

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: PrentaLux

Report Number: P878980

Luminaire Tested: PRLX-206-930-LL3-C-U-S-X-X-WHHR-FL-X

Issue Date: 9/24/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P878980  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-2405-094-1)  
Test Lab: COOPER LIGHTING SOLUTIONS  
Issue Date: 9/24/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: PrentaLux  
Catalog Number: PRLX-206-930-LL3-C-U-S-X-X-WHHR-FL-X  
Description: PrentaLux 200 SERIES 3D PRINTED LUMINAIRE, 206 SHADE, CLEAR LENS.  
Light Source: 3000K CCT, 90 CRI LEDS  
Ballast/Driver: -

**Summary**

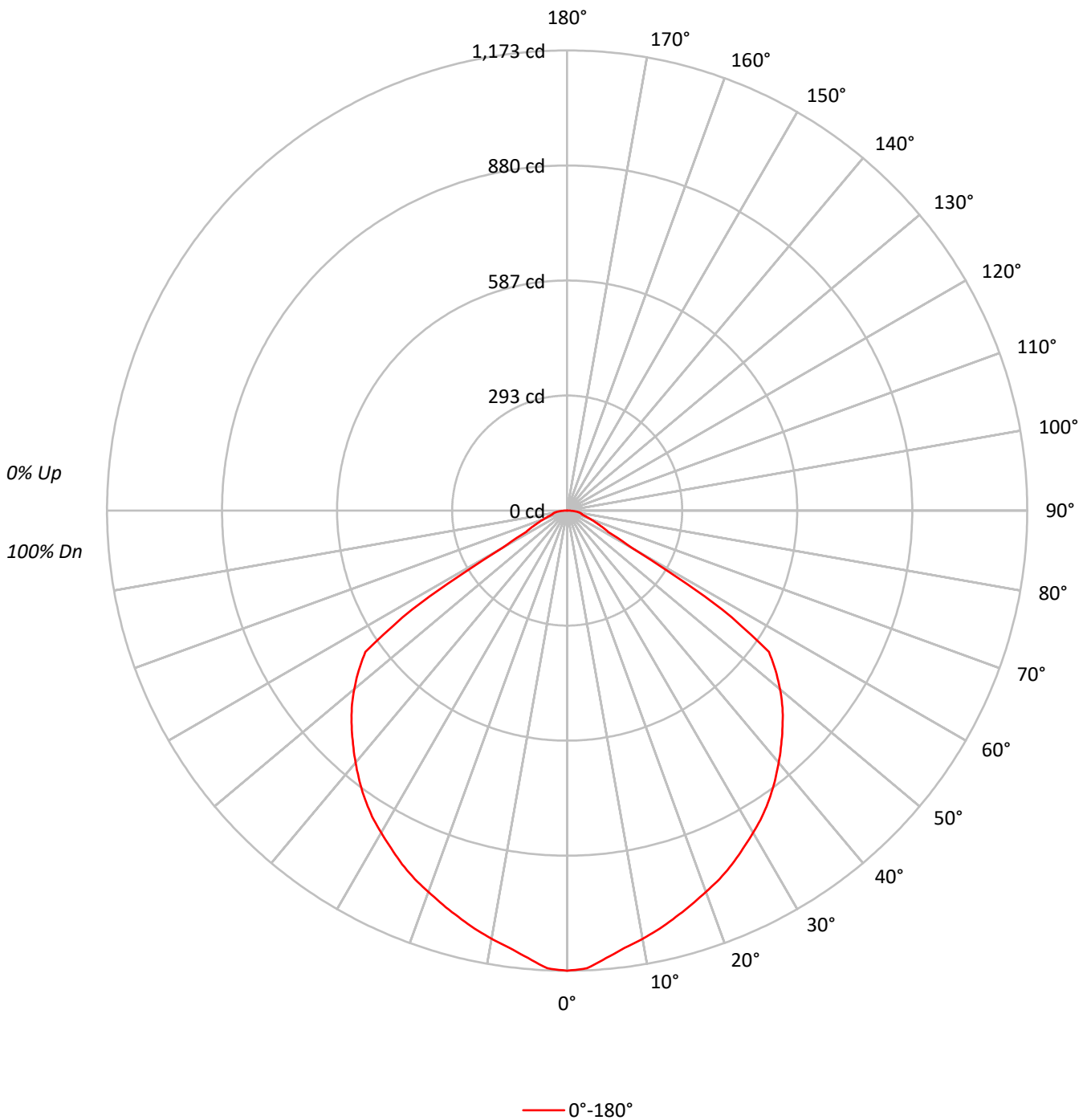
Lumens per Lamp: N/A  
Luminaire Lumens: 2694.5 lumens  
Efficiency: N/A  
Efficacy: 154.9 lumens/watt  
Spacing Criteria (0/90/45): 1.21 / 1.21 / 1.37  
Luminous Opening: Circular (Dia: 0.88' x H: 0')  
CIE Type: Direct

Input Watts (W): 17.4  
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: 0.5 HR  
Operation Time: 3 HR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P878980

CATALOG NUMBER: PRLX-206-930-LL3-C-U-S-X-X-WHHR-FL-X

### Luminous Intensity Polar Plot



TEST NUMBER: P878980

CATALOG NUMBER: PRLX-206-930-LL3-C-U-S-X-X-WHHR-FL-X

**COEFFICIENT OF UTILIZATION - ZONAL CAVITY METHOD:**

|     |     |     |     |     |     |     |     |     |     |     |     |  |     |     |     |  |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|-----|-----|-----|--|-----|-----|-----|-----|
| RF  | 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   | 111 | 107 | 103 | 100 | 108 | 105 | 101 | 99  | 100 | 98  | 95  |  | 97  | 95  | 93  |  | 93  | 91  | 90  | 88  |
| 2   | 102 | 95  | 89  | 85  | 100 | 93  | 88  | 84  | 90  | 86  | 82  |  | 87  | 83  | 80  |  | 84  | 81  | 78  | 76  |
| 3   | 94  | 85  | 78  | 72  | 92  | 83  | 77  | 72  | 81  | 75  | 70  |  | 78  | 73  | 69  |  | 75  | 71  | 68  | 66  |
| 4   | 87  | 76  | 68  | 62  | 85  | 75  | 67  | 62  | 72  | 66  | 61  |  | 70  | 65  | 60  |  | 68  | 63  | 59  | 57  |
| 5   | 80  | 68  | 60  | 54  | 78  | 67  | 60  | 54  | 65  | 59  | 53  |  | 63  | 57  | 53  |  | 62  | 56  | 52  | 50  |
| 6   | 74  | 62  | 54  | 48  | 72  | 61  | 53  | 47  | 59  | 52  | 47  |  | 58  | 51  | 47  |  | 56  | 51  | 46  | 44  |
| 7   | 69  | 56  | 48  | 42  | 67  | 55  | 48  | 42  | 54  | 47  | 42  |  | 53  | 46  | 42  |  | 51  | 46  | 41  | 39  |
| 8   | 64  | 51  | 43  | 38  | 63  | 51  | 43  | 38  | 49  | 42  | 37  |  | 48  | 42  | 37  |  | 47  | 41  | 37  | 35  |
| 9   | 60  | 47  | 39  | 34  | 59  | 47  | 39  | 34  | 45  | 39  | 34  |  | 44  | 38  | 34  |  | 43  | 38  | 33  | 32  |
| 10  | 56  | 43  | 36  | 31  | 55  | 43  | 36  | 31  | 42  | 35  | 31  |  | 41  | 35  | 31  |  | 40  | 34  | 30  | 29  |

**AVERAGE LUMINANCE (cd/sqm):**

|     |       |
|-----|-------|
|     | 0°    |
| 0°  | 20997 |
| 5°  | 20571 |
| 10° | 20147 |
| 15° | 19868 |
| 20° | 19701 |
| 25° | 19650 |
| 30° | 19599 |
| 35° | 19634 |
| 40° | 19608 |
| 45° | 19665 |
| 50° | 19730 |
| 55° | 19590 |
| 60° | 6852  |
| 65° | 4147  |
| 70° | 3261  |
| 75° | 2773  |
| 80° | 3443  |
| 85° | 4108  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
 Vertical Angle: 47.5°  
 Luminance: 19737 cd/sqm

TEST NUMBER: P878980

CATALOG NUMBER: PRLX-206-930-LL3-C-U-S-X-X-WHHR-FL-X

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 108.1  | 4.0       |
| 10°-20°   | 302.8  | 11.2      |
| 20°-30°   | 458.6  | 17.0      |
| 30°-40°   | 562.0  | 20.9      |
| 40°-50°   | 599.5  | 22.2      |
| 50°-60°   | 493.2  | 18.3      |
| 60°-70°   | 103.9  | 3.9       |
| 70°-80°   | 45.9   | 1.7       |
| 80°-90°   | 20.5   | 0.8       |
| 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°    | 869.6  | 32.3      |
| 0°-40°    | 1431.6 | 53.1      |
| 0°-60°    | 2524.2 | 93.7      |
| 0°-90°    | 2694.5 | 100.0     |
| 90°-120°  | 0.0    | 0.0       |
| 90°-150°  | 0.0    | 0.0       |
| 90°-180°  | 0.0    | 0.0       |
| 0°-180°   | 2694.5 | 100.0     |

**CANDELA DISTRIBUTION:**

|     | 0°   | Flux |
|-----|------|------|
| 0°  | 1173 |      |
| 5°  | 1145 | 108  |
| 15° | 1072 | 303  |
| 25° | 995  | 459  |
| 35° | 898  | 562  |
| 45° | 777  | 600  |
| 55° | 628  | 493  |
| 65° | 98   | 104  |
| 75° | 40   | 46   |
| 85° | 20   | 20   |
| 90° | 0    |      |

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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     |
|-------|--------|
| 0°    | 1173.0 |
| 2.5°  | 1167.8 |
| 5°    | 1144.8 |
| 7.5°  | 1124.0 |
| 10°   | 1108.4 |
| 12.5° | 1091.4 |
| 15°   | 1072.1 |
| 17.5° | 1053.5 |
| 20°   | 1034.2 |
| 22.5° | 1016.4 |
| 25°   | 994.9  |
| 27.5° | 971.2  |
| 30°   | 948.2  |
| 32.5° | 925.2  |
| 35°   | 898.5  |
| 37.5° | 869.5  |
| 40°   | 839.1  |
| 42.5° | 808.0  |
| 45°   | 776.8  |
| 47.5° | 744.9  |
| 50°   | 708.5  |
| 52.5° | 670.0  |
| 55°   | 627.7  |
| 57.5° | 468.9  |
| 60°   | 191.4  |
| 62.5° | 118.0  |
| 65°   | 97.9   |
| 67.5° | 78.6   |
| 70°   | 62.3   |
| 72.5° | 49.0   |
| 75°   | 40.1   |
| 77.5° | 37.1   |
| 80°   | 33.4   |
| 82.5° | 28.2   |
| 85°   | 20.0   |
| 87.5° | 10.4   |
| 90°   | 0.0    |

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**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 | 21.80            | 23.30 | 22.16 | 23.62 | 23.93 | 21.80          | 23.30 | 22.16 | 23.62 | 23.93 |
|                 | 3H   | 21.85            | 23.18 | 22.23 | 23.51 | 23.87 | 21.85          | 23.18 | 22.23 | 23.51 | 23.87 |
|                 | 4H   | 21.86            | 23.10 | 22.26 | 23.45 | 23.82 | 21.86          | 23.10 | 22.26 | 23.45 | 23.82 |
|                 | 6H   | 21.88            | 23.02 | 22.29 | 23.39 | 23.78 | 21.88          | 23.02 | 22.29 | 23.39 | 23.78 |
|                 | 8H   | 21.90            | 22.98 | 22.33 | 23.37 | 23.77 | 21.90          | 22.98 | 22.33 | 23.37 | 23.77 |
|                 | 12H  | 21.92            | 22.95 | 22.35 | 23.34 | 23.76 | 21.92          | 22.95 | 22.35 | 23.34 | 23.76 |
| 4H              | 2H   | 21.70            | 22.94 | 22.10 | 23.29 | 23.67 | 21.70          | 22.94 | 22.10 | 23.29 | 23.67 |
|                 | 3H   | 21.82            | 22.82 | 22.23 | 23.23 | 23.63 | 21.82          | 22.82 | 22.23 | 23.23 | 23.63 |
|                 | 4H   | 21.85            | 22.75 | 22.28 | 23.16 | 23.60 | 21.85          | 22.75 | 22.28 | 23.16 | 23.60 |
|                 | 6H   | 21.93            | 22.71 | 22.39 | 23.15 | 23.62 | 21.93          | 22.71 | 22.39 | 23.15 | 23.62 |
|                 | 8H   | 21.98            | 22.71 | 22.44 | 23.15 | 23.62 | 21.98          | 22.71 | 22.44 | 23.15 | 23.62 |
|                 | 12H  | 22.03            | 22.68 | 22.51 | 23.16 | 23.63 | 22.03          | 22.68 | 22.51 | 23.16 | 23.63 |
| 8H              | 4H   | 21.79            | 22.52 | 22.26 | 22.97 | 23.44 | 21.79          | 22.52 | 22.26 | 22.97 | 23.44 |
|                 | 6H   | 21.92            | 22.52 | 22.41 | 23.02 | 23.49 | 21.92          | 22.52 | 22.41 | 23.02 | 23.49 |
|                 | 8H   | 22.00            | 22.55 | 22.52 | 23.06 | 23.55 | 22.00          | 22.55 | 22.52 | 23.06 | 23.55 |
|                 | 12H  | 22.11            | 22.61 | 22.62 | 23.10 | 23.66 | 22.11          | 22.61 | 22.62 | 23.10 | 23.66 |
| 12H             | 4H   | 21.77            | 22.42 | 22.25 | 22.90 | 23.37 | 21.77          | 22.42 | 22.25 | 22.90 | 23.37 |
|                 | 6H   | 21.89            | 22.45 | 22.41 | 22.96 | 23.45 | 21.89          | 22.45 | 22.41 | 22.96 | 23.45 |
|                 | 8H   | 22.02            | 22.52 | 22.53 | 23.01 | 23.57 | 22.02          | 22.52 | 22.53 | 23.01 | 23.57 |

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

Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

SHAPER

Report Number: SP1-2203-582-2

Test Date: 05/25/2022

Luminaire Tested: 225-90-30K-27L-UNV-STD-X-X-WHHR-SR-X  
Data in this report applies to 200 Series families of products



**Test Information**

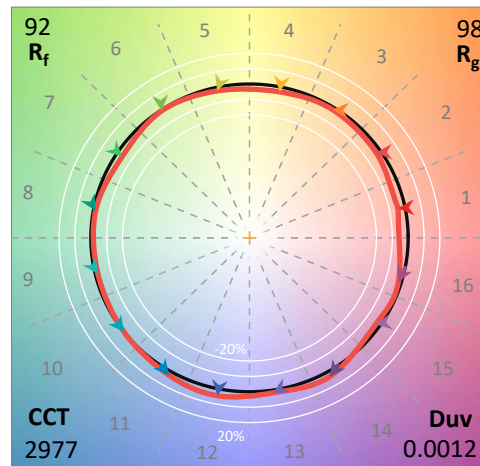
Test Method: LM-79-2019  
 Report Number: SP1-2203-582-2  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry: 4π  
 Issue Date: 05/25/2022  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: SHAPER  
 Catalog Number: **225-90-30K-27L-UNV-STD-X-X-WHHR-SR-X**  
 Description: Shaper 3D PRINTED 200 Series Pendants

**Spectral Parameters**

CCT (K): 2977  
 CIE u': 0.2509  
 CIE v': 0.5235  
 Duv: 0.0012  
 CIE x: 0.4402  
 CIE y: 0.4082  
 CIE z: 0.1515  
 Peak Wavelength (nm): 622  
 Dominant Wavelength (nm): 582  
 Purity: 54.9  
 Rf: 92.3  
 Rg: 97.8

|           |      |      |      |
|-----------|------|------|------|
| CRI (Ra): | 93.8 |      |      |
| R1:       | 93.9 | R9:  | 64.0 |
| R2:       | 97.0 | R10: | 92.1 |
| R3:       | 98.8 | R11: | 94.8 |
| R4:       | 93.7 | R12: | 81.7 |
| R5:       | 93.4 | R13: | 94.8 |
| R6:       | 96.4 | R14: | 98.7 |
| R7:       | 93.1 |      |      |
| R8:       | 84.0 |      |      |

**Test Conditions**  
 Stabilization Time: 71M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.7/43%  
 Sphere Temperature (°C): 25.0



REPORT NUMBER: SP1-2203-582-2

| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | 76INCH SPHERE IN0058  | 2/7/2022         | 8/7/2022             |
| Power Meter                    | XITRON 2801 IN0071    | 11/29/2021       | 11/29/2022           |
| AC Power Source                | CHROMA 61603 IN0063   | 11/29/2021       | 11/29/2022           |
| DC Power Source                | AGILENT E3634A IN0208 | 11/29/2021       | 11/29/2022           |
| Sphere Thermometer             | ONSET IN0085          | 11/29/2021       | 11/29/2022           |
| Room Thermometer               | ONSET IN0046          | 11/29/2021       | 11/29/2022           |

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**CIE 1931 Chromaticity Diagram**



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



Point lies inside the ANSI 3000K 4-step quadrangle

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**Photopic Flux vs. Wavelength**

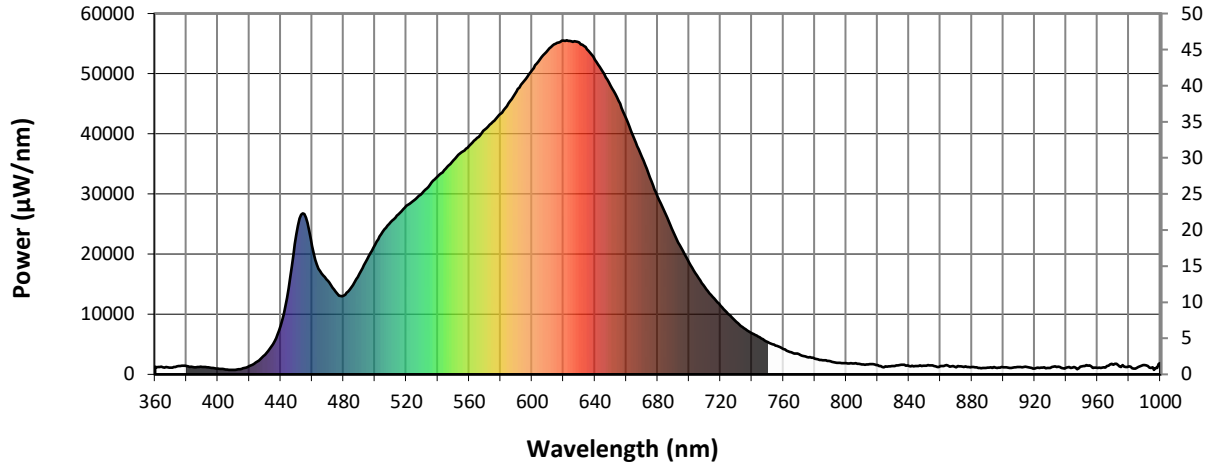


#####

| λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) |
|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|
| 360    | 1256          | NR            | 490    | 16713         | NR            | 620    | 55488         | NR            | 750    | 5386          | NR            | 880    | 1232          | NR            |
| 365    | 1189          | NR            | 495    | 19116         | NR            | 625    | 55411         | NR            | 755    | 4806          | NR            | 885    | 1083          | NR            |
| 370    | 1111          | NR            | 500    | 21564         | NR            | 630    | 55189         | NR            | 760    | 4232          | NR            | 890    | 1127          | NR            |
| 375    | 1400          | NR            | 505    | 23751         | NR            | 635    | 54062         | NR            | 765    | 3663          | NR            | 895    | 1144          | NR            |
| 380    | 1360          | NR            | 510    | 25303         | NR            | 640    | 52304         | NR            | 770    | 3348          | NR            | 900    | 1167          | NR            |
| 385    | 1156          | NR            | 515    | 26615         | NR            | 645    | 50301         | NR            | 775    | 2859          | NR            | 905    | 1078          | NR            |
| 390    | 1201          | NR            | 520    | 28043         | NR            | 650    | 48008         | NR            | 780    | 2628          | NR            | 910    | 1246          | NR            |
| 395    | 1115          | NR            | 525    | 28969         | NR            | 655    | 45500         | NR            | 785    | 2352          | NR            | 915    | 1219          | NR            |
| 400    | 953           | NR            | 530    | 30127         | NR            | 660    | 42527         | NR            | 790    | 2172          | NR            | 920    | 941           | NR            |
| 405    | 814           | NR            | 535    | 31549         | NR            | 665    | 39145         | NR            | 795    | 1908          | NR            | 925    | 1132          | NR            |
| 410    | 755           | NR            | 540    | 32918         | NR            | 670    | 36112         | NR            | 800    | 1858          | NR            | 930    | 1076          | NR            |
| 415    | 915           | NR            | 545    | 34219         | NR            | 675    | 32740         | NR            | 805    | 1832          | NR            | 935    | 1285          | NR            |
| 420    | 1363          | NR            | 550    | 35624         | NR            | 680    | 29556         | NR            | 810    | 1648          | NR            | 940    | 1131          | NR            |
| 425    | 2118          | NR            | 555    | 36908         | NR            | 685    | 26682         | NR            | 815    | 1723          | NR            | 945    | 1200          | NR            |
| 430    | 3273          | NR            | 560    | 38001         | NR            | 690    | 23679         | NR            | 820    | 1549          | NR            | 950    | 1309          | NR            |
| 435    | 5028          | NR            | 565    | 39315         | NR            | 695    | 21005         | NR            | 825    | 1330          | NR            | 955    | 1517          | NR            |
| 440    | 8074          | NR            | 570    | 40713         | NR            | 700    | 18600         | NR            | 830    | 1388          | NR            | 960    | 1079          | NR            |
| 445    | 14325         | NR            | 575    | 41978         | NR            | 705    | 16437         | NR            | 835    | 1616          | NR            | 965    | 1117          | NR            |
| 450    | 23321         | NR            | 580    | 43289         | NR            | 710    | 14495         | NR            | 840    | 1375          | NR            | 970    | 1618          | NR            |
| 455    | 26653         | NR            | 585    | 45077         | NR            | 715    | 12890         | NR            | 845    | 1381          | NR            | 975    | 1214          | NR            |
| 460    | 21360         | NR            | 590    | 47036         | NR            | 720    | 11407         | NR            | 850    | 1451          | NR            | 980    | 1308          | NR            |
| 465    | 17172         | NR            | 595    | 48772         | NR            | 725    | 10022         | NR            | 855    | 1508          | NR            | 985    | 1082          | NR            |
| 470    | 15539         | NR            | 600    | 50601         | NR            | 730    | 8726          | NR            | 860    | 1391          | NR            | 990    | 1563          | NR            |
| 475    | 13714         | NR            | 605    | 52357         | NR            | 735    | 7674          | NR            | 865    | 1446          | NR            | 995    | 1194          | NR            |
| 480    | 13103         | NR            | 610    | 53915         | NR            | 740    | 6815          | NR            | 870    | 1157          | NR            | 1000   | 1844          | NR            |
| 485    | 14477         | NR            | 615    | 54990         | NR            | 745    | 6153          | NR            | 875    | 1251          | NR            |        |               |               |

REPORT NUMBER: SP1-2203-582-2

**Scotopic Flux vs. Wavelength**



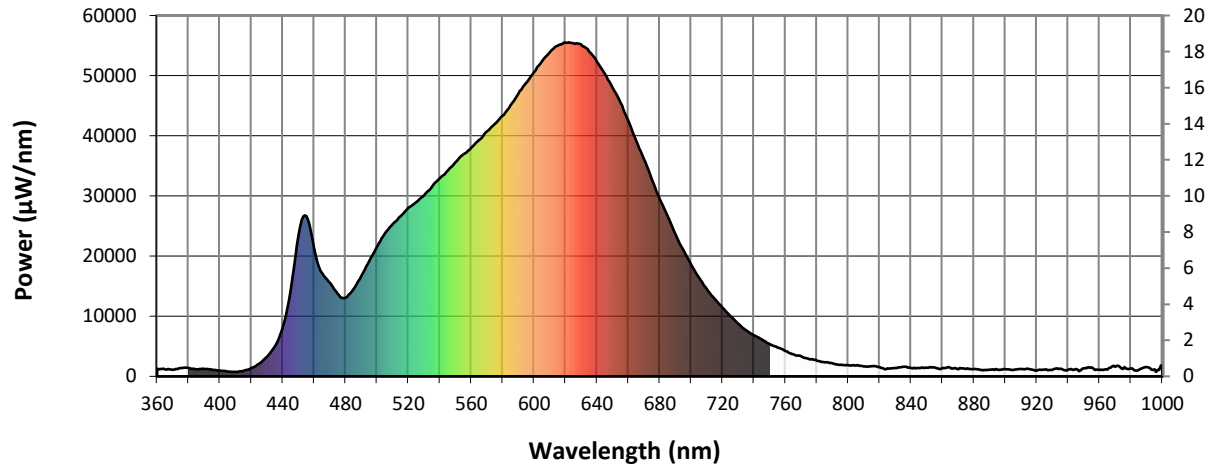
**Scotopic Lumens: 3917.4**

**S/P: 1.42**

| $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) |
|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|
| 360               | 1256                                 | NR                             | 490               | 16713                                | NR                             | 620               | 55488                                | NR                             | 750               | 5386                                 | NR                             | 880               | 1232                                 | NR                             |
| 365               | 1189                                 | NR                             | 495               | 19116                                | NR                             | 625               | 55411                                | NR                             | 755               | 4806                                 | NR                             | 885               | 1083                                 | NR                             |
| 370               | 1111                                 | NR                             | 500               | 21564                                | NR                             | 630               | 55189                                | NR                             | 760               | 4232                                 | NR                             | 890               | 1127                                 | NR                             |
| 375               | 1400                                 | NR                             | 505               | 23751                                | NR                             | 635               | 54062                                | NR                             | 765               | 3663                                 | NR                             | 895               | 1144                                 | NR                             |
| 380               | 1360                                 | NR                             | 510               | 25303                                | NR                             | 640               | 52304                                | NR                             | 770               | 3348                                 | NR                             | 900               | 1167                                 | NR                             |
| 385               | 1156                                 | NR                             | 515               | 26615                                | NR                             | 645               | 50301                                | NR                             | 775               | 2859                                 | NR                             | 905               | 1078                                 | NR                             |
| 390               | 1201                                 | NR                             | 520               | 28043                                | NR                             | 650               | 48008                                | NR                             | 780               | 2628                                 | NR                             | 910               | 1246                                 | NR                             |
| 395               | 1115                                 | NR                             | 525               | 28969                                | NR                             | 655               | 45500                                | NR                             | 785               | 2352                                 | NR                             | 915               | 1219                                 | NR                             |
| 400               | 953                                  | NR                             | 530               | 30127                                | NR                             | 660               | 42527                                | NR                             | 790               | 2172                                 | NR                             | 920               | 941                                  | NR                             |
| 405               | 814                                  | NR                             | 535               | 31549                                | NR                             | 665               | 39145                                | NR                             | 795               | 1908                                 | NR                             | 925               | 1132                                 | NR                             |
| 410               | 755                                  | NR                             | 540               | 32918                                | NR                             | 670               | 36112                                | NR                             | 800               | 1858                                 | NR                             | 930               | 1076                                 | NR                             |
| 415               | 915                                  | NR                             | 545               | 34219                                | NR                             | 675               | 32740                                | NR                             | 805               | 1832                                 | NR                             | 935               | 1285                                 | NR                             |
| 420               | 1363                                 | NR                             | 550               | 35624                                | NR                             | 680               | 29556                                | NR                             | 810               | 1648                                 | NR                             | 940               | 1131                                 | NR                             |
| 425               | 2118                                 | NR                             | 555               | 36908                                | NR                             | 685               | 26682                                | NR                             | 815               | 1723                                 | NR                             | 945               | 1200                                 | NR                             |
| 430               | 3273                                 | NR                             | 560               | 38001                                | NR                             | 690               | 23679                                | NR                             | 820               | 1549                                 | NR                             | 950               | 1309                                 | NR                             |
| 435               | 5028                                 | NR                             | 565               | 39315                                | NR                             | 695               | 21005                                | NR                             | 825               | 1330                                 | NR                             | 955               | 1517                                 | NR                             |
| 440               | 8074                                 | NR                             | 570               | 40713                                | NR                             | 700               | 18600                                | NR                             | 830               | 1388                                 | NR                             | 960               | 1079                                 | NR                             |
| 445               | 14325                                | NR                             | 575               | 41978                                | NR                             | 705               | 16437                                | NR                             | 835               | 1616                                 | NR                             | 965               | 1117                                 | NR                             |
| 450               | 23321                                | NR                             | 580               | 43289                                | NR                             | 710               | 14495                                | NR                             | 840               | 1375                                 | NR                             | 970               | 1618                                 | NR                             |
| 455               | 26653                                | NR                             | 585               | 45077                                | NR                             | 715               | 12890                                | NR                             | 845               | 1381                                 | NR                             | 975               | 1214                                 | NR                             |
| 460               | 21360                                | NR                             | 590               | 47036                                | NR                             | 720               | 11407                                | NR                             | 850               | 1451                                 | NR                             | 980               | 1308                                 | NR                             |
| 465               | 17172                                | NR                             | 595               | 48772                                | NR                             | 725               | 10022                                | NR                             | 855               | 1508                                 | NR                             | 985               | 1082                                 | NR                             |
| 470               | 15539                                | NR                             | 600               | 50601                                | NR                             | 730               | 8726                                 | NR                             | 860               | 1391                                 | NR                             | 990               | 1563                                 | NR                             |
| 475               | 13714                                | NR                             | 605               | 52357                                | NR                             | 735               | 7674                                 | NR                             | 865               | 1446                                 | NR                             | 995               | 1194                                 | NR                             |
| 480               | 13103                                | NR                             | 610               | 53915                                | NR                             | 740               | 6815                                 | NR                             | 870               | 1157                                 | NR                             | 1000              | 1844                                 | NR                             |
| 485               | 14477                                | NR                             | 615               | 54990                                | NR                             | 745               | 6153                                 | NR                             | 875               | 1251                                 | NR                             |                   |                                      |                                |

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**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 1507.9 S/P: 0.55**

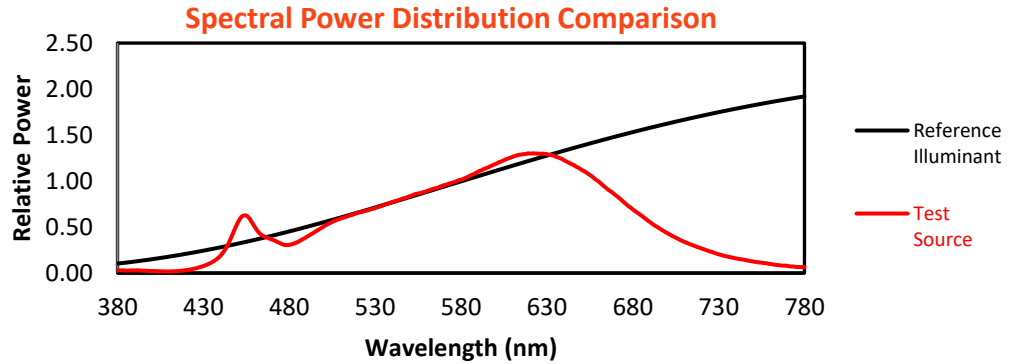
| λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) |
|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|
| 360    | 1256          | NR            | 490    | 16713         | NR            | 620    | 55488         | NR            | 750    | 5386          | NR            | 880    | 1232          | NR            |
| 365    | 1189          | NR            | 495    | 19116         | NR            | 625    | 55411         | NR            | 755    | 4806          | NR            | 885    | 1083          | NR            |
| 370    | 1111          | NR            | 500    | 21564         | NR            | 630    | 55189         | NR            | 760    | 4232          | NR            | 890    | 1127          | NR            |
| 375    | 1400          | NR            | 505    | 23751         | NR            | 635    | 54062         | NR            | 765    | 3663          | NR            | 895    | 1144          | NR            |
| 380    | 1360          | NR            | 510    | 25303         | NR            | 640    | 52304         | NR            | 770    | 3348          | NR            | 900    | 1167          | NR            |
| 385    | 1156          | NR            | 515    | 26615         | NR            | 645    | 50301         | NR            | 775    | 2859          | NR            | 905    | 1078          | NR            |
| 390    | 1201          | NR            | 520    | 28043         | NR            | 650    | 48008         | NR            | 780    | 2628          | NR            | 910    | 1246          | NR            |
| 395    | 1115          | NR            | 525    | 28969         | NR            | 655    | 45500         | NR            | 785    | 2352          | NR            | 915    | 1219          | NR            |
| 400    | 953           | NR            | 530    | 30127         | NR            | 660    | 42527         | NR            | 790    | 2172          | NR            | 920    | 941           | NR            |
| 405    | 814           | NR            | 535    | 31549         | NR            | 665    | 39145         | NR            | 795    | 1908          | NR            | 925    | 1132          | NR            |
| 410    | 755           | NR            | 540    | 32918         | NR            | 670    | 36112         | NR            | 800    | 1858          | NR            | 930    | 1076          | NR            |
| 415    | 915           | NR            | 545    | 34219         | NR            | 675    | 32740         | NR            | 805    | 1832          | NR            | 935    | 1285          | NR            |
| 420    | 1363          | NR            | 550    | 35624         | NR            | 680    | 29556         | NR            | 810    | 1648          | NR            | 940    | 1131          | NR            |
| 425    | 2118          | NR            | 555    | 36908         | NR            | 685    | 26682         | NR            | 815    | 1723          | NR            | 945    | 1200          | NR            |
| 430    | 3273          | NR            | 560    | 38001         | NR            | 690    | 23679         | NR            | 820    | 1549          | NR            | 950    | 1309          | NR            |
| 435    | 5028          | NR            | 565    | 39315         | NR            | 695    | 21005         | NR            | 825    | 1330          | NR            | 955    | 1517          | NR            |
| 440    | 8074          | NR            | 570    | 40713         | NR            | 700    | 18600         | NR            | 830    | 1388          | NR            | 960    | 1079          | NR            |
| 445    | 14325         | NR            | 575    | 41978         | NR            | 705    | 16437         | NR            | 835    | 1616          | NR            | 965    | 1117          | NR            |
| 450    | 23321         | NR            | 580    | 43289         | NR            | 710    | 14495         | NR            | 840    | 1375          | NR            | 970    | 1618          | NR            |
| 455    | 26653         | NR            | 585    | 45077         | NR            | 715    | 12890         | NR            | 845    | 1381          | NR            | 975    | 1214          | NR            |
| 460    | 21360         | NR            | 590    | 47036         | NR            | 720    | 11407         | NR            | 850    | 1451          | NR            | 980    | 1308          | NR            |
| 465    | 17172         | NR            | 595    | 48772         | NR            | 725    | 10022         | NR            | 855    | 1508          | NR            | 985    | 1082          | NR            |
| 470    | 15539         | NR            | 600    | 50601         | NR            | 730    | 8726          | NR            | 860    | 1391          | NR            | 990    | 1563          | NR            |
| 475    | 13714         | NR            | 605    | 52357         | NR            | 735    | 7674          | NR            | 865    | 1446          | NR            | 995    | 1194          | NR            |
| 480    | 13103         | NR            | 610    | 53915         | NR            | 740    | 6815          | NR            | 870    | 1157          | NR            | 1000   | 1844          | NR            |
| 485    | 14477         | NR            | 615    | 54990         | NR            | 745    | 6153          | NR            | 875    | 1251          | NR            |        |               |               |

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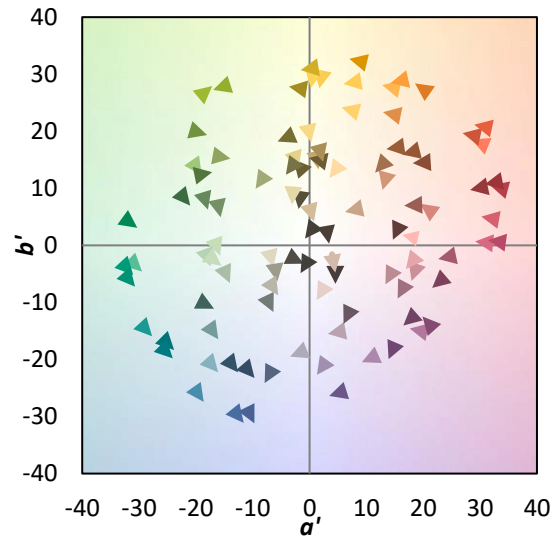
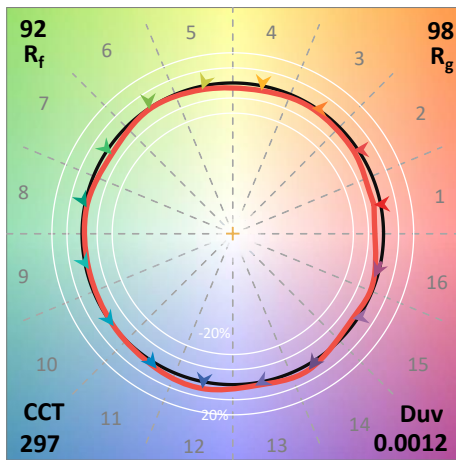
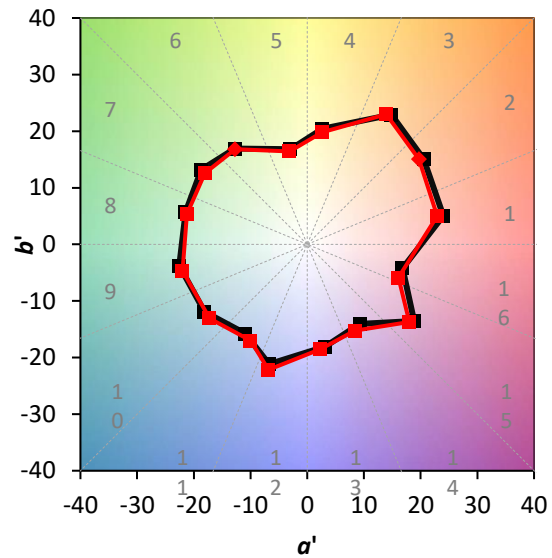
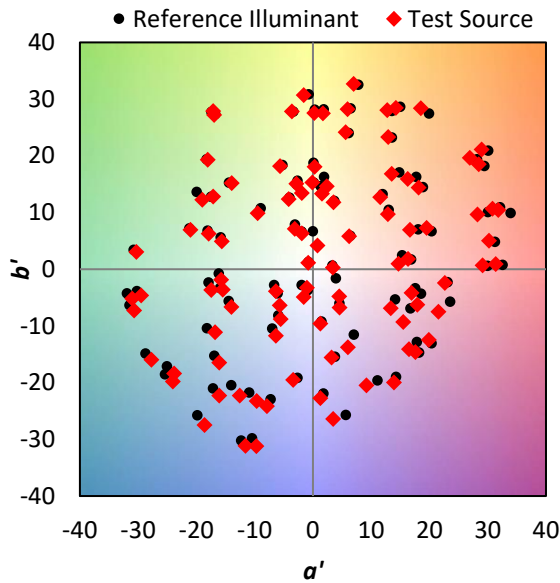
TM-30-18

**Summary**

$R_f = 92.3$   
 $R_g = 97.8$   
 CIE  $R_a = 93.8$   
 $R_9 = 64.0$



**Color Vector Graphics**



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 96 | CES51 = 95 | CES76 = 92 |
| CES02 = 63 | CES27 = 91 | CES52 = 98 | CES77 = 90 |
| CES03 = 32 | CES28 = 98 | CES53 = 96 | CES78 = 90 |
| CES04 = 70 | CES29 = 95 | CES54 = 92 | CES79 = 94 |
| CES05 = 51 | CES30 = 89 | CES55 = 91 | CES80 = 93 |
| CES06 = 51 | CES31 = 96 | CES56 = 93 | CES81 = 84 |
| CES07 = 43 | CES32 = 94 | CES57 = 91 | CES82 = 97 |
| CES08 = 42 | CES33 = 95 | CES58 = 92 | CES83 = 96 |
| CES09 = 29 | CES34 = 98 | CES59 = 97 | CES84 = 95 |
| CES10 = 76 | CES35 = 98 | CES60 = 93 | CES85 = 83 |
| CES11 = 59 | CES36 = 82 | CES61 = 93 | CES86 = 85 |
| CES12 = 65 | CES37 = 97 | CES62 = 86 | CES87 = 93 |
| CES13 = 44 | CES38 = 85 | CES63 = 93 | CES88 = 96 |
| CES14 = 74 | CES39 = 98 | CES64 = 90 | CES89 = 87 |
| CES15 = 72 | CES40 = 98 | CES65 = 90 | CES90 = 94 |
| CES16 = 48 | CES41 = 95 | CES66 = 88 | CES91 = 78 |
| CES17 = 50 | CES42 = 98 | CES67 = 88 | CES92 = 81 |
| CES18 = 57 | CES43 = 98 | CES68 = 90 | CES93 = 88 |
| CES19 = 72 | CES44 = 99 | CES69 = 91 | CES94 = 82 |
| CES20 = 67 | CES45 = 99 | CES70 = 89 | CES95 = 86 |
| CES21 = 86 | CES46 = 97 | CES71 = 85 | CES96 = 93 |
| CES22 = 79 | CES47 = 93 | CES72 = 95 | CES97 = 97 |
| CES23 = 92 | CES48 = 89 | CES73 = 86 | CES98 = 94 |
| CES24 = 91 | CES49 = 98 | CES74 = 91 | CES99 = 91 |
| CES25 = 72 | CES50 = 96 | CES75 = 87 |            |

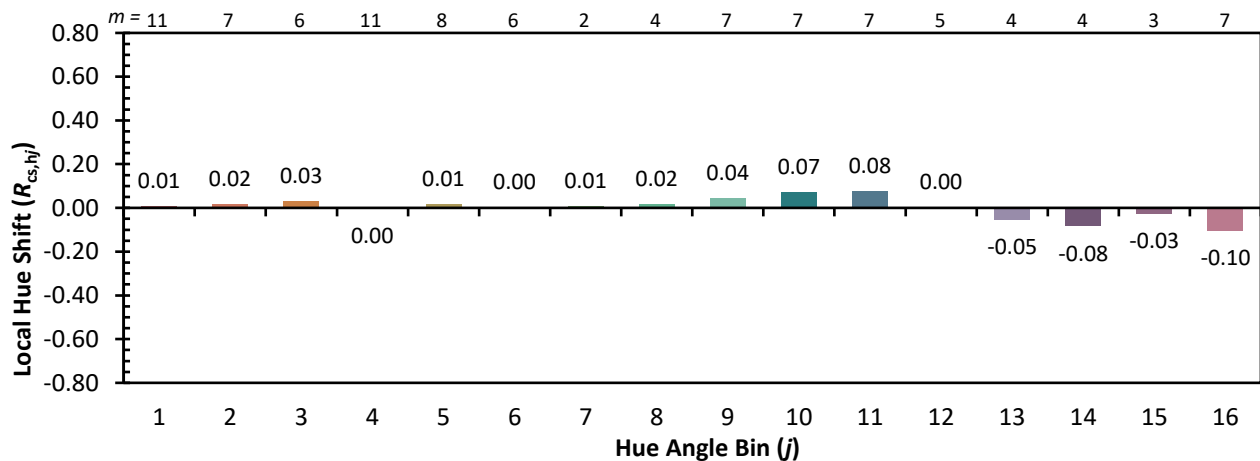




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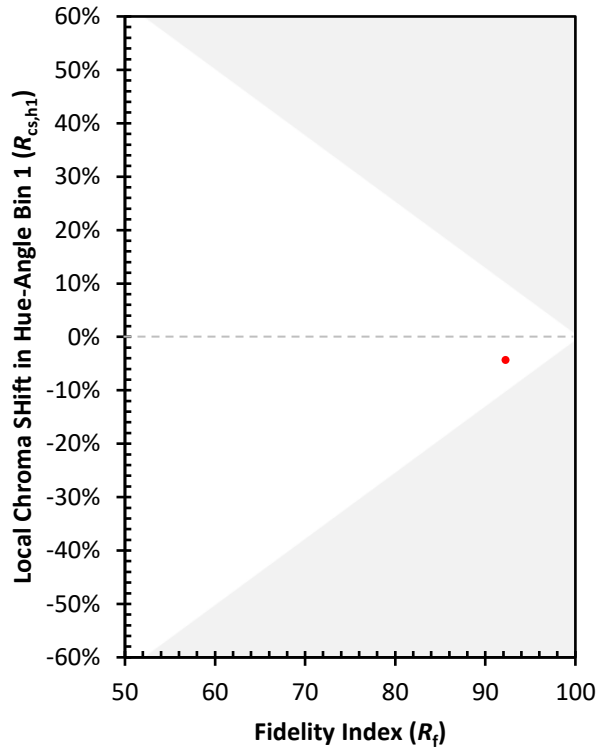
Color Rendition by Hue-Angle Bin



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Measure Comparisons



(END OF REPORT)