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: LUMARK

Report Number: P980951

Luminaire Tested: **NFFLD-L-C150-7027-66**

Issue Date: 04/10/2025

Report Generated By 670245763

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

Scaled Data Report

**Test Information**

| | |
|---|---|
| Test Method: | LM-79-08 |
| Report Number: | P980951 |
| Test Lab: | INNOVATION CENTER(G2) |
| Issue Date: | 04/10/2025 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS (FORMERLY EATON) |
| Product Line: | LUMARK |
| Catalog Number: | NFFLD-L-C150-7027-66 |
| Description: | LUMARK NIGHT FALCON LARGE SIZE 320W 70CRI 2700K LED FIXTURE NEMA 6 |
| Light Source: | (4) 2700K CCT, 70 CRI LEDS |
| Ballast/Driver: | ELECTRONIC DRIVER |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 45661.9 lumens |
| Efficiency: | N/A |
| Efficacy: | 140.9 lumens/watt |
| Luminous Opening: | Rectangular (W 1' x L: 0.67' x H: 0') |
| IES Classification: | Type I - Short |
| BUG Rating: | B5 - U0 - G3 |

| | |
|---|---|
| Input Watts (W): | 324.1 |
| Input Voltage (V): | 120 |
| Input Current (Ain): | NR |
| Voltage Rise (V): | NR |
| Power Factor: | 0.99 |
| Total Harmonic Distortion (THDi): | 2.79% |
| Frequency (hertz): | 60 |
| Stabilization Time: | NR |
| Operation Time: | NR |
| Ambient Temperature (°C): | NR |
| Test Distance: | 28.75 FT |

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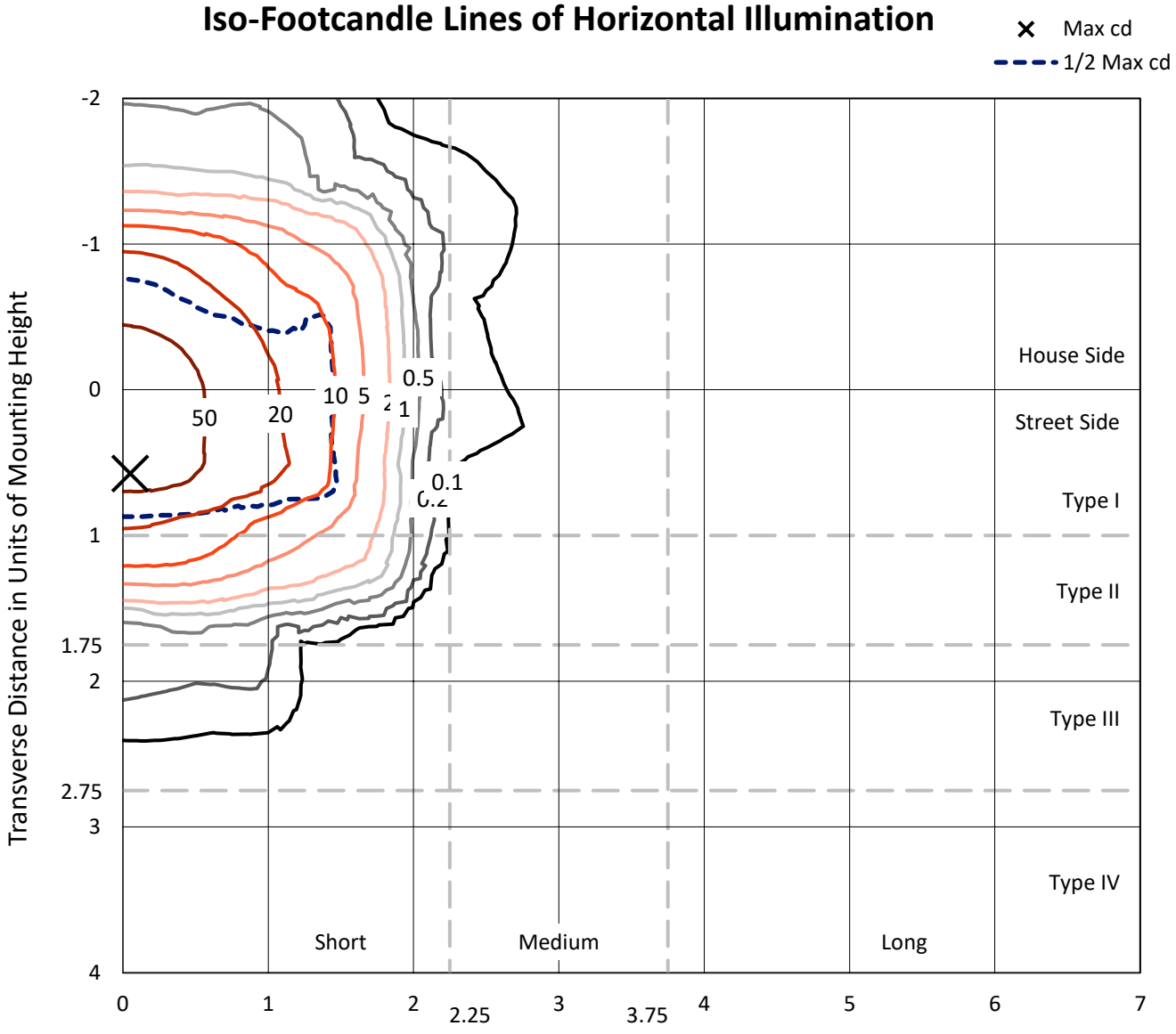
Scaled Data Report

REPORT NUMBER: P980951
CATALOG NUMBER: NFFLD-L-C150-7027-66

## Iso-Footcandle Lines of Horizontal Illumination




Based on 15 foot mounting height. Maximum calculated value = 84.9 fc
Type I - Short - N/A

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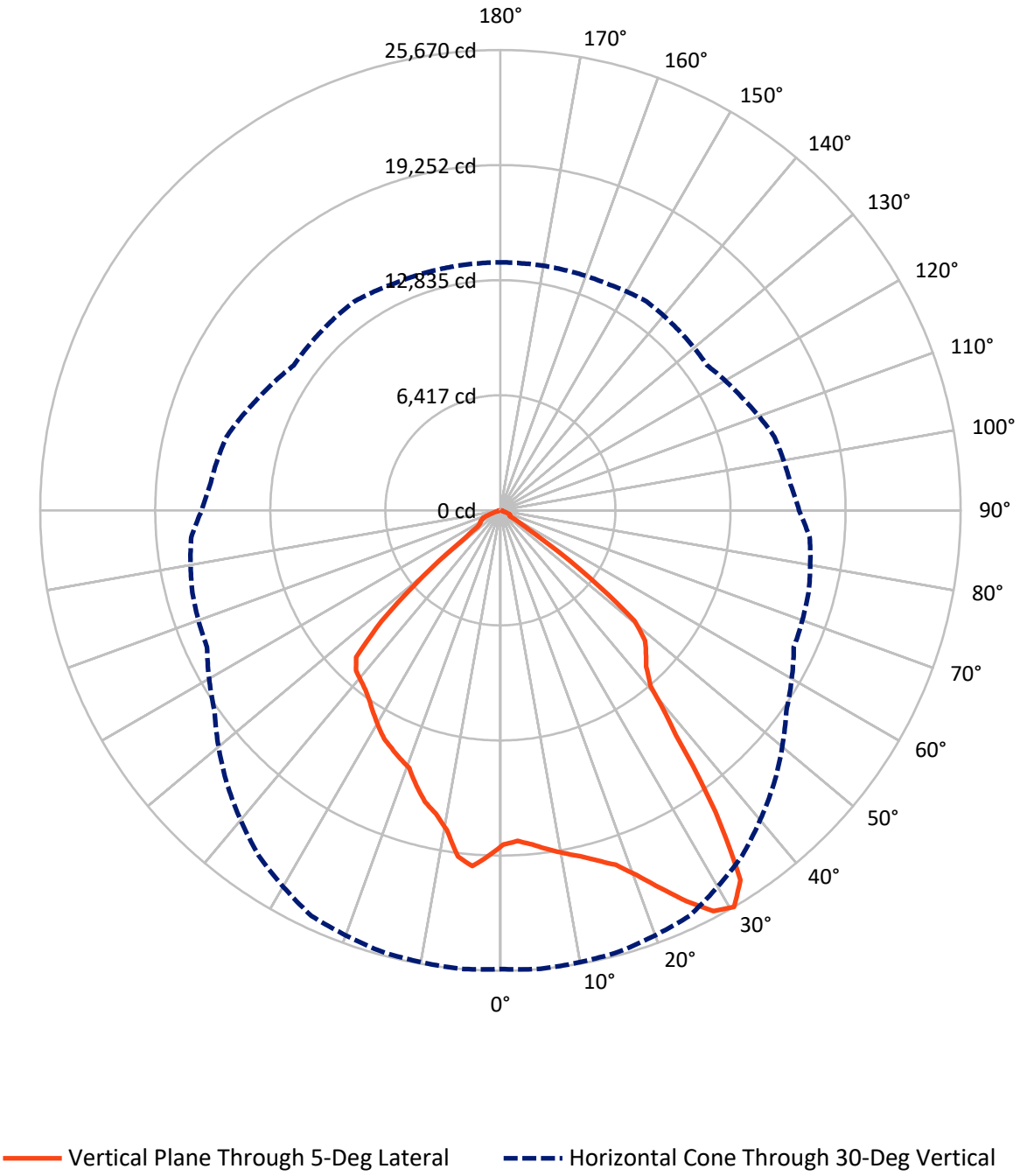
CATALOG NUMBER: NFFLD-L-C150-7027-66

## Luminous Intensity Polar Plot



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Scaled Data Report

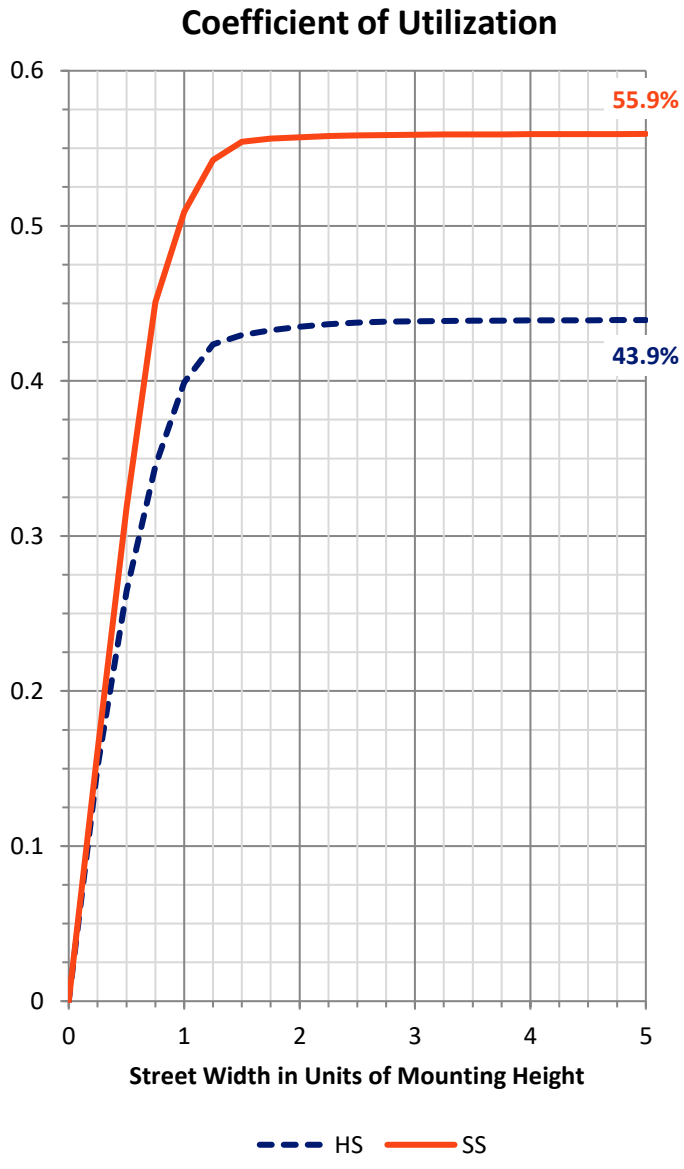
REPORT NUMBER: P980951
CATALOG NUMBER: NFFLD-L-C150-7027-66

**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 20195.8 | 0.0 | 20195.8 |
| | % Fixture | 44.2 | 0.0 | 44.2 |
| **Street Side** | Lumens | 25466.1 | 0.0 | 25466.1 |
| | % Fixture | 55.8 | 0.0 | 55.8 |
| **Total** | Lumens | 45661.9 | 0.0 | 45661.9 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 1823.2 | 4.0 |
| 10°-20° | 5281.5 | 11.6 |
| 20°-30° | 8416.5 | 18.4 |
| 30°-40° | 10522.0 | 23.0 |
| 40°-50° | 10325.7 | 22.6 |
| 50°-60° | 7382.2 | 16.2 |
| 60°-70° | 1633.3 | 3.6 |
| 70°-80° | 250.9 | 0.5 |
| 80°-90° | 26.5 | 0.1 |
| 90°-100° | 0.0 | 0.0 |
| 100°-110° | 0.0 | 0.0 |
| 110°-120° | 0.0 | 0.0 |
| 120°-130° | 0.0 | 0.0 |
| 130°-140° | 0.0 | 0.0 |
| 140°-150° | 0.0 | 0.0 |
| 150°-160° | 0.0 | 0.0 |
| 160°-170° | 0.0 | 0.0 |
| 170°-180° | 0.0 | 0.0 |
| 0°-90° | 45661.9 | 100.0 |
| 0°-180° | 45661.9 | 100.0 |



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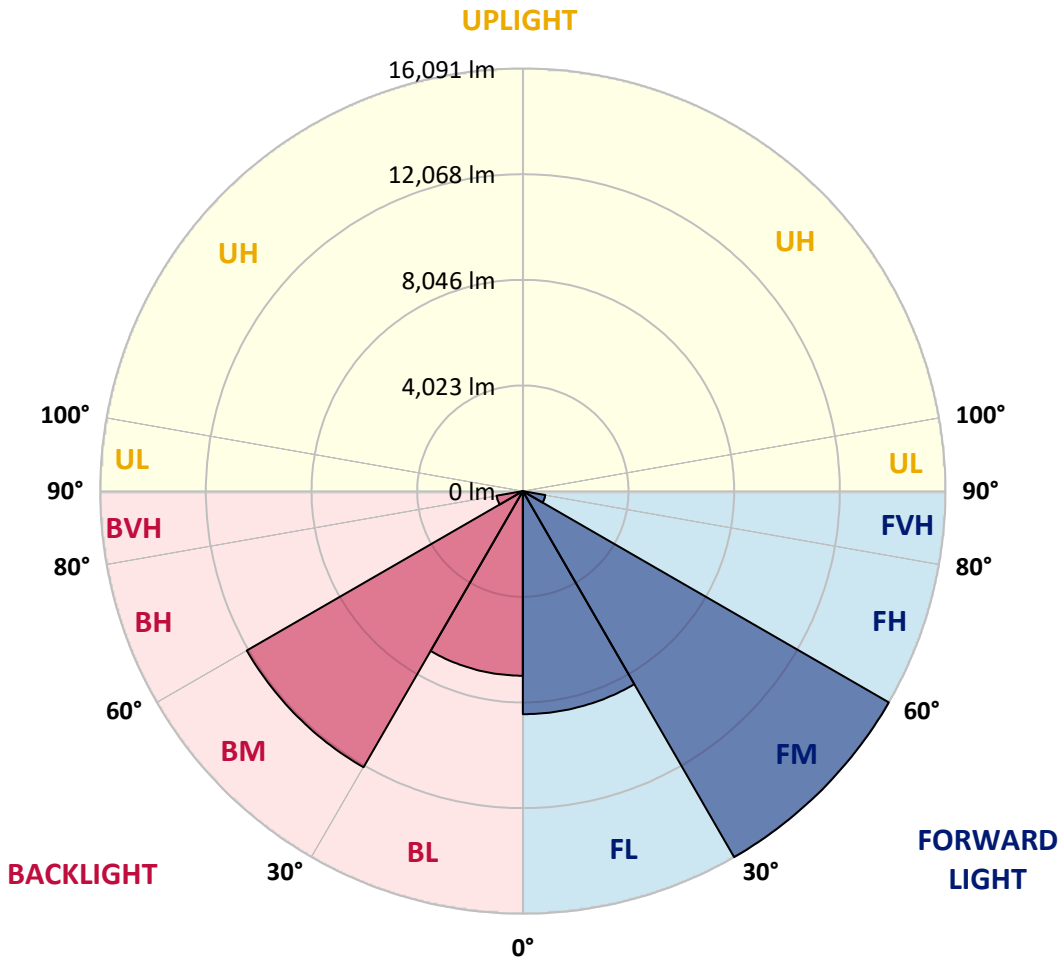
REPORT NUMBER: P980951
CATALOG NUMBER: NFFLD-L-C150-7027-66

## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 8492.7 | 18.6 | | | |
| FM | (30°-60°) | 16091.2 | 35.2 | | | |
| FH | (60°-80°) | 868.8 | 1.9 | | | G1/1800 |
| FVH | (80°-90°) | 13.4 | 0.0 | | | G1/100 |
| BL | (0°-30°) | 7028.5 | 15.4 | B5 | | |
| BM | (30°-60°) | 12138.7 | 26.6 | B5 | | |
| BH | (60°-80°) | 1015.5 | 2.2 | B3/2500 | | G3/2500 |
| BVH | (80°-90°) | 13.1 | 0.0 | | | G1/100 |
| UL | (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH | (100°-180°) | 0.0 | 0.0 | | U0/0 | |

**BUG Rating: B5-U0-G3**
Type I Short



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REPORT NUMBER: P980951
CATALOG NUMBER: NFFLD-L-C150-7027-66

**CANDELA DISTRIBUTION (FULL):**

| | 0° | 5° | 15° | 25° | 35° | 45° | 55° | 65° | 75° | 85° | 90° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 18637.6 | 18637.6 | 18637.6 | 18637.6 | 18637.6 | 18637.6 | 18637.6 | 18637.6 | 18637.6 | 18637.6 | 18637.6 |
| 2.5° | 18429.0 | 18458.8 | 18488.6 | 18533.3 | 18592.9 | 18622.7 | 18592.9 | 18563.1 | 18548.2 | 18578.0 | 18592.9 |
| 5° | 18682.3 | 18727.0 | 18741.9 | 18771.7 | 18801.5 | 18771.7 | 18756.8 | 18727.0 | 18712.1 | 18727.0 | 18771.7 |
| 7.5° | 19054.8 | 19084.6 | 19069.7 | 19054.8 | 19039.9 | 18935.6 | 18831.3 | 18786.6 | 18786.6 | 18831.3 | 18950.5 |
| 10° | 19382.5 | 19442.1 | 19367.6 | 19308.0 | 19203.7 | 19039.9 | 18861.1 | 18756.8 | 18786.6 | 18876.0 | 19025.0 |
| 12.5° | 19799.7 | 19799.7 | 19725.2 | 19665.6 | 19427.2 | 19233.5 | 18995.2 | 18831.3 | 18831.3 | 18995.2 | 19159.0 |
| 15° | 20306.2 | 20261.5 | 20231.7 | 20067.8 | 19784.8 | 19471.9 | 19173.9 | 18935.6 | 18890.9 | 19144.1 | 19248.4 |
| 17.5° | 20946.8 | 20782.9 | 20708.5 | 20425.4 | 20038.0 | 19635.8 | 19233.5 | 19039.9 | 18905.8 | 19173.9 | 19054.8 |
| 20° | 21825.8 | 21706.6 | 21468.3 | 21021.3 | 20231.7 | 19710.3 | 19233.5 | 18980.3 | 18876.0 | 19025.0 | 18905.8 |
| 22.5° | 22958.1 | 22883.6 | 22347.3 | 21781.1 | 20738.3 | 19769.9 | 19159.0 | 18816.4 | 18786.6 | 18712.1 | 18458.8 |
| 25° | 24343.6 | 24149.9 | 23598.7 | 22794.2 | 21498.1 | 20350.9 | 19144.1 | 18518.4 | 18414.1 | 18220.5 | 17773.5 |
| 27.5° | 25520.6 | 25312.0 | 24641.6 | 23926.5 | 22540.9 | 21215.0 | 19263.3 | 18160.9 | 18041.7 | 17907.6 | 17356.4 |
| 30° | 25580.2 | 25669.5 | 25490.8 | 24954.4 | 23509.3 | 21572.5 | 19471.9 | 18056.6 | 17788.4 | 17311.7 | 16656.2 |
| 32.5° | 24373.4 | 24582.0 | 25014.0 | 25207.7 | 24239.3 | 22004.6 | 19650.7 | 18101.3 | 17609.6 | 16462.5 | 15926.1 |
| 35° | 20246.6 | 20663.8 | 22436.6 | 24105.2 | 24447.9 | 22630.3 | 19799.7 | 18101.3 | 17550.0 | 15851.7 | 15434.5 |
| 37.5° | 15553.7 | 15896.3 | 17401.1 | 20425.4 | 23524.2 | 23017.7 | 20127.4 | 17997.0 | 17475.6 | 15896.3 | 15330.2 |
| 40° | 12708.1 | 12901.8 | 13557.3 | 15613.3 | 20276.4 | 22377.1 | 20455.2 | 18116.2 | 17252.1 | 15926.1 | 15389.8 |
| 42.5° | 11933.4 | 11918.5 | 11784.5 | 12544.3 | 15464.3 | 20499.9 | 20678.7 | 18414.1 | 16879.6 | 15732.5 | 15285.5 |
| 45° | 11412.0 | 11382.2 | 11263.0 | 11412.0 | 12231.4 | 16775.3 | 20514.8 | 18950.5 | 16417.8 | 15047.2 | 14749.2 |
| 47.5° | 10845.9 | 10860.8 | 10816.1 | 10875.7 | 10726.7 | 12737.9 | 19591.1 | 19173.9 | 15628.2 | 13900.0 | 13795.7 |
| 50° | 9490.1 | 9713.6 | 10309.5 | 10369.1 | 9981.8 | 10279.7 | 16775.3 | 19069.7 | 15062.0 | 13572.2 | 13482.8 |
| 52.5° | 5899.7 | 6257.2 | 8015.2 | 9505.0 | 9281.6 | 9281.6 | 12797.5 | 19218.6 | 14049.0 | 13453.0 | 13512.6 |
| 55° | 2085.7 | 2353.9 | 4290.7 | 6540.3 | 8313.2 | 8477.1 | 10115.9 | 17103.1 | 13929.8 | 13661.6 | 13721.2 |
| 57.5° | 521.4 | 640.6 | 1311.0 | 2830.7 | 5601.7 | 7687.5 | 9043.2 | 14123.5 | 10577.7 | 10205.2 | 10354.2 |
| 60° | 610.8 | 595.9 | 819.4 | 908.8 | 2175.1 | 6078.5 | 8149.3 | 9534.8 | 6823.4 | 6391.3 | 6465.8 |
| 62.5° | 655.5 | 610.8 | 640.6 | 804.5 | 357.6 | 2979.6 | 6495.6 | 5676.2 | 2815.8 | 2085.7 | 2204.9 |
| 65° | 581.0 | 551.2 | 506.5 | 744.9 | 253.3 | 551.2 | 3828.8 | 1668.6 | 402.3 | 640.6 | 581.0 |
| 67.5° | 387.4 | 402.3 | 417.1 | 595.9 | 238.4 | 238.4 | 506.5 | 417.1 | 283.1 | 581.0 | 506.5 |
| 70° | 223.5 | 238.4 | 283.1 | 357.6 | 238.4 | 193.7 | 223.5 | 342.7 | 238.4 | 581.0 | 506.5 |
| 72.5° | 134.1 | 134.1 | 134.1 | 149.0 | 238.4 | 163.9 | 149.0 | 283.1 | 208.6 | 536.3 | 506.5 |
| 75° | 104.3 | 104.3 | 104.3 | 89.4 | 208.6 | 104.3 | 104.3 | 223.5 | 178.8 | 387.4 | 387.4 |
| 77.5° | 89.4 | 89.4 | 89.4 | 74.5 | 119.2 | 89.4 | 89.4 | 163.9 | 163.9 | 193.7 | 223.5 |
| 80° | 59.6 | 59.6 | 59.6 | 59.6 | 74.5 | 74.5 | 59.6 | 89.4 | 74.5 | 89.4 | 104.3 |
| 82.5° | 29.8 | 44.7 | 44.7 | 29.8 | 44.7 | 44.7 | 44.7 | 59.6 | 44.7 | 59.6 | 59.6 |
| 85° | 14.9 | 14.9 | 14.9 | 14.9 | 14.9 | 14.9 | 14.9 | 29.8 | 14.9 | 14.9 | 29.8 |
| 87.5° | 0.0 | 0.0 | 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 |

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Peachtree City, GA 30269

Scaled Data Report

REPORT NUMBER: P980951
CATALOG NUMBER: NFFLD-L-C150-7027-66

**CANDELA DISTRIBUTION (continued):**

| | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 18637.6 | 18637.6 | 18637.6 | 18637.6 | 18637.6 | 18637.6 | 18637.6 | 18637.6 | 18637.6 | 18637.6 |
| 2.5° | 18622.7 | 18697.2 | 18801.5 | 18965.4 | 19025.0 | 19129.2 | 19218.6 | 19293.1 | 19293.1 | 19263.3 |
| 5° | 18861.1 | 19069.7 | 19352.7 | 19606.0 | 19695.4 | 19799.7 | 19844.4 | 19918.9 | 19904.0 | 19889.1 |
| 7.5° | 19069.7 | 19397.4 | 19695.4 | 19874.2 | 19844.4 | 19710.3 | 19620.9 | 19501.7 | 19457.0 | 19486.8 |
| 10° | 19233.5 | 19531.5 | 19665.6 | 19546.4 | 19188.8 | 18876.0 | 18473.7 | 18205.6 | 18071.5 | 18116.2 |
| 12.5° | 19293.1 | 19397.4 | 19278.2 | 18622.7 | 18175.8 | 17877.8 | 17550.0 | 17371.3 | 17296.8 | 17311.7 |
| 15° | 19308.0 | 19069.7 | 18414.1 | 17922.5 | 17594.7 | 17222.3 | 16954.1 | 16790.2 | 16790.2 | 16805.1 |
| 17.5° | 18995.2 | 18414.1 | 17848.0 | 17475.6 | 17013.7 | 16626.4 | 16477.4 | 16417.8 | 16045.3 | 16104.9 |
| 20° | 18712.1 | 17877.8 | 17564.9 | 16983.9 | 16432.7 | 16179.4 | 15315.3 | 15225.9 | 15240.8 | 15255.7 |
| 22.5° | 18116.2 | 17490.5 | 17207.4 | 16447.6 | 15821.9 | 15121.6 | 15002.5 | 14913.1 | 14928.0 | 14928.0 |
| 25° | 17296.8 | 16939.2 | 16551.9 | 15762.3 | 15002.5 | 14868.4 | 14779.0 | 14659.8 | 14600.2 | 14615.1 |
| 27.5° | 16834.9 | 16388.0 | 15672.9 | 15002.5 | 14510.8 | 14570.4 | 14466.1 | 14287.3 | 14287.3 | 14302.2 |
| 30° | *16253.9* | *15821.9* | *14868.4* | *14078.8* | *14123.5* | *14212.9* | *13959.6* | *13870.2* | *13825.5* | *13825.5* |
| 32.5° | 15538.8 | 14942.9 | 14108.6 | 13363.7 | 13631.8 | 13602.0 | 13289.2 | 13319.0 | 13348.8 | 13319.0 |
| 35° | 15002.5 | 14227.8 | 13527.5 | 13125.3 | 13021.0 | 12901.8 | 12737.9 | 12842.2 | 12886.9 | 12857.1 |
| 37.5° | 14868.4 | 13944.7 | 13214.7 | 12931.6 | 12529.4 | 12305.9 | 12350.6 | 12454.9 | 12514.5 | 12499.6 |
| 40° | 14823.7 | 13661.6 | 12946.5 | 12648.5 | 12112.2 | 11918.5 | 11978.1 | 12186.7 | 12261.2 | 12246.3 |
| 42.5° | 14764.1 | 13467.9 | 12782.6 | 12425.1 | 11680.2 | 11546.1 | 11829.1 | 12022.8 | 12037.7 | 12022.8 |
| 45° | 14451.2 | 13259.4 | 12678.3 | 11963.2 | 11024.6 | 11188.5 | 11546.1 | 11650.4 | 11471.6 | 11397.1 |
| 47.5° | 13721.2 | 12872.0 | 12365.5 | 11397.1 | 10488.3 | 10801.2 | 10845.9 | 9713.6 | 9058.1 | 8909.1 |
| 50° | 13512.6 | 12886.9 | 12007.9 | 10726.7 | 10160.6 | 10473.4 | 8521.8 | 6510.5 | 5691.1 | 5527.2 |
| 52.5° | 13453.0 | 12737.9 | 12142.0 | 10026.5 | 10041.4 | 8834.6 | 5378.2 | 3188.2 | 2562.5 | 2443.3 |
| 55° | 13602.0 | 13393.5 | 12365.5 | 9609.3 | 9341.2 | 5750.7 | 2502.9 | 1504.7 | 1549.4 | 1504.7 |
| 57.5° | 10264.8 | 11203.4 | 12633.6 | 8953.8 | 6823.4 | 2771.1 | 1579.2 | 1460.0 | 1355.7 | 1325.9 |
| 60° | 6406.2 | 7300.1 | 9251.8 | 7702.4 | 3501.1 | 1653.7 | 1609.0 | 1355.7 | 1311.0 | 1296.1 |
| 62.5° | 2115.5 | 3247.8 | 5303.7 | 5065.4 | 968.4 | 1638.8 | 1623.9 | 1206.8 | 1206.8 | 1206.8 |
| 65° | 536.3 | 551.2 | 1460.0 | 1743.1 | 715.1 | 1460.0 | 1549.4 | 1132.3 | 1102.5 | 1147.2 |
| 67.5° | 461.8 | 417.1 | 774.7 | 685.3 | 595.9 | 1013.1 | 1355.7 | 1087.6 | 1028.0 | 1028.0 |
| 70° | 461.8 | 491.6 | 759.8 | 640.6 | 372.5 | 551.2 | 983.3 | 670.4 | 595.9 | 551.2 |
| 72.5° | 432.0 | 476.7 | 670.4 | 581.0 | 253.3 | 268.2 | 432.0 | 223.5 | 208.6 | 178.8 |
| 75° | 372.5 | 387.4 | 521.4 | 521.4 | 268.2 | 134.1 | 178.8 | 149.0 | 149.0 | 134.1 |
| 77.5° | 253.3 | 193.7 | 298.0 | 372.5 | 193.7 | 89.4 | 74.5 | 74.5 | 74.5 | 59.6 |
| 80° | 134.1 | 74.5 | 74.5 | 59.6 | 74.5 | 74.5 | 44.7 | 59.6 | 59.6 | 44.7 |
| 82.5° | 74.5 | 44.7 | 44.7 | 29.8 | 29.8 | 44.7 | 29.8 | 29.8 | 29.8 | 29.8 |
| 85° | 29.8 | 29.8 | 14.9 | 14.9 | 14.9 | 29.8 | 14.9 | 14.9 | 14.9 | 14.9 |
| 87.5° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 14.9 | 14.9 |
| 90° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

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

Lumark

Report Number: SP1-2501-319-9

Test Date: 02/05/2025

Luminaire Tested: NFFLD-C55-7027-66

Data in this report applies to families of products including NFFLD-C55-7027-66

Report Generated By FNC07603 / LDUCLS01DT446
Version: v7.04

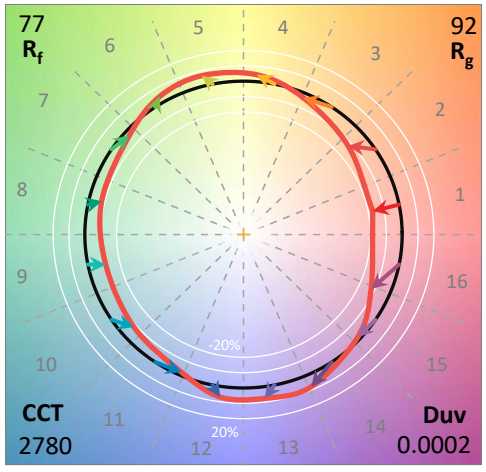
## Test Information

| | |
|---|---|
| Test Method: | LM-79-2019 |
| Report Number: | SP1-2501-319-9 |
| Test Lab: | COOPER LIGHTING SOLUTIONS |
| Photometer: | SP1 - 76IN SPHERE |
| Measurement Geometry: | 4π |
| Issue Date: | 02/06/2025 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS |
| Product Line: | Lumark |
| Catalog Number: | **NFFLD-C55-7027-66** |
| Description: | LUMARK NIGHT FALCON 16900LM NEMA 6 |

## Spectral Parameters

| | | | | | |
|---|---|---|---|---|---|
| CCT (K): | 2780 | CRI (Ra): | 72.0 | | |
| CIE u': | 0.2590 | R1: | 68.2 | R9: | -35.8 |
| CIE v': | 0.5260 | R2: | 85.1 | R10: | 68.0 |
| Duv: | 0.0002 | R3: | 93.3 | R11: | 62.3 |
| CIE x: | 0.4536 | R4: | 66.5 | R12: | 62.2 |
| CIE y: | 0.4095 | R5: | 68.5 | R13: | 71.6 |
| CIE z: | 0.1369 | R6: | 81.1 | R14: | 96.6 |
| Peak Wavelength (nm): | 597 | R7: | 74.6 | R15: | 59.0 |
| Dominant Wavelength (nm): | 583 | R8: | 38.9 | | |
| Purity: | 59.08593 | | | | |

| | |
|---|---|
| Rf: | 77.4 |
| Rg: | 92.5 |




## Test Conditions

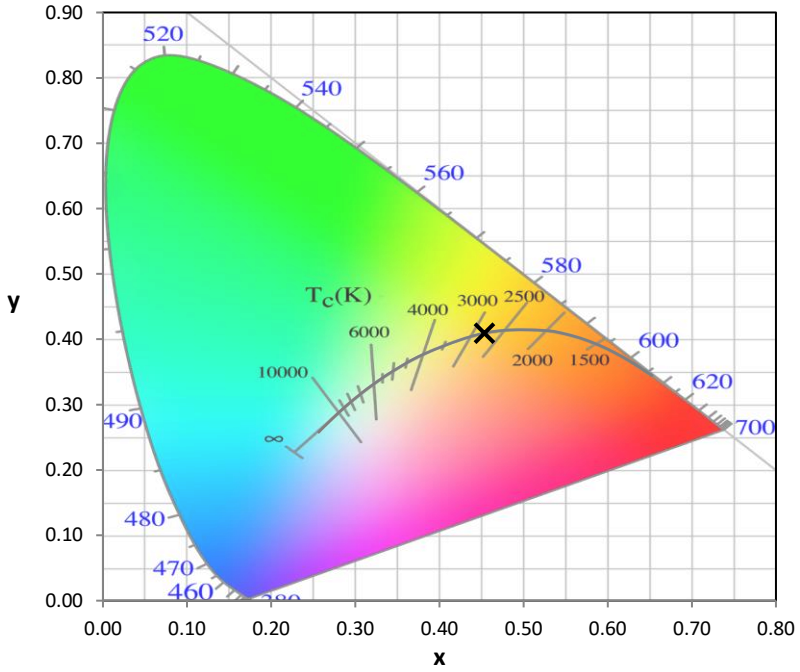
| | |
|---|---|
| Stabilization Time: | 20M |
| Operation Time: | 1H 20M |
| Sphere Temperature (°C): | 25.0 |

REPORT NUMBER: SP1-2501-319-9

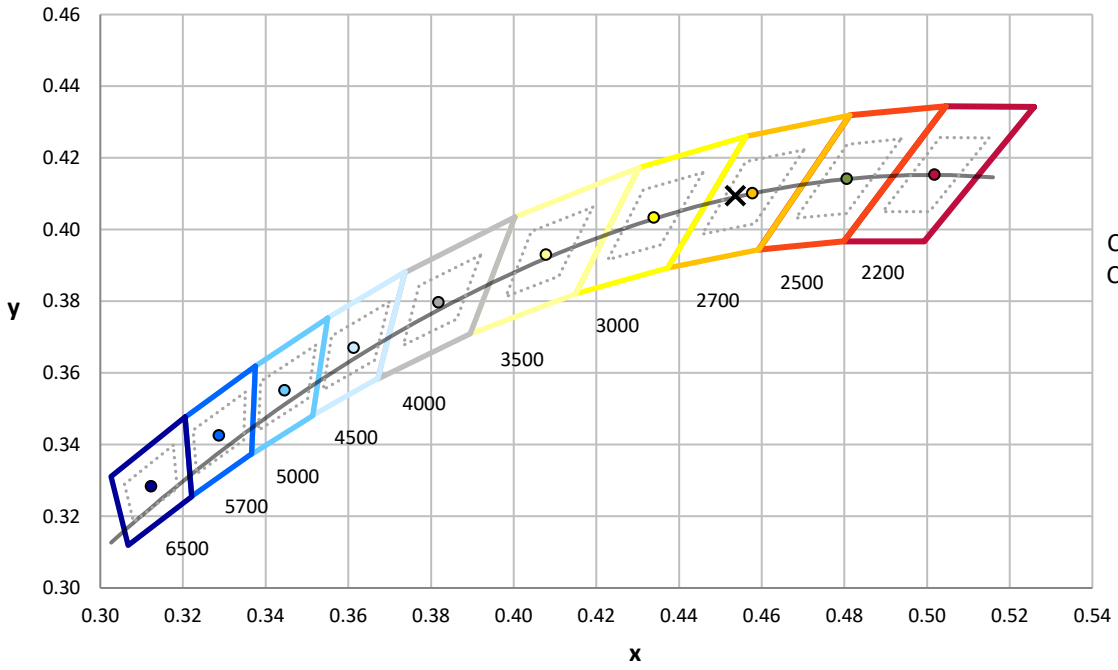
| Measurement and Test Equipment | | | |
|---|---|---|---|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | IN0058 | 12/16/2024 | 6/16/2025 |
| Power Meter | INXT2011004 | 1/212025 | 1/21/2026 |
| AC Power Source | IN0063 | 10/22/2024 | 10/22/2025 |
| DC Power Source | IN0208 | 10/22/2024 | 10/22/2025 |
| Sphere Thermometer | IN0085 | 10/22/2024 | 10/22/2025 |
| Room Thermometer | IN0046 | 10/22/2024 | 10/22/2025 |

REPORT NUMBER: SP1-2501-319-9

## CIE 1931 Chromaticity Diagram




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




CCT = 2780K
CIE x = 0.4536
CIE y = 0.4095
Duv = 0.0002

Point lies inside the ANSI 2700K 4-step quadrangle

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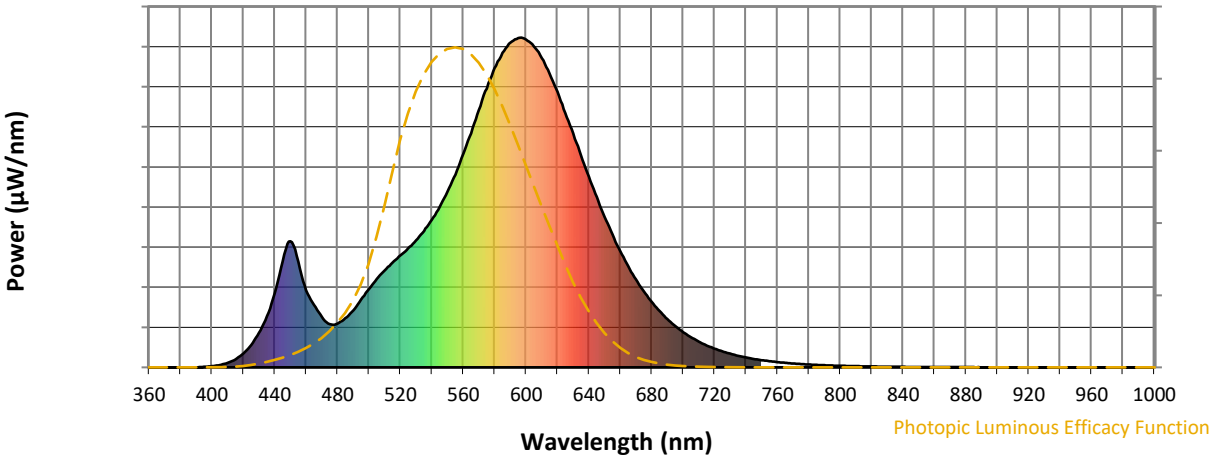
## Photopic Flux vs. Wavelength




## Photopic Lumens: NR

| λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 360 | 0 | NR | 490 | 173 | NR | 620 | 836 | NR | 750 | 22 | NR | 880 | 1 | NR |
| 365 | 0 | NR | 495 | 205 | NR | 625 | 771 | NR | 755 | 19 | NR | 885 | 1 | NR |
| 370 | 0 | NR | 500 | 238 | NR | 630 | 710 | NR | 760 | 16 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 268 | NR | 635 | 643 | NR | 765 | 14 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 294 | NR | 640 | 578 | NR | 770 | 12 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 317 | NR | 645 | 516 | NR | 775 | 10 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 340 | NR | 650 | 456 | NR | 780 | 9 | NR | 910 | 0 | NR |
| 395 | 2 | NR | 525 | 361 | NR | 655 | 403 | NR | 785 | 8 | NR | 915 | 0 | NR |
| 400 | 4 | NR | 530 | 386 | NR | 660 | 352 | NR | 790 | 6 | NR | 920 | 0 | NR |
| 405 | 7 | NR | 535 | 413 | NR | 665 | 307 | NR | 795 | 6 | NR | 925 | 0 | NR |
| 410 | 14 | NR | 540 | 447 | NR | 670 | 266 | NR | 800 | 5 | NR | 930 | 0 | NR |
| 415 | 25 | NR | 545 | 487 | NR | 675 | 230 | NR | 805 | 4 | NR | 935 | 0 | NR |
| 420 | 42 | NR | 550 | 533 | NR | 680 | 199 | NR | 810 | 4 | NR | 940 | 0 | NR |
| 425 | 68 | NR | 555 | 585 | NR | 685 | 170 | NR | 815 | 3 | NR | 945 | 0 | NR |
| 430 | 104 | NR | 560 | 647 | NR | 690 | 147 | NR | 820 | 3 | NR | 950 | 0 | NR |
| 435 | 155 | NR | 565 | 710 | NR | 695 | 125 | NR | 825 | 2 | NR | 955 | 0 | NR |
| 440 | 224 | NR | 570 | 780 | NR | 700 | 107 | NR | 830 | 2 | NR | 960 | 0 | NR |
| 445 | 322 | NR | 575 | 846 | NR | 705 | 92 | NR | 835 | 2 | NR | 965 | 0 | NR |
| 450 | 382 | NR | 580 | 907 | NR | 710 | 78 | NR | 840 | 2 | NR | 970 | 0 | NR |
| 455 | 321 | NR | 585 | 954 | NR | 715 | 66 | NR | 845 | 1 | NR | 975 | 0 | NR |
| 460 | 234 | NR | 590 | 985 | NR | 720 | 57 | NR | 850 | 1 | NR | 980 | 0 | NR |
| 465 | 189 | NR | 595 | 999 | NR | 725 | 48 | NR | 855 | 1 | NR | 985 | 0 | NR |
| 470 | 152 | NR | 600 | 994 | NR | 730 | 41 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 131 | NR | 605 | 973 | NR | 735 | 35 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 133 | NR | 610 | 938 | NR | 740 | 30 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 150 | NR | 615 | 891 | NR | 745 | 26 | NR | 875 | 1 | NR | | | |

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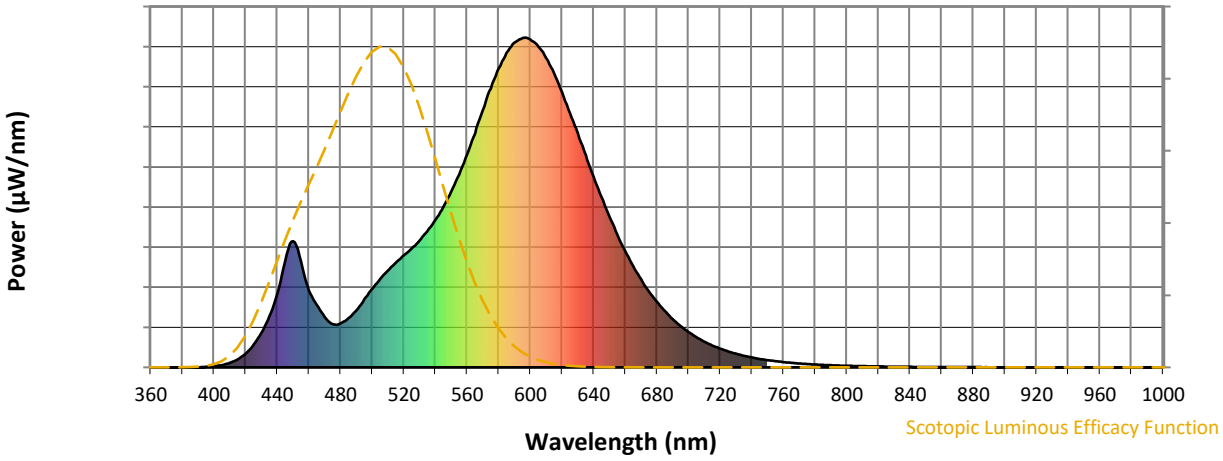
## Scotopic Flux vs. Wavelength




**Scotopic Lumens: NR** **S/P: 1.17**

| λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 360 | 0 | NR | 490 | 173 | NR | 620 | 836 | NR | 750 | 22 | NR | 880 | 1 | NR |
| 365 | 0 | NR | 495 | 205 | NR | 625 | 771 | NR | 755 | 19 | NR | 885 | 1 | NR |
| 370 | 0 | NR | 500 | 238 | NR | 630 | 710 | NR | 760 | 16 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 268 | NR | 635 | 643 | NR | 765 | 14 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 294 | NR | 640 | 578 | NR | 770 | 12 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 317 | NR | 645 | 516 | NR | 775 | 10 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 340 | NR | 650 | 456 | NR | 780 | 9 | NR | 910 | 0 | NR |
| 395 | 2 | NR | 525 | 361 | NR | 655 | 403 | NR | 785 | 8 | NR | 915 | 0 | NR |
| 400 | 4 | NR | 530 | 386 | NR | 660 | 352 | NR | 790 | 6 | NR | 920 | 0 | NR |
| 405 | 7 | NR | 535 | 413 | NR | 665 | 307 | NR | 795 | 6 | NR | 925 | 0 | NR |
| 410 | 14 | NR | 540 | 447 | NR | 670 | 266 | NR | 800 | 5 | NR | 930 | 0 | NR |
| 415 | 25 | NR | 545 | 487 | NR | 675 | 230 | NR | 805 | 4 | NR | 935 | 0 | NR |
| 420 | 42 | NR | 550 | 533 | NR | 680 | 199 | NR | 810 | 4 | NR | 940 | 0 | NR |
| 425 | 68 | NR | 555 | 585 | NR | 685 | 170 | NR | 815 | 3 | NR | 945 | 0 | NR |
| 430 | 104 | NR | 560 | 647 | NR | 690 | 147 | NR | 820 | 3 | NR | 950 | 0 | NR |
| 435 | 155 | NR | 565 | 710 | NR | 695 | 125 | NR | 825 | 2 | NR | 955 | 0 | NR |
| 440 | 224 | NR | 570 | 780 | NR | 700 | 107 | NR | 830 | 2 | NR | 960 | 0 | NR |
| 445 | 322 | NR | 575 | 846 | NR | 705 | 92 | NR | 835 | 2 | NR | 965 | 0 | NR |
| 450 | 382 | NR | 580 | 907 | NR | 710 | 78 | NR | 840 | 2 | NR | 970 | 0 | NR |
| 455 | 321 | NR | 585 | 954 | NR | 715 | 66 | NR | 845 | 1 | NR | 975 | 0 | NR |
| 460 | 234 | NR | 590 | 985 | NR | 720 | 57 | NR | 850 | 1 | NR | 980 | 0 | NR |
| 465 | 189 | NR | 595 | 999 | NR | 725 | 48 | NR | 855 | 1 | NR | 985 | 0 | NR |
| 470 | 152 | NR | 600 | 994 | NR | 730 | 41 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 131 | NR | 605 | 973 | NR | 735 | 35 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 133 | NR | 610 | 938 | NR | 740 | 30 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 150 | NR | 615 | 891 | NR | 745 | 26 | NR | 875 | 1 | NR | | | |

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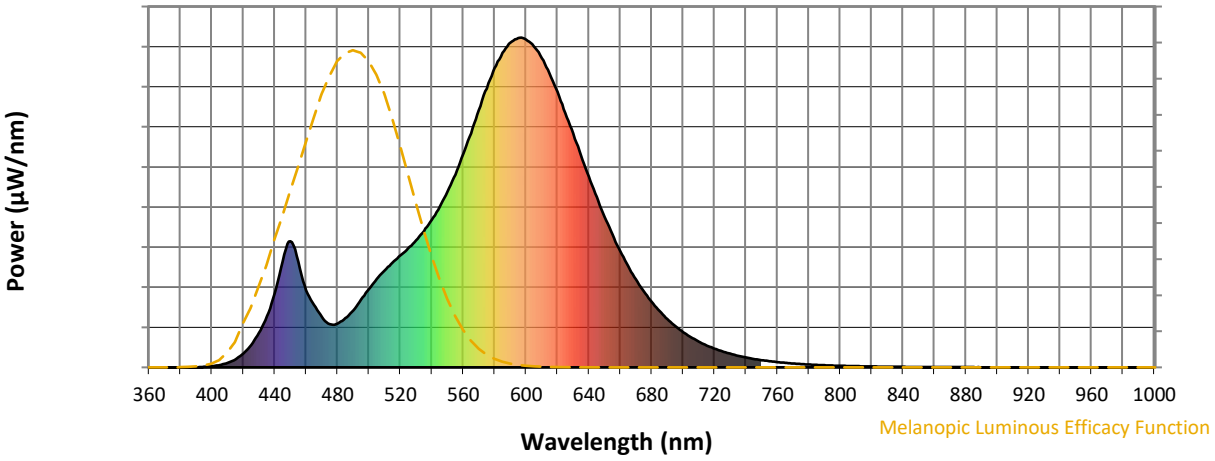
## Melanopic Flux vs. Wavelength




**Melanopic Lumens: NR** **M/P: 2.15**

| λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 360 | 0 | NR | 490 | 173 | NR | 620 | 836 | NR | 750 | 22 | NR | 880 | 1 | NR |
| 365 | 0 | NR | 495 | 205 | NR | 625 | 771 | NR | 755 | 19 | NR | 885 | 1 | NR |
| 370 | 0 | NR | 500 | 238 | NR | 630 | 710 | NR | 760 | 16 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 268 | NR | 635 | 643 | NR | 765 | 14 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 294 | NR | 640 | 578 | NR | 770 | 12 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 317 | NR | 645 | 516 | NR | 775 | 10 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 340 | NR | 650 | 456 | NR | 780 | 9 | NR | 910 | 0 | NR |
| 395 | 2 | NR | 525 | 361 | NR | 655 | 403 | NR | 785 | 8 | NR | 915 | 0 | NR |
| 400 | 4 | NR | 530 | 386 | NR | 660 | 352 | NR | 790 | 6 | NR | 920 | 0 | NR |
| 405 | 7 | NR | 535 | 413 | NR | 665 | 307 | NR | 795 | 6 | NR | 925 | 0 | NR |
| 410 | 14 | NR | 540 | 447 | NR | 670 | 266 | NR | 800 | 5 | NR | 930 | 0 | NR |
| 415 | 25 | NR | 545 | 487 | NR | 675 | 230 | NR | 805 | 4 | NR | 935 | 0 | NR |
| 420 | 42 | NR | 550 | 533 | NR | 680 | 199 | NR | 810 | 4 | NR | 940 | 0 | NR |
| 425 | 68 | NR | 555 | 585 | NR | 685 | 170 | NR | 815 | 3 | NR | 945 | 0 | NR |
| 430 | 104 | NR | 560 | 647 | NR | 690 | 147 | NR | 820 | 3 | NR | 950 | 0 | NR |
| 435 | 155 | NR | 565 | 710 | NR | 695 | 125 | NR | 825 | 2 | NR | 955 | 0 | NR |
| 440 | 224 | NR | 570 | 780 | NR | 700 | 107 | NR | 830 | 2 | NR | 960 | 0 | NR |
| 445 | 322 | NR | 575 | 846 | NR | 705 | 92 | NR | 835 | 2 | NR | 965 | 0 | NR |
| 450 | 382 | NR | 580 | 907 | NR | 710 | 78 | NR | 840 | 2 | NR | 970 | 0 | NR |
| 455 | 321 | NR | 585 | 954 | NR | 715 | 66 | NR | 845 | 1 | NR | 975 | 0 | NR |
| 460 | 234 | NR | 590 | 985 | NR | 720 | 57 | NR | 850 | 1 | NR | 980 | 0 | NR |
| 465 | 189 | NR | 595 | 999 | NR | 725 | 48 | NR | 855 | 1 | NR | 985 | 0 | NR |
| 470 | 152 | NR | 600 | 994 | NR | 730 | 41 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 131 | NR | 605 | 973 | NR | 735 | 35 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 133 | NR | 610 | 938 | NR | 740 | 30 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 150 | NR | 615 | 891 | NR | 745 | 26 | NR | 875 | 1 | NR | | | |

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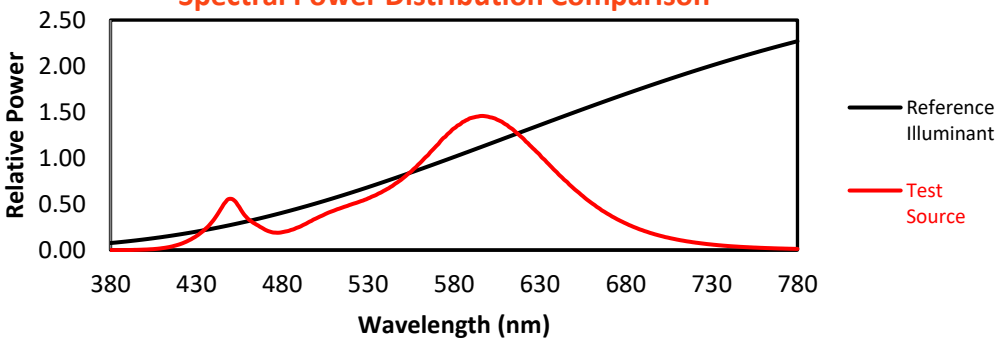
# TM-30-18

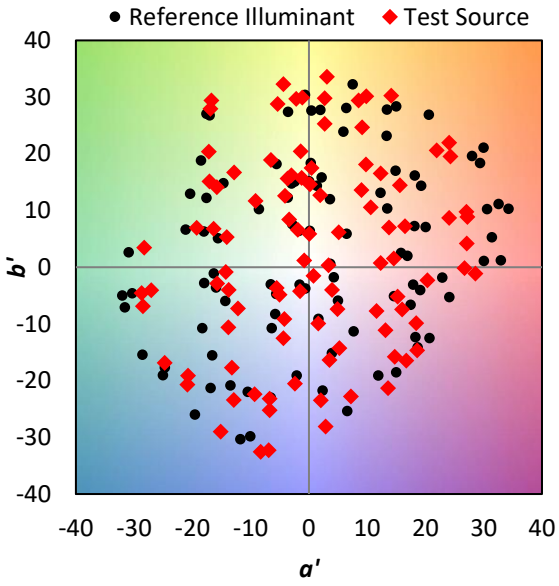
## Summary

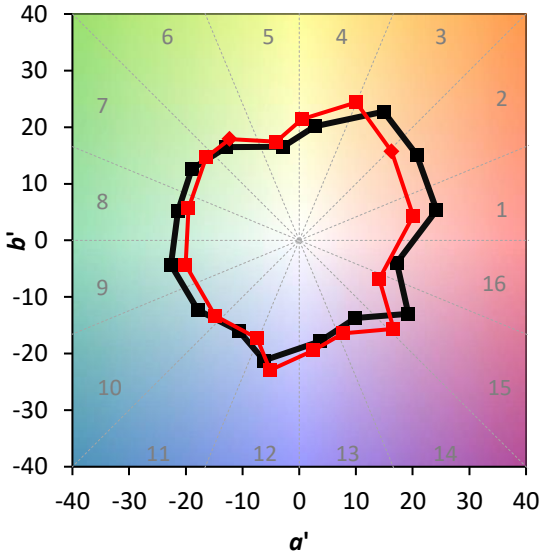
$R_f$ = 77.4
$R_g$ = 92.5
CIE $R_a$ = 72.0
$R_9$ = -35.8

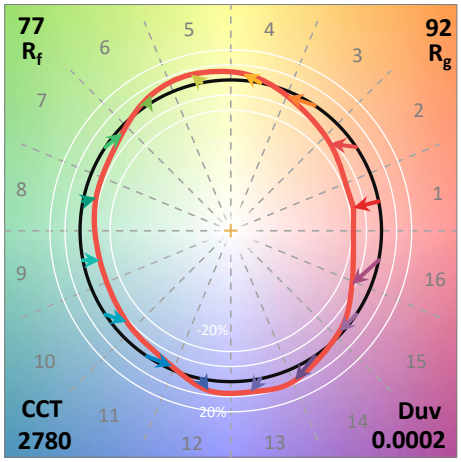
## Spectral Power Distribution Comparison

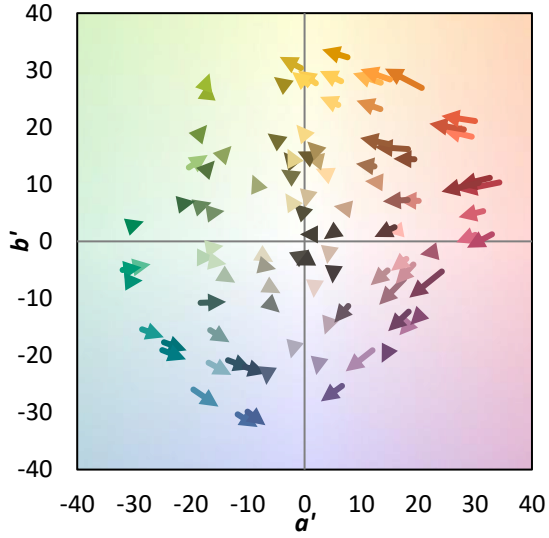



## Color Vector Graphics



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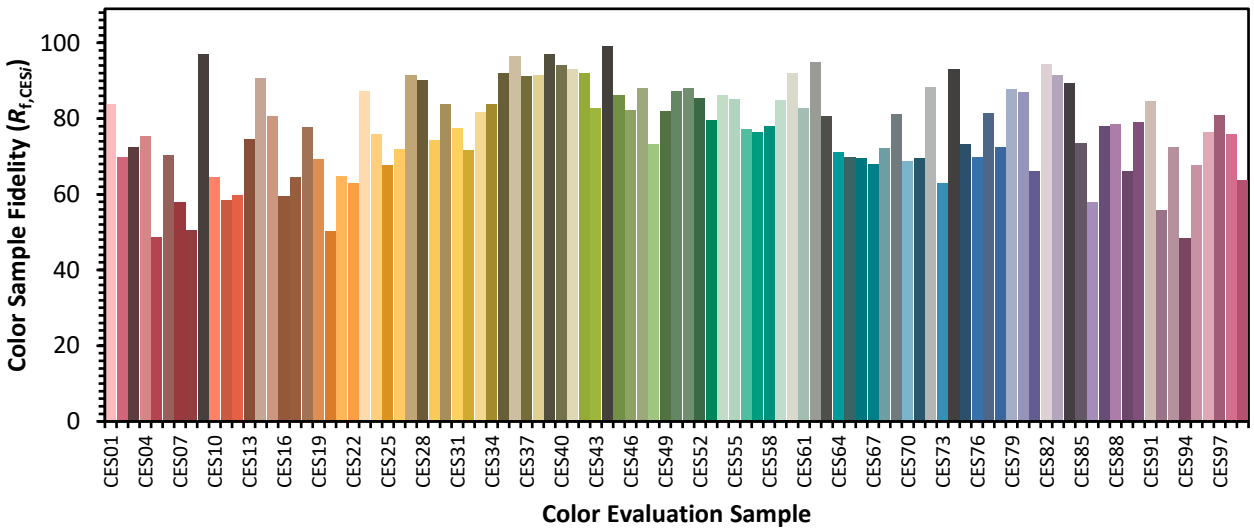
## TM-30-18

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

| | | | |
|---|---|---|---|
| CES01 = 86 | CES26 = 72 | CES51 = 88 | CES76 = 70 |
| CES02 = 63 | CES27 = 91 | CES52 = 85 | CES77 = 81 |
| CES03 = 31 | CES28 = 90 | CES53 = 80 | CES78 = 73 |
| CES04 = 71 | CES29 = 74 | CES54 = 86 | CES79 = 88 |
| CES05 = 50 | CES30 = 84 | CES55 = 85 | CES80 = 87 |
| CES06 = 52 | CES31 = 77 | CES56 = 77 | CES81 = 66 |
| CES07 = 42 | CES32 = 72 | CES57 = 76 | CES82 = 95 |
| CES08 = 40 | CES33 = 82 | CES58 = 78 | CES83 = 91 |
| CES09 = 29 | CES34 = 84 | CES59 = 85 | CES84 = 89 |
| CES10 = 77 | CES35 = 92 | CES60 = 92 | CES85 = 74 |
| CES11 = 60 | CES36 = 96 | CES61 = 83 | CES86 = 58 |
| CES12 = 66 | CES37 = 91 | CES62 = 95 | CES87 = 78 |
| CES13 = 43 | CES38 = 92 | CES63 = 81 | CES88 = 78 |
| CES14 = 74 | CES39 = 97 | CES64 = 71 | CES89 = 66 |
| CES15 = 72 | CES40 = 94 | CES65 = 70 | CES90 = 79 |
| CES16 = 47 | CES41 = 93 | CES66 = 70 | CES91 = 85 |
| CES17 = 50 | CES42 = 92 | CES67 = 68 | CES92 = 56 |
| CES18 = 57 | CES43 = 83 | CES68 = 72 | CES93 = 73 |
| CES19 = 73 | CES44 = 99 | CES69 = 81 | CES94 = 48 |
| CES20 = 67 | CES45 = 86 | CES70 = 69 | CES95 = 68 |
| CES21 = 87 | CES46 = 82 | CES71 = 70 | CES96 = 77 |
| CES22 = 80 | CES47 = 88 | CES72 = 88 | CES97 = 81 |
| CES23 = 92 | CES48 = 73 | CES73 = 63 | CES98 = 76 |
| CES24 = 91 | CES49 = 82 | CES74 = 93 | CES99 = 64 |
| CES25 = 73 | CES50 = 87 | CES75 = 73 | |



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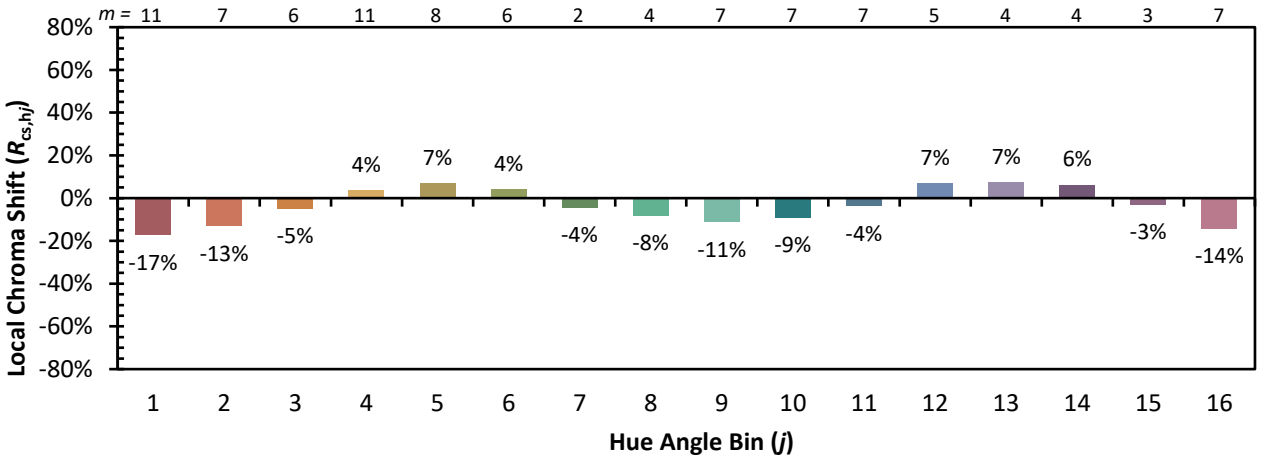
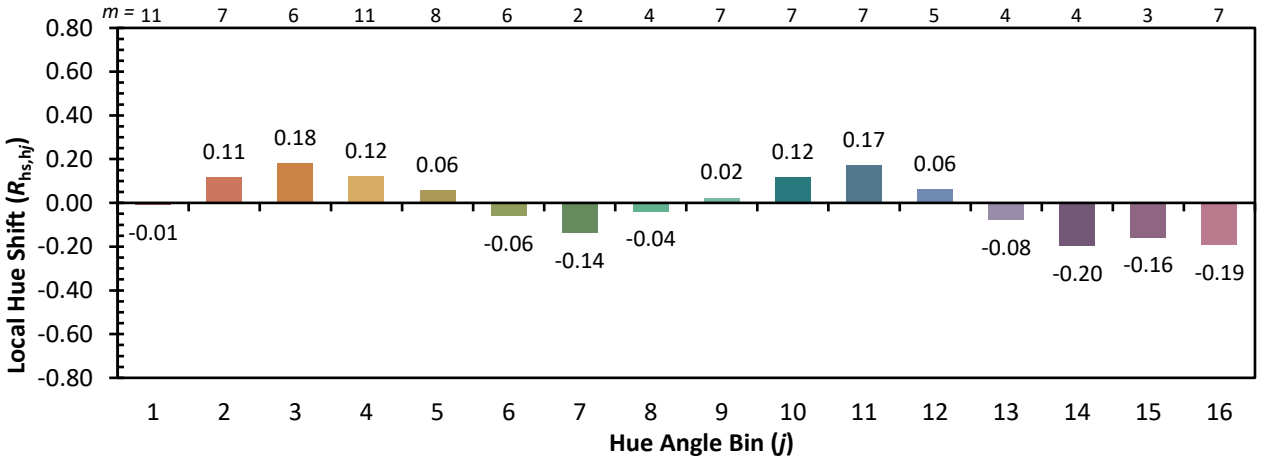
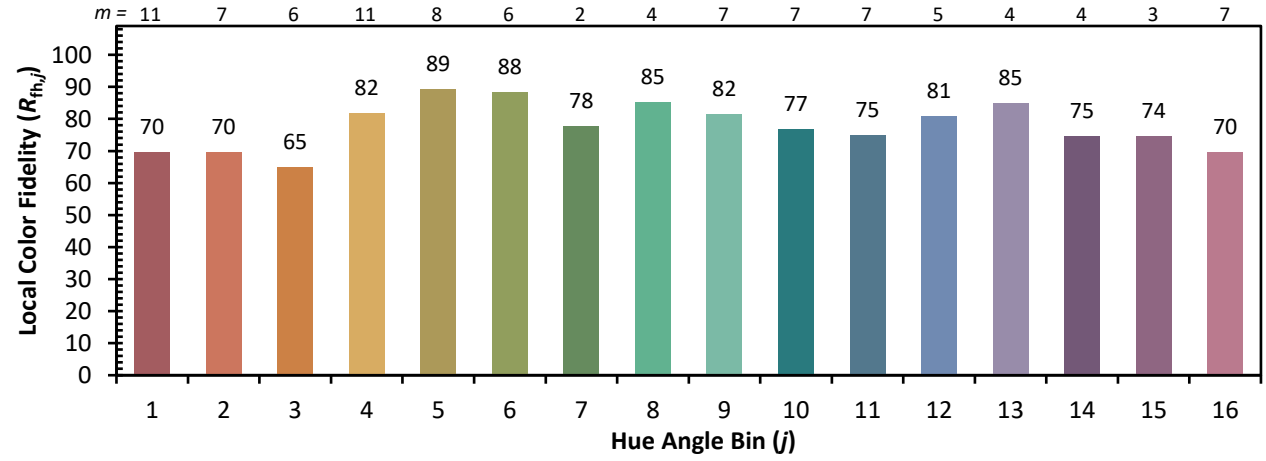
## Color Rendition by Hue-Angle Bin



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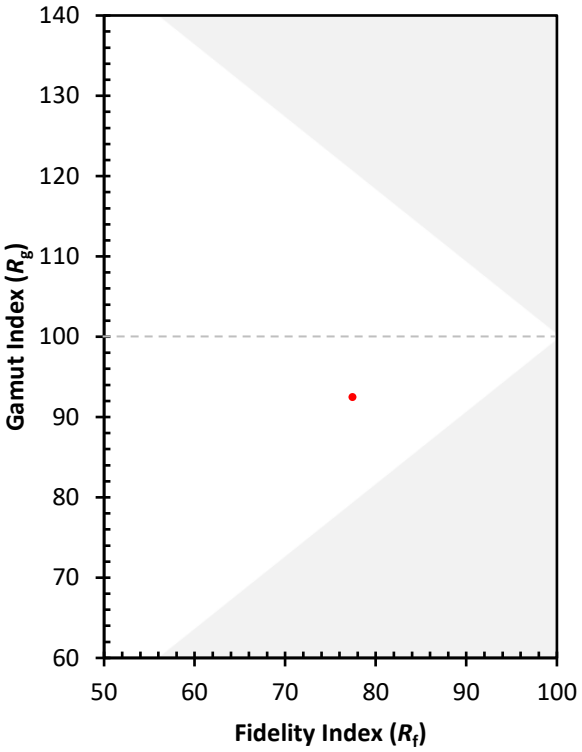
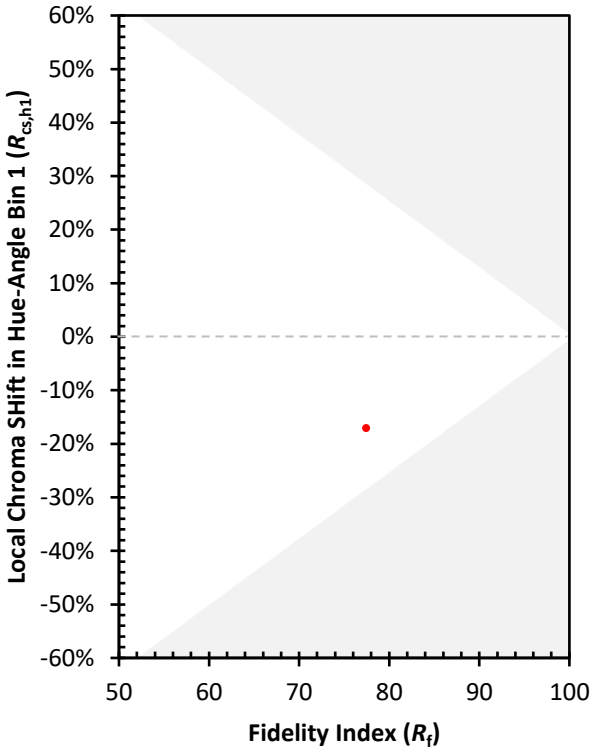
## Measure Comparisons




(END OF REPORT)