

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: P856411

Luminaire Tested: **FFX-CLB-60-750-U-VM9**

Issue Date: 07/16/2024



**Test Information**

Test Method: LM-79-08  
Report Number: P856411  
Test Lab: INNOVATION CENTER(G3)  
Issue Date: 07/16/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: STREETWORKS  
Catalog Number: FFX-CLB-60-750-U-VM9  
Description: FAIRFAX POST TOP FIXTURE w/ ULA ACORN 9 INCH NECK  
Light Source: (6) 5000K CCT, 70 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

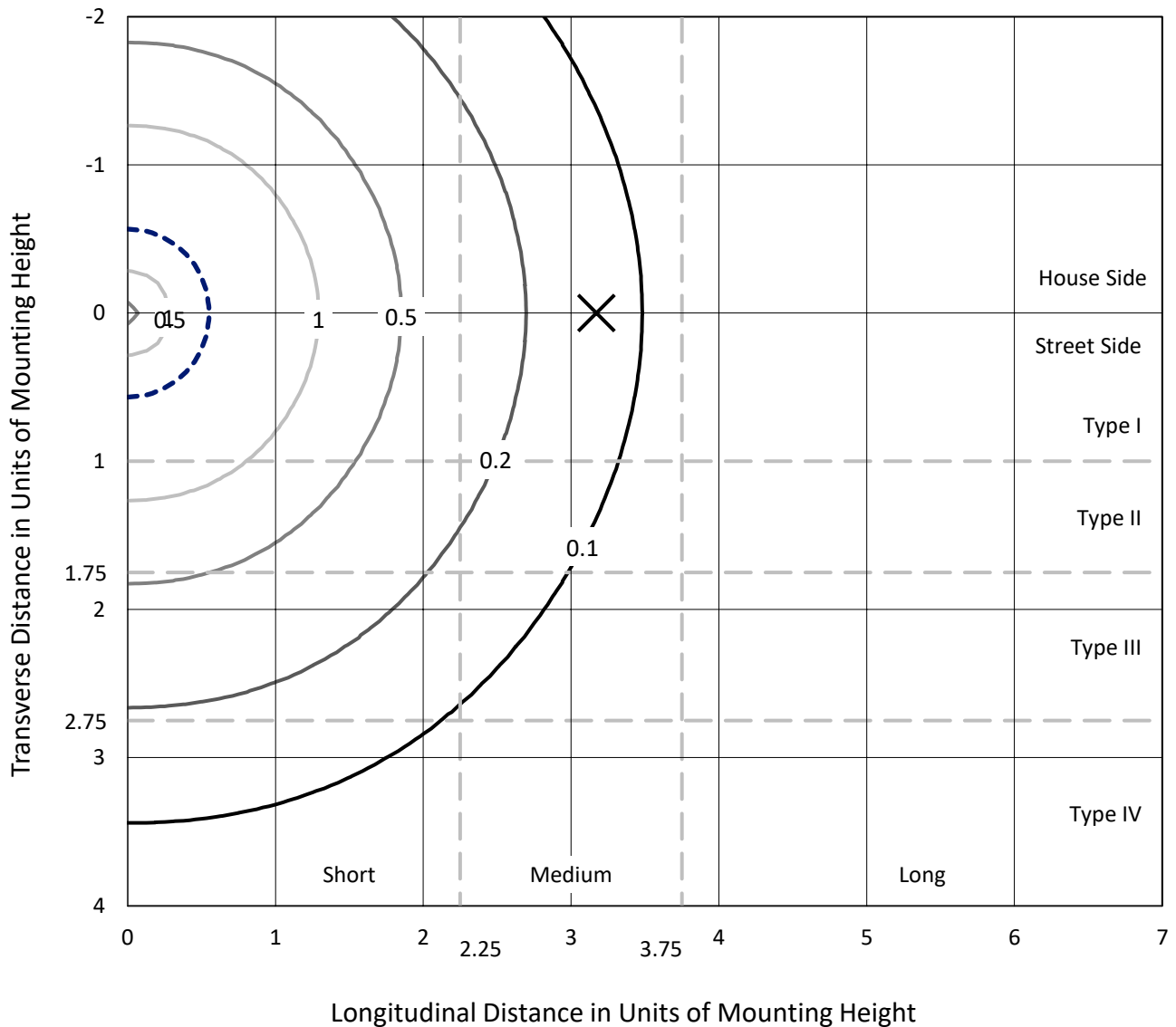
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 9449.7 lumens  
Efficiency: N/A  
Efficacy: 158.0 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

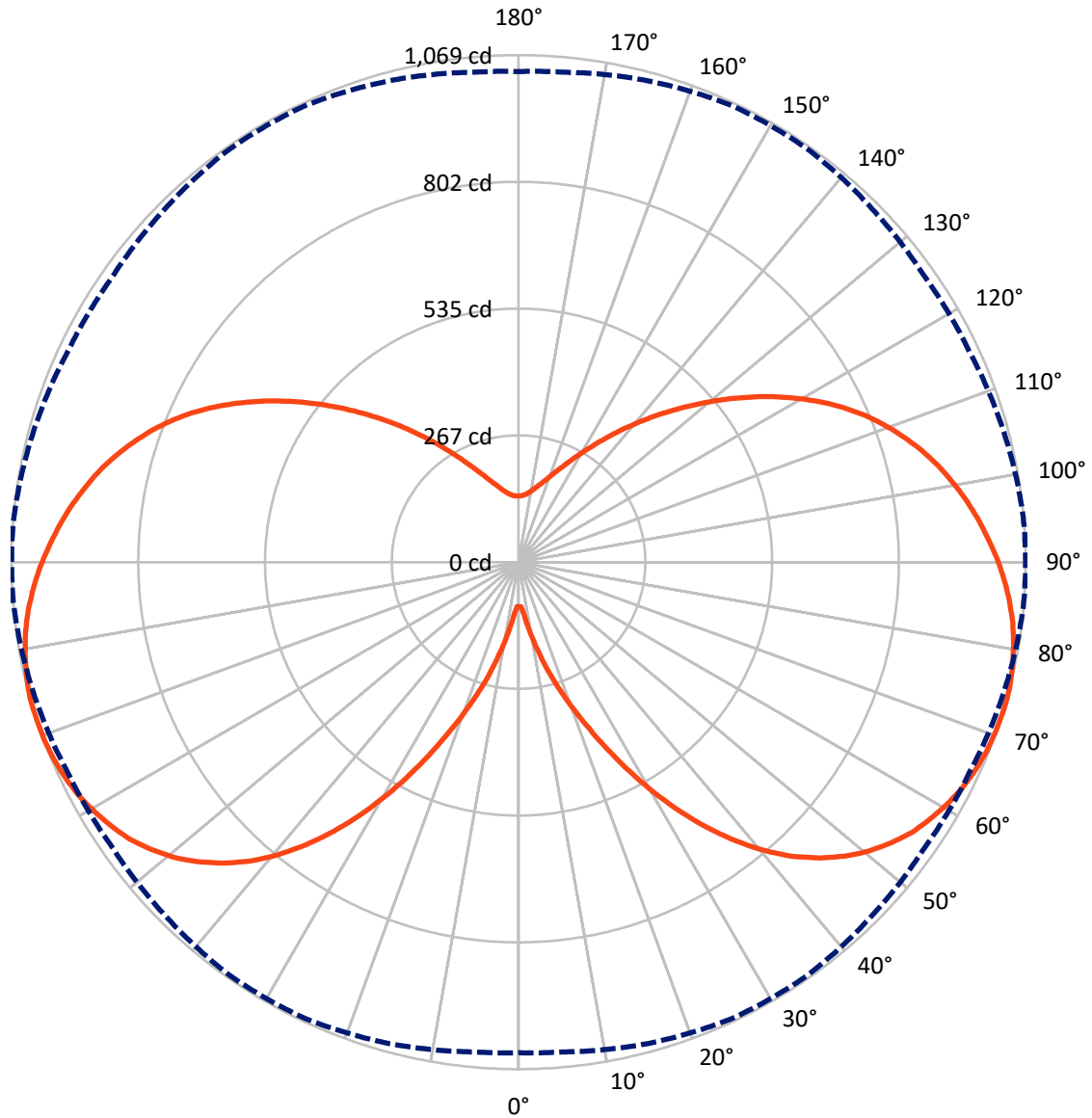
× Max cd  
 - - - 1/2 Max cd



Based on 15 foot mounting height. Maximum calculated value = 1.7 fc  
 Type V - Short - N/A

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### Luminous Intensity Polar Plot



— Vertical Plane Through 90-Deg Lateral    - - - Horizontal Cone Through 72.5-Deg Vertical

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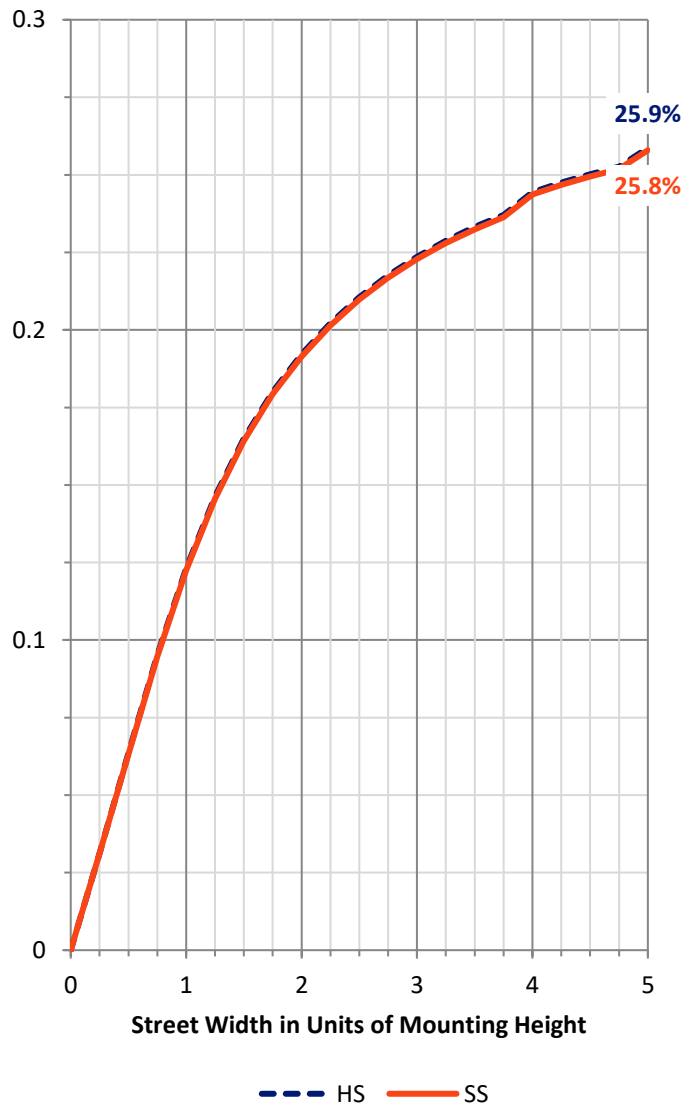
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 2767.7   | 1957.1 | 4724.9 |
|                    | % Fixture | 29.3     | 20.7   | 50.0   |
| <b>Street Side</b> | Lumens    | 2767.7   | 1957.1 | 4724.9 |
|                    | % Fixture | 29.3     | 20.7   | 50.0   |
| <b>Total</b>       | Lumens    | 5535.5   | 3914.3 | 9449.7 |
|                    | % Fixture | 58.6     | 41.4   | 100.0  |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 12.1   | 0.1       |
| 10°-20°   | 70.9   | 0.8       |
| 20°-30°   | 204.8  | 2.2       |
| 30°-40°   | 426.1  | 4.5       |
| 40°-50°   | 676.2  | 7.2       |
| 50°-60°   | 887.6  | 9.4       |
| 60°-70°   | 1035.0 | 11.0      |
| 70°-80°   | 1111.7 | 11.8      |
| 80°-90°   | 1111.1 | 11.8      |
| 90°-100°  | 1040.1 | 11.0      |
| 100°-110° | 912.6  | 9.7       |
| 110°-120° | 733.9  | 7.8       |
| 120°-130° | 527.1  | 5.6       |
| 130°-140° | 338.8  | 3.6       |
| 140°-150° | 196.6  | 2.1       |
| 150°-160° | 103.2  | 1.1       |
| 160°-170° | 48.1   | 0.5       |
| 170°-180° | 13.8   | 0.1       |
| 0°-90°    | 5535.5 | 58.6      |
| 0°-180°   | 9449.7 | 100.0     |

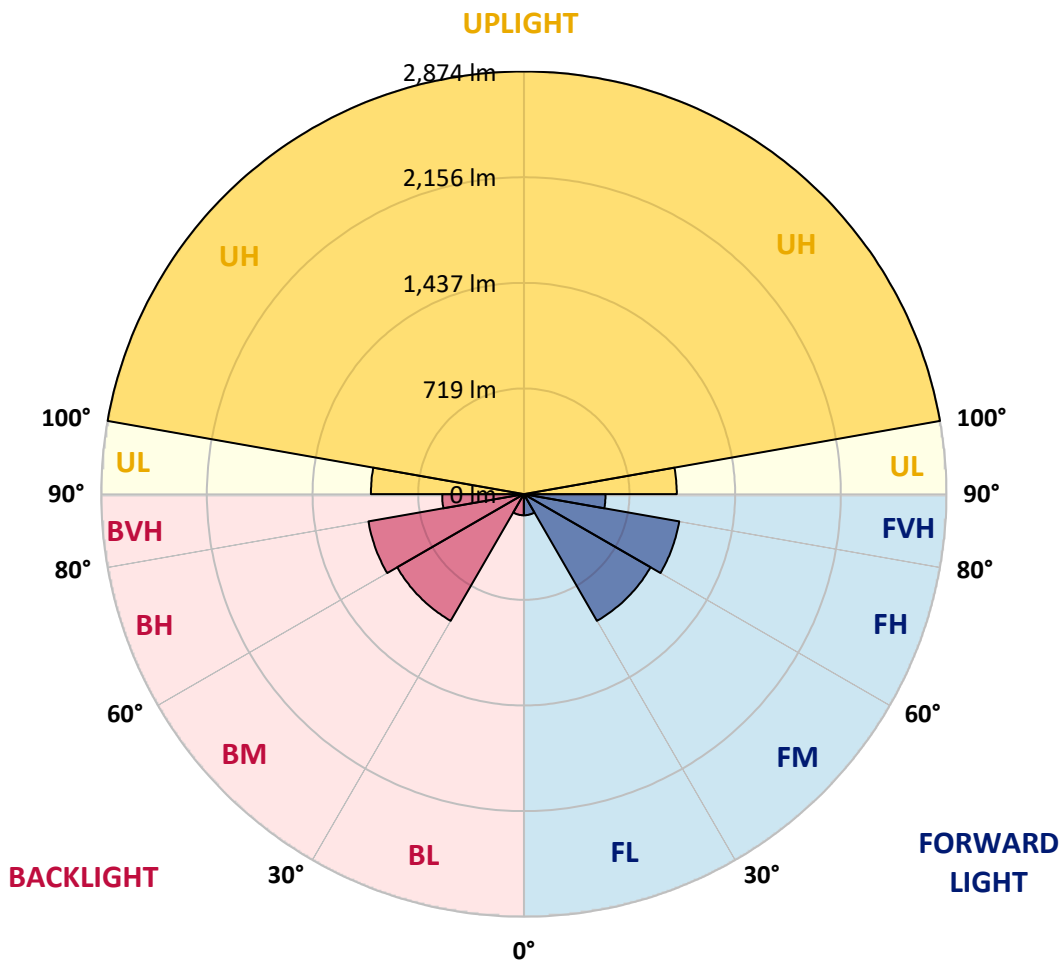


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**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone           | Lumens | % Fixture | Zone Rating/Lumen Limit |    |         |
|----------------|--------|-----------|-------------------------|----|---------|
|                |        |           | B                       | U  | G       |
| FL (0°-30°)    | 143.9  | 1.5       |                         |    |         |
| FM (30°-60°)   | 994.9  | 10.5      |                         |    |         |
| FH (60°-80°)   | 1073.3 | 11.4      |                         |    | G1/1800 |
| FVH (80°-90°)  | 555.6  | 5.9       |                         |    | G4/750  |
| BL (0°-30°)    | 143.9  | 1.5       | B1/500                  |    |         |
| BM (30°-60°)   | 994.9  | 10.5      | B1/1000                 |    |         |
| BH (60°-80°)   | 1073.3 | 11.4      | B3/2500                 |    | G1/1800 |
| BVH (80°-90°)  | 555.6  | 5.9       |                         |    | G4/750  |
| UL (90°-100°)  | 1040.1 | 11.0      |                         | U5 |         |
| UH (100°-180°) | 2874.2 | 30.4      |                         | 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°     | 93.7   | 93.7   | 93.7   | 93.7   | 93.7   | 93.7   | 93.7   | 93.7   | 93.7   | 93.7   | 93.7   |
| 2.5°   | 97.3   | 97.3   | 96.7   | 96.7   | 96.1   | 95.5   | 95.5   | 94.9   | 94.3   | 94.3   | 94.3   |
| 5°     | 108.3  | 107.7  | 107.7  | 107.7  | 107.7  | 107.1  | 107.7  | 107.1  | 107.1  | 107.1  | 107.7  |
| 7.5°   | 132.0  | 131.4  | 131.4  | 131.4  | 132.0  | 132.0  | 132.6  | 133.2  | 133.8  | 133.8  | 133.8  |
| 10°    | 163.0  | 162.4  | 162.4  | 161.8  | 163.0  | 163.0  | 163.6  | 162.4  | 164.2  | 164.2  | 164.8  |
| 12.5°  | 199.5  | 198.9  | 198.9  | 198.3  | 199.5  | 198.9  | 200.1  | 198.9  | 201.9  | 200.7  | 200.7  |
| 15°    | 239.0  | 239.0  | 238.4  | 237.8  | 239.7  | 239.7  | 240.9  | 240.9  | 242.7  | 241.5  | 242.1  |
| 17.5°  | 281.0  | 280.4  | 280.4  | 279.8  | 281.6  | 281.6  | 281.6  | 282.8  | 285.3  | 282.8  | 284.7  |
| 20°    | 326.0  | 325.4  | 325.4  | 324.8  | 326.6  | 326.6  | 327.9  | 328.5  | 330.9  | 329.1  | 330.3  |
| 22.5°  | 374.7  | 374.1  | 374.1  | 374.1  | 376.5  | 377.1  | 377.1  | 378.9  | 382.0  | 378.9  | 381.4  |
| 25°    | 428.8  | 428.2  | 428.2  | 430.0  | 431.9  | 432.5  | 433.7  | 436.1  | 439.2  | 436.1  | 439.2  |
| 27.5°  | 486.6  | 486.0  | 487.2  | 489.7  | 491.5  | 492.7  | 494.5  | 495.1  | 499.4  | 496.3  | 500.6  |
| 30°    | 546.2  | 545.6  | 546.8  | 549.9  | 552.3  | 556.0  | 556.0  | 557.8  | 563.9  | 559.6  | 563.9  |
| 32.5°  | 605.2  | 604.6  | 606.4  | 610.1  | 613.7  | 617.4  | 618.0  | 620.4  | 626.5  | 623.5  | 627.7  |
| 35°    | 663.6  | 663.0  | 665.4  | 670.3  | 674.0  | 677.6  | 678.8  | 681.3  | 687.9  | 684.9  | 689.2  |
| 37.5°  | 719.0  | 719.0  | 721.4  | 726.9  | 731.1  | 736.0  | 735.4  | 738.4  | 744.5  | 742.7  | 746.9  |
| 40°    | 770.7  | 770.7  | 773.7  | 780.4  | 785.3  | 788.3  | 787.7  | 790.7  | 797.4  | 796.8  | 800.5  |
| 42.5°  | 817.5  | 817.5  | 821.8  | 828.5  | 833.3  | 835.1  | 835.1  | 838.2  | 845.5  | 844.9  | 848.5  |
| 45°    | 857.0  | 858.9  | 863.7  | 871.0  | 875.3  | 877.1  | 875.9  | 878.9  | 886.8  | 886.8  | 889.9  |
| 47.5°  | 893.5  | 896.0  | 900.8  | 908.1  | 911.2  | 913.0  | 911.8  | 914.2  | 922.1  | 923.3  | 926.4  |
| 50°    | 925.2  | 927.0  | 933.1  | 941.0  | 944.0  | 944.0  | 942.2  | 944.6  | 953.1  | 955.6  | 958.0  |
| 52.5°  | 952.5  | 954.4  | 961.1  | 969.6  | 971.4  | 970.8  | 968.4  | 970.8  | 979.3  | 981.7  | 983.6  |
| 55°    | 974.4  | 976.3  | 984.2  | 992.7  | 994.5  | 992.7  | 989.0  | 992.1  | 1000.0 | 1003.6 | 1006.7 |
| 57.5°  | 992.1  | 993.9  | 1003.0 | 1011.5 | 1013.4 | 1009.7 | 1005.5 | 1008.5 | 1017.6 | 1021.9 | 1023.1 |
| 60°    | 1006.7 | 1008.5 | 1018.2 | 1027.4 | 1028.6 | 1024.3 | 1019.4 | 1022.5 | 1031.6 | 1036.5 | 1037.7 |
| 62.5°  | 1018.2 | 1020.1 | 1030.4 | 1040.7 | 1041.3 | 1035.9 | 1030.4 | 1033.4 | 1042.6 | 1048.0 | 1049.9 |
| 65°    | 1026.1 | 1028.0 | 1039.5 | 1049.9 | 1051.1 | 1044.4 | 1038.9 | 1042.0 | 1050.5 | 1057.2 | 1058.4 |
| 67.5°  | 1031.6 | 1033.4 | 1046.2 | 1057.2 | 1057.8 | 1050.5 | 1044.4 | 1046.8 | 1056.6 | 1063.2 | 1064.5 |
| 70°    | 1034.0 | 1035.9 | 1049.3 | 1060.8 | 1061.4 | 1053.5 | 1046.2 | 1049.3 | 1059.0 | 1066.9 | 1068.1 |
| 72.5°  | 1034.7 | 1037.1 | 1051.1 | 1062.6 | 1063.2 | 1054.1 | 1046.8 | 1049.3 | 1059.6 | 1068.7 | 1069.3 |
| 75°    | 1032.2 | 1035.3 | 1049.9 | 1062.0 | 1062.0 | 1051.7 | 1043.8 | 1046.2 | 1057.8 | 1067.5 | 1069.3 |
| 77.5°  | 1029.2 | 1031.0 | 1046.2 | 1058.4 | 1057.8 | 1046.8 | 1037.7 | 1041.3 | 1052.9 | 1063.9 | 1065.1 |
| 80°    | 1022.5 | 1024.9 | 1040.1 | 1051.7 | 1050.5 | 1038.3 | 1029.8 | 1033.4 | 1045.6 | 1057.2 | 1058.4 |
| 82.5°  | 1014.0 | 1016.4 | 1031.6 | 1042.0 | 1040.7 | 1028.0 | 1019.4 | 1023.7 | 1036.5 | 1048.6 | 1049.9 |
| 85°    | 1003.6 | 1006.1 | 1020.7 | 1030.4 | 1028.6 | 1015.8 | 1007.3 | 1010.9 | 1024.9 | 1037.1 | 1038.3 |
| 87.5°  | 990.3  | 992.7  | 1007.3 | 1015.8 | 1014.0 | 1000.6 | 993.3  | 998.2  | 1010.9 | 1023.7 | 1024.3 |
| 90°    | 975.0  | 978.1  | 990.9  | 998.8  | 996.3  | 984.2  | 977.5  | 982.3  | 995.1  | 1007.3 | 1008.5 |
| 92.5°  | 959.8  | 961.1  | 973.2  | 979.9  | 978.1  | 967.1  | 961.1  | 966.5  | 978.1  | 990.3  | 990.3  |
| 95°    | 941.6  | 943.4  | 954.4  | 959.8  | 958.0  | 948.9  | 943.4  | 949.5  | 959.8  | 971.4  | 972.0  |
| 97.5°  | 922.1  | 924.0  | 933.1  | 938.6  | 936.7  | 928.8  | 925.2  | 931.3  | 940.4  | 951.3  | 951.9  |
| 100°   | 901.4  | 902.7  | 910.6  | 915.4  | 913.6  | 907.5  | 905.1  | 911.2  | 919.7  | 930.0  | 930.0  |
| 102.5° | 878.3  | 879.5  | 885.6  | 888.7  | 888.1  | 883.2  | 883.2  | 889.9  | 896.6  | 906.3  | 907.5  |
| 105°   | 854.0  | 855.2  | 859.5  | 861.3  | 860.7  | 858.9  | 860.1  | 866.8  | 872.2  | 880.8  | 882.0  |
| 107.5° | 826.6  | 827.8  | 830.3  | 830.9  | 830.9  | 830.9  | 835.1  | 841.2  | 847.3  | 853.4  | 854.0  |
| 110°   | 797.4  | 798.0  | 799.9  | 799.3  | 799.3  | 800.5  | 806.6  | 813.2  | 818.1  | 824.2  | 824.8  |



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 CATALOG NUMBER: FFX-CLB-60-750-U-VM9

**CANDELA DISTRIBUTION (continued):**

|        | 0°    | 5°    | 15°   | 25°   | 35°   | 45°   | 55°   | 65°   | 75°   | 85°   | 90°   |
|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 112.5° | 765.8 | 766.4 | 767.6 | 765.2 | 765.8 | 768.2 | 776.1 | 783.4 | 786.5 | 792.6 | 792.6 |
| 115°   | 732.3 | 731.7 | 733.0 | 729.9 | 729.3 | 733.6 | 742.1 | 750.6 | 753.0 | 757.3 | 757.9 |
| 117.5° | 695.9 | 696.5 | 695.9 | 692.2 | 691.6 | 697.7 | 705.6 | 713.5 | 716.5 | 721.4 | 720.2 |
| 120°   | 658.1 | 657.5 | 658.1 | 653.9 | 653.3 | 660.0 | 667.9 | 675.8 | 677.6 | 681.9 | 680.6 |
| 122.5° | 619.8 | 619.2 | 618.6 | 614.3 | 614.3 | 619.8 | 629.6 | 637.5 | 636.2 | 641.1 | 640.5 |
| 125°   | 580.3 | 580.3 | 579.1 | 574.8 | 574.8 | 581.5 | 589.4 | 596.7 | 595.5 | 601.0 | 599.1 |
| 127.5° | 541.4 | 541.4 | 540.1 | 536.5 | 536.5 | 542.6 | 549.9 | 557.2 | 555.3 | 560.2 | 558.4 |
| 130°   | 503.0 | 503.0 | 501.8 | 498.2 | 498.2 | 503.0 | 510.9 | 517.0 | 514.6 | 518.8 | 518.2 |
| 132.5° | 466.5 | 465.9 | 465.3 | 461.7 | 462.3 | 467.1 | 473.2 | 478.7 | 476.3 | 481.1 | 479.3 |
| 135°   | 431.3 | 430.7 | 430.0 | 426.4 | 427.0 | 431.9 | 437.3 | 441.6 | 439.8 | 442.8 | 442.2 |
| 137.5° | 397.8 | 397.2 | 396.6 | 393.5 | 394.2 | 397.8 | 403.3 | 406.9 | 404.5 | 408.8 | 406.9 |
| 140°   | 366.2 | 365.6 | 364.3 | 362.5 | 363.1 | 366.8 | 369.8 | 374.1 | 371.6 | 375.3 | 373.5 |
| 142.5° | 335.8 | 335.8 | 334.5 | 332.7 | 333.3 | 337.0 | 339.4 | 342.5 | 340.0 | 343.1 | 341.8 |
| 145°   | 307.8 | 307.8 | 306.6 | 305.3 | 305.3 | 308.4 | 310.2 | 313.3 | 310.8 | 313.9 | 312.6 |
| 147.5° | 282.2 | 282.2 | 281.0 | 279.8 | 279.8 | 282.8 | 284.1 | 286.5 | 284.1 | 286.5 | 285.3 |
| 150°   | 258.5 | 258.5 | 257.9 | 256.7 | 257.3 | 258.5 | 259.7 | 261.6 | 259.7 | 261.6 | 260.9 |
| 152.5° | 237.8 | 237.8 | 237.2 | 236.6 | 236.0 | 237.8 | 238.4 | 240.3 | 238.4 | 240.3 | 239.0 |
| 155°   | 219.6 | 219.0 | 219.0 | 217.8 | 217.8 | 219.0 | 219.6 | 220.8 | 219.0 | 220.8 | 220.2 |
| 157.5° | 203.2 | 203.2 | 202.6 | 201.9 | 201.9 | 202.6 | 203.2 | 203.8 | 202.6 | 204.4 | 203.2 |
| 160°   | 189.2 | 189.2 | 188.6 | 188.0 | 188.0 | 188.6 | 188.6 | 189.2 | 188.0 | 189.2 | 188.6 |
| 162.5° | 177.0 | 177.0 | 176.4 | 176.4 | 175.8 | 176.4 | 177.0 | 177.0 | 176.4 | 177.0 | 176.4 |
| 165°   | 167.3 | 167.3 | 166.7 | 166.1 | 166.1 | 166.7 | 166.7 | 167.3 | 166.1 | 166.7 | 166.7 |
| 167.5° | 158.1 | 158.1 | 158.1 | 157.5 | 156.9 | 157.5 | 157.5 | 157.5 | 156.9 | 157.5 | 157.5 |
| 170°   | 151.5 | 151.5 | 151.5 | 150.8 | 150.2 | 150.8 | 150.8 | 150.8 | 150.2 | 150.8 | 150.8 |
| 172.5° | 146.0 | 146.0 | 146.0 | 145.4 | 145.4 | 145.4 | 145.4 | 145.4 | 145.4 | 145.4 | 145.4 |
| 175°   | 142.3 | 142.3 | 142.3 | 142.3 | 141.7 | 142.3 | 142.3 | 142.3 | 142.3 | 142.3 | 141.7 |
| 177.5° | 140.5 | 139.9 | 139.9 | 139.9 | 139.9 | 139.9 | 139.9 | 139.9 | 139.9 | 139.9 | 139.9 |
| 180°   | 139.3 | 139.3 | 139.3 | 139.3 | 139.3 | 139.3 | 139.3 | 139.3 | 139.3 | 139.3 | 139.3 |



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: SP1-2406-133-5

Test Date: 07/12/2024

Luminaire Tested: FFX-CLB-100-750-U-FR-T5

Data in this report applies to families of products including FFX-CLB-100-750-U-FR-T5.

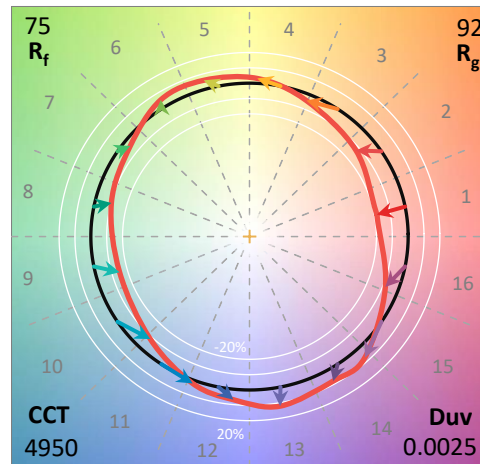
**Test Information**

Test Method: LM-79-2019  
 Report Number: SP1-2406-133-5  
 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-100-750-U-FR-T5**  
 Description: FAIRFAX ACORN W/ FAIRFAX REFRACTOR 100W T5

**Spectral Parameters**

CCT (K): 4950  
 CIE u': 0.2102  
 CIE v': 0.4882  
 Duv: 0.0025  
 CIE x: 0.3471  
 CIE y: 0.3583  
 CIE z: 0.2946  
 Peak Wavelength (nm): 452  
 Dominant Wavelength (nm): 571  
 Purity: 11.64963  
 Rf: 74.8  
 Rg: 92.4

|           |      |      |       |
|-----------|------|------|-------|
| CRI (Ra): | 73.0 |      |       |
| R1:       | 69.1 | R9:  | -35.4 |
| R2:       | 80.1 | R10: | 51.9  |
| R3:       | 87.3 | R11: | 66.1  |
| R4:       | 70.6 | R12: | 40.1  |
| R5:       | 69.4 | R13: | 71.5  |
| R6:       | 71.2 | R14: | 93.0  |
| R7:       | 82.5 | R15: | 62.2  |
| R8:       | 53.6 |      |       |



**Test Conditions**

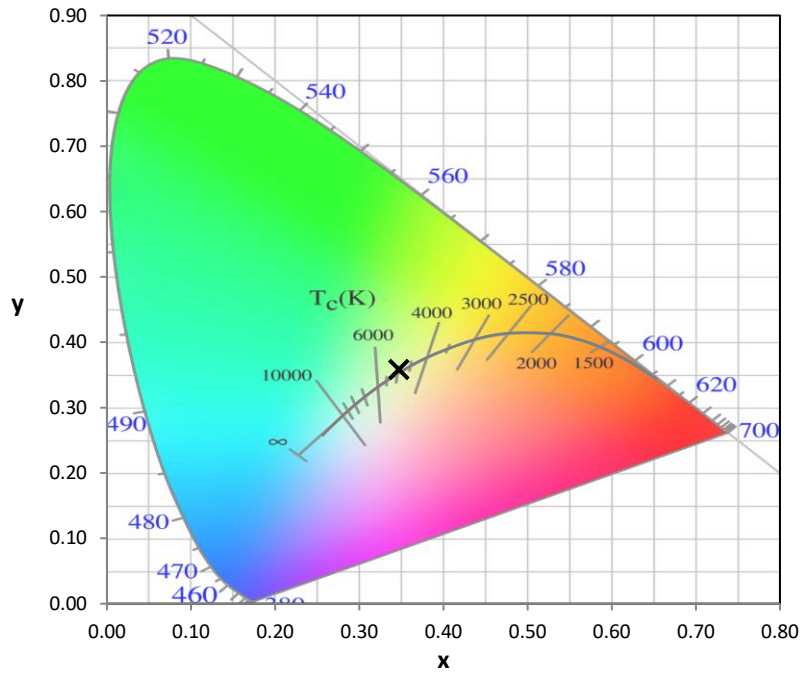
Stabilization Time: 0.803355M  
 Operation Time: 1H  
 Sphere Temperature (°C): 24.7

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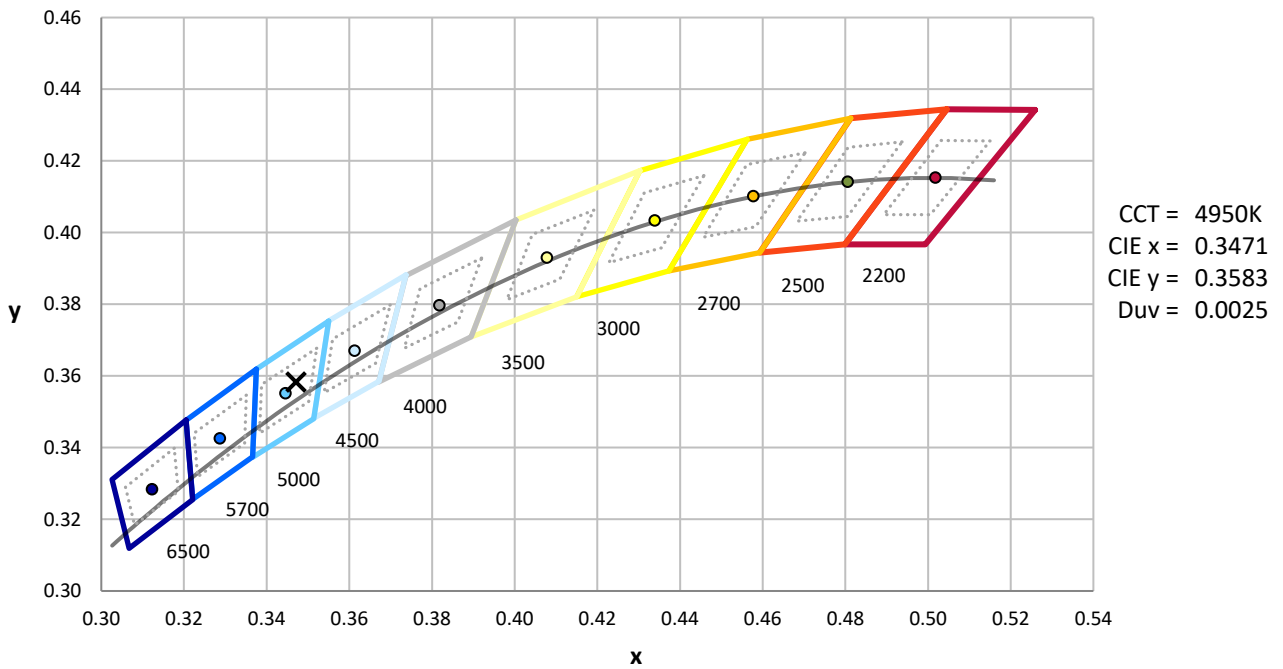
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| 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



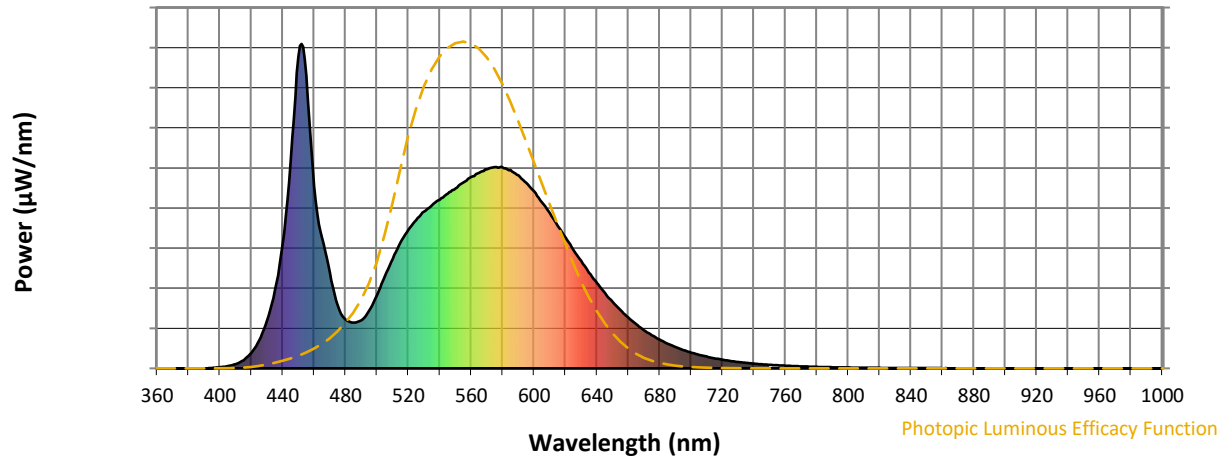
CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies inside the ANSI 5000K 4-step quadrangle

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**Photopic Flux vs. Wavelength**

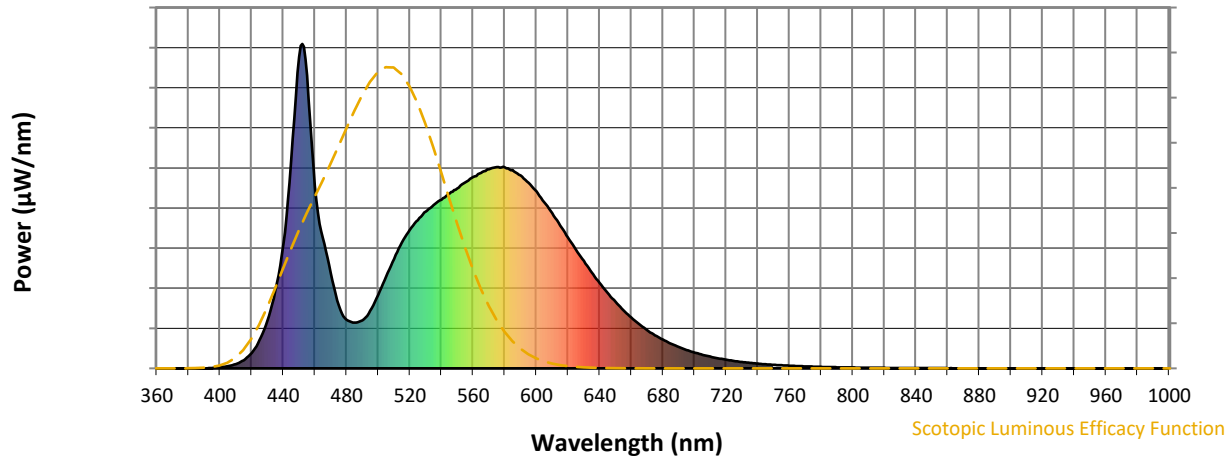


**Photopic Lumens: NR**

| 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    | 148                      | NR            | 620    | 403                      | NR            | 750    | 11                       | NR            | 880    | 0                        | NR            |
| 365    | 0                        | NR            | 495    | 178                      | NR            | 625    | 366                      | NR            | 755    | 9                        | NR            | 885    | 0                        | NR            |
| 370    | 0                        | NR            | 500    | 226                      | NR            | 630    | 331                      | NR            | 760    | 8                        | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 283                      | NR            | 635    | 295                      | NR            | 765    | 7                        | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 338                      | NR            | 640    | 263                      | NR            | 770    | 6                        | NR            | 900    | 0                        | NR            |
| 385    | 0                        | NR            | 515    | 387                      | NR            | 645    | 232                      | NR            | 775    | 5                        | NR            | 905    | 0                        | NR            |
| 390    | 0                        | NR            | 520    | 428                      | NR            | 650    | 205                      | NR            | 780    | 5                        | NR            | 910    | 0                        | NR            |
| 395    | 1                        | NR            | 525    | 457                      | NR            | 655    | 179                      | NR            | 785    | 4                        | NR            | 915    | 0                        | NR            |
| 400    | 4                        | NR            | 530    | 484                      | NR            | 660    | 156                      | NR            | 790    | 3                        | NR            | 920    | 0                        | NR            |
| 405    | 7                        | NR            | 535    | 503                      | NR            | 665    | 136                      | NR            | 795    | 3                        | NR            | 925    | 0                        | NR            |
| 410    | 13                       | NR            | 540    | 520                      | NR            | 670    | 118                      | NR            | 800    | 3                        | NR            | 930    | 0                        | NR            |
| 415    | 25                       | NR            | 545    | 538                      | NR            | 675    | 102                      | NR            | 805    | 2                        | NR            | 935    | 0                        | NR            |
| 420    | 48                       | NR            | 550    | 555                      | NR            | 680    | 89                       | NR            | 810    | 2                        | NR            | 940    | 0                        | NR            |
| 425    | 87                       | NR            | 555    | 573                      | NR            | 685    | 76                       | NR            | 815    | 2                        | NR            | 945    | 0                        | NR            |
| 430    | 147                      | NR            | 560    | 590                      | NR            | 690    | 66                       | NR            | 820    | 2                        | NR            | 950    | 0                        | NR            |
| 435    | 242                      | NR            | 565    | 603                      | NR            | 695    | 56                       | NR            | 825    | 1                        | NR            | 955    | 0                        | NR            |
| 440    | 384                      | NR            | 570    | 614                      | NR            | 700    | 49                       | NR            | 830    | 1                        | NR            | 960    | 0                        | NR            |
| 445    | 638                      | NR            | 575    | 621                      | NR            | 705    | 42                       | NR            | 835    | 1                        | NR            | 965    | 0                        | NR            |
| 450    | 960                      | NR            | 580    | 619                      | NR            | 710    | 36                       | NR            | 840    | 1                        | NR            | 970    | 0                        | NR            |
| 455    | 902                      | NR            | 585    | 611                      | NR            | 715    | 31                       | NR            | 845    | 1                        | NR            | 975    | 0                        | NR            |
| 460    | 564                      | NR            | 590    | 594                      | NR            | 720    | 27                       | NR            | 850    | 1                        | NR            | 980    | 0                        | NR            |
| 465    | 402                      | NR            | 595    | 572                      | NR            | 725    | 23                       | NR            | 855    | 1                        | NR            | 985    | 0                        | NR            |
| 470    | 293                      | NR            | 600    | 546                      | NR            | 730    | 20                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 194                      | NR            | 605    | 511                      | NR            | 735    | 17                       | NR            | 865    | 0                        | NR            | 995    | 0                        | NR            |
| 480    | 150                      | NR            | 610    | 478                      | NR            | 740    | 14                       | NR            | 870    | 0                        | NR            | 1000   | 0                        | NR            |
| 485    | 141                      | NR            | 615    | 440                      | NR            | 745    | 13                       | NR            | 875    | 0                        | NR            |        |                          |               |

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**Scotopic Flux vs. Wavelength**



**Scotopic Lumens: NR**

**S/P: 1.8**

| 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    | 148                      | NR            | 620    | 403                      | NR            | 750    | 11                       | NR            | 880    | 0                        | NR            |
| 365    | 0                        | NR            | 495    | 178                      | NR            | 625    | 366                      | NR            | 755    | 9                        | NR            | 885    | 0                        | NR            |
| 370    | 0                        | NR            | 500    | 226                      | NR            | 630    | 331                      | NR            | 760    | 8                        | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 283                      | NR            | 635    | 295                      | NR            | 765    | 7                        | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 338                      | NR            | 640    | 263                      | NR            | 770    | 6                        | NR            | 900    | 0                        | NR            |
| 385    | 0                        | NR            | 515    | 387                      | NR            | 645    | 232                      | NR            | 775    | 5                        | NR            | 905    | 0                        | NR            |
| 390    | 0                        | NR            | 520    | 428                      | NR            | 650    | 205                      | NR            | 780    | 5                        | NR            | 910    | 0                        | NR            |
| 395    | 1                        | NR            | 525    | 457                      | NR            | 655    | 179                      | NR            | 785    | 4                        | NR            | 915    | 0                        | NR            |
| 400    | 4                        | NR            | 530    | 484                      | NR            | 660    | 156                      | NR            | 790    | 3                        | NR            | 920    | 0                        | NR            |
| 405    | 7                        | NR            | 535    | 503                      | NR            | 665    | 136                      | NR            | 795    | 3                        | NR            | 925    | 0                        | NR            |
| 410    | 13                       | NR            | 540    | 520                      | NR            | 670    | 118                      | NR            | 800    | 3                        | NR            | 930    | 0                        | NR            |
| 415    | 25                       | NR            | 545    | 538                      | NR            | 675    | 102                      | NR            | 805    | 2                        | NR            | 935    | 0                        | NR            |
| 420    | 48                       | NR            | 550    | 555                      | NR            | 680    | 89                       | NR            | 810    | 2                        | NR            | 940    | 0                        | NR            |
| 425    | 87                       | NR            | 555    | 573                      | NR            | 685    | 76                       | NR            | 815    | 2                        | NR            | 945    | 0                        | NR            |
| 430    | 147                      | NR            | 560    | 590                      | NR            | 690    | 66                       | NR            | 820    | 2                        | NR            | 950    | 0                        | NR            |
| 435    | 242                      | NR            | 565    | 603                      | NR            | 695    | 56                       | NR            | 825    | 1                        | NR            | 955    | 0                        | NR            |
| 440    | 384                      | NR            | 570    | 614                      | NR            | 700    | 49                       | NR            | 830    | 1                        | NR            | 960    | 0                        | NR            |
| 445    | 638                      | NR            | 575    | 621                      | NR            | 705    | 42                       | NR            | 835    | 1                        | NR            | 965    | 0                        | NR            |
| 450    | 960                      | NR            | 580    | 619                      | NR            | 710    | 36                       | NR            | 840    | 1                        | NR            | 970    | 0                        | NR            |
| 455    | 902                      | NR            | 585    | 611                      | NR            | 715    | 31                       | NR            | 845    | 1                        | NR            | 975    | 0                        | NR            |
| 460    | 564                      | NR            | 590    | 594                      | NR            | 720    | 27                       | NR            | 850    | 1                        | NR            | 980    | 0                        | NR            |
| 465    | 402                      | NR            | 595    | 572                      | NR            | 725    | 23                       | NR            | 855    | 1                        | NR            | 985    | 0                        | NR            |
| 470    | 293                      | NR            | 600    | 546                      | NR            | 730    | 20                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 194                      | NR            | 605    | 511                      | NR            | 735    | 17                       | NR            | 865    | 0                        | NR            | 995    | 0                        | NR            |
| 480    | 150                      | NR            | 610    | 478                      | NR            | 740    | 14                       | NR            | 870    | 0                        | NR            | 1000   | 0                        | NR            |
| 485    | 141                      | NR            | 615    | 440                      | NR            | 745    | 13                       | NR            | 875    | 0                        | NR            |        |                          |               |

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Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 3.74

| 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    | 148                      | NR            | 620    | 403                      | NR            | 750    | 11                       | NR            | 880    | 0                        | NR            |
| 365    | 0                        | NR            | 495    | 178                      | NR            | 625    | 366                      | NR            | 755    | 9                        | NR            | 885    | 0                        | NR            |
| 370    | 0                        | NR            | 500    | 226                      | NR            | 630    | 331                      | NR            | 760    | 8                        | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 283                      | NR            | 635    | 295                      | NR            | 765    | 7                        | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 338                      | NR            | 640    | 263                      | NR            | 770    | 6                        | NR            | 900    | 0                        | NR            |
| 385    | 0                        | NR            | 515    | 387                      | NR            | 645    | 232                      | NR            | 775    | 5                        | NR            | 905    | 0                        | NR            |
| 390    | 0                        | NR            | 520    | 428                      | NR            | 650    | 205                      | NR            | 780    | 5                        | NR            | 910    | 0                        | NR            |
| 395    | 1                        | NR            | 525    | 457                      | NR            | 655    | 179                      | NR            | 785    | 4                        | NR            | 915    | 0                        | NR            |
| 400    | 4                        | NR            | 530    | 484                      | NR            | 660    | 156                      | NR            | 790    | 3                        | NR            | 920    | 0                        | NR            |
| 405    | 7                        | NR            | 535    | 503                      | NR            | 665    | 136                      | NR            | 795    | 3                        | NR            | 925    | 0                        | NR            |
| 410    | 13                       | NR            | 540    | 520                      | NR            | 670    | 118                      | NR            | 800    | 3                        | NR            | 930    | 0                        | NR            |
| 415    | 25                       | NR            | 545    | 538                      | NR            | 675    | 102                      | NR            | 805    | 2                        | NR            | 935    | 0                        | NR            |
| 420    | 48                       | NR            | 550    | 555                      | NR            | 680    | 89                       | NR            | 810    | 2                        | NR            | 940    | 0                        | NR            |
| 425    | 87                       | NR            | 555    | 573                      | NR            | 685    | 76                       | NR            | 815    | 2                        | NR            | 945    | 0                        | NR            |
| 430    | 147                      | NR            | 560    | 590                      | NR            | 690    | 66                       | NR            | 820    | 2                        | NR            | 950    | 0                        | NR            |
| 435    | 242                      | NR            | 565    | 603                      | NR            | 695    | 56                       | NR            | 825    | 1                        | NR            | 955    | 0                        | NR            |
| 440    | 384                      | NR            | 570    | 614                      | NR            | 700    | 49                       | NR            | 830    | 1                        | NR            | 960    | 0                        | NR            |
| 445    | 638                      | NR            | 575    | 621                      | NR            | 705    | 42                       | NR            | 835    | 1                        | NR            | 965    | 0                        | NR            |
| 450    | 960                      | NR            | 580    | 619                      | NR            | 710    | 36                       | NR            | 840    | 1                        | NR            | 970    | 0                        | NR            |
| 455    | 902                      | NR            | 585    | 611                      | NR            | 715    | 31                       | NR            | 845    | 1                        | NR            | 975    | 0                        | NR            |
| 460    | 564                      | NR            | 590    | 594                      | NR            | 720    | 27                       | NR            | 850    | 1                        | NR            | 980    | 0                        | NR            |
| 465    | 402                      | NR            | 595    | 572                      | NR            | 725    | 23                       | NR            | 855    | 1                        | NR            | 985    | 0                        | NR            |
| 470    | 293                      | NR            | 600    | 546                      | NR            | 730    | 20                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 194                      | NR            | 605    | 511                      | NR            | 735    | 17                       | NR            | 865    | 0                        | NR            | 995    | 0                        | NR            |
| 480    | 150                      | NR            | 610    | 478                      | NR            | 740    | 14                       | NR            | 870    | 0                        | NR            | 1000   | 0                        | NR            |
| 485    | 141                      | NR            | 615    | 440                      | NR            | 745    | 13                       | NR            | 875    | 0                        | NR            |        |                          |               |

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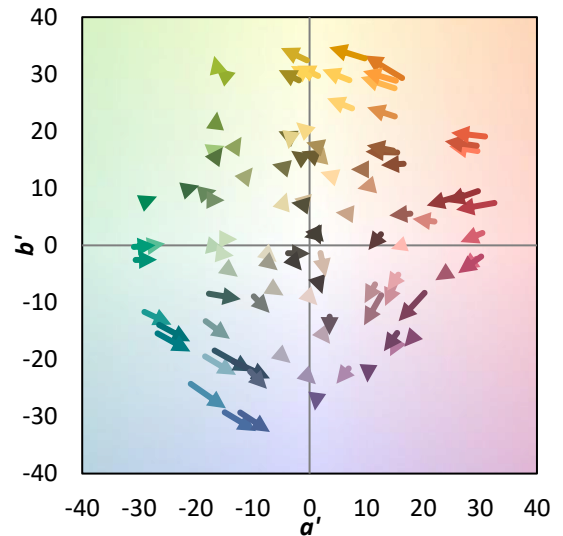
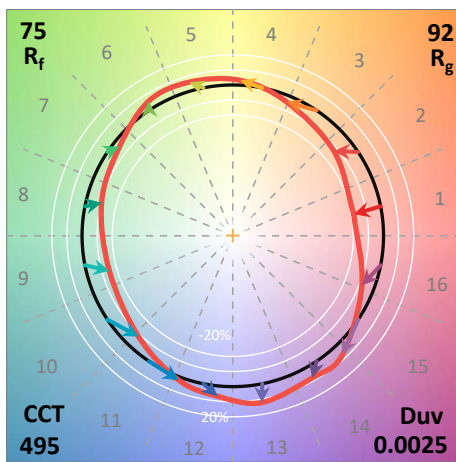
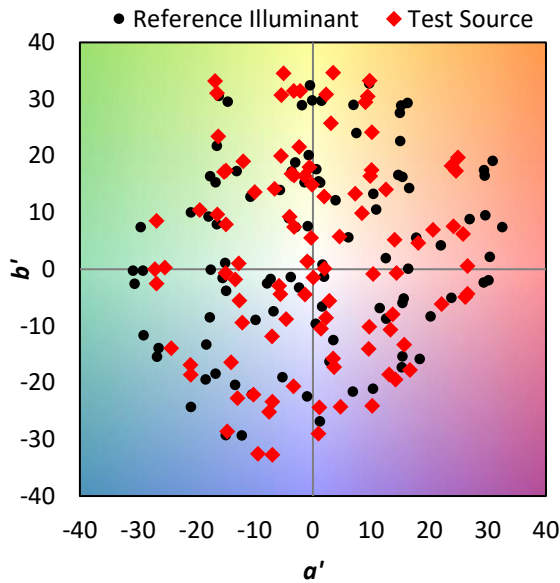
TM-30-18

**Summary**

$R_f = 74.8$   
 $R_g = 92.4$   
 CIE  $R_a = 73.0$   
 $R_9 = -35.4$



**Color Vector Graphics**



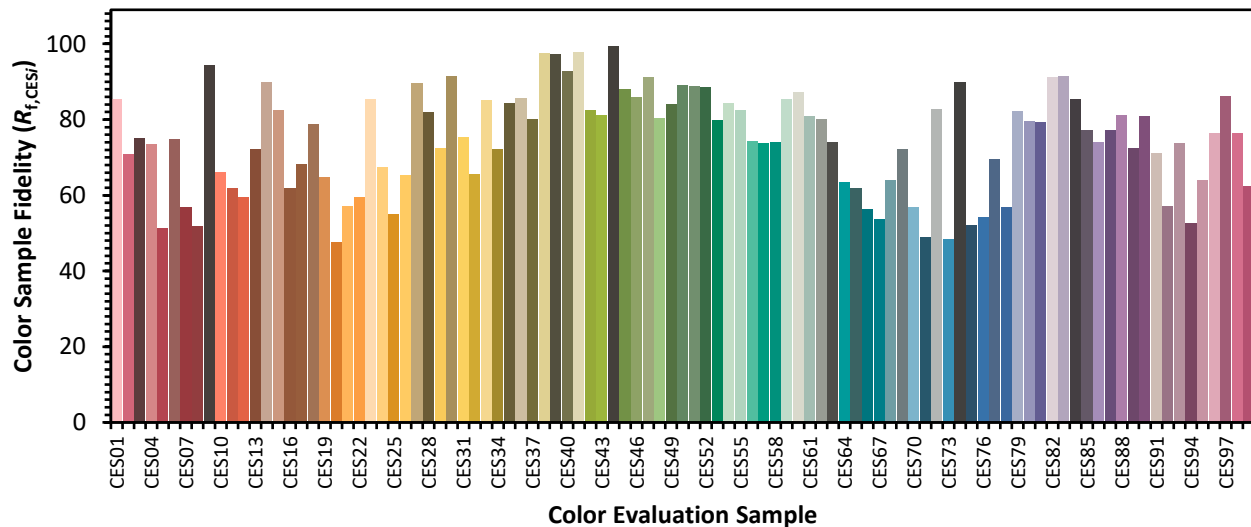


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**Individual Sample Fidelity Index ( $R_{f,i}$ )**

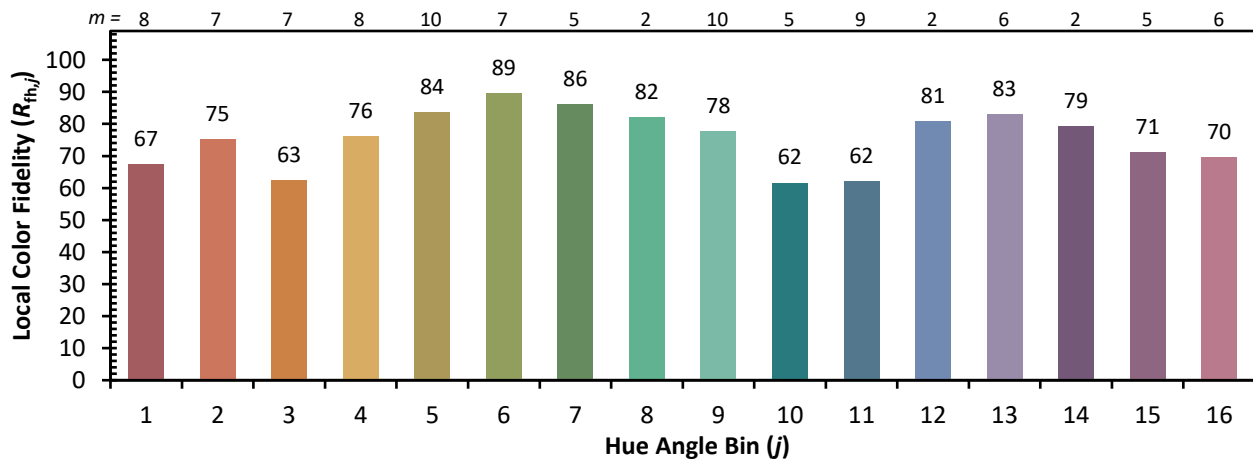
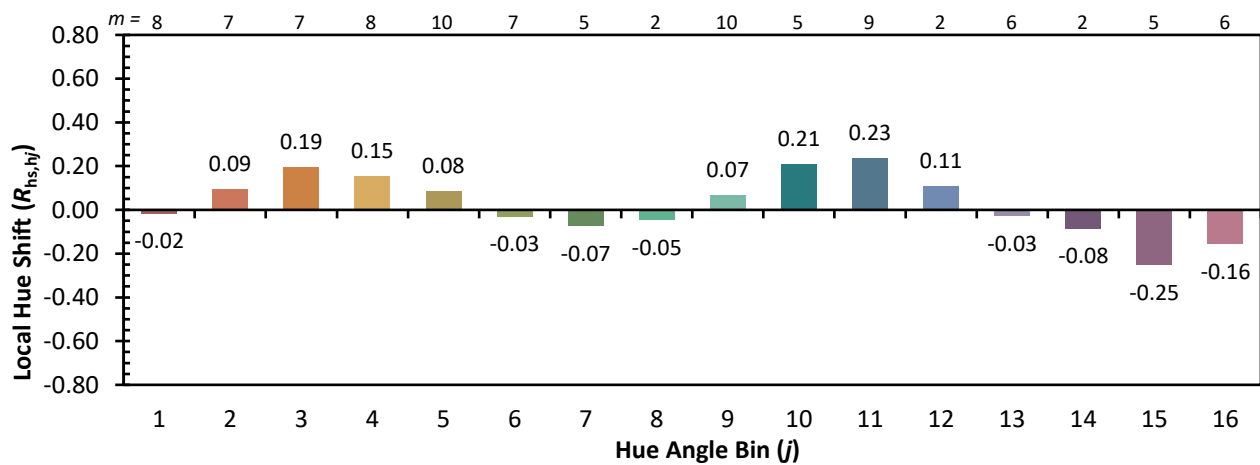
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 65 | CES51 = 89 | CES76 = 54 |
| CES02 = 60 | CES27 = 90 | CES52 = 88 | CES77 = 69 |
| CES03 = 30 | CES28 = 82 | CES53 = 80 | CES78 = 57 |
| CES04 = 69 | CES29 = 72 | CES54 = 84 | CES79 = 82 |
| CES05 = 46 | CES30 = 91 | CES55 = 82 | CES80 = 79 |
| CES06 = 50 | CES31 = 75 | CES56 = 74 | CES81 = 79 |
| CES07 = 39 | CES32 = 66 | CES57 = 74 | CES82 = 91 |
| CES08 = 38 | CES33 = 85 | CES58 = 74 | CES83 = 91 |
| CES09 = 29 | CES34 = 72 | CES59 = 85 | CES84 = 85 |
| CES10 = 73 | CES35 = 84 | CES60 = 87 | CES85 = 77 |
| CES11 = 56 | CES36 = 86 | CES61 = 81 | CES86 = 74 |
| CES12 = 62 | CES37 = 80 | CES62 = 80 | CES87 = 77 |
| CES13 = 41 | CES38 = 98 | CES63 = 74 | CES88 = 81 |
| CES14 = 74 | CES39 = 97 | CES64 = 63 | CES89 = 72 |
| CES15 = 70 | CES40 = 93 | CES65 = 62 | CES90 = 81 |
| CES16 = 46 | CES41 = 98 | CES66 = 56 | CES91 = 71 |
| CES17 = 49 | CES42 = 83 | CES67 = 54 | CES92 = 57 |
| CES18 = 55 | CES43 = 81 | CES68 = 64 | CES93 = 74 |
| CES19 = 71 | CES44 = 99 | CES69 = 72 | CES94 = 53 |
| CES20 = 64 | CES45 = 88 | CES70 = 57 | CES95 = 64 |
| CES21 = 85 | CES46 = 86 | CES71 = 49 | CES96 = 76 |
| CES22 = 77 | CES47 = 91 | CES72 = 83 | CES97 = 86 |
| CES23 = 91 | CES48 = 80 | CES73 = 48 | CES98 = 77 |
| CES24 = 90 | CES49 = 84 | CES74 = 90 | CES99 = 62 |
| CES25 = 71 | CES50 = 89 | CES75 = 52 |            |



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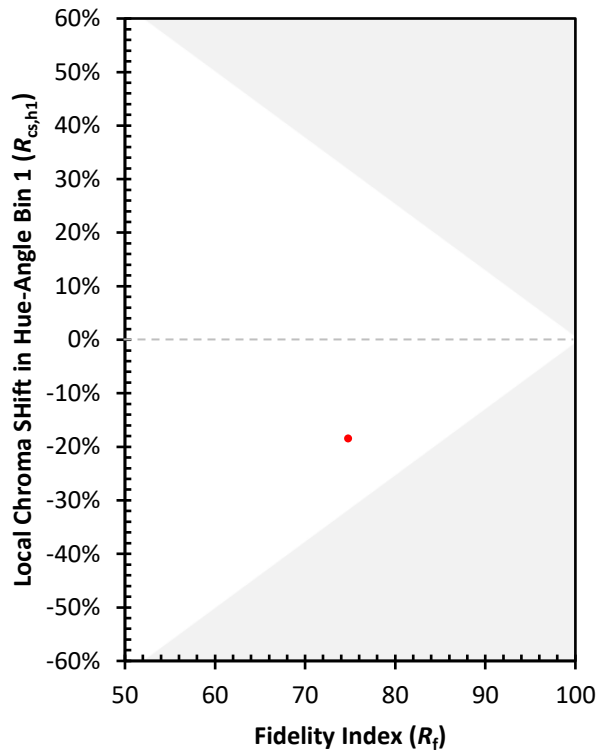
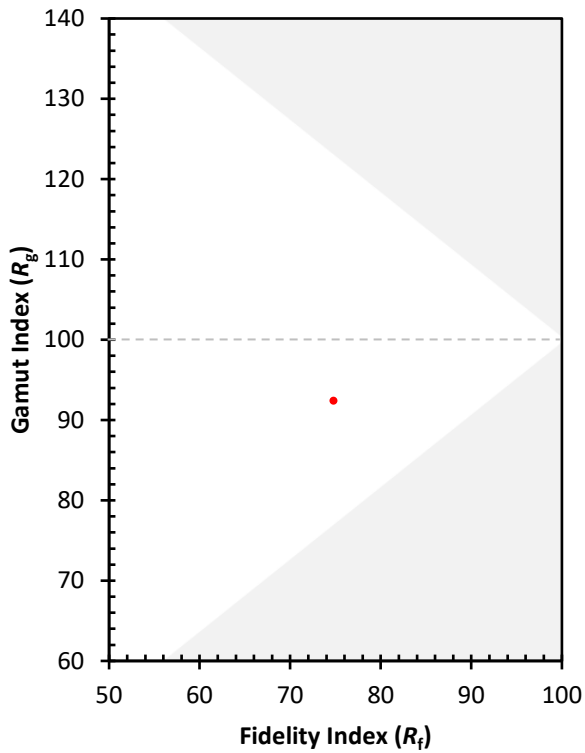
Color Rendition by Hue-Angle Bin



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Measure Comparisons



(END OF REPORT)