       | 1909             | NR               |
| 470       | 19318            | NR               | 600       | 145800           | NR               | 730       | 7134             | NR               | 860       | 1765             | NR               | 990       | 3617             | NR               |
| 475       | 17265            | NR               | 605       | 141363           | NR               | 735       | 6437             | NR               | 865       | 2581             | NR               | 995       | 4767             | NR               |
| 480       | 18260            | NR               | 610       | 134199           | NR               | 740       | 5834             | NR               | 870       | 3016             | NR               | 1000      | 2528             | NR               |
| 485       | 20845            | NR               | 615       | 127683           | NR               | 745       | 5500             | NR               | 875       | 3952             | NR               |           |                  |                  |

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**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 3101.5 M/P: 0.45**

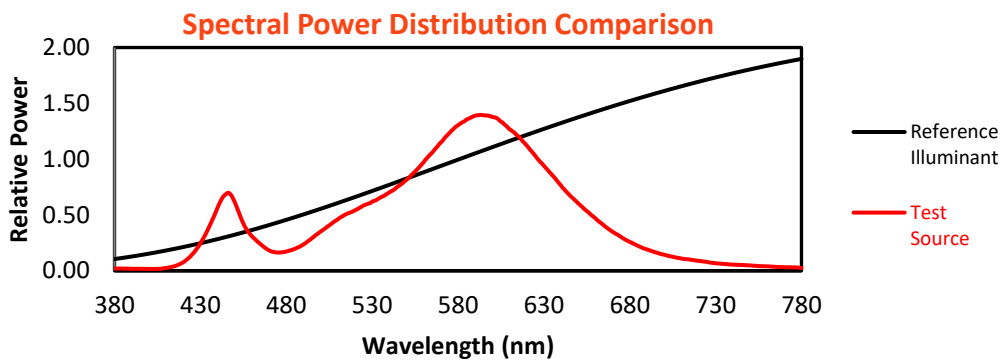
| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 2397             | NR               | 490       | 24908            | NR               | 620       | 118784           | NR               | 750       | 5037             | NR               | 880       | 2677             | NR               |
| 365       | 2084             | NR               | 495       | 30998            | NR               | 625       | 108951           | NR               | 755       | 4413             | NR               | 885       | 2940             | NR               |
| 370       | 2143             | NR               | 500       | 37103            | NR               | 630       | 99573            | NR               | 760       | 4189             | NR               | 890       | 3116             | NR               |
| 375       | 2413             | NR               | 505       | 42987            | NR               | 635       | 90444            | NR               | 765       | 3677             | NR               | 895       | 3345             | NR               |
| 380       | 2172             | NR               | 510       | 48702            | NR               | 640       | 80749            | NR               | 770       | 3366             | NR               | 900       | 2312             | NR               |
| 385       | 1997             | NR               | 515       | 53741            | NR               | 645       | 71664            | NR               | 775       | 3211             | NR               | 905       | 2829             | NR               |
| 390       | 1830             | NR               | 520       | 57283            | NR               | 650       | 63936            | NR               | 780       | 2682             | NR               | 910       | 2783             | NR               |
| 395       | 1861             | NR               | 525       | 61876            | NR               | 655       | 56611            | NR               | 785       | 2804             | NR               | 915       | 2662             | NR               |
| 400       | 1717             | NR               | 530       | 65398            | NR               | 660       | 49763            | NR               | 790       | 2581             | NR               | 920       | 3047             | NR               |
| 405       | 1761             | NR               | 535       | 69597            | NR               | 665       | 42891            | NR               | 795       | 2711             | NR               | 925       | 2256             | NR               |
| 410       | 2680             | NR               | 540       | 74214            | NR               | 670       | 36939            | NR               | 800       | 2609             | NR               | 930       | 2976             | NR               |
| 415       | 4374             | NR               | 545       | 79911            | NR               | 675       | 31946            | NR               | 805       | 2581             | NR               | 935       | 3503             | NR               |
| 420       | 8071             | NR               | 550       | 86153            | NR               | 680       | 27385            | NR               | 810       | 2404             | NR               | 940       | 4226             | NR               |
| 425       | 15169            | NR               | 555       | 93952            | NR               | 685       | 23504            | NR               | 815       | 2556             | NR               | 945       | 2930             | NR               |
| 430       | 26038            | NR               | 560       | 102904           | NR               | 690       | 20210            | NR               | 820       | 2742             | NR               | 950       | 2115             | NR               |
| 435       | 41316            | NR               | 565       | 112009           | NR               | 695       | 17459            | NR               | 825       | 2014             | NR               | 955       | 2634             | NR               |
| 440       | 59674            | NR               | 570       | 121662           | NR               | 700       | 15207            | NR               | 830       | 2488             | NR               | 960       | 4200             | NR               |
| 445       | 72751            | NR               | 575       | 130476           | NR               | 705       | 13322            | NR               | 835       | 2625             | NR               | 965       | 1982             | NR               |
| 450       | 65091            | NR               | 580       | 137926           | NR               | 710       | 11676            | NR               | 840       | 2754             | NR               | 970       | 3613             | NR               |
| 455       | 44894            | NR               | 585       | 143406           | NR               | 715       | 10626            | NR               | 845       | 2708             | NR               | 975       | 4034             | NR               |
| 460       | 32712            | NR               | 590       | 147039           | NR               | 720       | 9416             | NR               | 850       | 2608             | NR               | 980       | 3922             | NR               |
| 465       | 25296            | NR               | 595       | 147365           | NR               | 725       | 8333             | NR               | 855       | 2605             | NR               | 985       | 1909             | NR               |
| 470       | 19318            | NR               | 600       | 145800           | NR               | 730       | 7134             | NR               | 860       | 1765             | NR               | 990       | 3617             | NR               |
| 475       | 17265            | NR               | 605       | 141363           | NR               | 735       | 6437             | NR               | 865       | 2581             | NR               | 995       | 4767             | NR               |
| 480       | 18260            | NR               | 610       | 134199           | NR               | 740       | 5834             | NR               | 870       | 3016             | NR               | 1000      | 2528             | NR               |
| 485       | 20845            | NR               | 615       | 127683           | NR               | 745       | 5500             | NR               | 875       | 3952             | NR               |           |                  |                  |

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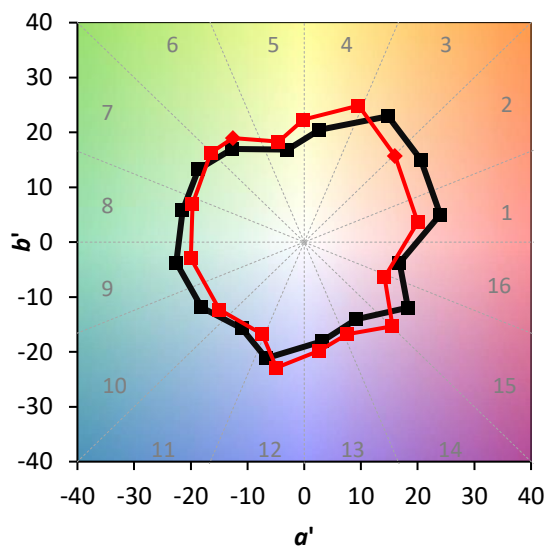
**TM-30-18**

**Summary**

$R_f = 75.7$   
 $R_g = 93.9$   
 CIE  $R_a = 71.8$   
 $R_g = -38.3$



**Color Vector Graphics**



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 67 | CES51 = 87 | CES76 = 63 |
| CES02 = 63 | CES27 = 88 | CES52 = 86 | CES77 = 80 |
| CES03 = 31 | CES28 = 87 | CES53 = 78 | CES78 = 67 |
| CES04 = 71 | CES29 = 66 | CES54 = 84 | CES79 = 87 |
| CES05 = 49 | CES30 = 73 | CES55 = 84 | CES80 = 86 |
| CES06 = 51 | CES31 = 70 | CES56 = 75 | CES81 = 71 |
| CES07 = 41 | CES32 = 65 | CES57 = 74 | CES82 = 94 |
| CES08 = 40 | CES33 = 73 | CES58 = 76 | CES83 = 90 |
| CES09 = 29 | CES34 = 79 | CES59 = 85 | CES84 = 89 |
| CES10 = 76 | CES35 = 89 | CES60 = 93 | CES85 = 77 |
| CES11 = 59 | CES36 = 97 | CES61 = 84 | CES86 = 61 |
| CES12 = 65 | CES37 = 87 | CES62 = 91 | CES87 = 78 |
| CES13 = 43 | CES38 = 81 | CES63 = 77 | CES88 = 77 |
| CES14 = 74 | CES39 = 95 | CES64 = 72 | CES89 = 67 |
| CES15 = 71 | CES40 = 92 | CES65 = 68 | CES90 = 76 |
| CES16 = 47 | CES41 = 88 | CES66 = 69 | CES91 = 89 |
| CES17 = 50 | CES42 = 89 | CES67 = 67 | CES92 = 58 |
| CES18 = 56 | CES43 = 79 | CES68 = 72 | CES93 = 74 |
| CES19 = 73 | CES44 = 99 | CES69 = 81 | CES94 = 49 |
| CES20 = 66 | CES45 = 85 | CES70 = 66 | CES95 = 68 |
| CES21 = 87 | CES46 = 80 | CES71 = 67 | CES96 = 76 |
| CES22 = 79 | CES47 = 82 | CES72 = 88 | CES97 = 82 |
| CES23 = 92 | CES48 = 69 | CES73 = 59 | CES98 = 75 |
| CES24 = 91 | CES49 = 80 | CES74 = 95 | CES99 = 62 |
| CES25 = 73 | CES50 = 87 | CES75 = 69 |            |



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**Color Rendition by Hue-Angle Bin**



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**Measure Comparisons**



(END OF REPORT)