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

Scaled data based on original data using

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

Test Report Prepared for

Cooper Lighting Solutions

Brand: METALUX

Report Number: P976937

Luminaire Tested: 24SR-LD2-C-29-UNV-L835-CD1-SO-U

Issue Date: 03/18/2025

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

Scaled Data Report

**Test Information**

| | |
|---|---|
| Test Method: | LM-79-2019 |
| Report Number: | P976937 |
| Test Lab: | INNOVATION CENTER(P3) |
| Issue Date: | 03/18/2025 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS |
| Product Line: | METALUX |
| Catalog Number: | 24SR-LD2-C-29-UNV-L835-CD1-SO-U |
| Description: | METALUX SKYRIDGE 2x4 2900LM PACKAGE 80CRI 3500K TROFFER with Storaro Orange SKYTR |
| Light Source: | 3500K CCT, 80+ CRI LEDS |
| Ballast/Driver: | - |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 1930.0 lumens |
| Efficiency: | N/A |
| Efficacy: | 97.5 lumens/watt |
| Spacing Criteria (0/90/45): | 1.17 / 1.85 / 1.72 |
| Luminous Opening: | Rectangular (W 2' x L: 4' x H: 0') |
| CIE Type: | Direct |

| | |
|---|---|
| Input Watts (W): | 19.8 |
| Input Voltage (V): | 120 |
| Input Current (Ain): | NR |
| Voltage Rise (V): | NR |
| Power Factor: | NR |
| Total Harmonic Distortion (THDi): | NR |
| Frequency (hertz): | 60 |
| Stabilization Time: | NR |
| Operation Time: | NR |
| Ambient Temperature (°C): | NR |
| Test Distance: | 28.75 FT |

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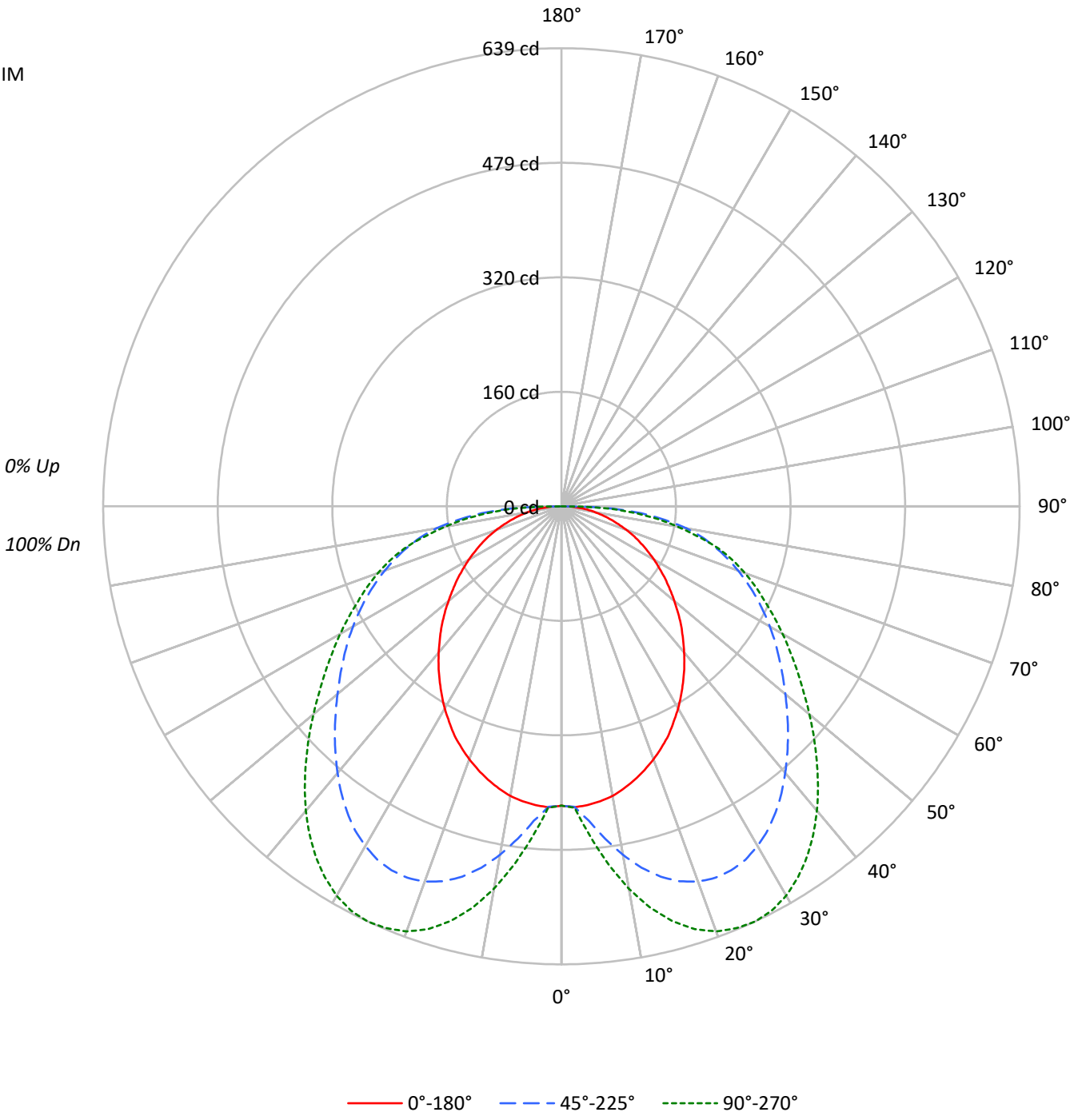
TEST NUMBER: P976937
CATALOG NUMBER: 24SR-LD2-C-29-UNV-L835-CD1-SO-U

## Luminous Intensity Polar Plot



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TEST NUMBER: P976937
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## COEFFICIENT OF UTILIZATION - ZONAL CAVITY METHOD:

| RF | 20 | | | | 20 | | | | 20 | | | 20 | | | 20 | | | 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RC | 80 | | | | 70 | | | | 50 | | | 30 | | | 10 | | | 0 |
| RW | 70 | 50 | 30 | 10 | 70 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 0 |
| RCR | | | | | | | | | | | | | | | | | | |
| 0 | 119 | 119 | 119 | 119 | 116 | 116 | 116 | 116 | 111 | 111 | 111 | 106 | 106 | 106 | 102 | 102 | 102 | 100 |
| 1 | 107 | 101 | 96 | 91 | 104 | 99 | 94 | 90 | 94 | 90 | 87 | 90 | 87 | 84 | 87 | 84 | 82 | 79 |
| 2 | 96 | 87 | 79 | 72 | 93 | 85 | 77 | 71 | 81 | 75 | 70 | 78 | 73 | 68 | 74 | 70 | 66 | 64 |
| 3 | 87 | 75 | 66 | 59 | 84 | 74 | 65 | 58 | 70 | 63 | 57 | 68 | 61 | 56 | 65 | 60 | 55 | 53 |
| 4 | 79 | 66 | 56 | 49 | 77 | 65 | 56 | 49 | 62 | 54 | 48 | 60 | 53 | 47 | 57 | 52 | 47 | 44 |
| 5 | 72 | 59 | 49 | 42 | 70 | 57 | 48 | 42 | 55 | 47 | 41 | 53 | 46 | 41 | 51 | 45 | 40 | 38 |
| 6 | 67 | 53 | 43 | 36 | 65 | 52 | 43 | 36 | 50 | 42 | 36 | 48 | 41 | 35 | 46 | 40 | 35 | 33 |
| 7 | 62 | 47 | 38 | 32 | 60 | 47 | 38 | 32 | 45 | 37 | 31 | 43 | 36 | 31 | 42 | 36 | 31 | 29 |
| 8 | 57 | 43 | 34 | 28 | 56 | 42 | 34 | 28 | 41 | 33 | 28 | 40 | 33 | 28 | 39 | 32 | 27 | 25 |
| 9 | 53 | 39 | 31 | 25 | 52 | 39 | 31 | 25 | 38 | 30 | 25 | 37 | 30 | 25 | 35 | 29 | 24 | 23 |
| 10 | 50 | 36 | 28 | 23 | 49 | 36 | 28 | 22 | 35 | 27 | 22 | 34 | 27 | 22 | 33 | 27 | 22 | 20 |

## AVERAGE LUMINANCE (cd/sqm):

| | 0° | 45° | 90° |
|---|---|---|---|
| 0° | 562 | 562 | 562 |
| 5° | 565 | 595 | 624 |
| 10° | 561 | 674 | 740 |
| 15° | 550 | 745 | 835 |
| 20° | 538 | 798 | 904 |
| 25° | 524 | 832 | 949 |
| 30° | 506 | 850 | 974 |
| 35° | 487 | 856 | 981 |
| 40° | 468 | 853 | 974 |
| 45° | 449 | 851 | 958 |
| 50° | 430 | 853 | 945 |
| 55° | 415 | 870 | 942 |
| 60° | 402 | 903 | 959 |
| 65° | 391 | 954 | 996 |
| 70° | 381 | 1031 | 1071 |
| 75° | 371 | 1158 | 1179 |
| 80° | 372 | 1370 | 1282 |
| 85° | 412 | 1720 | 1555 |

## MAXIMUM LUMINANCE 45°-90°:

Horizontal Angle: 45°
Vertical Angle: 87.5°
Luminance: 2181 cd/sqm

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TEST NUMBER: P976937
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**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 43.3 | 2.2 |
| 10°-20° | 145.9 | 7.6 |
| 20°-30° | 244.3 | 12.7 |
| 30°-40° | 306.0 | 15.9 |
| 40°-50° | 321.0 | 16.6 |
| 50°-60° | 303.3 | 15.7 |
| 60°-70° | 265.5 | 13.8 |
| 70°-80° | 205.0 | 10.6 |
| 80°-90° | 95.7 | 5.0 |
| 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°-30° | 433.6 | 22.5 |
| 0°-40° | 739.5 | 38.3 |
| 0°-60° | 1363.8 | 70.7 |
| 0°-90° | 1930.0 | 100.0 |
| 90°-120° | 0.0 | 0.0 |
| 90°-150° | 0.0 | 0.0 |
| 90°-180° | 0.0 | 0.0 |
| 0°-180° | 1930.0 | 100.0 |

**CANDELA DISTRIBUTION:**

| | 0° | 22.5° | 45° | 67.5° | 90° | Flux |
|---|---|---|---|---|---|---|
| 0° | 418 | 418 | 418 | 418 | 418 | |
| 5° | 418 | 418 | 440 | 457 | 462 | 40 |
| 15° | 395 | 450 | 535 | 583 | 599 | 111 |
| 25° | 353 | 453 | 560 | 617 | 639 | 162 |
| 35° | 296 | 414 | 521 | 577 | 597 | 185 |
| 45° | 236 | 351 | 447 | 490 | 504 | 182 |
| 55° | 177 | 292 | 371 | 395 | 402 | 158 |
| 65° | 123 | 239 | 300 | 308 | 313 | 122 |
| 75° | 71 | 179 | 223 | 225 | 227 | 76 |
| 85° | 27 | 94 | 111 | 103 | 101 | 28 |
| 90° | 0 | 0 | 0 | 0 | 0 | |

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TEST NUMBER: P976937
CATALOG NUMBER: 24SR-LD2-C-29-UNV-L835-CD1-SO-U

**CANDELA DISTRIBUTION (FULL):**

| | 0° | 5° | 10° | 15° | 20° | 25° | 30° | 35° | 40° | 45° | 50° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 417.6 | 417.6 | 417.6 | 417.6 | 417.6 | 417.6 | 417.6 | 417.6 | 417.6 | 417.6 | 417.6 |
| 2.5° | 420.3 | 419.7 | 418.9 | 417.6 | 417.0 | 417.0 | 417.0 | 417.0 | 417.6 | 419.7 | 420.9 |
| 5° | 418.3 | 418.3 | 417.0 | 416.3 | 417.0 | 418.9 | 422.3 | 427.7 | 432.9 | 440.3 | 446.3 |
| 7.5° | 415.0 | 414.3 | 413.6 | 414.3 | 420.3 | 429.0 | 437.6 | 447.7 | 457.0 | 467.7 | 476.3 |
| 10° | 410.3 | 409.6 | 410.3 | 415.6 | 427.7 | 441.7 | 454.3 | 467.0 | 479.6 | 493.6 | 505.7 |
| 12.5° | 403.0 | 403.0 | 405.6 | 417.6 | 434.3 | 451.6 | 468.3 | 484.3 | 500.4 | 516.3 | 530.3 |
| 15° | 395.0 | 395.6 | 402.2 | 419.7 | 440.3 | 460.3 | 479.6 | 498.4 | 517.1 | 535.0 | 550.4 |
| 17.5° | 385.6 | 386.9 | 398.3 | 419.7 | 443.0 | 466.3 | 488.3 | 509.0 | 529.0 | 548.4 | 564.4 |
| 20° | 375.6 | 376.9 | 393.6 | 418.3 | 444.3 | 469.7 | 493.0 | 515.7 | 537.1 | 557.1 | 573.7 |
| 22.5° | 364.3 | 366.3 | 387.6 | 414.3 | 443.0 | 470.3 | 494.3 | 517.7 | 539.7 | 561.0 | 577.7 |
| 25° | *352.9* | *355.6* | *380.3* | *409.0* | *439.0* | *467.0* | *492.4* | *515.7* | *539.1* | *560.4* | *577.0* |
| 27.5° | 338.9 | 343.5 | 371.5 | 400.9 | 432.9 | 461.0 | 486.4 | 511.0 | 534.4 | 555.8 | 572.4 |
| 30° | 325.6 | 331.6 | 361.0 | 391.6 | 424.3 | 452.3 | 477.7 | 502.3 | 525.7 | 547.0 | 563.7 |
| 32.5° | 310.9 | 318.2 | 348.9 | 381.0 | 412.9 | 440.3 | 466.3 | 491.0 | 514.4 | 535.7 | 551.7 |
| 35° | 296.2 | 304.9 | 336.3 | 368.9 | 400.3 | 427.7 | 453.0 | 477.7 | 500.4 | 521.0 | 536.4 |
| 37.5° | 281.5 | 290.8 | 322.3 | 355.6 | 385.6 | 412.3 | 437.6 | 461.7 | 485.0 | 504.3 | 519.7 |
| 40° | 266.2 | 276.8 | 308.2 | 340.2 | 370.3 | 396.2 | 421.6 | 445.0 | 467.0 | 485.6 | 500.4 |
| 42.5° | 250.8 | 262.8 | 294.2 | 325.6 | 354.2 | 379.6 | 404.9 | 427.7 | 448.3 | 466.3 | 480.3 |
| 45° | 236.2 | 248.2 | 278.8 | 310.2 | 338.2 | 363.6 | 388.2 | 410.3 | 430.3 | 447.0 | 460.3 |
| 47.5° | 220.8 | 234.2 | 264.8 | 295.5 | 322.3 | 347.6 | 371.5 | 392.3 | 411.6 | 426.9 | 439.7 |
| 50° | 205.5 | 220.1 | 250.2 | 280.2 | 307.5 | 332.2 | 355.6 | 375.6 | 393.6 | 407.6 | 419.7 |
| 52.5° | 190.8 | 206.1 | 236.8 | 266.2 | 292.9 | 317.6 | 340.2 | 359.6 | 376.3 | 389.0 | 399.6 |
| 55° | 176.8 | 192.8 | 223.5 | 252.2 | 279.5 | 303.5 | 324.9 | 343.5 | 358.9 | 370.9 | 380.3 |
| 57.5° | 162.7 | 180.2 | 210.8 | 240.1 | 266.2 | 290.2 | 310.9 | 328.2 | 342.2 | 353.6 | 361.6 |
| 60° | 149.5 | 167.4 | 198.8 | 227.5 | 253.5 | 276.8 | 296.9 | 312.8 | 326.2 | 335.6 | 341.6 |
| 62.5° | 135.5 | 154.8 | 186.1 | 215.4 | 241.5 | 263.6 | 282.9 | 298.2 | 309.5 | 317.6 | 322.9 |
| 65° | 122.7 | 142.1 | 174.1 | 203.5 | 228.2 | 249.5 | 267.5 | 282.2 | 292.9 | 299.6 | 302.9 |
| 67.5° | 110.1 | 130.1 | 162.1 | 190.8 | 214.8 | 235.5 | 252.2 | 266.2 | 275.5 | 280.9 | 283.5 |
| 70° | 96.8 | 118.0 | 149.5 | 177.5 | 200.8 | 220.1 | 236.8 | 248.8 | 257.5 | 262.2 | 263.6 |
| 72.5° | 83.4 | 105.4 | 136.8 | 164.1 | 186.1 | 204.8 | 220.1 | 231.5 | 239.5 | 242.8 | 243.5 |
| 75° | 71.4 | 92.1 | 122.7 | 148.7 | 170.1 | 187.4 | 202.8 | 213.5 | 219.5 | 222.8 | 223.5 |
| 77.5° | 59.3 | 79.4 | 108.7 | 133.4 | 152.1 | 168.8 | 183.5 | 193.4 | 199.5 | 202.2 | 202.2 |
| 80° | 48.0 | 66.7 | 93.4 | 115.4 | 133.4 | 148.7 | 162.1 | 172.1 | 177.5 | 176.8 | 174.1 |
| 82.5° | 37.3 | 54.7 | 77.4 | 96.8 | 112.7 | 126.8 | 140.1 | 146.1 | 148.1 | 146.1 | 144.1 |
| 85° | 26.7 | 40.7 | 58.7 | 74.7 | 88.7 | 99.4 | 108.1 | 112.7 | 113.4 | 111.4 | 109.4 |
| 87.5° | 15.4 | 22.7 | 33.4 | 45.3 | 52.7 | 59.3 | 66.7 | 69.4 | 69.4 | 70.7 | 66.7 |
| 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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Scaled Data Report

TEST NUMBER: P976937
CATALOG NUMBER: 24SR-LD2-C-29-UNV-L835-CD1-SO-U

**CANDELA DISTRIBUTION (continued):**

| | 55° | 60° | 65° | 70° | 75° | 80° | 85° | 90° |
|---|---|---|---|---|---|---|---|---|
| 0° | 417.6 | 417.6 | 417.6 | 417.6 | 417.6 | 417.6 | 417.6 | *417.6* |
| 2.5° | 420.3 | 420.9 | 420.9 | 422.3 | 423.0 | 423.0 | 422.3 | *420.9* |
| 5° | 448.3 | 452.3 | 454.9 | 459.0 | 461.0 | 463.0 | 463.6 | *462.3* |
| 7.5° | 481.0 | 487.0 | 492.4 | 498.4 | 501.0 | 503.1 | 505.7 | *503.7* |
| 10° | 512.4 | 520.4 | 527.0 | 533.7 | 537.7 | 540.4 | 542.4 | *541.7* |
| 12.5° | 539.1 | 548.4 | 555.8 | 562.4 | 567.7 | 571.7 | 573.7 | *573.7* |
| 15° | 559.7 | 570.4 | 579.7 | 587.1 | 592.4 | 596.4 | 599.1 | *599.1* |
| 17.5° | 575.8 | 586.4 | 596.4 | 603.8 | 609.1 | 614.5 | 617.1 | *618.4* |
| 20° | 585.1 | 596.4 | 606.4 | 614.5 | 620.5 | 626.4 | 629.1 | *631.1* |
| 22.5° | 589.8 | 601.1 | 611.8 | 620.5 | 627.1 | 632.4 | 635.7 | *637.1* |
| 25° | *589.8* | *601.7* | *613.1* | *621.7* | *628.5* | *634.5* | *637.8* | *639.1* |
| 27.5° | 585.7 | 598.4 | 609.8 | 617.8 | 625.1 | 631.1 | 634.5 | *635.7* |
| 30° | 577.7 | 590.4 | 601.7 | 609.8 | 617.1 | 622.4 | 625.8 | *627.1* |
| 32.5° | 565.1 | 578.4 | 589.1 | 597.0 | 604.4 | 609.8 | 613.1 | *613.7* |
| 35° | 550.4 | 563.0 | 573.1 | 581.1 | 588.4 | 593.1 | 595.8 | *597.0* |
| 37.5° | 532.4 | 544.3 | 554.4 | 561.8 | 568.4 | 573.7 | 576.4 | *577.0* |
| 40° | 513.0 | 524.3 | 533.0 | 539.7 | 546.4 | 551.1 | 553.7 | *554.4* |
| 42.5° | 492.4 | 503.1 | 511.0 | 517.1 | 523.0 | 527.0 | 529.0 | *529.7* |
| 45° | 471.0 | 480.3 | 487.7 | 493.0 | 498.4 | 501.7 | 503.7 | *503.7* |
| 47.5° | 449.6 | 458.4 | 464.3 | 468.3 | 473.0 | 476.3 | 478.4 | *477.7* |
| 50° | 428.3 | 435.6 | 440.3 | 444.3 | 448.3 | 450.3 | 452.3 | *451.6* |
| 52.5° | 406.9 | 413.6 | 416.3 | 419.7 | 423.0 | 425.0 | 426.9 | *425.6* |
| 55° | 386.3 | 390.9 | 393.6 | 396.2 | 398.9 | 400.9 | 402.2 | *401.6* |
| 57.5° | 366.3 | 369.6 | 371.5 | 374.2 | 376.3 | 377.6 | 378.9 | *378.3* |
| 60° | 344.9 | 347.6 | 348.9 | 351.6 | 353.6 | 354.9 | 356.3 | *356.3* |
| 62.5° | 324.9 | 326.9 | 327.6 | 330.3 | 331.6 | 332.9 | 334.9 | *334.2* |
| 65° | 303.5 | 305.6 | 306.9 | 308.9 | 310.2 | 311.6 | 313.6 | *312.8* |
| 67.5° | 283.5 | 285.6 | 286.2 | 288.2 | 290.2 | 292.2 | 292.9 | *292.9* |
| 70° | 263.6 | 264.8 | 265.5 | 268.2 | 268.9 | 270.8 | 272.2 | *272.2* |
| 72.5° | 243.5 | 244.2 | 245.5 | 247.5 | 248.8 | 250.2 | 251.5 | *250.8* |
| 75° | 222.2 | 223.5 | 224.1 | 225.5 | 225.5 | 226.8 | 226.8 | *226.8* |
| 77.5° | 200.2 | 198.1 | 197.5 | 196.8 | 196.1 | 196.1 | 196.1 | *195.4* |
| 80° | 170.1 | 168.1 | 167.4 | 166.2 | 166.2 | 166.2 | 166.2 | *165.4* |
| 82.5° | 140.8 | 138.1 | 136.8 | 136.1 | 135.5 | 135.5 | 135.5 | *134.7* |
| 85° | 106.7 | 104.0 | 103.4 | 102.7 | 102.7 | 102.1 | 101.4 | *100.7* |
| 87.5° | 66.1 | 64.0 | 63.4 | 62.0 | 62.7 | 61.4 | 61.4 | *61.4* |
| 90° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | *0.0* |

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Scaled Data Report

TEST NUMBER: P976937
CATALOG NUMBER: 24SR-LD2-C-29-UNV-L835-CD1-SO-U

**CIE UGR TABLE:**

| Reflectances: | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ceiling | 0.7 | 0.7 | 0.5 | 0.5 | 0.3 | 0.7 | 0.7 | 0.5 | 0.5 | 0.3 |
| | Wall | 0.5 | 0.3 | 0.5 | 0.3 | 0.3 | 0.5 | 0.3 | 0.5 | 0.3 | 0.3 |
| | Reference plane | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| Room Dimensions | | Viewed crosswise | | | | | Viewed endwise | | | | |
| X=2H | Y=2H | 9.8 | 11.5 | 10.2 | 11.9 | 12.2 | 12.4 | 14.1 | 12.8 | 14.4 | 14.8 |
| | 3H | 11.7 | 13.3 | 12.1 | 13.6 | 14.0 | 14.8 | 16.4 | 15.2 | 16.8 | 17.1 |
| | 4H | 12.4 | 13.9 | 12.8 | 14.3 | 14.6 | 16.0 | 17.5 | 16.4 | 17.9 | 18.2 |
| | 6H | 13.0 | 14.4 | 13.4 | 14.7 | 15.1 | 17.0 | 18.4 | 17.4 | 18.8 | 19.2 |
| | 8H | 13.2 | 14.5 | 13.6 | 14.9 | 15.3 | 17.5 | 18.8 | 17.9 | 19.2 | 19.6 |
| | 12H | 13.3 | 14.6 | 13.7 | 15.0 | 15.4 | 17.9 | 19.2 | 18.3 | 19.5 | 20.0 |
| 4H | 2H | 11.3 | 12.8 | 11.7 | 13.2 | 13.6 | 13.1 | 14.6 | 13.5 | 15.0 | 15.4 |
| | 3H | 13.7 | 15.0 | 14.1 | 15.4 | 15.8 | 15.8 | 17.1 | 16.3 | 17.5 | 17.9 |
| | 4H | 14.8 | 15.9 | 15.2 | 16.3 | 16.8 | 17.2 | 18.4 | 17.6 | 18.8 | 19.2 |
| | 6H | 15.6 | 16.6 | 16.1 | 17.1 | 17.5 | 18.4 | 19.4 | 18.8 | 19.9 | 20.3 |
| | 8H | 15.9 | 16.9 | 16.4 | 17.3 | 17.8 | 18.9 | 19.9 | 19.4 | 20.3 | 20.8 |
| | 12H | 16.1 | 17.0 | 16.6 | 17.5 | 18.0 | 19.4 | 20.3 | 19.9 | 20.8 | 21.2 |
| 8H | 4H | 15.8 | 16.8 | 16.3 | 17.2 | 17.7 | 17.7 | 18.7 | 18.2 | 19.1 | 19.6 |
| | 6H | 17.1 | 17.9 | 17.6 | 18.4 | 18.9 | 19.1 | 20.0 | 19.6 | 20.4 | 20.9 |
| | 8H | 17.6 | 18.4 | 18.1 | 18.9 | 19.4 | 19.8 | 20.5 | 20.3 | 21.0 | 21.5 |
| | 12H | 18.1 | 18.8 | 18.6 | 19.2 | 19.8 | 20.4 | 21.1 | 20.9 | 21.6 | 22.1 |
| 12H | 4H | 16.0 | 16.9 | 16.5 | 17.4 | 17.9 | 17.8 | 18.7 | 18.3 | 19.2 | 19.6 |
| | 6H | 17.5 | 18.2 | 18.0 | 18.7 | 19.2 | 19.3 | 20.1 | 19.8 | 20.5 | 21.1 |
| | 8H | 18.2 | 18.8 | 18.7 | 19.3 | 19.9 | 20.1 | 20.7 | 20.6 | 21.2 | 21.8 |

Cooper Lighting Solutions Photometric Lab
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Peachtree City, GA 30269

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

Report Prepared for

Cooper Lighting Solutions

Metalux

Report Number: SP1-2506-457-6

Test Date: 07/01/2025

Luminaire Tested: 24SR-LD2-64-C-UNV-L935-CD1-U

Data in this report applies to families of products including 24SR-LD2-64-C-UNV-L935-CD1-U

Report Generated By FNC07603 / LDUCLS01DT446
Version: v7.04

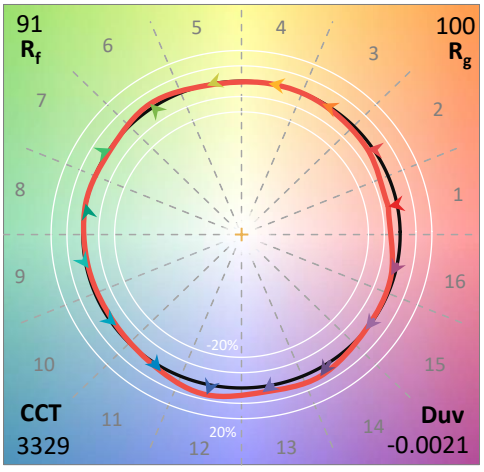
## Test Information

| | |
|---|---|
| Test Method: | LM-79-2019 |
| Report Number: | SP1-2506-457-6 |
| Test Lab: | COOPER LIGHTING SOLUTIONS |
| Photometer: | SP1 - 76IN SPHERE |
| Measurement Geometry: | 4π |
| Issue Date: | 07/02/2025 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS |
| Product Line: | Metalux |
| Catalog Number: | **24SR-LD2-64-C-UNV-L935-CD1-U** |
| Description: | 2X4 SKYRIDGE 6400LM Fixture with new LTN chip |

## Spectral Parameters

| | |
|---|---|
| CCT (K): | 3329 |
| CIE u': | 0.2411 |
| CIE v': | 0.5118 |
| Duv: | -0.0021 |
| CIE x: | 0.4128 |
| CIE y: | 0.3894 |
| CIE z: | 0.1979 |
| Peak Wavelength (nm): | 630 |
| Dominant Wavelength (nm): | 582 |
| Purity: | 40.74075 |
| Rf: | 91.4 |
| Rg: | 100.2 |

| | | | | | |
|---|---|---|---|---|---|
| CRI (Ra): | 93.9 | | | | |
| R1: | 95.4 | R9: | 60.5 | | |
| R2: | 97.4 | R10: | 92.5 | | |
| R3: | 97.7 | R11: | 95.9 | | |
| R4: | 94.9 | R12: | 82.0 | | |
| R5: | 95.1 | R13: | 96.0 | | |
| R6: | 95.7 | R14: | 98.0 | | |
| R7: | 91.7 | R15: | 91.5 | | |
| R8: | 83.2 | | | | |




## Test Conditions

| | |
|---|---|
| Stabilization Time: | 48M |
| Operation Time: | 1H 48M |
| Sphere Temperature (°C): | 24.0 |

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| Measurement and Test Equipment | | | |
|---|---|---|---|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | 76INCH SPHERE IN0058 | 6/16/2025 | 12/16/2025 |
| Power Meter | XITRON INXT2011004 | 1/21/2025 | 1/21/2026 |
| AC Power Source | CHROMA 61603 IN0063 | 10/22/2024 | 10/22/2025 |
| DC Power Source | AGILENT E3634A IN0208 | 10/22/2024 | 10/22/2025 |
| Sphere Thermometer | ONSET IN0085 | 10/22/2024 | 10/22/2025 |
| Room Thermometer | ONSET IN0046 | 10/22/2024 | 10/22/2025 |

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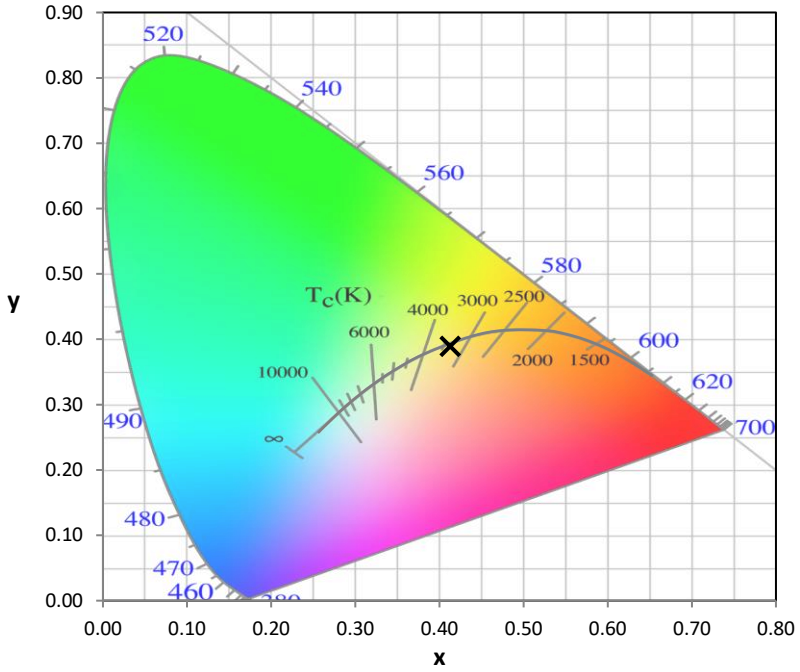
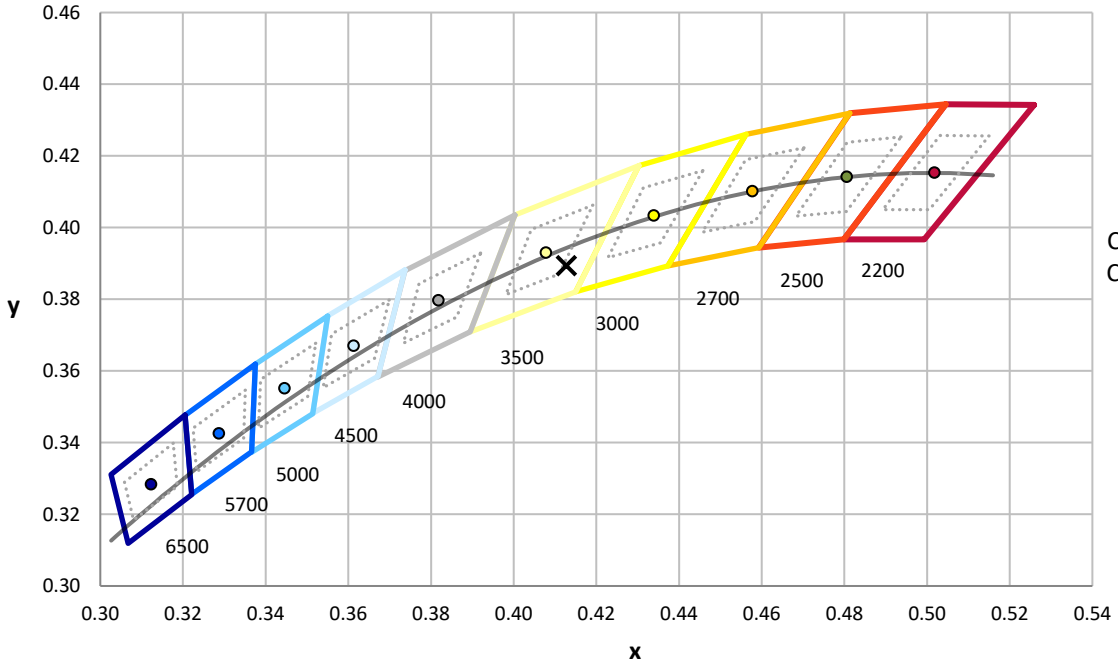
## CIE 1931 Chromaticity Diagram




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




CCT = 3329K
CIE x = 0.4128
CIE y = 0.3894
Duv = -0.0021

Point lies inside the ANSI 3500K 7-step quadrangle

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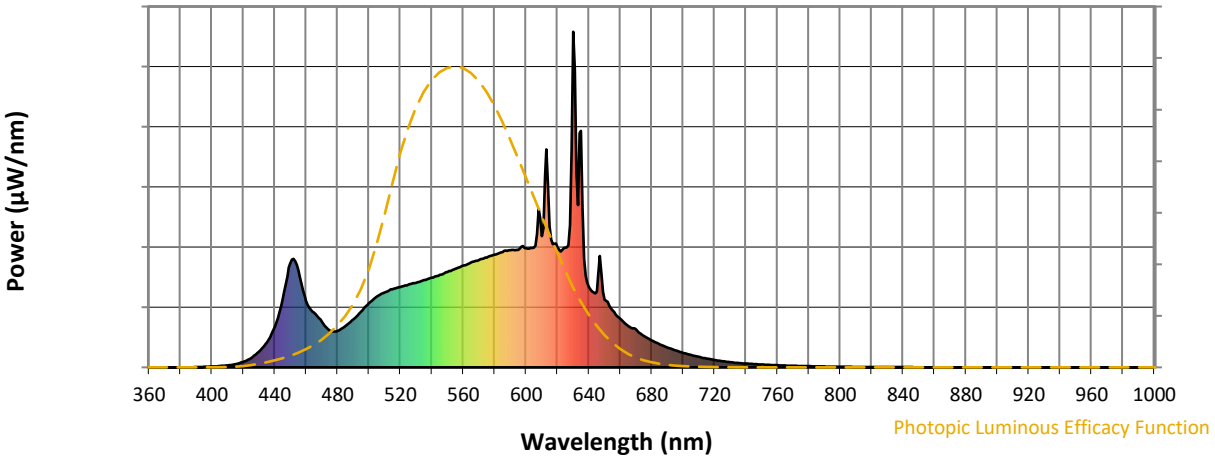
## Photopic Flux vs. Wavelength




## 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 | 143 | NR | 620 | 358 | NR | 750 | 9 | NR | 880 | 0 | NR |
| 365 | 0 | NR | 495 | 166 | NR | 625 | 357 | NR | 755 | 7 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 191 | NR | 630 | 1000 | NR | 760 | 6 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 210 | NR | 635 | 705 | NR | 765 | 5 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 223 | NR | 640 | 239 | NR | 770 | 5 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 233 | NR | 645 | 226 | NR | 775 | 4 | NR | 905 | 0 | NR |
| 390 | 1 | NR | 520 | 240 | NR | 650 | 201 | NR | 780 | 3 | NR | 910 | 0 | NR |
| 395 | 2 | NR | 525 | 246 | NR | 655 | 170 | NR | 785 | 3 | NR | 915 | 0 | NR |
| 400 | 3 | NR | 530 | 251 | NR | 660 | 145 | NR | 790 | 2 | NR | 920 | 0 | NR |
| 405 | 4 | NR | 535 | 260 | NR | 665 | 123 | NR | 795 | 2 | NR | 925 | 0 | NR |
| 410 | 6 | NR | 540 | 267 | NR | 670 | 113 | NR | 800 | 2 | NR | 930 | 0 | NR |
| 415 | 9 | NR | 545 | 276 | NR | 675 | 93 | NR | 805 | 2 | NR | 935 | 0 | NR |
| 420 | 16 | NR | 550 | 284 | NR | 680 | 80 | NR | 810 | 1 | NR | 940 | 0 | NR |
| 425 | 28 | NR | 555 | 294 | NR | 685 | 69 | NR | 815 | 1 | NR | 945 | 0 | NR |
| 430 | 46 | NR | 560 | 303 | NR | 690 | 59 | NR | 820 | 1 | NR | 950 | 0 | NR |
| 435 | 75 | NR | 565 | 313 | NR | 695 | 51 | NR | 825 | 1 | NR | 955 | 0 | NR |
| 440 | 120 | NR | 570 | 319 | NR | 700 | 43 | NR | 830 | 1 | NR | 960 | 0 | NR |
| 445 | 203 | NR | 575 | 327 | NR | 705 | 37 | NR | 835 | 1 | NR | 965 | 0 | NR |
| 450 | 311 | NR | 580 | 336 | NR | 710 | 31 | NR | 840 | 1 | NR | 970 | 0 | NR |
| 455 | 290 | NR | 585 | 344 | NR | 715 | 26 | NR | 845 | 1 | NR | 975 | 0 | NR |
| 460 | 197 | NR | 590 | 349 | NR | 720 | 22 | NR | 850 | 0 | NR | 980 | 0 | NR |
| 465 | 163 | NR | 595 | 350 | NR | 725 | 18 | NR | 855 | 0 | NR | 985 | 0 | NR |
| 470 | 135 | NR | 600 | 355 | NR | 730 | 15 | NR | 860 | 0 | NR | 990 | 0 | NR |
| 475 | 110 | NR | 605 | 357 | NR | 735 | 13 | NR | 865 | 0 | NR | 995 | 0 | NR |
| 480 | 108 | NR | 610 | 391 | NR | 740 | 11 | NR | 870 | 0 | NR | 1000 | 0 | NR |
| 485 | 123 | NR | 615 | 421 | NR | 745 | 10 | NR | 875 | 0 | NR | | | |

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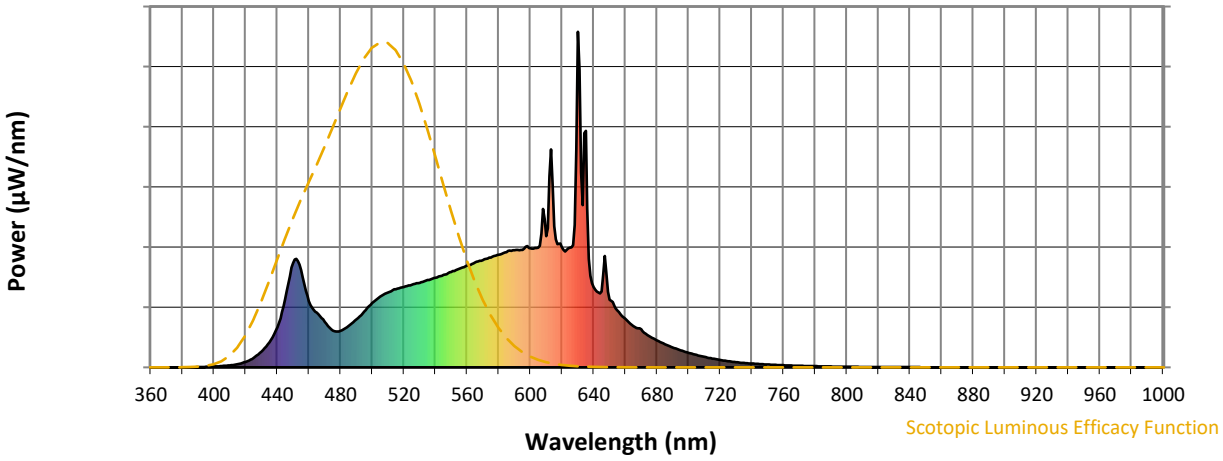
## Scotopic Flux vs. Wavelength




**Scotopic Lumens: NR** **S/P: 1.57**

| 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 | 143 | NR | 620 | 358 | NR | 750 | 9 | NR | 880 | 0 | NR |
| 365 | 0 | NR | 495 | 166 | NR | 625 | 357 | NR | 755 | 7 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 191 | NR | 630 | 1000 | NR | 760 | 6 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 210 | NR | 635 | 705 | NR | 765 | 5 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 223 | NR | 640 | 239 | NR | 770 | 5 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 233 | NR | 645 | 226 | NR | 775 | 4 | NR | 905 | 0 | NR |
| 390 | 1 | NR | 520 | 240 | NR | 650 | 201 | NR | 780 | 3 | NR | 910 | 0 | NR |
| 395 | 2 | NR | 525 | 246 | NR | 655 | 170 | NR | 785 | 3 | NR | 915 | 0 | NR |
| 400 | 3 | NR | 530 | 251 | NR | 660 | 145 | NR | 790 | 2 | NR | 920 | 0 | NR |
| 405 | 4 | NR | 535 | 260 | NR | 665 | 123 | NR | 795 | 2 | NR | 925 | 0 | NR |
| 410 | 6 | NR | 540 | 267 | NR | 670 | 113 | NR | 800 | 2 | NR | 930 | 0 | NR |
| 415 | 9 | NR | 545 | 276 | NR | 675 | 93 | NR | 805 | 2 | NR | 935 | 0 | NR |
| 420 | 16 | NR | 550 | 284 | NR | 680 | 80 | NR | 810 | 1 | NR | 940 | 0 | NR |
| 425 | 28 | NR | 555 | 294 | NR | 685 | 69 | NR | 815 | 1 | NR | 945 | 0 | NR |
| 430 | 46 | NR | 560 | 303 | NR | 690 | 59 | NR | 820 | 1 | NR | 950 | 0 | NR |
| 435 | 75 | NR | 565 | 313 | NR | 695 | 51 | NR | 825 | 1 | NR | 955 | 0 | NR |
| 440 | 120 | NR | 570 | 319 | NR | 700 | 43 | NR | 830 | 1 | NR | 960 | 0 | NR |
| 445 | 203 | NR | 575 | 327 | NR | 705 | 37 | NR | 835 | 1 | NR | 965 | 0 | NR |
| 450 | 311 | NR | 580 | 336 | NR | 710 | 31 | NR | 840 | 1 | NR | 970 | 0 | NR |
| 455 | 290 | NR | 585 | 344 | NR | 715 | 26 | NR | 845 | 1 | NR | 975 | 0 | NR |
| 460 | 197 | NR | 590 | 349 | NR | 720 | 22 | NR | 850 | 0 | NR | 980 | 0 | NR |
| 465 | 163 | NR | 595 | 350 | NR | 725 | 18 | NR | 855 | 0 | NR | 985 | 0 | NR |
| 470 | 135 | NR | 600 | 355 | NR | 730 | 15 | NR | 860 | 0 | NR | 990 | 0 | NR |
| 475 | 110 | NR | 605 | 357 | NR | 735 | 13 | NR | 865 | 0 | NR | 995 | 0 | NR |
| 480 | 108 | NR | 610 | 391 | NR | 740 | 11 | NR | 870 | 0 | NR | 1000 | 0 | NR |
| 485 | 123 | NR | 615 | 421 | NR | 745 | 10 | NR | 875 | 0 | NR | | | |

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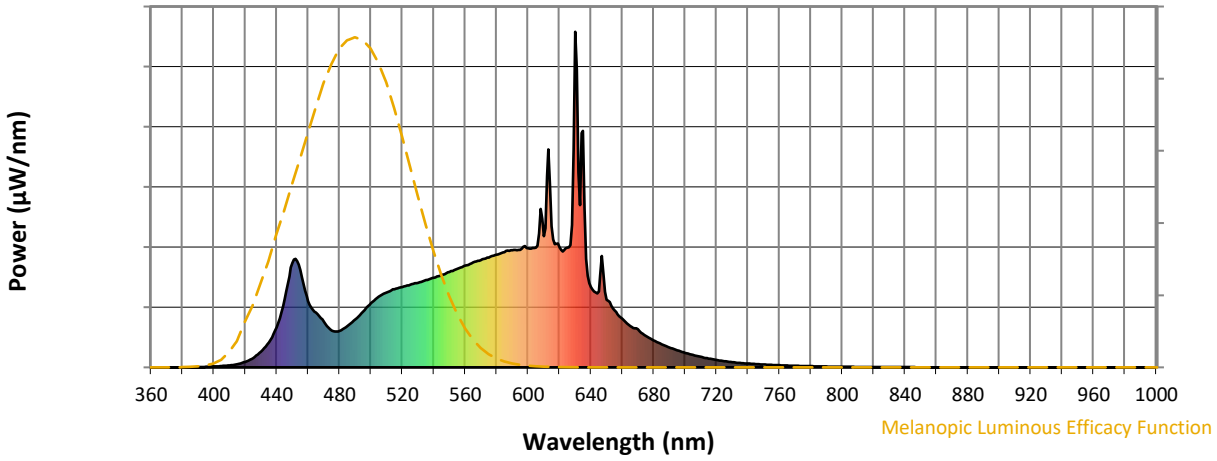
## Melanopic Flux vs. Wavelength




**Melanopic Lumens: NR** **M/P: 3.17**

| 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 | 143 | NR | 620 | 358 | NR | 750 | 9 | NR | 880 | 0 | NR |
| 365 | 0 | NR | 495 | 166 | NR | 625 | 357 | NR | 755 | 7 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 191 | NR | 630 | 1000 | NR | 760 | 6 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 210 | NR | 635 | 705 | NR | 765 | 5 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 223 | NR | 640 | 239 | NR | 770 | 5 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 233 | NR | 645 | 226 | NR | 775 | 4 | NR | 905 | 0 | NR |
| 390 | 1 | NR | 520 | 240 | NR | 650 | 201 | NR | 780 | 3 | NR | 910 | 0 | NR |
| 395 | 2 | NR | 525 | 246 | NR | 655 | 170 | NR | 785 | 3 | NR | 915 | 0 | NR |
| 400 | 3 | NR | 530 | 251 | NR | 660 | 145 | NR | 790 | 2 | NR | 920 | 0 | NR |
| 405 | 4 | NR | 535 | 260 | NR | 665 | 123 | NR | 795 | 2 | NR | 925 | 0 | NR |
| 410 | 6 | NR | 540 | 267 | NR | 670 | 113 | NR | 800 | 2 | NR | 930 | 0 | NR |
| 415 | 9 | NR | 545 | 276 | NR | 675 | 93 | NR | 805 | 2 | NR | 935 | 0 | NR |
| 420 | 16 | NR | 550 | 284 | NR | 680 | 80 | NR | 810 | 1 | NR | 940 | 0 | NR |
| 425 | 28 | NR | 555 | 294 | NR | 685 | 69 | NR | 815 | 1 | NR | 945 | 0 | NR |
| 430 | 46 | NR | 560 | 303 | NR | 690 | 59 | NR | 820 | 1 | NR | 950 | 0 | NR |
| 435 | 75 | NR | 565 | 313 | NR | 695 | 51 | NR | 825 | 1 | NR | 955 | 0 | NR |
| 440 | 120 | NR | 570 | 319 | NR | 700 | 43 | NR | 830 | 1 | NR | 960 | 0 | NR |
| 445 | 203 | NR | 575 | 327 | NR | 705 | 37 | NR | 835 | 1 | NR | 965 | 0 | NR |
| 450 | 311 | NR | 580 | 336 | NR | 710 | 31 | NR | 840 | 1 | NR | 970 | 0 | NR |
| 455 | 290 | NR | 585 | 344 | NR | 715 | 26 | NR | 845 | 1 | NR | 975 | 0 | NR |
| 460 | 197 | NR | 590 | 349 | NR | 720 | 22 | NR | 850 | 0 | NR | 980 | 0 | NR |
| 465 | 163 | NR | 595 | 350 | NR | 725 | 18 | NR | 855 | 0 | NR | 985 | 0 | NR |
| 470 | 135 | NR | 600 | 355 | NR | 730 | 15 | NR | 860 | 0 | NR | 990 | 0 | NR |
| 475 | 110 | NR | 605 | 357 | NR | 735 | 13 | NR | 865 | 0 | NR | 995 | 0 | NR |
| 480 | 108 | NR | 610 | 391 | NR | 740 | 11 | NR | 870 | 0 | NR | 1000 | 0 | NR |
| 485 | 123 | NR | 615 | 421 | NR | 745 | 10 | NR | 875 | 0 | NR | | | |

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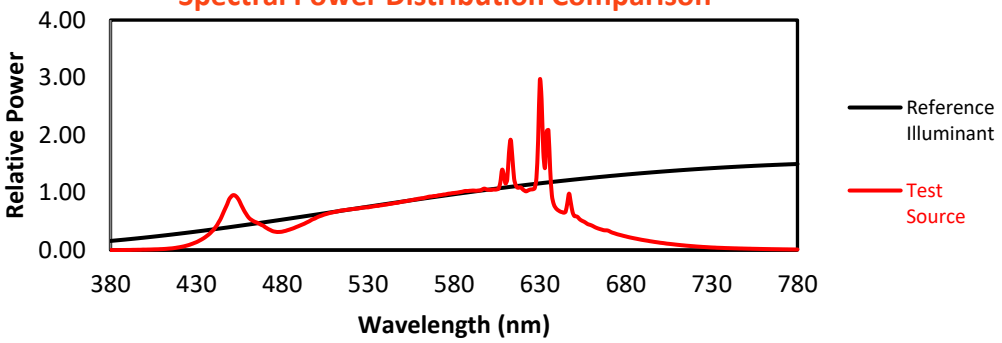
# TM-30-18

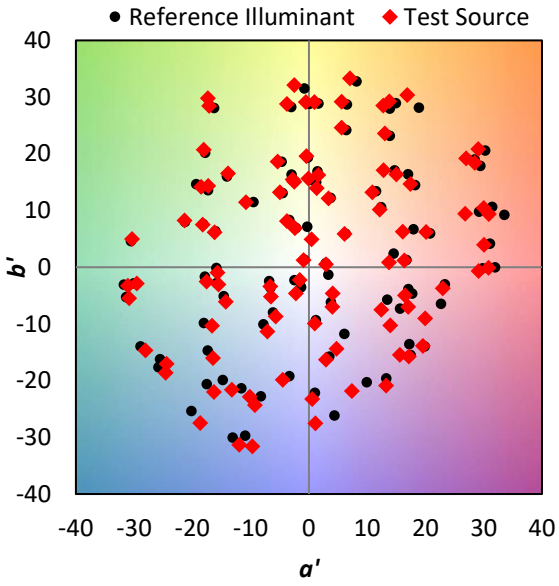
## Summary

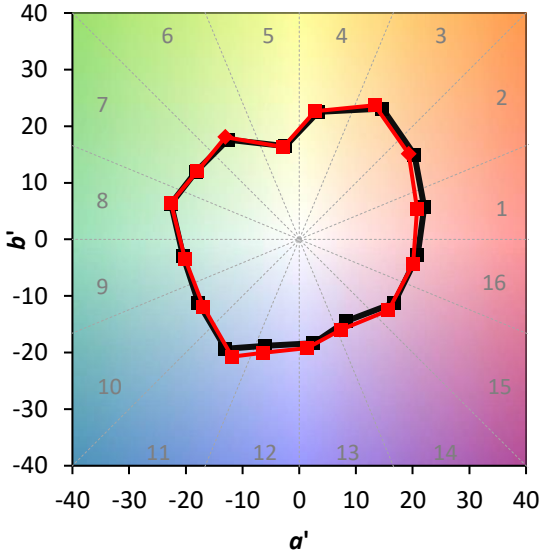
$R_f$ = 91.4
$R_g$ = 100.2
CIE $R_a$ = 93.9
$R_9$ = 60.5

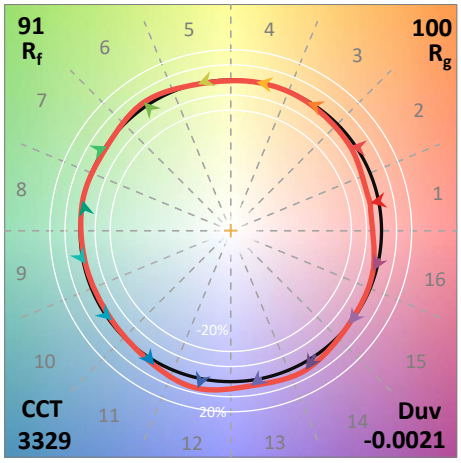
## Spectral Power Distribution Comparison

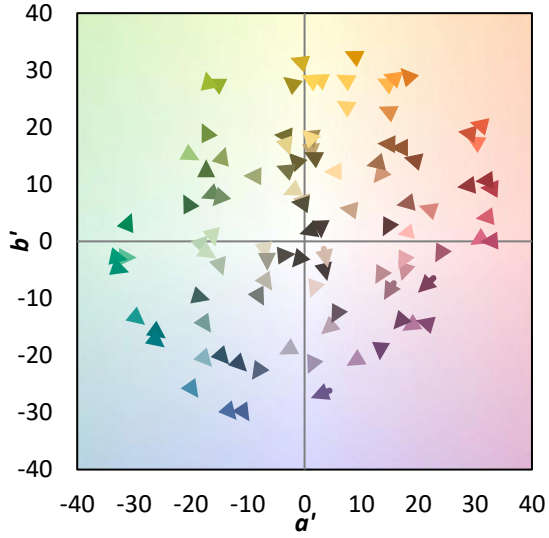



## Color Vector Graphics



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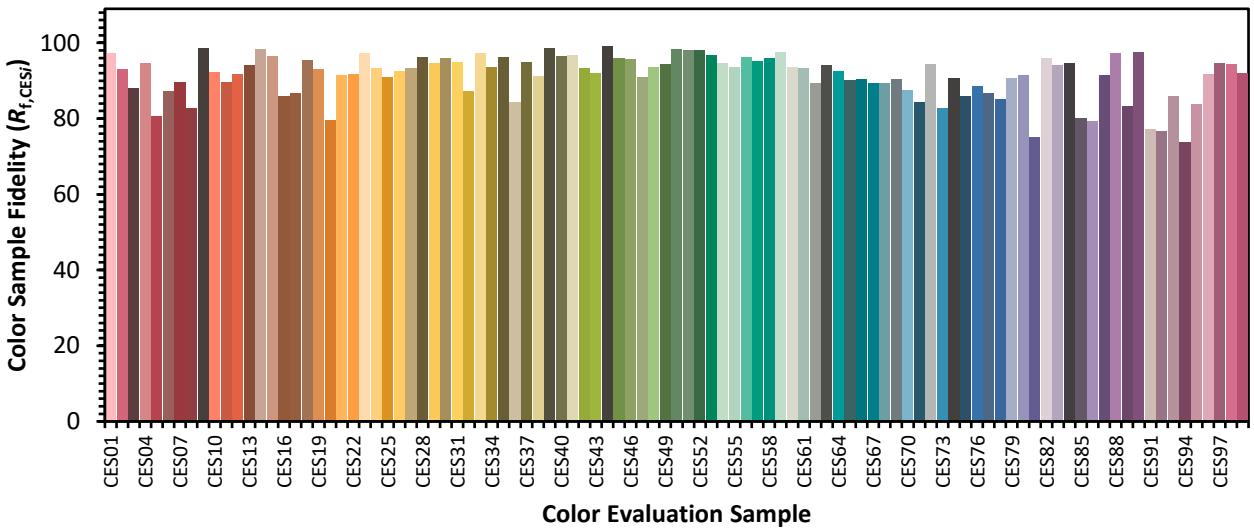
# TM-30-18

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

| | | | |
|---|---|---|---|
| CES01 = 86 | CES26 = 93 | CES51 = 98 | CES76 = 88 |
| CES02 = 63 | CES27 = 93 | CES52 = 98 | CES77 = 87 |
| CES03 = 31 | CES28 = 96 | CES53 = 97 | CES78 = 85 |
| CES04 = 70 | CES29 = 95 | CES54 = 95 | CES79 = 91 |
| CES05 = 50 | CES30 = 96 | CES55 = 94 | CES80 = 92 |
| CES06 = 51 | CES31 = 95 | CES56 = 96 | CES81 = 75 |
| CES07 = 43 | CES32 = 87 | CES57 = 95 | CES82 = 96 |
| CES08 = 42 | CES33 = 97 | CES58 = 96 | CES83 = 94 |
| CES09 = 29 | CES34 = 94 | CES59 = 98 | CES84 = 95 |
| CES10 = 75 | CES35 = 96 | CES60 = 94 | CES85 = 80 |
| CES11 = 58 | CES36 = 84 | CES61 = 93 | CES86 = 79 |
| CES12 = 64 | CES37 = 95 | CES62 = 89 | CES87 = 91 |
| CES13 = 44 | CES38 = 91 | CES63 = 94 | CES88 = 97 |
| CES14 = 74 | CES39 = 99 | CES64 = 92 | CES89 = 83 |
| CES15 = 72 | CES40 = 97 | CES65 = 90 | CES90 = 98 |
| CES16 = 48 | CES41 = 97 | CES66 = 90 | CES91 = 77 |
| CES17 = 49 | CES42 = 93 | CES67 = 89 | CES92 = 77 |
| CES18 = 56 | CES43 = 92 | CES68 = 89 | CES93 = 86 |
| CES19 = 71 | CES44 = 99 | CES69 = 91 | CES94 = 74 |
| CES20 = 67 | CES45 = 96 | CES70 = 88 | CES95 = 84 |
| CES21 = 86 | CES46 = 96 | CES71 = 84 | CES96 = 92 |
| CES22 = 78 | CES47 = 91 | CES72 = 94 | CES97 = 95 |
| CES23 = 91 | CES48 = 94 | CES73 = 83 | CES98 = 94 |
| CES24 = 90 | CES49 = 94 | CES74 = 91 | CES99 = 92 |
| CES25 = 71 | CES50 = 98 | CES75 = 86 | |



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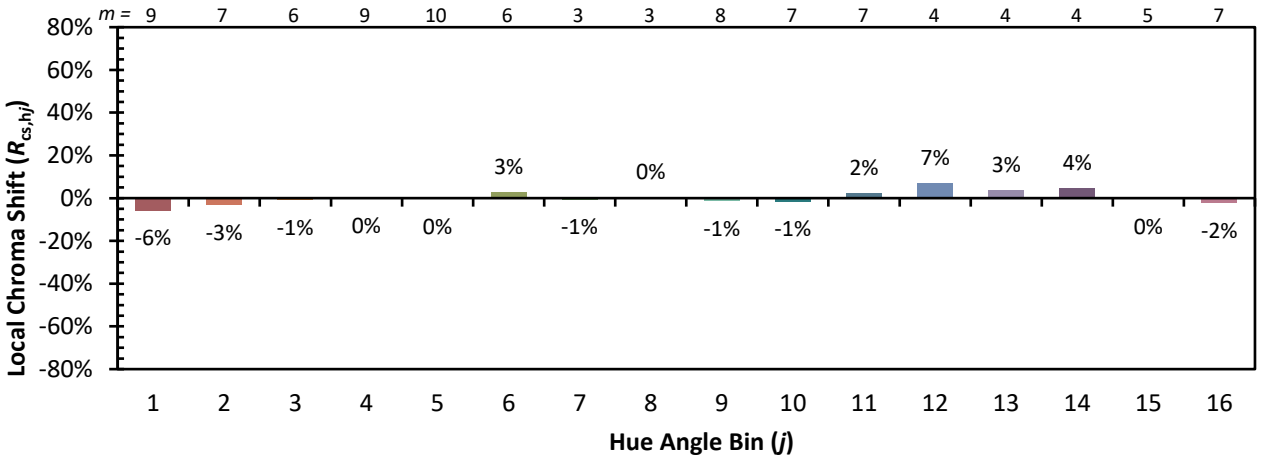
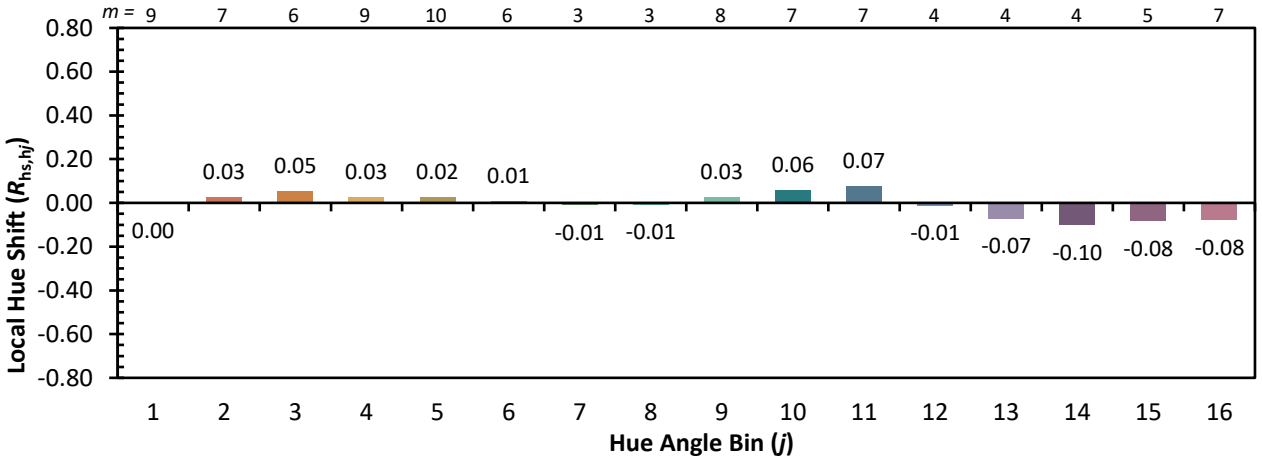
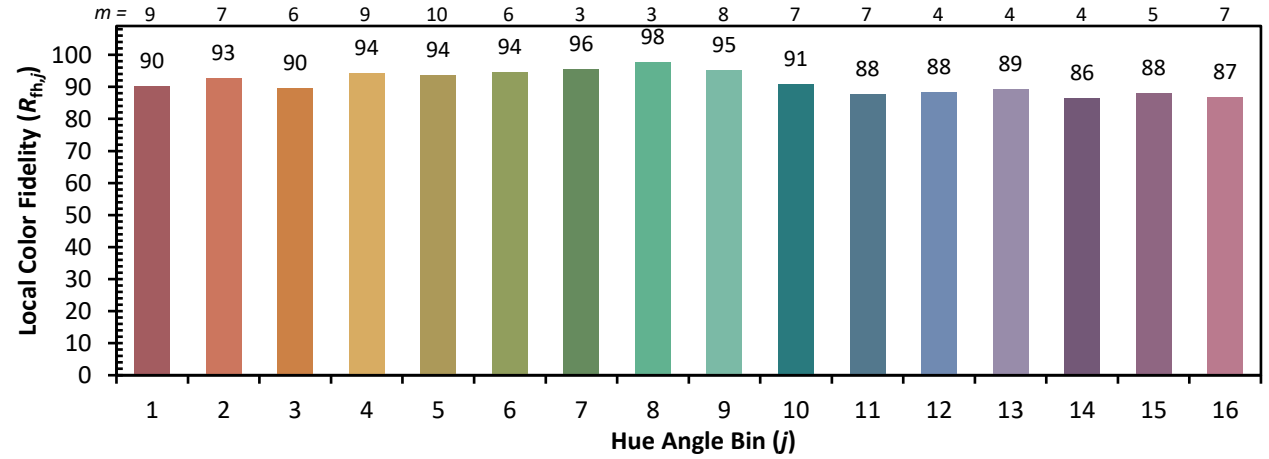
# TM-30-18

## Color Rendition by Hue-Angle Bin



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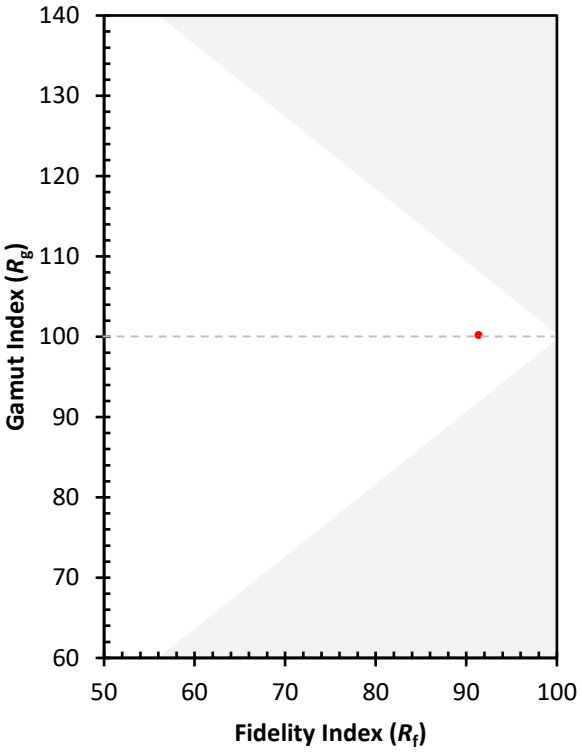
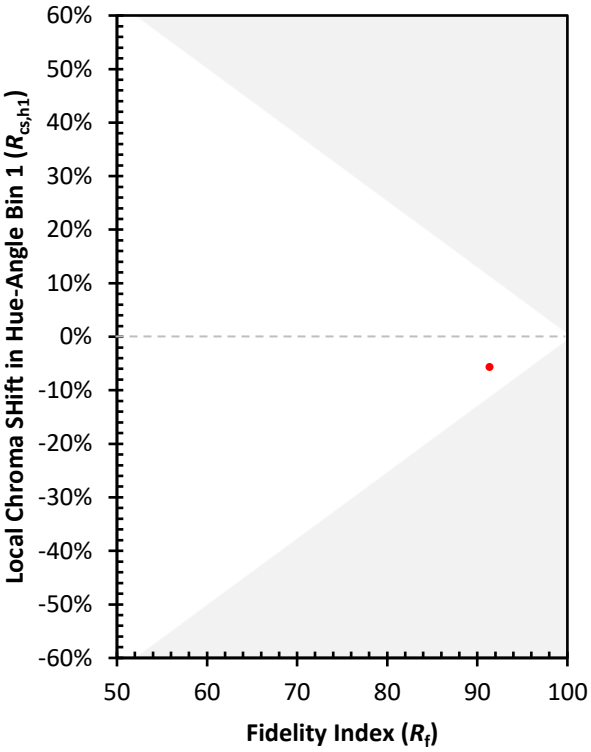
## TM-30-18

### Measure Comparisons




(END OF REPORT)