

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: STREETWORKS

Report Number: P856348

Luminaire Tested: **FFX-CLB-60-730-U-VM8**

Issue Date: 07/16/2024



**Test Information**

Test Method: LM-79-08  
Report Number: P856348  
Test Lab: INNOVATION CENTER(G3)  
Issue Date: 07/16/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: STREETWORKS  
Catalog Number: FFX-CLB-60-730-U-VM8  
Description: FAIRFAX POST TOP FIXTURE w/ ULA ACORN 8 INCH NECK  
Light Source: (6) 3000K CCT, 70 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

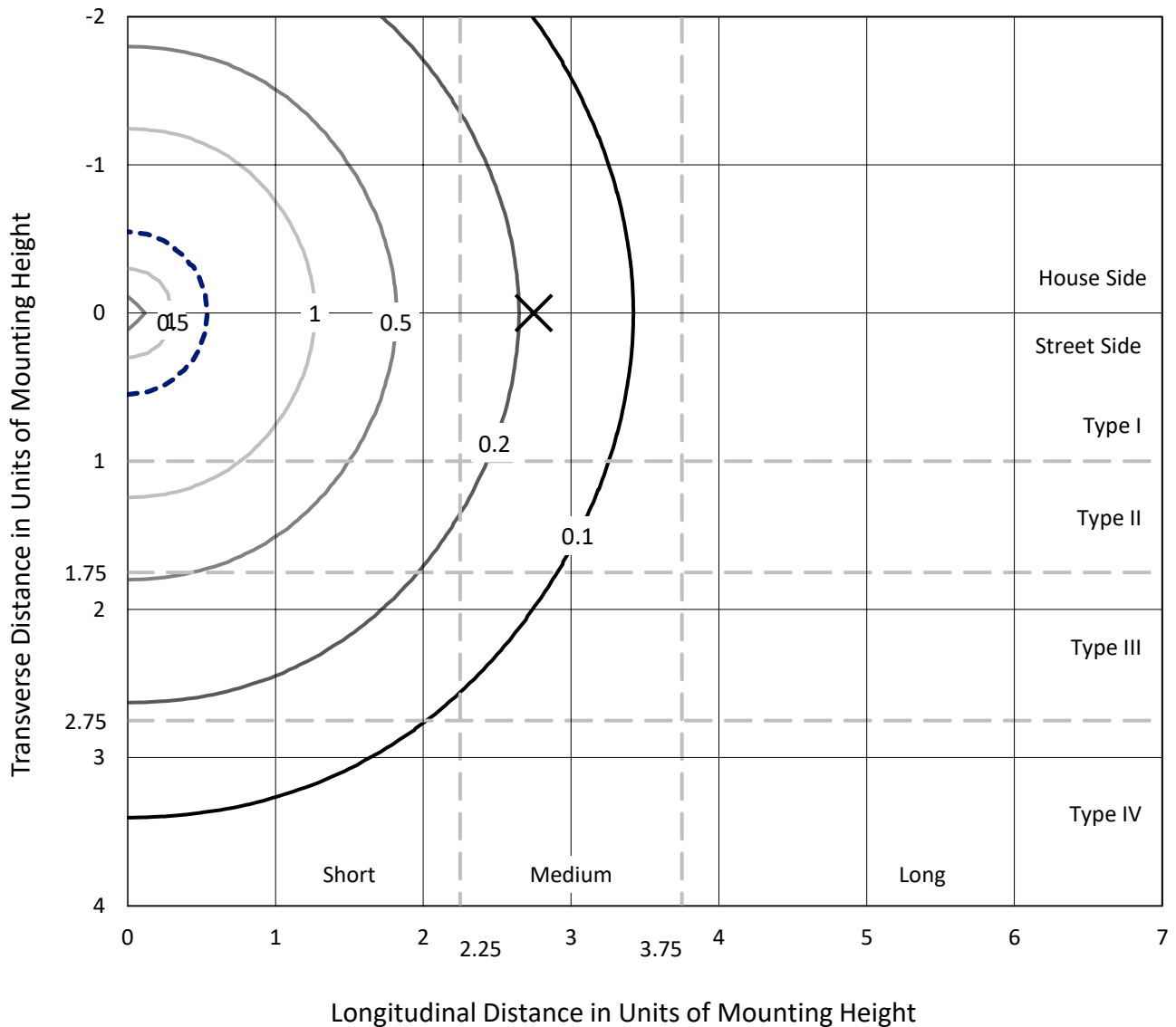
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 9421.3 lumens  
Efficiency: N/A  
Efficacy: 157.5 lumens/watt  
Luminous Opening: Vertical Cylinder (Dia: 1.33' x H: 2.08')  
IES Classification: Type V - Short  
BUG Rating: B3 - U5 - G4  
  
Input Watts (W): 59.8  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.99  
Total Harmonic Distortion (THDi): 8.9%  
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

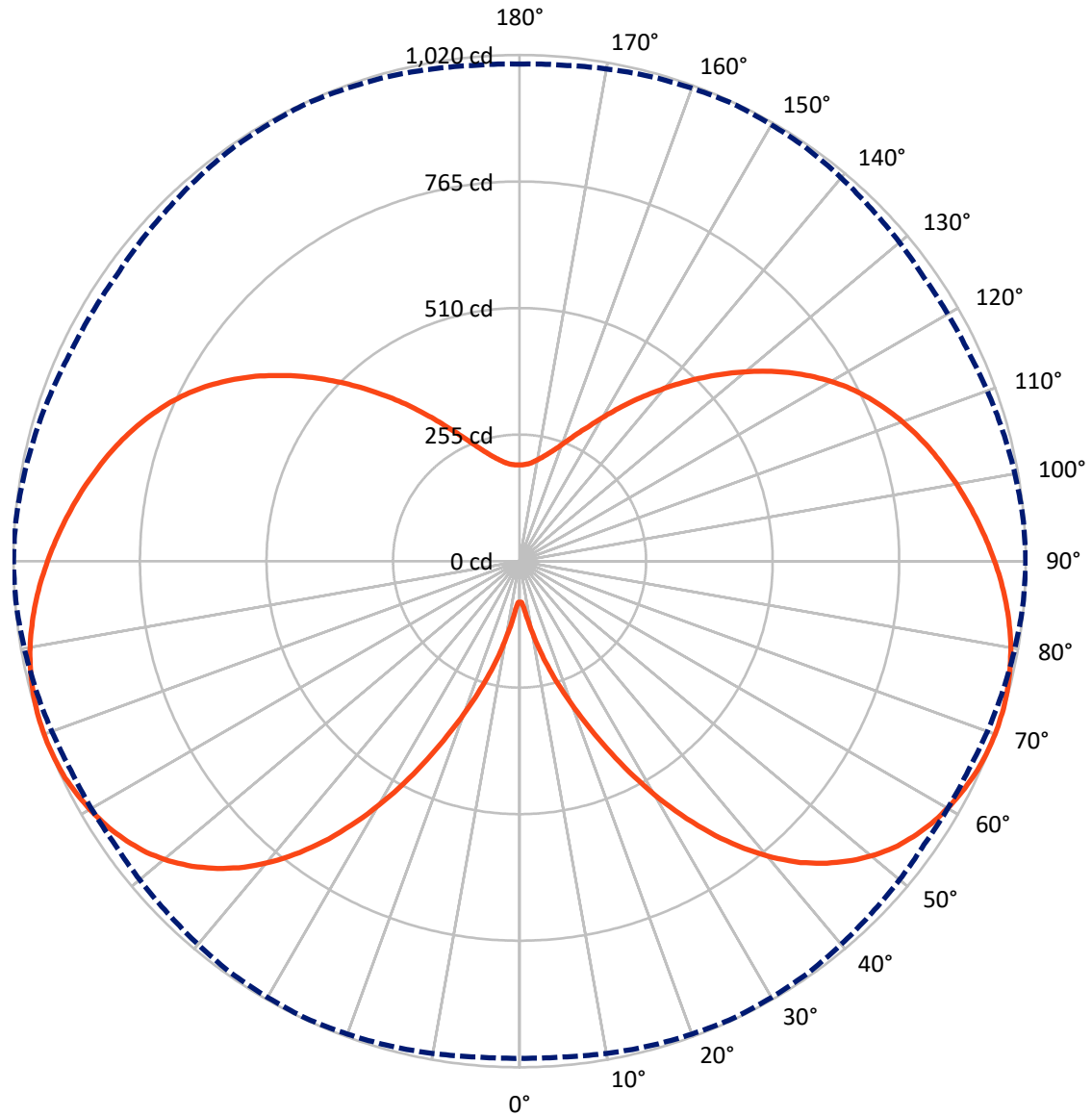
× Max cd  
 - - - 1/2 Max cd



Based on 15 foot mounting height. Maximum calculated value = 1.6 fc  
 Type V - Short - N/A

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### Luminous Intensity Polar Plot



— Vertical Plane Through 90-Deg Lateral    - - - Horizontal Cone Through 70-Deg Vertical

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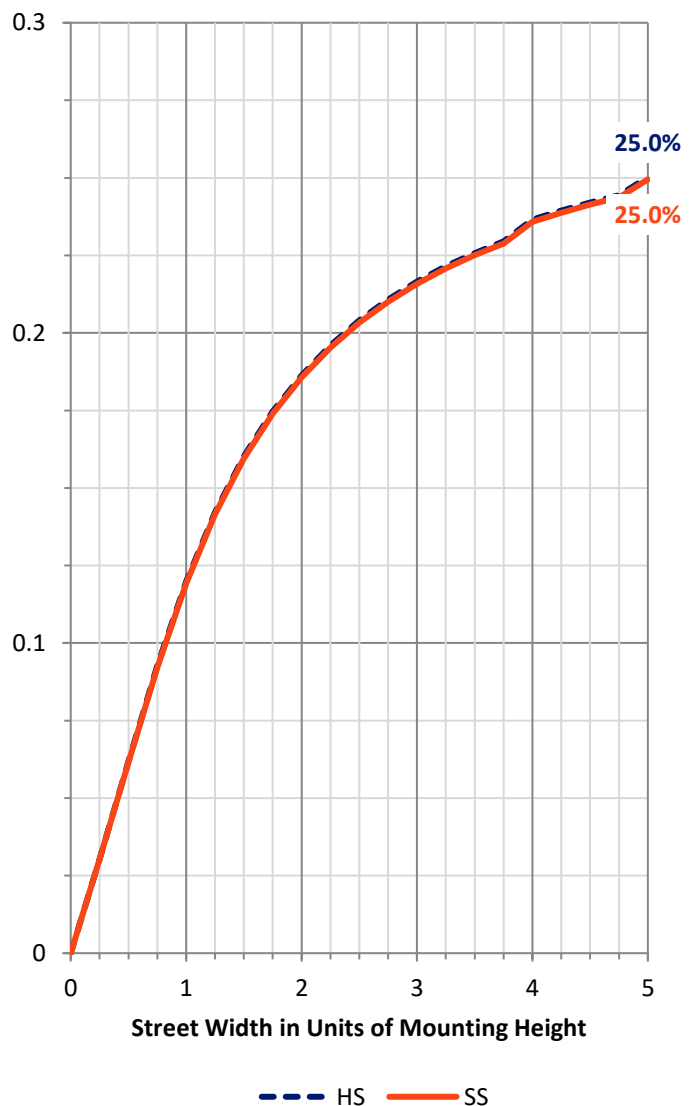
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 2668.0   | 2042.6 | 4710.6 |
|                    | % Fixture | 28.3     | 21.7   | 50.0   |
| <b>Street Side</b> | Lumens    | 2668.0   | 2042.6 | 4710.6 |
|                    | % Fixture | 28.3     | 21.7   | 50.0   |
| <b>Total</b>       | Lumens    | 5336.1   | 4085.2 | 9421.3 |
|                    | % Fixture | 56.6     | 43.4   | 100.0  |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 11.1   | 0.1       |
| 10°-20°   | 67.4   | 0.7       |
| 20°-30°   | 201.3  | 2.1       |
| 30°-40°   | 420.8  | 4.5       |
| 40°-50°   | 660.4  | 7.0       |
| 50°-60°   | 857.2  | 9.1       |
| 60°-70°   | 992.3  | 10.5      |
| 70°-80°   | 1062.3 | 11.3      |
| 80°-90°   | 1063.2 | 11.3      |
| 90°-100°  | 1002.6 | 10.6      |
| 100°-110° | 897.1  | 9.5       |
| 110°-120° | 754.3  | 8.0       |
| 120°-130° | 578.6  | 6.1       |
| 130°-140° | 395.9  | 4.2       |
| 140°-150° | 241.5  | 2.6       |
| 150°-160° | 132.0  | 1.4       |
| 160°-170° | 64.0   | 0.7       |
| 170°-180° | 19.1   | 0.2       |
| 0°-90°    | 5336.1 | 56.6      |
| 0°-180°   | 9421.3 | 100.0     |

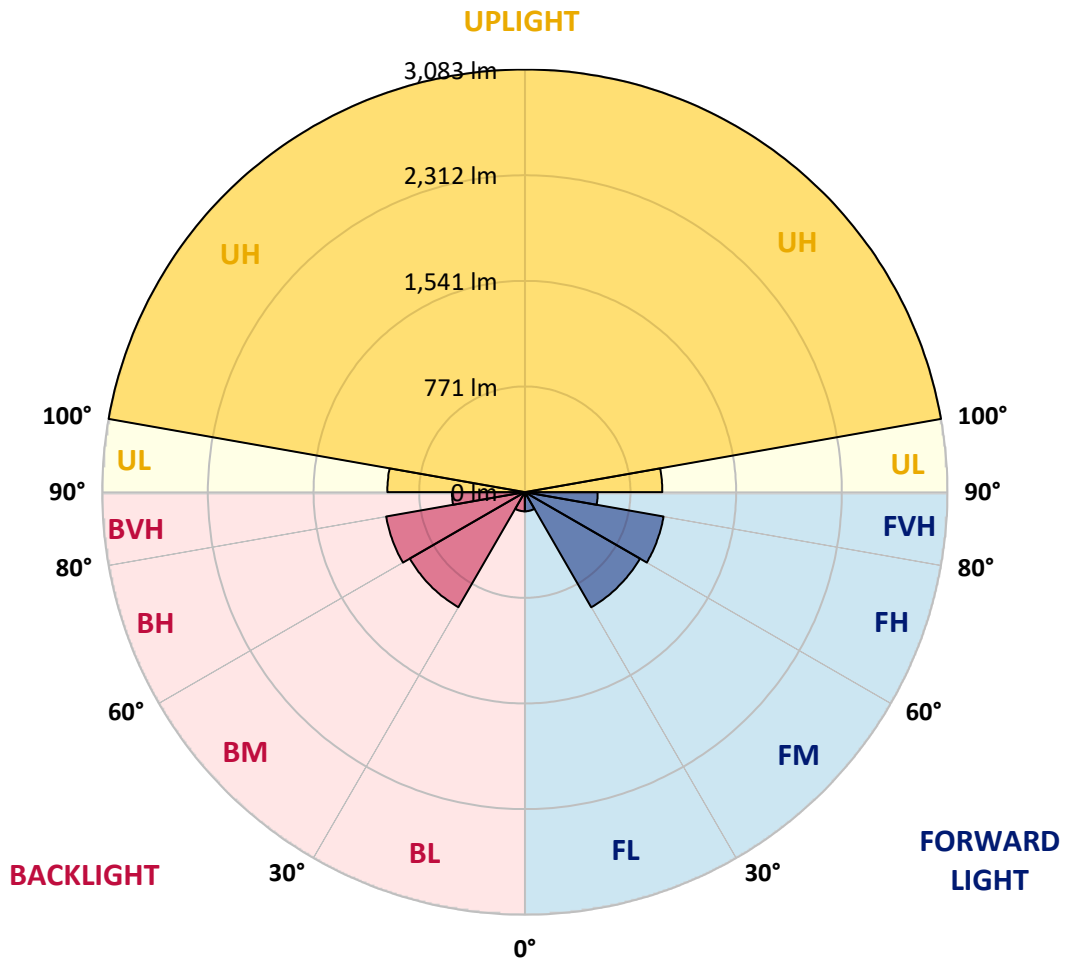


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**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone           | Lumens | % Fixture | Zone Rating/Lumen Limit |    |         |
|----------------|--------|-----------|-------------------------|----|---------|
|                |        |           | B                       | U  | G       |
| FL (0°-30°)    | 139.9  | 1.5       |                         |    |         |
| FM (30°-60°)   | 969.2  | 10.3      |                         |    |         |
| FH (60°-80°)   | 1027.3 | 10.9      |                         |    | G1/1800 |
| FVH (80°-90°)  | 531.6  | 5.6       |                         |    | G4/750  |
| BL (0°-30°)    | 139.9  | 1.5       | B1/500                  |    |         |
| BM (30°-60°)   | 969.2  | 10.3      | B1/1000                 |    |         |
| BH (60°-80°)   | 1027.3 | 10.9      | B3/2500                 |    | G1/1800 |
| BVH (80°-90°)  | 531.6  | 5.6       |                         |    | G4/750  |
| UL (90°-100°)  | 1002.6 | 10.6      |                         | U5 |         |
| UH (100°-180°) | 3082.6 | 32.7      |                         | U5 |         |

**BUG Rating: B3-U5-G4**  
 Type V Short





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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°   | 65°   | 75°    | 85°    | 90°    |
|--------|--------|--------|--------|--------|--------|--------|-------|-------|--------|--------|--------|
| 0°     | 82.7   | 82.7   | 82.7   | 82.7   | 82.7   | 82.7   | 82.7  | 82.7  | 82.7   | 82.7   | 82.7   |
| 2.5°   | 86.3   | 86.3   | 85.7   | 85.7   | 85.1   | 84.5   | 84.5  | 84.5  | 83.9   | 83.9   | 83.3   |
| 5°     | 98.4   | 97.8   | 97.8   | 97.2   | 97.8   | 97.2   | 97.2  | 97.2  | 97.2   | 96.0   | 96.0   |
| 7.5°   | 122.0  | 121.4  | 121.4  | 120.8  | 122.0  | 120.8  | 120.8 | 121.4 | 121.4  | 120.8  | 120.8  |
| 10°    | 152.8  | 152.2  | 152.2  | 150.9  | 152.2  | 151.6  | 151.6 | 150.3 | 150.9  | 150.3  | 150.9  |
| 12.5°  | 189.6  | 187.8  | 187.8  | 187.2  | 188.4  | 187.8  | 187.2 | 186.0 | 187.2  | 186.6  | 186.6  |
| 15°    | 227.6  | 228.2  | 227.6  | 227.0  | 228.2  | 228.2  | 227.6 | 226.4 | 227.6  | 226.4  | 227.0  |
| 17.5°  | 269.9  | 269.9  | 269.9  | 268.1  | 269.9  | 270.5  | 269.9 | 268.7 | 269.3  | 269.9  | 269.9  |
| 20°    | 315.8  | 315.8  | 316.4  | 315.2  | 318.2  | 316.4  | 315.8 | 315.2 | 315.8  | 316.4  | 317.0  |
| 22.5°  | 366.5  | 366.5  | 367.1  | 366.5  | 368.3  | 368.3  | 367.7 | 367.7 | 368.3  | 369.5  | 369.5  |
| 25°    | 422.7  | 423.3  | 423.3  | 421.5  | 425.7  | 426.9  | 425.7 | 425.7 | 426.9  | 428.7  | 428.7  |
| 27.5°  | 480.6  | 483.0  | 481.8  | 481.8  | 487.3  | 487.9  | 487.3 | 487.9 | 489.7  | 491.5  | 492.1  |
| 30°    | 540.4  | 542.2  | 544.6  | 542.8  | 548.9  | 549.5  | 550.1 | 550.7 | 553.1  | 556.1  | 556.1  |
| 32.5°  | 600.2  | 602.0  | 603.2  | 603.2  | 611.0  | 610.4  | 609.8 | 612.3 | 615.9  | 617.1  | 618.9  |
| 35°    | 660.0  | 660.0  | 661.2  | 661.8  | 669.6  | 669.0  | 670.2 | 672.0 | 675.7  | 678.1  | 679.3  |
| 37.5°  | 713.7  | 712.5  | 715.5  | 716.7  | 722.7  | 723.4  | 724.0 | 727.0 | 731.2  | 734.2  | 735.4  |
| 40°    | 762.6  | 761.4  | 765.0  | 766.8  | 772.3  | 772.3  | 773.5 | 777.1 | 781.9  | 784.9  | 785.5  |
| 42.5°  | 806.1  | 805.5  | 809.1  | 811.5  | 816.9  | 816.3  | 815.7 | 820.6 | 826.0  | 829.6  | 830.8  |
| 45°    | 843.5  | 842.9  | 847.7  | 850.8  | 855.0  | 853.8  | 853.8 | 858.0 | 864.0  | 868.3  | 868.9  |
| 47.5°  | 875.5  | 875.5  | 880.9  | 884.6  | 888.2  | 886.4  | 885.2 | 889.4 | 895.4  | 901.5  | 902.1  |
| 50°    | 903.9  | 903.3  | 909.3  | 913.5  | 916.6  | 914.2  | 912.3 | 916.6 | 923.2  | 929.2  | 930.5  |
| 52.5°  | 926.2  | 927.4  | 933.5  | 938.9  | 941.3  | 937.7  | 934.7 | 938.9 | 946.2  | 952.8  | 954.0  |
| 55°    | 945.5  | 946.2  | 952.8  | 959.4  | 960.6  | 955.8  | 952.2 | 955.8 | 963.7  | 970.9  | 972.1  |
| 57.5°  | 960.6  | 961.9  | 969.7  | 975.7  | 976.3  | 970.9  | 966.7 | 969.7 | 978.2  | 985.4  | 987.2  |
| 60°    | 973.9  | 975.1  | 982.4  | 989.0  | 989.6  | 983.0  | 977.6 | 980.0 | 989.0  | 997.5  | 998.7  |
| 62.5°  | 984.2  | 986.0  | 993.9  | 999.9  | 999.9  | 992.0  | 985.4 | 987.8 | 997.5  | 1006.5 | 1007.7 |
| 65°    | 992.6  | 994.5  | 1002.3 | 1008.3 | 1007.7 | 998.7  | 991.4 | 993.9 | 1004.1 | 1013.2 | 1015.0 |
| 67.5°  | 998.7  | 999.9  | 1008.3 | 1014.4 | 1012.0 | 1002.3 | 995.1 | 996.9 | 1007.7 | 1016.8 | 1018.6 |
| 70°    | 1002.3 | 1003.5 | 1012.0 | 1017.4 | 1013.8 | 1003.5 | 995.7 | 998.1 | 1008.9 | 1018.6 | 1020.4 |
| 72.5°  | 1004.1 | 1005.9 | 1013.8 | 1018.6 | 1014.4 | 1002.9 | 994.5 | 997.5 | 1008.3 | 1018.6 | 1019.8 |
| 75°    | 1003.5 | 1004.7 | 1012.6 | 1016.8 | 1011.4 | 1000.5 | 991.4 | 994.5 | 1005.9 | 1015.0 | 1016.8 |
| 77.5°  | 1000.5 | 1001.7 | 1008.9 | 1012.6 | 1005.9 | 995.1  | 986.6 | 989.6 | 1000.5 | 1009.6 | 1011.4 |
| 80°    | 995.7  | 996.9  | 1003.5 | 1005.9 | 999.3  | 988.4  | 980.6 | 983.6 | 993.9  | 1002.3 | 1004.1 |
| 82.5°  | 987.8  | 989.6  | 995.7  | 996.9  | 989.6  | 980.0  | 972.1 | 975.1 | 984.8  | 992.6  | 993.9  |
| 85°    | 978.2  | 979.4  | 984.8  | 985.4  | 978.2  | 969.7  | 963.1 | 966.1 | 974.5  | 980.6  | 982.4  |
| 87.5°  | 967.3  | 967.3  | 972.7  | 972.7  | 964.9  | 957.0  | 952.2 | 954.6 | 962.5  | 967.3  | 969.1  |
| 90°    | 954.0  | 954.6  | 958.2  | 957.6  | 950.4  | 943.7  | 939.5 | 942.5 | 949.2  | 953.4  | 954.6  |
| 92.5°  | 939.5  | 940.1  | 943.1  | 941.9  | 934.7  | 929.2  | 925.6 | 929.2 | 935.3  | 938.3  | 939.5  |
| 95°    | 923.8  | 924.4  | 926.8  | 924.4  | 917.8  | 913.5  | 910.5 | 914.8 | 919.6  | 922.6  | 923.8  |
| 97.5°  | 907.5  | 908.1  | 909.9  | 907.5  | 900.3  | 896.6  | 895.4 | 899.1 | 903.9  | 906.3  | 907.5  |
| 100°   | 890.6  | 890.6  | 891.8  | 888.2  | 882.1  | 879.1  | 878.5 | 882.8 | 887.6  | 890.0  | 891.2  |
| 102.5° | 871.9  | 872.5  | 872.5  | 868.9  | 862.8  | 861.0  | 861.0 | 865.8 | 870.7  | 872.5  | 873.7  |
| 105°   | 852.6  | 852.6  | 852.6  | 849.5  | 842.9  | 841.7  | 842.3 | 847.1 | 852.6  | 855.0  | 856.2  |
| 107.5° | 831.4  | 832.0  | 830.8  | 827.8  | 822.4  | 821.2  | 822.4 | 829.0 | 833.8  | 836.3  | 837.5  |
| 110°   | 809.1  | 809.7  | 809.1  | 805.5  | 800.6  | 800.0  | 801.8 | 808.5 | 813.3  | 815.7  | 817.5  |



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 CATALOG NUMBER: FFX-CLB-60-730-U-VM8

**CANDELA DISTRIBUTION (continued):**

|        | 0°    | 5°    | 15°   | 25°   | 35°   | 45°   | 55°   | 65°   | 75°   | 85°   | 90°   |
|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 112.5° | 785.5 | 786.1 | 785.5 | 782.5 | 777.7 | 777.7 | 780.1 | 786.7 | 792.2 | 794.0 | 795.8 |
| 115°   | 760.8 | 761.4 | 760.2 | 757.8 | 752.9 | 754.1 | 756.6 | 763.2 | 768.6 | 770.4 | 772.9 |
| 117.5° | 734.2 | 734.8 | 734.2 | 731.2 | 727.0 | 728.2 | 731.8 | 738.4 | 743.3 | 745.1 | 747.5 |
| 120°   | 705.2 | 705.2 | 705.2 | 702.2 | 698.0 | 700.4 | 704.0 | 711.3 | 715.5 | 716.7 | 719.1 |
| 122.5° | 675.7 | 674.4 | 674.4 | 672.6 | 667.8 | 670.8 | 674.4 | 681.7 | 685.9 | 686.5 | 688.3 |
| 125°   | 643.0 | 643.6 | 641.8 | 640.6 | 636.4 | 640.0 | 643.0 | 650.3 | 653.9 | 654.5 | 656.3 |
| 127.5° | 608.0 | 609.8 | 608.0 | 606.2 | 603.2 | 606.8 | 610.4 | 617.1 | 620.1 | 620.7 | 621.9 |
| 130°   | 575.4 | 575.4 | 573.6 | 572.4 | 569.4 | 573.0 | 576.6 | 582.7 | 585.7 | 585.7 | 586.9 |
| 132.5° | 542.8 | 541.0 | 540.4 | 539.2 | 535.6 | 539.8 | 542.2 | 548.2 | 550.7 | 550.1 | 551.3 |
| 135°   | 507.2 | 507.2 | 505.4 | 504.8 | 501.8 | 506.0 | 508.4 | 513.8 | 515.6 | 515.0 | 516.2 |
| 137.5° | 474.0 | 474.0 | 472.8 | 471.6 | 469.8 | 473.4 | 475.8 | 480.0 | 481.8 | 480.0 | 481.8 |
| 140°   | 441.4 | 441.4 | 440.8 | 439.6 | 437.8 | 441.4 | 443.2 | 446.8 | 448.6 | 446.8 | 448.0 |
| 142.5° | 411.2 | 410.0 | 409.4 | 408.8 | 406.4 | 410.0 | 411.2 | 414.8 | 415.4 | 414.2 | 416.0 |
| 145°   | 379.2 | 379.8 | 379.2 | 378.6 | 376.8 | 379.8 | 381.0 | 384.0 | 384.6 | 383.4 | 385.2 |
| 147.5° | 352.6 | 350.8 | 351.4 | 350.8 | 349.0 | 352.0 | 352.6 | 354.4 | 355.6 | 354.4 | 355.6 |
| 150°   | 326.1 | 324.8 | 324.8 | 324.2 | 323.0 | 325.4 | 326.1 | 327.9 | 328.5 | 327.3 | 328.5 |
| 152.5° | 302.5 | 301.9 | 301.9 | 301.3 | 300.1 | 301.9 | 302.5 | 303.7 | 304.3 | 303.1 | 303.7 |
| 155°   | 281.4 | 280.8 | 280.8 | 280.2 | 279.0 | 280.8 | 280.8 | 282.0 | 282.6 | 282.0 | 282.6 |
| 157.5° | 262.7 | 262.0 | 262.0 | 262.0 | 260.8 | 262.0 | 262.0 | 263.3 | 263.3 | 262.7 | 263.3 |
| 160°   | 247.6 | 246.3 | 247.0 | 246.3 | 245.1 | 246.3 | 246.3 | 247.0 | 247.0 | 247.0 | 247.0 |
| 162.5° | 233.7 | 233.7 | 233.7 | 233.1 | 232.5 | 233.1 | 233.1 | 233.7 | 233.7 | 233.7 | 233.1 |
| 165°   | 222.8 | 222.8 | 222.8 | 222.2 | 221.6 | 222.2 | 222.2 | 222.2 | 222.2 | 222.2 | 222.2 |
| 167.5° | 213.7 | 213.1 | 213.7 | 213.1 | 212.5 | 213.1 | 213.1 | 213.1 | 213.1 | 213.1 | 213.1 |
| 170°   | 205.9 | 205.9 | 205.9 | 205.9 | 205.3 | 205.9 | 205.9 | 205.9 | 205.9 | 205.9 | 205.9 |
| 172.5° | 201.1 | 200.5 | 200.5 | 200.5 | 199.9 | 200.5 | 199.9 | 200.5 | 199.9 | 200.5 | 199.9 |
| 175°   | 196.8 | 196.8 | 196.8 | 196.8 | 196.2 | 196.2 | 196.2 | 196.2 | 196.2 | 196.2 | 196.2 |
| 177.5° | 194.4 | 194.4 | 194.4 | 194.4 | 194.4 | 194.4 | 194.4 | 194.4 | 194.4 | 194.4 | 194.4 |
| 180°   | 193.8 | 193.8 | 193.8 | 193.8 | 193.8 | 193.8 | 193.8 | 193.8 | 193.8 | 193.8 | 193.8 |



Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269



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

Report Prepared for

Cooper Lighting Solutions

Streetworks

Report Number: SP1-2406-133-4

Test Date: 07/12/2024

Luminaire Tested: FFX-CLB-100-730-U-FR-T5

Data in this report applies to families of products including FFX-CLB-100-730-U-FR-T5.

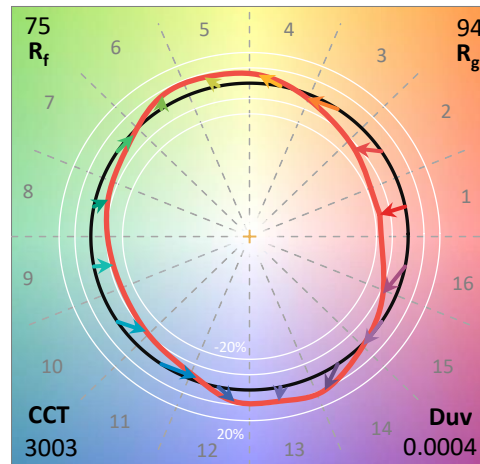
**Test Information**

Test Method: LM-79-2019  
 Report Number: SP1-2406-133-4  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry: 4π  
 Issue Date: 07/12/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: Streetworks  
 Catalog Number: **FFX-CLB-100-730-U-FR-T5**  
 Description: FAIRFAX ACORN W/ FAIRFAX REFRACTOR 100W T5

**Spectral Parameters**

CCT (K): 3003  
 CIE u': 0.2503  
 CIE v': 0.5219  
 Duv: 0.0004  
 CIE x: 0.4373  
 CIE y: 0.4053  
 CIE z: 0.1573  
 Peak Wavelength (nm): 595  
 Dominant Wavelength (nm): 582  
 Purity: 52.93545  
 Rf: 75.2  
 Rg: 93.8

CRI (Ra): 71.9  
 R1: 68.2  
 R2: 82.2  
 R3: 93.9  
 R4: 67.6  
 R5: 67.2  
 R6: 75.3  
 R7: 77.6  
 R8: 43.1  
 R9: -33.7  
 R10: 59.0  
 R11: 62.4  
 R12: 48.5  
 R13: 70.8  
 R14: 96.6  
 R15: 60.0



**Test Conditions**

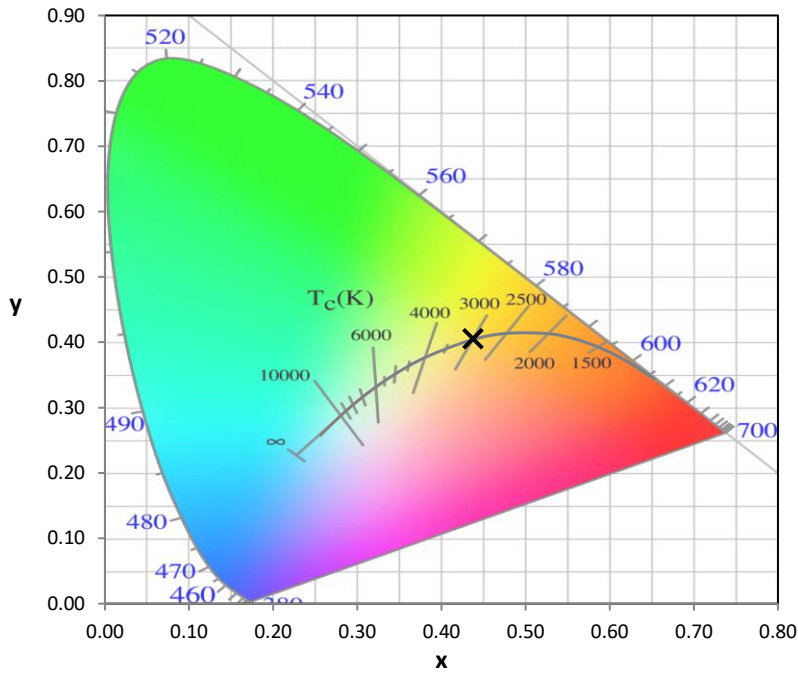
Stabilization Time: 0.794393M  
 Operation Time: 1H  
 Sphere Temperature (°C): 24.7

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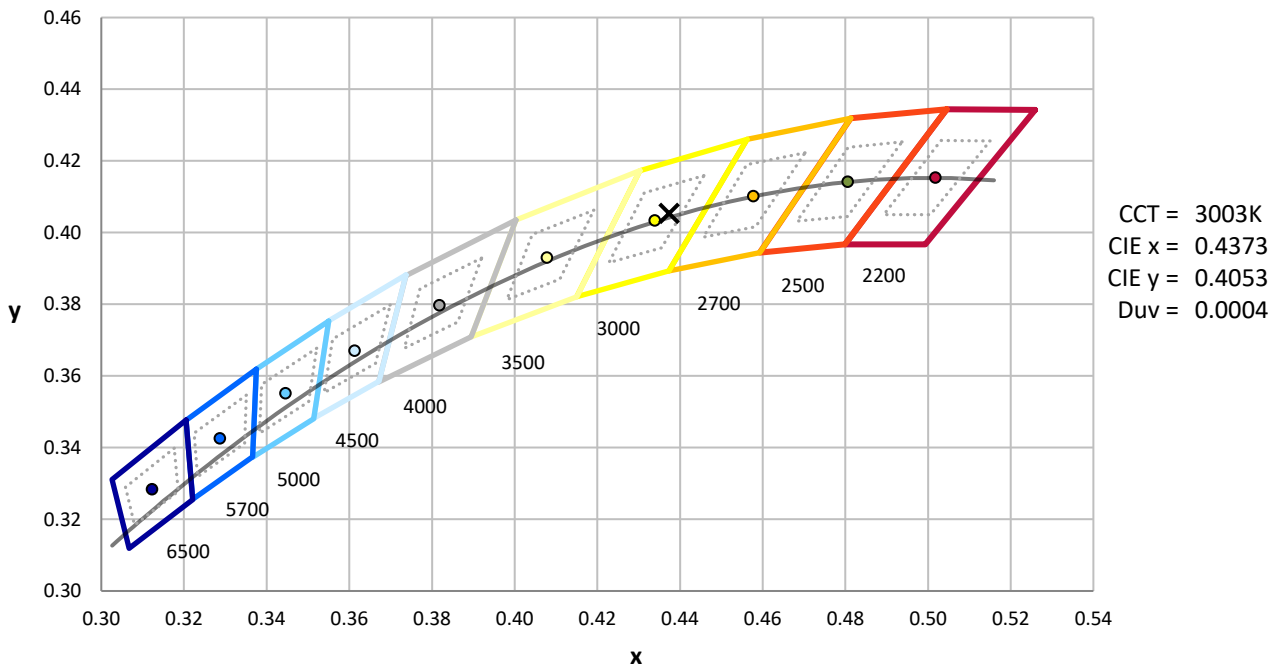
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date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

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CIE 1931 Chromaticity Diagram



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



Point lies inside the ANSI 3000K 4-step quadrangle

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**Photopic Flux vs. Wavelength**

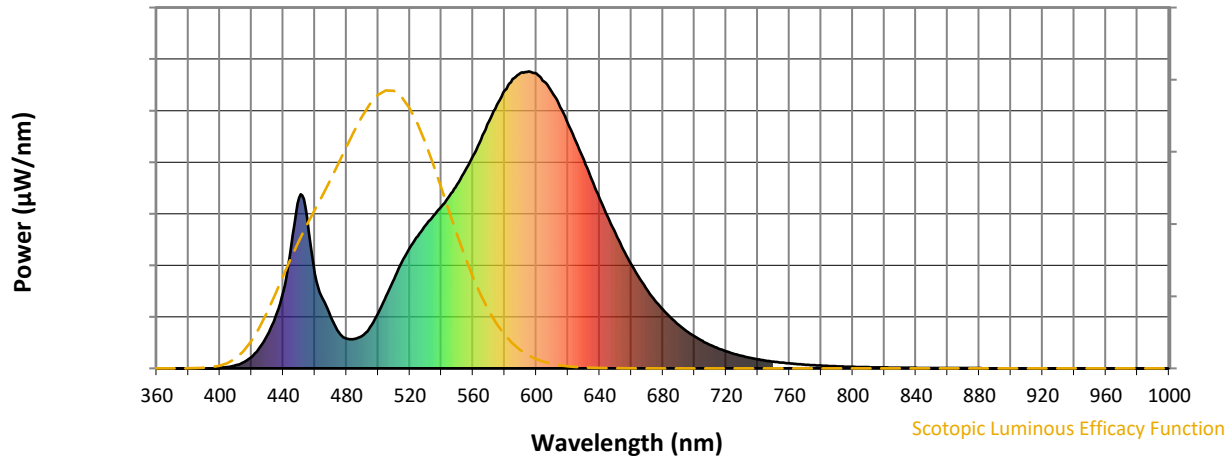


**Photopic Lumens: NR**

| $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) | $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) | $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) | $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) | $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) |
|-------------------|-----------------------------|-------------------------|-------------------|-----------------------------|-------------------------|-------------------|-----------------------------|-------------------------|-------------------|-----------------------------|-------------------------|-------------------|-----------------------------|-------------------------|
| 360               | 0                           | NR                      | 490               | 110                         | NR                      | 620               | 825                         | NR                      | 750               | 23                          | NR                      | 880               | 1                           | NR                      |
| 365               | 0                           | NR                      | 495               | 139                         | NR                      | 625               | 765                         | NR                      | 755               | 19                          | NR                      | 885               | 1                           | NR                      |
| 370               | 0                           | NR                      | 500               | 186                         | NR                      | 630               | 702                         | NR                      | 760               | 17                          | NR                      | 890               | 0                           | NR                      |
| 375               | 0                           | NR                      | 505               | 243                         | NR                      | 635               | 635                         | NR                      | 765               | 14                          | NR                      | 895               | 0                           | NR                      |
| 380               | 0                           | NR                      | 510               | 301                         | NR                      | 640               | 572                         | NR                      | 770               | 12                          | NR                      | 900               | 0                           | NR                      |
| 385               | 0                           | NR                      | 515               | 357                         | NR                      | 645               | 512                         | NR                      | 775               | 11                          | NR                      | 905               | 0                           | NR                      |
| 390               | 0                           | NR                      | 520               | 406                         | NR                      | 650               | 455                         | NR                      | 780               | 9                           | NR                      | 910               | 0                           | NR                      |
| 395               | 0                           | NR                      | 525               | 445                         | NR                      | 655               | 400                         | NR                      | 785               | 8                           | NR                      | 915               | 0                           | NR                      |
| 400               | 2                           | NR                      | 530               | 483                         | NR                      | 660               | 350                         | NR                      | 790               | 7                           | NR                      | 920               | 0                           | NR                      |
| 405               | 5                           | NR                      | 535               | 514                         | NR                      | 665               | 305                         | NR                      | 795               | 6                           | NR                      | 925               | 0                           | NR                      |
| 410               | 10                          | NR                      | 540               | 545                         | NR                      | 670               | 264                         | NR                      | 800               | 5                           | NR                      | 930               | 0                           | NR                      |
| 415               | 21                          | NR                      | 545               | 581                         | NR                      | 675               | 229                         | NR                      | 805               | 4                           | NR                      | 935               | 0                           | NR                      |
| 420               | 39                          | NR                      | 550               | 620                         | NR                      | 680               | 198                         | NR                      | 810               | 4                           | NR                      | 940               | 0                           | NR                      |
| 425               | 69                          | NR                      | 555               | 666                         | NR                      | 685               | 170                         | NR                      | 815               | 3                           | NR                      | 945               | 0                           | NR                      |
| 430               | 112                         | NR                      | 560               | 716                         | NR                      | 690               | 147                         | NR                      | 820               | 3                           | NR                      | 950               | 0                           | NR                      |
| 435               | 174                         | NR                      | 565               | 771                         | NR                      | 695               | 125                         | NR                      | 825               | 3                           | NR                      | 955               | 0                           | NR                      |
| 440               | 260                         | NR                      | 570               | 831                         | NR                      | 700               | 107                         | NR                      | 830               | 2                           | NR                      | 960               | 0                           | NR                      |
| 445               | 410                         | NR                      | 575               | 887                         | NR                      | 705               | 92                          | NR                      | 835               | 2                           | NR                      | 965               | 0                           | NR                      |
| 450               | 574                         | NR                      | 580               | 937                         | NR                      | 710               | 79                          | NR                      | 840               | 2                           | NR                      | 970               | 0                           | NR                      |
| 455               | 508                         | NR                      | 585               | 974                         | NR                      | 715               | 67                          | NR                      | 845               | 1                           | NR                      | 975               | 0                           | NR                      |
| 460               | 319                         | NR                      | 590               | 994                         | NR                      | 720               | 57                          | NR                      | 850               | 1                           | NR                      | 980               | 0                           | NR                      |
| 465               | 234                         | NR                      | 595               | 1000                        | NR                      | 725               | 49                          | NR                      | 855               | 1                           | NR                      | 985               | 0                           | NR                      |
| 470               | 174                         | NR                      | 600               | 992                         | NR                      | 730               | 42                          | NR                      | 860               | 1                           | NR                      | 990               | 0                           | NR                      |
| 475               | 121                         | NR                      | 605               | 966                         | NR                      | 735               | 36                          | NR                      | 865               | 1                           | NR                      | 995               | 0                           | NR                      |
| 480               | 100                         | NR                      | 610               | 929                         | NR                      | 740               | 30                          | NR                      | 870               | 1                           | NR                      | 1000              | 0                           | NR                      |
| 485               | 99                          | NR                      | 615               | 880                         | NR                      | 745               | 26                          | NR                      | 875               | 1                           | NR                      |                   |                             |                         |

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**Scotopic Flux vs. Wavelength**



**Scotopic Lumens: NR**

**S/P: 1.21**

| λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) |
|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|
| 360    | 0                        | NR            | 490    | 110                      | NR            | 620    | 825                      | NR            | 750    | 23                       | NR            | 880    | 1                        | NR            |
| 365    | 0                        | NR            | 495    | 139                      | NR            | 625    | 765                      | NR            | 755    | 19                       | NR            | 885    | 1                        | NR            |
| 370    | 0                        | NR            | 500    | 186                      | NR            | 630    | 702                      | NR            | 760    | 17                       | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 243                      | NR            | 635    | 635                      | NR            | 765    | 14                       | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 301                      | NR            | 640    | 572                      | NR            | 770    | 12                       | NR            | 900    | 0                        | NR            |
| 385    | 0                        | NR            | 515    | 357                      | NR            | 645    | 512                      | NR            | 775    | 11                       | NR            | 905    | 0                        | NR            |
| 390    | 0                        | NR            | 520    | 406                      | NR            | 650    | 455                      | NR            | 780    | 9                        | NR            | 910    | 0                        | NR            |
| 395    | 0                        | NR            | 525    | 445                      | NR            | 655    | 400                      | NR            | 785    | 8                        | NR            | 915    | 0                        | NR            |
| 400    | 2                        | NR            | 530    | 483                      | NR            | 660    | 350                      | NR            | 790    | 7                        | NR            | 920    | 0                        | NR            |
| 405    | 5                        | NR            | 535    | 514                      | NR            | 665    | 305                      | NR            | 795    | 6                        | NR            | 925    | 0                        | NR            |
| 410    | 10                       | NR            | 540    | 545                      | NR            | 670    | 264                      | NR            | 800    | 5                        | NR            | 930    | 0                        | NR            |
| 415    | 21                       | NR            | 545    | 581                      | NR            | 675    | 229                      | NR            | 805    | 4                        | NR            | 935    | 0                        | NR            |
| 420    | 39                       | NR            | 550    | 620                      | NR            | 680    | 198                      | NR            | 810    | 4                        | NR            | 940    | 0                        | NR            |
| 425    | 69                       | NR            | 555    | 666                      | NR            | 685    | 170                      | NR            | 815    | 3                        | NR            | 945    | 0                        | NR            |
| 430    | 112                      | NR            | 560    | 716                      | NR            | 690    | 147                      | NR            | 820    | 3                        | NR            | 950    | 0                        | NR            |
| 435    | 174                      | NR            | 565    | 771                      | NR            | 695    | 125                      | NR            | 825    | 3                        | NR            | 955    | 0                        | NR            |
| 440    | 260                      | NR            | 570    | 831                      | NR            | 700    | 107                      | NR            | 830    | 2                        | NR            | 960    | 0                        | NR            |
| 445    | 410                      | NR            | 575    | 887                      | NR            | 705    | 92                       | NR            | 835    | 2                        | NR            | 965    | 0                        | NR            |
| 450    | 574                      | NR            | 580    | 937                      | NR            | 710    | 79                       | NR            | 840    | 2                        | NR            | 970    | 0                        | NR            |
| 455    | 508                      | NR            | 585    | 974                      | NR            | 715    | 67                       | NR            | 845    | 1                        | NR            | 975    | 0                        | NR            |
| 460    | 319                      | NR            | 590    | 994                      | NR            | 720    | 57                       | NR            | 850    | 1                        | NR            | 980    | 0                        | NR            |
| 465    | 234                      | NR            | 595    | 1000                     | NR            | 725    | 49                       | NR            | 855    | 1                        | NR            | 985    | 0                        | NR            |
| 470    | 174                      | NR            | 600    | 992                      | NR            | 730    | 42                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 121                      | NR            | 605    | 966                      | NR            | 735    | 36                       | NR            | 865    | 1                        | NR            | 995    | 0                        | NR            |
| 480    | 100                      | NR            | 610    | 929                      | NR            | 740    | 30                       | NR            | 870    | 1                        | NR            | 1000   | 0                        | NR            |
| 485    | 99                       | NR            | 615    | 880                      | NR            | 745    | 26                       | NR            | 875    | 1                        | NR            |        |                          |               |

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Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 2.22

| λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) |
|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|
| 360    | 0                        | NR            | 490    | 110                      | NR            | 620    | 825                      | NR            | 750    | 23                       | NR            | 880    | 1                        | NR            |
| 365    | 0                        | NR            | 495    | 139                      | NR            | 625    | 765                      | NR            | 755    | 19                       | NR            | 885    | 1                        | NR            |
| 370    | 0                        | NR            | 500    | 186                      | NR            | 630    | 702                      | NR            | 760    | 17                       | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 243                      | NR            | 635    | 635                      | NR            | 765    | 14                       | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 301                      | NR            | 640    | 572                      | NR            | 770    | 12                       | NR            | 900    | 0                        | NR            |
| 385    | 0                        | NR            | 515    | 357                      | NR            | 645    | 512                      | NR            | 775    | 11                       | NR            | 905    | 0                        | NR            |
| 390    | 0                        | NR            | 520    | 406                      | NR            | 650    | 455                      | NR            | 780    | 9                        | NR            | 910    | 0                        | NR            |
| 395    | 0                        | NR            | 525    | 445                      | NR            | 655    | 400                      | NR            | 785    | 8                        | NR            | 915    | 0                        | NR            |
| 400    | 2                        | NR            | 530    | 483                      | NR            | 660    | 350                      | NR            | 790    | 7                        | NR            | 920    | 0                        | NR            |
| 405    | 5                        | NR            | 535    | 514                      | NR            | 665    | 305                      | NR            | 795    | 6                        | NR            | 925    | 0                        | NR            |
| 410    | 10                       | NR            | 540    | 545                      | NR            | 670    | 264                      | NR            | 800    | 5                        | NR            | 930    | 0                        | NR            |
| 415    | 21                       | NR            | 545    | 581                      | NR            | 675    | 229                      | NR            | 805    | 4                        | NR            | 935    | 0                        | NR            |
| 420    | 39                       | NR            | 550    | 620                      | NR            | 680    | 198                      | NR            | 810    | 4                        | NR            | 940    | 0                        | NR            |
| 425    | 69                       | NR            | 555    | 666                      | NR            | 685    | 170                      | NR            | 815    | 3                        | NR            | 945    | 0                        | NR            |
| 430    | 112                      | NR            | 560    | 716                      | NR            | 690    | 147                      | NR            | 820    | 3                        | NR            | 950    | 0                        | NR            |
| 435    | 174                      | NR            | 565    | 771                      | NR            | 695    | 125                      | NR            | 825    | 3                        | NR            | 955    | 0                        | NR            |
| 440    | 260                      | NR            | 570    | 831                      | NR            | 700    | 107                      | NR            | 830    | 2                        | NR            | 960    | 0                        | NR            |
| 445    | 410                      | NR            | 575    | 887                      | NR            | 705    | 92                       | NR            | 835    | 2                        | NR            | 965    | 0                        | NR            |
| 450    | 574                      | NR            | 580    | 937                      | NR            | 710    | 79                       | NR            | 840    | 2                        | NR            | 970    | 0                        | NR            |
| 455    | 508                      | NR            | 585    | 974                      | NR            | 715    | 67                       | NR            | 845    | 1                        | NR            | 975    | 0                        | NR            |
| 460    | 319                      | NR            | 590    | 994                      | NR            | 720    | 57                       | NR            | 850    | 1                        | NR            | 980    | 0                        | NR            |
| 465    | 234                      | NR            | 595    | 1000                     | NR            | 725    | 49                       | NR            | 855    | 1                        | NR            | 985    | 0                        | NR            |
| 470    | 174                      | NR            | 600    | 992                      | NR            | 730    | 42                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 121                      | NR            | 605    | 966                      | NR            | 735    | 36                       | NR            | 865    | 1                        | NR            | 995    | 0                        | NR            |
| 480    | 100                      | NR            | 610    | 929                      | NR            | 740    | 30                       | NR            | 870    | 1                        | NR            | 1000   | 0                        | NR            |
| 485    | 99                       | NR            | 615    | 880                      | NR            | 745    | 26                       | NR            | 875    | 1                        | NR            |        |                          |               |

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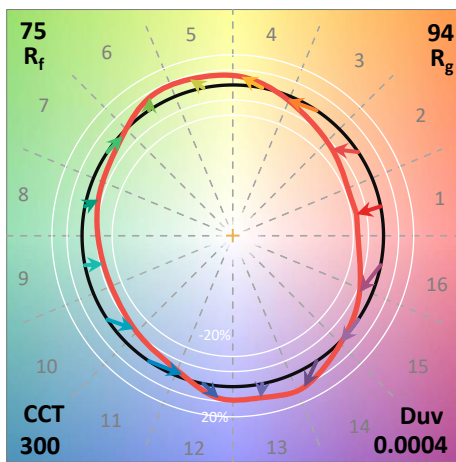
TM-30-18

**Summary**

$R_f = 75.2$   
 $R_g = 93.8$   
 CIE  $R_a = 71.9$   
 $R_g = -33.7$



**Color Vector Graphics**





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

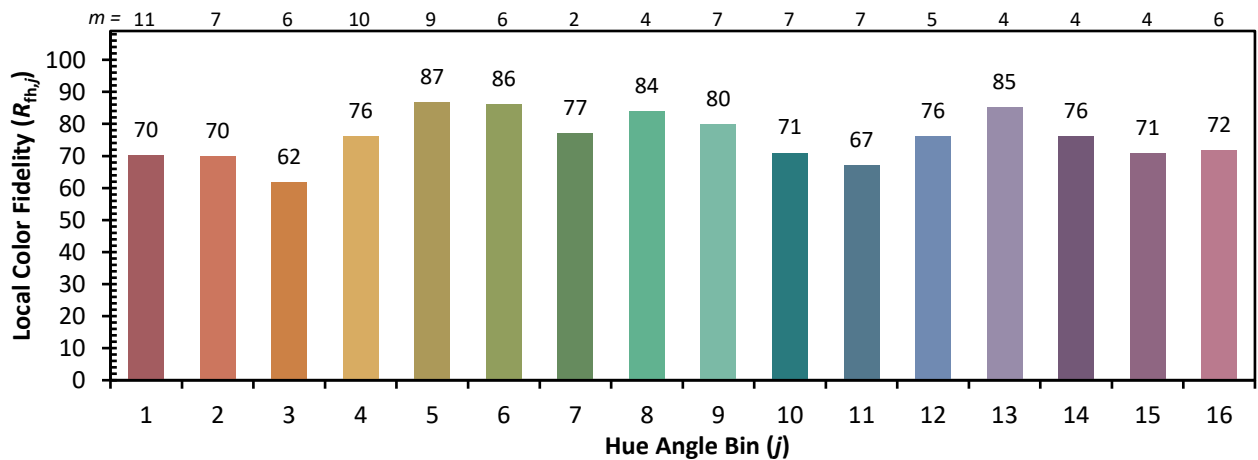
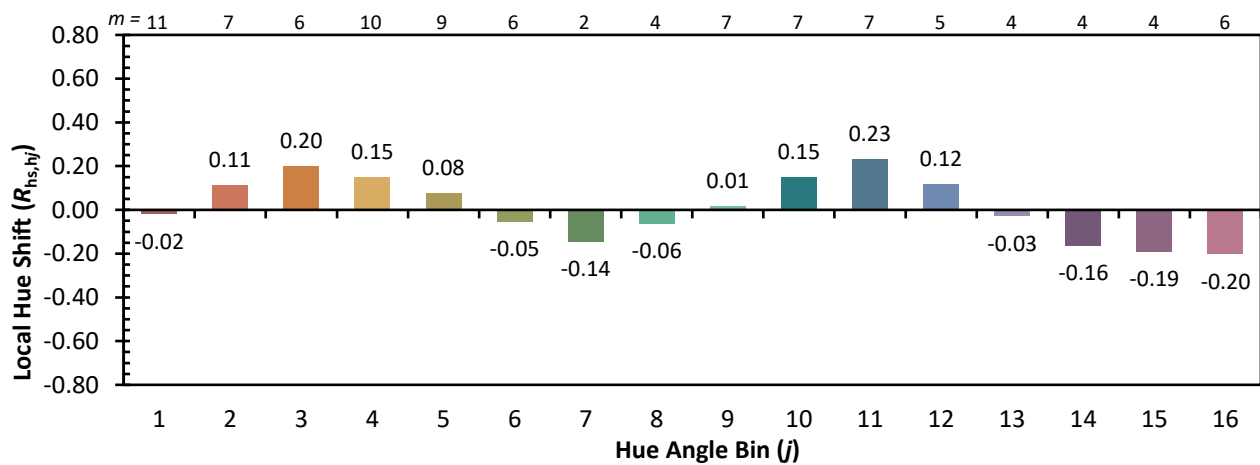
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 66 | CES51 = 87 | CES76 = 59 |
| CES02 = 62 | CES27 = 89 | CES52 = 85 | CES77 = 77 |
| CES03 = 31 | CES28 = 85 | CES53 = 77 | CES78 = 63 |
| CES04 = 71 | CES29 = 69 | CES54 = 86 | CES79 = 86 |
| CES05 = 49 | CES30 = 84 | CES55 = 84 | CES80 = 84 |
| CES06 = 51 | CES31 = 72 | CES56 = 75 | CES81 = 72 |
| CES07 = 41 | CES32 = 65 | CES57 = 74 | CES82 = 93 |
| CES08 = 40 | CES33 = 79 | CES58 = 75 | CES83 = 91 |
| CES09 = 29 | CES34 = 76 | CES59 = 85 | CES84 = 88 |
| CES10 = 76 | CES35 = 87 | CES60 = 90 | CES85 = 75 |
| CES11 = 59 | CES36 = 93 | CES61 = 81 | CES86 = 63 |
| CES12 = 65 | CES37 = 85 | CES62 = 89 | CES87 = 77 |
| CES13 = 43 | CES38 = 92 | CES63 = 75 | CES88 = 80 |
| CES14 = 74 | CES39 = 97 | CES64 = 66 | CES89 = 67 |
| CES15 = 71 | CES40 = 93 | CES65 = 65 | CES90 = 80 |
| CES16 = 47 | CES41 = 93 | CES66 = 61 | CES91 = 80 |
| CES17 = 50 | CES42 = 87 | CES67 = 59 | CES92 = 57 |
| CES18 = 56 | CES43 = 79 | CES68 = 67 | CES93 = 73 |
| CES19 = 73 | CES44 = 99 | CES69 = 76 | CES94 = 50 |
| CES20 = 66 | CES45 = 85 | CES70 = 61 | CES95 = 67 |
| CES21 = 87 | CES46 = 81 | CES71 = 58 | CES96 = 77 |
| CES22 = 79 | CES47 = 86 | CES72 = 85 | CES97 = 83 |
| CES23 = 92 | CES48 = 75 | CES73 = 54 | CES98 = 76 |
| CES24 = 91 | CES49 = 79 | CES74 = 95 | CES99 = 65 |
| CES25 = 73 | CES50 = 86 | CES75 = 61 |            |



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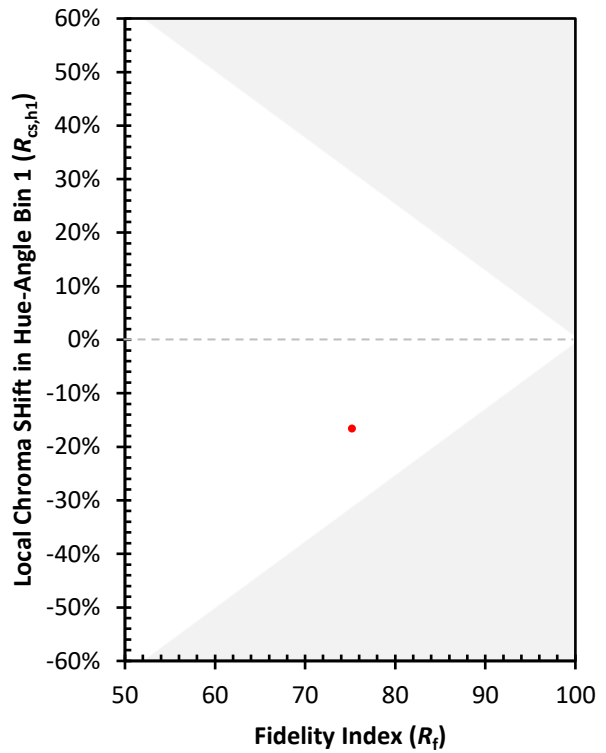
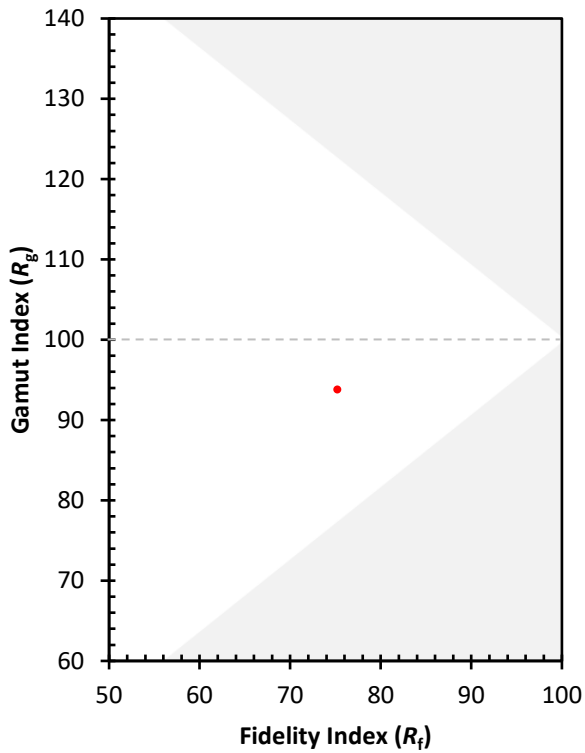
Color Rendition by Hue-Angle Bin



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Measure Comparisons



(END OF REPORT)